



Environmental Impact Statement

Volume V of V

Boat Harbour Remediation Project
Pictou Landing, Nova Scotia

Nova Scotia Lands Inc.

November 17, 2020





Environmental Impact Statement

Section 8 | Environmental Effects Assessment Summary

Boat Harbour Remediation Project
Pictou Landing, Nova Scotia

Nova Scotia Lands Inc.

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8. Summary of Environmental Effects Assessment

The Boat Harbour Remediation Project (BHRP or Project) is not predicted to result in any significant adverse residual environmental effects based on the environmental effects assessment carried out and supporting baseline studies completed for each of the identified Valued Components (VCs). In general, the potential adverse effects as detailed in Section 7.3 and summarized in this section are temporary in nature and responsive to the proposed mitigation measures specified for the Project presented in Tables 8.1-1 and 8.1-2.

Notwithstanding this, both follow up and monitoring programs are proposed to collect data for VCs during the Project, and the data will be used to verify and adjust mitigation and monitoring programs as needed to maintain baseline conditions during Project implementation or remediated conditions as targeted. Section 9 of this Environmental Impact Statement (EIS) outlines the follow-up and monitoring programs.

Table 8.1-2 summarizes the potential residual effects associated with the Project and their associated significance. With this in mind, Table 8.1-2 presents a summary of this information organized by the following parameters:

- VC Affected
- Area of Federal Jurisdiction
- Potential Effects
- Proposed Mitigation
- Residual Effect
- Significance of Residual Adverse Effect

Proposed Mitigation

Nova Scotia Lands Inc. (NSLI) has committed to protect the environment from any adverse environmental effects while carrying out the Project. That commitment is articulated in its draft Environmental Management Plan (EMP) and draft Project Environmental Protection Plan (PEPP) which are found in Appendix B to this EIS. The draft EMP along with the draft PEPP include all commitments made in the EIS. As discussed in Section 7.3, a variety of mitigation measures are available to eliminate, reduce, or control the effect that Project components may have on the environment. These include standard operating procedures, compliance with regulatory standards, Project specific mitigation measures, and standardized Best Management Practices¹ (BMPs).

The standard/general mitigation measures and BMPs that would apply to all of the Project components and activities are described by VC and by Project phase as appropriate in Table 8.1-1. The Project specific mitigation measures to prevent or reduce the adverse effects of the Project outside of standard operating procedures or BMPs are listed in Table 8.2-1. All mitigation measures and BMPs are detailed in the draft PEPP and are also included in the draft EMP where appropriate.

¹ General term for techniques or methods widely used to achieve an objective in a field due to their effectiveness and practicality.



The reader is referred to the respective environmental effects assessment for each VC in Section 7 of this EIS for a full understanding and the context of mitigation measures to be implemented to avoid or minimize the identified adverse environmental effects of the Project and ultimately, the determination of significance of effects.

Table 8.1-1 Mitigation Measures and Best Management Practices

Mitigation Type	Applicable VCs	Project Phase	Mitigation Measures and BMPs Proposed
General BMPs	<ul style="list-style-type: none"> All VCs 	All Phases	<ul style="list-style-type: none"> Implement Site speed limits (10 kilometre/hour [km/hr] in constricted sightline areas with less visibility and a limit of 20 to 25 km/hr in areas where there are open sightlines) including signage to increase awareness for personnel to reduce the probability of vehicular collisions, or collisions between vehicles and mammals and wildlife Refuel 30 m from any identified critical habitat areas Upgrade existing roads wherever possible, instead of building new roads to reduce habitat fragmentation Ensure regulatory compliance during the transportation of Dangerous Goods Use approved equipment (tanker hauler) for the transport of leachate Provide driver training including accident or malfunction protocols
Dust and Odour Management Measures	<ul style="list-style-type: none"> Air quality and odour Greenhouse gases Terrestrial habitat and vegetation Mammals and wildlife Migratory birds Species at Risk Mi'kmaq of Nova Scotia Economic and social Human Health 	Site Preparation and Construction	<ul style="list-style-type: none"> Enforce Site speed limits for Project vehicles traveling within the Site to minimize dust emissions Manage dust emissions through the use of water or dust suppressants on non-paved roads and cleaning of paved roads, where applicable, reflecting regulatory direction and approval Implement a policy on-site to limit engine idling and ensure the use of fuel-efficient vehicles and equipment to reduce diesel combustion emissions Ensure that equipment maintenance and checks occur on a regular basis Cover all soil and aggregate material being transported to/from the Site to reduce emissions of particulate matter from wind exposure Reduce stockpile sizes during demolition activity to limit the amount of dust emissions from stockpile wind erosion and cover stockpiles, where applicable
		Operation	<ul style="list-style-type: none"> Enforce Site speed limits for Project vehicles traveling within the Site to minimize dust emissions Minimize vehicle traffic and reduce trip length to limit GHG emissions produced Continue to manage dust emissions through the use of water or dust suppressants on non-paved roads and cleaning of paved roads, where applicable, reflecting regulatory direction and approval Continue to enforce reduction of engine idling policy on-site and ensure the use of fuel-efficient vehicles and equipment to reduce diesel combustion emissions.

Table 8.1-1 Mitigation Measures and Best Management Practices

Mitigation Type	Applicable VCs	Project Phase	Mitigation Measures and BMPs Proposed
			<ul style="list-style-type: none"> • Ensure that equipment maintenance and checks occur on a regular basis • Ensure vehicles travel over mud-mats² to remove soil at all times before leaving the Site; and as needed are cleaned at wheel wash station on-site • Cover all soil and aggregate material being transported to/from the Site to reduce emissions of particulate matter from wind exposure • Minimize the drop heights for all equipment transferring soil/aggregate to reduce emissions of particulate matter • Cover stockpiles onsite to reduce emissions of particulate matter from wind exposure • Cover all stockpiles of dredged sediment to reduce emissions of contaminants and odour • Cover all impacted sediment being transported by truck and maintain wet condition of dredged material to minimize the exposed area and the odour emissions during transportation of the dredged material
		Decommissioning and Abandonment	<ul style="list-style-type: none"> • Reduce stockpile sizes during demolition activity to limit the amount of dust emissions from stockpile wind erosion and cover stockpiles, where applicable • Limit the general particle size of material from demolition activities to reduce the likelihood of particles becoming airborne
Noise Reduction Measures	<ul style="list-style-type: none"> • Noise • Mammals and wildlife • Migratory birds • Species at Risk • Mi'kmaq of Nova Scotia • Economic and social • Human health 	Site Preparation and Construction	<ul style="list-style-type: none"> • Ensure equipment meets industry standards with respect to noise level thresholds • Undertake regular maintenance of the equipment as part of the preventative maintenance plans implemented for all mobile and stationary equipment • Train Site workers to ensure equipment is used in ways that minimize noise • Control noise by maintaining separation distance between source and receptor and equipment design, where feasible
		Operation	<ul style="list-style-type: none"> • Continue to implement the noise reduction measures listed above for the site preparation and construction, as appropriate • Implement a noise management plan

² Mud-mats (also known as rumble mats) are used to create bumpy surfaces for vehicles to drive over so that the loose mud is shaken off the tires and from wheel wells.

Table 8.1-1 Mitigation Measures and Best Management Practices

Mitigation Type	Applicable VCs	Project Phase	Mitigation Measures and BMPs Proposed
Light Pollution Preventative Measures	<ul style="list-style-type: none"> • Light • Mammals and wildlife • Migratory birds • Species at Risk • Mi'kmaq of Nova Scotia • Human health 	Site Preparation and Construction	<ul style="list-style-type: none"> • Install downward-facing lights on Site infrastructure and roads to reduce light pollution • Install, wherever possible, motion-sensors to ensure lights are not turned on when not required to reduce light pollution
		Operation	<ul style="list-style-type: none"> • Use only direct and focused light for worker safety to reduce light pollution
Sediment and Erosion Control Measures	<ul style="list-style-type: none"> • Geology, geochemistry and soil • Groundwater • Surface water • Terrestrial habitat and vegetation • Wetlands • Mammals and Wildlife • Marine environment • Fish and aquatic habitat • Species at Risk 	Site Preparation and Construction	<ul style="list-style-type: none"> • Implement all erosion and sediment control practices as per the PEPP prior to any soil disturbing activities in accordance with the most recent version of NSE's Erosion and Sedimentation Handbook for Construction Sites • Maintain existing vegetation cover whenever possible and minimize overall areas of disturbance to reduce the potential for erosion • Manage construction and roadway runoff through natural vegetation and/or sediment controls such as silt fence or bales • Use clean, non-ore-bearing, non-watercourse derived and non-toxic materials for erosion control methods • Avoid frequent or unnecessary travel over erosion prone areas through communication with personnel and Site project planning • Place rip-rap around the discharge points to dissipate energy and reduce erosion of native soil material • Ensure runoff is not directed towards impacted wetlands or fish habitat • Construct channels to act as temporary storm ditches or diversion swales to convey stormwater runoff away from excavation areas
		Operation	<ul style="list-style-type: none"> • Manage contaminated silt migration through the use of silt curtains, on-site drainage control, and proper storage of impacted materials • Use appropriate erosion and siltation control measures during the remediation of impacted wetlands

Table 8.1-1 Mitigation Measures and Best Management Practices

Mitigation Type	Applicable VCs	Project Phase	Mitigation Measures and BMPs Proposed
			<ul style="list-style-type: none"> Continue to implement the sediment and erosion control measures and BMPs listed above for the Site Preparation and Construction phase, as appropriate
		Decommissioning and Abandonment	<ul style="list-style-type: none"> Manage runoff through selecting discharge locations with well-established vegetation that are less susceptible to erosion and through planting native vegetation where required Continue to implement the sediment and erosion control measures and BMPs listed above for the Site Preparation and Construction phase, as appropriate Ensure proper sediment and erosion controls (such as silt curtains) are in place prior to the removal of the flow control structure
Vegetation Management Measures	<ul style="list-style-type: none"> Terrestrial habitat and vegetation Wetlands Mammals and Wildlife Marine environment Fish and aquatic habitat Species at Risk 	Site Preparation and Construction	<ul style="list-style-type: none"> Limit clearing to approved alteration areas Conduct vegetation management by cutting (e.g., no use of herbicides) Re-vegetate the slope between the edge of the Project infrastructure, roads or stockpile locations, or ditch and adjacent habitat to stabilize the slope and limit erosion and sedimentation into each adjacent habitat Employ measures to reduce the spread of invasive species, including cleaning and inspecting vehicles, wherever possible to maintain the quality of remaining habitat Maintain cleared areas along roadsides to improve visibility and reduce the potential for collisions with wildlife and/or pedestrians
		Operation	<ul style="list-style-type: none"> Continue to implement the vegetation management measures listed above for the Site Preparation and Construction phase, as appropriate
		Decommissioning and Abandonment	<ul style="list-style-type: none"> Continue to implement the vegetation management measures listed above for the Site Preparation and Construction phase, as appropriate Keep riparian vegetation in good condition surrounding areas of potential aquatic habitat, no herbicides shall be used near possible aquatic habitat and areas of potential fish habitat Use straw crimped and/ or matted and seeded erosion control blankets upon final abandonment in areas that have erosion potential to return the area to pre-disturbance conditions in a timely fashion
Spill Prevention Measures	<ul style="list-style-type: none"> Surface water 	All phases	<ul style="list-style-type: none"> Securely control and lock-up all hazardous materials (e.g., oils, lubricants, fuels, paints, solvents, paint thinners, etc.) when not in use to avoid vandalism and accidental spills

Table 8.1-1 Mitigation Measures and Best Management Practices

Mitigation Type	Applicable VCs	Project Phase	Mitigation Measures and BMPs Proposed
	<ul style="list-style-type: none"> Wetlands Marine environment Fish and aquatic habitat 		<ul style="list-style-type: none"> Store materials in a location that is clean, dry, and well-ventilated with impermeable pads, a minimum of 30 m from water or wetlands and handle in a manner which prevents release into the environment Avoid the storage of hazardous material or equipment containing hazardous material overnight in isolated areas nearby a waterbody or wetland (e.g., within the cofferdam), with the exception of dewatering pumps used to reduce the risk of flooding Transfer all deleterious substances (including fuel, cleaners, solvents, paints, etc.) at designated refuelling areas that are equipped to handle a potential spill to limit the release of deleterious substances to the surrounding environment Where feasible, replace fluids with non-toxic bio-degradable fluids, such as vegetable oil for hydraulic oil, to reduce environmental impacts in the event of an accidental release (e.g., a hydraulic line rupture)) Ensure containment trays are in place, and a portable spill kit is on hand prior to any refuelling activities to ensure immediate containment of an accidental spill Employ BMPs for loading and transportation of contaminated materials
Wetland Awareness Measures	<ul style="list-style-type: none"> Wetlands Mammals and wildlife Marine environment Fish and aquatic habitat Species at Risk 	Site Preparation and Construction	<ul style="list-style-type: none"> Ensure wetland boundary flagging tape is in place prior to construction activities occurring in the area Complete pre-construction Site meetings to educate relevant construction staff on the locations of wetlands and watercourses and policies related to working around wetlands and watercourses Communicate schedule of construction activities as it relates to alteration of wetland habitat to staff Instruct personnel to avoid entering the wetland outside of approved alteration area with machinery Enforce Site-specific terms and conditions in the approval for all work associated with wetland alterations
		Operation	<ul style="list-style-type: none"> Continue to implement the wetland awareness measures listed above for the Site Preparation and Construction phase, as appropriate

Table 8.1-1 Mitigation Measures and Best Management Practices

Mitigation Type	Applicable VCs	Project Phase	Mitigation Measures and BMPs Proposed
Wildlife Awareness and Avoidance Measures	<ul style="list-style-type: none"> • Mammals and Wildlife • Migratory birds • Species at Risk 	Site Preparation and Construction	<ul style="list-style-type: none"> • Provide wildlife awareness training to all Site personnel during Site-specific orientation. Wildlife awareness training will include measures to reduce interactions between Site personnel and wildlife • Store hazardous and non-hazardous waste and food in designated locations, in appropriate containers to reduce potential for spills and prevent attracting wildlife (e.g., food, food-waste in bear proof containers) • Establish wildlife reporting protocol so wildlife activity can be tracked throughout the BHETF. This information can be used to install signage, if appropriate, in areas with high wildlife sightings
		Operation	<ul style="list-style-type: none"> • Continue to implement the wildlife awareness and avoidance measures listed for the Site Preparation and Construction phase, as appropriate
Fish Avoidance Measures	<ul style="list-style-type: none"> • Fish and aquatic habitat • Wetlands • Marine environment 	Site Preparation and Construction	<ul style="list-style-type: none"> • Avoid fish habitat wherever possible during detailed project planning and design • Adhere to wetland and watercourse alteration and general construction schedules • Identify and communicate schedule of construction activities as it relates to alteration of fish habitat to staff
		Operation	<ul style="list-style-type: none"> • Conduct construction and major operations within wetlands and estuary outside critical periods for the protection of aquatic life as defined by Fisheries and Oceans Canada (DFO) (spawning, migration, etc.)
Bird Awareness and Management Measures	<ul style="list-style-type: none"> • Wetlands • Migratory birds • Species at Risk 	Site Preparation and Construction	<ul style="list-style-type: none"> • Avoid removal of native vegetation during the breeding season for migratory birds where practical (beginning of April to end of August for migratory birds) • Where scheduling outside of breeding season is not possible, complete appropriate nesting surveys; if no nesting birds are present clearing will be carried out. Should an active nest be identified a nest mitigation plan will be developed prior to construction and in consultation with Environment and Climate Change Canada (ECCC) and provincial regulators
		Operation	<ul style="list-style-type: none"> • Complete remediation activities within wetlands outside the known breeding bird window (beginning of April to end of August for migratory birds) • Where scheduling outside of breeding season is not possible, complete appropriate nesting surveys prior to commencing remediation based on Project approval terms defined by ECCC and Nova Scotia Environment (NSE)

Key Criteria for Determining Significance

Key Criteria for Determining Significance, as detailed in Section 7.2 and included in Table 8.1-2, are defined as follows:

- Magnitude | The size or degree of the effects compared against baseline conditions or reference levels, and other applicable measurement parameters (i.e., standards, guidelines, objectives).
- Geographical Extent | The geographic area over which the effects are likely to be measurable.
- Timing | Considers when the residual environmental effect is expected to occur. Timing considerations are noted in the evaluation of the residual environmental effect, where applicable or relevant.
- Duration | The time period over which the effects are likely to last.
- Frequency | The rate of recurrence of the effects (or conditions causing the effect).
- Reversibility | The degree to which the effects can or will be reversed (typically measured by the time it will take to restore the environmental attribute or feature).

Table 8.1-2 Summary Table of Environmental Impact Assessment

Valued Component Affected	Area of Federal Jurisdiction ⁽¹⁾ (✓)	Project Activity	Potential Effects	Proposed Mitigation	Residual Effect	Key Criteria for Determining Significance ⁽²⁾						Significance of Residual Adverse Effect
						Magnitude ⁽³⁾	Geographic Extent ⁽⁴⁾	Timing ⁽⁵⁾	Duration ⁽⁶⁾	Frequency ⁽⁷⁾	Reversibility ⁽⁸⁾	
Air Quality and Odour		Waste Management	<ul style="list-style-type: none"> • Temporary elevated emissions of particulate matter from access road improvements and widening • Temporary odours in the vicinity of the Site from the release of Landfill Gas (LFG) from waste within the containment cell or release from sludge into the surrounding areas • Temporary emissions from diesel combustion engines • Emissions from materials movement and storage of waste • Temporary emission from the operation of the Temporary Leachate Treatment Facility (TLTF) 	<ul style="list-style-type: none"> • Keep waste material contained through use of Geotubes® or equivalent technology • Use odour neutralizing foam in vicinity of odour source, as needed to reduce any potential odour impacts to sensitive receptors • Cap the containment cell and install passive venting after remediation is complete to control landfill gas 	Temporarily Degraded Air Quality	M	SSA	A	ST	S	R	Not Significant
		Dredging	<ul style="list-style-type: none"> • Release of Volatile Organic Compounds (VOCs) into the surrounding ambient air from removal of the contaminated soil/sludge • Release of VOCs into the ambient air from exposed contaminated soil/sludge • Temporary emissions from diesel combustions engines 	<ul style="list-style-type: none"> • Minimize the dry operation of dredged materials to reduce emissions of particulate matter • Keep waste material contained through use of dredge piping and Geotubes® or equivalent technology • Locate dredge piping cleanouts away from and out of proximity to sensitive receptors to limit any potential odour impacts 	Temporarily Degraded Air Quality	M	SSA	A	T	C	R	Not Significant
		Wetland Management	<ul style="list-style-type: none"> • Temporary elevated emissions of particulate matter from wetland access construction • Temporary elevated emission levels of VOCs and odour from the dredged material being released into the surrounding ambient air • Release of VOCs into the ambient air from exposed contaminated soil/sludge • Release of products of combustion from the required heavy equipment during wetland management activities 	<ul style="list-style-type: none"> • Minimize the dry operation of dredged materials to limit the release of any contaminants or the creation of dust • Keep waste material contained through use of dredge piping and Geotubes® or equivalent technology • Locate dredge piping cleanouts away from and out of proximity to sensitive receptors to limit any potential odour impacts 	Temporarily Degraded Air Quality (Increased Air Concentrations)	M	SSA	A	ST	R	R	Not Significant

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						Magnitude ⁽³⁾	Geographic Extent ⁽⁴⁾	Timing ⁽⁵⁾	Duration ⁽⁶⁾	Frequency ⁽⁷⁾	Reversibility ⁽⁸⁾	
		Bridge at Highway 348	<ul style="list-style-type: none"> Elevated emissions of particulate matter from vehicle traffic and stockpiles Emissions from diesel combustion engines 	<ul style="list-style-type: none"> No further mitigation measures proposed outside of the applicable mitigation measures listed in Table 8.1-1 and included in the draft PEPP 	Temporarily Degraded Air Quality	M	SSA	A	ST	R	R	Not Significant
		Treatment Buildings	<ul style="list-style-type: none"> Production of hazardous waste materials from decommissioning Emissions from diesel combustion engines 	<ul style="list-style-type: none"> Provide a copy of the <i>Hazardous Materials Survey</i> (WSP, 2018) report to contractor who will undertake the future demolition work for the buildings investigated as part of this assessment Require that contractors follow procedures to minimize the generation of dust that is identified to contain asbestos, lead or other hazardous substances Retain qualified contractors to remove and dispose of lead material as per the applicable acts, regulations and codes of practice Wet building materials to reduce airborne concentrations of particulate matter Place hazardous material into appropriate secure disposal containers for off-site removal Restrict all vehicles transporting hazardous material from traveling through the PLFN community 	Temporarily Degraded Air Quality	M	SSA	A	ST	R	R	Not Significant
		Dam	<ul style="list-style-type: none"> Dust and vehicle combustion emissions from temporarily increased truck traffic Dust emissions from demolition of concrete structures 	<ul style="list-style-type: none"> No further mitigation measures proposed outside of the applicable mitigation measures listed in Table 8.1-1 and included in the draft PEPP 	Temporarily Degraded Air Quality	M	SSA	A	ST	R	R	Not Significant
Greenhouse Gas		Waste Management	<ul style="list-style-type: none"> Production of LFG from within containment cell 	<ul style="list-style-type: none"> Conduct operations in a way which limits the biological material that is placed in the containment cell to reduce long-term LFG emissions. This will be done by limiting the amount of non-impacted vegetation placed in the containment cell Cap the containment cell and install passive venting after remediation is complete to control landfill gas Design and construct final landfill cover contours to accommodate the anticipated range of final waste volumes and control the release of LFG 	Ongoing release of LFG	L	LSA	N/A	LT/P	C	IR	Not Significant
Noise		Waste Management	<ul style="list-style-type: none"> Temporarily elevated sound levels in the Local Study Area (LSA) due to increased heavy equipment 	<ul style="list-style-type: none"> Restrict heavy equipment movement and haulage from 11:00 p.m. to 7:00 a.m. during the site preparation and construction phase 	Temporary elevation of sound levels in LSA	L	LSA	A	MT	R	R	Not Significant

Table 8.1-2 Summary Table of Environmental Impact Assessment

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						Magnitude ⁽³⁾	Geographic Extent ⁽⁴⁾	Timing ⁽⁵⁾	Duration ⁽⁶⁾	Frequency ⁽⁷⁾	Reversibility ⁽⁸⁾	
			<ul style="list-style-type: none"> Temporary elevated sound levels due to operation of the TLTF 	<ul style="list-style-type: none"> Locate stockpile areas and infrastructure at minimum 500 m away from sensitive receptors Undertake regular checks for excessive noise on-site and in proximity to sensitive receptors Design Site, including widening of roadways, the turn-around at containment cell and placement of Site infrastructure to minimize the need for reversing and vehicle reversing alarms Implement Complaint Procedure Protocol (described in Section 9.1) 								
		Dredging	<ul style="list-style-type: none"> Temporary elevated sound levels in LSA due to dredging activities 	<ul style="list-style-type: none"> Restrict heavy equipment movement and haulage from 11:00 p.m. to 7:00 a.m. during the operation phase Locate stockpile areas and infrastructure a minimum 500 m away from sensitive receptors Undertake regular checks for excessive noise on-site and in proximity to sensitive receptors Implement Complaint Procedure Protocol (described in Section 9.1) 	Temporary minor elevation of sound levels in LSA	L	LSA	A	MT	C	R	Not Significant
		Wetland Management	<ul style="list-style-type: none"> Temporary elevated sound levels in LSA due to dredging activities 	<ul style="list-style-type: none"> Restrict heavy equipment movement and haulage from 11:00 p.m. to 7:00 a.m. during the site preparation and construction phase Contractor agreements will include an obligation to ensure noise levels at the property limit meet provincial and local regulations, permits, and approvals Locate stockpile areas and infrastructure at minimum 500 m away from sensitive receptors Undertake regular checks for excessive noise on-site and in proximity to sensitive receptors Design Site, including widening of roadways, the turn-around at containment cell and placement of Site infrastructure to minimize the need for reversing and vehicle reversing alarms Implement Complaint Procedure Protocol (described in Section 9.1) 	Temporary minor elevation of sound levels in LSA	L	LSA	A	ST	R	R	Not Significant
		Bridge at Highway 348	<ul style="list-style-type: none"> Temporary elevated sound levels in LSA due to construction areas Increase in traffic noise at existing residences due to increase traffic noise from construction 	<ul style="list-style-type: none"> Restrict heavy equipment movement and haulage from 11:00 p.m. to 7:00 a.m. during the site preparation and construction phase Contractor agreements will include an obligation to ensure noise levels at the property limit meet provincial and local regulations, permits, and approvals 	Temporary minor elevation of sound levels in LSA	L	LSA	A	ST	R	R	Not Significant

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						Magnitude ⁽³⁾	Geographic Extent ⁽⁴⁾	Timing ⁽⁵⁾	Duration ⁽⁶⁾	Frequency ⁽⁷⁾	Reversibility ⁽⁸⁾		
				<ul style="list-style-type: none"> Locate stockpile areas and infrastructure at minimum 500 m away from sensitive receptors Undertake regular checks for excessive noise on-site and in proximity to sensitive receptors Design Site, including widening of roadways, the turn-around at containment cell and placement of Site infrastructure to minimize the need for reversing and vehicle reversing alarms Implement Complaint Procedure Protocol (described in Section 9.1) 									
		Treatment Buildings	<ul style="list-style-type: none"> Temporary elevated sound levels in LSA 	<ul style="list-style-type: none"> Restrict heavy equipment movement and haulage from 11:00 p.m. to 7:00 a.m. during the decommissioning and abandonment phase Contractor agreements will include an obligation to ensure noise levels at the property limit meet provincial and local regulations, permits, and approvals Locate stockpile areas and infrastructure at minimum 500 m away from sensitive receptors Undertake regular checks for excessive noise on-site and in proximity to sensitive receptors Implement Complaint Procedure Protocol (described in Section 9.1) 	Temporary minor elevation of sound levels in LSA	L	LSA	A	ST	R	R	Not Significant	
		Dam	<ul style="list-style-type: none"> Temporary elevated sound levels in LSA due to demolition areas 	<ul style="list-style-type: none"> Restrict heavy equipment movement and haulage from 11:00 p.m. to 7:00 a.m. during decommissioning and abandonment phase Contractor agreements will include an obligation to ensure noise levels at the property limit meet provincial and local regulations, permits, and approvals Locate stockpile areas and infrastructure at minimum 500 m away from sensitive receptors Undertake regular checks for excessive noise on-site and in proximity to sensitive receptors Continue to implement Complaint Procedure Protocol (described in Section 9.1) 	Temporary minor elevation of sound levels in LSA	L	LSA	A	MT	R	R	Not significant	

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Light		All Project Activities	<ul style="list-style-type: none"> Temporary elevation in light with respect to flora, fauna, and sensitive receptors in the LSA (see Terrestrial Habitat and Vegetation, Mammals and Wildlife, Migratory Birds; SAR; Socio-Economic; Human Health) 	<ul style="list-style-type: none"> Include an obligation to comply with environmental protection including light reduction in Subcontractor agreements Restrict heavy equipment movement and haulage from 11:00 p.m. to 7:00 a.m. during the site preparation and construction phase Implement Complaint Procedure Protocol (described in Section 9.1) 	Temporary elevation in light in LSA	L	LSA	A	MT	R	R	Not Significant
Geology, Geochemistry and Soil		Waste Management	<ul style="list-style-type: none"> Degradation of soil quality in the vicinity of TLTF if spill/release occurs 	<ul style="list-style-type: none"> Monitor to limit/eliminate the mobilization of impacted material to other areas of the Site that have not been previously impacted (i.e., soil, wetlands, watercourses, habitats) Grade area around the TLTF and leachate loading station such that any spills will be directed to the lined stormwater management pond Develop and implement spill management protocols as outlined in the Contingency Plan and fully communicate protocols to staff to protect soil from accidental spills Maintain the isolation valve on the stormwater pond outlet structure in a normally closed position during operation phase of the TLTF Monitor the TLTF operation daily Design and construct TLTF to have a secondary containment for all chemicals on-site as a spills management measure The effluent conveyance piping will be monitored daily to ensure no releases occur 	Disturbance, potential degradation of soil quality	N	SSA	N/A	ST	O	PR	Not Significant
		Dredging	<ul style="list-style-type: none"> Removal of impacted material to eliminate future impacts to geology, geochemistry, and soil Degradation of soil quality if spill/release occurs 	<ul style="list-style-type: none"> Implement the QA/QC Program for dredging, which will involve: <ul style="list-style-type: none"> Confirmation by the CMOC that dredging has been completed to the target evaluation (less than 0.025 m of sludge remaining) Confirmation by the CMOC that the concentration of the contaminants of potential concern in the remaining sediment meets the proposed end-point criteria/site specific target levels Develop and implement spill management protocols as outlined in the Contingency Plan and fully communicate protocols to staff to protect soil from accidental spills The effluent conveyance piping will be monitored daily to ensure no releases occur 	Disturbance, removal of impacted material to eliminate future impacts to VC	H	SSA	N/A	LT	O	PR	Not Significant

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Valued Component Affected	Area of Federal Jurisdiction ⁽¹⁾ (√)	Project Activity	Potential Effects	Proposed Mitigation	Residual Effect	Key Criteria for Determining Significance ⁽²⁾						Significance of Residual Adverse Effect	
						Magnitude ⁽³⁾	Geographic Extent ⁽⁴⁾	Timing ⁽⁵⁾	Duration ⁽⁶⁾	Frequency ⁽⁷⁾	Reversibility ⁽⁸⁾		
				<ul style="list-style-type: none"> Install and maintain silt curtains between active dredging cell and adjacent cells and apply erosion and sediment control means (such as coir logs or bales), at stream entrances to dredging areas as needed Monitor suspended solids concentration to ensure the use of silt curtains are performing and repair as needed 									
		Wetland Management	<ul style="list-style-type: none"> Removal of impacted material to eliminate future impacts to geology, geochemistry, and soil Degradation of soil quality if spill/release occurs 	<ul style="list-style-type: none"> Implement the QA/QC Program for dredging, which will involve: <ul style="list-style-type: none"> Confirmation by the CMOC that dredging has been completed to the target evaluation (less than 0.025 m of sludge remaining) Confirmation by the CMOC that the concentration of the contaminants of potential concern in the remaining sediment meets the proposed end-point criteria/site specific target levels Develop and implement spill management protocols as outlined in the Contingency Plan and fully communicate protocols to staff to protect soil from accidental spills. The effluent conveyance piping will be monitored daily to ensure no releases occur Install and maintain silt curtains between active dredging cell and adjacent cells and apply erosion and sediment control means (such as coir logs or bales), at stream entrances to dredging areas as needed Monitor suspended solids concentration to ensure the use of silt curtains are performing and repair as needed Minimize handling of impacted sludge/sediment being removed from wetlands through detailed delineation of impacts and tight controls on removal equipment and operations 	Disturbance, removal of impacted material to eliminate future impacts to VC	H	SSA	N/A	LT	O	PR	Not Significant	
		Bridge at Highway 348	<ul style="list-style-type: none"> Degradation of soil quality if impacts are mobilized during construction activities Degradation of soil quality if spill/release occurs 	<ul style="list-style-type: none"> Monitor to limit the mobilization of impacted material to other areas of the Site that are not impacted (i.e., soil, wetlands, watercourses, habitats) Develop and implement spill management protocols as outlined in the Contingency Plan and fully communicate protocols to staff to protect soil from accidental spills 	Disturbance, potential degradation of soil quality	L	SSA	N/A	ST	O	R	Not Significant	
		Pipeline Decommissioning	<ul style="list-style-type: none"> Potential for degradation of soil quality if impacted sediments are mobilized during construction activities 	<ul style="list-style-type: none"> No further mitigation measures proposed outside of the applicable mitigation measures listed in Table 8.1-1 and included in the draft PEPP 	Disturbance, potential degradation of soil quality								

Table 8.1-2 Summary Table of Environmental Impact Assessment

Valued Component Affected	Area of Federal Jurisdiction ⁽¹⁾ (✓)	Project Activity	Potential Effects	Proposed Mitigation	Residual Effect	Key Criteria for Determining Significance ⁽²⁾						Significance of Residual Adverse Effect
						Magnitude ⁽³⁾	Geographic Extent ⁽⁴⁾	Timing ⁽⁵⁾	Duration ⁽⁶⁾	Frequency ⁽⁷⁾	Reversibility ⁽⁸⁾	
		Dam	<ul style="list-style-type: none"> Removal of impacted material to eliminate future impacts to geology, geochemistry, and soil Degradation of soil quality if spill/release occurs 	<ul style="list-style-type: none"> Implement the QA/QC Program for dredging, which will involve: <ul style="list-style-type: none"> Confirmation by the CMOC that dredging has been completed to the target evaluation (less than 0.025 m of sludge remaining) Confirmation by the CMOC that the concentration of the contaminants of potential concern in the remaining sediment meets the proposed end-point criteria/site specific target levels Develop and implement spill management protocols as outlined in the Contingency Plan and fully communicate protocols to staff to protect soil from accidental spills Install cofferdam upstream and downstream of the dam Continual monitoring of suspended solids concentration to ensure the use of cofferdam is performing and repair as needed 	Disturbance, potential degradation of soil quality and/or removal of impacted material to eliminate future impacts to VC	L	SSA	N/A	ST	O	R	Not Significant
Groundwater		Waste Management	<ul style="list-style-type: none"> Contamination to groundwater from leachate Change to groundwater flow downgradient 	<ul style="list-style-type: none"> Construct proposed liner system and leachate collection system within the containment cell Monitor perimeter groundwater wells for COCs as outlined in the Groundwater Monitoring Plan Grade area around the TLTF and leachate loading station to direct any spills to the lined stormwater management pond Implement the proposed interim cover on the containment cell following waste placement to reduce leachate generation Construct a leachate holding tank with appropriate seals and construct spill containment in case of spill while pumping from the holding tank to tanker truck to haul leachate off-site Monitor and maintain leachate collection system within containment cell. The amount of leachate generated will be logged via the Supervisory Control and Data Acquisition (SCADA) computer system and will be monitored for trends that would indicate changes to effectiveness of the leachate collection system, or failure of pumps Automatically logging of leachate levels in the holding tank will be completed and tracked by SCADA computer system. The system has the ability to contact the operator to demonstrate pre-set fill levels to allow for arrangement of hauling 	Change to groundwater flow downgradient	M	SSA	A	ST	R	R	Not Significant

Table 8.1-2 Summary Table of Environmental Impact Assessment

Valued Component Affected	Area of Federal Jurisdiction ⁽¹⁾ (√)	Project Activity	Potential Effects	Proposed Mitigation	Residual Effect	Key Criteria for Determining Significance ⁽²⁾						Significance of Residual Adverse Effect
						Magnitude ⁽³⁾	Geographic Extent ⁽⁴⁾	Timing ⁽⁵⁾	Duration ⁽⁶⁾	Frequency ⁽⁷⁾	Reversibility ⁽⁸⁾	
				<ul style="list-style-type: none"> Develop and implement spill management protocols as outlined in the Contingency Plan and fully communicate protocols to staff to protect groundwater from accidental spills 								
		Dredging	<ul style="list-style-type: none"> Change to groundwater flow downgradient 	<ul style="list-style-type: none"> Conduct construction/mitigation groundwater quality monitoring every week as outlined in the draft PEPP 	Potential contamination of groundwater	M	SSA	A	ST	R	R	Not Significant
		Wetland Management	<ul style="list-style-type: none"> Contamination to groundwater from construction of access roads Contamination to groundwater due to dredging of wetlands 	<ul style="list-style-type: none"> Use clean imported material for construction of access roads Conduct construction/mitigation groundwater quality monitoring every week as outlined in the draft PEPP Monitor groundwater levels and quality during dredging as outlined in the Groundwater Monitoring Plan Reduce interaction that could lead to degradation of water quality or detrimental quantity reductions between surface water and groundwater by implementing surface water mitigation measures and BMPs 	Potential contamination of groundwater	M	SSA	A	ST/MT	R/C	R	Not Significant
		Pipeline Decommissioning	<ul style="list-style-type: none"> Contamination to groundwater from contaminated surface water from a spill/release of deleterious substance from pipe into water/soil 	<ul style="list-style-type: none"> Implement erosion controls for the removal of portion of the pipeline, which would include silt fence on the downgradient sides of the excavation location and any stockpiles and truck cleaning prior to departure to prevent migration of impacted materials Develop and implement spill management protocols as outlined in the Contingency Plan and fully communicate protocols to staff to protect groundwater from accidental spills 	Potential contamination to groundwater from contaminated surface water from a spill/release of deleterious substance from pipe into water	L	LSA	A	ST	O	R	Not Significant
		Dam	<ul style="list-style-type: none"> Change to groundwater flow downgradient 	<ul style="list-style-type: none"> Conduct construction/mitigation groundwater quality monitoring every week as outlined in the draft PEPP 	Change to groundwater flow downgradient	M	SSA	A	ST	R	R	Not Significant
Surface Water		Waste Management	<ul style="list-style-type: none"> Temporary storage of contaminated substances in areas that could interact with surface water Temporary loss of vegetative cover has potential to reduce natural surface water drainage Use of geomembrane as an interim cover has potential to increase stormwater runoff Erosion and sedimentation during construction and operation Contamination of surface water through potential leachate spill during transportation 	<ul style="list-style-type: none"> Install the new stormwater management system to separate stormwater runoff and leachate, which will greatly improve the quality of the stormwater Develop and implement spill management protocols as outlined in the Contingency Plan and fully communicate protocols to staff to protect surface water from accidental spills Direct stormwater runoff from containment cell while under interim and final cover to the forebay pond through a constructed channel, which will be rock lined to prevent erosion and reduce stormwater velocity Construct the outlet pipe from the stormwater pond using High-Density Polyethylene (HDPE) pipe 	<p>Temporary increased sedimentation</p> <p>Potential spill of leachate and resulting surface water impacts</p>	M	SSA	A	ST/LT	R	R	Not Significant

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Valued Component Affected	Area of Federal Jurisdiction ⁽¹⁾ (✓)	Project Activity	Potential Effects	Proposed Mitigation	Residual Effect	Key Criteria for Determining Significance ⁽²⁾						Significance of Residual Adverse Effect	
						Magnitude ⁽³⁾	Geographic Extent ⁽⁴⁾	Timing ⁽⁵⁾	Duration ⁽⁶⁾	Frequency ⁽⁷⁾	Reversibility ⁽⁸⁾		
				<ul style="list-style-type: none"> Design stormwater management system to have the capacity to contain stormwater generated from a 100-year precipitation event without any flooding Fully line the forebay and settling ponds with a heavy geotextile liner system. The ponds will have an additional lining of angular stones for approximately 6 inches (150 millimetre [mm]) Construct ponds to accommodate stormwater generated from the 100-year precipitation event while maintaining a freeboard of 0.6 metres (m), which is twice the recommended freeboard of 0.3 m Construct outlet flow control structure to reduce sedimentation Maintain surface water flow regime outside the containment cell perimeter to preserve current conditions Refueling will occur 30 m from the nearest waterbodies (except Boat Harbour) 									
		Dredging	<ul style="list-style-type: none"> Effect on water quality due to the re-suspension of sediment resulting in increased suspended solids and turbidity Possible increase of sediment particles that could affect fish egg settling, TSS can also have an impact on fish gills Modification of average size of particles that could have a major impact of macroinvertebrate community structures Contamination of surface water through spill when refueling and equipment failure 	<ul style="list-style-type: none"> Control effluent discharge to estuary at the outlet control structure to respect the TSS CCME criteria (< 25 mg/L from background level) and confirm by applying a TSS monitoring program Use properly installed silt curtains to control sedimentation as outlined in the most recent version of NSE's <i>Erosion and Sedimentation Handbook for Construction Sites</i> Develop and implement spill management protocols as outlined in the Contingency Plan and fully communicate protocols to staff to protect surface water from accidental spills Refueling will occur 30 m from the nearest waterbodies (except Boat Harbour) Develop and implement a refueling plan for any refueling that will need to occur on or near water within Boat Harbour during active dredging. This will include the requirement for equipment to be fitted with emergency controls to limit leakage and the requirement to have floating spill containment booms on hand during refueling activities near water 	Temporary increased sedimentation	M	SSA	A	MT	C	R	Not Significant	
		Wetland Management	<ul style="list-style-type: none"> Increased impervious area increasing runoff Effect on water quality due to the re-suspension of sediment resulting 	<ul style="list-style-type: none"> Confirm background TSS as per the draft EMP and draft PEPP in the estuary before beginning remediation work to use as a baseline to compare the results from the TSS monitoring that will be completed during remediation 	Temporary increased sedimentation	M	SSA	ST/MT	R/C	R	R	Not Significant	

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Valued Component Affected	Area of Federal Jurisdiction ⁽¹⁾ (✓)	Project Activity	Potential Effects	Proposed Mitigation	Residual Effect	Key Criteria for Determining Significance ⁽²⁾						Significance of Residual Adverse Effect
						Magnitude ⁽³⁾	Geographic Extent ⁽⁴⁾	Timing ⁽⁵⁾	Duration ⁽⁶⁾	Frequency ⁽⁷⁾	Reversibility ⁽⁸⁾	
			<ul style="list-style-type: none"> in increased suspended solids and turbidity Possible release of contaminants that have been historically contained in sediments during the wetland remediation process Contamination of surface water through spill when refueling and equipment failure 	<ul style="list-style-type: none"> Use properly installed silt curtains to control sedimentation as outlined in the most recent version of NSE's Erosion and Sedimentation Handbook for Construction Sites. Use a "moon pool" system complete with dual perimeter curtains during any dredging within the estuary to limit an increase in TSS in adjacent areas. Control effluent discharge to estuary at the outlet control structure to respect the TSS CCME criteria (< 25 mg/L from background level) and confirm by applying a TSS monitoring program Refueling will occur 30 m from the nearest waterbodies (except Boat Harbour) Develop and implement a refueling plan for any refueling that will need to occur on or near water within wetlands during active dredging. This will include the requirement for equipment to be fitted with emergency controls to limit leakage and the requirement to have floating spill containment booms on hand during refueling activities near water 								
		Bridge at Highway 348	<ul style="list-style-type: none"> Temporary loss of vegetative cover has potential to reduce natural surface water drainage Effect on water quality due to the re-suspension of sediment resulting in increased suspended solids and turbidity Increased surface water quantity due to storm surge/ changing climate Contamination of surface water through spill when refueling and equipment failure 	<ul style="list-style-type: none"> Confirm background TSS as per the draft EMP and draft PEPP in the estuary before beginning remediation work to use as a baseline to compare the results from the TSS monitoring that will be completed during remediation Implement additional sediment controls as needed to respect the TSS CCME criteria (< 25 mg/L from background level) and confirm by applying a TSS monitoring program Refueling will occur 30 m from the nearest waterbodies (except Boat Harbour) Develop and implement a refueling plan for any refueling that will need to occur on or near water within Boat Harbour. This will include the requirement for equipment to be fitted with emergency controls to limit leakage 	Temporary increased sedimentation	M	SSA	A	ST	R	R	Not Significant
		Pipeline Decommissioning		<ul style="list-style-type: none"> Develop and implement spill management protocols as outlined in the Contingency Plan and fully communicate protocols to staff to protect surface water from accidental spills Inspect effluent pipeline for damage and residual contaminated material after cleaning and before cutting and capping, re-clean as needed 	No residual effects anticipated	L	SSA	A	ST	O	R	Not Significant

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Valued Component Affected	Area of Federal Jurisdiction ⁽¹⁾ (✓)	Project Activity	Potential Effects	Proposed Mitigation	Residual Effect	Key Criteria for Determining Significance ⁽²⁾						Significance of Residual Adverse Effect
						Magnitude ⁽³⁾	Geographic Extent ⁽⁴⁾	Timing ⁽⁵⁾	Duration ⁽⁶⁾	Frequency ⁽⁷⁾	Reversibility ⁽⁸⁾	
		Dam	<ul style="list-style-type: none"> Loss of habitat through clearing/grubbing of vegetation along shoreline/banks Effect on water quality due to the re-suspension of sediment resulting in increased suspended solids and turbidity during removal of dam and dredging Potential for positive impact when tidal influence is returned to the area and wetland remediation is complete Contamination of surface water through spill when refueling and equipment failure 	<ul style="list-style-type: none"> Confirm background TSS in estuary before beginning remediation work Implement surface water BMPs to respect the TSS CCME criteria (< 25 mg/L from background level) and confirm by applying a TSS monitoring program As articulated in the Project EPP properly installed silt curtains and cofferdams will be used as per the most recent version of NSE's <i>Erosion and Sedimentation Handbook for Construction Sites</i> Install additional silt curtains in the water upstream and downstream of the dam decommissioning works to control the migration of silt generated as a result of the dam removal Develop and implement spill management protocols as outlined in the Contingency Plan and fully communicate protocols to staff to protect surface water from accidental spills Refueling will occur 30 m from the estuary Develop and implement a refueling plan for any refueling that will need to occur on or near water within Boat Harbour. This will include the requirement for equipment to be fitted with emergency controls to limit leakage and the requirement to have floating spill containment booms on hand during refueling activities near water 	No residual effects anticipated	L	SSA	A	ST	O	R	Not Significant
Terrestrial Habitat and Vegetation		Waste Management	<ul style="list-style-type: none"> Temporary loss of forested vegetative cover, resulting in landscape disturbance and habitat fragmentation Increased dust and heavy vehicle traffic may degrade air quality, which could reduce the amount of usable habitat for lichen species Introduction of invasive species; seeds and roots of invasive species can be transferred from construction equipment, transportation vehicles, or workers into adjacent natural habitat during Project activities 	<ul style="list-style-type: none"> Establish construction methods, such as working upgradient to downgradient that reduce the potential to drain or flood a partially altered wetland or downgradient wetland via indirectly altered hydrology due to remediation, site dewatering, or road construction Develop and implement spill management protocols as outlined in the Contingency Plan and fully communicate protocols to staff to protect habitat from accidental spills Maintain riparian wetland and watercourse buffers (where practical) to reduce adverse effects to wetlands, watercourses, and downstream receiving environments by clearly defining the limits of work Refueling will occur 30 m from the nearest waterbodies (except Boat Harbour) Develop and implement a refueling plan for any refueling that will need to occur on or near the water within Boat Harbour. This will include the requirement for equipment to be fitted with 	Habitat loss and disturbance	M/L	SSA	A	MT	S/O	PR/R	Not Significant

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						Magnitude ⁽³⁾	Geographic Extent ⁽⁴⁾	Timing ⁽⁵⁾	Duration ⁽⁶⁾	Frequency ⁽⁷⁾	Reversibility ⁽⁸⁾		
				<p>emergency controls to limit leakage and the requirement to have floating spill containment booms on hand during refueling activities near water</p> <ul style="list-style-type: none"> Implement a reclamation program for terrestrial areas within the Project footprint to re-establish native vegetation communities 									
		Dredging	<ul style="list-style-type: none"> Temporary loss and disturbance of vegetative cover Increased dust and heavy vehicle traffic may degrade air quality, which could reduce the amount of usable habitat for lichen species 	<ul style="list-style-type: none"> Develop and implement spill management protocols as outlined in the Contingency Plan and fully communicate protocols to staff to protect habitat from accidental spills Refueling will occur 30 m from the nearest waterbodies (except Boat Harbour) Develop and implement a refueling plan for any refueling that will need to occur on or near water within Boat Harbour during active dredging. This will include the requirement for equipment to be fitted with emergency controls to limit leakage and the requirement to have floating spill containment booms on hand during refueling activities near water 	Disturbance, temporary loss of vegetative cover, temporary degradation in air quality	L	SSA	A	MT	O	R	Not Significant	
		Wetland Management	<ul style="list-style-type: none"> Temporary loss of forested vegetative cover, resulting in landscape disturbance and habitat fragmentation Extensive ground works adjacent to wetlands has the potential to destabilize land surfaces and the root zone of vegetative areas, including wetland buffers Increased dust and heavy vehicle traffic may degrade air quality, which could reduce the amount of usable habitat for lichen species Introduction of invasive species; seeds and roots of invasive species can be transferred from construction equipment, transportation vehicles, or workers into adjacent natural habitat during Project activities 	<ul style="list-style-type: none"> Establish construction methods, such as working from upgradient to downgradient that will reduce the potential to drain or flood a partially altered wetland or downgradient wetland via indirectly altered hydrology due to remediation, site dewatering, or road construction Develop and implement spill management protocols as outlined in the Contingency Plan and fully communicate protocols to staff to protect habitat from accidental spills 	Disturbance - temporary loss of forested vegetative cover, habitat fragmentation, minor degradation of air quality.	M	SSA	A	MT	O	R	Not Significant	

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						Magnitude ⁽³⁾	Geographic Extent ⁽⁴⁾	Timing ⁽⁵⁾	Duration ⁽⁶⁾	Frequency ⁽⁷⁾	Reversibility ⁽⁸⁾	
		Bridge at Highway 348	<ul style="list-style-type: none"> Loss and potential disturbance of vegetative cover Increased dust and heavy vehicle traffic may degrade air quality, which could reduce the amount of usable habitat for lichen species 	<ul style="list-style-type: none"> Develop and implement spill management protocols as outlined in the Contingency Plan and fully communicate protocols to staff to protect habitat from accidental spills 	Disturbance – temporary loss of vegetative cover, minor degradation of air quality	L	SSA	A	ST	O	PR	Not Significant
		Dam	<ul style="list-style-type: none"> Temporary loss and disturbance of vegetative cover Increased dust and heavy vehicle traffic may degrade air quality, which could reduce the amount of usable habitat for lichen species 	<ul style="list-style-type: none"> Develop and implement spill management protocols as outlined in the Contingency Plan and fully communicate protocols to staff to protect habitat from accidental spills 	Disturbance – temporary loss of vegetative cover, minor degradation of air quality	L	SSA	A	ST	O	R	Not Significant
Wetlands	✓ 5 (a) (i,iii)	Waste Management	<ul style="list-style-type: none"> Temporary loss of portion of Wetland-13a 	<ul style="list-style-type: none"> Develop and implement spill management protocols as outlined in the Contingency Plan and fully communicate protocols to staff to protect habitat from accidental spills Compensate for loss of wetland functions that support mammals and wildlife as part of the wetland compensation plan to be submitted to NSE 	Disturbance, Habitat loss	L	SSA	A	ST	O	R	Not Significant
		Wetland Management	<ul style="list-style-type: none"> Dredging may alter natural channels and substrate in the wetlands Excavation or removal by other means of wetland areas may affect the natural processes those wetlands carry out; wetland hydrology and size may be impacted by the return of tidal influence to the area During hydraulic and/or mechanical dredging, impacted sediments may be suspended, increasing levels of TSS, total dissolved solids (TDS), turbidity, and conductivity. If wetland vegetation is removed, water temperatures may increase as well Disturbance to wetland during Operation by trucks travelling on access road beside wetland 	<ul style="list-style-type: none"> Compensate for loss of wetland functions that support mammals and wildlife as part of the wetland compensation plan to be submitted to NSE 	Disturbance, Habitat loss	L/M	SSA	A	ST	O/C	R	Not Significant

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						Magnitude ⁽³⁾	Geographic Extent ⁽⁴⁾	Timing ⁽⁵⁾	Duration ⁽⁶⁾	Frequency ⁽⁷⁾	Reversibility ⁽⁸⁾	
			<ul style="list-style-type: none"> Removal of impacted sediments from the wetland areas will likely involve the complete removal of wetland vegetation in the impacted areas, which may impact wetland function, seeds, and roots of invasive species may be transported during the mobilization of impacted sediment Wetlands are hosts to several species, including birds, fish, amphibians, plants, and macroinvertebrates, the loss of wetland area may temporarily decrease biomass at the Site 									
		Dam	<ul style="list-style-type: none"> Excavation or removal of wetland areas may affect the natural processes those wetlands carry out Wetland hydrology and size may be impacted by the return of tidal influence to the area During removal of the Dam, impacted sediments may be suspended, increasing levels of TSS, TDS, turbidity, and conductivity Removal of wetland vegetation may increase water temperatures Potential for spread of invasive species that may be transported during the mobilization of impacted sediment If wetland areas are converted to saltmarsh, wildlife may have to seek out alternate habitat for those processes taking place in freshwater wetlands Temporary removal of wetland vegetation 	<ul style="list-style-type: none"> Limit disturbance to areas within the wetlands through refining the extent of the areas to be remediated based on additional sampling to preserve wetland habitat as much as possible Develop and implement spill management protocols as outlined in the Contingency Plan and fully communicate protocols to staff to protect wetland habitat from accidental spills Restrict all dredging activities in the wetlands to the limits that were identified for remediation based on the sampling that was completed Enforce Site-specific terms and conditions as per the approval obtained for all work associated with wetland and watercourse alterations Use barge/floating equipment wherever possible to limit driving and use of machinery within the estuary. Where not practical swamp mats/corduroy bridges in wet areas will be used to prevent rutting, diverting water flow, and sedimentation Use appropriate erosion and siltation control measures during the remediation of impacted wetlands including the use silt curtains between all active dredging cells and adjacent cells in the wetland and use of a "moon pool" system complete with dual perimeter curtains during any dredging within the estuary to limit an increase in TSS in adjacent areas Identify natural channels running through wetlands prior to remediation to protect the integrity of hydrology in the wetland 	Disturbance, Habitat loss	M	SSA	A	ST	C	R	Not Significant

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						Magnitude ⁽³⁾	Geographic Extent ⁽⁴⁾	Timing ⁽⁵⁾	Duration ⁽⁶⁾	Frequency ⁽⁷⁾	Reversibility ⁽⁸⁾	
			<ul style="list-style-type: none"> • Temporary loss of forested vegetative cover would decrease habitat availability for wildlife and mammals • Long-term improvement in habitat quality through removal of contaminated sediments • Extensive ground works, including activities such as excavation will increase noise levels; increase in vehicular traffic will add to sensory disturbance through increased noise • Commercial vehicles, and heavy machinery emit noise which may deter terrestrial fauna from utilizing habitat areas found on-site • Lighting at night could alter habitat quality and sleep/wake cycles within the immediate vicinity of the BHETF, this may decrease efficiency of nocturnal hunters • Increased commercial vehicle traffic at the BHETF and surrounding roadways may result in an increase of direct mortality of fauna species due to vehicular collisions 	<ul style="list-style-type: none"> • Compensate for loss of wetland functions that support mammals and wildlife as part of the wetland compensation plan to be submitted to NSE 								
Mammals and Wildlife		Waste Management	<ul style="list-style-type: none"> • Disturbance, habitat loss, temporary habitat fragmentation 	<ul style="list-style-type: none"> • Develop and implement spill management protocols as outlined in the Contingency Plan and fully communicate protocols to staff to protect adjacent habitats from accidental spills • Compensate for loss of wetland functions that support mammals and wildlife as part of the wetland compensation plan to be submitted to NSE 	Disturbance	M/L	SSA	A	ST/MT	S/R	PR/R	Not Significant
		Dredging	<ul style="list-style-type: none"> • Temporary disturbance to vegetation along banks of areas being dredged • Extensive ground works, including activities such as excavation will 	<ul style="list-style-type: none"> • Develop and implement spill management protocols as outlined in the Contingency Plan and fully communicate protocols to staff to protect adjacent habitats from accidental spills 	Disturbance, habitat loss, habitat degradation, temporary habitat fragmentation	L/M	SSA	A	MT	S/C	R	Not Significant

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						Magnitude ⁽³⁾	Geographic Extent ⁽⁴⁾	Timing ⁽⁵⁾	Duration ⁽⁶⁾	Frequency ⁽⁷⁾	Reversibility ⁽⁸⁾	
			<p>increase noise levels; increase in vehicular traffic will add to sensory disturbance through increased noise, this has the potential for faunal habitat avoidance</p> <ul style="list-style-type: none"> Commercial vehicles, and heavy machinery emit noise which may deter terrestrial fauna from utilizing habitat areas found on-site Dredging activities will occur 24/7 and therefore will require lighting at night, which can alter habitat quality and sleep/wake cycles within the immediate vicinity of the BHETF, this may decrease efficiency of nocturnal hunters Increased commercial vehicle traffic at the BHETF and surrounding roadways may result in an increase of direct mortality of fauna species due to vehicular collisions 									
		Wetland Management	<ul style="list-style-type: none"> Temporary loss of wetland vegetation may decrease the amount of cover available for fauna and increase predation Heavy machinery emits noise which may deter terrestrial fauna from utilizing habitat areas found on-site Wetland dredging activities will occur 24/7 and therefore will require lighting at night, which can alter habitat quality and sleep/wake cycles within the immediate vicinity of the BHETF, this may decrease efficiency of nocturnal hunters 	<ul style="list-style-type: none"> Compensate for loss of wetland functions that support mammals and wildlife as part of the wetland compensation plan to be submitted to NSE 	Habitat loss, disturbance. Alteration of natural wetland function or watercourse morphology	M	SSA	A	ST	R	R	Not Significant
		Bridge at Highway 348	<ul style="list-style-type: none"> Removal of causeway and construction of a new bridge will add to sensory disturbance through 	<ul style="list-style-type: none"> Reduce light pollution on-site by installing downward-facing lights on the bridge 	Disturbance – temporarily reduced habitat, influence on nocturnal hunters	M	SSA	A	ST	R	R	Not Significant

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Valued Component Affected	Area of Federal Jurisdiction ⁽¹⁾ (✓)	Project Activity	Potential Effects	Proposed Mitigation	Residual Effect	Key Criteria for Determining Significance ⁽²⁾						Significance of Residual Adverse Effect
						Magnitude ⁽³⁾	Geographic Extent ⁽⁴⁾	Timing ⁽⁵⁾	Duration ⁽⁶⁾	Frequency ⁽⁷⁾	Reversibility ⁽⁸⁾	
			<p>increased noise, which has the potential to reduce habitat for fauna</p> <ul style="list-style-type: none"> Lights on the bridge which would be operational at all times, could impact habitat quality and sleep/wake cycles within the immediate vicinity of the BHETF, this may decrease efficiency of nocturnal hunters Increased commercial vehicle traffic at the BHETF and surrounding roadways may result in an increase of direct mortality of fauna species due to vehicular collisions 									
		Dam	<ul style="list-style-type: none"> Temporary loss of wetland vegetation may decrease the amount of cover available for mammals and wildlife and increase predation Operation of the heavy machinery used for removal of dam and dredging the channel will increase noise levels, which may deter mammals and wildlife from utilizing habitat areas found on-site Increased commercial vehicle traffic at the BHETF and surrounding roadways may result in an increase of direct mortality of mammals and wildlife due to vehicular collisions 	<ul style="list-style-type: none"> No further mitigation measures proposed outside of the applicable mitigation measures listed in Table 8.1-1 and included in the draft PEPP 	Temporary loss of habitat, disturbance	M	LSA	A	MT	R	R	Not Significant
Marine Environment	✓ 5 a (i)	Wetland Management	<ul style="list-style-type: none"> Direct destruction of fish during the removal of impacted sediments in selected wetlands Increased disturbance to the marine environment from heavy machinery operation in and around estuary 	<ul style="list-style-type: none"> Limit disturbance to areas in the estuary through refining the extent of the areas to be remediated based on additional sampling to preserve wetland habitat as much as possible Restrict all dredging activities in the wetlands to the limits that were identified for remediation based on the sampling that was completed Enforce Site-specific terms and conditions in the approval for all work associated with alterations in the Estuary 	Disturbance; remediation. Destruction of fish that have been exposed to contamination, removal of impacted sediment	H	SSA	A	ST	C	R	Not Significant

Table 8.1-2 Summary Table of Environmental Impact Assessment

Valued Component Affected	Area of Federal Jurisdiction ⁽¹⁾ (✓)	Project Activity	Potential Effects	Proposed Mitigation	Residual Effect	Key Criteria for Determining Significance ⁽²⁾						Significance of Residual Adverse Effect
						Magnitude ⁽³⁾	Geographic Extent ⁽⁴⁾	Timing ⁽⁵⁾	Duration ⁽⁶⁾	Frequency ⁽⁷⁾	Reversibility ⁽⁸⁾	
			<ul style="list-style-type: none"> Dredging may alter natural channels and substrate in the estuary During remediation, impacted sediments may be suspended, increasing levels of TSS, TDS, turbidity, and conductivity. If estuary vegetation is removed, water temperatures may increase as well Possible release of contaminants that have been historically contained in sediments during the wetland remediation process Removal of impacted sediments from the estuary will likely involve the complete removal of wetland vegetation in the impacted areas 	<ul style="list-style-type: none"> Limit heavy machinery usage in the estuary Use appropriate erosion and siltation control measures during the remediation of the estuary, including use of silt curtains in conjunction with additional measures such as a "moon pool" system³ Identify natural channels running through estuary prior to remediation to protect the integrity of hydrology in the wetland Use barge/floating equipment wherever possible to limit driving and use of machinery within the estuary. Where not practical swamp mats/corduoy bridges in wet areas will be used to prevent rutting, diverting water flow, and sedimentation Stabilize and re-vegetate slopes to limit erosion and sedimentation into the estuary Develop and implement a Wildlife Emergency Response Plan as part of the EMP/PEPPDevelop and implement spill management protocols as outlined in the Contingency Plan and fully communicate protocols to staff to protect marine habitat from accidental spills 								
		Dam	<ul style="list-style-type: none"> Removal of dam will result in temporary loss of habitat within the estuary and disturbance through operation of heavy machinery Possible release of contaminants into the estuary during removal of dam Potential for positive impact when tidal influence is returned to the area and wetland remediation is complete, several hundred hectares of habitat are to become accessible, and anadromous fish species may utilize habitat found in the Project area 	<ul style="list-style-type: none"> Ensure proper sedimentation and erosion controls are in place prior to the removal of the dam control structure including use of silt curtains in conjunction with sedimentation additional measures such as a "moon pool" system Implement the following fish habitat awareness and avoidance measures: <ul style="list-style-type: none"> Instruct personnel to avoid entering areas of the estuary that are outside of approved alteration areas with machinery Adhere to watercourse alteration and general construction schedules Develop and implement spill management protocols as outlined in the Contingency Plan and fully communicate protocols to staff to protect marine habitat from accidental spills Ensure adequate remediation has taken place and impacted sludge is removed before releasing process water into the Northumberland Strait 	Disturbance, habitat gain	M	A	A	ST	O	R	Not Significant

³ Use appropriate erosion and siltation control measures during the remediation of the estuary, including use of silt curtains in conjunction with additional measures such as, a "Moon Pool"

Table 8.1-2 Summary Table of Environmental Impact Assessment

Valued Component Affected	Area of Federal Jurisdiction ⁽¹⁾ (√)	Project Activity	Potential Effects	Proposed Mitigation	Residual Effect	Key Criteria for Determining Significance ⁽²⁾						Significance of Residual Adverse Effect
						Magnitude ⁽³⁾	Geographic Extent ⁽⁴⁾	Timing ⁽⁵⁾	Duration ⁽⁶⁾	Frequency ⁽⁷⁾	Reversibility ⁽⁸⁾	
Fish and Aquatic Habitat	✓ 5 (a) (i)	Waste Management	<ul style="list-style-type: none"> Upgrades to access road will result in temporary removal of wetland habitat, and continued disturbance through heavy truck travel that will use the road during operation 	<ul style="list-style-type: none"> Implement the following fish habitat awareness and avoidance measures: <ul style="list-style-type: none"> Complete pre-construction meetings to ensure construction staff are aware of fish habitat on-site Identify and communicate schedule of construction activities as it relates to alteration of fish habitat Provide copies of relevant maps and digital format locations of fish habitat as well as approvals, terms and conditions, as it pertains to the contractor Enforce Site-specific terms and conditions in the approval for all work associated with wetland and watercourse alterations Where aquatic habitat cannot be avoided, minimization of total Project footprint within the surface water system will be considered during planning Submit surface water alteration applications (wetlands and watercourses) during Project planning and design to request an authorization to alter fish habitat. Loss of fish habitat will be addressed in these alteration applications and recommended timing windows will be adhered to for potential direct loss of fish and fish habitat Compensate for permanent loss of aquatic habitat through habitat compensation activities, subject to DFO, based on the <i>Fisheries Act</i> current at time of the Project remedial phase and decommissioning phase Establish construction methods, such as working from upgradient to downgradient to reduce the potential to drain or flood a partially altered wetland or downgradient wetland via indirectly altered hydrology due to remediation, site dewatering, or road construction 	Temporary habitat disturbance	M	SSA	A	ST	O	R	Not Significant
		Dredging	<ul style="list-style-type: none"> Direct destruction of fish during the removal of impacted sediments During remediation, impacted sediments may be suspended, increasing levels of TSS, TDS, turbidity, and conductivity Fish found in the immediate area may search out alternate habitat due to noise associated with heavy machinery 	<ul style="list-style-type: none"> Obtain authorization from DFO for fish euthanization and follow conditions of approval Complete euthanization of fish in a culturally sensitive manner that will be determined in consultation with PLFN Implement the following fish awareness and avoidance measures: <ul style="list-style-type: none"> Complete pre-construction meetings to ensure construction staff are aware of potential and confirmed fish habitat on-site 	Disturbance; remediation. Destruction of fish that have been exposed to contamination, temporary habitat disruption	L/H	SSA	A	ST/MT	O/C	R	Not Significant

Table 8.1-2 Summary Table of Environmental Impact Assessment

Valued Component Affected	Area of Federal Jurisdiction ⁽¹⁾ (✓)	Project Activity	Potential Effects	Proposed Mitigation	Residual Effect	Key Criteria for Determining Significance ⁽²⁾						Significance of Residual Adverse Effect	
						Magnitude ⁽³⁾	Geographic Extent ⁽⁴⁾	Timing ⁽⁵⁾	Duration ⁽⁶⁾	Frequency ⁽⁷⁾	Reversibility ⁽⁸⁾		
				<ul style="list-style-type: none"> - Provide copies of relevant maps and digital format locations of fish habitat as well as approvals, terms and conditions, as they pertain to the contractor - Where aquatic habitat cannot be avoided, minimization of total Project footprint within the surface water system will be considered during planning • Establish construction methods, such as working from upgradient to downgradient to reduce the potential to drain or flood a partially altered wetland or downgradient wetland via indirectly altered hydrology due to remediation, site dewatering, or road 									
		Wetland Management	<ul style="list-style-type: none"> • Direct destruction of fish during the removal of impacted sediments in selected wetlands • Construction of access road will result in temporary removal of wetland habitat, and continued disturbance through heavy truck travel that will use the road during operation • Currently the Boat Harbour Stabilization Lagoon (BHSL) is considered to not be productive fish habitat, incoming watercourses are currently impacted, Project is projected to increase fish habitat quality and availability • Short-term impact on watercourse accessibility in areas set for wetland remediation, several fringe wetlands at the BHSL are found at the outflow of watercourses • Possible release of contaminants that have been historically contained in sediments during the wetland remediation process 	<ul style="list-style-type: none"> • Implement the following designated protocols for fish: <ul style="list-style-type: none"> - Obtain authorization from DFO for fish euthanization and follow conditions of approval - Complete euthanization of fish in a culturally sensitive manner that will be determined in consultation with PLFN • Submit surface water alteration applications (wetlands and watercourses) during Project planning and design to request an authorization to alter fish habitat, loss of fish habitat will be addressed in these alteration applications and recommended timing windows will be adhered to for potential direct loss of fish and fish habitat - Compensate for permanent loss of fish habitat through fish habitat compensation activities, subject to DFO, based on the Fisheries Act current at time of the Project • Implement the following fish habitat awareness and avoidance measures: <ul style="list-style-type: none"> - Complete pre-construction meetings to ensure construction staff are aware of fish habitat on-site - Identify and communicate schedule of construction activities as it relates to alteration of fish habitat - Provide copies of relevant maps and digital format locations of fish habitat as well as approvals, terms and conditions, as it pertains to the contractor - Where aquatic habitat cannot be avoided, minimization of total Project footprint within the surface water system will be considered during planning - Submit surface water alteration applications (wetlands and watercourses) during Project planning and design to request an authorization to alter fish habitat. Loss of fish 	Disturbance; remediation. Destruction of fish that have been exposed to contamination, temporary habitat disruption	M/H	SSA	A	ST	O/C	R	Not Significant	

Table 8.1-2 Summary Table of Environmental Impact Assessment

Valued Component Affected	Area of Federal Jurisdiction ⁽¹⁾ (✓)	Project Activity	Potential Effects	Proposed Mitigation	Residual Effect	Key Criteria for Determining Significance ⁽²⁾						Significance of Residual Adverse Effect	
						Magnitude ⁽³⁾	Geographic Extent ⁽⁴⁾	Timing ⁽⁵⁾	Duration ⁽⁶⁾	Frequency ⁽⁷⁾	Reversibility ⁽⁸⁾		
				<p>habitat will be addressed in these alteration applications and recommended timing windows will be adhered to for potential direct loss of fish and fish habitat</p> <ul style="list-style-type: none"> – Compensate for permanent loss of aquatic habitat through habitat compensation activities, subject to DFO, based on the Fisheries Act current at time of the Project remedial phase, and decommissioning phase – Establish construction methods, such as working from upgradient to downgradient to reduce the potential to drain or flood a partially altered wetland or downgradient wetland via indirectly altered hydrology due to remediation, site dewatering, or road construction – Identify natural channels running through wetlands prior to remediation to protect the integrity of hydrology in the wetland 									
		Bridge at Highway 348	<ul style="list-style-type: none"> • Removal of causeway will result in loss of aquatic habitat, and disturbance through operation of heavy machinery • Possible release of contaminants during removal of causeway 	<ul style="list-style-type: none"> • Establish construction methods, such as working from upgradient to downgradient to reduce the potential to drain or flood fish habitat via indirectly altered hydrology due to remediation activities • Develop and implement spill management protocols as outlined in the Contingency Plan and fully communicate protocols to staff to protect aquatic habitat from accidental spills 	Disturbance, minor loss of habitat	M	SSA	A	ST	O	R	Not Significant	
		Dam	<ul style="list-style-type: none"> • Removal of dam will result in loss of aquatic habitat, and disturbance through operation of heavy machinery • Possible release of contaminants during removal of dam • Decrease in surface water volume when flow control structure is removed • Potential for positive impact when tidal influence is returned to the area and wetland remediation is complete, several hundred hectares of habitat are to become accessible, and anadromous fish species may utilize habitat found in the Project area 	<ul style="list-style-type: none"> • Develop and implement spill management protocols as outlined in the Contingency Plan and fully communicate protocols to staff to protect aquatic habitat from accidental spills 	Disturbance – temporary loss of habitat followed by habitat compensation	M	A	A	ST	O	R	Not Significant	

Table 8.1-2 Summary Table of Environmental Impact Assessment

Valued Component Affected	Area of Federal Jurisdiction ⁽¹⁾ (✓)	Project Activity	Potential Effects	Proposed Mitigation	Residual Effect	Key Criteria for Determining Significance ⁽²⁾						Significance of Residual Adverse Effect
						Magnitude ⁽³⁾	Geographic Extent ⁽⁴⁾	Timing ⁽⁵⁾	Duration ⁽⁶⁾	Frequency ⁽⁷⁾	Reversibility ⁽⁸⁾	
Migratory Birds	✓ 5 (a) (iii)	Waste Management	<ul style="list-style-type: none"> • Temporary loss of terrestrial and wetland habitat through access road upgrades, construction of new stormwater management pond, leachate transfer hauling station • Truck and vehicular traffic will increase noise levels, which may displace and/or disturb birds • Use of diesel-powered generators will cause noise that may disturb or displace birds from preferred habitats • There is the potential for migratory bird mortality during clearing activities • Birds may become attracted to or disoriented by lighting at night, which could affect certain behaviours 	<ul style="list-style-type: none"> • Avoid construction on native vegetation during the breeding season for migratory birds where practical (beginning of April to end of August for migratory birds; Environment and Climate Change Canada [ECCC] 2015), where this is not possible, an active bird nest mitigation plan will be developed prior to construction and in consultation with ECCC and provincial regulators • Cover large piles or patches of bare soil or un-vegetated areas during the breeding season, wherever possible to discourage ground-nesting or burrow-nesting species (such as common nighthawk and bank swallows) • Work with ECCC and NSE to develop buffer and non-disturbance distances and zones that incorporate adaptive management should any ground- or burrow-nesting species initiate breeding activities on stockpiles or exposed areas • Routes for machinery are to be shown on a figure, and then ground-truthed and corridors are to be surveyed for nesting birds during nesting season 	Disturbance, temporary habitat loss and fragmentation	M	SSA/RSA	A	ST/MT	S/R	PR	Not Significant
		Dredging	<ul style="list-style-type: none"> • Temporary loss of terrestrial and wetland habitat through mechanical excavation of the effluent ditches and the shallower areas at the edges of Boat Harbour • Increased truck and vehicular traffic will increase noise levels, which may displace and/or disturb birds • Use of diesel-powered generators will cause noise that may disturb or displace birds from preferred habitats • An increase in traffic volume could result in the increased injury or mortality of birds, particularly fledglings or the young of precocial birds, which are not able to fly • Birds may become attracted to or disoriented by lighting at night, which could affect certain behaviours 	<ul style="list-style-type: none"> • Cover large piles or patches of bare soil or un-vegetated areas during the breeding season, wherever possible to discourage ground-nesting or burrow-nesting species (such as common nighthawk and bank swallows) • Work with ECCC and NSE to develop buffer and non-disturbance distances and zones that incorporate adaptive management should any ground- or burrow-nesting species initiate breeding activities on stockpiles or exposed areas 	Disturbance, temporary habitat loss and fragmentation	M	SSA	A	MT	S/C	R	Not Significant

Table 8.1-2 Summary Table of Environmental Impact Assessment

Valued Component Affected	Area of Federal Jurisdiction ⁽¹⁾ (✓)	Project Activity	Potential Effects	Proposed Mitigation	Residual Effect	Key Criteria for Determining Significance ⁽²⁾						Significance of Residual Adverse Effect
						Magnitude ⁽³⁾	Geographic Extent ⁽⁴⁾	Timing ⁽⁵⁾	Duration ⁽⁶⁾	Frequency ⁽⁷⁾	Reversibility ⁽⁸⁾	
		Wetland Management	<ul style="list-style-type: none"> Clearing and grubbing during Site preparation areas may cause temporary and medium-term loss of habitat for birds Soil disturbance associated with the construction of access roads around the wetlands to facilitate dewatering and removal activities may impact the terrestrial environment (i.e., vegetation and habitat) Increased truck and vehicular traffic will increase noise levels, which may displace and/or disturb birds Use of diesel-powered generators will cause noise that may disturb or displace birds from preferred habitats An increase in truck traffic volumes could result in the increased injury or mortality of birds, particularly fledglings or the young of precocial birds, which are not able to fly Birds may become attracted to or disoriented by lighting at night, which could affect certain behaviours 	<ul style="list-style-type: none"> Routes for machinery are to be shown on a figure, and then ground-truthed and corridors are to be surveyed for nesting birds during nesting season Cover large piles or patches of bare soil or un-vegetated areas during the breeding season, wherever possible to discourage ground-nesting or burrow-nesting species (such as common nighthawk and bank swallows) Work with ECCC and NSE to develop buffer and non-disturbance distances and zones that incorporate adaptive management should any ground- or burrow-nesting species initiate breeding activities on stockpiles or exposed areas Develop and implement a Wildlife Emergency Response Plan as part of the EMP/PEPP Compensate for lost wetland functions that support migratory birds as part of the wetland compensation plan that will be submitted to NSE 	Disturbance, temporary habitat loss	M	SSA	A	ST	S	PR/R	Not Significant
		Bridge at Highway 348	<ul style="list-style-type: none"> Use of diesel-powered construction equipment will cause noise that may disturb or displace birds from preferred habitats An increase in traffic volume could result in the increased injury or mortality of birds, particularly fledglings or the young of precocial birds, which are not able to fly Birds may become attracted to or disoriented by lighting at night, which could affect certain behaviours 	<ul style="list-style-type: none"> No further mitigation measures proposed outside of the applicable mitigation measures listed in Table 8.1-1 and included in the draft PEPP 	Disturbance, temporary habitat loss	M	SSA	A	ST	R	R	Not Significant

Table 8.1-2 Summary Table of Environmental Impact Assessment

Valued Component Affected	Area of Federal Jurisdiction ⁽¹⁾ (✓)	Project Activity	Potential Effects	Proposed Mitigation	Residual Effect	Key Criteria for Determining Significance ⁽²⁾						Significance of Residual Adverse Effect
						Magnitude ⁽³⁾	Geographic Extent ⁽⁴⁾	Timing ⁽⁵⁾	Duration ⁽⁶⁾	Frequency ⁽⁷⁾	Reversibility ⁽⁸⁾	
		Treatment Buildings	<ul style="list-style-type: none"> Loss of the habitat that treatment buildings provide for nesting for migratory birds Increased truck and vehicular traffic will increase noise levels, which may displace and/or disturb birds There is the potential for migratory bird mortality during demolition 	<ul style="list-style-type: none"> Schedule demolition of treatment buildings outside of typical breeding season (beginning of April to end of August for migratory birds), where not possible all buildings and laydown areas will be inspected for presence of active nests before demolition occurs 	Disturbance, temporary habitat loss	M	SSA	A	ST	R	R	Not Significant
		Dam	<ul style="list-style-type: none"> Loss of habitat through clearing/grubbing of vegetation along shoreline/banks Demolition and cleanup activities and the associated truck traffic will increase noise levels, which may displace and/or disturb birds Birds may become attracted to or disoriented by lighting at night, which could affect certain behaviours 	<ul style="list-style-type: none"> Cover large piles or patches of bare soil or un-vegetated areas during the breeding season, wherever possible to discourage ground-nesting or burrow-nesting species (such as common nighthawk and bank swallows) Work with ECCC and NSE to develop buffer and non-disturbance distances and zones that incorporate adaptive management should any ground- or burrow-nesting species initiate breeding activities on stockpiles or exposed areas 	Disturbance, temporary habitat loss	M	LSA	A	MT	S	R	Not Significant
Species at Risk (SAR)		Waste Management	<ul style="list-style-type: none"> Loss of forested vegetative cover would decrease habitat availability for SAR, extensive ground works, including activities such as excavation will increase noise levels, increase in vehicular traffic will add to sensory disturbance through increased noise Commercial vehicles, and heavy machinery emit noise which may deter SAR from utilizing habitat areas found on-site Lighting at night associated, could alter habitat quality and sleep/wake cycles within the immediate vicinity of the BHETF, this may decrease efficiency of nocturnal hunters Increased commercial vehicle traffic at the BHETF and surrounding roadways may result in an increase of direct mortality of 	<ul style="list-style-type: none"> Avoid intact forest stands and wetlands wherever possible during detailed Project planning and design in favor of previously disturbed areas (e.g., stands disturbed by timber harvesting, existing roads, or other development), especially those that are predominantly mature softwood, as several Species of Conservation Concern (SOCC) lichens utilize this type of habitat Cover large piles or patches of bare soil or un-vegetated areas during the breeding season, wherever possible to discourage ground-nesting or burrow-nesting species (such as common nighthawk and bank swallows) Work with ECCC and NSE to develop buffer and non-disturbance distances and zones that incorporate adaptive management should any ground- or burrow-nesting species initiate breeding activities on stockpiles or exposed areas Routes for machinery are to be shown on a figure, and then ground-truthed and corridors are to be surveyed for nesting birds during nesting season Notify ECCC within 24 hours in the event of the mortality or injury of ten or more migratory birds in a single event, or in the 	Disturbance, temporary habitat loss, habitat fragmentation	M/L	SSA	A	ST/MT	S/R	PR/R	Not Significant

Table 8.1-2 Summary Table of Environmental Impact Assessment

Valued Component Affected	Area of Federal Jurisdiction ⁽¹⁾ (✓)	Project Activity	Potential Effects	Proposed Mitigation	Residual Effect	Key Criteria for Determining Significance ⁽²⁾						Significance of Residual Adverse Effect
						Magnitude ⁽³⁾	Geographic Extent ⁽⁴⁾	Timing ⁽⁵⁾	Duration ⁽⁶⁾	Frequency ⁽⁷⁾	Reversibility ⁽⁸⁾	
			fauna species due to vehicular collisions	<ul style="list-style-type: none"> event of the mortality or injury of a single or more migratory bird SAR and work with ECCC to prevent any future mortality or injuries Ensure spill management protocols as outlined in the Contingency Plan are being implemented and are fully communicated to staff to protect SAR habitat from accidental spills 								
		Dredging	<ul style="list-style-type: none"> Temporary disturbance to vegetation along banks of areas being dredged Extensive ground works, including activities such as excavation will increase noise levels, increase in vehicular traffic will add to sensory disturbance through increased noise, which could deter SAR from using the area Dredging activities will occur 24/7 and therefore will require lighting at night, which can alter habitat quality and sleep/wake cycles within the immediate vicinity of the BHETF, this may decrease efficiency of nocturnal hunters Increased commercial vehicle traffic at the BHETF and surrounding roadways may result in an increase of direct mortality of SAR due to vehicular collisions 	<ul style="list-style-type: none"> Cover large piles or patches of bare soil or un-vegetated areas during the breeding season, wherever possible to discourage ground-nesting or burrow-nesting species (such as common nighthawk and bank swallows) Work with ECCC and NSE to develop buffer and non-disturbance distances and zones that incorporate adaptive management should any ground- or burrow-nesting species initiate breeding activities on stockpiles or exposed areas Notify ECCC within 24 hours in the event of the mortality or injury of ten or more migratory birds in a single event, or in the event of the mortality or injury of a single or more migratory bird SAR and work with ECCC to prevent any future mortality or injuries 	Disturbance, temporary habitat loss, habitat fragmentation	L/M	SSA	A	MT	S/C	R	Not Significant
		Wetland Management	<ul style="list-style-type: none"> Temporary loss of wetland vegetation may decrease the amount of cover available for SAR and increase predation Heavy machinery emits noise which may deter SAR from utilizing habitat areas found on-site Wetland dredging activities will occur 24/7 and therefore will require lighting at night, which can alter habitat quality and sleep/wake 	<ul style="list-style-type: none"> Cover large piles or patches of bare soil or un-vegetated areas during the breeding season, wherever possible to discourage ground-nesting or burrow-nesting species (such as common nighthawk and bank swallows) Work with ECCC and NSE to develop buffer and non-disturbance distances and zones that incorporate adaptive management should any ground- or burrow-nesting species initiate breeding activities on stockpiles or exposed areas Maintain riparian wetland and watercourse buffers (where practical) to reduce adverse effects to wetlands, watercourses, 	Habitat loss, disturbance - Alteration of natural wetland function or watercourse morphology	M	SSA	A	ST	R	PR/R	Not Significant

Table 8.1-2 Summary Table of Environmental Impact Assessment

Valued Component Affected	Area of Federal Jurisdiction ⁽¹⁾ (✓)	Project Activity	Potential Effects	Proposed Mitigation	Residual Effect	Key Criteria for Determining Significance ⁽²⁾						Significance of Residual Adverse Effect
						Magnitude ⁽³⁾	Geographic Extent ⁽⁴⁾	Timing ⁽⁵⁾	Duration ⁽⁶⁾	Frequency ⁽⁷⁾	Reversibility ⁽⁸⁾	
			<p>cycles within the immediate vicinity of the BHETF, priority bird species may become attracted to or disoriented by lighting at night, which could affect certain behaviours</p> <ul style="list-style-type: none"> An increase in truck traffic volumes could result in the increased injury or mortality of SAR 	<p>and downstream receiving environments by clearly defining the limits of work</p> <ul style="list-style-type: none"> Notify ECCC within 24 hours in the event of the mortality or injury of ten or more migratory birds in a single event, or in the event of the mortality or injury of a single or more migratory bird SAR and work with ECCC to prevent any future mortality or injuries Compensate for loss of wetland functions that support mammals and wildlife as part of the wetland compensation plan to be submitted to NSE 								
		Bridge at Highway 348	<ul style="list-style-type: none"> Removal of causeway and construction of a new bridge will add to sensory disturbance through increased noise, which has the potential to reduce habitat for SAR Lights on the bridge which would be operational at all times, could impact habitat quality for priority bird species Increased commercial vehicle traffic at the BHETF and surrounding roadways may result in an increase of direct mortality of SAR due to vehicular collisions 	<ul style="list-style-type: none"> Notify ECCC within 24 hours in the event of the mortality or injury of ten or more migratory birds in a single event, or in the event of the mortality or injury of a single or more migratory bird SAR and work with ECCC to prevent any future mortality or injuries 	Disturbance, temporary habitat loss, habitat fragmentation	M/L	SSA	A	ST/P	R/C	R/IR	Not Significant
		Pipeline Decommissioning	<ul style="list-style-type: none"> Potential disturbance to terrestrial SAR 	<ul style="list-style-type: none"> Cover large piles or patches of bare soil or un-vegetated areas during the breeding season, wherever possible to discourage ground-nesting or burrow-nesting species (such as common nighthawk and bank swallows) Work with ECCC and NSE to develop buffer and non-disturbance distances and zones that incorporate adaptive management should any ground- or burrow-nesting species initiate breeding activities on stockpiles or exposed areas Notify ECCC within 24 hours in the event of the mortality or injury of ten or more migratory birds in a single event, or in the event of the mortality or injury of a single or more migratory bird SAR and work with ECCC to prevent any future mortality or injuries Develop and implement spill management protocols as outlined in the Contingency Plan and fully communicate protocols to staff to protect SAR habitat from accidental spills 	Temporary habitat disturbance	L	RSA	A	ST	O	R	Not Significant

Table 8.1-2 Summary Table of Environmental Impact Assessment

Valued Component Affected	Area of Federal Jurisdiction ⁽¹⁾ (✓)	Project Activity	Potential Effects	Proposed Mitigation	Residual Effect	Key Criteria for Determining Significance ⁽²⁾						Significance of Residual Adverse Effect
						Magnitude ⁽³⁾	Geographic Extent ⁽⁴⁾	Timing ⁽⁵⁾	Duration ⁽⁶⁾	Frequency ⁽⁷⁾	Reversibility ⁽⁸⁾	
		Treatment Buildings	<ul style="list-style-type: none"> Loss of the habitat that treatment buildings provide for nesting for priority bird species Increased truck and vehicular traffic will increase noise levels, which may displace and/or disturb SAR There is the potential for mortality of priority bird species during demolition 	<ul style="list-style-type: none"> Schedule demolition of treatment buildings outside of typical breeding season (beginning of April to end of August for migratory birds), where not possible all buildings and laydown areas will be inspected for presence of active nests before demolition occurs Notify ECCC within 24 hours in the event of the mortality or injury of a single or more migratory bird SAR and work with ECCC to prevent any future mortality or injuries 	Disturbance, temporary habitat loss	M	SSA	A	ST	R	R	Not Significant
		Dam	<ul style="list-style-type: none"> Temporary loss of wetland vegetation may decrease the amount of cover available for SAR and increase predation Operation of the heavy machinery used for removal of dam and dredging the channel will increase noise levels, which may deter SAR from utilizing habitat areas found on-site Increased commercial vehicle traffic at the BHETF and surrounding roadways may result in an increase of direct mortality of SAR due to vehicular collisions 	<ul style="list-style-type: none"> Cover large piles or patches of bare soil or un-vegetated areas during the breeding season, wherever possible to discourage ground-nesting or burrow-nesting species (such as common nighthawk and bank swallows) Work with ECCC and NSE to develop buffer and non-disturbance distances and zones that incorporate adaptive management should any ground- or burrow-nesting species initiate breeding activities on stockpiles or exposed areas Notify ECCC within 24 hours in the event of the mortality or injury of a single or more migratory bird SAR and work with ECCC to prevent any future mortality or injuries Ensure all remedial procedures are complete prior to re-introduction of tide 	Disturbance, habitat gain	M	A	A	ST	O	R	Not Significant
Mi'kmaq of Nova Scotia	✓ 5 (c) (i-iv)	Waste Management	<ul style="list-style-type: none"> Environmental remediation Job creation Temporarily increased traffic volumes Temporarily increased air, noise, and light emissions Potential effects on residents in close proximity and/or water sources in the event of an accident or spill when transporting leachate Perceived limitation in restoration of traditional land and resource use 	<ul style="list-style-type: none"> Include an obligation to comply with environmental protection including noise reduction in Subcontractor agreements Implement Complaint Procedure Protocol (described in Section 9.1) Conduct long-term groundwater and surface water monitoring for the containment cell to confirm leakage is not occurring and to document water quality Restrict all vehicles transporting leachate, which is considered as a hazardous material from traveling through the PLFN community Carryout all Accommodations in Section 6.5 	<p>Positive: Environmental remediation and job creation</p> <p>Negative: Negligible to minor disturbance to local residents</p>	L	SSA, LSA	N/A	ST, MT, LT	O,C	R, IR	Not Significant
		Dredging	<ul style="list-style-type: none"> Environmental remediation Temporarily increased air, noise, and light emissions 	<ul style="list-style-type: none"> Include an obligation to comply with environmental protection including noise reduction in Subcontractor agreements 	Positive: Environmental remediation and job creation	N	SSA, LSA	N/A	ST, MT	O	R	Not Significant

Table 8.1-2 Summary Table of Environmental Impact Assessment

Valued Component Affected	Area of Federal Jurisdiction ⁽¹⁾ (✓)	Project Activity	Potential Effects	Proposed Mitigation	Residual Effect	Key Criteria for Determining Significance ⁽²⁾						Significance of Residual Adverse Effect
						Magnitude ⁽³⁾	Geographic Extent ⁽⁴⁾	Timing ⁽⁵⁾	Duration ⁽⁶⁾	Frequency ⁽⁷⁾	Reversibility ⁽⁸⁾	
			<ul style="list-style-type: none"> Temporarily increased traffic volumes Job creation 	<ul style="list-style-type: none"> Implement Complaint Procedure Protocol (described in Section 9.1) 	Negative: Negligible to minor disturbance to local residents							
		Wetland Management	<ul style="list-style-type: none"> Environmental remediation Temporarily increased air, noise, and light emissions Temporarily increased traffic volumes Job creation 	<ul style="list-style-type: none"> Include an obligation to comply with environmental protection including noise reduction in Subcontractor agreements Implement Complaint Procedure Protocol (described in Section 9.1) 	Positive: Environmental remediation and job creation Negative: Negligible to minor disturbance to local residents	N	SSA, LSA	N/A	ST	O	R	Not Significant
		Bridge at Highway 348	<ul style="list-style-type: none"> Temporarily increased air, noise, and light emissions Temporarily increased traffic volumes Job creation 	<ul style="list-style-type: none"> Include an obligation to comply with environmental protection including noise reduction in Subcontractor agreements Implement Complaint Procedure Protocol (described in Section 9.1) 	Positive: Environmental remediation, new bridge, increased height to facilitate recreational boat traffic, job creation Negative: Negligible to minor disturbance to local residents	L,N	SSA, LSA	N/A	ST, LT	O,C	R	Not Significant
		Pipeline Decommissioning	<ul style="list-style-type: none"> Temporarily increased traffic, air, noise, and light emissions Eliminated risk of pipeline spill Job creation 	<ul style="list-style-type: none"> Implement Complaint Procedure Protocol (described in Section 9.1) 	Positive: Environmental remediation and job creation Negative: Negligible to minor disturbance to local residents	L	SSA, LSA	N/A	ST	O,C	R, IR	Not Significant
Economic and Social		Waste Management	<ul style="list-style-type: none"> Job creation Increased traffic volumes Potential effects on residents in close proximity and/or water sources in the event of an accident or spill when transporting leachate 	<ul style="list-style-type: none"> Minimize the size/extent of open faces of the containment cell that have potential to emit odours or other contaminants Include an obligation to comply with environmental protection including noise reduction in Subcontractor agreements Implement Complaint Procedure Protocol (described in Section 9.1) Keep material contained through use of Geotubes® or equivalent technology Restrict heavy equipment movement and haulage from 11 p.m. to 7 a.m. during the operation phase 	Positive: Job creation and economic spinoff Negative: Negligible to minor disturbance to local residents	L	SSA/ LSA	N/A	ST/ MT/ LT	O	F	Not Significant

Table 8.1-2 Summary Table of Environmental Impact Assessment

Valued Component Affected	Area of Federal Jurisdiction ⁽¹⁾ (✓)	Project Activity	Potential Effects	Proposed Mitigation	Residual Effect	Key Criteria for Determining Significance ⁽²⁾						Significance of Residual Adverse Effect
						Magnitude ⁽³⁾	Geographic Extent ⁽⁴⁾	Timing ⁽⁵⁾	Duration ⁽⁶⁾	Frequency ⁽⁷⁾	Reversibility ⁽⁸⁾	
		Dredging	<ul style="list-style-type: none"> Job creation Increased traffic volumes Noise, light, air emissions resulting from dredging on-site activity 	<ul style="list-style-type: none"> Minimize potential odour emissions by properly covering the dredged sediment to minimize the exposed area and the potential odour emissions during transportation of the dredged material Design Site, including widening of roadways, the turn-around at containment cell and placement of Site infrastructure to minimize the need for reversing and vehicle reversing alarms Restrict heavy equipment movement and haulage from 11 p.m. to 7 a.m. during the operation phase Locate stockpile areas and infrastructure at a minimum 500 m away from sensitive receptors Undertake regular checks for excessive noise on-site and in proximity to sensitive receptors 	<p>Positive: Job creation and economic spinoff</p> <p>Negative: Negligible to minor disturbance to local residents</p>	N	SSA/LSA	N/A	ST/MT	O	R	Not Significant
		Wetland Management	<ul style="list-style-type: none"> Job creation Increased traffic volumes Noise, light, air emissions resulting from the construction of access roads and dredging on-site activity 	<ul style="list-style-type: none"> No further mitigation measures proposed outside of the applicable mitigation measures listed in Table 8.1-1 and included in the draft PEPP 	<p>Positive: Job creation and economic spinoff</p> <p>Negative: Negligible to minor disturbance to local residents</p>	N	SSA/LAA	N/A	ST	O	R	Not Significant
		Bridge at Highway 348	<ul style="list-style-type: none"> Job creation Increased traffic volumes Renewed lifespan for bridge 	<ul style="list-style-type: none"> Reduce vehicle traffic volume and speed limit for the temporary causeway to minimize the amount of airborne emissions. Volume and speed limits will be adjusted appropriately to conditions at the time (i.e., dry weather and dust) and temporary lights will be used to regulate traffic flow Restrict heavy equipment movement and haulage from 11 p.m. to 7 a.m. during the site preparation and construction phase Include an obligation to comply with environmental protection including noise reduction in Subcontractor agreements will Implement Complaint Procedure Protocol (described in Section 9.1) 	<p>Positive: Job creation and economic spinoff</p> <p>Negative: Negligible to minor disturbance to local residents</p>	L	SSA/LSA	N/A	ST/LT	O/C	R	Not Significant
		Pipeline Decommissioning	<ul style="list-style-type: none"> Job creation Increased traffic volumes Noise, light, air emissions resulting from site work 	<ul style="list-style-type: none"> Implement Complaint Procedure Protocol (described in Section 9.1) 	<p>Positive: Job creation and economic spinoff</p> <p>Negative: Negligible to minor disturbance to local residents</p>	L	SSA/LSA	N/A	ST	O	R	Not Significant
		Dam	<ul style="list-style-type: none"> Job creation Increased traffic volumes 	<ul style="list-style-type: none"> Implement Complaint Procedure Protocol (described in Section 9.1) 	<p>Positive: Job creation and economic spinoff</p>	L	SSA/LAA	N/A	ST/MT	O	R	Not Significant

Table 8.1-2 Summary Table of Environmental Impact Assessment

Valued Component Affected	Area of Federal Jurisdiction ⁽¹⁾ (✓)	Project Activity	Potential Effects	Proposed Mitigation	Residual Effect	Key Criteria for Determining Significance ⁽²⁾						Significance of Residual Adverse Effect
						Magnitude ⁽³⁾	Geographic Extent ⁽⁴⁾	Timing ⁽⁵⁾	Duration ⁽⁶⁾	Frequency ⁽⁷⁾	Reversibility ⁽⁸⁾	
			<ul style="list-style-type: none"> Noise, light, air emissions resulting from demolition and construction activity 	<ul style="list-style-type: none"> Restrict heavy equipment movement and haulage from 11 p.m. to 7 a.m. during the decommissioning and abandonment phase Undertake regular checks for excessive noise on-site and in proximity to sensitive receptors 	Negative: Negligible to minor disturbance to local residents							
Archaeological/Cultural Heritage Resources		Waste Management	<ul style="list-style-type: none"> Disturbance, destruction and/or loss of archaeological/cultural heritage resources 	<ul style="list-style-type: none"> Review archaeological assessment reports for areas of avoidance Complete additional shovel testing, as required, prior to ground disturbance in areas described as high archaeological potential Complete a Site-specific background research, shovel testing and/or test excavation for ground disturbances within 50 m of the identified archaeological sites Complete operator training for identification of potential archaeological/cultural heritage resources Implement construction monitoring throughout the duration of the Project in areas that will be disturbed and are identified currently as moderate to high archaeological potential Halt all work and make immediate contact with the Coordinator of the Special Places Program if archaeological/cultural resources are encountered during waste management activities Immediately contact the Coordinator of Special Places and Assembly of Nova Scotia Mi'kmaq Chiefs via the Kwilmu'kw Maw-klusuaqn Negotiation Office in the unlikely event that human remains are encountered Complete archaeological monitoring during any ground disturbance within the historic limits of Boat Harbour and its associated marshes 	Potential disturbance, destruction, and/or loss or archaeological/ cultural heritage resources	L/M	SSA	N/A	P	O	IR	Not Significant
		Dredging				M	SSA	N/A	P	O	IR	Not Significant
		Wetland Management				M	SSA	N/A	P	O	IR	Not Significant
		Bridge at Highway 348				N	SSA	N/A	P	O	IR	Not Significant
		Pipeline Decommissioning				N	SSA	N/A	P	O	IR	Not Significant
		Dam				N,M	SSA	N/A	P	O	IR	Not Significant
Human Health		Waste Management	<ul style="list-style-type: none"> Increased traffic volumes Noise, light, air emissions 	<ul style="list-style-type: none"> Restrict heavy equipment movement and haulage from 11 p.m. to 7 a.m. during the site preparation and construction phase Minimize the size/extent of open faces of the containment cell that have potential to emit odours or other contaminants Design Site to reduce need for reversing and vehicle reversing alarms Implement Complaint Procedure Protocol (described in Section 9.1) Conduct long-term groundwater and surface water monitoring for the containment cell to confirm leakage is not occurring and to document water quality 	Negative: Negligible to minor disturbance to local residents	L	SSA LSA	N/A	ST/ MT/ LT	O	R	Not Significant

Table 8.1-2 Summary Table of Environmental Impact Assessment

Valued Component Affected	Area of Federal Jurisdiction ⁽¹⁾ (√)	Project Activity	Potential Effects	Proposed Mitigation	Residual Effect	Key Criteria for Determining Significance ⁽²⁾						Significance of Residual Adverse Effect	
						Magnitude ⁽³⁾	Geographic Extent ⁽⁴⁾	Timing ⁽⁵⁾	Duration ⁽⁶⁾	Frequency ⁽⁷⁾	Reversibility ⁽⁸⁾		
				<ul style="list-style-type: none"> Restrict all vehicles transporting leachate, which is considered as a hazardous material from traveling through the PLFN community Carry out all Accommodations in Section 6.5 									
		Dredging	<ul style="list-style-type: none"> Increased traffic volumes Noise, light, air emissions resulting from dredging activities 	<ul style="list-style-type: none"> Minimize potential odour emissions by properly covering the dredged sediment to minimize the exposed area and the potential odour emissions during transportation of the dredged material Implement Project-specific Health and Safety Plan (HASP) Restrict heavy equipment movement and haulage from 11 p.m. to 7 a.m. during the operation phase Stockpile areas and infrastructure will be located in the central portions of the Site, further from sensitive receptors surrounding the Site Undertake regular checks for excessive noise on-site and in proximity to sensitive receptors Implement Complaint Procedure Protocol (described in Section 9.1) 	<p>Positive: Long-term air quality improvement</p> <p>Negative: Negligible to minor disturbance to local residents</p>	N	SSA/LSA	N/A	ST/MT	O	R	Not Significant	
		Wetland Management	<ul style="list-style-type: none"> Increased traffic volumes Noise, light, air emissions resulting from the construction of access roads and dredging on-site activity 	<ul style="list-style-type: none"> Implement Project-specific Health and Safety Plan (HASP) Minimize the dry operation of dredged materials to reduce emissions of particulate matter Transfer the dredged material in positions near the access roads to limit the amount of travel of all heavy equipment Implement Complaint Procedure Protocol (described in Section 9.1) 	<p>Positive: Long-term air quality improvement</p> <p>Negative: Negligible to minor disturbance to local residents</p>	N	SSA/LSA	N/A	ST	O	R	Not Significant	
		Bridge at Highway 348	<ul style="list-style-type: none"> Increased traffic volumes Renewed lifespan of bridge 	<ul style="list-style-type: none"> Adjust volume and speed limits appropriately to conditions at the time (i.e., dry weather and dust) and temporary lights will be used to regulate traffic flow Design and implement sidewalks with appropriate lighting on either side of the bridge, which will assist with safety (pedestrian and vehicles) Implement Complaint Procedure Protocol (described in Section 9.1) 	<p>Positive: New lifespan for bridge/new bridge</p> <p>Negative: Negligible to minor disturbance to local residents</p>	L/N	SSA/LSA	N/A	ST/LT	O/C	R	Not Significant	
		Pipeline Decommissioning	<ul style="list-style-type: none"> Increased traffic volumes Noise, light, air emissions resulting from site work 	<ul style="list-style-type: none"> Implement traffic, noise, light, and air mitigation measures 	<p>Negative: Negligible to minor disturbance to local residents</p>	L	SSA/LSA	N/A	ST	O	R	Not Significant	

Table 8.1-2 Summary Table of Environmental Impact Assessment

Valued Component Affected	Area of Federal Jurisdiction ⁽¹⁾ (√)	Project Activity	Potential Effects	Proposed Mitigation	Residual Effect	Key Criteria for Determining Significance ⁽²⁾					Significance of Residual Adverse Effect
						Magnitude ⁽³⁾	Geographic Extent ⁽⁴⁾	Timing ⁽⁵⁾	Duration ⁽⁶⁾	Frequency ⁽⁷⁾	

Notes:

⁽¹⁾ As per the EIS Guidelines, a check mark has been used to indicate which valued components can be considered "environmental effects" as defined in Section 5 of CEAA 2012, and the relevant subsection of Section 5 has been specified.

⁽²⁾ Key criteria used to determine significance have been detailed in Section 7.2, Effects Assessment Methodology, and summarized below. The ecological and social context within which potential environmental effects may occur has been taken into account when considering each VC, as per the EIS Guidelines.

⁽³⁾ N - Negligible, L - Low, M - Moderate, H - High

⁽⁴⁾ SSA - Site Study Area, LSA - Local Study Area, RSA - Regional Study Area

⁽⁵⁾ N/A - Not Applicable, A- Applicable

⁽⁶⁾ ST - Short-Term, MT - Medium-Term, LT - Long-Term, P - Permanent

⁽⁷⁾ O - Once, S - Sporadic, R - Regular, C- Continuous

⁽⁸⁾ R - Reversible, PR - Partially Reversible, IR - Irreversible

Key Measures to Mitigate any Significant Adverse Project Effects

As shown in Table 8.1-1, the Project is not anticipated to result in significant adverse residual environmental effects based on the environmental effects assessment carried out and supporting baseline studies completed for each of the identified VCs. The potential adverse effects as detailed in Section 7.3 and summarized in Table 8.1-2 are generally temporary in nature and are typically addressed by standard construction mitigation measures, standard operating procedures or best management practices.

However, there are some instances where specific key mitigation measures outside of typical best management have been proposed that are essential in ensuring that the Project will not result in significant adverse environmental effects. These measures have been summarized in a second table (Table 8.1-3), as per the EIS Guidelines to highlight the key mitigation measures and commitments that NS Lands will be responsible for implementing. Not all VCs are listed Table 8.1-3, as a VC was only listed if there were key mitigation measures that were essential in ensuring that there would be no significant adverse environmental effects to it.

Many of the mitigation measure discussed below are specific to the proposed design of the Project components (i.e., the containment cell liner system and TLTF) and associated environmental controls which are described in detail in Section 3.

Table 8.1-3 Summary of Key Mitigation Measures Preventing Significant Adverse Project Effects

Valued Component Affected	Area of Federal Jurisdiction ⁽¹⁾ (√)	Project Activity	Potential Significant Adverse Project Effects	Essential Mitigation Measure Proposed	Residual Effect	Key Criteria for Determining Significance ⁽²⁾						Significance of Residual Adverse Effect
						Magnitude ⁽³⁾	Geographic Extent ⁽⁴⁾	Timing ⁽⁵⁾	Duration ⁽⁶⁾	Frequency ⁽⁷⁾	Reversibility ⁽⁸⁾	
Air Quality and Odour		Waste Management	<ul style="list-style-type: none"> Release of VOCs into the ambient air from exposed contaminated soil/sludge 	<ul style="list-style-type: none"> Keep waste material contained through use of Geotubes® or equivalent technology 	Temporarily Degraded Air Quality	M	SSA	A	MT	S	R	Not Significant
		Dredging and Wetland Management	<ul style="list-style-type: none"> Temporary elevated emission levels of VOCs and odour from the dredged material and exposed contaminated soil/sludge being released into the surrounding ambient air 	<ul style="list-style-type: none"> Minimize the dry operation of dredged materials to reduce emissions of particulate matter Keep waste material contained through use of dredge piping and Geotubes® or equivalent technology 	Temporarily Degraded Air Quality	M	SSA	A	MT	C	R	Not Significant
Greenhouse Gas		Waste Management	<ul style="list-style-type: none"> Production and release of LFG from within containment cell 	<ul style="list-style-type: none"> Conduct operations in a way which limits the biological material that is placed in the containment cell to reduce long-term LFG emissions. This will be done by limiting the amount of non-impacted vegetation placed in the containment cell Cap the containment cell and install passive venting after remediation is complete, to control landfill gas Design and construct final landfill cover contours to accommodate the anticipated range of final waste volumes and control the release of LFG 	Ongoing release of LFG	L	LSA	N/A	LT/P	C	IR	Not Significant
Noise		Waste Management	<ul style="list-style-type: none"> Temporarily elevated sound levels in the Local Study Area (LSA) due to increased heavy equipment Temporary elevated sound levels due to operation of the TLTF 	<ul style="list-style-type: none"> Restrict heavy equipment movement and haulage from 11:00 p.m. to 7:00 a.m. during the site preparation and construction phase Locate stockpile areas and infrastructure at minimum 500 m away from sensitive receptors Design Site, including widening of roadways, the turn-around at containment cell and placement of Site infrastructure to minimize the need for reversing and vehicle reversing alarms 	Temporary elevation of sound levels in LSA	L	LSA	A	MT	R	R	Not Significant
		Dredging	<ul style="list-style-type: none"> Temporary elevated sound levels in LSA due to dredging activities 	<ul style="list-style-type: none"> Restrict heavy equipment movement and haulage from 11:00 p.m. to 7:00 a.m. during the operation phase Locate stockpile areas and infrastructure at minimum 500 m away from sensitive receptors 	Temporary minor elevation of sound levels in LSA	L	LSA	A	MT	C	R	Not Significant
		Wetland Management	<ul style="list-style-type: none"> Temporary elevated sound levels in LSA due to dredging activities 	<ul style="list-style-type: none"> Restrict heavy equipment movement and haulage from 11:00 p.m. to 7:00 a.m. during the site preparation and construction phase Locate stockpile areas and infrastructure at minimum 500 m away from sensitive receptors Design Site, including widening of roadways, the turn-around at containment cell and placement of Site infrastructure to minimize the need for reversing and vehicle reversing alarms 	Temporary minor elevation of sound levels in LSA	L	LSA	A	ST	R	R	Not Significant

Table 8.1-3 Summary of Key Mitigation Measures Preventing Significant Adverse Project Effects

Valued Component Affected	Area of Federal Jurisdiction ⁽¹⁾ (√)	Project Activity	Potential Significant Adverse Project Effects	Essential Mitigation Measure Proposed	Residual Effect	Key Criteria for Determining Significance ⁽²⁾						Significance of Residual Adverse Effect
						Magnitude ⁽³⁾	Geographic Extent ⁽⁴⁾	Timing ⁽⁵⁾	Duration ⁽⁶⁾	Frequency ⁽⁷⁾	Reversibility ⁽⁸⁾	
		Bridge at Highway 348	<ul style="list-style-type: none"> Temporary elevated sound levels in LSA due to construction areas Increase in traffic noise at existing residences due to increase traffic noise from construction 	<ul style="list-style-type: none"> Restrict heavy equipment movement and haulage from 11:00 p.m. to 7:00 a.m. during the site preparation and construction phase Locate stockpile areas and infrastructure at minimum 500 m away from sensitive receptors Design Site, including widening of roadways, the turn-around at containment cell and placement of Site infrastructure to minimize the need for reversing and vehicle reversing alarms 	Temporary minor elevation of sound levels in LSA	L	LSA	A	ST	R	R	Not Significant
		Treatment Buildings	<ul style="list-style-type: none"> Temporary elevated sound levels in LSA 	<ul style="list-style-type: none"> Restrict heavy equipment movement and haulage from 11:00 p.m. to 7:00 a.m. during the decommissioning and abandonment phase Locate stockpile areas and infrastructure at minimum 500 m away from sensitive receptors 	Temporary minor elevation of sound levels in LSA	L	LSA	A	ST	R	R	Not Significant
		Dam	<ul style="list-style-type: none"> Temporary elevated sound levels in LSA due to demolition areas 	<ul style="list-style-type: none"> Restrict heavy equipment movement and haulage from 11:00 p.m. to 7:00 a.m. during decommissioning and abandonment phase Locate stockpile areas and infrastructure at minimum 500 m away from sensitive receptors 	Temporary minor elevation of sound levels in LSA	L	LSA	A	MT	R	R	Not significant
Groundwater		Waste Management	<ul style="list-style-type: none"> Contamination to groundwater from leachate Change to groundwater flow downgradient 	<ul style="list-style-type: none"> Construct proposed liner system and leachate collection system within the containment cell Monitor perimeter groundwater wells for COCs as outlined in the Groundwater Monitoring Plan Grade area around the TLTF and leachate loading station to direct any spills to the lined stormwater management pond Implement the proposed interim cover on the containment cell following waste placement to reduce leachate generation Construct a leachate holding tank with appropriate seals and construct spill containment in case of spill while pumping from the holding tank to tanker truck to haul leachate off-site Monitor and maintain leachate collection system within containment cell 	Change to groundwater flow downgradient	M	SSA	A	ST	R	R	Not Significant
Surface Water		Waste Management	<ul style="list-style-type: none"> Temporary storage of contaminated substances in areas that could interact with surface water 	<ul style="list-style-type: none"> Install the new stormwater management system to separate stormwater runoff and leachate, which will greatly improve the quality of the stormwater Direct stormwater runoff from containment cell while under interim and final cover to the forebay pond through a constructed channel, which will be rock lined to prevent erosion and reduce stormwater velocity Construct the outlet pipe from the stormwater pond using High-Density Polyethylene (HDPE) pipe 	<p>Temporary increased sedimentation</p> <p>Potential spill of leachate and resulting surface water impacts</p>	M	SSA	A	ST/LT	R	R	Not Significant

Table 8.1-3 Summary of Key Mitigation Measures Preventing Significant Adverse Project Effects

Valued Component Affected	Area of Federal Jurisdiction ⁽¹⁾ (✓)	Project Activity	Potential Significant Adverse Project Effects	Essential Mitigation Measure Proposed	Residual Effect	Key Criteria for Determining Significance ⁽²⁾						Significance of Residual Adverse Effect	
						Magnitude ⁽³⁾	Geographic Extent ⁽⁴⁾	Timing ⁽⁵⁾	Duration ⁽⁶⁾	Frequency ⁽⁷⁾	Reversibility ⁽⁸⁾		
				<ul style="list-style-type: none"> Design stormwater management system to have the capacity to contain stormwater generated from a 100-year precipitation event without any flooding Fully line the forebay and settling ponds with a heavy geotextile liner system. The ponds will have an additional lining of angular stones for approximately 6 inches (150 mm) Construct ponds to accommodate stormwater generated from the 100-year precipitation event while maintaining a freeboard of 0.6 m, which is twice the recommended freeboard of 0.3 m Construct outlet flow control structure to reduce sedimentation 									
		Dredging	<ul style="list-style-type: none"> Effect on water quality due to the re-suspension of sediment resulting in increased suspended solids and turbidity Possible increase of sediment particles that could affect fish egg settling, TSS can also have an impact on fish gills 	<ul style="list-style-type: none"> Control effluent discharge to estuary at the outlet control structure to respect the TSS CCME criteria (< 25 mg/L from background level) and confirm by applying a TSS monitoring program Use properly installed silt curtains to control sedimentation as outlined in the most recent version of NSE's <i>Erosion and Sedimentation Handbook for Construction Sites</i> 	Temporary increased sedimentation	M	SSA	A	MT	C	R	Not Significant	
		Wetland Management	<ul style="list-style-type: none"> Effect on water quality due to the re-suspension of sediment resulting in increased suspended solids and turbidity Possible release of contaminants that have been historically contained in sediments during the wetland remediation process 	<ul style="list-style-type: none"> Use a "moon pool" system complete with dual perimeter curtains during any dredging within the estuary to limit an increase in TSS in adjacent areas Control effluent discharge to estuary at the outlet control structure to respect the TSS CCME criteria (< 25 mg/L from background level) and confirm by applying a TSS monitoring program 	Temporary increased sedimentation	M	SSA	ST/MT	R/C	R	R	Not Significant	
		Dam	<ul style="list-style-type: none"> Effect on water quality due to the re-suspension of sediment resulting in increased suspended solids and turbidity during removal of dam and dredging 	<ul style="list-style-type: none"> Implement surface water BMPs to respect the TSS CCME criteria (< 25 mg/L from background level) and confirm by applying a TSS monitoring program As articulated in the Project EPP properly installed silt curtains and cofferdams will be used as per the most recent version of NSE's <i>Erosion and Sedimentation Handbook for Construction Sites</i> Install additional silt curtains in the water upstream and downstream of the dam decommissioning works to control the migration of silt generated as a result of the dam removal 	No residual effects anticipated	L	SSA	A	ST	O	R	Not Significant	

Table 8.1-3 Summary of Key Mitigation Measures Preventing Significant Adverse Project Effects

Valued Component Affected	Area of Federal Jurisdiction ⁽¹⁾ (√)	Project Activity	Potential Significant Adverse Project Effects	Essential Mitigation Measure Proposed	Residual Effect	Key Criteria for Determining Significance ⁽²⁾						Significance of Residual Adverse Effect
						Magnitude ⁽³⁾	Geographic Extent ⁽⁴⁾	Timing ⁽⁵⁾	Duration ⁽⁶⁾	Frequency ⁽⁷⁾	Reversibility ⁽⁸⁾	
Wetlands	✓ 5 (a) (i,iii)	Wetland Management	<ul style="list-style-type: none"> During hydraulic and/or mechanical dredging, impacted sediments may be suspended, increasing levels of TSS, total dissolved solids (TDS), turbidity, and conductivity. If wetland vegetation is removed, water temperatures may increase as well 	<ul style="list-style-type: none"> Compensate for loss of wetland functions that support mammals and wildlife as part of the wetland compensation plan to be submitted to NSE Use a "moon pool" system complete with dual perimeter curtains during any dredging within the estuary to limit an increase in TSS in adjacent areas 	Disturbance, Habitat loss	L/M	SSA	A	ST	O/C	R	Not Significant
		Dam	<ul style="list-style-type: none"> During removal of the Dam, impacted sediments may be suspended, increasing levels of TSS, TDS, turbidity, and conductivity 	<ul style="list-style-type: none"> Use appropriate erosion and siltation control measures during the remediation of impacted wetlands including the use silt curtains between all active dredging cells and adjacent cells in the wetland and use of a "moon pool" system complete with dual perimeter curtains during any dredging within the estuary to limit an increase in TSS in adjacent areas 	Disturbance, Habitat loss	M	SSA	A	ST	C	R	Not Significant
Marine Environment	✓ 5 a (i)	Wetland Management	<ul style="list-style-type: none"> Direct destruction of fish during the removal of impacted sediments in selected wetlands During remediation, impacted sediments may be suspended, increasing levels of TSS, TDS, turbidity, and conductivity. If estuary vegetation is removed, water temperatures may increase as well Possible release of contaminants that have been historically contained in sediments during the wetland remediation process 	<ul style="list-style-type: none"> Euthanize fish in a culturally sensitive manner that will be determined in consultation with PLFN Use appropriate erosion and siltation control measures during the remediation of the estuary, including use of silt curtains in conjunction with additional measures such as a "moon pool" system.⁴ 	Disturbance; remediation. Destruction of fish that have been exposed to contamination, removal of impacted sediment	H	SSA	A	ST	C	R	Not Significant

⁴ Use appropriate erosion and siltation control measures during the remediation of the estuary, including use of silt curtains in conjunction with additional measures such as, a "Moon Pool"

Table 8.1-3 Summary of Key Mitigation Measures Preventing Significant Adverse Project Effects

Valued Component Affected	Area of Federal Jurisdiction ⁽¹⁾ (✓)	Project Activity	Potential Significant Adverse Project Effects	Essential Mitigation Measure Proposed	Residual Effect	Key Criteria for Determining Significance ⁽²⁾						Significance of Residual Adverse Effect
						Magnitude ⁽³⁾	Geographic Extent ⁽⁴⁾	Timing ⁽⁵⁾	Duration ⁽⁶⁾	Frequency ⁽⁷⁾	Reversibility ⁽⁸⁾	
		Dam	<ul style="list-style-type: none"> Possible release of contaminants into the estuary during removal of dam 	<ul style="list-style-type: none"> Ensure proper sedimentation and erosion controls are in place prior to the removal of the dam control structure including use of silt curtains in conjunction with sedimentation additional measures such as a "moon pool" system Ensure adequate remediation has taken place, and impacted sludge is removed before releasing process water into the Northumberland Strait 	Disturbance, habitat gain	M	A	A	ST	O	R	Not Significant
Fish and Aquatic Habitat	✓ 5 (a) (i)	Dredging	<ul style="list-style-type: none"> Direct destruction of fish during the removal of impacted sediments During remediation, impacted sediments may be suspended, increasing levels of TSS, TDS, turbidity, and conductivity 	<ul style="list-style-type: none"> Obtain authorization from DFO for fish euthanization and follow conditions of approval Complete euthanization of fish in a culturally sensitive manner that will be determined in consultation with PLFN Use of silt curtains to limit levels of TSS, TDS, turbidity, and conductivity during remediation 	Destruction of fish that have been exposed to contamination, temporary habitat disruption	L/H	SSA	A	ST/MT	O/C	R	Not Significant
		Wetland Management	<ul style="list-style-type: none"> Direct destruction of fish during the removal of impacted sediments in selected wetlands During remediation, impacted sediments may be suspended, increasing levels of TSS, TDS, turbidity, and conductivity Possible release of contaminants that have been historically contained in sediments during the wetland remediation process 	<ul style="list-style-type: none"> Obtain authorization from DFO for fish euthanization and follow conditions of approval Complete euthanization of fish in a culturally sensitive manner that will be determined in consultation with PLFN Use of silt curtains to limit levels of TSS, TDS, turbidity, and conductivity during remediation 	Disturbance; remediation. Destruction of fish that have been exposed to contamination, temporary habitat disruption	M/H	SSA	A	ST	O/C	R	Not Significant
		Dam	<ul style="list-style-type: none"> Possible release of contaminants during removal of dam 	<ul style="list-style-type: none"> Ensure proper sedimentation and erosion controls are in place prior to the removal of the dam control structure including use of silt curtains in conjunction with sedimentation additional measures such as a "moon pool" system 	Disturbance – temporary loss of habitat followed by habitat compensation	M	A	A	ST	O	R	Not Significant
Migratory Birds	✓ 5 (a) (iii)	Waste Management	<ul style="list-style-type: none"> Temporary loss of terrestrial and wetland habitat through access road upgrades, construction of new stormwater management pond, leachate transfer hauling station 	<ul style="list-style-type: none"> Avoid construction on native vegetation during the breeding season for migratory birds where practical (beginning of April to end of August for migratory birds; Environment and Climate Change Canada [ECCC] 2015), where this is not possible, an active bird nest mitigation plan will be developed prior to construction and in consultation with ECCC and provincial regulators 	Disturbance, temporary habitat loss and fragmentation	M	SSA/RSA	A	ST/MT	S/R	PR	Not Significant

Table 8.1-3 Summary of Key Mitigation Measures Preventing Significant Adverse Project Effects

Valued Component Affected	Area of Federal Jurisdiction ⁽¹⁾ (√)	Project Activity	Potential Significant Adverse Project Effects	Essential Mitigation Measure Proposed	Residual Effect	Key Criteria for Determining Significance ⁽²⁾						Significance of Residual Adverse Effect
						Magnitude ⁽³⁾	Geographic Extent ⁽⁴⁾	Timing ⁽⁵⁾	Duration ⁽⁶⁾	Frequency ⁽⁷⁾	Reversibility ⁽⁸⁾	
		Dredging	<ul style="list-style-type: none"> Temporary loss of terrestrial and wetland habitat through mechanical excavation of the effluent ditches and the shallower areas at the edges of Boat Harbour 	<ul style="list-style-type: none"> Cover large piles or patches of bare soil or un-vegetated areas during the breeding season, wherever possible, to discourage ground-nesting or burrow-nesting species (such as common nighthawk and bank swallows) 	Disturbance, temporary habitat loss and fragmentation	M	SSA	A	MT	S/C	R	Not Significant
		Wetland Management	<ul style="list-style-type: none"> Clearing and grubbing during Site preparation areas may cause temporary and medium-term loss of habitat for birds 	<ul style="list-style-type: none"> Routes for machinery are to be shown on a figure, and then ground-truthed and corridors are to be surveyed for nesting birds during nesting season Cover large piles or patches of bare soil or un-vegetated areas during the breeding season, wherever possible, to discourage ground-nesting or burrow-nesting species (such as common nighthawk and bank swallows) Compensate for lost wetland functions that support migratory birds as part of the wetland compensation plan that will be submitted to NSE 	Disturbance, temporary habitat loss	M	SSA	A	ST	S	PR/R	Not Significant
		Treatment Buildings	<ul style="list-style-type: none"> Loss of the habitat that treatment buildings provide for nesting for migratory birds 	<ul style="list-style-type: none"> Schedule demolition of treatment buildings outside of typical breeding season (beginning of April to end of August for migratory birds). Where not possible, all buildings and laydown areas will be inspected for presence of active nests before demolition occurs 	Disturbance, temporary habitat loss	M	SSA	A	ST	R	R	Not Significant
		Dam	<ul style="list-style-type: none"> Loss of habitat through clearing/grubbing of vegetation along shoreline/banks 	<ul style="list-style-type: none"> Cover large piles or patches of bare soil or un-vegetated areas during the breeding season, wherever possible, to discourage ground-nesting or burrow-nesting species (such as common nighthawk and bank swallows) 	Disturbance, temporary habitat loss	M	LSA	A	MT	S	R	Not Significant
Species at Risk (SAR)		Waste Management	<ul style="list-style-type: none"> Loss of forested vegetative cover would decrease habitat availability for SAR, extensive ground works, including activities such as excavation will increase noise levels, increase in vehicular traffic will add to sensory disturbance through increased noise 	<ul style="list-style-type: none"> Avoid intact forest stands and wetlands, wherever possible, during detailed Project planning and design in favor of previously disturbed areas (e.g., stands disturbed by timber harvesting, existing roads, or other development), especially those that are predominantly mature softwood, as several Species of Conservation Concern (SOCC) lichens utilize this type of habitat Cover large piles or patches of bare soil or un-vegetated areas during the breeding season, wherever possible, to discourage ground-nesting or burrow-nesting species (such as common nighthawk and bank swallows) 	Disturbance, temporary habitat loss, habitat fragmentation	M/L	SSA	A	ST/MT	S/R	PR/R	Not Significant

Table 8.1-3 Summary of Key Mitigation Measures Preventing Significant Adverse Project Effects

Valued Component Affected	Area of Federal Jurisdiction ⁽¹⁾ (✓)	Project Activity	Potential Significant Adverse Project Effects	Essential Mitigation Measure Proposed	Residual Effect	Key Criteria for Determining Significance ⁽²⁾						Significance of Residual Adverse Effect
						Magnitude ⁽³⁾	Geographic Extent ⁽⁴⁾	Timing ⁽⁵⁾	Duration ⁽⁶⁾	Frequency ⁽⁷⁾	Reversibility ⁽⁸⁾	
		Dredging	<ul style="list-style-type: none"> Extensive ground works, including activities such as excavation will increase noise levels, increase in vehicular traffic will add to sensory disturbance through increased noise, which could deter SAR from using the area 	<ul style="list-style-type: none"> Cover large piles or patches of bare soil or un-vegetated areas during the breeding season, wherever possible, to discourage ground-nesting or burrow-nesting species (such as common nighthawk and bank swallows) 	Disturbance, temporary habitat loss, habitat fragmentation	L/M	SSA	A	MT	S/C	R	Not Significant
		Wetland Management	<ul style="list-style-type: none"> Temporary loss of wetland vegetation may decrease the amount of cover available for SAR and increase predation 	<ul style="list-style-type: none"> Maintain riparian wetland and watercourse buffers (where practical) to reduce adverse effects to wetlands, watercourses, and downstream receiving environments by clearly defining the limits of work Compensate for loss of wetland functions that support mammals and wildlife as part of the wetland compensation plan to be submitted to NSE 	Habitat loss, disturbance - Alteration of natural wetland function or watercourse morphology	M	SSA	A	ST	R	PR/R	Not Significant
		Treatment Buildings	<ul style="list-style-type: none"> Loss of the habitat that treatment buildings provide for nesting for priority bird species 	<ul style="list-style-type: none"> Schedule demolition of treatment buildings outside of typical breeding season (beginning of April to end of August for migratory birds). Where not possible, all buildings and laydown areas will be inspected for presence of active nests before demolition occurs 	Disturbance, temporary habitat loss	M	SSA	A	ST	R	R	Not Significant
		Dam	<ul style="list-style-type: none"> Temporary loss of wetland vegetation may decrease the amount of cover available for SAR and increase predation 	<ul style="list-style-type: none"> Work with ECCC and NSE to develop buffer and non-disturbance distances and zones that incorporate adaptive management should any ground- or burrow-nesting species initiate breeding activities on stockpiles or exposed areas 	Disturbance, habitat gain	M	A	A	ST	O	R	Not Significant
Mi'kmaq of Nova Scotia	✓ 5 (c) (i-iv)	Waste Management	<ul style="list-style-type: none"> Perceived limitation in restoration of traditional land and resource use 	<ul style="list-style-type: none"> Conduct long-term groundwater and surface water monitoring for the containment cell to confirm leakage is not occurring and to document water quality Carry out all Accommodations in Section 6.5 	Negligible to minor disturbance to local residents	L	SSA, LSA	N/A	ST, MT, LT	O,C	R, IR	Not Significant
Archaeological/ Cultural Heritage Resources		Waste Management	<ul style="list-style-type: none"> Disturbance, destruction and/or loss of archaeological/cultural heritage resources 	<ul style="list-style-type: none"> Complete additional shovel testing, as required, prior to ground disturbance in areas described as high archaeological potential Implement construction monitoring throughout the duration of the Project in areas that will be disturbed and are identified currently as moderate to high archaeological potential Halt all work and make immediate contact with the Coordinator of the Special Places Program if archaeological/cultural resources are encountered during waste management activities Immediately contact the Coordinator of Special Places and Assembly of Nova Scotia Mi'kmaq Chiefs via the Kwilmu'kw 	Potential disturbance, destruction, and/or loss or archaeological/ cultural heritage resources	L/M	SSA	N/A	P	O	IR	Not Significant
		Dredging				M	SSA	N/A	P	O	IR	Not Significant
		Wetland Management				M	SSA	N/A	P	O	IR	Not Significant
		Bridge at Highway 348				N	SSA	N/A	P	O	IR	Not Significant
		Pipeline Decommissioning				N	SSA	N/A	P	O	IR	Not Significant

Table 8.1-3 Summary of Key Mitigation Measures Preventing Significant Adverse Project Effects

Valued Component Affected	Area of Federal Jurisdiction ⁽¹⁾ (✓)	Project Activity	Potential Significant Adverse Project Effects	Essential Mitigation Measure Proposed	Residual Effect	Key Criteria for Determining Significance ⁽²⁾						Significance of Residual Adverse Effect
						Magnitude ⁽³⁾	Geographic Extent ⁽⁴⁾	Timing ⁽⁵⁾	Duration ⁽⁶⁾	Frequency ⁽⁷⁾	Reversibility ⁽⁸⁾	
		Dam		Maw-klusuaqn Negotiation Office in the unlikely event that human remains are encountered		N,M	SSA	N/A	P	O	IR	Not Significant
Human Health		Waste Management	<ul style="list-style-type: none"> Air and odour emissions resulting from operation of containment cell 	<ul style="list-style-type: none"> Minimize the size/extent of open faces of the containment cell that have potential to emit odours or other contaminants 	Negligible to minor disturbance to local residents	L	SSA LSA	N/A	ST/ MT/ LT	O	R	Not Significant
		Dredging	<ul style="list-style-type: none"> Noise, light, air emissions resulting from dredging activities 	<ul style="list-style-type: none"> Minimize potential odour emissions by properly covering the dredged sediment to minimize the exposed area and the potential odour emissions during transportation of the dredged material 	Negligible to minor disturbance to local residents	N	SSA/ LSA	N/A	ST/ MT	O	R	Not Significant
		Wetland Management	<ul style="list-style-type: none"> Noise, light, air emissions resulting from the construction of access roads and dredging on-site activity 	<ul style="list-style-type: none"> Minimize the dry operation of dredged materials to reduce emissions of particulate matter Transfer the dredged material in positions near the access roads to limit the amount of travel of all heavy equipment 	Negligible to minor disturbance to local residents	N	SSA/ LSA	N/A	ST	O	R	Not Significant

Notes:

- ⁽¹⁾ As per the EIS Guidelines, a check mark has been used to indicate which valued components can be considered "environmental effects" as defined in Section 5 of CEAA 2012, and the relevant subsection of Section 5 has been specified.
- ⁽²⁾ Key criteria used to determine significance have been detailed in Section 7.2, Effects Assessment Methodology, and summarized below. The ecological and social context within which potential environmental effects may occur has been taken into account when considering each VC, as per the EIS Guidelines.
- ⁽³⁾ N - Negligible, L - Low, M - Moderate, H - High
- ⁽⁴⁾ SSA - Site Study Area, LSA - Local Study Area, RSA - Regional Study Area
- ⁽⁵⁾ N/A - Not Applicable, A- Applicable
- ⁽⁶⁾ ST - Short-Term, MT - Medium-Term, LT - Long-Term, P - Permanent
- ⁽⁷⁾ O - Once, S - Sporadic, R - Regular, C- Continuous
- ⁽⁸⁾ R - Reversible, PR - Partially Reversible, IR - Irreversible



Environmental Impact Statement

Section 9 | Follow up and Monitoring Programs

Boat Harbour Remediation Project
Pictou Landing, Nova Scotia

Nova Scotia Lands Inc.

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9. Follow-up and Monitoring Programs

A number of follow-up and monitoring programs are proposed for the Valued Components (VCs) presented in this Environmental Impact Statement (EIS). Follow-up and monitoring programs are a best practice, but are also a requirement under federal legislation, and satisfy the requirements outlined within the Boat Harbour Remediation Project (BHRP or Project) EIS Guidelines.

Throughout this section, and as defined by the *Canadian Environmental Assessment Act, 2012* (CEAA 2012) a follow-up program means a program for:

- (a) verifying the accuracy of the environmental assessment of a designated project
- (b) determining the effectiveness of any mitigation measures

As per the EIS Guidelines, the purpose of a follow-up program is "to verify the accuracy of the effects assessment and to determine the effectiveness of the measures implemented to mitigate the adverse effects of the Project." Follow-up programs are an integral part of a broader environmental management plan that will be implemented post-approval for the purposes of verifying environmental effects predictions and the effectiveness of mitigation (as detailed in Section 7.3). Follow-up programs also provide Nova Scotia Lands Inc. (NSLI) with a means of ensuring compliance with applicable laws and regulations, and targets and objectives for continuous improvement.

The purpose of a monitoring program is "to ensure that proper measures and controls are in place in order to decrease the potential for environmental degradation during all phases of project development, and to provide clearly defined action plans and emergency response procedures to account for human and environmental health and safety". Monitoring programs provide NSLI with the means for identifying undesirable change and a basis for adaptive management (if and as required).

There are several circumstances where monitoring activities are identified in this EIS, and these are presented in the appropriate sections below. For clarity, this section will distinguish between measures or recommendations that are defined as "follow-up" (i.e., to verify the environmental effects predictions and/or the effectiveness of mitigation) as distinct from those that are related to "monitoring" (i.e., for demonstrating compliance or for any other purpose outside of the meaning of "follow-up" as defined by CEAA 2012).

Responsibilities

As the Proponent, NSLI has the responsibility to ensure that the follow-up and monitoring programs are implemented as intended during all phases of the Project. While many aspects of the programs will be conducted through contractors, the ultimate responsibility to implement the follow-up and monitoring programs recommended in this EIS and as confirmed by regulators and rests with NSLI. This also includes any additional requirements for monitoring identified in approvals, such as the Industrial Approval that would be applied for from Nova Scotia Environment through Part V – Approvals pursuant to the *Nova Scotia Environment Act*.

Methodology of Follow-Up or Monitoring

It is noted that some elements (including the parameters of the follow-up or monitoring programs, the implementation timing and frequency of monitoring described herein) are conceptual and presented in this EIS at a relatively high level. The details and methodology of these programs will be determined and finalized following discussions with regulators, and scientific advisors. Furthermore, as the Project progresses through detailed design, permitting and approvals, and implementation, the methodology for each program will be documented and adjusted as necessary, following the adaptive management approach described below.

Adaptive Management

Should an issue be identified, through implementation of the follow-up and monitoring programs regarding the predictions of potential effects and the significance of residual effects made in the EIS or in the effectiveness of mitigation, the issues will be investigated and resolved through use of adaptive management measures (as described in the CEEA Operational Policy Statement on adaptive management measures [CEEA 2009]). The Operational Policy Statement defines adaptive management as "a planned and systematic process for continuously improving environmental management practices by learning about their outcomes".

Adaptive management provides flexibility to identify and implement new mitigation measures or to modify existing ones during the life of a project. Issues observed will be discussed with regulators and additional mitigation measures or other corrective measures will be identified and implemented to address the situation.

As part of adaptive management, the follow-up and monitoring programs will be evaluated for effectiveness and appropriateness and the parameters being measured and reported. Details regarding the evaluation of the follow up and monitoring programs, such as frequency and reporting requirements will be specified in the Environmental Management Plan (EMP).

Stakeholder and PLFN Involvement

NSLI recognizes the inherent value of an open and flexible approach to follow up and monitoring that allows for stakeholder feedback and participation. Accordingly, the results of the follow up and monitoring programs will be documented and where appropriate, summaries of compliance and effects monitoring programs will be made available in a timely manner on the NSLI's Boat Harbour Remediation website: <https://novascotia.ca/boatharbour/monitoring>.

In addition to posting the results of the monitoring and follow up programs on the NSLI's Boat Harbour Remediation website, NSLI will engage with local community groups PLFN, and scientific advisors throughout the duration of the Project.

PLFN has been involved with ongoing monitoring activities at the Site and will continue to be provided with the opportunity to participate in monitoring activities throughout the lifespan of the Project where appropriate.

Documentation

Data gathered from the follow-up and monitoring programs will be rigorously evaluated to ensure the quality of the results. It will be documented in monitoring reports to be completed at a frequency

determined by Nova Scotia Environment (NSE) and through permits and approvals secured for implementation of the Project. The reports will be prepared in alignment with guidelines provided by the regulatory agencies for preparing monitoring reports, such as the number, content, frequency, and format. In the event that non-compliance with regulatory requirements is observed, operational practices and compliance programs will be reviewed to determine the appropriate course of action.

Follow-up and monitoring reports will be posted on the NSLI's Boat Harbour Remediation website, where appropriate.

Unexpected Deterioration of the Environment

In the event that the results of the follow-up or monitoring programs indicate a contamination issue or if an unexpected deterioration of the environment is observed, the results will be discussed with regulators in a timely manner. Investigations to determine the cause of the contamination/deterioration of the environment will be conducted and further mitigation measures and operational practices will be reviewed to determine the appropriate course of action.

9.1 Follow-up Programs

As stated, follow-up is a process to verify the accuracy of predicted effects and determine the degree to which mitigation measures were successful in eliminating, reducing, or controlling those effects. Follow-up programs for the Project are developed through careful consideration of each VC after the effects assessment has occurred.

As per the EIS Guidelines, the following items were taken into consideration when developing the preliminary follow-up programs:

- Whether the Project will impact environmentally sensitive areas/VCs or protected areas or areas under consideration for protection.
- The nature of Mi'kmaq of Nova Scotia and public concerns raised about the Project.
- Incorporation of Mi'kmaq of Nova Scotia knowledge, where available.
- The accuracy of predictions.
- Whether there is a question about the effectiveness of mitigation measures, or the proponent proposes to use new or unproven techniques and technology.
- The nature of cumulative environmental effects.
- The nature, scale and complexity of the program.
- Whether there was limited scientific knowledge about the effects in the Environmental Assessment (EA).

At a high level, the follow-up programs are composed of five steps based on a conceptual level of design:

1. **Review Baseline Conditions** | Baseline data will be reviewed, PLFN knowledge will be reviewed and further data will be collected **if required** during site preparation and construction, in order to verify the potential effects predicted in Section 7.3.

2. [Confirm Compliance Monitoring](#) | Confirmation that mitigation measures were implemented as intended.
3. [Verify Predicted Potential Effects](#) | Based on the confirmation of the baseline conditions, the accuracy of predictions of the potential environmental effects, including potential cumulative effects during each phase of the Project, will be established.
4. [Determine the Effectiveness of Mitigation Measures](#) | Through confirmation of the accuracy of predictions of the potential environmental effects, it will be determined if the mitigation measures that were proposed in Section 7.3 are sufficient to address the potential adverse effects resulting from each component/activity during each phase of the Project.
5. [Establish Additional Mitigation Measures if Required](#) | If it is determined that additional mitigation measures are required, they will be developed in discussion with regulatory agencies and PLFN.

Table 9.1 1 summarizes the preliminary follow up programs that are currently proposed for the Project. The preliminary programs will be finalized following discussions with regulators, public stakeholders, and PLFN. NSLI will continue to engage and consult with PLFN specifically relating to follow up programs as appropriate to address the EIS Guidelines. The finalized follow up programs will detail the measures NSLI will be taking to ensure protection of the environment and human health and will comply with the EMP and Project Environmental Protection Plan (PEPP) developed for this Project.

Table 9.1-1 Summary of the Preliminary Follow-up Programs Proposed for the Boat Harbour Remediation Project

Preliminary Follow-up Program	Objective	Elements for Follow-up	Studies to be Completed (parameters to be measured)	Planned Implementation Schedule
Atmospheric Environment	To ensure mitigation measures proposed for air quality and odour are sufficient at addressing potential effects to nearby sensitive receptors.	<ul style="list-style-type: none"> Ambient air quality Complaint response protocol 	<p>Independent Ambient Air Monitoring Program The Independent Ambient Air Monitoring Program currently ongoing for the Project will continue until full scale remediation has been completed. Data will continue to be monitored prior to construction and during construction. This will assist in confirming the predicted residual effects and to determine if additional mitigation measures are required. Parameters to measured are disused in Table 9.2-1.</p>	Site preparation and construction and operation.
			<p>Complaint Response Protocol (CRP) Follow-up regarding noise and light will occur only on an as needed basis as per the complaint response protocol, as directed by NSE. Details relating to the CRP are provided in Section 9.1.1.</p>	CRP will be in place throughout the duration of the Project.
Geology, Geochemistry and Soil, Groundwater and Surface Water	To ensure the mitigation measures, erosion and sediment control measures and the environmental controls proposed for the Project are successful at preventing adverse effects to geology, geochemistry and soil, groundwater or surface water.	<ul style="list-style-type: none"> Groundwater quality and groundwater elevation Surface water quality and quantity 	<p>Monitoring of Erosion and Sediment Control Measures Erosion and sediment control measures and soil stabilization practices will be monitored and maintained until slopes have stabilized/areas have been re-vegetated.</p>	Site preparation and construction and operation (and post closure for the containment cell).
			<p>Groundwater Quality and Quantity Monitoring A comprehensive list of analytes will be measured to identify any operations-related alterations to groundwater quality. Should impacts above applicable criteria for the Site area be detected, the effects would be further evaluated by a re-sampling and if found to be indicative of an effect mitigation measures would be employed in consultation with appropriate regulatory agencies.</p>	Site preparation and construction and operation (and post closure for the containment cell).
			<p>Water Discharge Criteria and Sampling Program This will include (at a minimum) monitoring the total suspended solids and biochemical oxygen demand of the water that is to be discharged into the Northumberland Strait during active dredging and operation of the Temporary Leachate Treatment System (TLTS). The Proponent is working with regulators to confirm the details of the effluent discharge sampling program.</p>	Years 2-6 during dredging and during operation of the TLTF.
			<p>Containment Cell Monitoring Infrastructure for long-term monitoring and care of the containment cell will be constructed, including the required groundwater and leachate monitoring wells and a surface water monitoring station located at the stormwater outlet structure.</p>	Closure and post-closure of the containment cell (6-25+ years).
Riparian, Wetlands and Terrestrial Environments	To ensure there are no permanent adverse effects to terrestrial habitat and vegetation, wetlands or mammals and wildlife by reviewing baseline conditions and conduct post remediation monitoring. The follow-up program will also ensure periods of environmental sensitivity are avoided during construction.	<ul style="list-style-type: none"> Compliance Monitoring Success in wildlife's re-establishment of the habitat provided at the Site after remediation 	<p>Compliance Monitoring Complete regular observations during remediation to ensure mitigation measures are properly implemented.</p> <p>Communicate with contractor and Project staff on the location of monitoring stations within remaining wetland habitat that is not approved for alteration.</p> <p>Re-evaluate wetland areas following the decommissioning of the Site to identify trends or impacts to wetlands due to project operations.</p>	Site preparation and construction, operation and decommissioning and abandonment.
Aquatic Environments	To ensure there are no permanent adverse effects post remediation monitoring of fish and aquatic habitat will be conducted.	<ul style="list-style-type: none"> Monitoring of remedial activities to evaluate their ability for allowing natural re-establishment of high quality aquatic habitat 	Re-evaluate aquatic areas following the decommissioning of the Site to identify trends or impacts to aquatic environments due to project operations.	Site preparation and construction, operation and decommissioning and abandonment.

Table 9.1-1 Summary of the Preliminary Follow-up Programs Proposed for the Boat Harbour Remediation Project

Preliminary Follow-up Program	Objective	Elements for Follow-up	Studies to be Completed (parameters to be measured)	Planned Implementation Schedule
Migratory Birds	To ensure there are no permanent adverse effects to migratory birds by reviewing baseline conditions and conducting post-remediation monitoring.	<ul style="list-style-type: none"> Compliance Monitoring Monitor known nests near equipment 	<p>Compliance Monitoring Verify the effectiveness of mitigation measures related to heavy machinery usage in wetland areas, and areas (if any) where excessive light pollution may disorient or attract avian species.</p>	Implement at the start of construction until the end of the decommissioning phase.
Mi'kmaq of Nova Scotia/Human Health	<p>To ensure there are no significant temporary effects during remediation activities to the Mi'kmaq of Nova Scotia or to human health through compliance monitoring.</p> <p>To ensure beneficial impacts related to employment opportunities are occurring.</p>	<ul style="list-style-type: none"> Atmospheric environment elements Archaeological resources Follow-up with contractors to ensure meaningful employment opportunities are offered to PLFN and local residents An additional PLFN well-being survey will be conducted 	<p>Compliance Monitoring Verify the effectiveness of mitigation measures related to air quality, odour, noise and light. To assess and document any related changes in well-being.</p>	Implement at the start of construction until the end of the decommissioning phase. Well-being follow-up will occur via a survey conducted once remediation activities have been completed.

9.1.1 Complaint Response Protocol

A Compliant Response Protocol (CRP) for this Project has been developed in which it is the responsibility of the CMOC to implement for the entire duration of site preparation, construction, and operation. The intention of the CRP is to ensure a swift and sure response to any and all complaints from area residents and business owners. The CRP will include the following requirements:

1. Notifying residents and business owners within 500 metres (m) of construction areas of the anticipated construction schedules for each site, at least one month prior to the start date.
2. Publicize details of the complaint protocol, including contact details, service performance standards, etc.
3. Provide a 24-hour telephone service with a performance standard of fielding/responding to complaints.
4. The CMOC will be responsible for establishing and maintaining a complaint register to record the following key information, at a minimum, for each formal complaint received through the 24-hour complaint telephone line:
 - Time complaint was made
 - Complainant name, address, and contact information
 - Type of issue (noise, vibration, odour)
 - Date and time of issue
 - Brief explanation of issue
 - Effects of issue (furniture/windows rattling, cannot hold conversation outdoors, smell requires us to shut our windows, etc.)
 - Name of personnel recording complaint
5. The CMOC will be responsible for the following activities at a minimum, for each formal complaint:
 - Being reactive to complaints and taking field measurements (i.e. noise, odour) of compliant activity if required
 - Reviewing and issuing directions to the contractor(s) to alter construction work programs for noise, vibration and odour impacts
 - Identify on a daily basis with the contractor(s) any high-risk activities
 - Reviewing Site specific environment protective measures with the contractor(s) and adjusting where required

NSLI will be responsible for supervision of any long-term noise monitoring programs if they are required.

Contingency Response and Corrective Measures

Upon receipt of the complaint within the area from any resident or facility the CMOC will begin discussions with the property owner on a remedy.

The Complainant will be advised in writing by NSLI via CMOC of any corrective measures taken.

With respect to noise, if the source of the noise is found to be a result of an activity occurring on-site, the CMOC with construction contractor /operations manager will:

- Determine the problem and take appropriate measures to mitigate the problem.
- Inform the resident of the measures taken to mitigate the problem

Should a complaint be received for a residence outside of the 1000 m radius from the Site, the CMOC will examine the situation on a case by case basis.

If construction equipment exceeds Project noise requirements and/or if corrective action is determined to be warranted through follow-up investigations, the following corrective measures will be considered:

- Replacement of construction equipment.
- Construction stoppage and/or revisions to construction schedules.
- Administrative controls such as staged construction to limit simultaneous operation of bad actors.
- Implementation of controls, including exhaust mufflers, temporary noise barriers, enclosures on generators or compressors, etc.
- Re-routing of equipment and/or travel routes.
- 24/7 noise monitoring if required at each complaint location.

Noise monitoring will be completed on an as needed basis in response to complaints received from the public.

Light monitoring may be completed if there are complaints to assist in identifying the significant sources of light. The light monitoring will be completed using a light meter to measure the light levels of the various operations. These results will be used to assist in identifying the sources of light that are potentially causing the complaints and help mitigate the sources of light.

9.2 Monitoring Programs

As previously mentioned, the objective of the proposed monitoring programs are to ensure that the necessary measures and environmental controls are implemented in order to decrease the likelihood for environmental degradation during all phases of the Project and to provide clearly defined action plans and emergency response procedures to account for human and environmental health and safety. The monitoring programs proposed will ensure compliance with regulatory permits, approvals, and requirements for this Project and will fully comply with the EMP and the PEPP.

Table 9.2 1 summarizes the preliminary monitoring programs presently proposed for the Project that were developed based on a conceptual level of design (including the management of leachate from the containment cell and groundwater monitoring). It is anticipated that the programs outlined will be refined based on comments from regulators, the public and PLFN through the EIS process and then worked into final documents presented to the various regulators for final approval.

The table summarizing the preliminary monitoring programs is arranged by VCs. The table only includes the VCs where monitoring was identified as being required. Where applicable, the monitoring requirements of regulatory instruments (permits and approvals) are outlined in the table, along with the anticipated monitoring reporting requirements. The preliminary monitoring programs will be finalized based on discussions with regulators, scientific advisors, and PLFN. The finalized monitoring programs will include specific measures to ensure that all Project phases (site preparation and construction, operation, and decommissioning and abandonment) are properly monitored.

Table 9.2-1 Summary of the Preliminary Monitoring Programs Proposed for the Boat Harbour Remediation Project

Valued Component	Preliminary Monitoring Programs	Program Objective	Method and Frequency	Anticipated Reporting Requirements
Air Quality and Odour	<p>The Independent Ambient Air Monitoring Program will continue during full scale remediation until completion. It will include the following air contaminants for long-term monitoring at the Fixed Monitoring Station and real-time monitoring within Boat Harbour.</p> <p>Fixed Long-term Monitoring</p> <p>Long-term monitoring parameters may include:</p> <ul style="list-style-type: none"> • Total Suspended Particulate (TSP) • Particulate Matter with Aerodynamic Diameter less than or equal to 10 microns (PM10) • Particulate Matter with Aerodynamic Diameter less than or equal to 2.5 microns (PM2.5) • Metals and Mercury • Polycyclic Aromatic Hydrocarbons (PAHs) • Speciated Volatile Organic Compounds (VOCs) • Dioxins and Furans • Ammonia, Acetaldehyde, and Formaldehyde • Speciated Reduced Sulphur Compounds • Chlorine, Chlorine Dioxide, and Methanol 	<p>To ensure:</p> <ul style="list-style-type: none"> • That concentrations of contaminants are below provincial and federal thresholds and/or the conditions of the Industrial Approval issued by NSE. • On-site dust abatement is effective • Project activities that require additional mitigation measures are identified. • That the monitoring conditions of the Industrial Approval are met. 	<ul style="list-style-type: none"> • Ambient air quality in the area will be monitored and reviewed over the lifetime of the Project. • Based on the results of the ongoing Independent Ambient Air Monitoring Program and in consultation with regulators, the parameters to be sampled and the frequency during remediation will be confirmed. • The frequency of sampling will be specified in the Environmental Management Plan. 	<ul style="list-style-type: none"> • The number, content, frequency, and format of the Independent Ambient Air Monitoring Reports during remediation will be confirmed with regulatory agencies. • Reporting requirements for the fixed long-term monitoring are anticipated to be similar to the reporting that is being completed for the ongoing long-term monitoring: <ul style="list-style-type: none"> – Weekly Interim Report – Monthly Fixed Station Report – Monthly Non-Technical Summary • Reporting requirements for the real-time monitoring are anticipated to be similar to the reporting that was completed for the real-time monitoring during the pilot scale activities: <ul style="list-style-type: none"> – Daily reports.

Table 9.2-1 Summary of the Preliminary Monitoring Programs Proposed for the Boat Harbour Remediation Project

Valued Component	Preliminary Monitoring Programs	Program Objective	Method and Frequency	Anticipated Reporting Requirements
	<p>Real-time Monitoring Real-time monitoring may include:</p> <ul style="list-style-type: none"> • Total Suspended Particulate (TSP) • Particulate Matter with Aerodynamic Diameter less than or equal to 10 microns (PM₁₀) • Hydrogen Sulfide (H₂S) • Total Volatile Organic Compounds (TVOCs) <ul style="list-style-type: none"> – Monitoring program will include action levels for monitored parameters such as TSP and PM₁₀ along with Site-specific corrective actions (additional watering, reduced daily truck traffic, reduced speeds, etc.) to ensure protection of residential receptors in the area. 			<ul style="list-style-type: none"> – All reports will continue to be posted on the Boat Harbour Remediation Project website and provided to PLFN in hard copy
Groundwater	<p>Groundwater Quality and Quantity Monitoring</p> <ul style="list-style-type: none"> • The groundwater quality and quantity monitoring program will at a minimum involve the locations, frequency and parameters of the existing program in place at the Site and will be supplemented if directed by regulatory authorities. 	<ul style="list-style-type: none"> • To verify groundwater flow and quality predictions made in the Impact Assessment and satisfy the requirements of the Industrial Approval. 	<ul style="list-style-type: none"> • The groundwater quality and quantity monitoring program will at a minimum involve the locations, frequency and parameters of the existing program in place at the Site and will be supplemented if directed by regulatory authorities. 	<ul style="list-style-type: none"> • The number, content, frequency, and format of the groundwater monitoring reporting will be determined in consultation with regulatory agencies and specified in the EMP • At a minimum, groundwater monitoring will be reported on an annual basis as part of the Annual Compliance Report, associated

Table 9.2-1 Summary of the Preliminary Monitoring Programs Proposed for the Boat Harbour Remediation Project

Valued Component	Preliminary Monitoring Programs	Program Objective	Method and Frequency	Anticipated Reporting Requirements
	<p>Containment Cell Monitoring</p> <ul style="list-style-type: none"> As part of containment cell closure, infrastructure for long-term monitoring and care of the containment cell will be constructed, including, the required groundwater and leachate monitoring wells. Leachate collection system cleanout riser piping will be installed to allow for long-term inspection, maintenance, and cleaning of the leachate collection piping. The long-term groundwater monitoring program will track changes in groundwater quality and flow over time and will be used to assess the validity of the model predictions regarding the containment cell and liner systems performance. 	<ul style="list-style-type: none"> To ensure all environmental controls function as intended and to validate model predictions regarding the containment cell and liner systems performance. 	<ul style="list-style-type: none"> Routine monitoring will occur during closure and post-closure of the containment cell. The methods and frequency of the monitoring will be specified in the Environmental Management Plan and regulated under the Industrial Approval. 	<p>with approval of the federal EIA</p> <ul style="list-style-type: none"> The results of containment cell monitoring will be reviewed and interpreted in detail annually as part of the annual reporting process and issued to NSE for their review. Annual reporting will continue through closure and post-closure. Annual data interpretation and reporting is used to ensure any deteriorations in environmental performance are identified and addressed through changes in operational practices or implementation of augmented remedial responses.
Surface Water	Water Quality Monitoring	<ul style="list-style-type: none"> To ensure compliance with discharge water quality, to verify predictions in the EIA and to ensure 	<ul style="list-style-type: none"> The methods and frequency of the monitoring will be specified in the Environmental Management Plan and 	<ul style="list-style-type: none"> The number, content, and format of the surface water monitoring reporting will be determined in consultation with

Table 9.2-1 Summary of the Preliminary Monitoring Programs Proposed for the Boat Harbour Remediation Project

Valued Component	Preliminary Monitoring Programs	Program Objective	Method and Frequency	Anticipated Reporting Requirements
	<ul style="list-style-type: none"> Samples will be collected during a wet event¹ and during a dry event² in spring, summer, and fall periods. Samples from each of the main streams entering Boat Harbour, plus one from the pond outfall near the containment cell will be collected. <p>Total Suspended Solids (TSS) Monitoring</p> <ul style="list-style-type: none"> Monitoring will include the enforcement of limits on specific contaminants of concerns (COCs) that may be associated with the suspended solids (i.e., metals, dioxins and furans). <p>Water Quantity Monitoring</p> <ul style="list-style-type: none"> Flow measurements will be collected at the Boat Harbour outlet throughout remediation. <p>Containment cell Monitoring</p> <ul style="list-style-type: none"> As part of containment cell closure, a surface water monitoring station will be constructed to facilitate ongoing surface water monitoring. 	<p>long term environmental controls associated with the containment cell function as intended.</p>	<p>regulated under the Industrial Approval.</p>	<p>regulatory agencies and specified in the Environmental Management Plan.</p> <ul style="list-style-type: none"> Surface water monitoring reporting will be submitted to NSE at a frequency set out in the Industrial Approval.
Wetlands	<p>Post Remediation Monitoring</p> <ul style="list-style-type: none"> Areas within the wetlands will be re-evaluated following the decommissioning of the Site. The Wetland Compensation Plan will include monitoring of newly created or restored wetlands. 	<ul style="list-style-type: none"> To identify trends or impacts to wetlands due to Project operations and to ensure the success of compensation activities. 	<ul style="list-style-type: none"> The specific parameters that will be measured during post remediation monitoring will be confirmed based on the results of the Human Health and Ecological Risk Assessment (HHERA) 	<ul style="list-style-type: none"> Wetland monitoring will be documented annually in the Annual Compliance Report.

¹ A wet event is defined as a sampling event following a rainfall event in excess of 5 mm

² A dry event is defined as a sampling event following a minimum of 3-4 days of no rain

Table 9.2-1 Summary of the Preliminary Monitoring Programs Proposed for the Boat Harbour Remediation Project

Valued Component	Preliminary Monitoring Programs	Program Objective	Method and Frequency	Anticipated Reporting Requirements
			<p>and through discussions with regulators.</p> <ul style="list-style-type: none"> The Wetland Compensation Plan will be reviewed on a regular basis as determined in collaboration with NSE. 	
Mammals and Wildlife	<ul style="list-style-type: none"> Post Remediation Monitoring Environmental monitoring will take place in areas thought to have a high potential for contamination after the Site is decommissioned, these include wetland areas found near the containment cell, and monitoring water quality at the mouth of the BHSL. Monitoring of remedial activities to evaluate their ability for allowing natural re-establishment of habitat for native species and monitoring wetlands for condition and integrity may be necessary post decommissioning phase. 	<ul style="list-style-type: none"> To determine if remedial objectives were achieved allowing for the natural re-establishment of habitat suitable for species typical of the area. 	<ul style="list-style-type: none"> The specific parameters that will be measured and the frequency of post remediation monitoring will be confirmed based on the results of the HHERA and through discussions with regulators and scientific advisors. 	<ul style="list-style-type: none"> Post remediation monitoring will be documented in the Annual Compliance Report.
Marine Environment	<p>Post Remediation Monitoring</p> <ul style="list-style-type: none"> Areas within the estuary will be re-evaluated following the decommissioning of the Site to identify trends or impacts to wetlands due to project activities. 	<ul style="list-style-type: none"> To identify trends or impacts to the areas within the estuary due to Project operations and to ensure the success of compensation activities. 	<ul style="list-style-type: none"> The specific parameters that will be measured and the frequency of post remediation monitoring will be confirmed based on the results of the HHERA and through discussions with 	<ul style="list-style-type: none"> Post remediation monitoring will be documented in the Annual Compliance Report.

Table 9.2-1 Summary of the Preliminary Monitoring Programs Proposed for the Boat Harbour Remediation Project

Valued Component	Preliminary Monitoring Programs	Program Objective	Method and Frequency	Anticipated Reporting Requirements
			regulators and scientific advisors.	
Fish and Aquatic Habitat	<p>BHSL and Basins Confirmatory Sampling</p> <ul style="list-style-type: none"> Confirmatory sampling of BHSL and Basins will be completed after remediation has been completed. 	<ul style="list-style-type: none"> To verify remedial objectives have been achieved 	<ul style="list-style-type: none"> The specific parameters that will be measured and the frequency will be confirmed based on the results of the HHERA and through discussions with regulators and scientific advisors. 	<ul style="list-style-type: none"> The confirmatory sampling will be documented in the Annual Compliance Report.
Migratory Birds	<p>Bird Monitoring</p> <ul style="list-style-type: none"> Should Project Components/Activities occur during the breeding bird season, a nest survey will be conducted within 10 days of any activity occurring. Should a nest be identified, a buffer must be established, and the nest is to be monitored. Monitor known nests near equipment or material stockpiles and exposed areas from a distance with a spotting scope or binoculars to verify the effectiveness of the buffer until the nests are inactive. 	<ul style="list-style-type: none"> To ensure migratory birds are not impacted by the Project. 	<ul style="list-style-type: none"> Routine inspections will be conducted. Inspections are anticipated to be conducted daily by operators, and as required by qualified avian experts during the remediation phase of the project and all other phases that interact directly or indirectly with those areas. 	<ul style="list-style-type: none"> No formal report anticipated; monitoring to be documented in the Annual Compliance Report.
Species at Risk	<p>Post Remediation Monitoring</p> <ul style="list-style-type: none"> Environmental monitoring shall take place after the Site is decommissioned, at wetland areas 	<ul style="list-style-type: none"> To determine if remedial objectives were achieved allowing for the natural re- 	<ul style="list-style-type: none"> The specific parameters that will be measured and the frequency of post remediation monitoring 	<ul style="list-style-type: none"> Post remediation monitoring will be documented in the

Table 9.2-1 Summary of the Preliminary Monitoring Programs Proposed for the Boat Harbour Remediation Project

Valued Component	Preliminary Monitoring Programs	Program Objective	Method and Frequency	Anticipated Reporting Requirements
	<p>found near the containment cell, and the water quality will be monitored at the mouth of the BHSL.</p> <ul style="list-style-type: none"> Monitoring of remedial activities to evaluate their success in establishing habitat for wildlife and monitoring wetlands for condition and integrity may be necessary post decommissioning phase. 	<p>establishment of habitat suitable for SAR to occur.</p>	<p>will be confirmed based on the results of the HHERA and through discussions with regulators and scientific advisors.</p>	<p>Annual Compliance Report.</p>
Mi'kmaq of Nova Scotia	<p>Country Food Monitoring</p> <ul style="list-style-type: none"> Post Remediation Monitoring of country foods (such as edible fish, shellfish, birds and/or aquatic plants) will be conducted within the remediated sediment areas (aquatic areas) at the Site. 	<ul style="list-style-type: none"> To ensure country foods at the Site are safe for human consumption. 	<ul style="list-style-type: none"> Country foods sampling requirements will be determined based on the results of the HHERA and through discussions with regulators. 	<ul style="list-style-type: none"> A report summarizing the results of the sampling of country foods will be submitted to regulatory agencies and to PLFN for their review.
	<p>HHERA</p> <ul style="list-style-type: none"> Confirmatory sediment sampling will be completed to confirm Site Specific Target Levels (SSTLs) are met, based on human health sediment contact. 	<ul style="list-style-type: none"> To ensure Project remedial objectives were met. 	<ul style="list-style-type: none"> The contaminants of potential concern and sediment SSTLs outlined in the final draft HHERA will be utilized, following confirmation with regulators, as well as frequency of monitoring. 	<ul style="list-style-type: none"> Post remediation monitoring will be documented in the Annual Compliance Report.
Economic and Social	<p>Roadway Monitoring</p> <ul style="list-style-type: none"> Monitor roads and highways for pavement conditions and liaise with Nova Scotia Transportation and Infrastructure Renewal (NSTIR) as needed to facilitate repairs. 	<ul style="list-style-type: none"> To determine any repairs required as result of traffic associated with the Project. 	<ul style="list-style-type: none"> Frequency of monitoring will be determined through consultation with NSTIR. 	<ul style="list-style-type: none"> No formal report anticipated; monitoring to be documented in the Annual Compliance Report.

Table 9.2-1 Summary of the Preliminary Monitoring Programs Proposed for the Boat Harbour Remediation Project

Valued Component	Preliminary Monitoring Programs	Program Objective	Method and Frequency	Anticipated Reporting Requirements
	<p>Air Monitoring</p> <ul style="list-style-type: none"> See the proposed monitoring programs associated with air quality and odour. 			
Archaeological/Cultural Heritage Resources	<ul style="list-style-type: none"> Monitoring of excavation works in areas noted to have archeological potential. Members of PLFN community will be given the opportunity to be on-site during all ground disturbance work. Rock trap will be monitored for any archeological artifacts. In the event that human remains, or intact archaeological deposits are encountered during any work associated with Project Components/Activities, all work in the associated area(s) will be halted and immediate contact made with the Coordinator of the Special Places Program (Sean Weseloh McKeane: 902-424-6475). If human remains are encountered, immediate contact will also be made with the Assembly of Nova Scotia Mi'kmaq Chiefs via the Kwilmu'kw Maw-klusuaqn Negotiation Office (Heather MacLeod-Leslie: 902-843-3880). An exclusion zone of 100 m surrounding the area will be established should any cultural resources be encountered. If human remains or intact archaeological deposits are discovered no further ground 	<ul style="list-style-type: none"> To protect and preserve archaeological/cultural heritage resources and to satisfy the requirements of the Category C Archaeological Resource Impact Assessment Permit (should it be required). 	<ul style="list-style-type: none"> Monitoring of excavation works will occur throughout the life of the Project during any ground disturbance activities in areas noted to have high archeological potential. Monitoring of the rock trap will occur throughout the operation of the Project on a routine basis. The methods used for the archaeological excavations should they be required will require approval by Minister of the Department of Communities, Culture and Heritage prior to initiation. 	<ul style="list-style-type: none"> Any archaeological artifacts found will be recorded and documented as specified in the Environmental Management Plan. No formal report anticipated; ongoing monitoring to be documented in the Annual Compliance Report.

Table 9.2-1 Summary of the Preliminary Monitoring Programs Proposed for the Boat Harbour Remediation Project

Valued Component	Preliminary Monitoring Programs	Program Objective	Method and Frequency	Anticipated Reporting Requirements
	disturbance work will be permitted at the Site until approval has been received from the appropriate regulatory agency to resume the work.			
Human Health	Air Monitoring <ul style="list-style-type: none"> See the proposed monitoring programs associated with the air quality and odour VC. 			
	Country Food Monitoring <ul style="list-style-type: none"> See the proposed monitoring program for Mi'kmaq of Nova Scotia. 			
	HHERA <ul style="list-style-type: none"> See the proposed monitoring program for Mi'kmaq of Nova Scotia. 			

As with any environmental monitoring program, modifications to the programs are occasionally necessary to adapt the program to evolving conditions. Accordingly, the monitoring programs will be reviewed, as part of the reporting process to ensure that the programs are adequately characterizing Site conditions.

Contractor Non-Compliance

As stated above, many aspects of the follow-up and monitoring programs will be conducted through contractors and sub-contractors, but the ultimate responsibility to implement the follow-up and monitoring programs recommended in this EIS resides with NSLI. As such, NSLI will take all reasonable steps to ensure the follow-up and monitoring programs are implemented as intended. All contracts issued by NSLI will state the legal and environmental requirements and obligations that must be implemented by contractors that have been established as part of the EIA and the draft EMP and PEPP.

Additional steps that NSLI will take during the Project activities include engaging the CMOC whose role is to monitor, audit, and report on environmental compliance alongside other construction contract requirements. This oversight role will ensure requirements, including bi-weekly conformity check-lists and monthly project meetings to discuss conformance with NSLI requirements by the Contractor(s).

In the event that non-conformance was identified by NSLI or their CMOC, the Contractor(s) will be notified immediately and be required to implement corrective actions.

Environmental Impact Statement

Section 10 | References

Boat Harbour Remediation Project
Pictou Landing, Nova Scotia

Nova Scotia Lands Inc.

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10.2 References Available for Download on the Project Website

The following references are available for download on the Boat Harbour Remediation Project website at the following link: <https://novascotia.ca/boatharbour/resources.asp>. The numbers listed below correspond to the number of the files available on the Project website for download.

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