

TERMS OF REFERENCE FOR THE PREPARATION OF AN ENVIRONMENTAL ASSESSMENT REPORT

**Regarding the Replacement Effluent Treatment Facility Project
Proposed by Northern Pulp Nova Scotia Corporation**

NOVA SCOTIA ENVIRONMENT

April 28, 2020

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1.0 INTRODUCTION

1.1 Background

The Replacement Effluent Treatment Facility Project (the Project or undertaking) proposed by Northern Pulp Nova Scotia Corporation (Northern Pulp or the Proponent) was registered for environmental assessment (EA) as a Class 1 undertaking pursuant to Part IV of the *Environment Act* on February 7, 2019. A thorough environmental assessment review concluded that the Registration Document did not provide enough information to determine if adverse effects or significant environmental effects would result from the Project.

On March 29, 2019, the Minister of Environment determined that the registration information was insufficient to make a decision on the Project, and a Focus Report was required in accordance with clause 13(1)c of the Environmental Assessment Regulations, pursuant to Part IV of the *Environment Act*.

On October 2, 2019, Northern Pulp submitted the Focus Report for EA, in accordance with Part IV of the *Environment Act*. A thorough environmental assessment review of this information concluded that the company failed to provide enough information to properly assess whether there may be adverse effects or significant environmental effects as a result of the Project. Through the environmental assessment review process, concerns were raised about incorrect and incomplete baseline information; assumptions and methodology used in the analysis; and the absence of mitigation measures related to the potential environmental effects.

On December 17, 2019, the Minister of Environment concluded that Northern Pulp would be required to complete an EA Report on this Project.

1.2 Purpose of the Terms of Reference

An Environmental Assessment is a planning tool that allows sustainable development to occur while protecting the environment. When a company registers its project for an environmental assessment, government's expectation is that the company provide a complete and comprehensive assessment of the project's potential risks and related mitigations. Based on the environmental assessment review, the Minister of Environment has a number of decision options: If the Minister is of the opinion that any adverse effects or significant environmental effects related to the project can be mitigated, then the project is able to proceed. If such effects cannot be mitigated, a project may be rejected. In cases where not enough evidence is provided to determine whether or not there may be adverse effects or significant environmental effects related to a project, the Minister may require more information (in the form of a more information decision, a Focus Report or an EA Report) to be provided to address gaps or deficiencies in the required information.

The purpose of this document is to identify for Northern Pulp the information requirements for the preparation of an EA Report. Northern Pulp is expected to prepare an EA Report that addresses the deficiencies in the information provided to date through the environmental assessment process and which fulfills the intent of the Terms of Reference. The EA Report must consider all of the effects that are likely to arise from the Project, including any not explicitly identified in the Terms of Reference. The EA Report will be used to meet the requirements of a provincial Class I Undertaking.

Northern Pulp must include in its EA Report all the information requested within the Terms of Reference, as a minimum, in accordance with the Environmental Assessment Regulations pursuant to Part IV of the *Environment Act*. The Terms of Reference include Valued Ecosystem Components (VECs) which must be adequately addressed in the EA Report. While the Terms of Reference provide a framework for preparing a complete EA Report, it is the responsibility of the Proponent to provide sufficient data and analysis on any potential environmental effects of the Project to permit a proper evaluation by governments, the Mi'kmaq of Nova Scotia and the public.

The EA Report is expected to provide a comprehensive and complete assessment of the potential effects of the Project, presented in a clear format that can easily be reviewed by the Minister, governments, the Mi'kmaq of Nova Scotia and the public. If the Minister decides to refer the EA Report to an EA Review Panel for review, the EA Report will serve as the cornerstone of the Panel's review and evaluation of the potential effects of the Project and thus must be a stand-alone document. The EA Report will also allow governments, the Mi'kmaq of Nova Scotia and members of the public to understand the Project, the existing environment, and the potential environmental effects of the Project.

1.3 Proposed Project

This Terms of Reference is based on the proposed Project as described in the February 2019 Environmental Assessment Registration Document (EARD). The Northern Pulp Northern Bleached Softwood Kraft pulp mill is located at Abercrombie Point adjacent to Pictou Harbour in Pictou County, Nova Scotia (NS). The proposed Project consists of the development of a new effluent (wastewater) treatment facility (ETF) constructed on Northern Pulp property, and a transmission pipeline that will carry treated effluent overland and in the marine environment and discharge via an engineered diffuser (marine outfall).

The ETF is proposed to employ the AnoxKaldnes BAS™ Biological Activated Sludge process purchased from Veolia Water Technologies, which combines Moving Bed Biofilm Reactor (MBBR) technology with conventional activated sludge. Once treated onsite at Northern Pulp's facility, effluent is proposed to be sent through an approximately 15 km long pipeline, of which approximately 8.7 km is included in the overland section. An additional land-based section of effluent pipeline, less than 1 km will be installed on mill property as a part of the ETF design by KSH Solutions. Approximately 1.5 km of the treated effluent pipeline will follow a marine crossing in Pictou Harbour adjacent to the Pictou Causeway. The land-based section of the pipeline begins on the north side of Pictou Harbour where it enters the Nova Scotia Department of Transportation and Infrastructure Renewal's (TIR's) Highway 106 right-of-way (ROW) and runs generally north, parallel to Highway 106, along the outermost eastern portion of the ROW toward Caribou, NS. The pipeline will then travel through the marine environment to the proposed outfall location approximately 4.0 km offshore within the Northumberland Strait.

1.4 Environmental Assessment Requirements

The Project is a Class I Undertaking pursuant to Schedule A of the Environmental Assessment Regulations made under Section 49 of the *Environment Act*. In accordance with Section 18(b) of the Environmental Assessment Regulations, the Minister of Environment has determined that an EA Report is required.

The Proponent is required to submit the EA Report within two years of the date of this Terms of Reference. This may be extended to three years if the required studies would cause preparation of the EA Report to exceed the two-year period. If the EA Report does not include the items specified in the Terms of Reference, Northern Pulp will be required to include further information before the EA Report can be accepted. Upon acceptance of the EA Report, Nova Scotia Environment (NSE) has 14 days to publish a notice advising the public where the EA Report can be accessed for review and comment.

Once the EA Report has been accepted, the Minister has the option to refer the EA Report to an EA Review Panel for review. At the conclusion of this process, the Minister has 3 decision options: a) the undertaking is approved with conditions; b) the undertaking is approved without conditions; or c) the undertaking is rejected.

2.0 PREPARATION AND PRESENTATION OF THE ENVIRONMENTAL ASSESSMENT REPORT

Pursuant to subsection 19(1) of the Environmental Assessment Regulations, the EA Report must include, but not be limited to, the following information:

- a description of the proposed undertaking;
- the reason for the undertaking;
- other methods of carrying out the undertaking;
- a description of alternatives to the undertaking;
- a description of the environment that might reasonably be affected by the undertaking;
- the environmental effects of the undertaking, including identifying any effects on species at risk, species of conservation concern and their habitats;
- an evaluation of advantages and disadvantages to the environment of the undertaking;
- measures that may be taken to prevent, mitigate or remedy negative environmental effects and maximize the positive environmental effects on the environment;
- a discussion of adverse effects or significant environmental effects which cannot or will not be avoided or mitigated through the application of environmental control technology;
- a program to monitor environmental effects produced by the undertaking during its construction, operation and abandonment phases;

- a program of public information to explain the undertaking; and
- information obtained under subsection 19(2) which the Administrator considers relevant.

The information obtained under subsection 19(2) shall be prepared taking into consideration comments from:

- the public;
- departments of Government;
- the Government of Canada and its agencies;
- municipalities in the vicinity of the undertaking or in which the undertaking is located;
- any affected aboriginal people or cultural community; and
- neighbouring jurisdictions to Nova Scotia in the vicinity of the undertaking.

In preparing the EA Report, Northern Pulp shall refer to comments from the above-noted parties during the EA review of both the EARD and the Focus Report submitted by Northern Pulp to NSE, as well as this Terms of Reference prepared by NSE, to identify and include the supplementary information required to provide a comprehensive and complete assessment of the potential effects of the Project. The EA Report must be a stand-alone document that presents a complete discussion and analysis of predicted effects (direct and indirect effects) that is qualitative and quantitative, evidence-based and supported by credible sources of information. This report shall build upon, where appropriate, the science and evidence outlined in the EARD and in the Focus Report. Northern Pulp is expected to prepare an EA Report that fulfils the intent of the Terms of Reference and considers all the effects that are likely to arise from the Project, including those not explicitly identified in the Terms of Reference.

Since the EA Report is intended for public review, the information should include an Executive Summary presented in non-technical language. The Proponent will be required to submit an electronic copy of the EA Report in accordance with the EA Branch Bulletin on Requirements for Submitting Electronic Copies of Environmental Assessment (EA) Documents for publication on the Department's website.

All site-specific data used to support the EA Report must be collected using equipment installed, operated, maintained and calibrated as specified by the manufacturer's instructions. All samples are to be collected, preserved and analyzed by qualified personnel, in accordance with recognized industry standards and procedures and at accredited laboratories. Data shall undergo quality assurance and quality control (QA/QC) processes. Data shall be collected over an appropriate time period that is justified and rationalized in the EA Report. Where models are used, all modelling inputs and assumptions shall be provided, including use of baseline data. Model calibration and validation processes, and model results evaluation methods shall be provided.

The EA Report must include, but not be limited to, the following information, as identified under the corresponding sections. Note that direction included in this Terms of Reference cannot be considered as new requirements, but rather provides clarity where the Proponent previously did not undertake sufficient analysis to meet the requirements of an environmental assessment and properly assess whether there may be adverse effects or significant environmental effects as a result of the Project.

3.0 PROJECT DESCRIPTION

Describe each component of the Project as it is planned through its full life cycle, including site preparation, construction, commissioning, operation, maintenance, and decommissioning, including any accidents and/or malfunctions that may occur during each phase of the Project. This will include consideration of:

- any planned changes to mill infrastructure and in-mill improvements that may affect the performance of the effluent treatment facility (ETF);
- the ETF;
- land-based sections of the pipeline; and
- marine based sections of the pipeline and the diffuser.

Where final decisions have not been made in regard to an element of Project design, or several options exist for a particular component or activity, the assessment of effects of that element of the Project on the environment should be conducted at the same level of detail for all available options.

3.1 The Proponent

Outline the Proponent's corporate commitment to sustainable development and environmental protection goals and principles, including pertinent corporate policies, programs, plans, strategies, protocols, guidelines, codes, and environmental management systems (EMS). Provide copies of all policies, plans, etc. referred to in the EA Report.

Provide summary information on the nature of the management structure and organizational accountability for designing, constructing, operating and modifying the Project; implementing environmental mitigation measures and environmental monitoring; and managing potential adverse environmental effects.

Provide details on relevant corporate experience of the Proponent and related companies and experience in building and operating other similar facilities. Provide a record of the environmental performance and capability of the Proponent in conducting this type of Project.

3.2 Project Location

Provide a concise description of the geographical setting in which the Project is to be constructed/operated. Describe how the Project site was chosen, including a discussion of the specific environmental considerations used in site selection of all Project components, and the advantages and disadvantages of the proposed site. Describe the Project's compatibility with existing local and regional land-use policies and plans, and opportunities to integrate Project planning into regional scale development efforts. Discuss compatibility of the Project location in relation to people and their community and traditional activities and land uses by the Mi'kmaq of Nova Scotia.

Describe the physical boundaries of the Project in a regional context, including existing and proposed land uses and infrastructure such as road networks, highway realignment, railways, power lines, pipelines, proximity to permanent and seasonal residences, individual and community water supplies, wetlands, water bodies, streams, parks, ecologically sensitive areas, priority flora and fauna species, marine refuge areas (Scallop Buffer Zone 24), and cultural and archaeological sites. Identify proposed local shipping routes for importing and exporting products. Include mapping at an appropriate scale with UTM coordinates to illustrate the boundaries of the Project in a regional context and proximity of Project components to these features.

Provide a list and map of communities in the region, including Mi'kmaq communities, potentially affected by the Project and indicate the distance between those communities and the specific Project components as appropriate.

Provide details on ownership of property within the Project footprint, including lands owned by the Proponent, the Crown, or private property owners. Include a list of all properties (i.e., Parcel Identification Numbers) that will intersect with each component of the Project. Provide details of existing agreements to develop the Project on lands not owned by the Proponent. Provide plans for the acquisition or use of private lands and Crown Lands, as well as identifying easements required to maintain access to adjacent private lands and discuss any contingencies should these lands not be available for Project development.

3.3 Project Design and Components

Describe the design plans and appropriate design standards for all Project components, associated infrastructure, and other characteristics that will assist in understanding the Project, including but not limited to: any planned changes to mill infrastructure and in-mill improvements that may affect the performance of the ETF, the ETF, land-based sections of the pipeline, and marine based sections of the pipeline and the diffuser. Discuss the environmental controls planned for the Project and how environmental protection, conservation, best management practices (BMPs), and best available technology have been considered in the design.

Provide potential design variations and implications of those variations, including advantages or disadvantages to the environment. Describe any assumptions which underlie the details of the Project design. Where specific codes of practice, guidelines, policies, and BMPs apply to the design, those documents shall be cited and include links to such documents if they are available online. If no available online, provide copies of those documents in the EA Report.

In addition to the above, this section will include, but not be limited to information on the following Project components:

Any Planned Changes to Mill Infrastructure and In-Mill Improvements that may affect performance of ETF

- Preliminary design overview for any in-mill improvements necessary, or planned, to achieve the design assumptions for the Project (e.g., in-mill cooling towers);
- Preliminary design overview of any other planned in-mill changes or projects that will affect the performance of the ETF (e.g., oxygen delignification);
- Schedule of any in-mill improvements and other changes relative to the ETF construction schedule; and
- Provide a dangerous goods and waste dangerous goods management plan for the Project that will accommodate for worst case scenario within design of the ETF. It is important to note that the ETF is not proposed to treat dangerous goods or waste dangerous goods based on the information provided in the EARD and in accordance with requirements of NSE.

Effluent Treatment Facility (ETF)

- Preliminary design overview of the ETF. This must also contain preliminary design overview of the spill basin, including, management and disposal of contaminated material present at the site, liner details, secondary containment features, clean-out access and connection to the mill infrastructure and ETF;
 - As the ETF is not proposed to treat dangerous goods or waste dangerous goods based on the information provided in the EARD and in accordance with requirements of NSE and the Dangerous Goods Management Regulations, if applicable, provide details on how the spill basin can be safely managed to accommodate multi-purpose usage (e.g., collection of spills of dangerous goods or waste dangerous goods, process effluent, off-spec effluent, flow balancing etc.) and specifically considering worst case scenarios and the interaction of non-compatible materials
 - Justify spill basin size, shape and function
 - If applicable, provide details for any other basins to be used to collect spills of dangerous goods or waste dangerous goods or to be used for ETF flow balancing;
- Equipment description and specifications, including appropriate diagrams and flow charts for the ETF and associated infrastructure;
- Details, including characteristics and toxicities, and the quantities of all products that could be introduced to the ETF, including by-products and chemical intermediaries and any interaction of such products with any contaminants of potential concern (COPCs);
- Given that the mill is no longer operating, using existing historical data from the mill and if needed, supplemented by data from comparable mills or existing literature where appropriate, provide a complete physical and chemical characterization of raw wastewater, similar to what is expected for the proposed Project. Identify and evaluate all COPCs, to support the assessment of proposed treatment technology selection. Characterization data ranges (i.e., broad chemical analysis) must adequately represent the range of ETF influent quality for various operating conditions that may exist at the mill (e.g., seasonality, range of flow rates, changes in sources of fiber, production, start-up and shut-down cycles). The assessment of proposed treatment technology selection shall include, but not be limited to, bench-scale testing, identifying all influent and effluent COPCs concentration ranges and chemical oxygen demand (COD) fractionation concentrations (soluble and total);
- Comparison of the effluent characterization results from the above assessment with appropriate regulations and/or guidelines, including but not limited to the latest versions of draft and current Pulp and Paper Effluent Regulations (PPER) daily and monthly average limits and demonstrate how compliance with COD influent limits will be achieved;

- Effluent flow data using existing historical data from the mill or predicted for future operations to support the proposed peak treatment capacity of 85,000 m³ of effluent per day;
- Evaluation of sludge disposal and sludge management options, including the rationale for the preferred option. Provide a contingency plan for sludge disposal if the preferred option is the biomass boiler; and
- Provide details of the ETF commissioning process and impact of commissioning phase on performance of proposed treatment technology.

Land-Based Sections of the Pipeline Route

- Provide information on corridor width requirements, demonstrating minimization of the corridor width;
- Plans for appropriate, intrusive geotechnical surveys to support proposed pipeline construction methods
 - The geotechnical survey plan must anticipate collection of standard hydrogeological information on borehole, monitoring well and test pit records including:
 - estimated water levels
 - soil types, description and depths
 - bedrock geology description of rock type, rock quality fracturing) and depths
 - monitoring well construction details (when applicable);
- Functional design drawings of land-based pipeline alignment within current highway right-of-way and in relation to all existing key features. Must show sufficient detail in legend, plan, profile, and cross-sections at regular intervals and key locations, at an appropriate scale including but not limited to: dimensions of pipe and trench/thrust pit excavation limits from adjacent key features (e.g., utilities and municipal infrastructure, structures/foundations, original ground surface, edge of asphalt, edge of shoulder, top/bottoms of cut/fill slopes, current/proposed right-of-way boundaries, intersecting roads, etc.);
- Risk assessment of the land-based pipeline design, including:
 - Evaluation of the probability of a leak, spill or release, based on a literature review of comparable designs and installations, and considering future construction/maintenance activities that may be undertaken by TIR or others (e.g., ditching, culvert replacement, roadside brush cutting, future highway twinning, installation of underground and/or overhead utilities or municipal services)
 - Identification of points along the pipeline route that are most susceptible to failure;
- Details of a secondary containment system (e.g., double-walled pipeline) and/or other protective engineered measures and proposed locations, based on the risk assessment. At a minimum, a secondary containment system is required within the Town of Pictou's water supply protection area; and
- External and internal leak detection technologies for the entire land-based pipeline, considering the Town of Pictou's water supply protection area and private supply wells. Provide details on the sensitivity of detection technologies, staff training plans, maintenance and inspection frequencies, methodologies and response protocols.

Marine Based Sections of the Pipeline Route

- Appropriate, intrusive geotechnical survey results to support proposed marine pipeline construction methods;
- Discussion of how dredging for pipeline installation may affect stability/settlement of the Harvey A Veniot Causeway;

- Risk assessment of the marine based pipeline design, including:
 - Evaluation of the probability of a leak, spill or release, based on a literature review of comparable designs and installations, considering potential for ice scour and grounding other activities that may be undertaken in the area
 - Identification of points along the pipeline route that are most susceptible to failure;
- Details of a secondary containment system (e.g., a double-walled pipeline) and/or other protective engineered measures and proposed locations, based on the risk assessment; and
- External and internal leak detection technologies for the entire marine-based pipeline. Provide details on the sensitivity of detection technologies, staff training plans, maintenance and inspection frequencies, methodologies and response protocols, including during periods of ice coverage.

3.4 Construction

All aspects of the physical construction activities for the Project must be outlined in detail including any temporary structures, such as access roads for construction and the disposal location for any proposed dredge materials.

Describe the construction of all Project components and supporting infrastructure, including but not limited to:

- Construction schedule for all Project components, including days of the week, times of the day, seasonal schedules and anticipated commencement and completion dates;
- Physical works and activities carried out during the construction phase, identified and described by location, including clearing and grubbing, blasting, site access and road construction, marine construction activities, watercourse crossings or diversions, fuel, and explosive and dangerous goods storage areas, and utilities;
- Description of equipment used for construction activities, both terrestrial and marine;
- Detailed work plans that address traffic operational constraints and requirements (e.g., lane closures, stoppage of traffic on Highway 106, changes to signage or pavement markings, movement of overweight/oversized items, use of trenchless technology and sleeving to cross below active roadways/structures and facilitate future pipe maintenance/replacement) and considers requirements under the Transportation of Dangerous Goods Regulations;
- Dredge management/disposal plans that characterize and quantify marine sediments and identify dredging locations and potential land-based and marine disposal locations. These plans should be developed in accordance with applicable standards and in consultation with ECCC and other relevant government departments;
- Evaluation of feasibility of pipe jacking or other crossing methods for roads or structure location crossings, including limitations associated with practical pipe length and available space for thrust/reception pits on either side of crossings;
- Discussion of how excavating and replacing large rock fill along the alignment may affect stability/settlement of the Harvey A Veniot Causeway; and
- Waste disposal plans including locations, types of waste, disposal methods and quantities.

3.5 Operation

Describe the operation of all Project components and supporting infrastructure. The description of the operation shall include but not be limited to:

- Routine and maintenance operations for all Project components;

- Environmental controls and BMPs, including pollution prevention techniques in addition to traditional treatment and disposal practices;
- As the ETF is not proposed to treat dangerous goods or waste dangerous goods based on the information provided in the EARD and in accordance with requirements of NSE and the Dangerous Goods Management Regulations, provide a spill basin management plan that addresses sequential spills/leaks/releases, clean-out and liquid/solid removal procedures for the different types of collected materials, and appropriate final disposal procedures considering applicable provincial and federal regulations. If applicable, the management plan must also address the management of different types of materials, including the interaction of non-compatible materials; and
- Staffing, training and operation oversight plans, ensuring adequate management of the ETF by trained personnel at all times.

3.6 Decommissioning and Reclamation

Describe the proposed plans for decommissioning the Project, including all infrastructure and reclamation of any impacted sites. The EA Report shall also discuss the post-decommissioning land use options of the property(ies).

4.0 REGULATORY ENVIRONMENT

Describe the existing regulatory environment (Federal, Provincial and Municipal) including all permitting, licensing and regulatory requirements that apply to all phases of the Project and associated infrastructure. Provide a schedule indicating anticipated dates for required regulatory approvals.

Describe applicable guidelines and standards that would apply to the Project. Those applicable standards or guidelines shall also be referenced in the appropriate sections of the EA Report and linked to environmental protection objectives.

Given that significant portions of the proposed Project to be evaluated by the EA Report are located on federal lands, federal authorities have indicated that, in accordance with Section 82 of the federal *Impact Assessment Act*, they must make a determination as to whether the Project is likely to cause significant adverse effects and/or in the case of Public Services and Procurement Canada (PSPC), seek an Order in Council prior to providing authorizations, licenses, or leases. The Proponent is encouraged to refer to all comments provided by the federal government in response to this Terms of Reference prepared by NSE and to consult with all applicable federal departments to determine federal assessment requirements under Section 82. Where these requirements overlap with expectations outlined in this document, they must also be provided in the EA Report.

To ensure potential environmental effects of the Project presented in the EA Report are addressed to the satisfaction of federal authorities under Section 82 of the *Impact Assessment Act*, the Proponent shall provide copies of all necessary authorizations, licenses, or leases for all applicable federal authorities. If the authorizations, licenses or leases cannot be obtained in the time allotted for the preparation of the EA Report, it must be demonstrated in the EA Report that the work necessary to support the federal applications is complete and has been considered in tandem during the preparation of the EA Report. The Proponent is advised to begin consulting with all applicable federal departments and seeking these approvals immediately upon receipt of this Terms of Reference.

5.0 NEED FOR AND PURPOSE OF THE PROJECT

The need for and purpose of the Project should be established from the perspective of the Proponent. The Project is being designed to meet specific objectives and these objectives should be discussed. If the objectives of the Project are related to or contribute to a larger private or public sector policy, program or plan, this information should be included.

6.0 DESCRIPTION OF ALTERNATIVES TO THE PROJECT

Include an analysis of alternative means of carrying out the Project; describing functionally different ways to meet the Project need and achieve the Project purpose.

Northern Pulp shall refer to all comments from relevant government departments, the Mi'kmaq of Nova Scotia, and the public during the EA review of the EARD and the Focus Report submitted by Northern Pulp to NSE, and on this Terms of Reference prepared by NSE. Where alternatives have been identified by these reviewers they should be considered in this section.

7.0 OTHER METHODS FOR CARRYING OUT THE PROJECT

Discuss other methods for meeting the need for the Project, including but not limited to, pipelines and treatment technologies. This section shall also discuss alternate locations for the Project components.

The rationale for rejecting other described methods of carrying out the Project must be provided, including a discussion of how environmental sustainability and impact avoidance criteria were applied.

8.0 ASSESSMENT METHODOLOGY

Include the study strategy, methodology and boundaries used for preparing the EA Report. The following must be clearly defined:

- Temporal boundaries (i.e., duration of specific Project activities and potential impacts) for construction and operation through to decommissioning;
- Study boundaries or Project area (local and regional) and all space that will be potentially impacted by the Project as proposed, or subject to subsequent modifications, and the rationale and methodology used to identify the study boundaries. Provide spatial files of the Project area boundaries;
- Valued Ecosystem Components (VECs) within the study boundaries and the methodology used to identify the VECs. The methodology used for VEC identification shall include input from members of the public, government departments and agencies, other experts, and other interested parties, as well as direct engagement with the Mi'kmaq of Nova Scotia;
- Where appropriate, identify environmental protection objectives (including those contained in applicable legislation or guidelines) associated with each VEC;
- Strategy for investigating the interactions between the Project and each VEC and how that strategy was used to coordinate the individual studies undertaken;
- Method for predicting and evaluating Project impacts upon the environment; determining necessary avoidance, mitigation, remediation and/or compensation (in this order of consideration); and
- Determining and defining the significance of any residual impacts for each VEC.

The EA Report is to be prepared using an accepted and proven EA methodology and a qualified person(s) should predict and evaluate Project impacts upon the environment. If there are no predicted effects to a specific VEC, provide rationale to support that claim. The EA Report shall be a stand-alone document that presents a complete discussion and analysis of predicted effects (direct and indirect effects). Analysis shall be provided that is qualitative and quantitative, evidence-based and supported by credible sources of information. Provide a list of literature and sources used in the preparation of the EA Report. In preparing the EA Report, Northern Pulp shall refer to all comments provided during the EA review of both the EARD and the Focus Report submitted by Northern Pulp to NSE, as well as this Terms of Reference prepared by NSE, to identify and include the supplementary information required to provide a comprehensive and complete assessment of the potential effects of the Project.

The following sections outline specific concerns and requirements related to the existing environment, adverse effects and environmental effects assessment, proposed mitigation, residual environmental impacts, proposed compliance and effects monitoring, and the public information program that are to be addressed in the EA Report for the proposed Project.

9.0 EXISTING ENVIRONMENT

Provide a baseline description of the environment in the vicinity of the Project and all other areas that could be impacted by the Project. This description must include the components of the existing environment and environmental processes, their interrelations and interactions, as well as variability in these components, processes and interactions over time scales appropriate to the effects assessment. The Proponent's description of the existing environment shall be in sufficient detail to permit the identification, assessment and evaluation of the significance of potentially adverse environmental effects that may be caused by the Project.

The EA Report shall build upon, where appropriate, the science outlined in the EARD and in the Focus Report, considering comments on those documents during their respective EA review processes, as well as on this Terms of Reference.

For the EA Report, the spatial boundaries must include the Project footprint and relevant receiving environments such as airsheds and watersheds. Temporal boundaries must address applicable guidelines, standards and regulatory requirements and include Project construction, operation, decommissioning and post-decommissioning.

The Proponent is encouraged to consult with relevant government departments when determining the need for, extent, methods, and timing of site-specific studies/surveys and/or the use of models. Where technical reports are included or referenced, they must be finalized and signed by the qualified individual(s). Mapping clearly indicating the extent of studies/surveys, sampling points, and illustrating key findings should also be included and presented logically within the EA Report in a location that allows for ease of review. Detailed descriptions of all survey methodologies and site selections are required to support the validity of all survey results presented in the EA Report, including any surveys that were already completed as part of previous submissions (i.e., EARD and Focus Report).

The EA Report shall clearly indicate baseline data/information which is not available or where existing data cannot accurately represent environmental conditions in the Project area. If the background data have been extrapolated or otherwise manipulated to depict environmental conditions in the Project area, modelling methods and equations shall be described and shall include calculations of margins of error and uncertainty.

Where modelling is used, they should be setup, calibrated, validated and results evaluated in accordance with applicable program manuals and established industry standards. Rationale should be provided to support model selection. Collected and applicable existing condition and regionally available data should be used, if applicable, for model setup, calibration and validation. Model input parameters must be included in the EA Report, along with listing assumptions, references and parameter limitations. Datasets used for model setup, calibration or validation are to be provided as digital submissions to support model setup and results assessment. Goodness of Fit and other appropriate industry-standard statistical procedures are to be applied to evaluate model adequacy in completing the requirements outlined in the Terms of Reference.

Northern Pulp shall refer to all comments from relevant government departments, the Mi'kmaq of Nova Scotia, and the public during the EA review of the EARD and the Focus Report submitted by Northern Pulp to NSE, and on this Terms of Reference prepared by NSE.

The components of the environment to be discussed shall include identified VECs and those indicated within Sections 9.1 – 9.8.

9.1 Geophysical Environment

Topographical maps should be provided locating the Project in both regional and local contexts. Describe the physical geography of the Project study area including post-glaciated landforms, coastal features, and marine features.

Include a description of bedrock geology, surficial geology and soils. Marine geotechnical survey results must address potential dredging constraints and confirm bedrock depth in areas of uncertainty identified in the Focus Report. Geological properties of all Project sites in the study area which may influence stability, occupational health and safety, rehabilitation programs, or the quality of discharge water leaving any area disturbed by the Project should be described. The EA Report must consider the potential for Acid Rock Drainage/Metal Leaching (ARD/ML) where new bedrock may be exposed and/or excavated.

Include a discussion pertaining to surficial sediment characteristics and mobility under present and future environmental conditions. This section should also identify any mineral resources that may be impacted by the Project.

Provide marine sediment chemical characterization over the full study area at multiple locations. Marine sampling locations must be clearly identified. Marine sediment baseline sampling must include COPCs associated with marine construction and treated effluent. These studies must be completed to the satisfaction of relevant government departments and be used to support modeling activities.

Provide an ice scour and grounding baseline study. The ice scour and grounding survey should capture conditions immediately following spring break up. Results will need to be accounted for in the final pipeline design and associated impact assessment elements. The study shall also include and assess all existing data (from all relevant sources) on sea ice in the study area. The study must be completed to the satisfaction of relevant government departments.

9.2 Water Resources

Include a description of groundwater, surface water, marine water and wetland resources potentially affected by the Project.

9.2.1 Groundwater

Provide a description of the regional and local hydrogeology of the study area. A discussion of groundwater use in the study area, including both current and likely potential future uses must be provided. Provide a map showing all water supply well locations (including municipal wells and private wells) within 500 metres of the pipeline route.

9.2.2 Surface Water

Provide a general hydrologic, hydraulic and water quality description of all surface water resources in the study area, including upstream and downstream to all Project components. Existing uses, approved water withdrawals, and users of the watercourses shall be identified, including use by the Mi'kmaq of Nova Scotia. Provide a map showing all potentially affected watercourses along the pipeline route.

9.2.3 Marine Water

Provide baseline studies that characterize environmental conditions representative of the full study area (e.g., multiple locations) for all four seasons and accounting for yearly variations, including: climate, water quantity (e.g., current profiles, water column stratification, wave height, tide levels), and water quality (e.g., temperature, salinity, chemical and physical water quality). These studies shall include characterization of both normal and extreme and/or atypical environmental conditions (e.g., extreme high or low tides, water levels, localized and overall currents, flow, water and air temperature, wave heights, wind, storms, ice). These studies must be conducted to the satisfaction of relevant government departments and are to be used to support modeling activities.

Develop calibrated and validated existing conditions scenarios for the computer models to be used for the receiving water study and the marine water effects assessment (see Section 10). Baseline climate and marine water quantity and quality data should be used for model setup, calibration and validation. Evaluate the adequacy of seasonal variation and the lengths of the datasets used in model setup and/or calibration/validation. A summary of model confidence in adequately representing the existing marine water environment in all seasons is to be included. Model selection, scenarios and setup must be conducted to the satisfaction of relevant government departments.

9.2.4 Wetlands

Identify the location, size and class(es) of any wetland and/or wetland complexes within the predicted zone of influence and conduct a wetland evaluation. Evaluation of the wetlands shall include wildlife habitat potential (including rare and endangered species) and wetland/species specific uses, groundwater recharge potential, role of the wetland in surface water regulation (e.g., stormwater retention and flood control) and the role of the wetland in watershed health. Based on the results of the evaluation, the EA Report must specifically identify wetlands that:

- Support a significant species or species assemblages;
- Support significant hydrologic functions or benefits;
- Provide high support functions to wildlife; and

- Have high social or cultural importance.

The wetland evaluation shall include assessment of adjacent wetland areas and the anticipated extent of impacts associated with construction activities. The wetland evaluation must include identification of assessment areas and catchment areas used in the evaluation and include any associated outputs or assessment scoring outputs. Any wetlands potentially impacted by Project activities must also be evaluated for potential impacts to fish and fish habitat.

Baseline studies must describe and document pre-construction conditions, including, but not limited to, wetland class distribution, vegetation community structure, soil characteristics, and hydrology indicators and trends.

9.3 Atmospheric Resources

Describe atmospheric resources including ambient air quality, the acoustic environment, greenhouse gas (GHG) emissions, and impacts on climate.

9.3.1 Climate

Include a discussion of regional climate conditions and meteorology in the vicinity of the Project, as well as expected changes over the next 50 years due to climate change. This section should include climate norms, extreme conditions, as well as trends in these conditions and climate change impacts, as well as the effect these changes may have on the Project and plans to mitigate against those impacts.

In addition to historical and projected climate data, the climate sub-section of the existing environment should include a summary of GHG emission projections for the Project.

Please follow the Guide to Considering Climate Change in Project Development in Nova Scotia when completing this section:

<https://novascotia.ca/nse/ea/docs/Development.Climate.Change.Guide.pdf>.

9.3.2 Air Quality

For the study area, provide a review of baseline ambient air quality and meteorological data, including annual and seasonal climatic conditions for the region.

Provide a description of existing ambient air quality conditions for pre and post hibernation periods of the mill, for the study area, with particular attention to ambient and peak levels of nitrogen dioxide (NO₂), sulfur dioxide (SO₂), carbon monoxide (CO), ozone (O₃), particulate matter (total suspended particulate (TSP), fine particulate matter (diameter less than 2.5 microns) (PM_{2.5}) and coarse particulate matter (diameter less than 10 microns) (PM₁₀), total reduced sulphur (TRS) and volatile organic compounds (VOCs) levels.

Discuss the influence of local and regional emission sources and the influence of climate and weather conditions. The data should be used for the development of an appropriate baseline model(s) for the study area to be provided in the EA Report.

Also describe any potentially sensitive receptors and/or locations. The EA Report shall expressly define the term “receptor” and will describe the steps taken to evaluate the existence of potential receptors in relation to stated and justified criteria. The criteria shall be drawn from relevant and current scientific literature which will be cited and include links to such documents if available online.

9.3.3 Ambient Noise and Light Levels

Describe the existing ambient acoustical environment at the Project site (including the marine environment), and in any other areas where Project activities could be expected to have an environmental effect.

Provide the spatial boundaries of existing noise and vibration levels, as well as locations of recording stations and length of record for any acoustic or vibration data presented. Consider the effects of different meteorological conditions on noise propagation. Provide information on any existing relevant standards, guidelines or objectives with respect to noise and vibration levels.

Describe existing ambient light levels at the Project site and at any other areas where Project activities could have an environmental effect on light levels. Describe night-time illumination levels during different weather conditions and seasons.

9.4 Biota

Identify all species and habitat types that will be impacted, or potentially impacted by all components of the Project. Appropriate field surveys agreed to by Nova Scotia Lands and Forestry (NSLAF) – Wildlife Division and Environment and Climate Change Canada (ECCC) Canadian Wildlife Service, shall be conducted as part of the evaluation. Surveys should be described by results, methodology, and spatial and temporal boundaries.

9.4.1 Terrestrial Environment

This section must include, but not be limited to the following:

- Identification of typical species of flora, sensitive flora, flora species-at-risk, and potential habitat for flora species-at-risk in the study area. Sensitive flora could include any species identified that is particularly sensitive to habitat disruption and/or construction activities. This should also identify any priority species and associated habitats as outlined in the Guide to Assessing Wildlife Species and Habitat in an EA Registration Document. Current information shall be obtained from NSLAF – Wildlife Division and the Forestry Division, the Atlantic Canada Conservation Data Center (ACDC), ECCC, the Nova Scotia Museum of Natural History, and local naturalists and relevant interest groups;
- Identification of areas of old growth forest. Current information shall be obtained from NSLAF – Wildlife Division and the Forestry Division, the ACDC, ECCC, the Nova Scotia Museum of Natural History, and local naturalists and relevant interest groups. Field surveys and investigations required to supplement the available data shall be completed in a manner that is acceptable to NSLAF – Wildlife Division and all survey results shall be included;
- Identification of any existing or planned wildlife management areas, ecological reserves or wilderness areas as well as managed wetlands and significant wildlife habitat;
- Identification and delineation on a map ‘roadless areas’ and discussion of their potential value to Nova Scotia’s protected areas network, including areas with high wildlife concentrations, wildlife corridors or habitats rare/unique to Nova Scotia;
- Identification of typical species of fauna (including invertebrate species), sensitive fauna, fauna species-at-risk, and potential habitat for fauna species-at-risk in the study area. Sensitive fauna could include any species identified that is particularly sensitive to habitat disruption and/or construction activities. This should also identify any priority species and associated habitats as outlined in the Guide to Assessing Wildlife Species and Habitat in an EA Registration Document. Current information shall be obtained from NSLAF – Wildlife Division; ACDC; ECCC; Nova Scotia Communities, Culture and Heritage (CCH); the latest Committee on the Status of Endangered Wildlife in Canada (COSEWIC) list; the Atlas of Breeding Birds of the Maritime Provinces; and local naturalists and relevant interest groups;
- Results of spring and fall migratory bird surveys at representative survey points along the pipeline route, with survey transects providing a complete view of bird species distribution and habitat use. When surveys are necessary to supplement the available data and adequately describe the use of the area by migratory birds during different times of the year (breeding season, migration, winter), emphasis will be placed on determining whether any bird species-at-risk, colonial nesting species, species particularly vulnerable to habitat fragmentation, etc., occur or breed in or near the study area. Identification of nests of bird species which are protected under the *Wildlife Act*, or with respect to certain species, protected under the *Migratory Bird Convention Act*, regardless of whether they are active or not must also be considered;
- Results of bird baseline survey using established protocols during the breeding season for common nighthawk (*Chordeiles minor*), including rationale for survey point selection to the satisfaction of NSLAF;
- Results of a raptor nest survey to identify nest locations for the entire Project area including the pipeline route; and
- Results of a herptile survey for the Project area, which includes the pipeline route, to include both spring and fall survey information and using a survey methodology developed in consultation with NSLAF.

9.4.2 Freshwater Aquatic and Marine Environment

This section must include, but not be limited to the following:

- Results of fish and fish habitat (as defined in the *Fisheries Act*) baseline surveys for the freshwater and marine environments;
- Description of any freshwater fish or fish habitat that exists in any identified watercourse or any other receiving watercourse that may be impacted by the Project. The description of these species and habitat should identify any species-at-risk and ecologically sensitive or critical habitat and migratory routes of fish;
- Description the relative distribution and abundance of valued fish resource components within the predicted zone of influence, including description of fish species, age, health, and diversity;
- Description of any seasonal variation in the location, abundance and activities of aquatic species, and describing and identifying key habitat features, such as spawning, rearing, nursery, feeding, migration and overwintering areas, as they occur within the Project area. Also describe the criteria utilized for determining the zone of influence of the Project on fish habitat;
- Description of the marine habitat and species of fish, including pelagic and demersal finfish, shellfish, crustaceans, and marine mammals, likely to be present within the surrounding marine environment. This description should identify any species-at-risk, any suitable habitats or other ecologically important areas associated with that species and migratory routes of fish and marine mammals; and
- Results of a baseline study completed to the satisfaction of relevant government departments for fish and shellfish tissue with chemical analysis that includes COPCs of representative key marine species important for commercial, recreational and Aboriginal fisheries (food, social and ceremonial) in the vicinity of the proposed effluent pipeline and diffuser location. The locations of samples must be clearly identified.

9.5 Agriculture, Aquaculture, Fisheries and Forestry Resources

Identify and describe agricultural resources in the study area. Identify agricultural operations in the study area and describe crop types, growing seasons and growing methods.

Describe all commercial, recreational and Aboriginal fisheries (including food, social, ceremonial (FSC), as well as commercial), aquaculture, and harvesting (e.g., marine plants, shellfish) in the study area. Describe the commercial and recreational species, caught, grown or harvested, and their economic importance. Identify fishing, aquaculture and harvesting locations, the amount caught, and methods used.

Identify and describe forestry activities in the study area.

9.6 Socio-Economic Conditions

Describe the current socio-economic conditions of the study area, including population demographics and economic conditions (including Aboriginal Peoples). Provide details of employment rates and trends at the municipal and regional level. The spatial boundaries of this analysis should include areas within which employees of the Project are expected to reside. Identify key industries in the region (both land-based and marine-based) and describe their contribution to the local and regional economies. Provide details of residential and commercial property values. Describe any local and regional economic development goals and objectives identified through community consultation, or existing economic development plans and strategies.

9.7 Existing and Planned Land Uses

Describe the patterns of current and planned land use and settlement in the study area including residential, industrial, agricultural, parks, and protected areas. Provide details of areas under existing mineral exploration licenses as well as areas licensed for pulpwood harvesting. Identify locations of abandoned mine workings, mine tailings and waste rock disposal areas, as well as contaminated sites. This section shall include map(s) to illustrate land uses and provide distances to significant settlements.

The EA Report must also identify lands and resources of special social, cultural or spiritual value to the Mi'kmaq of Nova Scotia, with particular emphasis on any current use of land for traditional purposes. A Mi'kmaq Ecological Knowledge Study (MEKS) should be used to identify land and resource use that have and/or continue to be pursued by the Mi'kmaq of Nova Scotia.

9.8 Archaeological Resources

Identify any areas containing features and/or artifacts of historical, paleontological, cultural or archaeological importance in a manner acceptable CCH. Describe the nature of the features and/or artifacts located in those areas. Particular attention shall be given to Mi'kmaq of Nova Scotia archaeological sites and burial sites. All heritage research permits acquired, and engagement with the Mi'kmaq of Nova Scotia during this analysis should be identified in the document. Results of the Archaeological Resource Impact Assessment reports related to Indigenous land use and known archaeological sites of interest to the Mi'kmaq, should be provided to CCH, the Office of Aboriginal Affairs, Pictou Landing First Nation and relevant federal departments.

10.0 ADVERSE EFFECTS AND ENVIRONMENTAL EFFECTS ASSESSMENT

Describe the effects of the Project on the environment during all phases of the Project (e.g., site preparation, construction, commissioning, operation, maintenance, and decommissioning), including any environmental change on health, socio-economic conditions, archaeology, and the current use of land for traditional purposes by the Mi'kmaq of Nova Scotia. The effects assessment shall also consider impacts of the environment (including weather and climate) on the Project, including a discussion of how potential climate change will impact all components of the Project.

The EA Report shall identify and describe the accidents and/or malfunctions that may occur during all phases of the Project and assess the effects on VECs. Provide a detailed Contingency Plan that considers site-specific conditions and sensitivities, the lifespan of different components and includes, but is not limited to:

- Full hazard identification and qualitative risk assessment, including those risks which have or may have an environmental impact (directly or indirectly) and considers both normal conditions and worst case scenario;
- Description the types, fate and distribution of COPCs under normal and worst case scenarios during all phases of the Project;
- Discussion of potential impacts on emergency and health services in communities near the Project area; and
- Description of emergency response procedures.

Section 9.0 includes details regarding the requirements for setup and use of models in representing existing environmental conditions. Those requirements in conjunction with consultation with relevant government departments also apply to models used to support effects assessment activities (Section 10.0). In addition, modelling of various scenarios should be conducted, representing multiple operating and/or discharge conditions, including worst case scenarios. Furthermore, Northern Pulp shall refer to comments from relevant government departments during review of the EARD and the Focus Report submitted by Northern Pulp, and on this Terms of Reference prepared by NSE.

10.1 Geophysical Environment

In conducting the effects assessment on the geophysical environment, the EA Report must identify and evaluate:

- Geotechnical stability of causeway embankment and structures as a result of underwater excavation works near base of Harvey A Veniot Causeway;
- Potential effects of geophysical impact related activities (e.g., blasting, bedrock removal, excavation and disposal) along the full pipeline route, referencing sediment sampling and the results of geotechnical investigations; and
- Ice scour and grounding effects considering proposed pipeline burial depths.

10.2 Water Resources

In conducting the effects assessment on water resources, the EA Report must identify and evaluate:

- Changes in groundwater and surface water quality and quantity as a result of effluent discharges from the Project site, considering ecosystem integrity and changes in hydrology to areas immediately adjacent to the Project area;

- Potential associated impacts to users of groundwater and surface water; and
- Where wetland avoidance is not possible or where project activities occur immediately adjacent to wetlands, identify and discuss how project activities will directly or indirectly impact wetland size, composition and functions.

Appropriate guidelines including but not limited to the Canadian Council for Ministers of the Environment (CCME) Water Quality Guidelines and background water quality results shall be used in evaluating the significance of the predicted impacts on water quality and ensure the protection of relevant water uses (aquatic life, recreational use, agricultural use, and drinking water supply).

It is recommended that applicable federal guidance documents be reviewed and applied in the evaluation where relevant.

10.2.1 Groundwater

In conducting the effects assessment on groundwater, the EA Report must identify and evaluate potential risk to groundwater resources associated with the Project. The assessment shall include, but is not limited to, quantitative calculation of time of travel between the pipeline and water supply wells and surface watercourses, delineation of well capture zones and determination of groundwater flow directions. The results of this assessment shall be considered in the final pipeline design in terms of providing for greater protection in areas of greatest risk.

Provide a description of consultation with the Town of Pictou regarding groundwater assessment results. Include information on any outstanding concerns from the Town of Pictou and how any such concerns will be addressed.

10.2.2 Surface Water

In conducting the effects assessment on surface water resources, the EA Report must identify and evaluate:

- Potential effects to surface water quality and quantity on fish and fish habitat;
- Potential effects to community water supplies (protected and unprotected), and industrial/commercial, recreational and agricultural users; and
- Potential impacts to surface waters related to accidents or malfunctions (e.g., pipeline leaks/breaks).

10.2.3 Marine Water

In conducting the effects assessment on marine resources, the EA Report must identify and evaluate, to the satisfaction of relevant government departments:

- Potential short term and long-term effects on the receiving water environment based on a receiving water study that assesses fate and transport of all COPCs for a range of scenarios reflective of conditions possible in the study area. It must also account for conditions associated with seasonal changes and extreme weather events. This study shall be based on the results of the effluent characterization and other relevant studies, such as the Human Health Risk Assessment (HHRA). Input datasets (e.g., water level and wave height data) to support model setup and results of the assessment are to be provided as digital submissions, including, but not limited to, discharge plume dimensions and dilution ratios;
- Evaluate the adequacy of the receiving water study model in representing the receiving water environment for the calibration and validation periods using Goodness of Fit and other appropriate industry-standard statistical procedures including the adequacy of the seasonal variation and lengths of datasets used in model setup and calibration/validation for all scenarios simulated. A summary of model confidence in adequately representing multi-year effluent discharge transportation of COPCs and accretion/build-up within the receiving water environment is to be included;
- Based on the results of the receiving water study, evaluate whether colour is expected to be visible at the ocean surface above the diffuser site, including influence of in-water reactions (e.g., potential stratification of the water column) and any associated impacts on marine sediments and marine life;

- Potential effects of the build-up of COPCs (e.g., marine and shoreline accumulation), including the estimated dilution potential at various distances from the diffusers based on calibrated model results, as appropriate;
- Potential impacts of sediment transport within near-field and far-field areas using sediment transport modelling, accounting for various transportation scenarios that may be possible. The modelling shall consider chemical and physical characterization of the distributed solids, interaction with marine sediments and waters, and effects within the marine environment, particularly to marine organisms and including potential bioaccumulation/biomagnification; and
- Potential risk of impacts to the marine environment resulting from leaks from marine based sections of pipeline.

10.2.4 Wetlands

In conducting the effects assessment on wetlands, the EA Report must identify and evaluate the potential impacts to wetlands/wetland complexes associated with the Project. The assessment shall include, but is not limited to, a description of the impacts to wetland size and/or function based on likely activities required to support project activities. The assessment shall describe predicted impacts to wetland characteristics and functions provided by the wetland/wetland complex and should be based on the results of existing and/or any required supplemental field surveys and description of general construction activities required. The effects assessment must specifically address:

- Potential direct and indirect impacts to wetlands and explanation of how Project development will adhere to the Nova Scotia Wetland Conservation Policy;
- Where wetland avoidance is not possible, discuss wetland-specific construction activities including trenching, trench dewatering, surface water diversions and/or maintenance of hydrologic connection of wetland complexes; and
- Impacts to priority wildlife and wildlife habitat as a result of wetland-specific construction activities.

10.3 Atmospheric Resources

Describe the sources, types and estimated quantities of air emissions from the mill for all potential air COCs related to the Project under routine conditions and in the case of malfunctions and accidental events, on a seasonal and annual basis. Air contaminants to be evaluated should include but not be limited to, impacts of CO, hydrogen sulphide (H₂S), nitrogen oxides (expressed as nitrogen dioxide)(NO₂), O₃, SO₂, TSP, PM_{2.5}, PM₁₀, TRS, speciated VOCs, semivolatile VOCs, polycyclic aromatic hydrocarbons (PAHs) and metals. The description shall include appropriate models based on known or measured atmospheric conditions throughout the year.

For all Project phases, construction, operation and decommissioning, estimate the GHG emissions and provide an inventory of GHG emissions from all Project components. This includes carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O) chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs), sulfur hexafluoride (SF₆), nitrogen trifluoride (NF₃) and conversion of these emissions to an equivalent amount of CO₂. Also include an inventory of the precursors or tropospheric ozone (CO, NO_x, and VOCs).

Where possible, include a comparison of the above information with estimates of total GHG contributions from Nova Scotia, and from similar facilities in Canada.

While considering the effects on air quality, the EA Report must discuss the potential impacts of predicted increases in noise and light levels during all phases of the Project, on surrounding residential, commercial, recreational and institutional areas, human health and marine and terrestrial species and habitats.

It is recommended that applicable federal guidance documents be reviewed and applied in the evaluation where relevant.

In addition, the EA Report must also include, but not be limited to revised air dispersion modelling that addresses the following:

- Consideration of the effects of fumigation, coastal interaction and nearby large water bodies;

- The operating scenario for the occasion when the highest concentration of an air contaminant occurs at ground level, which may occur when the facility is at the maximum production level, running at a lower production level, or when the process is in transition;
- Description of the operating conditions that result in the maximum ground level concentration of an air contaminant;
- Identification of individual emission rates, as measured or estimated, including the reference and justification for values used;
- Comparison of the maximum predicted ground level concentrations of all contaminants with relevant ambient air quality criteria (in the absence of Nova Scotia adopted ambient air quality criteria, the Proponent shall utilize criteria from Federal and/or other Provincial jurisdictions);
- Comparison of the maximum predicted ground level concentrations of all contaminants with their relevant upper risk thresholds;
- Risk assessment of contaminants that demonstrate a predicted exceedance of a relevant upper risk threshold;
- Isopleth mapping for all contaminants predicted to exceed relevant ambient air quality criteria;
- Identification of discrete receptors on all isopleth mapping; and
- All data and other modelling inputs are to be provided so that the model can be replicated and verified.

10.4 Biota

10.4.1 Terrestrial Environment

Identify and evaluate the potential effects on wildlife and wildlife habitat/communities during all phases of the Project, including the risk and potential impacts associated with a pipeline rupture or spill at any point along the pipeline route, including impact to wetlands. Include impacts on species at risk or of concern, significant habitats and protected areas or areas of potential value to Nova Scotia's protected areas network that may be potentially disturbed, altered or removed. The effects assessment must also consider the potential for effects to wildlife associated with landscape fragmentation and sensory disturbances.

10.4.2 Freshwater Aquatic and Marine Environment

Evaluate the potential effects on aquatic environments, including fish and fish habitat. While considering the effects that the Project may have on freshwater and marine species, include a full account species at risk or of concern and significant habitats. This section must include activities that may affect avifauna in the aquatic environments. Consider potential effects to marine species from blasting, dredging and other marine construction, as well as vessel traffic and Project operation.

To support the assessment of potential impact of biomagnification on migratory birds such as shorebirds, include marine benthic invertebrates (e.g., polychaete worms, mussel spat, small clams) in the bioaccumulation/biomagnification assessment of the discharge plume.

Include an assessment of COPCs in the baseline fish and shellfish populations and potential effects due to expected discharge quality.

Undertake a model-based evaluation of the chronic effects of thermal cooling water discharge on fish and fish habitat in the receiving water.

Include a summary of the potential effects on freshwater and marine species known to be important to the Mi'kmaq of Nova Scotia.

10.5 Agriculture, Aquaculture, Fisheries and Forestry Resources

Include an effects assessment of the Project on existing and future agriculture activity within the study area.

Assess the impacts on commercial/recreational fishing, aquaculture or other marine harvesting which may be impacted by the proposed Project. The effects assessment should consider changes in commercial/recreational fishing, aquaculture or other marine harvesting species, including contamination of species consumed by people as a result of increased erosion, sedimentation and from effluent discharges from the Project,

displacement, mortality or loss and/or alteration of habitat. Also discuss navigation restrictions and loss of traditional fishing areas of the Mi'kmaq of Nova Scotia.

Assess the potential effects of treated effluent on representative key marine fish species important for commercial, recreational and Aboriginal fisheries. This must be based upon information, studies and an understanding of expected movement of contaminants according to the receiving water study. Include appropriate invertebrates and lower trophic level test organisms and assess the potential for bioaccumulation for all test animals. Based on the effluent quality characterization completed to support the Project assessment, chronic and acute toxicity testing of non-diluted treated effluent is to be conducted through a series of controlled laboratory experiments. Species used in the assessment should be applicable to the receiving water environment. The selection of information sources, representative marine species and assessment methodology must first be agreed upon by relevant government departments.

The EA Report must include a discussion on the potential effects on any forestry resources within the Project area.

10.6 Human Health

Provide the completed Human Health Risk Assessment (HHRA) conducted to the satisfaction of Health Canada. It is recommended that applicable federal guidance documents be reviewed and applied in the evaluation where relevant. Please refer to Section 4.0 of this Terms of Reference regarding Section 82 of the federal *Impact Assessment Act*.

10.7 Socio-Economic Conditions

Identify potential impacts of the Project on economic conditions, populations and employment.

Identify potential impacts of the proposed Project on residential property values and property demand during all phases of the Project (including temporary accommodation required during construction, if applicable).

Describe the effect of the proposed Project on present and future commercial, residential, institutional, recreational and resource land uses within the study area, including impacts to areas under mineral exploration licenses or forestry licenses.

Identify the potential impact on recreational opportunities, including the effects on aesthetics from areas surrounding the Project area. This analysis should be supported by visual impact assessments from both the land and water.

Identify the potential impact on the current use of land/marine and resources for traditional purposes and any Aboriginal specific land claims within the study area.

While considering the effects on economic conditions and employment, include a discussion on expenditures and the anticipated direct and indirect employment positions that will be created during all phases of the Project.

10.8 Existing and Planned Land Uses

The EA Report must consider the effects that may restrict the ability of people to use and enjoy adjacent lands and marine area presently, and in the future. Describe the potential impacts from existing or planned land uses in the study area. This shall include a discussion of Project interactions with any rural planning initiatives, parks, protected areas, contaminated sites, former mine workings, and mine disposal areas.

Identify and evaluate potential effects on traditional and current recreational and commercial use by the Mi'kmaq of Nova Scotia.

Discuss the anticipated changes in traffic density and patterns during all phases of the Project including the effects on transportation.

While assessing the effects on navigation and navigable waters, consider navigation patterns of all waters that may be impacted by the Project. Potential effects on traditional and current recreational and commercial use must be identified and evaluated.

10.9 Archaeological Resources

As part of an archaeological resource impact assessment process, evaluate the potential effects of any changes in the environment as a result of Project activities on physical and cultural resources, structures and/or sites of historic, archaeological, or paleontological significance.

In conducting the effects assessment on archaeological resources, it is recommended that the Proponent engage with CCH, Pictou Landing First Nation and the KMKNO-ARD.

11.0 PROPOSED MITIGATION

Describe all measures that have, or will be, taken to avoid or mitigate negative impacts, and maximize the positive environmental effects of the Project during all Project phases. Mitigation includes the elimination, reduction or control of the adverse effects or the significant environmental effects of the Project and may include restitution for any damage to the environment caused by such effects through replacement, restoration, compensation or any other means. Describe proposed compensation that will be provided when environmental damage is unavoidable or cannot be adequately mitigated by any other means.

In considering mitigation measures to be employed, the EA Report must describe any legislation, regulations, guidelines, policies, BMPs, and specifications that will be adhered to during construction and operation of the Project that will lead to mitigation of environmental impacts.

11.1 Geophysical Environment

If applicable, describe alternatives to disrupting net acid producing bedrock. When no practical alternative to exposing acid producing bedrock exists, provide mitigation plans for minimizing the impacts on the aquatic environment. Discuss commitments to provide contingency and remediation plans for watercourses that have been degraded due to the disturbance of net acid producing bedrock or tills.

If contaminated soils are to be disturbed, discuss methods to minimize adverse impacts.

Provide applicable mitigation measures and preliminary agreements and plans that meet provincial regulatory disposal and transportation requirements for potential dredge materials.

11.2 Water Resources

11.2.1 Groundwater

Describe measures to avoid, minimize or otherwise mitigate effects on groundwater quality and quantity.

Provide a Groundwater Protection Plan based on the assessment of risks to local water supplies (municipal and private) and the environment. This plan should include management/contingency response actions and reference the groundwater monitoring plan (see Section 14.0).

Describe measures to be employed in the event of accidental contamination or dewatering of any water supply wells (municipal and private) as a result of the construction or operation of the Project, including compensation for loss or degradation of water supplies. Describe mitigation measures planned to prevent and remediate contamination of groundwater from the accidental release of a hazardous substance.

Discuss commitments to provide contingency and remediation plans for any contamination of groundwater resources, including decrease of water quality.

11.2.2 Surface Water

Describe measures to avoid, minimize or otherwise mitigate effects on surface water resources, including but not limited to erosion and run-off control features and storm drainage management.

Discuss all mitigation measures planned to prevent the release of hazardous substances into local surface waters.

Discuss commitments to provide contingency and remediation plans for any impact to surface water resources, including decrease of water quality or quantity.

11.2.3 Marine Water

Describe measures to avoid, minimize or otherwise mitigate effects to marine water resources.

Discuss all mitigation measures planned to prevent the release of hazardous substances into marine waters.

Discuss commitments to provide contingency and remediation plans for any impact to marine water resources, including decrease of water quality or quantity.

11.2.4 Wetlands

Describe measures to avoid, minimize or otherwise mitigate effects on wetland resources. Specifically, the EA Report must describe measures to maintain ecological and hydrological integrity of any wetlands in the area. Where avoidance is not possible, provide wetland specific mitigations proposed to lessen impacts of the Project and describe commitments to monitoring and compensation for any loss of wetland habitat. Also provide discussion and commitment regarding remediation/rehabilitation of aquatic habitat as a result of incidental releases of treated effluent in wetlands.

11.3 Atmospheric Resources

Describe measures to avoid, minimize or otherwise mitigate effects on biological receptors (vegetation, fish, wildlife, and human health).

Specifically, describe measures that will be taken to control emissions including but not limited to CO, H₂S, nitrogen oxides expressed as NO₂, O₃, SO₂, TSP, PM_{2.5} and PM₁₀, TRS, speciated VOCs, semivolatile VOCs, PAHs and metals.

Based on the results of the air dispersion modelling, include:

- Mitigation measures for the mill and/or ETF to address any predicted exceedances of relevant ambient air quality criteria (including criteria from Federal and/or other provincial jurisdictions in the absence of Nova Scotia adopted ambient air quality criteria) and any contaminants that demonstrate a predicted exceedance of a relevant upper risk threshold. The model shall be rerun incorporating the mitigation measures to demonstrate no predicted exceedances; and
- Provide an implementation schedule for mitigation options.

The EA Report must also include a discussion of measures that have been considered and/or are proposed to reduce air emissions and reduce or offset GHG emissions. Describe any GHG mitigation plans.

Describe all measures that will be taken to mitigate any potential increase in noise and light levels resulting from all Phases of the Project.

11.4 Biota

11.4.1 Terrestrial Environment

Discuss measures to avoid, minimize or otherwise mitigate effects on flora species. Include any landscaping plans for preservation of existing vegetation.

Describe measures to avoid, minimize or otherwise mitigate effects on terrestrial wildlife. Include any plans for preservation of existing habitat and compensation for loss or degradation of terrestrial habitat (i.e., habitat rehabilitation/replacement). Measures to comply with wildlife legislation (e.g., *Migratory Birds Convention Act* and regulations) should also be provided.

Discuss commitments to provide contingency and remediation plans for impacts to terrestrial habitat as a result of accidental events at all stages of construction and operation.

In addition, the EA Report must also include, but not be limited to the following additional items:

- Mitigation plans developed in consultation with NSLAF that include additional details to protect wildlife and wildlife habitat, including birds, mammals, herptiles, raptors, and species at risk. The plans must include but not be limited to the following:
 - a) mitigation measures that will be taken to avoid destroying rare priority species and associated habitat detected in floristic surveys;
 - b) mitigation and monitoring measures developed in consultation with both ECCC and NSLAF for any species at risk likely to be found in the Project area (e.g., Evening Grosbeak (*Coccothraustes vespertinus*) Bobolink (*Dolichonyx oryzivorus*), Canada Warbler (*Cardellina canadensis*)), including but not limited to the Eastern Wood-Pewee (*Contopus virens*, SARA Special Concern, NSESA Vulnerable), Barn Swallow (*Hirundo rustica*, SARA Threatened, NSESA Endangered), and Common Nighthawk (*Chordeiles minor*, SARA Threatened, NSESA

Threatened) found during the course of field surveys and Kildeer (*Charadrius vociferous*) identified to likely be breeding in the Project area, as well as at-risk bats and invertebrates;

- c) additional details on how impacts to the Double-Crested Cormorant (*Phalacrocorax auratus*) colony located along the east side of Harvey A Veniot Causeway will be mitigated during installation of the pipeline across Pictou Harbour;
- d) mitigation measures to protect Double-crested Cormorant nests in the event of a pipeline rupture;
- e) specific measures to be developed to discourage waterfowl from accessing the spill basin and other open ETF components;
- f) specific measures to be developed to control of spread of invasive species;
- g) measures that demonstrate a special emphasis on avoidance of impacts to old growth forest;
- h) specific measures to be developed to address potential foraging and overwintering habitat for turtles;
- i) a training program for field staff to enable them to recognize the potential for species occurrences and procedures to follow;
- j) mitigation measures for non-migratory bird species protected under the *Wildlife Act* and the *Endangered Species Act*;
- k) measures to avoid creating temporary or artificial habitat (sandpits) during construction that may encourage turtle nesting;
- l) measures to reduce adverse impacts of light, noise, and dust on wildlife and wildlife habitat; and
- m) standards or BMPs to avoid entrapment of wildlife as a result of construction activities (i.e., trenching).

11.4.2 Freshwater Aquatic and Marine Environment

Discuss measures to avoid, minimize or otherwise mitigate effects on marine and freshwater aquatic species, avifauna and their habitats. Include any plans for preservation of existing habitat and compensation for loss or degradation of aquatic habitat.

Where impacts to fish habitat cannot be avoided or mitigated, discuss compensation measures to ensure impacts are offset. In the case of fish habitat, offsetting measures are related to a physical activity as outlined in the Fish and Fish Habitat Protection Policy Statement, August 2019. If offsetting is planned to be applied to the Project as a mitigation measure, the Proponent must provide a preliminary offsetting plan, developed in consultation with relevant government departments.

Based on the results of the evaluation of effluent temperature effects on fish, include appropriate mitigation measures.

Describe the measures that will be taken to minimize the introduction of non-native species to the area.

Discuss commitments to provide contingency and remediation plans for impacts to aquatic habitat as a result of accidental events.

11.5 Agriculture, Aquaculture, Fisheries and Forestry Resources

Discuss measures to avoid, minimize or otherwise mitigate effects on agriculture, fishing, aquaculture, marine harvesting, and forestry.

11.6 Human Health

Provide measures to avoid, minimize or otherwise mitigate effects on human health.

Based on the results of the evaluation of effluent temperature, provide measures to mitigate the potential for nutrient loading and bacteriological water quality effects.

Should the completed HHRA identify risks to human health, it is recommended that the HHRA be refined to reduce uncertainty and/or that mitigation measures are identified that would help to reduce human exposure to COPCs. It is recommended that applicable federal guidance documents be reviewed and applied in the evaluation where relevant.

11.7 Socio-Economic Conditions

Describe measures to avoid, minimize or otherwise mitigate effects on private and commercial property, existing industry and businesses, planned land use, recreation and other human activities, including traditional activities and land uses by the Mi'kmaq of Nova Scotia.

Provide a dispute resolution policy for addressing Project related complaints and concerns that may be received throughout all phases of the Project.

11.8 Existing and Planned Land Uses

Describe measures to avoid, minimize or otherwise mitigate effects on existing and planned land uses.

Discuss the mitigation measures planned to address anticipated impacts from any predicted changes in traffic speed, traffic routes, marine navigation, exclusion zones and density in adjacent residential and commercial areas.

11.9 Archaeological Resources

Describe mitigation measures and recommendations to preserve, protect, or recover any resources of cultural or archaeological value that are identified in the study area.

12.0 RESIDUAL EFFECTS AND ENVIRONMENTAL EFFECTS

This section of EA Report shall list and contain a detailed discussion and evaluation of the residual impacts for each VEC, including the criteria for determining significance. Residual impacts are those adverse effects or significant environmental effects which cannot or will not be avoided or mitigated through the application of environmental control technologies or other acceptable means. Those impacts that can be mitigated or avoided shall be clearly distinguished from those impacts that will not be mitigated or avoided.

These impacts become important in the evaluation of a proposed Project as they represent the environmental cost of the Project.

13.0 EVALUATION OF THE ADVANTAGES AND DISADVANTAGES TO THE ENVIRONMENT

Present an overall evaluation of the advantages and disadvantages to the environment, including the VECs, during the construction, operation and decommissioning phases of the Project. The evaluation of the disadvantages shall include an examination and justification of each disadvantage.

14.0 PROPOSED COMPLIANCE AND EFFECTS MONITORING PROGRAMS

Include a framework upon which compliance and effects monitoring will be based throughout the life of the proposed Project, including decommissioning and post-decommissioning activities. Monitoring programs must be designed to determine the effectiveness of the implemented mitigation measures. The EA Report shall describe the compliance reporting methods to be used, including reporting frequency, duration, methods, parameters, comparison standards or guidelines, format, and receiving agencies. Mapping clearly illustrating baseline and proposed monitoring locations should also be included.

Recognizing that the effectiveness of compliance and effects monitoring depends on a workforce that can identify and address potential impacts during construction and operation of the Project, the framework shall include procedures for providing training and orientation to on site employees during construction and operation of the Project.

The description of the compliance and effects monitoring program shall also include any procedures/plans for addressing potential exceedances of environmental protection standards, guidelines or approvals.

The discussion of compliance monitoring shall include, but not be limited to Sections 14.1 – 14.4.

14.1 Geophysical Environment

Describe plans and procedures for assessing ARD potential and associated monitoring in the event of disturbance or exposure.

Describe plans and procedures to ensure adequate pipeline cover depth and/or protection measures for ice scour and grounding effects.

Describe plans, if applicable, for monitoring contaminated soils and/or sediments that may be disturbed or require management for all phases of the Project.

Develop a sediment sampling program to confirm predicted effects of the discharge plume in support of the Environmental Effects Monitoring program.

14.2 Water Resources

Submit a groundwater quality and level monitoring plan for all phases of the Project, including the pipeline route and mill location and the location of monitoring wells, monitoring sampling frequency and monitoring parameters. The plan must consider the final pipeline design as well as the potential risk to the environment and local water supplies as a result of pipeline construction and possible pipeline leak. The plan must address, as a minimum, sensitive areas along the pipeline route, such as shallow water table intersecting surface water features, proximity to water supply wells and areas along the pipeline more susceptible to failure. Locations where the pipeline may be constructed below the seasonal high-water table shall be identified.

Discuss plans for a survey of structures if blasting is planned, to include wells, building foundations, etc., which may experience damage or impact due to seismic vibrations or air concussion.

Discuss any surface water monitoring plans for all phases of the Project, including both water quality and quantity aspects.

Develop a marine discharge plume delineation monitoring program to confirm plume dimensions, and effluent concentrations and characteristics in support of the Environmental Effects Monitoring program.

Submit a wetland specific post-construction monitoring plan. The plan must consider collection of pre-construction baseline condition and identify post-construction wetland performance indicators to address impacts. The plan must detail proposed methodologies that will be used to complete the monitoring program and must detail the proposed frequency of data collection, location of proposed monitoring points and indicate how wetland integrity will be monitored for wetland areas extending beyond the Project footprint and present adaptive management options to address post-construction management, including repairs and/or maintenance, vegetation management, drainage and land contour management. The plan should also propose compensation measures required to address loss of wetland habitat and function.

14.3 Freshwater Aquatic and Marine

Submit an Environmental Effects Monitoring Program that includes water quality, sediment and tissue sampling and is based on the results of various relevant baseline studies and receiving water study. The program should at a minimum be designed based on applicable regulatory requirements and must be designed to the satisfaction of relevant government departments.

14.4 Atmospheric Resources

Complete an ambient air quality monitoring plan, acceptable to NSE, based on the results of the air dispersion modelling. This plan must include but not be limited to sampling locations, parameters, monitoring methods, protocols and frequency. The plan shall ensure adequate monitoring coverage of areas where elevated levels of air contaminants may occur and will set out steps to address and eliminate any such exceedances in a timely and effective manner.

Describe plans for GHG monitoring, reduction targets and reduction plans.

Discuss the plans for monitoring baseline, construction and operational noise levels at the site, and at any residential or commercial areas near the Project.

14.5 Human Health

Provide suitable monitoring measures to confirm impact predictions. Where monitoring is proposed, include a plan for reporting/communicating reporting exceedances of relevant guidelines/thresholds.

14.6 Other Monitoring Plans

Include any other monitoring plan which may include an Environmental Protection Plan or other guidelines, policies or plans, proposed for the construction, operation and decommissioning of the Project.

15.0 CONSULTATION PROGRAM

The Class I EA process for the Project includes the following opportunities to participate (specifically government departments/agencies, the Mi'kmaq of Nova Scotia and the general public will be invited to provide comments):

- the Environmental Assessment (EA) Report.

Consultation is most valuable if initiated as early as possible, before final decisions are made. Consultation is most effective when there is transparency throughout the process based on open lines of communication and the provision of timely, accurate, clear and objective information by the Proponent. Sharing information with the Mi'kmaq of Nova Scotia and the general public throughout the process, before and after the EA Report is submitted, is very important to ensure adequate time for interested parties to review the information and for these parties to share feedback with the Proponent and identify their concerns.

15.1 Public Consultation

For any consultation undertaken with the general public, the EA Report must describe ongoing and proposed consultation and information sessions.

Describe all steps taken by the Proponent to identify the concerns of the public about the adverse effects or environmental effects of the Project. It shall provide a summary of all concerns expressed by the public and all steps taken by the Proponent to address these concerns. Moreover, the EA Report must describe any outstanding concerns.

The EA Report will also provide details of efforts made to distribute Project information and provide a description of the information and materials distributed to inform the general public.

15.2 Consultation with the Mi'kmaq of Nova Scotia

To assist the provincial Government in their consultation process with the Mi'kmaq of Nova Scotia, the EA Report must describe all steps taken by the Proponent to identify the concerns of Mi'kmaq of Nova Scotia about the adverse effects or environmental effects of the Project as well as any adverse impacts to established or asserted Aboriginal and Treaty Rights. It shall provide a summary of all concerns expressed by the Mi'kmaq of Nova Scotia, including any adverse impacts to established or asserted Aboriginal and Treaty Rights and all steps taken by the Proponent to address or accommodate these concerns and impacts. Moreover, the EA Report must describe any outstanding concerns.

During the EA process, NSE will serve as the provincial Crown consultation coordinator.

The EA Report will also provide details of efforts made by the Proponent to distribute Project information and provide a description of the information and materials distributed, the date they were distributed, and the method used to distribute them, to inform the Mi'kmaq of Nova Scotia. As best practice, the Proponent should seek advice from the Mi'kmaq of Nova Scotia on any additional information, plans or programs that they would like to receive in relation to any aspect of the Project.

In parallel to Proponent engagement with the Mi'kmaq of Nova Scotia, the Government of Nova Scotia will undertake continued consultation directly with the Mi'kmaq of Nova Scotia pursuant to the Mi'kmaq-Nova Scotia-Canada Consultation Process (2010).

The Proponent is encouraged to engage the Mi'kmaq of Nova Scotia as referenced in the Nova Scotia Office of Aboriginal Affairs' Proponent's Guide: The Role of Proponents in Crown Consultation with the Mi'kmaq of Nova Scotia (2011).

The EA Report will include any plans for ongoing public consultation or formation of a community liaison committee (CLC) during construction, operation and decommissioning.

16.0 ASSESSMENT SUMMARY AND CONCLUSION

This section of the EA Report shall summarize the overall findings of the EA with emphasis on the main environmental issues identified and predict the significance of adverse environmental effects of the Project.