

Lily Lake Storage Project — Preliminary Emergency Response Plan (ERP)

Location: 277 Lily Lake Rd, Selwyn, Ontario

Prepared by: Nexus Energy

Proponent: 16656048 Canada Inc.

Energy Capacity: 80 MWh AC

Technology: Battery Energy Storage Project

Disclaimer

This is a draft version submitted to support Municipal Support Resolution. The final version will be provided during the Development stage.

This Emergency Response Plan (ERP) is a controlled document. Printed copies are uncontrolled. Ensure you are using the latest approved version.

This ERP is intended for planning and training; operational decisions remain with the Incident Commander and Unified Command based on conditions at the time of the incident.

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Disclaimer

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1. Introduction

Nexus Energy, on behalf of 16656048 Canada Inc., is developing an 10MW/80MWh BESS project at 277 Lily Lake Rd, Selwyn. The intent of this Emergency Response Plan (ERP) is to provide a high-level view of the procedures and responsibilities to be followed in the event of an emergency at the 80 MWh Lithium-Ion Battery Energy Storage System (BESS) located within the Township of Selwyn, Ontario. The ERP will be revised, as necessary, throughout the design, permitting, construction and operation phases in consultation with the Township and the Selwyn Fire Department. The ERP is designed to protect human life, minimize property damage, and mitigate environmental impacts that may arise from incidents or other site-specific emergencies. The plan also outlines communication and coordination procedures between on-site personnel, first responders, regulatory authorities, and the project owner. The Plan provides a context-based guide for managing incidents at the Lily Lake Storage Project.

The purpose of this Emergency Response Plan is to define clear lines of communication, roles, and actions for effective emergency management. It applies to all employees, contractors, and visitors present on-site during both operational and maintenance periods. This plan complements existing safety management systems and has been prepared in accordance with applicable Ontario legislation and industry best practices.

2. Regulatory & Standards Framework

This plan references NFPA 855 (installation of stationary energy storage systems), NFPA 72 (fire alarm and signaling), and NFPA 68/69 (deflagration venting and explosion prevention). It aligns with Ontario Fire Code requirements, the Electrical Safety Authority (ESA) under the Ontario Electrical Safety Code, and Hydro One's BESS Fire Protection Risk & Response Assessment Standard (2023). Initial isolation benchmarks for lithium-ion battery incidents are informed by the Emergency Response Guidebook (ERG), Guide 147.

3. Facility Description

The proposed Lily Lake Storage Project (the "Project") will comprise of approximately 20 to 22 containerized battery enclosures arranged in rows, served by ten (10) power conversion systems (PCS), with transformers and switchgear. The site is secured by perimeter fencing with gated access, access roads, and a designated laydown/muster area near the main gate. There are no hydrants onsite; extended operations rely on rural water shuttle or well. Setbacks from wetlands, roads, and neighbouring residences meet the planning criteria illustrated on the site plan.



Figure 1 — Site plan (concept). Final stamped drawings to be appended at IFC stage.

4. Technology and Safety Features

The technology currently under consideration for the Project is the CALB C173F5016 containerized BESS system utilizing Lithium Ion Ferro-phosphate (LiFePO₄) based cells. This is subject to change as design and procurement progresses.

4.1 Battery System Architecture

Each CALB C173F5016 container houses two energy storage banks built from liquid-cooled packs and high-voltage racks. The architecture, voltages, and protective functions are summarized below for responder awareness and technical coordination with OEM support.

Item	Parameter	Notes
Cell Model	L173F314 (LFP)	UN38.3 / IEC 62619 / UL 1642 / UL 1973 / UL 9540A

Pack Configuration	1P104S	Approx. 104.5 kWh; 332.8 V nominal; 291.2–369.2 V range
Rack Configuration	1P416S (4 packs)	≈ 417.996 kWh; 1331.2 V nominal; 1164.8–1476.8 V range
Container Configuration	12 racks (12P416S)	Two banks per container; non-walk-in 20-ft enclosure
Nominal Container Voltage	≈ 1331.2 Vdc	Short-circuit protections coordinated at pack/rack/bank
Cycle Life / Service Life	≥ 6000 cycles @ 80% SOH / 20 years	Per CALB spec

Battery management employs a three-level hierarchy: BMUs on packs collect cell voltage/temperature; BCUs at each rack execute protection (over/under-voltage, over-current/short-circuit, insulation/leakage) and control contactors; the BAU aggregates data and interfaces with PCS/EMS for safe dispatch and alarms.

4.2 Thermal Management

A closed-loop liquid cooling system maintains cell temperature uniformity and extends life. The electrical compartment is cooled independently, and dehumidifiers control internal humidity to prevent condensation. Components are listed below for each container.

Component	Quantity per Container	Function
Liquid cooling plate	48 (one per pack)	Heat extraction at pack level
Chiller (battery loop)	1	Circulates coolant to packs
Air-conditioner (electrical bay)	1	Cools auxiliaries/controls
Dehumidifier	3	Humidity control to prevent condensation
Piping assembly	1 set	Supply/return interconnections

4.3 Fire Detection & Suppression (Container Level)

Each container integrates multi-criteria detection and dual-agent suppression. Aerosol modules provide rapid knockdown within the battery compartment when a confirmed fire condition is detected (coincident smoke + heat). A water piping header with three sprinklers offers supplemental cooling/suppression and connects to a DN65 fire department interface at the container front. A dedicated fire control host receives detector signals and executes programmable logic; it integrates via CAN/dry contact with BMS/EMS/PCS, annunciates “DO NOT ENTER” during agent discharge, and provides a graphic display for responders.

Component	Quantity per Container	Location / Notes
Smoke detectors	3	2 in battery compartment; 1 in electrical compartment
Heat detectors	3	2 in battery compartment; 1 in electrical compartment
Combustible gas detectors	2	Battery compartment; drives ventilation logic
Aerosol agent modules	7	Overhead above racks; rapid discharge
Water piping & sprinklers	1 set / 3 nozzles	Top of container; DN65 FDC at front
Fire control host/panel	1	Electrical compartment; CAN/dry contacts to BMS/EMS/PCS

4.4 Explosion Relief & Ventilation

Explosion control uses engineered deflagration relief panels and a pressure-relief plate to manage internal overpressure. Forced exhaust via explosion-proof fans and electric louvers purges off-gases per gas-detection logic. Vent/relief paths must remain unobstructed during operations.

Component	Quantity per Container	Notes
Deflagration panels	4	Directional relief per NFPA 68 principles
Pressure-relief plate	1	Opens at set pressure threshold

Explosion-proof fan	1	Outlet fan; linked to gas detection
Electric louver/intake	1	Admits make-up air during purge

5. Hazard Mitigation Analysis (HMA) Summary

The CALB system incorporates protective devices and coordinated fusing at multiple levels (pack, rack, bank) to interrupt fault energy, supported by BMS logic for over/under-voltage, over-current/short-circuit, insulation monitoring, and over-temperature. Deflagration relief and forced ventilation mitigate explosion hazards, while dual-agent suppression and liquid cooling limit thermal propagation risk.

6. Pre-Incident Planning

Unified Command will be established with Selwyn Fire Department upon arrival. The Owner/O&M Representative serves as initial Site IC until Unified Command is in place. First Responder Panel (FRP) and Emergency Stop (E-Stop) will be installed at the main gate kiosk/control panel, with a mirrored E-Stop at the head of the first container row to allow status access and shutdown from outside the hazard area. A designated muster point is proposed near the main access road. Final positions and drafting points will be confirmed during the pre-incident walk-through during development stage.

7. Emergency Management & Roles (Ontario IMS)

Response follows Ontario IMS. Command functions: Incident Commander, Safety Officer, Liaison Officer, Operations (Suppression/Exposure, Isolation/Shutdown, Air Monitoring, Water Supply), Planning (IAP, Tech Specialists, Air Modelling), Logistics (Rehab, Traffic, Equipment, Water Shuttle), and Finance/Admin (Costs, Claims). ICS-201/202/203/205A/208/214 forms will be used to document actions and resource assignments.

8. Notifications & External Coordination

Notification stakeholders

Emergency (Fire/Police/EMS): 911

Selwyn Fire Department (Admin): 705-292-7282 | fire@selwyntownship.ca

MECP Spills Action Centre (24/7): 1-800-268-6060 | 416-325-3000 (Toronto)

Electrical Safety Authority (ESA) — Incidents: 1-877-372-7233 (1-877-ESA-SAFE)

Hydro One — Power Outage & Emergency (24/7): 1-800-434-1235

Peterborough Regional Health Centre (Switchboard): 705-743-2121 | 1 Hospital Dr,
Peterborough, ON K9J 7C6
Nexus Energy: Project Manager

Coordination: Document all notifications with date/time, contact, and summary. Coordinate public information under Unified Command.

9. Site Control, Zones & Public Safety

Initial control zones are established using conservative benchmarks and refined with monitoring:

Hot Zone $\approx$ 25 m around container(s);
Warm Zone $\approx$ 100 m upwind for decon/staging;
Public Safety Perimeter up to $\approx$ 500 m for large fire scenarios (e.g., trailer/ISO container involvement).

Use thermal imaging and gas readings (LEL/H₂/THCs; HF screening as available) to adjust zones. Keep clear of deflagration panels and louver exhaust paths.

10. Scenario Procedures

A) Incipient Alarm (Smoke/Heat) — No visible fire:

- Verify container ID and alarm type via SCADA/BMS/FRP. Do not open container.
- Establish Unified Command; set zones; secure ingress/egress; prepare exposure cooling.
- If aerosol discharge is imminent/occurred, maintain non-entry; confirm status at FRP; monitor temperatures with TIC externally.

B) Confirmed Fire/Thermal Runaway:

- Do not force entry. Allow self-consumption control while protecting exposures.
- Apply water to cool adjacent containers, cable trays, structural elements as directed by IC; avoid foam inside containers.
- Maintain standoff from relief paths; continuous TIC and gas monitoring; prepare for long-duration operations and reignition.

C) Combustible Gas Alarm / Ventilation Activation:

- Treat as explosion hazard; eliminate ignition sources; verify ventilation status; monitor %LEL/H₂/THCs; consider HF downwind screening.

D) Severe Weather / Loss of Safety Power:

- Confirm detection/ventilation on UPS; if impaired, increase standoff and surveillance; inspect for obstructions to relief/vents after storms.

E) Medical/Decontamination:

- Potential exposures include smoke/combustion products and alkaline residues; provide gross decon; bag contaminated PPE; transport symptomatic patients to PRHC.

11. Water Supply Operations (No Hydrants)

- Rural tender shuttle to portable dump tanks placed upwind and outside the Warm Zone (≥ 100 m). Drafting points (primary/secondary) will be selected with Selwyn Fire Department, considering seasonal access and shoulder integrity. Typical planning assumptions: two 3000–4000 gal portable tanks in parallel with jet-siphon; tenders 2000–3000 gal on a fixed haul route. Sustainable flows set by the IC using heat flux/TIC observations.

12. Spatial Separation, Barriers & Vegetation

Maintain clearances to lot lines, public ways, buildings, combustibles, and egress consistent with NFPA 855 for outdoor ESS. Where spacing is constrained, apply AHJ-approved equivalencies. Maintain a 3 m vegetation-free buffer around BESS equipment and manage tree-fall risks.

13. Safe Shutdown & Re-Energization Controls

Emergency shutdown is executed via FRP/SCADA in coordination with BMS/PCS. Post-incident, remain de-energized until OEM inspection confirms no hidden damage, stranded energy is neutralized, and the AHJ authorizes restoration. Apply Lock Out/Tag Out (LOTO) to AC/DC sources per site procedures.

14. Air/Gas Dispersion & Protective Actions

When off-site impacts are possible, Planning develops an Air Monitoring Plan. Priority indicators: CO, CO₂, H₂, total hydrocarbons; consider HF screening. Use recognized health benchmarks (e.g., ERPGs) to determine public protective actions (shelter-in-place vs. evacuation) in consultation with Public Health and Unified Command.

15. Training & Exercises

Provide training to Selwyn Fire Department for following

- BESS hazards.
- FRP/E-Stop operation

- apparatus positioning
- water shuttle operations
- air monitoring
- post-incident hazards.

16. Documentation & Records

The owner plans to maintain following documentation and records

- Maintain training rosters
- drill IAPs and AARs
- system ITM logs (NFPA 72 / vendor guidance)
- OEM maintenance record
- RP revision history.

Appendix A

Emergency Contact Directory

Organization / Role	Phone / Details
Emergency (Fire/Police/EMS)	911
Selwyn Fire Department (Admin)	705-292-7282 fire@selwyntownship.ca
MECP Spills Action Centre (24/7)	1-800-268-6060 416-325-3000 (Toronto)
Electrical Safety Authority (ESA) — Incidents	1-877-372-7233 (1-877-ESA-SAFE)
Hydro One — Power Outage & Emergency (24/7)	1-800-434-1235
Peterborough Regional Health Centre (Switchboard)	705-743-2121 1 Hospital Dr, Peterborough, ON K9J 7C6
Nexus Energy — Duty Manager	TBD

Appendix B

Draft Site Plan



Appendix C

Preliminary ITM (Inspection, Testing and Maintenance) Checklists

Disclaimer

This ITM Checklist is a draft version assuming CALB BESS equipment. The final version will be completed during the development stage. This document is intended for the Municipality to support Municipal Support Resolution.

NFPA 855 and Ontario Fire Code require documented ITM programs for ESS installations. This section provides detailed inspection, testing, and maintenance tasks for critical safety systems at the Lily Lake Storage Project. These checklists align with NFPA 72, NFPA 855, and OEM guidance.

ITM Checklist Table

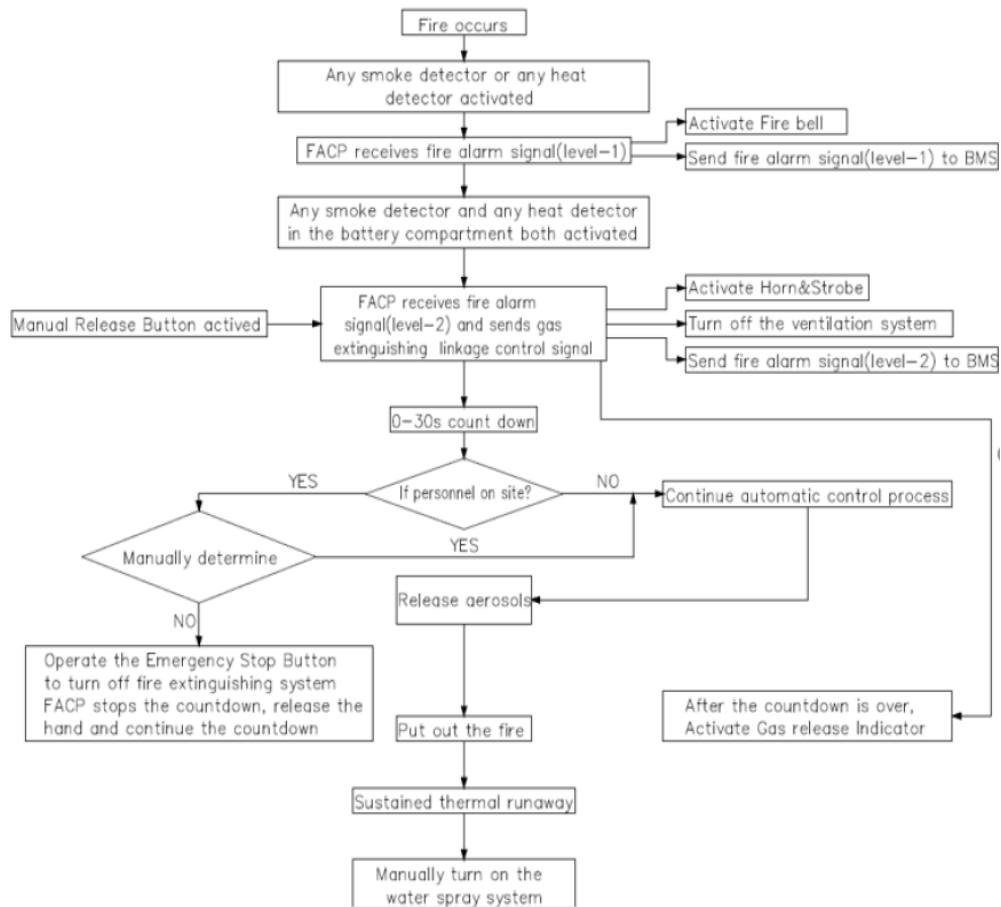
System	Task	Frequency	Standard Reference
Fire Detection (Smoke/Heat/Gas)	Functional test of all detectors; verify annunciation at FRP and SCADA	Monthly	NFPA 72, OEM
Fire Detection (Smoke/Heat/Gas)	Calibration and sensitivity check for gas detectors	Semi-Annual	NFPA 72, OEM
Fire Suppression (Aerosol)	Inspect aerosol modules for integrity and expiration date	Quarterly	NFPA 855, OEM
Fire Suppression (Water)	Flow test of sprinkler piping and DN65 fire department connection	Annual	NFPA 25, OEM
Ventilation & Explosion Relief	Verify operation of explosion-proof fans and louvers via gas detection logic	Monthly	NFPA 69, OEM
Ventilation & Explosion Relief	Inspect deflagration panels and pressure-relief plate for obstructions/damage	Quarterly	NFPA 68, OEM
Thermal Management	Check chiller operation, coolant level, and piping integrity	Monthly	OEM
Thermal Management	Inspect dehumidifiers and HVAC performance	Monthly	OEM
Electrical & Control Systems	Verify BMS/PCS/EMS communication health and alarm path	Monthly	NFPA 855, OEM
Electrical & Control Systems	Test UPS backup for safety systems	Quarterly	NFPA 111, OEM

Appendix D

Fire Suppression System

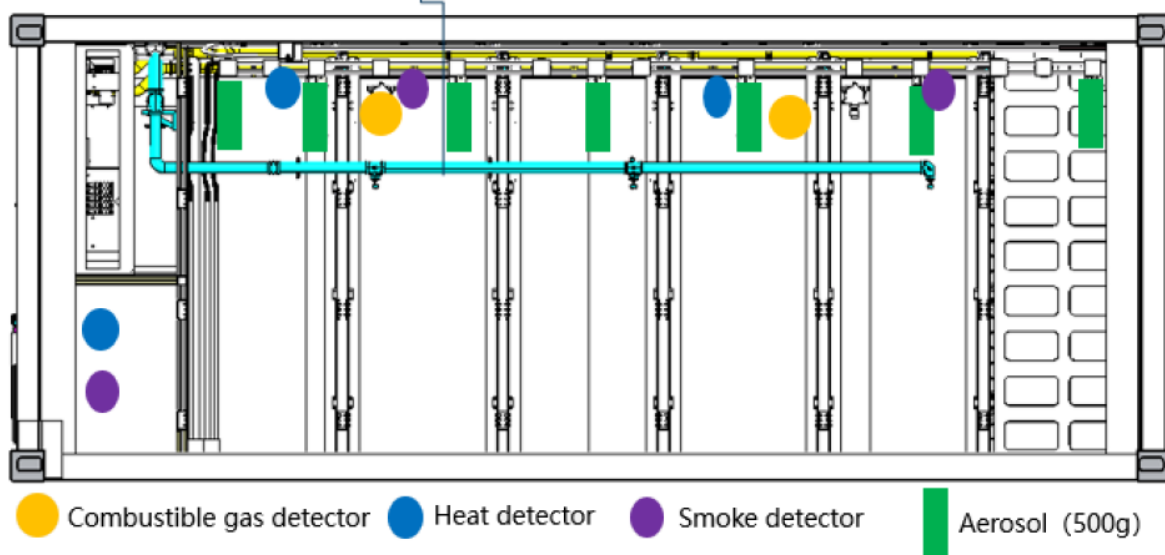
Disclaimer

This Fire Suppression System is a draft version assuming CALB BESS equipment. The final version will be completed during the development stage. This document is intended for the Municipality to support Municipal Support Resolution.



Fire Supporession System Control System

hydrant pipe



Fire Suppression System Layout

Appendix E

ICS 201 — Incident Briefing

Disclaimer

This ICS-201 Incident Briefing is a draft version. The final version will be completed after consultation with the Selwyn Fire Department and during the development stage. This document is intended for the Municipality to support Municipal Support Resolution.

1. Incident Name

Incident Name: Lily Lake BESS — Container Fire / Thermal Runaway

2. Incident Number

Incident Number: [Assign by Dispatch/Agency]

3. Date/Time

Date/Time Initiated: YYYY-MM-DD HH:MM (EDT)

Location: 277 Lily Lake Rd, Selwyn, Ontario

Map Reference: Lily Lake Storage Project Site (see Map)

4. Map



Map Notes (proposed for initial actions):

- Gate kiosk: First Responder Panel (FRP) & E-Stop (proposed).
- Muster Point: Laydown area near main access road (upwind if possible).
- Dump Tanks/Staging: Upwind, ≥ 100 m from involved container(s).

- Control Zones: Hot $\approx$ 25 m; Warm $\approx$ 100 m upwind; Public Safety up to $\approx$ 500 m (adjust with monitoring).

5. Situation Summary & Health and Safety Briefing

Situation Summary:

- Alarm received for smoke/heat in one CALB C173F5016 container (non-walk-in). Potential thermal runaway; aerosol activation possible/underway. No known injuries at this time. No hydrants on site. Exposures include adjacent BESS containers, PCS/transformers, cabling, and vegetation.

Health & Safety:

- Do NOT force entry to container. Maintain standoff from deflagration panels and vent paths. Use SCBA; monitor for flammable/toxic gases. Beware of re-ignition potential and energized conductors ($\approx$ 1331 Vdc container nominal). Designate safety officer; establish responder rehab and gross decon area upwind.

7. Current and Planned Objectives (Operational Period 0–6 hours)

- Life safety: account for all personnel; establish Unified Command and control zones.
- Size-up: identify involved container ID; verify status via FRP/SCADA; confirm aerosol/water suppression status.
- Fire control: allow controlled self-consumption; protect exposures; cool adjacent containers/cableways as directed by IC.
- Air monitoring: monitor %LEL/H₂/THCs; consider HF screening downwind; adjust zones accordingly.
- Water supply: establish rural shuttle with portable dump tanks upwind/outside Warm Zone.
- Notifications: 911, Selwyn Fire, MECP SAC, ESA, Hydro One, PRHC; internal Nexus duty roster.
- Incident stabilization: prepare for long-duration ops and re-ignition; secure scene for OEM/AHJ investigation.

8. Current and Planned Actions, Strategies, and Tactics

Initial Actions (first hour):

- Establish Unified Command; designate Safety/Liaison/Operations/Planning/Logistics.
- Confirm no entry to involved container; verify aerosol discharge state; TIC external walls/roof.
- Set Hot (25 m), Warm (100 m upwind), Public Safety (up to 500 m) per conditions.

- Position apparatus outside relief/vent paths; protect exposures; start water shuttle staging.
- Initiate air monitoring; control ignition sources; traffic control for Lily Lake Rd as needed.
- Begin notifications and documentation (ICS 214).
- Planned Actions (hours 1–6):
- Maintain exterior cooling as required; prevent propagation to adjacent containers.
- Continue monitoring for re-ignition; rotate crews through rehab; maintain SCBA discipline.
- Prepare for OEM/technical specialist arrival; collect container telemetry if available.
- Establish demobilization triggers (sustained temps down, stable gas readings, OEM clearance).

6. Current Organization

• Incident Commander (IC): [Selwyn Fire Captain/Acting IC] — Unified Command with Nexus Energy O&M

1. Safety Officer: [TBD]
2. Liaison Officer: [TBD]
3. Public Information (if assigned): [TBD]
4. Operations Section Chief: [Name] (Divisions: Fire/Exposure, Isolation/Shutdown, Water Supply, Air Monitoring)
5. Planning Section Chief: [Name] (Resources/Documentation/SitStat/Tech Specialist)
6. Logistics Section Chief: [Name] (Comms/Rehab/Facilities/Supply)
7. Finance/Admin Section Chief: [TBD]

10. Resource Summary

Resource	Identifier	Kind/Type	ETA	Location/Assignment	Status
Engine	E-1	Pumper	On-scene	Exposure protection / TIC	Assigned
Tanker/Tender	T-1	Water Tender	On-scene	Water shuttle	Assigned
Tanker/Tender	T-2	Water Tender	10 min	Water shuttle	En-route
Rescue	R-1	Rescue	On-scene	Accountability/Rehab/Decon	Assigned
Duty Officer	DO-Selwyn	Command	On-scene	Unified Command/IC	Assigned
Hydro Utility	Hydro One Rep	Liaison	30 min	Utility coordination	Requested
O&M Rep	Nexus Energy	Technical	On-scene	Site access/telemetry/FRP	Assigned

11. Communications (Summary)

- Command Net: [Frequency/Channel] — IC/Safety/Division Supervisors
- Ops/Tactical: [Frequency/Channel] — Fire/Exposure/Water Supply/Air Monitoring
- Liaison/Utility: [Phone/Channel] — Hydro One, ESA, MECP SAC
- Medical: PRHC Switchboard 705-743-2121; EMS via 911

12. Safety Message (Highlights)

- No entry to involved container. Maintain standoff from deflagration panels and vent paths.
- Full PPE with SCBA; monitor for flammable/toxic gases; consider HF screening downwind.
- Electrical hazard: treat container and adjacent equipment as energized until verified isolated.
- Establish Rehab and Gross Decon upwind; rotate crews; monitor for heat stress.

Prepared By

Name: Nexus Energy