Evolugen

Evolugen South March BESS Owner's Engineering Services
Ottawa, ON

Review of requirements in Appendix 11

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1. Introduction

Fitzroy BESS Inc., a subsidiary of Evolugen by Brookfield Renewable (Brookfield) in partnership with the Algonquins of Pikwàkanagàn, is proposing to develop the South March Battery Energy Storage System (BESS) Project (the Project). The Project will be in the West Carleton-March Ward in the City of Ottawa, Ontario. The Project is located on two leased parcels of land at 2555 and 2625 Marchurst Road, Ottawa, Ontario, and situated south of Thomas A. Dolan Parkway, west of Marchurst Road, and north of John Aselford Drive. The Project has a Development Area of approximately 9.0 hectares on approximately 84.5 hectares of property. The leased rural lots currently include two residential buildings with an access lane, naturalized areas with woodland and wetland, as well as limited noncommercial pasture use.

The Project is a 250-megawatt (MW) energy storage facility that uses lithium ion (lithium iron phosphate) technology and is designed to store up to 1,000 megawatt hours of energy, providing four hours of continuous discharge at full capacity.

The Project will consist of 256 BESS containers at the start of commercial operations and will progressively increase to 307 BESS containers over the duration of the IESO Offtake Agreement. The additional BESS containers will be added through the augmentation process to maintain the required 250 MW capacity. This process is further detailed within the Augmentation Process Memo.

This report considers the full Augmentation Process (total of 307 BESS containers). Its findings and conclusions are not affected by any stage of augmentation, from 256 to 307 BESS containers.

2. Objective

The intent of this review is to assess Appendix 11 of the City of Ottawa Sewer Design Guidelines, received on March 6, to determine if any of the geotechnical or hydrogeological requirements set out in the appendix are applicable to, or may affect, the proposed project.

3. Appendix 11 summary

Appendix 11 defines the minimum geotechnical and hydrogeological investigation requirements to support the review, approval, design, construction, and long-term operation of stormwater management (SWM) facilities subject to approval, assumption, or regulatory oversight by the City

of Ottawa under the Planning Act and related municipal processes. The guideline is intended to ensure that subsurface conditions, groundwater regimes, and potential interactions with surrounding infrastructure, water resources, and sensitive receptors are adequately characterized to demonstrate technical feasibility and minimize risks to public safety, property, and the natural environment. It establishes a consistent and defensible framework for technical pre-consultation, investigation, monitoring, liner assessment, and reporting to support municipal decision-making and confirm compliance with City standards and provincial best practices.

4. Available reports for Hydrogeology and Geotechnical

The following information was provided to BBA for the design of the project:

- Fluvial Geomorphology Assessment (H375035-0000-2B0-066-0001) of November 26, 2025;
- Preliminary Geotechnical Investigation (H375142-0000-2A0-230-0001) of November 6, 2025;
- Hydrogeological and terrain analysis study (H375142-0000-2A4-030-0001) of April 20, 2026.

5. Wet pond design and consideration

The wet pond has been designed in accordance with standard engineering practices and with careful consideration of the site conditions identified in the available fluvial and geotechnical investigations. The fluvial and geotechnical reports provided sufficient information regarding soil stratigraphy, groundwater observations, and surface water conditions to allow for the development of a robust and constructible design. Based on a professional review of these reports, it was determined that no additional investigations were required to confirm the overall feasibility and intended function of the proposed wet pond.

During the design phase, the precise elevation of the groundwater table could not be conclusively established due to observed variability and limited temporal groundwater data. However, groundwater was observed at or near the existing ground surface during several site visits. In the absence of a clearly defined long-term groundwater elevation, a conservative design approach was adopted, whereby the groundwater table was assumed to be at ground level. This assumption represents a worst-case hydraulic condition and was accepted by the client as an appropriate and prudent basis for design.

By adopting a conservative groundwater elevation, the design explicitly accounts for maximum potential uplift pressures beneath the wet pond. This approach ensures the wet pond remains stable and functional under adverse groundwater conditions, including seasonal high

groundwater events. The soil characteristics and groundwater conditions were therefore treated as governing constraints during the design process, and all relevant design measures were developed accordingly.

The wet pond is lined with an impermeable membrane to maintain design water levels, prevent uncontrolled seepage, and protect surrounding soils. Under high groundwater conditions, impermeable liners are susceptible to uplift forces resulting from hydrostatic pressure acting beneath the membrane. If not adequately addressed, such uplift forces could lead to membrane deformation, loss of contact with subgrade materials, or reduced long-term performance of the pond.

To mitigate this risk, a ground improvement and ballast system was incorporated beneath the wet pond footprint. Specifically, a 1.5 m thick layer of impermeable material with an assumed density of 2000 kg/m³ was provided below the pond. This layer was selected to act as a counterweight to the buoyant forces generated under the conservative groundwater assumption. The thickness and density of this material provide sufficient downward force to resist uplift pressures and ensure an acceptable factor of safety against flotation of the membrane system.

The inclusion of this impermeable ballast layer ensures that upward hydraulic forces are effectively counteracted, thereby maintaining liner stability under all anticipated groundwater conditions. This design measure minimizes the risk of liner displacement, damage, or performance degradation and contributes to the long-term durability and reliability of the wet pond. The selected material and configuration are compatible with construction practices and do not adversely affect the hydraulic or environmental performance of the facility.

6. Conclusion

At the time the wet pond was designed, Appendix 11 of the Ottawa Sewer Design Guidelines had not yet been issued and was therefore not available to inform the scope of investigations. The design was instead completed based on the fluvial and geotechnical information available at that time, supplemented by site observations and conservative engineering judgment. Based on this information, the extent of investigations undertaken was deemed sufficient to characterize site conditions relevant to the proposed wet pond and to address key design considerations, including soil conditions, groundwater presence, and uplift risk. While Appendix 11 outlines expanded investigation requirements, it is our professional opinion that not all these requirements were necessary, from a fluvial and geotechnical standpoint, to complete an adequate and reliable design for this site. The adopted design approach appropriately reflects site conditions and project risk.