Trail Road BESS
BESS Decommissioning and Site Restoration Plan

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Executive Summary

This document outlines the Decommissioning and Site Restoration Plan for the Trail Road Battery Energy Storage System (BESS) project, located at 4186 William McEwen Dr, Richmond, ON, Canada. The purpose of this plan is to provide a framework for the safe and systematic removal of all project components at the end of the facility's operational life, anticipated to be approximately 25 years. The plan details the procedures for decommissioning the BESS units, power conversion systems, the private transmission line, and all associated infrastructure. It also addresses the responsible management of waste materials, including the recycling and disposal of battery components, transformer oil, and glycol coolant. The ultimate objective is to restore the site to a condition that is as close to its original state as possible, in full compliance with all local, provincial, and federal regulations in effect at the time of decommissioning. This document is intended as a guiding framework, to be updated with specific details and regulatory requirements closer to the time of decommissioning.

1.0 Project Overview & Objectives

The Trail Road BESS project is a large-scale energy storage facility located in Richmond, Ontario. The facility is designed to provide 600 MWh of storage capacity and deliver 150 MWac at the Point of Interconnection (POI).

1.1 Project Components

The project infrastructure includes:

- **Energy Storage:** 156 Sungrow ST5015UX-4H-US Battery Units. Each unit is a 5 MWh liquid-cooled Lithium Iron Phosphate (LFP) system housed in a 20-ft container.
- **Power Conversion:** 39 Sungrow MVS5140-LS-US MV Skids (MVT), each with a 5140 kVA, 34.5 kV oil-filled transformer and an integrated SCC for local control.
- **Transmission Line:** A 4.0 km private 230 kV overhead transmission line using steel monopoles, and the section of underground 230kV cable.
- **Substation & Switchyard:** A project substation with a Main Power Transformer, HVCB, disconnect switch, and associated equipment. A POI switchyard is also included with 1 HVCB, 2 HV disconnect switches, and 2 small control enclosures.
- **Ancillary Systems:** 20 EMS Controller Systems, underground MV and DC cabling in conduit, foundations for all major equipment, roadways, and a wet pond for stormwater management. The BESS area features a layer of washed gravel over an impermeable layer for step and touch protection and environmental containment.

1.2 Plan Objectives

The primary objectives of this Decommissioning and Site Restoration Plan are to:

1. Ensure the safe and controlled shutdown and de-energization of the entire BESS facility.
2. Provide a systematic procedure for the removal of all project-related equipment and infrastructure.
3. Establish protocols for the proper handling, transportation, and recycling or disposal of all waste materials, with a focus on hazardous substances.
4. Restore the project site to a condition that aligns with its surrounding landscape and original land use.

1.3 Definition of a Qualified Contractor

As decommissioning is scheduled approximately 25 years in the future, a specific contractor cannot be named at this time. However, a "qualified" decommissioning contractor will be defined by the following criteria:

- **Experience:** Proven experience in the electrical industry, specifically with the decommissioning of utility-scale energy projects or similar industrial sites.
- **Certifications:** Possesses all necessary licenses, certifications, and permits to operate in the Province of Ontario and the City of Ottawa.
- **Safety Record:** A documented track record of adhering to strict health and safety protocols and a low incident rate.
- **Expertise:** Demonstrates technical expertise in handling high-voltage equipment, hazardous materials (including battery cells and transformer oil), and complex logistical challenges.
- **Environmental Responsibility:** A commitment to environmentally sound practices, including partnerships with certified recyclers and waste management facilities.

2.0 Decommissioning Procedures & Site Restoration

The decommissioning process will be executed in a methodical, phased approach to ensure safety and efficiency.

2.1 System De-energization and Lockout/Tagout (LOTO)

The initial and most critical phase is the safe de-energization of the facility. This will involve:

- Issuing a formal system shutdown request to the Independent Electricity System Operator (IESO).
- Discharge all the BESS containers to a zero State of Charge
  Check all BESS Modules are de-energized as much as possible
- Opening all relevant circuit breakers, including the HVCB at the POI switchyard and the project substation.
- Opening all HV and MV disconnect switches.
- Following a strict Lockout/Tagout (LOTO) procedure on all HVCBs and disconnect switches to prevent accidental re-energization.

2.2 Equipment Removal

Once the site is de-energized, the removal of equipment will proceed in a logical sequence:

- **Transmission Line:** The 4.5 km private 230 kV overhead line will be dismantled, including the removal of conductors, insulators, and steel monopoles.

- **Switchyards & Substation:** Equipment from the POI switchyard and project substation, including transformers, HVCBs, disconnect switches, and control enclosures, will be removed. The MPT sump will be emptied and removed.
- **BESS Area:** The 156 Sungrow BESS containers and 39 MVT skids will be disconnected and prepared for transport. This includes draining the glycol coolant from the BESS containers. The underground MV and DC cables, as well as the conduit, will be excavated and removed.
- **Foundations:** The concrete foundations for the BESS containers, MVT skids, steel monopoles, and all other structures will be excavated and removed from the site and as required the associated holes will be backfilled with appropriate materials.

2.3 Site Restoration and Reclamation

- **Removal of Road and Ground Materials:** The rock used for roads and the washed gravel layer in the BESS and Substation/Switchyard areas will be excavated. This material will be transported to a local quarry for offsite storage and later sale. The underlying impermeable layer will also be removed and recycled or disposed of at an approved waste management facility.
- **Grading and Backfilling:** All excavated areas will be backfilled/regraded to enable the reuse of the land, such as it was before with native top soil used on top where the land will be used for grazing etc.
- **Revegetation:** The site will be prepared for natural revegetation to blend with the surrounding environment, in accordance with any City of Ottawa or provincial requirements in place at the time. The wet pond will be managed to ensure it remains a functional part of the local ecosystem.

2.4 Soil, Water, and Drainage Protections

During all decommissioning activities, specific measures will be employed to protect soil, surface water, and groundwater quality:

- Prior to any excavation, the site will be assessed for areas of known or suspected contamination. Soil or groundwater that exhibits evidence of contamination, or fails to meet applicable regulatory criteria, will be handled in accordance with procedures established by the Ontario Ministry of the Environment, Conservation and Parks (MECP).
- Temporary erosion and sediment controls (e.g., silt fencing, straw bales, berms) will be installed around active work areas and excavations, especially in proximity to the wet pond and drainage routes, to prevent runoff and sediment migration.
- Draining or removal of transformer oil, glycol coolant, and battery fluids will be carried out over impervious spill containment surfaces, with dedicated spill kits and absorbents on hand.
- If spills or product releases are detected, work will cease immediately in the affected area. Site-specific spill response and remediation activities—including soil or groundwater sampling, excavation, and off-site disposal of contaminated material—will be undertaken in line with MECP requirements.
- Stormwater management structures (including the wet pond) will be protected throughout decommissioning, and any changes in drainage patterns will be mitigated. The pond's integrity and ecological function will be maintained unless otherwise directed by environmental authorities.

3.0 Health and Safety Plan and Environmental Management

Safety is the highest priority throughout the decommissioning process. All work will be performed under a detailed Health and Safety Plan.

3.1 Identified Hazards

- **Electrical Hazards:** Risks associated with high-voltage (230 kV) equipment and stored energy within the BESS units.
- **Chemical Hazards:** Potential exposure to transformer oil, glycol coolant, and the chemical contents of the LFP battery cells.
- **Mechanical Hazards:** Crush and pinch point hazards from heavy machinery and the lifting of large equipment.
- **Fire Hazards:** A comprehensive fire prevention and suppression plan will be in place, particularly when handling batteries.

3.2 Safety Protocols

- All decommissioning staff will be required to wear appropriate Personal Protective Equipment (PPE), including insulated gloves (Class 0 per 29 CFR 1910.137) for high-voltage work.
- All work will be conducted by personnel trained and certified for the specific tasks, with a focus on LOTO procedures and hazardous materials handling.
- An emergency response plan will be developed and implemented in coordination with local emergency services.

3.3 Contingency and Emergency Response Planning

Robust contingency procedures will be established for any unexpected events during decommissioning. These include:

- **Spill/Release Response:** Immediate stoppage of work, containment, and cleanup using pre-positioned materials. All spills will be reported as required to regulatory bodies and local authorities, with documentation and post-incident soil/water sampling.
- **Discovery of Unknown Hazards:** If previously unidentified hazardous materials, waste, or underground structures are discovered, decommissioning activities in the affected area will be suspended pending risk assessment and regulatory guidance.
- **Archaeological or Cultural Finds:** Should archaeological artifacts or human remains be encountered, all work will halt in the vicinity, and appropriate authorities (e.g., the Ministry of Heritage, Sport, Tourism and Culture Industries) will be notified and protocols followed.
- **Wildlife and Endangered Species:** The presence of protected or endangered species—discovered during decommissioning—will trigger notification to the appropriate environmental agencies and adjustments to decommissioning activities as per legal requirements.
- **Incident Reporting:** All environmental or health/safety incidents will be documented, reported to the relevant agencies, and subject to root cause review and corrective actions before work resumes.

3.4 Labor, Skills, and Training Requirements

The decommissioning and site restoration process will involve a multidisciplinary workforce, including:

- **Electrical Trades:** Licensed electricians and high-voltage technicians experienced with BESS, substations, and transmission assets.

- **Heavy Equipment Operators:** Skilled personnel for excavation, removal of foundations, grading, and transportation.
- **Environmental Technicians:** Specialists in hazardous materials handling, soil/water sampling, and waste management.
- **General Laborers:** Workers to assist with dismantling, materials segregation, and site cleanup.
- **Project Management/Supervision:** On-site supervisors and safety officers responsible for compliance with this plan, site safety, documentation, and quality control.

At each phase of decommissioning:

- **Workforce Scale:** It is anticipated that between 20–50 workers may be required on site during peak decommissioning activities, with crew sizes varying based on the phase and concurrent operations.
- **Subcontracting:** Experienced contractors will be engaged for specific tasks such as battery removal, transformer draining, and environmental monitoring.

Training and Pre-Job Safety

- All personnel will be required to provide proof of training/certification relevant to their role, including but not limited to: high-voltage safety, hazardous materials handling, first aid, and spill response.
- Job-specific safety orientations and toolbox talks will be held prior to the start of each major decommissioning phase and daily as part of work briefings, with emphasis on site-specific hazards and emergency procedures.
- Specialized training and refresher courses will be provided as required for evolving decommissioning and restoration tasks, particularly as related to BESS technologies.

4.0 Waste and Materials Management

Responsible and compliant waste management is a key component of this plan.

4.1 Waste Segregation

All removed materials will be segregated into separate streams:

- **Recyclable:** Battery cells, transformer oil, steel, copper, aluminum, and other metals.
- **Hazardous Waste:** Transformer oil, BESS glycol coolant, and any other identified hazardous substances.
- **Non-Hazardous Waste:** Non-recyclable plastics, insulation, and other general waste.
- **Reusable Materials:** The rock material from roads and the BESS pad will be separated for off-site storage and later sale.

4.2 Recycling and Disposal

- **Batteries:** The LFP battery cells will be sent to a certified battery recycling facility. The chosen facility will be capable of processing LFP chemistry and will provide a certificate of recycling.

- **Fluids:** Transformer oil and BESS glycol coolant will be drained on-site by a qualified environmental contractor and transported to an approved facility for proper disposal or recycling in accordance with all applicable provincial and federal regulations.
- **Other Materials:** All other recyclable materials will be sent to appropriate processing facilities. Non-recyclable waste will be disposed of at an approved waste management facility.

4.3 Documentation and Record Keeping

Comprehensive documentation and record management will be maintained throughout all decommissioning and site restoration phases:

- Detailed waste manifests will be created for every load of material removed from the site, including hazardous waste shipments and recycling records. Copies of certificates of recycling/disposal will be retained.
- Pre- and post-decommissioning site photos will be taken from established vantage points, and a record of all site conditions—including erosion and sediment controls, spill responses, and restoration activities—will be compiled.
- All correspondence, permits, monitoring reports, and incident logs will be filed for regulatory review.
- At project closeout, a final decommissioning and restoration summary report—complete with supporting documentation—will be submitted to the City of Ottawa, MECP, and other relevant authorities.

5.0 Schedule & Regulatory Compliance

This is a conceptual timeline and will be refined closer to the time of decommissioning with specific project schedule details.

Phase 1: Planning and Permitting (Months 1-3)

- Engage a qualified decommissioning contractor (as per Section 1.3).
- Update this plan to reflect final project details, current regulations, and contractor-specific procedures.
- Secure all necessary permits and approvals from the City of Ottawa and the Province of Ontario.

Phase 2: System Shutdown and Component Removal (Months 4-8)

- Execute the LOTO and de-energization procedures.
- Remove the transmission line, switchyard, and substation equipment.
- Remove BESS containers, MVT skids, and ancillary equipment.

Phase 3: Site Restoration and Final Reporting (Months 9-12)

- Excavate and remove all foundations and underground infrastructure.
- Remove and transport the rock and impermeable layer.
- Re-grade and prepare the site for revegetation.
- Submit a final report to the City of Ottawa confirming the completion of all decommissioning activities and the full restoration of the site.

6.0 Regulatory Compliance

This plan is a proactive framework. It assumes that specific City of Ottawa bylaws and provincial regulations regarding BESS decommissioning do not currently exist. However, the plan is fundamentally committed to full compliance with all relevant regulations in effect at the time of decommissioning. The final plan will be updated to address all requirements from regulatory bodies, including but not limited to the Ontario Ministry of the Environment, Conservation and Parks (MECP), the Ministry of Labour, and the City of Ottawa Planning and Building departments.