Environmental Impact Statement

Volume I of V

Boat Harbour Remediation Project
Pictou Landing, Nova Scotia

Nova Scotia Lands Inc.

November 17, 2020

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Boat Harbour Remediation Project – Table of Concordance

Impact Assessment Agency of Canada Environmental Impact Statement Guidelines						Boat Harbour Remediation Project Environmental Impact Statement			
Part	Sec.	Title	Sub. Sec.	Title	Summary of Required Content	Location of Required Content in EIS	Title	Sub. Sec.	Title
1	4	Preparation and Presentation of the Environmental Impact Statement (EIS)	4.5	Summary of the Environmental Impact Statement	The proponent will prepare a summary of the EIS in both of Canada's official languages (French and English) to be provided to the Agency at the same time as the EIS that will include the followings: • A concise description of all key components of the project and related activities. • A summary of the engagement with the Mi'kmaq of Nova Scotia, and the participation of the public and government agencies, including a summary of the issues raised and the proponent's responses; – an overview of expected changes to the environment. • An overview of the key environmental effects of the project, as described under Section 5 of CEAA 2012, and proposed technically and economically feasible mitigation measures. • An overview of how factors under paragraph 19(1) of CEAA 2012 were considered; the proponent's conclusions on the residual environmental effects of the project, and the significance of those effects, after taking into account the mitigation measures.	NA	Summary of the Environmental Impact Statement		
2	1	Introduction and Overview	1.1	The Proponent	In the EIS, the proponent will: provide contact and legal identification information; describe corporate and management structures; specify the mechanism used to ensure that corporate policies will be implemented and respected for the project; and identify key personnel, and contractors responsible for preparing the EIS.	1	Introduction and Overview	1.1	The Proponent
			1.2	Project Overview	The EIS will describe the project, key project components, associated activities, scheduling details, timing of each phase, and other key features. If the project is part of a larger sequence of projects, the EIS will outline the larger context.			1.2	Project Overview
			1.3	Project Location	The EIS will contain a description of the geographical setting in which the project will take place focused on those aspects of the project and its settings that are important in order to understand the potential environmental effects of the project. The following information will be included: • UTM projection coordinates of the main project site. • Current land use in the area. • Distance of the project facilities and components to any federal lands. • Environmental significance and value of the geographical setting in which the project will take place and the surrounding area. • Environmentally sensitive areas, including protected areas, designated areas (e.g., Important Bird Areas), wetlands, estuaries, mature and interior forest habitat of migratory birds, habitats of federally or provincially listed designated Species at Risk. • Description of local communities. • Traditional territories and/or consultation areas, treaty lands and Indian Reserve lands.			1.3	Project Location
			1.4	Regulatory Framework and the Role of Government	The EIS will identify: • Any federal power, duty or function that may be exercised that would permit the carrying out of the project or associated activities. • Legislation and other regulations that are applicable to the project at the federal, provincial, regional and municipal levels. • Government policies, resource management plans, planning or study initiatives pertinent to the project and/or EA and their implications. • Any treaty, self-government or other agreements between federal or provincial governments and the Mi'kmaq of Nova Scotia that are pertinent to the project and/or EA. • Any relevant land use plans, land zoning, or community plans. • Information on land lease agreement or land tenure, when applicable.			1.4	Regulatory Framework and the Role of Government

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					• Regional, provincial and/or national objectives, standards or guidelines that have been used by the proponent to assist in the evaluation of any predicted environmental effects.				
	2	Project Justification and Alternatives Considered	2.1	Purpose of the Project	The EIS will describe the purpose of the project by: • Providing the rationale for the project, explaining the background, the problems or opportunities that the project is intended to satisfy and the stated objectives from the perspective of the proponent. • If the objectives of the project are related to broader private or public sector policies, plans or programs, this information will also be included. • The EIS will also describe the predicted environmental, economic and social benefits of the project.	2	Project Justification and Alternatives Considered	2.1	Purpose of the Project
			2.2	Alternative Means of Carrying Out the Project	The EIS will identify and consider the environmental effects of alternative means of carrying out the project that are technically and economically feasible. The analysis will address: • Remediation and disposal options for hazardous waste (solid and liquid); Dredging methods. • Access to the project site; location of key project components. • Energy sources to power the project site. • Management of water supply and wastewater. • Water management.			2.2 2.3	Alternative Means Alternative Means by Project Component
	3	Project Description	3.1	Project Components	The EIS will describe the project, by presenting the project components (as identified in Part 1, Section 3.1), associated and ancillary works, and other characteristics that will assist in understanding the environmental effects. This will include: • Maps, at an appropriate scale, of the project location, the project components, boundaries of the proposed site with UTM coordinates, the major existing infrastructure, proponent lands properties or leased lands used for the project, adjacent land uses and any important environmental features. • Information on the care and control of project components. • Sludge disposal cell facility (footprint, location and preliminary designs, (including proposed design standards [e.g., CCME National Guidelines for Hazardous Waste Landfills]). • Sandy substrate along the Pictou Road section of the Northumberland Strait. • Management of proposed control, collection, treatment, and discharge of surface drainage and groundwater seepage to the receiving environment from all key components of the project infrastructure (e.g., residual mill effluent, sludge disposal cell effluent and wetland effluent). • Permanent and temporary linear infrastructures (roads, pipelines and hoses, power supply), identifying the route of each of these linear infrastructures, the location and types of any structure used for stream crossings. • Storage areas for fuels wastes. • Drinking and industrial water requirements (source, quantity required, need for water treatment). • Energy supply (source, quantity). • Waste disposal (types of waste, methods of disposal, quantity). For project components in the marine environment, the EIS will describe: • Dredging work (including any maintenance dredging anticipated), specifying the nature and volume of sediment, dredging methods (type of dredge, duration, frequency, etc.), surface.	3	Project Description	3.1	Project Components

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			3.2	Project Activities	The EIS will include descriptions of the construction, operation, decommissioning and reclamation associated with the proposed project. This will include descriptions of the activities to be carried out during each phase, the location of each activity, expected outputs and an indication of the activity's magnitude and scale. The EIS will include a summary of the changes that have been made to the project since originally proposed, including the benefits of these changes to the environment, the Mi'kmaq of Nova Scotia, and the public. The EIS will include a schedule including time of year, frequency, and duration for all project activities. The information will include a description of: **Site Preparation and Construction** • Site clearing, earthmoving, leveling, and drilling excavation. • Construction and upgrading of access roads. • Borrow materials requirement (source and quantity). • Sludge disposal cell modifications. • Water management, including water diversions, dewatering or deposition activities required (location, methods, timing). • Equipment requirements (type, quantity); Administrative buildings, garages, other ancillary facilities. • Number of employees and transportation of employees. • Storage and management of hazardous materials, fuels and residues. **Operation** • Dewatering of project components (e.g., effluent pipe, ditches, basins). • Dredging of contaminated sludge/sediment, storage, handling and transport of hazardous materials. • Residual mill effluent. • Water management on the project site including, storm water, process water, wastewater, water recycling and effluent treatment (quantity, treatment requirements, release point[s]). • Storage and handling of reagents, petroleum products, chemical products, hazardous materials and residual materials (quantity and quality, treatment requirements, release point[s]); Characterization and management of impacted sludge and sediment. • QA/QC program for dredging (e.g., confirmatory sampling plan to assess efficiency of sediment removal; including presentation of proposed end point criteria for each contaminant in all affected media. • Characterization and management of workforce, including transportation, work schedules and lodging. **Decommissioning and Abandonment** • Preliminary outline of a decommissioning and reclamation plan for any components associated with the project. • Ownership, transfer and control of the different project components. • Clearing and demolition of buildings. • Dam demolition. • Bridge demolition. • Responsibility for monitoring and maintaining the integrity of the remaining structures; and – for permanent facilities, a conceptual discussion on how decommissioning and abandonment could occur.			3.2	Project Activities

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	4	Public Participation and Concerns			The EIS will describe the ongoing and proposed public participation activities that the proponent will undertake or that it has already conducted on the project. It will provide a description of efforts made to distribute project information and provide a description of information and materials that were distributed during the consultation process. The EIS will indicate the methods used, where the consultation was held, the persons and organizations consulted, the concerns voiced and the extent to which this information was incorporated in the design of the project as well as in the EIS. The EIS will provide a summary of key issues raised related to the project and its potential effects to the environment as well as describe any outstanding issues and ways to address them.	4	Public Participation and Concerns	4.1	Persons and Organizations Consulted With Appendix C
								4.2	Methods of Communication and Consultation Appendix E
								4.3	Distribution of Information and Materials Appendix E, F, H
								4.4	Consideration of Key Issues Raised
								4.5	Addressing Outstanding Issues and Ongoing Consultation Appendix D, G, H
	5	Engagement with the Mi'kmaq of Nova Scotia and Concerns Raised			The proponent is expected to engage with potentially affected Mi'kmaq of Nova Scotia. For the purposes of developing the EIS, the proponent will engage with the Mi'kmaq of Nova Scotia that may be affected by the project, to obtain their views on: • The project. • Effects of changes to the environment on Aboriginal peoples (health and socio-economic conditions; physical and cultural heritage, including any structure, site or thing that is of historical, archaeological, paleontological or architectural significance; and current use of lands and resources for traditional purposes) pursuant to paragraph 5(1)(c) of CEAA 2012, and – potential adverse impacts of the project on potential or established Aboriginal or Treaty rights, in respect of the Crown's duty to consult, and where appropriate, accommodate Aboriginal peoples. In order to allow the Mi'kmaq of Nova Scotia to engage and provide views on the above, the proponent will provide the Mi'kmaq of Nova Scotia with the following timely and relevant: • Opportunities to learn about the project including providing information about the proposed project (including but not limited to project design, location, potential effects, mitigation measures and follow-up and monitoring programs). • Opportunities to provide input on the overall project; effects of changes to the environment on Aboriginal peoples pursuant to paragraph 5 (1)(c) of CEAA, 2012 and potential adverse impacts of the project on potential or established Aboriginal or Treaty rights. The proponent will structure its engagement activities to provide adequate time for groups to review and comment on the relevant information. Engagement activities are to be appropriate to the groups' needs, arranged through discussions with the groups and in keeping with established consultation protocols, where available. The EIS will describe all efforts, successful or not, taken to solicit the information required from groups to support the preparation of the EIS. With respect to engagement activities, the EIS will document: • The engagement activities undertaken with each group prior to the submission of the EIS, including the date and means of engagement (e.g., meeting, mail, telephone). • The main issues and comments raised during the engagement activities by each group and the proponent's responses (effort should be made to collating like issues together along VCs identified in the EIS). • Any future planned engagement activities.	5	Engagement with the Mi'kmaq of Nova Scotia and Concerns Raised	5.1	Informal Consultation and Community Engagement Prior to the Initiation of the Federal Environmental Impact Assessment Process Appendix I
								5.2	Formal Consultation Prior to CEA Agency/IAAC Notice of Determination of Requirement for Federal Environmental Impact Assessment Appendix I
								5.3	Engagement with the Mi'kmaq of Nova Scotia and Concerns Raised During the Federal Environmental Impact Assessment Appendix I
								5.4	Consideration of Key Issues Raised Appendix I, J, Q, R
								5.5	Ongoing Consultation Appendix I, J, K, L, M, O, P

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					• Where and how Mi'kmaq of Nova Scotia's perspectives were integrated into and/or contributed to decisions regarding the project, design, construction, operation, decommissioning, abandonment, maintenance, follow-up and monitoring and associated potential effects (paragraph 5[1][c]) and the associated mitigation utilized to manage those effects. The effects and mitigation measures should be clearly linked to VCs in the EIS as well as to specific project components or activities. • How engagement activities by the proponent allowed groups to understand the project and evaluate its impacts on their communities, activities, potential or established Aboriginal or Treaty rights. Where impacts are identified, provide a discussion of how those would be managed or mitigated (and provide this information for each Mi'kmaq of Nova Scotia group separately).				
	6	Impacts to Potential or Established Aboriginal or Treaty Rights			With respect to potential adverse impacts of the project on potential or established Aboriginal or Treaty rights, the EIS will document for each group identified in Part 2, Section 5 of these guidelines (or in subsequent correspondence from the Agency): • Potential or established Aboriginal or Treaty rights , when this information is directly provided by a group to the proponent, the Agency or is available through public records, including but not limited to: - Location of the right being practiced or exercised - Context in which the right is practiced or exercised (including information about which groups of Mi'kmaq of Nova Scotia practice the right (women, elders, youth), how the right was practiced historically), How the Mi'kmaq of Nova Scotia's cultural traditions, laws and governance systems inform the manner in which they exercise their rights (the who, what, when, how, where and why) - The Mi'kmaq of Nova Scotia's perspectives on the importance of the land on which the Project is located and how it intersects with any land management uses and/or plans they may have - How often the right is practiced or exercised and timing or seasonality of the practice or exercise of the right - Maps and data sets (e.g., fish catch numbers) • Potential adverse impacts of each of the project components and physical activities, in all phases, on potential or established Aboriginal or Treaty rights, including those raised by the Mi'kmaq of Nova Scotia. • Measures identified to accommodate potential adverse impacts of the project on the potential or established Aboriginal or Treaty rights. These measures will clearly describe how the proponent intends to implement them and may go beyond mitigation measures that are developed to address potential adverse environmental effects. Include perspectives and specific suggestions raised of potentially impacted Mi'kmaq of Nova Scotia; as well as any views of Mi'kmaq of Nova Scotia on the effectiveness of mitigation measures. • Potential adverse impacts on potential or established Aboriginal or Treaty rights that have not been fully mitigated or accommodated as part of the EA and associated engagement with the Mi'kmaq of Nova Scotia. Include perspective of potentially impacted Mi'kmaq of Nova Scotia. • Potential adverse impacts that may result from the residual and cumulative environmental effects. Include the perspectives of potentially impacted Mi'kmaq of Nova Scotia.	6	Impacts to Potential or Established Aboriginal or Treaty Rights	6.1	Identifying Potential or Established Aboriginal or Treaty Rights Appendix J, K
								6.2	Use and Importance of Lands and Resources for Traditional Purposes
								6.3	Land Management, Use, and Planning
								6.4	Potential Adverse Effects on Potential or Established Aboriginal or Treaty Rights (includes direct, residual, and cumulative impacts)
								6.5	Accommodations for Potential Effects on Aboriginal and Treaty Rights
								6.6	Residual Impacts of the Project on PLFN's Aboriginal or Treaty Rights
	7	Effects Assessment	7.1	Project Setting and Baseline Conditions	Based on the scope of the project described in Section 3 (Part 1), the EIS will present baseline information in sufficient detail to enable the identification of how the project could affect the VCs and an analysis of those effects.	7	Effects Assessment	7.1	Baseline Assessment

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			7.1.1	Atmospheric Environment	• A baseline survey of ambient air quality in the project areas and in the air shed likely to be affected by the project by identifying and quantifying emission sources for, but not limited to, the following contaminants and odorous emissions: total suspended particulates, fine particulates smaller than 2.5 microns (PM2.5), respirable particulates of less than 10 microns (PM10), carbon monoxide (CO), sulphur oxides (SOx), nitrogen oxides (NOx), volatile organic compounds (VOCs), hydrogen sulfide (H2S) and all other toxic air pollutants (mobile and stationary sources). • Identify and quantify existing greenhouse gas emissions by individual pollutant measured as kilotonnes of CO^2 equivalent per year in the project study areas. • Direct and indirect sources of air emissions. • Current provincial/territorial/federal limits for greenhouse gas emission targets. • Current ambient noise levels at key receptor points (e.g., Mi'kmaq of Nova Scotia or communities), including the results of a baseline ambient noise survey. Information on typical sound sources, geographic extent and temporal variations will be included. • Existing ambient night-time light levels at the project site and at any other areas where project activities could have an effect on light levels. The EIS will describe night-time illumination levels during different weather conditions and seasons. • Historical records of relevant meteorological information (e.g., total precipitation (rain and snow); mean, maximum and minimum temperatures; and typical wind speed and direction).			7.1.2	Atmospheric Environment Appendix U, V, W, X
			7.1.2	Geology and Geochemistry	• Bedrock and host rock geology of the project area, including a table of geologic descriptions, geological maps and cross-sections of appropriate scale. • The geomorphology, topography and geotechnical characteristics of areas proposed for construction of major project components. • Geological hazards that exist in the areas planned for the project facilities and infrastructure, including: history of seismic activity in the area; isostatic rise or subsidence; landslides, slope erosion and the potential for ground and rock instability, and subsidence during and following project activities. • Baseline concentrations of project contaminants of concern within the local, regional and downstream receiving environments. • Geochemical characterization of leaching potential of the landfill during and after remediation work is completed and landfill is capped.			7.1.3	Geology, Geochemistry and Soil Appendix Y
			7.1.3	Topography and Soil	• Baseline mapping and description of landforms and soils within the local and regional project areas. • Maps depicting soil depth by horizon and soil order within the project area to support soil salvage and reclamation efforts, and to potential for soil erosion. • Suitability of topsoil and overburden for use in the rehabilitation of disturbed areas.			7.1.3	Geology, Geochemistry and Soil
			7.1.4	Riparian, Wetland and Terrestrial Environments	• Characterization of soils in the excavation area, in terrestrial and riparian environments, with a description of their past use. • Topography, drainage, geology and hydrogeology, and the physicochemical characteristics of potential on-land sediment or soil disposal sites. • Characterization of the shoreline, banks, current and future flood risk areas, and wetlands (fens, marshes, peatlands, mudflats and eelgrass beds, etc.), including the location and extent of wetlands likely to be affected by project activities according to their size, type (class and form), the description of their ecological function (ecological, hydrological, wildlife, socioeconomic, etc.) and species composition.			7.1.5	Riparian, Wetland and Terrestrial Environments Appendix AA

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Part	Sec.	Title	Sub. Sec.	Title	Summary of Required Content	Location of Required Content in EIS	Title	Sub. Sec.	Title
					• Plant, lichen, and animal species (abundance, distribution and diversity) and their habitats, with a focus on species at risk, species of conservation concern, and species that are of social, economic, cultural or scientific significance, as well as invasive alien species.				
			7.1.5	Groundwater and Surface Water	• Hydrogeology, including: - Hydrogeological context (e.g., hydrostratigraphy with aquifers and aquitards, major faults, etc.), including the delineation of key stratigraphic and hydrogeologic boundaries - Physical properties of the hydrogeological units (e.g., hydraulic conductivity, transmissivity, saturated thickness, storativity, porosity, specific yield); groundwater flow patterns and rates - A discussion of the hydrogeologic, hydrologic, geomorphic, climatic and anthropogenic controls on groundwater flow - Temporal changes in groundwater flow (e.g., seasonal and long term changes in water levels) - A delineation and characterization of groundwater - surface water interactions including temperature and the locations of groundwater discharge to surface water and surface water recharge to groundwater - Temperature changes in surface water as a result of groundwater-surface water interactions - Changes to surface water quality, including seasonal changes in runoff entering watercourses • Hydrogeological maps and cross-sections for the project area to outline the extent of aquifers and aquitards, including bedrock fracture and fault zones, locations and depths of wells and strainers, groundwater types springs, surface waters, and project facilities. Groundwater levels, potentiometric contours, flow directions, groundwater divides and areas of recharge and discharge should be included. • All groundwater monitoring wells, including their location, in respect to the project area, including geologic, hydrostratigraphic, piezometric and construction data (e.g., depths of surficial rock and bedrock, bedrock quality, fracture zones, piezometric levels, hydraulic conductivity, diameter and screen depth and intercepted aquifer unit). • Monitoring protocol for collection of existing groundwater and surface water data; – an appropriate hydrogeologic model for the project area, which discusses the hydrostratigraphy and groundwater flow systems; a sensitivity analysis will be performed to test model sensitivity to climatic variations (e.g., recharge) and hydrogeologic parameters (e.g., hydraulic conductivity); surface water and groundwater quality, including lab analytical results for metals, major ions, other contaminants of concern, and physical parameters, including temperature, with the interpretation of results for any anomalous values and for contaminants of concern. • Graphs or tables indicating the seasonal variations in groundwater levels, flow regime, and quality. • Local and regional potable groundwater supplies, including their current use and potential for future use. • Bedrock fracture sizes and orientations in relation to groundwater flow. • The delineation of drainage basins, at appropriate scales (water bodies and watercourses), including intermittent streams, flood risk areas and wetlands, boundaries of the watershed and subwatersheds, overlaid by key project components. • Hydrological regimes, including monthly, seasonal and annual water flow (discharge) data.			7.1.4	Groundwater and Surface Water Appendix Z

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Part	Sec.	Title	Sub. Sec.	Title	Summary of Required Content	Location of Required Content in EIS	Title	Sub. Sec.	Title
					• For each affected water body, the total surface area, bathymetry, maximum and mean depths, water level fluctuations, type of substrate (sediments). • Seasonal surface water quality, including analytical results (e.g., water temperature, turbidity, pH, dissolved oxygen profiles) and interpretation for representative tributaries and water bodies including all sites to receive effluents or runoff. • Any local and regional potable surface water resource. • Sediment quality analysis for key sites likely to receive effluents.				
			7.1.6	Marine Environment	• In the estuary and along the strait shoreline immediately outside the mouth of Boat Harbour: marine water quality; Bottom sediments, including quality, thickness, grain size and mobility. • Available bathymetric information for the site. • Marine plants, including all benthic and detached algae, marine flowering plants, brown algae, red algae, green algae and phytoplankton; Marine fauna, including benthic organisms, fish, marine mammals, and sea turtles, and their associated habitat. • Federally and provincially listed marine species at risk.			7.1.6	Aquatic Environments Appendix BB
			7.1.7	Fish and Fish Habitat	• A characterization of fish populations on the basis of species and life stage, including information on the surveys carried out and the source of data available (e.g., location of sampling stations, catch methods, date of catches, species, catch-per-unit effort). • A description of primary and secondary productivity in affected water bodies with a characterisation of season variability. • A list of any fish or invertebrate species at risk that are known to be present. • A description of the habitat by homogeneous section, including the length of the section, width of the channel from the high water mark (bankful width), water depths, type of substrate (sediments), aquatic and riparian vegetation, and photos. • A description of natural obstacles (e.g., falls, beaver dams) or existing structures (e.g., water crossings) that hinder the free passage of fish. • Maps, at a suitable scale, indicating the surface area of potential or confirmed fish habitat for spawning, rearing, nursery, feeding, overwintering, migration routes, etc. Where appropriate, this information should be linked to water depths (bathymetry) to identify the extent of a water body's littoral zone. • The description and location of suitable habitats for fish species at risk that appear on federal and provincial lists and that are found or are likely to be found in the study area. Note that certain intermittent streams or wetlands may constitute fish habitat or contribute indirectly to fish habitat. The absence of fish at the time of the survey does not irrefutably indicate an absence of fish habitat.			7.1.6	Aquatic Environments Appendix BB
			7.1.8	Migratory Birds and Their Habitat	• Birds and their habitats that are found or are likely to be found in the study area. This description may be based on existing sources, but supporting evidence is required to demonstrate that the data used are representative of the avifauna and habitats found in the study area. The existing data must be supplemented by surveys, if required. • Abundance, distribution, and life stages of migratory and non-migratory birds (including waterfowl, raptors, shorebirds, marsh birds and other land birds) likely to be affected in the project area based on existing information, or surveys, as appropriate, to provide current field data; Characterization of various ecosystems found in the project area, likely to be affected, based on existing information (land cover types, vegetation). • Year-round migratory bird use of the area (e.g., winter, spring migration, breeding season, fall migration), based on preliminary data from existing sources and surveys to provide current field data if appropriate. • Results of any baseline surveys and a description of methodology used.			7.1.7	Migratory Birds Appendix CC

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Part	Sec.	Title	Sub. Sec.	Title	Summary of Required Content	Location of Required Content in EIS	Title	Sub. Sec.	Title
					• In addition to information obtained from previous environmental assessments in the area, naturalists and Indigenous peoples, other relevant datasets should be consulted, such as those available from government departments and the Atlantic Canada Conservation Data Centre; consideration to areas of concentration of birds, such as breeding, staging and/or wintering areas; species at risk and species of conservation concern; as well as breeding areas of species low in number and high in the food chain. • The description of the existing environment will include consideration of existing or proposed protected areas, special management areas, and conservation areas in the regional study area.				
			7.1.9	Species at Risk	• A list of all species at risk listed under the Species at Risk Act (fauna and flora) that may be affected by the project, using existing data and literature as well as surveys to provide current field data; A list of all species assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as extirpated, endangered, threatened and of special concern. • Any published studies that describe the regional importance, abundance and distribution of species at risk including recovery strategies or plans. The existing data must be supplemented by surveys, as required. • Information on residences, seasonal movements, movement corridors, habitat requirements, key habitat areas, identified critical habitat and/or recovery habitat (where applicable) and general life history of species at risk that may occur in the project area, or be affected by the project.			7.1.8	*Species at Risk Act* Listed Species
			7.1.10	Mi'kmaq of Nova Scotia	The proponent shall gather and document baseline information in the EIS for each Mi'kmaq of Nova Scotia group identified in Part 2, Section 5 of these guidelines (and any groups identified after these guidelines are finalized). The baseline information will: • Describe and characterize the elements in paragraph 5(1)(c) of CEAA 2012 based on the spatial and temporal scope selected for the EA according to the factors outlined in Part 1, Section 3.2.3 of this document. Characterize the regional context of each of the elements of paragraph 5(1)(c) of CEAA 2012 to support the assessment of project related effects, including consideration of the differences of experiences by sub-populations within a Mi'kmaq of Nova Scotia group, as appropriate (for example, women, youth, elders, families) and cumulative effects. • Be sufficient to provide a comprehensive understanding of the current state of each VC related to effects of changes to the environment on Aboriginal peoples. Each of the VCs for effects of changes to the environment on Aboriginal peoples is interrelated and therefore baseline information will often overlap.			7.1.9	Mi'kmaq of Nova Scotia Appendix A, S, T
			7.1.11	Other Changes to the Environment Arising as a Result of a Federal Decision or Due to Changes on Federal Lands, in Another Province or Outside Canada	Should there be the potential for a change to the environment arising as a result of a federal decision(s), or on federal lands, lands in another province or lands outside Canada, the EIS will include baseline information on the environmental component likely to be affected (if this information is not already covered in other subsections of these guidelines). For example, if an authorization provided under the Fisheries Act was to result in the flooding of key wildlife habitat, baseline information should be provided on the wildlife species likely to be affected.				No other changes to the Environment Arising as a Result of a Federal Decision or Due to Changes on Federal Lands, in Another Province or Outside Canada were identified.

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Part	Sec.	Title	Sub. Sec.	Title	Summary of Required Content	Location of Required Content in EIS	Title	Sub. Sec.	Title
			7.1.12	Human Environment	• The rural and urban settings likely to be affected by the project. • Any federal lands, lands located outside the province or Canada that may be affected by the project. • The current use of land in the study area, including a description of hunting, recreational and commercial fishing, trapping, gathering, outdoor recreation, use of seasonal cabins, outfitters. • Current use of all waterways and water bodies that will be directly affected by the project, including recreational uses, where available. • Location of and proximity of any permanent, seasonal or temporary residences or camps. • Health and socio-economic conditions, including the functioning and health of the socioeconomic environment, encompassing a broad range of matters that affect communities in the study area in a way that recognizes interrelationships, system functions and vulnerabilities. • Physical and cultural heritage, including structures, sites or things of historical, archaeological, paleontological, or architectural significance.			7.1.10	Human Environment Appendix DD, EE
			7.2	Predicted Changes to the Physical Environment	The EA will include a consideration of the predicted changes to the environment as a result of the project being carried out or as a result of any powers, duties or functions that are to be exercised by the federal government in relation to the project. These predicted changes to the environment are to be considered in relation to each phase of the project (construction, operation, decommissioning, and abandonment) and are to be described in terms of the magnitude, geographic extent, duration and frequency, and whether the environmental changes are reversible or irreversible. As changes to various parts of the physical environment, listed below, may be inter-related as part of an ecosystem, the EIS will explain and describe the connections between the changes described.			7.3	Valued Components Environmental Effects Assessment
			7.2.1	Changes to the Atmospheric Environment	• Completion of an atmospheric dispersion modelling of the main contaminants and odorous compounds in order to estimate the concentrations present in the entire area that could potentially be affected by atmospheric emissions (Section 7.1.1, above) resulting from various project-related activities (sources), including dredging, hazardous waste storage, the use of heavy machinery during construction and road transportation, and water and wastewater treatment and retention. • Comparison of anticipated air quality concentration against the Canadian Ambient Air Quality Standards (CAAQS) for fine particulate matter, SO_2, and NO_2.'			7.3.1.1	Predicted Changes to Air Quality and Odour {{*Atmospheric dispersion modelling is currently being completed – once complete a comparison of anticipated air quality concentration against the CAAQS will be me made and included in the EIS*}}
					• Description of all methods and practices that will be implemented to minimize and control atmospheric emissions throughout the project life cycle. If the best available technologies are not included in the project design, the proponent will need to provide a rationale for the technologies selected. • An estimate of the direct greenhouse gas emissions associated with all phases of the project as well as any mitigation measures proposed to minimize greenhouse gas emissions. This information is to be presented by individual pollutant and should also be summarized in CO_2 equivalent per year. The proponent is responsible for the following: - Provide an estimate of the contribution of the project emissions at the local, provincial and federal scale, and indicate the category into which the project falls in terms of the relative magnitude of its contribution to greenhouse gas emissions (project with low, medium or high emission rates) - Justify all estimates and emission factors used in the analysis			7.3.2.1	Predicted Changes to Greenhouse Gas Emissions

Impact Assessment Agency of Canada Environmental Impact Statement Guidelines						Boat Harbour Remediation Project Environmental Impact Statement			
Part	Sec.	Title	Sub. Sec.	Title	Summary of Required Content	Location of Required Content in EIS	Title	Sub. Sec.	Title
					- Provide the estimation or derivation method, and disclose and describe all assumptions and emission intensity factors used - Provide the methods and calculations used for the analysis - Compare and assess the level of estimated emissions of greenhouse gases to the regional, provincial and federal emission targets - Provide information related to the project's electrical demand and sources of electrical power for facilities and equipment (i.e., the project's main source and any other additional sources [generators, etc.], as appropriate)				
					• Changes in ambient noise levels.			7.3.3.1	Predicted Changes to Noise
					• Changes in night-time light levels.			7.3.4.1	Predicted Changes to Night-Time Light Levels
			7.2.2	Changes to Groundwater and Surface Water	• Changes to groundwater flow patterns, fluxes, and divides based on the results of groundwater flow modelling that incorporates changes related to the project. • Changes to turbidity, oxygen level, water temperature, ice regime, water quality; – changes in surface water quality associated with any project effluent releases or surface runoff. • Changes to the hydrological and hydrometric conditions. • Changes to groundwater recharge/discharge areas and any changes to groundwater infiltration areas. • Changes to community water supplies. • Changes to groundwater quality associated with storage or release of any project effluents or drainage including surface runoff: - Quantity and quality of residual mill effluent to be released from the site into the Northumberland Strait receiving waters - Seepage water quality from the landfill during remediation and long-term storage			7.3.6 7.3.7	Groundwater Surface Water
			7.2.3	Changes to Riparian, Wetland and Terrestrial Environments	• Overall description of changes related to landscape disturbance.			7.3.8	Terrestrial Habitat and Vegetation
					• Changes to the habitat of migratory and non-migratory birds, with a distinction made between the two birds category, including losses, structural changes and fragmentation of riparian habitat (aquatic grass beds, intertidal marshes) of terrestrial environments and wetlands frequented by birds (types of cover, ecological unit of the area in terms of quality, quantity, diversity, distribution and functions). • Changes to critical habitat for federally listed species at risk. • Changes to key habitat for species important to current use of lands and resources for traditional purposes.			7.3.9	Wetlands
					• Changes to critical habitat for federally listed species at risk.			7.3.10	Mammals and Wildlife
			7.3	Predicted Effects on Valued Components	Based on the predicted changes to the environment identified in Section 7.1, the proponent is to assess the environmental effects of the project on the following VCs. All interconnections between VCs and between changes to multiple VCs will be described.			7.3	Valued Components Environmental Effects Assessment
			7.3.1	Fish and Fish Habitat	• The identification of any potential adverse effects to fish and fish habitat as defined in subsection 2(1) of the Fisheries Act, including the calculations of any potential habitat loss (temporary or permanent) in terms of surface areas (e.g., spawning grounds, fry-rearing areas, feeding), and in relation to watershed availability and significance. The assessment will include a consideration of: - Geomorphological changes and their effects on hydrodynamic conditions and fish habitats (e.g., modification of substrates, dynamic imbalance, silting of spawning beds)			7.3.12	Fish and Aquatic Habitat

Impact Assessment Agency of Canada Environmental Impact Statement Guidelines						Boat Harbour Remediation Project Environmental Impact Statement			
Part	Sec.	Title	Sub. Sec.	Title	Summary of Required Content	Location of Required Content in EIS	Title	Sub. Sec.	Title
					- Modifications of hydrological and hydrometric conditions on fish habitat and on the fish species' life cycle activities (e.g., reproduction, fry-rearing, movements) - Potential effects on riparian areas that could affect aquatic biological resources and productivity taking into account any anticipated modifications to fish habitat - Any potential imbalances in the food web in relation to baseline conditions - Effects on the primary and secondary productivity of water bodies and how project-related effects may affect fish food sources • The effects of changes to the aquatic environment on fish and their habitat, including: - Anticipated changes in the composition and characteristics of the populations of various fish species, including shellfish and forage fish - Any modifications in migration or local movements (upstream and downstream migration, and lateral movements) following the construction and operation of works (physical and hydraulic barriers) - Any reduction in fish populations as a result of potential overfishing due to increased access to the project area - Any modifications and use of habitats by federally or provincially listed fish species; a discussion of how project construction timing correlates to key fisheries windows for freshwater and anadromous species, and any potential effects resulting from overlapping periods				
			7.3.2	Wetlands	All direct and indirect effects on wetland functions, including hydrological functions, anticipated as a result of the project.			7.3.9	Wetlands
			7.3.3	Marine Environment	• Physical effects on the estuarine and marine environment, including changes to water quality, chemical composition, temperature, oceanographic conditions, etc. • Effects to the use of the marine environment, including estuarine, floodplain and marine habitats by fish, invertebrates and marine mammals with regard to their life cycles (e.g., migration, spawning, emergence). • Any effects resulting from overlapping periods between construction periods and key fisheries (e.g., commercial salmon fishery) windows for marine species. • Any effects to marine organisms, including marine fish, marine mammals, marine birds, sea turtles, benthic organisms, etc.			7.3.11	Marine Environment
			7.3.4	Marine Plants	Marine plants, including all benthic and detached algae, marine flowering plants, brown algae, red algae, green algae and phytoplankton.			7.3.11	Marine Environment
			7.3.5	Migratory Birds	• Direct and indirect adverse effects on migratory birds, including population level effects that could be caused by all project activities, including but not limited to: - Site preparation - Deposit of harmful substances in waters that are frequented by migratory birds • Risk of collision of migratory birds with any project infrastructure and vehicles; indirect effects caused by increased disturbance (e.g., noise, light, presence of workers), relative abundance movements, and losses or changes in migratory bird habitat, considering the critical breeding and migration periods for the birds.			7.3.13	Migratory Birds
			7.3.6	Species At Risk	• Potential adverse effects of the project on species at risk listed under the Species at Risk Act and, where appropriate, it's critical habitat; i.e., direct and indirect effects on the survival or recovery of species listed under the Species at Risk Act. • Potential adverse effects of the project on species listed by the Committee on the Status of Endangered Wildlife in Canada classified as extirpated, endangered, threatened or of special concern (flora and fauna) and their habitat.			7.3.14	Species at Risk

Impact Assessment Agency of Canada Environmental Impact Statement Guidelines						Boat Harbour Remediation Project Environmental Impact Statement			
Part	Sec.	Title	Sub. Sec.	Title	Summary of Required Content	Location of Required Content in EIS	Title	Sub. Sec.	Title
			7.3.7	Mi'kmaq of Nova Scotia	With respect to the Mi'kmaq of Nova Scotia, including the Native Council of Nova Scotia, provide a description and analysis, for each Mi'kmaq of Nova Scotia group, of how changes to the environment caused by the project will affect the health and socio-economic conditions, physical and cultural heritage including any structure, site or thing of historical, archaeological or paleontological importance, and current use of lands and resources for traditional purposes.			7.3.15	Mi'kmaq of Nova Scotia Appendix R Appendix S
			7.3.8	Other valued components that may be affected as a result of a federal decision or due to effects on federal lands, another province or outside Canada	The EIS should include a description of the specific project components for which a federal authorization/decision is required, and an assessment of any other VCs (not already covered in other subsections of these guidelines) that may be affected by the changes to the environment caused by these specific project components. If there is the potential for the project to result in environmental changes on federal lands, another province, or another country, then VCs of importance not already identified should be included. For example, if the project will result in the generation of greenhouse gas emissions, the EIS should include a description of the project's greenhouse gas emissions in a regional, provincial, national or international context, if applicable.			NA	No other valued components that may be affected as a result of a federal decision or due to effects on federal lands, another province or outside Canada were identified.
			7.4	Mitigation Measures	Every EA conducted under CEAA 2012 will consider measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the project. The EIS will describe the standard mitigation practices, policies and commitments that constitute technically and economically feasible mitigation measures and that will be applied as part of standard practice regardless of location. The EIS will then describe the project's environmental protection plan and its environmental management system, through which the proponent will deliver this plan.			7.2.5 7.3	Environmental Effects Methodology – Mitigation Measures Valued Components Environmental Effects Assessment Appendix B - Draft Project Environmental Protection Plan (PEPP) and Environmental Management Plan (EMP)
			7.5	Significance of Residual Effects	The EIS will present any residual environmental effects of the project on the VCs identified in Section 6.3. Where significant adverse effects are identified, the EIS will set out the probability (likelihood) that they will occur and describe the degree of scientific uncertainty related to the data and methods used within the framework of this environmental analysis.			7.2.6 7.3	Environmental Effects Methodology – Residual Effects and Determination of Significance Valued Components Environmental Effects Assessment
			7.6	Other Effects to Consider				7.4	Other Effects to Consider
			7.6.1	Effects of Potential Accidents or Malfunctions	The failure of certain works caused by human error or exceptional natural events (e.g., flooding, earthquake, forest fire) could cause major effects. The proponent will therefore conduct an analysis of the risks of accidents and malfunctions, determine their effects, and present preliminary emergency response measures. Taking into account the lifespan of different project components, the proponent will identify the probability of potential accidents and malfunctions related to the project, including an explanation of how those events were identified, potential consequences (including the environmental effects as defined in Section 5 of CEAA 2012), the plausible worst case scenarios and the effects of these scenarios.			7.4.1	Effects of Potential Accidents or Malfunctions
			7.6.2	Effects of the Environment on the Project	The EIS will take into account how local conditions and natural hazards, such as sea level rise, severe and/or extreme weather conditions, and external events (e.g., flooding, drought, ice jams, landslides, avalanches, erosion, subsidence, fire, outflow conditions, and seismic events), could adversely affect the project and how this in turn could result in effects to the			7.4.2	Effects of the Environment on the Project

Impact Assessment Agency of Canada Environmental Impact Statement Guidelines						Boat Harbour Remediation Project Environmental Impact Statement			
Part	Sec.	Title	Sub. Sec.	Title	Summary of Required Content	Location of Required Content in EIS	Title	Sub. Sec.	Title
					environment (e.g., extreme environmental conditions result in malfunctions and accidental events).				
			7.6.3	Cumulative Effects Assessment	The proponent will identify and assess the project's cumulative effects using the approach described in the Agency's guidance documents related to cumulative environmental effects. In its EIS, the proponent will: • Identify and provide a rationale for the VCs that will constitute the focus of the cumulative effects assessment, focussing the cumulative effects assessment on the VCs most likely to be affected by the project and other project and activities. To this end, the proponent must consider, without limiting itself thereto, the following components likely to be affected by the project: fish and fish habitat, including salmon and other valued fish species; migratory birds; species at risk; Indigenous peoples; and any VCs associated with Subsection 5(2) of CEAA 2012. • Identify and justify the spatial and temporal boundaries for the cumulative effect assessment for each VC selected. The boundaries for the cumulative effects assessments will generally be different for each VC considered. These cumulative effects boundaries will also generally be larger than the boundaries for the corresponding project effects. • Identify the sources of potential cumulative effects. Specify other projects or activities that have been or that are likely to be carried out that could cause effects on each selected VC within the boundaries defined, and whose effects would act in combination with the residual effects of the project. This assessment may consider the results of any relevant study conducted by a committee established under Section 73 or 74 of CEAA 2012. • Assess the cumulative effects on each VC selected by comparing the future scenario with the project and without the project. Effects of past activities (activities that have been carried out) will be used to contextualize the current state of the VC. In assessing the cumulative effects on current use of lands and resources for traditional purposes, the assessment will focus on the cumulative effects on the relevant activity (e.g., hunting, fishing, trapping, plant harvesting). • Describe the mitigation measures that are technically and economically feasible. The proponent shall assess the effectiveness of the measures applied to mitigate the cumulative effects. In cases where measures exist that are beyond the scope of the proponent's responsibility that could be effectively applied to mitigate these effects, the proponent will identify these effects and the parties that have the authority to act. In such cases, the EIS will summarize the discussions that took place with the other parties in order to implement the necessary measures over the long term. • Determine the significance of the cumulative effects. • Develop a follow-up program to verify the accuracy of the assessment or to dispel the uncertainty concerning the effectiveness of mitigation measures for certain cumulative effects.			7.4.3	Cumulative Effects Assessment
	8	Summary of Environmental Effects Assessment			The EIS will contain a table summarizing the following key information: • Potential environmental effects on VCs. • Proposed mitigation measures to address the effects identified above. • Potential residual effects and the significance of the residual environmental effects. In a second table, the EIS will summarize all key mitigation measures and commitments made by the proponent which will more specifically mitigate any significant adverse effects of the project on VCs (i.e., those measures that are essential to ensure that the project will not result in significant adverse environmental effects).	8	Summary of Environmental Effects Assessment		

Impact Assessment Agency of Canada Environmental Impact Statement Guidelines						Boat Harbour Remediation Project Environmental Impact Statement			
Part	Sec.	Title	Sub. Sec.	Title	Summary of Required Content	Location of Required Content in EIS	Title	Sub. Sec.	Title
	9	Follow-up and Monitoring Programs	9.1	Follow-up Program	A follow-up program is designed 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. The EIS shall present a preliminary follow-up program and shall include: • Objectives of the follow-up program and the VCs targeted by the program. • List of elements requiring follow-up. • Number of follow-up studies planned as well as their main characteristics (list of parameters to be measured, planned implementation timetable, etc.). • Intervention mechanism used in the event that an unexpected deterioration of the environment is observed. • Mechanism to disseminate follow-up results among the concerned populations. • Accessibility and sharing of data for the general population. • Opportunity for the proponent to include the participation of the Mi'kmaq of Nova Scotia and stakeholders on the affected territory, during the development and implementation of the program. • Involvement of local and regional organizations in the design, implementation and evaluation of the follow-up results as well as any updates, including a communication mechanism between these organizations and the proponent.	9	Follow-up and Monitoring Programs	9.1	Follow-up Programs Appendix B - EMP
			9.2	Monitoring	The proponent will prepare an environmental monitoring program for all phases of the project. Specifically, the environmental impact statement shall present an outline of the preliminary environmental monitoring program, including the: • Identification of the interventions that pose risks to one or more of the environmental and/or VCs and the measures and means planned to protect the environment. • Identification of regulatory instruments that include a monitoring program requirement for the VCs • Description of the characteristics of the monitoring program where foreseeable (e.g., location of interventions, planned protocols, list of measured parameters, analytical methods employed, schedule, human and financial resources required). • Description of the proponent's intervention mechanisms in the event of the observation of non-compliance with the legal and environmental requirements or with the obligations imposed on contractors by the environmental provisions of their contracts. • Description of the responsibilities for monitoring and maintaining the integrity of remaining structures. • Management of disposal cell leachate and groundwater monitoring (including frequency and parameters to be monitored). • Guidelines for preparing monitoring reports (number, content, frequency, format) that will be sent to the authorities concerned. • Plans to engage the Mi'kmaq of Nova Scotia in monitoring, where appropriate.			9.2	Monitoring Programs Appendix B - EMP

List of Acronyms

A

AAQC | Ambient Air Quality Criteria

AAQMP | Ambient Air Quality Monitoring Program

ACCDC | Atlantic Canada Conservation Data Centre

AFDD | Accumulated Freezing Degree-Days

ANSMC | Assembly of Nova Scotia Mi'kmaq Chiefs

ASB | Aeration Stabilization Basin

B

bgs | Below ground surface

BHA | *Boat Harbour Act*

BHEAC | Boat Harbour Environmental Advisory Committee

BHETF | Boat Harbour Effluent Treatment Facility

BHRP | Boat Harbour Remediation Project

BHSL | Boat Harbour Stabilization Lagoon

BMPs | Best Management Practices

BOD | Biochemical Oxygen Demand

C

C&D | Construction and Demolition

CAAQS | Canadian Ambient Air Quality Standards

CBHDC | Canadian Bridge Highway Design Code

CCME | Canadian Council of Ministers of the Environment

CD | Chart Datum

CEA Agency | Canadian Environmental Assessment Agency

CEAA 2012 | Canadian Environmental Assessment Act, 2012

CHBDC | Canadian Highway Bridge Design Code

CLC | Community Liaison Coordinator

CO | Carbon Monoxide

CO_2 | Carbon Dioxide

CO_2e | Carbon Dioxide equivalent

COCs | Contaminants of Concern

COPCs | Chemicals or (Contaminants) of Potential Concern

COSEWIC | Committee on the Status of Endangered Wildlife in Canada

CRP | Complaint Response Protocol

CSM | Conceptual Site Models

CTD-Tu | Conductivity, temperature and turbidity

D

D/F TEQ | Dioxins and Furans Total Equivalent

DEFRA | Department of Environment Food and Rural Affairs

DFO | Department of Fisheries and Oceans

E

EBSA | Ecologically and Biologically Significant Area

ECCC | Environment & Climate Change Canada

EGSPA | Environmental Goals and Sustainable Prosperity Act

EIA | Environmental Impact Assessment

EIS | Environmental Impact Statement

EMP | Environmental Management Plan

EPP | Environmental Protection Plan

EPA | Environmental Protection Agency

EQS | Environmental Quality Standards

ERA | Ecological Risk Assessment

ERP | Emergency Response Plan

ESA | Endangered Species Act

ESL | Ecological Screening Levels

F

FHWA | Federal Highway Administration

FML | Flexible membrane liner

FPTCCCEA | Federal-Provincial Guidance for Considering Climate Change in Environmental Assessment

FSC | Food, Social and Ceremonial

G

GAC | Granular Activated Carbon

GCL | Geosynthetic Clay Liner

GCM | Global Climate Models

GHG | Greenhouse Gas

GPR | Ground Penetrating Radar

H

H_2S | Hydrogen Sulphide

HADD | Harmful Alteration, Disruption or Destruction

HC | Health Canada

HCN | Hydrogen Cyanide

HD | High Disturbance

HDPE | High Density Polyethylene

HELP | Hydrologic Evaluation of Landfill Performance

HHERA | Human Health and Ecological Risk Assessment

HHRA | Human Health Risk Assessment

HHWLT | Highest High-Water Large Tide

HQ | Hazard Quotient

I

IA | Industrial Approval

IAAC | Impact Assessment Agency of Canada

IAAMP | Independent Ambient Air Monitoring Program

ICIP | Investing in Canada Infrastructure Program

ICS | Indigenous Services Canada

IDF | Intensity-duration-frequency

ILE | Institution of Lighting Engineers

INAC | Indigenous and Northern Affairs Canada

IPCC | Intergovernmental Panel on Climate Change

IR | Irreversible

ISC | Indigenous Services Canada

ISO | International Organization for Standards

ISQGs | Interim Sediment Quality Guidelines

K

KMKNO | Kwilmu'kw Maw-klusuaq Negotiations Office

L

LCP | Late Carboniferous non-marine sediments of the Pictou Group

LD | Low Disturbance

LFG | Landfill gas

LSA | Local Study Area

M

MAL | Marine aquatic life

MBCA | Migratory Birds Convention Act

MCG | Mi'kmaw Conservation Group

MEKS | Mi'kmaq Ecological Knowledge Study

MGS | Membertou Geomatics Solution

mTPH | Modifed Total Petroleum Hydrocarbons

N

N/L | No/Low

NA | Not applicable

NAPS | National Air Pollution Surveillance

NO_2 | Nitrogen Dioxide

NOx | Nitric Oxide

NPRI | National Pollutant Release Inventory

NS ESA | Nova Scotia Endangered Species Act

NSLI | Nova Scotia Lands Inc.

NSTIR | Nova Scotia Department of Transportation and Infrastructure Renewal

NSDLF | Nova Scotia Department of Lands and Forestry

NSDNR | Nova Scotia Department of Natural Resources

NSE | Nova Scotia Environment

NSEQSs | Nova Scotia Environmental Quality Standards

O

O_3 | Ozone

OH | Open House

OIT | Oxidative Induction Time

OU | Odour Unit

O&M | Operation and Maintenance

P

PAHs | Polycyclic Aromatic Hydrocarbons

PCBs | Polychlorinated Biphenyls

PELs | Probable Effect Levels

PEPP | Project Environmental Protection Plan

Phase I ESA | Phase I Environmental Site Assessment

Phase II ESA | Phase II Environmental Site Assessment

PHC | Petroleum Hydrocarbons

PLFN | Pictou Landing First Nation

PM_{10} | Particulate Matter less than 10 microns in diameter

PM_{25} | Particulate Matter less than or equal to 2.5 microns

POH | Public Open House

PPER | Pulp and Paper Effluent Regulation

pphmv | Parts per hundred million by volume

PR | Partially Reversible

Province | Province of Nova Scotia

PVC | Polyvinyl Chloride

R

RFP | Request for Proposal

RODD | Remedial Option Decision Document

RPP | Reinforced Plastic Pipe

RSA | Regional Study Area

S

SARA | Species at Risk Act

SAR | Species at Risk

SDG | Sustainable Development Goals

SNSMR | Service Nova Scotia and Municipal Relations

SO_2 | Sulfur Dioxide

SOCC | Species of Conservation Concern

SSA | Site Study Area

SSEPP | Site-specific Environmental Protection Plan

SSI | Supplemental Site Investigation

SSTL | Site Specific Target Levels

ST | Short-Term

STPCORP | Sydney Tar Ponds and Coke Ovens Remediation Project

Su | Shulie Association

SWMP | Stormwater Management Ponds

T

TAC | Technical Advisory Committee

TC | Transport Canada

tCO2e | Emissions

TEQ | Toxic Equivalence

TLTF | Temporary Leachate Treatment Facility

TOR | Terms of Reference

TPH | Total Petroleum Hydrocarbons

TRS | Total Reduced Sulphur

TRV | Toxicity Reference Values

TSP | Total Suspended Particulate

TDS | Total Dissolved Solids

TSS | Total Suspended Solids

TVOCs | Total Volatile Organic Compounds

U

UCLM | Upper Confidence Level of the Mean

UNDRIP | United Nations Declaration on the Rights of Indigenous Peoples

USEPA | United States Environmental Protection Agency

V

VC | Valued Component

VOC | Volatile Organic Compound

W

WC | Watercourse

Well-Being Study | Well-Being Baseline Study

WSS | Wetland of Special Significance

WWTP | Wastewater Treatment Plant

List of Measurements

Measurement Units

% | Percent

°C | Degrees Celsius

cm | Centimetre

cm/s | Centimetres Per Second

cm^2/sec | Centimetres Squared Per Second

g/L | Grams Per Litre

ha | Hectares

hr | Hour

km | Kilometres

kt | Kilotonnes

kWh | Kilowatt Per Hour

L/s | Litres Per Second

m | Metres

m^3 | Cubic Metres

mAMSL | Metres Above Mean Sea Level

mASL | Metres Above Sea Level

mg | Milligrams

mm | Millimetres

Mt | Megatonnes

MT | Metric Tonnes

MW | Megawatts

pg TEQ/m^3 | Picogram Toxicity Equivalent Per Cubic Metre

µS/cm | Micro Siemens Per Centimeter

µg/m3 | Microgram Per Cubic Metre

Glossary of Terms

Activated Sludge | A biological wastewater treatment process that uses aeration and a biological flocculant composed of bacteria, fungi and protozoa to remove organic (carbonaceous) pollution from wastewaters. The term 'activated' comes from the fact that some of the settled biological flocculants, after treatment, are returned to the beginning of the treatment process to "activate" it, and the process is initiated again.

Aeration Stabilization Basin | A holding and/or treatment pond provided with artificial aeration to promote the biochemical of wastewaters.

Anadramous | Describes the migration pattern of certain fish, such as Atlantic Salmon, that spend most of their life in saltwater before travelling to shallow fresh water to reproduce.

Anthropogenic | Resulting from the influence of humans on nature.

Approval | Permission granted by an authorized individual or organization for an undertaking to proceed.

Aquifer | A geological formation, group of formations or part of a formation that contains sufficient saturated permeable material to yield groundwater .

Avian | Pertaining to or derived from birds.

Baseline | The conditions prior to initiating a project.

Bedrock | A general term for rock that underlies soil or other unconsolidated material.

Bench Scale Testing | Small scale testing of a technology in lab conditions.

Benthic | Of, or relating to, the bottom or floor of a water body.

Berm | A constructed shelf that breaks the continuity of a slope, or artificial ridge of earth, with the purpose of reducing erosion, or to increase the thickness of the embankment at a point of change in a slope or defined water surface elevation, or to direct surface water runoff.

Bioaccumulation | A term used to describe the process by which chemicals are accumulated in the tissues of an organism directly from exposure to water or soil.

Biodiversity | The number and variety of organisms found within a specified geographic region.

Biota | The organisms, including animals, plants, fungi, and micro-organisms, found in a given area.

Boat Harbour | Formerly known as A'se'k in Mi'kmaq, was originally a tidal estuary connected to the Northumberland Strait in Nova Scotia.

***Boat Harbour Act, 2015* |** Legislation passed by the Government of Nova Scotia in 2015, committing to the cessation of the reception and treatment of new effluent to the Boat Harbour Effluent Treatment by January 31, 2020.

Boat Harbour Effluent Treatment Facility | Constructed by the Province of Nova Scotia in 1967 to treat effluent from industrial sources, including a chlor-alkali plant and a bleached Kraft Pulp Mill.

Catadromous | Describes the migration pattern of certain fish, such as American eel, that spend most of their life in freshwater before travelling to oceanic waters to reproduce.

Climate | The statistical averages of precipitation, temperature, humidity, sunshine, wind velocity, and other phenomena such as fog, frost, and hailstorms for a particular region and time period, generally taken over a 30-year period (Climate normal).

Climate Change | Changes in the earth's climate, which can be caused both by natural forces and human activities. Most commonly associated with global warming and the global greenhouse effect, which highlight discernable changes to the earth's climate, (i.e., increasing temperatures, due to man-made activities and processes).

Commercial, Recreational, and Aboriginal Fisheries | Fish that are part of commercial, recreational, or Aboriginal fisheries are interpreted to be those fish that fall within the scope of applicable federal or provincial fisheries regulations, as well as those that can be fished by Aboriginal organizations or their members for food, social or ceremonial purposes or for purposes set out in a land claims agreement. The prohibition against "serious harm" to fish applies to fish and fish habitat that are part of or support commercial creational or Aboriginal fisheries.

Complaint Response Procedure | The Complaint Response Protocol (CRP) outlines the process that will be undertaken upon receipt of a complaint from residents to ensure a swift and sure response to any and all complaints from area residents and business owners regarding this Project.

Compensation | A mitigation method that counterbalances or makes up in part or in whole for an adverse effect.

Containment Cell | An engineered facility to contain wastes and manage leachate, if any. In terms of this Project, the pre-existing sludge disposal cell on-site that will be used for long-term storage of impacted sediment and material.

Contaminant | A biological, chemical, physical or radiological substance that becomes harmful for humans or living organisms, when accidentally or deliberately introduced to air, water, soil, or food.

Contingency Plan | A set of predetermined actions to be taken in the event of an accident, malfunction or unplanned event.

Cumulative Effects | As defined in the draft Technical Guidance for Assessing Cumulative Environmental Effects under CEAA 2012 (2014), cumulative effects can include the following:

a) "An additive cumulative effect is the sum of individual effects of two or more physical activities"

b) "A synergistic cumulative effect occurs as a result of the interaction between two or more effects when, the resultant combination is greater or different than the simple addition of the effects"

c) "Compensatory cumulative effects are effects from two or more physical activities that "offset" each other"

d) Masking cumulative effects are "the effects of one project might mask the effects of another in the field"

Deleterious Substance | A substance that is harmful to the environment it is released to.

Dilution | The process of making weaker or less concentrated most often pertaining to water.

Disturbance | A temporary or permanent alteration of the physical structure or arrangement of biotic and abiotic elements.

Dredge | To remove a portion (e.g., trench), of a waterbody or substrate in a waterbody with a machine usually by buckets on an endless chain or a suction tube.

Ecosystem | A spatially defined system including all biological organisms and abiotic media.

Effect | As defined under *Impact Assessment Act*, effect means, unless the context requires otherwise: "changes to the environment or to health, social or economic conditions and the positive and negative consequences of these changes."

Emergency Response Plan | A plan that describes roles, decision-making and communication processes, expertise and capacity so that the response to an environmental emergency is quick and effective.

Emissions | All solid, liquid, or gaseous discharges from equipment or facility, but normally referring to gaseous and particulate air emissions (typically solids are referred to as residue and liquids as effluent).

Endangered | A species facing imminent extirpation or extinction.

Engineered | Designed and build using scientific and engineering principles.

Environment | As defined by the *Impact Assessment Act*, environment means "the components of the earth, including:

(i) land, water and air, including all layers of the atmosphere;

(ii) all organic and inorganic matter and living organisms; and

(iii) the interacting natural systems that include components referred to in paragraphs (a) and (b)."

Environmental Effect | Shouldn't we use federal? As defined under *Nova Scotia's Environment Act*, environmental effect means:

Any change, whether negative or positive, that the undertaking may cause in the environment, including any effect on socio-economic conditions, on environmental health, physical and cultural heritage or on any structure, site or thing including those of historical, archaeological, paleontological or architectural significance.

and

Any changes to the undertaking that may be caused by the environment, whether the change occurs inside or outside the Province.

Environmental Impact Assessment (EIA) | Planning and decision-making tool, where the environmental effects of an undertaking are predicted and evaluated, and a subsequent decision is made based on the acceptability of the undertaking. The objectives of an EIA are to minimize or avoid environmental effects before they occur and incorporate environmental factors into decision making.

Environmental Management Plan | It is a living document that ensures that Project will be reflective of legislative and environmental responsibilities but is sensitive to any changes that might arise during its implementation. It describes at high level each Project component and the plan to protect and mitigate/manage/minimize any negative environmental effects throughout the project. The Environmental

Management Plan (EMP) serves as an early warning system through implementation of the Environmental Effects Monitoring Plan and forms an important cornerstone in all contractual phases of the Project such that all Project participants (Contractor(s) and stakeholders) will be responsible for adherence to the EMP; under the accountability of Nova Scotia Lands Inc.

Environmental Quality Standards | Environmental quality standards (EQS) are guidelines against which the acceptability of the presence and concentration of substances in soil, surface water, ground water, vapour and sediment are determined. EQS aid in improving the assessment of the equality of the environment.

Effluent | Usually referring to liquid releases from a facility or structure.

Estuary | The part of a river or stream or other body of water having unimpaired connection with the open sea, where the sea water is typically measurably diluted with freshwater derived from land drainage. The estuarine environment is typically defined as the aquatic environment where a river meets the sea.

Existing Conditions | Existing conditions are studied as part of the environmental assessment process to understand baseline conditions against which to assess anticipated environmental change.

Extinction | In biology and ecology, extinction is the ceasing of existence of a species or group of taxon's. The moment of extinction is generally considered to be the death of the last individual of that species.

Extirpation | To eliminate completely a species from a region.

Fauna | Animal species.

Fish | Under Section 2 of the *Fisheries Act*, includes:

a) Part of fish

b) Shellfish, crustaceans, marine animals and any parts of shellfish, crustaceans or marine animals

c) The eggs, sperm, spawn, larvae, spat and juvenile stages of fish, shellfish, crustaceans and marine animals

Fish Habitat | As fined under the *Fisheries Act*, fish habitat includes the spawning grounds and nursery, rearing, food supply and migration areas on which fish depend directly or indirectly in order to carry out their life processes.

Flora | Plant species.

Greenhouse Gases (GHGs) | Gaseous compounds that inhibit the release of heat from the atmosphere. The primary greenhouse gases considered in this Project are carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O).

Geotube® | For the purpose of this Project, a geotextile tube used to hold the dredged material, made of a permeable but soil-tight geotextile material.

Ground Penetrating Radar (GPR) | Geophysical remote sensing method to determine variances below the ground surface as a result of chemical or physical change. This is often used to survey selected areas as part of archaeological and environmental investigative work.

Hazardous Material | A hazardous material is any items or agent (biological, chemical, radiological, and/or physical), which has the potential to cause harm to humans, animals or the environment, either by itself or through interactions with other factors.

Herptile | A reptile or amphibian.

Human Health and Ecological Risk Assessment (HHERA) | A process used to assess the potential risks to human and ecological receptors as a result of environmental stressors.

Hydrogeology | Study of the properties, distribution and circulation of water below the ground surface.

Hydrology | Study of the properties, distribution and circulation of water on the ground surface.

Illuminance | The total luminous flux (the perceived power of light) incident on a surface per unit area.

Important Bird Areas | Discrete sites that support specific groups of birds: threatened birds, large groups of birds, and birds restricted by range or by habitat as defined through surveys and research

Infiltration | The movement of water from the land surface into the soil.

Intertidal | The region between the high tide mark and the low tide mark.

Invertebrates | Animals lacking a backbone or spinal column.

Leachate | For the purpose of this Project, water that comes in contact with impacted material within the sludge disposal cell.

Mitigation | Action(s) that remove or alleviate to some degree the potential negative effects associated with an activity.

Monitoring | Periodic or continuous surveillance and/or testing to determine the characteristics of a substance or the level of compliance with statutory requirements and/or contaminant levels in various media or in humans, plants, and animals.

Noise | Noise is defined as an unwanted, undesired, or unpleasant sound.

Non-vascular Plant | Non-vascular plants include mosses, hornworts and liverworts, and some algae. They are generally small plants limited in size by poor transport methods for water, gases, and other compounds. They reproduce via spores rather than seeds and do not produce flowers, fruit or wood.

Northern Bleached Softwood Kraft | Northern Bleached Softwood Kraft pulp in its finished form is made up of long slender fibres that provide excellent bonding and tensile properties. The pulp is used for manufacturing a variety of paper products including printing and writing paper, specialty grades and a range of tissue products.

Outfall | In the context of the project, outfall describes the location where the effluent pipeline terminates, and treated effluent is released into the Northumberland Strait.

Parameter | A variable that defines a system and can be varied in an experiment to determine its behavior.

Pilot Scale Testing | Small scale testing of a technology in real world conditions.

Potable Water | Water that is fit for drinking by humans and animals.

Potential Effect | An effect that is deemed possible to result from an activity.

Project Environmental Protection Plan | An overall comprehensive strategy for the protection of the natural environment throughout the Project. It is a living document that will be updated throughout the Project which provides a strategic environmental framework that facilitates further development at the detailed construction stage of the Project through more element-specific environmental documentation. The Project Environmental Protection Plan includes all the general construction and mitigation measures found in the Site-Specific Environmental Protection Plans, plus additional environmental effects monitoring programs.

Proponent | A person who; carries out or proposed to carry out an understanding of an undertaking; or is the owner or person having charge, management, or control of an undertaking.

Remediation | In the case of this Project, remediation is defined as the action of reversing or stopping environmental damage.

Residual Environmental Effect | An environmental effect that remains, or is predicted to remain, even after mitigation measures have been applied.

Right of Way | A term used to describe the legal right, established by usage or grant, to pass along a specific route through grounds or property belongings to another.

Run-Off | The portion of precipitation that does not infiltrate into the ground surface and flows to surface water bodies.

Sediment | Fragmented material from weathered rocks and organic material that is suspended in, transported by and eventually deposited by water or air.

Serious Harm | For the purposes of the *Fisheries Act*, serious harm to fish is the death of fish or any permanent alteration to, or destruction of, fish habitat.

Service Life | The period of time during which the components of a properly designed and maintained engineered facility will function and perform as designed.

Shovel Test | Typically a small shallow hole, dug in areas of elevated archaeological potential, to confirm the presence or absence of archaeological resources.

Significance | A defined threshold of acceptability. The significance of adverse environmental effects is determined by a combination of scientific data, regulated thresholds, standards, social values and professional judgement.

Site Study Area | In the context of this Project, spans from the first standpipe on the Kraft Pulp Mill property, through the effluent pipeline, described above, through existing and historic BHETF lands, Boat Harbour and its banks, extending to Northumberland Strait, and PLFN, located between Boat Harbour and Northumberland Strait.

Sites of Ecological Significance | Sites hosting organisms of ecological significance as defined by legislation.

Species at Risk | An extirpated, endangered or threatened species or a species of a special concern as defined by legislation.

Species Rank | A provincial rarity ranking assigned for the purpose of setting protection priorities for a species and/or ecological community. This ranking system is used by conservation data centres and natural heritage programs.

Spill | An accidental release of a substance, most often liquids.

Standpipe | A high vertical pipe or reservoir that is used to secure a uniform pressure in a water-supply system.

Threatened Species | A species that is likely to become an endangered species if nothing is done to reverse the factors leading to extirpation or extinction as defined by legislation.

Tidal Estuary | Partially enclosed coastal body of water, having an open connection with the ocean, where freshwater from inland is mixed with saltwater from the sea.

Topographic | The configuration of a surface including its relief and the position of its natural and man-made features.

Valued Component | Valued Component (VC) refers to environmental, biophysical or human features that may be impacted by a project.

Vascular plant | Plants that have specialized tissues for conducting water, including ferns, flowering plants, and conifers.

Vegetation | Plants in general or plants that are found in a particular area.

UTM | Universal Transverse Mercator. A mapping grid developed by the National Imagery and Mapping Agency (USA). The globe is divided into numbered zones, and within each zone northing and easting values are used to locate any point on the Earth's surface.

Watercourse | A natural or artificial channel through which water flows.

Wetland | Wetlands are areas where water covers the soil or is presented either at or near the surface of the soil all year or for varying periods of time during the year, including during the growing season. Nova Scotia Environment (1989) defines wetlands as "land commonly referred as marsh, swamp, fen, or bog that either periodically or permanently has a water table at, near or above the land's surface or that is saturated with water, and sustains aquatic processes as indicated by the presence of poorly drained soils, hydrophytic vegetation and biological activities adapted to wet conditions".

Wildlife Management Area | Areas designated by the Province of Nova Scotia for the protection of wildlife, such as the Abercrombie Wildlife Management Area.