10.0 SUMMARY AND CONCLUSIONS

Laurentian Energy Corporation (LEC) is proposing to dredge a navigation channel in Sydney Harbour, and construct and operate a marine container terminal facility in the Sydport Industrial Park, located in the Cape Breton Regional Municipality, Nova Scotia. The proposed marine terminal will be located in the Sydport Industrial Park (SIP) near Edwardsville, Cape Breton County, Nova Scotia.

Construction of the proposed marine container terminal facility will occur in two phases. Phase I will involve:

- dredging the channel that provides access to the South Arm to approximately 17 m;
- constructing a confined disposal facility (CDF) extending from the shore of the Sydport site that will serve as the marine footprint for the new terminal;
- potential construction of a smaller secondary CDF for excess dredge spoil east of the proposed terminal.
- dredging at the proposed terminal berth line to approximately 16.5 m;
- infilling the area within the CDF of approximately 72 ha with the dredge spoils;
- completion of a two berth, 800 m long section of wharf within the new terminal footprint including construction of container storage facilities and an on-dock Intermodal Container Transfer Facility (ICTF);
- construction of an access road; and
- minor extension of the existing Sydport on dock rail spur to connect to the Sydney-Truro rail line.

The throughput capacity for Phase I will be approximately 750,000 twenty foot equivalent unit (TEU's) per year. As Phase I nears its operating limits, the intention is to complete a second Phase (Phase II) and double terminal capacity by completing an additional two berths and 750-800 m of marginal wharf.

The detailed Project description is included as Section 2.0 of this report.

The Project requires federal and provincial environmental approvals including federal and provincial environmental assessments (EA). This report provides the basis for an Environmental Screening under the Canadian Environmental Assessment Act (CEAA) and satisfies the requirements for a Class I Registration under the Environmental Assessment Regulations of the Nova Scotia Environment Act. This EA Report describes and evaluates the potential environmental and socio-economic effects of the Project during all Project phases.

A detailed discussion of the key environmental regulatory requirements for the Project is included in Section 1.5 of this report.

A scoping process was undertaken to identify Valued Environmental Components (VECs) most appropriate for this assessment. This scoping included: regulator and stakeholder consultation; regulatory issues and guidelines; research; and professional judgment of the Study Team. The following VECs were selected for the assessment:

- Benthic Habitat Communities and Sediment Quality;

- Marine Fish and Water Quality;
- Marine Mammals and Marine-related Birds;
- Terrestrial Habitats and Wildlife;
- Atmospheric Environment;
- Land Use;
- Commercial Fisheries;
- Archaeological and Heritage Resources.

Each of the VECs selected for the assessment was evaluated for potential interactions between the VEC and Project activities during all project phases (*i.e.,* construction, operation, decommissioning and abandonment) as well as malfunctions or accidents that may occur. These interactions were evaluated for potential significance after application of technically and economically feasible mitigative measures, where appropriate, to reduce or eliminate potential adverse Project-related environmental effects. The potential for cumulative environmental effects from the Sydport Project in conjunction with other past, present and likely future projects and activities was also evaluated. Environmental monitoring and follow-up measures will be undertaken, where necessary, to ensure compliance with applicable regulations, standards, and guidelines, as well as to verify environmental effect predictions and refine mitigative measures where required.

A detailed discussion of issues scoping and environmental assessment methods are included in Section 5.0 of this report.

10.1 Mitigation, Follow-Up and Monitoring Summary

The Proponent has committed to constructing and operating a facility in which all aspects complies with relevant legislation, permit conditions and accepted good practice. They will be proactive in implementing procedures to prevent pollution and to continually improve environmental performance and, along with their contractors, will manage environmental issues as a priority. Through this environmental assessment, various measures have been identified that will ensure that the potential environmental effects of this Project are managed to an acceptable level to allow the Project to provide long-term, sustainable economic benefits for the residents of Sydney and Nova Scotia.

Some of these measures are inherent in the Project design and represent standard practices for marine dredging operations and the construction and operation of marine terminals. While these measures may not be specifically related to a particular VEC, they are nonetheless important in demonstrating the Proponent's commitment to identifying and managing potentially adverse environmental effects. These environmental design features are described in detail in Section 2.12 of this assessment report and summarized in Table 10.1. Through the development of the Environmental Protection Plan (EPP) and other Project management plans, many of these generalized commitments will be developed into site-specific instructions to contractors and employees. Others will simply be incorporated into the final Project design.

TABLE 10.1 Summary of Project Environmental Design Features

Project Component	Environmental Design Feature
General Design/Equipment Features	▪ Development of Project on currently underutilized lands zoned specifically for marine terminal development. ▪ Cold dock/electric plug-ins will reduce emissions from ship hotelling and other equipment (*e.g.,* refrigeration). ▪ Trailing Suction Hopper Dredge (TSHD) is the state-of-the-art dredging method and will minimize overdredging, reduce turbidity, and limit resuspension of sediments. ▪ Confined Disposal Facilities (CDF) will be designed to prevent re-entry of sediments to marine environment. ▪ Terminal lighting will be designed to minimize light pollution. ▪ Set-backs and landscaping buffers will be put in place for area residents to create a more aesthetically pleasing viewshed where feasible. ▪ At the request of local residents, normal access to the site will not be via Hospital Road. Entrance to the site from Hospital Road will be only required under emergency situations.
Safety and Accident Prevention	▪ All required permits from regulatory agencies will be obtained prior to the start of any construction. ▪ Emergency response and contingency plans (*e.g.,* for spills, fires) will be developed and reviewed by the responsible government agencies. ▪ All site activities will be conducted in full compliance with occupational health and safety requirements.
Noise Mitigation	▪ The use of a cold dock, electric cranes, and electric refrigeration units. ▪ Compliance with provincial noise guidelines and municipal noise by-law
Hazardous Materials	▪ Hazardous wastes (waste oils, paint and solvent wastes) will be stored onsite in a temporary storage area with secondary containment. ▪ Hazardous wastes will be removed from the site by a licensed contractor and disposed of at an approved facility. ▪ Spill prevention and response plan. ▪ Project staff will be appropriately trained in the handling, storage, and disposal of hazardous materials.
Waste Management	▪ Efforts will be made to reduce solid waste and to recycle. ▪ Solid waste materials will be hauled by qualified waste management companies to approved disposal or recycling facilities.
Effluents Management	▪ The Project will meet or improve upon applicable regulations or standards with respect to effluent discharge. ▪ A Stormwater Management Plan will be developed in accordance with Provincial requirements. ▪ Installation of appropriate effluent management controls prior to ground disturbance, including silt fencing, vegetation cover, erosion control blankets, straw bales, check dams, siltation ponds, and rock riprap. ▪ Stormwater during Project operation will be managed by the installation of catch basins, piping, manholes, and retention ponds. ▪ Sanitary sewage will be piped to the CBRM sanitary sewer system. Alternatively, wastewater will be handled by a small packaged treatment facility installed on-site.

In addition to the environmental design features, assessment of the identified VECs has demonstrated the need for further VEC-specific mitigation that is economically and technically feasible to manage potential adverse environmental effects of the Project and promote sustainability. These are summarized by VEC in Table 10.2. These proposed mitigation measures will also become part of the EPPs for construction and operation. These measures, along with the general environmental design features, are also considered appropriate for the minimization of potential cumulative effects.

TABLE 10.2 Summary of Mitigation, Follow-up and Monitoring

VEC	Mitigation	Follow-up and Monitoring
Benthic Habitat Communities and Sediment Quality	▪ HADD Authorization for capital dredging at a compensation ratio to be determined by DFO-HPSD. ▪ HADD Authorization for infill of terminal and secondary CDFs at a compensation ratio to be determined by DFO-HPSD. ▪ Intensive fishing and relocation program immediately prior to dredging (subject to DFO approval). ▪ Extension to commercial fishing season in dredge and in-fill areas (subject to DFO approval). ▪ Use of state-of-the-art dredging technology (suction dredging rather than bucket dredging). ▪ Control of suspended sediments in CDF dewatering. ▪ Compliance with Transport Canada required for CSA on ballast water control	▪ Some monitoring requirements may be associated with the HADD Authorization and approved compensation projects. ▪ Land-based effluent will be monitored including CDF dewatering
Marine Fish and Water Quality	▪ HADD Authorization for capital dredging at a compensation ratio to be determined by DFO-HPSD. ▪ HADD Authorization for port footprint at a compensation ratio to be determined by DFO-HPSD. ▪ Use of state-of-the-art dredging technology (suction dredging rather than bucket dredging). ▪ Control of suspended sediments in CDF dewatering.	▪ Land-based effluent will be monitored including CDF dewatering ▪ Some monitoring requirements may be associated with the HADD Authorization and approved compensation projects.
Marine Mammals and Marine-related Birds	▪ HADD Authorization for capital dredging at a compensation ratio to be determined by DFO-HPSD. ▪ Use of state-of-art dredging technology (suction dredging rather than bucket dredging. ▪ Other mitigation for marine species as noted above. ▪ Standard vessel operating procedures, including avoidance of marine mammals and further reduction in speed if they are sighted. ▪ Project vessels to use fixed navigation routes.	▪ Monitoring of dredging activities at night and night time terminal operations for evidence of bird collisions
Terrestrial Habitats and Wildlife	▪ Minimize area cleared for terminal. ▪ Buffer eagle nest near site. ▪ Avoid identified cluster of rare plant species. ▪ EPP for construction (*e.g.,* erosion and sedimentation control). ▪ Minimize direct and indirect wetland effects were possible. ▪ Compensation for lost wetland habitat. ▪ Clearing to be conducted in compliance with *MBCA* (including contingency if clearing required during breeding season). ▪ Revegetation with non-invasive species ▪ Lighting design to reduce light pollution.	▪ Develop plan for monitoring the effectiveness of the wetland compensation project(s). ▪ Follow-up survey of the Bald Eagle nest near the site.

TABLE 10.2 Summary of Mitigation, Follow-up and Monitoring

VEC	Mitigation	Follow-up and Monitoring
Atmospheric Environment	▪ Monitoring and response to any exceedance of NSE Noise Guidelines. ▪ Scheduling construction to avoid sensitive times if necessary to comply with Guidelines. ▪ Dust control measures. ▪ Cold dock. ▪ Use of electric cranes and refrigerators.	▪ Monitoring during construction period to ensure activities such as dredging and pile driving do not disturb residents in nearby Edwardsville. ▪ Monitoring for dust and noise complaints if they arise. ▪ Noise monitoring in early stages of operation to set baseline conditions (including ship noise, emergency equipment, and normal operating modes).
Land Use	▪ Noise and dust mitigation (see above). ▪ Traffic control measures. ▪ Site access control measures. ▪ Site design measures such as buffering and screening for nearby residences.	▪ Detailed site planning to include consideration of traffic management and buffering of residential properties. ▪ Monitor noise and dust complaints from residents.
Commercial Fisheries	▪ HADD Authorization for capital dredging at a compensation ratio to be determined by DFO-HPSD. ▪ Intensive fishing and relocation program immediately prior to dredging (subject to DFO approval). ▪ Extension to commercial fishing season in dredge and in-fill areas (subject to DFO approval). ▪ Use of state-of-art dredging technology (suction dredging rather than bucket dredging. ▪ Preferred schedule for Dredging to be conducted outside of the key commercial lobster fishing season (if coincident with availability of TSHD). ▪ Dredging contingency plan (*i.e.,* communication program with lobster fishers) if TSHD is not available at currently scheduled time. ▪ Management of suspended solids levels during CDF dewatering. ▪ Mandatory pilotage. ▪ Port Practices and Procedures. ▪ Notices to mariners/shipping. ▪ Normal practice of seafarers.	▪ Some monitoring requirements may be associated with the HADD Authorization and approved compensation projects.
Archaeological and Heritage Resources	▪ Avoidance of identified terrestrial archaeological features where feasible. ▪ Full excavation of terrestrial features where avoidance is not feasible. ▪ Development of monitoring protocols to address impact to potential submerged resources.	▪ Follow-up archaeological assessment of any changes or expansion to the Project footprint. ▪ Contact responsible authorities in the event that previously-unknown archaeological resources are encountered,

10.2 Residual Effects Summary

Table 10.3 summarizes the residual environmental effects for each VEC for Project construction, operation, and malfunctions and accidents. The effects assessment for the routine Project phases is presented in Section 6.0 with that for malfunction and accidents presented in Section 7.0.

TABLE 10.3 Summaries of Residual Environmental Effects

VEC	Significance			Probability of Occurrence[1]	Scientific Uncertainty
	Construction	Operation	Malfunctions and Accidental Events		
Benthic Habitat Communities and Sediment Quality	N	N	N	n/a	n/a
Marine Fish and Water Quality	N	N	N	n/a	n/a
Marine Mammals and Marine-related Birds	N	N	S	1	3
Terrestrial Habitats and Wildlife	N	N	N	n/a	n/a
Atmospheric Environment	N	N	S	1	3
Land Use	N	P	n/a	n/a	n/a
Commercial Fisheries	N	N	S	1	3
Archaeological and Heritage Resources	N	N	N	n/a	n/a

KEY:

- Significance: S=Significant Adverse Effect; N=Non-significant Adverse Effect; P=Positive Effect
- Probability of Occurrence: Based on professional judgment; 1=Low; 2=Medium; 3=High; n/a=not applicable (effect is not predicted to be significant)
- Scientific Uncertainty: Based on scientific information and statistical analysis or professional judgment; 1 = Low level of confidence; 2 = Medium level of confidence; 3 = High level of confidence; n/a = not applicable (effect is not predicted to be significant).
- [1]Likelihood is defined only for effects that are evaluated as significant (CEA Agency 1994).
- n/a = Not Applicable (*e.g.,* where significant effects not identified)

With the implementation of the proposed mitigation measures (summarized in Tables 10.1 and 10.2), adverse residual environmental effects of routine Project-related construction and operation and decommissioning and abandonment are predicted to be not significant for all VECs. A positive effect is predicted, on land use because development of the land for use by the Project represents an increase in the current use-value obtained from the land to the benefit of the people of Sydney and the CBRM. This is in accordance with the MPS and LUB.

Dredging of the deep navigational channel and construction of the marine terminal will position Sydney Harbour as the first deep water mainland port of call for large post-panamax vessels that are deployed on the developing Suez to North America services corridor. This will provide opportunities for immediate and future economic development and expansion opportunities for the Ports of Sydney and other proponents in Cape Breton.

There are expected to be up to 100 construction-related jobs created by the Project. In addition, the Ports of Sydney Master Plan (TEC 2007) estimates that during operation, 3,500 direct, indirect and induced full time equivalent positions will result from the Project. LEC will undertake to enhance local economic benefits for qualified local suppliers and local skilled labourers; these measures may include contractor open houses, tendering processes that allow for participation by local contractors and local hiring preferences for qualified workers.

In the highly unlikely event of a serious Project-related ship incident resulting in a large oil spill, significant adverse environmental effects are predicted for marine-related birds and fisheries resources; however, this significant event is highly unlikely to occur. Temporary and localized significant adverse effects on atmospheric resources (*i.e.,* exceeding air quality regulatory limits) and human health and

safety could result due to fires; however, these accidents are unlikely to occur and would be rapidly controlled by trained first responders (*e.g.,* trained on-site crews and municipal emergency response forces). An Emergency Response and Contingency Plan are expected to reduce the magnitude of effects resulting from fire and other serious accidental events. In addition, design features and safety precautions at the facility will minimize the likelihood of significant effects due to fires.

Cumulative effects have also been evaluated as part of this assessment. Likely future projects and activities identified include the Muggah Creek Remediation Project, Other Port Terminal Development in Sydney Harbour (*e.g.,* Marine Atlantic dock upgrades, upgrades at Sydney Marine Terminal), and ongoing commercial fisheries activities. Several of these activities could have cumulative environmental interactions with residual environmental effects from the Sydport Project. Spatial separation will generally limit the potential for adverse cumulative effects in the marine environment, and mitigation and compliance with regulatory requirements will further minimize opportunities for cumulative adverse environmental effects. Significant adverse cumulative effects are predicted to be unlikely. Implementation of the mitigative measures contained in this report and adherence to applicable legislation and guidelines will ensure that significant cumulative environmental effects will be unlikely. Cumulative environmental benefits are expected to occur with respect to enhanced industrial land use for port development in Sydney Harbour from the combination of the Sydport Project, Muggah Creek remediation, and other terminal development consistent with the CBRM Planning Strategy and Ports of Sydney Master Plan.

Effects of the environment on the Project were evaluated as part of the assessment. Conditions evaluated include: extreme weather; sea ice; and climate change and sea level rise. The container facility and all related equipment will be fully weather-proofed and designed for a full range of climatic conditions, and container vessels are designed to be seaworthy in all types of weather. If the weather exceeds design criteria, container vessels will not dock or undock until conditions improve. Project design will incorporate an adequate factor of safety to deal with unanticipated changes in weather severity during the lifetime of the Project, including storms and sea level rise associated with climate change. Monitoring and/or contingency planning will also serve to minimize any adverse effects. Effects of the environment on the Project are therefore predicted to be not significant.

10.3 Conclusions

In conclusion, the Sydney Harbour Access Channel Deepening and Sydport Container Terminal Project are not likely to have significant adverse effects on the environment. The Project will contribute to the economic development of Cape Breton and Nova Scotia by establishing Sydney Harbour as a key port of call for large post-panamax vessels that would otherwise not have been able to navigate in the harbour. Adverse environmental effects will be reduced to acceptable levels through the use of technically and economically feasible design and mitigation measures.

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