Draft Joint Guidelines

GCT DELTAPORT EXPANSION – BERTH FOUR PROJECT (DP4)

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DRAFT FOR CONSULTATION

Canada

BRITISH COLUMBIA

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List of Abbreviations and Acronyms

Abbreviation/Acronym	Definition
Agency	Impact Assessment Agency of Canada
B.C.	British Columbia
B.C. Act	The *Environmental Assessment Act*, S.B.C. 2018, c.51
BAT	Best available technologies
BEP	Best environmental practices
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
DBTs	Dibenzothiophenes
EAO	Environmental Assessment Office
GCT	GCT Canada Limited Partnership
GCT Deltaport	Deltaport container terminal
GHG	Greenhouse Gas
IAA	*Impact Assessment Act* (S.C. 2019, c. 28, s.1)
PAHs	Polycyclic Aromatic Hydrocarbons
Project or DP4	GCT Deltaport Expansion, Berth Four Project
Registry	Canadian Impact Assessment Registry
SRKW	Southern Resident Killer Whale
TFN	Tsawwassen First Nation
VFPA	Vancouver Fraser Port Authority
VC	Valued Component
VOCs	Volatile Organic Compounds

Symbols and Units of Measure

Abbreviation/Acronym	Definition
%	percent
ha	hectare
m	metre
m^2	square meter
m^3	cubic meter
TEU	twenty-foot equivalent unit

Glossary

Term	Definition
Application	An application for an environmental assessment certificate (EAC) under the B.C. Act. The joint guidelines use the federal term “impact statement” to refer to the application.
Assessment	Review of the project that will meet both federal requirements for an impact assessment under the *Impact Assessment Act* and provincial requirements for an environmental assessment under the *Environmental Assessment Act* (2018).
Biodiversity	Variability of living organisms of all origins, including, in particular, the terrestrial, marine and other aquatic ecosystems and the ecological system of which they are part. This includes diversity within species, among species and among ecosystems.
Canadian Impact Assessment Registry	The Canadian Impact Assessment Registry is an Internet site established and maintained by the Agency consisting of project files relevant to the impact assessment process.
Contaminant of potential concern	A contaminant at a site that has the potential to adversely affect a human or non-human biological receptor, or any chemical substance for which the concentration in an environmental medium is likely to be high due to the project’s activities.
Crown	A term used to refer to both the Government of Canada (federal Crown) and the Government of British Columbia (provincial Crown).
Direct or incidental effect	Effects that may result from federal decisions or from federal funding that would permit a designated project to be carried out in whole orin part.
Effects	Positive or negative consequences of changes to the environment or to health, social or economic conditions that are likely to be caused by the carrying out of the project. This includes direct and incidental effects, as well as cumulative effects.
Environmental Assessment Office (EAO)	The EAO is a neutral regulatory agency within British Columbia’s government. The EAO administers the B.C. Act, including the conduct of environmental assessments of major projects in B.C. and provides provincial Ministers with advice to inform their decision on whether a project should proceed.

EPIC	The EAO Project Information Centreis an online publicly available database of all projects and important documents established and maintained by the EAO.
Gender	Refers to the socially constructed roles, behaviours, expressions and identities of girls, women, boys, men, and gender diverse people. It influences how people perceive themselves and each other, how they act and interact, and the distribution of power and resources in society. Gender is usually conceptualized as a binary (girl/woman and boy/man) yet there is considerable diversity in how individuals and groups understand, experience, and express it.
Gender-based Analysis Plus	An analytical framework that guides the assessment of how designated projects may have different positive and negative impacts on diverse groups of people or communities. The “plus” in GBA+ acknowledges the multiple identity factors that intersect with sex and gender to affect how people may experience projects differently and be differently impacted by projects.
Gender-based violence	Violence based on gender norms and unequal power dynamics, perpetrated against someone based on their gender, gender expression, gender identity, or perceived gender. It takes many forms, including physical, economic, sexual, as well as emotional (psychological) abuse.
Human Health Risk Assessment	Assessment of the effects on the health of persons exposed to biophysical stressors, particularly increased concentrations of chemical substances present in the environment and linked to various phases of a project (construction, operation, closure and reclamation, as the case may be).
Impact Assessment Agency of Canada (the Agency)	The Agency is a federal body accountable to the Minister of Environment and Climate Change. The Agency provides high-quality impact assessments that contribute to informed decision-making, in support of sustainable development. The Agency is the responsible authority for all federal impact assessments.
Impact Statement	Detailed technical document prepared by the proponent as per the requirements set out in the Joint Guidelines. It also refers to an application for an environmental assessment certificate under the B.C. Act.
Indigenous interests	Refers to all the requirements relating to Indigenous peoples required by both the *Impact Assessment Act*, and the *Environmental Assessment Act*, 2018.The *Impact Assessment Act* requires the assessment of the impacts that the proposed 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*”. The *Impact Assessment Act* also requires an assessment of, the effects of the project with respect to the Indigenous peoples of Canada, including 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; and any change occurring in Canada to the health, social or economic conditions of the Indigenous peoples of Canada. Paragraph 2(2)(b) of the *British Columbia Environmental Assessment Act, 2018* defines Indigenous Interests as "those interests related to an Indigenous nation and their rights recognized and affirmed by section 35 of the *Constitution Act, 1982*, including Treaty rights and Aboriginal rights and title, that may be impacted by a proposed project".
Indigenous nations / groups	First Nations and Métis peoples of British Columbia[1].
Joint Guidelines	Document that provides direction and requirements for the proponent in preparing an impact statement. The joint guidelines detail all information and studies required to conduct the assessment. This document includes the federal requirements for Tailored Impact Statement Guidelines and the provincial Application Information Requirements.
Joint Indigenous Engagement and Partnership Plan (JIEPP)	Document outlining how Indigenous nations may wish to participate in the coordinated federal and provincial assessment process, including, where available, information on proponent-led engagement activities.
Key receptors	Key receptors include sensitive receptors and other existing and reasonably foreseeable receptors that may be affected by project activities. Depending on the context, ecological receptors may also be considered, such as important areas of wildlife use.
Participating Indigenous nation	Term defined in the B.C. Act. An Indigenous nation that has notified the EAO that they would like to participate in the assessment of a project under the B.C. Act as a participating Indigenous nation. Participating Indigenous Nations (PINs) are afforded specific procedural rights within the B.C. Act, including consensus seeking processes, providing a notice of consent or lack of consent at specific decision points, and access to facilitated dispute resolution.

[1] This is not an acknowledgement by British Columbia that it owes a duty of consultation or accommodation to Métis in British Columbia under section 35 of the *Constitution Act, 1982*

Planning phase	First phase of the federal impact assessment process, where parties are invited to provide information and contribute to planning the assessment.
Proponent	A person or entity that proposes the carrying out of, or carries out, a designated project. In the case of this project, the proponent is GCT Canada Limited Partnership.
Receptor	The entity (e.g. organism, population, community, ecosystem, humans) that might be adversely affected by contact with or exposure to a substance of concern.
Review Panel	A review panel is a group of independent experts appointed by the president of the Agency to conduct an impact assessment. The members are selected on the basis of their knowledge or experience relative to the potential effects of the project or knowledge of Indigenous issues, and must be free from bias or conflict of interest relative to the project. The review panel is responsible for conducting the impact assessment, which includes collecting information, holding a public hearing and preparing the impact assessment report.
Sex	Refers to the biological and physiological characteristics that define males, females and intersex persons.
Sensitive receptor	Refers to human receptors that are more sensitive to exposure to a substance of concern. Sensitive receptors may include vulnerable individuals or subgroups of a population (e.g. individuals with compromised health, children, pregnant women, seniors) and places, such as 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), and recreational areas (e.g. recreational land, urban parks, parks and conservation areas).
Subgroup	In the context of GBA+, refers to diverse groups or subgroups within the general population or communities that may be impacted by the project. This may include women, gender-diverse people, youth, elders, people with disabilities, recent immigrants, visible minorities, among others.
Traditional Foods	All foods that do not come from commercial systems. Includes all food trapped, fished, hunted, gathered or cultivated for medicinal or subsistence purposes outside the commercial food chain, including aquatic and terrestrial wildlife that is fished, trapped, hunted or harvested for domestic consumption; fruits and vegetables harvested from the wild; plant tissue ingested for medicinal or other uses; agricultural products grown in gardens and/or home orchards, and aquatic and terrestrial wildlife produced exclusively for domestic consumption.

Disclaimer

This document is not a legal authority, nor does it provide legal advice or direction; it provides information only, and must not be used as a substitute for the *Impact Assessment Act,* the B.C. *Environmental Assessment Act*, *2018* or their respective regulations. In the event of a discrepancy, the language from the *Impact Assessment Act,* the B.C. *Environmental Assessment Act, 2018*, or their respective regulations will prevail. Portions of these acts or regulations have been paraphrased in this document, but will not be relied upon for legal purposes.

Preface

Global Container Terminals (GCT) Canada Limited Partnership (the proponent) is proposing to expand its existing GCT Deltaport Container Terminal, a container storage and handling facility located in Delta, British Columbia (B.C.). The GCT Deltaport Expansion – Berth Four Project (the project) would add a fourth berth on the east side of the Roberts Bank Causeway, and include an expansion of the intermodal rail yard along the causeway (Roberts Bank Way) and dredging to provide safe access for ships. The additional land-based container storage and handling facilities would provide capacity for an additional two million 20-foot long storage containers per year at the existing terminal.

On October 28, 2021, the Impact Assessment Agency of Canada (the Agency) determined that an impact assessment is required for the project, pursuant to Canada's *Impact Assessment Act* (IAA). Likewise, on on the same day, the British Columbia Environmental Assessment Office (EAO) provided a notice of decision under Section 18(1) of the *Environmental Assessment Act, 2018* (the B.C. Act) that the project will proceed to an environmental assessment.

On November 3, 2021, the federal Minister also referred the project to an independent review panel. The EAO intends to principally rely on the federal review panel's impact assessment to meet the provincial requirements for an environmental assessment. Each government retains the power to make their own decisions regarding the project.

For more information on the assessment of the project or to view the information and comments received, visit the Canadian Impact Assessment Registry (the Public Registry) at *GCT Deltaport Expansion - Berth Four Project - Canada.ca (iaac-aeic.gc.ca)* or the EAO Project Information Centre (EPIC) at *EPIC (gov.bc.ca)*.

The purpose of the draft joint guidelines is to identify for the proponent the information requirements for the preparation of an Impact Statement for the designated project to be assessed pursuant to the IAA and the B.C. Act . This document specifies the nature, scope and extent of the information required for the assessment.

This document has been drafted and tailored for the project jointly by the the Agency and the EAO to ensure it reflects both provincial and federal requirements including the requirements outlined in the Agency's Tailored Impact Statement Guidelines and the EAO's Application Information Requirements Guidelines. GCT Canada Limited Partnership led the early draft of this document to ensure it appropriately reflects the nature of the project it is proposing. Early input from federal authorities and Indigenous nations was also considered in the development of this draft. This input is part of the Project File and can be made available upon request. These Joint Guidelines set out minimum information requirements. It is the responsibility of the proponent to provide sufficient information, data and analysis to permit a thorough assessment of the potential impacts of the project. Except where specified, the proponent has the discretion to select the most appropriate methods to compile and present data, information and analyses in the Impact Statement.

The Agency and EAO are now seeking input from Indigenous nations, expert federal and provincial departments, local governments, members of the public and other participants. Specific feedback is requested on the scope of the assessment, and information requirements. A final version of these Joint Guidelines which reflects the input received will then be issued to the proponent at the end of the Planning Phase of the assessment.

Guidance on reviewing the draft joint guidelines

The Agency and EAO have prepared draft joint guidelines to inform the assessment of the project. The draft joint guidelines provide direction and requirements for the proponent in preparing an impact statement, and are designed to be tailored specifically to the project being assessed.

As part of the cooperative assessment process, the Agency and EAO are making the draft joint guidelines available for participants to review and provide feedback. From November 10 until December 23, 2021, the Agency and EAO are inviting participants to provide comments on the draft joint guidelines.

When reviewing the draft joint guidelines, the Agency and EAO would like participants to focus their comments on the following questions:

- What locations and/or valued components are of importance to you and could be affected by the project?
- What information is necessary for a thorough and complete assessment to be conducted?
- Are there any potential effects or impacts of the project you are concerned about that are not included in the draft joint guidelines?

Scope of the assessment

In addition, the Agency and EAO are seeking input on the appropriate scope of the assessment of the project. This includes direction to the proponent on the selection of valued components and sub-components and appropriate geographic and temporal scope of the assessment of effects and cumulative effects. This also includes the spatial boundaries proposed by the proponent in Appendix 1 of the draft joint guidelines.

The Agency and EAO are also seeking input on the geographic extent of activities that are relevant to the assessment of the project, such as marine shipping and road and rail transportation. The Agency and EAO have not made a final determination with respect to the geographic extent of these activities. Specifically, the Agency and EAO are seeking comment on the geographic extent of the following activities related to the project:

- assessing marine shipping incidental to the project beyond the 12 nautical mile limit of the territorial sea of Canada (see section 15 of the draft joint guidelines);
- assessing road transportation beyond the proponent's lease boundary (see section 17.1 of the draft joint guidelines); and
- assessing rail transportation beyond the proponent's lease boundary (see section 17.2 of the draft joint guidelines).

The Agency and EAO's final determination on the scope of the assessment will be reflected in the final joint guidelines.

How to submit comments

From November 10, 2021 to December 23, 2021, the Agency and EAO will invite comments on the joint guidelines. Comments can be submitted online by visiting the project home page on the Canadian Impact Assessment Registry (reference number *81010*). Comments may also be submitted by email to *Deltaport@iaac-aeic.gc.ca*, by regular mail or phone (see contact information on project home page). Comments may be submitted in either official language. Comments received by the Agency and the EAO are considered public and will be published online.

1. Project Introduction and Overview

The Impact Statement must provide a high-level overview of the project including:

- the type of project;
- the objective of the project;
- a statement of the general project location and names of the nearest communities; and
- the relevant history of the project, including exploratory or investigative history.

The Impact Statement must describe the designated 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.

1.1. Proponent Information

The Impact Statement must:

- identify the proponent and, where applicable, the name of the legal entity(ies) that would develop, manage and operate the project;
- describe GCT, including company history, type of company or organization, affiliations, and headquarter location;
- specify the mechanism used to ensure that corporate policies will be implemented and respected for the project;
- provide contact information for GCT representatives for the project (for example, name, address, phone, fax, email);
- identify key personnel, main contractors, and/or sub-contractors responsible for preparing the Impact Statement and conducting the assessment including their qualifications; and
- describe the corporate and management structure, including roles and responsibilities of key personnel.

1.2. Project Location

The Impact Statement must describe the project 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, cultural and economic effects of the project. The following information must be included and, where appropriate, located on maps:

- project site including the latitude and longitude coordinates of the main project site (for centralized projects) and endpoints (for linear projects);

- geographic coordinates (i.e. longitude/latitude using international standard representation in degrees, minutes, seconds) for the centre of the main project site;
- project footprint, including the extent of the tenure;
- surface areas, location and spacing of project components;
- services and infrastructure and current land and aquatic uses in the area including:
  - roads;
  - municipalities and administrative regions;
  - infrastructure and resource development projects already underway in the assessment area (e.g. port developments, LNG, industrial projects); and
  - local businesses and industries such as fisheries and outfitters, and any other relevant uses;
- project access route and transportation corridors;
- primary, secondary and tertiary watersheds;
- all waterbodies, including intermittent and ephemeral streams, and their location on a map;
- navigable waterways;
- landcover in the area, including important or critical habitats;
- ecozones, ecoregions, and ecodistricts as per the province's or *Canada's Ecological Landscape Classification*;
- environmentally sensitive areas, such as national, provincial, territorial and regional parks, Indigenous Protected and Conserved Areas, UNESCO World Heritage Sites, ecological reserves, marine protected areas, marine refuges, ecologically and biologically sensitive or significant areas, wildlife habitat areas, old growth management areas, ungulate winter ranges, wetlands, estuaries, habitats of federally or provincially listed Species at Risk and other sensitive areas;
- the environmental significance and value of the geographical setting in which the project will take place and the surrounding area;
- lands and waters subject to conservation agreements;
- distance to the international or provincial border (e.g. the United States) if the potential for effects to cross a border is identified;
- distance of the project components to any federal lands and the location of any federal lands within the regional assessment area;
- description and locations of all potable drinking water sources (i.e. municipal or private);
- local and Indigenous communities and nations, including distances to these communities and nations;
- 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
- summary of culturally and locally important features of the landscape.

The following information must be included on maps:

- on- and off-site project components;

- Indigenous traditional territories and/or consultation areas, Treaty and/or Title lands, and Reserve lands;
- local and Indigenous communities;
- international, provincial and territorial boundaries, where applicable;
- parks and protected areas; and
- legally protected wildlife habitat.

The following shapefiles and .kmz files for the project must be provided, where not previously provided or where updates have been made to the shapefiles submitted with the Initial or *Detailed Project Description*:

- project footprint;
- known or proposed project components;
- project access route;
- boundaries of Local Assessment Area (LAA) and Regional Assessment Areas (RAA) for each VC; and
- description and locations of all potable drinking water sources (i.e. municipal or private).

See section 1.6 - Format and Accessibility for more information about format requirements for map files.

1.3. Matters and Factors to Be Considered in the Assessment

The Joint Guidelines correspond to factors and matters to be considered in the assessment.

The factors to be taken into account in the assessment as per subsection 22(1) of the *Impact Assessment Act* are:

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:

   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 achievable 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 IAA;
p. any relevant assessment referred to in sections 92, 93, or 95 of the IAA;
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 IAA—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 impact assessment that the Agency requires to be taken into account.

The assessment matters required under section 25 of the B.C. Act are:

1. The effects of a project on Indigenous nations and rights recognized and affirmed by section 35 of the *Constitution Act, 1982* must be assessed in every assessment.
2. The following matters must be considered in every assessment:
    a. positive and negative, direct and indirect effects of the reviewable project, including environmental, economic, social, cultural and health effects and adverse cumulative effects;
    b. risks and uncertainties associated with those effects, including the results of any interaction between effects;
    c. risks of malfunctions or accidents;
    d. disproportionate effects on distinct human populations, including
    e. populations identified by gender;

f. effects on biophysical factors that support ecosystem function;

g. effects on current and future generations;

h. consistency with any land-use plan of the government or an Indigenous nation if the plan is relevant to the assessment and to any assessment conducted under section 35 or 73;

i. greenhouse gas emissions, including the potential effects on the province being able to meet its targets under the *Greenhouse Gas Reduction Targets Act*;

j. alternative means of carrying out the project that are technically and economically feasible, including through the use of the best available technologies, and the potential effects, risks and uncertainties of those alternatives;

k. potential changes to the reviewable project that may be caused by the environment; and

l. other prescribed matters.

1.4. Gender-Based Analysis Plus (GBA+)

For consideration of the intersection of sex and gender with other identity factors (paragraph 22(1)(s) of the IAA) and disproportionate effects on distinct human populations, including populations identified by gender (paragraph 25(1)(d) of the B.C. Act), the Joint Guidelines will refer to Gender-based Analysis Plus (GBA+). GBA+ 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 Joint Guidelines refer to "diverse subgroups" in the context of GBA+, 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+ in the Impact Statement. The *Human and Community Well-Being guidelines* can also provide useful information to support the analysis.

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

- be sufficiently disaggregated to support the analysis of disproportionate effects as per the GBA+. 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 Indigenous and community knowledge from affected populations, including community developed indicators and locally collected data, was used in establishing existing conditions and informing effects assessments;
- describe how community members differ in access to resources, opportunities and services. As much as possible, describe multiple intersections of identity factors in the analysis;
- describe the circumstances in which diverse subgroups could suffer more adverse effects or receive fewer benefits related to the project than others, and how they may respond differently to potential effects;
- describe mitigation or enhancement measures to address these differential effects and reflect community engagement and input; and

- describe follow-up measures and plans to address these differential impacts and reflect community engagement and input.

If data gaps exist, the proponent should document those in the Impact Statement and justify why the information was not available.

Quantitative information, including gender sensitive data, should be complemented by qualitative insights from studies or consultations, and other sources. The collection of data should be flexible to accommodate input, for example, through storytelling, song, or oral history. The description of effects should be based on both data collected and concerns expressed through engaging with the affected Indigenous nations and community members.

1.5. Preparing the Impact Statement

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

The Impact Statement must address all requirements outlined in the Joint Guidelines. Where the proponent is of the opinion that the information is not required, they should contact the Agency and the EAO 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 and the EAO 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 and the EAO are available to support the proponent during the preparation of the Impact Statement. The proponent is encouraged to engage the Agency and the EAO early in the process to clarify requirements and expectations as presented in the Joint 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 proponent is expected to demonstrate scientific integrity in the preparation and delivery of the Impact Statement 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.

The proponent is expected to demonstrate their adherence to these methods and processes within their Impact Statement. For example, it is expected that the proponent 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.

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 subgroups. 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* or standards adopted by an Indigenous nation) and disaggregated data from small or unique populations

1.6. Format and Accessibility

The assessment must be based on information that is publically accessible. The proponent must provide a summary of the documents that served as key references in the Impact Statement that are not otherwise publically 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 and the EAO with the corresponding electronic geospatial data file(s). The Agency and the EAO 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;
- point of contact and originator; and
- 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, the Agency, the EAO or the Review Panel upon request. The Agency, the EAO or the Review Panel may require specific data sets to support review of the Impact Statement or for the 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 the Government of Canada's commitment to Open Science and Data and will 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 and the EAO to obtain additional direction regarding the format and distribution of the Impact Statement.

2. Project Description

2.1. Project Components

The Impact Statement must:

- describe the project components determined to be within the scope of the project, including both on- and off-site facilities, associated and ancillary works, and other characteristics to assist in understanding the potential effects on environment, health, social, cultural and economic conditions and impacts on Indigenous interests;
- if applicable, describe how existing infrastructure will be used for the project;
- 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 subgroups and any other relevant sources was used to identify potential components 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.

2.1.1 Marine Components

At a minimum, the Impact Statement must describe and consider the following marine components, to the extent to which the Agency and EAO, as appropriate, determine they are incidental to the project, including:

- the approach channel, harbour basin, and berth areas[2] for the marine terminal and tug basin (including area and size, location, and orientation to existing terminals);
- the marine terminal and tug basin, and all associated infrastructure, ancillary systems and support facilities (including size, dimensions, location, design criteria, and construction development plans);
- breakwaters and erosion protection structures, including scour protection;
- mooring systems;

[2] The approach channel, harbour basin, and berth areas taken together include: (1) the area in which a marine vessel, in-bound for the project, leaves the navigation channel up to the point at which the vessel arrives at the marine terminal, (2) the area in which an out-bound marine vessel leaves the marine terminal up until it enters the navigation channel, and (3) the area in which any tug activity occurs in support of the arrival and/or departure of a marine vessel from the marine terminal.

- short sea shipping berth, and all associated infrastructure, ancillary systems and support facilities (including size, dimensions, location, design criteria, and construction development plans); and
- Tsawwassen First Nation marina including installation of utility and electrical infrastructure.

2.1.2 Onshore Components

At a minimum, the Impact Statement must describe and consider the following onshore components, to the extent to which the Agency and EAO, as appropriate, determine they are incidental to the project, including:

- the container storage and handling yard including installation of utility and electrical infrastructure, container handling equipment (e.g. gantry cranes), and paved surfaces;
- the intermodal rail yard, including the installation of utility and electrical infrastructure, container handling equipment (e.g. rail gantry cranes), and rail tracks;
- permanent and temporary linear infrastructures (including description and size of road, railroad, pipelines, power supply and primary electrical transmission lines), identifying the route of each of these linear infrastructures, the location, types and ownership;
- causeway and other road improvements;
- 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);
- utilities, including underground stormwater, water, sanitary, electric and data utilities;
- construction workspace and laydown areas;
- temporary or permanent infrastructure, including administration buildings, warehouse, garages, maintenance and security offices;
- container handling equipment;
- storage for fuels, explosives, and hazardous wastes;
- source drinking and industrial water;
- energy supply source;
- waste disposal (types of waste, methods of disposal, quantity, disposal sites or facilities);
- cargo traffic (including type, tonnage, and storage time in the terminal for goods handled), with data to be provided separately for imports, exports, ship-to-ship transfers, and land-to-land transfers and increases relative to existing traffic volumes);
- road and rail traffic (including number, type, size and capacity of trucks and trains including approximate timing of arrivals and departures and increases relative to existing traffic volumes); and
- any other infrastructure relevant to the project.

2.2. Project Activities

The Impact Statement must:

- include descriptions of project activities to be carried out during each project phase, including construction, operations, and ongoing maintenance, refurbishment and replacement to ensure the assets will continue to function in perpetuity. The focus should be on activities with the greatest potential for effects on environmental, health, social, cultural and economic conditions, or impacts on Indigenous interests;
- if applicable, identify a pre-construction phase and describe any activities that are planned to be conducted prior to construction of the full project (for example, dredging or decommissioning/removal of existing infrastructure that is not required for the project and must be removed before the start of construction);
- include a detailed schedule including expected start date, sequencing, time of year, frequency, and duration for all project activities;
- describe the location, construction methods used, magnitude and scale of each project activity. Any overlapping phases should be described;
- highlight activities that involve periods of increased disturbance to environmental, health, social, cultural and economic conditions or Indigenous interests;
- 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); and
- detail how input from diverse subgroups was used to identify potential components or activities of concern.

2.2.1 Site Preparation and Construction

Site preparation and construction activities are listed below (for additional information refer to the *Detailed Project Description*) and must be described and considered in the Impact Statement:

- construction staging;
- surveying and staking;
- construction of site fencing;
- changes to existing infrastructure including marine terminal expansion, container storage and handling yard, intermodal rail yard expansion, relocation of tug basin and Westshore overpass;
- rock and fill materials required (source, quantity, method and timing of transportation to project site such as by truck or barge);
- storage areas for material stockpiles;
- dust control measures;

- water management, including, dewatering or deposition activities, stormwater management required (location, methods, timing) , site drainage, runoff management and sediment or erosion control;
- water management to divert, control, collect and discharge surface drainage to the receiving environment, including collector ditches, sumps, and pump and pipeline systems;
- 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 new permanent infrastructure including but not limited to short sea shipping berth and marina;
- transportation of employees;
- storage, gestation, disposal and management of hazardous materials, fuels and waste (indicate types, methods and amounts);
- land reclamation activities for marine terminal expansion, including surcharge program;
- marine and/or port related dredging;
- pile installation;
- 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); and
    - sediment transportation modes to the construction or disposal sites, including management of dewatering basins, if necessary;
- 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; and
    - the nature of sediments (physical and chemical characteristics).
- for terrestrial disposal sites or dewatering basins, if required:
    - the size, location, type, volume and the level of contamination of sediments to be stored, as the case may be;

2.2.2 Operations

Project operational activities are listed below (for additional information refer to the *Detailed Project Description*):

- marine navigation activities, including short sea shipping, relating to product transport or support vessels;
- management and disposal of wastes onshore and offshore;
- storage, handling, and transport of materials;
- lighting;
- power requirements for all project components, including for ship to shore power supply, if any;
- fueling and maintenance activities for marine vessels, locomotives, trucks, and cargo handling equipment;
- if applicable, dredging and maintenance dredging;
- water management, including water diversions, site drainage and runoff management, sediment and erosion controls, potable water, water use requirements, storm 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;
- ocean disposal, methods, and disposal locations;
- waste management and recycling; and
- workforce management, including transportation, work schedules, and lodging.

2.2.3 Suspension, Abandonment or Decommissioning

The Impact Statement must:

- provide examples of ongoing maintenance, refurbishment and replacement activities to ensure the assets will continue to function in perpetuity; and
- describe how the project would be decommissioned and abandoned, in whole or in part, should the need arise.

2.3. Workforce Requirements

The Impact Statement must describe the anticipated labour requirements including:

- anticipated workforce region of origin (i.e. local, regional, out of province or international employees);
- the number of full-time and part-time positions to be created for each project phase and timeline for when they will be created. Positions should be presented using the National Occupational Classification system;
- the skill and education levels required for the positions;

- working conditions and anticipated work scheduling for construction and operation (e.g. hours of work, rotational schedules);
- investment in training opportunities;
- anticipated work rotation schedules and means to get employees to the project site (for example, private vehicles, proponent vehicles, use of public transportation);
- anticipated housing arrangements, if required, for the workforce for each project phase;
- anticipated hiring policies including hiring programs;
- workplace trainings, policies and programs for Indigenous employment and employment of underrepresented groups;
- employee assistance programs and benefits including career planning, employee counselling, family support, transition planning, pension plan and group insurance benefit plans;
- workplace policies and programs including codes of conduct, workplace safety programs and cultural training and awareness programs; and
- workforce development conditions.

Workforce requirements must take GBA+ 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 nations and other relevant diverse subgroups.

3. 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"*.

3.1. 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/processing, etc.) and indicate the target market (e.g. international, domestic, local, etc.), where applicable. The purpose of statement should include any objectives the proponent has in carrying out the project.

The proponent should consider the perspectives of participants (e.g. public, Indigenous nations, governments) in establishing objectives that relate to the intended effect of the project on society.

3.2. 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 including but not limited to:
  - existing and planned capacity for containers on the west coast of Canada;
  - description of container capacity demand forecasts for low, medium, and high growth scenarios in consideration of potential changes in economic trends; and
  - trends in container shipping, including changes in ship size and the use of ultra large container vessels.
- comments or views from Indigenous nations, the public and other participants on the proponent's need statement.

3.3. Alternatives to the Project

The proponent 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 nations 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 19 – 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 IAA and B.C. Act.

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

- expansions of existing terminals located on the west coast of Canada, including but not limited to terminals located on the Fraser River, Burrard Inlet, and the Fairview Terminal in Prince Rupert;
- constructing a new terminal, including other potential locations and comparable projects with the same purpose and intent; and
- the no-action (null) alternative to serve as a benchmark for the assessment and comparison of the project and any alternatives to a project. The description should note the existing conditions of the VCs associated with the project, as well as changes to these existing conditions that are likely to occur in the future if a project was not carried out (e.g. changes as a result of other projects already planned for the region, changes to socioeconomic conditions, future climate change).

3.4. Alternative Means of Carrying Out the Project

The Impact Statement must identify and consider alternative means of carrying out the project that are technically and economically feasible, including the use of best available technologies, and the potential effects of those alternatives on environmental, health, social, cultural and economics conditions, and the impacts on Indigenous interests. The alternative means analysis must address all project components for all project phases, where relevant to the project activities and design. Considerations include, but are not limited to, alternative technologies, processes, mitigation and design.

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, cultural and economic effects, and their impacts on Indigenous interests as identified by Indigenous nations.

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. Criteria must include, but are not limited to, consideration of the following parameters:
  - impacts on Indigenous interests;
  - effects on environmental, health, social, cultural and economic conditions. Environmental criteria should include, at a minimum, effects to air quality and greenhouse gas emissions, water quality, all wildlife and associated habitat (including wetlands);
  - potential effects to species at risk as per the *Species at Risk Act*, including any critical habitat, must be considered in the alternatives 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;
  - risks and uncertainities of the technically and economically feasible alternative means; and
  - logistics and other parameters relevant to the comparison may also be included.
- the preferred means of carrying out the project and the rationale for the selection should be based on consideration of:
  - the criteria described above;
  - technical and economic feasibility;
  - how effects, risks and uncertainties are addressed;
  - the use of best available technologies; and
  - sustainability principles described in section 19 – Extent to which the Project Contributes to Sustainability;
- application of GBA+ to the analysis of alternative means of carrying out the project to inform how effects may vary for diverse subgroups; and
- how concerns, views and information provided by Indigenous nations, the public and other participants were taken into account in establishing criteria and conducting the analysis.

In its alternative means analysis, the proponent must address key project activities and project infrastructure, including, but not limited to, the following:

- route or corridor and means options for transportation (e.g. marine shipping);
- project site location;
- access to the project site;
- location, orientation and layout of key project components, including but not limited to:
  - marine approach area;
  - container terminal berth and short sea shipping berth;
  - marina;
  - tug basin;

    - dredge pocket and dredge depths required for various sizes of container ships;
    - causeway road improvements;
    - intermodal rail yard;
    - container handling and storage area;
    - container handling equipment;
- facility design;
- energy sources to power the project site;
- options for the provision of shore power for docked vessels;
- water and wastewater management including;
    - location of effluent discharge points;
    - treatment technologies and techniques to control effluent quality.
- construction alternatives;
- alternatives to and methods for dredging;
- alternatives to disposal at sea of sediments;
- disposal at sea location(s);
- timing options for components and phases of the project; and
- 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;
- 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 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 participants; and
- other studies or assessments realized by other proponents.

4. Regulatory Framework

4.1. Environmental Assessment Process

The Impact Statement must identify where the project has met the definition of a designated project under the IAA and where the project has met the definition of a reviewable project under the B.C. Act. The Impact Statement should make reference to the appropriate sections of the *Physical Activities Regulations* and the *Reviewable Projects Regulation*, and provide a high-level overview of the joint assessment process. It must also state whether there are Indigenous-led assessments.

4.2. Relevant Policies, Initiatives, Assessments and Role of the Government

The Impact Statement must identify government policies, study initiatives, and regional and strategic assessments relevant to the project and/or the current assessment and their implications.

The Impact Statement must also:

- 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;
- identify legislation and other regulatory approvals that are applicable to the project at the federal, provincial, regional and municipal levels or from any body—including a co-management body—established under a land claim agreement referred to in section 35 of the *Constitution Act*, *1982*, or from an Indigenous governing body as defined in the IAA that has powers, duties or functions in relation to the environmental effects of a project;
- list the federal, provincial or territorial greenhouse gas legislation, policies or regulations that will apply to the project, in accordance with the *Strategic Assessment of Climate Change* (SACC);
- identify government policies, resource management plans, planning or study initiatives relevant to the project and/or the current assessment and their implications, including relevant regional studies and strategic assessments;
- identify information on land lease agreement or land tenure, when applicable;
- identify municipal, regional, provincial and/or national objectives, standards or guidelines that have been used by the proponent to assist in the evaluation of any predicted environmental, health, social, cultural or economic effects or impacts on Indigenous interests; and
- identify any relevant land or marine use plans, land zoning, or community plans of a government (municipal, provincial, federal) or of an Indigenous nation that may be relevant to the project area including whether the project is consistent with the identified plans.

4.3. Indigenous Nation Arrangements

The Impact Statement must identify and describe how the assessment has considered the following arrangements:

- any applicable Indigenous nation arrangements between federal or provincial governments and Indigenous nations that are pertinent to the project and/or the assessment (for example, any treaty, self-government, land claims); and
- any agreements between the proponent and Indigenous nations applicable to the assessment of the project.

4.4. Permits, Licences, Approvals and Authorizations

The Impact Statement must provide an update to the information provided on permitting in the *Detailed Project Description* and identified in the *Joint Permitting Plan / Regulatory Coordination Plan*, which must:

- describe existing licenses, permits, approvals or tenures and the date received; and
- describe anticipated authorizations and permits, the expected submission dates of the applications, and an indication of whether they would be submitted during the assessment.

5. Description of Engagement with Indigenous Nations

The Impact Statement must identify which Indigenous nations may be affected by the project and explain how the proponent has identified and engaged with those potentially affected Indigenous nations. This assessment process will be conducted in a manner consistent with the *Joint Indigenous Engagement and Partnership Plan* (JIEPP). For the purposes of this assessment, the term Indigenous nations will be used instead of Indigenous groups, peoples or communities based on input from Indigenous nations.

As part of the assessment process, the proponent must collaborate with Indigenous nations 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, just as it integrates scientific knowledge;
- share project information frequently and transparently with Indigenous nations;
- support the participation of Indigenous nations in the development of the Impact Statement, which could include funding studies conducted by potentially affected Indigenous nations who will have demonstrated interest in this regard; and
- cooperate with Indigenous nations to identify preferred mitigation measures to avoid, minimize, offset or otherwise accommodate for potential adverse impacts on Indigenous nations or their rights, as well as to optimize the project's benefits for their communities.

5.1. Potentially Impacted Indigenous Nations

At a minimum, the proponent must engage with the Indigenous nations identified[3] by the Crown in the JIEPP 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 nations, and to inform an assessment of the potential impacts of the project on Indigenous interests. Further details on the information requirements for the assessment of the impacts of the project on Indigenous interests is found in section 12 and section 0.

The Impact Statement must assess the project's potential effects on the Indigenous nations identified by the proponent and confirmed by the Agency and EAO in the Joint Summary of Issues and Engagement and any others that may be identified by the Agency or EAO prior to the submission of the Impact Statement. Of the

[3] The list of Indigenous nations 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 assessment. The Agency and EAO reserve the right to modify the list in the Joint Indigenous Engagement and Participation Plan based on additional information gathered during the assessment.

Indigenous nations identifed, 17 notified the EAO that they would like to participate in the assessment of the project under the B.C. Act as as participating Indigenous nations (PINs) for the purposes of the provincial process. The Indigenous nations who have submitted PIN notices are identified with an asterisk.

- Cowichan Tribes*
- Ditidaht First Nation*
- Esquimalt Nation (No'ilung Si'em 'i' sche'le'chu)*
- First Nations of the Maa-nulth Treaty Society, which represents Huu-ay-aht First Nation,Ka:'yu:'k't'h'/Che:k'tles7et'h First Nations, Toquaht Nation, Uchucklesaht Tribe, and Yuułu?iɬ?atḥ Government*
- Halalt First Nation*
- Katzie First Nation
- Kwantlen First Nation
- Kwikwetlem First Nation
- Leq'á:mél First Nation
- Lyackson First Nation*
- Malahat First Nation*
- Matsqui First Nation
- Métis Nation British Columbia
- Musqueam Indian Band*
- Pacheedaht First Nation*
- Pauquachin First Nation*
- Penelakut Tribe
- Popkum First Nation
- Sc'ianew (Beecher Bay) First Nation*
- Seabird Island First Nation
- Semiahmoo First Nation
- Shxw'ōwhámél First Nation
- S'ólh Téméxw Stewardship Alliance, which includes member nations Aitchelitz First Nation, Chawathil First Nation, Cheam First Nation, Kwaw-kwaw-Apilt First Nation, Sumas (Semá:th) First Nation, Shxwhá:y Village, Skowkale First Nation, Skwah First Nation, Soowahlie First Nation, Skawahlook (Sq'ewá:lwx) First Nation, Sq'éwlets First Nation, Squiala First Nation, Tzeachten First Nation, Yakweakwioose First Nation, and Yale First Nation*
- Songhees First Nation
- Squamish Nation
- Stz'uminus First Nation*
- Tsartlip First Nation
- Tsawout First Nation
- Tsawwassen First Nation*
- Tseycum First Nation
- Tsleil-Waututh Nation*
- T'Sou-ke First Nation*
- Ts'uubaa-asatx (Lake Cowichan) Nation*

5.2. Indigenous Engagement

The Impact Statement must set out the proponent's overall approach to collaborating with Indigenous nations. Section 5.2.1 - Record of Engagement and section 5.2.2 - Analysis and Response to Concerns Raised by Indigenous Nations explain how the Impact Statement will document the proponent's specific engagement to date with Indigenous nations, and how it has responded to issues raised by Indigenous nations.

The JIEPP outlines opportunities and methods for meaningful engagement and consultation with potentially affected Indigenous nations throughout the assessment process for the project. The JIEPP is intended to be flexible and does not preclude the Crown from making changes to the approaches described in the JIEPP to accommodate changes that may occur during the assessment process, including adopting revised approaches suggested by Indigenous nations. The assessment will be conducted in a manner consistent with the JIEPP. The proponent will coordinate with the Agency and EAO to ensure that Indigenous nations receive the most current information about the assessment process and opportunities to engage.

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 nations and ensuring that there is effective and meaningful participation of Indigenous nations 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 nations, with the intention to achieve consensus. The proponent must demonstrate how they have meaningfully engaged with Indigenous nations.

Engagement should also be consistent with jurisprudence and best practices in respect of implementing the common law duty to consult. The JIEPP identifies the Indigenous nations with which the Crown will consult to understand the concerns and potential impacts of the project on their Indigenous interests and, where appropriate, mitigate and accommodate impacts. The degree of engagement with each nation will vary and in general, will be proportionate to the information provided by Indigenous nations, the Crown and the proponent regarding potential pathways of impact from the project on Indigenous interests.

5.2.1 Record of Engagement

The Impact Statement must present a record of the proponent's engagement with each potentially affected Indigenous nation, which summarizes the proponent's efforts to collaborate with Indigenous nations and the perspectives, concerns, and feedback provided by Indigenous nations during those engagements.

Engagement with Indigenous nations must involve ongoing information sharing and collaboration between the proponent and Indigenous nations to contribute to the validation of conclusions and assessment findings. The results of any engagement with each Indigenous nation must be presented in the Impact Statement, and, as best as possible, convey the perspective of the Indigenous nations. The record of engagement and inclusion of Indigenous knowledge in the Impact Statement should demonstrate that the proponent sought to build consensus and obtain the agreement of Indigenous nations regarding information presented in the Impact Statement.

Not all Indigenous nations may be willing to collaborate with the proponent, therefore the proponent must demonstrate it has made best efforts at collaboration and provide an explanation regarding circumstances where collaboration was not possible. The proponent should continue sharing information and analyses with the Indigenous nations, to use publicly available sources of information to support the assessment, and to document its efforts in that respect.

The proponent must consult the Agency and EAO guidance documents on Indigenous participation and engagement throughout the Impact Statement:

- *Practitioner's Guide to Federal Impact Assessments under the Impact Assessment Act*;
- *Policy Context: Indigenous Participation in Impact Assessment*;
- *Guidance: Indigenous Participation in Impact Assessment*;
- *Policy Context : Assessment of Potential Impacts on the Rights of Indigenous Peoples*;
- *Guidance: Assessment of Potential Impacts on the Rights of Indigenous Peoples*;

- *Guidance: Collaboration with Indigenous Peoples in Impact Assessments*;
- *Guidance: Indigenous Knowledge under the Impact Assessment Act: Procedures for Working with Indigenous Communities*;
- *Guidance: Protecting Confidential Indigenous Knowledge under the Impact Assessment Act;*
- Section 4 of the EAO's *Effects Assessment Policy* for guidance on assessing effects to Indigenous nations;
- *Guide to Indigenous Knowledge in Environmental Assessments*; and
- *Guide to Consensus-Seeking under the Environmental Assessment Act, 2018*.

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 nation 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.

The record of engagement section must include:

- the list of Indigenous nations engaged by the proponent, including those that the proponent was unsuccessful in engaging;
- the engagement activities undertaken with each Indigenous nation, including the date, means and results of engagement;
- a description of the outcomes of conversations with each Indigenous nation about how they wish to be engaged by the proponent;
- the list of the consultation or engagement protocols adopted by each Indigenous nation, if applicable. A copy of the protocols must be included when available in writing;
- an explanation for cases where engagement efforts have proven unsuccessful;
- a description of the preferred methods for sharing information, including alternative solutions implemented for people and locations where technological resources are limited or language barriers exist (e.g. translation of written documents or provision of summaries in Indigenous languages whenever requested and reasonably possible);
- a description of the proponent's efforts to engage with diverse populations within each Indigenous nation in culturally appropriate ways, including populations identified by sex, gender, age, or other community relevant factors (e.g. hunters, trappers, and other harvesters) to support the collection of information needed to complete the gender-based analysis (GBA+) and demonstrate diverse, equitable and accessible engagement. The proponent's efforts to engage with diverse populations will be guided by feedback obtained during engagement with Indigenous nations;
- an identification of any barriers to engaging with diverse populations and efforts to overcome those barriers;
- a description of how input and Indigenous Knowledge (IK) from Indigenous nations was incorporated into the Impact Statement. To the extent possible and appropriate, the proponent will include nation-specific and contextual information about the members within an Indigenous nation (e.g. men, women, youth, two-spirited people, elders, people with disabilities);

- a description of the proponent's level of engagement with Indigenous nations regarding potential impacts of the project on Indigenous interests, and where possible, the project's potential interference with Indigenous interests, and potential positive impacts on Indigenous interests;
- a description of how the proponent considered Indigenous views when selecting criteria, such as criteria related to spatial and temporal boundaries, Indigenous interests, characterizing impacts on Indigenous interests, mitigation, and residual effects;
- a description of how the proponent's engagement activities worked to ensure opportunities were created for Indigenous nations to evaluate the project's potential positive and adverse effects on their members, communities, activities, and Interests, as identified by the Indigenous nation;
- a description of any arrangements or agreements developed between the proponent and Indigenous nations regarding collaboration on the development of the Impact Statement or delivery of the project (e.g. information sharing agreements, capacity funding agreements) to the extent permitted by the underlying arrangement and agreement terms and the Indigenous nations' wishes;
- if applicable, a description of Indigenous nations conducting independent effects assessments and a summary of the scope and objectives of those independent assessments, as made available to the proponent; and
- a summary explaining the proponent's process for validating the results of engagement and the Impact Statement findings with Indigenous nations involved.

The record of engagement must demonstrate that the capacity needs of Indigenous nations were taken into account, and that timelines were adequately communicated and flexible enough to ensure Indigenous nations 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 in a manner that is attentive to the concerns of Indigenous peoples and committed to producing mutually beneficial outcomes.

5.2.2 Analysis and Response to Concerns Raised by Indigenous Nations

The Impact Statement must describe how the proponent has collected, analyzed, addressed, and responded to Indigenous nations' concerns; and explain the input Indigenous nations gave the proponent on the project.

The Impact Statement must provide an analysis of the input received from Indigenous nations with respect to the project. This analysis is to include all input received by Indigenous nations prior to, and since commencing, the assessment process. It is also important to describe the context in which Indigenous nations provide their Indigenous knowledge and to convey it in a culturally appropriate manner. For more information, proponents should refer to the Agency and EAO Guidance: *Indigenous Knowledge under the Impact Assessment Act: Procedures for Working with Indigenous Communities* and *Guide to Indigenous Knowledge in Environmental Assessments*.

The Impact Statement must:

- describe how the proponent responded to questions, comments and issues raised by Indigenous nations;

- describe the potential effects and impacts to environmental, health, social, cultural and economic conditions of each Indigenous nation, as informed by the Indigenous nation;
- describe the interests and rights of each Indigenous nation, that the nation themselves have identified, that may be impacted by the project;
- describe the Indigenous nation's perspective on the resolution of issues, how unresolved input has been addressed in the Impact Statement, and/or how unresolved input will be addressed through the Impact Statement or another regulatory process or government initiative; and
- where and how Indigenous nations' perspectives were integrated into, considered, or contributed to decisions regarding the project, including, but not limited to:
    - development and collection of information on existing conditions;
    - plans for construction, operation, closure and post closure or decommissioning;
    - evaluation of alternatives to the project;
    - identification of VCs;
    - developing the assessment, including setting spatial and temporal boundaries;
    - characterization of potential environmental, health, social, cultural and economic effects of the project for each Indigenous nation;
    - measures to mitigate effects or to enhance or optimize potential project benefits;
    - follow-up and monitoring should the project proceed; and
    - describe how the information gathered during the Planning Phase of the assessment of the project was included, including the documents uploaded to the Registry by Indigenous nations during that phase of the assessment.

The Impact Statement must include a summary table of input received from each Indigenous nation, which must include:

- questions, comments, or issues raised;
- the proponent's response including reference, where appropriate, to proposed measures to avoid, mitigate or otherwise manage effects;
- the Indigenous nation's perspective on the response, if available; and
- status of issue and next steps.

The Impact Statement must address Indigenous nations's perspectives on Indigenous Knowledge in section 0, cumulative impacts on Indigenous interests in section 12.2, project impacts on Indigenous interests in section 12.4, and mitigation and enhancement measures in section 12.4.1.

5.2.3 Collaboration with Indigenous Nations Following the Submission of the Impact Statement

The proponent must explain in the Impact Statement how it plans to continue to work with Indigenous nations during subsequent phases of the assessment process and throughout the lifecycle of the project, if it is allowed to proceed.

The Impact Statement must:

- describe the type of work the proponent intends to accomplish with Indigenous nations during subsequent phases of the assessment process;
- set out any proponent commitments for engaging local Indigenous nations, where appropriate;
- provide a rationale for not undertaking further engagement if there are no future engagement activities planned;
- describe how Indigenous nations 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.

For this section, the proponent may refer to information presented in other sections of the Impact Statement.

6. Local Government Engagement

The Impact Statement must:

- describe the proponent's ongoing and proposed local government engagement activities regarding the project and during the development of the Impact Statement
- describe the efforts made to distribute project information and the information and materials that were distributed during the consultation process. Indicate the methods used, where the consultation was held, the views expressed and the extent to which this information was incorporated in the design of the project as well as in the Impact Statement;
- provide a summary of key issues related to the project that were raised through engagement with local government and the potential environmental, economic, social, cultural and health effects, including disproportionate effects on distinct human populations and effects to current and future generations. Describe ways to address the issues raised, such as alternatives means, specific mitigation measures or specific monitoring programs and adaptive management to deal with uncertainty. Identify local government concerns that were not addressed, if any, and provide reasons why the concerns were not addressed; and
- provide details regarding how local governments will be kept involved during all phases of the project, if the project is approved and proceeds.

7. Public Engagement

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.

The proponent should consult Agency guidance documents on this topic, particularly: *Interim Framework: Public Participation Under the Impact Assessment Act*, and *Interim Guidance: Public Participation under the Impact Assessment Act*.

The Impact Statement must:

- describe the proponent's ongoing and proposed public and stakeholder engagement activities regarding the project and during the development of the Impact Statement. The proponent's public and stakeholder engagement strategy will be informed in part by the *Joint Assessment Plan* issued by the Agency and the EAO;
- describe the efforts made to distribute project information and the information and materials that were distributed during the consultation process to date. Indicate the methods used, where the consultation was held, the number of people, the persons, organizations and diverse subgroups consulted, the views expressed and the extent to which this information was incorporated in the design of the project as well as in the Impact Statement;
- describe efforts to engage diverse subgroups of the community to support the collection of information needed to complete the GBA+;
- describe the decision-making processes and abilities of individuals or groups about development in the community, particularly on the use of resources. Provide information on how the project intends to support culturally sensitive participation of women and diverse groups in decision-making;
- provide a summary of key issues related to the project, including the potential environmental, health, social, cultural and economic effects and the potential for disproportionate effects on diverse subgroups within the population, that were raised through engagement with participants, or how they were incorporated into the Impact Statement;
- describe any questions and comments raised by participants 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 concerns that have not been addressed, if any, and provide the reasons why they have not been; and
- provide details and commitments regarding how participants 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.

8. Assessment Methodology

The Impact Statement must describe the methods used to assess the potential effects of the project. The methods chosen must allow for a fulsome assessment of the potential interactions between the project and the biophysical and human environment, as well as the potential for overarching effects of the project on biophysical factors that support ecosystem function and human environment factors that support community well-being.

The Impact Statement must describe how scientific, Indigenous, and community knowledge was used in the assessment. For Indigenous knowledge, the Impact Statement must outline how the Indigenous knowledge was used in alignment with the Indigenous knowledge policies and protocols of the Indigenous nations. Further, the Impact Statement must confirm that the Indigenous nation has provided consent for its use and public disclosure and that the Indigenous nation agrees that the Indigenous knowledge has been appropriately characterized within the Impact Statement.

The requirements of section 8 must be applied to the assessment of all effects of the project on VCs and impacts on Indigenous interests as described in sections 9 to 0 of these Joint Guidelines. Additional requirements related to the assessment of impacts on Indigenous interests are described in section 12 and 0. If the an Indigenous nation and the proponent decide together to use a different methodology to assess project impacts on Indigenous interests than what is outlined in section 8, a rationale will be provided in that nations section of the Impact Statement.

The proponent should consult the *Agency's policy and guidance* as well as *EAO's* *Effects Assessment Policy* and *Human and Community Well-being: Guidelines for Assessing Social, Economic, Cultural and Health Effects in Environmental Assessments* to support the development of the Impact Statement.

8.1. Valued Component Selection

The Impact Statement must describe the VCs that will serve as the focal points for the assessment. VCs consists of components that are of particular concern or value to participants and that may be affected by the project. VCs help to organize the description of the effects of the project required by the Joint Guidelines.

The VCs must be selected to allow for the assessment of potential adverse and positive environmental, health, social, cultural and economic effects, as well as impacts on Indigenous peoples and the rights and interests of Indigenous peoples arising from the project. The VCs must also be selected to allow for the consideration of the matters and factors listed in section 1.3 that are relevant to the assessment. The Joint Guidelines provide information requirements organized in categories that may be considered as VCs, or may be considered as intermediate components or pathways to inform the assessment of VCs, depending on the project. In some sections, the Joint Guidelines may also identify specific sub-components of VCs or representative species (e.g. types of fish or specific fish species within the fish and fish habitat section). The proponent may also identify additional VCs beyond those included in the Joint Guidelines in consultation with Indigenous nations and other participants.

Indigenous nations may identify holistic VCs that encompass the effects on a number of individual environmental, health, social, cultural or economic valued components. Proponents are encouraged to work with Indigenous nations 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 nation, but is excluded from the Impact Statement, the proponent must provide a justification for its exclusion.

The Impact Statement must:

- describe the VCs in sufficient detail to allow the reviewer to understand their importance and to assess the potential effects arising from the project;
- provide a rationale for the selection of VCs;
- indicate the source of the concerns or interests considered in the selection of VCs, including from the public, provincial or federal authorities, Indigenous nations, and other participants engaged and consulted in the preparation of the Impact Statement;
- identify the reasons given by participants for their concerns and interests, such as environmental, cultural, spiritual, historical, health, social, economic, recreational, and aesthetic considerations;
- describe how Indigenous and community knowledge and their perspectives were considered in selecting VCs;
- select VCs that consider:
    - VC presence in the study area;
    - the extent to which the effects of the designated project and related activities have the potential to interact with the VC;
    - the extent to which the VC may be under stress from other past, existing or future undertakings in combination with other human activities and natural processes;
    - the extent to which the VC is linked to Indigenous interests and whether an Indigenous nation has requested the VC;
    - the extent to which the VC is linked to federal, provincial, territorial or municipal government priorities;
    - information from any ongoing or completed regional assessment processes;
    - the possibility that an adverse or positive effect on the VC would be of particular concern to Indigenous nations, the public, or federal, provincial, territorial, municipal or Indigenous governments; 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;
- select VCs that are:
    - relevant to at least one of the assessment matters and factors presented in section 1.3 and clearly linked to the values reflected in the issues raised in respect of the project;
    - comprehensive, so that taken together, the VCs selected for an assessment should enable an understanding of the potential effects of the project;
    - representative of the important features of the biophysical and human environment likely to be affected by the project;

- responsive to the potential effects of the project; and
- concise, so that the nature of the interactions between the project and the VCs can be clearly articulated and understood, and redundant analysis is avoided.

There may be cases where a candidate VC may not be selected as a VC, but the pathways of effects would still be assessed under other VCs. In these cases, a description of changes to the physical environment is to be integrated into the effects assessment of each VC and the interaction between VCs in the Impact Statement.

Appendix 1 of the Joint Guidelines presents the VCs proposed by the proponent to focus the assessment. The proponent has also chosen to describe pathways of effects using the term “elements”. This list is mainly reflected in sections 9 to 0 of the Joint Guidelines which constitute the minimum requirements for the assessment. Following the comment period, as appropriate, the Agency and EAO will include a list of components raised by participants to be considered by the proponent in the final selection of VCs for the assessment.

8.2. Relevant Statutes, Policies and Frameworks

The Impact Statement must summarize the regulatory and planning context for the management of potential effects to environment, health, social, cultural and economic conditions, including relevant legislation, policies and frameworks specific to the VC. These may include various acts, regulations, policies, standards, cooperation agreements, and/or decision-making frameworks including Indigenous legislation or policy.

8.3. Assessment Boundaries

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

The Impact Statement must also describe the methods used to identify the boundaries and provide a rationale for each boundary. Information on boundaries for each VC (or subcomponent) must be included in the appropriate VC sections of the Impact Statement, and must encompass all relevant project phases, components, and activities. Transboundary spatial boundaries must be identified where transboundary effects are expected outside of the Province of British Columbia’s or Government of Canada’s jurisdiction. The spatial boundary maps for VCs (or subcomponents) must clearly identify parts of the project footprint located on lands and waters that lie within federal jurisdiction or treaty lands.

The proponent must engage with Indigenous nations when defining boundaries for VCs that are identified by, or related directly to, Indigenous nations. The Impact Statement must explain how the proponent considered the information received by Indigenous nations in its definition of boundaries, particularly for VCs related to impacts on Indigenous nations.

The proponent should consider the additional guidance for assigning appropriate study areas or boundaries provided in Appendix 6 - Establishing spatial and temporal boundaries.

8.3.1 Spatial Boundaries

The proponent should establish three spatial boundaries of study areas to assess the effects on each VC and may opt for a fourth one if required:

- **Project Area:** defined as the project footprint including all temporary and permanent areas associated with the project, and alternatives considered;
- **Local Assessment Area (LAA):** defined as the area beyond the project footprint where project effects may extend;
- **Regional Assessment Area (RAA):** The RAA is used to provide context for the assessment of potential project effects and includes the LAA. The RAA is typically based on a natural transition (for example, watershed boundary, ecological zone) or an artificial delineation (for example, political or economic district or zone) that is relevant to the VC in order to understand the context for the effect. The RAA boundary should be at an appropriate scale that provides relevant context for consideration of project direct and indirect effects, offers useful and meaningful data and neither over-emphasizes nor under-emphasizes the scale of the project effects; and
- **Cumulative Effect Assessment Area:** as required, if different from RAA. The RAA may be used as the spatial boundary for the assessment of potential cumulative effects, or a different boundary may be chosen that better reflects the nature of cumulative effects relevant to the project's potential effects. The spatial boundary for cumulative effects assessment for a VC should encompass the area within which the residual effects of the project are likely to interact cumulatively with the effects of other past, existing and reasonably foreseeable future projects and activities on that same VC.

The Impact Statement must:

- describe the spatial boundaries for each VC, including local and regional assessment areas, 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);
    - Indigenous and community knowledge;
    - current or traditional land and resource use by Indigenous nations;
    - Indigenous interests, including cultural and spiritual practices;
    - physical, technical, ecological, social, health, economic and cultural considerations; and,
    - size, nature, location and known effects of past, existing and foreseeable projects and activities, particularly for the regional and cumulative effects assessment study areas;
    - any ongoing or completed regional assessment in the proposed project area or any relevant strategic assessments; and

- 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.

The proponent has proposed spatial boundaries in Appendix 1. The final spatial boundaries will be determined with input from Indigenous nations, the public, government authorities, and other participants. Following the issuance of the final joint guidelines, if those were to be modified during the development of the Impact Statement, the proponent would need to follow the instructions above and provide a justification in the Impact Statement. The proponent would also be encouraged to consult with the Agency and EAO.

8.3.2 Temporal Boundaries

The Impact Statement must:

- describe the temporal boundaries for each VC and provide a rationale for each boundary;
- describe the methods used to identify the boundaries and provide a rationale for each boundary. Information on boundaries for each VC (or subcomponent) must be included in the appropriate VC sections of the Impact Statement, and must encompass all relevant project phases, components, and activities;
- define temporal boundaries by taking into account;
    - schedule of all phases of the project;
    - when and for how long certain VCs may be affected by the project;
    - duration of the effects on a VCs;
    - past conditions and historical context;
    - Indigenous and community knowledge;
    - Indigenous interests, including cultural and spiritual practices and current or traditional land and resource use by Indigenous nations;
    - 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.

8.3.3 Administrative Boundaries

Where administrative or technical boundaries have constrained the assessment of potential effects, the nature of the boundaries and their influence on the assessment must be documented in the Impact Statement.

8.4. Existing Conditions

For each VC (or subcomponent), the Impact Statement must describe the existing conditions (i.e. “current baseline”) within the study areas in enough detail to enable potential project-VC interactions to be identified,

understood and assessed. This description may include the characteristics of the VC (or subcomponent) itself and other components upon which the integrity of the VC relies. This should include the existing environmental, health, social, cultural and economic components, interrelations and interactions among them, and the variability in these conditions over time scales and spatial boundaries appropriate to the project.

The Impact Statement must:

- describe the existing conditions for the environmental, health, social, cultural and economic conditions directly and incidentally related to the project and the interrelations and interactions among them;
- describe the natural and/or human-caused trends that may alter the VC irrespective of the changes that may be caused by the project or other projects and activities in the local area (for example, climate change). Understanding trends in a VC is also important context for identifying potential cumulative effects. Trends may include population fluctuations, employment or existing health status, forecasted climatic changes such as temperature or precipitation, or other trends that are important for understanding how the sensitivity of the VC to project effects and cumulative effects may change over time;
- describe if and how other past and existing projects and activities in the study area have affected, or are affecting each VC, to support the consideration of project effects and cumulative effects;
- include a description of the quality and reliability of the data on existing conditions and its applicability for the purpose used, including any data gaps and additional steps taken to address gaps in information, insufficiencies, and uncertainties, particularly for the purpose of monitoring activities;
- include data on existing conditions 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 assessment areas;
- provide a detailed description of the data collection methods and information sources used to compile information on existing conditions, including any standards or guidelines followed, sampling, survey and research protocols, modeling methods, sources of uncertainty, error estimates, and any assumptions or biases. Models should be validated using field data from the appropriate local and regional study areas. Where additional project- and VC-specific field studies are undertaken, the scope and methods used should follow published documents pertaining to data collection and analysis methods, where these are available. Where methods used for data collection deviate from applicable published guidance, the rationale for the variance must be provided in the impact statement;
- demonstrate 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;
- provide a description of Indigenous and community knowledge used in the assessment; and

- describe how GBA+ was applied to examine differences in existing conditions among diverse subgroups and provide disaggregated data where necessary.

Further data requirements are included in the specific existing conditions sections in the Joint Guidelines.

The Impact Statement may provide technical reports that present the data on existing conditions in appendices and summarize the key findings of these technical reports directly in the Impact Statement. Regardless of the approach, the description of the existing conditions must be presented in a manner that allows the reader to understand the effects assessment for each VC (or subcomponent).

Meaningful, two-way dialogue with communities and Indigenous nations should be undertaken to provide input on how environmental, health, social, cultural and economic conditions are interrelated.

Proponents are encouraged to consult with the Agency and EAO during the development and planning of studies to collect information on existing conditions.

Relevant sources of information are listed in Appendix 6 - *Sources of information on existing conditions*.

8.5. Potential Effects

The Impact Statement must describe the changes to the environment or to the health, social, cultural 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. The description must include, at a minimum, the information requirements detailed in specific effects sections in the Joint Guidelines.

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 effects assessment should take into account views and concerns expressed through engagement with Indigenous nations and community members.

Potential positive effects may be directly related to the project or may be identified after considering the consequences of technically and economically feasible mitigation measures that maximize a wider range of benefits. Proponents are encouraged to look for opportunities to create positive effects and practically extend the scope or extent of project-specific mitigation, restoration, and enhancement measures to produce net project benefits.

Adverse effects may result from interactions between the project and VCs, and may be avoided, minimized, restored, or offset through mitigation and management measures. Following the identification of mitigation and management measures, any residual negative effects on VCs must be assessed and described in the Impact Statement.

The Impact Statement must:

- describe in detail the project's potential direct and indirect, adverse and positive effects for each phase of the project;
- must identify the potential interactions between the project, including the various physical works and activities, and each VC (or subcomponent);
- describe any indicators used for the assessment of potential effects and the parameters used to facilitate the evaluation of potential project effects. Potential interactions must be identified using a table format;
- identify the effects falling within federal jurisdiction and the direct or incidental effects, as defined in section 2 of the IAA;
- describe how data on existing conditions was used to inform this analysis;
- describe how long-term trends (for example, changing environment, employment and technology) and market fluctuations have been considered;
- describe the analytical methods selected to assess effects, including clearly stated assumptions for all predictions,how each assumption has been tested, and how the methods selected represent a conservative approach in the prediction of potential effects;
- describe the degree of uncertainty and conservatism related to the data and methods;
- where appropriate, and where the best practice or evidence-based thresholds exist, effects should be described quantitatively using these criteria. Where a quantitative description is not possible, effects should be described qualitatively;
- 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 and EAO before submitting the Impact Statement;
- describe the effectiveness of mitigation measures and proposed adaptive management measures and describe the prediction of potential residual effects. If additional risk analysis is required to fully characterize the potential risk where there is high uncertainty about the mitigation effectiveness (for example, where mitigation measures are proposed to be implemented for which there is little experience or questions about their effectiveness), a range of likely, plausible and possible outcomes will be assessed and additional studies, mitigation or contingency plans may be required;
- describe how any positive effect may be monitored and adaptively managed;
- when residual effects on a VC are predicted and the VC is also considered a "pathway" for other potential effects on other VCs, the Impact Statement must identify the linkages between the VCs;
- 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 effects on environmental, health, social, cultural and economic conditions, and impacts on Indigenous interests;

- 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 the effects assessment;
- describe how GBA+ was applied to examine differences in effects among diverse subgroups 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.

A matrix is a useful tool for demonstrating potential interactions and key potential interactions. Diagrams and tables are also useful tools to illustrate complex direct and indirect potential effect pathways and interactions between potential effects that may involve multiple VCs or subcomponents.

Where offsetting measures are proposed to directly or indirectly address a potential effect, the Impact Statement must first describe any potential effects following the implementation of measures to avoid, minimize, and restore on-site. For transparency, the change to the VC prior to the implementation of offsetting should be clearly identified, quantified and characterized in the Impact Statement to fully understand the consequences of the project being assessed. The characterization is best undertaken in the context of describing the proposed suite of mitigation, the need for and scope of offset, and residual effect.

8.6. Mitigation and Enhancement Measures

The Impact Statement must identify measures that are technically and economically feasible and that would mitigate the project's adverse effects on environmental, health, social, cultural and economic conditions. 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.

The Impact Statement must:

- apply the mitigation hierarchy of avoid, minimize, restore on-site and offset;
- describe mitigation practices, policies 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, including site selection, project scheduling, project design (for example, equipment selection, placement, emissions abatement measures), and construction and operation procedures and practices);
- describe the standard mitigation practices, policies and commitments including consideration of best management practices, environmental management plans, environmental protection plans, contingency plans, emergency response plans and other general practices that constitute proven technically and economically feasible mitigation measures and that are to be applied as part of standard practice;
- describe measures that are specific to each identified effect, including new or innovative mitigation measures being proposed and clearly indicate how the mitigation measures will reduce the potential adverse effects or enhancement measures will increase positive effects on the VC (measures are to

be written as specific commitments that clearly describe how the proponent intends to implement them and the outcome these measures are designed to address);

- identify and describe the use and application of best available technology and best environmental practice in identifying, assessing and implementing mitigation measures;
- describe the approach used to identify and select additional mitigation measures to be implemented to address potential adverse effects (including any offset plans);
- propose differentiated mitigation measures, if applicable, so that adverse effects do not fall disproportionately on diverse subgroups, 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 those who are vulnerable and/or disadvantaged;
- 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 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 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 nations for avoiding, mitigating or otherwise accommodating the project's environmental, health, social, cultural 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 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;
- summarize the mitigation measures for potential project effects by project phase and VC and identify any mitigation measures that are in management or offset plans; and
- provide information regarding relevant municipal, provincial, federal or multi-jurisdictional initiatives that may assist in mitigating the effects of the project, including:
    - name and brief description of initiative;

  - implementing authority;
  - timeline for implementation;
  - budget;
  - eligibility criteria for participation of Indigenous nations and the public;
  - description of the proponent'sconsultation activities with implementing authorities; and
  - a description of the nature of project effects that the initiative may assist in mitigating.

For each mitigation measure identified, the Impact Statement must:

- provide an assessment of the anticipated effectiveness and resulting residual effects and 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; and
  - the anticipated time required for mitigation measures to become effective, to enable understanding of the duration of residual effects and the temporal characteristics of reversibility;
- 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, cultural and economic conditions of Indigenous peoples or impacts on rights of Indigenous peoples, provide a description of the consultation with Indigenous nations regarding the residual effects;
- assess any potentially adverse environmental effects associated with the mitigation method itself;
- describe how any disproportionate effects that were identified in the GBA+ results were used to inform mitigation and enhancement measures;
- at a minimum, provide offsetting plans to address all residual effects to species at risk, and their critical habitat, migratory birds, fish and fish habitat and/or wetland functions (if applicable) for review during the assessment process. The plans must:
  - describe any potential effects following the implementation of measures to avoid, minimize, and restore on-site habitat. For transparency, the change to the VC prior to the implementation of offsetting should be clearly identified, quantified and characterized in the Impact Statement to fully understand the consequences of the project being assessed. The characterization is best undertaken in the context of describing the proposed suite of mitigation, the need for and scope of offset, and residual effect. Describe the existing conditions at the offsetting location;
  - describe the baseline condition of the species at risk, critical habitat, migratory birds and wetland functions potentially impacted by the project;
  - describe residual effects being offset;
  - describe the proposed offsetting and provide a rationale;
  - describe how the proposed offsetting aligns with published recovery, management, or action plans and strategies;

- demonstrate habitat equivalency with rationale, including how any policies or guidance provided by FAs, provincial authorities and Indigenous groups have been considered;
- identify the location and timing of implementation of offsetting;
- identify a compensation ratio with rationale, including how any policies or guidance provided by FAs, provincial authorities and Indigenous peoples have been considered;
- identify and describe the success criteria; and
- identify and detail non-habitat measures.

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.

In addition to the general requirements above, additional requirements and recommended mitigation measures are shown in the specific mitigation subsections that follow. The proponent may propose measures that differ from the specific requirements and recommendations. If other measures are proposed, 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 Joint Guidelines.

For projects that propose offsetting, the Impact Statement must provide offsetting or compensation plans following the Procedures for *Mitigating Impacts on Environmental Values* (Environmental Mitigation Procedures) (Ministry of Environment 2014b or as updated).

For more guidance on developing mitigation measures see Appendix 6 - *Developing mitigation measures and enhancements.*

8.7. Characterization of Residual Effects

For all adverse residual effects[4], the Impact Statement must:

- provide a detailed characterization of the residual effects, even if deemed small or negligible, using criteria and language most appropriate for the effect;
- define the criteria/terms used to characterize the residual effects;
- for every residual effect, the context needs to be fully described using qualitative and/or quantitative information, including:
  - effects of past and present projects and activities;
  - potential trends in the condition of the VC; and
  - vulnerability and resiliency of the VC;
- for every adverse residual effect, use the following criteria in characterizing residual effects:

[4] Residual effects are defined as effects remaining after the implementation of mitigation measures.

- magnitude;
- geographic extent;
- timing;
- duration;
- reversibility;
- frequency;
- affected populations;
- importance;
- risk and uncertainty; and
- the environmental, health, social, cultural, and economic context within which potential effects may occur must be taken into account when considering the criteria above, for example:
  - the sensitivity and importance of affected aquatic and terrestrial species, including species at risk and species of importance for Indigenous nations;
  - the sensitivity and importance of affected habitats and their functions for wildlife;
  - the existence of environmental standards, guidelines, tolerance levels, and other sources of information to assess effects; and
  - the potential for disproportionate residual effects for diverse subgroups as per the GBA+; and

- describe the likelihood of whether a residual effect is likely to occur using appropriate quantitative or qualitative terms and enough description to understand how the conclusions were reached.

If an Indigenous nation identifies that there are residual effects to their interests, those effects should be carried through for residual effects analysis.

8.8. Cumulative Effects Assessment

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 future 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, cultural or economic component or an Indigenous nation or the interests of Indigenous nations 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 and provide a rationale for the selection of VCs that will be the focus of 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 participants, including Indigenous nations;
  - VCs where the predicted residual effects might not indicate the need for a cumulative effects assessment, but rely heavily on uncertain mitigation measures; and
  - VCs for which cumulative effects were identified as a concern during the Planning Phase;
- provide a rationale to justify the exclusion of other VCs from the cumulative effects assessment, as applicable;
- describe the methods used to determine potential cumulative effects, including data sources and collection methods, data analysis, and any other relevant assessment information;
- identify and justify the spatial and temporal boundaries for the cumulative effect assessment for each VC selected. Take into account that:
  - the boundaries of the cumulative effects assessments may differ for each selected VC and must not be constrained by administrative or jurisdictional boundaries;
  - spatial and temporal boundaries for cumulative effects will generally be larger than the boundaries for the project effects alone, and may extend beyond the jurisdictional boundaries of Canada;
  - temporal boundaries should account for all potential effects over the lifecycle of the project, including decommissioning and abandonment; and
  - spatial and temporal boundaries for VCs related to effects and impacts on Indigenous peoples must be defined in collaboration with the Indigenous peoples concerned.
- identify past, existing and future projects and activities (certain and reasonably foreseeable) that have been or that are likely to be carried out that could interact cumulatively with each selected VC within the boundaries defined, and whose residual effects would act in combination 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. The cumulative effects assessment should consider landscape changes over time, including settlement, urbanization and agricultural land availability in the RAA, including, but not limited to, the following major projects:
  - Annacis Auto Terminal;
  - B.C. Ferries operations;
  - Centerm Terminal (existing) and Expansion;
  - Coast 2000 Terminals;
  - Commercial fishing operations;
  - Delta Grinding Facility Project;

- Duke Point Terminal Expansion Project;
- FortisBC Tilbury LNG Plant;
- GCT Deltaport Terminals;
- GCT Vanterm (existing) and Phase 1 Expansion;
- George Massey Tunnel Replacement Project;
- Highway 91/17 Upgrade Project;
- Transmountain Pipeline Expansion Project;
- Land use changes resulting from local, regional, and provincial land use or resource development plans, such as Land and Resource Management Plans and Official Community Plans;
- Lehigh Hanson Aggregate Facility;
- Lions Gate Wastewater Treatment Plant Project;
- North Shore Trade Area Project – Western Lower Level Route Extension;
- Pattullo Bridge Replacement Project;
- Port of Seattle;
- Port of Tacoma;
- Roberts Bank Terminal 2;
- Seaspan Ferry operations;
- South Fraser Perimeter Road;
- Tilbury Marine Jetty Project;
- Tilbury Phase 2 LNG Expansion Project;
- Vancouver Airport Fuel Delivery Project;
- Westshore Terminals;
- Woodfibre LNG Project;
- Relevant residential and commercial developments (including the proposed Amazon Warehouse and the existing Tsawwassen Mills mall).

- assess the cumulative effects to each 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 may include a comparison of possible future scenarios with and without the project, but must reflect the full range of cumulative effects and not just the project's contribution. Climate change is to be considered as part of future conditions or provide a rationale to justify the exclusion of climate change impacts on the VC;
  - 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; and

    - 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;
- consider the historical context and pre-industrial baseline of the VC using scientific, Indigenous, and community knowledge;
- take into account the results of any relevant regional studies or regional assessments;
- describe technically and economically feasible mitigation measures proposed for cumulative effects on environmental, health, social, cultural and economic conditions, as well as potential impacts on Indigenous interests, including:
    - the criteria or rationale used to determine technically and economically feasible mitigation measures;
    - an assessment of the effectiveness of the measures and adaptive management 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 plans, including communication plans;
- assess the regional implications of applying project-specific mitigation and enhancement measures, taking into account any certain and reasonably foreseeable development in the area;
- quantify, where appropriate, and evaluate residual cumulative effects using the characterization of residual effects described in section 8.7; and
- develop a follow-up program to verify the accuracy of the assessment and the effectiveness of mitigation measures for cumulative effects (see section 8.10 - Follow-up programs).

The cumulative effect assessment must include consideration of cumulative effects to the rights and interests of Indigenous peoples and their cultures. Both the content and means of presenting this information are to be developed in consultation with each Indigenous nation potentially impacted by the project. The proponent must collaborate with Indigenous nations in the cumulative effects assessment to the rights of Indigenous peoples and cultures. The Impact Statement must demonstrate how Indigenous nations were involved in the cumulative effect assessment and in the design of appropriate mitigation measures and follow-up programs. If Indigenous nations do not wish to participate in the cumulative effect assesment with the proponent, the proponent should continue sharing information and analyses with the Indigenous nation, to use publicly available sources of information to support the assessment, and to document their efforts in that respect.

The proponent can refer to the approach described in the Agency's guidance documents related to cumulative effects, including "*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 IAA.

8.9. Extent to which Effects within Federal Jurisdiction are Significant

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

- describe the extent to which the adverse effects, including cumulative effects, within federal jurisdiction and the adverse direct or incidental effects are significant;
- justify the approach used to determine the extent to which the effects are significant; and
- 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 nations and other participants were considered.

The information provided must be clear and sufficient to enable the Agency, review panel, Indigenous nations, and other participants to understand the proponent's characterization of residual effects and the analysis of the extent to which effects within federal jurisdiction are significant.

Effects within federal jurisdiction are:

(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*; and
  (iii) migratory birds, as defined in subsection 2(1) of the *Migratory Birds Convention Act, 1994*.

(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.

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 best practices described in the Agency's technical guidance document for *Determining whether a designated project is likely to cause significant adverse effects under the Canadian Environmental Assessment Act, 2012* may be considered for the characterization of residual effects in the context of the IAA, as applicable.

8.10. Follow-up Programs

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

The proponent should develop expected outcomes for their follow-up programs, in consultation with relevant authorities and Indigenous nations. 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. The proponent 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 assessment were not accurate, corrective action or additional measures may be required to be put in place by the proponent.

Follow-up programs are an opportunity to continue engaging with impacted Indigenous nations. If undertaken collaboratively, 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, the Impact Statement should take into account the considerations outlined in the guidance: *Follow-up Programs under the Canadian Environmental Assessment Act*.

8.10.1 Follow-up Program Framework

The duration of the follow-up program must be as long as required to verify the accuracy of the assessment and/or to determine 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;
- the expected outcome(s) of the follow-up program and information describing how the proponent expects to achieve the expected outcome(s);

- identification of the measures to ensure that mitigation measures are implemented as planned and evaluates the accuracy of the predicted effects;
- identification of measures to evaluate the effectiveness of proposed mitigation measures to meet the intended mitigation commitments and goals;
- identification of the regulatory instruments that include a monitoring requirement for the VC;
- preliminary description of follow-up studies planned, as well as their main characteristics (list of parameters to be measured, planned implementation timetable, etc.);
- identification of an appropriate strategy (for example, adaptive management) to apply if predicted effects and mitigation effectiveness are not as expected. This includes reference to further mitigation, involvement of key stakeholders, Indigenous nations, government agencies and any other measures deemed necessary to manage the issue;
- intervention mechanisms used in the event that the effects to the environment or impacts on Indigenous interests attributed to the project are not as predicted;
- identification of a mechanism to disseminate follow-up results among the concerned parties;
- consideration of accessibility and sharing of data publically; and
- opportunities for the involvement of Indigenous nations, 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.

Information about adaptive management can be found in the Agency's guidance on *Adaptive Management Measures under the Canadian Environmental Assessment Act 1992* (guidance to be updated by the Agency).

8.10.2 Follow-up Program Monitoring

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

- identification of regulatory instruments that include a monitoring requirement for the VCs;
- description of the methodology for tracking environmental, health, social, cultural and economic issues;
- description of the methodology and mechanism for monitoring the effectiveness of mitigation and reclamation;
- description of Indigenous involvement in 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 may pose a risk to the environmental, health, social, cultural 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 nations and local communities in monitoring, where appropriate.

8.10.3 Compliance Monitoring

Proponents are responsible for verifying whether the required mitigation measures are implemented. The Impact Statement must present a framework by which the proponent 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; and
- quality assurance and quality control measures to be applied to monitoring programs.

9. Biophysical Environment

In describing effects to the biophysical environment, the Impact Statement must take an ecosystem approach[5] that considers how the project may affect the structure and functioning of biotic and abiotic components within the ecosystem using scientific, Indigenous and community 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 or oceanographic patterns, nutrient cycling, abiotic-biotic and biotic interactions, population dynamics, genetic diversity, and Indigenous and community 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; and
- ecozones, ecoregions, and ecodistricts as per the province's or Canada's *Ecological Landscape Classification system*.

9.1. Environmental and Community Context

The Impact Statement must:

- provide a landscape-level overview of the project area that sets the context for the assessment and will allow a comprehensive understanding of the current level of ecosystem functions and community well-being. This sets the stage for the discussion of biophysical factors that support ecosystem function (in section 9) and factors that support human and community well-being (in section 10), based on the results of the VC assessments completed in the following sections; and

[5] *Ecosystem Approach* is a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way. It is based on the application of appropriate scientific methodologies focused on levels of biological organization which encompass the essential processes, functions and interactions among organisms and their environment. It recognizes that humans, with their cultural diversity, are an integral component of ecosystems.

- provide detailed information on the existing conditions for each VC in the relevant VC assessment section.

9.2. 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 sources, including unique weather station identifiers for:
  - monthly mean, maximum and minimum temperatures;
  - monthly mean, maximum and minimum precipitation;
  - typical wind speed and direction;
  - relative humidity;
  - 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; and
- describe the influence of climate change on the local and regional climate and in the risks of extreme weather events.

9.3. Geology and Geological Hazards

The Impact Statement must:

- describe the geomorphology, topography and geotechnical characteristics of areas proposed for construction of major project components;
- 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 seismic generated tsunamis, landslides and liquefaction;
  - evidence of active faults;
  - isostatic rise or subsidence;
  - history of slope erosion and subsidence during and following project activities;

- history of landslide-generated tsunamis;
- history and potential of submarine landslides;
- evidence of sediment mobility, sediment overpressures and loading, faults and their movement, erosion past and present and its potential as a hazard;
- history of dendritic channelization of the subtidal and intertidal sediment in the inter-causeway area; and
- history and potential of volcanic related hazards.

9.4. Air Quality

9.4.1 Relevant Statutes, Policies and Frameworks

Federal and provincial statutes, policies and frameworks that may be relevant to air quality include:

- *Canadian Environmental Protection Act, 1999* and regulations;
- *Environmental Management Act* and regulations;
- British Columbia Air Quality Objectives;
- Canadian Ambient Air Quality Standards;
- British Columbia Air Quality Dispersion Modelling Guideline;
- *Guidance for Evaluating Human Health Impacts in Environmental Assessment: Air Quality*;
- *British Columbia Guidance for Prospective Human Health Risk Assessment*; and
- additional sector or geographic specific statutes, policies and frameworks, as applicable, are to be determined in collaboration with relevant government authorities during the development of the Impact Statement. For example, Metro Vancouver air quality modelling requirements.

9.4.2 Assessment Boundaries

The Impact Statement must define assessment boundaries for the air quality VC, including spatial, temporal, and administrative and technical boundaries.

9.4.3 Existing Conditions

The existing condition requirements, including requirements for describing sources of baseline information as described in section 8.4 of these Joint Guidelines, must be followed in addition to the following requirements.

The Impact Statement must:

- characterize the ambient air quality in the project, local and regional assessment 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 than 2.5 microns ($PM_{2.5}$);
  - particulate matter less than than 10 microns (PM_{10});
  - carbon monoxide (CO);
  - ozone (O_3);
  - sulphur dioxide (SO_2) and sulphur oxides (SO_x);
  - nitrogen dioxide (NO_2) and nitrogen oxides (NO_x);
  - 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); and
  - any other relevant air pollutants from mobile, stationary or fugitive sources, including contaminants produced by the combustion of diesel fuel;
- 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 $PM_{2.5}$, O_3, SO_2 and NO_2 for 2020 and 2025;
- describe deposition through either existing long term, or new monitoring data for a duration of a minimum of one year;
- identify, describe, and quantify all direct and indirect existing regional emission sources (including mobile, stationary, and fugitive) in the regional assessment area that could have the potential to interact with emissions from the project (including any transportation as a result of the project). Regional emission inventories may be used (e.g. the Marine Emissions Inventory Tool);
- describe the data source(s), including data validation and quality control methods and explain which emission sources are quantified and modelled, and which are accounted for using monitoring data;
- justify and explain the rationale for selection of specific monitoring data versus modelling emission sources. There may be a small selection of emission sources that may be best represented by monitoring data, thus the assessment should strive to include as many regional emission sources as possible, and cannot rely only on monitoring data to reflect a base case;
- 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;
- provide air dispersion models of a base case, developed in accordance with provincial or federal standards to account for existing pollutant sources and to determine the spatial distribution of pollutant concentrations within the assessment area;

- provide appropriately scaled contour map(s) plotting the modelled concentrations of criteria air contaminants for the relevant averaging periods and modelling cases;
- analyze and summarize ambient air contaminant concentration monitoring data from multiple monitoring stations in the regional assessment area with appropriate duration, representativeness, data completeness, data validation and quality control;
- supplement base case modelling results with analyzed monitoring data to ensure any regional emission sources not accounted for in the dispersion modelling exercise are represented in the final base case;
- describe the local and regional climate projections for the area with the rationale of the climate model chosen and including a description of the current and projected climate impacts on air quality;
- describe sources of nuisance odour in the study area; and
- describe available Indigenous or community knowledge related to current air quality conditions.

9.4.4 Potential Effects

The Impact Statement must:

- describe potential effects to air quality, identify interactions between the project and these effects, and outline indicators that will be used to measure these effects;
- using established methods for estimating emissions, provide a quantitative assessment of project-related emissions (as listed in section 9.4.3) during construction and operation from the following types of sources:
    - point sources (e.g. including but not limited to power generation equipment such as gensets), turbines, compressor engines, incinerators, exhaust vents and stacks from processing facilities, ventilation vents, boilers and other heating equipment, flares, docked marine vessels, idling train engines and other transport vehicles, fugitive emissions from storage tanks). This should also include start-up and shut-down emissions, as appropriate;
    - area sources (e.g. including material handling and transport);
    - mobile/road sources (e.g. tailpipe emissions and fugitive dust emissions). Fugitive dust emission factors and assumed mitigation (control efficiency) should be described and should be justifiable based on what is practicable. Tailpipe emission factors should be estimated using established methods); and
    - emissions from project-related vessels and their tugs in transport along the entire marine shipping area, including short sea shipping barges and their tugs;
- provide detailed methodology, assumptions and related parameters used to estimate emissions of air pollutants released, including:
    - all relevant emission factors should be provided and referenced (with methodology, uncertainty assessment and references);
    - for all applicable emission sources, include the assumed tier of emission standard for each emission factor applied; and

  - provide details of the achievement of emission standards for all marine, 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 (see Appendix 6 - 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;
- combine results from the base case dispersion modelling (see section 9.4.3) with the project case dispersion modelling to illustrate how the predicted concentrations of the project interact with the regional emission sources;
- 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, 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; and
  - 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);
- provide an assessment of project emissions and resulting air pollutant concentrations that can potentially contribute or add to existing ground-level ozone concentrations;
- assess the potential for emissions and resulting air contaminant dry and wet deposition from the project to contribute to acid deposition and exceedances of critical loads for terrestrial and aquatic ecosystems;
- 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 relevant guidance or standard value. Emission sources should be grouped into appropriate categories;
- assess effects to receiving environment through:
  - comparison with ambient standards, including the CAAQS. The assessment against CAAQS should be based on the principles of “keeping clean areas clean” and continuous improvement, and in the context of air sheds and air zones with the Air Quality Management System;
  - comparison with critical thresholds (consider current, historical loadings, buffering capacity, including Acid Deposition Critical Loads);
  - comparison with sensitive ecological receptors (consider effects thresholds of species in question); and

    - comparison to other appropriate existing guidelines, objectives or standards, where relevant. This includes regional and community-based air quality guidelines; and
- describe any positive changes.

The proponent should refer to Health Canada's *Guidance for Evaluating Human Health Impacts in Environmental Assessment: Air Quality* and the *British Columbia Guidance for Prospective Human Health Risk Assessment* 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 air quality. It is requested that the proponent complete the checklists provided in the guide (Appendix A of that guide) to assist participants in verifying that the main elements of 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.

9.4.5 Mitigation and Enhancement Measures

The Impact Statement must:

- describe measures to mitigate effects on air quality, including approaches to avoid, reduce, mitigate or otherwise address potential adverse effects and enhance positive effects;
- provide a description, expected use, and quantification of the emission reductions associated with all methods and practices (e.g. control equipment, heat or gas recovery systems) to be implemented to reduce and control emissions. Further, outline any emission reduction technologies that may redirect contaminants from one part of the environment and release it to another (e.g. some marine vessel exhaust gas cleaning systems take contaminants from atmospheric exhaust and release those contaminants into wastewater in the oceans). If the best achievable technologies are not included in the project design, the proponent must 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;
- describe existing and planned measures to reduce odours and dust, including a description of improvements to existing infrastructure, as applicable;
- describe 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; and
- develop and implement strategies compliant with regional and national commitments, such as the CCME's commitment regarding pollution prevention.

9.5. Atmospheric Noise

9.5.1 Relevant Statutes, Policies and Frameworks

Federal and provincial statutes, policies and frameworks that may be relevant to atmospheric noise include:

- municipal bylaws (as applicable);

- *Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise*;
- *British Columbia Noise Control Best Practices Guideline* (as applicable); and
- additional sector or geographic specific statutes, policies and frameworks, as applicable, are to be determined in collaboration with relevant government authorities during the development of the Impact Statement.

9.5.2 Assessment Boundaries

The Impact Statement must define assessment boundaries for the atmospheric noise VC, including spatial, temporal, and administrative and technical boundaries.

9.5.3 Existing Conditions

The existing condition requirements, including requirements for describing sources of baseline information as described in section 8.4 of these Joint Guidelines, must be followed in addition to the following requirements.

The Impact Statement must:

- describe current ambient noise levels at key receptor points (e.g. closest or most affected receptors including communities, traditional land users, sensitive human receptors such as schools, childare centres, places of worship, hospitals, and wildlife), where relevant this may include providing the results of a baseline ambient noise survey and permissible sound levels for each receptor;
- describe the locations and characteristics of sensitive receptors including species at risk;
- for studies on ambient noise where there are human receptors present, consider the following during baseline data collection:
  - natural sounds;
  - soundscapes (see standard *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);
- describe typical sound sources (natural and anthropogenic), their geographic extent and temporal variations;
- justify the selection of and describe noise-sensitive receptors in the assessment area, including any foreseeable future receptors, and distances of receptors from the project; and
- describe available Indigenous or community knowledge related to current noise conditions.

9.5.4 Potential Effects

The Impact Statement must:

- describe potential effects to atmospheric noise, identify interactions between the project and these effects, and outline indicators that will be used to measure these effects;
- describe changes in ambient vibration and noise levels as a result of the project;
- quantify noise levels at appropriate distances, from any project facility and/or activities, including at key receptor locations, and describe the frequency, duration and character of noise;
- provide a comparaison between existing (baseline), project-sourced noise, and project plus baseline noise levels;
- where there is public concern associated with an increase in noise levels during construction, provide a vibration and noise impact assessment, including an overview of the concerns;
- identify and justify the approach to determine the extent to which sound effects resulting from the project are adverse;
- describe consultation with regulators, stakeholders, community groups, landowners and Indigenous nations about potential effects to the acoustic environment; and
- describe any positive changes.

The proponent should refer to *Health Canada's Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise* 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. It is requested that the proponent complete the checklists provided in the guide (Appendix B of that guide) to assist participants in verifying that the main elements of a noise 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 these aspects are found in several sections of the Impact Statement.

9.5.5 Mitigation and Enhancement Measures

The Impact Statement must:

- describe measures to mitigate effects on atmospheric noise, including approaches to avoid, reduce, mitigate or otherwise address potential adverse effects and enhance positive effects; and
- 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.

9.6. Underwater Noise

9.6.1 Relevant Statutes, Policies and Frameworks

Sector or geographic specific statutes, policies and frameworks, as applicable, are to be determined in collaboration with relevant government authorities during the development of the Impact Statement.

9.6.2 Assessment Boundaries

The Impact Statement must define assessment boundaries for the underwater noise VC, including spatial, temporal, and administrative and technical boundaries.

9.6.3 Existing Conditions

The existing condition requirements, including requirements for describing sources of baseline information as described in section 8.4 of these Joint Guidelines, must be followed in addition to the following requirements.

The Impact Statement must:

- describe ambient underwater noise levels in the local assessment area and regional assessment area based on acoustic measurements during both summer and winter conditions;
- describe the underwater noise sources including geographic extent and spatial and temporal variations within the water column and at the seafloor; and
- describe available Indigenous or community knowledge related to underwater noise.

9.6.4 Potential Effects

The Impact Statement must:

- describe potential effects to underwater noise, identify interactions between the project and these effects, and outline indicators that will be used to measure these effects;
- quantify underwater noise levels at appropriate distances from project construction for activities such as pile driving, dredging and the transit of vessels associated with construction;
- quantify underwater noise during summer and winter conditions at appropriate distances from vessels of various sizes likely to call at the proposed project including:
    - a vessel and accompanying tug undertaking short sea shipping;
    - a vessel in transit in a shipping lane;
    - a vessel that is approaching the terminal;
    - a vessel that is berthing with the assistance of support vessels such as tugs; and
- describe any positive changes.

9.6.5 Mitigation and Enhancement Measures

The Impact Statement must:

- describe measures to mitigate effects on underwater noise, including approaches to avoid, reduce or otherwise address potential adverse effects and enhance positive effects;
- provide an underwater noise management plan, including identification of the underwater noise sources, common noise mitigation measures, and the performance efficiency of underwater noise reduction and dampening methods and technologies;
- describe regional initiatives to reduce underwater noise in the Salish Sea including but not limited to the Oceans Protection Plan and Whales Initiative, and participation in those regional initiatives. If participation is not planned, provide a rationale indicating why participation is not required; and
- consider/identify alternative echosounder design and operation options that would be effective to reduce audible noise (specifically to Southern Resident Killer Whale (SRKW)) emitted by echosounder.

9.7. Marine Water, Sediment, and Coastal Geomorphology

9.7.1 Relevant Statutes, Policies and Frameworks

Federal and provincial statutes, policies and frameworks that may be relevant to marine water, sediment and coastal geomorphology include:

- *B.C. Environmental Management Act* and regulations;
- B.C. Water Quality Guidelines;
- *Fisheries Act* and regulations;
- *Migratory Birds Convention Act* and regulations;
- *Canada Shipping Act* and regulations;
- *Canadian Environmental Protection Act, 1999* and regulations; and
- The Canadian Council of Ministers of the Environment's Canadian Environmental Quality Guidelines.

9.7.2 Assessment Boundaries

The Impact Statement must define assessment boundaries for the marine water, sediment, and coastal geomorphology VC, including spatial, temporal, and administrative and technical boundaries.

9.7.3 Existing Conditions

The existing condition requirements, including requirements for describing sources of baseline information as described in section 8.4 of these Joint Guidelines, must be followed in addition to the following requirements.

The Impact Statement must:

- describe the marine water quality baseline characterization program including sampling site selection, monitoring duration and frequency, sampling methodology, and analytical protocol, including field and laboratory quality assurance and quality control measures (and accreditation), and methods for evaluation and analysis of marine water quality baseline data;
    - describe the incorporation of any applicable historical data or existing information; and
    - describe how the results helped to characterize existing conditions (e.g. filed an information gap, or confirmed or refuted older information);
- provide baseline marine water quality data for physiochemical parameters (e.g. temperature, pH, specific conductance, salinity, dissolved oxygen, turbidity, total suspended solids, total dissolved solids) and relevant chemical constituents (e.g. major and minor ions, total and dissolved metals, nutrients, and organic and inorganic compounds, including those of potential concern, such as hydrocarbons), and biological indicators (e.g. chlorophyll *a*, biological oxygen demand, bacteriological). Water sample collection and analysis should use appropriately sensitive detection limits and the data should illustrate the seasonal and inter-annual variability in baseline marine water quality with sufficient years of baseline data to fully characterize natural variability;
    - site selection characterization should include sampling locations within the project area, the local assessment area and the regional assessment area (i.e. all locations that could potentially be impacted by the proposed project). Baseline samples should also be collected from reference locations that are unlikely to be impacted by the project; and
    - consider available guidance documents (e.g. *CCME 2007*, *CCME 2015*, *BC ENV 2019*);
- describe baseline concentrations of potential contaminants of concern including in relation to applicable marine water quality guidelines or thresholds such as the B.C. Water Quality Guidelines and Canadian Environmental Quality Guidelines;
- describe the marine sediment quality baseline characterization program including sampling site selection, monitoring duration and frequency, sampling methodology, and analytical protocol, including field and laboratory quality assurance and quality control measures (and accreditation), methods for evaluation and analysis of marine sediment quality baseline data. Describe the incorporation of any applicable historical data or existing information;
    - baseline data should illustrate spatial variability in sediment quality (e.g. at surface and at depth where project-related interactions may occur);
- provide baseline marine sediment quality data for sediment composition (e.g. particle size analysis, total organic carbon content) and relevant contaminants of potential concern (e.g. metals and organic compounds, including hydrocarbons and bioaccumulative and/or persistent organic pollutants, such those of concern to the SRKW and their prey (e.g. polychlorinated biphenyls (PCBs), polybrominated diphenyl ethers (PBDEs), dioxins and furans);
- describe baseline concentrations of potential contaminants of concern in relation to applicable sediment quality guidelines or thresholds, such as the Canadian Environmental Quality Guidelines and guidelines protective of SRKW and their prey (e.g. *Recommended Environmental Quality Guidelines for the Protection of Southern Resident Killer Whale*). Sediment sample collection and analysis should use appropriately sensitive detection limits to be able to compare against applicable sediment quality guidelines or thresholds;

- provide a description of surficial geology including:
  - sediment stratigraphy, bottom sediment type, competence, thickness, porosity; and
  - sediment stability and load bearing capacity of marine sediments/seabed in the project area (in situ measurements of bed shear stress, porosity, and sediment density);
- sediment stability and load bearing capacity of materials to be used for fill in project construction (grain size, sediment porosity and density).Include characterization, including maps at appropriate scales of the following:
  - bathymetry;
  - surface and subsurface current patterns and velocities;
  - waves (e.g. heights, direction, and average length) and storm surges;
  - tides and currents;
  - other hydrodynamic processes;
  - sediment transport and coastal/subtidal erosion patterns, including long shore drift processes; and
  - sediment budget (sources and sinks);
- describe and provide maps, at an appropriate scale, or major drainage basins (i.e. Fraser River), including watershed and sub-watershed boundaries, flood risk areas and wetlands, overlaid by key project components;
- characterize the hydrological regime of the Fraser River Estuary, including monthly, seasonal and annual water flow (freshet) data from the Fraser River (including Canoe Pass) and groundwater flow through the Fraser Delta;
- describe the local and regional climate projections for the area with rationale of the climate model chosen and including a description of the current and projected climate impacts on marine water and sediment quality;
- describe the historical marine and near shore upland use and the potential that such waters and sediments could have been contaminanted by that use;
- describe the physical, chemical, and potential toxicological nature of any known or suspected sediment or near shore soil contamination within the study area that could be re-suspended, released, re-used, disposed or otherwise disturbed as a result of the project;
- describe, where relevant, the locations of marine bivalve shellfish harvesting areas, and the potential for contamination of such waters and sediments;
- identify domestic, communal, or municipal water wells within the local area, and provide information on their depth, distance from the project, and describe their current use, potential for future use, and whether their consumption has any Indigenous cultural importance;
- describe available Indigenous or community knowledge related to marine water and sediment quality;
- provide a description of the physical oceanography within the study area including surface and subsurface current patterns, current velocities, waves, storm surges, longshore drift processes, tidal

patterns, and tide levels for the site, in proximity to the site, and along the marine shipping routes with consideration of predicted climate change effects;

- describe seawater exchange in the inter-causeway area and assess the potential risks (e.g. eutrophication of water and sediment) associated with restrictions to seawater exchange in the inter-causeway area;
- identify ecosystems that are sensitive or vulnerable to acidification, eutrophication, and/or other impacts resulting from the deposition of atmospheric contaminants;
- describe coastal processes, including zones of erosion and deposition, intertidal dendritic channels (locations, sizes and a characterization of the processes including their formation and/or breakdown); and
- provide marine water quality data used to develop or inform water quality models, if required for the assessment.

9.7.4 Potential Effects

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

- potential effects to marine water, sediment, and coastal geomorphology, interactions between the project and these effects, and indicators that will be used to measure these effects;
- the physical effects to the estuarine and marine environment, including changes to:
  - water quality due to all project components and activities for all phases of the project, including from all project-related discharges, re-suspension and re-distribution of sediment during freshet and non-freshet conditions:
    - include data for physiochemical parameters and relevant chemical constituents, including those listed in section 9.7 for marine water quality; and
    - compare any changes to water quality to applicable marine water quality guidelines, thresholds, objectives, or standards;
  - sediment quality due to all project components and activities for all phases of the project, including from all project-related discharges and re-suspension of sediment and exposure of historic contaminants;
    - include data for sediment and relevant contaminants of potential concern, including those listed in section 9.7; and
    - compare any changes to sediment quality to applicable marine sediment quality guidelines or thresholds, including guidelines protective of SRKW and their prey (e.g. *Recommended Environmental Quality Guidelines for the Protection of Southern Resident Killer Whale*);
  - oceanographic conditions;
  - bathymetry and sea-level;
  - coastal geomorphology;
  - the sources, quantities and frequency of project related emissions and discharges to the marine environment from vessels and infrastructure at the project site and marine shipping area. This

should include, but not be limited to, discharges of ballast water, bilge water, scrubber effluent, grey water, sewage, food waste, deck wash, surface run-off, storm water, wastewater, aerial deposition of vessel emissions and any accidental spills of any kind;

- any applicable site water management plan for the project's life cycle, including site run-off, stormwater management and waste water discharges;
- any applicable water quality treatment measures and provide evidence supporting the effectiveness of these measures;
- the effects to the use of the marine environment, including estuarine, salt marsh and marine habitats;
- the potential for the project to affect groundwater sources in the local area, such as from saltwater intrusion;
- how the project, including construction of crest protection and dredging would affect longshore currents or littoral drift that move sediment downdrift along the beach and contribute to shoreline retreat, deposition updrift and erosion downdrift; and
- describe any positive changes.

With respect to dredging and disposal at sea, the Impact Statement must provide a description of:

- the location of dredging activity (including a bathymetric chart of the area before and after any dredging activity);
- local conditions, including seasonal flow currents and tide cycles that inform sediment transport;
- the sediments to be dredged, managed, re-used or disposed (e.g. quantities, particle size, chemical characteristics) based on a sampling program representative of site conditions and in keeping with *Environment and Climate Change Canada's disposal at sea sampling guidance*;
- chemical characterization of changes to sediment quality as a result of project activities, including relevant contaminants of potential concern. Data should illustrate spatial variability in sediment quality (e.g. at surface and at depth where project-related interactions may occur), including sediment quality that will be exposed as the new seafloor;
- the proposed location of disposal activity (including a bathymetric chart of area) and supporting rationale for a preferred disposal site along with waste management and disposal site alternatives considered;
- how disposal is to be conducted along with alternatives considered;
- the predicted dispersion and deposition of sediments over time of both dredging and disposal 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 seafloor along with contaminant concentrations; and
- the route, duration and number of trips between dredging site and disposal site(s) along with equipment employed.

9.7.5 Mitigation and Enhancement Measures

The Impact Statement must:

- describe measures to mitigate effects on marine water, sediment, and coastal geomorphology, including approaches to avoid, reduce or otherwise address potential negative effects and enhance positive effects.

9.8. Visual Environment

9.8.1 Relevant Statutes, Policies and Frameworks

Statutes, policies and frameworks that may be relevant to the visual environment include:

- municipal bylaws (as applicable); and
- *Visual Impact Assessment Guidebook*.

Additional sector or geographic specific statutes, policies and frameworks, as applicable, are to be determined in collaboration with relevant government authorities during the development of the Impact Statement.

9.8.2 Assessment Boundaries

The Impact Statement must define assessment boundaries for the visual resources and light VC, including spatial, temporal, and administrative and technical boundaries.

9.8.3 Existing Conditions

The Impact Statement must:

- describe the visual landscape from key use areas;
- describe landscapes of interest, visual screens and other components of the visual environment, and locate them on maps;
- 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 available Indigenous or community knowledge related to the visual environment.

9.8.4 Potential Effects

The Impact Statement must:

- describe potential effects to the visual environment, identify interactions between the project and these effects, and outline indicators that will be used to measure these effects;
- provide a description of any changes in nighttime light levels resulting from the project:

  - quantify light levels at appropriate distances, including at key receptor points, from any project facilities, including the timing (e.g. night hours), frequency, duration, distribution and character of light emissions; and
  - 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 consultation with regulators, stakeholders, community groups, landowners and Indigenous peoples about potential effects to the visual environment. Where appropriate, provide a record of engagement; and
- describe any positive changes.

9.8.5 Mitigation and Enhancement Measures

The Impact Statement must:

- describe measures to mitigate effects on the visual environment including approaches to avoid, reduce, mitigate or otherwise address potential negative effects and enhance positive effects;
- provide a light 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.

9.9. Marine Fish and Fish Habitat

Under the *Fisheries Act*, fish are defined as: 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. Marine mammals (or marine animals) have been identified as a separate VC for the purpose of these Joint Guidelines, and requirements pertaining to marine mammals can be found in section 9.10. In this section, the term fish is used to encompass marine fish and marine invertebrates.

The proponent must, at a minimum, assess the potential effects of the project on the following subcomponents and species:

- Pacific Salmon: Chinook salmon, Chum salmon, Sockeye salmon;

- Demersal fish: White sturgeon, Green sturgeon;
- Forage fish: Eulachon, Pacific sand lance, Pacific herring;
- Benthic epifauna: Dungeness crab;
- Benthic infauna; and
- Bivalve shellfish.

The proponent may also identify additional subcomponents and species to be assessed in consultation with Indigenous nations and other participants.

9.9.1 Relevant Statutes, Policies and Frameworks

Federal and provincial statutes, policies and frameworks that may be relevant to marine fish and fish habitat include:

- *Fisheries Act* and regulations;
- *Species At Risk Act*;
- Fish Habitat Policy Statement;
- *Canadian Environmental Protection Act, 1999*;
- *Oceans Act*;
- *Canada Shipping Act*; and
- *Wildlife Act*.

9.9.2 Assessment Boundaries

The Impact Statement must define assessment boundaries for the marine fish and fish habitat VC, including spatial, temporal, and administrative and technical boundaries.

9.9.3 Existing Conditions

The existing condition requirements, including requirements for describing sources of baseline information as described in sections 8.4 and 9.13.3 of these Joint Guidelines, must be followed in addition to the following requirements.

The Impact Statement must:

- list and describe all water bodies that may be directly or indirectly impacted by the project and provide:
  - type of water body;
  - size and maximum and average depths of waterbodies;
  - substrate type, aquatic vegetation and anthropogenic barriers to fish; and
  - description of any proposed water work;

- 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 frequented by fish, provide the location, distribution, condition 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:
    - marine water, sediment, and coastal geomorphology characteristics requested in section 9.7.3;
    - extent of habitat disturbance under existing conditions (e.g. fragmentation);
    - habitat use or suitability for fish present, including critical habitat and residences for species at risk, and habitat function (e.g. spawning, nursery, growth, prey, invertebrate population, food availability, foraging, migration, cover habitat, thermal and overwintering habitat, etc.), sensitive times for these activities and seasonal variability in habitat use; and
    - substrate type, aquatic vegetation, bank stability, light penetration, presence of woody debris, natural or anthropogenic barriers to fish passage, and geomorphological features and processes;
- for each potentially affect waterbody, provide a detailed description of potentially affected fish species and populations within the marine 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;
- provide baseline measurements of contaminants in fish;
- describe and provide maps of existing, designated or proposed special marine areas such as: marine refuges, marine conservation areas, species at risk critical habitat, ecological reserves and marine protected areas, in proximity to the project location or that could be affected by routine project operations;
- identify sensitive habitat areas (e.g. Ecologically and Biologically Sensitive Marine Areas) within the local and regional study areas and along the marine shipping areas, and include maps that demonstrate proximity of these areas;
- describe the historical occurrence, distribution and conservation status of marine fish;
- describe parameters and ecological processes relevant to identifying effects to population persistence and ecological processes of fish 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, age structure, sex ratios, 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;
- identify and describe the data sources used, including information on data collection and project-specific baseline surveys (e.g. gear and catch methods, location and sampling stations, date of catches, date of surveys, species surveyed, size and life cycle stage, catch per unit effort) and how the results helped to characterize baseline conditions. It is recommended that the information be presented in the form of tables;
- describe available Indigenous or community knowledge related to marine resources;
- describe the use of fish that are:
    - used as traditional foods, including a description of the particular species of importance and whether its consumption has cultural importance for Indigenousnations, including medicinal use. All sites used in the study area or historically important sites for the collection of traditional foods must be identified and mapped, such as important fishing sites; and
    - of Indigenous cultural use and value;
- provide a summary of existing studies and research on potential effects of noise and vibrations on potentially affected fish species, including behavioural impacts, in the marine environment; and
- describe the local and regional climate projections for the area with a rationale of the climate model chosen and including a description of the current and projected climate impacts on fish and fish habitat.

9.9.4 Potential Effects

The proponent must describe potential effects in accordance with sections 8.5 and 9.13.4 of these Joint Guidelines, in addition to the following requirements.

The Impact Statement must describe the potential effects on fish and fish habitat. 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. Refer to section 9.7 for related water quality requirements to inform the assessment.

The Impact Statement must:

- describe potential effects to fish and fish habitat, identify interactions between the project and these effects, and outline indicators that will be used to measure these effects;
- use of a *Pathways of Effects* approach to determine potential effects to fish and fish habitat;
- describe the geomorphological changes and their effects to hydrodynamic conditions and aquatic habitats (e.g. modification of substrates, changes in salinity, long term bank instability, silting of spawning grounds), including direct and indirect effects from habitat fragmentation;
- describe changes in hydrological, hydrometric and oceanographic 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;

- describe changes to the littoral zone that could affect fish and fish habitat, aquatic species at risk and productivity;
- delineate anticipated temporary and permanent changes to habitat in terms of area, habitat type, sensitivity of habitat and impact (e.g. magnitude, intensity and persistence). Habitat changes and losses must be clearly located and presented on a map at appropriate scales and in a table;
- describe any alteration to accessibility or use of habitat by fish species, aquatic species at risk;
- 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 on fish behaviour, distribution, abundance, migration patterns, species health and reproduction from project activitity;
- describe changes to primary and secondary productivity, food sources, potential imbalances in the food web and trophic levels;
- describe risk of fish mortality, including that associated with:
    - noise and vibrations caused by project activities in or near the aquatic environment; and
    - entrapment, impingement, crushing, burial or entrainment;
- describe effects from changes in light levels;
- describe effects from the potential introduction of aquatic invasive species, including pathogens, through project activities, including discussion of the frequency of those activities;
- describe effects from the potential introduction of deleterious substances (e.g. sediment, project-related contaminants);
- describe direct effects from contaminants on fish and also bioaccumulation of contaminants (e.g. PCBs, PBDEs, selenium, mercury) with a focus on traditional foods harvested by Indigenous peoples. Effects should be predicted or modelled using baseline measurements of contaminants in the complete food web (including water, invertebrates and prey fish), and should be discussed by comparing predicted water quality for all phases and at all key locations in the receiving environment to:
    - applicable water quality guidelines; and/or
    - site-specific objectives of benchmarks; and/or
    - relevant toxicity test results (either site-specific or published); and/or
    - other applicable methods;
- describe changes in access to the area and to fishing;
- describe the potential effects of marine traffic and underwater noise on fish, including, but not limited to:
    - disruption of activities such as resting, feeding, movement and migration;
    - fish behaviour and injury in comparison to underwater noise thresholds;

  - increased turbidity; and
  - ballast discharge and potential for introduction of invasive species;
- describe effects to fish biodiversity considering identified biodiversity metrics and 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 and federally listed fish species at risk, with respect to objectives in management plans, Recovery Strategies and Action Plans, for example;
  - effects on populations as a result of changes in access or traffic caused by the project; and
  - any modifications in migration, local movements or stranding of fish, following the construction, operation or closure of works (e.g. physical, chemical and hydraulic barriers);
- describe any positive changes, such as habitat creation and, where applicable, provide information on re-stocking (including the number of fish) or creation of new fish habitat (including the new area created);
- any other changes resulting from the project that may affect fish and fish habitat;
- describe tolerance thresholds for potential adverse effects that the Indigenous nations and other participants have identified, and how they were considered in the assessment; and
- describe any need for a *Fisheries Act* authorization and/or a *Species at Risk Act* permit and describe any consideration of Fisheries and Oceans Canada guidance documents.

Additional guidance that should be referenced to support the effects assessment and associated follow up can be found in Appendix 5 and 6.

9.9.5 Mitigation and Enhancement Measures

The proponent must describe mitigation and enhancement measures in accordance with sections 8.6 and 9.13.5 of these Joint Guidelines, in addition to the following requirements.

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

- measures to mitigate effects on marine fish and fish habitat, including approaches to avoid, reduce or otherwise address potential negative effects and enhance positive effects, as appropriate;
- 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 effects of temporary and permanent changes to 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;
- measures applicable to water intakes and outflows including how they would be maintained following construction of the project;
- measures to mitigate sensory disturbance and functional fish habitat loss that it may cause, including in relation to marine shipping activities;

- design options that would reduce effects to fish and fish habitat;
- measures to avoid fish mortality, for example, from dredging, placement of fill, and pile driving;
- measures to prevent the deposit of substances harmful to fish in the aquatic environment;
- measures to prevent the introduction and intrusion of invasive aquatic species during work in or near the aquatic environment; and
- describe how environmental protection plans will address any applicable federal and provincial policies with respect to fish habitat.

With respect to offsetting, provide the following:

- measures and plans to offset or compensate for any loss in productivity of fish populations and fish habitat as a result of the project;
- physical description of offset (e.g. habitat type, creation, restoration, or enhancement and size);
- preliminary designs and specifications;
- characterization of current habitat characteristics and function (fish use) of sites proposed for restoration or enhancement;
- description of the benefit of the proposed offset to fish, including habitat function for specific species and life stages;
- assessment of the technical feasibility of the offset, including a summary of technical investigations (surveys, engineering reports, archaeological investigations);
- information on land tenure, access, and evaluation of potential interactions with other land uses;
- summary of effectiveness of past offsetting projects undertaken for impacts to fish at Roberts Bank and any remedial actions taken;
- the functional criteria for assessment of the measures to offset or compensate any loss in fish populations and fish habitat, as well as the methods and timing and proposed documentation of this assessment; and
- an analysis of how the proposed offsetting plan will counterbalance any residual effects of the project on fish and fish habitat.

The proponent must refer to Fisheries and Oceans Canada guidance and explain how it was applied to the assessment, including the references provided Appendix 6 – *Compensation and offset plans* and *Fish and fish habitat*.

9.10. Marine Mammals

The proponent must, at a minimum, assess the potential effects of the project on the following subcomponents and species:

- Low-frequency cetaceans: North Pacific Humpback Whale;
- Mid-frequency cetaceans: SRKW;
- High-frequency cetaceans: Harbour porpoise; and

- Pinnipeds: Stellar sea lion and Harbour seal.

The proponent may also identify additional species to be assessed in consultation with Indigenous nations and other participants.

9.10.1 Relevant Statutes, Policies and Frameworks

Federal and provincial statutes, policies and frameworks that may be relevant to marine mammals include:

- *Fisheries Act* and Marine Mammal Regulations;
- *Species At Risk Act*;
- Fish and Fish Habitat Policy Statement;
- *Canadian Environmental Protection Act, 1999*;
- *Oceans Act*; and
- *Canada Shipping Act*.

9.10.2 Assessment Boundaries

The Impact Statement must define assessment boundaries for the marine mammals VC, including spatial, temporal, administrative and technical boundaries.

9.10.3 Existing Conditions

The existing condition requirements, including requirements for describing sources of baseline information as described in sections 8.4 and 9.13.3 of these Joint Guidelines, must be followed in addition to the following requirements.

As applicable, the Impact Statement must:

- provide a list of known marine mammal species that may be present in the local and regional assessment areas. Describe their abundance, distribution, times of year they are present, the ranges of the species, their habitat and their migration patterns;
- describe habitat use and suitability for marine mammals present, including critical habitat and residences for species at risk, and habitat function (e.g. calving, growth, food availability, foraging, migration habitat, etc.) and sensitive times/seasonal variation in these activities;
- describe and provide any project-specific baseline surveys completed, including the methods used and how the results helped to characterize existing conditions (e.g. filled an information gap; confirmed or refuted older information);
- describe important prey species and their abundance;
- describe and provide maps of any existing, designated or proposed special marine areas such as: marine refuges, marine conservation areas, species at risk critical habitat, ecological reserves and marine protected areas, within or in proximity to the project location including the marine shipping areas or that could be affected by routine project operations;

- 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;
- describe parameters and ecological processes relevant to predicted effects on marine mammals. For example, it may be necessary to establish a broader ecological baseline if the project affects an 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 marine mammals depend on to carry out their life history;
- provide a summary of existing studies and research on the potential effects of underwater noise and vibration on marine mammals;
- describe baseline levels of contaminants in marine mammals;
- describe the use of marine mammals that are:
    - used as traditional foods, including a description of the particular species of importance and whether its consumption has cultural importance for Indigenous peoples, including medicinal use. All sites used in the study area or historically important sites for the collection of traditional foods must be identified and mapped, such as important harvesting sites; and
    - of Indigenous cultural use and value;
- reference species of Indigenous cultural use and value based on available information; and
- describe available Indigenous or community knowledge related to marine mammals.

9.10.4 Potential Effects

The proponent must describe potential effects in accordance with sections 8.5 and 9.13.4 of these Joint Guidelines, in addition to the following requirements.

The Impact Statement must:

- describe potential effects to marine mammals, identify interactions between the project and these effects, and outline indicators that will be used to measure these effects;
- describe any alteration to accessibility or use of habitat, including residence and critical habitat of marine mammals species at risk;
- delineate anticipated temporary and permanent changes to marine mammal habitat in terms of area, habitat type, sensitivity of habitat and impact (e.g. magnitude, intensity and persistence). Habitat changes must be clearly located and presented on a map at appropriate scales and in a table;
- describe potential effects to marine mammals based on specific life history processes, population status, resilience in the face of change, dependance on specific habitat features, or limiting ecological processes or variables;

- describe changes in underwater noise during all phases of the project, provide maps of the geographic extent of these changes, and compare the results with thresholds or guidelines for injury and behaviour disturbance;
- describe changes to the primary and secondary productivity, food sources, potential imbalances in the food web and trophic levels;
- describe the potential effects of marine traffic and underwater noise on marine mammals individuals and populations, including, but not limited to:
  - risk of collision with vessels (ship strike);
  - disruption of activities such as resting, feeding, calving, movement, migration;
  - alteration of habitat;
  - marine mammal behaviour, including the effects of underwater noise on acoustic masking of echolocation or communication calls;
  - potential effects from contaminants in vessel discharge (e.g. ballast water, grey water, bilge water and scrubber effluent);
  - increased turbidity; and
  - effect of ballast discharge and potential for the introduction of invasive species;
- describe potential effects on marine mammal behaviour, distribution, abundance, migration patterns, species health and reproduction from project activities, including marine shipping activities;
- describe changes in potential contaminant levels in harvested marine mammal species and their prey, with a focus on country foods harvested by Indigenous nations;
- assess potential effects to marine mammals from contaminants, including by comparing predicted water quality and sediment quality for all project phases and at all key locations in the receiving environment to applicable water quality and sediment quality guidelines (including guidelines protective of the SRKW and their prey), objectives or standards;
- describe tolerance thresholds for potential adverse effects that the Indigenous nations and other participants have identified, and how they were considered in the assessment;
- describe potential effects on provincially or federally listed marine mammals, with respect to objectives in management plans, Recovery Strategies and Action Plans (e.g. potential losses of individuals and relationship to population density and the resilience of populations);
- quantify and describe the destruction of any critical habitat based on potential effects to the biophysical functions, features, and attributes of critical habitat for species at risk;
- 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.

9.10.5 Mitigation and Enhancement Measures

The proponent must describe mitigation and enhancement measures in accordance with section 8.6 and 9.13.5 of these Joint Guidelines, in addition to the following requirements.

The Impact Statement must describe:

- measures to mitigate effects on marine mammals, including approaches to avoid, reduce or otherwise address potential negative effects and enhance positive effects, as appropriate;
- all standard measures, policies, and commitments regarding mitigation that constitute technically 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 temporary or permanent changes to marine mammal habitat, or injury or death caused by any project activity, including during the sensitive periods and in sensitive locations (e.g. feeding, migration);
- describe how timing windows can be used to avoid effects of project construction on Southern Resident Killer Whales during periods of high habitat use;
- describe sound dampening technologies that could be used during construction, and provide a description of their potential effectiveness;
- describe the use of any exclusion zones to avoid effects on marine mammals during construction;
- measures to mitigate sensory disturbance and habitat loss that it may cause, including in relation to marine shipping;
- measures to prevent the deposit of substances harmful to marine mammals in the aquatic environment;
- measures to prevent the introduction and intrusion of invasive aquatic species during work in or near the aquatic environment;
- how environmental protection plans will address any applicable federal and provincial policies with respect to marine mammals;
- how the mitigation measures are consistent with any applicable recovery strategy, action plan or management plan; and
- describe participation in regional measures for SRKW, such as *2021 Management Measures to Protect Southern Resident Killer Whales* or provide rationale why participation is not required.

9.11. Marine Vegetation and Wetlands

The proponent must, at a minimum, assess the potential effects of the project on all wetland habitats as defined by the Canadian Wetland Classification System, including the following subcomponents and species:

- biofilm;
- eelgrass;
- macroalgae;
- intertidal marsh;
- sandflat;
- mudflat; and
- shallow subtidal.

The proponent may also identify additional components or species to be assessed in consultation with Indigenous nations and other participants.

9.11.1 Relevant Statutes, Policies and Frameworks

Federal and provincial statutes, policies and frameworks that may be relevant to marine vegetation and wetlands include:

- *Species at Risk Act*;
- *Fisheries Act*;
- *Canadian Environmental Protection Act, 1999*;
- Federal Policy on Wetland Conservation; and
- Ramsar Convention.

9.11.2 Assessment Boundaries

Impact Statement must define assessment boundaries for the marine vegetation and wetlands VC, including spatial, temporal, and administrative and technical boundaries.

9.11.3 Existing Conditions

The existing condition requirements, including requirements for describing sources of baseline information as described in sections 8.4 and 9.13.3 of these Joint Guidelines, must be followed in addition to the following requirements.

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 within the local and regional study areas of the project; including:
  - rare plant communities and communities of limited distribution; 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 assessment area, and where available, the regional assessment area;
- 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 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;

- describe the natural disturbance regimes and their sources (e.g. tides, storms, fire, floods, droughts, diseases, insects and other pests, etc.);
- provide information on biofilm quantity and quality (e.g. fatty acid content and diatom community composition) between the causeways and on Roberts Bank (control). Sampling should be conducted monthly for a sufficient period of time so as to capture inter-annual and inter-seasonal variability (recommend at least three years), with an increase in monitoring frequency during the April/May shorebird migration period. If existing data are available for the study area, it can be used to supplement the data collected in the field;
- describe marine water quality parameters including water temperature and salinity on at least an hourly scale (see section 9.7), as well as nutrients (e.g. nitrogen, phosphorous) to assess potential project effects on biofilm ecology; and
- describe available Indigenous or community knowledge related to marine vegetation and wetlands.

Regarding wetlands, the Impact Statement must:

- quantify, describe and map wetlands (marshes, eelgrass beds, mudflats and intertidal wetlands, etc.) within the local and regional assessment area potentially affected by the project, in the context of:
  - wetland class, ecological community type and conservation status;
  - biodiversity;
  - wetland habitat that provides important functions for species at risk;
  - provide written descriptions and maps of primary, secondary and tertiary watersheds and major and minor rivers and lakes;
  - Provide written descriptions and maps of ecozones, ecoregions, and ecodistricts as per provincial or Canada's Ecological Land Classification;
  - abundance and distribution at local, regional and provincial scales; and
  - current level of both anthropogenic and natural (e.g. fire, flood, drought) disturbance;
- determine whether the 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. Provide information adequate to determine if the Federal Policy on Wetland Conservation applies;
- 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 for a representative selection of wetlands that the project would directly impact and for any wetlands that are hydrologically connected:
  - the wetland functions assessment should be prepared 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 6 - *Additional Guidance for Biophysical Components* for more guidance on conducting a wetland function assessment); and

- 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).

9.11.4 Potential Effects

The proponent must describe potential effects in accordance with sections 8.5 and 9.13.4 of these Joint Guidelines, in addition to the following requirements.

The Impact Statement must describe all the interactions between the project and vegetation and wetland environments, including:

- potential effects to Marine Vegetation and Wetlands, identify interactions between the project and these effects, and outline indicators that will be used to measure these effects;
- all potential effects due to the project, for all phases, to vegetation and wetland environments;
- the key indicators used to assess project effects and the sensitivity of vegetation communities and wetlands environments to disturbance;
- the area of vegetation communities, and wetland environments, that may be cleared or otherwise disturbed within the project footprint, local assessment area, and regional assessment area during all phases of the project, including a description of the disturbance;
- effects on the biodiversity of wetland environments, including effects from fragmentation, and changes to regional biodiversity;
- 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;
- 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;
- 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;
- potential changes to wetland environments due to activities that may affect erosion, compaction, and productivity, contamination, bank slopes and suspension of sediment or due to any contaminants of concern potentially associated with the project that may affect vegetation, sediment or water;
- any changes in biofilm quantity, quality, and community composition; and
- any positive changes.

9.11.5 Mitigation and Enhancement Measures

The proponent must describe mitigation and enhancement measures in accordance with sections 8.6 and 9.13.5 of these Joint Guidelines, in addition to the following requirements.

In particular, the Impact Statement must:

- describe measures to mitigate effects on marine vegetation and wetlands, including approaches to avoid, reduce or otherwise address potential negative effects and enhance positive effects, as appropriate;
- describe and justify the ways of avoiding or reducing the temporary or permanent adverse effects on vegetation and wetlands;
- 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 6 - *Compensation and offset plans* for relevant guidance);
- describe any reclamation, including wetland reclamation and/or 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;
    - 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;
- reclamation standards to be used to evaluate ecological equivalency of post-operation reclaimed landscapes, in consultation with Indigenous nations; and
- a wetland function compensation plan for impacts of the project on wetlands.

9.12. Birds and their Habitat

The proponent must, at a minimum, assess the potential effects of the project on the following sub-components and species:

- waterfowl;
- aquatic birds and seabirds (other than waterfowl);
- land birds, including songbirds;
- birds of prey;
- shorebirds; and
- identified species at risk under federal or provincial jurisdiction.

The proponent may also identify additional species to be assessed in consultation with Indigenous nations and other participants.

9.12.1 Relevant Statutes, Policies and Frameworks

Federal and provincial statutes, policies and frameworks that may be relevant to birds include:

- B.C. *Wildlife Act* and General Regulation;
- *Species at Risk Act*;
- *Migratory Birds Convention Act, 1994* and regulations;
- B.C. Conservation Framework; and
- Government Actions Regulation under the *Forest & Range Practices Act.*

9.12.2 Assessment Boundaries

The Impact Statement must define assessment boundaries for the birds VC, including spatial, temporal, and administrative and technical boundaries.

9.12.3 Existing Conditions

The existing condition requirements, including requirements for describing sources of baseline information as described in section 8.4 of these Joint Guidelines, must be followed in addition to the following requirements.

The Impact Statement must:

- describe the diversity of bird species and their habitats that are found or are likely to be found in the local and regional study areas. The description of diversity must include:
  - the species or communities found, abundance, density, species richness and evenness, species distribution within the study areas;
  - their ecological role or position in food webs, including a description of trophic linkages to summarize biotic interactions that are relevant to the study areas; and
  - 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 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 by the project and describe their:
  - 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);
- identify species that may be affected differently by the project and may require different mitigation measures;
- provide an estimate of year-round bird use of the area (e.g. winter, spring migration, breeding season, fall migration). The estimate must be based on data from existing sources and surveys to provide current field data if required to generate reliable estimates. Survey effort 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;
  - include data from baseline monitoring that is of sufficient length so as to capture inter-annual and inter-seasonal variability and that uses control locations established on Roberts Bank; and
  - include a detailed description of the methods used and how the results helped to characterize existing conditions (e.g. filled an information gap; confirmed or refuted older information etc.);
- identify the biodiversity metrics, biotic and abiotic indicators that are used to characterize the baseline avifauna biodiversity and discuss the rationale for their selection;
- identify, and show on maps, areas of concentration of migratory birds, including sites used for, breeding, feeding, wintering, resting, staging and migrating;
- provide estimates of existing bird-vehicle collisions and identify existing areas along roads within the proponent's jurisdiction with high collision rates;
- describe the habitat and habitat features (e.g. breeding colonies, protected nests, roosts) 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 available Indigenous or community knowledge related to birds;
- reference species of Indigenous cultural use and value and describe the use (magnitude, timing) of birds as traditional foods, including a description of the particular species of importance and whether its consumption has cultural importance for Indigenous peoples, including medicinal or regalia use. All sites used in the study area or historically important sites for the collection of traditional foods must be identified and mapped, such as important hunting sites;
- describe the source of the data, data collection methods, and provide a rationale for any modelling approaches chosen. The baseline data must be based on at least two years of field data to account for natural variability in populations and have been collected by well designed studies;
- provide a list or description of bird and bird habitat management objectives as defined in land and resource management plans or sustainable resource management plans;
- identify any applicable *Bird Conservation Regions (BCRs) and BCR strategies*;
- describe the local and regional climate projections for the area, with rationale of the climate model chosen, and including a description of the current and projected climate impacts on birds, and suitable habitat and/or migration patterns of each subcomponent or species;
- describe any established conservation thresholds (e.g. as defined in a recovery strategy, conservation plan, or similar document) and whether these are exceeded at baseline (e.g. linear feature density, core security habitat, critical habitat); and
- describe any relevant current conditions from *B.C. Cumulative Effects Framework* reports.

For avian species at risk, in addition to the requirements found in section 9.13.3, the Impact Statement must:

- 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 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, Important Bird Areas, RAMSAR Sites or other priority areas or sanctuaries for birds, National Wildlife Areas or World Biosphere Reserves, offshore Marine Protected Areas and Ecologically and Biologically Significant Marine Areas; and
    - provide a list of Wildlife Habitat Areas, Wildlife Management Areas, Bird Conservation Regions, or sanctuaries and the extent to which these overlap with the wildlife VC spatial boundaries.

See Appendix 6 - *Additional Guidance for Biophysical Components* for more guidance on collecting data on existing conditions. 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.

9.12.4 Potential Effects

The Impact Statement must describe the potential effects to birds in accordance with section 8.5 of these Joint Guidelines, in addition to the following requirements.

The Impact Statement must:

- describe potential effects to birds, identify interactions between the project and these effects, and outline indicators that will be used to measure these effects;
- describe the interaction between the project and 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, salinity regime, and sediment load;
  - 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); and
  - any project activities that may occur during critical periods and/or restricted activity periods for all birds, including species at risk;
- describe the potential effects of the project on birds, their nest and eggs, including, but not limited to, from:
  - short term and long term changes to habitats and food sources of birds (in terms of types of cover, ecological unit of the area in terms of quality, quantity, availability, distribution and function), including health, integrity, habitat loss, fragmentation and structural change;
    - consider important habitats for nesting, foraging, staging, overwintering, rearing and moulting and to movement corridors between habitat, including: riparian habitat and wetlands (aquatic seagrass beds, intertidal marshes, intertidal mudflats, biofilm), and open waters; and
    - 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 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 with project infrastructure, buildings, overhead lines, vessels, rail cars 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 critical periods for the birds, including but not limited to breeding, migration and overwintering periods;

        - if a temporary relocation hypothesis is made during the operational phases of the project, support the hypothesis with scientific evidence or through study and monitoring within the project area as the project proceeds; and
        - 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, and whether or not those activities would be permanent or non-permanent in the environment;
    - contaminants and bioaccumulation of contaminants birds, including those that may be consumed by Indigenous peoples;
- describe tolerance thresholds for potential adverse effects that the Indigenous nations and other participants have identified, and how they were considered in the assessment; and
- describe any positive changes.

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

- *Avoiding harm to migratory birds*; and
- *A framework for the scientific assessment of potential project impacts on birds*; and
- *Migratory birds environmental assessment guideline.*

9.12.5 Mitigation and Enhancement Measures

The Impact Statement must:

- describe measures to mitigate effects on birds and their habitat, including approaches to avoid, reduce or otherwise address potential negative effects and enhance positive effects, as appropriate;
- describe the measures to mitigate adverse effects to 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 the breeding season;
- demonstrate how the proponent considered the timing of construction to be outside the main breeding season;
- describe measures to mitigate sensory disturbance and the functional habitat loss it may cause; and
- describe measures for preventing the deposit of substances harmful to migratory birds in areas frequented by migratory birds.

The proponent should refer to the *Guidelines to reduce risk to migratory birds* and to the *General nesting periods for migratory birds*, which covers the main nesting periods of migratory birds and reduces 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.

9.13. Species at Risk

The Impact Statement must provide information on existing conditions, potential effects, and the mitigation and enhancement measures for species at risk potentially affected by the project. In addition to the information required in marine fish and fish habitat (section 9.9), marine mammals (section 9.10), marine vegetation and wetlands (section 9.11), and birds and their habitat (section 9.12), the following information must be provided for each of those VCs. The information on species at risk may be presented within those VC sections or in a separate section.

The proponent must assess the potential effects of the project on all species at risk. If an assessment of effects on a species at risk is not provided, the proponent must provide a justification to explain why another species is considered to be representative, for example if they occupy comparable types of habitat, serve similar ecological roles, consume a similar diet, or could otherwise be affected by the project in an analogous way.

9.13.1 Relevant Statutes, Policies and Frameworks

Federal and provincial statutes, policies and frameworks that may be relevant to species at risk include:

- B.C. *Wildlife Act* and General Regulation; and
- *Species at Risk Act*.

9.13.2 Assessment Boundaries

The Impact Statement must define assessment boundaries for species at risk, including spatial, temporal, and administrative and technical boundaries.

9.13.3 Existing Conditions

The existing condition requirements, including requirements for describing sources of baseline information as described in section 8.4 of these Joint Guidelines, must be followed in addition to the following requirements.

The Impact Statement must:

- provide a list of all species at risk that are likely to be in the project and study areas, including:
  - species listed under Schedule 1 of the federal *Species at Risk Act.* The proponent should consult the Species at Risk Public Registry to obtain information on the list of species at risk and their protection status, as well as available recovery strategies;
  - species protected under provincial legislation; and
  - species assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as extirpated, endangered, threatened or of special concern. The proponent should refer to the most recent COSEWIC annual report for the list of assessed wildlife species posted on its website;
- for each species at risk identified in the list above:

  - describe occurrence, abundance (including relative abundance in each habitat type), population status, threats and conservation goals, and distribution;
  - provide a map showing survey sites, species sighting records, the areas of highest concentration or areas of use;
  - provide information and/or mapping at an appropriate scale for residences, seasonal movements, movement corridors, habitat requirements, key habitat areas, identified or proposed critical habitat and/or recovery habitat (where applicable), differentiated by federal and non-federal lands;
  - describe the location, distribution, condition, and amount of critical habitat;
  - describe the general life history (e.g. breeding, foraging) that may occur in the project area, or be affected by the project; and
  - identify critical periods (e.g. denning, rutting, spawning, calving, breeding, roosting), setback distances, or other restrictions related to these species;
- provide any published studies that describe the regional importance (including economic), abundance and distribution of species at risk, including recovery strategies or plans;
- describe any established conservation thresholds (e.g. as defined in a recovery strategy, conservation plan, or similar document) and whether these are exceeded at baseline (e.g. linear feature density, core security habitat, critical habitat);
- describe available Indigenous or community knowledge related to species at risk;
- describe the source of the species at risk data, including survey design, sampling protocols and data handling;
  - include a detailed description of the survey methods used and how the results helped to characterize existing conditions (e.g. filled an information gap; confirmed or refuted older information etc.);
  - 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 Indigenous and community knowledge was incorporated.

The Impact Statement must specify the references to consulted documents and dates consulted. The proponent is responsible for ensuring that the most up-to-date documents have been used and that the status of the species is up to date.

See Appendix 6 - *Additional Guidance* for more guidance on collecting data on existing conditions. 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.

9.13.4 Potential Effects

The Impact Statement must describe the potential effects to Species at Risk in accordance with section 8.5 of these Joint Guidelines, in addition to the following requirements.

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 interactions between the project and potential effects, and outline indicators that will be used to measures these effects;
- 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 habitat of these species that are not currently listed under the *Species at Risk Act*;
- 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, including direct effects and indirect effects due to noise and vibration, and artificial light in the project area on usage patterns and migratory behaviour of species at risk;
- describe the residual effects that are likely to result from the project after avoidance and mitigation 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
    - amount of critical habitat temporarily or permanently destroyed;
- describe and take into account the tolerance thresholds for potential adverse effects that Indigenous nations have identified; and
- describe any positive changes.

The Province of British Columbia 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, additional information requirements are presented in section 9.13.4.

9.13.5 Mitigation and Enhancement Measures

The Impact Statement must describe mitigation and enhancement measures for species at risk, as described in section 8.6 of these Joint Guidelines, in addition to the following requirements.

The Impact Statement must describe the measures for mitigating potential effects on species at risk, as well as ecological communities at risk, including:

- the proposed mitigation measures for potential adverse effects on species at risk and critical habitat, including the justification, based on scientific data, for the proposed measures;
- 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;
- mitigation measures to reduce the risk of harmful, destructive or disruptive activities in sensitive times and places of importance to species at risk;
- measures to prevent the release of harmful substances into waters or areas frequented or occupied by species at risk;
- mitigation measures for effects on habitat, aligned with the hierarchy of mitigation measures and justify moving from one mitigation option to another. Additional guidance is available in Appendix 6 – *Developing Mitigation and enhancement measures*; and
- any measures that may enhance positive effects

9.14. Climate Change

9.14.1 Introduction

The following requirements are based on the *Strategic Assessment of Climate Change* (SACC) developed by Environment and Climate Change Canada. The proponent must follow the directions and guidance contained in the SACC for each information requirement listed below, and should refer to the most recent version of any additional guidance published in support the SACC. All proponents will be required to provide information on greenhouse gas (GHG) emissions, impact of the project on carbon sinks, impact of the project on federal emissions reduction efforts and on global GHG emissions, mitigation measures and climate change resilience. More details are provided in the the *Draft Technical Guide Related to the Strategic Assessment of Climate Change: Guidance on Quantification of Net GHG Emissions and Impacts on Carbon Sinks, Mitigation measures, Net-Zero Plan, and Upstream GHG Assessment* (the technical guide).

9.14.2 GHG Emissions

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 by GHG type 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 (refer to section 3.1.1 of the SACC);

- each term of Equation 1 (Net GHG emissions = Direct GHG emissions + Acquired energy GHG emissions - CO_2 captured and stored - Avoided domestic GHG emissions - Offset credits), per year for each phase of the project (refer to section 3.1.1 of the SACC);
- 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);
- a discussion on the development of emissions estimates and uncertainty assessment (refer to section 3.3 of the SACC);
- a description of the potential effects of the project on the province being able to meet its targets under the *Greenhouse Gas Reduction Targets Act*, now the *Climate Change Accountability Act*;
- a description of other relevant emissions targets, including those of a local, provincial, federal, or Indigenous government and how the project would affect those targets; and
- when applicable, a description of large sources of GHG emissions that may be the consequence of accidents or malfunctions.

9.14.3 Impact of the Project on Carbon Sinks

The Impact Statement must provide a quantitative and qualitative description of the project's positive or negative impact on carbon sinks, which must include:

- description of project activities in relation to significant landscape features such as topography, hydrology and regionally dominant ecosystems;
- land areas directly impacted by the project, by ecosystem type (forests, cropland, grassland, wetlands, built-up land) over the course of the project lifetime; this includes the areas of restored or reclaimed ecosystem(s);
- initial carbon stocks in living biomass, dead biomass and soils (by ecosystem type) on land directly impacted by the project over the course of the project lifetime;
- fate of carbon stocks on directly impacted land, by ecosystem type: immediate emissions, delayed emissions (timeframe), storage (e.g. in wood products);
- anticipated land cover on the impacted land areas after the project is in place; and
- estimating quantitative impacts of a project on carbon sinks amounts to estimating the reduction (or increase) in the quantity of carbon that an area would have accumulated without the project, over the project lifetime.

The proponent can refer to the technical guide for information on quantifying impacts on carbon sinks.

9.14.4 Impact of the Project on Federal Emissions Reduction Efforts and on Global GHG Emissions

With regards to federal emissions reduction efforts and on global GHG emissions, the Impact Statement must provide:

- an explanation of how the project may impact Canada's efforts to reduce GHG emissions, if applicable, including how the project would result in GHG emission reductions in Canada (e.g. by replacing higher emitting activities) (refer to section 5.1.3 of the SACC);
    - a discussion on how the project could impact global GHG emissions, if applicable (refer to section 5.1.3 of the SACC). This could include, for example: if the project may displace emissions internationally, the Impact Statement could describe how the project is likely to result in global emission reductions. For example, a project that enables the displacement of high-emitting energy abroad with lower emitting energy produced in Canada could be considered as having a positive impact;
- should the potential exist for the project to result in increased forest fires in the region, a description of the impact of increased forest fires on climate change.

9.14.5 Mitigations for Climate Change and Greenhouse Gas Emissions

The Impact Statement must include a credible plan that describes the mitigation measures that will be taken to minimize GHG emissions throughout all phases of the project, and achieve net-zero by 2050 (refer to sections 5.1.4 and 5.3 of the SAAC). The plan must demonstrate how the net GHG emission equation (refer to Equation 1 in the SAAC) will equal 0 kt CO_2 eq/year by 2050 and thereafter for the remainder of the lifetime of the project. Emphasis should be placed on minimizing net GHG emissions as early as possible and throughout the project lifetime.

The credible plan must include, at a minimum, the following information:

- a description of measures identified to mitigate GHG emissions, including using best available technologies and project design;
- the conclusions of the best available technologies and best environmental practices (BAT/BEP) determination process to identify and select the technically and economically feasible technologies, techniques, or practices, including emerging technologies, to minimize GHG emissions throughout all phases of the project with a net-zero perspective. This must include at a minimum:
    - the list of all potential GHG mitigation measures that were considered in the BAT/BEP determination process;
    - the list of potential GHG mitigation measures selected at the end of the process that are considered for implementation in all phases of the project (BAT/BEP and emerging technologies), including the following information:
        - the potential percentage reduction in GHG emissions associated with each measure;
        - the level of technology maturity (when the technology could be implemented);
        - the barriers to implementing the selected mitigation measures; and

  - a rationale for eliminating each technology or practice that has not been selected for implementation; and
  - subject to the public availability of information, a comparison of the project's projected GHG emissions (direct and acquired) to similar high-performing, energy-efficient projects in Canada and internationally. If applicable, the comparison should explain why the emissions of the project is different;
- a description of any additional mitigation measures considered for the project to achieve net-zero emissions by 2050, if applicable. This can include:
  - implementation of CO_2 capture and storage technologies;
  - if any, a description of the proponent's corporate-level GHG commitments and/or net-zero plan and an explanation on how it aligns with the project's net-zero credible plan; and
  - acquisition of offset credits;
- the implementation schedule describing when the mitigation measures will be implemented, considering equipment replacement. This does not need to describe every technology or practice the project will implement over time to achieve net-zero emissions. In this case, the proponent must instead describe the process they will follow in order to make the decisions and investments needed to achieve net-zero emissions by 2050. The implementation schedule must include relevant data sources, assumptions, information, and a discussion on factors associated with the schedule such as schedule dependencies, constraints and risk;
- the emissions reductions at specified intervals determined by the proponent, up to 2050. Explain how net GHG emissions reductions are maximized in the earlier years of the project's lifespan. Environment and Climate Change Canada recommends intervals to be every 5 years or as appropriate for the project;
- a description of measures taken to mitigate the project's impact on carbon sinks, including measures to restore disturbed carbon sinks;
- any other relevant information such as supportive actions that the proponent would need in order to be able to achieve net-zero emissions; and
- a description of monitoring, follow-up and reporting requirements to confirm findings from the assessment.

10. Socioeconomic Conditions

The Impact Statement must describe how Indigenous and community knowledge was used to collect existing conditions data, assess social, economic and cultural effects. The source of Indigenous and community knowledge must be disaggregated by sex, gender, age and other community-relevant identity factors to support identification of disproportionate effects through the Impact Statement of GBA+. In assessing effects to the socioeconomic VCs, the analysis should discuss circumstances in a community where diverse subgroups, because of their particular circumstances, could experience adverse effects from the designated project more severely than others, or be excluded from potential benefits. Section 1.4 - Gender-based Analysis Plus GBA+ must be considered in preparing the Impact Statement and in the assessment of socioeconomic effects.

In the assessment of effects to socioeconomic VCs, 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 socioeconomic effects should be described. 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*.

10.1. Social Conditions and Community Well-Being

10.1.1 Relevant Statutes, Policies and Frameworks

Sector or geographic specific statutes, policies and frameworks, as applicable, are to be determined in collaboration with relevant government authorities during the development of the Impact Statement.

10.1.2 Assessment Boundaries

The Impact Statement must define assessment boundaries for the social conditions and community well-being VC, including spatial, temporal, administrative and technical boundaries.

10.1.3 Existing Conditions

The Impact Statement must describe the existing social conditions and community well-being for individual communities and Indigenous nations.

The Impact Statement must:

- be sufficiently detailed to provide a comprehensive understanding of the current state of each VC, including relevant trends;
- identify the social area of influence of the project;

- describe how Indigenous and community knowledge from relevant populations was used in establishing existing conditions, including input from diverse subgroups;
- describe existing conditions using disaggregated data for diverse subgroups (e.g. women, youth, two-spirited people, elders and people with disabilities) and their different access to resources, opportunities and services within the community to support GBA+; and
- provide information on those likely to be affected directly and indirectly by the project in association with a consideration of those in the community who are considered particularly vulnerable to changes brought about by the project.

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

- influences on community well-being (e.g. disposable income, cost of living, lifestyle, language, rates of alcohol and substance abuse, and of illegal activities and violence; rates of sexually transmitted infections and gender-based violence), including indicators proposed by Indigenous nations;
- community cohesion, including level of support and engagement in community or neighbourhood, social networks, social and cultural activities;
- the psychosocial environment and its influence on community well-being;
- the socio-cultural environment, identifying Indigenous peoples and predominant cultural communities;
- the cultural history and identity in the project area including governance and stewardship systems, customs, beliefs and values;
- language and intergenerational knowledge transfer;
- 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.

10.1.4 Potential Effects

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

The Impact Statement must:

- describe potential effects to social conditions and community well-being, identify interactions between the project and these effects, and outline indicators that will be used to measure these effects;

- assess potential adverse and positive effects, at the community level, of changes to social conditions including, but not limited to:
  - food security;
  - income inequity;
  - non-commercial/trade economy; and
  - those conditions considered for analysis of determinants of health in section 11.4.2;
- 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);
- consider the potential for stresses on community, family and household cohesion, alcohol and substance misuse, or illegal or other potentially disruptive activities;
- describe potential increases in organized crime;
- 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 Indigenous and community 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+ within the information related to community well-being and document how potential effects of changes to community well-being could be different for diverse subgroups, including Indigenous nations or other relevant subgroups (e.g. women, youth, two-spirited people, elders and people with disabilities).

10.1.5 Mitigation and Enhancement Measures

The Impact Statement must describe measures to mitigate effects on social conditions and community well-being, including approaches to avoid, reduce or otherwise address potential negative effects and enhance positive effects, as appropriate.

10.2. Employment and Economy

10.2.1 Relevant Statutes, Policies and Frameworks

Statutes, policies and frameworks that may be relevant to the employment and economy include national, provincial, regional and/or local economic development plans, strategies and action plans.

10.2.2 Assessment Boundaries

The Impact Statement must define assessment boundaries for the employment and economy VC, including spatial, temporal, and administrative and technical boundaries.

10.2.3 Existing Conditions

The economic baseline should document the local and regional economic conditions and trends based on the spatial and temporal boundaries selected. The scope and content of the economic baseline should reflect the specific project context, take into account community and Indigenous nations' input, and should include indicators and information that are useful and meaningful for the effects analysis.

Provide information on those likely to be affected directly and indirectly by the project in association with a consideration of those in the community who are considered particularly vulnerable to changes brought about by the project. As applicable, information must be sufficiently disaggregated and analyzed to support the analysis of potential disproportionate effects to distinct human populations as per GBA+, by sex, gender, age and ethnicity if possible.

As applicable, the Impact Statement must:

- describe the local and regional economy including the main economic activities in the assessment area;
- describe the demographic features of the local and regional population;
- describe prevalent economic concerns and economic aspirations of residents, families and workers in the assessment area;
- describe any local, provincial, or federal economic development plans for the assessment area;
- decribe any relevant treaty provisions pertaining to economic development for Indigenous nations;
- describe the local workforce, including the availability of skilled and unskilled workers, existing working conditions, wage and income information including average salary range, full-time and part-time employment and training, and gender gaps such as for skilled trades and in wages and qualifications;
- describe GBA+ aspects of employment including:
    - how women and men and diverse groups of people are employed either as wage earners in the labour market or in customary livelihood occupations;
- the level or nature of unemployment (e.g. people with low levels of educational attainment, specific sectors);
- provide an overview of the existing employment rates and economic well-being in the assessment area and impacted communities including trends in labour force and employment statistics for residents in the local and regional assessment areas, including jobs likely to be in demand over the life of the project;
- describe the current use of land for economic activities in the assessment area including a description of hunting, trapping, outdoor recreation, use of seasonal cabins, and outfitters;

- describe local and regional workforce development and training plans including those specific to Indigenous peoples;
- discuss trends and factors influencing the cost of living (e.g. housing, food, goods and services);
- describe tax revenues to all levels of government and potential expenditures to all levels of government;
- describe, and where possible and applicable, quantify, land and resource valuations;
- provide an overview of the businesses that could provide products and services required for the project;
- describe baseline economic conditions using disaggregated data for diverse subgroups (e.g. women, youth, two-spirited people, elders, and people with disabilities) and their different access to resources, opportunities and services within the community to support GBA+; and
- describe available Indigenous or community knowledge related to employment and economy.

Relevant sources of baseline information are listed in Appendix 6 – *Sources of Information on Existing Conditions*.

10.2.4 Potential Effects

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*.

The Impact Statement must:

- describe potential effects to employment and economy, identify interactions between the project and these effects, and outline indicators that will be used to measure these effects;
- 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;
  - situations where the project may cause the displacement of local workers; and
  - any potential long term changes to the local and regional labour markets as a result of this project;

- describe the potential changes in training including:
  - training programs to improve employment opportunities for local and Indigenous peoples; and
  - potential economic effects from training related to the project;
- describe the GBA+ aspects of employment, including:
  - the social norms and broader social power structures, such as legal frameworks, that can impact women, men and diverse groups of people's ability to equally benefit from the employment opportunities;
  - the potential effects on employment for women, Indigenous peoples and other diverse subgroups;
  - if applicable, any actions that will be taken to increase the employment development and retainment of Indigenous peoples, women and other diverse subgroups in the project, including training programs; and
  - the project's diversity and inclusion workforce plans, policies and practices;
- set out the investment in the project for each phase, 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 or nations, women, or other diverse subgroups;
- describe any economic benefit agreements concluded with local communities or Indigenous nations;
- 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 nations;
- 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; and
  - 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;
- describe the potential effects of changes to economic conditions for specific sectors in affected communities, including Indigenous nations, for example, to:
  - fishing, hunting, and trapping;
  - commercial outfitters; and
  - commercial recreation and tourism;
- describe the potential effects of changes to land and resources used in local economic activity, including:
  - potential effects of the project on the availability, value and quality of commercial land and real estate; and
  - a description of the indirect effects on the economy resulting from changes in land use;

- 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 nations 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); and
  - 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;
- estimate the potential effects of the project on the traditional economy, including the potential loss of related jobs; and
- provide information on the economic viability of the project, to support the net benefits assessment, including, but not limited to:
  - cash-flow modelling results for the project, with a focus on net-present value, internal rate of return, and break-even commodity prices for the project;
  - sensitivity analysis pertaining to key aspects of the project, including, but not limited to, discount rates, prices, capital and operating costs; and
  - discussion of environmental, social, and governance risks to project economics, including the cost of capital.

The economic information provided will be made publicly available and should not contain confidential business information

10.2.5 Mitigation and Enhancement Measures

The Impact Statement must:

- describe measures to mitigate effects on employment and economy, including approaches to avoid, reduce or otherwise address potential negative effects and enhance positive effects, as appropriate;
- identify and describe opportunities for enhancing positive effects, such as creation of local employment and Indigenous employment, including:
  - education, training and hiring practices that encourage employment of local people;
  - actions taken to increase access to education and training opportunities for different groups (e.g. provision of transportation, flexible hours);
  - a summary of commitments made with respect to employment, training and trade, including any economic benefit plans or specific cooperation agreements with Indigenous nations;
  - training, education, and scholarship programs that the proponent plans to support in order to improve employment opportunities, including participation in and contribution to local training networks. Specify the types of employment targeted by these programs, as well as the targeted clientele, such as local residents, Indigenous peoples, and various relevant subgroups (e.g. Indigenous women);
  - cultural competency training plans for non-Indigenous employees to ensure a respectful working relationship with Indigenous contractors; and

    - all cultural awareness training plans for non-Indigenous employees to promote a safe work environment that fosters the well-being of Indigenous employees;
- describe plans, programs and policies to encourage contracting and procurement opportunities for local and regional businesses and Indigenous peoples;
    - describe supplier network development initiatives, including the identification of potential local suppliers, and plans to provide them with information on technical, commercial and other requirements, and to debrief unsuccessful bidders;
    - describe any procurement policies that facilitate the opportunities for local companies;
    - describe technology transfer and research and development programs that will facilitate the use of local suppliers of goods and services and local employees, and that will develop new capabilities related to project requirements; and
    - elaborate on the potential of the project to benefit community members in relevant subgroups;
- 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 nations.

10.3. Infrastructure and Services

10.3.1 Relevant Statutes, Policies and Frameworks

Relevant federal, provincial and local government statutes, policies and frameworks that may be relevant to the infrastructure and services VC include:

- official community plans;
- regional growth strategies;
- municipal and regional district bylaws;
- service provider management/development plans and strategies;
- community charters;
- *Transportation Act*; and
- *Local Government Act*.

10.3.2 Assessment Boundaries

The Impact Statement must define assessment boundaries for the infrastructure and services VC, including spatial, temporal, and administrative and technical boundaries.

10.3.3 Existing Conditions

As applicable, the Impact Statement must:

- describe relevant population demographics and trends (e.g. health status, community safety and crime, education and training);
- describe the capacity and availabilityof existing local and regional infrastructure facilities in the assessment area, including:
  - health care and social services and facilities;eldercare and services:
    - hospitals, clinics, shelters and testing centers; and
    - existing health services and programs, including health providers capacity;
  - educational services and facilities including daycare;
  - community recreational infrastructure, facilities, parks and services;
  - public transportation;
  - emergency response services including ambulance services, police and fire departments;
  - domestic water supply;
  - sewage and water treatment facilities;
  - pipelines, water mains and sewer lines; and
  - solid waste collection and disposal services, landfills and recycling facilities;
- describe the capacity of local and regional transportation infrastructure including:
  - road infrastructure and traffic safety;
  - railways;
  - ferry and marine terminals;
  - airports;
  - pipelines, water mains and sewer lines;
  - power lines;
  - utilities; and
  - any other potentially affected infrastructure and transportation routes;
- describe the capacity of housing and accommodation (e.g. affordability, availability, suitability), including camping facilities;
- describe any other relevant public or private sector infrastructure and services; and
- describe available Indigenous or community knowledge related to infrastructure and services as applicable.

Information in the Impact Statement must be sufficiently disaggregated and analyzed to support the analysis of potential effects to distinct segment of the populations.

10.3.4 Potential Effects

The Impact Statement must:

- describe potential effects to infrastructure and services, identify interactions between the project and these effects, and outline indicators that will be used to measure these effects;
- describe the predicted effects to the local and regional infrastructure facilities and services in the assessment area, including adverse and positive effects to:
  - housing (e.g. affordability, availability, appropriateness), including camping facilities;
  - access to green spaces, recreation and parks;
  - waste disposal;
  - pipelines, water mains and sewer lines;
  - energy infrastructure, including generating facilities, power lines;
  - telecommunications;
  - road infrastructure and traffic safety;
  - transportation infrastructure (railways, ferry and marine terminals, airports);
  - police and firefighting;
  - educational services, facilities and day care;
  - ambulance and health care services; including elder care and services;
  - mental health and social services; 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.

10.3.5 Mitigation and Enhancement Measures

The Impact Statement must describe measures to mitigate effects on infrastructure and services, including approaches to avoid, reduce or otherwise address potential negative effects and enhance positive effects, as appropriate.

10.4. Land and Resource Use

10.4.1 Relevant Statutes, Policies and Frameworks

Federal, provincial and local government statutes, policies and frameworks that may be relevant to the land and resource use VC include:

- crown land policies;
- land use plans;
- official community plans;
- regional growth strategies;
- municipal and regional district bylaws;
- *Agricultural Land Commission Act;*
- *Water Sustainability Act;*
- *Land Act;*
- *Parks Act;*
- *Wildlife Act;*
- *Fisheries Act;* and
- *Local Government Act*.

10.4.2 Assessment Boundaries

The Impact Statement must define assessment boundaries for the land and resource use VC, including spatial, temporal, and administrative and technical boundaries.

10.4.3 Existing Conditions

As applicable, the Impact Statement must:

- 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, such as any regional Land and Resource Management Plans and official community plans, as well as associated zoning or land use policies;
- 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 nations and Indigenous traditional territories;
- identify subgroups within the assessment area and their vulnerability to land and resource use effects (e.g. Indigenous nations, farmers);
- describe the following types of land or resource uses, including location and access, in the vicinity of the project, including:
    - sites or areas that are used by local people and Indigenous nations either as a permanent residence or as a seasonal/temporary location, and the number of people using each identified site or area (include a map, if possible);
    - private property and residential areas;
    - industrial and commercial land uses;

  - parks, recreation and protected areas including: parks and recreation areas (including local and provincial/territorial parks and recognized scenic areas), Parks Canada lands, conservation areas, and International Biological Program sites or other ecological reserves;
  - registered or recognized hunting, trapping or guiding areas, recreational and commercial fishing areas, preferred harvesting areas, and other tenured, permitted or licensed land uses;
  - consumptive land uses (e.g. hunting, fishing, trapping, vegetation gathering);
  - outdoor recreation areas (e.g. camping, hiking, boating, caving);
  - agricultural areas land uses (including special crops, orchards and vineyards);
  - tourism; and
  - water supplies and water lots, as well as water sources and intakes for farms, industries, residents and municipalities;
- describe the local and regional climate projections for the area with rationale of the climate model chosen and including a description of the current and projected climate impacts on land and resource use; and
- describe available Indigenous and community knowledge related to land and resource use.

10.4.4 Potential Effects

The Impact Statement must:

- describe potential effects to land and resource use, identify interactions between the project and these effects, and outline indicators that will be used to measure these effects;
- describe the potential interactions of the designated project with local and regional land use and resource activities as applicable, including adverse and positive effects to:
  - transportation and utilities corridors;
  - residential land use;
  - commercial outfitters as applicable;
  - 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 nations, including effects to:
  - access to the resources;
  - quantity and quality of the resources; and
  - overall experience when undertaking recreational activities, including noise effects;
- describe potential effects to land and resource use arising from the changes made to the visual and acoustic landscapes, including to visual and acoustic landscapes identified by Indigenous nations;

- describe the land use losses associated with the security buffer zones applicable to the project; and
- determine the anticipated effects of the project on the quality and quantity of groundwater or surface water used for recreational purposes.

10.4.5 Mitigation and Enhancement Measures

The Impact Statement must describe measures to mitigate effects on land and resource use, including approaches to avoid, reduce or otherwise address potential negative effects and enhance positive effects, as appropriate. The Impact Statement must also take into account local and regional land use and develoment plans where applicable mitigation or enhancement measures are proposed.

10.5. Marine Use

10.5.1 Relevant Statutes, Policies and Frameworks

Relevant federal statutes, policies and frameworks that may be relevant to the marine use VC include:

- *Canadian Navigable Waters Act*;
- *Canada Marine Act* and regulations;
- *Pilotage Act*;
- *Canada Shipping Act*;
- *Marine Transportation Security Act* and regulations; and
- *Fisheries Act*.

10.5.2 Assessment Boundaries

The Impact Statement must define assessment boundaries for the marine use VC, including spatial, temporal, and administrative and technical boundaries.

10.5.3 Existing Conditions

The Impact Statement must:

- describe baseline conditions for navigation;
- identify and describe existing navigable waterways and their uses;
- describe relevant marine use plans;
- describe all marine protected areas;
- describe Port operations, management plans, policies and objectives;
- describe Canadian Coast Guard services in the area;
- describe marine infrastructure and navigation aids;

- describe applicable marine communication policies and procedures;
- describe and quantify shipping and other marine traffic (e.g. cruise ships, ferries, fishers, recreational boaters, commercial tour operators, military, coast guard, tugboats, and barges);
- describe the current use of water bodies for economic activities in the assessment area including a description of recreational and commercial fishing (including species fished, catch rates, visitation rates, and angling days, number of licenses, value of fisheries and breakdown between domestic vs. international fisheries, where applicable);
- describe other tenured, permitted or licensed marine uses (e.g. aquaculture, moorage);
- describe Indigenous fisheries and boating routes;
- describe other marine harvesting uses and activities;
- describe marine recreation and tourism in the area;
- provide a list of potentially affected waterway users and concerns regarding waterway use and access;
- describe available Indigenous or community knowledge related to marine use; and
- identify recent regional initiatives and programs developed by federal agencies (such as proposed area-based closures for recreational and commercial fishing under Government of Canada's Whale Initiative) to be considered within the assessment.

Information in the Impact Statement must be sufficiently disaggregated and analysed to support the analysis of potential effects to distinct human populations.

Relevant sources of baseline information are listed in Appendix 6 – *Sources of Information on Existing Conditions*.

10.5.4 Potential Effects

The Impact Statement must:

- describe potential effects to commercial and recreational marine use, including on navigation and navigation safety, identify interactions between the project and these effects, and outline indicators that will be used to measure these effects. Including a description of:
  - ancillary project components that will be constructed in, on, under, over, through or across navigable waterways to support the project;
  - navigable waterways that could be impacted by the project;
  - potentially affected waterway users and describe consultation with waterway users and Indigenous nations regarding navigational use, issues raised and how issues were addressed; and
  - any positive changes.

10.5.5 Mitigation and Enhancement Measures

The Impact Statement must describe measures to mitigate effects on marine use, including approaches to avoid, reduce or otherwise address potential negative effects and enhance positive effects, as appropriate.

10.6. Archaeological and Heritage Resources

10.6.1 Relevant Statutes, Policies and Frameworks

Relevant federal, provincial, local government, and Indigenous nation statutes, policies and frameworks that may be relevant to the archaeological and heritage resources VC include:

- B.C. *Heritage Conservation Act*;
- Fossil Management Framework;
- Fossil Management Policy including Fossil Impact Assessment Guidelines;
- Vancouver Charter; and
- other local government or Indigenous nation requirements.

10.6.2 Assessment Boundaries

The Impact Statement must define assessment boundaries for the archaeological and heritage resources VC, including spatial, temporal, and administrative and technical boundaries.

10.6.3 Existing Conditions

As applicable, the Impact Statement must:

- describe and provide archaeological studies completed in the local and regional assessment area and any sites found within the project footprint;
- describe the archaeological and paleontological potential in the project area;
- describe any natural and cultural heritage;
- describe buildings, sites and things of historical, archaeological, paleontological or architectural significance in the assessment area, including land, natural features and resources considered to be heritage and provide maps; and
- describe available Indigenous and community knowledge related to archaeological and heritage resources.

10.6.4 Potential Effects

The Impact Statement must:

- describe potential effects to archaeological and heritage resources, identify interactions between the project and these effects, and outline indicators that will be used to measure these effects;
- 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; and
  - changes to places, objects or things that are sacred, ceremonial or culturally significant, languages, histories and traditions;
- describe changes in visual aesthetics during the life of the project and after decommissioning or abandonment of the project, as relevant. Consider potential effects on physical and cultural heritage when assessing effects on social and economic conditions;
- 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;
- in the event that project activities may disturb the soil Crown lands, on the surface or underground, conduct an archaeological potential study for the Crown territory affected. Based on the recommendations of this study, field work (visual inspection without snow cover, archaeological inventory, or other) could be necessary. Depending on the findings, this expertise could lead to mitigation measures related to the findings obtained, which can take the form, for example, of intensive digs at a given site or a proposal for modification of the anticipated route; and
- 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 12 and 0 of these Joint Guidelines.

10.6.5 Mitigation and Enhancement Measures

The Impact Statement must:

- describe measures to mitigate effects on archaeology and heritage resources, including approaches to avoid, reduce or otherwise address potential negative effects and enhance positive effects, as appropriate; 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.

11. Human Health

11.1. Relevant Statutes, Policies and Frameworks

Federal and provincial statutes, policies and frameworks that may be relevant to the human health VC include:

- *Public Health Act* and regulations;
- Contaminated Sites Regulation under the *Environmental Management Act*;
- *Drinking Water Protection Act*;
- Health Canada Guidance for Evaluating Human Health Impacts in Environmental Assessment: Human Health Risk Assessment;
- B.C. Guidance for Prospective Human Health Risk Assessment – Version 1.0 (April 2021); and
- Relevant statutes, policies and frameworks related to air quality, surface water, marine traditional foods, and atmospheric noise.

11.2. Assessment Boundaries

The Impact Statement must define assessment boundaries for the human health VC, including spatial, temporal, and administrative and technical boundaries.

11.3. Existing 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)[6] 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 selection of determinants can should be guided by the references listed in Appendix 5.

The Impact Statement must:

- provide sufficient information to provide a comprehensive understanding of the state of human health in the assessment area;
- provide information that is sufficiently detailed to describe the pathways by which the project's influence on the determinants of health may affect health outcomes;

[6] PHAC, 2018. *Key Health Inequalities in Canada, Introduction Chapter*.

- provide a comparison of data at the provincial, regional or national level, if possible, to better interpret existing conditions;
- identify the social area of influence of the project;
- describe how Indigenous and community knowledge from relevant populations was used in establishing existing conditions, including input from diverse subgroups; and
- describe existing conditions using disaggregated data for diverse subgroups (e.g. women, youth, two-spirited people, elders and people with disabilities) and their different access to resources, opportunities and services within the community to support GBA+.

To understand the community context and existing health profile, including for Indigenous nations, the Impact Statement must:

- develop community health profiles for the City of Delta, the Lower Mainland, and Indigenous nations, that reflect the overall health of each community, where information is available, including birth rates, death rates, rates of sexually transmitted infections, injuries, and chronic disease, as well as mental health status 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 existing conditions for VCs that are relevant to the social determinants of health and that contribute to population health, including social conditions and community well-being (section 10.1), employment and economy (section 10.2), infrastructure and services (section 10.3), land and resource use (section 10.4), and marine use (section 10.5);
- describe the determinants of health selected specifically for Indigenous nations, including for subgroups 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);
- on a map, provide the approximate location and distance of likely human receptors, including foreseeable future receptors, which could be affected by changes in air, water, traditional food quality, and noise and light levels. Include communities' gathering, hunting, trapping and fishing areas, permanent residences, 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;

- describe the consumption of traditional foods as a health-related behaviour, including what species are used, quantities, frequency, harvesting locations and how the data were collected (e.g. site-specific consumption surveys, First Nations Food, Nutrition and Environment Study);
    - traditional 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;
- describe existing conditions for quality of traditional foods. Information can be pulled from relevant VCs such as vegetation and wetlands, fish and fish habitat and marine mammals;
- provide existing contaminant concentrations in ambient air, drinking water and tissues of traditional foods consumed by Indigenous nations and local communities. The proponent should work with local Indigenous nations to collect tissue samples where appropriate;
- describe the level of food security and food sovereignty within local and Indigenous nations. 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;
- 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; and
- describe available Indigenous or community knowledge related to human health.

Guidance for developing the appropriate existing information relevant to human health is identified in Appendix 5. The proponent should refer to the Health Canada guides to ensure that best practices are followed in collecting existing information for assessment of the project's impacts on human health . The proponent must justify any omission or deviation from the recommended characterization approaches and methods for existing conditions, including the Health Canada guidelines.

11.4. Potential Effects

The proponent must assess the potential effects of the project on human health. Interconnections between human health and other VCs and interactions between effects must be described. 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 subgroups (e.g. women, youth, two-spirited people, elders and people with disabilities).

A dedicated Health Impact Assessment must be completed to show an understanding of the project's health, social, and economic impacts, including on Indigenous peoples and will 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 5.

The Impact Statement must:

- describe potential effects to human health resulting from changes on biophysical, social, cultural and economic determinants of health, identify interactions between the project and these effects, and outline indicators that will be used to measure these effects;
- apply a Human Health Impact Assessment approach, including consideration of determinants of health;
- describe any potential project effects on the community health profile;
- describe how Indigenous and community knowledge was used in assessing human health effects; and
- apply GBA+ across all health effects and document how potential effects or changes to human health conditions could be different for diverse subgroups (e.g. women, youth, two-spirited people, elders and people with disabilities).

11.4.1 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;
  - noise exposure and effects of vibration;
  - light levels;
  - current and future availability and quality of 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 the contaminants (e.g. arsenic, cadmium, lead, mercury) related to the project, and that can potentially end up in the water, air or soil, can be absorbed in traditional foods (i.e. foods that are trapped, fished, hunted, harvested or grown for subsistence, cultural or medicinal purposes);
- provide the rationale if a determination is made that an assessment of the potential for contamination of traditional foods or other exposure pathways, such as inhalation are not required or if some contaminants are excluded from the assessment;
- identify other potential routes of exposure to contaminants;

- provide a detailed justification for every contaminant of potential concern (COPC[7]) or exposure route that would be excluded and/or eliminated from the assessment of the human health risks;
- conduct a problem formulation exercise and/or preliminary model predictions to determine whether a HHRA is required. The proponent must provide a rationale if the problem formulation and/or preliminary model predictions indicate that a HHRA is not warranted;
    - problem formulation consists of identifying the main factors to consider. It briefly addresses the following factors:
        - identification of the boundaries of the study;
        - identification of the current and future COPCs;
        - identification of current and future human receptors;
        - identification of current and future exposure pathways; and
        - development of the conceptual site model illustrating the connections existing between the COPC, the receptors and the exposure routes;
- if a 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*);
- if conducted, describe and quantify specific thresholds used for HHRA and document if different thresholds were considered for vulnerable populations, including by sex, gender and age. Provide a justification if any applicable threshold was not used;
- 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 associated unit risk value published by the *Environmental Protection Agency* of California that, despite not being expressly recognized in Canada, can provide an overview of the potential impacts that a particular project may have on the risks associated with diesel emissions; 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:

[7] 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.

        - 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
        - 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);
- document and take into account tolerance thresholds for potential adverse effects on health identified by Indigenous nations;
- 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:
    - describe changes in terms of availability, use, consumption and quality of traditional foods, and the potential effects related to these changes on physical and mental health of communities, including for Indigenous nations[8]; and
    - identify possibilities of avoidance of certain traditional food sources or drinking or recreational water sources by the Indigenous nations due to the perception of contamination;
- describe and quantify the potential for sleep disturbance to local residents and all noise sensitive receptors near the project area; and
- describe any project-related changes that could result in a positive health effect (e.g. remediation projects).

11.4.2 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:
    - demographic information on the region, including available descriptive statistics (e.g. age, ethnicity, sex and gender, language);

[8] Refer to: Health Canada, *Eating Well with Canada's Food Guide - First Nations, Inuit and Métis*

  - community cohesion;
  - average income and wage inequality;
  - education level;
  - factors supporting mental health and community well-being (including perceived stress, feelings of isolation, of remoteness, of concern for future generations);
  - safety of Indigenous women; and
  - gender-based violence (e.g. sexual harassment, violence against women, human trafficking);
- 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;
- 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).

11.5. Mitigation and Enhancement Measures

The Impact Statement must:

- describe measures to mitigate effects on human health, including approaches to avoid, reduce or otherwise address potential negative effects and enhance positive effects, as appropriate;
- describe the mitigation and enhancement measures proposed separately for each Indigenous nation;
- 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*.

12. Assessment of Impacts on Indigenous Interests

The Impact Statement must provide information on how the project may affect Indigenous nations, as informed by the Indigenous nations involved in the assessment. The term Indigenous interests responds to nations' request to apply a holistic approach to assess how the project interacts with them and their territories.

For the purposes of this assessment, the term Indigenous interests refers to all the requirements relating to Indigenous nations specified by both theIAA and the B.C. Act:

- The IAA requires the assessment of the impacts that the proposed 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*". This requirement uses a methodology outlined in this policy: *Guidance: Assessment of Potential Impacts on the Rights of Indigenous Peoples*. The review panel will provide advice to the Minister in their impact assessment report. Impacts on rights are a factor to be considered in the public interest determination. The Crown will maintain a relationship with Indigenous nations throughout the assessment and will decide if consultation was adequate for the purposes of a decision under the IAA.
- The IAA requires an assessment of the effects of the project with respect to the Indigenous peoples of Canada, including 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; and any change occurring in Canada to the health, social or economic conditions of the Indigenous peoples of Canada. The review panel will have to provide advice to the Minister in the impact assessment report on the extent to which likely, adverse effects within federal jurisdiction and direct or incidental effects on Indigenous nations are significant. The extent to which adverse effects in federal jurisdiction and direct and incidental effects are significant is a factor to be considered in the public interest determination.
- Section 2(2)(b) of the B.C. Act defines Indigenous interests as "those interests related to an Indigenous nation and their rights recognized and affirmed by section 35 of the *Constitution Act, 1982*, including Treaty rights and Aboriginal rights and title, that may be impacted by a proposed project". Section 25(1) of the B.C. Act requires the assessment of effects of a project on Indigenous nations and rights recognized and affirmed by section 35 of the *Constitution Act, 1982*. The B.C. environmental assessment decision must take this into account along with consent or non-consent from participating Indigenous nations and information, if any, respecting an arrangement reached with a participating Indigenous nation in relation to the potential effects of the project on the nation.

At a minimum, the assessment of potential impacts on Indigenous interests must include both adverse and positive effects.

The Impact Statement must contain a nation-specific assessment in a separate section for each Indigenous nation potentially affected by the project. This nation-specific assessment need not repeat everything from the analysis of each VC, particularly where the VC directly overlaps an Indigenous interest and Indigenous input

and perspectives have been incorporated throughout but should summarize and present the appropriate information in the context relevant for each Indigenous nation. The Indigenous nation-specific assessments will follow the assessment methodology presented in section 8, unless otherwise specified below in section 12 or in section 13, and be tailored to include any nation-specific methodological considerations found in section 13, based on feedback from Indigenous nations. Ideally, each nation-specific assessment should be done in a way that works best for nations such that the nations set the methodology, do the analysis and provide their conclusions on each requirement included in the definition of Indigenous interests. The proponent is encouraged to work collaboratively with each Indigenous nation in order to provide conclusions with respect to project impacts on Indigenous interests.

The Impact Statement must:

- describe how Indigenous interests were identified, through engagement with each Indigenous nation or otherwise;
- summarize the VCs used in the assessment of effects on Indigenous interests and whether they were carried forward from the VC assessment in previous sections of the guidelines or developed specifically for the assessment of Indigenous interests;
- describe Indigenous nation-specfic assessment methods, data collection, and analysis discussed with nations and used to undertake the assessment of effects to Indigenous interests; and
- describe linkages with other Indigenous interests.

The proponent must engage with Indigenous nations, in order to identify and understand the potential impacts of their project on Indigenous nations and their interests, and to incorporate Indigenous knowledge into the assessment. The VC assessment methodology described in section 8 provides a strong foundation for undertaking an assessment of effects that are fully inclusive of Indigenous interests, including rights that have been addressed by the courts and other interests that may inform Indigenous nations' views on a project. 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 each individual VC into an assessment of the holistic VCs identified by Indigenous nations.

The proponent should apply Agency and EAO guidance on engaging with Indigenous nations and appropriate methodologies for assessing potential effects and impacts on Indigenous nations and their interests. The proponent should use guidance from *Section 3: Indigenous Participation and Engagement from the Practitioner's Guide to Federal Impact Assessments under the Impact Assessment Act* and *Section 4 of the EAO Effects Assessment Policy* in the assessment of Indigenous interests.

Engagement with Indigenous nations is also required to identify proposed measures to avoid, minimize, offset or otherwise accommodate for potential impacts on Indigenous nations or their interests. This engagement may also identify potential positive outcomes, including enhancement measures that could improve the underlying baseline conditions that support Indigenous interests. Ideally, the project will be designed to minimize adverse impacts and to maximize positive impact on the quality of life of Indigenous nations.

Engagement with Indigenous nations must involve ongoing information sharing to the extent possible to help validate the information and assessment findings in the Impact Statement. In cases where a specific study addressing elements relevant to the assessment of the project has been prepared by an Indigenous nation,

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 nation, except in cases where the information could be confidential in nature.

The proponent must provide an opportunity for Indigenous nations to review their sections and relevant conclusions prior to submission of the Impact Statement. If the information is about an Indigenous nation, 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 nations has been incorporated, including Indigenous knowledge. To the extent possible, information should be specific to the individual Indigenous nations involved in the assessment, and describe contextual information about the members within an Indigenous nation (e.g. women, men, two spirit persons, elders and youth).

The proponent is also encouraged to work with Indigenous nations 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, waters and resources for traditional purposes, on potential impacts to Indigenous nations' interests, and for the identification of mitigation or enhancement measures. Where applicable, sections of the Impact Statement prepared by Indigenous nations must be clearly identified. All perspectives and the rationale for different conclusions should be documented in the Impact Statement.

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

12.1. Information Sources

The Impact Statement must clearly identify sources of all information used in preparing the assessment of impacts on Indigenous interests, noting where information represents the views of Indigenous nations, the proponent or otherwise. Information sources that include Indigenous knowledge must be clearly labelled as such.

The proponent must engage with Indigenous nations to request preferred information sources to inform nation-specific sections. If information is not directly available from Indigenous nations, the proponent must draft this section and complete any analysis using the best available sources. Even if information is publicly available (e.g. on an Indigenous nation's website or information provided through other regulatory processes) the proponent should seek the Indigenous nation's permission prior to including the information in its assessment.

12.1.1 Indigenous Knowledge

The Impact Statement must outline how the proponent worked with Indigenous nations to incorporate Indigenous knowledge into the assessment. The proponent must incorporate Indigenous knowledge into all aspects of the assessment, not only as an information source for potential project impacts on Indigenous interests.

Many Indigenous nations view and experience potential effects within holistic, interconnected frameworks of the world. In order to understand the potential impacts from the project, it may be necessary to understand in

greater depth the nation's views on how their values or interests are related. The proponent must attempt to work with nations to identify how best to undertake and present the assessment of impacts to Indigenous interests in a culturally appropriate manner that recognizes the perspectives and values of the nation, including how the impacts of the project can be best understood from a holistic, interconnected perspective. Given the holistic nature of Indigenous knowledge, it may be presented in one section of the Impact Statement, rather than being broken down into the technical sections or chapters.

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 approaches to be favoured. Appropriate, culturally-based Indigenous methodology for integrating Indigenous knowledge and community input into the assessment is necessary to appropriately and ethically assess potential impacts and significance of those impacts from an Indigenous perspective. Also refer to the provincial *Guide to Indigenous Knowledge in Environmental Assessments* for further information.

Regarding the collection and use of Indigenous knowledge, the Impact Statement must provide:

- an outline of the steps taken by the proponent to work with Indigenous nations to collect and incorporate Indigenous knowledge in the Impact Statement including a summary of any arrangements with the Indigenous nation regarding the use in the Impact Statement of Indigenous knowledge;
- confirmation that Indigenous nations support the characterization of any Indigenous knowledge used in the Impact Statement and give permission for its public disclosure;
- an explanation of how Indigenous knowledge informed project design, the assessment of impacts, and proposed mitigation measures; and
- plans (if applicable) for future cooperation between the proponent and Indigenous nations to further incorporate Indigenous knowledge into project implementation (such as monitoring and management plans).

12.2. Cumulative Impacts on Indigenous Interests

For the purposes of assessing cumulative impacts on Indigenous interests, the proponent must follow the approach outlined in the *Guidance: Assessment of Potential Impacts on the Rights of Indigenous Peoples*. This will include:

- understanding the context in which impacts on Indigenous interests would occur;
- identifing the environmental and socio-economic conditions that support the community's Indigenous interests; and
- understanding how historic, existing and reasonably foreseeable future projects and activities have cumulatively affected or could affect the conditions that support or limit the nation's Indigenous interests. The proponent must evaluate how current environmental and socio-economic conditions, including changes in those conditions, may be constraining or supporting a nation's ability to pursue their interests. Determining this will establish the state of the particular interest and identify

cumulative impacts on the interest. Establishing the context of existing cumulative impacts must be completed before considering project-specific impacts. The proponent will then continue through the assessment process outlined below to include exisiting conditions, project impacts on Indigenous interests, mitigation measures and assessing level of impacts on Indigenous interests, which includes considering cumulative impacts when characterizing residual impacts. A cumulative effect on an environmental, health, social or economic component or a cumulative impact on an Indigenous interest may be important even if the project's incremental effects to these components by themselves are minor. For any residual project impacts on Indigenous interests the proponent will then bring those considerations back into the broader cumulative effects conclusions for other VCs and include an Indigenous lens for the cumulative effects assessment and mitigation measures required in section 8.

Understanding cumulative impacts

Figure 1 Understanding cumulative impacts

12.3. Existing Conditions

The Impact Statement must describe the current context of each Indigenous nation potentially affected by the project. This must include background information on Indigenous nations, including ethnography, language, population, communities, reserves, and any other information they view as important to understanding the context for their nation. If information is not directly available on an Indigenous nation, the proponent must draft this section using the best available sources.

The Impact Statement must describe existing conditions pertaining to Indigenous nations' current context, including Indigenous interests such as physical and cultural heritage, land and waters, resource and marine use, health and socio-economic conditions, and Indigenous governance. Each Indigenous nation's section should reflect the nation specific context and interests.

The subsections below reflect the minimum requirements for the assessment of impacts to Indigenous interests. All of the required information noted below should be provided in sufficient detail to allow analysis of the impacts on Indigenous interests that result from changes to the environment and on health, social, economic and cultural conditions, and an assessment of impacts to Indigenous rights.

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 interests 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 Indigenous interests;
- include components of the environment identified by Indigenous nations as having heritage value, to reflect that natural and cultural heritage is a multidimensional concept which is not limited to particular sites or objects;
- provide the location of Indigenous interest features such as physical and cutural heritage sites and current use locations on maps, if it has be shared by an Indigenous nation with the proponent and if the proponent has obtained permission from the Indigenous nations for the information to be shared publicly; and
- describe how input from potentially impacted Indigenous nations 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 Impact Statement must describe how Indigenous nations use the lands, waters and resources of the assessment area in both contemporary and historical contexts, including Indigenous land use plans.

The description of existing conditions should give consideration to an understanding of the historical conditions associated with ability to transmit culture (e.g. through language, ceremonies, harvesting, teaching of sacred laws, traditional laws, stewardship laws, traditional knowledge). The description should also 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 interests, including rights. Indigenous nations must be involved in the baseline characterisation of conditions supporting the characterization of Indigenous interests, as well as the scoping and assessment of the impacts on Indigenous nations.

The proponent should consult the following guidance on the Agency and EAO websites to guide its engagement with Indigenous nations and its assessment:

- *Technical Guidance for Assessing Physical and Cultural Heritage or any Structure, Site or Thing*;
- *Technical Guidance for Assessing the Current Use of Lands and Resources for Traditional Purposes under CEAA, 2012*;
- *Guidance: Assessment of Potential Impacts on the Rights of Indigenous Peoples*;
- *Section 4 of the EAO's Effects Assessment Policy for guidance on assessing effects to Indigenous nations*;
- *Guide to Indigenous Knowledge in Environmental Assessments*; and
- *Guide to Consensus-Seeking under the Environmental Assessment Act, 2018*.

To meet the above requirements, the Impact Statement must describe and consider the efforts of the Indigenous nations to restore traditional practices, to the extent this information is available:

- location and description of Indigenous rights, title area, land claims or traditional territory (including maps where available and permitted by the respective Indigenous communities, to illustrate the location of treaties, traditional territories and Métis harvesting zones; This should include historic, regional, and community context, the geographic extent of traditional territory, the purpose and importance of the interests to the rights-bearing communities (e.g. the practices, customs, beliefs, worldviews and livelihoods), and information on how interests have already been affected;
- maps and data sets if they have been shared by Indigenous nations with the proponent and if the proponent has obtained permission from the Indigenous nations for the information to be shared pubicly (e.g. overlaying the project footprint, places of cultural and spiritual significance, traditional territories, fish and other marine resource catch numbers);
- the nature and extent of Indigenous interests (including the exercise of rights) of Indigenous nations, potentially impacted by the project, as identified by the Indigenous nation(s);
- location of reserves and communities;
- location of any Indigenous Protected and Conserved Areas;
- pre-existing impacts and cumulative effects that are already interfering with the ability to exercise Indigenous interests including the ability to pass along cultural practices (e.g. language, ceremonies, Indigenous knowledge);
- landscape and marine areas, social and cultural conditions that support the Indigenous nations's interests (e.g. large, intact and diverse landscapes and marine areas, areas of solitude; connection to landscape and marine areas, sense of place; language; Indigenous knowledge; clean water, biodiversity, abundance, distribution and quality of wildlife and vegetation);

- location of traditional uses, 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 fishing and harvesting;
- access and travel routes for conducting traditional practices;
- all uses of riverbanks, shorelines, waterways and water bodies navigable by Indigenous nations, such as for travel and recreation;
- waterways and water bodies used as drinking water sources;
- description of traditional foods consumed by Indigenous nations;
- the quality and quantity of resources at present (e.g. preferred species and perception of quality) and the quality and quantity of resources required to support a nation;
- access to resources at present (e.g. physical access to harvest specific species, culturally important harvesting locations, timing, seasonality, distance from community) and the access to resources required to support a nation;
- 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.) and any important landscape features associated with experience;
- information about members within an Indigenous nation, and their role in Indigenous interests (e.g. women, men, elders, youth, people with disabilities);
- the diversity of current use and practices among subgroups within the community;
- location of any Indigenous-led research or monitoring activities;
- other current uses identified by Indigenous nations;
- the relative importance of the project area and its surroundings, including any special characteristics or unique features, to the Indigenous interests;
- identification of thresholds identified by the Indigenous nation that, if exceeded, may impair the ability to meaningfully exercise their Indigenous interests;
- burial sites; spiritual sites, including rivers, watercourses and marine areas;
- cultural landscapes and marine areas;
- oral histories;
- teaching areas used to transfer knowledge between generations;
- cultural values and experiences of being on the land and water;
- toponymy, language and other components that make up a culture;
- sacred, ceremonial or culturally important places, plants, animals, objects, beings or things;
- archaeological potential and/or artifact places; and
- sites used or occupied historically.

The Impact Statement must consider potential impacts on the health of Indigenous nations, including the nations' physical, spiritual, mental, and emotional health. The Impact Statement will examine direct and indirect effects to the community and individual members with respect to social, cultural, and economic aspects that support their ability to benefit from the land now and into the future. The Impact Statement must meet the requirements set out in sections 10 and 11with regard to the baseline for health, social and economic conditions, which must take into account Indigenous nations and GBA+ considerations specific to Indigenous nations. The Impact Statement must provide community-specific social and economic conditions on a disaggregated basis (without identifying individuals).

The Impact Statement must consider the following non-exclusive list of social and cultural aspects when assessing project impacts on Indigenous interests:

- food and medicine;
- sharing within the community or family;
- ceremonial or spiritual purposes;
- trade or bartering;
- teaching or knowledge transfer;
- language transference; and
- Indigenous governance regimes and Indigenous laws associated with health and socio-economic conditions.

The Impact Statement must include background information on Indigenous nations' governance and economy. The Impact Statement must provide an overview of Indigenous nations' governance context in the area affected by the project including information, where available, regarding:

- how any Indigenous laws, governance, philosophies or customs have historically been applied and currently apply to this area, including how those may have evolved over time, how those processes should be used to review the potential impacts of the project on Indigenous interests and what information the Indigenous nation may need or processes that are required to support its decision making in the area;
- any laws, customs, or requirements for the area including any existing Indigenous land use plans;
- Indigenous governance systems and Indigenous laws associated with the current use of lands, waters and resources for traditional purposes or physical or cultural heritage, including those tied to the landscape or marine areas;
- any agreements with other Indigenous nations regarding governance of areas of territory overlap, as relevant to the project; and
- how the Indigenous nation's cultural traditions, laws and governance systems inform the manner in which they exercise their interests (the who, what, when, how, where and why).

12.4. Project Impacts on Indigenous Interests

The Impact Statement must describe the level of engagement with Indigenous nations regarding the assessment of potential impacts of the project on Indigenous interests.

It is important that Indigenous nations 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 Indigenous interests. The proponent is therefore encouraged to share studies with Indigenous nations prior to assessing the impact of the project on their interests. The proponent must document the approach taken to support Indigenous nations in identifying the potential impacts of the project on their interests, including the hypotheses put forward on the potential impacts.

Where an Indigenous nation has not provided its views on the impact of the project on their interests, the proponent should describe a rationale for its assessment. Impacts on interests may be assessed using a methodology identified by Indigenous nations, including community-led assessments. This may include supporting Indigenous-led studies that are to be provided publicly and to the Governments of Canada and British Columbia.

The Impact Statement must assess potential impacts on Indigenous interests and must be informed by engagement with Indigenous nations and consideration of Indigenous knowledge. The Impact Statement should provide a characterization of adverse residual impacts of the project to each Indigenous interest identified. Residual impacts are the remaining negative environmental, health, social or economic effects of the project after the proponent implements mitigation measures. The Impact Statement should also assess the impact on the exercise of Indigenous rights.

The proponent is must collaborate on the development of conclusions in the assessment with Indigenous nations regarding the project impacts on Indigenous interests. This applies to conclusions on the interrelated matters of extent of significance for any residual impacts on current use of lands, waters and resources for traditional purposes, physical and cultural heritage and structures, sites or things of historical, archaeological, paleontological or architectural significance to groups, change occurring in Canada to the health, social or economic conditions of the Indigenous peoples of Canada; and the seriousness of any impact on the exercise of Indigenous rights.

The Impact Statement must :

- provide a detailed assessment of the project's potential and anticipated impacts on Indigenous interests;
- define the assessment boundaries for the impacts on Indigenous interests, including spatial and temporal boundaries;
- identify, where relevant, administrative and technical boundaries;
- include mitigation measures, which describes how the project will avoid, manage or mitigate potential and anticipated impacts on Indigenous interests;
- provide views of Indigenous nations on the project's impacts on their Indigenous interests;
- characterize of residual impacts, which details the remaining negative impacts of the project on Indigenous interests after the implementation of mitigation measures; and
- provide a cumulative effect asssessment on Indigenous interests following the requirements of section 8.

The proponent, in collaboration with Indigenous nations, should consider the following:

- how the project will affect the planning, management or stewardship of traditional lands, waters and resources by Indigenous nations;
- how the project will affect the ability of Indigenous nations 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 nations in the fight against climate change;
- the manner in which the project and its impacts affect the authority of Indigenous nations on their territory;
- how the project may impact community members or groups disproporionately; and
- how the project affects all other components of significance identified by Indigenous nations.

The Impact Statement must:

- assess potential impacts 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 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 impacts on physical and cultural heritage when assessing the impacts on social and economic conditions;
- provide copies of correspondence with federal, provincial, territorial or Indigenous authorities responsible for heritage resources with comments on any heritage resource assessment and proposed mitigation measures;
- describe the outcomes of engagement and consultation activities with Indigenous nations with concerns about heritage resources in the project area and indicate the participation of the members of these nations 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 nations, 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 nations as having heritage value;
- assess the potential impacts on current use of lands, and resources for traditional purposes, within the context of historical and current cumulative impacts, including to:
    - current and future availability and quality of traditional foods;

  - quality, quantity and distribution of resources available for harvesting (e.g. species of cultural importance, traditional and medicinal plants);
  - access to culturally important harvesting areas or resources, access to traditional territory and to/from the community and reserves;
  - experiences of being on the land or water (e.g. changes in air quality, noise exposure, impacts 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 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 sensory experience of being on the land or water, due to noise and change in soundscape, changes in the visual landscape and marine area, and odor, and any corollary wellness impacts as a result of these sensory changes;
- describe potential impacts 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 and marine areas, including nighttime landscapes and marine areas, 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 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 impacts to environmental and socio-cultural conditions affecting Indigenous land, water, and resource use;
- describe potential impacts of changes to the access, cabins, travelways and harvesting and traditional land, water, and resource use areas affects cultural values, spirituality or importance attached to physical and cultural heritage sites;
- describe potential impacts of changes to traditional use of cultural landscapes and marine areas 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;
- describe potential impacts of 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;
- assess 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 rating 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 impacts to current use of lands, waters and resources for traditional purposes; and
- describe all reasonable alternatives considered that would avoid impacts on current use of lands, waters and resources for traditional purposes considered during project development.

The proponent should refer to the Agency guidance on *Analyzing Health, Social and Economic Effects under the Impact Assessment Act*.

The Impact Statement must meet the requirements set out in sections above with regard to the effects on health, social and economic conditions, which must take into account Indigenous nations and GBA+ specific to Indigenous nations.

- The assessment of these impacts on Indigenous nations must describe and take into account interactions with the impacts on physical and cultural heritage, on structures, sites or things of significance, and on the current use of lands, waters and resources for traditional purposes. For example, an impact on a traditional food may have consequences for the practice of traditional activities and could lead to an impact 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 impacts that the project may have on Indigenous nations; and
- list other impacts highlighted by Indigenous nations or other participants, if applicable.

The Impact Statement will include a table that categorizes the project's potential impacts by Indigenous interests and links potential impacts to VCs.

The proponent should consult the following Agency and EAO guidance on this topic: *Section 4 of the EAO's Effects Assessment Policy for guidance on assessing effects to Indigenous nations*; *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 Impact Statement must:

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

12.4.1 Mitigation and Enhancement Measures

The Impact Statement must describe how the proponent proposes to avoid, manage, and mitigate potential adverse project impacts on Indigenous interests and enhance positive impacts, as appropriate. Refer to section 3.4 of the *Effects Assessment Policy* for additional information related to mitigation and enhancement measures.

The proponent must work with Indigenous nations towards finding mutually agreeable methods to address concerns raised about the project, especially for those concerns raised by Indigenous nations about impacts on the exercise of their Indigenous interests. If a nation does not agree that a mitigation measure will address the impact on their Indigenous interest, the impact should be carried through the rest of the assessment of project impacts on Indigenous interests. The proponent should provide available evidence of the effectiveness for all mitigation measures related to potential impacts on Indigenous nations. Where no evidence exists, the proponent should describe plans to monitor the effectiveness of mitigation measures. The proponent is encouraged to share results with Indigenous nations and to monitor the effectiveness of mitigation measures in cooperation with Indigenous nations.

The Impact Statement must:

- provide information on measures proposed to address adverse impacts, including the perspectives of Indigenous nations on potential mitigation measures;
- provide additional mitigations that are specific to Indigenous nations or Indigenous interests;
- provide proposed monitoring initiatives or review processes related to impacts on Indigenous interests
- describe collaboration with Indigenous nations to identify preferred mitigation measures for potential adverse impacts on Indigenous nations or their intersts, as well as to optimize the project's benefits for their nations;
- include perspectives of the Indigenous nations on the effectiveness of the mitigation options as well as the relative level of uncertainty or risk associated with the mitigation option;
- describe the proposed mitigation and enhancement measures for all potential impacts on Indigenous nations, as well as on potential impacts to the interests of Indigenous nation, 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 impacts as described in the previous sections that will also apply to effects on Indigenous nations and impacts on their interests, and elaborate on how these measures may vary for each Indigenous nation;
- describe if and how these measures will be integrated into the project design, if applicable;
- demonstrate how the timing of Indigenous activities on the land and water was considered when establishing the schedule for project activities;
- provide 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;

- describe the measures that will be implemented by the proponent for the potential impacts of the project on Indigenous interests, including how the measures directly address the possible impacts of the project on the exercise of interests and the scope of the measures;
- describe the measures that would enhance or support the exercise or practice of Indigenous interests 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 nations;
- propose differentiated mitigation measures, if applicable, so that adverse impacts do not fall disproportionately on Indigenous nations and vulnerable subgroups, and they are not disadvantaged in sharing any positive impact resulting from the project. These mitigation measures should be developed in collaboration with the potentially affected communities and subgroups; and
- describe how the GBA+ results on differential and disproportionate impacts have been used to inform mitigation and enhancement measures.

12.4.2 Characterization of Residual Impacts on Indigenous Interests

The Impact Statement must provide a detailed description of the methods used to assess anticipated negative impacts to Indigenous interests. The proponent should reference the assessment methodology for the characterization of residual effects presented in section 8.7 above as a starting point for describing residual impacts on Indigenous interests.

The Impact Statement should consider and present an assessment of:

- how the project may contribute cumulatively to any existing impacts on the exercise of Indigenous interests, as identified by the Indigenous group(s);
- the interference of the project on the quality and quantity of resources available for the exercise of Indigenous interests;
- the interference of the project on the access to areas important to the exercise of Indigenous interests;
- the interference of the project on the experience associated with the exercise of Indigenous interests;
- the interference of the project on Indigenous traditions, laws and governance; and
- the severity of the impacts on the exercise of Indigenous rights, as identified by the Indigenous nation(s).

The Impact Statement should provide a characterization of adverse residual impacts of the project for each Indigenous interest identified. Residual effects are the remaining negative environmental, health, social or economic impacts of the project after the proponent implements mitigation measures. If a nation does not agree that a mitigation measures will address the impact, the residual impact should be carried through the rest of the assessment of project impacts on Indigenous interests.

As detailed in section 8.7, the Impact Statement should provide a detailed characterization of the residual impacts, even if deemed small or negligible, using criteria and language most appropriate for the impact. For

the characterization of Indigenous interests, the proponent should work with Indigenous nations to identify which of the criteria below the nations consider relevant for the assessment of their Indigenous interests and to characterize the residual impacts. Any additional characterization criteria should be developed with the Indigenous nation through engagement with the nation and with consideration of the nature of the impacts, the nature of the Indigenous interest, the unique context of the nation, consideration for Indigenous knowledge, and how the nation wishes to present the information. See section 4.5 of the *Effects Assessment Policy* for an example of how the VC residual impacts characterizations may be considered in the context of impacts to an Indigenous nation's interests.

The proponent should clearly state the rationale for selecting the criteria used to characterize the residual impacts to Indigenous interests and describe the level of uncertainty regarding the data or methods used to frame the analysis.

The Impact Statement must consider the ecological, health, cultural, social and economic contexts in which impacts may occur and apply the most appropriate criteria to characterize each residual impact. The proponent should give consideration to the following criteria for each nation-specific assessment:

- **Likelihood:** Estimate how probable it is that the impact will occur.
- **Geographic extent**: Consider the geographic extent of the impacts in relation to the geographic extent of the interest.
- **Frequency, duration and reversibility:** Consider how often the impact may occur within a given period of time, the length of time that an impact may be discernible, and whether the interests are expected to recover from the impact.
- **Cultural well-being**: Consider what the impacts of the project are on the ability of a group to continue customs, traditions and practices that are integral to the group's distinct culture.
- **Cumulative impacts**: Identify and assess the degree to which the existing interests may be more or less vulnerable to the impacts of the project when the impacts are added to, and interact with, the baseline conditions, including existing cumulative impacts from other sources.
- **Governance**: Consider whether the impacts of the project will affect the community's ability and systems for self-governance and self-determination with respect to their members (including future generations) and for the management of traditional lands, waters and resources, taking into consideration the laws, customs and structures of the community (including consideration of Aboriginal title).
- **Impact inequity**: Consider the impacts on sub-populations of a community (including women, elders, youth, two-spirited people, and others) with consideration of risks and benefits for members of the sub-population, and likely resiliency of the sub-population to negative impacts.
- **Health**: Consider impacts from the project on the health of the Indigenous community as a whole, or to the health of individual members. Health includes considerations of physical, mental, emotional, and spiritual health.
- **Risk and Uncertainty**: the perspectives of Indigenous nations regarding the risk and uncertainty are integrated into the assessment of impacts to Indigenous interests.
- **Importance**: the importance of an interest to the Indigenous nation. Some interests may have a different level of importance to an Indigenous nation. The views of the nation regarding importance of

the Indigenous interest should be integrated where appropriate. Indigenous planning or governance information and/or Indigenous knowledge may also provide insight into the importance of a value.

- **Interconnectedness**: Many Indigenous nations view and experience potential impacts within holistic, interconnected frameworks of the world. In order to understand the potential impacts from a project, it may be necessary to understand in greater depth the Indigenous nation's views on what other interests are related. The proponent should work with Indigenous nations to identify how best to undertake and present the assessment of impacts to Indigenous interests in a culturally appropriate manner that recognizes the perspectives and values of the Indigenous nation, including how the impacts of the project can be best understood from a holistic, interconnected perspective.

The Impact Statement must also describe the process for integrating Indigenous perspectives into the characterization of residual impacts and state the views of Indigenous nations with respect to the residual impacts.

As detailed further in section 8.8 above, the cumulative effect assessment must include consideration of cumulative impacts to the rights and interests of Indigenous nations and their cultures. The proponent must collaborate with Indigenous nations in the assessment of cumulative impacts to the interests of Indigenous nations and cultures. The Impact Statement must demonstrate how Indigenous nations were involved in the cumulative effects assessment and in the design of appropriate mitigation measures and follow-up programs.

Where no mitigation measures are proposed or mitigation is not possible, the Impact Statement must describe the potential adverse impacts on the interests of Indigenous nations, as identified by the Indigenous nation. In addition, the Impact Statement must include perspectives of the potentially impacted Indigenous nation on the effectiveness of particular mitigation measures on such impacts. This section should include the nations' views on the residual impacts on their interests. In cases where Indigenous nations have not provided their views on the project's impacts on their interests, or in cases where the proponent and the Indigenous nation agree that it is better for the Indigenous nation to provide this information directly to the governments of Canada or British Columbia, the proponent will provide a rationale for the approach taken.

12.4.3 Positive Impacts

The Impact Statement must describe the positive impacts the project may have on Indigenous nations including:

- a description of plans to encourage equitable employment, procurement and contracting opportunities for Indigenous nations and communities, including training plans;
- an estimate of the anticipated levels of Indigenous economic participation in the project in comparison to the total project requirements (e.g. number of workers, revenue sharing, ownership, equity and other related measures);
- a description of any plans for cultural sensitivity training for non-Indigenous employees to promote a safe work environment that supports the well-being of Indigenous employees; and
- a description of any plans for cultural competence training for non-Indigenous employees to foster a respectful professional relationship with Indigenous businesses.

The Impact Statement must also describe how the project may contribute to improved environmental outcomes for Indigenous nations.

The Impact Statement must describe how the proponent engaged with the Indigenous nation, including any collaboration with the Indigenous nation as a participating Indigenous nation, or integrated the Indigenous nation's perspectives into, the assessment of positive impacts on Indigenous interest. This information can be combined with the requirements in sections 10.2.4 and 10.2.5 of the guidelines as well.

12.5. Summary

The Impact Statement must explain how the proponent engaged with Indigenous nations about the project's direct and indirect, residual and cumulative impacts including:

- the residual and cumulative impacts on Indigenous interests to consider when determining the overall seriousness of impact to the Indigenous interests;
- any major points of agreement or disagreement between the proponent and Indigenous nations; and efforts taken to address any points of disagreement;
- for the purposes of the impact assessment report, the proponent must provide a table summarizing the Indigenous nations views on the impact of the project on each Indigenous nation's interests. The proponent will work with Indigenous nations and respect their preference regarding the representation of the following impacts :
    - the extent of significance for any residual effects on current use of lands, waters and resources for traditional purposes, physical and cultural hertiage, to structures, sites or things of historical, archaeological, paleontological or architectural significance change occurring in Canada to the health, social or economic conditions of the Indigenous peoples of Canada; and
    - the seriousness of any impact on the exercise of Indigenous rights.

13. Nation-specific Assessment

Section 13 includes information requirements that are specific to each Indigenous nation based on the preliminary understanding of Indigenous interests identified thus far for this project, including, but not limited to:

- how the nation would like to participate in the assessment process;
- nation-specific interests and values that the nation specified to include in the assessment; and
- relevant information (such as policies, guidelines, and methodologies) that the nation has provided thus far for assessing effects on their interests and values.

The information requirements are provided below, listed by nation in alphabetical order. The proponent, in collaboration with the nation, should customize section 13, where possible, during the development of the Impact Statement. The guidance in section 12 should be applied into the sections below for each Indigenous nation.

13.1. Cowichan Nations

The Impact Statement must include a partially aggregated assessment of project impacts on the Indigenous interests of the Cowichan Nations, which includes the communities of Cowichan Tribes, Halalt First Nation, Lyackson First Nation, Penelakut Tribe, and Stz'uminus First Nation. In their separate notices to participate in the project, each stated that the Cowichan Nation communities typically work together on files of shared interests and concerns and details of this collaboration shall be defined further into the assessment. The Cowichan Nations assessment section should include aggregated sections on information sources, baseline conditions, and potential effects as the content of these subsections is anticipated to be very similar. Disaggregated or individual residual effects assessments should however be required for each member community. The proponent shall discuss this proposed partially aggregated approach with Cowichan Tribes, Halalt First Nation, Lyackson First Nation, Penelakut Tribe, and Stz'uminus First Nation.

Cowichan Nations submitted individual notices to the EAO to participate as participating Indigenous nations between November and December 2020. Penelakut Tribe did not submit a notice.

Table 13.1 Cowichan Nation-Specific Potential Effects on Indigenous Interests

Preliminary Indigenous Interests	Preliminary Potential Effects
Harvesting and Subsistence Activities	Effects on use of area for Food, Social and Ceremonial purposes, such as: • effects on water quality and water clarity; and • effects on fish habitat, including eelgrass beds, and interference with critical habitat processes.

	Effects on finfish, shellfish, forage fish, migratory birds and other wildlife. Effects on the Fraser River salmon and subsequent impacts to Cowichan Nations communities' ability to harvest for Food, Social, and Ceremonial purposes. Effects on the ability of Cowichan Nations communities to exercise their harvesting rights surrounding the Tl'uqtinus village site and Tumbo Island.
Cultural Use Sites and Areas	Effects from erosion on areas with high archaeological potential or burials along shorelines. Effects on the ability of Cowichan Nations communities to exercise their harvesting rights surrounding the Tl'uqtinus village site and Tumbo Island.
Social and Economic Conditions	Effects on the Cowichan Nations' economic rights including the utilization of their Aboriginal Communal Fishing Licenses. Effects on operation of Le'eyqsun campground from sensory disturbances during construction and operation. Positive effects - Employment opportunities for Cowichan Nations members.
Indigenous Health and Well-being	Effects from scour protection, dust, noise and light pollution from the project.
Cultural Continuation	Effects on SRKW and habitat. Effects on the ability to exercise harvesting rights and the subsequent potential to affect the intergenerational knowledge transfer and cultural continuity. Effects on the ability for Cowichan Nations communities to safely access resources in a culturally appropriate manner.

13.2. Ditidaht First Nation

Ditidaht First Nation self-identified as participating Indigenous nation to the EAO on December 17, 2020. The Impact Statement must include a nation-specific assessment of project effects on Ditidaht First Nation's Indigenous interests.

Ditidaht First Nation is currently in the B.C. Treaty negotiation process. Of the six-stage process, Ditidaht First Nation is in stage five (Negotiation of an Agreement-in-Principle).

Ditidaht have indicated they will require capacity to effectively participate in the project assessment to facilitate the hiring of qualified professionals to work with their staff, elders and knowledge keepers; and to continue developing their stewardship capacity.

Table 13.2 Ditidaht First Nation-Specific Potential Effects on Indigenous Interests

Preliminary Indigenous Interests	Preliminary Potential Effects
Harvesting and Subsistence Activities	Effects of shipping on quality and quantity of fishing resources near Swiftsure Bank which subsequently affects Ditidaht First Nation's ability to fish for Food, Social, and Ceremonial purposes. Effects of increased shipping on ability to safely access Ditidaht First Nation's marine territory and resources, including Swiftsure Bank. Effects of project on eelgrass and the ability to harvest crabs. Effects of marine emergency and spill response on the safety of the nation's fishermen. Impact of increased vessel traffic on safety of fishermen, particularly at Swiftsure Bank.
Cultural Use Sites and Areas	Effects of increased shipping on the access and use of culturally important marine environments, including through Swiftsure Bank.
Cultural Continuation	Cumulative effects of marine shipping and other marine activities within Ditidaht traditional territory on rights, title and culture. Impacts on species at risk notably the Southern Resident Killer Whale, part of the nation's culture.
Indigenous Governance Systems	Effects of shipping lanes and shipping traffic on Ditidaht First Nation's ability to exercise Indigenous rights. Impact on the ability, currently being negotiated through treaty, to co-manage traditional lands, waters and food resources and the restoration, protection of salmon bearing streams, rivers.

13.3. Esquimalt Nation

Esquimalt Nation self-identified as participating Indigenous nation to the EAO on December 16, 2020. The Impact Statement must include a nation-specific assessment of project effects on Esquimalt Nation's Indigenous interests.

Esquimalt has indicated that, based on the historical use and occupation of their traditional territory, Esquimalt has constitutionally protected Aboriginal rights, including Aboriginal title, within their traditional territory. Esquimalt also has treaty rights pursuant to the Douglas Treaties, including a right to hunt on unoccupied lands and carry on their fisheries as formerly.

Table 13.3 Esquimalt Nation-Specific Potential Effects on Indigenous Interests

Preliminary Indigenous Interests	Preliminary Potential Effects
Harvesting and Subsistence Activities	Effects of construction, operation and shipping on water quality, fish and fish habitat (including Sockeye, Chinook, Coho salmon and shellfish), propagation of invasive species, and the health of the ocean and the subsequent effects to resources. Effects of construction, operation and shipping on migratory birds, marine mammals, and other wildlife.
Cultural Use Sites and Areas	Effects of project construction, operation, and shipping on Esquimalt Nation's cultural and heritage sites.
Indigenous Health and Well-being	Effects of construction, operation, and shipping on the safety of Esquimalt Nation members. Effects on Esquimalt Nation members' well-being from not being able to carry out traditional practices as preferred. Effects of potential marine shipping accidents and malfunction.
Cultural Continuation	Impacts to the environment and resources within Esquimalt territories could affect Esquimalt culture as a whole.
Indigenous Governance Systems	Effects on Esquimalt Nation's ability to exercise their Indigenous and Treaty rights. Esquimalt's role in project-related monitoring, reporting, Esquimalt-led stewardship initiatives and adaptive management.

13.4. First Nations of the Maa-nulth Treaty Society

The First Nations of the Maa-nulth Treaty Society self-identified as participating Indigenous nations to the EAO on November 27, 2020.

Maa-nulth are five independent self-governing modern treaty nations, participating collectively in this engagement through the Maa-nulth Treaty Society. The nations represented in this Society are: Huu-ay-aht First Nations, Ka:'yu:k't'h'/Che:k'tles7et'h' First Nations, Toquaht Nation, Uchucklesaht Tribe, and Yuułuʔiłʔatḥ Government.

The Impact Statement must include an aggregate assessment of project effects on the Indigenous interests of member Indigenous nations of the First Nations of the Maa-nulth Treaty Society.

The proponent and First Nations of the Maa-nulth Treaty Society are currently engaged in confidential discussions regarding VCs and Indigenous interests. This version of the First Nations of the Maa-nulth Treaty

Society assessment does not contain confidential information provided by the First Nations of the Maa-nulth Treaty Society.

The Maa-nulth Treaty Society specified the following guiding principles for the assessment process:

Commitments from the proponent:

- be guided by the principles of meaningful, transparent, timely, and responsive engagement;
- support the principles of the United Nations Declaration on the Rights of Indigenous Peoples; and
- strive to develop and maintain strong, mutually respectful relationships with Indigenous nations.

Maa-nulth's approach for this engagement:

- guided by their sacred principles: ʔiisaak (utmost respect), ʔuuʔałuk (taking care of) and hišuk ma c̓awak (everything is one), spelled and pronounced slightly different in Northern and Southern Nuu-chah-nulth dialects;
- with a belief that the Maa-nulth Treaty is only the beginning of reconciliation for Maa-nulth people;
- with a belief that project engagements too play a key role in advancing reconciliation and implementing the *United Nations Declaration on the Rights of Indigenous Peoples*;
- with intention to build a strong, mutually respectful relationship with the proponent;
- with a belief that two-eyed seeing and transparency are foundational to that relationship; and
- with an interest in the network of marine economic highways through their territories.

Table 13.4 Maa-nulth Treaty Society-Specific Potential Effects on Indigenous Interests

Preliminary Indigenous Interests	Preliminary Potential Effects
Harvesting and Subsistence Activities	Impacts on crab and other marine species. Impacts of marine shipping noise, not just on SRKW but also juvenile fish and fauna ocean species. Impacts from invasive species being brought into the area from travelling ships.
Cultural Use Sites and Areas	Impacts to the environment and resources within Maa-nulth territories will impact Maa-nulth culture as a whole.
Social and Economic Conditions	Trade and barter as an impacted cultural and economic activity.
Indigenous Health and Well-being	Impacts on Maa-nulth members' well-being from not being able to carry out traditional practices as preferred.

Indigenous Governance Systems	Concerns about the unjustifiably infringement of Aboriginal and/or Treaty Rights, including resource harvesting and traditional practices.

* Maa-nulth have requested that marine shipping accidents and malfunctions should be listed as a potential pathway for effects, for all categories.

13.5. Katzie First Nation

The Impact Statement must include a nation-specific assessment of project effects on Katzie First Nation's Indigenous interests.

13.6. Kwantlen First Nation

The Impact Statement must include a nation-specific assessment of project effects on Kwantlen First Nation's Indigenous interests.

Table 13.6 Kwantlen First Nation-Specific Potential Effects on Indigenous Interests

Preliminary Indigenous Interests	Preliminary Potential Effects
Harvesting and Subsistence Activities	Effects from dredging and subsequent changes to Kwantlen First Nation's harvesting and subsistence activities.
Indigenous Health and Well-being	Effects of air emissions, and its changes to the health and well-being of Kwantlen First Nation members. Effects of increased container, road and rail traffic.

13.7. Kwikwetlem First Nation

The Impact Statement must include a nation-specific assessment of project effects on Kwikwetlem First Nation.

Table 13.7 Kwikwetlem First Nation-Specific Potential Effects on Indigenous Interests

Preliminary Indigenous Interests	Preliminary Potential Effects
Harvesting and Subsistence Activities	Effects on fisheries and the ability to exercise harvesting rights, including the right to harvest for Food, Social, and Ceremonial purposes. Effects on fisheries, wildlife and sea mammals (e.g. whales) resulting from project-related activities (e.g. ship traffic). Effects on the health of the Fraser River fishery. Effects on Kwikwetlem's lands and waters.
Stewardship and Governance	Effects of the project on the Nation's efforts to re-establish self-governance. Effects of incidental activities to the project, such as short sea shipping, on the health of the Fraser River.

13.8. Leq'á:mel First Nation

The Impact Statement must include a nation-specific assessment of project effects on Leq'á:mel First Nation's Indigenous interests.

13.9. Malahat Nation

Malahat Nation self-identified as a participating Indigenous nation to the EAO on November 27, 2020. The Impact Statement must include a nation-specific assessment of project effects on Malahat Nation's Indigenous interests.

Malahat Nation have stated that:

"The Malahat Nation, (Malahat) is a Coast Salish Indigenous community located on southern Vancouver Island. The Malahat people have lived, travelled, hunted and fished throughout the Salish Sea including southern Vancouver Island, the Gulf Islands, the San Juan Islands, and the mouth of the Fraser River since time immemorial. As such, Malahat has asserted Aboriginal rights and title to an area, which includes the project area and associated marine shipping route. We are descendants of the South Saanich people, who are signatories to the Douglas treaties. Malahat people therefore possess the right to fish "as formerly" under the Douglas Treaties. In addition, Malahat is a member of the Te'mexw Treaty Association, which has been

involved in negotiating a comprehensive modern treaty through the BC Treaty Commission process since 1995."

Table 13.9 Malahat Nation-Specific Potential Effects on Indigenous Interests

Preliminary Indigenous Interests	Preliminary Potential Effects
Harvesting and Subsistence Activities	Effects of the project on Indigenous rights to harvesting enshrined in historical and modern treaties and the Constitution. Effects on harvesting for Food, Social, and Ceremonial purposes. Effects on historical and contemporary preferred harvesting sites and accessibility of culturally important harvesting sites. Changes to the abundance, distribution or quality of resources relied upon to engage in harvesting and subsistence activities. Effects of the project on current and future availability, quality and quantity of traditional foods. The Impact Statement must also consider the following effects on Indigenous interests relating to harvesting and subsistence activities identified by Malahat Nation listed in the rows below. Effects on marine species and resources and subsequent effects on the continuation of sustainable fisheries and the ability for Malahat Nation to exercise their fishing and marine resource harvesting rights. Effects on Malahat Nation's distribution of fish. Effects on marine shipping on species and ecosystems, including cetaceans, marine mammals (e.g. seals and sea lions), and migratory birds.
Cultural Use Sites and Areas	Effects of project activities on the cultural and ceremonial use of areas in and around the project area. Physical disturbance of cultural, heritage, archaeological, paleontological, and architectural sites, including through changes to: • physical and cultural heritage; • access to physical and cultural heritage; • cultural value, spirituality, or importance associated with physical and cultural heritage; and • sacred, ceremonial culturally important places, objects, or things, including languages, stories and traditions. Visual aesthetics over the life of the project and post-project abandonment or decommissioning. Effects of increased marine traffic on the access and use of culturally important marine environments. Effects of the project on the use of travel ways, navigable waterways, and water bodies.

	The Impact Statement must also consider the following effects on Indigenous interests relating to cultural use sites and areas identified by Malahat Nation listed in the rows below. Effects on marine resources and subsequent social and cultural effects on Malahat Nation community members. Effects on the Malahat Nation's cultural practices. Effects on coastal archaeological sites from increased shipping traffic and erosion, as well as subsequent effects on Malahat Nation spirituality and well-being. Interference from ships and the ability for Malahat Nation to connect to important places within Malahat Nation territory.
Cultural Continuation	Increased disruption to the protection, and persistence of Indigenous culture. Effects on the cultural practice of distributing food to community members and elders. Effects of project activities on the interruption of intergenerational transmission of Indigenous knowledge. Changes to ability to fish, hunt, trap and gather for cultural or ceremonial activities and practices. Effects on the cultural continuation of food sharing. Effects on Indigenous culture and teachings linked to the health and persistence of culturally important species, including SRKW. Effects on the cultural practice of distributing food to Malahat Nation community members. Effects of shipping on the interruption of intergenerational transmission of Indigenous knowledge. Effects of shipping on Malahat Nation's ability to continue cultural traditions. Effects of shipping on Malahat Nation's ability to safely access culturally important areas and resources. Effects of shipping on Malahat Nation's ability to maintain connections with neighboring Indigenous communities. Effects on the culturally and spiritually important SRKW from acoustic disturbances, habitat changes, prey availability and biomagnification/bioaccumulation of toxins. Effects on marine resources and subsequent social and cultural effects on Malahat Nation community members. Effects on coastal archaeological sites from increased shipping traffic and erosion, as well as subsequent effects on Malahat Nation spirituality and well-being.
Indigenous Governance Systems	Effects on Malahat Nation's ability to exercise Indigenous rights. Changes to Malahat Nation's stewardship responsibilities to marine species within the traditional territory and the potential effects to Malahat Nation's social and cultural uses of marine resources. Interference from ships and the ability for Malahat Nation to connect to important places within Malahat Nation territory.
Economic Activities	Effects on Indigenous and economic rights to marine fisheries and commercially licensed fishing, hunting, trapping and gathering. Economic losses from project effects on harvesting.

	Economic benefits from the project through business opportunities and employment. Interference with Malahat Nation's ability to fully utilize commercial crab licenses, as well as other commercial licenses and harvest other marine resources for economic purposes. Effects on Malahat Nation's ability to harvest marine resources for economic purposes.
Indigenous Health and Well-being	Changes to the experience when exercising an Indigenous interest, including presence of visual disturbances, changes in air quality, effects of vibrations, and acoustic disruption. Effects on community food distribution and subsequent effects on community health and well-being. Effects on Malahat Nation spirituality and well-being as a result of disturbance of or damage to coastal archaeological sites from increased shipping traffic and erosion. Effects of shipping on the Malahat Nations' members safety and well-being while travelling throughout their marine territory. Project-related atmospheric emissions, including greenhouse gases.

13.10. Matsqui First Nation

The Impact Statement must include a nation-specific assessment of project effects on Matsqui First Nation's interests.

The proponent should refer to the following references and consider them, as applicable, for the development of this section:

- Guide to Conducting Cumulative Effects Assessment in Matsqui First Nation Traditional Territory; and
- Matsqui First Nation's Land Use Plan and Environmental Management Plan, which provide context for assessing project impacts on Mómeqwem and Matsqui First Nation's community.

Potential effects on Matsqui First Nation should be refined through engagement with Matsqui First Nation.

Table 13.10 Matsqui First Nation-Specific Potential Effects on Indigenous Interests

Preliminary Indigenous Interests	Preliminary Potential Effects
Harvesting and Subsistence Activities	Effects on aquatic and marine environments, as well as subsequent effects on fishing and marine harvesting rights. Effects of increased ship traffic (specifically freight traffic in the Georgia Straight and the Straight of Juan de Fuca) and the proposed fishing boat marina included in the project, on whales, salmon, birds, crabs, and other marine life that are important to Matsqui First Nation.

Indigenous Health and Well-being	Effects on ambient air quality and local air quality, particularly on Matsqui First Nation main reserve from contribution of ships and port operations to greenhouse gas, particulate, and pollutant emissions, and resulting. Requests the assessment of emissions related to the project and its impacts.

13.11. Métis Nation British Columbia

The Impact Statement must include a nation-specific assessment of project effects on Métis Nation British Columbia's Indigenous interests.

13.12. Musqueam Indian Band

Musqueam Indian Band (Musqueam) self-identified as a participating Indigenous nation to the EAO on December 17, 2020. The Impact Statement must include a nation-specific assessment of project effects on Musqueam's Indigenous interests.

Musqueam have stated that:

"Musqueam is a priority rights holder in the project area and stands to be among the most heavily impacted by the project. The project site is in close proximity to some of Musqueam's most sacred, spiritually relevant and culturally significant sites and these sites are considered by many Musqueam, alongside over 125 other named sites, to form a network in the region, critical to Musqueam's cultural continuity."

The Musqueam-specific assessment should be undertaken in collaboration with Musqueam and follow the provided Methodology for Musqueam Rights Impact Assessment document, including determining appropriate historical context and baselines and a key role for Musqueam in the determination of the seriousness of project-specific and cumulative infringements on Musqueam rights.

- Principle 1: The methodology for the assessment of impacts on rights should be informed by or, where possible, developed in collaboration with the rights-holding Indigenous group.
- Principle 2: The assessment must consider the nature and scope of rights, as those rights are asserted, and how the rights might be impacted.
- Principle 3: The focus of Rights Impact Assessment is on potential impacts to Musqueam rights, not on environmental effects.
- Principle 4: Assessing new project-specific impacts on the exercise of Musqueam rights requires understanding the context of historical and contemporary cumulative effects in which rights are exercised. How conditions supporting the opportunity to exercise rights have changed over time must be evaluated in order to understand the potential severity of new project-specific effects on those rights.
- Principle 5: The impacts of the project on the exercise of Musqueam rights should be assessed in a broad sense, inclusive of any type of potential project effect on the conditions that support the continuity of rights and way of life.

- Principle 6: The assessment must consider Musqueam's perspective and knowledge.
- Principle 7: The assessment must consider Musqueam values, norms and laws, as provided by Musqueam.
- Principle 8: Musqueam will lead the selection of methods and indicators for assessing impacts on Musqueam rights.
- Principle 9: Thresholds and measures to understand the potential severity of effects of a project on the exercise of rights and culture are to be utilized where they have been defined by Musqueam.
- Principle 10: The potential effectiveness of proposed mitigation and off-setting measures ("mitigation measures") must be determined through a collaborative analysis undertaken by Musqueam and other appropriate parties, based on existing evidence and examples from current projects. Where a proposed mitigation measure is unprecedented, and/or where there is a high level of uncertainty as to its effectiveness, the assessment will include an estimation of its potential effectiveness to reduce residual effects.

Table 13.11 An eleven-step process is proposed to determine the severity of impacts on Musqueam rights as a result of the proposed project.

Rights Impact Assessment Steps	
Establish Context	1) Identify potential impacted rights and study boundaries
	2) Establish historical context
	3) Establish current conditions
	4) Identify future conditions and opportunities for future use
	5) Identify thresholds of acceptable change
Assess Project Effects	6) Identify potential project-rights interactions and analyse potential project effects
	7) Identify mitigations and evaluate effectiveness
	8) Identify project-specific residual effects on rights
	9) Identify cumulative effects on rights
Determine Severity of Impacts	10) Characterize net residual impacts
	11) Determine severity of impacts

Table 13.12 Musqueam-Specific Potential Effects on Indigenous Interests

Preliminary Indigenous Interests	Preliminary Potential Effects
Fishing Rights	Interference with Musqueam Indian Band's constitutionally protected right to harvest fish to meet its food, social, economic, and ceremonial requirements as the project area is the historical and contemporary preferred fishing area of Musqueam Indian Band. Reduction in Musqueam Indian Band members' abilities to freely access preferred resources and waters in the area as a result of project restrictions. Effects on traditional food sources from the contamination of shellfish, including crab. Effects on fishery resources and subsequent effects on Musqueam Indian Bands economic rights to marine fisheries. Changes to the abundance, distribution or quality of resources relied upon to engage in harvesting and subsistence activities.
Sense of Place and Identity	Effects on cultural heritage sites due to project construction and operation. Effects on Musqueam Indian Band's sense of place and identity as a result of: • changes to valued places and place characteristics from increases in marine traffic, noise disturbances, and ecological changes; and • avoidance of the area caused by increases in marine traffic, hydrological and ecological changes, and noise disturbances. Effects on the ability to traverse to and between cultural heritage sites and other important sites to Musqueam. Effects on culturally important species, including, but not limited to Dungeness crab, white sturgeon, orca, salmon, and migratory birds. These species are important to Musqueam's cultural continuity, sense of place and identity and intergenerational knowledge transfer. Interference with Musqueam Indian Bands ability to connect with their cultural heritage due to direct and indirect project effects on fishing, ceremonies, gathering, traditional food consumption and other cultural practices. Disruption to the ability for Musqueam Indian Band to live by šxʷtəhiṁ (i.e. ways, manners, and customs) and snəẇeyəɬ (i.e. teachings received since childhood, including identity and responsibilities) Increased psychological and emotional stress due to reduced ability to access resources in a safe manner. Effects on biodiversity and traditional food species and habitats, which are incongruent with Indigenous law. Changes in the importance or value of cultural use sites and areas. Physical disturbance of cultural, heritage, archaeological, paleontological, and architectural sites, including through changes to: • physical and cultural heritage; • access to physical and cultural heritage;

	● cultural value, spirituality, or importance associated with physical and cultural heritage; and ● sacred, ceremonial culturally important places, objects, or things, including languages, stories and traditions. Visual aesthetics over the life of the project and post-project abandonment or decommissioning. Increased interruptions to knowledge transmission and lost opportunities to transmit knowledge due to the loss of access and quality of access to the area. Changes in the currency of Musqueam Indian Band knowledge from the rapid environmental change caused by project activities. Effects on culturally significant aquatic species (e.g. Dungeness crab, white sturgeon, orca, salmon, and migratory birds) and subsequent effects on cultural continuity including intergenerational knowledge transfer. Effects on traditional and rights-based activities including Sparrow fishing rights, and subsequent effects on intergenerational knowledge transfer. Effects on the use of travel ways, navigable waterways and water bodies. Effects on the cultural practice of distributing food to community members and elders. Effects on the cultural continuation of food sovereignty.
Human Health	Increased risks to human health as a result of changes in the ability of Musqueam Indian Band members to exercise their rights to make use of the Fraser River and Salish Sea for fishing, travel, harvesting, and other activities. Effects on Indigenous health due to: ● sensory disturbances due to increased noise and light levels; ● decrease in air quality due to air emissions; ● potential safety risks due to increased traffic; and ● effects of vibrations from blasting or other activities. Changes to access and stewardship of marine species and food harvesting. Effects on food harvesting and food security and subsequent effects to community health well-being. Effects on availability and quality of traditional foods. Changes to the experience when exercising an Indigenous interest, including presence of visual disturbances, changes in air quality, effects of vibrations, and acoustic disruption. Effects on human health must consider impacts on community well-being from disruptions to participating in traditional and rights-based activities as a result of the project.
Governance Role	Effects on Musqueam Indian Band's historical use and control of the Fraser River as recognized in the 1990 R. v. Sparrow decision. Compounding effects of industrial development projects, urbanization, and environmental stressors on the resources, lands, and waters. Effects of shipping traffic on Indigenous nations' ability to exercise Indigenous interests. Changes to access and stewardship of marine species and food harvesting.

	Changes to Musqueam Indian Band's ability to access locations and resources in their traditional lands and waters. Changes to Musqueam Indian Band's ability to exercise Musqueam decision-making authority within and over Musqueam territorial lands and waters more broadly, including Roberts Bank and interrelated parts of the Fraser River Estuary. Effects on biodiversity, traditional food species, and habitats, which are incongruent with Indigenous law. Changes in the ability to manage and make decisions in accordance with traditions, cultures, governance, and/or practices, now and in the future. Effects from the project and project-related mitigations and activities to Musqueam Indian Band's traditional governance protocols and relationships with neighbouring Indigenous nations.
Economic Activities	Economic losses from project effects on marine resource harvesting which effects Musqueam Indian Band's economic well-being. Effects on Indigenous and economic rights to marine fisheries and commercially licensed fishing, hunting, trapping, and gathering. Economic benefits from the project through business opportunities and employment.

13.13. Pacheedaht First Nation

Pacheedaht First Nation self-identified as a participating Indigenous nation to the EAO on November 26, 2020. The Impact Statement must include a nation-specific assessment of project effects on Pacheedaht First Nation's Indigenous interests.

Pacheedaht First Nation is currently in the B.C. Treaty negotiation process. Of the six-stage process, Pacheedaht First Nation is in stage five (Negotiation of an Agreement-in-Principle).

Pacheedaht have stated that publicly available information about their Nation is not to be used without explicit permission from Pacheedaht.

Table 13.13 Pacheedaht First Nation-Specific Potential Effects on Indigenous Interests

Preliminary Indigenous Interests	Preliminary Potential Effects
Harvesting and Subsistence Activities	Effects on Pacheedaht First Nation's right to harvest for Food, Social, and Ceremonial purposes. Effects on fish and mammals relied on by Pacheedaht could avoid the area due to the increased noise and disturbance caused by the vessels. Effects on historical and contemporary preferred harvesting sites from changes to the accessibility of culturally importance harvesting areas and sites, such as shoreline and intertidal zones within Pacheedaht First Nations' marine territory.

	Effects of increased shipping traffic on the ability for Pacheedaht First Nation to safely access harvest areas including Swiftsure Bank and the entrance to the Juan de Fuca Strait. Effects on air quality from large marine vessels' emissions predicted to be greatest within the Juan de Fuca Strait due to the longer transit time and greater average speed of ships in that segment affecting air quality in Pacheedaht's territory.
Cultural Use Sites and Areas	Effects of shipping on Pacheedaht First Nations' ability to safely access and use culturally important sites, including historic and contemporary preferred harvesting sites. This includes the accessibility and adverse effects of open water, shoreline and intertidal culturally important harvesting sites due to shipping interference with navigation, destruction of fishing gear, and wake effects. Potential for damage to Pacheedaht shoreline archaeological sites. The vast majority of Pacheedaht's archeology sites are located on the shoreline. These sites are vulnerable to changes in wave frequency, direction, and size. Wave modelling from the project's associated ships should be completed for Pacheedaht's territory and incorporated into an assessment of potential impacts to shoreline archaeological sites. Effects of shipping noise and the ability for Pacheedaht First Nations' to effectively exercise Indigenous harvesting rights.
Social and Economic Conditions	Effects of shipping on Indigenous and economic rights to marine fisheries due to proximity of shipping lanes to preferred harvesting areas, destruction of gear, and ability to safely access harvesting sites.
Indigenous Health and Well-being	Disruption to the sense of quiet that is required for harvesting that supports spiritual connection to the marine territory. Effects on Indigenous health due to changes to availability and access to marine resources and ability to harvest. Avoidance of the marine territory by Pacheedaht members due to concerns about collisions, habitat contamination, contamination of resources from discharges and spills. Effects on Pacheedaht First Nation's cultural and spiritual well-being due to project effects on culturally important marine species, especially orcas due to the interconnections to Pacheedaht traditions, cosmology, and mythology.
Cultural Continuation	Effects of shipping activities on the interruption of intergenerational transmission of Indigenous knowledge and language by interfering with Pacheedaht's ability to be safely on the water with elders and children, including the transmission of resource management, culture, teachings and harvesting. Effects on Pacheedaht First Nation culture and traditions linked to the well-being and survival of many marine species especially orcas, which are central to cultural practices and interconnected within Pacheedaht First Nation cosmology and mythology. Potential impacts on humpback whales and Steller sea lions. Both species are of great cultural and spiritual importance to Pacheedaht. Effects of increased shipping on Pacheedaht First Nation culture due to the adverse effects on marine mammal populations from ship strikes and interference of foraging behaviour.

	Risk of vessel strikes and disturbance to marine birds from marine shipping associated with the project. There are numerous species of marine birds of great cultural significance to Pacheedaht in the vicinity of the shipping lanes. Effects on Swiftsure Bank and subsequent effects on Pacheedaht First Nation member identity as Swiftsure Bank is central to who Pacheedaht First Nation are as a people. Noise interference on Pacheedaht First Nation's spiritual connection to their marine territory.
Indigenous Governance Systems	Effects of increased shipping on Pacheedaht First Nations' ability to govern and safely access Indigenous marine territory and resources including Swiftsure Bank. Effects on Pacheedaht First Nations' ability to exercise Indigenous rights in their marine territory including governing and harvesting for Food, Social and Ceremonial, cultural, and economic purposes, and cultural rights related to knowledge transmission and language.

13.14. Pauquachin First Nation

Pauquachin First Nation self-identified as a participating Indigenous nation to the EAO on December 14, 2020. The Impact Statement must include a nation-specific assessment of project effects on Pauquachin First Nation's Indigenous interests.

Pauquachin is one of four of the W̱SÁNEĆ First Nations who occupied and utilized lands, waters and resources around the Saanich Peninsula, the southern Gulf Islands, Point Roberts and San Juan Islands. Stemming from their use and occupation of these areas, Pauquachin has constitutionally protected Douglas treaty rights and Aboriginal rights.

Table 13.14 Pauquachin First Nation-Specific Potential Effects on Indigenous Interests

Preliminary Indigenous Interests	Preliminary Potential Effects
Harvesting Rights	Effects on the ability for Pauquachin First Nation to exercise their Indigenous and Douglas Treaty rights including the right to harvest. Effects on marine ecosystem and species health due to the introduction of invasive species from ships and the subsequent effects on the ability for Pauquachin First Nation members to exercise Indigenous and Treaty rights.
Cultural Heritage	Effects of increased shipping traffic and project construction on Pauquachin First Nation's ability to safely access important cultural, heritage and harvesting sites.

Social and Human Health	Effects of shipping on Pauquachin First Nation's ability to safely navigate waterways. Effects on physical and mental health.
Economic Activities	Effects of shipping on Pauquachin First Nation's economic interests. Economic benefits derived from training, job, and business opportunities.
Stewardship and Governance	Effects on the ability for Pauquachin First Nation's ability to exercise their Indigenous and Douglas Treaty rights including governance rights.

13.15. Popkum First Nation

The Impact Statement must include a nation-specific assessment of project effects on Popkum First Nation's Indigenous interests.

Table 13.15 Popkum First Nation-Specific Potential Effects on Indigenous Interests

Preliminary Indigenous Interests	Preliminary Potential Effects
Harvesting and Subsistence Activities	Effects on fish and fish habitat. Adverse environmental impacts (including but not limited to impacts to fish and fish habitat).
Cultural Use Sites and Areas	Adverse impacts of accidents and malfunctions on water, land, environment (wildlife), cultural heritage sites, etc. Increased traffic.
Social and Economic Conditions	Requirement for Indigenous monitors for during and after construction of the project.
Indigenous Health and Well-being	Cumulative effects as they relate to climate change. Cumulative effects of the project taking place around the Fraser River.
Indigenous Governance Systems	Adverse impacts to Popkum's ability to exercise its Aboriginal rights, including harvesting rights.

13.16. Sc'ianew (Beecher Bay) First Nation

Sc'ianew First Nation self-identified as a participating Indigenous nation to the EAO on November 27, 2020. The Impact Statement must include a nation-specific assessment of project effects on Sc'ianew First Nation's Indigenous interests.

Table 13.16 Sc'ianew First Nation-Specific Potential Effects on Indigenous Interests

Preliminary Indigenous Interests	Preliminary Potential Effects
Harvesting and Subsistence Activities	Effects of underwater noise on SRKW. Effects on water quality and aquatic and marine ecosystem health and the subsequent effects on the ability for Sc'ianew First Nation to exercise Indigenous and Treaty rights including the right to harvest for Food, Social, and Ceremonial purposes. Effects of project construction and operations on Fraser River species including Sockeye, Chinook and Coho salmon and subsequent effects on Sc'ianew First Nation rights to harvest. Effects of the project on birds, shellfish, marine mammals, wildlife, the propagation of invasive species, overall ocean health and the subsequent effects to Sc'ianew First Nation resources and ability to exercise their Indigenous and Treaty rights. Effects from construction materials and waste discharge being released into the marine environment.
Cultural Use Sites and Areas	Changes to ability to harvest resources for cultural and traditional activities. Cultural impacts should be broadened from impacts to particular cultural sites, objects and activities. Impacts to the environment and resources within Sc'ianew territories impact Sc'ianew culture as a whole.
Social and Economic Conditions	Economic benefits deriving from training, job, and business opportunities.
Indigenous Health and Well-being	Effects on Sc'ianew First Nation members' health and safety including physical and mental health. Effects from potential vessel collisions, or containers falling overboard. Effects from construction materials and waste discharge being released into the marine environment.
Cultural Continuation	Changes to ability to harvest resources for cultural and traditional activities. Interference to cultural practices and traditions due to adverse effects on the ocean and marine resources.

Indigenous Governance Systems	Effects of shipping traffic on Sc'ianew First Nation's ability to exercise Indigenous and Treaty rights. Effects of project activities and increased shipping on Sc'ianew First Nation's ability to safely access Sc'ianew First Nation's marine territory. Effects from GHG emissions on Indigenous stewardship activities.

13.17. Seabird Island Band

The Impact Statement must include a nation-specific assessment of project effects on Seabird Island Band's Indigenous interests.

Table 13.17 Seabird Island Band-Specific Potential Effects on Indigenous Interests

Preliminary Indigenous Interests	Preliminary Potential Effects
Harvesting and Subsistence Activities	Effects on salmon returns, which is a traditional food for Seabird Island. Effects on marine life due to noise; exhaust; ballast/bilge water, and potential spills, which in turn would affect the health and wealth of traditional food fisheries and the ecosystem that sustains the salmon and its food sources. Concerns about the project's contribution to the cumulative effects of development on the Fraser River food fishery, with key species being eulachon, sockeye and spring (chinook) salmon, and sturgeon.
Social and Economic Conditions	Concerns about the impacts to Indigenous businesses and whether the proponent intends to set aside contracts for Indigenous businesses.

13.18. Semiahmoo First Nation

The Impact Statement must include a nation-specific assessment of project effects on Semiahmoo First Nation's Indigenous interests.

Table 13.18: Semiahmoo First Nation-Specific Potential Effects on Indigenous Interests

Preliminary Indigenous Interests	Preliminary Potential Effects

Harvesting and Subsistence Activities	Effects of the project on Indigenous rights to harvesting enshrined in historical and modern treaties and the Constitution. Effects on harvesting for Food, Social, and Ceremonial purposes. Effects on historical and contemporary preferred harvesting sites and accessibility of culturally important harvesting sites. Changes to the abundance, distribution or quality of resources relied upon to engage in harvesting and subsistence activities. Effects of the project on current and future availability, quality and quantity of traditional foods. The Impact Statement must also consider effects on Indigenous interests relating to Harvesting and Subsistence Activities identified by Semiahmoo Alliance listed in the rows below. Effects of developments limiting access to traditional fishing activities for Semiahmoo fishers in the surrounding area. Project effects on shellfish contamination.
Cultural Use Sites and Areas	Effects of project activities on the cultural and ceremonial use of areas in and around the project area. Physical disturbance of cultural, heritage, archaeological, paleontological, and architectural sites, including through changes to: ● physical and cultural heritage; ● access to physical and cultural heritage; ● cultural value, spirituality, or importance associated with physical and cultural heritage; and ● sacred, ceremonial culturally important places, objects, or things, including languages, stories and traditions. Visual aesthetics over the life of the project and post-project abandonment or decommissioning. Effects of increased marine traffic on the access and use of culturally important marine environments. Effects of the project on the use of travel ways, navigable waterways, and water bodies. Interests relating to Cultural Use Sites and Areas identified by Semiahmoo First Nation listed in the rows below. Effects on archaeological and cultural sites due to foreshore erosion. Effects of wave and tidal action, and currents.
Cultural Continuation	Increased disruption to the protection, and persistence of Indigenous culture. Effects on the cultural practice of distributing food to community members and elders. Effects of project activities on the interruption of intergenerational transmission of Indigenous knowledge. Changes to ability to fish, hunt, trap and gather for cultural or ceremonial activities and practices.

	Effects on the cultural continuation of food sharing. Effects on Indigenous culture and teachings linked to the health and persistence of culturally important species, including SRKW.
Indigenous Governance Systems	Effects of project related shipping traffic on Indigenous interests. Effects on Indigenous nations' ability to govern and safely access Indigenous marine territory. Changes in the ability to manage and make decisions in accordance with traditions, cultures, governance and/or practices, now and in the future. Effects on Indigenous nations' ability to practice Indigenous law.
Economic Activities	Effects on Indigenous and economic rights to marine fisheries and commercially licensed fishing, hunting, trapping and gathering. Economic losses from project effects on harvesting. Economic benefits from the project through business opportunities and employment.
Indigenous Health and Well-being	Changes to the experience when exercising an Indigenous interest, including presence of visual disturbances, changes in air quality, effects of vibrations, and acoustic disruption.

13.19. Shxw'ow'hamel First Nation

The Impact Statement must include a nation-specific assessment of project effects on Shxw'ow'hamel First Nation's Indigenous interests.

13.20. S'ólh Téméxw Stewardship Alliance

The S'ólh Téméxw Stewardship Alliance self identified as a participating Indigenous nation to the EAO on December 4, 2020. The Impact Statement must include an aggregate assessment of project effects on the Indigenous interests of member Indigenous nations of the S'ólh Téméxw Stewardship Alliance: Aitchelitz First Nation, Shxwhà:y Village, Skowkale First Nation, Soowahlie First Nation, Sq'éwlets, Squiala First Nation, Tzeachten First Nation, Yakweakwioose First Nation, Kwaw'Kwaw'Apilt First Nation, Scowlitz First Nation, Skawahlook (Sq'ewá:lxw) First Nation, Skwah First Nation, Sumas First Nation, and Yale First Nation.

S'ólh Téméxw Stewardship Alliance have stated:

"Today, in continuity with thousands of years of history, the Stó:lō (People of the River) occupy and use S'ólh Téméxw, the lower Fraser River watershed of southwestern British Columbia. As Halq'eméylem-speaking Coast Salish people, Stó:lō are culturally and familially tied to many Coast Salish Tribes, and families. Stó:lō are interconnected with the land and resources of S'ólh Téméxw, culturally spiritually, physically, psychologically, and economically. They maintain a long-standing and deep-seated relationship with, defense

and protection of, and continued management and use throughout their territory, S'ólh Téméxw. Stó:lō occupation of S'ólh Téméxw extends back thousands of years, to time immemorial."

Table 13.20 S'ólh Téméxw Stewardship Alliance-Specific Potential Effects on Indigenous Interests

Preliminary Indigenous Interests	Preliminary Potential Effects
Harvesting and Subsistence Activities	Effects of the project on Indigenous rights to harvesting enshrined in historical and modern treaties and the Constitution. Effects on harvesting for Food, Social, and Ceremonial purposes. Effects on historical and contemporary preferred harvesting sites and accessibility of culturally important harvesting sites. Changes to the abundance, distribution or quality of resources relied upon to engage in harvesting and subsistence activities. Effects of the project on current and future availability, quality and quantity of traditional foods. The Impact Statement must also consider effects on Indigenous interests relating to Harvesting and Subsistence Activities identified by the S'ólh Téméxw Stewardship Alliance listed in the rows below. Project effects on fish and fish habitat, other marine and aquatic species, and habitat. Effects of the project on migratory bird harvesting.
Cultural Use Sites and Areas	Effects of project activities on the cultural and ceremonial use of areas in and around the project area. Cumulative effects on the Southern Resident Killer Whale, to which the S'ólh Téméxw Stewardship Alliance member First Nations have a significant cultural connection. Assess linkages between various project activities and cultural values and spiritual activities.
Economic Activities	Effects on Indigenous and economic rights to marine fisheries and commercially licensed fishing, hunting, trapping and gathering. Economic losses from project effects on harvesting. Economic benefits from the project through business opportunities and employment.
Indigenous Health and Well-being	Changes to the experience when exercising an Indigenous interest, including presence of visual disturbances, changes in air quality, effects of vibrations, and acoustic disruption. Effects on Indigenous health due to: • changes in harvesting and subsistence activities; • changes in air quality and water quality; and • effects of vibrations and acoustic disturbance.

13.21. Songhees Nation

The Impact Statement must include a nation-specific assessment of project effects on Songhees Nation's Indigenous interests.

13.22. Squamish Nation

The Impact Statement must include a nation-specific assessment of project effects on Squamish Nation's Indigenous interests.

13.23. Tsartlip First Nation

The Impact Statement must include a nation-specific assessment of project effects on Tsartlip First Nation's Indigenous interests.

13.24. Tsawout First Nation

The Impact Statement must include a nation-specific assessment of project effects on Tsawout First Nation's Indigenous interests.

Tsawout wants an assessment of the project in the context of the existing cumulative impacts on their interests and considering future projects in the region.

13.25. Tsawwassen First Nation

Tsawwassen First Nation self-identified as a participating Indigenous nation to the EAO on November 27, 2020. The Impact Statement must include a nation-specific assessment of project effects on Tsawwassen First Nation's Indigenous interests.

Tsawwassen First Nation is a modern treaty nation and entered into a tri-partite agreement with Canada and British Columbia in 2007, known as the Tsawwassen First Nation Final Agreement (the Treaty). The Treaty recognized and affirmed Tsawwassen First Nation's land and self-government rights. The Tsawwassen First Nation assessment must meet Treaty commitments and uphold the spirit and intent of Treaty. The proponent must work with Tsawwassen First Nation and provincial and federal governments to ensure that:

- Tsawwassen First Nation has an opportunity to comment on the project's scope, environmental effects, mitigation measures, and implementation of follow-up programs; and
- comments provided by Tsawwassen First Nation are given full and fair consideration prior to any decision being made to which Tsawwassen First Nation's comments pertain.

The Agency and the EAO, together with Tsawwassen First Nation, are in conversations to implement a Tsawwassen-led impacts to rights assessment.

For this purpose, Tsawwassen First Nation is developing a methodology that would allow the Nation to work with the proponent during the Impact Statement Phase where the assessment considers not only the impacts to biophysical value components related to the Nation's interests, but also considers Tsawwassen's culture and traditional way of life. Tsawwassen First Nation recommends assessing the project through their four pillars of life, as they provide a clear understanding of Tsawwassen First Nation's concerns for potential project effects on Tsawwassen First Nation's rights and interests:

- Pillar 1: Social and Human Health;
- Pillar 2: Harvesting Rights;
- Pillar 3: Cultural Heritage;
- Pillar 4: Stewardship and Governance.

Table 13.25 Tsawwassen First Nation-Specific Potential Effects on Indigenous Interests

Preliminary Indigenous Interests	Preliminary Potential Effects
Harvesting Rights	Effects on habitats, biofilm, eelgrass, marine resources (e.g. crabs, migratory birds, salmon, eulachon, sturgeon), SRKW, wildlife and plants and subsequent effects on the ability for Tsawwassen First Nation members to exercise their Aboriginal and Treaty rights. Effects on Tsawwassen First Nation Treaty rights and culture, including right to fish and harvest crab, migratory birds, wildlife, and plants. Continued decrease in the salmon population and effects on other species that have social, cultural, and ceremonial values to members (e.g. SRKW). Effects on native plants and species that Tsawwassen First Nation members harvest for traditional medicine due to invasive species being brought into the area from traveling ships. Effects of increased road and marine traffic on Tsawwassen First Nation's ability to access land and marine areas to gather for Food, Social and Ceremonial purposes. Effects of the project on Indigenous rights to harvesting enshrined in historical and modern treaties and the Constitution. Effects on Indigenous and economic rights to marine fisheries and commercial fishing, hunting, trapping and gathering. Effects of the project on current and future availability, quality, and quantity of traditional foods.
Cultural Heritage	Effects on Tsawwassen First Nation heritage, culture, sense of identity, Indigenous knowledge transfer and its subsequent negative effects on future generations. Effects on Tsawwassen First Nation's archaeological, paleontological, architectural, heritage and cultural interests.

	Effects on Tsawwassen First Nation Treaty rights and culture, including right to fish and harvest crab, migratory birds, wildlife and plants. Changes to the ability of Tsawwassen First Nation to teach its language and sustain its cultural practices resulting from a loss of or decreased ability to access Tsawwassen Territory and sea. Effects on the intergenerational transfer of knowledge due to potential changes to important geographical features associated with important həm̓ q̓ əmiṅ əm̓ place names. Effects on the interruption of intergenerational transmission of Indigenous knowledge. Effects on community culture linked to the well-being and survival of culturally important species, including SRKW and salmon. Effects of increased shipping on the access and use of culturally important marine environments. Changes in the importance or value of cultural use sites and areas. Effects on the cultural practice of distributing food to community members and elders. Effects on the use of travel ways, navigable waterways and water bodies. Effects on the cultural continuation of food sovereignty. Physical disturbance of cultural, heritage, archaeological, paleontological, and architectural sites, including through changes to: ● physical and cultural heritage; ● access to physical and cultural heritage; ● cultural value, spirituality, or importance associated with physical and cultural heritage; and ● sacred, ceremonial culturally important places, objects, or things, including languages, stories and traditions. Visual aesthetics over the life of the project and post-project abandonment or decommissioning.
Social and Human Health	Effects on food sovereignty resulting from decreased ability to access fishing and harvesting areas. Effects on community health as a result of visual disturbance from project construction and operation. Effects on Tsawwassen First Nation members' knowledge and language about their home and subsequent effects on community members' spiritual and cultural well-being. Changes to the community use and experience on Tsawwassen First Nations Treaty Lands due to potential health effects as a result of increased pollution derived from the project. Changes to the experience when exercising rights, including presence of visual disturbances, changes in air quality, effects of vibrations, and acoustic disruption. Effects to food security due to reduced ability to access fishing and harvesting sites, limiting community harvesting for food, social, ceremonial and economic purposes. Effects on current and future availability and quality of traditional foods and subsequent health effects. Effects on Indigenous health due to:

	• changes in the quality and quantity of harvested resources, including perceived changes; • changes in air quality and water quality; • effects of vibrations and noise disturbances; and • changes to access and stewardship of marine species and food harvesting. Human Health Impact Assessment for Tsawwassen Members using a holistic health approach with a focus on Indigenous determinants of health.
Economic Activities	Effects on Tsawwassen First Nation's traditional economies and overall socio-economic indicators resulting from changes to road and marine traffic, access to land, population growth, residential development and cost of living. Economic losses from project effects on marine resource harvesting including crab. Economic benefits from the project through business opportunities and employment.
Stewardship and Governance	Effects on Tsawwassen First Nation's self-governance and stewardship interests, and Tsawwassen First Nation laws. Effects of shipping traffic on Tsawwassen First Nation's ability to exercise Indigenous interests, including the ability to safely access harvesting areas. Effects of the project that contribute to or detract from reconciliation. Changes in the ability to manage and make decisions in accordance with traditions, cultures, governance and/or practices, now and in the future. Effects on Tsawwassen First Nation's ability to practice Tsawwassen law. Effects on Tsawwassen First Nation's ability to practice self-determination. Effects on Tsawwassen First Nation's ability to implement the Treaty.

13.26. Tseycum First Nation

The Impact Statement must include a nation-specific assessment of project effects on Tseycum First Nation's Indigenous interests.

13.27. Tsleil-Waututh Nation

The Impact Statement must include a nation-specific assessment of project effects on Tsleil-Waututh Nation's Indigenous interests.

Tsleil-Waututh Nation have advised the following references should be used in assessing project impacts on their interests:

- Tsleil-Waututh Nation Stewardship Policy, which outlines Tsleil-Waututh's stewardship laws and requirements for meaningful consultation with Tsleil-Waututh. Specific parts of the Tsleil-Waututh Stewardship Policy relevant to the Impact Assessment, include for the project to:

- demonstrate that it can contribute to the restoration of the natural and cultural health of the Tsleil-Waututh Nation's territory;
- demonstrate that it will provide more positive than negative social impacts for Tsleil-Waututh people; and
- collect and share Tsleil-Waututh knowledge to be meaningfully use it to scope and assess impacts;

- Tsleil-Waututh Nation Climate Change Vulnerabilities Report.

Table 13.27 Tsleil-Waututh Nation-Specific Potential Effects on Indigenous Interests

Preliminary Indigenous Interests	Preliminary Potential Effects
Harvesting and Subsistence Activities	Existing cumulative effects leading to loss and degradation of biodiversity and traditional food species. Effects of increased marine shipping on Tsleil-Waututh Nation members' ability to travel in small vessels in relation to subsistence travel. Effects on Indigenous community-based fishing at the mouth of, and on the Fraser River. Effects of increased levels of marine shipping activity could change accessibility for Tsleil-Waututh Nation to the mouth of the Fraser including access to important fishing and crab harvesting sites. Effects on fish populations (especially salmon), in relation to Tsleil-Waututh Nation's ability to harvest these resources and the Nation's environmental remediation programs aimed at restoring these resources (especially herring, sturgeon and eulachon). Effects of the project on other traditional foods including crab, shellfish, particularly clams, and marine birds, particularly ducks.
Cultural Use Sites and Areas	Effects on tangible and intangible cultural heritage.
Cultural Continuation	Effects on food sovereignty including on Tsleil-Waututh Nation cultural and ceremonial activities since salmon, crab, clams, herring and birds are central to such activities. Effects on cultural transmission, including on harvesting and preparing of traditional foods as the primary context for such cultural transmission. Effects on community, culture and teachings that are linked to the well-being, health and survival of the SRKW.
Indigenous Governance Systems	Project interactions with the conditions set by Tsleil-Waututh Nation's Stewardship Policy. Effects on Tsleil-Waututh Nation laws.

Economic Activities	Economic benefit from the lands and resources of their territory.
Indigenous Health and Well-being	Effects on food sovereignty. Effects of noise and light on Indigenous rights and activities. Effects on Tsleil-Waututh's cultural health including project effects on SRKW and other marine mammals. Effects of increased emissions from marine vessels, cargo handling, and vehicle movements and climate change and how that would effect Tsleil-Waututh Nation rights. Effects on intangible cultural impacts. Work with Tsleil-Waututh Nation on how to adapt the health assessment beyond a human health risk assessment.

13.28. T'Sou-ke First Nation

T'Sou-ke Nation self-identified as a participating Indigenous nation to the EAO on February 24, 2021. The Impact Statement must include a nation-specific assessment of project effects on T'Sou-ke Nation's Indigenous interests.

T'Sou-ke is a member of the Te'mexw Treaty Association, which is negotiating comprehensive treaties within the British Columbia Treaty Commission. In the six-stage treaty process, negotiations are currently in the fifth stage of this process.

Table 13.28 T'Sou-ke First Nation-Specific Potential Effects on Indigenous Interests

Preliminary Indigenous Interests	Preliminary Potential Effects
Harvesting Rights	Effects of shipping on fishing/harvesting activities.
Cultural Heritage	An increase in marine shipping may impact T'Sou-ke rights in relation to navigation of the Salish Sea, stewardship of the marine environment (including over the sacred SRKWs)
Stewardship and Governance	Effects on Indigenous and Douglas Treaty rights resulting from increased project related marine shipping. Effects on T'Sou-ke Nation's rights in relation to navigation in and around the Salish Sea. Effects on T'Sou-ke Nation's stewardship of the marine environment (including the SRKW).

13.29. Ts'uubaa-asatx (Lake Cowichan) Nation

Ts'uubaa-asatx Nation self-identified as a participating Indigenous nation to the EAO on October 14, 2021. The Impact Statement must include a nation-specific assessment of project effects on Ts'uubaa-asatx Nation's Indigenous interests.

Ts'uubaa-asatx have advised that their Advocacy Policy should be reflected in the Joint Guidelines. This has been taken into account in the table below.

Table 13.29 Ts'uubaa-asatx Nation-Specific Potential Effects on Indigenous Interests

Preliminary Indigenous Interests	Preliminary Potential Effects
Harvesting and Subsistence Activities	Effects of the project on Indigenous rights to harvesting enshrined in historical and modern treaties and the Constitution. Effects on harvesting for Food, Social, and Ceremonial purposes. Effects on historical and contemporary preferred harvesting sites and accessibility of culturally important harvesting sites. Changes to the abundance, distribution or quality of resources relied upon to engage in harvesting and subsistence activities. Effects of the project on current and future availability, quality and quantity of traditional foods. The Impact Statement must also consider the following potential effects to Indigenous interests relating to Harvesting and Subsistence Activities identified by Ts'uubaa-asatx First Nation listed in the rows below. Effects on fish, fish habitat and biofilm.
Cultural Use Sites and Areas	Effects of project activities on the cultural and ceremonial use of areas in and around the project area. Physical disturbance of cultural, heritage, archaeological, paleontological, and architectural sites, including through changes to: • Physical and cultural heritage; • Access to physical and cultural heritage; • Cultural value, spirituality, or importance associated with physical and cultural heritage; and, • Sacred, ceremonial culturally important places, objects, or things, including languages, stories and traditions. Visual aesthetics over the life of the project and post-project abandonment or decommissioning. Effects of increased marine traffic on the access and use of culturally important marine environments.

	Effects of the project on the use of travel ways, navigable waterways, and water bodies. The Impact Statement must also consider the following potential effects to Indigenous interests relating to Cultural Use Sites and Areas identified by Ts'uubaa-asatx First Nation listed in the rows below. Effects of off-sets or banking on archaeological sites. Shoreline effects on marine habitats and wildlife.
Cultural Continuation	Increased disruption to the protection, and persistence of Indigenous Culture. Effects on the cultural practice of distributing food to community members and Elders. Effects of project activities on the interruption of intergenerational transmission of Indigenous knowledge. Changes to ability to fish, hunt, trap and gather for cultural or ceremonial activities and practices. Effects on the cultural continuation of food sharing. Effects on Indigenous Culture and teachings linked to the health and persistence of culturally important species, including Southern Resident Killer Whales (SRKW).
Indigenous Governance Systems	Effects of project related shipping traffic on Indigenous interests. Effects on Indigenous nations' ability to govern and safely access Indigenous marine territory. Changes in the ability to manage and make decisions in accordance with traditions, cultures, governance and/or practices, now and in the future. Effects on Indigenous nations' ability to practice Indigenous law.
Economic Activities	Effects on Indigenous and economic rights to marine fisheries and commercially licensed fishing, hunting, trapping and gathering. Economic losses from project effects on harvesting. Economic benefits from the project through business opportunities and employment. Effects economic interests associated with the project area, including exercise of the right to trade in the project area.
Indigenous Health and Well-being	Changes to the experience when exercising an Indigenous Interest, including presence of visual disturbances, changes in air quality, effects of vibrations, and acoustic disruption.

14. Effects of the Environment on the Project

The Impact Statement must consider and describe how environmental conditions could adversely affect the project and how this in turn could result in effects on the environment, health, social, economic and cultural 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:

- consider how environmental conditions, including natural hazards such as severe and/or extreme weather conditions and external events (e.g. earthquakes, flooding, drought, landslides/submarine landslides, tsunamis, volcanoes, sea-level changes, erosion, subsidence, fire, outflow conditions), could adversely affect the designated project and how this in turn could result in effects to the environment, health, social, economic and cultural conditions and impacts on Indigenous interests;
- describe how climate change might increase the likelihood (based on future climate change projections) and severity of the above-mentioned environmental conditions;
- 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;
- provide details of planning, design and construction strategies intended to minimize the potential adverse effects of the environment on the project;
- identify any areas of potential wind or water erosion;
- describe mitigation measures that can be implemented in anticipation or in preparation for effects of the environment on the project;
- describe possible mitigation measures, including environmental contingency plans, and climate risk plans to avoid or minimize the adverse environmental, health, social, cultural and economic effects resulting from effects of the environment on the project;
- describe measures to enhance positive environmental, health, social, cultural and economic effects resulting from effects of the environment on 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;

- provide a conclusion about the potential risk of an effect of the environment on the project and relevant VCs; 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* developed by Environment and Climate Change Canada.

15. Accidents and Malfunctions

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

15.1. Risk Assessment

The Impact Statement must:

- identify hazards for each project phase that could lead to accidents and malfunctions related to the project, describe the circumstances under which the accident and malfunction could occur 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);
- describe the methodology used to determine risk, and the rankings assigned for likelihood and consequence of adverse events. Assigned rankings should be accompanied by a rationale;
- describe the potential consequences (including the environmental, health, social, cultural and economic effects and on Indigenous interests) of each hazard and adverse event;
- 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;
    - influence of local and regional terrain, topography and weather conditions (e.g. difficult access for interventions);
    - modelling for any contaminants spilled or released indirectly into water or air;
    - 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;
    - potential environmental, health, social, cultural and economic effects, and effects on Indigenous interests. With respect to human health specifically, consideration should be given to potential pathways of effects associated with surface water, air, traditional foods, and other relevant media, including short-term and long-term risks to human health;

  - relative locations of sensitive receptors (e.g. humans, fish and/or wildlife and their habitat, waterways, private drinking water wells);
  - timing related to sensitive receptors (e.g. migration and nesting periods of birds, spawning periods for fish, hunting season, tourist season); and
  - 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;
- provide conclusions on the potential risks of the scenarios assessed;
- at a minimum, analyze the risks associated with the following specific incidents:
  - container falling overboard;
  - fire and explosion at the terminal and on marine vessels;
  - minor and major accidental release of fuel, or loss of dangerous goods at permanent or temporary installations during the construction and operation phases, or during maintenance operations if necessary;
  - collision, grounding, foundering and allision during the operation of marine vessels; and
  - road incidents and train derailments at the intermodal railyard;
- model the expected behaviour for spills of petroleum and hazardous and noxious substances that will be carried by vessels within the study area using information regarding physical oceanography within the study area including surface and subsurface current patterns, current velocities, waves, storm surges, longshore drift processes, wind patterns, tidal patterns, and tide levels for the site, in proximity to the site, and along the marine shipping routes with consideration of predicted climate change effects.

15.2. Mitigation

The Impact Statement must:

- describe the mitigation measures and safeguards that would be in place to reduce the likelihood and consequence of 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 and explosion/overpressure minimization);
  - these measures should reflect existing regulations and marine emergency response procedures, overseen and administered by federal and international authorities. This may include information on spill response planning and provisions;
- 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, cultural and economic and effects, including impacts on rights of Indigenous peoples, in the event of an accident or malfunction, such as emergency response and repair procedures that would be put in place;
- describe the monitoring, evaluation, adaptive management and recovery measures that would be implemented to identify, proactively avoid and manage effects to the environment and health, social, economic and cultural conditions, including effects on Indigenous peoples, from accidents and malfunctions, including those to remediate affected lands and waters;
- 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 and the time lag for mitigation to become effective.

15.3. Emergency Management

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

- identify emergency planning and and emergency response zones;
- present preliminary emergency measures and response procedures for 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);
- document spill response strategies for each type of spill scenario, including strategic locations of spill response equipment relative to likely accident and malfunction sites and/or likely pathways to sensitive environmental receptors;
- 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, including exercise and training plans for emergency response;
- 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, grounding, allision or other accidents or malfunctions associated with the project;
- describe the role of Indigenous peoples in incident prevention and response;
- describe emergency response training and exercise programs, including a description of the participation and training agreements with Indigenous nations that could be impacted by accidents or malfunctions;

- 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 peoples, and how these will be informed by the public and Indigenous nations. 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 nations;
- explain how the proponent has made and will continue to make an outreach effort to ensure public and Indigenous nations' understanding of the risks associated with this type of project (e.g. providing non-technical information, providing information in local languages if requested) volunteer management plans; and
- describe any waste management plans as it pertains to waste generated during an emergency response.

16. Marine Shipping

The movement of container ships (referred to as marine shipping incidental to the project), short sea shipping and vessel movements associated with the Tsawwassen First Nation marina are physical activities identified by the proponent that are incidental to the project, but are outside its care and control. Under the *IAA,* the proponent must provide information and conduct an assessment of the effects resulting from these three physical activities in a manner that is consistent with the assessment approach and methods outlined in section 8 of these guidelines. This information must be presented in a stand-alone report or section of the Impact Statement to facilitate the review by Indigenous nations and other participants that may primarily be affected by or concerned with marine shipping incidental to the project.

In the *Detailed Project Description*, the proponent indicated that the geographic extent of marine shipping incidental to the project may extend from GCT Deltaport through the international shipping lanes to Buoy J, which marks the western entrance to Juan de Fuca Strait from the Pacific Ocean. The proponent indicated that it was not possible to predict shipping routes for short sea shipping, as they are not clearly defined unlike shipping routes for traditional container ships. The geographic extent of vessel movements associated with the Tsawwassen First Nation marina was not described in the *Detailed Project Description*.

The Agency and the EAO have yet to determine the geographic extent of marine shipping incidental to the project, short sea shipping, and vessel movements associated with the Tsawwassen First Nation marina. In establishing the geographic extent for these physical activities, the Agency and EAO will consider comments received during the comment period, as well as comments received to date. To date, participants have indicated that the geographic extent of marine shipping incidental to the project should extend beyond the 12 nautical mile limit of Canada's territorial sea, such as to the 200 nautical mile limit of the Exclusive Economic Zone, and should also include Southern Resident Killer Whale critical habitat. The geographic extent of the assessment for these three physical activities will be outlined in the final Joint Guidelines. Once defined, the geographic extent of these three physical activities will be referred to as "the marine shipping area".

The following sections provide specific direction and outline requirements related to the assessment of the effects of marine shipping incidental to the project, short sea shipping and vessel movements associated with the Tsawwassen First Nation marina, and must be included in the Impact Statement in addition to the requirements outlined in section 8.

16.1. Description of Incidental Activities

In addition to the activities related to the construction and operation of the marine terminal described in section 2 - Project Description, the Impact Statement must include a detailed description of the marine shipping incidental to the project, short sea shipping activities and vessel movements associated with the Tsawwassen First Nation marina *within the geographic extent to be set by the Agency and EAO*.

The Impact Statement must:

- describe the type, size, weight, and capacity of vessels expected to call on the proposed project;

- describe the anticipated number, frequency, routing, speed and transit time of container ships, short sea shipping barges and tugs, and recreational/commercial vessels associated with the Tsawwassen First Nation marina;
- describe anticipated increases to traffic along the shipping routes and short sea shipping routes. This analysis should include a description of the projected increase along various segments of the routes;
- describe anticipated increases to traffic as a result of vessel movements associated with the Tsawwassen First Nation marina;
- describe associated activities such as ballasting, anchorage, maneuvering, loading, bunkering and fuel types used, pilotage, and tugboat escort, and the locations of those activities; and
- describe alternatives considered, such as different routing, frequency and vessel types.

16.2. Existing Conditions

The Impact Statement must:

- describe and provide maps of the geographic setting of the marine shipping area;
- provide an overview of oceanography, including a description of the physical characteristics of all waters in the marine shipping area;
- describe the marine environments, including the type of water body and any special management areas in or near the assessment area;
- describe marine habitat use and species presence;
- identify and describe any additional federally and/or provincially listed species at risk in the assessment area;
- identify, describe and map marine habitats for areas at higher risk of environmental effects from marine shipping incidental to the project, short sea shipping and vessel movements associated with the Tsawwassen First Nation marina, and accidents and malfunctions;
- provide an overview of the existing regulatory framework and role of government including in navigation and shipping, marine traffic management, and emergency response to safety or environmental emergencies;
- describe policies, frameworks, and initiatives that influence marine shipping activities and the effects of marine shipping in the marine shipping area;
- describe the numbers, types and sizes of vessels currently operating in the region, particularly those likely to be encountered by vessels associated with the project. Variations in traffic density statistics, types of cargo, and ports of origin and destination should also be described;
- describe the type, number, and size of vessels in the territory of potentially impacted Indigenous nations;
- describe fishing activities, including:
    - Indigenous and non-Indigenous activities, as well as seasonality of these activities;
    - types, number, size and capacity of fishing vessels used in the area, gear types and existing interactions with shipping; and

    - commercial, recreational and Indigenous fisheries statistics (e.g. species, annual catch and number of licenses);
- provide maps of fishing areas in the assessment area and descriptions of their relative importance in a broader regional context (e.g. representative percentage of regional landings or economic value); and
- provide an inventory, description (including maps), and evaluation of any archaeological, cultural and historical resources, sites or practices that may be affected by the marine shipping incidental to the project.

16.3. Effects Assessment

The Impact Statement must present an assessment of the effects and cumulative effects of marine shipping incidental to the project, short sea shipping activities and vessel movements associated with the Tsawwassen First Nation marina on VCs and on Indigenous interests in a manner that is consistent with the approach and methods outlined in section 8 of these guidelines and consistent *with the geographic extent to be determined by the Agency and EAO.*

Using the approach outlined in section 7.1 of these guidelines, the proponent must identify VCs for any potential effects that may result from these three physical activities. The proponent must consider any effects whether they are adverse or positive, direct or indirect, and temporary or permanent, for all phases of the project.

At a minimum, the proponent must consider the effects on:

- Indigenous interests;
- air quality;
- atmospheric noise;
- underwater noise;
- marine water;
- light;
- wave environment;
- marine fish and fish habitat;
- marine mammals;
- birds and their habitat;
- species at risk;
- human health;
- socio-economic conditions;
- marine use; and
- archaeological and heritage resources.

The proponent may also identify additional VCs to be assessed in consultation with Indigenous nations and other participants.

In assessing the effects of these three physical activities, the proponent must describe the type, size, and capacity of the vessel used in its predictions and should base its selection on the vessels likely to call on the project. In assessing the cumulative effects of these three activities, the proponent must refer to the list of projects described in section 8.8 - Cumulative Effects Assessment.

The Impact Statement must describe the spatial boundaries of the various effects resulting from these three activities based on the approach described in section 8.3.1 of these guidelines. In determining these spatial boundaries, the proponent shall consider, but not be limited to:

- the extent of aquatic and terrestrial ecosystems, local communities, and Indigenous interests which could potentially be affected by these three activities, including potential accidents and malfunctions; and
- areas that could potentially be affected by the worst-case scenario for dispersal of marine fuel oil or other cargo, or other scenarios considered in the assessment of the potential effects related to accidents and malfunctions.

The spatial boundaries of effects may be different for each VC, and may be smaller than the marine shipping area.

The temporal boundaries for the consideration of these three activities shall be based on the approach outlined in section 8.3.2 of these guidelines.

16.4. Mitigation and Enhancement Measures

The Impact Statement must:

- describe voluntary and mandatory initiatives by the Government of Canada, the province of British Columbia, the United States of America and other parties in the mitigation and management of general effects related to marine shipping, short sea shipping, and recreational/commercial vessel movements in the Salish Sea, including details on effectiveness of such measures, length of implementation, and any expiry dates;
- describe the proponent's involvement in any such initiatives, and how they may specifically assist in the mitigation of project-specific effects;
- describe how existing initiatives can inform and focus the design of mitigation measures and/or follow-up programs;
- identify industry best practices, standards and contractual arrangements with vessel operators and the shipping industry that can be implemented by the proponent to mitigate the effects of marine shipping incidental to the project;
- describe additional mitigation measures (if known) that could be impemented by third parties to potentially further reduce the extent to which any identified project effect may be adverse; and
- describe any measures that may enhance positive effects.

The proponent is encouraged to seek input and/or work with federal and provincial governments, Indigenous nations, and other participants to identify potential mitigation measures.

16.5. Accidents and Malfunctions

In addition to the requirements set out in section 15 of these guidelines, the Impact Statement must also describe the potential for accidents and malfunctions during marine shipping incidental to the project, short sea shipping and vessel movements associated with the Tsawwassen First Nation marina *within the geographic extent to be set by the Agency and EAO in the final Joint Guidelines.*

The Impact Statement must:

- describe major commercial traffic routes, network focal points or areas where close-quarter situations and/or crossing traffic are likely to occur, and the frequency and magnitude of shipping incidents;
- describe and evaluate the potential effects on the environment of accidents and malfunctions arising from these three physical activities, including impacts on social, economic or cultural elements of the environment and human health of people in close proximity of spilled contaminants;
- where there is the potential for serious accidents or malfunctions, and the necessary data are available, conduct an assessment of the probability and consequences of such an occurrence, taking into account contributing factors such as weather or external events;
- describe the existing emergency response mechanisms and arrangements with response organizations within the spatial extent of these three physical activities, and describe what role it would play in the event of a spill, collision, grounding, container loss or other accident or malfunction at or adjacent to the marine shipping area, including any emergency spill response training and exercise regimes; 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 Environment and Climate Change Canada contained in A Field Guide to Oil Spill Response on Marine Shorelines constitutes a useful guide in this regard.

17. Road and Rail Activities

Background

The Agency and EAO are considering the geographic extent of road and rail activities that must be taken into account in the assessment of the project. Road and rail activities that take place outside of the proponent's lease boundary have been identified by the proponent as physical activities that are incidental to the project, but are outside its care and control. The proponent has indicated that it is collaborating with government, Indigenous nations, and rail companies, among others, to confirm any improvements that may be required to the road and rail network as a result of the project.

The geographic extent of road and rail traffic outside the proponent's lease boundary has yet to be determined. In establishing the geographic extent for road and rail activities, the Agency and EAO will consider comments received during the public comment period, as well as comments received to date. To date, participants have indicated that road and rail activities are critical to the operation of the project, regardless of whether they occur outside of the proponent's lease boundary. Participants stated that these activities should be included in the assessment, including a regional-scale modelling of traffic-related impacts (congestion, noise, air quality, and associated human, ecosystem health, and economic impacts). The geographic extent of the assessment for road and rail transportation activities will be outlined in the final Joint Guidelines.

17.1. Road Transportation

In its *Detailed Project Description* and proponent's memo: *Road and Rail activities incidental to the proposed GCT Deltaport Expansion Berth Four Project*, the proponent indicated that the project would result in approximately 2,900 additional truck movements per day, and 1,700 other road movements per day. The proponent stated that truck traffic leaving/arriving at Deltaport would use Highway 17 and would then branch off onto other Lower Mainland roads to their final destination or collection points. The proponent indicated that the principal routes that are expected to be utilized by truck traffic to and from Deltaport terminal are Highways 17, 99, 91, 19, 10, and 1.

The proponent indicated that although the project would increase container truck traffic by approximately 50% at Roberts Bank, project-related traffic would soon become imperceptible as project-related traffic disperses in a variety of directions, rapidly reducing to below 10% of overall relative traffic at the intersection of Highways 17 and 99. The proponent specifically noted that traffic could be expected to be imperceptible at the George Massey Tunnel during typical weekday traffic. The proponent noted that Indigenous nations and other participants such as municipalities raised concerns about the effects of increased road traffic due to the project, and some participants requested that the effects of road transportation be included in the assessment.

The Impact Statement must include a detailed description of road transportation within the geographic extent to be set by the Agency and EAO in the final Joint Guidelines. The proponent will need to conduct an assessment of effects and cumulative effects in accordance with the requirements of these guidelines. This is in addition to the activities related to truck movements at the marine terminal described in section 2 - Project Description.

17.1.1 Existing Conditions

The Impact Statement must:

- build on the information in section 2.1.2 - Onshore Components that describes the road transportation within the proponent's lease boundary. Describe the road traffic, including number, type, size and capacity of trucks including approximate timing of arrivals and departures and increases relative to existing traffic volumes on the principal routes to be taken by container truck traffic *within the geographic extent to be set by the Agency and EAO*;
- describe and provide maps of the geographic setting where project-related road transportation is expected to travel;
- provide an overview of the existing regulatory framework and role of government in traffic management; and
- include the results of a traffic study that examines the movement and potential effects of truck and other traffic on the principal routes arriving at and departing from the project.

17.1.2 Effects Assessment

The Impact Statement must present an assessment of the effects and cumulative effects of road transportation on VCs and on Indigenous interests in a manner that is consistent with the approach and methods outlined in section 8 and 12 of these guidelines, *and consistent with the geographic extent of the activity to be determined by the Agency and EAO.*

Using the approach outlined in section 7.1 of these guidelines, the proponent must identify VCs for any potential effects that may result from road transportation. The proponent must consider any effects whether they are adverse or positive, direct or indirect, and temporary or permanent, for all phases of the project.

At a minimum, the proponent must consider the effects of road transportation on:

- Indigenous interests;
- air quality;
- atmospheric noise;
- light;
- birds and their habitat;
- species at risk;
- human health;
- socio-economic conditions; and
- archaeological and heritage resources.

The proponent may also identify additional VCs to be assessed in consultation with Indigenous nations and other participants.

The Impact Statement must describe the spatial boundaries of the various effects resulting road traffic based on the approach described in section 8.3.1., *and in consideration of the geographic extent of road*

transportation to be set by the Agency and EAO. The temporal boundaries for the consideration of road transportation incidental to the project shall be based on the approach outlined in section 8.3.2 of these guidelines.

17.1.3 Mitigation and Enhancement Measures

The Impact Statement must:

- describe any voluntary or mandatory initiatives by the province of British Columbia, local municipalities, the government of Canada, or other parties in the mitigation and management of effects related to road transportation in the study area;
- describe the proponent's involvement in any such initiatives and how they may specifically assist in the mitigation of project-specific effects;
- describe how existing initiatives can inform and focus the design of mitigation measures and/or follow-up programs;
- identify industry best practices, standards and contractual arrangements with operators and the trucking industry that can be implemented by the proponent to mitigate the effects of road transportation;
- describe additional mitigation measures (if known) that could be implemented by third parties to potentially further reduce the extent to which any identified project effect may be adverse; and
- describe any measures that may enhance positive effects.

The proponent is encouraged to seek input and/or work with federal, provincial, and municipal governments, Indigenous nations, and other participants to identify potential mitigation measures.

17.1.4 Accidents and Malfunctions

The Impact statement must describe the potential for accidents and malfunctions due to road transportation, *within the geographic extent to be set by the Agency and EAO in the final Joint Guidelines*.

17.2. Rail Transportation

As stated in the *Detailed Project Description* and proponent's memo: *Road and Rail activities incidental to the proposed GCT Deltaport Expansion Berth Four Project*, the project would include the expansion of an intermodal rail yard within the proponent's lease boundary to accommodate additional rail infrastructure. The purpose of this section is to address rail transportation outside the proponent's lease boundary. The proponent identified rail transportation outside of the lease boundary as a physical activities that is incidental to the project, but outside its care and control.

The proponent indicated that all international railcars destined to or from the Deltaport terminal would travel along the Roberts Bank Rail Corridor (RBRC), from the Roberts Bank Causeway to the Mission Railway Bridge, passing the Pratt, Livingston, and Hydro rail junctions. At the Mission Railway Bridge, eastbound trains cross the Fraser River and continue their journey on Canadian Pacific Railway (CP) track to Hope, and then north

through the Fraser Canyon to Kamloops and beyond to destinations across Canada and the US Midwest. Westbound trains from Kamloops utilize the Canadian National Railway (CN) tracks on the opposite side of the river to connect onto the RBRC.

The proponent indicated that railcars servicing the Deltaport terminal do not currently follow any other route. The proponent did not provide any information on which routes railcars may take beyond Kamloops, but traffic is anticipated to disperse in various directions beyond this point given it is the site of a major junction.

The project is expected to increase rail traffic by adding an additional four trains (8 movements) over the span of approximately 30 years when nearing capacity. The proponent indicated that along the RBRC, between the Deltaport Terminal and Hydro Junction, 28% - 33% of all trains would be attributable to the project. The proponent stated that once trains arrive at or leave the CN Mainline at Hydro Junction, the percentage of trains attributable to the project would decrease dramatically as a result of the large increase in the number of trains going to and from the Thornton rail yard.

The Impact Statement must include a detailed description of rail transportation within the geographic extent to be set by the Agency and EAO in the final Joint Guidelines. The proponent will need to conduct an assessment of effects and cumulative effects in accordance with the requirements of these guidelines. This is in addition to the activities related to rail movements at the marine terminal described in section 2 - Project Description.

17.2.1 Existing Conditions

In addition to the activities related to rail movements at the onsite intermodal yard described in section 2 - Project Description, the Impact Statement must include a detailed description of rail transportation *within the geographic extent to be set by the Agency and EAO*.

The Impact Statement must:

- describe the expected rail traffic, including number, type, size, and capacity of trains, including approximate timing of arrivals and departures and increases relative to existing traffic volumes;
- describe and provide maps of the geographic setting where rail transportation is expected to travel; and
- provide an overview of the existing regulatory framework and role of government in the management of rail transportation.

17.2.2 Effects Assessment

Using the approach outlined in section 7.1 of these guidelines, the proponent must identify VCs for any potential effects that may result from rail transportation. The proponent must consider any effects whether they are adverse or positive, direct or indirect, and temporary or permanent, for all phases of the project.

At a minimum, the proponent must consider the effects of rail transportation incidental to the project on:

- Indigenous interests;
- air quality;
- atmospheric noise;

- light;
- birds and their habitat;
- vegetation and wetlands;
- wildlife;
- species at risk;
- human health;
- socio-economic conditions; and
- archaeological and heritage resources.

The proponent may also identify additional VCs to be assessed in consultation with Indigenous nations and other participants.

The Impact Statement must describe the spatial boundaries of the various effects resulting rail transportation based on the approach described in section 8.3.1 *and in consideration of the geographic extent of rail transportation to be set by the Agency and EAO*. The temporal boundaries for the consideration of rail transportation shall be based on the approach outlined in section 8.3.2 of these guidelines.

17.2.3 Mitigation and Enhancement Measures

The Impact Statement must:

- describe voluntary and mandatory initiatives by the Government of Canada, the province of British Columbia, rail companies (e.g. CN or CP), or other parties in the mitigation and management of effects related to rail transportation in southern British Columbia;
- describe the proponent's involvement in any such initiatives and how they may specifically assist in the mitigation of project-specific effects;
- describe how existing initiatives can inform and focus the design of mitigation measures and/or follow-up programs;
- identify industry best practices, standards and contractual arrangements with operators and the rail industry that can be implemented by the proponent to mitigate the effects of rail transportation;
- describe additional mitigation measures (if known) that could be implemented by third parties to potentially further reduce the extent to which any identified project effect may be adverse; and
- describe any measures that may enhance positive effects.

The proponent is encouraged to seek input and/or work with federal, provincial, and municipal governments, rail companies, Indigenous nations, and other participants to identify potential mitigation measures.

17.2.4 Accidents and Malfunctions

The Impact Statement must describe the potential for accidents and malfunctions due to rail transportation incidental to the project within the geographic extent to be set by the Agency and EAO.

18. Canada's Ability to Meet its Environmental Obligations and its Climate Change Commitments

The Government of Canada, through the IAA, 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 IAA, 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.

Federal environmental obligations relevant to this project include:

- the Convention on Biological Diversity and Canada's supporting national framework (e.g. the Canadian Biodiversity Strategy, Canada's Biodiversity Outcomes Framework and the current biodiversity goals and objectives in Canada); and legislation that supports the implementation of Canada's biodiversity commitments, including *Species at Risk Act* and the *Canada Wildlife Act*, 1985, as well as supporting 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 on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar), as implemented in part under the Federal Policy on Wetland Conservation and supporting guidance documents such as the North American Waterfowl Management Plan;
- 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 derived from bird conservation regions and strategies;
- federal environmental obligations relevant to this project that may be applicable, depending on the range of transport for emissions that is determined for the Project:
    - UNECE Protocol to Abate Acidification, Eutrophication, and Ground-level Ozone (Gothenburg Protocol); also known as the Gothenburg Protocol to Reduce Transboundary Air Pollution; and
    - The Canada-United States Air Quality Agreement.
- London Protocol on Prevention of Marine Pollution, which prohibits the disposal of wastes at sea and Part 7, Division 3 of the *Canadian Environmental Protection Act, 1999,* which prohibits disposal at sea without a permit.

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, the proponent's plans and commitments to ensure that positive contributions are respected;
- describe where the project may adversely affect Canada's ability to meet its environmental obligations, the mitigation measures and follow-up programs related to those effects; and
- describe the potential effects of the project on the province being able to meet its targets under the *Greenhouse Gas Reduction Targets Act*, now the *Climate Change Accountability Act*.

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 environmental obligations, taking into consideration proposed mitigation measures. As outlined in section 6 of the SAAC, the Government of Canada will provide supplemental analysis on the project's net GHG emissions provided in the Impact Statement, in the context of Canada's emissions targets and forecasts, including Canada's commitments under the Paris agreement, the goal for Canada to achieve net-zero emissions by 2050 and Canada's 2030 emission targets.

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*.

19. Extent to which the Project Contributes to Sustainability

Under the IAA, 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 assessment, beginning in planning phase. Information and data requirements to inform the sustainability analysis should be considered from the outset of the assessment. Paragraph 25(2)(f) of the B.C. Act requires that effects on current and future generations are considered in every assessment. The results of this analysis synthesizes all of the components of the effects assessment to provide the decision makers with greater insight into the sustainability of the project. Further guidance on how to complete an assessment on Current and Future Generations is provided in *Section 5.4 Effects Assessment Policy*.

In the Impact Statement, the sustainability analysis will consider the potential effects of a project through 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 sustainability analysis 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* and *Interim Framework: Implementation of the Sustainability Guidance*.

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 *Interim Framework: Implementation of the Sustainability Guidance* 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 nations;
- describe the project-specific context, including key issues of importance to Indigenous groups and the public that will inform the sustainability assessment;
- discuss the potential outcome that residual effects to VCs and Indigenous interests will have on both current and future generations;
- describe how input from engagement related to effects on current and future generations was incorporated and how the project has changed as a result;

- demonstrate how any strategic direction from the Province of BC regarding sustainable development was considered;
- identify any relevant regional or provincial growth strategies and describe how the project is or is not aligned with them;
- 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; and
  - 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, cultural and economic effects of the project, with emphasis on potentially affected Indigenous nations, local communities and disadvantaged populations;
- discuss the type(s) of economic growth that would be generated by the project and how this growth would be distributed, both within the population and over time;
- provide any mitigation measures proposed to more equitably distribute positive and negative effects over time (e.g. across generations); and
- indicate how monitoring, management and reporting systems consider the sustainability principles and attempt to ensure continuous progress towards sustainability.

20. Summaries

20.1. Impact Statement Summary

The proponent must include a summary of the Impact Statement. The summary must be a stand-alone, plain language summary 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, cultural and economic effects, potential adverse impacts on Indigenous peoples, proposed mitigation measures, residual effects and any required follow-up programs.

The summary provides an opportunity for the proponent to demonstrate correspondence between issues raised during the planning phase and issues addressed in the assessment. This summary should be presented by VC, which will allow 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 summary must summarize the following:

- the description of the project;
- the description of the assessment scope;
- the overview of engagement activities with Indigenous nations, the public, local governments (including regional districts), provincial and federal government agencies and stakeholders;
- the key issues raised by Indigenous nations, the public, government authorities, and other participants;
- the key effects, proposed mitigation measures, and predicted residual and cumulative effects; and
- the summary of key effects on Indigenous nations and their rights, and proposed mitigation measures.

A brief overview of the assessment approach must be provided in the summary to explain:

- regulatory requirements;
- engagement with Indigenous nations, the public, government authorities, and other participants;
- how predicted changes to elements of the environment will be described to provide information that supports the subsequent assessment of VCs; and
- the integration of overarching themes that are woven through the assessment (i.e. Sustainability, Ecosystem Approach, Culture, and Gender Based Analysis).

20.2. Summary of Biophysical Factors that Support Ecosystem Function

The intent of the section is to provide a holistic assessment of the project effects to ecosystem function recognizing the interdependence of components of an ecosystem and that impacts to specific biophysical factors within an ecosystem can have impacts to the function of the ecosystem.

The Impact Statement must consider project effects on biophysical factors that support ecosystem function based on the results of the VC assessments, including the cumulative effects assessments. The Impact Statement must:

- provide an overview of the current ecosystem function in the vicinity of the project at a landscape- and watershed level;
- identify the key biophysical factors that support ecosystem function that the project effects may interact with;
- discuss how the VC assessments and cumulative effects assessments considered effects on these biophysical factors;
- summarize the positive and negative effects, including adverse cumulative effects, on biophysical factors that support ecosystem function based on appropriate information from the VC assessments;
- identify proposed measures required to manage potential effects on biophysical factors that support ecosystem function; and
- describe any predicted changes to ecosystem function as a result of the project.

Further guidance on how to complete an assessment of biophysical factors that support ecosystem function is provided in the *EAO's Effects Assessment Policy (Appendix 1)*.

20.3. Summary of Human and Community Well-being

The intent of this section is to summarize the broad range of potential social, economic, health and cultural effects that contribute to changes in human and community well-being with the understanding that these effects can be highly dependent on each other and interrelated. These effects are also often closely intertwined with the state of and trends in the biophysical environment, which demonstrates the need to consider potential effects on human and community well-being from a holistic perspective.

The proponent must:

- provide an overview of the current state of human and community well-being in the project area from both a local and Indigenous perspective;
- summarize potential positive and negative effects including residual adverse cumulative effects of the project on human and community well-being based on the results of the VC assessments under social, economic, health and culture and the assessment of effects to Indigenous interests;

- identify how the project interacts differently with distinct human populations;
- identify if the project interacts with other factors that support human and community well-being that were not specifically assessed as part of a VC;
- identify any key measures proposed to manage potential effects on human and community well-being; and
- describe any anticipated changes to human and community well-being more generally as a result of the project.

Refer to the *Human and Community Well-being: Guidelines for Assessing Social, Economic, Cultural and Health Effects in Environmental Assessments*, for more information.

20.4. Summary of Gender Based Analysis Plus (GBA+)

The Impact Statement must assess the potential Impacts to Gender Based Analysis Plus (GBA+) in an interdisciplinary manner through all applicable VCs. The Impact Statement will provide a cross referencing linkage and summary table, directing reviewers to specific locations in the Impact Statement where this topic is discussed in greater detail.

20.5. Summary Tables

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

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

The table of mitigation measures for potential project effects must be by project phase and indicate where the mitigation would be housed, including the proponent's proposed commitments and requirements associated with permitting authorizations. This table will be used by the EAO during issues resolution, in updating the *Joint Permitting Plan / Regulatory Coordination Plan* to describe how issues are being addressed in the assessment or could be further addressed in permitting, and in the development of the draft provincial environmental assessment certificate including proposed conditions.

Appendix 1 - Valued Components, Elements and Spatial Boundaries Proposed by the Proponent

Candidate Valued Components

This appendix presents the VCs proposed by the proponent to focus the assessment. The proponent has also chosen to describe pathways of effects using the term “elements”. This list from the proponent with additions from the Agency and EAO is mainly reflected in sections 9 to 0 of the Joint Guidelines, which constitute the minimum requirements for the assessment. Following the comment period, as appropriate, the Agency and EAO will include a list of components raised by participants to be considered by the proponent in the final selection of VCs for the assessment. The candidate VCs proposed by the proponent are provided in Table A1. 1.

Table A1. 1 Proponent valued components selection

Valued Components	Subcomponents	Topics to be Captured by the Assessment
Marine Fish and Habitat	• Eelgrass • Biofilm • Other marine vegetation • Benthic infauna • Benthic epifauna (e.g. crabs) including habitat forming invertebrates	• Saltmarsh/brackish marsh • Eelgrass abundance, productivity and fish usage • Macroalgae abundance, productivity and fish usage • Biofilm distribution and quality • Species at risk • Invasive/non-native species • Other species of management concern • Traditional use species • Commercial use species
	• Salmon • Demersal fish • Forage fish (e.g. sand lance, surf smelt, herring, eulachon, etc.)	• Underwater noise • Increased/change in light on predator-prey dynamics • Fish habitat preferences • Species at risk • Other species of management concern • Traditional use species • Invasive species • Accidents and malfunctions
Marine Mammals	• Low Frequency Cetaceans (e.g. humpback whales) • Mid Frequency Cetaceans (e.g. Southern Resident killer whales) • High Frequency Cetaceans (e.g. harbour porpoise) • Ottariids (e.g. Steller sea lion) • Phocids (e.g. harbour seal) • Mustelids (e.g. sea otter)	• Species at risk • Underwater noise • Collision risk • Important habitats • Critical habitats

Valued Components	Subcomponents	Topics to be Captured by the Assessment
Birds	• Shorebirds • Coastal Waterbirds • Marine Birds • Great Blue Heron	• Current relative abundance, spatial and temporal distribution • Species of concern or importance • Migratory and overwintering birds • Species at risk • Traditional use species
Employment and Economy	• Employment	• Changes in availability of/access to jobs and training • Availability of contracting opportunities • Changes in labour income • Access to economic opportunities/economic equity • Upward pressure on local wages • GBA+ considerations
	• Economy	• Tax revenues and government expenditures • GDP contributions • Changes in business opportunities and revenue • Land and resource valuations • Cost of living • GBA+ considerations
Land and Resource Use	• Private property uses	• Use and enjoyment of private property • Potential effects on productivity of agricultural land or associated farming operations • Other tenured, permitted, or licensed land uses • Cultural considerations
	• Public land and resources	• Agriculture • Tourism • Cultural considerations • GBA+ considerations

Valued Components	Subcomponents	Topics to be Captured by the Assessment
Marine Use	• Navigation	• Effects on marine navigation • Interference with marine safety • Shipping lanes • Commercial and recreational marine traffic • Marine transportation schedules
	• Tenured marine use	• Ability of licensed tenure-holders to operate or otherwise conduct activities
	• Public marine use	• Consumptive marine uses (i.e. fishing, harvesting shellfish and vegetation gathering) • Ability to participate in non-consumptive marine uses/recreation (i.e. boating, and windsurfing) • Ability to access and use the marine environment (including marine protected areas) • Marine tourism opportunities • Cultural dimensions related to sharing family values and enhance life skills (i.e. marine-based food gathering and recreational activities) • Enhanced sense of belonging to the West Coast culture • Strengthening connections to nature and unique West Coast marine life (i.e. SRKW) • Cultural considerations • GBA+ considerations.
Infrastructure and Services	• Infrastructure and Community Services	• Access to any of the following: • Emergency response services • Domestic water supply • Sewage and water treatment facilities • Landfills and recycling facilities • Community recreational facilities

Valued Components	Subcomponents	Topics to be Captured by the Assessment
		• Educational services and facilities, including daycare • Other public and private sector services • Access, availability, and demand for affordable housing • GBA+ considerations
	• Transportation infrastructure	• Transportation services and the public's ability to travel • Changes in access to critical infrastructure • Movement of essential goods and services during construction • SDH considerations related to the built environment and healthy activities (i.e. bikeways, foot paths, etc.) • GBA+ considerations
	• Health and Social Services	• Access to health and social services and facilities (i.e. community services, education, family services, etc.) • Changes in demand for housing and accommodation • Cultural considerations • GBA+ considerations
Social Determinants of Health (SDH)	• Lifestyle factors/healthy behaviour	• Stress and anxiety over a disruption of sleep due to overexposure to noise, vibration and light. • Stress and anxiety, feeling unsafe due to detours and roadblocks and exposure to dust. • Mental health and connecting with nature/physical environment • Increase in unhealthy behaviours (i.e. alcohol, smoking) due to project induced stress • GBA+ considerations
	• Social and Community Factors	• Access to neighbours or neighbourhoods, community amenities, and areas for recreation and social interactions • Disruption of outdoor social gatherings or events due to noise or light

Valued Components	Subcomponents	Topics to be Captured by the Assessment
		• Changes in lifestyle as a result of a change in access to or opportunities for active living or routine activities; • Changes in the built environment and implications to safety and mobility (i.e. bike paths, trails etc. that enhance public safety or social interactions • Potential implications for culture (i.e. intergenerational relationships/knowledge) • GBA+ considerations
	• Livelihood factors	• Changes in income level impacting lifestyle and quality of life • Access to resources that act as sources of household sustenance • Changes in employment, economic or other livelihood opportunity(ies) • GBA+ considerations
Human Health	• Emissions Human Health Risk Assessment	• Air quality • Noise • Soil quality • Quality and quantity of traditional foods
	• Noise and Vibration Human Health Risk Assessment	• Air quality • Noise
	• Marine shellfish tissue assessment and human health risk assessment	• Quality and quantity of traditional foods
Archaeological and Heritage Resources	•	• Specific to an Indigenous nation's interests
Indigenous Nation identified VC	• To be determined	• To be determined

Table A1. 2 Elements selection

Element	Sub-Element	Topics to be Captured by the Assessment
Air Quality	Air Quality	Increase in: • Criteria Air Contaminants, including NOx, SO2, suspended particulate matter (PM), and CO • Volatile Organic Compounds (VOCs), including acrolein, benzene, 1,3-butadiene, acetaldehyde, formaldehyde, naphthalene, ethylbenzene, polycyclic organic matter (POM) • Other air pollutants, including diesel particulate matter, black carbon
Atmospheric Noise	Atmospheric Noise	• Increase in environmental noise levels including daytime, nighttime, low frequency, and percent highly annoyed
Underwater Noise	Underwater Noise	• Pile driving • Marine Transportation
Marine Water and Sediment Quality	Marine Water Quality	• Contaminants • Nutrients • Total Suspended Solids • Turbidity • Salinity • Flow
Marine Water and Sediment Quality	Marine Sediment Quality	• Sediment disturbance • Sediment quality: carbon, nutrients, metals, organic compounds (i.e. PCBs, PBDEs, and PAHs)
Coastal Geomorphology (Note: Includes Hydrology)	Coastal Geomorphology	• Waves (model) • Ocean Currents (model) • Morphodynamics (survey)
Light	Light trespass Sky glow	• Existing light levels • Sky quality levels • Light fixture photometric data from manufacturers

Element	Sub-Element	Topics to be Captured by the Assessment
Visual Resources	Visual resources	• Changes to visual resources affecting the public's ability to enjoy or appreciate view-scapes • Potential tourism impacts arising from "spoiled views"

Table A1. 3 Rationale for inclusion as element rather than valued component

Element	Rationale for not including as a VC
Air Quality	Assessed via pathway to Human Health
Acoustic	Assessed via pathway to Marine Birds and Human Health
Underwater Noise	Assessed via pathway to Marine Fish and Habitat, Marine Mammals, and Birds
Visual Resources	Assessed via pathway to Land and Resource Use, Marine Use, and Social Determinants of Health
Marine Water Quality Marine Sediment Quality	Assessed via pathway to Marine Fish and Habitat, Marine Mammals, Birds, Marine Use, and Human Health
Coastal Geomorphology	Assessed via pathway to Marine Fish and Habitat, Birds, and Archaeological and Heritage Resources

Figure 2 VC/Element linkage matrix

		Element							Valued Component										
	An 'x' indicates that the subject in the row informs the subject in the column	Air Quality	Atmospheric Noise	Underwater Noise	Marine Water and Sediment Quality	Coastal Geomorphology (incl. hydrology)	Light	Visual Resources	Marine Fish and Habitat	Marine Mammals	Birds	Employment and Economy	Land and Resource Use	Marine Use	Infrastructure and Services	Social Determinants of Health	Human Health	Archaeological and Heritage Resources	Indigenous Nation identified VCs
Element	Air Quality																x		
	Atmospheric Noise										x			x			x		
	Underwater Noise								x	x	x								
	Marine Water and Sediment Quality								x	x	x			x			x		
	Coastal Geomorphology								x		x							x	
	Light							x	x		x		x	x		x			
	Visual Resources												x	x		x			
Valued Component	Marine Fish and Habitat									x	x			x		x	x		
	Marine Mammals													x		x			
	Birds												x	x		x			
	Employment and Economy												x	x		x			
	Land and Resource Use													x	x	x		x	
	Marine Use														x	x	x		
	Infrastructure and Services															x	x	x	
	Social Determinants of Health																x		
	Human Health																		
	Archaeological and Heritage Resources															x			
	Indigenous Nation identified VCs																		

The proponent described changes to the physical environment in the context of elements. The proponent proposed that elements would be used to inform the assessment of effect to VCs as shown in the figure above. There are also interrelationships between VCs that are also shown with the subject in the row informing the subject in the column when an “X” is identified.

Spatial Boundaries

Table A1. 4 and Table A1. 5 reflect the spatial boundaries proposed by the proponent for the elements and valued components the proponent identified in Table A1. 1 and Table A1. 2. The spatial boundaries presented below do not represent the final spatial boundaries that will be described in the Impact Statement and used in the assessment. *The Agency and the EAO are seeking comments on the spatial boundaries that should be used in the assessment, including the information provided by the proponent in the tables below. The final spatial boundaries will be determined with input from Indigenous nations, the public, government authorities, and other participants.*

Table A1. 4 Spatial boundaries for elements proposed by the proponent

Element	Sub-Element	Topics to be Captured by the Assessment	LAA: Encompasses the project footprint and the zone of influence of the project, including areas that may be affected by direct and indirect project effects	RAA: Includes the LAA, and a broader spatial boundary for the assessment of potential cumulative effects based on other past, present or reasonably foreseeable projects
Air Quality	n/a	• Criteria Air Contaminants, including NOx, SO_2, suspended particulate matter (PM), and CO • Volatile Organic Compounds (VOCs), including acrolein, benzene, 1,3-butadiene, acetaldehyde, formaldehyde, naphthalene, ethylbenzene, polycyclic organic matter (POM) • Other air pollutants, including diesel particulate matter, and black carbon.	Within 10 km of both the project footprint and the shipping route utilized by the project, extending to the 12 nm limit of Canada's territorial sea.	Within 30 km of the project footprint and the shipping route utilized by the project, extending to the 12 nm limit of Canada's territorial sea.
Atmospheric Noise	n/a	• Environmental noise levels including daytime, nighttime, low frequency, and percent highly annoyed	Within 10 km of the project footprint as well as within 4 km of the shipping route utilized by the project,	Within 10 km of the project footprint as well as within 10 km of the shipping route utilized by the

Element	Sub-Element	Topics to be Captured by the Assessment	LAA: Encompasses the project footprint and the zone of influence of the project, including areas that may be affected by direct and indirect project effects	RAA: Includes the LAA, and a broader spatial boundary for the assessment of potential cumulative effects based on other past, present or reasonably foreseeable projects
			extending to the 12 nm limit of Canada's territorial sea.	project, or nearest shoreline (mainland or Vancouver Island) extending to the 12 nm limit of Canada's territorial sea.
Underwater Noise	n/a	• Pile driving • Marine Transportation	Based on the Marine Mammals VC LAA including within 8.5 km of the project footprint as well as within 6.5 km of the shipping route utilized by the project, extending to the 12 nm limit of Canada's territorial sea.	The Salish Sea encompassing the project shipping route (as shown in DPD Figure 5) from Sturgeon Bank through the Strait of Georgia to Swiftsure Bank at the western entrance to the Juan de Fuca Strait (the 12 nm limit of Canada's territorial sea), excluding Puget Sound.
Marine Water and Sediment Quality	Marine Water Quality	• Contaminants • Nutrients • Total Suspended Solids • Turbidity • Salinity • Flow	Includes intertidal and subtidal areas of Roberts Bank, from the US Border to Canoe Passage, and from the high-water mark seaward to approximately 100 m below Chart Datum (CD), in the Strait of Georgia. Limited to the USA – Canada border (excludes the USA territory). Also includes area within 2 km of the shipping route utilized by the project, extending to the 12 nm limit of Canada's territorial sea.	The Salish Sea encompassing the project shipping route (as shown in DPD Figure 5) from Sturgeon Bank through the Strait of Georgia to Swiftsure Bank at the western entrance to the Juan de Fuca Strait (the 12 nm limit of Canada's territorial sea), excluding Puget Sound.
Marine Water and Sediment Quality	Marine Sediment Quality	• Sediment disturbance	Includes intertidal and subtidal areas of Roberts Bank, from the US Border to Canoe Passage, and from the high-	The Salish Sea encompassing the project shipping route (as shown in DPD Figure 5) from Sturgeon Bank

Element	Sub-Element	Topics to be Captured by the Assessment	LAA: Encompasses the project footprint and the zone of influence of the project, including areas that may be affected by direct and indirect project effects	RAA: Includes the LAA, and a broader spatial boundary for the assessment of potential cumulative effects based on other past, present or reasonably foreseeable projects
		• Sediment quality: carbon, nutrients, metals, organic compounds	water mark seaward to approximately 100 m below Chart Datum (CD), in the Strait of Georgia. Limited to the USA – Canada border (excludes the USA territory). Also includes area within 2 km of the shipping route utilized by the project, extending to the 12 nm limit of Canada's territorial sea.	through the Strait of Georgia to Swiftsure Bank at the western entrance to the Juan de Fuca Strait (the 12 nm limit of Canada's territorial sea), excluding Puget Sound.
Coastal Geomorphology	n/a	• Waves • Ocean Currents • Morphodynamics	Includes intertidal and subtidal areas of Roberts Bank, from the US Border to Canoe Passage, and from the high-water mark seaward to approximately 100 m below Chart Datum (CD), in the Strait of Georgia. Limited to the USA – Canada border (excludes the USA territory). Also includes area within 2 km of the shipping route utilized by the project, extending to the 12 nm limit of Canada's territorial sea.	The Salish Sea encompassing the project shipping route (as shown in DPD Figure 5) from Sturgeon Bank through the Strait of Georgia to Swiftsure Bank at the western entrance to the Juan de Fuca Strait (the 12 nm limit of Canada's territorial sea), excluding Puget Sound.
Light	Light trespass Skyglow	• Light levels • Sky quality levels • Light fixture photometric data from manufacturers • First Nations concerns regarding sky glow and visibility of stars	Within 60 km of the project footprint (night). Also includes area within 4 km of the shipping route utilized by the project, extending to the 12 nm limit of Canada's territorial sea.	Within 70 km of the project footprint (night). Also includes the Salish Sea encompassing the project shipping route (as shown in DPD Figure 5) from Sturgeon Bank through the

Element	Sub-Element	Topics to be Captured by the Assessment	LAA: Encompasses the project footprint and the zone of influence of the project, including areas that may be affected by direct and indirect project effects	RAA: Includes the LAA, and a broader spatial boundary for the assessment of potential cumulative effects based on other past, present or reasonably foreseeable projects
				Strait of Georgia to Swiftsure Bank at the western entrance to the Juan de Fuca Strait (the 12 nm limit of Canada's territorial sea), excluding Puget Sound.
Visual Resources	Visual resources	• Changes to visual resources affecting the public's ability to enjoy or appreciate view-scapes • Potential tourism impacts arising from "spoiled views" • First nations concerns regarding impacts on viewscapes.	Within 8 km of the project footprint (Day).	Within 40 km of the project footprint (Day).

Table A1. 5 Spatial boundaries for valued components proposed by the proponent

Valued Components	Subcomponents	Topics to be Captured by the Assessment	LAA: Encompasses the project footprint and the zone of influence of the project, including areas that may be affected by direct and indirect Project effects	RAA: Includes the LAA, and a broader spatial boundary for the assessment of potential cumulative effects based on other past, present or reasonably foreseeable projects
Marine Fish and Habitat	Marine vegetation and invertebrates • Eelgrass • Biofilm • Other marine vegetation • Saltmarsh • Benthic infauna • Benthic fauna (e.g. crabs), including habitat-forming invertebrates	• Saltmarsh/brackish marsh • Eelgrass abundance, productivity and fish usage • Macroalgae abundance, productivity and fish usage • Biofilm distribution and quality • Species at risk • Invasive/non-native species • Other species of management concern • Traditional use species • Commercial use species	Includes intertidal and subtidal habitats of Roberts Bank, from the BC Ferries Tsawwassen Terminal to 500 m northwest of the Roberts Bank Causeway, and from the high-water mark seaward to 20 m below Chart Datum (CD), in the Strait of Georgia. Also includes area within 6.5 km of the shipping route utilized by the project, extending to the 12 nm limit of Canada's territorial sea.	Includes intertidal and subtidal areas in Roberts Bank, from Canoe Passage to the US border, and from the high-water mark seaward to –100 m (CD). Limited to the USA – Canada border (excludes the USA territory). Also includes the Salish Sea encompassing the project shipping route (as shown in DPD Figure 5) from Sturgeon Bank through the Strait of Georgia to Swiftsure Bank at the western entrance to the Juan de Fuca Strait (the 12 nm limit of Canada's territorial sea), excluding Puget Sound.
	• Marine fish • Salmon • Demersal fish (e.g. sturgeon) • Forage fish (e.g. sand lance, surf smelt, herring, eulachon, etc.)	• Underwater noise • Increased/change in light on predator-prey dynamics • Fish habitat preferences • Species at risk • Other species of management concern • Traditional use species • Invasive species	Includes intertidal and subtidal areas of Roberts Bank, from the US Border to Canoe Passage, and from the high-water mark seaward to approximately 100 m below Chart Datum (CD), in the Strait of Georgia Limited	Includes the Fraser River estuary from Boundary Bay to Sturgeon Bank and from the high-water mark seaward, plus the Fraser River North and Main Arms and main stem to New Westminster. Also includes the Salish Sea encompassing the project

Valued Components	Subcomponents	Topics to be Captured by the Assessment	LAA: Encompasses the project footprint and the zone of influence of the project, including areas that may be affected by direct and indirect Project effects	RAA: Includes the LAA, and a broader spatial boundary for the assessment of potential cumulative effects based on other past, present or reasonably foreseeable projects
		• Accidents and malfunctions	to the USA – Canada border (excludes the USA territory). Also includes area within 6.5 km of the shipping route utilized by the project, extending to the 12 nm limit of Canada's territorial sea.	shipping route (as shown in DPD Figure 5) from Sturgeon Bank through the Strait of Georgia to Swiftsure Bank at the western entrance to the Juan de Fuca Strait (the 12 nm limit of Canada's territorial sea), excluding Puget Sound.
Marine Mammals	• Low-Frequency Cetaceans (e.g. humpback whales) • Mid Frequency Cetaceans (e.g. Southern Resident killer whales) • High-Frequency Cetaceans (e.g. harbour porpoise) • Ottariids (e.g. Steller sea lion) • Phocids (e.g. harbour seal) • Mustelids (e.g. sea otter)	• Species at risk • Underwater noise • Collision risk • Important habitats • Critical habitats • Exposure to contaminants	Within 8.5 km of the project footprint as well as within 6.5 km of the shipping route utilized by the project, extending to the 12 nm limit of Canada's territorial sea.	Encompassing the Salish Sea from the northern extent of the Strait of Georgia to Swiftsure Bank at the western entrance to the Juan de Fuca Strait. This includes SRKW critical habitat in Canadian and US waters, excluding Puget Sound, and encompassing the project shipping route, extending to the 12 nm limit of Canada's territorial sea.
Birds	• Shorebirds • Coastal Waterbirds	• Current relative abundance, spatial and temporal distribution	Intertidal areas northwest of the Roberts Bank causeway to Brunswick Point and the	Intertidal habitats of the Strait of Georgia, from Sturgeon Bank to Boundary Bay, and

Valued Components	Subcomponents	Topics to be Captured by the Assessment	LAA: Encompasses the project footprint and the zone of influence of the project, including areas that may be affected by direct and indirect Project effects	RAA: Includes the LAA, and a broader spatial boundary for the assessment of potential cumulative effects based on other past, present or reasonably foreseeable projects
	• Great Blue Heron	• Species of concern or importance • Migratory and overwintering birds • Species at risk • Traditional use species	inter-causeway area between the Roberts Bank and Tsawwassen Ferry Terminal causeways to low tide (approximately 0 m CD).	from the high water mark seaward to low tide (approximately 0 m CD) for shorebirds, and to 1 km seaward of the low tide mark for coastal waterbirds and great blue heron.
	Marine Birds	• Current relative abundance, spatial and temporal distribution • Species of concern or importance • Migratory and overwintering birds • Species at risk • Traditional use species	Within 3 km of the project footprint, and 4 km of the project shipping route utilized by the project, extending to the 12 nm limit of Canada's territorial sea.	The Salish Sea encompassing the project shipping route (as shown in DPD Figure 5) from Sturgeon Bank through the Strait of Georgia to Swiftsure Bank at the western entrance to the Juan de Fuca Strait (the 12 nm limit of Canada's territorial sea), excluding Puget Sound.
Employment and Economy	Employment	• Changes in availability of/access to jobs and training • Availability of contracting opportunities • Changes in labour income • Access to economic opportunities/economic equity • Upward pressure on local wages • GBA+ considerations	Metro Vancouver (a federation of 21 municipalities, one Electoral Area and one Treaty First Nation that collaboratively plans for and delivers regional-scale services).	Province of B.C.
	Economy	• Tax revenues and government expenditures	Metro Vancouver (a federation of 21	Province of B.C.

Valued Components	Subcomponents	Topics to be Captured by the Assessment	LAA: Encompasses the project footprint and the zone of influence of the project, including areas that may be affected by direct and indirect Project effects	RAA: Includes the LAA, and a broader spatial boundary for the assessment of potential cumulative effects based on other past, present or reasonably foreseeable projects
		• GDP contributions • Changes in business opportunities and revenue • Land and resource valuations • Cost of living • GBA+ considerations	municipalities, one Electoral Area and one Treaty First Nation that collaboratively plans for and delivers regional-scale services).	
Land and Resource Use	Private property uses	• Use and enjoyment of private property • Potential effects on productivity of agricultural land or associated farming operations • Other tenured, permitted, or licensed land uses • Cultural considerations	Within the area limited to the northwest by the influence of the Fraser River through Canoe Passage and to the southeast by the existing BC Ferries terminal causeway and inland approximately 2 km from the adjacent shoreline.	City of Delta boundary and Tsawwassen First Nation
	Public land and resources	• Agriculture • Tourism • Cultural considerations • GBA+ considerations	Within the area limited to the northwest by the influence of the Fraser River through Canoe Passage and to the southeast by the existing BC Ferries terminal causeway and inland approximately 2 km from the adjacent shoreline.	City of Delta boundary
Marine Use	Navigation	• Effects on marine navigation • Interference with marine safety • Shipping route	Within 10 km of the project footprint excluding Boundary Bay and extending northward to	Includes the Salish Sea encompassing the project shipping route (as shown in DPD Figure 5) from Sturgeon Bank through the Strait of

Valued Components	Subcomponents	Topics to be Captured by the Assessment	LAA: Encompasses the project footprint and the zone of influence of the project, including areas that may be affected by direct and indirect Project effects	RAA: Includes the LAA, and a broader spatial boundary for the assessment of potential cumulative effects based on other past, present or reasonably foreseeable projects
		• Commercial and recreational marine traffic • Marine transportation schedules	encompass the entrance to the South arm of the Fraser River. Also within 2 km of the shipping route utilized by the project, extending to the 12 nm limit of Canada's territorial sea.	Georgia to Swiftsure Bank at the western entrance to the Juan de Fuca Strait (the 12 nm limit of Canada's territorial sea), excluding Puget Sound.
	Tenured marine use	Ability of licensed tenure-holders to operate or otherwise conduct activities	Within 10 km of the project footprint excluding Boundary Bay and extending northward to encompass the entrance to the South arm of the Fraser River. Also includes area within 2 km of the shipping route utilized by the project, extending to the 12 nm limit of Canada's territorial sea.	Includes the Salish Sea encompassing the project shipping route (as shown in DPD Figure 5) from Sturgeon Bank through the Strait of Georgia to Swiftsure Bank at the western entrance to the Juan de Fuca Strait (the 12 nm limit of Canada's territorial sea), excluding Puget Sound.
	Public marine use	• Consumptive marine uses (i.e. fishing, harvesting shellfish and vegetation gathering) • Ability to participate in non-consumptive marine uses/recreation (i.e. boating, and windsurfing) • Ability to access and use the marine environment (including marine protected areas) • Marine tourism opportunities	Within 10 km of the project footprint excluding Boundary Bay and extending northward to encompass the entrance to the South arm of the Fraser River. Also within 2 km of the shipping route utilized by the project, extending to the 12 nm limit of Canada's territorial sea.	Includes the Salish Sea encompassing the project shipping route (as shown in DPD Figure 5) from Sturgeon Bank through the Strait of Georgia to Swiftsure Bank at the western entrance to the Juan de Fuca Strait (the 12 nm limit of Canada's territorial sea), excluding Puget Sound.

Valued Components	Subcomponents	Topics to be Captured by the Assessment	LAA: Encompasses the project footprint and the zone of influence of the project, including areas that may be affected by direct and indirect Project effects	RAA: Includes the LAA, and a broader spatial boundary for the assessment of potential cumulative effects based on other past, present or reasonably foreseeable projects
		• Cultural dimensions related to sharing family values and enhance life skills (i.e. marine-based food gathering and recreational activities) • Enhanced sense of belonging to the West Coast culture • Strengthening connections to nature and unique West Coast marine life (i.e. SRKW) • Cultural considerations • GBA+ considerations.		
Infrastructure and Services	Infrastructure and Community Services	Access to any of the following, including GBA+ considerations: • Emergency response services • Domestic water supply • Sewage and water treatment facilities • Landfills and recycling facilities • Community recreational facilities • Educational services and facilities, including daycare • Other public and private sector services • Access, availability, and demand for affordable housing	City of Delta and Tsawwassen First Nation	Metro Vancouver with a focus on the adjacent municipalities of Richmond and Surrey

Valued Components	Subcomponents	Topics to be Captured by the Assessment	LAA: Encompasses the project footprint and the zone of influence of the project, including areas that may be affected by direct and indirect Project effects	RAA: Includes the LAA, and a broader spatial boundary for the assessment of potential cumulative effects based on other past, present or reasonably foreseeable projects
	Transportation infrastructure	• Transportation services and the public's ability to travel • Changes in access to critical infrastructure • Movement of essential goods and services during construction • SDH considerations related to the built environment and healthy activities (i.e. bikeways, footpaths, etc.) • GBA+ considerations	City of Delta and Tsawwassen First Nation	Metro Vancouver with a focus on the adjacent municipalities of Richmond and Surrey
	Health and Social Services	• Access to health and social services and facilities (i.e. community services, education, family services, etc.) • Changes in demand for housing and accommodation • Cultural considerations • GBA+ considerations	City of Delta and Tsawwassen First Nation	Metro Vancouver with a focus on the adjacent municipalities of Richmond and Surrey
Social Determinants of Health (SDH)	Lifestyle factors/healthy behaviour	• Stress and anxiety over a disruption of sleep due to overexposure to noise, vibration and light. • Stress and anxiety, feeling unsafe due to detours and roadblocks and exposure to dust.	City of Delta and Tsawwassen First Nation	Metro Vancouver with a focus on the adjacent municipalities of Richmond and Surrey

Valued Components	Subcomponents	Topics to be Captured by the Assessment	LAA: Encompasses the project footprint and the zone of influence of the project, including areas that may be affected by direct and indirect Project effects	RAA: Includes the LAA, and a broader spatial boundary for the assessment of potential cumulative effects based on other past, present or reasonably foreseeable projects
		• Mental health and connecting with nature/physical environment • Increase in unhealthy behaviours (i.e. alcohol, smoking) due to project induced stress • GBA+ considerations		
	Social and Community Factors	• Access to neighbours or neighbourhoods, community amenities, and areas for recreation and social interactions • Disruption of outdoor social gatherings or events due to noise or light • Changes in lifestyle as a result of a change in access to or opportunities for active living or routine activities; • Changes in the built environment and implications to safety and mobility (i.e. bike paths, trails etc. that enhance public safety or social interactions • Potential implications for culture (i.e. intergenerational relationships/knowledge) • GBA+ considerations	City of Delta and Tsawwassen First Nation	Metro Vancouver with a focus on the adjacent municipalities of Richmond and Surrey

Valued Components	Subcomponents	Topics to be Captured by the Assessment	LAA: Encompasses the project footprint and the zone of influence of the project, including areas that may be affected by direct and indirect Project effects	RAA: Includes the LAA, and a broader spatial boundary for the assessment of potential cumulative effects based on other past, present or reasonably foreseeable projects
	Livelihood factors	• Changes in income level impacting lifestyle and quality of life • Access to resources that act as sources of household sustenance • Changes in employment, economic or other livelihood opportunity(ies) • GBA+ considerations	City of Delta and Tsawwassen First Nation	Metro Vancouver with a focus on the adjacent municipalities of Richmond and Surrey
Human Health	• Emissions Human Health Risk Assessment • Noise and Vibration Human Health Risk Assessment • Marine shellfish tissue assessment and human health risk assessment	• Air quality • Noise • Marine sediment quality • Quality and quantity of country foods	Area within 10 km of the project footprint and the shipping route utilized by the project, extending to the 12 nm limit of Canada's territorial sea.	Includes the Salish Sea encompassing the project shipping route (as shown in DPD Figure 5) from Sturgeon Bank through the Strait of Georgia to Swiftsure Bank at the western entrance to the Juan de Fuca Strait (the 12 nm limit of Canada's territorial sea), excluding Puget Sound.
Archaeological and Heritage Resources	Archaeological and Heritage Resources	• Specific to an Indigenous nation's interests • Potential for and presence of archaeological sites by site type • Potential for and presence of archaeological sites by landform or geographic area	Area within 250 m of the project footprint as well as the intertidal area southeast of the Roberts Bank Causeway to the BC Ferries terminal causeway (the intercauseway area), ending landward at the dike and	The intertidal zone in proximity to the project footprint and where vessel wake wave heights have the potential to contribute to shoreline erosion along the shipping route utilized by the project within Georgia and Juan de Fuca Straits and

Valued Components	Subcomponents	Topics to be Captured by the Assessment	LAA: Encompasses the project footprint and the zone of influence of the project, including areas that may be affected by direct and indirect Project effects	RAA: Includes the LAA, and a broader spatial boundary for the assessment of potential cumulative effects based on other past, present or reasonably foreseeable projects
			pathway that extends between the causeways. Also includes area within 2 km of the shipping route focused on the intertidal zone where vessel wake wave heights have the potential to contribute to shoreline erosion along the shipping route utilized by the project, extending to the 12 nm limit of Canada's territorial sea. However, subtidal areas will be excluded.	extending to the 12 nm limit of Canada's territorial sea.
Indigenous Nation identified VC	To be determined	To be determined	To be defined based on the LAAs of VCs which are linked to the assessment of each Nation or Organization's Indigenous Interests	To be defined based on the RAAs of VCs which are linked to the assessment of each Nation or Organization's Indigenous Interests

Appendix 2 - Requested Project for Certification

The Impact Statement must provide the proponent's requested project description for the provincial environmental assessment certificate (EAC), including maps and the requested duration of the provincial EAC.

See the EAO's *Environmental Assessment Certificate Policy* for further guidance on the provincial requirements for a project description including maps.

Appendix 3 - Authorship

The Impact Statement must identify key personnel responsible for preparing the Impact Statement including, their employers, qualifications, and the sections for which they were contributors.

The Impact Statement must identify key information, reports and data used to support the development of the Impact Statement and the associated contributing organization and relevant qualifications. The Impact Statement must demonstrate that a qualified individual has prepared the information or studies provided. A qualified individual would include someone who, through education, experience or knowledge relevant to a matter, may be relied on by the proponent to provide advice within his or her area of expertise. Knowledge relevant to a matter may include Indigenous and community knowledge.

In support of ensuring transparency and the quality of the scientific information and analysis being applied, the proponent must provide information on the individuals who prepared the sections within the Impact Statement related to effects on environmental, health, social, cultural and economic conditions and impacts on Indigenous interests. The proponent is required to demonstrate that qualified individuals have prepared the information or studies provided. A qualified individual would include someone who, through education, experience or knowledge relevant to a particular matter, may be relied on by the proponent to provide advice within his or her area of expertise. Knowledge relevant to a particular matter may include Indigenous and community knowledge.

Appendix 4 – Engagement with federal and provincial authorities

The Impact Statement must provide a summary of engagement activities with provincial and federal authorities that may have supported the development of the Impact Statement, in a tracking table showing:

- the reviewer;
- the date information was provided to the reviewer;
- the information that was provided to the reviewer;
- the date comments were received from the reviewer;
- the comments received from the reviewer; and
- how comments were addressed.

Appendix 5 – Resources and guidance

Human Health

Evaluating Human Health Impacts in Environmental Assessments: Air Quality available at *hhttps://www.canada.ca/en/health-canada/services/publications/healthy-living/guidance-evaluating-human-health-impacts-air-quality.html*.

Canadian Ambiant Air Quality Standards.

BC Ambiant Air Quality Objectives.

Evaluating Human Health Impacts in Environmental Assessments: Country Foods available at *http://www.canada.ca/en/health-canada/services/publications/healthy-living/guidance-evaluating-human-health-impacts-country-foods.html*. Health Canada. 2017.

Evaluating Human Health Impacts in Environmental Assessments: Noise available at *http://www.canada.ca/en/health-canada/services/publications/healthy-living/guidance-evaluating-human-health-impacts-noise.html*. Health Canada. 2017.

Evaluating Human Health Impacts in Environmental Assessments: Water Quality available at *http://www.canada.ca/en/health-canada/services/publications/healthy-living/guidance-evaluating-human-health-impacts-water-quality.html*. Health Canada. 2017.

Health Canada's Risk Assessment Guidance Parts I through VII available at *https://www.canada.ca/en/health-canada/services/environmental-workplace-health/contaminated-sites/guidance-documents.html*. Health Canada. 2017.

Minimum Elements and Practice Standards for Health Impact Assessment, Version 3 (Bathia et al, 2014).

Health Equity Impact Assessment (HEIA) Tool by the Ministry of Health of Ontario.

Determinants of Health

Social determinants of health and health inequalities recognized by the Public Health Agency of Canada.

National Collaborating Centre for Determinants of Health, such as the fact sheet *What are the social determinants of health?.*

National Collaborating Centre for Healthy Public Policy.Institut national de santé public Québec.

National Collaborating Centre for Indigenous Health, such as the report *Health inequalities and the social determinants of Aboriginal peoples' health*.

National Collaborating Centre for Environmental Health on *Health Impact Assessments*; and the *Positive Mental Health Surveillance Indicator Framework.*

Water Quality and Sediment Quality

CCME 2007. Canadian Guidance Framework for the Management of Nutrients in Nearshore Marine Systems. Available at: *https://www.ccme.ca/fr/res/2007-canadian-guidance-framework-for-the-management-of-nutrients-in-nearshore-marine-systems-ssd-1387-en.pdf*.

CCME 2015. Guidance Manual for Optimizing Water Quality Monitoring Program Design. Available at: *Guidance Manual for Optimizing Water Qualtiy Monitoring Program Design (ccme.ca)*.

BC ENV 2019. Marine Monitoring Guidance. Available at: *Marine Monitoring Guidance (gov.bc.ca).*

Government of Canada. 2020. Recommended Environmental Quality Guidelines for the Protection of Southern Resident Killer Whales and Their Prey. Available at: *https://www.canada.ca/en/environment-climate-change/services/wildlife-habitat/conservation-funding-success-stories/reducing-contaminants-threat-southern-resident-killer-whales.html.*

Birds and their Habitat

A Framework for the Scientific Assessment of Potential Project Impact on Birds. Prepared by Alan Hanson et al. Available at *http://www.publications.gc.ca/collections/collection_2010/ec/CW69-5-508-eng.pdf*. Environment and Climate Change Canada. Technical Report Series Number 508.

Bird Survey Inventories in Canada. Available at *https://www.canada.ca/en/environment-climate-change/services/bird-surveys.html*. Compiled by Environment and Climate Change Canada.

BC Coastal Waterbird Survey. Available at *https://www.birdscanada.org/bird-science/british-columbia-coastal-waterbird-survey/.*

Migratory birds environmental assessment guideline. Environment and Climate Change Canada. Available at *http://publications.gc.ca/pub?id=9.647049&sl=0.*

Avoiding harm to migratory birds. Environment and Climate Change Canada. Available at *https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds.htm.l*

Wetlands

Canadian Wetland Classification System. Developed by the National Wetlands Working Group. Available at *http://www.wetlandpolicy.ca.*

Wetland Ecological Functions Assessment: An Overview of Approaches. Prepared by Alan Hanson et al. Available at *http://publications.gc.ca/site/eng/343283/publication.html*. Environment and Climate Change Canada. 2008.

The Federal Policy on Wetland Conservation. Government of Canada 1991. Available at: *http://nawcc.wetlandnetwork.ca/Federal%20Policy%20on%20Wetland%20Conservation.pdf.*

Fish and Fish Habitat

A framework for assessing fisheries productivity for the Fisheries Protection Program. Developed by Canadian Science Advisory Secretariat of Fisheries and Oceans Canada.

A Science-Based Framework for Assessing the Response of Fisheries Productivity to State of Species or Habitats. Developed by Canadian Science Advisory Secretariat of Fisheries and Oceans Canada.

Species at Risk

COSEWIC Status Reports. Developed by the Committee on the Status of Endangered Wildlife in Canada. Available at: *Cosewic / Cosepac - Status reports.*

SARA Registry. Available at: *https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html.*

BC Ecosystem Explorer. Available at: *https://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/conservation-data-centre/explore-cdc-data/species-and-ecosystems-explorer.*

Provincial Resources Information Standards Committee (RISC) survey protocols. Available at: https://www2.gov.bc.ca/gov/content/environment/natural-resource-stewardship/laws-policies-standards-guidance/inventory-standards.

Appendix 6 - Additional Guidance

Sources of Information on Existing Conditions

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

- field studies, including site-specific survey methods;
- database searches, including federal, provincial, territorial, municipal and local data banks, including:
  - eBird Canada *https://ebird.org/canada/home*;
  - Breeding Bird Survey (BBS) *https://wildlife-species.canada.ca/resultats-releve-oiseaux-nicheurs*;
  - Christmas bird count *https://netapp.audubon.org/CBCObservation/Historical/ResultsByCount.aspx*;
  - Birds Canada's Canadian Migration Monitoring Network *https://www.bsc-eoc.org/birdmon/cmmn/main.jsp*;
  - Nature Counts: *https://www.birdscanada.org/birdmon/default/searchquery.jsp*;
  - iNaturalist: *https://www.inaturalist.org/*;
  - Neighbourhood Bat Watch: *https://batwatch.ca/*; and
  - Bird Conservation Region (BCR) plans: *https://www.canada.ca/en/environment-climate-change/services/migratory-bird-conservation/regions-strategies.html*;
- 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);
- government publications;
- 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;
- natural resource management plans

- 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 under *Community and Health System Characteristics* (Canadian Institute for Health Information);
- community and regional economic profiles;
- statistical surveys, as applicable; and
- project specific data sources that proponent may want to consult.

In all instances where humans are research subjects, 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.

Establishing Spatial and Temporal Boundaries

The following guidance is supplemental to the requirements in section 8.3 - Assessment 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. Considerations in assigning appropriate study areas or boundaries would include, but not be limited to:

- areas potentially impacted by changes to water quality and quantity,changes in flow in the watershed and hydrologically connected waters, the extent of changes in underwater noise;
- areas potentially impacted by airborne emissions or odours;
- air zone(s) and Airsheds under the Air Quality Management System;
- local major emission sources;
- location of sensitive receptors, including species, soil types or areas with historical loading or poor buffering;
- 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 and the locations and characteristics of the most sensitive receptors[9];
- 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 land, cultural, spiritual and resource use; and
- existing affected infrastructure.

For biophysical VC, spatial boundaries should be defined using an ecosystem-centered approach. See the 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 and marine 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 assessment area and regional assesement 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 assessment 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.

Where a VC is wildlife other than birds, the proponent should contact provincial and/or local government authorities to verify appropriate boundaries for wildlife species

The temporal boundaries of the 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, LAA, and RAA and, if required, the cumulative effects assessment area throughout the year and from one year to another, and to estimate their temporal pattern of use (e.g. breeding, migrants

[9] Sensitive receptors and other current and reasonably foreseeable human receptors that may be affected by project activities. The most sensitive receptors may include, but not be limited to, residences, health and social services institutions (hospitals, long-term care facilities, seniors' residences, etc.), educational institutions (schools, daycare centres, early childhood centres, etc.), tourism establishments (tourism information offices, museums, ski areas, summer camps, outdoor recreation areas, camp sites, etc.), recreational areas (recreational land, urban parks, parks and conservation areas, etc.), and important areas of wildlife use including within the marine environment.

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 and Enhancement Measures

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.

As a first step, 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 communities and Indigenous nations 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 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, and wetland functions potentially impacted by the project;
- explain and justify the hierarchy of mitigation measures considered;
- describe the effectiveness of mitigation measures to eliminate, reduce or control the adverse effects of the project;
- identify and describe residual effects that are the subject of the compensatory measures;
- describe the selection process for proposed compensation sites and baseline conditions of the proposed sites;
- identify the location and proposed timing of implementation of compensation projects. Include a plan to minimize the delay between the time the adverse effects occur and the time the compensation project is fully functioning;
- identify and describe in detail non-habitat related compensation measures (e.g. predator control);
- describe how the compensatory measures counterbalance residual effectsdescribe how the proposed complementary measures align with published provincial and federal recovery management or action plans and strategies for species at risk, fish and fish habitat and wetlands;
- describe how the proposed measures align with published provincial and federal recovery management or action plans and strategies for wetlands;
- identify compensation objectives, including target habitats and species;
- describe the habitat functions gained at the compensation site(s);
- identify and describe the criteria that would be used to determine success of the compensatory measures. Provide evidence that habitat functions can be replaced by the proposed offset activities;
- 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 nations were involved in the development of the compensation plans. The proponent must demonstrate how the information received from Indigenous nations has been taken into account, including the choice of compensation ratios, if applicable. The proponent must also elaborate on how Indigenous nations 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 and the Policy for applying measures to offset adverse effects on fish and fish habitat udner the Fisheries Act*.

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 adequacy of the measures to counterbalance adverse project effects; 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.

Additional Guidance for Biophysical Components

Atmospheric environment

The following guidance should be consulted in conjunction with sections 9.2 and section 9.4.

- 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; and
  - dispersion modelling to indicate spatial distribution of contaminants;
- for requirements pertaining to the use of atmospheric dispersion modelling, the proponent should:
  - conduct dispersion modelling for the following scenarios: existing conditions (accounting for all existing emission sources project alone (representing emissions from the project only), Impact Statement case (existing conditions plus the project), and cumulative effects (Impact Statement case plus projects and activities that are reasonably forseeable);
  - 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; and
  - 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 9.11 - Marine Vegetation and Wetlands.

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

- complete this assessment for wetlands that the project would directly impact and for any 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;
- 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. Sample size and spatial balance of sample location must be sufficient to enable reliable assessments and predictions both spatially and temporally; and
- survey designs should be sensitive enough to detect and quantify the impacts at the spatial and temporal scales identified above (i.e. project study area, local assessment area, and regional assessment area), any departures from predictions, and the effectiveness of mitigations. Justify the selection of modeling techniques based on current and recent scientific literature.

Fish and Fish Habitat

The following guidance should be consulted in conjunction with section 9.9 - Marine Fish and Fish Habitat, as relevant to the establishment of baseline conditions:

- parameters to be measured may include: bathymetry and hydrology (ordinary high water mark, maximum and average depth, current, turbidity, tidal action) substrate type (shoreline and bottom), shoreline characeristics, intertidal and subtidal zones, aquatic and riparian vegetation, water quality, natural and anthropogenic barriers (causeways, 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 marine environments, it refers to those parts of the water body bed and banks that are frequently flooded by water so as to leave a mark on the land and where the natural vegetation changes from predominately aquatic vegetation to terrestrial vegetation (excepting water tolerant species); and
- baseline measurements of contaminants should be provided for the complete fish food web (including water, invertebrates, prey fish), and include carbon and nitrogen stable isotope measurements in fish and the complete fish food web. These measurements should then be used to inform the assessment of effects from contaminants, including bioaccumulation of contaminants, in fish.

For potentially affected fish, the proponent should:

- use existing information first (e.g. 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; and

- 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 potential temporary and permanent changes to habitat on maps at appropriate scales, as well as in the form of tables;
- include changes to surface water conditions resulting from changes to groundwater quantity and discharge location;
- refer to standard metrics for changes in habitat quality and quantity to choose an analysis that is appropriate to the type and scale of effects (see *A framework for assessing fisheries productivity for the Fisheries Protection Program*). For example, broader, ecosystem-wide effects may require a modelling approach. It is recommended that the information be collected in the form of a map at appropriate scales, as well as in the form of a table; and
- 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 their habitat

The following guidance should be consulted in conjunction with section 9.12 - Birds and their Habitat.

In order to establish adequate baseline conditions for birds, the proponent should take into account the following technical recommendations:

- collect data to adequately represent the following temporal sources of variation:
  - among years;
  - within and among seasons (e.g. spring migration, breeding, fall migration, overwintering); and
  - within the 24 hour daily cycle;
- collect and include in the Impact Statement explanatory data (i.e. covariate) necessary for modeling in such a way as to adequately represent the following sources of variation:
  - spatial variation in land cover composition;
  - soil type;
  - geomorphology;
  - hydrological processes;
  - climatic conditions; and
  - temporal, especially annual, variation in local weather, inter- and intra-annual climatic variability;
- collect data in a manner that enables reliable extrapolations in space (i.e. at minimum to project, local, and regional study areas, both marine shipping and terminal areas) and in time (i.e. across 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 (i.e. project footprint, local and regional assessment areas, both marine shipping and terminal areas), any departures from predictions, and the effectiveness of mitigation measures. The selection of modeling techniques should be justified based on current and recent scientific literature;
- survey protocol planning should include modeling and simulations to estimate sampling requirements and analysis to evaluate resulting survey options;
- collect field data over at least two years to identify trends across seasons and increase the understanding of natural variability;
- plan sample size to support evaluation of the project study area within the context of the local assessment area and regional assessment area. Design of surveys must include multiple survey locations in order to represent the habitat heterogeneity of the regional study area, and to yield multiple survey locations per land cover or habitat class, without requiring aggregation of habitat classes post-hoc;
- design sampling effort per unit area with field survey effort to be most intensive within the project footprint. The level of effort per unit area may be similar or somewhat less within the remainder of the local assessment area, but should be scaled to the likelihood that project effects will affect birds within that zone. Efforts outside the project study area should be carefully designed to ensure that estimates comparing within and across the project area, local assessmentarea and regional assessmentarea, within both marine shipping and terminal areas, are unbiased and as precise as possible;
- use simulation modelling to assess bias and precision between project study area, local assessmentarea, and regional assessmentarea to ensure the estimates are useful for comparison;
- provide raw survey data and analysis results for bird species showing the species ranked according to:
    - frequency of occurrence, where frequency of occurrence: % frequency for Species A = (# sampling locations in which Species A detected / total # sampling locations) * 100;
    - abundance;
    - abundance in each habitat type; and
    - map(s) showing areas of highest concentrations of species;
- provide 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. Databases and GIS files should be accompanied by detailed metadata that meets ISO 19115 standards;
- 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);

- generate measures of abundance and distribution using spatially balanced, randomly selected sample locations. Sampling should include edges and transitions between habitat types and should not be focused exclusively within homogeneous patches of a given habitat type:
    - use simulation modelling prior to sampling to ensure coverage is broad enough to estimate and account for detection error as well as provide unbiased estimates of abundance and distributions; and
    - sampling within temporal boundaries should be spatially and temporally balanced so that all spatial areas receive comparable temporal coverage;
- 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). Use of hypothesis testing p - values is generally not appropriate in this context and their use should be justified;
- when estimating densities for species, consider observer-induced detection error for comparisons among counts (e.g. between, before and after surveys, or between affected and unaffected sites) to be valid. When accounting for detection error the method used should account for variable detection between land cover types, observers, weather, time of year, species, as well as random variation between visits. Simulation methods can help determine if a specific method is appropriate for a given survey design and analysis. Care should be taken to avoid affecting the reliability of abundance estimates;
- a spatially dispersed stratified random sampling approach should be used to maximize efficiency. Sample sites should be selected with a randomization procedure that accounts for the project design footprint. To select specific sampling sites, care should be taken to ensure sites are spatially distributed across the area of interest and coverage is obtained across habitat types. Site locations should be randomly selected using an approach that avoids implicit bias in site selection; and
- provide a justification on the approach chosen. If necessary to constrain or adjust site selection based on access limitations, simulation modelling should provide evidence that this sampling strategy has not resulted in the introduction of bias. Survey vegetation features of concern in a manner that is not disproportionate to other types. Avoid bias in estimates of abundance and impair extrapolation and statistical inference; and include all criteria used to choose plot locations.

The following must be considered when identifying areas of concentration of migratory birds:

- migratory bird concentrations can vary within a year and between years. It is therefore important to survey across the project study area, local assessmentarea, and regional assessmentarea both temporally and spatially;
- migratory bird counts can vary strongly between years and so survey length must be able to estimate the variation accurately;
- 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; and

- include avian monitoring frequency on a daily basis during spring migration, and weekly during fall migration;
- the 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; and
    - mixed wood and old-growth forest land cover and other upland vegetation types may be particularly important for many forest 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;
- 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 as 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; and
- consider sources of error for all analyses to ensure that the final effects predictions indicate the best estimate of precision. Wherever possible, non-linear, indirect and synergistic responses to the project should be explicitly explored. Any assumptions regarding relocation or temporary displacement during construction and operation of the project should be justified using scientific references, and surveys should provide evidence that there is available, suitable (ecologically equivalent) 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 project footprint, local assessment area, and regional assessment area.

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.

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. The Canadian Wildlife Service's *Framework for the Scientific Assessment of Potential Project Impacts on Birds* provides examples of project types and recommended techniques for assessing effects on migratory birds.

Species at Risk

The following guidance should be consulted in conjunction with section 9.13 - Species at Risk.

For field surveys, the proponent should:

- collect data in order to represent sources of temporal variation between years, during and between seasons (e.g. spring dispersal and migration, breeding, fall migration, wintering), and in the daily 24-hour cycle;
- collect field data to account for natural variability in populations. To achieve this, a minimum of two years of inventory is normally required. However, if existing data are available for the study area, it can be used to complement the data collected in the field (minimum one year). The available data must be sufficiently robust to assess the inter-annual and seasonal variability of populations between years and a demonstration must be presented for that purpose;
- take into account that the detection of species at risk will require more survey effort, since they are generally less abundant, which needs to be considered in the survey design by increasing the number and duration of surveys;
- 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. In terms of sampling effort per unit area, focus primarily on field surveys within the project area. The level of effort per unit area may be similar or slightly lower in the remainder of the local assessmentarea, but should be proportional to the likelihood that project effects will affect species at risk in that area. Actions undertaken outside the project area must be carefully designed to ensure that comparative estimates between the project area, local assessmentarea and regional study area are unbiased and sufficiently accurate;
- 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.

The combined information from existing data and field surveys must at least be able to describe the distribution and abundance of species at risk in relation to the study areas. The proponent should:

- locate, species by species, on a map at an appropriate scale, potential habitats, survey sites, species sighting records, residences and critical habitat. Illustrate, on the map, the project footprint by identifying temporary and permanent infrastructures. Locate the highest concentrations or areas of use by the species;
- submit complete data sets of all target sites. These data sets should be presented as comprehensive, high-quality relational databases, containing accurately georeferenced information on the site, precise data on observations and visits, as well as observations and measurements in non-summary form; and

- attach to the analysis results, documentation and digital files that allow for a clear understanding of the methodology, the analyses and a replication of results (preference is given to data processing procedures rather than 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 obtained for surveys on federal lands and in the marine environment that are likely to harm, harass, capture or kill species at risk other than migratory birds.