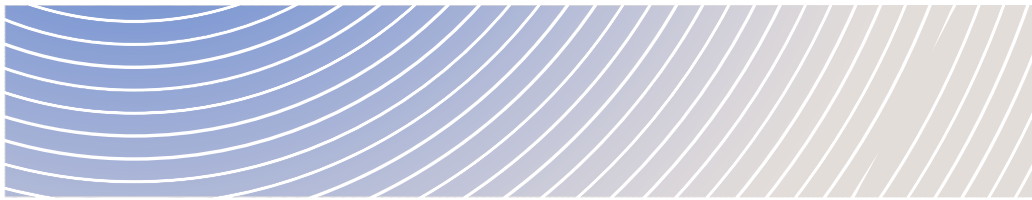




Tailored Impact Statement Guidelines

SOREL-TRACY PORT TERMINAL PROJECT



Draft version

This is a draft document.

Contents may change as a result of ongoing engagement and feedback received.





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Abbreviations and Short Forms

Term	Definition
the Act	<i>Impact Assessment Act</i>
the Agency	Impact Assessment Agency of Canada
BAT/BEP	Best Available Technologies / Best Environmental Practices
BCRs	Bird Conservation Regions
CAAQS	Canadian Ambient Air Quality Standards
CCME	Canadian Council of Ministers of the Environment
COPC	Contaminant of Potential Concern
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
ECCC	Environment and Climate Change Canada
GBA Plus	Gender Based Analysis Plus
the Guidelines (TISG)	Tailored Impact Statement Guidelines
GHG	Greenhouse gas
HHRA	Human Health Risk Assessment
LSA	Local Study Area
Minister	Minister of Environment and Climate Change
NAAQO	National Ambient Air Quality Objective
OCAP	Ownership, Control, Access and Possession
OHWM	Ordinary High Water Mark
PA	Project Area
PAH	Polycyclic aromatic hydrocarbons
Registry	Canadian Impact Assessment Registry
RSA	<i>Regional Study Area</i>
SARA	<i>Species at Risk Act</i>



SACC	Strategic Assessment of Climate Change
the Template	Tailored Impact Statement Guidelines Template
VC	Valued component
VOC	Volatile organic compound



In order to ensure the relevance of the guidelines, the Agency proposes to remove or simplify certain requirements that are unlikely to inform decision-makers about the potential impacts of the project in areas of federal jurisdiction or to inform the public interest decision under the Impact Assessment Act. Some of these requirements will be reviewed as part of the Quebec government's environmental assessment process.

Elements that the Agency is considering removing from the project's TISG are shown in bold and crossed out.

*Example: ~~**culturally significant landscape features.**~~*

1. Introduction

The federal impact assessment process serves as a planning tool that considers a broad range of potential environmental, health, social and economic effects of designated projects identified by regulation or designated by the Minister of Environment and Climate Change (the Minister). The Agency or a review panel uses the proponent's Impact Statement and other information received during the impact assessment process to prepare an impact assessment report. At the end of the impact assessment process, the decision made is whether the potential adverse effects within federal jurisdiction, and the adverse direct or incidental effects, are in the public interest. Under section 2 of the *Impact Assessment Act* (the Act), the effects within federal jurisdiction are defined as:

- a) a change to the following components of the environment that are within the legislative authority of Parliament:
 - (i) fish and fish habitat, as defined in subsection 2(1) of the Fisheries Act,
 - (ii) aquatic species, as defined in subsection 2(1) of the Species at Risk Act,
 - (iii) migratory birds, as defined in subsection 2(1) of the Migratory Birds Convention Act, 1994, and
 - (iv) any other component of the environment that is set out in Schedule 3;
- b) a change to the environment that would occur
 - (i) on federal lands,
 - (ii) in a province other than the one where the physical activity or the designated project is being carried out, or
 - (iii) outside Canada;
- c) with respect to the Indigenous peoples of Canada, an impact — occurring in Canada and resulting from any change to the environment — on
 - (i) physical and cultural heritage,
 - (ii) the current use of lands and resources for traditional purposes, or
 - (iii) any structure, site or thing that is of historical, archaeological, paleontological or architectural significance;
- d) any change occurring in Canada to the health, social or economic conditions of the Indigenous peoples of Canada; and
- e) any change to a health, social or economic matter that is within the legislative authority of Parliament that is set out in Schedule 3 of the Act.

And the direct or incidental effects are defined as effects that are directly linked or necessarily incidental to a federal authority's exercise of a power or performance of a duty or function that would permit the carrying out, in whole or in part, of a physical activity or designated project, or to a federal authority's provision of financial assistance to a person for the purpose of enabling that activity or project to be carried out, in whole or in part.

The public interest determination must be based on the impact assessment report from the Agency or a review panel and consider the factors set out in section 63 of the Act:

- a) the extent to which the project contributes to sustainability;
- b) the extent to which the adverse effects within federal jurisdiction and the adverse direct or incidental effects that are indicated in the impact assessment report in respect of the project are significant;
- c) the implementation of the mitigation measures that the Minister or the Governor in Council, as the case may be, considers appropriate;
- d) the impact that the project may have on any Indigenous peoples and any adverse impact that the designated project may have on the rights of the Indigenous peoples¹ of Canada recognized and affirmed by section 35 of the *Constitution Act, 1982*; and
- e) the extent to which the effects of the project hinder or contribute to the Government of Canada's ability to meet its environmental obligations and its commitments in respect of climate change.

A key element for the impact assessment process is the preparation of Tailored Impact Statement Guidelines² (the Guidelines), which provide the proponent with directions and requirements for the preparation of an Impact Statement. The [draft] Guidelines for Sorel-Tracy Port Terminal Project (the project) proposed by QSL International Ltd. (the proponent), were tailored by the Impact Assessment Agency of Canada (the Agency) during the planning phase of the impact assessment. The tailoring was based on the nature, complexity and context of the project, and was informed and guided by consultation and engagement with the proponent, the public, Indigenous groups, federal authorities (FAs) and other interested parties.

The Guidelines will be finalized following a comment period on this draft version of the Guidelines, which will run from February 8 to March 9, 2023.

1.1. Factors to be considered in the impact assessment

The Guidelines correspond to factors to be considered in the impact assessment. These factors are listed in subsection 22(1) of the Act and prescribe that the impact assessment of a designated project must take into account:

- a) the changes to the environment or to health, social or economic conditions and the positive and negative consequences of these changes that are likely to be caused by the carrying out of the designated project, including:

¹ These guidelines use the term “Indigenous peoples” to represent the “aboriginal peoples of Canada” which includes Indian, Inuit and Métis peoples as defined in subsection 35(2) of the *Constitution Act, 1982*, and “rights of Indigenous peoples” is used to reflect the full scope of Aboriginal and Treaty rights recognized and affirmed by section 35 of the *Constitution Act, 1982*.

² As set out in paragraph 18(1)(b) of the *Impact Assessment Act*.



- i. the effects of malfunctions or accidents that may occur in connection with the designated project;
 - ii. any cumulative effects that are likely to result from the designated project in combination with other physical activities that have been or will be carried out; and
 - iii. the result of any interaction between those effects.
- b) mitigation measures that are technically and economically feasible and that would mitigate any adverse effects of the designated project;
 - c) the impact that the designated project may have on any Indigenous group and any adverse impact that the designated project may have on the rights of the Indigenous peoples of Canada recognized and affirmed by section 35 of the *Constitution Act, 1982*;
 - d) the purpose of and need for the designated project;
 - e) alternative means of carrying out the designated project that are technically and economically feasible, including through the use of best available technologies, and the effects of those means;
 - f) any alternatives to the designated project that are technically and economically feasible and are directly related to the designated project;
 - g) Indigenous knowledge provided with respect to the designated project;
 - h) the extent to which the designated project contributes to sustainability;
 - i) the extent to which the effects of the designated project hinder or contribute to the Government of Canada's ability to meet its environmental obligations and its commitments in respect of climate change;
 - j) any change to the designated project that may be caused by the environment;
 - k) the requirements of the follow-up program in respect of the designated project;
 - l) considerations related to Indigenous cultures with respect to the designated project;
 - m) community knowledge provided with respect to the designated project;
 - n) comments received from the public;
 - o) comments from a jurisdiction that are received in the course of consultations conducted under section 21 of the Act;
 - p) any relevant assessment referred to in sections 92, 93 or 95 of the Act;
 - q) any assessment of the effects of the designated project that is conducted by or on behalf of an Indigenous governing body and that is provided with respect to the designated project;
 - r) any study or plan that is conducted or prepared by a jurisdiction—or an Indigenous governing body not referred to in paragraph (f) or (g) of the definition *jurisdiction* in section 2 of the Act—that is in respect of a region related to the designated project and that has been provided with respect to the project;
 - s) the intersection of sex and gender with other identity factors; and
 - t) any other matter relevant to the IA that the Agency requires to be taken into account.

The scope of the factors in paragraphs 22(1)(a) to (f), (h) to (l), (s) and (t) that are to be taken into account, including the extent of their relevance to the impact assessment, is determined by the Agency and is outlined in the Guidelines.

1.2. Gender-based Analysis Plus (GBA Plus)

For consideration of the intersection of sex and gender with other identity factors (paragraph 22(1)(s) of the Act), the Guidelines will refer to Gender-based Analysis Plus (GBA Plus). GBA Plus is an analytical process that can guide practitioners to identify who is impacted by a project and assess how they may experience impacts differently, in order to develop mitigation measures to address these differential impacts. These Guidelines refer to “diverse groups of people” in the context of GBA Plus, in reference to groups within the general population and within communities (e.g. by sex, gender, age, ethnicity, Indigeneity, socio-economic status, health status and any other community-relevant identify factors). The Agency’s [Guidance: Gender-Based Analysis Plus in Impact Assessment](#) provides guiding principles and tools to apply GBA Plus in the Impact Statement.

To support GBA Plus, the information provided in the Impact Statement must:

- be sufficiently disaggregated to support the analysis of disproportionate effects as per GBA Plus. As much as possible, the data must be disaggregated (e.g. by sex, gender, age, ethnicity, Indigeneity, ability, and any other community-relevant identify factors) and presented distinctly for each specific subgroup;
- describe how community and Indigenous knowledge from affected populations, including community developed indicators and locally collected data, was used in establishing baseline conditions and informing effects assessments;
- describe how community members differ in access to resources, opportunities and services;
- describe the circumstances in which diverse groups of people could suffer more adverse effects or receive fewer benefits related to the project than others, and how they may respond differently to potential effects; and
- describe mitigation or enhancement measures to address these differential effects.

Quantitative information, including gender sensitive data, should be complemented by qualitative insights from studies or consultations, and other sources. The description of effects should be based on both data collected and concerns expressed through engaging with the affected Indigenous groups and community members.

1.3. Preparing the Impact Statement

In the preparation of the Impact Statement, the proponent must adhere to relevant ethical guidelines and cultural protocols governing research, data collection and confidentiality. This is particularly important in the case of information gathered and studies conducted with diverse groups of people. The proponent must respect the obligation of protecting personal information and adopt the established standards for the management of Indigenous data (e.g. the [First Nations principles of Ownership, Control, Access and](#)



[Possession](#) (OCAP) or standards adopted by an Indigenous group) and disaggregated data from small or unique populations.

The proponent may present the information in the Impact Statement in the manner it deems most appropriate. While the Guidelines do not prescribe a preferred structure for the Impact Statement, it is recommended to follow a structure similar to the Guidelines in order to facilitate the review of the Impact Statement and participation in the process. In order to facilitate the review of the Impact Statement, the proponent must provide a table of concordance that indicates where each requirement of the Guidelines is addressed.

The Impact Statement must address all requirements outlined in the Guidelines. Where the proponent is of the opinion that the information is not required, it should contact the Agency to confirm the rationale for not including it prior to submitting the Impact Statement. The rationale for not including the information must also be provided in the Impact Statement. The proponent should also notify the Agency of any changes made to the project as originally proposed in the Detailed Project Description that may result in a different set of effects and may require a reconsideration of information requirements.

The Agency is available to support the proponent during the preparation of the Impact Statement and may establish technical advisory groups, consisting of FAs and others, as appropriate. The proponent is encouraged to engage the Agency early in the process to clarify requirements and expectations as presented in the Guidelines. The proponent should also consider submitting documents for review (e.g. proposed study plans, draft sections of the Impact Statement) prior to submitting the formal Impact Statement. Active engagement will support early identification and resolution of issues.

The Agency will review the submitted Impact Statement, and will engage with FAs, jurisdictions, Indigenous groups and other participants to identify any deficiencies in the information provided, in comparison to the Guidelines, which the proponent must address. When the Agency is satisfied that the proponent has provided it with all of the required information or studies, it will post a notice on the *Canadian Impact Assessment Registry* (the Registry). The proponent must provide the Agency with the information or studies within three years after the day on which a copy of the Notice of Commencement is posted on the Registry. The time limit will include the time required for the review of the Impact Statement and for the proponent to address any deficiencies. On the proponent's request, the Agency may extend the time limit by any period that is necessary for the proponent to provide the Agency with the information or studies. If the proponent does not provide the Agency with the information or studies within the three-year time limit, or within any extension of that time limit, the impact assessment is terminated.

1.4. Format and accessibility

The impact assessment must be based on information that is publicly accessible, within the limitations of confidentiality and ethical constraints, such as in relation to Indigenous and community knowledge, business confidential information, and intellectual property. The proponent must provide a summary for the documents that served as key references in the Impact Statement that are not otherwise publicly



accessible or consider appending them to the Impact Statement. Any information provided by the proponent in the Impact Statement must be in machine-readable, accessible format.

Where information is required or is provided as a map in the Impact Statement, the proponent must also provide the Agency with the corresponding electronic geospatial data file(s). The Agency will make the geospatial data files available to the public under the terms of the [Open Government License – Canada](#). Geospatial data files must include metadata that is compliant with the ISO 19115 standard and, at a minimum, provides:

- title;
- abstract or summary of what is contained in the data file;
- source of the data;
- date of creation for the data;
- the point of contact and originator;
- confirmation that there are no restrictions or limitations on sharing the data.

The proponent should review the Agency's [Guidance on submitting geospatial data](#) for more information.

The proponent should curate all data collected and analyses performed in such a way that it may be made available to participants or the Agency upon request. The Agency or the Review Panel may require specific data sets to support review of the Impact Statement or for the impact assessment.

The proponent should be prepared to provide:

- all biophysical survey data in a well-documented data file which provides information on the site, site visits and individual observations or measurements (georeferenced where possible);
- individual results of all laboratory analysis, including methods, standards or references followed, detection limits, controls, and quality assurance and control procedures;
- socioeconomic data in a well-documented data file;
- input and output data from modeling; and
- documentation and results of analysis that allow for a clear understanding of analytical methods and for replication of results.

These requirements will support of the Government of Canada's commitment to Open Science and Data and would facilitate the sharing of information with the public through the Registry and the Government of Canada's Open Science and Data Platform. The proponent should contact the Agency to obtain additional direction regarding the format and distribution of the Impact Statement.



2. Proponent information

2.1. The proponent

The Impact Statement must:

- provide contact information for proponent representatives for the project (e.g. name, address, phone, email);
- identify the proponent(s) and, where applicable, the name of the legal entity(ies) that would develop, manage and operate the project;
- describe corporate structure, including roles and responsibilities of key personnel;
- specify the mechanism used to ensure that corporate policies will be implemented and respected for the project; and
- identify key personnel, contractors, and/or sub-contractors responsible for preparing the Impact Statement.

2.2. Qualifications of individuals preparing the Impact Statement

In support of transparency, the Impact Statement must:

- provide information on the individuals who prepared the sections within the Impact Statement; and
- demonstrate that qualified individuals have prepared the information or studies. Where possible, the proponent should use experts who are members of a professional body or recognized association.

A qualified individual would include someone who may be relied on by the proponent to provide advice within their area of expertise, as demonstrated by:

- formal education, training or certification;
- experience in relevant area;
- credibility or standing as a holder of Indigenous or community knowledge.

The Agency also expects proponents to demonstrate scientific integrity in their preparation and delivery of Impact Statements by:

- following existing standards and best practices for the responsible conduct of scientific research;
- declaring and managing any real or perceived conflict of interest for individuals involved in preparing the Impact Statement;



- eliminating, controlling for, or appropriately managing potential biases; and
- characterizing all potential sources of scientific uncertainty, including their magnitude and any differences in the interpretation of scientific results.

Proponents are expected to demonstrate their adherence to these methods and processes within their Impact Statement. For example, it is expected that proponents provide information on data collection methods, sources of information and knowledge, and the completeness of the data provided, including any identified gaps and the nature of these gaps. Furthermore, proponents are expected to identify how they have responded to scientific uncertainty and potential bias in their Impact Statement.



3. Project Description

3.1. Project overview

The Impact Statement must describe the project, key project components and ancillary activities, scheduling details, the timing of each phase of the project, the total lifespan of the project and other key features. If the project is part of a larger sequence of projects, the Impact Statement must outline the larger context.

3.2. Project location

The Impact Statement must describe the project's location, the geographical setting and the socio-ecological context in which the project is to take place. The description should focus on aspects of the project and its setting that are important in order to understand the potential environmental, health, social and economic effects and impacts of the project. The following information must be included and, where appropriate, located on map(s):

- geographic coordinates (i.e. longitude/latitude using international standard representation in degrees, minutes, seconds) for the centre of the main project site and the geographical coordinates of the wharf's extremities;
- project footprint (during construction and operation phases), including the extent of the tenure, the temporary structures and the ship manoeuvring and approach areas;
- surface areas, location and spacing of project components;
- distance of the project components to any federal lands and the location of any federal lands within the regional study area;
- services and infrastructure and current land and aquatic uses in the area including:
 - roads;
 - municipalities and administrative regions;
 - resource development projects already underway in the study area (e.g. mines and forestry operations); and
 - local businesses and industries such as fisheries and outfitters, and any other relevant uses.
- primary, secondary and tertiary watersheds;
- all waterbodies, including intermittent and ephemeral streams, and their location on a map;
- navigable waterways, including the distance from the main shipping lane;
- landcover in the area; including important or critical habitats;

- ecozones, ecoregions, and ecodistricts as per the province's or Canada's Ecological Land Classification³;
- environmentally sensitive areas, such as national, provincial, territorial and regional parks, Indigenous Protected and Conserved Areas, UNESCO World Heritage Sites, ecological reserves, ecologically and biologically sensitive or significant areas, wetlands, estuaries, and habitats of federally or provincially listed species at risk and other sensitive areas;
- lands subject to conservation agreements;
- description and locations of all potable drinking water sources (i.e. municipal or private);
- description of local community and Indigenous groups;
- Indigenous traditional territories and/or consultation areas, Treaty and/or Title lands, Indian Reserve lands, Indigenous harvesting regions (with permission of Indigenous groups), Métis settlements; and
- culturally important features of the landscape.

3.3. Regulatory framework and the role of government

The Impact Statement must identify:

- any federal power, duty or function that may be exercised that would permit the carrying out (in whole or in part) of the project or associated activities;
- legislative or regulatory requirements that are applicable to the project at the federal, provincial, regional and municipal levels or from anybody, including a co-management body, established under a land claim agreement referred to in section 5 of the *Constitution Act, 1982*, or from an Indigenous governing body as defined in the Act that has powers, duties or functions in relation to the environmental effects of a project;
- federal, provincial or territorial greenhouse gas (GHG) legislation, policies or regulations that will apply to the project, explaining any impact on the project, as described in Section 3.5.4 of the [Strategic Assessment of Climate Change \(SACC\)](#) technical guide;
- government policies, resource management plans, planning or study initiatives relevant to the project and/or the impact assessment and their implications, including relevant regional studies, regional assessments and strategic assessments;
- any treaty, self-government, land claims or other agreements between federal or provincial governments and Indigenous groups that are pertinent to the project and/or the impact assessment;
- any relevant land use plans, land zoning, or community plans;
- information on land lease agreement or land tenure, when applicable; and

³ [Introduction to the Ecological Land Classification \(ELC\) 2017](#) and [Ecozones Introduction by Canadian Council on Ecological Areas](#).

- municipal, regional, provincial and/or national objectives, standards or guidelines, by-laws or ordinances that have been used by the proponent to assist in the evaluation of any predicted environmental, health, social or economic effects or impacts.

3.4. Project components and activities

The Impact Statement must:

- describe the project components, associated and ancillary works, and other characteristics to assist in understanding the potential environmental, health, social and economic effects, and impacts on Indigenous peoples and rights of Indigenous peoples. Project components that should be considered in this description are outlined in [Appendix 1 – List of Project Components](#);
- describe project activities to be carried out during each project phase, with a focus on activities with the greatest potential to have environmental, health, social and economic effects, or impacts on Indigenous people and their rights. Project activities that should be considered in this description are outlined in [Appendix 1 – List of Project Activities](#);
 - describe the location, methods used, schedule (including expected start date, time of year, duration and frequency), magnitude and scale of each project activity;
 - highlight activities that involve periods of increased disturbance to environmental, health, social and economic conditions or impacts on Indigenous peoples.
- provide a summary of any change made to the project as originally proposed in the Detailed Project Description, including the reasons for these changes;
- provide sufficient detail to support analysis regarding the project's impacts in the context of potential interaction between valued components (VCs);
- detail how input from diverse groups of people was used to identify potential components or activities of concern; and
- include maps of key project components, boundaries of the proposed site with geographic coordinates, major existing infrastructure, proponent lands, and leased properties or lands, adjacent resource lease boundaries, adjacent land uses and any important environmental features (e.g. the aquatic grassbeds upstream and downstream of the project).

At a minimum, the Impact Statement must describe the components and activities set out in the List of Project Components & Activities section of Appendix 1.



3.5. Workforce requirements

The Impact Statement must describe the anticipated labour requirements, employee programs and policies, and workforce development opportunities for the designated project, including:

- opportunities for employment outlining the anticipated number of full-time and part-time positions to be created, and timeline for when they will be created. Positions should be presented using the National Occupational Classification system;
- anticipated workforce region of origin (i.e. local, regional, out-of-province or international employees);
- the skill and education levels required for the positions;
- anticipated hiring policies and programs;
- investment in training opportunities;
- working conditions and anticipated work scheduling for construction and operation (e.g. hours of work, rotational schedules, workers' modes of travel to work sites and changes to local traffic);
- workplace policies and programs for Indigenous employment, and employment of other underrepresented groups;
- workplace policies and programs, including codes of conduct, workplace safety programs and cultural training programs; and
- employee assistance programs and benefits programs.

Workforce requirements must take GBA Plus into consideration. The information must be presented in sufficient detail to analyse how historically excluded or underrepresented groups will be taken into account, including Indigenous groups and other relevant diverse groups of people.



4. Project purpose, need and alternatives considered

The proponent must identify the purpose of and need for the project. The proponent must also analyze alternatives to the project and alternative means of carrying it out. The proponent should consult the Agency guidance documents [Guidance: "Need for", "Purpose of", "Alternatives to" and "Alternative Means"](#) and [Policy Context: "Need for", "Purpose of", "Alternatives" and "Alternative Means"](#).

4.1. Purpose of the project

The Impact Statement must outline what is to be achieved by carrying out the project. The Impact Statement should broadly classify the project (e.g. transportation, electricity supply, mineral extraction) and indicate the target market (e.g. international, domestic, local), where applicable. The *purpose of* statement should include any objectives the proponent has in carrying out the project.

The proponent is encouraged to consider the perspectives of participants (i.e. public, Indigenous groups, governments) in establishing objectives that relate to the intended effect of the project on society.

4.2. Need for the project

The Impact Statement must describe the underlying opportunity or issue that the project intends to seize or solve and should be described from the perspective of the proponent. In many cases, the need for the project can be described in terms of the demand for a resource. The information provided should make it possible to reasonably conclude that there is an opportunity or issue that warrants a response and that the proposed project is an appropriate approach.

The description must include:

- supporting information that demonstrates the need for a project.
- An analysis of:
 - the sector's port capacity and how the project fits into it;
 - the sector's supply chain and the effects of the project on it;
 - the economic impacts of the project.
- any comments or view of Indigenous peoples, the public and other participants on the proponent's need statement.

4.3. Alternatives to the project

The Impact Statement must provide a description of the alternatives to the project that are technically and economically feasible to meet the project need and achieve the project purpose, from the perspective of the proponent. The process of identifying and considering alternatives to the project must consider the views, information and knowledge from Indigenous groups potentially impacted by the project and other participants, as well as existing studies and reports.

The Impact Statement must present a rationale for selecting the proposed project over other options, which includes how sustainability principles (described in [section 17 - Extent to which the project contributes to sustainability](#)) were considered. The analysis of alternatives to the project should serve to validate that the preferred alternative for the project is a reasonable approach to meeting the need and purpose and is consistent with the aims of the Act.

The Impact Statement must describe, at a minimum, the following alternatives to the project:

- the expansion of the existing QSL International Ltd. port terminal in Saint-Joseph-de-Sorel;
- the construction of a new terminal at other potential locations;
- no measurement alternative (null) that will be used as the baseline for the evaluation and comparison of the project and any alternative means of carrying out the project. The description should highlight the baseline VC conditions associated with the project, as well as changes to these baseline conditions that are likely to occur in the future if a project were not to proceed (e.g., changes resulting from other projects already planned for the region, changes in socio-economic conditions, future climate change).

4.4. Alternative means of carrying out the project

The Impact Statement must identify and consider the potential environmental, health, social and economic effects and the impacts on the rights of Indigenous peoples of alternative means of carrying out the designated project that are technically and economically feasible.

For the selection of the alternative means of carrying out the project, the Impact Statement must describe:

- the criteria to determine technical and economic feasibility of possible alternative means;
- the best available technologies considered and applied in determining alternative means;
- those alternative means that are technically and economically feasible presented in sufficient and appropriate detail; and
- the particularities for each alternative mean and their potential adverse and positive environmental, health, social and economic effects, and their impacts on the rights of Indigenous peoples as identified by Indigenous peoples.

The Impact Statement must then describe:

- the methodology and criteria that were used to compare the alternative means, to determine the preferred means of carrying out the project, and to justify the exclusions of other solutions, based on the trade-offs associated with the preferred and other alternative means;
 - environmental criteria should include effects to air quality, water quality, all wildlife and associated habitat (including wetlands), human health, risk from accidents and malfunctions;
 - potential effects to species at risk as per the *Species at Risk Act* (SARA), including any critical habitat, must be considered in alternative assessment, including a description of how avoidance of effects was considered and how it may be achieved through alternative means of carrying out the project or alternatives to the project.
- potential impacts of the alternatives on GHG emissions and how GHG emissions were considered as a criterion in the alternative's selection (refer to section 4.1.3 of the SACC);
- the preferred means of carrying out the project and the rationale for the selection based on the consideration of environmental, health, social and economic effects, the impacts on the rights of Indigenous peoples, technical and economic feasibility, and the use of best available technologies, and consideration of the sustainability principles (described in section 17 - *Extent to which the project contributes to sustainability*);
- application of GBA Plus to the analysis of alternative means of carrying out the project to inform how effects may vary for diverse groups of people; and
- how concerns, views and information provided by Indigenous peoples, the public and other participants were taken into account in establishing criteria and conducting the analysis.

In its alternative means analysis, the Impact Statement must address key project elements, including, but not limited to, the following, where relevant to the project:

- route or corridor and means options for transportation (e.g. marine shipping, moving oil or gas);
- route or corridor and means options for linear projects (e.g. transmission lines, roads, railways);
- project site and/or component locations;
- timing options for components and phases of the project;
- access to the project site;
- facility design;
- switchyard design;
- energy sources to power the project site and other stationary sources to provide heat or steam to the project;
- water and wastewater management including;
 - location of effluent discharge points;
 - treatment technologies and techniques to control effluent quality.
- waste management;
- construction alternatives;



- location, construction and crossing methods for waterbodies, watercourses, wetlands and other obstacles;
- management of excavated materials, including those that are potentially acid generating or leachable;
- suspension, abandonment or decommissioning options.

As relevant, the alternatives to and alternative means assessments should be informed by, but not limited to, the following:

- any regional or strategic assessment;
- studies and plans arising from the St. Lawrence Action Plan, 2011–2026;
- any study or plan that is conducted or prepared by a jurisdiction—or an Indigenous governing body—in respect to the region related to the project and that has been provided with respect to project;
- any relevant assessment of the effects of the designated project that is conducted by or on behalf of an Indigenous governing body and that is provided with respect to the designated project;
- Indigenous knowledge, community knowledge, comments received by the public, comments received from a jurisdiction; and
- other studies or assessments realized by the proponent or other proponents.



5. Description of public participation and views

The proponent must engage with local communities and stakeholders. Engagement activities should be inclusive and ensure that interested members of the public have an opportunity to share their views. They should also consider the language needs, with regards to official languages, of the people being engaged. Particular attention must be paid to the engagement of individuals and communities that have rights and interests in the lands affected by the proposed project.

The proponent should consult Agency guidance documents on this topic, particularly: [Framework: Public Participation Under the Impact Assessment Act](#), and [Guidance: Public Participation under the Impact Assessment Act](#).

5.1. Summary of public engagement activities

The Impact Statement must describe the proponent's public engagement activities regarding the designated project, including;

- efforts made to distribute project information and the information and materials that were distributed during the consultation process;
- methods used, where consultations were held, the persons, organizations and diverse groups of people consulted; and
- efforts to engage diverse groups of people in the community to support the collection of information needed to complete the GBA Plus.

5.2. Analysis and response to questions, comments and issues raised

The Impact Statement must:

- provide a summary of key issues related to the project, including the potential environmental, health, social and economic effects and potential for disproportionate effects for diverse groups of people, that were raised through engagement with the public, or how they were incorporated into the Impact Statement;
- describe any questions and comments raised by the public and how they influenced the design, of the project;
- identify the alternative means, mitigation measures or the monitoring and follow-up programs identified to deal with public uncertainties;



- identify public concerns that have not been addressed, if any, and provide the reasons why they have not been; and
- provide details and commitments regarding how the public will be kept involved if the project were to be approved and were to proceed, such as public involvement in follow-up and monitoring programs.

6. Description of engagement with Indigenous groups

The proponent must engage with Indigenous groups at the earliest reasonable opportunity, in order to identify and understand the potential impacts of the project on Indigenous peoples and their rights, including their lands, territories and resources, and to incorporate Indigenous knowledge into the impact assessment. Engagement with Indigenous groups is required to inform the impact assessment and identify measures to avoid or minimize potential impacts on Indigenous peoples and their rights from the project, including cumulative effects. If it is not possible to avoid impacts on Indigenous peoples and their rights, the proponent must explain why, with reference to the alternatives considered, and demonstrate that the approach chosen minimizes any impacts on Indigenous peoples and their rights from the project. This engagement may also identify potential positive outcomes, including measures that could improve the underlying baseline conditions that support the exercise of rights. Ideally, the project will be designed not only in such a way as to minimize its negative effects, but also to maximize its positive impact on the quality of life of Indigenous peoples.

As part of an impact assessment process under the Act, the proponent must collaborate with Indigenous groups in completing its Impact Statement. For the purposes of the Impact Statement, the proponent must:

- collect available Indigenous knowledge and expertise and integrate it into its Impact Statement, on equitable footing with scientific knowledge;
- share project information frequently and transparently with Indigenous peoples;
- support the participation of Indigenous groups in the completion of the Impact Statement, which could include funding studies conducted by potentially affected Indigenous groups who will have demonstrated interest in this regard;
- cooperate with Indigenous groups to identify preferred mitigation measures to avoid and, if avoidance is not possible, to minimize, offset or otherwise accommodate for potential adverse impacts on Indigenous peoples or their rights, as well as to optimize the project's benefits for their communities.

The engagement efforts should be consistent with the Government of Canada's commitment to implement the United Nations Declaration on the Rights of Indigenous Peoples (the Declaration) as a comprehensive international human rights instrument and Canada's roadmap for reconciliation. The Declaration emphasizes the importance of recognizing and upholding the rights of Indigenous peoples and ensuring that there is effective and meaningful participation of Indigenous groups in decisions that affect them, their communities, and territories. The Declaration also emphasizes the need to work together in partnership and respect, as articulated through the principle of free, prior and informed consent. This principle reflects working together in good faith on decisions that impact Indigenous peoples, with the intention to achieve consensus.

Engagement should also be consistent with jurisprudence and best practices in respect of implementing the common law duty to consult. The Indigenous Engagement and Partnership Plan identifies Indigenous communities that the Crown will consult with to understand the concerns and potential impacts of the



project on their exercise of potential or established Aboriginal or Treaty rights and, where appropriate, make accommodations. The degree of engagement with each community will vary and in general, will be proportionate to the evidence provided by Indigenous groups regarding potential pathways of impact from the project on Aboriginal or Treaty rights. Engagement is also conducted for other purposes, including as an opportunity to learn about and further explore Indigenous community interests in a project, or to understand other potential project effects not directly related to the exercise of Aboriginal or Treaty rights. At a minimum, the proponent must engage with the Indigenous communities identified⁴ by the Crown in the *Indigenous Engagement and Partnership Plan*. For Indigenous communities identified in Section 4.2 of the *Indigenous Engagement and Partnership Plan*, to be notified of the Project at key milestones of the impact assessment process, the proponent must provide project updates at these times and document the notifications in the Impact Statement. In order to facilitate the participation of each Indigenous community in the development of the Impact Statement, the proponent is required to work with each Indigenous community named in section 4 of the *Indigenous Engagement and Partnership Plan* to establish a mutually agreed approach to their participation, should they wish to participate.

Engagement with Indigenous groups must involve ongoing information sharing and collaboration between the proponent and Indigenous groups to contribute to the development and validation of conclusions and assessment findings related to potential impacts and pathways of effects to Indigenous peoples and impacts on the rights of Indigenous peoples. The results of any engagement with each Indigenous group must be presented in the Impact Statement, and, as best as possible, convey the perspective of the Indigenous groups being engaged. The record of engagement and inclusion of Indigenous knowledge in the Impact Statement should demonstrate substantive inclusion of Indigenous contributions, perspectives and knowledge. The proponent must demonstrate that they sought to build consensus and obtained the agreement from specific Indigenous groups regarding information specifically pertaining to those Indigenous groups that is presented in the Impact Statement.

The Agency notes that not all Indigenous groups may be willing to collaborate with the proponent, therefore the proponent must demonstrate they have made best efforts at collaboration, including securing free and prior informed consent for the consultation process. If a proponent is unable to obtain the collaboration or free and prior informed consent to the consultation process, they must provide the Agency with an explanation regarding circumstances where collaboration and consultation was not possible. The proponent should continue sharing information and analyses with the Indigenous groups, to use reliable publicly available sources of information to support the assessment, and to document their efforts in that respect.

⁴ The list of Indigenous peoples, groups or communities identified during the planning phase may change as knowledge of the effects and potential impacts of the Project is gained, or if the Project or its components are modified during the impact assessment. The Agency reserves the right to modify the list in the Indigenous Engagement and Partnership Plan based on additional information gathered during the impact assessment and will notify the proponent.



The proponent must consult the Agency's guidance documents on Indigenous participation and engagement throughout the Impact Statement, which are available on the Agency's website and are listed in [Appendix 2 – Indigenous engagement resources](#).

6.1. Indigenous knowledge considerations

Indigenous knowledge⁵ is holistic and when integrated in impact assessment, it informs the assessment on areas including the biophysical environment, as well as social, cultural, economic, and health aspects, Indigenous governance, resource use, and mitigation. Indigenous knowledge should be brought together on equitable footing with scientific or technical aspects to inform the impact assessment including the environmental, health, social, economic and rights assessments and best practices and mitigation. It is important that Indigenous knowledge, where available to the proponent, be included for all of these aspects in the impact assessment, not only to look at potential impacts of the project on Indigenous groups. It is also important to capture the context in which Indigenous groups provide their Indigenous knowledge and to convey it in a culturally appropriate manner.

The proponent must seek out Community-specific engagement protocols and procedures around Indigenous knowledge in assessment processes. Such protocols should be understood, respected, and implemented. The Impact Statement must indicate where input from Indigenous groups, including Indigenous knowledge, has been incorporated and how it was considered. Information should be specific to the individual Indigenous group(s) involved in the assessment, and describe contextual information about the members within an Indigenous group.

If Indigenous knowledge is not incorporated, the proponent must indicate this in the assessment and provide a rationale for its exclusion.

Indigenous knowledge, whether publicly available or directly shared with the proponent, should not be included without written consent and validation from the Indigenous community, regardless of the source of the Indigenous knowledge. The guidance document [Protecting Confidential Indigenous Knowledge under the Impact Assessment Act](#), to which the proponent must refer, describes the general approaches favoured by the Impact Assessment Agency of Canada. However, the proponent should verify with each Indigenous group whether this approach is acceptable to them. Appropriate, culturally-based Indigenous methodology for integrating Indigenous knowledge and community input into the impact assessment is necessary to appropriately and ethically assess potential effects and significance of those effects from an Indigenous perspective.

⁵ The Government of Canada recognizes that Indigenous Peoples refer to their knowledge in different ways, characteristic of their unique languages. Within the context of these Guidelines, the term Indigenous knowledge is used to refer to all Indigenous ways of knowing. The proponent is encouraged to respect the terminology preferences of the Indigenous communities involved in the assessment.

6.2. Record of engagement

The Impact Statement must provide a record of engagement that describes all efforts, successful and unsuccessful, taken to seek the views of each potentially affected Indigenous group with respect to the designated project. This record of engagement is to include all engagement activities undertaken prior to the submission of the Impact Statement.

At a minimum, the proponent must engage with the Indigenous groups identified⁶ by the Crown in the Indigenous Engagement and Partnership Plan issued along with the Notice of Commencement for the project. The purpose of this engagement is to gain an understanding of the issues and concerns of potentially affected Indigenous groups, and to inform an assessment of the potential adverse impacts of the project on Indigenous peoples and their rights.

The record of engagement in the Impact Statement must include:

- the proponent's Indigenous engagement policy, as well as established policies and stated principles related to the collection of traditional knowledge and traditional land use information;
- the list of Indigenous groups engaged by the proponent, including those that the proponent was unsuccessful in engaging;
- the list of Indigenous groups or communities wishing to be engaged but omitted by the proponent from engagement and the reasons for their omission;
- where applicable, a copy of each community-specific engagement plan developed collaboratively by the Indigenous community and the proponent for the project. If only one engagement plan was developed solely by the proponent for engagement with all Indigenous groups, provide a rationale for this approach);
- the engagement activities undertaken with each Indigenous group, including the date, means, substance and results of engagement;
- a description of the outcomes of conversations with each Indigenous group about how they wish to be engaged by the proponent;
- the results of any engagement and the perspectives of the Indigenous peoples involved;
- the list of the consultation or engagement protocols adopted by each Indigenous group, if applicable. A copy of the protocols must be included when available in writing;
- an explanation for cases where engagement efforts have proven unsuccessful;

⁶ The list of Indigenous peoples, groups or communities identified during the planning phase may change as knowledge of the effects and potential impacts of the project is gained, or if the project or its components are modified during the impact assessment. The Agency reserves the right to modify the list in the Indigenous Engagement and Partnership Plan based on additional information gathered during the impact assessment.

- a description of how project information is frequently and transparently shared with Indigenous peoples;
- a description of each Indigenous group's preferred methods for sharing information, including alternative solutions implemented for people and locations where technological resources are limited or language barriers exist (i.e. translation of written documents or provision of summaries in Indigenous languages);
- a description of how Indigenous groups were provided with a reasonable opportunity to review draft sections of the Impact Statement prior to them being filed, to submit feedback and propose modifications, and how the feedback and modifications were considered and a rationale for any feedback or modifications that was not accepted by the proponent;
- a description of how Indigenous expertise will be sought to assist with the carrying out of the project, should it be approved;
- a description of efforts to engage diverse segments of each Indigenous community in culturally appropriate ways, including groups identified by gender, age or other community relevant factors (e.g. hunters, trappers, and other harvesters) to support the collection of information needed to complete the GBA Plus;
- a description of how engagement activities by the proponent were intended to ensure Indigenous groups were provided an opportunity to evaluate the project's potential positive and negative effects and impacts on their members, communities, activities, and rights, as identified by the Indigenous group(s); and
- any agreements pertaining to engagement that are finalized or in progress, with anticipated timelines to complete.

The record of engagement must demonstrate that the capacity needs of Indigenous groups were taken into account, and that timelines were adequately communicated and flexible enough to ensure Indigenous groups had the ability to review and gain understanding of information in the Impact Statement, including, where applicable, specific procedures for contributing information for sections of the Impact Statement.

It is expected that the engagement activities for the preparation of the Impact Statement will be carried out with integrity and transparency, without conflicts of interest, in good faith, and conducted in a manner that is attentive to the concerns of Indigenous groups and committed to producing mutually beneficial outcomes.

6.3. Analysis and response to questions, comments, and issues raised

The Impact Statement must provide an analysis of any potential effects to Indigenous groups and impacts on the rights of Indigenous peoples and of all the input received from Indigenous groups with respect to the project, including its contribution to cumulative effects. This analysis is to include all input received by Indigenous groups prior to, and since commencing, the impact assessment process. This analysis should serve to inform the identification of potential effects and impacts on any applicable VCs,



impacts on Indigenous peoples and their rights, and proposed measures to mitigate or accommodate for adverse impacts, enhance or optimize positive effects.

The analysis may be summarized in the relevant section on effects to a VC. The location and level of detail of the information in the Impact Statement will depend on its importance to the selected VCs.

It is recommended that the proponent organize and analyze information relevant to Indigenous groups in separate sections for each group potentially affected by the project, either by nation, community, or other grouping based on the preference expressed by the relevant group. Where applicable, the information and analysis must also be sufficiently disaggregated to support the GBA Plus analysis of disproportionate effects. In all cases, ethical guidelines and culturally appropriate protocols governing research, data collection and confidentiality must be followed.

The Impact Statement must:

- consider and, where an Indigenous group so desires, incorporate Indigenous knowledge, spiritual practices, cultural beliefs, laws and norms in the assessment, including an analysis of whether the project would be inconsistent with Indigenous laws and norms;
- describe the type of information received from Indigenous groups (observations, questions, issues, comments, knowledge, expertise or other);
- describe the potential effects and impacts to environmental, health, social, cultural and economic conditions of each Indigenous group, informed by the Indigenous group(s) involved in the assessment and must include both adverse and positive effects;
- describe the rights or interests of each Indigenous group, that the groups themselves have identified, that may be impacted by the project;
- describe the potential effects and impacts to lands in a reserve within the meaning of subsection 2(1) of the *Indian Act*. Note that section 2 of the Act defines federal lands as including “reserves, surrendered lands and any other lands that are set apart for the use and benefit of a band and that are subject to the *Indian Act*, and all waters on and airspace above those reserves or lands”;
- provide an analysis of the extent of the potential effects on each Indigenous community, and the views of Indigenous communities regarding the extent of impact on the exercise of rights as well as how these effects or impacts may be avoided, and if avoidance is not possible, managed, mitigated, or accommodated;
- detail the main issues, questions and comments raised by each Indigenous group during engagement activities and the proponent’s responses, including how matters have been addressed in the Impact Statement or will be addressed in the future;
- append any specific studies or assessments provided by Indigenous groups, if permission has been obtained from the Indigenous group concerned to publish them;
- identify all sources of information used in the analyses of potential impacts to rights, as well as assumptions and methodologies used for the analyses;

- integrate the perspectives of Indigenous youth, women, two-spirited people, individuals with disabilities, Elders, and individuals identified by other identity factors relevant to the community where provided;
- indicate where and how Indigenous groups' perspectives and input were integrated into or contributed to decisions regarding the project or its impact assessment, including:
 - the construction, operation, decommissioning, closure and reclamation plans;
 - the evaluation of alternatives to the project;
 - developing the assessment including setting spatial and temporal boundaries, identifying and selecting VCs and collection of baseline information;
 - characterization of potential environmental, health, social and economic effects of the project for each Indigenous group;
 - measures to mitigate effects or to enhance or optimize potential project benefits;
 - follow-up and monitoring activities should the project proceed; and
 - describe how the information gathered during the Planning Phase of the impact assessment of the project was included, including the documents uploaded to the Registry by Indigenous groups during that phase of the impact assessment.

6.4. Collaboration with Indigenous peoples following the submission of the Impact Statement

The proponent must explain in the Impact Statement how it plans to continue to work with affected Indigenous peoples during subsequent phases of the impact assessment process and throughout the lifecycle of the project, if it is allowed to proceed. For this section, the proponent may refer to information presented in other sections of the Impact Statement.

The Impact Statement must:

- describe the type of work the proponent intends to accomplish with Indigenous groups during subsequent phases of the impact assessment process;
- set out any proponent commitments for engaging affected Indigenous groups, where appropriate;
- describe how Indigenous peoples will be involved in decision making processes related to the project throughout the lifecycle of the project; and
- describe how Indigenous expertise and knowledge would be considered in carrying out the project.

7. Assessment Methodology

7.1. Baseline methodology

The Impact Statement must provide a description of the baseline for the environmental, health, social, and economic conditions related to the project. This should include the existing environmental, health, social and economic conditions, interrelations and interactions among them, and the variability in these conditions over time scales and spatial boundaries appropriate to the project. Meaningful, two-way dialogue with communities and Indigenous groups provides input that may describe how environmental, health, social and economic conditions are interrelated.

Baseline data must be collected in a manner to allow for reliable analysis, extrapolation and predictions. The baseline data should be suitable to estimate pre-project baseline conditions, to predict effects from the project, and to evaluate post-project changes in the conditions within and across the project, local and regional study areas. Further data requirements are included in the specific baseline conditions sections for biophysical environment (section 8), for the health, social, economic conditions (Sections 9) and for impacts on Indigenous peoples (section 10) in the Guidelines.

Ethical guidelines and relevant cultural protocols governing research, data collection and confidentiality must be adhered to. This is particularly important in the case of information gathered and studies conducted with vulnerable subgroups (e.g. analysis of gender-based violence). The proponent must respect the obligation of protecting personal information and adopt the established standards for the management of Indigenous data (e.g. the [First Nations principles of Ownership, Control, Access and Possession \(OCAP\)](#) or standards adopted by an Indigenous group).

For all baseline conditions, the Impact Statement must:

- describe the baseline for the environmental, health, social, and economic conditions related to the project and the interrelations and interactions among them;
- describe potential changes in the baseline conditions that are likely to occur in the future, if the Project was not carried out, including changes due to future climate change;
- include baseline data collected in a way that makes analyses, extrapolations and reliable predictions possible, and are suitable to estimate pre-project baseline conditions, to predict effects from the project, and to evaluate post-project changes in the conditions within and across the project, local and regional study areas;
- provide detailed descriptions of data sources and data collection methods, including sampling, survey and research protocols, modeling methods, sources of uncertainty, error estimates, and any assumptions or biases;
- describe modelling methods and include assumptions, calculations of margins of error, and other relevant statistical information. Models should be validated using field data from the appropriate local and regional study areas;

- show that the data sources are relevant to and representative of conditions within the established spatial and temporal boundaries and account for natural variability, especially if surrogate data from representative sites are used rather than specific measurements at the project site;
- indicate if baseline data gaps exist and additional steps taken to address gaps in information;
- describe where and how community or Indigenous knowledge and input were considered in determining baseline conditions;
- describe how GBA Plus was applied to examine differences in baseline conditions among diverse groups of people and provide disaggregated data where necessary; and
- describe how any ongoing or completed regional assessment in the proposed project area or any relevant strategic assessments were considered in determining baseline conditions.

Proponents are encouraged to consult with the Agency during the development and planning of baseline studies. Relevant sources of baseline information are listed in [Appendix 1 - Sources of baseline information](#).

7.2. Selection of valued components

The Impact Statement must identify the valued components (VCs) that will serve as the focal points for the impact assessment. VCs consists of components that are of particular concern or value to participants and that may be affected by the project. The value of a component not only relates to its role, but also to the value people place on it.

The Guidelines, in sections 8-11, provide information requirements organized in categories that may be considered as VCs, or may be considered as intermediate components to inform the assessment of VCs, depending on the project. The VCs will help to organize the description of the effects of the project required by the Guidelines. In some sections, the Guidelines identify specific sub-VCs (e.g. specific fish species within fish and fish habitat). The proponent must consult First Nations with regards to the selection of VCs and can identify additional VCs beyond those included in the Guidelines in consultation with Indigenous groups and other participants.

Indigenous groups may identify holistic VCs that encompass the effects on a number of individual environmental, health, social, or economic value components. Where identified, the proponent should structure analysis and presentation of individual VC into an assessment of the overarching Indigenous VC. Proponents are encouraged to work with Indigenous groups to identify holistic VCs, which may increase the efficiency of the assessment and clarity of presentation. In the event that a VC is suggested by an Indigenous group but is excluded from the Impact Statement, the proponent must provide a justification for its exclusion.

In selecting a VC to be included, the following factors should be considered:

- VC presence in the study area;



- the extent to which the effects of the project and related activities have the potential to interact with the VC;
- the extent to which the VC may be affected by other past, existing or future projects and activities and natural processes;
- the extent to which the VC is linked to Indigenous interests or rights of Indigenous peoples and whether an Indigenous group has requested the VC;
- the extent to which the VC is linked to a federal, provincial, territorial or municipal government priority;
- the possibility that an adverse or positive effect on the VC would be of particular concern to Indigenous groups, the public, or federal, provincial, territorial, municipal or Indigenous governments;
- information from any ongoing or completed regional or strategic assessment processes; and
- whether the potential effects of the project on the VC can be measured and/or monitored or would be better ascertained through the analysis of a proxy VC.

The Impact Statement must:

- describe the VCs and provide a rationale for the selection of VCs in sufficient detail to allow the reviewer to understand their relevance to the assessment;
- indicate the source and reasons of the concerns or interests considered in the selection of VCs, including from the public, provincial or federal authorities, Indigenous groups, and other participants;
- describe how community and Indigenous knowledge and the perspectives were considered in selecting VCs.

Based on comments from participants during the Planning phase, the following components have been raised as important to consider in the assessment, but it is not exhaustive:

- Risk of accidents and project failures (e.g., contaminant spills).
- Initiatives to hire and recruit a diverse and regional workforce.
- Number of jobs that would be created (full-time, part-time, permanent, temporary, contract, indirect).
- Types of goods that would be transshipped at the proposed terminal and associated storage methods (dry bulk, liquid bulk, hydrocarbons, etc.).
- Impacts of the project on sustainability and GHG emissions.
- Air quality impacts of the project on nearby sensitive receptors (seniors' residences, homes, summer camps, etc.).
- Project noise impacts (construction and operation) on human health.
- Cumulative effects of the project on the noise environment and impacts on human health.
- Effects of the project on the accumulation of contaminants in traditional foods consumed by Indigenous people, and their potential health effects.
- Impacts of the project on traditional land use (fishing, hunting, gathering).
- Impacts of the project on culturally important and sensitive species for First Nations (e.g. Lake and Atlantic Sturgeon, Yellow Perch, and migratory birds).

- Potential effects of each project phase on migratory birds and species at risk.
- Impacts of the project on fish and fish habitat (impacts on cumulative habitat loss and fragmentation, species at risk, shoreline erosion, and underwater noise).
- Effects of the project on the Copper Redhorse and its habitat, including effects on shallow water aquatic grassbeds (erosion and increased suspended solids, shoreline artificialization and shoreline industrial projects, introduction and spread of invasive species, disturbance by navigation, etc.).
- Impacts of the project on the spread of the Zebra Mussel, an invasive exotic species that requires solid surfaces to attach itself and competes with native mollusks that serve as food for the Copper Redhorse.
- Impacts of the project on the increase in traffic on Industrielle Street, Joseph Simard Street and Highway 132 and the capacity of these streets to accommodate this increase.
- Impacts of the project on the safety of road users (cyclists, pedestrians, public transit users).
- Impacts of the project on the increase in the number of ships waiting in the anchorage areas located near residential areas (noise, contaminants, light).
- Impacts of the project on the increase of road transport in residential and recreational areas located near the project and its impacts on human health (noise, contaminant emissions).
- Impacts of the project on recreational and tourism activities (e.g., boating).
- Impacts of the project on the ability of Kildair Service ULC to ensure the safe operation of its oil terminal and the safe navigation of vessels docking at or departing from its wharf.
- Potential to construct a holding area for trucks accessing the project site to avoid parking on the shoulder of Highway 132.
- Impacts of the increase in road transportation related to the project on the quality of life of citizens and on the market value of their property.
- Route used by trucks travelling between Highway 30, the existing Saint-Joseph-de-Sorel port terminal, and the site of the proposed port terminal.
- Possibility of relocating ship mooring areas to a sector where the St. Lawrence River is wider.
- Impact of the project on marine traffic (number of additional vessel passages) between the proposed terminal and Montreal, as well as upstream of Montreal.
- Possibility of improving planning related to the unloading of ships (waiting time for ships on the St. Lawrence in the Sorel-Tracy sector) and of ensuring better coordination between the Port of Montreal and the various private terminal operators in the Sorel-Tracy sector with regard to the mooring of ships (compliance with regulations and limitation of nuisances when they are moored).
- Possibility of identifying a central point of contact with which citizens can communicate for their complaints to be addressed.
- Cumulative effects related to the project given its location in an area that hosts several port terminals, including cumulative effects on water quality, air quality, the noise environment, and the condition of road infrastructure.



- Cumulative effects of the increase in marine transportation related to the project (shoreline erosion, contaminant releases).
- Consideration of the results of the St. Lawrence River Regional Assessment to evaluate the cumulative effects of the project on the rights of First Nations.
- Integration of the project into regional development (harmonization of industrial, residential, agricultural, and recreational uses).

Concerns and interests pertaining to these components have been considered in the Guidelines and are reflected in the information requirements. The proponent is expected to finalize the selection of VCs in consultation with Indigenous groups and other participants. The proponent should engage with participants and refer to comments received in relation to the project on the Registry for additional information to support the selection of VCs.

7.3. Spatial and temporal boundaries

The Impact Statement must establish appropriate spatial and temporal boundaries to describe the baseline conditions for, and to guide the assessment of, each VC. The spatial and temporal boundaries will vary depending on the VC and must be considered separately for each VC.

The proponent must engage with Indigenous groups when defining spatial and temporal boundaries for VCs that are identified by, or related directly to, Indigenous peoples. The Impact Statement must explain how the proponent considered the information received from Indigenous groups in its definition of spatial and temporal boundaries, particularly for VCs related to effects to Indigenous peoples.

The proponent should consider additional guidance for assigning appropriate study areas or boundaries provided in [Appendix 1 - Establishing spatial and temporal boundaries](#).

7.3.1. Spatial boundaries

Generally, it is recommended that the proponent establish three spatial boundaries of study areas to assess the impacts on each VC:

- Project Area (PA): defined as the project footprint including all temporary and permanent areas associated with the project, and alternatives considered;
- Local Study Area (LSA): defined as the area beyond the project footprint where project effects may extend;
- Regional Study Area (RSA): defined as the larger area around the LSA, (delineated by ecological, social, economic or other appropriate boundaries) including the region where cumulative effects may extend.

The Impact Statement must:



- describe the spatial boundaries for each VC and provide a rationale for each boundary. Spatial boundaries must be shown on maps;
- define spatial boundaries by taking into account:
 - scale and spatial extent of potential effects and impacts of the project;
 - the physical location of potential receptors, including, where applicable, the movement patterns of potential receptors;
 - relationships between VCs (e.g. interaction between wildlife and vegetation);
 - community knowledge and Indigenous knowledge;
 - current or traditional land and resource use by Indigenous groups;
 - rights of Indigenous peoples, including treaty lands, traditional territories and areas or sites used for cultural and spiritual practices;
 - physical, technical, ecological, social, health, economic and cultural considerations;
 - size, nature, location and known effects of past, present and foreseeable projects and activities, particularly for the regional study areas; and
 - any ongoing or completed regional assessment in the proposed project area or any relevant strategic assessments.
- identify where spatial boundaries may extend to areas that are (i) on federal lands, (ii) in a province other than the one where the physical activity or the project is being carried out, or (iii) outside Canada where effects are expected.

7.3.2. Temporal boundaries

The Impact Statement must:

- describe the temporal boundaries for each VC and provide a rationale for each boundary;
- define temporal boundaries by taking into account:
 - schedule of phases of the project;
 - past conditions and historical context;
 - community knowledge and Indigenous knowledge;
 - current or traditional land and resource use by Indigenous groups;
 - rights of Indigenous peoples, including treaty lands, traditional territories and areas or sites used for cultural and spiritual practices;
 - relevant physical, technical, ecological, social, health, economic and cultural considerations;
 - timing of past, present and foreseeable projects and activities; and
 - any ongoing or completed regional assessment in the proposed project area or any relevant strategic assessments.

7.4. Effects assessment methodology

The Impact Statement must describe the changes to the environment or to the health, social or economic conditions and the positive and negative consequences of these changes (the effects) that are likely to be caused by the carrying out of the project, and the results of interactions among the effects. This includes the effects to Indigenous peoples' physical and cultural heritage, current use of lands and resources for traditional purposes, any structure, site or thing that is of historical, archaeological, paleontological or architectural significance, and any change occurring in Canada to the health, social or economic conditions of the Indigenous peoples of Canada. The overall effects assessment methodology must also consider the project's potential interference with the exercise of rights of the Indigenous peoples of Canada as further detailed in [Section 11](#). The description must include the information requirements detailed in specific effects sections in the Guidelines.

The assessment of effects must be based on a comparison of baseline conditions and the predicted future conditions with the project. In some cases, it may be appropriate to determine future conditions both with, and without, the project, in order to account for potential changes in baseline conditions (e.g. due to climate change or to anticipated changes in socio-economic conditions). The assessment of effects should also provide the probability or likelihood of that effect occurring, and the degree of confidence in the analysis. The assessment of effects must use methods that are statistically and scientifically defensible and must describe the degree of uncertainty related to the data and methods used and reflect community and Indigenous knowledge if it is available.

After considering the technically and economically feasible mitigation measures (see [section 7.5 Mitigation and enhancement measures](#)), the Impact Statement must describe any residual environmental, health, social or economic effects of the project. The assessment of residual effects must also take into account interactions between the project and past, existing and reasonably foreseeable projects or physical activities to be carried out, as described in [section 7.6 Cumulative effects assessment](#).

Depending on the VC, the description of the effects can be either a qualitative or quantitative, taking into account any important contextual factors, as appropriate. The Impact Statement may describe the effects in terms of magnitude, geographic extent, timing, duration and frequency, and whether effects are reversible or irreversible. For some effects, it may be more appropriate to use other criteria, such as the nature of the effects, directionality, causation and probability. The ecological and socio-economic context should also be provided. The perception of the same effect may vary among different individuals, groups and communities. Consequently, the effect assessment should take into account views and concerns expressed through engagement with Indigenous peoples and community members.

The Impact Statement must:

- describe in detail the project's potential direct and indirect, adverse and positive effects for each phase of the project;
- identify and describe measures that are technically and economically feasible and that would mitigate the project's adverse effects or enhancements to increase positive effects (*see section 7.5 Mitigation and enhancement measures for more details*);

- describe any residual effects of the project;
- identify the effects falling within federal jurisdiction and the direct or incidental effects, as defined in section 2 of the Act;
- describe how baseline data was used to inform this analysis;
- describe the analytical methods selected to assess effects, including clearly stated assumptions for all predictions and how each assumption has been tested;
- describe the degree of uncertainty related to the data and methods;
- for quantitative predictions based on models, detail model assumptions, parameters, the quality of the data and the degree of certainty of the predictions obtained, including an explanation of model calibration, validation and model performance metrics used;
- discuss the degree of confidence in the predictions and conclusions of the effect assessment;
- if a detailed description of effects cannot be provided, provide a rationale for the absence of details and a general description of the potential effects and related project activities (e.g. activities and effects related to closure and reclamation). The proponent should confirm the rationale with the Agency before submitting the Impact Statement;
- for predictions that may be affected by climate change, discuss how the range of potential climates informed the assessment, including predicted changes in climate extremes;
- consider and describe the interactions among the environmental, health, social and economic effects and impacts on Indigenous peoples and their rights;
- consider and describe the perspectives, concerns and tolerance levels of Indigenous groups and other participants;
- describe where and how Indigenous and community knowledge and input were considered and incorporated into effects assessment;
- describe how GBA Plus was applied to examine differences in effects among diverse groups of people and provide disaggregated data where necessary, and
- describe how any ongoing or completed regional assessment in the proposed project area or any relevant strategic assessments were considered in the effects assessment.

7.5. Mitigation and enhancement measures

The Impact Statement must identify measures that are technically and economically feasible and that would mitigate the project's adverse environmental, health, social and economic effects. The proponent may also identify enhancement measures to increase positive effects, such as local and regional training efforts, investment in infrastructure and services, and projects to rehabilitate degraded environments.

If there is an ongoing or completed regional assessment in the proposed project area, the proponent should use the information generated through that process to inform possible mitigation and enhancement measures.



For more guidance on developing mitigation measures see [Appendix 1 - Developing mitigation measures and enhancements](#).

The Impact Statement must:

- describe mitigation measures that are specific to each environmental, health, social or economic effect identified in the effects assessment including:
 - mitigation practices, polices and commitments that are part of the project design and that are required to achieve the predicted effects (e.g. project design elements that were accounted for in the effects assessment);
 - standard mitigation practices, policies and commitments that constitute proven technically and economically feasible mitigation measures and that are to be applied as part of standard practice;
 - any new or innovative mitigation measures being proposed.
- propose differentiated mitigation measures, if applicable, so that adverse effects do not fall disproportionately on diverse groups of people, or so they are not disadvantaged in sharing any development benefits and opportunities resulting from the project. These mitigation measures should be developed in collaboration with members of diverse groups of people who are affected by the adverse effects, as well as people in positions within these groups to maximize the diversity and depth of perspectives and understanding;
- write mitigation measures as specific commitments that clearly describe how the proponent intends to implement them and the desired outcomes. Measures are to be specific, achievable, measurable and verifiable, and described in a manner that avoids ambiguity in intent, interpretation and implementation;
- identify and describe the use and application of best available technology and best environmental practice in identifying, assessing and implementing mitigation measures;
- describe any environmental protection plan(s) for the project and, if applicable, the environmental management system through which the proponent will deliver this plan. The plan(s) must provide an overall perspective on how potentially adverse effects would be minimized and managed over time;
- identify the party responsible for the implementation of mitigation measures and the system of accountability;
- discuss the mechanisms the proponent would use to require its contractors and sub-contractors to comply with any commitments;
- describe the approach that would be taken if a mitigation measure is no longer feasible while the project is carried out;
- describe how, throughout the project's duration, the lessons learned through follow-up programs will be used to continually improve mitigation measures;
- where appropriate, describe any adaptive management plans that will be implemented to address uncertainties associated with the effectiveness of mitigation measures included in a follow-up program (see section 13.4) including:
 - identifying the expected outcomes and targets that the Adaptive Management Plan will address;

- describing the uncertainties that the Adaptive Management Plan will address;
- developing hypotheses aimed at reducing the uncertainties described above;
- describing the relevant baseline(s) for the Adaptive Management Plan;
- describing mitigation measures to be employed and alternatives.
- where components are to be decommissioned and abandoned, include planned activities to do so. Project components that may be abandoned and decommissioned during the construction or operation phases may include access roads, temporary laydown areas, aggregate extraction sites and other temporary sites;
- where appropriate, provide details regarding financial liability and compensation in place as required by regulation or company commitment in relation to decommissioning or abandonment;
- document specific suggestions raised by Indigenous groups for avoiding and, where avoidance is not possible, mitigating or otherwise accommodating the project's environmental, health, social and economic effects, including potential effects and impacts on Indigenous peoples and describe whether and how these measures will be incorporated in the project design;
- identify opportunities for enhancing positive effects, such as creation of local employment and infrastructure improvements; and
- identify other technically and economically feasible mitigation measures that were considered but are not proposed for implementation and explain why they were rejected. Justify any trade-offs between cost savings and effectiveness of the various forms of mitigation measures.

For each mitigation measure identified, the Impact Statement must:

- provide an assessment of the anticipated effectiveness and resulting residual effects;
 - to the extent possible, provide relevant information to demonstrate anticipated mitigation effectiveness, including technical information from analogous projects and projects in the region, peer-reviewed studies, and local Indigenous and community knowledge.
- describe all relevant uncertainties and assess how they could affect predicted residual effects;
- if there is little experience or some question as to the effectiveness of any measures, describe the potential risks and effects should those measures not be effective or malfunction;
- for those mitigation measures intended to address effects to the environmental, health, social and economic conditions of Indigenous peoples or impacts on rights of Indigenous peoples, provide a description of the consultation with Indigenous groups regarding the residual effects;
- assess any potentially adverse environmental effects associated with the mitigation method itself; and
- describe how disproportionate effects that were identified in the GBA Plus results were used to inform mitigation and enhancement measures.

Effects of the project that remain after the implementation of other mitigation measures may need to be offset through the implementation of compensatory measures. Where compensation measures are proposed as mitigation for residual effects on species at risk and their critical habitat, fish and fish habitat, or wetland functions, the impact assessment must provide compensation plans for review during the

impact assessment process. Guidance on the preparation of compensation plans is provided in Appendix 1 - Compensation Plans.

In addition to the general requirements above, additional requirements and recommended mitigation measures are shown in the specific mitigation sub-sections that follow. The proponent may propose measures that differ from the specific requirements and recommendations. In which case, the proponent must provide a rationale. For example, the proponent could propose measures viewed as better suited to the anticipated effects than those listed in the Guidelines.

7.6. Cumulative effects assessment

The proponent must assess the project's cumulative effects using the approach described in the Agency's guidance documents related to cumulative effects. The proponent should consult the Agency guidance [Assessing Cumulative Environmental Effects under the Canadian Environmental Assessment Act \(2012\)](#). The best practices described in this document also apply to the assessment of cumulative effects under the Act, as applicable.

Cumulative effects are defined as changes to the environment, health, social, cultural and economic conditions, as a result of the project's residual effects combined with the effects of other past, existing and reasonably foreseeable projects and physical activities. Cumulative effects may result if:

- the implementation of the project may cause residual adverse effects to the VC; and
- the same VC has been or can be affected by other past, existing or future projects or physical activities.

A cumulative effect on an environmental, health, social or economic component or an Indigenous community or the rights of Indigenous peoples may be important even if the project's incremental effects to these components by themselves are minor. Activities from the project itself that generate multiple emissions and discharges (e.g. simultaneous operations) may also need to be considered in the cumulative effects analysis to understand synergistic, compensatory, masking or additive effects.

The Impact Statement must:

- identify the VCs that will be subject to the cumulative effects assessment, including;
 - VCs for which the proponent anticipates residual effects from the project (must be considered in the cumulative effects assessment);
 - VCs identified as being of particular concern in the context of cumulative effects by the public and by Indigenous groups;
 - VCs where the predicted residual effects might not indicate the need for a cumulative effects assessment, but rely heavily on uncertain mitigation measures;
 - VCs for which cumulative effects were identified as a concern during the Planning phase, including:
 - human health (noise, air quality, etc.), GHGs, species at risk, migratory birds, fish and fish habitat (particularly the Copper Redhorse), Aboriginal and Treaty rights of each of the First

Nations involved, culturally significant and sensitive species for First Nations, and traditional First Nations activities.

- include a rationale if VCs are excluded from the cumulative effects assessment;
- identify and justify the spatial and temporal boundaries for the cumulative effect assessment for each VC selected, taking into account:
 - boundaries may differ for each VC and should not be constrained by jurisdictional boundaries;
 - spatial and temporal boundaries will generally be larger than the boundaries for the project effects alone, and may extend beyond Canada's jurisdiction;
 - temporal boundaries should account for potential effects throughout the lifecycle of the project, including decommissioning and abandonment;
 - spatial and temporal boundaries for VCs related to effects and impacts on Indigenous peoples defined in collaboration with the Indigenous groups concerned.
- identify the sources of potential cumulative effects. Specify which other projects or activities that have been or will be carried out that could have resulted or could result in effects on the selected VCs within the defined boundaries and whether those effects could interact with the residual effects of the project. Clearly explain and justify the rationale for selecting other past, existing or future projects or activities to include in the cumulative effects assessment. Project activities to be considered include, but are not limited to:
 - the Contrecoeur Port Terminal Expansion Project, the Trois-Rivières Port Facilities Expansion Project (Terminal 21), CCG's annual dredging work to maintain the depth of the ship channel, the development of the Sorel-Tracy industrial port zone, and existing and planned port terminals along the St. Lawrence River in Quebec.
- consider the results of any relevant regional studies or regional assessments;
- describe how the selection of boundaries and other past, existing or future projects or activities for cumulative effects assessment were informed by consultations with the public, Indigenous peoples, lifecycle regulators, jurisdictions, federal authorities and other participants;
- assess the cumulative effects for each selected VC;
 - the analysis must include the effects of past, existing and future projects and physical activities in combination with the residual effects of the project, taking into account how the effects may interact (additive, synergistic, compensatory, and masking effects);
 - the analysis of the effects of future projects and physical activities must include a comparison of possible future scenarios with and without the project, and must reflect the full range of cumulative effects and not just the project's contribution;
 - the effects of past and existing projects and physical activities can be used to put the current state of the VC into context, but must be included in the cumulative effects analysis;
 - cumulative effects for the same VC may need to be assessed using a hierarchy, e.g. effects on local populations of certain species and on the larger populations.

- describe technically and economically feasible mitigation measures proposed for cumulative environmental, health, social and economic effects, as well as potential impacts on the rights of Indigenous peoples, including:
 - an assessment of the effectiveness of the measures applied to mitigate the cumulative effects; and
 - in cases where measures to mitigate these effects are beyond the control of the proponent, identify any parties that have the authority to act on these measures. In such cases, the Impact Statement must summarize any commitments by the other parties regarding implementation of the necessary measures and any associated communication plans.
- assess the regional implications of applying project-specific mitigation and enhancement measures, taking into account any reasonably foreseeable development in the area; and
- develop a follow-up program to verify the accuracy of the assessment and the effectiveness of mitigation measures for cumulative effects ([see section 15 Follow-up programs](#)).

The cumulative effects assessment must include consideration of cumulative effects in relation to the ability of Indigenous peoples to exercise their rights and culture. Both the content and means of presenting this information is to be developed in consultation with each potentially impacted Indigenous group. Proponents must collaborate with Indigenous groups in assessing the cumulative effects of the project on the rights and interests of Indigenous peoples. If Indigenous groups do not wish to participate in the cumulative effects assessment, the proponent should continue sharing information and analyses with the Indigenous groups, to use reliable publicly available sources of information to support the assessment, and to document their efforts in that respect.

7.7. Extent to which effects are significant

For adverse effects within federal jurisdiction and the adverse direct or incidental effects, as defined in s.2 of the Act, the Impact Statement must:

- characterize the residual effects, even if deemed small or negligible, and cumulative effects, using criteria and language most appropriate for the effect;
- consider using the following criteria for residual effects, as appropriate:
 - magnitude;
 - geographic extent;
 - timing;
 - duration;
 - frequency;
 - reversibility; and
 - the environmental, health, social and economic context within which potential effects may occur.
- Context should be described and applied as part of the key criteria above, for example:



- the sensitivity and importance of affected aquatic and terrestrial species, including species at risk and species of importance for Indigenous peoples;
- the sensitivity and importance of affected habitats and their functions for wildlife;
- the existence of standards, guidelines, tolerance levels and other sources of information to assess effects; and
- the potential for disproportionate residual effects for diverse groups of people as per the GBA Plus.
- describe the extent to which the adverse effects within federal jurisdiction and the adverse direct or incidental effects are significant;
- describe the extent to which the adverse cumulative effects within federal jurisdiction, and the adverse direct or incidental effects, are significant;
- justify the approach and choice of criteria used to determine the extent to which the effects are significant;
- identify and explain relevant sources of information that were used to characterize the extent to which those effects are significant, including how the perspectives, concerns and tolerance levels of Indigenous groups and other participants were considered; and
- describe how the probability or likelihood of that effect occurring and the degree of scientific uncertainty related to the data and methods used in the effect assessment, where considered in determining the extent of significance.

The information provided must be clear and sufficient to enable the Agency, Indigenous groups, and other participants to evaluate the proponent's characterization of residual effects and the analysis of the extent to which effects are significant.

The best practices described in the Agency's technical guidance document [*Guidance: Describing effects and characterizing extent of significance*](#) may be considered for the characterization of residual effects in the context of the Act, as applicable.

8. Biophysical Environment

In describing effects to the biophysical environment, the Impact Statement must take an ecosystem approach that considers how the project may affect the structure and functioning of biotic and abiotic components within the ecosystem using scientific, community and Indigenous knowledge. The Impact Statement must consider the resilience of relevant species populations, communities and associated habitats to the effects of the project. Ecological processes should be evaluated for potential susceptibility to adverse effects from the project. Considerations include, but are not limited to: patterns and connectivity of habitat patches, continuation of key natural disturbance regimes, structural complexity, hydrogeological patterns, nutrient cycling, abiotic-biotic and biotic interactions, population dynamics, genetic diversity, and Indigenous knowledge relevant for the conservation and sustainable use of relevant species populations, communities and associated habitats.

The presence of endangered ecosystems, rare, limited and/or significant habitat (e.g., [federal](#), provincial, or Indigenous protected areas, wildlife sensitivity maps, [RAMSAR sites](#), identified or proposed critical habitat in recovery strategies or action plans) potentially affected by the project should be included the description of the biophysical baseline conditions. The following must be included in relevant sections of the biophysical environment both in written description and on maps:

- primary, secondary and tertiary watersheds;
- waterbodies and watercourses, including intermittent and ephemeral streams;
- wetlands;
- ecozones, ecoregions, and ecodistricts as per the province's or Canada's Ecological Landscape Classification (see [Introduction to the Ecological Land Classification \(ELC\) 2017](#)).

8.1. Meteorological environment

The Impact Statement must:

- describe the local and regional climate, in sufficient detail to highlight weather variations and characteristics of the regions affected by project activities and components, including historical records of relevant meteorological information;
- provide summary data and the reference to underlying data source, including unique weather stations identifiers for:
 - monthly mean, maximum and minimum temperatures;
 - monthly mean, maximum and minimum precipitation;
 - typical wind speed and direction, presented in the form of compass rose;

- ~~standard meteorological measurement to provide estimates of evaporation (e.g. using the Penman, Morton or Meyer Methods) or estimates of monthly (or daily) evapotranspiration. The use of the pan evaporation measurements is not recommended.~~

- provide reference to sources (and unique weather station identifiers) for hourly meteorological data (wind speed and direction, air temperature, dew point temperature or humidity, air pressure and precipitation data) from a minimum of one year to support dispersion modelling that captures the normal variability of meteorological conditions;
- describe the influence of climate change on the local and regional climate and in the risks of extreme weather events.

8.2. Geology, geochemistry and geological hazards

8.2.1. Baseline conditions

The Impact Statement must:

- describe the geomorphology, topography and geotechnical characteristics of areas proposed for construction of major project components;
 - provide the geotechnical characteristics of the sandy silt unit, particularly the plasticity index, water content, and liquid limit;
 - show that these soils are either prone to liquefaction or very little prone to liquefaction using for example the charts developed by Boulanger and Idriss (2006), and Bray and Sancio (2006).⁷
- describe the geology of the bedrock and unconsolidated sediments at an appropriate scale for the project, including a table of geological descriptions, geological maps and cross-sections at the appropriate scale;
- identify on geological maps the location of areas of bedrock outcrops that will require blasting;
- identify any geological hazards that exist in the areas planned for the project facilities and infrastructure, including:
 - history of seismic activity in the area, including induced earthquakes, and secondary effects such as the risk of landslides and liquefaction;
 - evidence of active faults;
 - isostatic rise or subsidence;

⁷ Boulanger, R. Idriss, 2006. Liquefaction susceptibility criteria for silts and clays. Journal of Geotechnical and Geoenvironmental Engineering, Vol. 132, No. 11, 1413-1426.

Bray, J.D., Sancio, R.B. 2006. Assessment of the liquefaction susceptibility of fine-grained soils. Journal of Geotechnical and Geoenvironmental Engineering, Vol. 132, No. 9, 1165-1177.



- history of landslides, slope erosion and the potential for ground and rock instability/landslides, and subsidence during and following project activities; and
- history and potential of submarine landslides;
- provide a characterization of the geochemical composition of materials to be excavated.

8.2.2. Effects to geology, geochemistry and geological hazards

The Impact Statement must describe the effects of the project on geology, geochemistry and geological hazards.

- Evaluate the potential for soil liquefaction-induced lateral spreading to cause damaging lateral stress or displacement to the piles.

8.3. Topography, soil and sediment

8.3.1. Baseline conditions

The Impact Statement must:

- describe the terrain, soils and sediments within the local and regional study areas, including sediment stratigraphy. Provide surficial geology maps and cross-sections of appropriate scale;
- describe and map landforms associated with important wildlife habitat features including elevated land forms, eskers, ridges, cliffs, rock outcrops, exposed bedrock, talus, and other karst topography caves;
- provide a description and location of any erosion-sensitive soils and areas of ground instability;
- provide maps depicting soil depth by horizon and soil order within the project area to support soil salvage and reclamation efforts, and to outline potential for soil erosion;
- describe the historical land use and the potential for contamination of soils and sediments and
- describe any known or suspected soil or sediment contamination with the study area that could be re-suspended, released or otherwise disturbed as a result of the project;
- describe baseline concentrations of contaminants of concern (these may include but are not limited to selenium, sulphate, nitrate and calcite, heavy metals) within the local, regional and downstream receiving environments.



8.3.2. Effects to Topography, soil and sediment

The Impact Statement must describe all effects of the project on topography, soil and sediment including:

- potential and likelihood of re-suspended, releasing or otherwise disturbing known or suspected soil or sediment contamination.

8.4. Atmospheric, acoustic, and visual environment

8.4.1. Baseline conditions

The Impact Statement must:

- characterize the ambient air quality in the project, local and regional study areas and identify existing emissions and contaminant sources;
- provide baseline ambient air concentrations for contaminants, in particular near key receptors (e.g. communities, traditional land users, wildlife) and quantify emission sources for the following:
 - total particulate matter;
 - particulate matter less than 2.5 microns (PM_{2.5});
 - particulate matter less than 10 microns (PM₁₀);
 - carbon monoxide (CO);
 - sulphur dioxide (SO₂);
 - nitrogen dioxide (NO₂) and nitrogen oxides (NO_x);
 - ozone (O₃);
 - volatile organic compounds (VOCs), individual or an appropriate subset;
 - polycyclic aromatic compounds, including polycyclic aromatic hydrocarbons (PAHs), alkylated PAHs, PAH transformation products, including nitro and oxy-PAHs, and dibenzothiophenes (DBTs);
 - metals;
 - any other relevant air pollutants from mobile, stationary or fugitive sources, including contaminants produced by the combustion of diesel fuel; (e.g. acetaldehydes, formaldehydes, 1,3-butadiene, acrolein, benzene, and diesel particulates (DPM)).
- compare ambient air quality results with applicable regional, provincial and federal standards. For air pollutants with standards, the comparison must use the same averaging period and the statistical format associated with each numerical value;
 - standards include: Canadian Ambient Air Quality Standards (CAAQS), National Ambient Air Quality Objectives (NAAQO), or relevant provincial standards. The proponent must refer to the new

CAAQS established by the Canadian Council of Ministers of the Environment (CCME) for PM_{2.5}, O₃, SO₂ and NO₂ in place since 2020 and which will come into effect in 2025.

- describe deposition through either existing long term, or new monitoring data for a duration of a minimum of one year;
- describe the data source(s), including data validation and quality control methods;
- identify and address issues related to the quality of the monitoring data and seasonal variability in the baseline survey and determine ambient contaminant concentrations using complete, exhaustive, and representative monitoring data, collected over an appropriate duration (multi-year) and geographic scope;
- if modelling is undertaken to understand baseline ambient air quality, then describe direct and indirect sources of baseline air emissions, including mobile, stationary and fugitive;
- provide current ambient noise levels at key receptor points (e.g. communities, traditional land users, sensitive human receptors, and wildlife), including the results of a baseline ambient noise survey and permissible noise levels for each receptor. The information on usual noise sources (natural or anthropogenic), their geographic extent and temporal variations must be included. At the time of collecting baseline data for the study on ambient noise where there are human receptors, it is recommended that the following aspects be considered:
 - natural sounds;
 - soundscapes (see [ISO 12913-1:2014. Acoustics — Soundscape — Part 1: Definition and conceptual framework](#));
 - expectations regarding quiet conditions in specific places or at specific times;
 - usual sleeping hours (the default assumption is 10 p.m. to 7 a.m.); and
 - degree of baseline annoyance attributable to existing noise sources (e.g. vehicle traffic, aircraft, other industrial noise).
- justify the selection of and provide information on all receptors affected by noise in the study area, including any foreseeable potential receptor and the distance between the receptors and the project;
- describe the locations and characteristics of the most affected receptors, including species at risk;
- for the aquatic environment, provide current underwater soundscape and vibration sources in the study area and at the project site, based on acoustic measurements. Provide information on vibration and sound sources, geographic extent and spatial and temporal variations within the water column and on the riverbed;
- describe existing ambient night-time light levels at the project site and at any other areas where project activities could have an effect on light levels;
- describe night-time illumination levels during different weather conditions and seasons; and
- describe landscapes of interest, visual screens and other components of the visual environment, and locate them on maps.

The proponent should consult the additional guidance for atmospheric environment provided in [Appendix 1 - Additional guidance for biophysical components](#)

8.4.2. Effects to the atmospheric, acoustic, and visual environment

The Impact Statement must describe the effects of the project on the atmospheric, acoustic and visual environment, including:

- provide a detailed description of emission sources of air pollutants from the project listed under [8.4.1. Baseline conditions](#).
- provide detailed methodology and assumptions used to estimate emissions of air pollutants released;
 - all relevant emission factors should be provided and referenced;
 - for all applicable emission sources, include the assumed tier of emission standard for each emission factor applied;
 - provide details of the achievement of emission standards for all mobile and stationary engines used in the project.
- use atmospheric dispersion modelling to predict the fate of emissions resulting from project-related sources and provide appropriately scaled contour map(s) plotting the predicted emissions and receptors (see [Appendix 1 – Additional guidance for biophysical components](#) for guidance on dispersion modelling);
 - determine whether the formation of secondary pollutants (pollutants which are not directly emitted but form when other primary pollutants react in the atmosphere) resulting from the project under assessment has the potential to raise concentrations above baseline levels – if so, identify and characterize these pollutants;
- provide the rationale for the choice of air quality model, including the type and magnitude of emissions, the complexity of sources, terrain and meteorology, or for why modelling is not being used to predict fate of air emissions;
- provide justification for all control efficiencies used to reduce emission rates of sources within the model, including details of all assumptions associated with the related mitigation measures that would achieve in practice the control efficiencies used in the model, and their achievability;
- assess the uncertainty in the modeled air pollutant concentrations using relevant range of model inputs. All sources of uncertainty should be taken into account, including:
 - model uncertainty, including a consideration for how uncertainty in modelled predictions may vary spatially and temporally;
 - uncertainty in baseline concentration estimates, in the estimates of meteorological inputs, and in estimates of source emissions (from sources attributable to the project, and externally).
- conduct a source contribution analysis to assess the relative contributions of project and non-project emission sources on pollutant concentrations at key receptors. The source contribution analysis should be conducted for all pollutants that exceed 10% of the value of the relevant guidance or standard. Emission sources should be grouped into appropriate categories;
- assess effects to receiving environment through:

- compare modelled air pollutant concentrations with the most stringent applicable standards, including the Canadian Ambient Air Quality Standards (CAAQS). Assessment against the CAAQS should be based on the principles of continuous improvement and keeping clean areas clean, and in the context of the Air Quality Management System airsheds and air zones;
- compare with applicable thresholds (former thresholds in Quebec or those in Ontario) for dust deposition, if applicable (consider current deposits);
- comparison with sensitive ecological receptors (consider effects thresholds of species in question);
- comparison to other appropriate existing guidelines, objectives or standards, where relevant. This includes regional and community-based air quality guidelines.
- describe changes in ambient vibration and sound levels resulting from the project for the construction and operation phases;
- where there is public concern associated with an increase in sound levels during the construction and operation phases, provide a vibration and sound impact assessment, including an overview of the concerns;
- for projects that result or may result in an increase in sound emissions during any phase of the project:
 - quantify sound levels at appropriate distances from any project facility and/or activities and describe the frequency, duration and character of sound, including the frequency spectrum;
 - provide the hourly distribution of baseline nighttime sound events compared with the individual nighttime sound events expected at each receiving location;
 - describe consultation with regulators, stakeholders, community groups, landowners and Indigenous groups about potential effects to the acoustic environment;
 - identify and justify the approach to determine the extent to which sound effects resulting from the project are adverse.
- analyze and describe changes to air quality and noise at a scale and resolution that allows the results to be applied to the assessment of interrelated VCs, including human health;
- provide a description of any changes in nighttime light levels resulting from the project;
 - quantify light levels at appropriate distances from any project facilities, including the timing (e.g. night hours), frequency, duration, distribution and character of light emissions;
 - describe the locations and characteristics of the most sensitive receptors, including species at risk and areas favoured by Indigenous peoples for the practice of traditional activities;
 - describe consultations and, where appropriate, provide a record of engagement with regulators, stakeholders, community groups, landowners and Indigenous peoples regarding potential effects on the visual environment; and
- describe any positive changes.

The proponent should refer to Health Canada's [Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise](#) and [Guidance for Evaluating Human Health Impacts in Environmental Assessment: Air Quality](#) to ensure that it provides the information and analysis considered necessary to assess the project's impacts on human health in relation to changes to the sound environment and air quality. It is requested that the proponent complete the checklists provided in these guides (Appendix B in the noise guide and Appendix A in the air quality guide) to assist participants in verifying that the main elements of a noise or air quality impact assessment have been completed and in identifying the location of this information in the Impact Statement. These checklists will facilitate the review of the Impact Statement and will be particularly useful if analyses on these aspects are found in several sections of the Impact Statement.

8.4.3 Mitigation and enhancement measures

The Impact Statement must identify mitigation measures for adverse changes to the atmospheric, acoustic and visual environment or any enhancements for positive effects.

In particular, the Impact Statement must:

- describe all methods and practices to be deployed to reduce and control emissions. If the best available technologies are not included in the project design, the proponent should provide a rationale for the technologies selected;
- document and justify how the contaminant emission reduction efficiencies were applied in the calculation of emission rates, including details of all assumptions associated with these mitigation measures and their feasibility;
- provide a description of existing and planned measures to reduce odours and dust, including a description of improvements to existing infrastructure, as applicable;
- provide a description of participation in national or regional air emission tracking and reporting programs (e.g. National Pollutant Release Inventory) or provide rationale why participation is not required;
- develop and implement strategies compliant with regional and national commitments, such as the CCME's commitment regarding pollution prevention;
- provide a noise management plan, including identification of the noise sources, common noise mitigation measures, the performance efficiency of the noise control devices, the best practices programs and the continuous improvement programs, and establish the need for follow-up monitoring for the purposes of validation of the model or due to any concern raised by participants;
- provide a lighting management plan, including the planning and management of lighting and of the ambient light for every activity site and the consideration of measures for the reduction of excessive light during construction and operation. Consider the following options of measures for lighting management:
 - avoid or minimize the use of artificial light;
 - select low-intensity lighting;

- use lighting fixtures that limit or concentrate the lighting to targeted areas and avoid light spilling out of the spaces to be illuminated;
- limit the projection of light toward the sky by using fixtures that produce dark, uniform lighting that meets actual lighting needs;
- avoid the emission of light at more than 90 degrees; and
- avoid lights that emit blue/green/white/UV wavelengths.

8.5. Groundwater and surface water

8.5.1. Baseline conditions

Requirements for the characterization of baseline groundwater and surface water conditions in an Impact Statement will vary depending on the type of project. They will be commensurate in emphasis and detail with potential effects on groundwater and on surface water. Requirements listed here are in a sequence corresponding to the steps of a generic, coupled, groundwater–surface water characterization study.

The Impact Statement must:

- describe the hydrographic and hydro-climatic context of the project site (e.g. climate patterns);
- identify the hydrologic network, including but not limited to the watershed delineation, stream courses identification and mapping;
- describe the local monitoring program and hydrologic data collection;
- quantify the existing surface water conditions including the full range of seasonal and inter-annual variations, ice cover and snow regime. This may be based on data from on-site gauging stations or from reference regional gauging stations and on the history of temporal data;
- identify and describe the water bodies and water resources potentially affected by the project;
- provide complete hydrometeorological information (temperature, precipitation, evapotranspiration), based on data from nearby weather stations or from a weather station on site;
- describe and illustrate on one or more topographic maps, at appropriate scales, the drainage basins in relation to key project components. On the map(s), identify all waterbodies and watercourses, including intermittent streams, flood risk areas, wetlands, watershed and sub-watershed boundaries, and direction of flow;
 - if applicable, indicate the intended locations of water crossing and watercourse diversions.
- provide a list of all waterbodies and watercourses (permanent, intermittent and ephemeral) that may be directly or indirectly affected by the project. Provide a table that groups waterbodies and watercourses by sub-watershed and provides the following information about each:
 - type of watercourse impacted (e.g. lotic or lentic system, lake, river, pond, temporary or permanent stream);

- size of the waterbodies and watercourses, as applicable (e.g. width at the ordinary high water mark, length or area).
- provide flow hydrographs and corresponding water levels for nearby streams and rivers showing the full range of seasonal and inter-annual variations; as well as seasonal baseflow;
 - hydrographs may be based on data from nearby gauging stations or from gauging stations on site;
 - approach used should take into account the need to provide information for use in fish habitat characterization and effects assessment in accordance with the Canadian Science Advisory Secretariat report “Framework for Assessing the Ecological Flow Requirements to Support Fisheries in Canada”.
- for each waterbody and watercourse potentially affected by the project, provide a description of ice cover, thickness and conditions and the timing of freeze-thaw cycles;
- provide for each waterbody potentially affected by the project, bathymetry, maximum and mean depths, vertical profile information, information on stratification and turnover, and sediment composition (e.g. particle size analysis and sediment quality);
- using traditional field and mapping techniques, provide a delineation and characterization of groundwater–surface water interactions, including an identification of areas of resurgence as well as groundwater-dependent ecosystems, wetlands, discharge and recharge areas that are potentially affected by the project;
- describe the surface water, ground water and sediment quality baseline characterization program, including sampling site selection and locations, monitoring duration and frequency, sampling methodology, and analytical protocol, including quality assurance and quality control measures;
 - describe the incorporation of any applicable historical data or existing information;
 - characterization program should include sampling locations within the project area, the local and regional study areas, and should include reference locations that are unlikely to be impacted by the project.
- provide baseline data for relevant physicochemical parameters and chemical constituents for surface water, groundwater and sediment quality;
 - physicochemical parameters may include temperature, pH, electrical conductivity, dissolved oxygen, turbidity, total suspended solids, total hardness, total dissolved solids;
 - relevant chemical constituents may include major and minor ions, total and dissolved trace metals, radionuclides, total mercury, methylmercury, polycyclic aromatic compounds, nutrients, organic and inorganic compounds, or other compounds of potential concern;
 - water sample collection and analysis should use appropriately sensitive detection limits and the data should illustrate the seasonal and inter-annual variability in baseline surface water quality with sufficient years of data to fully characterize natural variability, including possible variabilities due to groundwater–surface water interactions.
- describe baseline concentrations for relevant physicochemical parameters and chemical constituents in relation to applicable water quality and sediment guidelines;

- identify springs and any other potable surface water resources within the local and regional project areas and describe their current use, potential for future use, and whether their consumption has Indigenous cultural importance;
- identify domestic, communal, or municipal water wells within the local and regional areas, and provide information on their depth, distance from the project, stratigraphy, screened hydrostratigraphic unit and piezometric level and capacity, and describe their current use, potential for future use, and whether their consumption has any Indigenous cultural importance;
- identify groundwater-producing strata (coarse-grained sediments and permeable bedrock) that may be affected by the project. Where current domestic, communal, or municipal water wells access these strata, their distance from the project must also be marked and added to the map;
- provide a summary of key groundwater monitoring wells used to inform the conceptual model, and identify their location, groundwater quality information and monitoring frequency. Provide representative hydrographs showing the range of seasonal and inter-annual water level variations and indicate any spatial variation in the regional study area;
- describe the hydrostratigraphic units (aquifers, aquitards, aquicludes) of the hydrogeological environment in both bedrock and overburden and provide a piezometric map showing heads and the direction of groundwater flow;
- describe the groundwater flow boundaries of the hydrogeological environment, including groundwater divides and boundaries with surface water;
- provide the hydraulic properties of the hydrostratigraphic units, including data on hydraulic conductivity, specific storage, transmissivity, storativity, saturated thickness, porosity, and specific yield, as applicable;
- provide hydrogeological maps and cross-sections of the study area showing water table elevations, potentiometric contours, interpreted groundwater flow directions, groundwater divides and areas of recharge and discharge;
- ~~present a conceptual model of the hydrogeological environment, including a discussion of geomorphic, hydrostratigraphic, hydrologic, climatic, and anthropogenic controls on groundwater flow;~~
- ~~present a 3-dimensional numerical groundwater flow model developed for the project area based on the conceptual model of the hydrogeological environment;~~
 - ~~state limitations and assumptions in the modelling approach, including calibration methods, model validation and accuracy;~~
 - ~~calibrate the numerical model to baseline hydrogeological conditions using groundwater level and stream flow monitoring data and provide metrics and graphs describing the quality of the calibration that was achieved and discuss how spatial variability is considered in model calibration;~~
 - ~~analyse the sensitivity of key model outputs to hydraulic properties and climatic parameters such as recharge;~~

~~o using the calibrated numerical model, provide a baseline groundwater budget including baseflow discharge to wetlands, streams and rivers, recharge from lakes or streams, and any anthropogenic withdrawals.~~

- present a conceptual model for the hydrological environment, as appropriate to describe baseline conditions for surface waters (the hydrological model can be integrated with the hydrogeological model). The model should be developed to support the assessment of potential changes to water and sediment quantity and quality in rivers, streams, lakes, springs and wetlands, with input from regulators and Indigenous groups; and
- explain how baseline data was gathered, and modelling developed, at a scale and resolution that allows for the application of results about groundwater and surface water to the assessment of interrelated VCs, notably for fish, birds and other wildlife, their habitat and their health, as well as human health.

8.5.2. Effects to groundwater and surface water

The Impact Statement must:

- describe the effects of the project on surface and ground water (quality and quantity), including effects related to:
 - o project use of surface water or groundwater resources;
 - o changes to water flow;
 - o discharge of water, effluent, wastewaters or other substances to the environment;
- describe how the effects of climate change are taken into account in the evaluation of the project effects;
- quantify the extent of hydrological changes that will result from disturbances to aquifers and surface water features, taking into account climate change (see also sections [8.11 Climate change](#) and [12 Effects of the environment on the project](#)). This includes changes to the quantity or timing of surface flow, water levels, ice thickness or extent, sediment input, and channel regime in watercourses, and water levels in affected waterbodies;
- present an integrated site water balance model incorporating surface and groundwater fluxes to or from all major project components, for all project phases. Include estimates of surface water runoff rates for major project components;
- indicate the groundwater and surface water withdrawal requirements during all phases and specify:
 - o the timing, quantity and quality of water withdrawn from the environment (flow rates and annual volumes).
- present a comprehensive site water management plan for the project's life cycle including for:
 - o water inflows and outflows from project site;
 - o water diversion;
 - o process water management;



- water management within the project site.
- describe the contaminants associated with the project, their spatial and temporal locations and their potential flow paths (e.g. groundwater seepage pathways and how they relate to potential receptors). Characterize how they could affect surface and groundwater quality, including information on the source(s) of any contaminants, and their transport and fate in the hydraulic environment;
- describe the downgradient flow of groundwater affected by the project, with the use of figures showing groundwater piezometric contours and particle tracking results;
- describe the contaminant attenuation capacity within the hydrogeological units in the project area. With this input, assess the potential for off-site groundwater and surface water contamination. Alternatively, the proponent may conservatively assume no attenuation capacity, but must still describe, in detail, potential degradation products (i.e. daughter materials) that may result from attenuation and other processes during groundwater flow;
- describe the potential changes to surface water, groundwater or sediment quality related to the project including:
 - potential changes to surface water quality due to surface erosion and sedimentation, from the removal of vegetation and changes to riparian, wetland, and terrestrial environments;
 - potential changes to surface water quality due to the generation and deposition of dust and particulate matter and any contaminants they contain (such as metals, metalloids, mercury, methylmercury);
 - changes to surface water and groundwater quality due to all discharges and effluents from the project, including changes to physicochemical parameters, and relevant chemical constituents.
- compare any changes to surface or groundwater quality to applicable guidelines, objectives or standards;
- describe the quantity and quality of all effluent streams released from the site to the receiving environment, including effluent from treatment facilities, dewatering activities, seepage and surface run off from project components and site;
 - compare the quality of all effluent streams to applicable guidelines, objectives or standards to better identify possible adverse effects on the receiving environment.
- describe locations at which potential changes to water or sediment quality will be assessed, including:
 - all point and diffuse sources of discharges;
 - immediate receiving environment for any point of diffuse sources of discharges from the project;
 - at project boundary;
 - at Local Study Area boundary, and
 - at Regional Study Area boundary.
- analyze and describe changes to surface and groundwater at a scale and resolution that allows for the application of results to the assessment of interrelated VCs, notably for fish and fish habitat and human health. Carry forward the assessment of potential changes in water quality, as required in the following sections of the Guidelines.



The proponent should refer to Health Canada's [*Guidance for Evaluating Human Health Impacts in Environmental Assessment: Drinking and Recreational Water Quality*](#) to ensure that it provides the information and analysis considered necessary to assess the project's effects on human health in relation to changes to water quality. It is requested that the proponent complete the checklist provided in this guide (Appendix A) to assist participants in verifying that the main elements of a water quality Impact Assessment have been completed and in identifying the location of this information in the Impact Statement. This checklist will facilitate the review of the Impact Statement and will be particularly useful if analyses on this aspect are found in several sections of the Impact Statement.

8.5.3. Mitigation and enhancement measures

The Impact Statement must:

- describe the mitigation measures for the possible effects on the quantity and quality of surface water, groundwater and sediment, including water supply wells and provide a rationale with quantitative and qualitative evidence that explains the effectiveness of proposed measures;
- describe any applicable water quality treatment measures and provide evidence supporting the effectiveness of these measures, including predicted inflow and outflow concentrations for relevant water quality parameters;
- provide the details of mitigation measures comprised in water management plans proposed for waterbodies and watercourses likely to be affected during all phases of the project, including measures applicable to water use minimization;
- describe and justify water use for the project and the measures that will be taken to eliminate or reduce the adverse effects, including the supply and discharge of water;
- describe groundwater and surface water monitoring programs during the operations and post-closure periods including;
 - the proposed monitoring points to assess changes to surface water quality, which should include monitoring at all point and diffuse sources of discharge and in the immediate receiving environment and at the boundaries for the outer mixing zone, the project, the local study areas;
 - the parameters that will be measured, the duration and frequency of monitoring, the sampling protocol and analysis protocol and the quality assurance and quality control measures. Include the description of the measures that will be implemented if the criteria are exceeded.
- describe any specific monitoring program planned during construction, including assessment of effects before and after construction activities in order to optimize or adapt mitigation measures at the time of their application.

8.6. Vegetation, riparian and wetland environments

In order to ensure the relevance of the guidelines, the Agency proposes to remove or simplify certain requirements that are unlikely to inform decision-makers about the potential impacts of the project in areas of federal jurisdiction or to inform the public interest decision under the Impact Assessment Act. Some of these requirements will be reviewed as part of the Quebec government's environmental assessment process.

The project's host environment, the site of a former thermal power plant located in the Sorel-Tracy industrial port zone, is already heavily anthropized and is not located on federal land. With the exception of a few small natural areas (herbaceous, shrubby or arborescent), the terrestrial portion of the project site (portion located above the high water mark) is free of vegetation cover and is already occupied by a warehouse and storage areas (see Map 2 of the [Detailed Project Description](#)). Also, the wetlands present in the limited project study area are located below the high water mark and are therefore included in the fish habitat (see Map 5 of the [2021 Supplementary Study – Biophysical Environment](#)) and covered by the requirements presented in Section 8.7 (Fish and Fish Habitat) of this document.

*The Agency is considering removing the wetland-related requirements from the project's TISG that are presented in bold and strikethrough (**example**) in the draft TISG.*

~~The proponent should consult the additional guidance on wetland requirements provided in Appendix 1 – Guidance for Biophysical Components.~~

8.6.1. Baseline conditions

The Impact Statement must:

- provide a description of the biodiversity, relative abundance and distribution of vegetation species and communities of ecological, economic or human importance with the local and regional study areas of the project; including:
 - rare plant communities and communities of limited distribution;
 - old growth forests;
 - species at risk, including those listed in Schedule 1 of the SARA, provincially listed or assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) to be 'at risk', including species of concern;
 - critical habitat as described in final or draft recovery strategies or action plans for species at risk; and
 - species or communities of importance to Indigenous peoples, including for traditional, medicinal and cultural purposes.
- describe the biodiversity metrics, biotic and abiotic indicators that are used to characterize the baseline vegetation biodiversity and discuss the rationale for their selection;

- provide maps, at an appropriate scale, of the vegetation species and communities of importance within the local study area, and where available, the regional study area;
- describe the current level of both anthropogenic and natural (fire, flood, drought, etc.) disturbance associated with vegetation, including a description of level of habitat fragmentation and loss, historical and current disturbance, any proximate activities that have resulted in changes to fire regimes (e.g., fire suppression, flooding, insect infestations, etc.);
- describe any weed species, other invasive species, and introduced species of concern;
- describe the use of local vegetation for medicinal purposes, or as a source of country foods (traditional foods) and whether its consumption has any Indigenous cultural importance;
- describe the shoreline, banks, current and future flood risk areas, and **wetland**-catchment boundaries;
- quantify, describe and map riparian areas within the local and regional study area potentially affected by the project;
- **quantify, describe and map wetlands (fens, marshes, peat lands, bogs, etc.) within the local and regional study area potentially affected by the project, according to the Canadian Wetland Classification System in the context of:**
 - **wetland class, ecological community type and conservation status;**
 - **biodiversity;**
 - **wetland habitat that provides important functions for species at risk;**
 - **abundance at local, regional and provincial scales;**
 - **distribution; and**
 - **current level of disturbance.**
- **determine whether these wetlands are within a geographic area of Canada where wetland loss or degradation has reached critical levels, or considered ecologically or socially or economically important to a region;**
- **identify and map wetlands on federal lands potentially affected by the project and within the scope of federal permits, authorizations, or other approvals;**
- **identify and describe wetland capacities to perform hydrological and water quality functions, provide for wildlife and wildlife habitat or other ecological functions;**
- **provide a wetland functions assessment in accordance with the guiding principles of [Wetland Ecological Functions Assessment: An Overview of Approaches](#) or any subsequent approved guidelines by which to determine the most appropriate functions assessment methodology to use (see [Appendix 1 – Additional Guidance for Biophysical Components](#) for more guidance on conducting a wetland function assessment);**
 - **provide a rationale for the wetland functions assessment method chosen and submit complete data sets from any survey sites, including geospatial data files.**
- **determine if other wetland conservation policies, regulations or wetland compensation guidelines apply (contact provincial and/or local government authorities);**

- ~~identifier une zone d'étude locale qui tient compte de la superficie du bassin versant et de la connexité hydrologique des milieux humides situées dans la zone du projet ou traversées par celle-ci; and~~
- ~~identify a regional study area of sufficient size to capture effects to wetlands within the larger drainage area and include wetlands located outside of the local study area that may be affected by hydrological changes as a result of cumulative effects.~~

8.6.2. Effects to vegetation, riparian and wetland environments

The Impact Statement must describe the effects of the project on vegetation and the riparian ~~and wetland~~ environments, including:

- describe all potential effects due to the project, for all phases, to vegetation and to the riparian ~~and wetland~~ environments;
- describe the key indicators used to assess project effects and the sensitivity of vegetation communities, ~~wetlands~~, and riparian and terrestrial environments to disturbance, including the rationale for their selection, and their relationship to the indicators used to characterize the baseline conditions;
- describe changes related to landscape disturbance, including loss and fragmentation of habitats, alteration of riparian areas, including buffers or setbacks and project effects on areas of soil or ground instability;
- quantify the area of vegetation communities and riparian, ~~wetland~~, and terrestrial environments that may be cleared or otherwise disturbed within the study area during all phases of the project, including a description of the disturbance and consider:
 - changes in habitat ratios between the interior and periphery;
 - changes in the availability of rare habitats;
 - changes in function within the remaining vegetation ~~or wetland complex~~.
- Describe the effects on biodiversity of riparian, ~~wetland~~ and terrestrial environments, including the effects of fragmentation and changes to regional biodiversity;
- describe effects related to potential introduction of weed species or invasive species or due to the increase in the spread and prevalence of diseases or pests;
- describe any hydrological or water flow changes, either permanent or temporary, that could alter moisture regimes or drainage conditions, and describe the effects on vegetation and wetlands, including effects on fish and fish habitat, if any;
- ~~describe any changes to or loss of wetland function, including consideration of ecological (e.g. hydrological, biogeochemical cycling, habitat and climate functions) and socio-economic functions of wetlands. Describe and justify the methodology used to assess the effects;~~

- describe potential effects from project emissions that may result in contamination and acidification of nearby land and waterbodies, including consideration of the sensitivity of vegetation communities, **wetlands**, and riparian and terrestrial environments to disturbance;
- describe potential changes to riparian, **wetland** and terrestrial environments due to activities that could affect topography, soil erosion, compaction, and productivity, contamination, bank slopes and suspension of sediment or due to any contaminants of concern potentially associated with the project that could affect vegetation, soil, sediment or water;
- describe any known or suspected soil contamination within the study area that could be re-suspended, released or otherwise disturbed as a result of the project; and
- describe any positive changes.

8.6.3. Mitigation and enhancement measures

The Impact Statement must describe the mitigation measures for the potential effects on vegetation and on riparian ~~and wetland~~ environments.

In particular, the Impact Statement must:

- describe and justify the construction methods used to cross ~~wetlands and other~~ sensitive habitats, and the criteria for determination of techniques proposed for each crossing, including the locations where trenchless crossing methods will be employed;
- describe and justify the ways of avoiding or reducing the temporary or permanent adverse effects on ~~wetlands and~~ riparian habitats;
- describe and justify the width of the construction right-of-way and the permanent right-of-way, including the locations where the right-of-way will be narrowed to eliminate or reduce the adverse effects;
- describe and justify the necessity of temporary construction sites, and the considerations taken for minimizing the adverse effects, namely the location choice and management measures;
- describe and justify the proposed measures to mitigate bank erosion, including measures to eliminate the potential for erosion, such as bank stabilization using vegetation;
- describe the vegetation standards and controls that will be deployed during construction and operation of the project;
 - describe and justify the measures allowing identification of invasive species or other undesirable introduced species, avoid their propagation and control them during all phases of the project, including the necessity of preconstruction surveys to identify any high density areas;
 - identify the criteria and circumstances of application of chemical, biological or mechanical control methods as well as the relevant regulations and determine the adverse effects associated with control methods; and
 - describe the selection of plant species to be conserved and planted in order to promote vegetation communities with low natural growth.

- ~~concerning wetlands:~~
 - ~~explain how avoidance of wetlands was considered, namely by considering other locations for project components and activities;~~
 - ~~explain how mitigation measures consider the natural succession and the variability of the environment over time; and~~
 - ~~describe proposed compensation measures (see Appendix 1 – Compensation and offset plans for relevant guidance).~~
- ~~describe any reclamation and revegetation procedures proposed as mitigation measures, including:~~
 - ~~revegetation techniques and the locations where they would be implemented;~~
 - ~~selection of plant species to be maintained and planted to promote return to a natural ecosystem, including consideration for Indigenous use, during operation and upon reclamation, and integration of the reclaimed landscape with the regional landscape;~~
 - ~~seed mixes to use, the spreading rates and the location of the spreading. Native and indigenous species adapted to the local conditions should be used when the purpose of revegetation is to naturalize or regenerate the area;~~
 - ~~fertilizers that will be used, the spreading rates and the locations, the criteria for determining these technical features;~~
 - ~~seeding and planting plans, which include a description of the species to be replanted, the replanting locations and the criteria for determining these specifications;~~
 - ~~the expected timelines, from an ecological perspective, for establishment and recovery of vegetation communities and the expected differences in community composition and structure. Identify the information sources on which the predictions rely, such as evidence from peer-reviewed scientific literature;~~
 - ~~any sources of uncertainty with respect to the anticipated effectiveness of reclamation. Explain how uncertainty was taken into account in the predictions; and~~
 - ~~reclamation standards to be used to evaluate ecological equivalency of post-operation reclaimed landscapes, in consultation with Indigenous groups.~~
- describe and justify how to locate pre-existing soil or sediment contamination, and how contaminated soil will be managed if it is excavated or reused, the mitigation and monitoring measures that will be undertaken in this regard, and the applicable regulatory restoration measures.

8.7. Fish and fish habitat

The proponent should consult the additional guidance for requirements pertaining to fish and fish habitat provided in [Appendix 1 – Guidance for Biophysical Components](#).

8.7.1. Baseline conditions

The Impact Statement must:

- prepare a list of all waterbodies and watercourses (permanent and intermittent) that may be directly or indirectly affected by the project and provide:
 - type of water body or watercourse;
 - size and depths of the waterbody or watercourse;
 - streamflow types and characteristics;
 - substrate type, vegetation and anthropogenic barriers to fish.
- ~~describe primary and secondary productivity in affected water bodies with a characterization of trophic levels, biodiversity, key functional interactions and processes (e.g. food web and nutrient cycling), seasonal variability, ranges and sensitive periods and include the rationale for the selection of biodiversity metrics and indicators;~~
- for each potentially affected waterbody or watercourse frequented by fish, provide the location and area of potential and confirmed fish habitat and a detailed assessment of physical and biological habitat characteristics. Present information as maps using satellite imagery overlaid with relevant information and text description, with associated summary tables. Relevant physical and biological habitat characteristics for fish habitat include:
 - surface and ground water characteristics requested in section 8.5.1 *Baseline Conditions*;
 - baseline extent of habitat disturbance (e.g. fragmentation);
 - habitat use or suitability for fish and aquatic species present, including critical habitat and residences for species at risk, and habitat function (e.g. spawning, calving, nursery, growth, prey, invertebrate population, food availability, foraging, migration, cover habitat, thermal and overwintering habitat, etc.) and sensitive times for these activities;
 - substrate type, aquatic vegetation, riparian vegetation, bank stability, light penetration, presence of woody debris, presence of beaver dams, stream segment type (riffle, run, pool), natural or anthropogenic barriers to fish passage, and geomorphological features and processes.
- for each potentially affected waterbody or watercourse, provide a detailed description of potentially affected fish⁸ species and populations (as defined in subsection 2(1) of the *Fisheries Act*) within the freshwater environment;
 - where data is used to generate biodiversity metrics (e.g. abundance, richness, diversity, density), provide rationale on the choice of metrics based on their applicability for use in the effects assessment and associated follow-up, if applicable.

⁸ fish includes: parts of fish, shellfish, crustaceans, marine animals and any parts of shellfish, crustaceans or marine animals, and the eggs, sperm, spawn, larvae, spat and juvenile stages of fish, shellfish, crustaceans and marine animals.

- describe parameters and ecological processes relevant to predicted effects on fish and aquatic species listed above. For example, it may be necessary to establish a broader ecological baseline if the project affects a spawning area for a migratory species but does not affect the larger area, they depend on for life processes. Relevant parameters and ecological process may include: migratory patterns, food webs and trophic levels, structural and functional linkages (e.g. predator-prey interactions), life history and population dynamics, sensitive habitats and periods, behaviour or other relevant ecological processes that fish depend on to carry out their life history;
 - use either a qualitative or a quantitative approach to characterize ecological processes, as appropriate, and include a rationale to support the selected approach.
- provide a list of aquatic species⁹ at risk likely to be present, and provide the location and description of suitable or potential habitat for these species (residence and critical habitat) in or near the project study area; including:
 - provincial or territorial species at risk (specify provincial or territorial legislation or regulations);
 - species listed in Schedule 1 of *SARA*; and
 - species listed as at risk by COSEWIC.
- identify and describe the data sources used, including information on data collection (e.g. gear and catch methods, location of sampling stations, date of catches, date of surveys, species surveyed, size and life cycle stage, catch per unit effort). It is recommended that the information be presented in the form of tables;
- provide baseline measurements of contaminants in fish and aquatic species;
- describe the use of fish as country foods or for other traditional purposes, including a description of the particular species of importance and whether its consumption has cultural importance for Indigenous peoples, including medicinal use. Parts of the study area used or historically important areas for the collection of country foods must be identified and, if the Indigenous group concerned consents to such, mapped;
- provide a summary of existing studies and research on potential effects of noise and vibrations on potentially affected aquatic species, including behavioral impacts, in the freshwater environment;
- describe any existing, designated or proposed special aquatic areas such as: protected areas, species at risk critical habitat, and ecological reserves, within or in proximity to the project location or that could be affected by routine project operations; and
- identify and describe sensitive habitat areas (e.g. Ecologically and Biologically Sensitive Aquatic Areas) within the local and regional study areas and include maps that demonstrate proximity of these areas.

Certain intermittent and ephemeral watercourses or waterbodies may constitute fish habitat or contribute indirectly to fish habitat during a certain period. The absence of fish or water at the time of the survey does

⁹ aquatic species means a wildlife species that is a fish, as defined in section 2(1) of the [Fisheries Act](#).

not irrefutably indicate an absence of fish and/or fish habitat (e.g. migratory corridor). Similarly, beaver dams and accumulations of woody debris are not considered to be permanent impassable barriers to fish.

8.7.2. Effects to fish and fish habitat

The Impact Statement must describe the potential effects of the project on fish and fish habitat, as defined in subsection 2(1) of the *Fisheries Act*, and on marine plants, as defined in section 47 of the *Fisheries Act*. Consider any effects whether they are adverse or positive, direct or indirect, and temporary or permanent, for all phases of the project, including from the release of effluent or the deposit of a deleterious substance to water frequented by fish, for all developmental stages of fish, and other aquatic species. Refer to section [8.5 Groundwater and surface water](#) for related water quality requirements to inform the assessment.

For each water body and watercourse affected by the project, the following must be documented and considered in the determination of effects:

- geomorphological changes and their effects on hydrodynamic conditions and aquatic habitats (e.g. modification of substrates, dynamic imbalance, long term bank instability, silting of spawning grounds), including direct and indirect effects from habitat fragmentation;
- changes in hydrological and hydrometric conditions and their effects on aquatic habitat and life cycle activities (e.g. reproduction rearing, feeding, movements, migrations, winter refuge) and any changes to aquatic invertebrate communities;
- changes to riparian areas that could affect fish and fish habitat, aquatic species at risk and productivity;
- any alteration to accessibility or use of habitat, including residence and critical habitat of aquatic species at risk;
- changes to the primary and secondary productivity, food sources, potential imbalances in the food web and trophic levels;
- risk of fish mortality, including that associated with:
 - noise and vibrations caused by project activities in or near the aquatic environment (e.g. blasting);
 - potential introduction of aquatic invasive species, including pathogens, through project activities, including discussion of the frequency of those activities.
- potential introduction of deleterious substances (e.g. sediment, project-related contaminants);
- changes in potential contaminant levels in harvested species and their prey, with a focus on traditional foods harvested by Indigenous peoples;
- changes in access to the area and increased access to fishing; and
- any other changes resulting from the project that may affect fish and fish habitat or aquatic species at risk and their habitat.

The Impact Statement must:

- use of a [Pathways of Effects](#) approach to determine potential effects to fish and fish habitat;

- clearly describe fish habitat losses in terms of damage, destruction, and disturbances based on area, habitat type, sensitivity of habitat, and habitat importance (e.g. magnitude, intensity, and persistence). Habitat losses must be clearly located and presented on a map at appropriate scales and in a table;
- describe potential effects to fish and fish habitat based on specific life history processes, population status, resilience in the face of change, dependence on specific habitat features, or limiting ecological processes or variables;
 - include an examination of the correlation between construction periods and sensitive periods for fish (e.g. reproduction), key fisheries windows for freshwater and anadromous/catadromous species, and any potential effects due to overlapping periods.
- describe potential effects to fish from contaminants, including from bioaccumulation downstream of the project. Include a comparison of predicted water quality for all project phases at all key locations in the receiving environment to applicable water quality guidelines, site-specific objectives or benchmarks, and relevant toxicity test results (either site-specific or published), or other applicable methods. Describe potential effects from contamination on fish and other aquatic species' behaviour, distribution, abundance, and migration patterns;
- describe how the project's effects on aquatic biodiversity may contribute to changes in regional biodiversity and effects on local and regional ecosystems;
- describe potential effects on provincially, territorially or federally listed aquatic species at risk, with respect to objectives in management plans, Recovery Strategies and Action Plans, for example;
 - potential losses of individuals and relationship to population density and the resilience of populations;
 - effects on populations as a result of increased access or traffic to the area caused by the project;
 - any modifications in migration, local movements (e.g. upstream and downstream migration, and lateral movements) or stranding of fish, following the construction, operation or closure of works (e.g. physical, chemical and hydraulic barriers).
- describe potential effects on the ecosystem from introduction of aquatic invasive species, including pathogens, through project activities;
- describe potential effects on fish behaviour, distribution, abundance, migration patterns;
- describe tolerance thresholds for potential adverse effects that the Indigenous peoples have identified, and how they were considered in the assessment;
- describe any need for an *Fisheries Act* authorization and/or a *Species at Risk Act* permit and describe any consideration of Fisheries and Oceans Canada guidance documents; and
- describe any positive changes, such as habitat creation.



8.7.3. Mitigation and enhancement measures

The Impact Statement must describe the mitigation measures for the potential effects on fish and fish habitat, including:

- all standard measures, policies, and commitments regarding mitigation that constitute technical and economically feasible proven mitigation measures and that will be applied in common practice, regardless of the location, as well as any new or innovative mitigation measure proposed;
- measures to prevent or mitigate the risk of harmful alteration, disruption or destruction of fish, fish habitat, or death of fish caused by any project activity, including during the sensitive periods and in the sensitive locations (e.g. spawning and migration) for fish and other aquatic species;
- measures recommended to avoid fish mortality, for example, during use of explosives in the aquatic environment or nearby;
- measures to prevent the deposit of substances harmful to fish in the aquatic environment;
- measures for impacted riparian or aquatic environments,
- mitigation measures to be applied during hydrostatic tests, including for water withdrawal and discharge activities, if applicable;
- measures to prevent the introduction and intrusion of invasive aquatic species during work in or near the aquatic environment;
- measures and plans to offset or compensate for any loss in fish habitat as a result of the project (see Appendix 1 – *Compensation and offset plans*, for relevant guidance);
- describe how environmental protection plans will address any applicable federal and provincial policies with respect to fish habitat; and
- describe how the mitigation measures are consistent with any applicable recovery strategy, action plan or management plan.

The proponent must refer to Fisheries and Oceans Canada guidance and explain how it was applied to the assessment, including the references provided Appendix 1 - *Additional guidance under Compensation and offset plans and Fish and fish habitat*.

8.8. Birds, migratory birds and their habitat

The proponent should consult the additional guidance for requirements pertaining to birds provided in [Appendix 1 – Guidance for Biophysical Components](#).

8.8.1. Baseline conditions

The Impact Statement must:

- Provide up-to-date baseline studies that are representative of current conditions;

- identify species or groups that may be affected differently by the project and may require different mitigation measures, and where possible should not collapse data into diversity metrics or narrow focus to an indicator species;
- the following groupings should be considered as unique VCs with rationale provided where groups are not included as unique VCs:(list to be tailored to the project):
 - waterfowl;
 - aquatic birds and seabirds (other than waterfowl);
 - land birds, including songbirds;
 - birds of prey;
 - shorebirds;
 - identified species at risk under federal or provincial jurisdiction;
 - important habitats associated with species at risk.
- identify any applicable [Bird Conservation Regions \(BCRs\) and BCR strategies](#);
- describe the biodiversity¹⁰ of bird species and their habitats that are found or are likely to be found in the local and regional study areas;
- identify the biodiversity metrics, and the biotic and abiotic indicators that are used to characterize the baseline avifauna biodiversity and discuss the rationale for their selection;
- identify bird species, communities, or groups that use the study areas at any time of the year that are likely to be directly or indirectly affected and describe their:
 - abundance (including relative abundance in each type of habitat) and population status;
 - distribution;
 - life cycle;
 - seasonal ranges, migration, movements;
 - frequency and timing of occurrence;
 - habitat association(s) and requirements for all relevant life cycle stages; and
 - sensitive periods (e.g. seasonal, time of day).
- provide an estimate of year-round bird use of the area (e.g. winter, spring migration, breeding season, fall migration), based on data from existing sources and surveys to provide current field data if required to generate reliable estimates. In each portion of the year, estimation of the use of the area by birds must account for differences in species movements including: winter usage of highly habitat reliant species and highly mobile species that will accurately characterize the use of a site;

¹⁰ A description of biodiversity can include the species or communities found, abundance, density, species richness and evenness, species distribution within the study area; their ecological role or position in food webs, their ecological or population health (e.g. breeding status, population trends, movement, habitat availability or connectivity, reproductive status or health, food availability or limitations)

- identify, and show on maps, areas of concentration of migratory birds, including sites used for, breeding, feeding, wintering, resting, staging and migrating;
- describe the habitat and habitat features found in the study areas that are associated with the presence of those bird species that are likely to be affected, based on the best available existing information (e.g. land cover types, vegetation, marine elements) (can refer to information provided in previous sections). Provide maps showing the location of identified habitat and habitat features associated with the presence of those bird species that are likely to be affected;
 - should there be anticipated displacement of nesting birds, baseline habitat data should provide evidence that there is enough equivalent habitat for birds to be displaced to and that the habitat being removed is not unique to the project study area or region;
- describe the current degree of disturbance to vegetation and wildlife, including habitat fragmentation and the extent of human access and use;
- describe natural disturbance regimes and their sources (e.g., fire, flooding, drought, disease, insects and other pests, etc.);
- for avian species at risk, locate on an appropriately scaled map the potential habitats, survey locations, records of the species, residences and critical habitat, except where locations and records are considered sensitive information;
 - identify any and all federal Species at risk and/or Critical Habitat in the study area;
 - identify any species assessed as being at risk by the Committee on the Status of Endangered Wildlife in Canada;
 - identify any provincial Species at risk;
 - identify any sites that are likely to be sensitive locations and habitat for birds or environmentally significant areas. These include national parks, areas of natural or scientific Interest, migratory bird sanctuaries or other priority areas or sanctuaries for birds, ecological reserves, established or proposed sanctuaries or protected areas, national wildlife areas or world biosphere reserves, UNESCO natural world heritage sites, areas under consideration for designation or study, and aquatic ecologically and biologically significant areas;
 - illustrate on the map the project's footprint, identifying temporary and permanent infrastructure;
 - locate the highest concentrations or areas of use by species.
- describe the use of (magnitude, timing) birds as a source of country foods (traditional foods) and whether consumption has Indigenous cultural importance;
- describe the source of the baseline data, data collection methods, and provide a rationale for any modelling approaches chosen and describe how local and Indigenous knowledge was integrated. The baseline data must be sufficient to account for natural variability in populations and have been collected by well designed studies (see Appendix 1 - *Guidance for Biophysical Components* for more guidance on collecting baseline data); and
- where predictive modelling is required, provide the explanatory data (e.g. covariables such as associated land cover) required to predict effects on birds (e.g. changes in abundance, distribution or other relevant effects) collected in such a way as to represent the following sources of variation



where applicable: spatial variation in land cover composition, soil type, geomorphology, hydrological processes, and inter-annual and intra-annual climate variability.

8.8.2. Effects to birds, migratory birds and their habitat

The Impact Statement must:

- describe the interaction between the project and birds, migratory birds, and their habitat, for all phases, including from:
 - site preparation, vegetation removal, particularly of habitats important for nesting, foraging, staging, overwintering or that act as movement corridors;
 - deposit of harmful substances in waters that are frequented by birds and changes to water quality;
 - changes to the aquatic flow regime and sediment load;
 - the construction and operation of ponds containing liquids or substances harmful to birds;
 - construction and operation of structures, including power transmission and distribution lines;
 - changes to the atmospheric, acoustic, and visual environment (e.g. noise, vibration, lighting, air emissions and dust);
 - site reclamation; and
 - any project activities that may occur during critical periods and/or restricted activity periods for migratory and non-migratory birds, including species at risk.
- describe the key indicators used to evaluate the effects of the project and the sensitivity of bird communities to disturbances, including a rationale for their selection and their relationship with the indicators used to characterize the baseline conditions;
- describe the potential effects of the project on migratory and non-migratory birds, their nest and eggs, including, but not limited to, from:
 - short- and long-term changes to habitats important for nesting, (including forests, riparian areas, wetlands, and open waters), foraging, staging, overwintering, rearing, and moulting, and to movement corridors between habitat, and from habitat loss, fragmentation and structural change. Any assumptions regarding temporary or permanent relocation should be justified using scientific evidence that there is available habitat to allow relocation under a variety of population scenarios. For example, it should be clear that a growing population will not be limited by habitat loss in the study area;
 - changes in food sources in terms of types, quality, quantity, availability, distribution and function, including short term and long term changes;
 - changes to bird-habitat relationships; the change in biodiversity, abundance, and density of the avian community that utilise the various habitat types or ecosystems;
 - changes to mortality risk, including as a result of collision of birds (migratory and non-migratory) with project infrastructure, buildings, flaring gas, overhead lines, vessels and vehicles, as a result

- of light attraction and from indirect effects, such as increased movement of predators or access to hunting;
- increased disturbance (e.g. sound, artificial light, presence of workers) considering the critical periods for the birds, including breeding, migration and overwintering;
- describe the activities most likely to result in disturbance, injury, or take of birds (migratory and non-migratory), their nests and eggs, such as vegetation clearing, increased noise from industrial machinery; indicate the time windows for these activities; the amount, duration, frequency, and timing of disruptions; and whether or not the impact of those activities would be permanent or non-permanent in the environment; and
- contaminants and bioaccumulation of contaminants, including those that may be consumed by Indigenous peoples.
- analyze the predicted effects for (1) migratory birds, (2) non-migratory birds, (3) each VC, including each species at risk and (4) priority BCR species. Include separate analyses for each activity, component and project phase;
- If an assumption of temporary relocation is made during project activity phases, support the assumption with scientific evidence that there is available habitat in the local or regional study area to allow for relocation under various population scenarios, supported by monitoring in the applicable study areas as the project progresses. For example, it should be clear that an increasing population will not be limited by habitat loss (direct or indirect due to sensorial deviation) in the study area.

The proponent should refer to the Government of Canada's guidance on this topic, including:

- [Avoiding harm to migratory birds.](#)
- [A framework for the scientific assessment of potential project impacts on bird](#)
- [Migratory birds environmental assessment guideline](#)

8.8.3. Mitigations and enhancement measures

The Impact Statement must:

- describe the measures to mitigate adverse effects to migratory and non-migratory birds and their habitat, including their eggs and nests;
- describe the measures to prevent and mitigate the risk of harmful, destructive or disruptive activities during sensitive periods and in sensitive locations (e.g. breeding bird season, migration and nesting) for birds, their nests and their eggs, or areas frequented by birds, such as avoiding lights at night during key migration peaks, avoiding excessive loud noises, vibration or blasting during breeding season;
- demonstrate how the proponent considered the timing of vegetation removal and construction to be outside the main breeding season;
- describe measures to mitigate sensory disturbance and the functional habitat loss it may cause;
- describe measures for preventing the release of harmful substances in water or in areas frequented by migratory birds;

- describe the deterrent systems that will be used to mitigate impacts on birds due to, for example, the attractiveness of the project site and/or the components and activities associated with the project.

The proponent should refer to the [Guidelines to reduce risk to migratory birds](#) and to the [General nesting periods for migratory birds](#), which provide estimates of the main nesting periods for migratory birds and provide advice on reducing the risk of taking their nests or eggs. This recommendation does not authorize the disruption, destruction, or taking of a migratory bird, its nest, or its eggs outside these periods.

~~8.9. Terrestrial wildlife and wildlife habitat~~

In order to ensure the relevance of the guidelines, the Agency proposes to remove or simplify certain requirements that are unlikely to inform decision-makers about the potential impacts of the project in areas of federal jurisdiction or to inform the public interest decision under the Impact Assessment Act. Some of these requirements will be reviewed as part of the Quebec government's environmental assessment process.

*The Agency is considering removing from the project guidelines section 8.9 which is presented in bold and strikethrough (**example**) in the draft TISG. Where the requirements of section 8.9 were not already present in sections 8.8 (Birds, Migratory Birds and their Habitat) and 8.10 (Species at Risk and their Habitat), they have been added to the latter. The purpose of this approach is to focus the requirements of the TISG on migratory birds and status wildlife species.*

The proponent should consult the additional guidance for requirements pertaining to wildlife provided in [Appendix 1 – Guidance for biophysical components](#).

~~8.9.1. Baseline conditions~~

The Impact Statement must:

- ~~describe and map the biodiversity¹¹ of terrestrial wildlife species (amphibians, reptiles, mammals) and wildlife habitats that are found or are likely to be found in the study area;~~
- ~~identify wildlife species, other than avian species, of ecological, economic or human importance, within the study area, that are likely to be directly or indirectly affected and describe each species:~~
 - ~~distribution and location;~~
 - ~~abundance and population status;~~

¹¹ A description of biodiversity can include the species or communities found, abundance, density, species richness and evenness, species distribution within the study area; their ecological role or position in food webs, their ecological or population health (e.g. breeding status, population trends, movement, habitat availability or connectivity, reproductive status or health, food availability or limitations)

- ~~life cycle;~~
- ~~known residences;~~
- ~~seasonal ranges, migration and movements;~~
- ~~habitat requirements;~~
- ~~sensitive periods (e.g. seasonal, diurnal and nocturnal); and~~
- ~~provide a map showing the highest concentrations or areas of use by species, and differentiating between federal and non-federal lands.~~
- ~~identify the metrics and biotic and abiotic indicators that are used to characterize the baseline conditions (e.g. population size, recruitment rates, etc.) and discuss the rationale for their selection;~~
- ~~describe the use of wildlife as a source of country foods (traditional foods) and whether its consumption has Indigenous cultural use and value, including for medicinal purposes;~~
- ~~describe the use and harvesting of fur-bearing species and whether its harvesting has Indigenous cultural use and value;~~
- ~~describe, quantify and show on maps the habitat type for animal species, including its: function; location; suitability; structure; diversity; relative use, natural inter-annual and seasonal variability, and; abundance as it existed before project construction;~~
- ~~describe any locations within the study area that might constitute sensitive areas for terrestrial wildlife, and show on maps, such as:~~
 - ~~species at risk critical habitat that has been designated or is under consideration;~~
 - ~~ecological reserves; wildlife management areas, established or proposed sanctuaries and protected areas, in proximity to the project location or that could be affected by routine project operations;~~
 - ~~any lands in the study area that might constitute sensitive areas and habitat for wildlife;~~
 - ~~nearby environmentally significant areas such as; National Parks, areas of natural or scientific interest, National Wildlife Areas, World Biosphere Reserves or UNESCO Natural World Heritage Sites; and areas under consideration or study for such designation.~~
- ~~identify and describe any invasive species, introduced species of concern; and other species that may be considered as “weed species” in the project’s context;~~
- ~~describe the levels of disturbance currently affecting wildlife and wildlife habitat, such as habitat fragmentation and the extent of human access and use;~~
- ~~describe the natural disturbance regimes and their sources (e.g. fire, floods, droughts, diseases, insects and other pests, etc.); and~~
- ~~describe the source of the baseline data, data collection methods, and provide a rationale for any modelling approaches chosen, and describe how community and Indigenous knowledge was incorporated. (see [Appendix 1 – Additional Guidance for Biophysical Components](#) for more guidance on collecting baseline data).~~

8.9.2. ~~Effects to terrestrial wildlife and their habitat~~

The Impact Statement must:

- ~~describe the potential effects of the project on wildlife and wildlife habitat, including population level, regional or local sub-population effects, including, but not limited to:

 - ~~site preparation, vegetation removal, particularly of habitats important for breeding, overwintering or that act as movement corridors;~~
 - ~~noise, light and sensory disturbances;~~
 - ~~water and air emissions or dust;~~
 - ~~bioaccumulation of contaminants in wildlife;~~
 - ~~habitat loss and fragmentation;~~
 - ~~introduction of invasive species;~~
 - ~~altered predator-prey relations, such as increased wildlife predation;~~
 - ~~increased access by hunters; and~~
 - ~~increase in the spread and prevalence of diseases and other health concerns.~~~~
- ~~describe and quantify, where possible, the potential effects to wildlife, including acute and chronic effects to wildlife health, of changes to air and water quality (e.g. from contaminants, effluents, atmospheric emissions, dust deposition, and bioaccumulation);~~
- ~~describe and assess the resilience and recovery capabilities of wildlife populations and habitats to disturbance, including the anticipated potential for the project area to be returned to its existing state with respect to wildlife populations and their habitat following operations;~~
- ~~describe the potential adverse effects of the project on species noted as important to Indigenous groups and local communities, and their habitat;~~
- ~~describe and take into account the tolerance thresholds for potential adverse effects that Indigenous groups have identified; and~~
- ~~describe changes to important habitat for species important to current use of lands and resources for traditional purposes.~~

The provincial government(s) should be considered a source of information on appropriate methodologies to predict impacts to terrestrial wildlife.

8.9.3. ~~Mitigation and enhancement measures~~

The Impact Statement must describe the measures for mitigating potential effects on terrestrial wildlife and wildlife habitat, including:

- ~~describe all feasible measures to avoid or lessen potential adverse effects to wildlife and their habitat, including residences and critical habitat. Include a description of the measures in terms of the effectiveness of each measure in avoiding negative effects;~~

- ~~provide the best technically and economically feasible approaches for mitigating effects on habitat, aligned with the hierarchy of mitigation measures, and justify moving from one mitigation option to another;~~
- ~~describe and explain the condition in which the temporary construction areas and right of way will be restored or maintained following construction, and explain the mitigation measures considered including possible revegetation, obstruction of the sightline, restoration of wildlife corridors and habitat connectivity, reduction of fragmentation and reduction of long-term cumulative effects;~~
- ~~describe the deterrent systems that will be used to mitigate impacts to wildlife and species at risk due to, for instance, attraction to the project site and/or components and activities associated with the project;~~
- ~~describe measures to prevent the release of harmful substances into waters or areas frequented or occupied by wildlife;~~
- ~~describe measures to address sensory disturbance and the resulting functional loss of wildlife habitat;~~
- ~~provide details of any compensation or offsetting plans proposed following guidance in Appendix 1 – *Compensation and offset plans* and available guidance documents, if effects cannot be otherwise avoided or mitigated; and~~
- ~~describe mitigation measures applicable to wildlife habitat and other biodiversity metrics that will be implemented through reclamation, including timelines and targets that will be used to assess effectiveness.~~

8.10. Species at Risk and their habitat

The proponent should consult the additional guidance for requirements pertaining to Species at Risk provided in [Appendix 1 - *Guidance for biophysical components*](#).

8.10.1. Baseline conditions

The Impact Statement must:

- provide up-to-date baseline studies that are representative of current conditions;
- consider each species at risk as a valued component, or justify the choice of a different approach;
- provide a list of all species at risk that are likely to be in the project area and the study area, including:
 - species listed in Schedule 1 of the federal *Species at Risk Act*;
 - species protected under provincial legislation, and
 - species assessed by COSEWIC as extirpated, endangered, threatened or of special concern. It is recommended to refer to the most recent COSEWIC annual report for the list of assessed wildlife species posted on its website.



- for each species at risk identify in the list above:
 - describe abundance (including relative abundance in each habitat type), population status, and distribution;
 - describe habitat requirements;
 - describe, quantify, and map wildlife habitat type, including function, location, suitability, structure, diversity, relative use, natural seasonal and inter-annual variability, and abundance prior to project construction.
- describe all locations in the study area that may be sensitive areas for species at risk, and indicate them on maps, e.g.:
 - residences and critical habitat for endangered species that has been designated or is under review;
 - established or proposed ecological reserves, wildlife management areas, sanctuaries, and protected areas in the vicinity of the project site or that may be affected by ongoing project activities;
 - neighbouring environmentally significant areas such as national parks, areas of natural or scientific interest, national wildlife areas, world biosphere reserves or UNESCO natural world heritage sites, and areas under consideration for designation;
 - areas of seasonal concentration of wildlife (e.g., amphibian breeding ponds in woodlands, mature forest stands, animal movement corridors);
 - provide a map showing survey sites, species sighting records, the areas of highest concentration or areas of use;
 - describe the current degree of disturbance to vegetation and wildlife, including habitat fragmentation and the extent of human access and use;
 - describe natural disturbance regimes and their sources (e.g., fire, flooding, drought, disease, insects, and other pests);
 - describe the general life history (e.g. breeding, foraging) that may occur in the project area, or be affected by the project);
 - identify critical periods (e.g. denning, rutting, spawning, calving, breeding, roosting), setback distances, or other restrictions related to these species.
- Identify the metrics and biotic and abiotic indicators used to characterize baseline conditions (e.g., population size, recruitment rate) and present a rationale for their selection;
- provide any published studies that describe the regional importance (including economic), abundance and distribution of species at risk, including recovery strategies or plans;
- describe the source of the Species at Risk baseline data, data collection methods, sampling protocols, and data handling, and provide a rationale for the chosen modelling approaches;
 - when using recognized standards, provide details of any modifications to the recommended methods and rationale for these modifications;

- indicate who was consulted in the development of the baseline surveys (e.g. federal/provincial wildlife experts, specialists and local Indigenous groups); and
- describe how community and Indigenous knowledge was incorporated.

See [Appendix 1 – Additional Guidance for Biophysical Components](#) for more guidance on collecting baseline data. The proponent should contact provincial or local government authorities to determine additional data sources and survey methods. A permit under the *Species at Risk Act* must be obtained prior to conducting surveys on federal lands that are likely to harm, harass, capture or kill species at risk other than migratory birds.

8.10.2. Effects to species at risk and their habitat

The Impact Statement must:

- describe the potential effects of the project on species at risk listed under Schedule 1 of the *Species at Risk Act*, and its critical habitat (including its extent, availability and presence of biophysical attributes). The analysis of potential effects should be provided separately for each species at risk, including separate analyses for each activity, component and phase of the project;
- describe the potential effects of the project on species protected by provincial legislation and on species assessed by the COSEWIC as extirpated, endangered, threatened or of special concern (flora and fauna), as well as on the potential habitat of these species that are not currently listed under the *Species at Risk Act*. Each of these species should be considered separately as a VC;
- describe the impacts of changes to the environment caused by the project on the above species (federally and provincially listed species and species recommended for listing by COSEWIC), their regional or local populations and sub-populations, potential habitat, and, where applicable, critical habitat, associated with, but not limited to, the following:
 - site preparation, vegetation removal, particularly in habitats important for breeding or wintering, or that serve as travel corridors;
 - noise, light, and sensory disturbance;
 - water, effluents, air emissions, and dust;
 - bioaccumulation of contaminants in wildlife;
 - habitat loss and fragmentation;
 - introduction of invasive species;
 - altered predator-prey relationships, such as increased wildlife predation;
 - increased access for hunters;
 - increased spread and prevalence of disease and other health problems;
 - any new access roads, pipelines, power lines, or rights-of-way with respect to the risk of species mortality and movement patterns.

- describe and assess the resiliency and recovery capabilities of wildlife populations and habitats to disturbance, including the anticipated potential for the project area to return to its current state with respect to wildlife populations and their habitats following operations;
- clearly identify the locations of federal and non-federal lands within the study area and differentiate between them in the presentation of information regarding species at risk;
- identify provincial, territorial or federal permits or authorizations that may be required in relation to the species at risk, and describe discussions with the appropriate authority regarding permits or authorizations;
- describe the area, biophysical attributes and location of habitat including critical habitat affected (e.g., destroyed, permanently altered, disrupted), including direct and indirect effects due to vibration and artificial light in the project area on usage patterns and migratory behaviour of species at risk; and
- describe the residual effects that are likely to result from the project after avoidance and minimization measures have been applied, including the extent, duration and magnitude of the effects on:
 - number of individuals killed, harmed, harassed;
 - number of residences damaged or destroyed; and
- describe and take into account the tolerance thresholds for potential adverse effects that Indigenous groups have identified.

The provincial government(s) should be considered a source of information on appropriate methodologies to predict impacts to wildlife species at risk. With respect to effects on bird species at risk, the information required is presented in section [8.8 Birds, migratory birds and their habitat](#).

8.10.3. Mitigation and enhancements measures

The Impact Statement must describe the measures for mitigating potential effects on species at risk and their habitat, including:

- describe the proposed mitigation measures for potential adverse effects on species at risk, their residences and critical habitat, include the justification, based on scientific data, for the proposed measures;
- provide an account of how the project and mitigation measures are consistent with the recovery strategy, action plan, or management plan for the species. Mitigation measures must be compatible with any applicable recovery strategy and action or management plan and be described in terms of the effectiveness of each measure in avoiding negative effects;
- describe mitigation measures to reduce the risk of harmful, destructive or disruptive activities in sensitive times and places of importance to species at risk;
- describe measures to prevent the release of harmful substances into waters or areas frequented or occupied by species at risk;
- provide mitigation measures for effects on habitat, aligned with the hierarchy of mitigation measures and justify moving from one mitigation option to another;



- describe and justify the condition in which temporary construction areas and the right of way will be restored or maintained after construction, and explain mitigation measures considered such as possible revegetation, restoration of wildlife corridors and habitat connectivity, reduction of fragmentation, and reduction of long-term cumulative effects;
- describe measures to prevent the release of deleterious substances into waters or areas frequented or occupied by federally and provincially listed species and species recommended for listing by COSEWIC;
- describe measures to address sensory disturbance and the resulting loss of functional habitat for these species;
- describe the deterrent systems that will be used to mitigate impacts on these species due to, for example, the attraction of the project site and/or project components and activities; and
- provide details of proposed compensation measures or plans as outlined in Appendix 1 – Compensation Plans and available guidance documents, if the effects cannot otherwise be avoided or mitigated.

With respect to bats:

- describe the effectiveness of the mitigation measures, taking into account the configuration of the resources in the environment and how local bat populations use these resources;
- describe how bat behaviour (differentiated by species) has been taken into account, based on the geographical location and time period; and
- at minimum, the following mitigation measures should be implemented:
 - spatial avoidance:
 - a buffer zone of 120 m is recommended;
 - for resting areas and nurseries in trees, apply a buffer zone to all roosting sites (including maternity roosts);
 - temporal avoidance (timing of disruption, destruction of resting areas or exclusion):
 - avoid disruption, destruction, and exclusion between April 30 and September 1;
 - lighting:
 - avoid or minimize the use of artificial light in bat habitats;
 - select low-intensity lighting;
 - use lighting fixtures that restrict or focus illumination to target areas;
 - avoid lights that emit blue/green/white/UV wavelengths.
 - follow the [Canadian National White-nose Syndrome Decontamination Protocol for entering bat hibernacula](#) (Canadian Wildlife Health Cooperative); and
 - other compensation.

8.11. Climate Change

The following requirements are based on the [Strategic Assessment of Climate Change](#) (SACC), developed by Environment and Climate Change Canada (ECCC). The SACC provides guidance on climate change requirements during the impact assessment process. More details are provided in the [Draft Technical Guide Related to the Strategic Assessment of Climate Change: Guidance on Quantification of Net Greenhouse Gas \(GHG\) Emissions, Impact on Carbon Sinks, Mitigation Measures, Net-Zero Plan and Upstream GHG Assessment](#) (hereafter “the technical guidance”), released in August 2021.

8.11.1. GHG emission

With regards to GHG emissions, the Impact Statement must provide:

- a description of each of the project’s main GHG emission sources and their estimated annual GHG emissions over the lifetime of the project;
- net GHG emissions by year for each phase of the project based on a project’s maximum throughput or capacity (for more information, refer to Section 2.1 of the technical guide);
- each term of Equation 1 (Net GHG emissions = Direct GHG emissions + Acquired energy GHG emissions - Avoided domestic GHG emissions - Offset credits), per year for each phase of the project (for more information, refer to Section 2.1 of the technical guide);
- when applicable, emissions intensity (Equation 4 of the technical guide) for each year of the operation phase of the project (for more information, refer to Section 2.1.5 of the technical guide);
- when applicable, the quantity and a description of the “units produced” used in Equation 2 for each year of the operation phase of the project (refer to Section 2.1.5 of the technical guide);
- methodology, data, emission factors and assumptions used to quantify each element of the net GHG emissions (refer to Section 3.1.1 of the SACC and to Section 2 of the technical guide);
- a discussion on the development of emissions estimates and uncertainty assessment (refer to Section 3.3 of the SACC); and
- when applicable, a description of large sources of GHG emissions that may be the consequence of accidents or malfunctions.

With respect to carbon sinks, the impact statement must provide a qualitative and quantitative description of the project’s positive or negative impacts on carbon sinks, as outlined in Section 5.1.2 of the SACC. Additional guidance on the methodology for estimating losses of or increases in carbon sinks is provided in Section 4 of the Technical Guide.

The impact statement must also provide any mitigation measures planned to restore disturbed carbon sinks, as described in Section 3.4.3 of the Technical Guide. With regard to upstream emissions (*applicable for projects with upstream GHG emissions likely greater than or equal to the thresholds outlined in Table 1 in Section 3.2.2 of the SACC*), the impact statement must provide an assessment of the GHG emissions upstream of the project, as described in section 3.2 of the SACC.

8.11.2. Impact of the project on federal emissions reduction efforts and on global GHG emissions

With respect to the impact of the project on federal efforts to reduce emissions and on global GHG emissions, the impact statement must include an explanation of how the project may impact Canada's efforts to reduce GHG emissions, as well as a discussion of how the project may impact global GHG emissions, if applicable. Additional information is provided in section 5.1.3 of the SACC.

8.11.3. Mitigations for climate change and greenhouse gas emissions

With respect to mitigation measures and the plan to achieve net-zero emissions, the impact assessment must include a determination of best available technologies and best environmental practices (BAT/BEP), as described in section 3.2 of the Technical Guide. This BAT/BEP determination process will evaluate potential mitigation measures throughout all phases of the project with an emphasis on reducing absolute net GHG emissions as early as possible in the life of the project, as described in section 5.1.4 of the SACC. Additional guidance is provided in sections 3.4.1 and 3.4.2 of the Technical Guide.

The proponent must also provide a credible plan for achieving carbon neutrality that would use and build upon the BAT/BEP determination process, describing the mitigation measures that will be taken to minimize GHG emissions during all phases of the project and achieve carbon neutrality by 2050, as described in section 5.3 of the CCSR. The plan to achieve carbon neutrality must follow the principles and include the required information described in sections 3.5.1 and 3.5.2 of the Technical Guide respectively.

8.12. Fluvial environment and fluvial geohazards

8.12.1. Baseline conditions

The Impact Statement must:

- describe seasonal water quality (e.g. water temperature, turbidity, hydrocarbons, total suspended solids and pH);
- provide a description of fluvial geology, geomorphology and geohazards including:
 - bottom sediment type, competence, thickness, grain size;
 - ice scours, gas-charged sediments, gas hydrates, sediment diapirs, fluid escape features.
- describe aquatic physical process;
- describe the historical aquatic area and near shore use and the potential for contamination of waters and sediments;
- describe existing and proposed shipping routes within the local and regional areas;

- describe the physical, chemical and potential toxicological nature of any known or suspected sediment or soil contamination within the study area that could be re-suspended, released or otherwise disturbed as a result of the project;
- provide surface and subsurface current patterns, current velocities, waves, storm surges, longshore drift processes, in proximity to the site, and along the marine shipping routes with consideration of predicted climate change effects;
- describe zones of erosion and deposition;
- provide bathymetric information for the study area and along marine shipping routes if applicable;
- describe ice climate in the regional and local study area, including ice formation and thickness, ridging, breakup and movement;
- describe ice conditions along the marine shipping routes with consideration of predicted climate change and its possible effect on ice formation in the future;
- provide a characterization and mapping of sensitive shorelines in all areas that may be of risk of shoreline oiling resulting from a potential accident or malfunction. ECCC's established characterization criteria contained with [A Field Guide to Oil Spill Response on Marine Shorelines](#) is a useful guide.

8.12.2. Effects on the aquatic environment

The Impact Statement must describe all the interactions between the project and the aquatic environment, including:

- describe the physical effects to the aquatic environment, including changes to:
 - water and sediment quality and characteristics (temperature, chemical composition, nutrients, turbidity), limnological conditions, etc.;
 - changes to bathymetry;
 - changes to the aquatic ecosystem, including effects to biodiversity;
 - changes to the aquatic resources and habitat;
 - changes caused by ship traffic; and
 - changes in ice conditions, formation, flow, and movement for any new structures associated with the project.
- describe the sources, quantities and frequency of project-related emissions and discharges to the aquatic environment from vessels or submerged infrastructures. This should include, but not be limited to, discharges of ballast water, grey water, sewage, food waste, deck wash, muds and drill cuttings resulting from all phases of the project or any accidental spills of any kind;
- for aquatic projects that require dredging activities or disposal at sea or causing resuspension of sediments, provide a description of:
 - the location of these activities (including a bathymetric chart of the area);
 - local conditions, including seasonal flow currents that inform sediment transport;



- the sediments that are resuspended (e.g. quantities, particle size) and are based on a sampling program representative of site conditions;
 - chemical characterization of sediment quality where there is a risk of contamination;
 - the proposed location of disposal activity (including a bathymetric chart of area) and supporting rationale for a preferred disposal site along with alternatives considered;
 - how disposal is to be conducted along with alternatives considered;
 - predicted dispersion and deposition of sediments over time for any activity where sediments are resuspended, using scientifically acceptable techniques, including dispersion modeling where appropriate. Such predictions would include attention to suspended solids in the water column or turbidity, and to short and long-term accumulation of material on the waterbed along with contaminant concentrations; and
 - route, duration, and number of trips between the dredging site and open water disposal site(s) along with equipment employed.
- describe the effects to the use of the aquatic environment;
 - describe how seawalls, jetties, groins, breakwaters, navigation channels, deepening, inlet formation, and sand removal by mining affect longshore currents or littoral drift that move sediment downdrift along the beach and contribute to shoreline retreat, deposition updrift and erosion downdrift.

8.12.3. Mitigation Measures

The impact statement must:

- describe the mitigation measures for the potential effects on the aquatic environment.



9. Health, Social and Economic Conditions

9.1. Health conditions

9.1.1. Baseline conditions

The Impact Statement must describe the current state of physical, mental and social well-being and incorporate a determinants of health approach to move beyond biophysical health considerations. In line with the World Health Organization's (WHO) expanded definition of health, a determinants of health approach recognizes that health is more than the absence of disease but rather a state of physical, mental, and social well-being.

The Impact Statement must, at a minimum:

- be sufficient to provide an understanding of the initial state of human health. The focus should be on state of vulnerability and/or resilience of communities that may be affected;
- identify the determinants of health that may be affected by the project and describe the pathways of effect;
- provide a comparison of data at the provincial, regional, or national level, if possible, to better interpret baseline conditions. Include only relevant background information that can be linked to the targeted determinants;
- identify the area where these determinants of health might be affected. Include only relevant background information that can be linked to the targeted determinants;
- describe how community and Indigenous knowledge from relevant populations was used in establishing baseline conditions, including input from diverse groups of people; and
- describe baseline conditions using disaggregated data for diverse groups of people and their different access to resources, opportunities and services within the community to support GBA Plus.

To understand the community context and baseline health profile, including for Indigenous communities, the Impact Statement must, at a minimum:

- develop community health profiles that reflect the overall health of each community, where information is available, and other community-relevant health information;
 - use, where known, secondary information sources (e.g. Public Health Agency of Canada, Statistics Canada, Indigenous Services Canada, Indigenous health authorities, provincial health authorities).
- describe any context-specific definitions of health and well-being, including from the perspective of the relevant Indigenous cultures and local communities;

- describe relevant community and Indigenous history or context, including historical impacts on health;
- describe the baseline information for determinants of health that may be relevant to the project, including social and economic conditions as outlined in [sections 9.2. Social Conditions and 9.3. Economic conditions](#);
- describe the determinants of health selected specifically for Indigenous communities, including for diverse groups of people within them;
- document and describe the relevant protection factors that contribute to community well-being and resilience (e.g. sense of belonging, cultural continuity, language, family supports);
- provide the approximate location on a map and distance of likely human receptors, including foreseeable future receptors and sensitive areas (e.g., schools, hospitals), which could be affected by changes in air, water, country food quality, and noise and light levels. Include communities' gathering, hunting, trapping and fishing areas, including for Indigenous peoples, temporary residences (e.g. Indigenous cottages and camps identified in collaboration with Indigenous peoples) and sensitive receptors (e.g. schools, hospitals, community centres, retirement complexes, health care centres) near the project;
- describe and characterize the existing health services and programs, including health care provider capacity;
- describe drinking water sources, both surface and/or groundwater (permanent, seasonal, periodic or temporary), including approximate wellhead capture zones and the distance from project activities;
- describe the consumption of country foods (traditional foods) as a health-related behaviour, including what species are used, quantities, frequency, harvesting locations and how the data were collected (e.g. area-specific consumption surveys, First Nations Food, Nutrition and Environment Study);
 - Country foods refer to all foods that do not come from commercial systems. It includes all food that is trapped, fished, hunted, harvested or grown for subsistence or medicinal purposes or has Indigenous cultural value.
- provide baseline contaminant concentrations in ambient air, drinking water and tissues of traditional foods consumed by Indigenous groups and local communities. The proponent should work with local Indigenous groups to collect tissue samples where appropriate;
- describe the level of food security and food sovereignty within local and Indigenous communities. Refer to the [Public Health Agency of Canada's website on food security](#) and to the First Nations Food, Nutrition & Environment Study for more information; and
- provide a summary of identified data and explain the selection of methods for statistical analysis of available data, including identifying uncertainties and limitations of proposed methods and available data. If surrogate data from reference sites are used rather than project site-specific measurements, demonstrate how the data are representative of site conditions.

Guidance for developing the appropriate baseline information relevant to human health is identified in [Appendix 2 – Human Health](#). The proponent should refer to the Health Canada guides to ensure that best practices are followed in collecting baseline information for assessment of the project's impacts on human health caused by changes in air quality, noise levels, the quality of drinking water and water used for recreational purposes, traditional foods and the multiple contaminant exposure routes. The proponent must



justify any omission or deviation from the recommended baseline characterization approaches and methods, including the Health Canada guidelines. Baseline conditions need to be described using disaggregated data for various population groups (e.g., Indigenous people, women, youth, and seniors) to support GBA Plus.

9.1.2. Effects to health conditions

The proponent must assess the potential effects of the project on human health. Describe interconnections between the project and determinants of health, as well as the interactions between them, according to the pathways identified in Section 9.1.1. Applying a determinants of health approach in the assessment of human health effects will support the identification of these linkages as well as of disproportionate effects across diverse groups of people.

The assessment should show an understanding of the project's health, social, and economic impacts, including on Indigenous peoples, and play a role in understanding the project's impacts on rights and culture. The proponent should refer to the Agency guidance on [Analyzing Health, Social and Economic Effects under the Impact Assessment Act](#) and to Guidance from Health Canada regarding Human Health Impacts and the best practices for the conduct of Health Impact Assessment in [Appendix 2 – Human Health](#).

The Impact Statement must:

- apply a Human Health Impact Assessment approach, including consideration of determinants of health;
- describe any potential effects of the project on health resulting from changes to biophysical and social determinants of health;
- describe how community and Indigenous knowledge was used in assessing human health effects; and
- apply GBA Plus across all health effects and document how potential effects or changes to human health conditions could be different for diverse groups of people.

9.1.3. Biophysical determinants of health

The Impact Statement must:

- provide an assessment of the potential effects on human health in consideration of, but not limited to, potential changes in:
 - air quality - As recommended in the [Air Quality Guidance Document](#) (refer to the Health Canada Guidance Document in Appendix 2). Note that air quality criteria and guidelines should not be considered as thresholds below which health effects do not occur, particularly for non-threshold substances.
 - noise exposure. For this purpose, it is recommended to use human health–based criteria such as sleep disturbance or percentage of people severely disturbed, taking into account the existing

- background noise (baseline + project). For more details, please refer to Health Canada's guide: [Noise](#) (see Appendix 2);
- effects of vibration;
 - light levels;
 - current and future availability and quality of country foods (traditional foods); and
 - current and future availability and quality of water for drinking, recreational and cultural uses.
- determine the anticipated effects of the project on the quality and quantity of groundwater or surface water used for domestic purposes based on the strictest guideline values for the following criteria: [Guidelines for Canadian Drinking Water Quality \(GCDWQ\)](#), or any relevant provincial water quality standards or guidelines;
 - describe how contaminants related to the project that can potentially end up in the water, air, or soil (e.g. arsenic, cadmium, lead, mercury) can be absorbed in country foods (particularly foods harvested from the St. Lawrence River);
 - provide a rationale if the proponent determines that an assessment of the potential for contamination of country foods is not required;
 - identify other potential routes of exposure to contaminants;
 - provide a detailed justification for every contaminant of potential concern (COPC¹²) or exposure route that would be excluded and/or eliminated from the assessment;
 - if a Human Health Risk Assessment (HHRA) is conducted, the assessment must examine all exposure pathways for contaminants of potential concern to adequately characterize potential biophysical risks to human health. A multimedia HHRA may need to be considered and conducted for any contaminant of potential concern with an identified risk and multiple pathways. Use best practices in health risk assessment methods (see Health Canada, 2019. [Guidance for Assessing Human Health Impacts in Environmental Assessments: Human Health Risk Assessment](#));
 - provide an assessment of the carcinogenicity of diesel exhaust gases when diesel engines are a source of air pollutant emissions for the project. In characterizing the carcinogenic risk of project-related diesel exhaust gases, the proponent has two options:
 - carry out a quantitative risk assessment using the new approach recently developed by Health Canada based on the relationship between ambient exposure to PM_{2.5} and lung cancer risk in the

¹² COPC: Any chemical substance for which the concentration in an environmental medium is likely to be high due to the project's activities may first be considered as a COPC. However, if it is established that the sum of the modelled concentrations and the background concentrations is below the guidelines, standards or criteria - based on health protection - for the affected area, the statement of the problem stage of the risk assessment may conclude that it is unnecessary to treat this chemical substance as a COPC in a quantitative risk assessment.

Canadian population (Health Canada, 2022).¹³ This quantitative assessment is considered appropriate for characterizing the cancer risk associated with diesel emissions given their contribution to ambient PM_{2.5} for most projects in Canada and the fact that the carcinogenicity of diesel exhaust has generally been assessed on the basis of the inhalable fraction of particles (Health Canada, 2016; IARC 2013).^{14, 15} A concrete example of the risk calculation based on this new approach is available upon request; or

- provide a qualitative risk assessment of the carcinogenic risk of diesel exhaust gases related to the project, which includes three different elements to ensure transparency:
 - identification of the main sources of diesel emissions for the project and acknowledgement of the relative importance of diesel emissions as a source of air pollution for the project;
 - acknowledgement that diesel emissions have been labelled a human carcinogen by international authorities such as Health Canada, WHO's International Agency for Research on Cancer, the U.S. Environmental Protection Agency and the California Environmental Protection Agency; and
 - if applicable, the reason why a quantitative assessment of the carcinogenic risk of diesel emissions for the project is not being done.
- ~~describe and quantify potential effects to mental and social well-being (e.g. stress, depression, anxiety, sense of safety);~~
- if an HHRA is conducted, describe and quantify specific thresholds used for the HHRA and document if different thresholds were considered for diverse groups of people, including by sex and age. Provide a justification if any applicable threshold was not used;
- document and take into account tolerance thresholds for potential adverse effects on health identified by Indigenous peoples;
- in situations where project related air, water or noise emissions meet local, provincial, territorial or federal guidelines, and yet public concerns were raised regarding human health effects, provide a description of the public concerns and how they were or are to be addressed;
- with regard to potential effects on food security:

¹³ Health Canada. 2022. Cancer du poumon et PM_{2.5} ambiantes au Canada: revue systématique et méta-analyse. https://publications.gc.ca/collections/collection_2022/sc-hc/H144-98-2022-fra.pdf

¹⁴ Health Canada, 2016. Evaluation des risques pour la santé humaine des gaz d'échappement des moteurs diesels. https://publications.gc.ca/collections/collection_2016/sc-hc/H129-60-2016-fra.pdf

¹⁵ International Agency for Research on Cancer (IARC). 2013. IARC monographs on the evaluation of carcinogenic risks to humans. Volume 109. Outdoor air pollution. <https://publications.iarc.fr/Book-And-Report-Series/Iarc-Monographs-On-The-Identification-Of-Carcinogenic-Hazards-To-Humans/Outdoor-Air-Pollution-2015>

- describe changes in terms of availability, use, consumption and quality of country foods (traditional foods), and the potential effects related to these changes on physical and mental health of communities, including for Indigenous peoples¹⁶;
- identify possibilities of avoidance of certain country food sources or drinking or recreational water sources by the Indigenous peoples due to the perception of contamination.
- describe any project-related changes that could result in a positive health effect (e.g. remediation projects).

9.1.4. Social determinants of health

The Impact Statement must:

- describe the potential health effects arising from the effects on social and economic VCs, and their respective indicators, reflecting the input of the affected communities;
- identify and describe anticipated changes to determinants of health that may be related to the project, for example:
 - ~~housing availability, home value, housing affordability and home ownership;~~
 - ~~demographic information on the region, including available descriptive statistics (e.g. age, ethnicity, sex and gender, language);~~
 - ~~access to health and social services;~~
 - access to green spaces, parks and recreational facilities;
 - community cohesion;
 - ~~average income and wage inequality;~~
 - ~~education level;~~
 - factors supporting mental health and community well-being; and
 - safety of diverse groups of people.
- identify any emotional or social stress factor that may result from the project, particularly:
 - concerns regarding public safety raised by the construction or by the risk of accidents or malfunctions related to project operations; and
 - disturbance of normal daily activities.
- ~~describe the effects that temporary work camps have on the safety of women and girls;~~
- ~~describe potential effects on access to social and health services, including the increased use of health services and related social services in the relevant communities;~~

¹⁶ Refer to: Health Canada, [Eating Well with Canada's Food Guide - First Nations, Inuit and Métis](#)

- indicate the potential health effects, short-term or long-term, resulting from changes on community cohesion and perception of well-being during the construction phase, and determine whether those effects would change again during the operation phase;
- describe how potential avoidance of land near project components by Indigenous peoples due to perceived changes in environmental quality and tranquillity was considered in assessing potential effects on the diet and health of Indigenous peoples;
- document and take into account tolerance thresholds for potential adverse effects identified by Indigenous peoples; and
- describe any positive health effects (e.g. resulting from improved economic opportunities, increased access to services).

9.1.5. Mitigation and enhancement measures

The Impact Statement must describe the proposed mitigation and enhancement measures for any potential effects on human health.

In particular, the Impact Statement must:

- describe the mitigation and enhancement measures proposed separately for Indigenous peoples and for each Indigenous community;
- if the level of emissions from a particular project or effluent discharge is below or at the applicable limits, identify if additional mitigation measures will still be considered. However, if the change may be substantial (even within established limits) as a result of local or regional circumstances or the extent of the change, the proponent must provide additional mitigation measures to minimize pollution and risks to human health;
- when potential effects on human health exist due to exposure to a non-threshold contaminant (e.g. certain air pollutants such as fine particulate matter and nitrogen dioxide, as well as arsenic and lead in drinking water), describe mitigation measures aimed at reducing residual effects to as low a level as reasonably possible; and
- identify mitigation and enhancement measures presented in other sections that are also applicable to health and well-being effects.

The proponent is encouraged to refer to the National Collaborating Centre for Healthy Public Policy's publication entitled [*Tools and approaches for assessing and supporting public health action on the social determinants of health and health equity*](#).

9.2. Social conditions

In order to ensure the relevance of the guidelines, the Agency proposes to remove or simplify certain requirements that are unlikely to inform decision-makers about the potential impacts of the project in areas of federal jurisdiction or to inform the public interest decision under the Impact Assessment Act. Some of



these requirements will be reviewed as part of the Quebec government's environmental assessment process.

*The Agency is considering removing some of the requirements in Sections 9.2. and 9.3. from the draft TISG. These requirements are shown in bold and strikethrough (**example**) in the draft TISG.*

9.2.1. Baseline conditions

The Impact Statement must describe the existing social conditions for individual communities and Indigenous groups.

The Impact Statement must:

- be sufficiently detailed and focused to provide a comprehensive understanding of the current state of each VC, including relevant trends;
- provide a comparison of data at the provincial, regional or national level, if possible, to better interpret baseline conditions;
- identify the social area of influence of the project;
- describe how community and Indigenous knowledge from relevant populations was used in establishing baseline conditions, including input from diverse groups of people; and
- describe baseline conditions using disaggregated data for diverse groups of people (e.g. women, youth, and elders) and their different access to resources, opportunities and services within the community to support GBA Plus.

9.2.1.1. Community profile

To understand the community context, the Impact Statement must prepare community profile(s) and describe:

- influences on community well-being (e.g. increased road traffic in the project area, reduced opportunities for leisure activities), including indicators proposed by Indigenous groups;
- ~~community cohesion, including level of support and engagement in community or neighbourhood, social networks and social activities;~~
- the psychosocial environment and its influence on community well-being;
- the socio-cultural environment of Indigenous peoples;
- demographic characteristics and major socio-cultural values and concerns of the population;
- ~~access, ownership and use of resources (e.g. land tenure, minerals, food, water, social infrastructure);~~
- ~~capacity (currently available or planned) of institutions to deliver public services and infrastructure;~~
- relevant historical community background; and
- applicable history with previous developers.



9.2.1.2. Land and resource use

The Impact Statement must describe baseline conditions for land and resource use, including:

- describe general patterns of human occupancy and of land resource use in the study area based on selected spatial and temporal boundaries (include maps, if possible);
- identify and take into account relevant local, regional, or provincial land use or resource development plans;
- describe sites or areas that are used by local people and Indigenous (include a map, if possible);
- identify remote, rural and urban residential areas (including seasonally and year-round occupied establishments), lands in a reserve within the meaning of subsection 2(1) of the *Indian Act*, Indigenous peoples and Indigenous traditional and/or treaty territories;
- identify parks and recreation areas (including local and provincial/territorial parks and recognized scenic areas);
- ~~identify monitored or administered forest areas (including forests under agreement and areas designated for timber sales);~~
- identify registered or recognized hunting, trapping or guiding areas, recreational and commercial fishing areas, preferred harvesting areas;
- identify water supplies and water lots, as well as water sources and intakes for farms, industries, residents and municipalities; and
- describe the natural and cultural heritage, and provide maps for buildings, sites and things of historical, archaeological, paleontological or architectural significance in the study area, including land, natural features and resources considered to be heritage.

9.2.1.3. Services and infrastructure

The Impact Statement must describe the existing local and regional infrastructure facilities in the study area, including:

- road infrastructure and traffic safety;
- railways;
- ferries and marine terminals;
- airports;
- pipelines, water mains and sewer lines;
- power lines;
- utilities; and
- any other potentially affected infrastructure and transportation routes.

The Impact Statement must describe the existing local and regional services in the study area, including:



- ~~accommodation and lodging (e.g. affordability, availability, suitability), including camping facilities;~~
- public transportation;
- recreation and parks;
- waste disposal near the port terminal;
- ~~educational services, facilities and daycare;~~
- ~~elder care and services;~~
- ~~existing health services and programs, including health providers capacity;~~
- ~~ambulance services;~~
- ~~police and fire departments;~~
- ~~social services; and~~
- all other potentially affected services.

9.2.1.4. Navigation

The Impact Statement must describe baseline conditions for navigation, including:

- identify and describe existing navigable waterways, and all their uses;
- describe the effect of the new facilities on existing navigation (construction and operation phases);
- provide a list of potentially affected waterway users and concerns regarding waterway use and access.

9.2.2. Effects to social conditions

The Impact Statement must assess the adverse and positive effects of the project on social conditions. Interconnections between social VCs and other VCs and interactions between effects must be described.

As applicable to the assessment, the analysis should describe the goals of local or regional land use plans or local or regional development plans and the extent to which the project is aligned with such plans to avoid or enhance social effects. The effects assessment should explore and discuss opportunities by which benefits to local communities can be enhanced.

The proponent should refer to the Agency guidance on [Analyzing Health, Social and Economic Effects under the Impact Assessment Act](#).

9.2.2.1. Effects to community well-being

The Impact Statement must:

- assess potential adverse and positive effects, at the community level, of changes to social conditions including, but not limited to:
 - ~~food security;~~

- ~~income inequity;~~
- ~~housing prices and availability;~~
- ~~changes that result from increased population (temporary or permanent) or increased cost of living;~~
 - non-commercial/trade economy;
 - those conditions considered for analysis of determinants of health in section 9.1.2.
- describe, at the community level, the expected interactions between the project's construction, operation and maintenance workforce and local communities, businesses and residents;
- ~~describe in-and-out migration effects, including changes in population;~~
- identify whether social divisions might be intensified as a result of a project;
- ~~evaluate effects on access, ownership and use of resources (e.g. land tenure, minerals, food, water, social infrastructure);~~
- ~~describe any anticipated effects to language, including changes to the availability of services in English, French, and local languages;~~
- consider the potential for stresses on community;
- ~~describe potential effects related to greater propagation of sexually transmitted infections and gender-based violence (e.g. harassment or human trafficking);~~
- document and take into account tolerance thresholds for potential adverse effects identified by Indigenous peoples;
- describe how community and Indigenous knowledge was used in assessing community well-being;
- describe any positive effects on well-being (e.g. resulting from improved economic opportunities, increased access to services); and
- apply GBA Plus within the information related to community well-being and document how potential effects of changes to community well-being could be different for diverse groups of people, including Indigenous peoples or other relevant subgroups (e.g. women, youth, elders).

9.2.2.2. Effects to land and resource use

The Impact Statement must:

- describe the potential interactions of the designated project with local and regional land use and resource activities, including adverse and positive effects to:
 - residential land use;
 - ~~forestry and logging operations;~~
 - commercial outfitters;
 - agriculture, including predicted effects to livestock health and productivity;
 - water supplies and water lots, as well as water sources and intakes for agricultural operations, industries, residents and municipalities; and

- other land uses.
- describe predicted effects to recreation (e.g. hunting, fishing, hiking, wildlife viewing, aesthetic enjoyment) by the community and Indigenous groups, including effects to:
 - access to the resources;
 - quantity and quality of the resources; and
 - overall experience when undertaking recreational and tourism activities, including noise effects.
- describe potential effects arising from the changes made to the visual and acoustic landscapes, including to visual and acoustic landscapes identified by Indigenous peoples;
- describe the losses of land use and aquatic environment associated with the security buffer zones applicable to the project;
- determine the anticipated effects of the project on the quality and quantity of groundwater or surface water used for recreational purposes;
- evaluate the potential effects of changes to heritage and to structures, sites, or things of historical, archaeological, paleontological or architectural significance to communities, including:
 - loss or destruction of physical and cultural heritage;
 - change in access to physical and cultural heritage;
 - changes to the cultural value, spirituality, or importance accorded to physical and cultural heritage;
 - changes to places, objects or things that are sacred, ceremonial or culturally significant, languages, histories and traditions;
 - changes in visual aesthetics during the life of the project and after decommissioning or abandonment of the project.
- provide copies of correspondence with provincial, territorial or Indigenous authorities responsible for heritage resources containing their comments on the heritage resource assessment and proposed mitigation measures;
- describe the results of consultation and engagement activities with communities having heritage resource concerns in the project area and indicate the involvement of community members in related studies, if applicable;
- on lands under provincial jurisdiction, project activities that could disturb the soil on the surface or undergrounds should comply with relevant provincial legislation and regulation.

Changes to heritage, structures, sites or things of historical, archaeological, paleontological or architectural significance specific to Indigenous peoples can be found in section [10. Indigenous Peoples](#).

9.2.2.3. Effects to services and infrastructure

The Impact Statement must:

- describe the predicted effects to the local and regional infrastructure facilities and services in the study area, including adverse and positive effects to:
 - ~~housing (e.g. affordability, availability, appropriateness), including camping facilities;~~

- ~~educational services, facilities and day care;~~
- access to green spaces, recreation and parks;
- ~~police and firefighting;~~
- ~~ambulance and health care services; including elder care and services;~~
- ~~mental health and social services;~~
- road infrastructure and traffic safety;
- transportation infrastructure (railways, ferries and marine terminals, airports);
- pipelines, water mains and sewer lines;
- waste disposal, especially in the residential area near the port;
- energy infrastructure, including generating facilities, power lines;
- telecommunications; and
- other utilities.
- take into account potential effects arising from a higher risk of accidents for each phase of the project, (e.g. a higher risk of impact on the road system and emergency services during the construction phase due to an increased use of roads); and
- describe any need for government and/or proponent expenditures for new or expanded services, facilities or infrastructure, arising out of project-related effects.

9.2.2.4. Navigation

The Impact Statement must:

- describe navigable waterways that could be impacted by the project, and specify the proposed crossing method;
- describe ancillary project components that will be constructed in, on, under, over, through or across navigable waterways to support the project, and specify the proposed crossing method;
- describe potentially affected waterway users and describe consultation with waterway users and Indigenous groups regarding navigational use, issues raised and how issues were addressed; and
- describe project effects to navigation and navigation safety.

9.2.3. Mitigation and enhancement measures

The Impact Statement must describe the mitigation and enhancement measures that will be implemented for all potential effects on social VCs. In particular, the Impact Statement must:

- identify opportunities to enhance positive impacts, such as improving infrastructure;
- take into account local and regional land use and development plans where applicable mitigation or enhancement measures are proposed; and

- describe mitigation measures considered for heritage and structures, sites, and things of significance, as well as contingency plans and communications plans in the event of such discoveries during construction.

9.3. Economic conditions

In order to ensure the relevance of the guidelines, the Agency proposes to remove or simplify certain requirements that are unlikely to inform decision-makers about the potential impacts of the project in areas of federal jurisdiction or to inform the public interest decision under the Impact Assessment Act. Some of these requirements will be reviewed as part of the Quebec government's environmental assessment process.

The Agency is considering removing some of the requirements in Sections 9.2. and 9.3. from the draft TISG. These requirements are shown in bold and strikethrough (~~example~~) in the draft TISG.

9.3.1. ~~Baseline conditions~~

The Impact Statement must describe the local and regional economic conditions and trends, including for Indigenous communities, including the following:

- demographic features of the local and regional population;
- prevalent economic concerns and economic aspirations of residents, families and workers in the study area;
- any local, provincial, or federal economic development plans for the study area;
- existing employment rates and economic well-being in the study area and impacted communities;
- workforce, including the availability of skilled and unskilled workers, existing working conditions, wages and average salary range, full-time and part-time employment and training and gender gaps such as for skilled trades and in wages and qualifications;
- ~~local and regional workforce development and training plans, including those specific for Indigenous people;~~
- describe the main economic activities in the study area;
- an overview of the businesses that may provide supplies and services required for the project;
- describe the current use of land and water bodies for economic activities in the study area including a description of hunting, recreational and commercial fishing (including catch rates, visitation rates, and angling days), trapping, outdoor recreation, use of seasonal cabins, outfitters, and forestry;
- describe commercial fisheries, including species fished (along with catch rates and fishing days), number of licences, value of fisheries;

- describe baseline conditions using disaggregated data for diverse groups of people (e.g. women, youth, and elders) and their different access to resources, opportunities and services within the community to support GBA Plus.

9.3.2. Effects to economic conditions

The Impact Statement must describe potential positive and adverse effects to the local, regional and provincial economies. The assessment of economic effects should take into consideration the temporal scale for construction, operation and beyond and the potential for boom-and-bust cycles associated with the project. The proponent should refer to the Agency guidance on [Analyzing Health, Social and Economic Effects under the Impact Assessment Act](#).

9.3.2.1. Employment

The Impact Statement must;

- describe the potential changes in employment including the following aspects:
 - an estimate of the direct, indirect and induced employment at each phase of the project (including an estimate of the full-time equivalent (FTE) employment during the operations phase of the project and an estimate of full- and part-time employment);
 - an estimate of direct, indirect or induced income or wages;
 - a description of the types of employment likely to be in demand;
 - an estimate of the ability of the local and regional labour market to meet demand;
 - an analysis of the potential for labour shortages in certain sectors as a result of after the project;
 - **a description of the plans and the justification for hiring of temporary workers to make up for any local shortage of labour and skills;**
 - **a description of the situations where the project may cause the displacement of local workers;**
 - **any potential long term changes to the local and regional labour markets as a result of this project;**
- **describe potential changes in training, including;**
 - **training programs to improve employment opportunities for local and Indigenous residents;**
 - **the potential economic effects of project-related training.**
- describe the GBA Plus aspects of employment, including;
 - the potential effects on employment for women, Indigenous peoples and other diverse groups of people;
 - if applicable, any actions that will be taken to increase the employment of Indigenous peoples, women and other diverse groups of people in the project, including training programs;
 - the project's diversity and inclusion workforce plans, policies and practices.



9.3.2.2. Business environment and local economy

The Impact Statement must:

- set out the investment in the project for each phase and the total investment, including detailed forecast of capital and operating costs;
- describe, if applicable, any actions to increase procurement from local or regional businesses, and from businesses owned by Indigenous peoples, women, or other diverse groups of people;
- describe any economic benefit agreements concluded with local communities or Indigenous groups;
- provide an estimate of the anticipated levels of local and regional economic participation in the project in comparison to the total project requirements (e.g., total dollar value of contracts), as well as for Indigenous groups;
- describe the effects of the project on the local economy overall, including
 - an estimate and description of direct, indirect and induced economic effects of the project in the short and long term;
 - the sources and methodologies used for developing multipliers and estimates and, where a generic multiplier may not accurately reflect the specific situation of the project, provide evidence of specific economic activity that will result from the project going ahead.
- describe situations when the project may directly or indirectly create economic hardships or the displacement of businesses;
- ~~estimate the potential effects of the project on the traditional economy, including the potential loss of related jobs;~~
- describe the potential effects of changes to economic conditions for specific sectors in affected communities, including Indigenous communities, for example, to:
 - ~~forestry and logging operations, including the recovery of wood cut during the construction phase;~~
 - ~~fishing, hunting, and trapping;~~
 - ~~commercial outfitters;~~
 - commercial recreation and tourism;
 - ~~agriculture, including predicted effects to crops and livestock health and productivity.~~
- describe the potential effects of changes to land and resources used in local economic activity;
- evaluate the net economic benefits to the economy as a whole, including;
 - a quantitative evaluation of effects on local, regional, provincial, territorial, federal government or Indigenous peoples revenues from tax levies, royalties, revenue sharing and other means for each phase of the project;
 - discuss how the project would affect the gross domestic product at provincial and potentially federal levels (if appropriate);



- a description of any new technology, process or other intellectual property that might be developed as part of this project, and any potential economic benefits to Canada.
- provide information on the economic viability of the project, to support the net benefits assessment, including, but not limited to:
 - sensitivity analysis pertaining to key aspects of the project, including, but not limited to, discount rates, prices, capital and operating costs;
 - details on the financial liability and compensation relating to the proponent's commitments for the decommissioning or abandonment of the project; and
 - discussion of environmental, social, and governance risks to project economics, including the cost of capital.

The assessment of economic effects should apply GBA Plus to describe the circumstances in which diverse groups of people could suffer more adverse effects or receive fewer benefits related to the Project. The economic information provided will be made publicly available and should not contain confidential business information

9.3.3. Mitigation and enhancement measures

The Impact Statement must describe the mitigation and enhancement measures that will be implemented for all potential effects on economic conditions:

- identify and describe opportunities for enhancing positive effects, such as creation of local employment for diverse groups of people, including Indigenous communities, including :
- describe plans, programs and policies to encourage contracting and procurement opportunities for local and regional businesses and Indigenous peoples;
- where appropriate, provide details regarding financial liability and compensation in place as required by regulation or the proponent's commitments in relation to decommissioning or abandonment; and
- describe and justify the need for compensation plans to mitigate potential effects on social and economic VCs related to Indigenous peoples.



10. Indigenous peoples

The Impact Statement must provide information on how the project may affect Indigenous peoples, as informed by the Indigenous group(s) involved in the assessment. The proponent should apply Agency guidance on engaging with Indigenous groups and appropriate methodologies for assessing potential effects and impacts on Indigenous peoples and their rights as identified by Indigenous peoples.

The assessment of potential effects must include both adverse and positive effects to the current use of lands and resources for traditional purposes, to physical and cultural heritage, to structures, sites or things of historical, archaeological, paleontological or architectural significance, and to environmental, health, social, cultural and economic conditions of Indigenous peoples affected by the project.

Proponents must engage with Indigenous groups, in order to identify and understand the potential impacts of their projects on Indigenous peoples and their rights, and to incorporate Indigenous knowledge into the impact assessment. Indigenous VCs may be holistic in nature and may encompass the effects on a number of individual environmental, health, social or economic value components. Where holistic VCs are identified, the proponent must combine the analysis of individual VC into an assessment of the holistic VCs identified by Indigenous groups.

However, Indigenous VCs may be holistic in nature and may encompass effects on a number of individual environmental, health, social, or economic valued components. Where holistic VCs are identified, the proponent must combine the analysis of an individual VC with the assessment of the holistic VCs identified by the Indigenous groups.

Engagement with Indigenous groups is also required to identify proposed measures to avoid, minimize, and if avoidance is not possible, offset or otherwise accommodate for potential impacts on Indigenous peoples or their rights. This engagement may also identify potential positive outcomes, including enhancement measures that could improve the underlying baseline conditions that support the exercise of rights. Ideally, the project will be designed to minimize negative effects and to maximize positive impact on the quality of life of Indigenous peoples.

Engagement with Indigenous groups must involve ongoing information sharing and collaboration with the proponent to help validate the information and assessment findings in the Impact Statement. In cases where a specific study addressing elements relevant to the impact assessment of the project has been prepared by an Indigenous group, the proponent must incorporate it into the Impact Statement and explain how it was taken into account. In addition, the proponent must append the full studies, as they were presented by each Indigenous group. Where information or studies shared by Indigenous groups are not included, the proponent should indicate this and provide a rationale for the exclusion, except in cases where the information could be confidential in nature.

The proponent must provide an opportunity for Indigenous groups to review the information and the impact statement prior to submission of the Impact Statement. When the information is about an Indigenous group, they must be afforded the opportunity to comment on the information in the Impact Statement and their comments should be included. The Impact Statement must indicate where input from Indigenous



groups has been incorporated, including Indigenous knowledge. If comments are not included, the proponent must indicate this and provide a rationale. To the extent possible, information should be specific to the individual Indigenous group(s) involved in the assessment, and describe contextual information about the members within an Indigenous group (e.g. women, men, 2SLGBTQI+ communities, elders, and youth).

The proponent is also encouraged to work with Indigenous groups who demonstrate an interest in drafting sections of the Impact Statement that concern them, including sections describing Indigenous knowledge, on the subject of current use of lands and resources for traditional purposes, on potential impacts to the rights of Indigenous peoples, and for the identification of mitigation or enhancement measures. Where applicable, sections of the Impact Statement prepared by Indigenous groups must be clearly identified. All perspectives and the rationale for different conclusions should be documented in the assessment report.

Where Indigenous groups do not wish to participate, the proponent should continue sharing information and analysis with the Indigenous groups of the potential effects of the project, to document its efforts in that respect, and to use available public sources of information to support the assessment.

10.1. Indigenous physical and cultural heritage, and structures, sites or things of significance

10.1.1. Baseline conditions

The Impact Statement must include a description of the baseline conditions associated with physical and cultural heritage and structure, site or thing of significance for Indigenous peoples. This description should give consideration to an understanding of the historical baseline conditions associated with ability to transmit culture (e.g. through language, ceremonies, harvesting, teaching of sacred laws, traditional laws, stewardship laws, traditional knowledge).

Information on heritage and structures, sites and things of significance for Indigenous peoples can include:

- burial sites;
- spiritual sites, including rivers and watercourse;
- cultural landscapes;
- oral histories;
- teaching areas used to transfer knowledge between generations;
- cultural values and experiences on the land;
- Indigenous governance systems and Indigenous laws tied to the territory;
- place names, language and other components that make up a culture;
- sacred, ceremonial or culturally important places, plants, animals, objects, beings or things; and
- places with archaeological potential or artefacts; and

- site occupied historically.

The Impact Statement must:

- describe the interconnections and impact pathways between heritage and cultural structures, sites, places, and things and the current use of lands, health, social, and economic components, Indigenous knowledge, and Indigenous rights for each potentially-impacted Indigenous community, including intergenerational impacts over the lifetime of the project;
- describe how historical and current cumulative effects to environmental and socio-cultural conditions, including changes to those conditions, have already impacted physical and cultural heritage;
- provide the location of physical and cultural heritage features on maps, if it has been shared by Indigenous peoples with the proponent and if the proponent has obtained permission from the Indigenous groups for the information to be shared publicly;
- include components of the environment identified by Indigenous groups as having heritage value, to reflect that natural and cultural heritage is a multidimensional concept which is not limited to particular sites or objects; and
- describe how input from potentially impacted Indigenous groups was sought and considered in the identification of these locations and features, including opportunities provided to participate in or lead historic resources studies (including field studies).

The proponent should consult the [Technical Guidance for Assessing Physical and Cultural Heritage or any Structure, Site or Thing](#) on the Agency's Website.

10.1.2. Effects to Indigenous physical and cultural heritage

The Impact Statement must:

- assess potential effects to physical and cultural heritage, and structures, sites or things of historical, archaeological, paleontological or architectural significance to groups, including, but not limited to:
 - loss or destruction of physical and cultural heritage;
 - changes to access to and/or experience with physical and cultural heritage;
 - changes to the cultural value, spirituality, or importance associated with physical and cultural heritage;
 - changes to sacred, ceremonial or culturally important places, objects, or things, including languages, stories and traditions; and
 - changes to visual aesthetics over the life of the project and post-project abandonment or decommissioning.
- take into account potential effects on physical and cultural heritage when assessing the effects on social and economic conditions;
- provide copies of correspondence with provincial, territorial or Indigenous authorities responsible for heritage resources with comments on any physical and cultural heritage resource assessment and proposed avoidance and mitigation measures;

- describe contingency plans and field interventions that will be applied should heritage resources be discovered during construction and operation, or cultural heritage training programs for workers;
- explain the interconnections with and potential impacts to physical and cultural heritage from changes to pre-development and current baseline environmental, social, and economic conditions;
- describe the outcomes of engagement and consultation activities with Indigenous groups with concerns about heritage resources in the project area and indicate the participation of the members of these communities in the related studies, if applicable;
- describe how Indigenous knowledge informed studies, including the identification of the sites to assess and include studies conducted by Indigenous peoples, if any;
- consider natural and cultural heritage as a multidimensional concept which is not limited to particular sites or objects and which can also include components of the environment identified by Indigenous peoples as having heritage value; and
- list any other effects highlighted by Indigenous groups or other participants, if applicable.

The proponent should consult the Agency's [*Technical Guidance for Assessing the Current Use of Lands and Resources for Traditional Purposes under CEAA, 2012*](#).

10.2. Current use of lands and resources for traditional purposes

10.2.1. Baseline conditions

The Impact Statement must include information on the current use of lands and resources for traditional purposes. The proponent should refer to the [*Technical Guidance for Assessing the Current Use of Lands and Resources for Traditional Purposes under CEAA, 2012*](#), on the Agency's website.

Where information is publicly available or is provided by Indigenous groups. The Impact Statement must identify and describe:

- Indigenous governance systems and Indigenous laws associated with the current use of lands and resources for traditional purposes;
- location and description of Treaty lands and/or geographic extent of Treaty rights, title area, land claims or traditional territory (including maps where available);
- location of reserves and communities;
- location of any Indigenous Protected and Conserved Areas;
- traditional activities presently or historically practiced (e.g. hunting, fishing, trapping, gathering of plants or medicines);
- location of traditional use, including hunting, trapping, and fishing camps, cabins and gathering or teaching grounds;

- resources important for traditional and cultural purposes (e.g. plants, fish, mammals, birds and other natural resources), and places where these resources are harvested. Identify those being species at risk and describe their traditional and cultural significance;
- rotational harvesting practices and how they vary in time, such as berry and tea harvesting, bait harvesting and fishing, big game hunting and trapping of fur-bearing animals;
- access and travel routes for conducting traditional practices (e.g. physical access to harvest specific species, culturally important harvesting locations, timing, seasonality, distance from community);
- all uses of riverbanks, shorelines, waterways and water bodies navigable by Indigenous peoples, such as for travel and recreation (e.g. canoe route and portage trails), including entry and exit/landing sites for watercraft;
- waterways, water bodies, springs, wetlands, and shallow groundwater used as drinking water sources and aesthetic properties (taste, colour, clarity, temperature, odour) of those waters;
- the current use of lands and water bodies in the study area, including for harvesting, hunting, gathering, and fishing, as well as social and ceremonial purposes, including as defined by Aboriginal and Treaty rights;
- the use of cabins, camp sites and staging areas;
- frequency, duration or timing of traditional practices;
- efforts by Indigenous groups to restore traditional practices;
- country foods (traditional foods) consumed by Indigenous groups;
- the quality and quantity of resources (e.g. preferred species and perception of quality);
- access to resources (e.g. physical access to harvest specific species, culturally important harvesting locations, timing, seasonality, distance from community);
- important features for the experience of the practice (e.g. connection to the landscape without artificial noise and sensory disturbances, air quality, visual landscape, perceived or real contamination, etc.);
- location of any Indigenous-led research or monitoring activities; and
- other current uses identified by Indigenous groups.

The information should be provided in sufficient detail to allow analysis of the effects to Indigenous peoples that result from changes to the environment and on health, social and economic conditions.

10.2.2. Effects to current use of lands and resources for traditional purposes

The impact statement must:

- assess the potential effects on current use of lands and resources for traditional purposes, within the context of historical and current cumulative effects, including to:
 - current and future availability and quality of country foods (traditional foods);

- quality, quantity and distribution of resources available for harvesting other than for food purposes (e.g. species of cultural importance, traditional and medicinal plants);
 - access to culturally important harvesting areas or resources and access to traditional territory;
 - experiences of being on the land (e.g. changes in air quality, noise exposure, effects of vibrations from blasting or other activities, increase in artificial light at permanent and temporary sites, fragmentation of traditional territory, visual aesthetics);
 - the use of travel ways, navigable waterways and water bodies;
 - sites or areas of interest to communities including for commercial and non-commercial fishing, hunting, trapping and gathering and cultural or ceremonial activities and practices;
 - access to the territory and to the distribution and availability of harvested wildlife (e.g. wildlife avoidance);
 - economic burdens of, and increased time for, travelling further to hunting, fishing, trapping, and gathering opportunities; and
 - impacts of changes in the experience of being on the land, due to noise and change in soundscape, changes in the visual landscape, and odor, and any corollary wellness impacts as a result of these changes.
- describe potential effects on the transmission of traditional knowledge, language, community tradition of sharing and community cohesion linked to activities potentially affected by the project;
 - take into account expectations pertaining to the preservation of landscapes, including nighttime landscapes and, if applicable, regulatory requirements and best practices in place concerning light pollution (the proponent needs to work with communities to ensure that any standards that are applied are protective of traditional uses and purposes and human health);
 - describe the methods used to collect information on traditional use of lands and resources by Indigenous communities;
 - describe how the traditions, perspectives, values and knowledge of Indigenous communities have been considered in determining the severity of the project's contribution to current cumulative effects to environmental and socio-cultural conditions affecting Indigenous land and resource use;
 - describe how information about impacts to land and resource use is integrated into section 10.1.2. including how:
 - changes to the access, cabins, travelways and harvesting and traditional land and resource use areas affects cultural values, spirituality or importance attached to physical and cultural heritage sites;
 - changes to traditional use of cultural landscapes including important travelways, waterways and harvesting areas associated with sacred, ceremonial or culturally important places, objects or things, use of placenames, languages, stories and traditions;
 - changes to visual, auditory or olfactory aesthetics over the life of the project and after reclamation, abandonment or decommissioning of the project affects traditional use; and

- impacts to harvesting and traditional use affects teaching and knowledge transfer between generations;
- describe how traditional land and resource use and cultural values informed the biophysical assessment and impact assessment criteria;
- describe how the results of the biophysical assessment were integrated in the traditional land and resource use assessment and considered in the determining residual effects and the severity of impacts;
- provide a detailed explanation of how comments from Indigenous communities and Indigenous knowledge informed the assessment of potential effects to current use of lands and resources for traditional purposes;
- describe all reasonable alternatives considered that would avoid impacts on current use of lands and resources for traditional purposes considered during project development;
- describe and assess the interconnections and impact pathways between the current use of lands and resources and health, social, and economic components, Indigenous knowledge, and Indigenous rights for each Indigenous community, including potential intergenerational impacts over the lifetime of the project;
- take into account expectations pertaining to the preservation of landscapes, including nighttime landscapes and, if applicable, regulatory requirements in place concerning light pollution;
- describe how Indigenous peoples who participated in the gathering of traditional use information took part in the impact assessment and in the development of proposed mitigation measures, including undertaking their own assessment of effects. Include all Indigenous comments on potential effect to current use of lands and resources for traditional purposes.

10.3. Health, social and economic conditions of Indigenous peoples

10.3.1. Baseline conditions

The Impact Statement must meet the requirements set out in sections above with regard to the baseline for health, social and economic conditions, which must take into account GBA Plus specific to Indigenous peoples.

The baseline conditions established for Indigenous groups must take into account Indigenous governance regimes and Indigenous laws associated with health and socio-economic conditions. The baseline conditions should provide community-specific social and economic conditions on a disaggregated basis (without identifying individuals).



10.3.2. Effects to Indigenous health, social and economic conditions

The assessment of these effects to Indigenous peoples must describe and take into account interactions with the effects on physical and cultural heritage, on structures, sites or things of significance, and on the current use of lands and resources for traditional purposes. For example, an effect on a traditional food may have consequences for the practice of traditional activities, and could lead to an effect on the cost of living, food security, and mental health at the community level or on vulnerable subgroups.

The Impact Statement must:

- describe the health, social and economic effects that the project may have on Indigenous peoples;
- list other effects highlighted by Indigenous groups or other participants, if applicable.

The proponent should refer to the following guidance:

- [*Analyzing Health, Social and Economic Effects under the Impact Assessment Act*](#);
- [*Indigenous Mental Wellness and Major Project Development: Guidance for Impact Assessment Professionals and Indigenous Communities*](#); and
- [*More-than-mental health: Indigenous identity, culture, community and relationship with land are integral to Indigenous wellbeing*](#) (training manual).

10.4. Rights of Indigenous Peoples

10.4.1. Baseline conditions

The Impact Statement must:

- identify and describe the Aboriginal and Treaty and rights of Indigenous peoples potentially affected by the project, including historic, regional, and community context, the geographic extent of traditional territory, the purpose and importance of the rights to the rights-bearing communities (e.g. the practices, customs, beliefs, worldviews and livelihoods), and information on how rights have already been affected. The description should include maps, when available and permitted by the respective Indigenous communities, to illustrate the location of treaty lands, traditional territories and harvesting zones;
- document the nature and extent of the exercise of rights of Indigenous peoples, potentially impacted by the project, as identified by the Indigenous group(s);
- consider how the information requirements related to physical and cultural heritage, current use, Indigenous health, social, and economic conditions are applicable to the nature and extent of the exercise of rights; and



- consider how the information requirements related to cumulative effects are applicable to the baseline conditions supporting the exercise of rights.

Indigenous groups may also provide their perspective through consultations with the Agency or directly to a Review Panel, and through the establishment of information requirements included in the Tailored Impact Statement Guidelines. Indigenous communities must be involved in the baseline characterisation of conditions supporting the exercise of rights, as well as the scoping and assessment of the nature and extent of the exercise of rights of Indigenous peoples.

The information related to the rights of Indigenous peoples may include, but is not limited to:

- a general description of the rights of Indigenous peoples potentially affected by the project, including the historic, regional and community context. The description should include maps, when available and authorized by the Indigenous groups involved, to illustrate the location of areas with titles, land claims and traditional territories;
- the quality and quantity of resources required to support exercise the right (e.g. preferred species);
- access to the resources required to exercise rights (e.g. physical access to culturally important places, timing, seasonality, distance from community);
- the experience associated with the exercise of rights (e.g. noise and sensory disturbances, air quality, visual landscape);
- specific areas of cultural importance where rights are exercised;
- landscape, social and cultural conditions that support the Indigenous group's exercise of rights (e.g. large, intact and diverse landscapes, areas of solitude; connection to landscape, sense of place; language; Indigenous knowledge; clean water, biodiversity, abundance, distribution and quality of wildlife and vegetation);
- Indigenous governance systems and Indigenous laws associated with the exercise of rights;
- where possible, information on subsets of the members within an Indigenous group, and their role in the exercise of rights (e.g. women, men, elders, youth, people with disabilities);
- how the Indigenous group's cultural traditions, laws and governance systems, social values, access and patterns of occupation and preferences inform the manner in which they exercise the rights (the who, what, when, how, where and why);
- where they exist, identification of thresholds identified by the community that, if exceeded, may impair the ability to meaningfully exercise of rights;
- maps and data sets (e.g. overlaying the project footprint, places of cultural and spiritual significance, traditional territories, fish catch numbers); and
- pre-existing impacts and cumulative effects that are already interfering with the ability to exercise rights or to pass along Indigenous cultures and cultural practices (e.g. language, ceremonies, Indigenous knowledge).

The proponent should consult Agency guidance on engaging Indigenous groups, and the [*Guidance: Assessment of Potential Impacts on the Rights of Indigenous Peoples*](#).

10.4.2. Impacts on rights of Indigenous peoples

The Impact Statement must describe the level of engagement with Indigenous groups regarding potential impacts of the project on the exercise of rights, and where possible, the project's potential interference with the exercise of rights. The proponent should strive to support Indigenous-led assessments of impacts on rights, and include them directly in the Impact Statement.

It is preferable that Indigenous groups have all the information about the project and its potential effects on hand to be able to assess the potential impacts of the project on their rights. The proponent is therefore encouraged to share studies with Indigenous groups prior to assessing the impact of the project on their rights. The proponent must document the approach taken to support Indigenous groups in identifying the potential impacts of the project on their rights, including the hypotheses put forward on the potential effects. Specific Indigenous groups should be provided the opportunity to review assessments of impacts on rights pertaining to those same Indigenous groups. Indigenous groups should also be provided the opportunity to approve use of Indigenous knowledge pertaining to those same Indigenous groups, prior to submission of the Impact Statement to the Agency.

Proponent should discuss with Indigenous groups their views on how best to reflect the assessment of impacts on rights in their Impact Statement. Impacts on rights may be assessed using a methodology identified by Indigenous groups, including community-led assessment methods, and agreed upon between the Indigenous community and the Agency. This may include supporting Indigenous-led studies and assessments to inform the assessment of effects to Indigenous peoples, including on their ability to practise their rights and the resources necessary to support those rights (e.g. for VCs, spatial and temporal boundaries, community health, social conditions, and community well-being) that are to be provided publicly and to the Government of Canada.

Where an Indigenous group has not provided its views on the impact of the project on their rights to the proponent, or both parties agree that it is better to provide information related to the impact on the exercise of rights directly to the Agency or the review panel, the proponent should provide a rationale for the approach taken to assess the impact on rights.

The proponent must work together with Indigenous groups to find mutually agreeable solutions to concerns raised about a proposed project, especially for those concerns raised by Indigenous peoples about impacts on the exercise of their rights.

The Impact Statement must:

- document the project's potential impacts on the exercise or practice of the rights of Indigenous peoples or the rights arising from treaties in the project area, as expressed by potentially impacted Indigenous peoples;
- describe the impact on the rights of Indigenous peoples, taking into account the concept of the link between resources, access and experience;
- document the views of potentially affected Indigenous peoples regarding the severity of impact that the project could have on their rights and interests; and

- describe how the results of the traditional land and resource use assessment, the cultural heritage assessment, health and socio-economic assessment of Indigenous peoples were integrated in the Indigenous Rights assessment and considered in the determining residual effects and the severity of impacts.

The proponent should consult the following Agency guidance on this topic: the [Policy Context: Assessment of Potential Impacts on the Rights of Indigenous Peoples](#) and the [Guidance on Assessing Potential Impacts on the Rights of Indigenous Peoples](#).

The proponent, in collaboration with Indigenous groups, should consider the following factors, as relevant:

- how the project may contribute cumulatively to any existing impacts on the exercise of rights, as identified by the Indigenous group(s);
- the interference of the project on the quality and quantity of resources available for the exercise of rights;
- how the project affects the ability to travel freely in the territory;
- the effects of the project on the access to areas important to the exercise of rights;
- the effects of the project on the experience associated with the exercise of rights, including the ability of Indigenous communities to exercise their rights in a peaceful manner (e.g. without changes in connection to land, well-being, knowledge of the landscape, air quality, noise exposure, effects of vibrations, artificial light, fragmentation, visual aesthetics, safety);
- the effects of the project on Indigenous traditions, laws and governance;
- how the project will affect the planning, management or stewardship of traditional lands and resources by Indigenous peoples;
- how the project will affect the ability of Indigenous peoples to derive future economic benefits from the land or water or to maintain an ongoing relationship with the land or water;
- the way that the project is aligned with the values, political direction and/or objectives of Indigenous peoples' actions to mitigate or to adapt to a changing climate;
- the manner in which the project and its impacts weaken or strengthen the authority of Indigenous peoples on their territory;
- how the project affects all other components of significance identified by Indigenous groups; and
- the severity of the impacts on the exercise of rights, as identified by the Indigenous communities.

10.5. Mitigation and enhancement measures

The Impact Statement must:

- describe the proposed mitigation and enhancement measures for all potential effects to Indigenous peoples, as well as for potential impacts on the rights of Indigenous peoples, and identify if these are measures for which the proponent or other parties would be responsible;



- describe all mitigation and enhancement measures proposed for potential effects to Indigenous peoples and impacts on the rights of Indigenous peoples, and elaborate on how these measures may vary for each Indigenous group/community or peoples;
- describe if and how these measures will be integrated into the project design, if applicable;
- include perspectives of the potentially impacted Indigenous groups, on the effectiveness of particular mitigation measures on such impacts;
- describe collaboration with Indigenous peoples to identify preferred mitigation measures for potential adverse impacts on Indigenous communities or their rights, as well as to optimize the project's benefits for their communities;
- demonstrate how the timing of Indigenous activities on the land was considered when establishing the schedule for project activities;
- provide any intervention and communication plans, as applicable, pertaining to heritage resources and structures, sites, and things of cultural, historical, archaeological, paleontological, or architectural significance, if there is a possibility of discovery during construction or development activities. This plan must include, at a minimum, the person to be contacted, intervention measures and the conditions that would lead to a shutdown and resumption of work;
- provide copies of correspondence from provincial and Indigenous heritage resource authorities containing their comments on the heritage resource assessment and proposed mitigation measures;
- describe the measures that will be implemented by the proponent for the potential impacts of the project on the exercise of rights, including how the measures directly address the possible impacts of the project on the exercise of rights and the scope of the measures;
- describe the measures that would enhance or support the exercise or practice of rights in the project area (e.g. employment, procurement and monitoring measures);
- describe how the proponent has addressed the suggestions and recommendations made by potentially affected Indigenous peoples including where Indigenous knowledge was provided and considered in respect of the design of mitigation measures;
- propose differentiated mitigation measures, if applicable, so that adverse effects do not fall disproportionately on Indigenous groups and vulnerable subgroups, and they are not disadvantaged in sharing any positive effect resulting from the project. These mitigation measures should be developed in collaboration with the potentially affected communities and subgroups;
- describe how the GBA Plus results on disproportionate effects have been used to inform mitigation and enhancement measures;
- describe predicted climate change considerations for VCs and incorporate climate change adaptation into reclamation planning;
- describe accommodation, mitigation and complementary measures for impacts to previously known heritage and structures, sites, and things of significance, or those identified in the course of impact assessment and other field studies; and
- provide available evidence of the effectiveness for all mitigation measures related to potential effects to Indigenous communities. Where no evidence exists, describe plans to monitor the effectiveness of



mitigation measures. The proponent is encouraged to share results with Indigenous communities and to monitor the effectiveness of mitigation measures in cooperation with Indigenous communities.

Where no mitigation measures are proposed or mitigation is not possible, the Impact Statement must describe the potential adverse impacts on the rights of Indigenous peoples, as identified by the Indigenous group(s). In addition, the Impact Statement must include perspectives of the potentially impacted Indigenous groups on the effectiveness of particular mitigation measures on such impacts.



11. Effects of potential accidents or malfunctions

The failure of certain works caused by technological malfunctions, human error or exceptional natural events (e.g. flooding, earthquake, forest fire) could cause major effects. If certain events are expected to occur (e.g. minor spills, road accidents), they should be included as expected effects in the previous sections.

11.1. Risk Assessment

The Impact Statement must:

- identify hazards, including those associated with ammonium nitrate, for each project phase that could lead to events of accidents and malfunctions related to the project and provide an explanation of how these events were identified (e.g. information sources, recognized risk assessment methodology, professional expertise, similar project, participants' input);
 - take into account the lifespan of different project components, design of different project components, complicating factors such as weather or external events, and the potential for vandalism or sabotage.
- conduct an analysis of the risk of each hazard and adverse event (including likelihood and consequences) and describe the potential consequences (including the environmental, health, social and economic effects and effects to Indigenous peoples);
- describe the plausible worst-case scenarios and the more-likely but lower-consequence alternative scenarios, including;
 - the magnitude, duration and extent of effects;
 - the quantity, mechanism, rate, form and characteristic of contaminants, greenhouse gases and other materials released or discharged into the environment;
 - the influence of local and regional terrain features, including topography and weather conditions (e.g. difficult access for interventions);
 - modelling for any contaminants spilled directly or released indirectly into water or air;
 - potential environmental, health, social and economic effects, including effects to Indigenous peoples. With respect to human health specifically, consideration should be given to potential pathways of effects associated with surface water, air, country foods, and other relevant media, including short-term and long-term risks to human health;
 - relative locations of sensitive ecological receptors (e.g. fish and/or wildlife and their habitat, waterways, private drinking water wells) and sensitive human receptors;

- timing related to sensitive ecological receptors (e.g. migration and nesting periods for migratory birds, spawning periods for fish, hunting season, tourist season) and sensitive human receptors;
- critical infrastructure, such as local drinking water treatment plants or facilities that can treat water sources affected by the project, as well as the ability and capacity of the drinking water treatment plants or facilities to treat water sources affected by accidental releases from the project during all project phases.
- identify and justify the spatial and temporal boundaries for the effect assessment associated with accidents and malfunctions. The spatial boundaries identified for effects from potential accidents and malfunctions will generally be larger than the boundaries for the project effects alone, and may extend beyond Canada's jurisdiction; and
- provide environmental sensitivity mapping that identifies site-specific conditions and sensitive receptors adjacent to project activities, including shores, streams and wetlands frequented by fish and / or migratory birds, and likely routes to them. Shoreline classification surveys and mapping must be conducted along major waterways where large spills are possible. The characterization criteria established by ECCC contained in the *Field Guide for Intervention in the Event of an Oil Spill on Maritime Shores* constitutes a useful guide in this regard.

11.2. Mitigation Measures

The Impact Statement must:

- describe the mitigation measures and safeguards that would be in place to avoid and prevent accidents and malfunctions, including project design choices and operational considerations, including engineering, safety and risk reduction standards, criteria and approaches to be used (e.g. spacing, fire protection, prevention of leaks of toxic chemicals, active fire suppression, explosion/overpressure minimization and spill prevention plan);
- describe the proposed security measures to reduce the potential for vandalism or other malicious acts that could lead to accidents or malfunctions;
- describe the mitigation measures for the potential adverse environmental, health, social and economic effects, including effects to Indigenous peoples, in the event of an accident or malfunction, such as emergency response and repair procedures that would be put in place;
- describe long-term monitoring and recovery measures, including adaptive management plans, that would be implemented to manage adverse effects to the environment and health, social and economic conditions, including effects to Indigenous peoples, resulting from accidents and malfunctions, including those to remediate affected lands and waters; these measures should take into account site-specific conditions and sensitivities;
- provide details of financial liability and compensation measures in place pursuant to regulations or the proponent's commitment in case of potential accidents or malfunctions associated with the project;
- describe mutual aid arrangements in the event that the incident exceeds proponent resources and how to access these resources; and

- describe the expected effectiveness of the mitigation measures, safeguards and response measures and systems.

11.3. Emergency Management

The Impact Statement must describe an emergency response plan and as part of this plan must:

- identify emergency planning and emergency response zones;
- present preliminary emergency measures to respond to such events, including identifying associated response systems and capabilities;
- take into account evacuation areas in the planning of emergency measures as well as the particularities linked to these areas (e.g. number of residents varying with the seasons, possible high number of individuals unfamiliar with the region, limited communication means in remote areas and with temporary residents);
- describe existing emergency preparedness and response systems and existing arrangements and/or coordination with the responsible response organizations in the spatial boundaries associated with the project;
- describe how the proponent will integrate its response operations into an incident management system (for example, the Response Command System (ICS)) when deploying a significant incident response effort;
- describe the role of the proponent in the case of spill, collision, fire, explosion or other accidents or malfunctions associated with the project;
- describe emergency response training and exercise programs, including a description of the participation and training agreements with Indigenous groups or communities that could be impacted by accidents or malfunctions;
- document spill response strategies for each type of scenario, including strategic locations of spill response equipment relative to likely accident and malfunction sites and/or likely pathways to sensitive environmental and human receptors;
- describe emergency communication and public notification plans, community awareness plans and public reporting;
- describe emergency communication plans that would provide emergency instructions to surrounding communities, including Indigenous communities, and how these will be informed by the public and Indigenous groups. The proponent should consider including:
 - immediate urgent actions, such as notifying the public of security and safety concerns, instructions for on-site shelter or shelter-in-place, procedures and evacuation routes; and
 - longer-term actions, such as a general website and telephone helplines, updates on the status of incidents, injured animal reports, etc.



- describe liaison and continuous education plans linked to emergency preparedness for surrounding communities that may be affected by the consequences of a significant incident, including for Indigenous communities;
- explain how the proponent has made and will continue to make an outreach effort to ensure public and Indigenous groups understanding the risks associated with this type of project (e.g. providing non-technical information, providing information in local languages if requested); and
- describe any waste management plan as it pertains to waste generated during an emergency response.



12. Effects of the environment on the project

The Impact Statement must consider and describe how environmental conditions, including natural hazards such as severe and/or extreme weather conditions and external events could adversely affect the project and how this in turn could result in effects to the environment, health, social and economic conditions. These events are to be considered in different probability patterns (e.g. 5-year flood vs. 100-year flood) taking into account how these could change under a range of potential future climate scenarios. The focus should be on credible external events that have a reasonable probability of occurrence and for which the resulting environmental effects could be major without careful management.

The Impact Statement must:

- describe how environmental conditions, including natural hazards such as severe and/or extreme weather conditions and external events, could adversely affect the project and how this in turn could result in effects to the environment, health, social and economic conditions;
- provide details of planning, design and construction strategies intended to minimize the potential adverse effects of the environment on the project;
- describe mitigation measures that can be implemented in anticipation or in preparation for effects of the environment on the project;
- describe possible mitigation measures to address adverse environmental, health, social and economic effects resulting from effects of the environment on the project;
- ~~describe measures to enhance positive environmental, health, social and economic effects resulting from effects of the environment on the project;~~
- describe the project's climate resilience and how the impacts of climate change have been integrated into the project design and planning throughout the life of the project, and describe the climate data, projections and related information used to assess risks over the life of the project;
- identify the project's sensitivities and vulnerabilities to changes in climate (both in mean conditions and extremes such as short-duration heavy precipitation events);
- describe all known and relevant trends in meteorological events, weather patterns or physical changes in the environment that are expected to result from climate change, and incorporate this information into a risk assessment as contributing or complicating factors for accidents and malfunctions (e.g. increased risk of forest fires). Provide mitigation measures (both passive and active) that the proponent is prepared to take to minimize the frequency, severity and consequences of these projected effects;
- identify any areas of potential wind or water erosion; and
assess the potential effects of seismic events on facilities and specify the soil movement parameters that will be used with the probability of occurrence (e.g. 2% in 50 years) and the best practice codes



and guides that are or will be used in the seismic effects analysis (e.g. National Building Code of Canada 2015, CAN/CSA-Z662 standard).

Additional guidance related to conducting climate change resilience assessments is included in the [Strategic Assessment of Climate Change](#).



13. Canada's ability to meet its environmental obligations

The Government of Canada, through the Act, recognizes that impact assessment contributes to Canada's understanding and ability to meet, first, its environmental obligations, and second, its commitments in respect of climate change.

In accordance with paragraph 22(1)(i) of the Act, the Impact Statement should describe the effects of the project in the context of environmental obligations, with a focus on Government of Canada obligations and commitments relevant to decision-making.

The type and extent of the analysis could range from a provision requiring a rigorous rationale to a detailed analysis depending on the specifics of the anticipated effects and covering the environmental obligation or commitment to climate change under consideration. The impact assessment should consider the need for mitigation and follow-up measures related to Canada's environmental obligations and commitment to climate change. Measures proposed to mitigate the adverse effects of a project may reduce a project's compliance with an environmental obligation or climate change commitment. The implementation of mitigation or complementary measures may also result in a designated project contributing to Canada's ability to meet its environmental obligations and climate change commitments.

Federal environmental obligations relevant to this project include:

- Canada's Convention on Biological Diversity and supporting national framework (e.g., the Canadian Biodiversity Strategy, Canada's Biodiversity Outcomes Framework, and Canada's current biodiversity goals and objectives), as well as legislation that supports the implementation of Canada's biodiversity commitments, including the Species at Risk Act and the Canada Wildlife Act (1985), and related policies and guidance documents;
- recovery strategies and action plans developed under the Species at Risk Act for all species at risk potentially affected by the project;
- the Convention for the Protection of Migratory Birds in the United States and Canada, as implemented in part under the Migratory Birds Convention Act, 1994, and supporting guidance documents on conservation objectives and strategies specific to bird conservation regions.

The Impact Statement must:

- describe the extent to which the effects of the project could hinder or contribute to Canada's ability to meet its environmental obligations;
- describe where the project may enable Canada to meet its environmental obligations, describe the proponent's plans and commitments to ensure that positive contributions are respected; and
- describe where the project may adversely affect Canada's ability to meet its environmental obligations, describe the mitigation measures and follow-up programs related to those effects.



With respect to climate change commitments, section 8.13 *Climate change* of these Guidelines outline the information required as part of the Impact Statement. The Agency, with the support of federal authorities will provide a supplementary analysis on the project's GHG emissions in the context of Canada's emissions targets and forecasts (see section 6 of the SACC). Although it is not required, the proponent may provide its views in the Impact Statement on the extent to which the effects of the project would hinder or contribute to the Government of Canada's ability to meet its commitments in respect of climate change in order to inform the impact assessment.

The proponent should refer to the Agency's guidance documents on this topic, including the document [*Policy Context: Considering Environmental Obligations and Commitments in Respect of Climate Change under the Impact Assessment Act.*](#)



14. Extent to which the project contributes to sustainability

Under the Act, one of the factors that must be considered in impact assessments is the extent to which a project contributes to sustainability. Sustainability is the ability to protect the environment, contribute to the social and economic well-being of the people of Canada and preserve their health in a manner that benefits present and future generations. Sustainability is a lens to be applied throughout the impact assessment, beginning in Planning phase. Information and data requirements to inform the sustainability analysis should be considered from the outset of the impact assessment.

The sustainability analysis will consider the potential effects of a project through the application of the following principles:

- consider the interconnectedness and interdependence of human-ecological systems;
- consider the well-being of present and future generations;
- consider positive effects and reduce adverse effects of the project; and
- apply the precautionary principle and consider uncertainty and risk of irreversible harm.

The application of the principles will result in better information on the effects of the project, including long-term effects on future generations and the interaction of effects, and may help to identify additional mitigation measures and enhancements. The proponent should refer to the Agency's guidance on this topic: [Guidance: Considering the Extent to which a Project Contributes to Sustainability](#).

The Impact Statement must provide an analysis of the extent to which the project contributes to sustainability. The analysis should be qualitative but may draw on quantitative data to provide context, and should follow the methodology outlined in the [Guidance: Considering the Extent to which a Project Contributes to Sustainability](#) and must:

- describe engagement with potentially affected Indigenous groups and outline measures and commitments that contribute to the sustainability of Indigenous livelihood, traditional use, culture and well-being:
 - include any description of sustainability as defined by Indigenous groups;
- describe the project-specific context, including key issues of importance to Indigenous groups and the public that will inform the sustainability assessment;
- describe how the sustainability principles were considered in:
 - the assessment of the potential effects of the project, including setting spatial and temporal boundaries, and identifying mitigation measures and enhancements;
 - the planning and design of the project and the selection of the preferred alternative means and alternatives to the project.
- describe and document all uncertainties and assumptions underpinning the analysis;



- describe how the precautionary principle was applied in cases where there may be risk of irreversible harm;
- provide a summary of the positive and adverse environmental, health, social, and economic effects of the project, with emphasis on potentially affected Indigenous groups, local communities, and diverse groups of people whose identities intersect and interact with various structural forms of exclusion (such as poverty, racism, colonialism, sexism, and ableism); and
- indicate how monitoring, management and reporting systems consider the sustainability principles and attempt to ensure continuous progress towards sustainability.

15. Follow-up programs

Follow-up programs are put in place by the proponent to verify the accuracy of the impact assessment and evaluate the effectiveness of mitigation measures. Through the conditions in the decision statement, the proponent is required to develop a follow-up program in consultation with relevant authorities and Indigenous groups and to submit to the Agency the results of monitoring efforts. Monitoring is a key component of follow-up programs and can identify the potential for environmental, health, social or economic degradation during all phases of project development. Monitoring can also assist in developing clearly defined action plans and emergency response procedures to account for environmental, health, social and economic protection.

The proponent should develop expected outcomes for their follow-up programs, in consultation with relevant authorities and Indigenous groups. An expected outcome is defined as an objective that the proponent can reasonably anticipate achieving through a project as a result of the implementation of effective mitigation measures. Expected outcomes may be qualitative or quantitative in nature but must be measurable in order to support a determination of whether mitigation measures are working effectively to eliminate, reduce, control, or offset adverse effects on VCs. Proponents will be expected to provide information on the extent to which they are achieving their expected outcomes in their annual follow-up program reports.

If the follow-up program indicates that mitigation measures are not working effectively, additional measures may be required and implemented. If, through a follow-up program, it is identified that the predictions of the impact assessment are not accurate, corrective action or additional measures could be required to be put in place by the proponent.

Follow-up programs are an opportunity to continue engaging with impacted Indigenous groups. If undertaken collaboratively with Indigenous groups, they can support solution-oriented approaches to managing adaptively through the early identification of issues in follow-up programs and appropriate solutions incorporating Indigenous knowledge.

In developing the follow-up program framework for environmental, health, social or economic valued components, as applicable, the Impact Statement should take into account the considerations outlined in the Agency guidance on the [Follow-up Programs under the Canadian Environmental Assessment Act](#) (guidance to be updated).

15.1. Follow-up program framework

The duration of the follow-up program must be as long as required to verify the accuracy of the environmental, health, cultural, social and economic effects and the impacts on the rights of Indigenous peoples predicted during the impact assessment and/or to evaluate the effectiveness of the mitigation measures.

The Impact Statement must present a follow-up program that includes:

- identification of VCs that warrant a follow-up program and rationale taking into account the guidance on follow-up programs cited above;
- the expected outcome(s) and targets of the follow-up program and information describing how the proponent expects to achieve the expected outcome(s);
- preliminary description of follow-up studies planned, as well as their main characteristics (list of parameters to be measured, planned implementation timetable, etc.);
- intervention mechanism used in the event that the effects to the environment or impacts on rights of Indigenous peoples and cultures attributed to the project are not as predicted;
- mechanism to disseminate follow-up results among the concerned interested parties;
- consideration of accessibility and sharing of data for the general population; and
- opportunities for the involvement of Indigenous groups, stakeholders, local and regional Indigenous organizations in the follow-up program design and implementation and the development of a communication mechanism between these organizations and the proponent.

15.2. Follow-up program monitoring

For the proposed follow-up framework, the Impact Statement must present the preliminary environmental, health, social and economic monitoring program, including, but not limited to the:

- identification of the monitoring activities that could pose a risk to environmental, health, social, and economic conditions, and/or VCs, and the measures and means planned to protect these conditions;
- identification of regulatory instruments that include a monitoring requirement for the VCs;
- description of the methodology for tracking environmental, health, social and economic issues;
- description of the methodology and mechanism for monitoring the effectiveness of mitigation and reclamation;
- description of the characteristics of monitoring where foreseeable (e.g. location of interventions, planned protocols, list of measured parameters, analytical methods employed, schedule, data management, human and financial resources required);
- identification of the monitoring activities that could pose a risk to the environmental, health, social and economic conditions and/or VCs and the measures and means planned to protect these conditions;
- guidelines for preparing monitoring reports (number, content, frequency, format, duration, geographic extent) that will be sent to the authorities involved; and
- plans, including funding options, to involve Indigenous groups and local communities in monitoring, where appropriate.

15.3. Compliance Monitoring

Proponents are responsible for verifying whether the required mitigation measures were implemented. The Impact Statement must present a framework by which it will undertake compliance monitoring for follow-up programs. This should include, but not be limited to:

- identification of those positions accountable and responsible for monitoring and ensuring compliance;
- description of the proponent's intervention mechanisms in the event of the observation of non-compliance with the legal and environmental requirements or with the obligations imposed on contractors by the provisions of their contracts;
- a description of how monitoring results will be used to trigger the proponent's response mechanisms for effects that do not have compliance-based thresholds (e.g., CAAQS for common air pollutants); and
- quality assurance and quality control measures to be applied to monitoring programs.

15.4. Adaptive Management Plans

Proponents should consider adaptive management as a means to address high uncertainties associated with the effectiveness of mitigation measures or predicted effects and to help ensure expected outcomes are achieved. Adaptive Management Plans establish a systematic process following six iterative steps: assess, design, implement, monitor, evaluate, and adjust. An Adaptive Management Plan may be warranted in addition to a follow-up program if it meets each of the following criteria:

1. There is high uncertainty around the effectiveness of mitigation measures or predicted effects.
2. There is a need for, or benefit to reducing uncertainties through an Adaptive Management Plan.
3. Adaptive management is technically feasible.

Adaptive management does not eliminate the need to provide sufficient information on the baseline conditions or effects attributed to the designated project. Nor does it eliminate the need to characterize effects and identify appropriate mitigation measures to eliminate, reduce or control those effects.

Please refer to the Agency's guidance on [Adaptive Management Measures under the Canadian Environmental Assessment Act 1992](#) (guidance to be updated).



16. Assessment summary

The proponent must prepare a stand-alone plain language summary of the Impact Statement in both of Canada's official languages (French and English). The summary must contain sufficient details for the reader to understand the project, any potential environmental, health, social and economic effects, potential adverse impacts on Indigenous peoples, proposed mitigation measures, residual effects and any required follow-up programs.

The Assessment Summary provides an opportunity for the proponent to demonstrate correspondence between issues raised during the planning phase and issues addressed in the assessment. The Assessment Summary should be presented by VC, which allows the proponent to demonstrate the completeness of the assessment and provide the results of the analysis. The summary must include key maps or figures illustrating the project location and key project components.

The Impact Statement should also include a series of tables summarizing the following information:

- potential environmental, health, social and economic effects and the potential impacts on Indigenous peoples;
- potential mitigation and enhancement measures in relation to potential effects and impacts;
- description of the residual effects of the project;
- cumulative effects and proposed mitigation measures to address them;
- any other commitments made by the proponent or recommendations made by the proponent to other parties; and
- identifies the effects falling within federal jurisdiction, as well as, direct or incidental effects and describes the extent to which the effects are significant (based on the characterization of residual effects). The effects within federal jurisdiction, and direct and incidental effects, are defined in s.2 of the Act.



Appendix 1 – Additional Guidance

This appendix contains guidance on how to address the requirements outlined in the main body of the Guidelines. Guidance has been placed in appendix for ease of reading. The proponent is expected to demonstrate how relevant guidance or technical recommendations were used. Alternatively, a rationale must be provided as to why it is not applicable, feasible, or why different approaches were found more adequate.

List of Project Components & Activities

The list of project components and activities, as required in section [3.4 Project components and activities](#), should focus on those with the greatest potential to have environmental, health, social and economic effects, or impacts on Indigenous peoples and their rights, as determined by Indigenous groups. Sufficient information must be included to adequately predict adverse and positive effects, the interaction between those effects and any disproportionate effects for diverse groups of people within communities.

Project components and activities should include the following elements, as relevant:

Project Components

- water management infrastructure to divert, control, collect and discharge surface drainage and groundwater discharges to the receiving environment, including collector ditches, groundwater interception wells, sedimentation ponds, sumps, and pump and pipeline systems;
- treatment facilities for potable water, sewage, wastewater and effluent (including proposed treatment technologies, footprint, location, discharge locations);
- material stockpiles including hazardous waste, fuel storage tanks, and explosives warehouses;
- waterbody diversions or realignments;
- crossings of waterbodies and watercourses, including bridges and culverts;
- construction workspace and laydown areas;
- temporary or permanent infrastructure, including administration buildings, warehouse, garages, maintenance offices);
- sources of drinking and industrial water;
- energy supply source;
- waste disposal (types of waste, methods of disposal, quantity, disposal sites or facilities);
- site access roads or routes;
- temporary or permanent worker accommodations;
- borrow pits and quarries;



- fences and barriers;
- marine terminals and associated changes in marine traffic;
- petroleum products storage tanks intended for the operation of machinery, compressors, generators, trucks, locomotives, ships or other (if any);
- marine infrastructures, including a jetty, a platform, a wharf for berthing ships, as well as mooring and berthing dolphins and interconnected walkways that may be installed between the platform, the jetty and the dolphins, specifying their area, size and location, as well as their orientation in relation to existing terminals;
- ships and tugboats maneuvering areas, approach channel, anchorage areas;
- terrestrial access roads at the site of the terminal, including their surface area, size, location, and orientation with respect to the wharf to be built;
- permanent and temporary linear infrastructure (including, if applicable, conduits, power lines, connection to the existing railway, etc.), indicating the route of these infrastructure and their location;
- temporary structures required for project construction;
- works for managing water, waste, cargo residues and hazardous materials;
- fire water systems.

Linear terrestrial Infrastructures

- permanent and temporary linear infrastructures such as road, railroad, power supply, primary electrical transmission lines.

River environment

- breakwaters and erosion protection structures;
- marine transportation;
- mooring systems;
- port or marine terminal infrastructure and facilities, including any components that will be constructed in support of the project;
- navigation activities, size and type of product transport and supply vessels;
- any other infrastructure relevant to the project.

Project Activities

Site preparation and construction

- preparation of the work, construction staging;
- surveying and staking;



- site grubbing, clearing and excavation, including tree and vegetation removal;
- excavation and salvage of topsoil, soil and bedrock, and rocky substrates including potentially contaminated materials;
- management of excavated materials, including potentially contaminated materials;
- blasting (frequency, duration, time of year, time of day and methods);
- explosives transportation, storage and management;
- construction of access roads;
- clearing of transmission corridor and construction of powerline to site;
- construction of site fencing;
- changes to existing infrastructure (e.g. modification of the existing access road);
- transportation and management of borrow materials requirement (source and quantity);
- storage areas for material stockpiles;
- water management, including water diversions, dewatering or deposition activities, storm water management, site drainage (including the wharf), runoff management and sediment or erosion control;
- water management to divert, control, collect and discharge surface drainage and groundwater seepage to the receiving environment, including collector ditches, groundwater interception wells, sedimentation ponds, sumps, and pump and pipe systems;
- construction of runoff water management facilities, including collector ditches, sumps, pump and pipe systems, and groundwater interception wells;
- water requirements for project construction, operation, decommissioning and closure, including estimate of quantities needed;
- management and treatment of wastewater and discharge points;
- operation of light duty, heavy-duty and mobile off-road equipment (type, quantity);
- construction of temporary or permanent infrastructure;
- establishment of worker accommodations (capacity, wastewater treatment);
- transportation of employees;
- storage, disposal and management of hazardous materials, fuels and waste (indicate types, methods and amounts);
- marine and/or port related dredging;
- any activity that may resuspend sediments.

Include for capital and maintenance dredging:

- the location, depth, surface area, volume and nature of the sediment (physical and chemical characteristics) to be dredged;
- dredging methods (e.g. equipment used, duration and frequency);

- management of anticipated dispersion plume of sediment that could be re-suspended during dredging or open-water disposal (if applicable);
- measures to prevent sediment resuspension;
- sediment management plans (open-water or terrestrial disposal);
- sediment transportation modes to the construction or disposal sites, including management of dewatering basins, if necessary.

Include for open-water disposal activities of dredged sediments, if applicable:

- rationale for the choice of the site and specifying the land area used;
- particle size distribution;
- the nature of sediments (physical and chemical characteristics).

Include for terrestrial disposal sites or dewatering basins, if required:

- the size, location, type, volume and the level of contamination of sediments to be stored.

Operation

- product stockpiling, processing and treatment;
- management (including recycling) and disposal of wastes;
- storage, handling and transport of materials;
- use and maintenance of access roads;
- water management, including water diversions, site drainage and runoff management, sediment and erosion controls, site dewatering, potable water, water use requirements, storm water, process water, wastewater, water recycling and effluent treatment (quantity, treatment requirements, release point(s) and receiving waterbodies);
- storage and handling of reagents, petroleum products, chemical products, hazardous materials and residual materials;
- workforce management, including transportation, work schedules and lodging;
- dredging and maintenance dredging;
- any activity that may resuspend sediments;
- marine navigation activities relating to product transport or support vessels;
- ocean disposal, methods and disposal locations;
- storage procedures for floating docks during the winter months.

Suspension, abandonment or decommissioning

- preliminary outline of a suspension, abandonment, decommissioning or reclamation plan for any components associated with the project;



- the ownership, transfer and control of the different project components;
- site restoration;
- removal of surface contamination from facilities and equipment;
- well decommissioning;
- dismantling and removal of equipment and systems;
- demolition or disposition of buildings and ancillary structures;
- long term care, monitoring and maintaining the integrity of the site, including site drainage and water management, and any remaining structures;
- suspension, abandonment or decommissioning for temporary or permanent facilities.

Sources of baseline information

Information sources and data collection methods used for describing the baseline environmental, health, social and economic setting may consist of the following:

- field studies, including site-specific survey methods;
- database searches, including federal, provincial, territorial, municipal and local data banks, including for example:
 - [eBird Canada](#);
 - [Breeding Bird Survey \(BBS\)](#);
 - [Christmas bird count https://netapp.audubon.org/CBCObservation/Historical/ResultsByCount.aspx](https://netapp.audubon.org/CBCObservation/Historical/ResultsByCount.aspx);
 - [Birds Canada's Canadian Migration Monitoring Network](#);
 - [Nature Counts](#);
 - [iNaturalist](#);
 - [Neighbourhood Bat Watch](#);
- [Bird Conservation Regions and strategies](#);
- land cover data, such as forest cover maps, or remote sensing data for important habitats features and important characteristics;
- research programs of regional industry, resource or species-specific committees;
- protected areas, watershed or coastal management plans;
- natural resource management plans;
- species recovery and restoration plans;
- field measurements to gather data on ambient or background levels for air, water, soil and sediment quality, light levels or acoustic environment (soundscape);
- published literature;

- environmental assessment documentation, including monitoring reports, from prior projects in the area and similar projects outside the area;
- regional studies or assessments, project assessments and strategic assessments;
- renewable harvest data;
- Indigenous knowledge, including oral histories;
- expert, community, public and Indigenous engagement and consultation activities, including workshops, meetings, open houses, surveys;
- qualitative information gathered from interviews, focus groups or observation;
- census data;
- human health impact assessments or risk assessments;
- information available from Canadian Institute for Health Information under [Community and Health System Characteristics](#);
- community and regional economic profiles;
- statistical surveys, as applicable.

The proponent should consult with federal, provincial or local government authorities to determine whether additional data sources and survey methods may be appropriate.

Establishing Spatial and Temporal Boundaries

The following guidance is supplement to the requirements in section 7.3 *Spatial and temporal boundaries*.

The study area boundaries must encompass the spatial boundaries of the project, including any associated project components or activities, and the anticipated boundaries of the project effects. The proponent should consider the following areas in assigning appropriate spatial boundaries:

- areas potentially impacted by changes to water quality and quantity or changes in flow in the watershed and hydrologically connected waters;
- areas potentially impacted by airborne emissions or odours;
- air zone(s) and airsheds under the Air Quality Management System;
- local major emission sources;
- areas of importance to people, including recreational areas;
- International and provincial or territorial borders which require transboundary assessment;
- modelling domain size based on isopleths resulting from the project-only case that represents 10% of the appropriate jurisdictional ambient air quality criteria (within the limits of validity of the model);
- areas within the range of vision, light and sound;
- the locations and characteristics of the most sensitive receptors or areas;



- species habitat areas, usage timing and migratory patterns;
- emergency planning and emergency response zones;
- the geographic extent of local and regional services;
- any affected communities;
- all potentially affected Indigenous groups;
- areas of known Indigenous land¹⁷, cultural, spiritual and resource use; and
- existing affected infrastructure.

For biophysical VC, spatial boundaries should be defined using an ecosystem-centered approach. See document [Technical Guidance for Assessing Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012 \(2014\)](#) for more information on establishing spatial boundaries).

For habitat-related VCs potentially affected by the Project, a land cover analysis, including freshwater environments, should be conducted to determine appropriate ecological boundaries and buffer distances around the project area. The spatial extent of habitat and habitat functions should influence the determination of an appropriate local study area and regional study area. Spatial boundaries of the RSA should be changed if one or more land cover types are concentrated in a sub-area and are uncommon in other parts of the region.

Where a VC is a species, the local study area should correspond to the project study area plus a buffer defined in consideration of direct and indirect project effects to species including habitat effects, changes to connectivity, alteration of predator/prey dynamics, mortality, sensory disturbance, and pollution. Use simulation modelling to help define buffers that address the species or species group being assessed. The proponent should contact federal, provincial and/or local government authorities to verify appropriate boundaries for wildlife species.

Spatial boundaries should consider the location of sensitive receptors, which may include:

- diverse groups of people (e.g. individuals with compromised health, children, pregnant women, seniors);
- residences, health and social services institutions (e.g. hospitals, long-term care facilities, seniors' residences);
- educational institutions (e.g. schools, daycare centres, early childhood centres);
- tourism establishments (e.g. tourism information offices, museums, ski areas, summer camps, outdoor recreation areas, camp sites);
- recreational areas (e.g. recreational land, urban parks, parks and conservation areas);
- areas for the exercise of the rights of Indigenous peoples; and
- sensitive wildlife species or habitats (e.g. soil types or areas with historical loading or poor buffering, important areas of wildlife use, harvesting activities).

¹⁷ Indigenous lands may encompass reserve lands, traditional territories and/or treaty lands

The temporal boundaries of the impact assessment should span all phases of the project. If potential effects are predicted after project decommissioning or abandonment, this should be taken into consideration in defining specific boundaries. Define temporal boundaries in a manner that enables detection of all species that use the Project Area, Local Study Area, and Regional Study Area throughout the year and from one year to another, and to estimate their temporal pattern of use (e.g. breeding, migrants stopping on northward and/or southward migration). Temporal boundaries spanning more than one year will enable accounting for variation due to irregular events (e.g. masting events, storms on migration, late snowfalls).

Developing mitigation measures and enhancements

Mitigation measures are technically and economically feasible measures to eliminate, reduce, control or offset the adverse effects of a designated project, and include restitution for any damage caused by those effects through replacement, restoration or compensation. The "hierarchy of mitigation measures" presents three options for types of mitigation measures, in descending order of preference:

- **eliminate:** refers to the elimination of effects, such as by changing the location or design of the project. It can also be referred to as "avoidance" of effects;
- **reduce and control:** aims to reduce effects to the extent possible, for example, by modifying the most adversely impactful project activities or components or by taking measures specific to the potential effects. There may still be residual effects where measures are not sufficient to eliminate the effects, or where their absolute effectiveness is uncertain. Effects may also be "minimized" when it is not possible to "avoid" them;
- **offset:** aimed at offsetting residual effects following consideration of elimination and reduction measures, through measures referred to as "compensation" or "restitution". For example, where an effect on fish habitat persists, it may be possible to offset through the creation of new habitat (replacement) or to propose measures to restore degraded habitat conditions. These include measures referred to as replacement, restoration or (financial) compensation.

The proponent should use an approach based on the avoidance and reduction of the adverse effects at the source, namely consider modifying the design or changing the location of certain project components.

Enhancement measures for positive effects are not necessarily required to mitigate negative effects, but are measures that may be developed to make use of opportunities presented by the project to contribute to, for example, local and regional training efforts, investment in infrastructure and services, projects to rehabilitate degraded environments, etc. Measures are to be specific, achievable, measurable and verifiable, and described in a manner that avoids ambiguity in intent, interpretation and implementation.

The proponent is encouraged to work with the community to align project goals with an aim to enhance positive project effects. Such an approach may include the modification of the design of the project or relocation of project components.

Compensation and offset plans

Where compensatory or offset measures are proposed to mitigate effects (e.g. on species at risk and their critical habitats, fish and fish habitat, or wetland functions), the Impact Statement must include the compensation or offset plans for consideration during the impact assessment process.

In general, these plans should address the following elements, or refer to locations in the Impact Statement where this information is presented:

- describe the baseline conditions of the species at risk, critical habitat, fish and fish habitat **and wetland functions** potentially impacted by the project;
- explain and justify the hierarchy of mitigation measures considered;
- identify and describe residual effects that are the subject of the compensatory measures;
- identify a compensation ratio with rationale, including how any policies or guidance provided by federal and provincial authorities and Indigenous peoples have been considered;
- where feasible, identify the location and implementation schedule of compensation projects;
- identify and describe the success criteria;
- identify and describe in detail nonhabitat related compensation measures (e.g. predator control);
- describe how the proposed measures align with published provincial and federal recovery management or action plans and strategies for species at risk, or for fish and fish habitat;
- describe how the proposed measures align with published provincial and federal recovery management or action plans and strategies for wetlands;
- identify, if possible, the parties responsible for implementation of the compensatory measures, including monitoring and review;
- identify indicator species for setting compensation objectives. The choice of indicator species should be based on baseline data. Species at risk should not be used as indicator species, since compensation efforts must be specifically directed to these species;
- describe the habitat functions gained at the compensation site(s);
- Provide evidence that habitat functions can be replaced by the proposed offset activities;
- describe the selection process for proposed compensation sites and associated baseline conditions;
- provide a description of the monitoring schedule and activities to be completed to verify the success of compensation activities; and
- if offsets are required to address residual effects, refer to the [Operational Framework for Use of Conservation Allowances](#).

The proponent must explain how Indigenous peoples were involved in the development of the compensation plans. The proponent must demonstrate how the information received from Indigenous peoples has been taken into account, including the choice of compensation ratios, if applicable. The proponent must also elaborate on how Indigenous peoples will be involved in the implementation of the compensation measures and the evaluation of the success of these measures.

For compensation plans targeting **species at risk**, the proponent can refer to Template 2 in the [Species at Risk Act Permitting Policy](#).

With respect to **wetlands**, compensation plans should:

- clearly indicate the location and total area of each type of wetland, as well as their respective locations, for which the residual effects should be mitigated by compensation measures;
- favour the restoration of drained or altered natural wetlands of the same type and function as those affected by the project. Wetland restoration is preferable to wetland enhancement, both of which are preferable to the creation of new wetlands;
- demonstrate that wetland functions can be replaced by the proposed compensation activities;
- indicate where it is not possible to compensate for the loss of functions in cases where wetlands are unique, perform habitat functions that ensure the survival of a large proportion of migratory birds, or provide habitat for species at risk; and take this information into consideration when developing compensation measures;
- ~~use a minimum ratio of 2:1 for the area of wetlands to be restored or created, versus the original area of wetlands affected. A higher compensation ratio is recommended for wetland types where compensation is more difficult or where there is uncertainty about the success of the compensation measures. The choice of ratio for wetland compensation needs to be justified;~~
- ~~compensate lost wetland functions on-site if site conditions are suitable for wetland functions. If this is not possible, the preference is to compensate within the same watershed, and then within the same ecosystem as the one where functions are affected;~~
- minimize the delay between the time the adverse effects occur, and the time habitat and functions are restored; and
- ~~explain how vegetation removals, as well as soil and peat excavation activities will be managed for reclamation of disturbed wetlands (e.g. methods, conditions and timing of stockpiling).~~

For **fish and fish habitat**, each offsetting plans should include:

- an exact location for the proposed measures of the project (latitude and longitude, lot number, municipality, regional municipality county, etc.) and property rights;
- baseline information including a description of the environment (biological, hydrological, physical, chemical, etc.), an estimation of the quality of the environment in question and a description of the issue to address. Ideally, the description of the environment should be accompanied by georeferenced and dated photographs;
- a description of the proposed measures (nature, extent, method, timetable, etc.);
- the fish species affected by the proposed measures, including the resulting fish habitat functions (feeding, reproduction, rearing, shelter, growth, migration);

- an assessment of the benefits to fish and fish habitat resulting from the offsetting measures in terms of the significance, magnitude and adequacy of the gains to be achieved with respect to the current situation; and
- a follow-up program to measure the success of offsetting objectives, including the details of its implementation. Offsetting objectives as well as the methods and criteria used to evaluate success (parameters, frequency, duration, etc.) must be clearly identified and described. Deliverables must be identified (e.g. baseline information, follow-up protocol, plans and specifications, work report, follow-up report, etc.), along with contingency measures in case success criteria are not met. The offsetting objectives and the timelines of the follow-up program (including deliverables) should be compiled in one or more tables.

Offsetting plans and monitoring programs for fish and fish habitat should be developed using standard Fisheries and Oceans Canada (DFO) guidance:

- [Policy for applying measures to offset adverse effects on fish and fish habitat under the Fisheries Act.](#)

Guidance for Biophysical Components

Atmospheric, acoustic and visual environment

The following guidance should be consulted in conjunction with sections [8.4. Atmospheric, acoustic and visual environment](#):

- project sources of air pollutant emissions should include the following types of sources:
 - point sources: including, but not limited to, power generation equipment (i.e. gensets), turbines, compressor engines, incinerators, exhaust vents and stacks from processing facilities, ventilation vents, boilers and other heating equipment, docked marine vessels, idling train engines and other transport vehicles, fugitive emissions from storage tanks, and leaks from gas pipes and other equipment. This should also include start-up and shut-down emissions, as appropriate;
 - area sources: including drilling and blasting activities, material handling (e.g. loading and unloading of transport trucks), wind erosion of material piles, and dust emissions from paved and unpaved roads. Fugitive dust emission factors and expected fugitive dust mitigation (control effectiveness) should be described and justified as feasible;
 - mobile/road sources: including exhaust emissions from on-road vehicle engines. Include all off-road and on-road fleet vehicles used in the project. Tailpipe emission factors should be estimated using established methods;
 - emissions from project-related vessels and their tugs in transport and rail transport;
- baseline data should be taken from existing or new long term monitoring with representative monitoring data, collected over an appropriate duration (multi-year) and geographic scope;
- if a long-term monitoring data is not available, then other techniques may be acceptable on a case-by-case basis – with a rationale provided – including:

- limited or short term monitoring;
- data from a surrogate site that has similar meteorological and air quality to represent the site in question;
- results of existing large scale modelling;
- dispersion modelling to indicate spatial distribution of contaminants;
- for requirements pertaining to the use of atmospheric dispersion modelling, the proponent should
 - conduct modelling for an appropriate time period to account for variability in meteorology and baseline conditions, and use the most recent meteorological and emissions data available;
 - conduct dispersion modelling for all relevant temporal scenarios, including a pre-development scenario, the base case (accounting for all existing emission sources plus projects approved and under construction, but excluding the project), a project alone scenario (representing emissions from the project only), an application case (base case plus the project), and, if applicable, a future development case (application case plus projects that are currently proposed but not yet approved);
 - use appropriate domain boundaries and identify transboundary considerations. At a minimum, the modelling domain should enclose concentrations that are 10% of relevant air quality criteria; use an air quality model that is appropriate for the complexity of the terrain, sources and meteorology.

Wetlands

~~The following guidance should be consulted in conjunction with section [8.6 Vegetation, riparian and wetland environments](#).~~

~~With regards to the wetlands functions assessment, the proponent should:~~

- ~~complete this assessment for a representative selection of wetlands that the project would directly impact and of wetland(s) that are hydrologically connected. In conducting this assessment, the proponent should ensure that wetlands are considered in the context of:~~
 - ~~the larger watersheds of which they are a part;~~
 - ~~adjacent land use with a focus on hydrological and other functions;~~
 - ~~landscape and/or watershed considering topography, soil types and hydrological linkages; and,~~
 - ~~the global significance of peatlands across the regional study area;~~
- ~~be as specific as possible to the biological characteristics of the wetland and to the ecological services and functions it provides;~~
- ~~collect data from representative wetlands in a manner that enables reliable extrapolations in space (i.e. at minimum to the project area, LSA and RSA) and in time (i.e. across years), including:~~

- design survey in support of the assessment so that they represent the spatial and temporal targets of modeling and extrapolations, and to produce scientifically defensible predictions of impacts and estimates of mitigation effectiveness. Survey designs should be sensitive enough to detect and quantify the effects at the appropriate spatial and temporal scales, any departures from predictions, and the effectiveness of mitigations. Justify the selection of modeling techniques based on current and recent scientific literature;
- plan survey protocol for representative wetlands to include modeling and simulations to estimate sampling requirements, and analysis to evaluate resulting design options. Sample size must be planned to support evaluation of the project study area within the context of the LSA and RSA. Appropriate design of surveys will need to consider multiple survey locations in order to represent the wetland heterogeneity of the RSA, and to yield multiple survey locations per wetland type, without requiring aggregation of habitat classes post-hoc.
- incorporate the value of wetlands from an Indigenous perspective and existing disturbance when making proposals for wetland offsets;
- provide this assessment in a quantitative form and include the collection of site-specific baseline information on wetland functions, including:
 - surveys to assess for the presence, abundance, density, and distribution of migratory birds and federally listed species at risk, provincially listed species at risk, and species assessed by COSEWIC as at-risk in relation to potentially affected wetlands and associated riparian areas. Surveys should meet appropriate standards, be species or bird group specific as appropriate, and be conducted during the appropriate times of the year;
 - surveys for species at risk should assess species individually where possible (typically an indicator approach is not appropriate for species at risk). Surveys should not be limited to species or groups of species that are wetland-obligate, but rather should include any species known to use wetland as part of its lifecycle. Data should be sufficiently robust to identify which wetland classes are important to which species (and for how many);
 - the location and a description of the biological characteristics of each potentially affected wetland and the ecological services and functions (hydrology, biochemical cycling, habitat, climate) they provide. The functions assessment should be as specific as possible to the biological characteristics of the wetland and to the ecological services and functions it provides; and ○ a supporting rationale and detailed description of the methods used in completing the wetland functions assessment, including sampling design;
 - a rationale and detailed description of the methodology used to conduct the wetland function assessment, including the sampling design.
- consider submitting complete data sets from any survey sites, including GIS files; and
- contact the relevant provincial and local government authorities to determine if other wetland conservation policies, regulations or wetland compensation guidelines apply. See also resources available from [The Wetland Network](#).

Fish and Fish Habitat

The following guidance should be consulted in conjunction with section [8.7 Fish and fish habitat](#), as relevant to the establishment of baseline conditions.

- for watercourses, it is recommended that the description be provided on the basis of homogenous section. Parameters to be measured may include: length of the section, wetted width at the ordinary high water mark (OHWM), depth, streamflow types and characteristics (depth, velocity, turbidity, peak and low flows), substrate type (shoreline and bottom), aquatic (e.g. grass flat) and riparian vegetation, natural (significant vertical drop, waterfalls, subsurface flow over large distances, etc.), and anthropogenic barriers (stream crossing structures, etc.) that impede or obstruct free passage of fish. The obstacles must be documented (size, condition, etc.) and their passability by fish must be assessed;
 - Ordinary High Water Mark is the usual or average level to which a body of water rises at its highest point and remains for sufficient time so as to change the characteristics of the land. In water bodies, streams, and wetlands, these are the 0–2 year flood levels.
- for waterbodies, the parameters to be measured include, but are not limited to, size, bathymetry, littoral, maximum and average depths, seasonal water level fluctuations, substrate type (sediment), aquatic (submerged, floating and emergent) and riparian vegetation, and water quality (temperature and dissolved oxygen profile, turbidity, transparency, pH).

For potentially affected fish, the proponent should:

- First, use existing information (e.g. the Fish and Wildlife Internet Mapping Tool, accessible regional reports, primary literature, fisheries management objectives, information from consultation and engagement activities, traditional knowledge of Indigenous peoples affected by the project, etc.). Existing information should be supplemented using field data collection as necessary to support the assessment, and as relevant to validate predictions and mitigation success in the future;
- Perform field data collection programs in a representative number of locations (including reference locations where applicable), using sampling methods appropriate to the aquatic system, and should be performed in multiple seasons;

With respect to the assessment of effects on fish and fish habitat, the proponent should:

- present the habitat deterioration, destruction and disturbance on maps at appropriate scales, as well as in the form of tables;
- consider that the effects of chronic and acute disturbances to fish populations are often dependent on the state of the fish population. If the fish population is already quite depleted, the effect of an acute disturbance may have a disproportionate effect on the population.

Birds and bird habitat

The following guidance should be consulted in conjunction with section [8.8. Birds, migratory birds and their habitat](#):

- the proponent should consider and assess the following groups of migratory and non-migratory birds separately: waterfowl, water birds (other than waterfowl), songbirds, shorebirds, each bird species at risk and their habitat;
- avian surveys should be designed based on a thorough review of the available scientific literature pertinent to the specific region, bird groups and anticipated effects;
- in order to establish adequate baseline conditions for birds, the proponent should take into account the following technical recommendations:
 - collect data to account for natural variability among years, within and among seasons, and within the 24-hour daily cycle;
 - collect data in a manner to allow for reliable extrapolations in space (i.e. at a minimum in the project area, local and regional study areas) and in time (i.e. over the years);
 - design surveys so that they represent the spatial and temporal targets of modeling and extrapolations, and to produce scientifically defensible predictions of impacts and estimates of the effectiveness of mitigation measures. Survey designs should be sensitive enough to detect and quantify the impacts at the spatial and temporal scales identified above (i.e. project area, LSA, RSA), any departures from predictions, and the effectiveness of mitigation measures. Justify the selection of modeling techniques based on current and recent scientific literature;
 - If applicable, survey protocol planning should include modeling and simulations to estimate sampling requirements and analysis to evaluate resulting survey options. It is recommended to collect field data over at least two years to account for natural variability in populations. As the number of sampling years increases so does the understanding of natural variability;
 - use spatially balanced and randomly chosen sampling sites, preferably using stratified random sampling that covers all habitat types. When major habitat edges are identified, sampling should be designed such that it is possible to sufficiently describe the importance not only of the types of habitat, but also of the edges between the types of habitat;
 - have sufficient sampling effort and sampling locations to reflect variability among habitat type in the project, local and regional study areas, with more intensive sampling effort:
 - in the project area;
 - in areas where habitats are more likely to be affected by the project;
 - for rare species that may be harder to detect.
 - take into account detection errors and provide unbiased estimates of abundance and distributions using, as appropriate, simulation modelling in study design;
 - provide estimates of confidence or error for all estimates of abundance and distribution. Estimates should be defined (e.g., mean across years, mean across sites, modeled prediction) and, if appropriate, confidence or other intervals should be defined (e.g., 95% confidence intervals, credible intervals).
- where predictive modelling is required, provide the explanatory data (e.g. covariables such as associated land cover, etc.) required to predict effects on bird groupings (e.g. changes in abundance, distribution or other relevant effects) collected in such a way as to represent the following sources of

variation where applicable: spatial variation in land cover composition, soil type, geomorphology, hydrological processes, and inter-annual and intra-annual climate variability;

- when selecting metrics to characterize avifauna biodiversity, it is recommended that:
 - biodiversity metrics should include the following: distribution in space, frequency of occurrence, occurrence and abundance trends in time, abundance and density, as well as the types of associated habitats and the strength of the associations; and
 - species communities should not be grouped together by diversity indicator and should not be limited to the indicator species. The identification of species, distribution, abundance and, when possible, estimates of species' breeding status should be the main quantification objectives.
- when identifying areas of concentration of migratory birds, the following must be considered:
 - migratory bird concentrations can vary within a year and between years. It is therefore important to collect information across the project study area, local study area, and regional study area both temporally and spatially;
 - migratory bird counts are dependent on length of stay as well as presence. Attempt to estimate abundances across a migratory period should incorporate an estimate of inter and intra-annual trends and estimates of lengths of stay. Irruptive species may act in ways similar to migrants in terms of abundance. They may be absent from an area until conditions change (such as a mast event), during which time the habitat becomes vital to these species.
- ~~to quantify trophic linkages in the project area and the local study area, the proponent should consider using Structural Equation Models;~~
- baseline description of bird habitats should include, at a minimum, characterization of biophysical conditions with regard to ecoregion and Bird Conservation Region (BCR), taking into account the specific conditions found near the borders of these regions;
 - habitat surveys need to be detailed enough within the local and regional study areas to provide context for local and regional habitat availability and quality;
 - mixed wood and old-growth forest land cover and other upland vegetation types may be particularly important for many forests associated birds, supporting birds during migration, breeding and through the winter. Peatlands and wetlands including fens and bogs are ecologically important elements of the landscape. River riparian corridors with adjacent mixed wood forest are another relatively uncommon feature that should be clearly identified;
- the analysis of predicted effects on birds should:
 - include separate analyses for each activity, component and project phase;
 - distinguish between migratory and non-migratory birds;
 - consider sources of error for all analyses to ensure that the final effects predictions indicate the best estimate given the precision of the data;
 - explore, wherever possible, non-linear, indirect and synergistic responses to the project;
 - produce defensible forecasts of effects on bird species or groupings and of the effectiveness of mitigation measures; and

- justify any assumptions regarding relocation or temporary displacement during construction and operation of the project by using scientific references. The reference data should provide evidence that there is a significant number of equivalent habitats in which the birds can move and that the vegetation removed is not unique to the project area.

The proponent should consult:

- *Framework for the Scientific Assessment of Potential Project Impacts on Birds* for examples of project types and recommended techniques for assessing effects on migratory birds;
- Government of Canada's guidance on the website [Avoiding harm to migratory birds](#) to characterize effects on birds in terms of amount, duration, frequency, and timing of disturbances;
- [Guidelines to reduce risk to migratory birds](#) and ECCC's website on [General nesting periods for migratory birds](#) to inform the development and application of mitigation measures;
 - Note that although the nesting period dates on ECCC's website cover the main nesting periods of migratory birds, in order to reduce the risk of taking nests or eggs, it does not authorize the disruption, destruction or taking of a migratory bird, its nest or its eggs outside these periods.

The description of bird species and their habitat in the study area may be based on existing sources, but supporting evidence is required that demonstrates that the data used are representative of the avifauna and habitats in the study area. Existing data must be supplemented by surveys, if required to produce a representative sample of the avifauna and habitats of the study area.

Wildlife and Species at Risk

The following guidance should be consulted in conjunction with ~~section 8.9. Terrestrial wildlife and wildlife habitat~~ and for section [8.10 Species at Risk and their habitat](#).

In order to establish adequate baseline conditions for wildlife and species at risk, take into account the following technical recommendations:

- collect data to represent sources of temporal variation between years, during and between seasons (e.g. spring migration, breeding, fall migration, wintering), and in the daily 24-hour cycle;
- consider that rare species require more survey effort to detect than common species, and this needs to be accounted for in survey design by increasing the number and duration of surveys;
- survey protocol planning should include modeling and simulations to estimate sampling requirements and analysis to evaluate resulting survey options. It is recommended to:
 - collect field data over at least two years to improve the understanding of natural variability in populations. Two years of sampling is suggested as a minimum. As the number of sampling years increases so does the understanding of natural variability;
 - if recent existing data are available for the study area, it can be used to complement the data collected in the field. The available data must be sufficiently robust to assess the variability of populations between years and a demonstration must be presented for that purpose;

- plan the sample size to ensure sufficient assessment of the project area in the context of the local and regional study areas. Survey design will need to consider a large number of sites to represent the heterogeneity of regional study area habitat and to plan the number of sites by land cover or by habitat class so that aggregation of post hoc habitat classes is not necessary;
- design sampling effort per unit area - field survey effort to be most intensive within the project study area. The level of effort per unit area may be similar or somewhat less within the remainder of the LSA, but should be scaled to the likelihood that project effects will effect species within that zone. Efforts outside the project study area should be carefully designed to ensure that estimates comparing within and across the project area, LSA, and RSA are unbiased and as precise as possible;
- use simulation modelling to assess bias and precision between project area, LSA, and RSA to ensure the estimates are useful for comparison.
- preferably use stratified random sampling of habitat. Sample sites must be selected using a random procedure such as a GIS grid overlay;
- plan to include several sampling stations and several visits to each station to support all required assessment analyses. Inventories and analyses should be conducted by qualified experts; and
- consult recovery plans for which a survey schedule would have been created to identify information gaps for these species, including for the designation of critical habitat.

It is recommended that the proponent be prepared to:

- submit complete data sets from all survey sites. These should be in the form of complete and quality assured relational databases, with precisely georeferenced site information, precise observation/visit information and with observations and measurements in un-summarized form; and
- provide documentation and digital files for all results of analyses that allow for a clear understanding of the methods and a replication of the results (raw scripts or workflows are preferred in place of descriptive documentation).

The proponent should contact provincial or local government authorities to determine additional data sources and survey methods.

A permit under the *Species at Risk Act* must be previously obtained for surveys on federal lands that are likely to harm, harass, capture or kill species at risk, other than migratory birds.

Appendix 2 – Resources and guidance

Atmospheric, acoustic and visual environment

Air Quality Management System (AQMS) and the Canadian Ambient Air Quality Standards (CAAQS). Canadian Council of Ministers of the Environment (CCME). Available at <https://ccme.ca/en/current-activities/air>

Convention on Long-range Transboundary Air Pollution. United Nations Economic Commission for Europe (UNECE). 1979. Available at <https://unece.org/convention-and-its-achievements>

Environmental Code of Practice for the Measurement and Control of Fugitive VOC Emissions from Equipment Leaks. Canadian Council of Ministers of the Environment (CCME). 1993. Available upon request to CCME.

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Birds, Migratory Birds and their Habitat

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Canada-US convention protecting migratory birds. Environment and Climate Change Canada. 1999. Available at <https://www.canada.ca/en/environment-climate-change/corporate/international-affairs/partnerships-countries-regions/north-america/canada-united-states-protecting-migratory-birds.html>

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North American Breeding Bird Survey Website - Results. Available at <https://wildlife-species.canada.ca/breeding-bird-survey-results/P001/A001/?lang=e>

NatureCounts. Birds Canada, Avian Knowledge Network. Available at <https://www.birdscanada.org/birdmon/default/searchquery.jsp>

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Gender-based Analysis Plus

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Greenhouse gases and climate change

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Social Determinants of Health and Health Inequalities available at <https://www.canada.ca/en/public-health/services/health-promotion/population-health/what-determines-health.html>. Public Health Agency of Canada. 2019.

What are the social determinants of health? National Collaborating Centre for Determinants of Health. Available at <https://nccdh.ca/resources/entry/SDH-factsheet>

Indigenous Participation and Engagement

The Agency expects proponents to keep apprised of updated or new practitioner guidance or policies published on the Agency's website as may be the case over the course of a multi-year IA process. Best practices and current published guidance should be relied upon to the extent possible by proponents in developing their Impact Statement, and the following list of resources may be updated from time to time.

Indigenous Knowledge under the Impact Assessment Act: Procedures for Working with Indigenous Communities. Impact Assessment Agency of Canada. 2020. Available at <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/indigenous-knowledge-under-the-impact-assessment-act.html>

Guidance: Assessment of Potential Impacts on the Rights of Indigenous Peoples. Impact Assessment Agency of Canada. 2020. Available at <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/guidance-assessment-potential-impacts-rights-indigenous-peoples.html>

Guidance: Collaboration with Indigenous Peoples in Impact Assessments. Impact Assessment Agency of Canada. 2020. Available at <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/collaboration-indigenous-peoples-ia.html>

Guidance: Indigenous Participation in Impact Assessment. Impact Assessment Agency of Canada. 2019. Available at <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/guidance-indigenous-participation-ia.html>

Policy Context: Indigenous Participation in Impact Assessment. Impact Assessment Agency of Canada. 2020. Available at <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/policy-indigenous-participation-ia.html>

Policy Context: Assessment of Potential Impacts on the Rights of Indigenous Peoples. Impact Assessment Agency of Canada. 2020. Available at <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/assessment-potential-impacts-rights-indigenous-peoples.html>

Protecting Confidential Indigenous Knowledge under the Impact Assessment Act – Supplementary Guidance to Indigenous Knowledge in Impact Assessment: Procedures for Working with Indigenous Communities. Impact Assessment Agency of Canada. 2020. Available at <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/protecting-confidential-indigenous-knowledge-under-the-impact-assessment-act.html>

Technical Guidance for assessing the Current Use of Lands and Resources for Traditional Purposes under the Canadian Environmental Assessment Act, 2012. Canadian Environmental Assessment Agency. 2015. Available at https://www.canada.ca/content/dam/iaac-acei/documents/policy-guidance/assessing-current-use-lands-resources-traditional-purposes/current_use_final_draft-eng.pdf

United Nations Declaration on the Rights of Indigenous Peoples. United Nations. 2007. Available at <https://www.un.org/development/desa/indigenouspeoples/declaration-on-the-rights-of-indigenous-peoples.html>

Public participation

Framework: Public Participation under the Impact Assessment Act. Impact Assessment Agency of Canada. 2019. Available at <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/framework-public-participation.html>

Guidance: Public Participation for Impact Assessment under the Impact Assessment Act. Impact Assessment Agency of Canada. 2019. Available at <https://www.canada.ca/en/impact->

[assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/guidance-public-participation-impact.html](https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/guidance-public-participation-impact.html)

Purpose and need

Guidance: “Need for”, “Purpose of”, “Alternatives to” and “Alternative means”. Impact Assessment Agency of Canada. 2020. Available at <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/guidance-need-for-purpose-of-alternatives-to-and-alternative-means.html>

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Social and economic conditions

Analyzing Health, Social and Economic Effects under the Impact Assessment Act. Impact Assessment Agency of Canada. Available at <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/analyzing-health-social-economic-effects-impact-assessment-act.html>

Technical Guidance for Assessing Physical and Cultural Heritage or any Structure, Site or Thing. Impact Assessment Agency of Canada. 2015. Available at <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/technical-guidance-assessing-physical-cultural-heritage-or-structure-site-or-thing.html>

Species at Risk

Canadian National White-nose Syndrome Decontamination Protocol for entering bat hibernacula. Canadian Wildlife Health Cooperative. 2016. Available at: http://www.cwhc-rcsf.ca/docs/WNS_Decontamination_Protocol-Nov2016.pdf

COSEWIC Status Reports. Committee on the Status of Endangered Wildlife in Canada. Available at: <https://cosewic.ca/index.php/en-ca/status-reports>

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Operational Framework for Use of Conservation Allowances. Environment and Climate Change Canada. 2012. Available at <https://www.canada.ca/en/environment-climate-change/services/sustainable-development/publications/operational-framework-use-conservation-allowances.html>

Scientific assessment to inform the identification of critical habitat for woodland caribou (Rangifer tarandus caribou), boreal population, in Canada. Environment Canada, Canadian Wildlife Service. 2011. Available at <https://central.bac-lac.gc.ca/item?id=CW66-296-2011-eng&op=pdf&app=Library>

Species at Risk Act Permitting Policy. Government of Canada. 2016. Available at <https://species-registry.canada.ca/index-en.html#/consultations/2983>

Species at risk public registry. Environment and Climate Change Canada. Available at <https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html>

Woodland Caribou, Boreal population (Rangifer tarandus caribou): amended recovery strategy [proposed]. 2019. Available at: <https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/recovery-strategies/woodland-caribou-boreal-2019.html>

Sustainability and environmental obligations

Canada's national biodiversity clearing-house. Federal, provincial and territorial working group on biodiversity. Available at <https://biodivcanada.chm-cbd.net/>

Guidance: Considering the Extent to which a Project Contributes to Sustainability under the Impact Assessment Act. Impact Assessment Agency of Canada. 2019. Available at <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/guidance-considering.html>

Policy Context: Considering Environmental Obligations and Commitments in Respect of Climate Change under the Impact Assessment Act. Impact Assessment Agency of Canada. 2020. Available at <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/considering-environmental-obligations.html>

Water Quality

Canadian Drinking Water Guidelines. Available at: [Canadian Drinking Water Guidelines - Canada.ca](https://www25.international.gc.ca/water-quality/qualite-de-l'eau/canada/canadian-drinking-water-guidelines-canada-ca)

Canadian Water Quality Guidelines for the Protection of Aquatic Life. Canadian Council of Ministers of the Environment. Available at <https://ccme.ca/en/resources/water-aquatic-life>

Wetlands

Canada – Ramsar website. Available at <https://www.ramsar.org/wetland/canada>

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Operational Guidance: Framework for determining whether a Monitoring Committee is warranted for a Designated Project under the Canadian Environmental Assessment Act 2012 and under the Impact Assessment Act. Impact Assessment Agency of Canada. 2020. Available at <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/framework-determining-monitoring-committee.html>

Agency guidance documents are available from the [Practitioner's Guide to Federal Impact Assessments under the Impact Assessment Act](#)