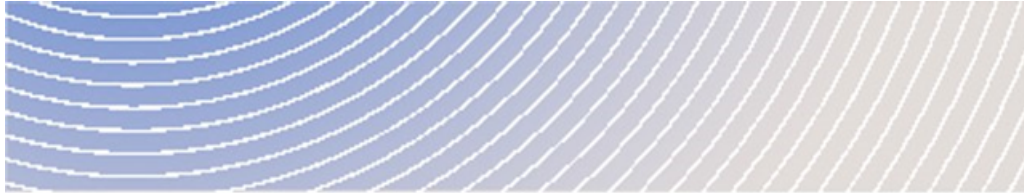


Tailored Impact Statement Guidelines



NORTHERN ROAD LINK PROJECT

AUGUST 18, 2023



Table of Contents

Abbreviations and Short Forms	1
1. Introduction	2
1.1. Factors to be considered in the impact assessment	3
1.2. Gender-based Analysis Plus (GBA Plus)	5
1.3. Preparing the Impact Statement	5
1.4. Format and accessibility	7
2. Overview	8
2.1. The proponent	8
2.2. Qualifications of individuals preparing the Impact Statement	8
3. Project description	9
3.1. Project overview	9
3.2. Project location	9
3.3. Regulatory framework and the role of government	11
3.4. Project components	12
3.5. Project activities	13
3.6. Workforce requirements	17
4. Project purpose, need and alternatives considered	18
4.1. Purpose of the Project	18
4.2. Need for the Project	18
4.3. Alternatives to the Project	19
4.4. Alternative means of carrying out the Project	19
5. Description of public participation and views	22
5.1. Analysis and response to questions, comments, and issues raised	23
5.2. Record of engagement	23
6. Description of engagement with Indigenous communities	24
6.1. Indigenous Knowledge considerations	27
6.2. Analysis and response to questions, comments, and issues raised	28
6.3. Record of engagement	30



6.4. Collaboration with Indigenous peoples following submission of the Impact Statement	31
7. Assessment methodology	32
7.1. Baseline methodology	32
7.2. Sources of baseline information	35
7.3. Considerations and methodology in selecting valued components	38
7.4. Spatial and temporal boundaries	40
7.5. Effects assessment methodology	42
7.6. Mitigation and enhancement measures	45
7.7. Cumulative effects assessment	49
7.8. Extent to which effects are significant	52
8. Biophysical environment	55
8.1. Meteorological environment	55
8.2. Atmospheric, acoustic, and visual environment	56
8.3. Geology, geochemistry and geological hazards	61
8.4. Topography, soil and sediment	62
8.5. Riparian and wetland environments	62
8.6. Vegetation	68
8.7. Groundwater and surface water	70
8.8. Fish and fish habitat	76
8.9. Birds, migratory birds and their habitats	80
8.10. Terrestrial wildlife and their habitat	92
8.11. Species at Risk	95
8.12. Climate change	109
9. Local and regional socio-economic conditions	111
9.1. Baseline conditions	111
9.2. Effects to local and regional socio-economic conditions	113
10. Indigenous peoples	115
10.1. Physical and cultural heritage, and structures, sites or things of significance	117
10.2. Current use of lands and resources for traditional purposes	119
10.3. Health, social and economic conditions	121
10.4. Rights of Indigenous peoples	137
10.5. Mitigation and enhancement measures	140
11. Effects of potential accidents or malfunctions	144



11.1. Risk assessment.....	144
11.2. Mitigation measures.....	146
11.3. Emergency management.....	146
12. Effects of the environment on the Project.....	147
13. Canada’s ability to meet its environmental obligations and its climate change commitments.....	148
14. Extent to which the Project contributes to sustainability.....	150
15. Follow-up programs.....	151
15.1 Follow-up program framework.....	152
15.2 Follow-up program monitoring.....	153
15.3 Compliance monitoring.....	154
16. Assessment summary.....	155
Appendix 1 – Resources and guidance.....	156
Atmospheric, acoustic and visual environment.....	156
Birds, Migratory Birds and their Habitat.....	156
Fish and Fish Habitat.....	157
Gender-based Analysis Plus.....	158
Greenhouse gases and climate change.....	159
Human Health.....	159
Indigenous Participation and Engagement.....	161
Public participation.....	163
Purpose and need.....	163
Social and economic conditions.....	163
Species at risk.....	164
Sustainability and environmental obligations.....	165
Water quality.....	166
Wetlands.....	166
Other references.....	167



Abbreviations and Short Forms

Term	Definition
the Agency	Impact Assessment Agency of Canada
BAT/BEP	Best Available Technologies / Best Environmental Practices
CAAQS	Canadian Ambient Air Quality Standards
CCME	Canadian Council of Ministers of the Environment
COPC	Contaminant of Potential Concern
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
ECCC	Environment and Climate Change Canada
GBA Plus	Gender Based Analysis Plus
GHG	Greenhouse gas
the Guidelines	Tailored Impact Statement Guidelines
HHRA	Human Health Risk Assessment
the IAA	<i>Impact Assessment Act</i>
LSA	Local Study Area
the Minister	Minister of Environment and Climate Change
OCAP	Ownership, Control, Access and Possession
PAHs	Polycyclic aromatic hydrocarbons
the Project	Northern Road Link Project
Registry	Canadian Impact Assessment Registry
RSA	Regional Study Area
SACC	Strategic Assessment of Climate Change
SARA	<i>Species at Risk Act</i>
VOC	Volatile organic compound

1. Introduction

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

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

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

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

- a) the extent to which the project contributes to sustainability;

- b) the extent to which the adverse effects within federal jurisdiction and the adverse direct or incidental effects that are indicated in the Impact Assessment Report in respect of the project are significant;
- c) the implementation of the mitigation measures that the Minister or the Governor in Council, as the case may be, considers appropriate;
- d) the impact that the project may have on any Indigenous peoples¹ 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*², 1982; and
- e) the extent to which the effects of the project hinder or contribute to the Government of Canada's ability to meet its environmental obligations and its commitments in respect of climate change.

A key element for the impact assessment process is the preparation of Tailored Impact Statement Guidelines³ (the Guidelines), which provide the proponent with directions and requirements for the preparation of an Impact Statement. The Guidelines for the Northern Road Link Project (the Project) proposed by Marten Falls First Nation and Webequie First Nation (the proponent), were tailored by the Agency during the planning phase of the impact assessment. The tailoring was based on the nature, complexity, and context of the Project, and was informed and guided by consultation and engagement with the proponent, the public, Indigenous communities⁴, federal authorities, and provincial ministries.

1.1. Factors to be considered in the impact assessment

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

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

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

² Section 35 of the the *Constitution Act, 1982* states: (1) The existing aboriginal and treaty rights of the aboriginal peoples of Canada are hereby recognized and affirmed. (2) In this Act, "aboriginal peoples of Canada" includes the Indian, Inuit and Métis peoples of Canada. (3) For greater certainty, in subsection (1) "treaty rights" includes rights that now exist by way of land claims agreements or may be so acquired. (4) Notwithstanding any other provision of this Act, the aboriginal and treaty rights referred to in subsection (1) are guaranteed equally to male and female persons.

³ As set out in paragraph 18(1)(b) of the IAA.

⁴ The terms "Indigenous communities" and "Indigenous community" in these guidelines refer to any of the Indigenous communities identified in the Indigenous Engagement and Partnership Plan for the Northern Road Link Project.



- (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 communities and any adverse impact that the designated project may have on the rights of the Indigenous peoples of Canada recognized and affirmed by section 35 of the *Constitution Act, 1982*;
- d) the purpose of and need for the designated project;
- e) alternative means of carrying out the designated project that are technically and economically feasible, including through the use of best available technologies, and the effects of those means;
- f) any alternatives to the designated project that are technically and economically feasible and are directly related to the designated project;
- g) Indigenous Knowledge provided with respect to the designated project;
- h) the extent to which the designated project contributes to sustainability;
- i) the extent to which the effects of the designated project hinder or contribute to the Government of Canada's ability to meet its environmental obligations and its commitments in respect of climate change;
- j) any change to the designated project that may be caused by the environment;
- k) the requirements of the follow-up program in respect of the designated project;
- l) considerations related to Indigenous cultures with respect to the designated project;
- m) community knowledge provided with respect to the designated project;
- n) comments received from the public;
- o) comments from a jurisdiction that are received in the course of consultations conducted under section 21 of the IAA;
- p) any relevant assessment referred to in section 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 scope of the factors in paragraphs 22(1)(a) to (f), (h) to (l), (s) and (t) that are to be taken into



account, including the extent of their relevance to the impact assessment, is determined by the Agency and is outlined in the Guidelines.

1.2. Gender-based Analysis Plus (GBA Plus)

For consideration of the intersection of sex and gender with other identity factors (paragraph 22(1)(s) of the IAA), the Guidelines will refer to GBA Plus. GBA Plus is an analytical process that can guide practitioners to identify who is impacted by a project and assess how they may experience impacts differently, in order to develop mitigation measures to address these differential impacts. The Guidelines refer to "diverse subgroups" in the context of GBA Plus, in reference to groups within the general population and within communities (e.g., by sex, gender, age, ethnicity, Indigeneity, socio-economic status, health status and any other community-relevant identity factors). The Agency's Guidance Gender-Based Analysis Plus in Impact Assessment⁵ provides guiding principles and tools to apply GBA Plus in the Impact Statement.

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

- be sufficiently disaggregated to support the analysis of disproportionate effects as per GBA Plus. As much as possible, the data must be disaggregated (e.g., by sex, gender, age, ethnicity, Indigeneity, ability, and any other community-relevant identity factors) and presented distinctly for each specific subgroup;
- describe how community knowledge and Indigenous Knowledge from affected populations, including community developed indicators and locally collected data, was used in establishing baseline conditions and informing effects assessments;
- describe how community members differ in access to resources, opportunities and services;
- describe the circumstances in which diverse 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; and
- describe mitigation or enhancement measures to address these differential effects.

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

1.3. Preparing the Impact Statement

In the preparation of the Impact Statement, the proponent must adhere to relevant ethical guidelines and cultural protocols governing research, data collection and confidentiality. This is particularly important in the case of information gathered and studies conducted with diverse subgroups. The proponent must

⁵ <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/gender-based-analysis.html>



respect the obligation of protecting personal information and adopt the established standards for the management of Indigenous data (e.g., the First Nations' principles of Ownership, Control, Access and Possession (OCAP)⁶ or standards adopted by an Indigenous community) and disaggregated data from small or unique populations.

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

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

The Agency is available to support the proponent during the preparation of the Impact Statement and may establish technical advisory groups, consisting of federal authorities and others, as appropriate. The proponent is encouraged to engage the Agency early in the process to clarify requirements and expectations as presented in the Guidelines. The proponent also should consider submitting documents for review (e.g., 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 provide the Agency with a concise workplan for the impact statement phase of the Project, within three months of the Notice of Commencement.

The Agency will review the submitted Impact Statement, and will engage federal authorities, provincial ministries, Indigenous communities, and other participants to identify any deficiencies in the information provided, in comparison to the Guidelines, which the proponent must address. When the Agency is satisfied that the proponent has provided it with all of the required information or studies, it will post a notice on the Registry.

The notice must be posted within three years of the day that a copy of the Notice of Commencement is posted on the Registry. The three-year time limit includes the time required for the review of the Impact Statement and for the proponent to address any deficiencies. On the proponent's request, the Agency may extend the time limit for the proponent to provide the Agency with the information or studies. If the proponent does not provide the Agency with the information or studies within the three-year time limit, or within any extension of that time limit, the notice is not posted and the impact assessment process is terminated.

⁶ <https://fnigc.ca/ocap-training/>

1.4. Format and accessibility

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

Where information is required or is provided as a map in the Impact Statement, the proponent must also provide the Agency with the corresponding electronic geospatial data file(s). The Agency will make the geospatial data files available to the public under the terms of the Open Government License⁷. Geospatial data files must include metadata that is compliant with the ISO 19115 standard and, at a minimum, provides:

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

The proponent should review the Agency's guidance on submitting geospatial data⁸ for more information.

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

The proponent should be prepared to provide:

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

⁷ <https://open.canada.ca/en/open-government-licence-canada>

⁸ <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/guidance-submitting-geospatial-data.html#toc8>



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

2. Overview

2.1. The proponent

The Impact Statement must:

- provide contact information for all proponent representatives for the project (e.g., name, address, phone, email);
- identify the proponent(s) and, where applicable, the name of the legal entity(ies) that would develop, manage and operate the Project;
- describe organizational structure, including key personnel and linkages between the management team and the project team;
- describe the management team, including affiliations of personnel, structural hierarchy, individual roles and responsibilities;
- describe the project-team structure, including affiliations of personnel, structural hierarchy, individual roles and responsibilities of key personnel;
- specify the mechanism used to ensure that organizational policies will be implemented and respected for the Project; and
- identify and describe qualifications of key personnel, contractors, and/or sub-contractors responsible for preparing the Impact Statement and conducting the impact assessment.

2.2. Qualifications of individuals preparing the Impact Statement

In support of transparency, the Impact Statement must:

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

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

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

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

- following existing standards and best practices for the responsible conduct of scientific research;
- declaring and managing any real or perceived conflict of interest for individuals involved in preparing the Impact Statement;
- eliminating, controlling for, or appropriately managing potential biases; and
- characterizing all potential sources of scientific uncertainty, including their magnitude and any differences in the interpretation of scientific results.

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

3. Project description

3.1. Project overview

The Impact Statement must describe the Project, key project components and ancillary activities, scheduling details, the timing of each phase of the Project, the total lifespan of the Project, and other key features. If the Project is part of a larger sequence of projects, the Impact Statement must outline the larger context, including likely future developments by other proponents that may use or rely on the Project, and activities that may be enabled by the Project.

3.2. Project location

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

- geographic coordinates (i.e., longitude/latitude using international standard representation in degrees, minutes, seconds) for the beginning and end points;

- project footprint, including the extent of the tenure;
- surface areas, location and spacing of project components;
- distance of the project components to any federal lands and the location of any federal lands within the regional study areas;
- services and infrastructure and current land and aquatic uses in the area including:
 - roads;
 - municipalities and administrative regions;
 - resource development projects already underway in the study area (e.g., mines and forestry operations);
 - dams, reservoirs and hydropower facilities in regulated waterways;
 - local businesses and industries such as fisheries campgrounds, outfitters, recreation features and tourism operators, and any other relevant users; and
 - boundaries of local resource management plans including water management plans, forest management plans, fisheries and wildlife management plans;
- primary, secondary, and tertiary watersheds, as per the Ontario Watershed Boundaries⁹;
- all waterbodies, including intermittent and ephemeral waterbodies, and their location on a map, as well as flow direction;
- navigable waterways;
- landcover in the area, including important or critical habitats;
- ecozones, ecoregions, and ecodistricts as per the province's or Canada's Ecological Land Classification¹⁰;
- environmentally sensitive areas, such as national, provincial, territorial and regional parks, Indigenous Protected and Conserved Areas, ecological reserves, ecologically and biologically sensitive or significant areas, wetlands as per the province's Ontario Land Cover Compilation v2.0, estuaries, and habitats of federally or provincially listed species at risk and other sensitive areas;
- lands subject to conservation agreements;
- mineral development proposals, and areas of early and advanced mineral exploration;
- areas for aggregate extraction;
- description and locations of all potable drinking water sources (i.e., municipal, Indigenous, or private);
- description of local communities and Indigenous communities;

⁹ <https://geohub.lio.gov.on.ca/maps/mnrf::ontario-watershed-boundaries-owb/about>

¹⁰ <https://www.statcan.gc.ca/en/subjects/standard/environment/elc/2017-1> and <https://ccea-ccae.org/ecozones-introduction/>

- Indigenous traditional territories and/or consultation areas, Treaty and/or Title lands, First Nation Reserve lands, Indigenous harvesting regions (with permission of Indigenous communities);
- culturally sensitive areas (as identified by Indigenous communities); and
- culturally important features of the landscape.

Information listed above, must incorporate relevant input received from Indigenous communities that may be affected by the Project. (See section 6.1 for requirements related to confidentiality.)

3.3. Regulatory framework and the role of government

The Impact Statement must identify:

- any federal power, duty or function that may be exercised that would permit the carrying out (in whole or in part) of the Project or associated activities;
- 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 5 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;
- federal or provincial greenhouse gas (GHG) legislation, policies or regulations that would apply to the Project, and explain their implications in accordance with the Strategic Assessment of Climate Change¹¹ (SACC) and section 3.5.4 of the associated technical guide¹²;
- for any coordinated assessment, the details of how the proponent plans to meet the requirements for both processes (including technical work and Indigenous and public engagement requirements);
- government policies, resource management plans, planning or study initiatives relevant to the Project and/or impact assessment and their implications, including relevant regional studies, and regional and strategic assessments;
- any treaty, self-government, land claims or other agreements between federal or provincial governments and Indigenous communities that are pertinent to the Project and/or the impact assessment;
- any relevant land use plans, including Indigenous land use plans, land zoning, or community plans (including any draft Community Based Land Use Plans that are publicly available or have been shared by Indigenous communities);
- information on land lease agreement or land tenure, when applicable; and

¹¹ <https://www.strategicassessmentclimatechange.ca/>

¹² The most recent versions of the SACC and its technical guide are online:
<https://www.canada.ca/en/services/environment/conservation/assessments/strategic-assessments.html>

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

3.4. Project components

The Impact Statement must describe the Project, by listing and describing the project components, associated and ancillary works, and other characteristics to assist in understanding the potential environmental, health, social and economic effects, effects on Indigenous peoples and impacts on the exercise of rights of Indigenous peoples¹³, as identified by the Indigenous communities. This description must be supported with maps of all project components listed below, boundaries of the proposed site with geographic coordinates, major existing infrastructure, proponent lands, properties or leased lands, adjacent resource lease boundaries, adjacent land uses and any important environmental features.

The Impact Statement must describe all project components including but not limited to:

- water management infrastructure to divert, control, collect and discharge surface drainage and groundwater discharges and any seepage (including footprint, location, discharge locations and their receiving environment);
- waterbody diversions/realignments, dewatering and deposition activities;
- the locations and conceptual designs of single and multi-span watercourse crossings and types of structure used for water crossings (crossing type, design, length, etc.);
- the locations and conceptual designs of culverts for water flow connectivity and water level balancing (type, design, length, etc.);
- final route for all permanent and temporary linear infrastructure, including the road corridor, width of road surface, width of cleared corridor, width of right-of-way, access roads (permanent and temporary), and temporary crossings;
- description of the area to be cleared;
- construction workspace and laydown areas (footprint, location);
- storage for fuels, explosives and hazardous wastes (method, footprint, location, management);
- sources of drinking and industrial water (source, quantity);
- treatment facilities for potable water, sewage, wastewater and effluent (including proposed treatment technologies, footprint, location, discharge locations);
- temporary and permanent fueling stations and energy supply sources (footprint, location);
- temporary or permanent infrastructure areas, including worker accommodations and camps;
- staging areas and storage areas (footprint, location);
- borrow pits, gravel or aggregate pits and quarries (footprint, location¹⁴, volumes, ownership, and development plans including pit phases and lifespan), including their location in relation to upland

¹³ This document uses the term 'Indigenous peoples' to represent the "aboriginal peoples of Canada" which includes Indian, Inuit and Métis peoples as defined in subsection 35(2) of the *Constitution Act, 1982*, and 'rights of Indigenous peoples' is used to reflect the full scope of potential or established Aboriginal and Treaty rights recognized and affirmed by section 35 of the *Constitution Act, 1982*.

¹⁴ If the proponent chooses to source aggregate located on a reserve during the construction and/or operation of the Project, a permit under the *Indian Act* would be required.

habitats and the presence of rare, limited and/or significant habitat (e.g., federal¹⁵, provincial, or Indigenous protected and conserved areas), ANSIs¹⁶ (Areas of Natural and Scientific Interest), Ramsar sites¹⁷, critical habitat identified under SARA, etc.;

- aggregate extraction and production (crushing/screening) facilities (footprint, technology, location);
- waste rock, overburden, topsoil, gravel and rock storage and stock piles (footprint, locations, volumes, development plans and design criteria);
- waste disposal (types of waste, methods of disposal, quantity, location of disposal sites);
- remediation of project site, including post-construction clean-up and restoration; and
- any other permanent or temporary infrastructure relevant to the Project, including any planned or anticipated co-location, construction or site preparation of additional right-of-way infrastructure such as, but not limited to, transmission lines, telecommunication infrastructure, overpasses¹⁸, and pipelines.

3.5. Project activities

The Impact Statement must include descriptions of project activities to be carried out during each project phase, the location of each activity and the activity's duration, magnitude and scale.

The Impact Statement must provide a complete list of project activities and focus on activities with the greatest potential to have environmental, health, social and economic effects on local communities and Indigenous people and the impacts to the exercise of Aboriginal or Treaty rights of Indigenous peoples, as defined in section 35 of the *Constitution Act, 1982*. The criteria used to determine which project activities have the greatest potential effects should be described. Sufficient information must be included to adequately predict adverse and positive environmental, health, social and economic effects, the interaction between those effects and any disproportionate effects for diverse subgroups.

The Impact Statement must provide evidence that input from diverse subgroups was sought through early, meaningful and ongoing engagement activities and that there was broad participation by individuals or groups to identify potential effects or other concerns and issues. The information must be sufficient to provide an analysis regarding the Project's impacts in the context of potential interaction between each valued component.

The Impact Statement must highlight activities that involve periods of increased disturbance to environmental, health, social and economic conditions or impacts on the exercise of rights of Indigenous peoples. The Impact Statement must include a schedule including time of year, frequency, and duration for all project activities.

The Impact Statement will include an updated project description, which outlines any new information or project details. This will include a summary of the changes that have been made to the Project since originally proposed in the Detailed Project Description, including the reasons for the changes and the

¹⁵ <https://www.canada.ca/en/environment-climate-change/services/national-wildlife-areas/protected-conserved-areas-database.html>

¹⁶ <https://www.ontario.ca/page/ontarios-parks-and-protected-areas#section-4>

¹⁷ <https://www.ramsar.org/wetland/canada>

¹⁸ The Impact Statement must be clear on what temporary and permanent overpasses are planned, and when they would be constructed and removed (if temporary) during the Project's lifespan.

anticipated changes to the environment or to health, social or economic conditions and the predicted positive and negative consequences of these changes. This will also include an appendix of all the proposed mitigation and follow-up program measures to address adverse effects and potential impacts on the rights of Indigenous peoples. Project activities, where relevant to the Project, may include, but are not limited to a description of the elements listed below.

3.5.1. Site preparation and construction

The Impact Statement must describe the anticipated activities during site preparation and construction of the Project, including:

- physical surveying of road right-of-way width and alignment, as well as supportive temporary infrastructure (e.g., access roads, aggregate source area and camps);
- vegetation clearing, earth excavation and other roadbed preparation activities, earth grading and granular placement for road construction;
- clearing, grubbing and excavation for construction and for activities such as aggregate sourcing, temporary lay-down areas, staging areas, access roads, work camps, and debris or timber stockpiles;
- management and stockpiling of topsoil and unsuitable earth material along the right-of-way;
- water management, including water diversions, dewatering or deposition activities, storm water management, site drainage, runoff management, sediment or erosion control, potable water, water use requirements, and wastewater if applicable, including:
 - site plans showing all project components, such as, water management infrastructures, location of all material stockpiles, location of all release points to the receiving environment, location of all major water crossings, location of all relevant waterbodies, and any other components or infrastructures relevant to the Project;
 - ditching and drainage excavation, including the construction of culverts for road drainage; and
 - construction of single and multi-span watercourse crossing structures, including culverts.
- extraction, production management and transportation of borrow material and aggregate requirements (location, method and quantity);
- wetland drainage;
- blasting (frequency, duration, time of year, time of day and methods);
- explosives transportation, storage and management;
- storage, gestation, disposal and management of hazardous materials, fuels and waste (types, methods and amounts);
- waste management and recycling;
- earth and aggregate hauling operations;
- operation of light duty, heavy-duty and mobile off-road equipment (type, quantity, power source);

- operation, maintenance and storage of machinery and equipment;
- transportation of employees;
- equipment and crew mobilization/de-mobilization;
- earthmoving, levelling, grading, and construction of the roadbed (for all new right of ways or roads);
- operation and dismantling of temporary camps (capacity, wastewater treatment);
- post-construction decommissioning, clean-up and restoration (including of construction equipment and vehicles, work areas, borrow pits, gravel pits, rock quarries, and laydown areas, construction materials, and temporary access roads);
- construction of access roads (permanent and temporary), haul roads, and overpasses;
- construction of fences and barriers (location);
- alteration of linked roadways needed for construction and operation;
- transport of equipment and supplies (type and quantity of equipment, and mode of transportation, including winter roads, air transport, rail, etc.);
- the ownership, transfer and control of the different project components, if applicable;
- use of winter roads for site preparation and construction; and
- use of the Anaconda and Painter Lake forestry roads.

3.5.2. Operation and maintenance

The Impact Statement must describe the anticipated activities during the operation and maintenance of the Project, including:

- the ownership, transfer and control of project components, if applicable, with a description of any influence retained over operational and maintenance activities;
- surface repairs, both localized and full resurfacing of the road, including materials and equipment requirements (type, quantity, anticipated frequency);
- dust control activities;
- vegetation management;
- winter maintenance, snow clearing and de-icing, including salt/sand application, and management;
- facility maintenance yard to store sand and/or salt and to house roadway maintenance equipment;
- bridges and culverts maintenance;
- water management, including:
 - maintenance of storm water and road drainage systems (culverts, ditches, outfalls, and any water diversions (location, methods, timing));

- potable water, water use requirements; and
- process water, wastewater, water recycling and effluent treatment (quantity, treatment requirements, release points and their receiving waterbodies).
- management and disposal of wastes;
- aggregate production and stockpiling, aggregate extraction, processing and treatment (including any drilling, crushing and sorting, and explosives manufacture, storage and use);
- characterization and management of borrow material, including overburden, and aggregate (storage, handling and transport of the volumes generated, mineralogical characterization, potential for metal leaching and acid rock drainage);
- transportation of employees;
- description of any road access controls, including:
 - access to and use of adjacent lands for traditional uses or other activities (e.g., mineral exploration, outfitters, etc.);
 - vehicle and operator licensing requirements;
 - insurance coverage requirements and general liability; and
 - enforcement/policing responsibility.
- anticipated road use by different users (traffic volume, type of vehicles, maximum weight, etc.), including Indigenous communities, the general public, and infrastructure and mining proponents of reasonably foreseeable future projects (e.g., anticipated future highways, Eagle's Nest, Blackbird, Black Thor, Black Label, Big Daddy);
- anticipated use of the Anaconda and Painter Lake forestry roads; and
- use of winter roads by the proponent.

3.5.3. Suspension, decommissioning and abandonment

The Impact Statement must describe the anticipated activities during suspension¹⁹, decommissioning and abandonment of the Project, including:

- the ownership, transfer and control of the different project components, with a description of any influence retained over activities during suspension and decommissioning;
- the preliminary outline of a suspension, decommissioning, reclamation or abandonment plan for any components associated with the Project that are in the proponent's control;
- site restoration and reclamation, including desired outcomes, approach, and follow-up or adaptive management to achieve outcomes;

¹⁹ Suspension means the proponent temporarily stops project-related activities under specific conditions (e.g. emergency evacuation) for a period of time, prior to completion of the activities, with the intent to resume the activities when conditions are appropriate.

- dismantling and removal of equipment and systems;
- removal and reclamation of ancillary structures;
- long term care, monitoring and maintenance of the integrity of the site, including water management, and any remaining structures; and
- suspension, decommissioning and abandonment of temporary or permanent facilities, including aggregate pits, access roads and water crossings.

If the proponent does not anticipate decommissioning and abandonment, it must state clearly under what circumstances decommissioning would occur and demonstrate a commitment to following environmental and social best practice in all its activities.

3.6. Workforce requirements

The Impact Statement must describe the anticipated labour requirements, employee programs and policies, and workforce development opportunities for all phases of the Project, including:

- opportunities for employment that outline the anticipated number of full-time and part-time, positions to be created, and timeline for when they will be created, and how this will change during the various phases of the Project. Positions should be presented using the National Occupational Classification system;
- anticipated workforce region of origin (i.e., local, regional, out-of-province or international employees), including the anticipated scenario, plus a qualitative summary of other plausible scenarios,
- the skill and education levels required for the positions;
- investment in training opportunities;
- working conditions and anticipated work scheduling for construction, operation and maintenance (e.g., hours of work, rotational schedules, fly-in/fly-out);
- accommodation and lodging requirements for the workforce over the lifespan of the Project;
- anticipated hiring policies, and programs;
- workplace policies and programs for Indigenous employment, workplace diversity and employment of other underrepresented groups;
- employee assistance programs and benefits programs; and
- workplace policies and programs, including codes of conduct, workplace safety programs, training to address gender-based violence and harassment, and cultural training programs.

In addition to the above, the Impact Statement must include GBA Plus²⁰ in its discussion of workforce requirements to describe any potential differential effects for diverse subgroups in communities potentially impacted by the Project. This must include a discussion of how hiring policies and programs, access to employment and training opportunities, investment in training, and workplace policies and programs take into consideration vulnerable or underrepresented groups, including Indigenous peoples or other community-relevant subgroups (e.g., women, youth, Elders).

The information must be presented in the Impact Statement in sufficient detail to analyse how historically excluded or underrepresented groups will be taken into account, including Indigenous communities and other relevant diverse subgroups.

4. Project purpose, need and alternatives considered

The proponent must identify the purpose of and need for the Project. The proponent must also analyze alternatives to the Project and alternative means of carrying it out. The proponent should consult the Agency guidance documents "Need for", "Purpose of", "Alternatives to" and "Alternative Means"^{21, 22}.

4.1. Purpose of the Project

The Impact Statement must outline what is to be achieved by carrying out the Project. The statement should broadly classify the Project (e.g., all-season multi-use road, electricity supply, mineral extraction/processing, etc.) and indicate the target market (e.g., international, domestic, local, etc.), or end-users, where applicable. The *purpose of* statement should include any objectives the proponent has in carrying out the Project. The proponent is encouraged to consider the perspectives of participants, including future project users (i.e., public, Indigenous communities, governments) in establishing objectives that relate to the intended effect of the Project on society.

4.2. Need for the Project

The Impact Statement must describe the underlying opportunity or issue that the Project intends to seize or solve and should be described from the perspective of the proponent. In many cases, the need for the Project can be described in terms of the demand for a resource, service or piece of critical infrastructure to further economic development goals. The proponent should provide supporting information that

²⁰ GBA Plus provides a framework to describe the full scope of potential adverse and positive effects under the IAA. GBA Plus is an analytical framework that guides practitioners, proponents and participants to ask important questions about how projects may affect diverse or potentially vulnerable population groups or subgroups who may be less likely to benefit from project activities.

²¹ <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/guidance-need-for-purpose-of-alternatives-to-and-alternative-means.html>

²² <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/need-for-purpose-of-alternatives-to-and-alternative-means.html>

demonstrates the need for the Project, inclusive of needs expressed by other parties that may share the need for the Project (e.g., public, Indigenous communities, governments). The information provided should make it possible to reasonably conclude that there is an opportunity or issue that warrants a response and that the Project is an appropriate approach.

The description must include:

- supporting information that demonstrates the need for a project;
- any comments or views of Indigenous peoples, the public and other participants on the proponent's need statement; and
- description of whether and how the Project would support any federal or provincial government objectives;

4.3. Alternatives to the Project

In addressing alternatives to the Project, the Impact Statement must provide a description of the functionally different ways that are technically and economically feasible to meet the project need and achieve the project purpose from the perspective of the proponent. For these technically and economically feasible alternatives to the Project, the Impact Statement must provide sufficient information for the selection of alternatives to the Project.

The process of identifying and considering alternatives to the Project must consider the views, information and knowledge from Indigenous communities and other participants, as well as existing studies and reports, and must be conducted in accordance with the Agency's policy and guidance documents. As relevant, the alternatives to the Project should be informed by any study or plan that is conducted or prepared by a jurisdiction and is in respect of a region related to the Project, and that has been provided with respect to the Project.

The analysis of alternatives to the Project should serve to validate that the preferred alternative for the Project is a reasonable approach for meeting the need and purpose and is consistent with the aims of the IAA.

The Impact Statement must further describe the no-action (null) alternative, noting the baseline conditions of the valued components associated with the Project, as well as changes to these baseline conditions that are likely to occur in the future if the Project is not carried out (e.g., changes as a result of other projects already planned for the region, changes to the socio-economic conditions, etc.).

The alternatives analysis should describe how sustainability (see Section 14) was considered in the selection of the preferred alternative for the Project.

4.4. Alternative means of carrying out the Project

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

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
- each alternative means in sufficient and appropriate detail to distinguish the particularities, potential adverse and positive environmental, health social and economic effects, and their impacts on the rights of Indigenous peoples of Canada as identified by Indigenous peoples potentially impacted by the Project.

The application of GBA Plus to consider the potential for disproportionate effects for diverse subgroups, including groups identified by age, socio-economic status or disability, is required.

The proponent must also consider the views or information provided by Indigenous communities, the public and other participants in establishing parameters to compare the alternatives means. The determination of alternative means must be conducted in accordance with the Agency's policy and guidance documents²³.

The Impact Statement must identify:

- the methodology and criteria used to compare the alternative means, to determine the preferred means of carrying out the Project, and to justify the exclusions of other solutions, based on the trade-offs associated with the preferred and other alternative means;
- environmental criteria that should include effects to air quality, water quality, fish and fish habitat, wildlife and their habitat (including riparian and wetland environments), and risk from accidents and malfunctions;
- potential effects to species at risk as per SARA, including any critical habitat, and 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;
- the preferred means of carrying out the Project and the rationale for the selection based on the consideration of environmental, health, social and economic effects, the impacts on the rights of Indigenous peoples, technical and economic feasibility, and the use of best available technologies, and consideration of the sustainability principles (described in section 14 *Extent to which the Project contributes to sustainability*);
- the application of GBA Plus 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 peoples, the public and other participants were taken into account in establishing criteria and conducting the analysis.

²³ <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/guidance-need-for-purpose-of-alternatives-to-and-alternative-means.html>

In the alternative means analysis, the Impact Statement must address key project elements that include the following, where relevant to the Project:

- project layout and/or component size and location, including the options for the highway route or corridor, widths of right-of-way, cleared area, and road surface;
- choice of engineering and design standards for the roads;
- access roads (permanent and temporary);
- aggregate pits, quarries, and gravel pits (including location, a description of how aggregate source alternatives were chosen, and indication whether aggregate may be coming from eskers or other glacial deposits);
- aggregate extraction activities (including extraction method, location and design of any facilities required to produce aggregate, location of aggregate stockpiles, and management of waste materials and any mobilized metals such as chromium and other naturally occurring metals);
- other linear infrastructure within the corridor, including electrical transmission lines;
- access to the project site;
- watercourse crossing locations and design, including culverts and bridges (permanent and temporary);
- water diversion routes;
- energy sources to power the project site, including worker camps (temporary and permanent, stationary and mobile);
- management of water supply, wastewater, and solid wastes;
- construction alternatives;
- timing options for various components and phases of the Project; and
- suspension, decommissioning, reclamation or abandonment 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, including information available as relevant from the Regional Assessment in the Ring of Fire Area;
- 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 Project;
- Indigenous Knowledge, community knowledge, comments received by the public, comments received from a jurisdiction; and
- other studies or assessments realized by the proponent or other proponents.



The proponent should refer to any current Agency guidance on this topic²⁴.

5. Description of public participation and views

The proponent must demonstrate that they have meaningfully engaged with local communities, technical experts, the public, associations, and stakeholders. The engagement activities are to prioritize the participation of those who are most affected by the proposed project, while also ensuring that interested members of the public have an opportunity to share their views.

The proponent must engage with the public and provide timely notification of proposed engagement activities to seek community knowledge and views on:

- baseline conditions;
- valued components and indicators, taking into consideration the requirements under section 14 of this document;
- effects assessment and the assessment of the Project's contribution to sustainability;
- mitigation and follow-up measures; and
- conclusions.

In addition to its own engagement activities, the proponent is expected to participate meaningfully in engagement activities outlined in the Public Participation Plan²⁵. The Agency will organize meetings, as per the Public Participation Plan, during which the proponent is expected to present information about the Project, including baseline conditions, potential effects, assessment of effects and the assessment of the Project's contribution to sustainability, mitigation and follow-up measures, and the proponent's assessment conclusions. The proponent is expected to take into consideration the feedback received during these meetings, as well as community knowledge, in the development of the Impact Statement.

The proponent should consult Agency guidance documents on this topic, particularly: *Framework: Public Participation under the Impact Assessment Act*²⁶, and *Guidance: Public Participation under the Impact Assessment Act*²⁷. Additionally, the proponent should consider public engagement methods and tools outlined in the Public Participation Plan for the Project. The Agency expects the proponent to engage with, at a minimum, the members of the public listed in Appendix 1 of the Public Participation Plan.

²⁴ <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/guidance-need-for-purpose-of-alternatives-to-and-alternative-means.html>

²⁵ <http://iaac-aeic.gc.ca/050/evaluations/document/152757?culture=en-CA>

²⁶ <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/framework-public-participation.html>

²⁷ <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/guidance-public-participation-impact.html>

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

The Impact Statement must provide an analysis of the input received from local communities and other stakeholders (e.g., associations, non-government organizations, academics, industry and public) for the impact assessment process. This analysis is to include all input received prior to, and since commencing, the process. This analysis is to take into consideration the requirements under section 14 of this document, relating to the Project's contribution to sustainability.

The Impact Statement and the analysis must include:

- a summary of key issues, questions and comments raised by local communities and other stakeholders during all engagement activities (led by the proponent and when participating in Agency led engagement activities), and all of the proponent's responses, including how matters have been addressed in the Impact Statement, or will be addressed through the impact assessment process;
- where and how public perspectives and input, including community knowledge, were integrated into or contributed to decisions regarding the Project (e.g., project design, proposed measures for mitigation, monitoring and follow-up);
- where and how community knowledge and input were integrated in avoiding or mitigating identified effects; and
- identify public concerns that were not addressed, if any, and provide reasons why the concerns were not addressed.

The Impact Statement should also provide details and commitments regarding how the public will be kept involved if the Project were to be approved and were to proceed, such as public involvement in follow-up and monitoring programs.

The proponent should refer to Agency guidance on this topic²⁸.

5.2. Record of engagement

The Impact Statement must provide a record of engagement that describes all efforts taken to seek the views of local communities and other stakeholders (e.g., associations, non-government organizations, academics, industry and public) with respect to the Project. This record of engagement is to include all engagement activities undertaken prior to the submission of the Impact Statement, including prior to and during the planning phase, and in the preparation of the Impact Statement. The Impact Statement must include, at a minimum:

- the list of local communities, associations, non-government organizations, academics, industry and stakeholders engaged by the proponent;

²⁸ Please refer to Agency guidance, including <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/impact-assessment-process-overview/phase5.html>

- the engagement activities undertaken by the proponent, including the methods used, where and when engagement activities were held, the persons, organizations and diverse groups engaged, and results of engagement;
- a description of efforts made by the proponent to distribute project information and provide a description of information and materials that were distributed during the engagement process;
- a description of efforts made by the proponent to engage diverse subgroup populations to support the collection of information needed to complete the GBA Plus;
- a description of the efforts made by the proponent to gather community knowledge and public views to discuss valued components, indicators, potential positive and adverse effects from the Project, effects assessment, assessment of the Project's contribution to sustainability, mitigation and follow-up measures, and assessment conclusions; and,
- a description of the efforts made by the proponent to validate with communities and public stakeholders how community knowledge was applied to the selection of valued components, indicators, effects assessment, mitigation measures and follow-up programs, and conclusions.

In relation to the record of public engagement, appendices of the Impact Statement must include, at a minimum:

- meeting summaries, including issues raised by local communities, associations, and stakeholders;
- description of meetings, including but not limited to date, location, number of participants, affiliation, and general information about sub-population represented;
- comprehensive list of all comments brought forward and their responses, including comments raised during proponent engagement activities; and
- copies of the information and materials distributed at engagement activities, including, but not limited to, panels, presentations, and handouts.

6. Description of engagement with Indigenous communities

At the earliest reasonable opportunity, the proponent must engage with all Indigenous communities, in order to identify and understand the potential impacts of the Project on Indigenous peoples and their rights, including their lands, territories and resources, and to incorporate Indigenous Knowledge into the impact assessment, which will be considered on equitable footing with western scientific information. Engagement with Indigenous communities is required to inform the impact assessment and identify measures to avoid or minimize potential impacts on Indigenous peoples and their rights from the Project. This engagement may also identify potential positive outcomes, including measures that could improve the underlying baseline conditions that support the exercise of rights. Ideally, the Project will be designed not only in such a way as to minimize its negative effects, but also to maximize its positive impact on the quality of life of Indigenous peoples.

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

The Indigenous Engagement and Partnership Plan²⁹ identifies the Indigenous communities that may be affected by the Project. In order to facilitate the participation of each Indigenous community in the development of the Impact Statement, the proponent is required to work with each Indigenous community identified³⁰ in section 4 of the Indigenous Engagement and Partnership Plan to establish a mutually agreed approach to their participation, should they wish to participate. This may involve, upon request from Indigenous communities, providing simultaneous translation during engagement sessions and giving plain language documents translated into Indigenous languages to the communities. The degree of engagement with each Indigenous community will vary and in general, will be proportionate to the evidence provided by Indigenous communities, regarding potential pathways of impact from the Project on Aboriginal or Treaty rights.

Section 4.1 of the Indigenous Engagement and Partnership Plan identifies the Indigenous communities with whom the proponent must engage to understand the concerns and potential impacts of the Project on their exercise of potential or established Aboriginal or Treaty rights and, where appropriate, make accommodations. Engagement with Indigenous communities must involve ongoing information-sharing and collaboration between the proponent and Indigenous communities to contribute to the development and validation of conclusions and assessment findings related to potential impacts and pathways of effects to Indigenous peoples and impacts on the rights of Indigenous peoples.

For the purposes of the Impact Statement, for the Indigenous communities identified in subsection 4.1 of the Indigenous Engagement and Partnership Plan, the proponent must:

- in accordance with any existing community protocols and/or guidance provided by the Agency, collect available Indigenous Knowledge and expertise and integrate it into its Impact Statement, just as it integrates scientific knowledge;
- share with Indigenous communities project information frequently, transparently and at the earliest opportunity, including information about methodologies proposed or followed and/or collected baseline data when requested by a potentially impacted Indigenous community;
- support the participation of Indigenous communities in the completion of the Impact Statement (e.g., Traditional Knowledge and Land Use studies to inform baseline studies and effects assessment; Indigenous-led evaluation of effects on health, socio-economic conditions,

²⁹ <http://iaac-aeic.gc.ca/050/evaluations/document/152755?culture=en-CA>

³⁰ The list of Indigenous peoples, groups, or communities identified during the planning phase may change as knowledge of the effects and potential impacts of the Project is gained, or if the Project or its components are modified during the impact assessment. The Agency reserves the right to modify the list in the Indigenous Engagement and Partnership Plan based on additional information gathered during the impact assessment and will notify the proponent of any modifications.

Indigenous Knowledge and land uses, cultural and physical heritage, as well as Aboriginal or Treaty rights) conducted by potentially affected Indigenous communities who will have demonstrated interest in this regard; and

- cooperate with Indigenous communities to identify preferred mitigation measures to avoid, minimize, offset, or otherwise accommodate for potential adverse impacts on Indigenous peoples or their rights, as well as to optimize the Project's benefits for their communities.

If the proponent becomes aware of potential adverse effects on the exercise of potential or established Aboriginal or Treaty rights of an Indigenous community that is not listed in subsection 4.1 of the Indigenous Engagement and Partnership Plan, that community must also be engaged, as outlined above, and the proponent is required to notify the Agency as soon as it has the opportunity to do so.

Engagement is also conducted for other purposes, including as an opportunity to learn about and further explore Indigenous community interests in a project, or to understand other potential project effects not directly related to the exercise of Aboriginal or Treaty rights. For Indigenous communities identified in subsection 4.2 of the Indigenous Engagement and Partnership Plan, the proponent must, at a minimum, provide project updates at key milestones of the impact assessment process, and document the engagement in the Impact Statement.

The results of any engagement with each Indigenous community must be presented in the Impact Statement, and, as best as possible, convey the perspective of the Indigenous communities being engaged. The record of engagement and inclusion of Indigenous Knowledge in the Impact Statement should demonstrate that the proponent sought to build consensus and obtained the agreement from specific Indigenous communities regarding information that is presented in the Impact Statement specifically about those Indigenous communities.

The Agency notes that not all Indigenous communities may be willing to collaborate with the proponent, therefore the proponent must demonstrate they have made best efforts at collaboration and provide the Agency with an explanation regarding circumstances where collaboration was not possible. The proponent should continue to share information and analyses with the Indigenous communities, use publicly available sources of information to support the assessment, and document their efforts in that respect.

The proponent must consult the Agency's guidance documents on Indigenous participation and engagement, which are available on the Agency's website and are listed in Appendix 1.

In addition, the Agency will organize a series of meetings, as per the Indigenous Engagement and Partnership Plan, in coordination with the proponent, to discuss technical matters as it progresses through its baseline data collection, effects assessment, impacts on the exercise of Aboriginal or Treaty rights, and mitigation and follow-up development. The proponent will participate in these meetings with the Agency, federal authorities, provincial ministries, and Indigenous communities to discuss technical matters. These meetings would be in addition to engagement with Indigenous communities, including community meetings, and discussions regarding Indigenous Knowledge, which the proponent would undertake during the preparation of the Impact Statement.

The purpose of these meetings is to provide all parties with opportunities to discuss key technical issues during the preparation of the Impact Statement and do not reduce the expectations for proponent

engagement with Indigenous communities that the Agency has outlined in this document. The proponent must consider the feedback received during these meetings in the development of the Impact Statement.

6.1. Indigenous Knowledge considerations

Indigenous Knowledge³¹ is holistic and when integrated in impact assessment, it informs the assessment on areas including the biophysical environment, as well as social, cultural, economic, and health aspects, Indigenous governance, resource use, and mitigation. Indigenous Knowledge should be brought together on equitable footing with scientific or technical aspects to inform the impact assessment, including the biophysical environment; health, social, and economic conditions; Indigenous peoples; and best practices and mitigation. It is important that Indigenous Knowledge, where available to the proponent, be included for all these aspects in the impact assessment, not only to look at potential impacts of the Project on Indigenous communities and their exercise of rights. It is also important to capture the context in which Indigenous communities provide their Indigenous Knowledge and to convey it in a culturally appropriate manner.

Community-specific engagement protocols and procedures around Indigenous Knowledge in assessment processes should be understood, respected, and implemented. The Impact Statement must indicate where input from Indigenous communities, including Indigenous Knowledge, has been incorporated and how it was considered. Information should be specific to the individual Indigenous community(ies) involved in the assessment and describe contextual information about the members within an Indigenous community (e.g., women, men, Elders and youth).

The proponent must indicate where Indigenous Knowledge that was provided was not included in the assessment and provide a rationale. Where findings differ between Indigenous Knowledge and scientific or technical studies, the proponent should clearly present how both were considered in the Impact Statement.

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*³² to which the proponent must refer, describes the approaches to be favoured, including approaches to confidentiality arrangements. Appropriate, culturally-based Indigenous methodology for integrating Indigenous Knowledge and community input into the impact assessment is necessary to appropriately and ethically assess potential effects and significance of those effects from an Indigenous perspective.

³¹ The Government of Canada recognizes that Indigenous peoples refer to their knowledge in different ways, characteristic of their unique languages. Within the context of these guidelines, the term Indigenous Knowledge is used to refer to all Indigenous ways of knowing. The proponent is encouraged to respect the terminology preferences of the Indigenous communities involved in the assessment.

³² <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/protecting-confidential-indigenous-knowledge-under-the-impact-assessment-act.html>

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

The Impact Statement must provide an analysis of any potential effects, including cumulative effects, and impacts on the rights of Indigenous peoples. This analysis should consider all Indigenous Knowledge and input received from Indigenous communities prior to, and since commencing, the impact assessment process. The analysis should include, but not be limited to, the identification of potential effects and impacts on any applicable valued components, including impacts on the exercise of Aboriginal or Treaty rights, and proposed measures to mitigate or accommodate for adverse impacts, and enhance or optimize positive effects.

The analysis may be summarized in the relevant sections on effects to a valued component. The location and level of detail of the information in the Impact Statement will depend on its importance to the selected valued components.

It is recommended that the proponent organize and analyze information relevant to Indigenous communities in separate sections for each Indigenous community potentially affected by the Project. Where applicable, the information and analysis must also be sufficiently disaggregated to support the GBA Plus of disproportionate effects. In all cases, ethical guidelines and culturally appropriate protocols governing research, data collection, and confidentiality must be followed.

The Impact Statement must include:

- a detailed description of key issues, questions, comments, expertise, and observations raised during the engagement activities by each Indigenous community and the proponent's responses, including how matters have been addressed in the Impact Statement or will be addressed through the impact assessment (including but not limited to avoidance, mitigation or other measures to address potential effects or impacts on the exercise of rights of Indigenous peoples); where and how Indigenous Knowledge, as well as perspectives, spiritual practices, cultural beliefs, laws, and norms of Indigenous communities were integrated into or contributed to decisions regarding the Project (e.g., project design), including whether the Project would be inconsistent with Indigenous laws and norms;
- where and how Indigenous communities' views, knowledge, perspectives, and input were integrated in the characterization of the nature of environmental, health, social and economic effects and impacts expected from the Project on each Indigenous community, for both adverse and positive effects;
- where and how Indigenous communities' perspectives and input, and Indigenous Knowledge were integrated in avoiding, mitigating, or accommodating identified effects and impacts;
- for each Indigenous community, a description of the rights and interests that the communities themselves have identified and consented to include in the Impact Statement. Describe separately for each Indigenous community the analysis of the extent of the potential effects on the community, and the views of the community regarding the extent of impact on the exercise of rights as well as how these effects or impacts may be avoided, managed, mitigated, or accommodated;
- a description of the potential effects and impacts to lands in a reserve within the meaning of subsection 2(1) of the *Indian Act* (note that section 2 of the IAA defines federal lands as including

“reserves, surrendered lands and any other lands that are set apart for the use and benefit of a band and that are subject to the *Indian Act*, and all waters on and airspace above those reserves or lands”);

- an account of the interest from Indigenous communities or effort made to collaborate on the effects assessment of the Project, including consideration of subsection 22(1)(q) of the IAA;
- any specific studies or assessments provided by Indigenous communities, added as appendices, if permission has been obtained from the Indigenous community concerned to publish them;
- identification of the sources of information used in the analyses of potential impacts to the exercise of rights³³, as well as assumptions and methodologies used for the analyses;
- the perspectives of Indigenous youth, women, two-spirited people, individuals with disabilities, Elders, and other community-relevant identity factors where provided;
- where and how Indigenous communities’ Indigenous Knowledge, perspectives, participation, and input were integrated into or contributed to decisions regarding the Project or its impact assessment, including:
 - construction, operation, decommissioning, reclamation, and abandonment plans, including final land use plans for the site;
 - the evaluation of alternatives to the Project, and alternative means of carrying out the Project (e.g., selection of the effluent discharge location);
 - developing the assessment including setting spatial and temporal boundaries, identifying, and selecting valued components and sensitive receptor locations, and collecting baseline information (e.g., moose and fish studies);
 - the validation of model assumptions (e.g., the rate of country food consumption);
 - characterization of potential environmental, health, social and economic effects of the Project for each Indigenous community;
 - the cumulative effects assessment;
 - measures to mitigate effects or to enhance or optimize potential project benefits;
 - the determination of the extent of significance of effects; and
 - follow-up and monitoring activities as well as adaptive management strategies should the Project proceed;
- a description of how the information gathered during the planning phase of the impact assessment of the Project was included in the analyses, such as the documents submitted to the Registry by Indigenous communities; and
- rationale to explain if engagement with certain Indigenous communities is not possible, including, as applicable, an outline of efforts made.

The proponent should seek opportunities to validate its analysis with the Indigenous communities while developing the Impact Statement.

³³ Where possible, for those Indigenous communities interested in doing so, opportunities may be provided to lead or collaborate on the assessment of impacts on the exercise of rights.

6.3. Record of engagement

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

The Impact Statement must include, at a minimum:

- the proponent's Indigenous engagement policy, as well as established policies and stated principles related to the collection of Indigenous Knowledge and traditional land use information;
- the list of Indigenous communities engaged by the proponent, including those that the proponent was unsuccessful in engaging;
- the list of Indigenous communities engaged by the proponent that requested specific consultation protocols or confidentiality agreements and where applicable, a copy of each community-specific engagement plan developed collaboratively by the Indigenous community and the proponent for the Project. If only one engagement plan was developed solely by the proponent for engagement with all Indigenous communities, provide a rationale for this approach;
- the list of Indigenous communities wishing to be engaged but omitted by the proponent from engagement and the reasons for their omission;
- a description of the outcomes of conversations with each Indigenous community about how they wish to be engaged by the proponent;
- the results of any engagement and the perspectives of the Indigenous peoples involved;
- the list of the consultation or engagement protocols adopted by each Indigenous community, if applicable. A written copy of the protocols must be included when available;
- a description of how project information is frequently and transparently shared with Indigenous peoples;
- 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 (i.e., translation of written documents or provision of summaries in Indigenous languages);
- the engagement activities undertaken with each Indigenous community, including the date, means, and results of engagement. Include a description of efforts to engage with groups that chose not to engage in the impact assessment process;
- a description of efforts to engage diverse populations of each Indigenous community in culturally appropriate ways, including groups identified by gender, age or other community-relevant identity factors (e.g., hunters, trappers, and other harvesters) to support the collection of information needed to complete the GBA Plus;
- a description of how engagement activities by the proponent were intended to ensure Indigenous communities were provided an opportunity to comment on the Project's effects, including potential

positive and negative consequences, and impacts on the exercise of their rights, as identified by the Indigenous community;

- a description of how Indigenous communities were provided with a reasonable opportunity to review draft sections of the Impact Statement prior to the sections being filed, where disagreements occurred, and how disagreements were considered;
- a description of how Indigenous expertise will be sought to assist with the carrying out of the Project, should it be approved; and
- an explanation for cases where engagement efforts have proven unsuccessful.

In relation to the record of engagement with Indigenous communities, appendices of the Impact Statement must include, at a minimum:

- a description of meetings, including but not limited to date, location, number of participants, affiliation, and general information about sub-population represented (e.g., youth, Elders, women, etc.);
- all meeting summaries and responses to input received from Indigenous communities; and
- copies of material used at each meeting, including panels, presentations, handouts (if the same documents were used in each meeting, one set of documents can be appended to the Impact Statement with an indication of which Indigenous communities received the material).

The record of engagement must demonstrate that the capacity needs of Indigenous communities were taken into account, and that timelines were communicated adequately and were flexible enough to ensure Indigenous communities 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.

The proponent should share engagement records with Indigenous communities on a routine basis prior to submitting the Impact Statement to the Agency. It is expected that the engagement activities for the preparation of the Impact Statement will be carried out with integrity and transparency, without conflicts of interest, in good faith, and conducted in a manner that is attentive to the concerns of Indigenous communities and committed to producing mutually beneficial outcomes.

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

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

The Impact Statement must:

- describe the type of work the proponent intends to accomplish with Indigenous communities during subsequent phases of the impact assessment process;

- set out any proponent commitments for engaging affected Indigenous communities, where appropriate;
- describe how Indigenous peoples will be involved in decision making processes related to the Project throughout the lifecycle of the Project; and
- describe how Indigenous Knowledge and expertise would be considered in carrying out the Project.

7. Assessment methodology

7.1. Baseline methodology

The Impact Statement must provide a description of the baseline for the environmental, health, social and economic conditions related to the Project. This should include the existing environmental, health, social and economic conditions, interrelations and interactions among them, and the variability in these conditions over time scales and spatial boundaries appropriate to the Project, including variability due to future climate change. A description of potential changes in baseline conditions, including changes due to future climate change, that are likely to occur in the future if the Project was not carried out, also is required in the Impact Statement. Meaningful, two-way dialogue with Indigenous communities and local communities provides input that may describe how these conditions are interrelated.

The proponent is encouraged to involve Indigenous Knowledge holders, and members of the youth from Indigenous communities in the design, collection, and review of baseline studies. The proponent may also want to consider data sharing agreements with interested Indigenous communities to support the participation of Indigenous Knowledge holders.

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

Baseline data can often be found in secondary information sources, such as census data, government publications, academic literature and studies done for other assessments in the region. To the extent reasonable, the proponent must utilize data collected for the assessments of Marten Falls Community Access Road and Webequie Supply Road. Any baseline data utilized for the assessment must allow for reliable analysis, extrapolation, and predictions. Approximately two consecutive years of data³⁴ should be provided, unless specified otherwise. The proponent will be responsible for collecting data, as necessary, and establishing appropriate data governance. The baseline data should be suitable to estimate pre-project baseline conditions, to predict effects from the Project, and to evaluate post-project changes in the conditions within and across the project study area. Further data requirements are included in the

³⁴ Approximately two consecutive years of data is particularly important for those valued components with inter-annual variation. Less than two consecutive years of data may be acceptable for the health, social and economic valued components.

baseline conditions sections for the biophysical environment (section 8), for the health, social, economic conditions (sections 9 and 10), and for impacts on Indigenous peoples (section 10) in the Guidelines.

The information describing the existing baseline conditions may be provided as a stand-alone chapter in the Impact Statement or integrated into clearly defined sections for relevant valued components, including effects assessment of each valued component and valued component interactions, identification of mitigation measures, residual effects analysis and cumulative effects assessment.

There is no need for the Impact Statement to provide detailed descriptions of existing features of environmental, health, social or economic components that would not be impacted by the Project as determined by the Agency through engagements with federal authorities, Indigenous communities, the public and interested parties.

In describing the biophysical environment, the Impact Statement must take an ecosystem approach that consider how the Project may affect the structure and functioning of biotic and abiotic components within the ecosystem using scientific, community and Indigenous Knowledge, as applicable. The Impact Statement must provide a description of the indicators and measures used to determine ecosystem health and integrity, identified during early planning, and reflected in the Guidelines. The presence of rare, limited and/or significant habitat (e.g., federal³⁵, provincial, or Indigenous protected areas, ANSIs³⁶, Ramsar sites³⁷, identified or proposed critical habitat in SARA recovery strategies or action plans), such as but not limited to spawning shoals, aquatic vegetation or overwintering pools, eskers or peatlands, potentially affected by the Project should be included in the description of the biophysical baseline conditions.

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: 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, Indigenous Knowledge relevant for the conservation and sustainable use of relevant species populations, communities and associated habitats.

For the baseline conditions, the Impact Statement must:

- include baseline data collected for all valued components to assess changes to environmental, health, social and economic conditions, and clearly demonstrate that these have been 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 area and local study area;
- provide detailed descriptions of data sources and data collection methods, including surrogate data, sampling, survey, and research protocols, modeling methods, sources of uncertainty, analytical detection limits, error estimates, and any assumptions or biases, and an explanation of why these are the most appropriate sources and methods for the Project;

³⁵ https://www.canada.ca/en/environment-climate-change/services/national-wildlife-areas/protected-conserved-areas-database.html#_blank

³⁶ <https://www.ontario.ca/page/ontarios-parks-and-protected-areas#section-4>

³⁷ https://www.ramsar.org/wetland/canada#_blank

- indicate if baseline data gaps exist and additional steps taken to address gaps in information;
- describe where and how community knowledge and Indigenous Knowledge, input, studies, and Indigenous participation were collected and considered in determining baseline conditions, including but not limited to Aboriginal and Treaty rights, archaeological studies, diet and harvest studies, and baseline monitoring of fish, wildlife, water quality and quantity, and air quality;
- describe how GBA Plus was applied to examine differences in baseline conditions 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 defining baseline conditions.

If the baseline data have been extrapolated or otherwise manipulated to depict environmental, health, social and/or economic conditions within the study area, modelling methods must be described and must include assumptions, calculations of margins of error and other relevant statistical information.

Study area boundaries must encompass the spatial boundaries of the Project (see section 7.4.1), including any associated project components or activities, and the anticipated boundaries of the project effects. Considerations in defining appropriate study areas or boundaries would include, but not be limited to:

- areas potentially affected by changes to water quality and quantity or changes in flow in the watershed and hydrologically connected waters;
- areas potentially affected by airborne emissions or odours;
- air zone(s) and airsheds under the Air Quality Management System;
- areas determined by dispersion and deposition modelling;
- areas within the range of vision, light and sound;
- the locations and characteristics of the most sensitive receptors or areas;
- species habitat areas, usage timing and migratory patterns;
- emergency planning and emergency response zones;
- the geographic extent of local and regional services;
- any impacted local communities, including municipalities;
- all potentially affected Indigenous communities;
- areas of known Indigenous land³⁸, cultural, spiritual and resource use; and
- existing affected infrastructure.

Where baseline data are available in geographic information system (GIS) format, this information is to be provided to the Agency as electronic geospatial data file(s) compliant with the ISO 19115 standard³⁹. This would support the Government of Canada's commitment to Open Science and Data and would facilitate

³⁸ Indigenous lands may encompass reserve lands, traditional territories and/or treaty lands.

³⁹ <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=16553>

the sharing of information with the public through the Canadian Impact Assessment Registry Internet site and the Government's Open Science and Data Platform. The Agency intends to make the geospatial data files available to the public under the terms of the Open Government License Canada⁴⁰.

The proponent is encouraged to consult with the Agency during the development and planning of baseline studies. The proponent should consult relevant guidance in Appendix 1.

7.2. Sources of baseline information

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

- Government of Canada's Open Science and Data Platform⁴¹ (This online, public platform provides access to government sources of science, data, publications and information about development activities across the country that are relevant to understanding cumulative effects. The platform can help identify relevant data and scientific articles in one online location and be a source of open data available for download.);
- Federal authorities (e.g., Environment and Climate Change Canada, Health Canada, Indigenous Services Canada, Statistics Canada, Women and Gender Equality Canada);
- Ontario provincial ministries (e.g., Ministry of the Environment, Conservation, and Parks, Ministry of Natural Resources and Forestry);
- Bird conservation regions and strategies⁴²;
- field studies, including site-specific survey methods;
- database searches, including federal, provincial, municipal and local data banks, such as:
 - eBird Canada⁴³;
 - Breeding Bird Survey (BBS)⁴⁴;
 - Christmas bird count⁴⁵;
 - Birds Canada's Canadian Migration Monitoring Network⁴⁶;
 - Nature Counts⁴⁷;

⁴⁰ <https://open.canada.ca/en/open-government-licence-canada>

⁴¹ <https://osdp-psdo.canada.ca/dp/en>

⁴² <https://www.canada.ca/en/environment-climate-change/services/migratory-bird-conservation/regions-strategies.html>

⁴³ <https://ebird.org/canada/home>

⁴⁴ <https://wildlife-species.canada.ca/resultats-releve-oiseaux-nicheurs>

⁴⁵ <https://netapp.audubon.org/CBCObservation/Historical/ResultsByCount.aspx>

⁴⁶ <https://naturecounts.ca/nc/cmmn/main.jsp>

⁴⁷ <https://naturecounts.ca/nc/default/searchquery.jsp>



- iNaturalist⁴⁸;
- Neighbourhood Bat Watch⁴⁹;
- protected areas, watershed, or coastal management plans;
- natural resource management plans;
- research programs of regional industry, resource, or species-specific committees;
- species recovery and restoration plans, including:
 - Species at Risk Public Registry⁵⁰ for information on federally listed species at risk and available recovery documents;
 - Species at Risk in Ontario⁵¹ for information on the provincial list of species at risk and available recovery documents;
 - Ontario Species at Risk Guides and Resources⁵² (includes many best management practices);
- field measurements to gather data on ambient or background levels for air, water, soil and sediment quality, light levels or acoustic environment (soundscape);
- land cover data, including:
 - terrestrial ecosystem mapping products;
 - forest cover maps;
 - remote sensing resources;
 - important habitat features and characteristics, such as:
 - water bodies, wetlands, watercourses;
 - riparian habitat;
 - river banks or other eroded habitats;
 - artificial water sources;
 - forest, tree patches, solitary trees (especially old decaying trees);
 - forest edges and tree rows;
 - ridges, including eskers;
 - caves and mines;
 - cliffs, rock outcrops, exposed bedrock, talus, and other karst topography;

⁴⁸ <https://www.inaturalist.org/>

⁴⁹ <https://batwatch.ca/>

⁵⁰ <https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html>

⁵¹ <https://www.ontario.ca/page/species-risk-ontario>

⁵² <https://www.ontario.ca/page/species-risk-guides-and-resources>

- buildings, bridges, and other anthropogenic features, including linear features;
 - sources of artificial lighting attracting insects;
 - critical habitat; and
 - any other habitat features known to be important in the area.
- published literature, such as peer reviewed journals, reports by think tanks, non-government organizations and government reports;
- environmental assessment documentation, including monitoring reports, from prior projects in the area and similar projects outside the area;
- regional studies, project assessments and strategic assessments;
- renewable harvest data;
- Indigenous Knowledge, including oral histories and knowledge gathered by spending time on the land with Indigenous Knowledge holders;
- community based monitoring and studies conducted by Indigenous communities;
- 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;
- baseline human health impact assessments or risk assessments;
- information available from Canadian Institute for Health Information under Community and Health System Characteristics;
- community and regional economic profiles;
- community well-being studies; and
- statistical surveys, as applicable.

The proponent should consult with federal authorities, provincial ministries or local government to determine whether additional data sources and survey methods may be appropriate. Where data is limited, secondary data sources may be used. The proponent should consult with the federal authorities, provincial ministries or local government to ensure all secondary data is applicable.

Although data directly relevant to the area surrounding the Project are limited, the proponent is encouraged to use, to the extent possible and when methodologically appropriate, existing count data that have been collected for other similar projects within the regional study area.

Where appropriate, data sharing between projects is the preferred approach, particularly for those valued components that require surveys involving Indigenous communities and where multiple primary data collection activities would increase consultation fatigue. The proponent should verify with the Agency whether the approach would be considered appropriate to meet the requirements of these Guidelines.

If using existing data sources, the Impact Statement must provide justification to show that the data sources are relevant in spatial and temporal coverage to the Project, and will lead to reliable conclusions.

Consult the Species at Risk Public Registry for information on the list of species at risk and available recovery documents and reference the documents and dates consulted. Ensure the most up to date documents are used and species statuses are up to date.

With regard to field studies, survey work must be planned to include multiple sampling locations and multiple visits to each location to support all required assessment analyses. See “Baseline conditions” in sections 8.5, 8.9, 8.10 and 8.11 of the Guidelines, for recommendations on survey design and methodology. Surveys and analyses should be conducted by qualified experts.

For specific sources of baseline information, see Appendix 1.

7.3. Considerations and methodology in selecting valued components

The Impact Statement must describe the valued components that will serve as the focal points for the impact assessment. Valued components represent components that are of particular concern or value to participants (e.g. fish and terrestrial wildlife species of importance to Indigenous communities) and that may be affected by the Project.

The list of valued components must be informed, validated, and finalized through engagement with the public, Indigenous communities, jurisdictions, federal authorities, and other interested parties. The Impact Statement must describe valued components, processes, and interactions that are identified to be of concern or that the Agency considers likely to be impacted by the Project and are included in the Guidelines.

Sections 8 to 10 of the Guidelines provide information requirements organized in categories that may be considered as valued components, or may be considered as intermediate components to inform the assessment of valued components. Valued components will help to organize the description of the effects of the Project required by the Guidelines. In some sections, the Guidelines identify specific sub-valued components (e.g., specific fish species within fish and fish habitat). The proponent may also identify additional valued components beyond those included in the Guidelines in consultation with Indigenous communities and other participants.

The Impact Statement must indicate to whom these concerns are important (e.g., the public, federal authorities or Indigenous communities) and the reasons why, including environmental, cultural, spiritual, historical, health, social, economic, recreational, aesthetic considerations, Indigenous Knowledge, and their relation to the exercise of Aboriginal and Treaty rights. The value of a component not only relates to its role in the ecosystem, but also to the value people place on it. Valued components included in the Guidelines are, in part, based on what local communities, and Indigenous communities identify as valuable to them in the planning phase.

Accordingly, the Impact Statement must provide the rationale for including or excluding any specific valued components or information specified in the Guidelines. The priority in selecting valued components to be included and assessed should be project-specific and focused on appropriateness, not

influenced by the quantity of information available or the use of the valued components in other assessments.

Indigenous communities may identify valued components holistically, encompassing the effects on a number of individual environmental, health, social, or economic valued components. Where identified, the proponent should structure analysis and presentation of individual valued components into an assessment of the overarching Indigenous valued components. The proponent is encouraged to work with Indigenous communities to identify valued components holistically. In the event that a valued component is suggested by an Indigenous community but is excluded from the Impact Statement, the proponent must provide a justification for its exclusion. The Impact Statement must describe how community knowledge and Indigenous Knowledge and the perspectives were considered in selecting valued components.

In selecting a valued component to include, the following factors should be considered:

- presence of the valued component within the spatial boundaries (refer to section 7.4.1);
- the extent to which the valued component is linked to interests or exercise of Aboriginal and Treaty rights of Indigenous peoples, and whether an Indigenous community has requested the inclusion of the valued component;
- the extent to which the effects (real or perceived) of the Project and related activities have the potential to interact with the valued component;
- the extent to which the valued components may be under cumulative stress from other past, existing or future projects and activities undertakings in combination with other human activities and natural processes;
- the extent to which the valued component is linked to federal, provincial, territorial or municipal government priorities (e.g., legislation, programs, policies);
- the extent to which the valued component is being addressed through any ongoing or completed regional assessment processes;
- the possibility that adverse or positive effects on the valued component would be of particular concern to Indigenous communities, the public, or federal, provincial, territorial, municipal or Indigenous governments and generate a notable contribution to sustainability⁵³; and
- whether the potential effects of the Project on the valued component can be measured and/or monitored or would be better ascertained through the analysis of a proxy valued component.

The valued components must be described in sufficient detail to allow the reviewer to understand their relevance to the assessment and to assess the potential adverse and positive environmental, health, social and economic effects and impacts arising from the Project activities.

⁵³ 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.

7.4. Spatial and temporal boundaries

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

The spatial and temporal boundaries to be used in the impact assessment are outlined and discussed through the tailoring process, and include comments and input from federal and provincial government departments and agencies, local government, Indigenous communities, the public and other interested parties. The proponent must engage with Indigenous communities when defining spatial and temporal boundaries for valued components that are identified by, or related directly to, Indigenous peoples. The Impact Statement must explain how the proponent considered the information received from Indigenous communities in its definition of spatial and temporal boundaries, particularly for valued components related to effects to Indigenous peoples.

The proponent should validate with the Agency the spatial and temporal boundaries for each valued component prior to commencing the baseline data collection.

7.4.1 Spatial boundaries

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

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

The Impact Statement must:

- describe the spatial boundaries for each valued component 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 valued components (e.g., interaction between wildlife and vegetation);
 - community knowledge and Indigenous Knowledge;

- current or traditional land and resource use by Indigenous communities;
- rights of Indigenous peoples, including treaty lands, traditional territories and areas or sites used for cultural and spiritual practices;
- physical, technical, ecological, social, health, economic, and cultural considerations;
- size, nature, location, and known effects of past, present, and foreseeable projects and activities, particularly for the RSA; and
- any ongoing or completed regional assessment in the project area and/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.

For biophysical valued components, spatial boundaries should be defined using an ecosystem-centered approach for the PSA, LSA and RSA, as wetlands and eskers are features that are likely to be most affected. Ecoregion boundaries or their derivatives should not be used since the Project occurs on, near and across ecoregion boundaries. See the Agency's guidance document on assessing cumulative effects⁵⁴ for more information on establishing spatial boundaries.

For habitat-related valued components potentially affected by the Project, a land cover analysis, including freshwater environments, should be conducted to determine appropriate ecological boundaries and buffer distances.

Where a valued component is a species, the LSA should correspond to PSA plus a buffer defined in consideration of direct and indirect project effects to species and their habitats, changes to connectivity, alteration of predator/prey dynamics, mortality, sensory disturbance, and pollution.

Guidance for specific species of interest have been listed below:

- for wolverine, the local study area should be at a minimum: project study area plus a 10-kilometre buffer. Simulation modeling may indicate a larger buffer;
- for bats, the local study area should be at a minimum: project study area plus a 1-kilometre buffer. Simulation modelling may indicate a larger buffer; and
- for caribou, the local study area should be at a minimum: project study area plus a 10-40-kilometre buffer. Simulation modeling may indicate a larger buffer. In addition to assessing project and cumulative effects at the scale of the three study areas defined above, also assess at the scale of the implicated Ontario caribou ranges (Missisa, Ozhinski, Nipigon and Pagwachuan), and the federal Far North caribou range.

⁵⁴ <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/policy-framework-assessing-cumulative-effects-under-impact-assessment-act.html>

7.4.2 Temporal boundaries

The temporal boundaries of the impact assessment span all phases of the Project determined to be within the impact assessment. When defining temporal boundaries, the proponent should consider how elements of environmental, health, social and economic well-being that Indigenous and local communities identify as being valuable could change over time.

The Impact Statement must:

- describe the temporal boundaries for each valued component and provide a rationale for each boundary;
- define temporal boundaries by taking into account:
 - schedule of phases of the Project;
 - past conditions and historical context;
 - community knowledge and Indigenous Knowledge;
 - current or traditional land and resource use by Indigenous communities;
 - rights of Indigenous peoples, including treaty lands, traditional territories, and areas or sites used for cultural and spiritual practices;
 - relevant physical, technical, ecological, social, health, economic, and cultural considerations (e.g., temporal pattern of use of PSA, LSA and RSA for breeding, or for migrants stopping on northward and/or southward migration);
 - the foreseeable period over which temporary impacts are expected (e.g., groundwater changes following decommissioning);
 - timing of past, present, and foreseeable projects and activities, including potential decommissioning or abandonment;
 - the project's contribution to sustainability and long-term effects on well-being of present and future generations; and
 - any ongoing or completed regional assessment in the proposed project area or any relevant strategic assessments.

7.5. Effects assessment methodology

7.5.1. Methodology

The Impact Statement must describe the changes to the environment or to the health, social or economic conditions and the positive and negative consequences of these changes (the effects) that are likely to be caused by the carrying out of the Project, and the results of interactions among the effects⁵⁵. This

⁵⁵ The proponent can utilize, where appropriate, other information (such as findings from assessments of social, health and economic effects or cumulative effects) from other projects, as reasonable. The rationale for using the information must be provided.

includes the effects to Indigenous peoples' physical and cultural heritage, current use of lands and resources for traditional purposes, any structure, site or thing that is of historical, archaeological, paleontological, or architectural significance, and any change occurring in Canada to the health, social, or economic conditions of the Indigenous peoples. The overall effects assessment methodology must also consider the Project's potential interference with the exercise of rights of the Indigenous peoples, as further detailed in section 10. The description must include the information requirements detailed in specific sections about effects in the Guidelines.

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

After considering the technically and economically feasible mitigation measures (see section 7.6 *Mitigation and enhancement measures*), the Impact Statement must describe any residual environmental, health, social or economic effects of the Project. The assessment of residual effects must also take into account interactions between the Project and past, existing and reasonably foreseeable projects or physical activities to be carried out, as described in section 7.7 *Cumulative effects assessment*. The environmental, health, social or economic effects should be described in terms of the context, magnitude, geographic extent, ecological context timing, duration and frequency, and whether effects are reversible or irreversible. The spatial scoping of the assessment should vary depending on the valued component and should be consistent with the spatial boundaries that were established for baseline data collection.

Depending on the valued component, the description of the effects can be either qualitative or quantitative, taking into account any important contextual factors, as appropriate. With respect to quantitative models and predictions, the Impact Statement must detail the model assumptions, parameters, the quality of the data and the degree of certainty of the predictions obtained. For some effects, it may be more appropriate to use other criteria, such as the nature of the effects, directionality, causation, and probability. The ecological and socio-economic context should also be provided. The perception of the same effect may vary among different individuals, groups and communities. Consequently, the effect assessment should take into account views and concerns expressed through engagement with Indigenous peoples and community members.

The Impact Statement must:

- identify the effects falling within federal jurisdiction and the direct or incidental effects, as defined in section 2 of the IAA;
- describe in detail the Project's potential direct and indirect, adverse and positive effects for each phase of the Project, as well as the approaches and methodologies used to determine them, and for analytical methods, clearly state assumptions for all predictions and how each assumption has been tested;

- identify and describe measures that are technically and economically feasible and that would mitigate the Project's adverse effects or would be enhancements to increase positive effects (see section 7.6. *Mitigation and enhancement measures* for more details);
- describe any residual effects of the Project;
- describe how baseline data and information was used to inform this analysis;
- describe key indicators used to assess project effects and provide a rationale for their selection, including a clear connection to indicators used to characterize baseline conditions;
- describe the degree of uncertainty related to the data and methods;
- for quantitative predictions based on models, detail model assumptions, parameters, the quality of the data and the degree of certainty of the predictions obtained, including an explanation of model calibration, validation and model performance metrics used;
- discuss the degree of confidence in the predictions and conclusions of the effect assessment;
- if a detailed description of effects cannot be provided, provide a rationale for the absence of details and a general description of the potential effects and related project activities (e.g., activities and effects related to decommissioning and abandonment). The proponent should confirm the rationale with the Agency before submitting the Impact Statement;
- for predictions that may be affected by climate change, discuss how the range of potential climates informed the assessment, including predicted changes in climate extremes;
- consider and describe the interactions among the environmental, health, social and economic effects and impacts on Indigenous peoples and their rights;
- consider and describe the perspectives, concerns and tolerance levels of Indigenous communities and other participants;
- describe where and how Indigenous Knowledge and community knowledge and input were considered and incorporated into effects assessment;
- describe how GBA Plus was applied to examine differences in effects among diverse 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.

7.5.2. Interactions between effects and valued components

Although the requirements set out in these guidelines are separated by environmental, health, social or economic conditions and elements, the Impact Statement must consider and describe the interactions between the environmental, health, social and economic effects as well as the interaction and interconnectedness of selected valued components taking into account values of local communities, including municipalities and Indigenous communities.

For example, an adverse environmental effect on water could also have an adverse effect on human health. That same adverse environmental effect on the physical component, water, could result in an adverse environmental effect on the biological component fish, that could in turn, have an adverse social effect on fishing and/or an adverse economic effect on an outfitter that provides guiding services. Alternatively, this pathway could also be impacted by a positive effect on water (e.g., in remediation-related projects). Considering and describing effects holistically, both positive and negative, requires taking a systems approach that considers interactions between valued components and with other environmental, health, social and economic factors. The holistic nature of Indigenous Knowledge that is provided may contribute to this approach.

7.6. Mitigation and enhancement measures

The Impact Statement must identify measures that are technically and economically feasible and that would mitigate the Project's adverse environmental, health, social and economic effects. The proponent may also identify enhancement measures to increase positive effects. Mitigation measures include measures to eliminate, reduce, control or offset the adverse effects of the Project, and include restitution for any damage caused by those effects through replacement, restoration, compensation or other means. Measures to enhance positive project effects may include skills training, local procurement strategies, investments in community infrastructure and services, and projects to rehabilitate degraded environments.

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

As a first step, the proponent is encouraged to use an approach based on the avoidance and reduction of the adverse effects at the source. The proponent must engage with Indigenous communities when developing mitigation measures. The proponent is also encouraged to work with the local communities and Indigenous communities 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.

The Impact Statement must:

- describe the standard mitigation practices, policies and commitments that constitute proven technically and economically feasible mitigation measures and that are to be applied as part of standard practice regardless of location as well as any new or innovative mitigation measures being proposed. Mitigation measures must be specific, achievable, measurable and verifiable, and must be described in a manner that avoids ambiguity in intent, interpretation and implementation;
- describe mitigation measures that are specific to each environmental, health, social or economic effect identified. Mitigation measures are to be written as specific commitments that clearly describe when and how the proponent intends to implement them, what decision-making criteria will be used, and the outcome these mitigation measures are designed to address;
- describe any environmental protection plan(s) for the Project and, if applicable, the environmental management system through which the proponent will deliver this plan. The plan(s) must provide

an overall perspective on how potentially adverse effects would be minimized and managed over time;

- identify the party responsible for the implementation of mitigation measures and the system of accountability;
- discuss the mechanisms the proponent would use to require its contractors and sub-contractors to comply with these commitments and policies and with auditing and enforcement programs;
- describe the approach that would be taken if a mitigation measure is no longer feasible while the project is carried out;
- where appropriate, describe any adaptive management plans that will be implemented to address uncertainties associated with the effectiveness of mitigation measures included in a follow-up program⁵⁶ (see section 8.11) including:
 - identifying the expected outcomes and targets that the Adaptive Management Plan will address;
 - describing the uncertainties that the Adaptive Management Plan will address;
 - developing hypotheses aimed at reducing the uncertainties described above;
 - describing the relevant baseline(s) for the Adaptive Management Plan;
 - describing mitigation measures to be employed and alternatives;
- include mitigation measures for all project components and 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 each Indigenous community for avoiding, mitigating, or otherwise accommodating the Project's environmental, health, social and economic effects, including potential effects and impacts on the exercise of rights of Indigenous peoples and:
 - for those mitigation measures intended to address effects of changes to the environmental, health, social and economic conditions of Indigenous peoples or impacts on the exercise of rights of Indigenous peoples, provide a description of the consultation with Indigenous communities regarding the residual effects; and
 - describe whether and how these measures will be incorporated in the Project design.
- identify opportunities for enhancing positive effects, such as creation of local employment and infrastructure improvements;

⁵⁶ The results of the follow-up program may be used to determine whether additional actions are necessary (i.e., adaptive management) to address unanticipated outcomes. Adaptive management is not considered as a mitigation measure. Please refer to the Agency's guidance on Adaptive Management Measures under the Canadian Environmental Assessment Act 1992 (guidance to be updated): <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/adaptive-management-measures-under-canadian-environmental-assessment-act.html>.

- identify and describe the use and application of best available technology and best environmental practice, including its effectiveness on the contaminants of concern, to prevent adverse effects on the receiving environment other than for GHG reduction purposes;
- 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;
- describe all relevant uncertainties on the effectiveness of the measures to address the Project's predicted residual effects and assess how they could affect these residual effects;
- provide an assessment of the likely effectiveness of the proposed technically and economically feasible mitigation measures and describe all relevant uncertainties on the effectiveness of the measures;
- provide information on record keeping, timing and frequency of application of any identified mitigation measures;
- provide best technically and economically feasible mitigation approaches to habitat mitigation that follow the hierarchy:
 - avoid potential impact;
 - minimize potential impact;
 - restore on-site;
 - provide biodiversity offsets to address any residual adverse environmental effects that cannot be avoided or sufficiently minimized; and
 - provide justification for moving from one mitigation alternative to the next.
- assess any potentially adverse environmental effects associated with the mitigation method itself;
- specify the actions, works, minimal disturbance footprint techniques, best available technology, best environmental practices, corrective measures or additions planned during the Project's various phases to eliminate or reduce adverse effects;
- assess impacts of each potential route option for effects to valued components and provide a quantitative comparison;
- identify opportunities to involve Indigenous communities in monitoring activities during the construction and operations phases to mitigate effects on traditional activities;
- describe mitigation measures that are specific to identified effects to Indigenous peoples;
- describe mitigation measures proposed by Indigenous communities and the consideration of those in the Project;
- propose differentiated mitigation measures for all potential adverse effects identified, if applicable, so that adverse effects do not fall disproportionately on vulnerable populations, including Indigenous communities, and that 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;

- propose practical mitigation and enhancement measures based on key issues that were identified in the GBA Plus results, including the identification of success measures and plans for monitoring progress; and
- provide offsetting or compensation 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 impact assessment process; the plans should:
 - describe the baseline condition of the species at risk, critical habitat, migratory birds and wetland functions potentially impacted by the Project;
 - apply the mitigation hierarchy;
 - identify and describe residual effects;
 - identify a compensation ratio with rationale, including how any policies or guidance provided by federal authorities, provincial authorities and Indigenous communities have been considered;
 - identify the location and timing of implementation of compensation projects (where feasible);
 - identify and describe the success criteria;
 - identify and detail non-habitat measures;
 - describe how the proposed measures align with published provincial and federal recovery, management, or action plans and strategies for species at risk;
 - identify the parties responsible for implementation, including monitoring and review;
 - identify indicator species for setting compensation objectives. Identification should be based on baseline data, Bird Conservation Strategies, and other information where available (note: species at risk should not be used as indicator species; compensation efforts need to be directed specifically to these species);
 - describe the functions gained at the compensation site(s);
 - provide evidence that functions can be replaced by the proposed offset activities;
 - describe the process of selecting proposed compensation site(s); and associated baseline condition(s);
 - describe information on any offset credits that have been or will be obtained, including the offset regime that issued the credits, project type, project start date and vintage year. Proponents may also provide information on their intent to acquire or generate international offset credits;
 - describe information on habitat banks or any habitat credits that have been or will be obtained, including the regime that issued them, project type, project start date and vintage year. Proponents may also provide information on their intent to acquire or generate international habitat credits;
 - provide a description of the monitoring schedule and activities to be completed to monitor the success of compensation activities; and
 - note that offsets are required to address residual effects. Environment and Climate Change Canada (ECCC) guidance on conservation allowances should be used⁵⁷.

The proponent may propose measures that differ from the specific requirements and recommendations. In which case, the proponent must provide a rationale. For example, the proponent could propose measures viewed as better suited to the anticipated effects than those listed in the Guidelines.

⁵⁷ <https://www.canada.ca/en/environment-climate-change/services/sustainable-development/publications/operational-framework-use-conservation-allowances.html>

Where mitigation measures for which there is little experience or for which there is some question as to their effectiveness are proposed to be implemented, the potential risks and effects should those measures not be effective must be clearly and concisely described. In addition, the Impact Statement must identify the extent to which technological innovations may help mitigate effects. Where possible, it will provide detailed information on the nature of these measures, their implementation, management, and the requirements of the follow-up program.

7.7. Cumulative effects assessment

The proponent must identify and assess the project's cumulative effects using the approach described in the Agency's guidance documents related to cumulative environmental, health, social and economic effects. 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 the cumulative effects assessment. The proponent should consult the Agency's *Policy Framework for Assessing Cumulative Effects under the Impact Assessment Act*⁵⁸.

Cumulative effects are defined as changes to the environment, health, social and economic conditions, as a result of the project's residual environmental, health, social and economic effects combined with the existence of other past, present and reasonably foreseeable physical activities, as well as within activities of the project itself from multiple emissions and discharges (e.g., simultaneous operations) to understand synergistic or additive effects. Cumulative effects may result if:

- the implementation of the Project may cause residual adverse effects to the valued components, after taking into account the application of technically and economically feasible mitigation measures; and
- the same valued component has been or can be affected by other past, present or future projects or physical activities.

A cumulative effect on an environmental, health, social or economic component of an Indigenous community or the rights of Indigenous peoples, may be important even if the project's effects to these components by themselves are minor. The tailoring process for developing the Guidelines identifies and prioritizes the list of valued components on which the cumulative effects assessment must focus and also substantiates the rationale for the final selection. Finalizing the choice of valued components and the appropriate boundaries, including potential transboundary areas, to assess cumulative effects, is informed and confirmed as part of the tailoring process through consultation with the public, Indigenous communities, lifecycle regulators, jurisdictions, federal authorities and other interested parties.

The cumulative effects assessment must include consideration of cumulative effects in relation to the ability of Indigenous peoples to exercise their rights and culture for all potentially impacted communities including those located in the areas which will be impacted by increased access to the region by exploration and mineral development projects. Both the content and means of presenting this information is to be developed in consultation with each potentially impacted Indigenous community. Proponents must collaborate with and clearly document and incorporate the views of Indigenous communities in the cumulative effects assessment. Where Indigenous communities do not wish to participate in the

⁵⁸ <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/policy-framework-assessing-cumulative-effects-under-impact-assessment-act.html>

cumulative effects assessment with the proponent, the proponent should continue sharing information and analyses with the Indigenous communities, to use publicly available sources of information to support the assessment, and to document their efforts in that respect.

The Government of Canada has developed the Open Science and Data Platform⁵⁹ as a means to access science, data, publications and information about development activities to better understand cumulative effects. Proponents are encouraged to make use of this resource in their cumulative effects analysis.

The Impact Statement must:

- identify and provide a rationale for the valued components that will constitute the focus of the cumulative effects assessment. The selected valued components are those most likely to be affected by the Project in combination with other projects and activities;
- include a rationale to justify the exclusion of other valued components from the cumulative effects assessment, as applicable;
- identify and justify the spatial and temporal boundaries for the cumulative effects assessment for each valued components selected. The boundaries for the cumulative effects assessments may differ for each valued component considered and must not be constrained by jurisdictional boundaries:
 - the cumulative effects spatial boundaries will generally be larger than the boundaries for the project effects alone, and may extend beyond Canada's jurisdiction;
 - temporal boundaries must include appropriate baseline and should look at all potential effects throughout the lifecycle of the project, including decommissioning and abandonment; and
 - spatial and temporal boundaries for valued components related to effects and impacts on Indigenous peoples defined in collaboration with the Indigenous communities concerned.
- assess cumulative effects using a hierarchy, with effects to both local populations and large populations assessed;
- describe the methodology used to determine boundaries and other past, existing or future projects or activities for cumulative effects assessment were informed by consultations with the public, Indigenous peoples, lifecycle regulators, jurisdictions, federal authorities and other participants;
- in relation to caribou: assess cumulative effects to caribou at the scale of the three study areas⁶⁰, as well as the implicated Ontario caribou ranges and the federal Far North caribou range;
- identify the sources of potential cumulative effects. Specify other projects or activities that have been or that are likely to be carried out that could cause effects to each selected valued component within the boundaries defined, including potential induced effects, and whose 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. This assessment must consider the results of any relevant regional study

⁵⁹ <https://osdp-psdo.canada.ca/dp/en>

⁶⁰ <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/policy-framework-assessing-cumulative-effects-under-impact-assessment-act.html>

conducted. At a minimum, the following projects or activities should be included in the cumulative effects assessment:

- historical and existing mineral developments (including, but not limited to, Goldcorp's Musselwhite Mine, DeBeers' Victor Mine, Greenstone Gold's Hardrock Mine);
 - other historical and reasonably foreseeable infrastructure projects;
 - the Webequie Supply Road Project, the Marten Falls Community Access Road Project and other all-season road projects;
 - power transmission projects;
 - construction of upgrades to the Anaconda and Painter Lake forestry access roads;
 - railway transload facility;
 - forest management units;
 - mining activities, including those associated with the following deposits: Eagle's Nest, Black Thor, BlackBird, Big Daddy, Black Label;
 - road use past Nakina, including transportation of ore to the proposed future Ferrochrome Production Facility in Sault Ste. Marie, or to the smelter in Sudbury;
 - mineral exploration activity in the area; and
 - past projects, including the Ogoki and Long Lac diversions.
- assess the cumulative effects to each valued component selected by comparing the future scenarios with the Project and without the Project, and must reflect the full range of cumulative effects and not just the project's contribution. Effects of past activities (activities that have been carried out) are to be used to contextualize the current state of the valued component. This assessment must also assess the cumulative effects to rights of Indigenous peoples and their cultures, and effects to caribou;
 - describe the mitigation measures that are technically and economically feasible to eliminate or reduce adverse cumulative environmental, health, social and economic effects, as well as potential impacts on the rights of Indigenous peoples. The Impact Statement must:
 - describe and provide an assessment of the effectiveness of the measures applied to mitigate the cumulative effects;
 - in cases where measures to mitigate these effects are beyond the control of the proponent, the Impact Statement must identify any parties that have the authority to act on these measures. In such cases, the Impact Statement must summarize any commitments by the other parties regarding implementation of the necessary measures and any associated communication plans; and
 - assess the implications of applying project-specific mitigation and enhancement measures within a regional context taking into account all reasonably foreseeable development of the area.

- describe and, where appropriate, quantify the level and severity of the adverse cumulative effects; and
- develop a follow-up program to verify the accuracy of the assessment or the effectiveness of mitigation measures for cumulative effects.

7.8. Extent to which effects 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:

- characterize the residual effects, even if deemed small or negligible, and cumulative effects, using criteria and language most appropriate for the effect;
- consider using the following criteria for residual effects, as appropriate:
 - magnitude;
 - geographic extent;
 - timing;
 - duration;
 - frequency;
 - reversibility; and
 - the environmental, health, social and economic context within which potential effects may occur.
- include context, described and applied as part of the key criteria above, for example:
 - the sensitivity and importance of affected aquatic and terrestrial species, including species at risk and species of importance for Indigenous peoples;
 - the sensitivity and importance of affected habitats and their functions for wildlife;
 - the existence of standards, guidelines, tolerance levels and other sources of information to assess effects; and
 - the potential for disproportionate residual effects for diverse subgroups as per GBA Plus;
- describe the extent to which the adverse effects within federal jurisdiction and the adverse direct or incidental effects are significant;
- describe the extent to which the adverse cumulative effects within federal jurisdiction, and the adverse direct or incidental effects, are significant;
- justify the approach and criteria used to determine extent to which effects are significant;
- identify and explain relevant sources of information that were used to characterize the extent to which those effects are significant, including how the perspectives, concerns and tolerance levels of Indigenous communities and other participants were considered; and

- describe how the probability or likelihood of that effect occurring and the degree of scientific uncertainty related to the data and methods used in the effect assessment, where considered in determining the extent of significance.

In particular, the effects to each valued component outlined in sections 8.5, 8.6, 8.9, 8.10, 8.11 must be described using the following criteria⁶¹:

- scope, defined spatially as the proportion of the valued component's occurrence or population within the project, local and regional study areas that can reasonably be expected to be affected by the predicted effect within 10 years. Characterize the scope of each predicted adverse effect on each valued component as follows:
 - pervasive: the effect is likely to be pervasive in its scope, affecting the valued component across all or most (71-100%) of its occurrence or population within the study areas;
 - large: the effect is likely to be widespread in its scope, affecting the valued component across much (31-70%) of its occurrence or population within the study areas;
 - restricted: the effect is likely to be restricted in its scope, affecting the valued component across some (11-30%) of its occurrence or population within the study areas; and
 - small: the effect is likely to be very narrow in its scope, affecting the valued component across a small proportion (1-10%) of its occurrence or population within the study areas.
- severity, defined as, within the scope, the level of damage to the valued component from the effect that can reasonably be expected; typically measured as the degree of destruction or degradation within the scope or the degree of reduction of the population within the scope. Characterize the severity of each predicted adverse effect on each valued component as follows:
 - extreme: within the scope, the effect is likely to destroy or eliminate the valued component, or reduce its population by 71-100% within ten years or three generations;
 - serious: within the scope, the effect is likely to seriously degrade or reduce the valued component, or reduce its population by 31-70% within ten years or three generations;
 - moderate: within the scope, the effect is likely to moderately degrade or reduce the valued component, or reduce its population by 11-30% within ten years or three generations; and
 - slight: within the scope, the effect is likely to only slightly degrade or reduce the valued component, or reduce its population by 1-10% within ten years or three generations.
- irreversibility, or permanence, is defined as the degree to which the effect can be reversed, and the valued component restored, if the effect no longer existed. Characterize the irreversibility of each predicted adverse effect on each valued component as follows:
 - very high: the effects cannot be reversed and it is very unlikely the valued component can be restored, and/or it would take more than 100 years to achieve this (e.g., wetlands converted to a shopping center);

⁶¹https://www.natureserve.org/sites/default/files/publications/files/natureserveconservationstatusfactors_apr12_1.pdf

- high: the effects can technically be reversed and the valued component restored, but it is not practically affordable and/or it would take 21-100 years to achieve this (e.g., wetland converted to agriculture);
 - medium: the effects can be reversed and the valued component restored with a reasonable commitment of resources and/or within 6-20 years (e.g., ditching and draining of wetland); and
 - low: the effects are easily reversible and the valued component can be easily restored at a relatively low cost and/or within 0-5 years (e.g., off-road vehicles trespassing in wetland).
- characterize the magnitude of each predicted adverse effect on each valued component as follows:

magnitude = scope x severity as below:

Severity	Scope			
	Pervasive	Large	Restricted	Small
Extreme	Very High	High	Medium	Low
Serious	High	High	Medium	Low
Moderate	Medium	Medium	Medium	Low
Slight	Low	Low	Low	Low

- characterize the degree of each predicted adverse effect on each valued component as follows:

degree of effect = magnitude x irreversibility

Magnitude	Irreversibility			
	Very High	High	Medium	Low
Very High	Very High	Very High	Very High	High
High	Very High	High	High	Medium
Medium	High	Medium	Medium	Low
Low	Medium	Low	Low	Low

Effects may impact local communities, Indigenous communities and stakeholders in different ways. The perception of the same effect may vary, and therefore responses to them differ. Determining and characterizing effects should be based largely on perspectives, concerns, and tolerance levels expressed through engagement with the potentially affected Indigenous communities and community members. The Proponent is required to gather Indigenous Knowledge from Indigenous communities to inform the Project’s effects assessment and to describe how it was considered in their Impact Statement. There are tools that can assist with these predictions and analyses, including multi-criteria analysis, risk assessment, modelling, in addition to seeking out expert and stakeholder input. Effects should be characterized using language most appropriate for the effect (e.g., impacts on the exercise of Aboriginal and Treaty rights and social effects may be described differently from biophysical effects).

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

The best practices described in the Agency's technical guidance document for describing effects and characterizing extent of significance⁶² may be considered for the characterization of residual effects in the context of the IAA, as applicable.

8. Biophysical environment

Impact Statement requirements for baseline conditions of the biophysical environment, effects and mitigation are described below. For the identified mitigation measures, the Impact Statement must demonstrate how mitigation hierarchy was considered when selecting the measures. The mitigation measures must be described in terms of the effectiveness of each measure and include a science-based rationale for proposing the selected mitigation measures.

Additional guidance and resources are identified in Appendix 1.

8.1. Meteorological environment

The Impact Statement must:

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

⁶² <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/guidance-describing-effects-characterizing-extent-significance.html>

- describe the influence of climate change on the local and regional climate and in the risks of extreme weather events.

8.2. Atmospheric, acoustic, and visual environment

8.2.1. Baseline conditions

The Impact Statement must:

- characterize the ambient air quality in the project, local and regional study areas and identify existing emissions and contaminant sources;
- provide baseline ambient air concentrations for contaminants in the local study area, in particular near key receptors (e.g., communities, traditional land users, wildlife), describe and quantify emission sources for the following:
 - total particulate matter;
 - particulate matter less than 2.5 microns (PM_{2.5});
 - particulate matter less than 10 microns (PM₁₀);
 - diesel particulate matter (DPM);
 - carbon monoxide (CO);
 - sulphur oxides (SO_x);
 - nitrogen dioxide (NO₂) and nitrogen oxides (NO_x);
 - ozone (O₃);
 - volatile organic compounds (VOCs), individual or an appropriate subset⁶³;
 - polycyclic aromatic compounds, including PAHs, alkylated PAHs, PAH transformation products, including nitro and oxy-PAHs, and dibenzothiophenes;
 - any other relevant air pollutants from mobile, stationary or fugitive sources, including contaminants produced by the combustion of diesel fuel;
- compare baseline ambient air quality constituent concentrations with applicable regional, provincial, and federal criteria and standards. For air pollutants with numerical standards and/or established air quality criteria, the comparison must use the same averaging period and the statistical format associated with each numerical standard:
 - standards include Canadian Ambient Air Quality Standards (CAAQS), National Ambient Air Quality Objectives (NAAQO), or relevant provincial criteria and standards. The proponent must refer to the new CAAQS established by the Canadian Council of Ministers of the Environment (CCME) for PM_{2.5}, O₃, SO₂ and NO₂ for 2020 and 2025;
- address seasonal variability in the baseline survey and include a determination of background or ambient contaminant concentrations at key receptor points (e.g., sites used for traditional land activities, sensitive human receptors such as daycares, schools, hospitals, community centres)

⁶³ See Appendix 1 for Health Canada's air quality guidance for evaluating human health impacts.

using data of appropriate duration, representativeness, completeness, validation and quality control, covering a minimum of one year to represent seasonal variability;

- provide dispersion modelling of a base case to account for existing pollutant sources and to determine the spatial distribution of pollutants within the study area;
- provide current ambient noise levels at key receptor points (e.g., sites used for traditional activities, human receptor locations, wildlife calving and foraging sites, nesting sites) including the results of a baseline ambient noise survey and permissible sound levels for each receptor location. Information on typical sound sources (both natural and anthropogenic), geographic extent and temporal variations must be included. At the time of collecting baseline data to study ambient noise where there are human receptors, it is recommended that the following aspects be considered:
 - natural (non-anthropogenic) sounds
 - soundscapes (see ISO 12913-1:2014. Acoustics — Soundscape — Part 1: Definition and conceptual framework⁶⁴);
 - 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);
- describe existing ambient nighttime light levels at the project site and at any other areas where project activities could have an effect on light levels. The Impact Statement must describe nighttime illumination levels during different weather conditions and seasons; and
- provide the approximate number, distance and identity factors of likely human receptors, including any foreseeable future receptors, that may be impacted by changes in air, water, country food quality (e.g., dust deposition on vegetation), and noise levels. At minimum, provide a map showing approximate locations of permanent residences, temporary land uses (e.g., cabins and sites used for traditional activities) and known locations of sensitive human receptors (e.g., schools, hospitals, community centres).
- describe landscapes of interest, visual screens, and other components of the visual environment, and locate them on maps relative to the Project.

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

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

- provide a quantitative assessment of common air pollutants (total particulate matter, fine particulate matter (PM_{2.5}), respirable particulate matter with a diameter less than 10 microns

⁶⁴ <https://www.iso.org/standard/52161.html>

(PM₁₀), sulphur oxides, nitrogen oxides, volatile organic compounds polycyclic aromatic hydrocarbons, diesel particulate matter, and carbon monoxide), as well as any air contaminants potentially associated with the Project such as dust resulting from construction activities and ongoing vehicle use during operations or maintenance of the gravel road bed;

- provide an assessment of the Project's emissions potentially contributing or adding to existing ground ozone levels, with rationale to explain the approach used;
- provide a comprehensive list of project activities (air pollutant emission sources) that may affect ambient air quality, such as, but not limited to:
 - the use of heavy machinery such as construction equipment;
 - vehicles and diesel generators during construction;
 - blasting activities;
 - exhaust emissions due to increased vehicular traffic during construction and operations; and
 - dust generation from material stockpiles, transportation and road maintenance during construction and operations;
- include an atmospheric dispersion model of the common air pollutants in order to estimate the contaminant concentrations present in the entire area that could potentially be affected by atmospheric emissions resulting from project activities (air pollutant emission sources);
- provide appropriately scaled contour map(s) plotting the predicted emission concentrations (isopleths). The choice of air quality model must be appropriate for the complexity of sources, terrain and meteorology;
- provide details of all air quality model configuration, including meteorology, land-use, gridded and sensitive receptors;
- describe the source characteristics (e.g., point emissions, area sources, incineration emissions, and fugitive sources, including dust generated by exposed soils that are cleared and stockpiled);
- provide emission rates for all project and regional sources within the study area, including emission factors (with methodology, uncertainty assessment and references) and all assumptions and related parameters that would enable calculations to be reproduced;
- use established methods for estimating emissions from on-road and off-road activities;
- provide a comparison of predicted air quality concentration against the CAAQS for fine particulate matter (PM_{2.5}), sulphur dioxide (SO₂) and nitrogen dioxide (NO₂), and ozone (O₃). Predicted concentrations for other air pollutants relevant to the Project, such as dust resulting from construction activities and ongoing vehicle use during operations or maintenance of the gravel roadbed, should be compared with appropriate provincial and territorial guidelines. 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;
- for air pollutants with numerical standards and/or established air quality criteria [e.g.,

- CAAQS, or Ontario Ambient Air Quality Criteria (AAQC)], observe the averaging time period and the statistical form associated with each numerical standard;
- provide details of the achievement of emission standards for all mobile and stationary engines used in the Project;
- 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;
- quantify sound levels at appropriate distances from any project component and/or activities and describe for each contributing source the timing (e.g., hours of night-time activities), number and duration of noise events and their sound characteristics, including frequency spectrum;
- provide the hourly distribution of baseline noise events at night in comparison to predicted individual noise events at night at each receptor location;
- 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, and differential effects for sensitive receptors;
- describe consultation and, where appropriate, provide a record of engagement with regulators, stakeholders, community groups, landowners and Indigenous communities about potential effects to the atmospheric, acoustic, and visual environment;
- consider the expectation of peace and quiet at receptors (e.g., in a quiet rural area or during Indigenous land use) and the applicable community-based policies concerning noise (e.g., complaints resolution processes);
- identify and justify the approach to determine the extent to which sound effects resulting from the Project are adverse;
- describe any changes in night-time light levels as a result of the Project, and quantify light levels at appropriate distances from any project activity, the timing (e.g. night hours), frequency, duration, distribution and character of light emissions; and
- describe any positive changes.

Additional guidance regarding air quality, health and noise effects is identified in Appendix 1.

The proponent should refer to Health Canada's Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise⁶⁵ and Guidance for Evaluating Human Health Impacts in Environmental Assessment: Air Quality⁶⁶ to ensure that it provides the information and analysis considered necessary to assess the Project's impacts on human health in relation to changes to the sound environment and air quality. It is requested that the proponent complete the checklists provided in these guides (Appendix B in the noise guide and Appendix A in the air quality guide) to assist participants in verifying that the main elements of a noise or air quality impact assessment have been completed and in identifying the location of this information in the Impact Statement. These checklists will facilitate the

⁶⁵ <https://iaac-aeic.gc.ca/050/documents/p80054/119378E.pdf>

⁶⁶ <https://iaac-aeic.gc.ca/050/documents/p80054/119376E.pdf>

review of the Impact Statement and will be particularly useful if analyses on these aspects are found in several sections of the Impact Statement.

8.2.3. Mitigation and enhancement measures

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

In particular, the Impact Statement must:

- describe all methods and practices to be deployed to reduce and control emissions. If the best available technologies are not included in the project design, the proponent should provide a rationale for the technologies selected;
- document and justify how the contaminant emission reduction efficiencies were applied in the calculation of emission rates, including details of all assumptions associated with these mitigation measures and their feasibility;
- provide a description of participation in national or regional air emission tracking and reporting programs or provide rationale why participation is not required;
- develop and implement strategies compliant with regional and national commitments, such as the CCME's commitment regarding pollution prevention;
- provide a noise management plan, including identification of the noise sources, common noise mitigation measures, the performance efficiency of the noise control devices, the best practices programs and the continuous improvement programs, and establish the need for follow-up monitoring for the purposes of validation of the model or due to any concern raised by participants; and
- provide a lighting management plan, including the planning and management of lighting and of the ambient light for every activity site and public safety, and the consideration of measures for the reduction of excessive light during construction and operation. Consider the following options of measures for lighting management:
 - avoid or minimize the use of artificial light;
 - select low-intensity lighting;
 - use lighting fixtures that limit or concentrate the lighting to targeted areas and avoid light spilling out of the spaces to be illuminated;
 - limit the projection of light toward the sky by using fixtures that produce dark, uniform lighting that meets actual lighting needs;
 - avoid the emission of light at more than 90 degrees; and
 - avoid lights that emit blue/green/white/UV wavelengths.

8.3. Geology, geochemistry and geological hazards

8.3.1. Baseline conditions

The Impact Statement must:

- describe the bedrock geology and lithological units, including a summary table of geologic descriptions, mineralization styles (if applicable) supported by geological maps and cross-sections at appropriate scale (normally 1:50 000). Provide in the table an inferred risk rating (i.e., low, medium, high) for acid rock drainage and metal leaching potential based on the desk-top review of bedrock geology and mineralization;
- provide written description and maps of the current location of eskers and other post-glacial deposits on a map;
- identify on geological maps the location of areas of bedrock outcrops that will require blasting;
- provide a characterization of the geochemical composition of all expected excavated material, overburden and potential construction materials (i.e., eskers, quarries, etc.);
- describe the representativeness of samples collected for acid rock drainage and metal(loid) leaching assessment. Provide a map that shows the sample locations and identification numbers. The map should also include the road alignment location, the approximate location of all aggregate pits, surficial geology, surface water bodies, and a scale and legend.
- describe the approach and methods for the prediction of acid rock drainage and metal(loid) leaching, including identification of potential parameters of concern.

For further guidance please use:

- British Columbia Technical Circular T -04/13; Evaluating the Potential for Acid Rock Drainage and Metal Leaching at Quarries, Rock Cut Sites and from Stockpiled Rock or Talus Materials used by the MOTI; September 15, 2013⁶⁷; and
- MEND Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials; MEND report 1.20.1, December 2009⁶⁸.
- identify any geological hazards that exist in the areas planned for the project components and infrastructure, including:
 - history of seismic activity in the area, including induced earthquakes, and secondary effects such as the risk of, landslides and liquefaction;
 - evidence of active faults;
 - isostatic rise or subsidence; and

⁶⁷ <https://www2.gov.bc.ca/assets/gov/driving-and-transportation/transportation-infrastructure/engineering-standards-and-guidelines/technical-circulars/2013/t04-13.pdf>

⁶⁸ <http://mend-nedem.org/mend-report/prediction-manual-for-drainage-chemistry-from-sulphidic-geologic-materials/>

- history of landslides, slope erosion and the potential for ground and rock instability/landslides, and subsidence during and following project activities.

8.4. Topography, soil and sediment

8.4.1. Baseline conditions

The Impact Statement must:

- describe the terrain, soils and sediments within the LSA and RSA (and their suitability for sourcing construction material), including sediment stratigraphy. Provide surficial geology maps and cross-sections of appropriate scale;
- describe the geomorphology, topography and geotechnical characteristics (e.g., soil erosion sensitivity, ground instability) of areas proposed for construction of major project components;
- describe and map landforms associated with important wildlife habitat features including elevated land forms, eskers, ridges, cliffs, rock outcrops, exposed bedrock;
- provide maps depicting soil depth by horizon and soil order within the project site area to support soil salvage and reclamation efforts, and to outline potential for soil erosion;
- describe the suitability of topsoil and overburden for use in the reclamation of disturbed areas including an assessment of the acid generating potential of overburden to be used (see section 8.3.1);
- describe the historical land use and the potential for contamination of soils and sediments and describe any known or suspected soil or sediment contamination with the study area that could be re-suspended, released or otherwise disturbed as a result of the Project;
- identify areas or ecosystems that are sensitive or vulnerable to acidification resulting from the deposition of atmospheric contaminants;
- describe permafrost conditions including distribution of frozen and unfrozen ground, thermal conditions (ground temperatures), ground ice, thaw sensitivity and active layer thickness, if applicable;
- describe the interactions between permafrost, surface water and groundwater, and topography, as well as rock fractures and talik zones between different surface-groundwaters; and
- describe the potential for thaw settlement and terrain instability associated with ground thawing in permafrost areas, if applicable.

8.5. Riparian and wetland environments

8.5.1. Baseline conditions

The Impact Statement must:

- provide pre-project characterization of the shoreline, banks, current and future flood risk areas, wetland catchment boundaries;

- quantify, map and describe wetlands (shallow open waters, swamps, fens, marshes, peat lands, bogs, etc.) within the local study area potentially directly, indirectly and/or cumulatively affected by the Project in the context of:
 - wetland class, ecological community type and conservation status;
 - biodiversity with respect to both flora and fauna;
 - wetland habitat that provides important functions for migratory birds, species at risk and species of importance to Indigenous peoples of Canada;
 - peatland volume;
 - abundance at local, regional and provincial scales;
 - distribution; and
 - current level of disturbance;
- define a local study area that takes into account watershed area and hydrological connectivity of wetlands within or bisected by the project study area;
- provide written description and maps of ecozones, ecoregions, and ecodistricts as per Ontario or Canada's Ecological Landscape Classification;
- identify and map all wetlands on federal lands, and all wetlands potentially directly or indirectly 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 Conservation⁶⁹ applies;
- determine whether these wetlands are within a geographic area of Canada where wetland loss or degradation has reached critical levels, or considered ecologically or socially or economically important to a region;
- identify and describe wetland capacities to perform hydrological and water quality functions, provide for wildlife and wildlife habitat or other ecological functions, such as carbon sequestration (see section 8.12.2);
- provide a wetland functions assessment in accordance with the guiding principles of Wetland Ecological Functions Assessment: An Overview of Approaches⁷⁰ or any subsequent approved guidelines by which to determine the most appropriate functions assessment methodology to use (see Appendix 1 for more guidance on conducting a wetland function assessment);
- provide a rationale for the wetland functions assessment method chosen and submit complete data sets from any survey sites, including geospatial data files;
- ensure that wetlands assessed for impacts 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;

⁶⁹ <https://publications.gc.ca/site/eng/100725/publication.html>

⁷⁰ <http://publications.gc.ca/site/eng/343283/publication.html>

- landscape and/or watershed considering topography, soil types and hydrological linkages; and
- the global significance of peatlands across the regional study area.
- collect data from representative wetlands in a manner that enables reliable extrapolations in space (i.e., to project, local and regional study 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 mitigation effectiveness. 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 study area, and regional study area), any departures from predictions, and the effectiveness of mitigations. Justify the selection of modeling techniques based on current and recent scientific literature;
 - survey protocol planning for representative wetlands should include modeling and simulations to estimate sampling requirements, and analysis to evaluate resulting design options;
 - sample size must be planned to support evaluation of the project study area within the context of the local study area and regional study area. Appropriate design of surveys will need to consider multiple survey locations in order to represent the wetland heterogeneity of the regional study area, and to yield multiple survey locations per wetland type, without requiring aggregation of habitat classes post-hoc; and
 - describe all criteria used to choose survey locations.
- ensure that the assessment is quantitative and includes the collection of site-specific baseline information on wetland functions, including:
 - Surveys to assess for the presence, abundance, density, and distribution of migratory birds and federally listed species at risk, provincially listed species at risk, and species assessed by Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as at-risk in relation to potentially affected wetlands and associated riparian areas. Surveys should meet appropriate standards (see sections 8.9, 8.10, and 8.11), be species or bird group specific as appropriate, and be conducted during the appropriate times of the year as specified in sections 8.9 through 8.11 of this document. Surveys for species at risk should assess species individually where possible (typically, an indicator approach is not appropriate for species at risk). Surveys should not be limited to species or groups of species that are wetland-obligate, but rather should include any species known to use wetland habitats as part of its lifecycle. Data should be sufficiently robust to identify which wetland classes are important to which species (and for how many).
 - The spatial location and a description of the biological characteristics of each potentially affected wetland and the ecological services and functions (hydrology, biochemical cycling, habitat, and climate) they provide. The functions assessment should be as specific as possible to the biological characteristics of the wetland and to the ecological services and functions it provides.
 - A supporting rationale and detailed description of the methods used in completing the wetland functions assessment, including sampling design.

- determine if other wetland conservation policies, regulations or wetland compensation guidelines apply (contact provincial and/or local government authorities). See also resources available from The Wetland Network; and,
- identify a regional study area of sufficient size to capture effects to wetlands within the larger drainage area and include wetlands located outside of the local study area that may be affected by hydrological changes as a result of cumulative effects.

8.5.2. Effects to riparian and wetland environments

The Impact Statement must:

- describe all potential direct, incidental and cumulative effects due to the project, for all phases, to riparian and wetland environments;
- describe potential changes to riparian, wetland and terrestrial environments due to activities that may affect topography, soil erosion, compaction, and productivity, contamination, bank slopes and suspension of sediment or due to any contaminants of concern;
- describe the historical land use and the potential for contamination of soils and sediments and potential for loss of soil fertility. Describe any known or suspected soil contamination within the study area that could be re-suspended, released or otherwise disturbed as a result of the Project;
- quantify the area of riparian and wetland environments that may be cleared or otherwise disturbed, and the volume of peat disturbed, within the project study area during all phases of the Project;
- provide a description of changes related to landscape disturbance including loss and fragmentation of habitats, alteration of riparian areas, including buffers or setbacks and project effects on areas of soil or ground instability;
- describe any hydrological or water flow drainage changes, either permanent or temporary, that may:
 - alter moisture regimes or drainage conditions, and describe how that may affect wetland function; and
 - disturb soils or wetlands (including peatlands and muskeg) and result in the release of mercury or methylmercury from disturbed soils, which may affect water and groundwater quality, fish, wildlife and human health;
- describe any changes to permafrost conditions as a result of the Project;
- describe any contaminants of concern (e.g., arsenic, chromium, mercury) potentially associated with the Project (including from acid rock drainage, metal(loid) leaching, spills or accidental discharges) that may affect soil, sediment, wetlands, surface water and groundwater (including substances used during summer and winter maintenance activities);
- describe direct, incidental and cumulative predicted positive and/or adverse effects to riparian, wetland (including separate description relevant to peatlands) and terrestrial biodiversity metrics, effects of fragmentation, changes to regional biodiversity that could be caused by all project

activities, including but not limited to effects to wetland ecological functions, including effects that may alter the wetland's capacity to perform hydrological, biogeochemical cycling, habitat, and climate functions;

- describe any positive changes (e.g., from offsets that result in new or enhanced wetlands).

8.5.3. Mitigation and enhancement measures

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

In particular, the Impact Statement must:

- describe and justify what efforts have been made to avoid and minimize temporary or permanent adverse effects to wetlands and riparian habitats and demonstrate that the mitigation hierarchy has been followed;
- demonstrate that mitigation measures have taken into account the health, integrity, and availability of wetland (including peatlands) habitats for the species that rely on them;
- 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 the proposed measures to mitigate bank erosion, including measures to eliminate the potential for erosion, such as bank stabilization using vegetation;
- explain mitigation measures developed specifically for peatlands;
- describe measures to be used for stockpiling all stripped peat for use during site reclamation, or describe the plan for stockpiling stripped peat and mitigate effects related to its long-term stockpiling or removal;
- describe methods for the prevention, monitoring, management and control of acid rock drainage, and metal(loid) leaching during all project phases, particularly in relation to aggregate sourcing and use activities;
- explain why alternative locations or means to carry out the Project, or alternatives to the Project were not possible, and how effects to the wetlands will be minimized;
- explain how avoidance of wetlands was considered, namely by considering other locations for project components and activities;
- describe minimization techniques that consider the natural succession and the variability of the environment over time;
- describe proposed compensation measures for any residual effect that couldn't be minimized through the following order: restoration, enhancement of existing wetlands, or creation of new wetlands;

- provide evidence that functions can be replaced by the proposed offset activities and note that this is particularly important for peatlands as there is little experience in carrying out restoration or offsets;
- in relation to designing offsets for wetlands:
 - indicate if it is not possible to compensate for lost functions in cases where wetlands are unique, or have habitat functions that support large proportions of migratory birds, or provide habitat required by species at risk, and take that into account when designing offsets;
 - identify a compensation ratio with rationale, including how any policies or guidance provided by federal authorities, provincial ministries and Indigenous communities have been considered (refer to the Operational Framework for Use of Conservation Allowances⁷¹);
 - clearly indicate the amount of wetlands (location, extent) for which residual effects should be addressed through offset measures;
 - prioritize restoration of drained or altered naturally occurring wetlands of the same type and function as those impacted. Restored wetlands are preferred over enhanced wetlands, both of which are preferred over newly created wetlands;
 - compensate lost wetland functions on-site if site conditions are suitable for wetland functions. Second preference is in the same watershed from which they were lost. Third preference is in the same ecosystem from which they were lost;
 - incorporate compensation measures to minimize the time lag in availability of habitat and functions between when the adverse effects occur to when they have been fully replaced; and
 - in relation to designing offsets for species at risk, mitigation measures should be developed in collaboration with federal authorities and included in the Impact Statement. See Template 2 in the proposed SARA permitting policy for guidance on preparing an offsetting plan⁷²;
- describe and justify the soil treatment methods to eliminate or reduce the adverse effects on the soils and materials in the root area, including recovery techniques (e.g. soil stripping including the proposed width, stump removal and other soil treatment techniques), soil separation maintenance measures, control measures for wind and water erosion, work shutdown procedures in case of wet conditions, and soil settlement prevention measures; and
- describe and justify how to locate pre-existing soil or sediment contamination, the mitigation and monitoring measures that will be undertaken in this regard, and the applicable regulatory restoration measures.

⁷¹ <https://www.canada.ca/en/environment-climate-change/services/sustainable-development/publications/operational-framework-use-conservation-allowances.html>

⁷² https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/policies-guidelines/proposed-policy-2016.html#_6

8.6. Vegetation


8.6.1. Baseline conditions

The Impact Statement must:

- provide a description of the biodiversity, relative abundance and distribution of vegetation species and communities of ecological, economic or human importance within the local and regional study areas of the Project including:
 - rare plant communities and communities of limited distribution;
 - old growth forests;
 - species at risk, including those listed in Schedule 1 of the SARA, provincially listed or assessed by the COSEWIC to be ‘at risk’, including species of concern;
 - the species critical habitat as described in final or draft recovery strategies or action plans and the current level of both anthropogenic and natural (fire, flood, drought, etc.) disturbance associated with vegetation, including a description of:
 - level of habitat fragmentation;
 - historical and current disturbance; and
 - any proximate activities that have resulted in changes to fire regimes (e.g., fire suppression, flooding, insect infestations, etc.)
 - (Consult Ontario’s Provincial Satellite Derived Disturbance Mapping digital resource⁷³ and Ontario’s Far North Land Cover layer); and
 - species or communities of importance to Indigenous peoples, including for traditional, medicinal and cultural purposes;
- identify the biodiversity metrics, biotic and abiotic indicators that are used to characterize the baseline vegetation biodiversity, and discuss the rationale for their selection;
- summarize information available from the Far North Biodiversity Project⁷⁴;
- provide data files of mapped features or maps, at an appropriate scale, of the vegetation species and communities of importance within the local study area, and where available, the regional study area. Maps should also include areas identified, at a scale appropriate to protect confidential Indigenous Knowledge, as either sensitive or culturally important to Indigenous communities, if communities have granted permission to share them;
- describe any weed species, other invasive species, and introduced species of concern;
- describe the use of local vegetation for medicinal or cultural purposes or as a source of country foods (traditional foods) and whether its consumption has any Indigenous cultural importance. The following species have known cultural importance to Indigenous communities: black spruce, white

⁷³ <https://geohub.lio.gov.on.ca/datasets/fire-disturbance-area>

⁷⁴ <http://sobr.ca/the-far-north-biodiversity-project/>



spruce, tamarack, balsam poplar, cedar, dwarf birch, red willow, trembling aspen, cottongrass, moss, black crowberry, blueberries, raspberries, reindeer moss, sphagnum moss, northern Labrador tea, caribou lichen, bearberry, dogwood, small cranberry, sage, sweetgrass, and lily pads; and

- describe any other plant species of concern for consumption or where its use has any Indigenous cultural importance.

8.6.2. Effects to vegetation

The Impact Statement must describe:

- all potential direct, incidental and cumulative effects due to the project, for all phases, to vegetation;
- describe any changes to eskers and similar geological features as a result of the Project;
- changes related to landscape disturbance including loss and fragmentation of habitats, including buffers or setbacks and project effects on areas of soil or ground instability;
- any hydrological or water flow drainage changes, either permanent or temporary, that may alter moisture regimes or drainage conditions, and describe how that may affect vegetation;
- any changes in risk to forest fires that may result from the Project;
- any changes to plant species of cultural importance to Indigenous peoples; and
- any positive changes (e.g., from offsets that result in re-vegetation etc.).

8.6.3. Mitigation and enhancement measures

The Impact Statement must:

- describe and justify the proposed measures to mitigate bank erosion, including measures to eliminate the potential for erosion;
- describe any considered vegetation standards and controls alternative (including manual vegetation control methods), including:
 - the criteria and circumstances for applying chemical, biological or mechanical control methods;
 - potential effects on country foods, animal browse, surface waters, wetlands and soil and proposed mitigation measures to herbicide application;
 - measures to prevent the road from being a conduit for the spread of invasive species such as European Common Reed (*Phragmites australis*); and
 - describe the selection of plant species to be conserved and planted in order to promote vegetation communities with low natural growth; and

- describe any reclamation and revegetation procedures proposed as mitigation measures, including:
 - revegetation techniques and the locations where they would be implemented;
 - selection of plant species to be maintained and planted to promote return to a natural ecosystem, including consideration for Indigenous use, during operation and upon reclamation, and integration of the reclaimed landscape with the regional landscape;
 - seed mixes to use, the spreading rates and the location of the spreading. Native and indigenous species adapted to the local conditions should be used when the purpose of revegetation is to naturalize or regenerate the area;
 - fertilizers that will be used, the spreading rates and the locations, the criteria for determining these technical features; and
 - seeding and planting plans, which include a description of the species to be replanted, the replanting locations and the criteria for determining these specifications;
 - the expected timelines, from an ecological perspective, for establishment and recovery of vegetation communities and the expected differences in community composition and structure. Identify the information sources on which the predictions rely, such as evidence from peer-reviewed scientific literature;
 - any sources of uncertainty with respect to the anticipated effectiveness of reclamation. Explain how uncertainty was taken into account in the predictions; and
 - reclamation standards to be used to evaluate ecological equivalency of post-operation reclaimed landscapes, in consultation with Indigenous communities.

8.7. Groundwater and surface water

8.7.1. Baseline conditions

The Impact Statement must:

- identify all domestic, communal, or municipal water wells within the local and regional study areas; provide information on their depth, distance from the Project, stratigraphy, including their screened hydrostratigraphic unit and piezometric level and capacity; and describe their current use, potential for future use, and whether their consumption has any Indigenous cultural importance;
- identify any groundwater monitoring wells in proximity to rock quarries and borrow areas, including their location, completion details (diameter, screen depth), geological log, screened hydrostratigraphic unit, piezometric level, and monitoring frequency;
- provide groundwater elevation data from any monitoring wells showing seasonal water level variations when pertinent to the period of quarry and borrow area operation;

- describe the groundwater quality baseline characterization program including sampling site selection, monitoring duration and frequency, sampling protocol, and analytical protocol including quality assurance and quality control measures;
- describe and provide the hydraulic properties of the hydrostratigraphic units, including data on hydraulic conductivity, specific storage, transmissivity, storativity, saturated thickness, porosity, and specific yield, as applicable;
- describe the structural geology of the hydrogeological environment, including major faults, fracture density and orientation with respect to groundwater flow directions;
- describe the groundwater flow boundaries of the hydrogeological environment, including groundwater divides and boundaries with surface water;
- provide hydrogeological maps and cross-sections of the study area showing water table elevations, potentiometric contours, interpreted groundwater flow directions, groundwater divides and areas of recharge and discharge;
- present a conceptual model of the hydrogeological environment, including a discussion of geomorphic, hydrostratigraphic, hydrologic, climatic, and anthropogenic controls on groundwater flow;
- describe permafrost conditions and their influence on groundwater–surface water interactions with consideration to potential for effects on surface water quality;
- describe the surface water, ground water and sediment quality baseline characterization program, including sampling site selection, monitoring duration and frequency, sampling methodology, and analytical protocol, including quality assurance and quality control measures:
 - describe the incorporation of any applicable historical data or existing information;
 - ensure the characterization program includes sampling locations within the project area, the local and regional study areas, and reference locations that are unlikely to be impacted by the Project;
- provide data⁷⁵ that illustrates seasonal and inter-annual variability, as well as groundwater-surface water interactions, including:
 - physicochemical parameters may include temperature, pH, electrical conductivity, dissolved oxygen, turbidity, total suspended solids, total hardness, total dissolved solids;
 - relevant chemical constituents may include major and minor ions, total and dissolved trace metals, total mercury, methylmercury, polycyclic aromatic compounds, nutrients, organic and inorganic compounds, or other compounds of potential concern;
 - water sample collection and analysis should use appropriately sensitive detection limits and the data should illustrate the seasonal and inter-annual variability in baseline surface water quality to fully characterize natural variability, including possible variabilities due to groundwater–surface water interactions;

⁷⁵ Baseline data may be found in secondary information sources. To the extent reasonable, the proponent is encouraged to utilize data collected for the assessments of the proposed Marten Falls Community Access Road and the proposed Webequie Supply Road, to fulfill baseline requirements.

- explain how baseline data was gathered, and modelling developed, at a scale and resolution that allows for the application of results about groundwater and surface water to the assessment of interrelated valued components, notably for fish, birds and other wildlife, their habitat and their health, as well as human health.
- delineate and characterize, using traditional field and mapping techniques, groundwater–surface water interactions, including identified groundwater-dependent ecosystems, wetlands, discharge and recharge areas:
- the chosen field and mapping techniques should take into account the potential effect that changes to groundwater-surface water interactions have on fish and fish habitat;
- describe and illustrate on topographic maps, at appropriate scales, the drainage basins in relation to key project components. On the maps, identify all waterbodies and watercourses, including permanent, intermittent and ephemeral streams, flood risk areas, wetlands, watershed (primary, secondary and tertiary) and sub-watershed boundaries, and direction of flow and indicate the intended locations of water crossing and watercourse diversions;
- provide for each water body and watercourse potentially affected by the Project (permanent, intermittent and ephemeral, major and minor lakes and rivers) a table that groups the waterbodies and watercourses by sub-watershed and provides the following information about each:
 - type of water body and watercourse impacted (e.g., lotic or lentic system, lake, river, pond, temporary or permanent stream);
 - size of the waterbodies and watercourses, as applicable (e.g., width at the ordinary high water mark, length or area);
- provide flow hydrographs and corresponding water levels for nearby streams and rivers potentially affected by the Project showing the full range of seasonal and inter-annual variations; as well as seasonal baseflow;
 - hydrographs may be based on data from nearby gauging stations or from gauging stations on site, if appropriate rationale is provided to explain the data applicability;
 - approach used should take into account the need to provide information for use in fish habitat characterization and effects assessment;
- provide stage hydrographs for lakes potentially affected by the Project showing the full range of seasonal and inter-annual water level variations;
- provide the timing of freeze/thaw cycles, ice cover, thickness and conditions for each waterbody and watercourse potentially affected by the Project;
- provide for each water body potentially affected by the Project, the total surface area, bathymetry, biological components (e.g. dissolved oxygen), flows, vertical profile information, information on stratification and turnover, and sediment composition (e.g., particle size analysis and sediment quality);
- provide the design flood at each water crossing;
- provide details on the hydraulic design of the water crossings;

- develop a quantitative surface water balance in relation to components of the Project that may result in significant changes to surface water flow patterns (e.g., quarry/aggregate extraction sites, stockpiles);
- identify all springs and any other potable surface water resources within the local and regional project study areas and describe their current use, potential for future use, and whether their consumption has Indigenous cultural importance;
- describe baseline concentrations for relevant physicochemical parameters and chemical constituents in relation to applicable water and sediment quality guidelines;
- present a conceptual model for the hydrological environment, as appropriate to describe baseline conditions for surface waters. The model should be developed to support the assessment of potential changes to water and sediment quantity and quality in rivers, streams, lakes, springs and wetlands, with input from regulators and Indigenous communities; and
- provide complete hydrometeorological (temperature, precipitation, evapotranspiration) information based on data from nearby weather stations or from a weather station on site.

8.7.2. Effects to groundwater and surface water

The Impact Statement must:

- provide a project-specific water use assessment identifying and describing the quantity and quality of water resources potentially affected by the Project, including:
 - any withdrawal of groundwater or surface water;
 - changes to the groundwater recharge/discharge areas;
 - temporal and spatial changes in groundwater quantity, quality and flow (e.g., long-term changes in water levels), including how these changes may relate to domestic, communal or municipal water supply wells;
 - the flow or volume of water available in the water bodies; and
 - how any waste waters or dewatering water would be managed and where it would be discharged;
- provide groundwater characterization including an appropriate groundwater model depicting the impacts of the Project;
- describe any changes to groundwater quality that could affect surface water quality;
- provide an assessment for off-site migration pathways for impacted groundwater, and an analysis of contaminant attenuation capacities within the hydrogeological units of the project study area;
- describe any potential direct and indirect effects on surface water quality and quantity, during all phases of the Project;
- present estimates of surface water runoff rates for major project components, including aggregate and overburden stockpiles;

- identify contaminants that could enter the receiving environment due to blasting via surface runoff and dewatering;
- compare the quality of all effluent streams to the CCME Water Quality Guidelines for the Protection of Aquatic Life, and to provincial water quality objectives for contaminants of concern (e.g., arsenic, chromium, mercury) that do not have CCME guidelines. CCME's Water Quality Guideline values are national science-based voluntary guidelines developed collaboratively among provincial, territorial, and federal jurisdictions for the protection of freshwater and marine life⁷⁶;

If the proponent undertakes quarrying activities to extract aggregate material that may result in effects on groundwater and surface water levels (i.e., quarrying below the water table), the Impact Statement must:

- present an integrated site water balance model incorporating surface and groundwater fluxes for the construction, operation and decommissioning of large quarrying sites;
- describe the risk to the receiving environment related to effects to the quantity and quality of all effluent streams released from the site, including surface runoff from aggregate and overburden stockpiles, and dewatering discharge;
- describe spatial and temporal (i.e., all project life cycle) changes to groundwater quality at potential receptor locations (e.g., existing or future drinking water wells and spring water sources), including traditional land users, due to effluents from the Project including changes to physicochemical parameters (temperature, pH, salinity, dissolved oxygen, dissolved organic carbon), chemical constituents (major and minor ions, trace metals, nutrients, organic compounds);
- describe spatial and temporal (i.e., over project life cycle) changes to surface water quality at potential receptor locations, including traditional land users, due to effluents and atmospheric deposition from the Project including changes to physicochemical parameters (temperature, pH, salinity, dissolved oxygen, turbidity, dissolved organic carbon, total suspended solids), chemical constituents (major and minor ions, trace metals, nutrients, organic compounds);

With respect to potential effects on water quality resulting from acid rock drainage and/or metal leaching, the Impact Statement must:

- provide estimates of the potential for aggregate extraction activities (i.e., eskers and quarries) and rock exposed in permanent rock cuts to be sources of acid rock drainage or metal leaching;
- describe the methods used to predict acid rock drainage and/or metal leaching for construction materials, including sample collection and laboratory testing;
- identify potential risks to surface and seepage water quality from the aggregate and overburden stockpiles and project infrastructure during construction, and operation, decommissioning and abandonment;
- provide aggregate sources, volumes and tonnage, and extraction construction methods;
- provide an acid rock drainage assessment and mitigation plan that describes the confirmatory monitoring of construction materials and potential mitigation strategies to prevent or control acid

⁷⁶ https://www.ccme.ca/en/resources/canadian_environmental_quality_guidelines/index.html

rock drainage and metal leaching during construction, operation, decommissioning and abandonment;

The Impact Statement also must:

- describe groundwater and surface water monitoring programs during construction, operation and decommissioning and abandonment;
- describe contingency plans, monitoring during operation, decommissioning and abandonment, and maintenance plans; and
- analyze and describe changes to surface water and groundwater at a scale and resolution that allows for the application of results to the assessment of interrelated valued components, notably for fish and fish habitat and human health. Carry forward the assessment of potential changes in water quality, as required in Sections 8 and 10 of the Guidelines.

The proponent should refer to Health Canada's Guidance for Evaluating Human Health Impacts in Environmental Assessment: Drinking and Recreational Water Quality⁷⁷ to ensure that it provides the information and analysis considered necessary to assess the project's effects on human health in relation to changes to water quality. It is requested that the proponent complete the checklist provided in this guide (Appendix A) to assist participants in verifying that the main elements of a water quality impact assessment have been completed and in identifying the location of this information in the Impact Statement. This checklist will facilitate the review of the Impact Statement and will be particularly useful if analyses on this aspect are found in several sections of the Impact Statement.

8.7.3. Mitigation and enhancement measures

The Impact Statement must:

- describe the mitigation measures for the possible effects on the quantity and quality of surface water, groundwater and sediment, including water supply wells, and provide a rationale with quantitative and qualitative evidence that explains the effectiveness of proposed measures;
- provide the details of mitigation measures comprised in water management plans proposed for waterbodies and watercourses likely to be affected during all phases of the Project, as well as measures proposed for water management plans applicable to aggregate source sites and stockpiles;
- describe and justify water use for the Project and the measures that will be taken to eliminate or reduce the adverse effects, including the supply and discharge of water (e.g. workers camps), and potential exchanges between watersheds;
- identify mitigation measures to prevent contaminants from blasting to enter the receiving environment;
- describe the Sediment and Erosion Control Plan, including the proposed mitigation measures and their effectiveness on the contaminants of concern; and

⁷⁷ <https://aeic-iaac.gc.ca/050/documents/p80054/119377E.pdf>

- provide information on potential de-icing substances to be used during different phases of the Project and mitigation measures associated with their use.

8.8. Fish and fish habitat

8.8.1. Baseline conditions

The Impact Statement must:

- provide a list of aquatic species at risk likely to be present within the study areas, and provide the location and description of suitable or potential habitat for these species (residence and critical habitat), including:
 - provincial species at risk (specify provincial legislation or regulations);
 - species listed in Schedule 1 of SARA; and
 - species listed as at risk by COSEWIC;
- identify and describe the data sources used, including information on data collection (e.g., gear and catch methods, location of sampling stations, date of catches, date of surveys, species surveyed, size and life cycle stage, catch per unit effort). It is recommended that the information be presented in the form of tables;
- describe the use of fish as country foods or for other traditional purposes, including a description of the particular species of importance and whether its consumption has cultural importance for Indigenous peoples, including medicinal use. All sites used in the study area or historically important sites for the collection of country foods must be identified and mapped, such as important fishing sites:
 - fish and/or aquatic species identified by Indigenous communities including Walleye (*Sander vitreus*), Northern Pike (*Esox lucius*), Lake Whitefish (*Coregonus clupeaformis*), Brook Trout (*Salvelinus fontinalis*), Chain Pickerel (*Esox niger*), Yellow Perch (*Perca flavescens*), Cisco (*Coregonus artedii*), Burbot (*Lota lota*), Longnose Sucker (*Catostomus catostomus*), White Sucker (*Catostomus commersoni*), Lake Sturgeon (*Acipenser fulvescens*) and Lake Chub (*Couesius plumbeus*);
- provide baseline measurements of contaminants in fish and aquatic species;
- for each potentially affected waterbody or watercourse frequented by fish, describe primary and secondary productivity with a characterization of trophic levels, biodiversity, key functional interactions and processes (e.g., food web and nutrient cycling), seasonal variability, ranges and sensitive periods and include the rationale for the selection of biodiversity metrics and indicators;
- for each potentially affected waterbody or watercourse frequented by fish, provide the location and area of potential and confirmed fish habitat and a detailed assessment of physical and biological habitat characteristics. Present information as maps using satellite imagery overlaid with relevant information and text description, with associated summary tables. Relevant physical and biological habitat characteristics for fish habitat include:

- groundwater and surface water characteristics requested in section 8.7;
- baseline extent of habitat disturbance (e.g. fragmentation);
- habitat use or suitability for fish and aquatic species present, including critical habitat and residences for species at risk, and habitat function (e.g., spawning, calving, nursery, growth, prey, invertebrate population, food availability, foraging, migration, cover habitat, thermal and overwintering habitat, etc.) and sensitive times for these activities;
- substrate type, aquatic vegetation, riparian vegetation, bank stability, light penetration, presence of woody debris, presence of beaver dams, stream segment type (riffle, run, pool), natural or anthropogenic barriers to fish passage, and geomorphological features and processes. Provide maps and photos; and
- natural obstacles (e.g., falls, beaver dams) or existing structures (e.g., water crossings) that hinder the free passage of fish;
- for each potentially affected waterbody or watercourse, provide a detailed description of potentially affected fish species and populations (as defined in subsection 2(1) of the *Fisheries Act*) within the freshwater environment;
 - where data is used to generate biodiversity metrics (e.g., abundance, richness, diversity, density), provide rationale on the choice of metrics based on their applicability for use in the effects assessment and associated follow-up, if applicable;
- describe parameters and ecological processes relevant to predicted effects on fish and aquatic species listed above. For example, it may be necessary to establish a broader ecological baseline if the Project affects a spawning area for a migratory species but does not affect the larger area they depend on for life processes. Relevant parameters and ecological process may include: migratory patterns, food webs and trophic levels, structural and functional linkages (e.g. predator-prey interactions), life history and population dynamics, sensitive habitats and periods, behaviour or other relevant ecological processes that fish depend on to carry out their life history;
 - use either a qualitative or a quantitative approach to characterize ecological processes, as appropriate, and include a rationale to support the selected approach;
- provide a characterization of fish habitat features that may demonstrate the presence of fish species in terms of appropriate habitats—water quality and quantity characteristics, sediment type characteristics, benthic features, prey, shelter, refuge, feeding, spawning habitats, nursery habitats, rearing habitats, overwintering, migration routes and the sensitive times for these activities;
- describe any existing effects associated with previous or current activities (e.g., angling pressures, commercial fisheries); and
- identify sensitive habitat areas (e.g., Ecologically and Biologically Sensitive Areas) within the study area.

Certain intermittent and ephemeral watercourses or waterbodies may constitute fish habitat or contribute indirectly to fish habitat during a certain period. The absence of fish or water at the time of the survey does not indicate irrefutably an absence of fish and/or fish habitat (e.g., migratory corridor). Similarly, beaver dams and accumulations of woody debris are not considered impassable barriers to fish.

8.8.2. Effects to fish and fish habitat

The Impact Statement must:

- use a Pathways of Effects⁷⁸ approach to determine potential effects to fish and fish habitats;
- describe any direct, incidental or cumulative predicted positive and/or adverse effects to fish (all developmental stages) and fish habitat as defined in subsection 2(1) of the *Fisheries Act*, including the calculations of any potential habitat loss (temporary or permanent) including spawning grounds, nursery, rearing, food supply, and migration areas, or death of fish.

The assessment must:

- describe effects to fish biodiversity considering identified biodiversity metrics;
- describe the anticipated changes in the composition and characteristics of the populations of fish, especially those species of cultural significance to Indigenous communities (section 8.8.1) and provincially or federally listed aquatic species at risk, following modifications to the aquatic environment, including but not limited to:
 - disruption of life stages or habitat with regard to their productivity, life cycles, migration, or local movements, including a consideration of spawning, rearing, feeding, and overwintering;
 - disruption of feeding activities of fish;
 - distribution and abundance of fish;
 - contaminant levels in harvested species and their prey;
 - any reduction in fish populations as a result of potential overfishing due to increased access to the area;
 - a consideration of a change in: behavior, displacement or stranding of fish, access to habitat (e.g., upstream and downstream migration, and lateral movements), habitat structure, species composition, ecosystem structure and function and habitat quality; and
 - freshwater animal health and condition;
- discuss potential losses of individuals and relationship to population density and the resiliency of populations;
- describe potential for direct effects of contamination downstream of the Project on fish and bioaccumulation of contaminants (e.g., selenium, mercury, chromium, arsenic) in fish that may be consumed by Indigenous communities;
- discuss the correlation between construction periods and sensitive periods for fish (e.g. reproduction), key fisheries timing windows for freshwater and anadromous/catadromous species, and any potential effects resulting from overlapping periods;

⁷⁸ <https://www.dfo-mpo.gc.ca/pnw-ppc/pathways-sequences/index-eng.html>

- include a discussion on how vibration caused by project activities (e.g., blasting) may affect fish habitat and behaviour, such as spawning or migrations;
- describe potential effects from impingement and entrainment of fish and other aquatic biota through water withdrawal;
- describe any need for an *Fisheries Act* authorization and/or a SARA permit and describe any consideration of Department of Fisheries and Oceans guidance documents;
- describe and justify watercourse-crossing techniques to be used and the criteria for determining the techniques proposed for each watercourse-crossing;
- include a risk assessment of the potential introduction and intrusion of aquatic invasive species, including pathogens, through project activities;
- describe the geomorphological changes and their effects to hydrodynamic conditions and fish habitats (e.g., modification of substrates, dynamic imbalance, silting of spawning beds) including direct and indirect effects from habitat fragmentation;
- discuss the modifications of hydrological, and hydrometric conditions and their effects on fish habitat, critical habitat for aquatic species at risk, and on the fish species' life cycle activities (e.g., reproduction, feeding, fry-rearing, migration);
- describe the potential effects to riparian areas that could affect aquatic biological resources and productivity, taking into account any anticipated modifications to fish habitat (e.g., structure, cover);
- changes to water quality both at the discharge point and in the receiving environment;
- changes to water quality due to runoff from any temporary and permanent project components;
- changes to the primary and secondary productivity of water bodies and watercourses, food sources, potential imbalances in the food web and trophic levels in relation to baseline conditions; and
- 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), and provide maps for proposed locations.

Additional guidance is identified in Appendix 1.

8.8.3. Mitigation and enhancement measures

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

- all standard measures, policies, and commitments regarding mitigation that constitute technical and economically feasible proven mitigation measures and that will be applied in common practice, regardless of the location, as well as any new or innovative mitigation measure proposed;

- measures to prevent and mitigate the risk of harm or death of fish, or harmful alteration, disruption or destruction of fish habitat, caused by any project activity, including during key sensitive periods (e.g., spawning and migration) and/or in sensitive locations;
- measures to prevent water crossings (i.e., culverts) from negatively impacting freshwater fish movement (e.g., due to flow, outlet velocity, debris, or “perching”), including designing culvert crossings through an evaluation of hydraulic conditions at individual watercourses and swim performance of target species in the watershed;
- measures to avoid the deposit of substances harmful to fish in water or areas frequented by fish;
- measures to prevent the introduction and intrusion of invasive aquatic species during work in or near the aquatic environment;
- measures and plans to offset or compensate for any loss in productivity of fish populations and fish habitat as a result of the Project;
- describe how environmental protection plans would address any applicable federal and provincial policies with respect to fish habitat; and
- describe how the mitigation measures are consistent with any applicable recovery strategy, action plan or management plan.

The proponent must refer to Fisheries and Oceans Canada guidance and explain how it was applied to the assessment.

8.9. Birds, migratory birds and their habitats

8.9.1. Baseline conditions

The Impact Statement must:

- describe and map the general biodiversity⁷⁹ of bird species and their habitats that are found or are likely to be found in the LSA and RSA, based on available information from a desktop analysis, supplemented by field data if necessary to build confidence in assumptions, including identification of Bird Conservation Regions and Bird Conservation Region Strategies⁸⁰. Possible information sources include, but are not limited to: wildlife experts/naturalists, Canadian Conservation Data Centres, Bird Conservation Region strategies, E-Bird, Breeding Bird Atlases, Environment and Climate Change Canada’s guidance on bird surveys (see Appendix 1);
- consider the following groupings of migratory birds and bird species of importance to Indigenous people as unique valued components:

⁷⁹ A description of biodiversity can include the species or communities found, abundance, density, species richness and evenness, species distribution within the study area; their ecological role or position in food webs, their ecological or population health (e.g., breeding status, population trends, movement, habitat availability or connectivity, reproductive status or health, food availability or limitations).

⁸⁰ <https://www.canada.ca/en/environment-climate-change/services/migratory-bird-conservation/regions-strategies.html>

- forest birds, such as warblers, vireos, thrushes;
- raptors;
- shorebirds, such as sandpipers, plovers, snipes;
- waterbirds, such as loons, gulls, terns;
- marshbirds, such as grebes, rails, herons;
- other landbirds, such as owls, swallows, kingfishers;
- waterfowl;
- bog/fen birds, and other wetland birds;
- any bird species of importance to Indigenous peoples (e.g., duck, eagle, geese, Ruffed Grouse, Spruce Grouse); and
- important habitats associated with species of importance to Indigenous peoples and with avian species at risk (refer to section 8.11);
- identify species or groups that may be affected differently by the Project and may require different mitigation measures, and where possible, do not collapse data into diversity metrics or narrow focus to an indicator species;
- identify whether any species listed in Schedule 1 of the *Migratory Bird Regulations, 2022*⁸¹, have the potential to breed in any study area;
- use avian surveys based on a thorough review of available scientific literature pertinent to the specific region, bird groups and anticipated effects;
- provide an estimate of year-round bird use of the local study area (e.g. winter, spring migration, breeding season, fall migration, overwintering), based on data from existing sources and surveys to provide current field data if required to generate reliable estimates. In each portion of the year, 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;
- where predictive modelling is used to portray baseline conditions and estimates of project effects, describe and provide the explanatory data (e.g., covariates such as associated land cover, etc.). It should be demonstrated that the explanatory data is sufficient to represent the following spatial and temporal sources of variation:
 - spatial variation:
 - land cover composition
 - soil type, geomorphology
 - hydrological processes,
 - climatic conditions; and,

⁸¹ <https://www.canada.ca/en/environment-climate-change/services/migratory-game-bird-hunting/status-update-modernization-regulations.html>

- temporal variation, especially annual, variation in local weather inter- and intra-annual climatic variability.
- use data that enables reliable extrapolations in space (i.e., at minimum to project, local and regional study areas) and in time (i.e., across years):
 - surveys should represent the spatial and temporal targets of modeling and extrapolations, to produce scientifically defensible predictions of impacts and estimates of mitigation effectiveness. Surveys should be sensitive enough to detect and quantify the impacts at the spatial and temporal scales identified above (i.e., project study area, local study area, and regional study area), any departures from predictions, and the effectiveness of mitigations. Justify the modeling techniques based on current and recent scientific literature;
 - protocol should include modeling and simulations used to estimate the sampling requirements, and include analysis used to evaluate resulting design options:
 - use data⁸² to 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;
 - sample size used must support the evaluation of the project study area within the context of the local study area and regional study area. Appropriate design of surveys will need to consider 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;
 - sampling effort per unit area - field survey effort should be most intensive within the project study area. The level of effort per unit area may be similar or somewhat less within the remainder of the local study area, but should be scaled to the likelihood that project effects will impact birds within that zone. Efforts outside the project study area should be carefully designed to ensure that estimates comparing within and across the project study area, local study area and regional study area are unbiased and as precise as possible;
 - more survey effort to detect rare species (compared to effort to detect common species), and species rarity should be accounted for in survey design by increased number and duration of surveys; and
 - simulation modelling should be used to assess bias and precision between project study area, local study area, and regional study area to ensure the estimates are useful for comparison.
 - at minimum, the combined information from existing data and field surveys should be detailed enough to describe the distribution and abundance of all bird species in relation to the study areas;

⁸² Baseline data may be found in secondary information sources. To the extent reasonable, the proponent is encouraged to utilize data collected for the assessments of the proposed Marten Falls Community Access Road and the proposed Webequie Supply Road, to fulfill baseline requirements.

- describe the protocols used for the surveys using point counts, Automated Recording Units (ARU), and aerial survey methods and provide rationale for why the selected protocols are best suited for the Project;
- submit complete data sets from all survey sites. These should be in the form of complete and quality assured relational databases, with precisely georeferenced site information, precise observation/visit information and with observations and measurements in un-summarized form. Databases and GIS files should be accompanied by detailed metadata that meets ISO 19115 standards⁸³;
- 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);
- provide raw survey data and analysis results 1) all birds, 2) each valued component, and 3) Bird Conservation Region Priority Species showing the species ranked according to:
 - frequency⁸⁴ of occurrence,
 - abundance;
 - abundance in each habitat type, and
 - map showing areas of highest concentrations of species;
- design suggestions for the PSA and LSA scales: Use a standardized design approach during survey planning. The resulting design details will serve as the basis to develop alternative designs, evaluate options for particular design details, and to identify potential efficiencies. The approaches and tools suggested elsewhere in this document (e.g., Land cover analysis data simulations) can be helpful tools as part of such an exercise should be considered during the planning phase. The following should be considered as inputs to design planning and evaluation;
 - transects and sites:
 - transects should be spaced every 2 kilometres along the project route, oriented perpendicular to the route, and with the mid-point of each transect located on the centreline of the route. A maximum length of 5 kilometres is likely suitable for sampling most habitat types, including those associated with eskers and similar linear features in alignment with the route. Transect lengths less than 5 kilometres may be suitable but should be justified with respect to an analysis of land cover that demonstrates no further change in land cover composition with increasing distance from the intersection of route and transect mid-point;
 - survey sites along transect should be located as follows: 1 site on centreline of route, sites spaced every 250 metres up to 1 kilometre, then spaced every 500 metres to end of transect. A 5-kilometre transect should have 15 survey sites;

⁸³ <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=16553>

⁸⁴ Frequency of occurrence: % frequency for Species A = (# sampling locations in which Species A detected / total # sampling locations) * 100

- every 100 kilometres of route should contain 50 transects. Of these, 20 transects should be sampled using ARU and 30 transects sampled by human observers (Point Count Transects); and
 - project components other than the route itself should be sampled. Such components that are linear (e.g., access or service roads) should be surveyed using transects as above. Non-linear components (e.g., aggregate pits) should be surveyed using a grid of sites spaced 250 metres apart and be sufficient to cover the Project component, plus a maximum 3-kilometre buffer. As with transect lengths, modification of buffer width to a minimum of 500 metres may be justifiable if land cover analysis demonstrates no further change in land cover classification with increasing buffer width;
 - bird sampling:
 - ARU Transects Deployment of ARUs should be used to inform estimates of site use by birds across a broad range of dates (including seasons) and times of day. Since ARUs capture bird movements across dates and times, sampling on ARU Transects should be conducted on a subset of sites within transects. This subset should include the route centreline site, with the remaining sites at 500-metre spacing out to the transect endpoint:
 - * Within each sampling year, ARUs should be deployed at sites as long as possible, with a minimum period of May 1 through July 10 (Breeding Recordings). Use deployments that maximize full use of battery and sound card capacity;
 - * A subset of at least 50% of the ARU sites should have ARUs deployed to align with periods during which sites are used by birds in fall migration (August 1 through September 30) and during the winter (December 1 through March 31) (i.e., collectively, Fall/Winter Recordings). These fall and winter sites may be a subset of either entire ARU transects or sites along transects but land cover analysis should be used to ensure the subset is an unbiased sample of the population of ARU sites;
 - * ARU deployments for Breeding Recordings should be programmed to record daily or every 2nd day, with a morning and an evening schedule. Recording should occur in two phases to avoid single recordings spanning two dates. Phase 1 would start at 00:00 (HH:MM), with a schedule of 3-minutes On and 12-minutes Off until 5 hours beyond local sunrise (i.e., SR+5hr). Phase 2 would start 30 minutes before local sunset, with a schedule of 3-minutes On and 12-minutes Off until 23:56 (HH:MM);
 - * ARUs should be set to record using a sampling rate of 44.1kHz.
 - Point Counts Transects:
 - Each site should be sampled by human observers using a standardized 10-minute point count.
 - * To enable observer: recorder comparisons, observers should also record the survey visit using a high quality portable recording device (i.e., with 360- degree recording in WAV format, selectable sampling rate, and adjustable microphone gain), mounted on a tripod. Observers should be skilled in bird identification by sight and sound, and should use 1- minute intervals within the 10-minute point count duration such that

each individual bird is entered in the first minute interval in which it was detected.

Estimated distances from observers to each bird should be recorded as: 0-50m, 50m-100m, and beyond 100m.

- Geomatics and habitat typing:
 - each site visited at any time between the dates of June 10 and August 30 should be photographically documented with 13 photos. At each cardinal direction (N, E, S, W): 1 photo at shoulder height with arm and camera extended parallel to ground, 1 photo with arm at 45-degrees (from body position) pointing down, and 1 photo with arm extended at 135-degrees (from body position) pointing up. And finally, one photo with arm extended straight up (i.e., vertically). Photos should be interpreted by qualified individuals as precisely as possible according to one or each of the classification schemes: Ontario Ministry of Natural Resources and Forestry's Boreal Ecosites, Wetland Ecosystem Classification for Northern Ontario (W-type), Forest Ecosystem Classification for Northern Ontario (V-type), and NRCan's Canadian National Vegetation Classification (vegetation association);
 - use the Ontario Ministry of Natural Resources and Forestry's Far North Land cover (version 1.4 or later, as available) and augmentation with fire history, digital elevation models, surficial geology and other data sources; and
 - all candidate survey sites should be attributed to a 100m buffer around site centroid, areal coverage and percentage of each land cover class be assigned to sites, and these values used as inputs to evaluations of representivity and options for design modifications.
- Acoustic file and data analysis:
 - acoustic files should be analysed by interpreters skilled in identifying birds by sound and familiar with bird communities of the region sampled. Interpretation of acoustic files should be done using the Wildtrax interface⁸⁵, with each individual detected recorded as a data point and referenced to the first 1-minute interval it was detected:
 - * Prior to interpretation, acoustic files suitable for analysis should be identified by examining spectrograms and listening to a short segment of the file. Files with substantial wind, rain or other noise (e.g., frogs) should be excluded.
 - * From the set of suitable files in the Breeding Recordings, select one (1) 3-minute segments per week from the Night period (midnight to 1 hour before sunrise), two (2) 3-minute segments per week for the Morning period (1 hour before to 5 hours after local sunrise), and one (1) 3-minute segment per week from the Dusk period (30 minutes before to 2 hours after local sunset).
 - * From the set of suitable files in the Fall/Winter recordings, select three (3) 3-minute segments per week from the Morning period (1 hour before to 5 hours after local sunrise).

⁸⁵ <https://www.wildtrax.ca/home>

- describe clearly and transparently the data analysis methods (e.g., annotated scripts), and extract the maximum information from the data that is appropriate for the data and protocols:
 - Generalized linear mixed models or suitable alternatives (e.g., boosted regression trees, generalized additive models, or models developed under a Bayesian framework) may be suitable approaches for analysing data obtained from the described design and for addressing a goal of predicting patterns beyond the sites and times sampled;
 - Analysis of ARU and point count data should account for differences in the survey methods (e.g., ability to detect, visit/sample timing and frequency). Offsets may be used to help account for variation in detection ability. Consider expert guidance on the proper use of offsets in modeling. Detection rates are unlikely to remain constant between visits so, if occupancy modeling is used it should be well justified.
- provide detailed descriptions of bird habitat that includes at a minimum, characterization of biophysical conditions with regard to ecoregion, Bird Conservation Region, and with respect to the particular conditions of boundary regions. The Project crosses and is in close proximity to ecoregion and Bird Conservation Region boundaries. Since the project study area is at the edges of the ecoregions and Bird Conservation Regions, habitat patterns are likely to reflect these border characteristics, with one of the outcomes being that habitat types common elsewhere in the ecoregion may be relatively uncommon and potentially more ecologically important in the border region. Surveys need to be detailed enough within the local study area and regional study area to put the project study area into context of these wider areas:
 - mixed wood forest landcover and other upland vegetation types may be particularly important for many forest associated birds, supporting birds during migration, breeding and through the winter. Eskers and related features are uncommon and potentially ecologically important elements of the landscape, and are likely to be disproportionately affected by these projects. River riparian corridors are another relatively uncommon feature with adjacent mixed wood forest; and
 - should there be some displacement of nesting birds, baseline data should provide evidence that there is enough equivalent habitat for birds to be displaced to and that the vegetation being removed (e.g., eskers) is not unique to the project study area.
- identify the biodiversity metrics, biotic and abiotic indicators that are used to characterize the baseline avifauna biodiversity and discuss the rationale for their selection:
 - species communities should not be collapsed into diversity metrics or the focus narrowed to indicator species. Species identity, distribution, abundance and where possible estimates of breeding status should be the primary targets of quantification.
 - metrics for each valued component should include:
 - frequency and timing of occurrence;
 - life cycle, seasonal ranges, migration, movements;
 - seasonal and annual variation in abundance, distribution in space and habitat use;
 - abundance (including relative abundance in each habitat type), population status, density, distribution, and patterns of occurrence and abundance trends in time; and

- habitat type(s), habitat association(s), associations, and requirements for all relevant life cycle stages; and
 - sensitive periods (e.g., seasonal, time of day).
- provide estimates of the abundance and distribution, and information on the life history of migratory and non-migratory birds (including, but not limited to, waterfowl, raptors, shorebirds, marsh birds and other land birds) in the study area. Estimates may be based on existing information, or additional surveys, as appropriate, to provide current data sufficient for reliable estimates. In doing so:
 - 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:
 - whenever estimating densities for species, consider observer-induced detection error for comparisons among counts (e.g., between, before and after surveys, or between affected and un-affected sites) to be valid. When accounting for detection error the method used should account for variable detection between landcover 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 estimates⁸⁶;
 - 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;
 - 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

⁸⁶ <https://onlinelibrary.wiley.com/doi/full/10.1111/biom.12734>

- include all criteria used to choose plot locations in the Impact Statement.
- identify areas of concentration of migratory birds, including sites used for migration, staging, breeding, feeding and resting. The following must be considered when identifying areas of concentration of migratory birds:
 - migratory bird concentrations can vary within year and between years. It is therefore important to survey across the project study area, local study area, and regional study area both temporally and spatially; and
 - 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.
- provide written description and maps of ecozones, ecoregions, and ecodistricts as per Ontario or Canada's Ecological Landscape Classification;
- provide a characterization of habitat features found in the project area 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, aquatic elements), including habitat fragmentation. Classification should include local aerial and on-site photos;
- describe the use of (magnitude, timing) birds as a source of country foods (traditional foods) or where use has Indigenous cultural importance; and

In addition, the proponent should consult:

- Framework for the Scientific Assessment of Potential Project Impacts on Birds⁸⁷ for examples of project types and potential techniques for assessing effects on migratory birds (see Appendix 1);
- Government of Canada's guidance on the website Avoiding harm to migratory birds⁸⁸ to characterize effects on birds in terms of amount, duration, frequency, and timing of disturbances;
- Guidelines to avoid harm to migratory birds⁸⁹ and ECCC's website on General nesting periods of migratory birds⁹⁰ to inform the development and application of mitigation measures;

Note that although the nesting period dates on ECCC's website cover the main nesting periods of migratory birds, in order to reduce the risk of taking nests or eggs, it does not authorize the disruption, destruction or taking of a migratory bird, its nest or its eggs outside these periods.

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

⁸⁷ https://publications.gc.ca/collections/collection_2010/ec/CW69-5-508-eng.pdf

⁸⁸ <https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds.html>

⁸⁹ <https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/reduce-risk-migratory-birds.html>

⁹⁰ <https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/general-nesting-periods.html>



8.9.2. Effects to birds, migratory birds and their habitats

The Impact Statement must:

- ensure the analysis of predicted effects on birds:
 - includes separate analyses for each activity, component, and project phase;
 - considers sources of error for all analyses;
 - explores, wherever possible, non-linear, indirect, and synergistic responses to the Project; and
 - outlines the effects on bird species or groupings, and the effectiveness of mitigation measures.
- describe direct, incidental and cumulative predicted positive and/or adverse effects, the interaction between the project and birds (especially migratory birds and avian species of importance to the Indigenous communities) and their habitats for all project phases, including but not limited to:
 - 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 migratory birds and changes to water quality;
 - changes to the aquatic flow regime and sediment load;
 - changes to the atmospheric, acoustic, and visual environment (e.g., noise, lighting, air emissions and dust), and any resulting functional loss of habitat;
 - increased vehicular traffic;
 - increased predation opportunities;
 - disruption of wildlife movement corridors;
 - increased poaching opportunities;
 - site reclamation; and
 - any project activities that may occur during critical periods and/or restricted activity periods for migratory birds and avian species of importance to the Indigenous communities, including species at risk. Include in the descriptions of the interactions activity details such as timing windows, the amount, duration, frequency, and timing of disturbances, and whether the activities would be permanent or non-permanent in the environment;
- include the following, as presented in the Framework for the Scientific Assessment of Potential Project Impacts on Birds⁹¹, when describing potential impacts to birds:
 - analyses of predicted effects for all birds, each valued component, and for Bird Conservation Region Priority Species. Include separate analyses for each project activity, component, and

⁹¹ <https://publications.gc.ca/site/eng/367511/publication.html>

phase. Incorporate sources of error for all analyses to ensure final impacts estimates show the best available estimate of precision;

- non-linear, indirect and synergistic responses to the Project, where reasonable;
- justification for any assumption of displacement, with scientific references and surveys provided as evidence that there is available habitat to accommodate displacement under a range of population scenarios. For example, it should be clear that a growing population will not be limited by the habitat loss along the project study area.
- consult the maps, data, and models developed through the Boreal Avian Modelling Project⁹², and describe how these materials have been incorporated where relevant;
- describe the potential effects of the Project on birds (migratory and species of importance to the Indigenous communities), their nests and eggs, including from:
 - short and long-term changes to habitats important for breeding, foraging, migration, overwintering, rearing, and moulting, and on food sources of migratory birds and avian species of importance to the Indigenous communities (types of cover, ecological unit of the area in terms of quality, quantity, distribution and functions), with a distinction made between these two birds categories and including:
 - changes to mortality risk for both diurnal and nocturnal birds, including as a result of collision of birds (migratory and non-migratory) with vehicles, as a result of light attraction and from indirect effects, such as increased movement of predators or access to hunting;
 - increased disturbance (e.g. sound, artificial light, presence of workers) considering the critical periods for the birds, including breeding, migration and overwintering;
 - activities most likely to result in disturbance, injury or take of birds (migratory and non-migratory), their nests and eggs, such as vegetation clearing or increased noise from vehicular traffic and equipment; indicate the timing windows for those activities, the amount, duration, frequency, and timing of disturbances, and whether or not the activities would be permanent or non-permanent in the environment;
- describe the changes in terms of the health, integrity, and availability of habitats. Important habitats to consider include eskers, (and similar upland features), forest, riparian, bog/fen/peatlands, other wetlands, and open water;
- provide the relative abundance of habitat types in the project study area, local study area and regional study area including the area and percentage of total lost of each type in each study area;
- quantify the area of relevant habitat types for birds and migratory birds that may be cleared or otherwise disturbed within the project study area during all phases of the Project;
- describe the effects caused by the new habitat types created in the project study area by clearing vegetation. The new habitats created may attract migratory birds, which were not present before (such as the Eastern Whip-poor-will or the Common Nighthawk). Describe how these species at risk may be impacted by the Project.

⁹² <https://borealbirds.ca/>

- describe the potential direct, incidental and cumulative adverse effects of the Project on migratory bird species (such as SARA-listed Yellow-Rail) who inhabit the project study area during breeding season as well as during migration (as staging and stopover sites);
- describe the change in mortality risk, including as a result of collision of migratory birds with any project infrastructure, vessels and vehicles;
- ensure surveys cover temporal windows that incorporates a variety of road usage by both diurnal and nocturnal species;
- account for indirect effects such as the increased movement of predators in the predictions of mortality effects; and
- describe, using evidence, the available habitat, if any, in the local study area and regional study area to accommodate the additional, displaced birds.

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

- Avoiding harm to migratory birds⁹³;
- A framework for the scientific assessment of potential project impacts on bird⁹⁴; and
- Migratory birds environmental assessment guideline⁹⁵.

Additional guidance is identified in in Appendix 1.

8.9.3. Mitigation and enhancement measures

The Impact Statement must:

- describe the measures to mitigate adverse effects to migratory and non-migratory birds and their habitat, including their eggs and nests;
- identify measures to prevent and mitigate the risk of harmful, destructive or disruptive activities during key sensitive periods and/or in sensitive locations (e.g., breeding bird season, migration and nesting) to birds, their nests and eggs, such as avoiding lights at night during key migration peaks, avoiding excessive loud noises, vibration or blasting during breeding season;
- demonstrate how the proponent considered the timing of vegetation clearing and construction to be conducted outside of the main breeding season;
- describe measures to mitigate sensory disturbance and the functional habitat loss it may cause;
- describe measures for preventing the deposit of substances harmful to migratory birds in areas frequented by migratory birds; and address mitigation of effects to eskers and related features rich in aggregate material, as these features are likely to be strongly impacted, to a degree much higher than their prevalence on the landscape. Describe, at a landscape scale rather than a single

⁹³ <https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds.html>

⁹⁴ https://publications.gc.ca/collections/collection_2010/ec/CW69-5-508-eng.pdf

⁹⁵ <https://publications.gc.ca/site/eng/9.647049/publication.html>

assessment of multiple hectares, how these measures address this uncommon high value landcover for forest birds during migration and breeding; and

- provide details of any compensation or offsetting plans proposed, if effects to bird habitat cannot otherwise be avoided or mitigated.

8.10. Terrestrial wildlife and their habitat

8.10.1. Baseline conditions

The Impact Statement must:

- provide baseline information that is representative of current conditions, with justification (statistical analyses, simulations, organized reasoning) if additional studies are not necessary to improve confidence in the prediction of residual effects and the appropriate selection of mitigation;
- identify wildlife species, other than avian species, of ecological or Indigenous importance (e.g., black bear, caribou, deer, moose, beaver, arctic fox, fisher, wolverine, rabbit, marten, muskrat, and otter), that are likely to be directly or indirectly affected, and describe each species:
 - distribution and location;
 - abundance⁹⁶ and population status;
 - life cycle;
 - known residences;
 - seasonal ranges, migration and movements;
 - habitat requirements; and
 - sensitive periods (e.g., seasonal, diurnal and nocturnal)
- provide a map showing the highest concentrations or areas of use by species and important habitat;
- for the species identified above, describe and quantify the habitat type, based on function, location, suitability, structure; diversity, relative use, natural inter-annual and seasonal variability, and abundance as it existed before project construction;
- provide written description and maps of ecozones, ecoregions, and ecodistricts as per Ontario or Canada's Ecological Landscape Classification;
- identify the biodiversity metrics and biotic and abiotic indicators that are used to characterize the baseline biodiversity and discuss the rationale for their selection;
- describe, and show on maps, any locations within the study area that might constitute sensitive areas for terrestrial wildlife such as:

⁹⁶ <https://www.britannica.com/science/biogeographic-region/Components-of-species-diversity-species-richness-and-relative-abundance#ref588341>

- ecological reserves and protected areas, in proximity to the project location or that could be affected by routine project operations;
- any lands in the study area that might constitute sensitive areas and habitat for wildlife; or
- nearby environmentally significant areas, such as national parks, areas of natural or scientific interest;
- describe the levels of disturbance currently affecting wildlife and wildlife habitat, such as habitat fragmentation and the extent of human access and use;
- describe the source of the baseline data, data collection methods, and provide a rationale for any modelling approaches chosen, and describe how community knowledge and Indigenous Knowledge was incorporated; and

The Ministry of the Environment, Conservation and Parks may be able to provide information on specific data sources and survey methodologies. Collect wildlife data to represent the following temporal sources of variation:

- among years;
- within and among seasons (e.g., spring dispersal, breeding, late summer/fall migration and swarming, hibernation); and
- within the 24-hour daily cycle. Rare species require more survey effort to detect than common species, and this needs to be accounted for in survey design by increasing the number and duration of surveys.

Submit complete data sets from all survey sites. These should be in the form of complete and quality assured relational databases, with precisely georeferenced site information, precise observation/visit information and with observations and measurements in un-summarized form. Databases and GIS files should be accompanied by detailed metadata that meets ISO 19115 standards⁹⁷.

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).

8.10.2. Effects to terrestrial wildlife and their habitat

The Impact Statement must:

- describe the potential direct, incidental and cumulative adverse effects to other wildlife and wildlife habitat (especially species noted as important to Indigenous communities and local communities and their habitat), including population level, regional or local sub-population effects, that could be caused by all project activities, including but not limited to: project noise and sensory disturbances, habitat alteration, fragmentation and loss, air emissions or dust, altered predator-prey relations, increased potential for spread of disease, invasive species introductions, bioaccumulation of contaminants in wildlife, poaching opportunities, any linear access corridors (roads, rights of way)

⁹⁷ <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=16553>

particularly in the vicinity of wetlands (including peatlands), lake and riparian habitats and on migratory corridors;

- describe effects to terrestrial wildlife biodiversity considering biodiversity metrics, effects of habitat fragmentation, changes to regional biodiversity;
- describe and quantify, where possible, the potential effects to wildlife, including acute and chronic effects to wildlife health, of changes to air and water quality (e.g. from contaminants, effluents, atmospheric emissions, dust deposition, and bioaccumulation);
- provide an evaluation of the effects of any new road access or rights of way on wildlife mortality risk and movement patterns;
- describe the potential adverse effects of the Project on wildlife as a result of poaching;
- describe changes to insects, pollinating species in particular; and
- describe changes to key habitat, including eskers and similar geologic features, wetlands and peatlands, for species important to current use of lands and resources for traditional purposes.

In addition to direction from Environment and Climate Change Canada via the Agency, the Ontario Ministry of the Environment, Conservation and Parks and the Ministry of Natural Resources and Forestry should be considered a source of information on appropriate methodologies to predict effects to wildlife.

Additional guidance is identified in Appendix 1.

8.10.3. Mitigation and enhancement measures

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

- identify all feasible measures to prevent and mitigate the risk of harmful, destructive or disruptive activities in key sensitive periods and/or locations to wildlife and wildlife habitat, including residences and critical habitat. Include a description of the measures in terms of the effectiveness of each measure in avoiding negative effects;
- provide the best technically and economically feasible approaches for mitigating effects on habitat, aligned with the hierarchy of mitigation measures, and justify moving from one mitigation option to another;
- describe and explain the condition in which the temporary construction areas and service roads would be restored or maintained following construction, and explain the mitigation measures considered (e.g., possible revegetation, obstruction of the sightline, restoration of wildlife corridors and habitat; reduction of fragmentation; reduction of long term cumulative effects);
- describe and explain the measures to control the use of the highway and access roads to access areas that were previously difficult to reach, including by wildlife predators as well as by hunters, off-roading recreationalists, and other users;

- describe the deterrent systems that will be used to mitigate impacts to wildlife and species at risk due to, for instance, attraction to the project site and/or components and activities associated with the Project;
- describe wildlife friendly road-design principles and features, which may include underpasses and wildlife bridges (as well as monitoring to estimate bat and other wildlife mortality);
- describe measures to prevent the release of harmful substances into waters and/or areas frequented or occupied by wildlife;
- describe measures to address sensory disturbance and the resulting functional loss of wildlife habitat;
- provide details of any compensation or offsetting plans, if effects cannot be otherwise avoided or mitigated; and
- describe mitigation measures applicable to wildlife habitat and other biodiversity metrics that will be implemented through reclamation, including timelines and targets that will be used to assess effectiveness.

8.11. Species at Risk

8.11.1. Baseline conditions

The Impact Statement must:

- provide a list of all species at risk that are likely to be in the project study area and the local study area, including:
 - species listed in Schedule 1 of the federal SARA;
 - species protected under provincial legislation, and
 - species assessed by COSEWIC as extirpated, endangered, threatened or of special concern. It is recommended to refer to the most recent COSEWIC annual report for the list of assessed wildlife species posted on its website;
- use existing data and literature as well as surveys to provide current field data that reflects the natural inter-annual and seasonal variability of each species. Specifically, the Impact Statement must consider each species at risk potentially affected by the Project as a valued component, which may include:
 - Lake sturgeon (*Acipenser fulvescens*);
 - Northern Myotis (*Myotis septentrionalis*);
 - Little Brown Myotis (*Myotis lucifugus*);
 - Caribou (Boreal, *Rangifer tarandus caribou*; and Eastern Migratory, *Rangifer tarandus* Provincial: Missisa, Ozhiski, Nipigon, and Pagwachuan ranges; Federal: Far North range);

- Rusty Blackbird (*Euphagus carolinus*);
 - Bank Swallow (*Riparia riparia*);
 - Barn Swallow (*Hirundo rustica*);
 - Canada Warbler (*Cardellina canadensis*);
 - Chimney Swift (*Chaetura pelagica*);
 - Common Nighthawk (*Chordeiles mino*);
 - Eastern Whip-poor-will (*Antrostomus vociferu*);
 - Evening Grosbeak (*Coccothraustes vespertinus*);
 - Olive-sided Flycatcher (*Contopus cooperi*);
 - Peregrine Falcon (*Falco peregrinus*);
 - Short-eared Owl (*Asio flammeus*);
 - Yellow Rail (*Coturnicops noveboracensis*); and
 - Wolverine (*Gulo gulo*);
- provide baseline information that is representative of current conditions;
 - consider key habitats associated with species at risk as valued components, including eskers and similar geologic features, wetlands and peatlands;
 - provide written description and maps of ecozones, ecoregions, and ecodistricts as per Ontario or Canada's Ecological Landscape Classification;
 - for each bird species of conservation concern, 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 federal species at risk/critical habitat in the study area;
 - identify migratory birds listed under SARA to which the Species at Risk Protection Statement applies (see Appendix 1);
 - identify provincial species at risk;
 - identify any species assessed as at risk by COSEWIC in Canada⁹⁸;
 - identify any sites that are likely to be sensitive locations and habitat for birds or environmentally specific areas such as Areas of Natural and Scientific Interest, Migratory Bird Sanctuaries or other priority areas or sanctuaries for birds;
 - illustrate on the map the Project's footprint, identifying temporary and permanent infrastructure; and
 - locate the highest concentrations or areas of use by species;

⁹⁸ <https://www.cosewic.ca/index.php/en-ca/>

- provide species at risk data to represent the following temporal sources of variation:
 - among years;
 - within and among seasons (e.g., spring dispersal, breeding, late summer/fall migration and swarming, hibernation); and
 - within the 24 hour daily cycle.
- account for the fact that rare species will require more survey effort to detect, which should be reflected in survey design by increasing the number and duration of surveys, for each species at risk identified in the list above:
 - collect field data over at least two years⁹⁹. The goal of collecting data over multiple years is to improve the understanding of natural variability in populations. Two years of sampling is being suggested as a minimum. As the number of sampling years increases so does the understanding of natural variability;
 - sample size must be planned to support a robust evaluation of the project study area within the context of the local study area and regional study area;
 - design of surveys will need to consider multiple number of survey locations in order to represent the habitat heterogeneity of the regional study area, and to plan the number of survey locations per land cover or habitat class so that aggregation of habitat classes post-hoc is not required;
 - identify critical periods (e.g. denning, rutting, spawning, calving, breeding, roosting, hibernating), setback distances, or other restrictions related to these species;
 - in terms of sampling effort per unit area, field survey effort should be most intensive within the project study area. The level of effort per unit area may be similar or somewhat less within the remainder of the local study area, but should be scaled to the likelihood that project effects will impact species at risk within that zone. Efforts outside the project study area should be carefully designed to ensure that estimates comparing and across the project study area, local study area and regional study area are unbiased and precise;
 - a habitat-stratified random sampling approach should be used. Sample sites should be selected with a randomization procedure such as a GIS grid overlay. and
 - where Critical Habitat has not been defined or has been partially identified, a Schedule of Studies may have been created to identify gaps in information for these species. The Schedule of Studies information should be referred to when implementing or assessing survey protocols, in order to provide necessary information for these species.
- ensure that the combined information from existing data and field surveys describe the population status, distribution and abundance (including relative abundance in each habitat type) of species at risk in relation to the study areas;
- contain 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

⁹⁹ Baseline data can often be found in secondary information sources. To the extent reasonable, the proponent is encouraged to utilize data collected for the assessments of the proposed Marten Falls Community Access Road and the proposed Webequie Supply Road, to fulfill baseline requirements.

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 standards¹⁰⁰;

- provide documentation and digital files for 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);
- For the species identified as valued components¹⁰¹:
 - provide any published studies that describe the regional importance, abundance and distribution of species at risk, including recovery strategies or plans;
 - consult relevant published studies that describe suitable survey methodologies for caribou and wolverine based on winter track observations including but not limited to:
 - caribou resource selection probability functions describing the probability of resource use at the range scale (see Hornseth & Rempel 2016);
 - caribou, moose, and wolf occupancy models describing their distribution in the far north (see Poley et al. 2014); and
 - wolverine occupancy models describing the distribution of wolverine in the far north (see Ray et al. 2018).
 - provide data and summary lists for each species at risk ranked according to:
 - abundance;
 - distribution across survey sites (i.e., percentage of survey stations at which they were recorded);
 - abundance in each habitat type; and
 - map showing the survey sites and areas of highest concentrations or areas of use by species.
- Data must be supplemented by surveys, as required;
 - survey protocols should optimize detectability and survey effort should provide for comprehensive coverage at the appropriate time of year (e.g., survey breeding habitat during breeding season, stopover habitat during migration);
 - survey protocols should provide a rationale for the scope of and the methodology used for surveys including design, sampling protocols and data manipulation; and
 - where using recognized standards, provide details of any modifications to the recommended methods and rationale for these modifications and indicate who was consulted in the

¹⁰⁰ <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=16553>

¹⁰¹ Should the Project require an authorization under Ontario's *Endangered Species Act*, the Government of Ontario will use Ontario-specific guidance for survey methods and desktop analysis to support the authorization application process. The proponent should review original submissions to the Agency from the Ontario Ministry of the Environment, Conservation and Parks and consult the Government of Ontario on specific permitting requirements, prior to collecting baseline data, to avoid timeline delays.

development of the baseline surveys (e.g., federal/provincial wildlife experts, specialists and local Indigenous communities).

- provide information and mapping at an appropriate scale (The project study area and local study area, as defined above for each valued component, constitute the appropriate scale.) for residences, seasonal movements, movement corridors, habitat requirements, key habitat areas, identified or proposed critical habitat and/or recovery habitat (where applicable). Describe the general life history of species at risk (e.g., breeding, foraging, hibernating) that may occur in the project area, or may be affected by the Project; and
- identify and map all species at risk, critical habitat, and residences on federal land within the project study area and local study area, as defined for each valued component (provincial and/or local government authorities should be contacted to determine any additional data sources and survey methodologies);

In relation to providing required information for bats, the Impact Statement must:

- quantify baseline bat activity (e.g., using acoustic detection to calculate an index of bat activity) to evaluate relative use of different habitats or features in the project study area to help support and evaluate project siting decisions or impact predictions. In addition, locate and confirm use of high-value features such as roosts, foraging areas and hibernacula.
- follow the survey requirements specific to bats:
 - to augment existing information sources and collect data able to establish robustly baseline conditions and assess impacts, undertake site-specific surveys to:
 - compile a species inventory (species present/not detected);
 - quantify baseline bat activity to evaluate relative use of different habitats or features in the project area and to help support and evaluate project siting decisions and impact predictions;
 - document baseline conditions within the project study area, local study area to support study of impacts;
 - locate and confirm use of high value habitat features such as roosts (including cavity trees and buildings with potential for roosting) and hibernacula. This could be done using desktop habitat suitability modelling with field surveys to confirm presence in high potential areas;
 - identify potential regional migration corridors; and
 - identify site-specific travel corridors and movement patterns.
 - the following types of surveys are required:
 - acoustic surveys, ensure study design is statistically valid, conducted in spring, summer, and fall to capture dispersal and migration (travel corridors), breeding, and roosting;
 - locate and assess potential hibernacula and roosts for use by bats, accounting for inter-annual and within-season variability in use. This could be done using desktop habitat suitability modelling with field surveys to confirm presence in high potential areas; and

- refer to provincial recommendations for guidelines on survey methodology¹⁰².
- data or reports must include information on acoustic detection methods used, including the following:
 - detector make and model;
 - microphone model used;
 - location of Detectors;
 - height of microphones;
 - orientation of microphones;
 - special housing that may effect microphone sensitivity (e.g., wind screen, cones, weatherproofing, etc.);
 - mounting method (e.g., meteorological tower, pole, etc.);
 - device specific settings (e.g., gain/sensitivity, TBC, etc.);
 - recording mode (i.e., full spectrum or zero-crossing); and
 - a summary of any issues with equipment failure, and a description of procedures used to ensure equipment was operational during deployment (including ensuring microphone sensitivity remains within an acceptable range).
- note that study design, analysis of acoustic data and interpretation of results would require the services of a bat expert;
- clearly describe methods used to define a bat “pass” and be consistent with the definition used for any comparison group. Provide a rationale for the chosen method;
- clearly describe methods used for acoustic identification, including any validation procedures used, criteria used for deciding on species classifications, and software used (including versions and settings); and
- where results are compared across years, timing of surveys compared, equipment and setup protocols must remain consistent across years.

In relation to providing required information for caribou, the Impact Statement must:

- describe caribou use of the study areas (e.g., distribution, movement) over time using surveys to complement existing data if data within the project study areas are insufficient or unavailable to be able to understand how caribou use the habitat. Involve province of Ontario for data and survey requirements. Consider Indigenous Knowledge and community knowledge;
- provide a justification for the sensitive periods considered in the assessment. Sensitive periods are associated with caribou life-stages such as calving, wintering, and travel. Ontario has specific

¹⁰² <https://www.ontario.ca/page/bats-and-bat-habitats-guidelines-wind-power-projects#section-4%20Appendix%20A>; while these guidelines were developed for wind energy projects, the methods for evaluating bat significant wildlife habitat apply to a range of project types.

sensitive time periods for caribou that are used in the identification, delineation, and consideration of habitat features;

- describe the type and spatial extent of biophysical attributes, as defined in Appendix H of the 2019 proposed amended caribou recovery strategy¹⁰³ present in the study areas;
- conduct surveys to complement existing data if data within the project study areas are insufficient or unavailable, to be able to understand where the biophysical attributes occur. Note that identification of biophysical attributes is not dependent on caribou currently being present in the area;
- provide the best available information from the Government of Ontario, on the level of disturbance (anthropogenic vs fire) in the range consistent with the methodology developed by Environment Canada (2011)¹⁰⁴. Follow the survey requirements specific to caribou:
 - In some instances, provincial methodologies may differ from federal recommendations. Consider both methodologies in order to apply the federal 35% habitat threshold, and to determine the amount of habitat disturbance. If provincial disturbance information applies more recent information (i.e., best available), that information should also be considered¹⁰⁵.
- For caribou, include a map and description of General Habitat Categories within the project study area, LSA, and RSA, using Ontario's General Habitat Description for the Forest-Dwelling Caribou and identify permanent alterations. The description must:
 - provide the best available information from the relevant jurisdiction concerning baseline range population size and trend;
 - consult with experts of the relevant jurisdiction on appropriate survey methodologies for caribou. Provide a justification for the selected methodologies;
 - in designing surveys for caribou, the following information sources should be consulted:
 - integrated Assessment Protocol for Woodland Caribou Ranges in Ontario (IAP) (request from Ontario Ministry of the Environment, Conservation and Parks);
 - general Habitat Description for the forest-dwelling Woodland Caribou (*Rangifer tarandus caribou*) (GHD)¹⁰⁶;
 - Ontario's Woodland Caribou Conservation Plan (CCP)¹⁰⁷;
 - range Management Policy in Support of Woodland Caribou Conservation and Recovery (RMP)¹⁰⁸;

¹⁰³ <https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/recovery-strategies/woodland-caribou-boreal-2019.html>

¹⁰⁴ https://wildlife-species.canada.ca/species-risk-registry/document/doc2248p/toc_tdm_st_caribou_e.cfm

¹⁰⁵ <https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/recovery-strategies/woodland-caribou-boreal-2020.html>

¹⁰⁶ <https://www.ontario.ca/page/general-habitat-description-forest-dwelling-woodland-caribou>

¹⁰⁷ <https://www.ontario.ca/page/woodland-caribou-conservation-plan#:~:text=The%20goal%20of%20the%20Caribou,the%20return%20of%20caribou%20to>

¹⁰⁸ <https://www.ontario.ca/page/range-management-policy-support-woodland-caribou-conservation-and-recovery>

- integrated Range Assessment for Woodland Caribou and their Habitat: The Far North of Ontario 2013 (IRAR)¹⁰⁹;
- Far North Technical Report (FNTR) (request from Ontario Ministry of Environment Conservation and Parks); and
- Indigenous Knowledge holders from across all of the potentially impacted Indigenous communities identified by the Agency.

COSEWIC does provide an annual report listing the designated wildlife species on its website (see Appendix 1).

For lake sturgeon, refer to section 8.8 *Fish and fish habitat*. For birds that are species at risk, refer to section 8.9 *Birds, migratory birds and their habitats*.

8.11.2. Effects to species at risk and their habitat

The Impact Statement must:

- describe the potential direct, incidental and cumulative adverse effects of the Project on species at risk listed under Schedule 1 of SARA and, where applicable, 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;
- provide survey results and detailed mapping of each species at risk and their habitat, including important habitat features
- describe the potential adverse effects of the Project on species protected by provincial statutes and assessed by the COSEWIC as extirpated, endangered, threatened or of special concern (flora and fauna) and their habitat that are not currently listed under SARA;
- identify critical timing windows (e.g., denning, rutting, spawning, calving, breeding, roosting, hibernating), setback distances, or other restrictions related to these species;
- analyse predicted effects for each species at risk. To fully understand the effects and/or benefits of one alternative versus another, all relevant metrics and evaluators for species at risk should be considered;
- consider potential effects to species at risk from bioaccumulation and biomagnification of contaminants of dust and other pollutants resulting from the Project;
- describe the effects of aggregate pits and quarries on species at risk, particularly if located on or near esker deposits;
- describe the area, biophysical attributes and location of habitat including critical habitat affected (e.g., destroyed, permanently altered, disrupted);

¹⁰⁹ <https://files.ontario.ca/environment-and-energy/species-at-risk/Berens-Range-EN.pdf>

- quantify the area of relevant habitat types for species at risk that may be cleared or otherwise disturbed within the project study area during all phases of the Project;
- describe clearings created for the Project, including road surfaces, road margins, and other open areas, that may create new habitat types thereby attracting species at risk which were not present before (such as the Eastern Whip-poor-will or the Common Nighthawk). Describe how new habitat types may impact species at risk in the project area;
- describe the residual effects that are likely to result from the Project after avoidance and minimization measures have been applied, including the extent, duration and magnitude of the effects on:
 - the number of individuals killed, harmed, harassed; and
 - the number of residences damaged or destroyed;
 - the amount of critical habitat destroyed;
- include post-construction surveys to verify predicted effects;
- clearly identify the locations of federal lands/non-federal lands within the study area and differentiate between these land tenures in the presentation of information regarding all species at risk. For example, total habitat disturbance for caribou should be presented at the range scale, but it should also be presented in a way that clearly indicates habitat disturbance specifically within federal lands;
- 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 all reasonable alternatives to the Project that would avoid the potential effects on species and their habitat, with particular attention to critical habitat, and important habitats such as upland habitat which is used as movement corridors by caribou, breeding areas for birds, and which contains roosting habitat for bats; and
- include post-construction surveys to verify predicted effects;

In relation to describing effects on bats, the Impact Statement must:

- provide an assessment of potential adverse effects on bat individuals;
- provide the relative abundance of roosting and foraging habitats in the project study area, LSA, and RSA, including the percentage of total lost in each study area; and
- describe the potential effects to hibernacula and travel corridors in the project study area, LSA and RSA including the percentage lost in each study area.

In relation to describing effects on caribou¹¹⁰, the Impact Statement must:

¹¹⁰ The effects assessment should take into account the known differences in behaviours, habitats and threats of both Boreal and Eastern Migratory caribou species.

- assess the effects of all linear disturbances (e.g., new road access or rights of way) on caribou, including movements between seasonal habitats to account for functional habitat loss and effects of increased predation.¹¹¹;
 - use population-level modeling to assess the effects of proposed disturbance on caribou at the scale of federal range boundaries and provincial range boundaries. Increases in predation caused mortality rates need to be considered as do the anticipated exacerbating effects of climate change;
 - with respect to effects on undisturbed habitat at the scale of the range:
 - provide an account (and GIS file if available) of added project disturbance using a 500-metre buffer, using the following formula: (Project footprint + 500-metre buffer) - overlapping area(s) already considered disturbed habitat (see glossary in the federal recovery strategy); and
 - determine whether the Project is expected to compromise the ability of ranges to be maintained at the disturbance management threshold and provide a rationale for the conclusion¹¹².
- with respect to effects on biophysical attributes as defined in Appendix H of the caribou Recovery Strategy, determine whether the Project is expected to remove or alter biophysical attributes necessary for caribou recovery or survival and provide a rationale for the conclusion (provide GIS file if available);
- with respect to the effects of predation: determine whether the Project is expected to result in an increase of predator and/or alternate prey access to undisturbed areas and provide a rationale for the conclusion;
- with respect to effects on individuals and population condition at the range scale:
 - provide best available information from the Ontario Ministry of the Environment, Conservation and Parks concerning baseline range population size and trend;
 - provide an assessment of the potential adverse effects of the Project on the population condition of the range (i.e., size and trend) at both the provincial range scale and the federal range scale;
 - any sensory disturbance (e.g., noise, vibration, light) or sources of collisions that could affect individual caribou, if they are present, and assess if these could lead to avoidance of habitat;
 - provide an assessment of the potential adverse effects on caribou individuals (e.g., sensory disturbance, mortality, pollution), including legal harvest from Indigenous communities.
- provide an assessment of the potential adverse effects on caribou habitat (e.g., at the range and sub-range scales) considering the direction provided in the RMP and GHD (see section 8.11.1) and informed by NHIC information layers and the General Habitat Description Mapping Product (available through the Ontario Ministry of Environment, Conservation and Parks);

¹¹¹ https://www.registrelep-sararegistry.gc.ca/virtual_sara/files/ri_boreal_caribou_science_0811_eng.pdf

¹¹² https://www.registrelep-sararegistry.gc.ca/virtual_sara/files/plans/rs_caribou_boreal_caribou_0912_e1.pdf

- with respect to effects on connectivity:
 - determine whether the Project is expected to result in a reduction of connectivity within or between the ranges and provide a rationale for the conclusion;
 - evaluate habitat and range connectivity at the local, regional and range scales using quantitative methods (e.g., habitat suitability analysis etc.); and
 - in addition, where telemetry data is available, evaluate movements of collared individuals using quantitative methods (e.g., step analysis), to determine existing movement corridors, and how these may be affected by project development.
- provide an evaluation of the following:
 - caribou (Habitat Protection) – Range Condition;
 - caribou (Species Protection) – Population Size Estimates at the Range Level (e.g., minimum animal count based on available information);
 - caribou (Species Protection) – Population Trend Estimates at the Range Level;
 - caribou (Habitat Protection) – Cumulative Disturbance at Range Level;
 - quantify additional disturbance being added to the range (footprint and footprint + 500 metre buffer);
 - alignment with existing disturbance; and
 - length of new linear disturbances.
 - caribou (Habitat Protection) – Habitat Amount and Arrangement;
 - caribou (Habitat Protection) – Categorized Habitat at the Sub-range Level:
 - category 1: High Use Area – Nursery Areas Habitat potentially impacted:
 - * number of Nursery Areas within the Range;
 - * number of Nursery Areas potentially impacted by the Project (e.g., how many intersect with project footprint, are within 2 kilometres, within 10 kilometres);
 - * relevant information on that habitat, such as average age of forest, condition of forest, etc., for each Nursery Area potentially impacted by the Project;
 - * area (ha) of each Nursery Area potentially being impacted; and
 - * area (ha) of each Nursery Area removed by Project.
 - Category 1: High Use Area – Winter Use Areas potentially impacted:
 - * number of Winter Use Areas within the Range;
 - * number of Winter Use Areas potentially impacted by the Project (e.g., how many intersect with project footprint, are within 2 kilometres, within 10 kilometres);
 - * relevant information on that habitat, such as average age of forest, condition of forest, etc. for each Winter Use Area potentially impacted by the Project;

- * area (ha) of each Winter Use Area potentially being impacted; and
- * area (ha) of each Winter Use Area removed by Project.
- Category 1: High Use Area – Travel Corridors potentially impacted:
 - * number of Travel Corridors within the Range;
 - * number of Travel Corridors potentially impacted by the Project (e.g., how many intersect with project footprint, are within 2 kilometres, within 10 kilometres);
 - * relevant information on that habitat, such as average age of forest, condition of forest, etc. for each Travel Corridor potentially impacted by the Project;
 - * area (ha) of each Travel Corridor potentially being impacted; and
 - * area (ha) of each Travel Corridor removed by Project.
- Category 2: Seasonal Ranges impacted:
 - * Area (ha) of Seasonal Ranges potentially being impacted;
 - * relevant information on that habitat, such as biophysical attributes for Seasonal Ranges potentially impacted by the Project; and
 - * Area (ha) of Seasonal Range removed by Project.
- Category 3: Remaining Areas in the Range impacted:
 - * remaining Areas (ha) in the Ranges potentially being impacted;
 - * relevant information on that habitat, such as biophysical attributes for remaining Areas in the Range potentially impacted by the Project; and
 - * remaining Areas (ha) in the Range removed by Project.
- caribou (Species Protection) – Incidental mortality due to anthropogenic effects (e.g., vehicular collisions, increased hunting pressure);
- caribou (Species Protection) – Indirect mortality due to increase in alternate prey sources (moose and deer) leading to increased predation (wolves, bears, etc.) and increased potential for spread of disease (e.g., brainworm);
- caribou (Species Protection) – Indirect effects due to sensory disturbance (e.g., light, sound, vibration, olfactory) within 10 kilometres of the Project;
- consult the following sources of information:
 - documents provided by Ontario:
 - IAP, CCP, RMP, and GHD (defined in section 8.11.1);
 - draft Selected Wildlife and Habitat Features: Inventory Manual for use in Forest Management Planning v1.0 (1997);
 - Indigenous Knowledge; and

- science-based evidence from the relevant jurisdiction that is consistent with the Recovery Strategy, including spatially explicit Population Viability Analysis.

Additional guidance is identified in Appendix 1.

8.11.3. Mitigation and enhancements measures

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

- describe the proposed mitigation measures for potential adverse effects on species at risk and critical habitat, include the justification, based on scientific data, for the proposed measures;
- demonstrate that avoidance and minimization measures will be applied for species at risk. Recovery Strategies will provide information such as Population and Distribution Objectives, and Strategic Direction for Recovery;
- provide an account of how the Project and mitigation measures are consistent with the recovery strategy, action plan, or management plan for the species at risk;
- describe all feasible measures that would be taken to eliminate the effects of the work or activity on species at risk and their habitats, particularly critical habitat;
- identify and describe mitigation measures, including alternative means of carrying out the Project that would avoid or lessen potential adverse effects to terrestrial and aquatic species and/or critical habitat listed under Schedule 1 of SARA, including but not limited to caribou (*Rangifer tarandus caribou*) and Lake Sturgeon (*Aciper fulvescens*). These measures:
 - are to be consistent with any applicable recovery strategy, action plan or management plan and will also identify and describe mitigation measures to avoid or lessen adverse effects to COSEWIC-assessed species; and
 - must be described in terms of the effectiveness of each measure to avoid the adverse effects and include a comprehensive science-based rationale for proposing the selected mitigation measures.
- describe mitigation measures to reduce the risk of harmful, destructive or disruptive activities in sensitive times and places of importance to species at risk;
- describe measures to mitigate sensory disturbance and the consequential functional habitat loss it may cause;
- describe measures to prevent the release of harmful substances into waters or areas frequented or occupied by species at risk; and
- provide mitigation measures for effects on habitat, aligned with the hierarchy of mitigation measures and justify moving from one mitigation option to another.

With respect to bats:

- describe how bat behavior (differentiated by species) was taken into account, based on the geographic location and time-period;
- apply appropriate mitigation measures, such as timing windows and setbacks, to all areas with potential roosting habitat, unless each structure is individually assessed and verified to not be used for roosting;
- specifically address mitigation of effects to eskers and related features rich in aggregate material, as these are important features for bat hibernacula;
- describe the effectiveness of different mitigation options taking into consideration the configuration of resources in the environment, and how local bat populations are using these resources.
- at a minimum, the following mitigation measures should be applied:
 - spatial avoidance (setbacks):
 - a buffer zone of 120 metre is recommended;
 - for resting areas and nurseries in trees (or anthropogenic structures as appropriate), apply a buffer zone to the entire complex of roosts and nurseries; and
 - for hibernacula apply the buffer zone to entire cave network.
 - temporal avoidance (timing of disturbance, roost destruction or exclusion):
 - avoid disturbance, destruction and exclusion between April 30 and September 1.
 - manage vegetation at bridges and other commuting corridors that intersect highways:
 - manage vegetation height and tree canopy height so that it is not in line with the height of traffic; and
 - include bat monitoring at bridges, close to significant habitat features (e.g., roosts, hibernacula, significant foraging habitats) and identified bat commuting corridor locations to estimate mortality. Where mortality is higher than background rates, compensation measures are required to reduce mortality.
 - lighting:
 - avoid or minimize the use of artificial light in bat habitats;
 - select lower intensity lighting;
 - use lighting fixtures that restrict or focus illumination to target areas; and
 - avoid lights that emit blue/green/white/UV wavelengths.
 - follow decontamination protocols for White-nose Syndrome by the Canadian Wildlife Health Cooperative; and
 - other compensation (offsets or trade-offs).

With respect to Boreal and Eastern Migratory caribou:

- demonstrate that measures to avoid and minimize effects would be applied for caribou and its critical habitat;
- describe mitigation measures, taking into account the Best Management Practices for Renewable Energy, Energy Infrastructure and Energy Transmission Activities and Woodland Caribou in Ontario¹¹³ and the Endangered Species Act Submission Standards for Activity Review and 17(2)(c) Overall Benefit Permits¹¹⁴;
- assess mitigation measures at the scale of provincial and federal ranges and incorporate the results of population level analyses;
- describe all reasonable alternative means of carrying out the Project that would avoid the adverse effects of the Project on caribou;
- describe how these alternative means have been considered, and provide a rationale to confirm that the best solution has been adopted to address adverse effects on caribou; and
- describe all feasible measures that will be taken to minimize the adverse effects of the Project on caribou and its critical habitat:
 - minimize the footprint of development and consider locations where habitat is already disturbed;
 - restore habitat to provide availability of undisturbed habitat over time;
 - avoid destruction of biophysical attributes (see Appendix H of the recovery strategy);
 - mitigate noise, light, smell, and vibrations;
 - develop an access management plan;
 - use techniques to prevent predators from using the corridor; and
 - report on how the project and mitigation measures are consistent with the recovery strategy, action plan or management plan for the species.

8.12. Climate change

The following requirements are based on the SACC, developed by ECCC. The proponent must follow the directions and guidance contained in the most recent version of the SACC and its related technical guides. Guidance on GHG emissions and climate change is listed in Appendix 1.

8.12.1. GHG emissions

As described in section 5.1.1 of the SACC, with regards to GHG emissions, the Impact Statement must provide the following:

¹¹³ <https://www.ontario.ca/page/best-management-practices-renewable-energy-energy-infrastructure-and-energy-transmission-activities>

¹¹⁴ https://files.ontario.ca/environment-and-energy/species-at-risk/stdprod_093115.pdf

- a description of each of the Project's main sources of GHG emission and their estimated annual GHG emissions over the lifetime of the Project;
- net GHG emissions by year for each phase of the Project based on the Project's maximum capacity for new projects (additional guidance at section 2.1 of the Technical Guide);
- each term of Equation 1 (Net GHG emissions = Direct GHG emissions + Acquired energy GHG emissions - Avoided domestic GHG emissions - Offset measures), per year for each phase of the Project (additional guidance at section 2.1 of the Technical Guide);
- methodology, data, emission factors and assumptions used to quantify each element of the net GHG emissions (refer to section 3.1.1 of the SACC and section 2 of the Technical Guide); and
- a discussion on the development of emissions estimates and uncertainty assessment (refer to section 3.3 of the SACC).

8.12.2. Carbon sinks

In terms of impact on carbon sinks, the Impact Statement must provide a quantitative and qualitative description of the Project's positive or negative impact on carbon sinks, as indicated in section 5.1.2 of the SACC. Additional guidance on the methodology to estimate losses or gains to carbon sinks is provided in section 4 of the Technical Guide.

The Impact Statement also must provide any mitigation measures planned to restore disturbed carbon sinks, as described in section 3.5.3 of the Technical Guide.

8.12.3. Impact of the Project on federal emissions reduction efforts and global GHG emissions

In terms of the impact of the Project on 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 as well as a discussion on how the Project could impact global GHG emissions, if applicable. Additional guidance is provided in section 5.1.3 of the SACC.

8.12.4. Mitigation for climate change and GHG emissions

In terms of mitigation measures, the Impact Statement must include a Best Available Technologies / Best Environmental Practices (BAT/BEP) Determination, as described in section 3.2 of the Technical Guide. This BAT/BEP Determination process will assess potential mitigation measures throughout all phases of the Project and put the emphasis on minimizing net GHG emissions as early as possible and throughout the project lifetime as described in section 5.1.4 of the SACC.

9. Local and regional socio-economic conditions

The Impact Statement must describe the local and regional socio-economic conditions and trends, inclusive of individual communities (such as the six wards of the Municipality of Greenstone) and Indigenous communities.

9.1. Baseline conditions

Baseline data may be found in secondary information sources. To the extent reasonable, the proponent is encouraged to utilize data collected for the assessments of the proposed Marten Falls Community Access Road and the proposed Webequie Supply Road, to fulfill baseline requirements.

The baseline information must be sufficiently disaggregated and analysed to understand the differences in norms, roles and relations for diverse subgroups; the different level of power they hold; their differing needs, constraints and opportunities; and the impact of these differences in their lives.

9.1.1. Community profile

To understand the context of each community, the Impact Statement must prepare community profiles that describe:

- demographic characteristics of each community;
- relevant community background and historical experience with similar infrastructure and/or resource development projects;
- crime rates, substance misuse and how they compare to regional/provincial/territorial averages;
- information on Indigenous women's safety and rates of gender-based violence;
- access, ownership and use of resources (e.g., minerals, food, water); and
- capacity (currently available or planned) of institutions to deliver public services and infrastructure to the community.

9.1.2. Services and infrastructure

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

- transmission line corridors;
- broadband corridors;
- airports;
- road infrastructure and traffic safety; details on the existing road network (all weather and winter roads) and traffic patterns, including any projections of future traffic patterns; and

- any other potentially affected infrastructure and transportation routes.

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

- educational services, facilities and daycare, including apprenticeships and training initiatives (e.g., Kiiikenomaga Kikenjigewen Employment & Training Services¹¹⁵, Mushkegowuk Council Employment & Training Services¹¹⁶, Workforce Development Stream¹¹⁷, etc.)
- existing health services and programs, including health providers capacity;
- emergency services (ambulance, fire, police);
- social services;
- cultural support; and
- all other potentially affected services.

9.1.3. Navigation

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

- existing navigable waterways and navigation use including type, volume, seasonality, manoeuvrability, and physical characteristics (e.g., size, width, depth, etc.), bank/bottom features, biological components, flow/tides, etc.;
- past, current, and anticipated future use of all waterways and waterbodies, including recreational uses by Indigenous communities and the public (including special events, fishing, cottagers, etc.);
- information on waterfront owners, other than the Crown;
- describe whether there is access by land or water;
- a list of potentially affected waterway users and concerns about waterway use and access; and
- potential of obstructions, restrictions, or expansions of access to navigable waterways (e.g., portage routes and access roads).

9.1.4. Employment and overall economy

The Impact Statement must describe the local and regional economic conditions and trends, including:

- economic and employment opportunities in the local and regional study areas;
- existing employment and unemployment rates and economic well-being of communities in the study areas;
- known barriers and opportunities to employment for underrepresented groups;

¹¹⁵ <http://www.kkets.ca/>

¹¹⁶ http://www.mushkegowuk.com/?page_id=2100

¹¹⁷ <https://nohfc.ca/en/pages/programs/people-talent-program/workforce-development-stream>

- workforce, including the availability of skilled and unskilled workers, existing working conditions, wages and average salary range, full-time and part-time employment and training;
- local and regional workforce development and training programs, including those specific for Indigenous peoples;
- the number of local and regional residents who have the skills and availability required to participate during the construction and operation phases of the Project, or who can be trained in a timely manner;
- existing local, provincial or federal economic development plans;
- an overview of the businesses that may provide supplies and services required for the Project;
- the main industries and largest employers, and any opportunities for local/regional businesses to benefit from the Project:
 - sites or areas that are used by Indigenous and non-Indigenous outfitters or tourism operators (include a map, if possible);
 - registered or recognized hunting, trapping or guiding areas, recreational and commercial fishing areas;
- all publicly available information about exploration projects in the region that inform an overview of the influence that exploration projects have on the regional economy;
- intersectional gender analysis that examines differences in the status of diverse subgroups (e.g., women, youth, and Elders) and their differential access to resources, opportunities and services; and
- baseline conditions, using disaggregated data for diverse subgroups (e.g., women, youth, and Elders) and their different access to resources, opportunities and services within the community to support GBA Plus.

Additional guidance is identified in Appendix 1.

9.2. Effects to local and regional socio-economic conditions

9.2.1. Effects to services and infrastructure

The Impact Statement must:

- describe the potential interactions of the Project with local and regional services and infrastructure, including adverse and positive effects to:
 - educational services, facilities and daycare;
 - health services and programs, including health providers capacity;

- emergency services (ambulance, fire, police); and
- transportation, utilities and communication corridors (including community airports and winter roads).

9.2.2. Effects to navigation

The Impact Statement must:

- describe effects to navigable waterways that could be impacted by the Project, including to physical characteristics (e.g., width, depth, etc.), bank/bottom features, biological components, flow/tides, etc., and specify the proposed crossing method;
- describe ancillary project components that will be constructed in, on, under, over, through or across navigable waterways to support the Project, and specify the proposed crossing method;
- describe potentially affected waterway users and describe consultation with waterway users regarding navigational use, issues raised and how issues were addressed; and
- describe project effects to navigation and navigation safety, including potential obstructions to navigation (natural/man-made, other works, navigation aids, etc.).

9.2.3. Effects to employment and overall economy

The Impact Statement must:

- describe the potential changes in employment including:
 - an estimate of the number of new jobs (for each phase of the Project), and the expected rates of pay, and an analysis of differential effects across relevant subgroups, including by sex, age and other relevant identity factors, as well as limitations to labour market access;
 - plans and justification for hiring temporary workers, including any temporary foreign workers, to make up for any local shortage of labour and skills; and
 - any potential long-term changes to the local and regional labour markets, resulting from the Project.
 - to the extent practicable indicate the affiliation of the participants to Indigenous communities identified in the *Indigenous and Engagement Partnership Plan*; and
 - opportunities for diverse groups of Indigenous women, and underrepresented groups, into higher-skilled jobs through provision of on-the-job training (e.g., surveyors, road safety auditors, and heavy equipment operators).
- describe the potential interactions of the Project with the main local and regional industries and largest employers, including adverse and positive effects to:
 - mining operations;
 - mineral exploration activities; and
 - commercial outfitters;

- provide a qualitative analysis and description of the extent to which the Project may facilitate developments, including mining projects, mineral exploration activities and other resource development in the area;
- provide an estimate and description of the Project's direct, indirect, and induced economic impact during construction and operation, such as:
 - effects on individual and community income (e.g., market economy, government transfer payments etc.);
 - effects on the broader economic contributors to the regional economy, such as small businesses (e.g., nature and outdoor tourism);
 - effects to local traditional subsidized and market economies, and current market trends;
 - any measurable effects on provincial/territorial GDP; and
 - increased consumer spending.
- provide the sources and methodologies used for developing multipliers and estimates to calculate the figures above.

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

10. Indigenous peoples

The Impact Statement must provide information on how the Project may affect Indigenous peoples, as informed by the Indigenous communities involved in the assessment. The proponent should follow Agency guidance on engaging with Indigenous communities and assessing potential effects and impacts on Indigenous peoples and their rights¹¹⁸.

The assessment of potential effects must include both adverse and positive effects to the current use of lands and resources for traditional purposes, to physical and cultural heritage, to structures, sites or things of historical, archaeological, paleontological or architectural significance, and to environmental, health, social, cultural and economic conditions of Indigenous peoples affected by the Project. The information used for the assessment should be disaggregated by sex, age, and other community relevant identify factors to support GBA Plus.

The proponent must engage with potentially impacted Indigenous communities, in order to identify and understand the potential impacts of the Project on their rights, and to incorporate Indigenous Knowledge into the impact assessment. Indigenous valued components may be holistic in nature and may encompass the effects on a number of individual environmental, health, social or economic valued components, as well as impacts to the exercise of Aboriginal or Treaty rights. Where holistic valued components are identified, the proponent must combine the analysis of individual valued components into

¹¹⁸ *Guidance: Assessment of Potential Impacts on the Rights of Indigenous Peoples* is available online at <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/guidance-assessment-potential-impacts-rights-indigenous-peoples.html>.

an assessment of the holistic valued components identified by Indigenous communities. The proponent also must analyze the Indigenous Knowledge across diverse subgroups where possible to identify differential effects highlighted by these groups.

Where appropriate, data sharing between projects is the preferred approach, particularly for those valued components that require surveys involving Indigenous communities and where multiple primary data collection activities would increase consultation fatigue. The proponent should verify with the Agency whether the approach would be considered appropriate to meet the requirements of these Guidelines.

Engagement with Indigenous communities is also required to identify proposed measures to avoid, minimize, offset or otherwise accommodate for potential impacts on Indigenous peoples or their rights. This engagement may also identify potential positive outcomes, including enhancement measures that could improve the underlying baseline conditions that support the exercise of rights. Ideally, the Project will be designed to minimize negative effects and to maximize positive impacts on the quality of life of Indigenous peoples.

Engagement with Indigenous communities must involve ongoing information sharing and collaboration 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 impact assessment of the Project has been prepared by an Indigenous community, 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 community, except in cases where the information could be confidential in nature.

The proponent must provide an opportunity for Indigenous communities to review the information prior to submission of the Impact Statement. If the information is about an Indigenous community, 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 communities has been incorporated, including Indigenous Knowledge. To the extent possible, information should be specific to the individual Indigenous community(ies) involved in the assessment and describe contextual information about the members within an Indigenous community (e.g., women, men, Elders and youth).

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

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

Requirements for engagement with potentially impacted Indigenous communities are discussed in further detail in section 6 of this document.

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

10.1.1. Baseline conditions

The Impact Statement must include a description of the baseline conditions¹¹⁹ associated with physical and cultural heritage and structure, site or thing of archaeological, paleontological, historical or architectural significance for Indigenous peoples. This description should give consideration to understanding historical baseline conditions associated with ability to transmit culture¹²⁰ (e.g., through language, ceremonies, harvesting, teaching of sacred laws, traditional laws, stewardship laws, traditional knowledge). Refer to Agency guidance in Appendix 1.

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

- burial sites;
- spiritual sites, including rivers and watercourses;
- cultural landscapes such as local eskers, river basins (Albany and Attawapiskat river basins);
- oral histories;
- teaching areas used to transfer knowledge between generations;
- cultural values and experiences on the land, including harvesting specific resources;
- Indigenous governance systems and Indigenous laws tied to the landscape;
- place names, language and other components that make up a culture;
- sacred, ceremonial or culturally important places, plants, animals, objects, beings, or things;
- places with archaeological potential or artefacts; and
- sites occupied historically.

The Impact Statement must:

- describe the natural and cultural heritage, and provide maps for buildings, sites and things of historical, archaeological, paleontological or architectural significance in the study area, including land, natural features and resources considered to be heritage;
- 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,

¹¹⁹ Where appropriate, data sharing between projects is the preferred approach, particularly for those valued components that require surveys involving Indigenous communities and where multiple primary data collection activities would increase consultation fatigue. Baseline data may be found in secondary information sources. To the extent reasonable, the proponent is encouraged to utilize data collected for the assessments of the proposed Marten Falls Community Access Road and the proposed Webequie Supply Road, to fulfill baseline requirements.

¹²⁰ The Cultural Heritage Baseline Study and Preliminary Impact Assessment should expand the definition of culture to include the definition provided by the United Nations Educational, Scientific and Cultural Organization (UNESCO).

Indigenous knowledge, and Indigenous rights for each potentially impacted Indigenous community, including intergenerational impacts over the lifetime of the Project;

- describe how historical and current cumulative effects to environmental and socio-cultural conditions, including changes to those conditions, have already impacted physical and cultural heritage;
- provide the location of physical and cultural heritage features on maps, if it has been shared by Indigenous peoples with the proponent and if the proponent has obtained permission from the Indigenous communities for the information to be shared publicly;
- include components of the environment identified by Indigenous communities as having heritage value, to reflect that natural and cultural heritage is a multidimensional concept which is not limited to particular sites or objects; and
- describe how input from potentially impacted Indigenous communities was sought and considered in the identification of these locations and features, including opportunities provided to participate in or lead historic resources studies (including field studies).

The proponent should consult the Technical Guidance for Assessing Physical and Cultural Heritage or any Structure, Site or Thing¹²¹ on the Agency's website.

10.1.2. Effects to Indigenous physical and cultural heritage

The Impact Statement must:

- describe both adverse and positive effects to physical and cultural heritage, and structures, sites or things of historical, archaeological, paleontological or architectural significance to Indigenous communities, including, but not limited to:
 - the loss or destruction of physical and cultural heritage;
 - changes to language, such as the relative balance of speakers of local languages, English, and French, and the availability of public services in these languages;
 - changes to access to and/or experience with physical and cultural heritage;
 - changes to the cultural value, spirituality, or importance associated with physical and cultural heritage;
 - changes to sacred, ceremonial or culturally important places, objects, or things, including languages, stories and traditions; and
 - changes to visual aesthetics over the life of the Project, including and decommissioning and abandonment;
- provide copies of correspondence with provincial ministries responsible for heritage resources with comments on any physical and cultural heritage resource assessment;

¹²¹ The Agency guidance is online at <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/technical-guidance-assessing-physical-cultural-heritage-or-structure-site-or-thing.html>.

- explain the interconnections with and potential impacts to physical and cultural heritage from changes to pre-development and current baseline environmental, social, and economic conditions; and
- take into account potential effects on physical and cultural heritage when assessing the effects on social and economic conditions.

10.2. Current use of lands and resources for traditional purposes

10.2.1. Baseline conditions

The Impact Statement should include information¹²² on the current use of lands and resources for traditional purposes of all potentially affected Indigenous communities. The proponent should refer to guidance¹²³ on the Agency's website on how to consider the current use of lands and resources for traditional purpose.

Where information is publicly available or is provided by Indigenous communities, the Impact Statement must identify and describe:

- Indigenous governance systems and Indigenous laws associated with the current use of lands and resources for traditional purposes;
- location and description of Treaty lands and/or geographic extent of Treaty rights, title area, land claims or traditional territory (including maps where available) of all Indigenous communities identified by the Agency;
- location of reserves and communities;
- location of any Indigenous Protected and Conserved Areas;
- traditional activities presently or historically practiced (e.g., hunting, fishing, trapping, gathering of plants or medicines, ceremonial or spiritual practices, passing on of Indigenous Knowledge);
- location of traditional uses, including hunting, trapping, and fishing camps, cabins, and gathering or teaching grounds;
- types of traditional resources of importance for supporting traditional use, such as fish, wildlife, birds, plants or other natural resources, and their habitats;
- places where culturally important fish, wildlife, birds, plants, or other natural resources are harvested;

¹²² Where appropriate, data sharing between projects is the preferred approach, particularly for those valued components that require surveys involving Indigenous communities and where multiple primary data collection activities would increase consultation fatigue. Baseline data may be found in secondary information sources. To the extent reasonable, the proponent is encouraged to utilize data collected for the assessments of the proposed Marten Falls Community Access Road and the proposed Webequie Supply Road, to fulfill baseline requirements.

¹²³ The guidance on assessing current use of lands and resources for traditional purposes is accessible online at <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/technical-guidance-assessing-current-use-lands-resources-traditional-purposes-under-ceaa-2012.html>.

- the historic and current use of terrestrial wildlife as a source of country foods (traditional foods) or where use has Indigenous cultural importance (See Section 8.10.1);
- the use and harvesting of fur-bearing species and whether its harvesting has Indigenous cultural importance;
- access and travel routes for conducting traditional practices (e.g., the use of the Attawapiskat River for transportation);
- all uses of riverbanks, shorelines, waterways and water bodies navigable by Indigenous peoples, such as for travel and recreation (e.g. canoe routes and portage trails), including entry and exit/landing sites;
- the use of cabins, camp sites and staging areas;
- frequency, duration, and/or timing of traditional practices;
- where known, efforts of the Indigenous communities to restore traditional practices;
- country foods (traditional foods) consumed by Indigenous communities;
- the quality and quantity of resources (e.g., preferred species and perception of quality);
- access to resources (e.g., physical access to harvest specific species, culturally important harvesting locations, timing, seasonality, distance from community);
- important features for the experience of the practice (e.g., connection to the landscape without artificial noise and sensory disturbances, air quality, visual landscape, perceived or real contamination, etc.);
- location of any Indigenous-led research or monitoring activities; and
- other current uses identified by Indigenous communities.

Should this type of information be found through public sources, the proponent should advise the Indigenous community and offer a reasonable opportunity to review and comment before including it in the Impact Statement.

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

The Impact Statement must:

- assess the potential effects on current use of lands and resources for traditional purposes, within the context of historical and current cumulative effects, including to:
 - current and future availability and quality of country foods (traditional foods);
 - quantity, quality and distribution of resources available for harvesting (e.g., species of cultural importance, including traditional and medicinal plants);
 - access to culturally important harvesting areas or resources, access to traditional territory and to/from the community and reserves;

- reliance on country foods as a result of the Project due to increased food prices, including any change to the required hunting quotas of impacted communities;
- experiences of being on the land, (e.g., changes in air quality, noise exposure, effects of vibrations from blasting or other activities, fragmentation of traditional territory, visual aesthetics, and the ability to pass on Indigenous Knowledge and language);
- the use of travel ways, navigable waterways and water bodies;
- sites of interest to communities including for fishing, hunting, trapping and gathering and cultural or ceremonial activities and practices; and
- economic burdens of, and increased time for, travelling further to hunting, fishing, trapping, and gathering opportunities;
- describe and assess the interconnections and impact pathways between the current use of lands and resources and health, social, and economic components, Indigenous knowledge, and Indigenous rights for each Indigenous community, including potential intergenerational impacts over the lifetime of the Project;
- provide a detailed explanation of how comments from Indigenous communities and Indigenous Knowledge informed the assessment of potential effects to current use of lands and resources for traditional purposes; and
- list other effects highlighted by Indigenous communities, if applicable.

10.3. Health, social and economic conditions

The baseline conditions¹²⁴ established for Indigenous communities must take into account Indigenous governance regimes and Indigenous laws associated with health and socio-economic conditions. The baseline conditions also should take into account GBA Plus specific to Indigenous peoples and provide community-specific social and economic conditions on a disaggregated basis (without identifying individuals).

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

The Impact Statement must describe:

- the health, social and economic effects that the Project may have on Indigenous peoples;

¹²⁴ Where appropriate, data sharing between projects is the preferred approach, particularly for those valued components that require surveys involving Indigenous communities and where multiple primary data collection activities would increase consultation fatigue. Baseline data may be found in secondary information sources. To the extent reasonable, the proponent is encouraged to utilize data collected for the assessments of the proposed Marten Falls Community Access Road and the proposed Webequie Supply Road, to fulfill baseline requirements.

- inter-generational impacts of the Project on community members, including by future economic opportunities associated with the Project, with a specific discussion or impacts to youth;
- impacts from reduced funding support due to changes in the remoteness classification level of Indigenous communities. Refer to the Band Classification Manual¹²⁵, for more information; and
- other effects highlighted by Indigenous communities, if applicable.

The proponent should refer to the following guidance:

- Analyzing Health, Social and Economic Effects under the Impact Assessment Act¹²⁶;
- Indigenous Mental Wellness and Major Project Development: Guidance for Impact Assessment Professionals and Indigenous Communities¹²⁷; and
- More-than-mental health: Indigenous identity, culture, community and relationship with land are integral to Indigenous wellbeing¹²⁸ (training manual).

10.3.1. Health conditions

10.3.1.1. Baseline conditions

The Impact Statement must describe the current state of physical, mental and social well-being and incorporate a determinants of health approach to move beyond biophysical health considerations. In line with the World Health Organization's (WHO) expanded definition of health, a determinants of health approach recognizes that health is more than the absence of disease, but is rather a state of physical, mental, and social well-being. This approach places emphasis on the causes of physical diseases and mental illnesses (i.e., Level-1 health determinants: health-related behavioural and biological factors; and Level-2 health determinants: service access and social, cultural and economic factors), and as important, on the causes of these causes (i.e., Level-3 health determinants: structural and equity factors).

Through their effects on well-being, the higher-level determinants of health influence behaviour that, along with human biology, directly impacts physical and mental health. The scope and content of the human health baseline¹²⁹ should reflect the specific project context, taking into account input of Indigenous communities, and should include indicators that are meaningful for the effects analysis.

The Impact Statement must:

¹²⁵ <https://publications.gc.ca/collections/Collection/R22-1-2000E.pdf>

¹²⁶ <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/analyzing-health-social-economic-effects-impact-assessment-act.html>

¹²⁷ <https://www.canada.ca/content/dam/iaac-acei/documents/research/indigenous-mental-wellness-and-ia-en.pdf>

¹²⁸ https://indigenouimpacts.uwo.ca/training_resources/indigenous_impacts_story_map.html

¹²⁹ Where appropriate, data sharing between projects is the preferred approach, particularly for those valued components that require surveys involving Indigenous communities and where multiple primary data collection activities would increase consultation fatigue. Baseline data may be found in secondary information sources. To the extent reasonable, the proponent is encouraged to utilize data collected for the assessments of the proposed Marten Falls Community Access Road and the proposed Webequie Supply Road, to fulfill baseline requirements.

- 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;
- identify the environmental and social area of influence of the Project;
- provide a comparison of data at the provincial, regional or national level, if possible, to better interpret baseline conditions;
- be sufficient to provide a comprehensive understanding of the current community health status, while respecting the need to protect personal information and standards for the management of Indigenous data (i.e., OCAP¹³⁰);
- describe how Indigenous Knowledge from relevant populations was used in establishing baseline conditions, including input from diverse subgroups;
- describe baseline conditions using disaggregated data for diverse subgroups and their different access to resources, opportunities and services in the community to support GBA Plus; and
- conduct intersectional gender analysis to examine differences in the status of diverse subgroups (e.g., women, youth, and Elders) and their differential access to resources, opportunities and services; describe any relevant indicators, and how they are reflective of community input.

To understand the community context and baseline health profile, the Impact Statement must:

- provide the approximate location on a map and distance of likely human receptors, including any foreseeable future receptors, that may be impacted by changes in air, water, country food quality (e.g., dust deposition on vegetation), and noise and light levels. Include communities' gathering, hunting, trapping and fishing areas, permanent residences and temporary residences (e.g., Indigenous cottages and camps identified in collaboration with Indigenous peoples) near the Project;
- provide baseline contaminant concentrations in ambient air, in drinking water and in the tissues of country foods (traditional foods) consumed by Indigenous communities and local communities. For game animals, the proponent is expected to work with local Indigenous communities to collect tissue-samples, where appropriate;
- describe the consumption of country foods¹³¹ 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);
- if a Human Health Risk Assessment is required¹³², provide baseline contaminant concentrations in the tissues of country foods (traditional foods) consumed by Indigenous communities;

¹³⁰ <https://fnigc.ca/ocap-training/>

¹³¹ Country foods (or 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.

¹³² It is recommended that the proponent conduct a problem formulation exercise (see section 10.3.1.2.1) to help inform the baseline collection program of any information gaps for the effects assessment.

- describe the level of food security and food sovereignty within the Indigenous communities. Refer to the Public Health Agency of Canada's website on food security¹³³ and to the First Nations Food, Nutrition & Environment Study¹³⁴ for more information;
- describe drinking water sources, both surface water and groundwater (permanent, seasonal, periodic or temporary), including their distance from project activities and approximate wellhead capture zones;
- develop a community context and baseline health profile for Indigenous communities that describes the overall health of the community which may include:
 - information on birth rates, death rates, rates of communicable diseases including sexually transmitted infections, and injuries;
 - health outcomes of interest, such as chronic diseases, mental health and addiction, rate of gender-based violence; and
 - health factors of interest, such as health-related behaviours (e.g., food consumption; physical activity; substance use), and mental well-being (e.g., feelings of depression; real or perceived health risks reflecting the level of chronic biological stress);
- describe relevant Indigenous history or context, including historical impacts on health;
- describe the determinants of health selected specifically for Indigenous communities, including for subgroups within them;
- describe any context-specific definitions of health and well-being, including from the perspective of the relevant Indigenous cultures, communities and spiritual well-being;
- 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);
- use a social determinants of health approach to identify and describe the causal chain on relevant health outcomes, across diverse subgroups. Relevant social determinants of health should be selected based on community input, if possible, to reflect the setting and circumstances of the impacted Indigenous communities. Guidance on selecting relevant determinants may be drawn from the suite of determinants recognized by the Public Health Agency of Canada¹³⁵. Other determinants may also be considered, such as the Determinants of Indigenous Peoples' Health in Canada¹³⁶. Examples of social determinants of health that may be relevant to the Project are provided for consideration:
 - housing availability, housing affordability, and home ownership;
 - access to health services;
 - crowdedness in housing;

¹³³ <https://cbpp-pcpe.phac-aspc.gc.ca/public-health-topics/food-security/>

¹³⁴ https://foodsecurecanada.org/sites/foodsecurecanada.org/files/fnfnes_ontario_regional_report_2014_final.pdf

¹³⁵ <https://www.canada.ca/en/public-health/services/health-promotion/population-health/what-determines-health.html>

¹³⁶ <https://canadianscholars.ca/book/determinants-of-indigenous-peoples-health/>

- income (average), poverty and income inequality;
 - food security, access to country foods (i.e., traditional foods);
 - education levels (number of residents completed high school, college or higher), disaggregated by sex, gender and age);
 - community mental health and well-being (including feelings of isolation, remoteness, concern for future generations, and other elements that have been raised in the wake of youth suicides in rural and remote Indigenous communities);
 - social cohesion;
 - women's safety, including Indigenous women; and
 - mobility (e.g., proportion of residents who hold driver's licences and own vehicles, intra- and inter-community transportation), disaggregated by sex and gender.
- describe and characterize the existing health services and programs and any service delivery arrangements such as with the Geraldton Hospital, including health care provider capacity;
 - describe the current health effects (physical, social, and mental) of geographic isolation and lack of economic development, to better understand the description of potential improvements;
 - use, where available, secondary information sources (e.g., Indigenous Services Canada, Public Health Agency of Canada, Statistics Canada, Indigenous health authorities, provincial and municipal health authorities); and
 - provide a summary of identified data and explain the selection of methods for statistical analysis of available data, including identifying uncertainties and limitations of proposed methods and available data. If surrogate data from reference sites are used rather than project site-specific measurements, demonstrate how the data are representative of site conditions.

The collection, analysis and reporting of data must adhere to relevant ethical and cultural protocols.

Guidance for developing the appropriate baseline information relevant to human health is identified in Appendix 1. The proponent should refer to Health Canada guidance documents such that current best practices are followed in the collection of baseline information to assess real and perceived project-related impacts to human health due to changes in air quality, noise, the quality of drinking water and water used for recreational purposes, country foods and the multiple contaminant exposure pathways. The proponent must justify any omission or deviation from recommended baseline characterization approaches and methods, including Health Canada guidelines.

10.3.1.2. Effects to health conditions

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.

A dedicated Health Impact Assessment, supported by a Human Health Risk Assessment (HHRA¹³⁷), should show an understanding of the Project's health, social, and economic impacts 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, *Analyzing Health, Social and Economic Effects under the Impact Assessment Act*¹³⁸, and to guidance from Health Canada regarding Human Health Impacts and the best practices for the conduct of Health Impact Assessment in Appendix 1 – Human Health.

The Impact Statement must:

- apply a Human Health Impact Assessment approach, including consideration of determinants of health;
- describe indicators selected for the effects assessment, including the rationale for their selection. Indicators must be developed using best practice, Agency guidance, and through engagement with Indigenous communities;
- describe any potential project effects (real or perceived) on Indigenous communities health profiles;
- describe any potential health effects resulting from changes on biophysical, social and economic determinants of health;
- describe how Indigenous Knowledge were used in assessing human health effects; and
- apply GBA Plus across all health effects and document how potential effects or changes to human health conditions could be different for diverse subgroups.

In addition to the references listed in sections 7.2 and 9, the following sources offer examples of data tools or data sources that include indicators potentially relevant to reporting on the determinants of health:

- PHAC, Health Inequalities Data Tool¹³⁹;
- Statistics Canada¹⁴⁰;
- Canadian Institute for Health Information (CIHI)¹⁴¹;
- First Nations Information Governance Centre¹⁴² ;
- Positive Mental Health Indicators Framework (PHAC)¹⁴³; and

¹³⁷ HHRA: 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, decommissioning and post-abandonment, as the case may be).

¹³⁸ <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/analyzing-health-social-economic-effects-impact-assessment-act.html>

¹³⁹ <https://health-infobase.canada.ca/health-inequalities/indicat>

¹⁴⁰ <https://www.statcan.gc.ca/en/start>

¹⁴¹ https://www.cihi.ca/en#comm_health

¹⁴² <https://fnigc.ca/>

¹⁴³ <https://health-infobase.canada.ca/positive-mental-health/>

- Past health impact assessments¹⁴⁴.

A detailed Health Impact Assessment inclusive of other reasonably foreseeable future projects would be appropriate to capture potential positive and adverse effects on social factors and economic factors (and where applicable cultural factors) in addition to the biophysical environmental factors. A health impact assessment may be able to assess the positive and negative consequences (i.e., differential) of effects on the environment and human health of those Indigenous communities whose territories are lost or removed along the road alignment. Best practices in Health Impact Assessment methods may include, for example, the following references to assist with consideration of social determinants and gender-based factors:

- Minimum Elements and Practice Standards for Health Impact Assessment¹⁴⁵. Bhatia R, Farhang L, Heller J, Lee M, Orenstein M, Richardson M and Wernham, A.;
- Health Impact Assessment of Transportation and Land Use Planning Activities: Guide Book and Toolkit¹⁴⁶. V, Metro Vancouver;
- National Collaborating Centre for Healthy Public Policy's website on health impact assessment¹⁴⁷; and
- Health Equity Impact Assessment toolkits¹⁴⁸.

10.3.1.2.1. *Biophysical determinants of health*

The Impact Statement must:

- provide an assessment of adverse and positive effects on human health in consideration of, but not limited to, potential changes in:

¹⁴⁴ <https://www.pewtrusts.org/en/projects/health-impact-project>

¹⁴⁵ <https://hiasociety.org/resources/Documents/HIA-Practice-Standards-September-2014.pdf>

¹⁴⁶ <https://planh.ca/node/502>

¹⁴⁷ <https://www.ncchpp.ca/health-impact-assessment/>

¹⁴⁸ <https://www.nccmt.ca/knowledge-repositories/search/146>

- air quality^{149 150 151};
 - noise exposure and effects of vibration;
 - light levels;
 - current and future availability (including quality) of country foods (i.e., food that is trapped, fished, hunted, harvested or grown for subsistence, cultural or medicinal purposes); and
 - current and future availability (including quality) of water for drinking, recreational and cultural uses.
- document and take into account tolerance thresholds for potential adverse effects on health identified by Indigenous communities;
 - food security: describe effects to availability, use and consumption of country foods (traditional foods) and health impacts of these effects;
 - describe and quantify the health risk from exposure to contaminants of potential concern (COPCs)¹⁵² via consumption of country foods and differential risk for vulnerable subgroups;
 - describe and quantify the project-related activities, and provide an inventory of COPCs and their sources, potential exposure pathways, adverse human health effects and the potential human receptors of these effects;
 - identify anticipated effects of the Project on the quality and quantity of groundwater or surface water used for domestic purposes based on the most stringent guideline values of the following

¹⁴⁹ It is recommended to assess the cancer risks of human exposures to all potentially carcinogenic PAHs in mixture rather than a single surrogate substance. A mixture analysis (weighted approach) allows for determination of the cancer risks of PAHs based on benzo(a)pyrene [B(a)P] Total Potency Equivalents (TPE), or the sum of estimated cancer potency relative to B(a)P, in comparison to the appropriate health-based toxicological reference values (e.g., Health Canada's Inhalation Unit Risk) and ambient air quality criteria (e.g., Ontario's Ambient Air Quality Criteria for annual and 24-hour exposures).

¹⁵⁰ It is recommended to 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:

- a) carry out a quantitative risk assessment based on the information in Health Canada's (2022) report, which provides a quantitative assessment of the relationship between ambient PM2.5 exposure and lung cancer risk. A sample calculation is available upon request to: ia-ei@hc-sc.gc.ca; or
- b) 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:
 - 1) 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;
 - 2) acknowledgement that diesel emissions have been labelled a human carcinogen by international authorities such as Health Canada, World Health Organization's International Agency for Research on Cancer, the U.S. Environmental Protection Agency and the California Environmental Protection Agency; and
 - 3) why a quantitative assessment of the carcinogenic risk of diesel emissions for the Project is not being done;

¹⁵¹ It is recommended to use World Health Organization's (2021) global air quality guidelines for quantitative risk assessment of PM2.5 and NO2 (24-hour and annual averaging times). Although a 1-hour WHO global air quality guideline for NO2 exists, it has not been re-evaluated in the latest Guidelines update (2021). Thus, the 1-hour CAAQS for NO2 is more stringent and might be more appropriate.

¹⁵² COPC: Any chemical substance (e.g., arsenic, chromium, mercury) 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.

criteria: Canadian Drinking Water Quality Guidelines (CDWQG)¹⁵³, or any relevant provincial water quality standards or guidelines;

- provide a detailed rationale if a determination is made that an assessment of any COPCs or exposure pathways should be excluded and/or screened out of the assessment and if the proponent decides to deviate from the suggested assessment approaches and methods or determines that such assessment is not warranted;
- use best practices in health risk assessment methods (see Health Canada, 2019. *Guidance for Evaluating Human Health Impacts in Environmental Assessments: Human Health Risk Assessment*¹⁴⁰);
- conduct a problem formulation exercise and/or preliminary model predictions to determine whether a HHRA is required. The proponent must provide a rationale/explanation if 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 required, the assessment must identify all potential contaminant exposure pathways for contaminants of concern to adequately characterize potential biophysical risks to human health. A multimedia HHRA may need to be considered and conducted for any COPC with an identified risk and multiple pathways (see Health Canada, 2019. *Guidance for Evaluating Human Health Impacts in Environmental Assessment: Human Health Risk Assessment*¹⁵⁴);
- describe and quantify specific thresholds used for HHRA and document if different thresholds were considered for vulnerable populations, including by sex and age. Provide a justification if any applicable threshold was not used;
- describe nuisances and environmental, social and economic changes that could potentially be sources of adverse human health effects and the potential human receptors of these effects;
- 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 the concerns of Indigenous communities, and how they were or are to be addressed; and

¹⁵³ <https://www.canada.ca/en/health-canada/services/environmental-workplace-health/water-quality/drinking-water/canadian-drinking-water-guidelines.html>

¹⁵⁴ <https://www.canada.ca/en/health-canada/services/publications/healthy-living/guidance-evaluating-human-health-impacts-risk-assessment.html>

- describe any project-related changes that may result in positive health effects.

10.3.1.2.2. *Social Determinants of health*

The Impact Statement must:

- describe the potential health effects arising from the effects on social and economic valued components, and their respective indicators (outlined in Sections 9 and 10), reflecting the input of the affected Indigenous communities;
- describe how Indigenous Knowledge were used in assessing human health effects;
- describe how variability in access to health services and levels of care can increase community susceptibility to adverse effects resulting from the Project;
- describe effects on the safety of women and girls from project activities, including worker accommodation, and as a result of new roads in remote areas;
- consider adverse and positive effects on health (i.e., overall well-being) based on the social and economic valued components, and their respective indicators (outlined in Sections 9 and 10). Specific priority indicators must be determined or validated by community members but may include, for example:
 - Level-1 health determinants related to behavioural factors (e.g., potential indicators related to diet/nutrition, alcohol and drug use);
 - Level-2 health determinants related to access to health, educational, social and other community services (e.g., potential indicator related to availability of health-care service providers);
 - Level-2 health determinants related to material circumstances (e.g., potential indicators related to living conditions, food availability);
 - Level-2 health determinants related to negative psychosocial factors for well-being, such as criminal activity as a result of an influx of outside workers (e.g., potential indicator related to sexual and gender-based violence); and
 - Level-3 health determinants related to structural and equity factors (e.g., potential indicators related to income, high school drop-out rates associated with seeking project-related employment) that may affect Level 2 determinants of health.
- with regard to potential effects on food security, describe changes in terms of accessibility, availability, use, consumption, and quality of country foods (traditional foods), and the potential effects related to these changes on physical and mental health of Indigenous peoples;
- identify possibilities of avoidance of certain country food sources or drinking or recreational water sources by the Indigenous peoples due to the perception of contamination; document and take into account tolerance thresholds for potential adverse effects identified by Indigenous peoples;
- apply GBA Plus across all relevant determinants of health (including access to health and social services) and document how potential changes to these determinants may have differential effects on diverse subgroups, including Indigenous peoples or other community relevant subgroups (e.g.,

children, women, youth, Elders) or may create or exacerbate existing health disparities identified in baseline assessment. Describe where biological factors (e.g., age and sex) can intersect with socioeconomic position and other health determinants to compound their vulnerability;

- describe and quantify specific thresholds and document if different thresholds were considered for vulnerable populations, including by sex and age; provide rationale and justification if specific thresholds not used;
- identify which health effects (negative or positive) are expected to be short-term or long-term, as well as which may be contingent upon future economic development projects (e.g., mining activity), or road connections; and
- describe any positive health effects (e.g., resulting from improved economic opportunities, increased access to health-social services).

The variation of effects during different project phases and times of year should be described, as well as potential project-related effects on the community health profile (e.g., changes to existing communal activities, support networks and cultural/spiritual practices that may contribute to community resilience).

Additional guidance from Health Canada regarding the assessment of human health impacts is identified in Appendix 1. It is requested that the proponent complete the checklists provided in the Health Canada guidance documents so as to assist Health Canada and other participants verify that the main components of the assessment are completed and to identify the locations of this information. Completing the checklists is especially useful when the analyses on a topic are found in multiple sections of the Impact Statement documentation. The proponent should provide a detailed rationale/explanation for any deviation from recommended assessment approaches/methods, including Health Canada's guidance, or when determining such assessment is not warranted.

10.3.2. Social conditions

10.3.2.1. Baseline conditions

The Impact Statement must describe the existing social conditions for all potentially affected Indigenous communities. The scope and content of the social baseline conditions¹⁵⁵ should be tailored to the specific project context, take into account Indigenous input and priorities, and should include indicators and information that are useful and meaningful for the effects analysis.

The Impact Statement must:

- describe any relevant indicators and how Indigenous Knowledge and engagement contributed to defining them;
- be sufficiently detailed to provide a comprehensive understanding of the current state of each valued component, including relevant trends;

¹⁵⁵ Where appropriate, data sharing between projects is the preferred approach, particularly for those valued components that require surveys involving Indigenous communities and where multiple primary data collection activities would increase consultation fatigue. Baseline data may be found in secondary information sources. To the extent reasonable, the proponent is encouraged to utilize data collected for the assessments of the proposed Marten Falls Community Access Road and the proposed Webequie Supply Road, to fulfill baseline requirements.

- provide a comparison of data at the provincial and regional level, if possible, to better interpret baseline conditions;
- describe how Indigenous Knowledge, including input from diverse subgroups, was used in establishing social baseline conditions and identifying potential indicators;
- describe social baseline conditions using disaggregated data for diverse subgroups (e.g. women, youth, and Elders) and their different access to resources, opportunities and services to support GBA Plus; and
- conduct intersectional gender analysis to examine differences in the status of diverse subgroups (e.g., women, youth, and elders) and their differential access to resources, opportunities and services.

In preparing a baseline, the proponent must prepare a community profile (section 9.1.1) for each Indigenous community. An additional factor to incorporate in each profile is any influences on community well-being, including youth mental health, current expectations within the community for the Project to bring social and economic development opportunities and implications of the Project not being realized.

10.3.2.2. Effects to social conditions

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

For the valued components listed below, the effects assessment should explore and discuss opportunities by which benefits to potentially affected Indigenous communities can be enhanced.

10.3.2.2.1. *Changes to community well-being*

The Impact Statement must:

- assess potential changes to local demographic conditions, including changes to population size and changes in the relative population of men and women, and younger and older people;
- describe in-and out-migration effects, including changes in social and cultural make-up of affected communities and changes in populations;
- identify whether social divisions might be intensified as a result of the Project;
- evaluate effects to social cohesion, both within and between potentially affected Indigenous communities;
- assess potential adverse and positive effects, at the community level, of changes to social conditions including, but not limited to:
 - food security;
 - community traditions of sharing and community cohesion;
 - illegal or potentially disruptive activities, including:

- violent crime, including sexual and physical violence (with particular consideration of effects to specific subgroups in the community such as young people, women and girls);
 - gender-based violence;
 - human trafficking;
 - vandalism;
 - poaching;
 - drug and alcohol distribution;
 - trafficking of illegal goods counterfeit goods;
 - other crimes;
- cost of living;
- income inequity;
- examine barriers and constraints that prevent individuals or groups from benefitting and how they are magnified across different subgroups;
- employment, including type of jobs (fulltime vs part time, temporary vs permanent, skilled vs unskilled; distribution of jobs to youth vs adult, women vs others);
- education and access to training opportunities; and
- safety travel to and from connected communities, including by public, commercial, and private transport, and ride sharing;
- trends in the cost of infrastructure and housing for members of Indigenous communities. (The proponent should request such data from Indigenous Services Canada and/or work with Indigenous communities to gather project costs data.);
- the predicted positive and adverse effects to accommodation/lodging, including crowding, and housing supply and costs, during the construction and operation phases;
- evaluate potential social effects associated with changes in disposable income, including potential adverse and positive lifestyle changes, feelings of empowerment, distribution of benefits among affected people; and
- describe the potential opportunities expected to become available for youth, and how youth will gain access to these opportunities, considering the conditions described (e.g., youth living in urban centres who are attending secondary school, youth who have left the community to seek training or work).

Additional guidance is identified in Appendix 1.

10.3.2.2.2. Changes to services and infrastructure

The Impact Statement must:

- describe the predicted effects to services and infrastructure available to the affected Indigenous communities, including but not limited to the positive and adverse effects to:
 - quality of road infrastructure;
 - traffic safety;
 - educational facilities and childcare;
 - health care facilities and mental health services;
 - recreational and social services facilities;
 - emergency services (e.g., police, ambulance, health care, fire fighting);
 - availability and use of fuel to generate power;
 - housing (ownership, cost, affordability, crowding);
 - communication services in the community (including telecommunications infrastructure);
 - transportation within and between communities, and in what forms (e.g., hitchhiking, shared rides, work buses);
 - cost and supply of goods and services, including food, fuel and electricity, and the potential for future saving opportunities that could be realized through the Project;
 - existing businesses;
 - community amenities (e.g., recreational spaces/services, green spaces); and
 - community governance.
- describe any need for government and/or proponent expenditures for new or expanded services, facilities or infrastructure, arising out of project-related effects; and
- take into account potential effects arising from a higher risk of accidents for each phase of the Project (e.g., risk of impact on the road system and emergency services during the construction phase due to an increased use of roads).

10.3.3. Economic conditions

10.3.3.1. Baseline conditions

The scope and content of the economic baseline¹⁵⁶ should be tailored to the specific project context, demonstrate how Indigenous Knowledge was taken into account, and should describe indicators for each valued component, including rationale for their selection and relevant trends.

¹⁵⁶ Where appropriate, data sharing between projects is the preferred approach, particularly for those valued components that require surveys involving Indigenous communities and where multiple primary data collection activities would increase consultation fatigue. Baseline data may be found in secondary information sources. To the extent reasonable, the proponent is encouraged to utilize data collected for the assessments of the proposed Marten Falls Community Access Road and the proposed Webequie Supply Road, to fulfill baseline requirements.

The Impact Statement must describe the local and regional economic conditions and trends (section 9.2.) and the following additional factors, with respect to the Indigenous communities:

- current use of land, water bodies and watercourses for economic activities in the local and regional study areas, including a description of hunting, recreational and commercial fishing (including catch rates, visitation rates, and angling days), trapping, outdoor recreation, use of seasonal cabins, outfitters, and forestry;
- any relevant treaty provisions pertaining to economic development for Indigenous peoples;
- access, ownership and use of lands and resources (e.g., mineral claims, mineral exploration, aggregate);
- income leakages from the communities to capture services that are being delivered outside of the community; and
- existing forest management plans.

10.3.3.2. Effects to economic conditions

The Impact Statement must describe potential positive and adverse effects to the economic conditions of Indigenous communities throughout the life of the Project. Interconnections between economic valued components and other valued components and interactions between effects also must be described.

The assessment of economic effects should take into consideration the longevity of economic opportunities related to the Project (direct, indirect and induced) relative to project stages and how the Project is likely to influence the stability of the economy through economic diversity.

The proponent should refer to the Agency guidance on Analyzing Health, Social and Economic Effects under the *Impact Assessment Act*¹⁵⁷.

10.3.3.2.1. Changes to business environment and local economy

The Impact Statement must describe the potential positive and negative effects of the Project on Indigenous businesses, during both the construction and operation phases of the Project, including:

- procurement and contracting opportunities from businesses owned by Indigenous peoples, women, or other diverse subgroups;
- an estimate of potential effects of the Project on the traditional economy, including the potential loss of traditional economies (including commercial, non-commercial and trade economies) and jobs;
- discuss the potential ability of local businesses to compete for project-related contracting;
- any economic benefit agreements established with Indigenous communities; and

¹⁵⁷ <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/analyzing-health-social-economic-effects-impact-assessment-act.html>

- an estimate of the anticipated levels of Indigenous economic participation in the Project in comparison to the total project requirements (e.g., total dollar value of contracts).

10.3.3.2.2. Changes to infrastructure

The Impact Statement must describe:

- describe the effects on infrastructure, including:
 - the extent of new road to be built, the number of connections to existing roads, the effect on travel times, and the additional traffic due to the replacement of winter roads;
 - whether the Project will result in, or facilitate the construction of other infrastructure (such as railways, airports, power plants, transmission lines, pipelines, dams, water mains, sewage lines, etc.); and
 - whether the Project will damage any existing infrastructure (same categories as above), how quickly this will be repaired, and how much the proponent will contribute to the repair cost.
- describe how the Project would affect the local/regional energy system, including:
 - how power will be provided during the construction phase;
 - once complete, how much power the Project is likely to use; and
 - whether the Project will improve, or could improve, the local energy transmission system (e.g., by facilitating new transmission lines, by making it easier for repair crews to access the area, etc.).

10.3.3.2.3. Changes to community finances

The Impact Statement must describe the Project's effects on Indigenous community public finances, including:

- revenue from tax levies, royalties, revenue sharing and other means, and how this could vary over time; and
- the cost of any public contribution, subsidies or tax incentives to support the Project.

Additional guidance is identified in Appendix 1.

10.4. Rights of Indigenous peoples

10.4.1. Baseline conditions

The Impact Statement should document the nature and extent of the exercise of rights of Indigenous peoples, potentially impacted by the Project¹⁵⁸.

The Impact Statement must:

- identify and describe the Treaty and/or Aboriginal rights of Indigenous peoples potentially affected by the Project, including the historic, regional and community context, the geographic extent of traditional territory, the purpose and importance of the rights to the rights-bearing communities (e.g. the practices, customs, beliefs, worldviews and livelihoods), and information on how rights have already been affected. The description should include maps, when available and permitted by the respective Indigenous communities, to illustrate the location of treaties, traditional territories and Métis harvesting zones;
- document the nature and extent of the exercise of rights of Indigenous peoples, potentially impacted by the Project, as identified by the Indigenous community(ies);
- consider and describe how the information requirements related to physical and cultural heritage, current use, Indigenous health, social, and economic conditions are applicable to the nature and extent of the exercise of rights, including but not limited to:
 - specific areas of cultural importance where rights are exercised;
 - the quality and quantity of resources required to support exercise of rights (e.g., preferred species, level of health of preferred species, volume of preferred species);
 - access to the resources required to exercise rights (e.g., physical access to culturally important places, timing, seasonality, distance from community);
 - the experience associated with the exercise of rights (e.g., noise and sensory disturbances, air quality, visual landscape);
 - landscape conditions that support the exercise of rights (e.g., large, intact and diverse landscapes, areas of solitude; connection to landscape; sense of place; language; Indigenous Knowledge; clean water; biodiversity; abundance; distribution and quality of wildlife and vegetation);
- consider and describe how the information requirements related to cumulative effects are applicable to the baseline conditions supporting the exercise of rights;

¹⁵⁸ Where appropriate, data sharing between projects is the preferred approach, particularly for those valued components that require surveys involving Indigenous communities and where multiple primary data collection activities would increase consultation fatigue. Baseline data may be found in secondary information sources. To the extent reasonable, the proponent is encouraged to utilize data collected for the assessments of the proposed Marten Falls Community Access Road and the proposed Webequie Supply Road, to fulfill baseline requirements.

- consider and describe pre-existing (real or perceived) impacts and cumulative effects that are already interfering with the ability to exercise rights or to pass along Indigenous cultures and cultural practices (e.g., language, ceremonies, Indigenous Knowledge);
- where possible, provide information about members within an Indigenous community, and their role in the exercise of rights (e.g., women, men, Elders, youth, people with disabilities);
- explain how each potentially impacted Indigenous community's cultural traditions, laws and governance systems, social values, access and patterns of occupation and preferences inform the manner in which they exercise the rights (the who, what, when, how, where and why); and
- where they exist, describe thresholds identified by each potentially impacted community that, if exceeded, may impair the ability to meaningfully exercise of rights.

The Impact Statement also must include maps and data sets (e.g., maps with overlays that reflect the habitat, migration routes and seasonal changes of species of cultural importance, places of cultural and spiritual significance, traditional territories, and fish catch numbers).

Indigenous communities may also provide their perspective through consultations with the Agency. Indigenous communities must be involved in the baseline characterisation of conditions supporting the exercise of rights, as well as the scoping and assessment of the nature and extent of the exercise of rights of Indigenous peoples.

The proponent should consult Agency guidance on engaging Indigenous communities, and the Guidance: Assessment of Potential Impacts on the Rights of Indigenous Peoples¹⁵⁹.

10.4.2. Impacts on rights of Indigenous peoples

The Impact Statement should describe the level of engagement with Indigenous communities regarding potential impacts of the Project on the exercise of rights, and where possible, the Project's potential interference with the exercise of rights.

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

Where an Indigenous community has not provided its views on the impact of the Project on their rights to the proponent, or both parties agree that it is better to provide information related to the impact on the exercise of rights directly to the Agency, the proponent should describe a rationale for the approach taken. The proponent should discuss with Indigenous communities their views on how best to reflect the

¹⁵⁹ <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/guidance-assessment-potential-impacts-rights-indigenous-peoples.html>

assessment of impacts on the exercise of rights in the Impact Statement. Impacts on rights may be assessed using a methodology identified by Indigenous communities, including community-led assessments, and agreed upon between the Indigenous community and the Agency. This may include supporting Indigenous-led studies and assessments to inform the assessment of effects to Indigenous peoples, including on their ability to practice their rights and the resources necessary to support those rights (e.g., for valued components, spatial and temporal boundaries, community health, social conditions and community well-being) that are to be provided publicly and to the Government of Canada.

For more information on identifying and assessing impacts on the exercise of rights, the proponent should consult the following Agency guidance: the Policy Context: Assessment of Potential Impacts on the Rights of Indigenous Peoples¹⁶⁰ and the Guidance on Assessing Potential Impacts on the Rights of Indigenous Peoples¹⁶¹.

The proponent, in collaboration with Indigenous communities, should consider and describe in the Impact Statement:

- how the Project may contribute cumulatively to any existing impacts on the exercise of rights of Indigenous peoples, as identified by the Indigenous communities;
- the interference of the Project on the quality and quantity of resources available for the exercise of rights;
- the interference of the Project on the access to areas important to the exercise of rights (including through effects to navigable waterways);
- the interference of the Project on the experience associated with the exercise of rights, including the ability of Indigenous communities to exercise their rights in a peaceful manner (e.g., without changes in connection to land, well-being, knowledge of the landscape, air quality, noise exposure, effects of vibrations, artificial light, fragmentation, visual aesthetics, safety) the interference of the Project on Indigenous traditions, laws and governance;
- the way that the Project is aligned with the values, political direction and/or objectives of Indigenous peoples' actions to mitigate or to adapt to a changing climate;
- the manner in which the Project and its impacts weaken or strengthen the authority of Indigenous peoples on their territory; and,
- the severity of the impacts on the exercise of rights of Indigenous peoples, as identified by the Indigenous communities.

The proponent is encouraged to work together with Indigenous communities to find mutually agreeable solutions to concerns raised about the Project, especially for those concerns raised by the Indigenous communities about impacts on the exercise of their rights. The Impact Statement should detail:

¹⁶⁰ <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/assessment-potential-impacts-rights-indigenous-peoples.html>

¹⁶¹ <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/guidance-assessment-potential-impacts-rights-indigenous-peoples.html>

- the Project's potential impacts on the exercise or practice of the rights of Indigenous peoples or the rights arising from treaties in the project area, as expressed by potentially impacted Indigenous peoples;
- the impact on the rights of Indigenous peoples, taking into account the concept of the link between resources, access and experience;
- how the results of the traditional land and resource use assessment, the cultural heritage assessment, health and socio-economic assessment of Indigenous peoples were integrated in the assessment of impacts on the exercise of rights of Indigenous peoples and considered in the determining residual effects and the severity of impacts;
- any measures identified in an attempt to avoid, minimize, offset or otherwise address potential adverse impacts of the Project on the exercise of rights;
- where measures are proposed by Indigenous communities, the intention to implement them, as appropriate; and
- with respect to mitigation measures proposed by the proponent, the perspectives of the potentially impacted Indigenous communities, on the effectiveness of particular mitigation measures on such impacts.

Where no mitigation measures are proposed or mitigation is not possible, the Impact Statement should identify potential level of severity of the adverse impacts on the exercise of Aboriginal and Treaty rights, as identified by the Indigenous community(ies). Mitigation measures are further discussed in section 7.6.

10.5. Mitigation and enhancement measures

The Impact Statement must:

- describe the proposed mitigation and enhancement measures for all potential effects to Indigenous peoples, as well as for potential impacts on the rights of Indigenous peoples, and:
 - if these are measures for which the proponent or other parties would be responsible;
 - how these measures may vary for each Indigenous community; and
 - if and how these measures would be integrated into the project design, if applicable;
- include perspectives of the potentially impacted Indigenous communities, on the effectiveness of particular mitigation measures on such impacts;
- describe collaboration with Indigenous peoples to identify preferred mitigation measures for potential adverse impacts on Indigenous communities or their rights, as well as to optimize the project's benefits for their communities;
- describe how Indigenous peoples who participated in the gathering of traditional use information took part in the impact assessment and in the development of proposed mitigation measures, including undertaking their own assessment of effects. Include all Indigenous comments on potential effect to current use of lands and resources for traditional purposes;

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

As best practice, the proponent is encouraged to include in the Impact Statement the following:

- a commitment to preferentially employ Indigenous peoples from Indigenous communities identified in the Indigenous Engagement and Partnership Plan, and use of the Northern Ontario Network of Indigenous Training Organizations (e.g., Indigenous Skills and Employment Training network¹⁶²);
- a commitment to work with Indigenous communities to establish conditions for access to and usage of community information, including collected data, and to work with the communities to identify mitigation measures to address community concerns about the Project;
- copies of correspondence with provincial, territorial or Indigenous authorities responsible for heritage resources with comments on any physical and cultural heritage resource assessment and proposed mitigation measures;
- contingency plans and field interventions that will be applied should heritage resources be discovered during construction and operation, or cultural heritage training programs for workers; and
- a description of the types of jobs available, timeframe for the employment or opportunity and how long such opportunities will be available.

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

Regarding effects from changes in health conditions, the Impact Statement must:

- describe the mitigation and enhancement measures proposed for each Indigenous community;
- if the level of emissions or releases from the Project is below or at the applicable limits, identify if additional mitigation measures would 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 equity¹⁶³.

¹⁶² <https://www.canada.ca/en/employment-social-development/programs/indigenous-skills-employment-training/service-delivery-organizations.html#a4>

¹⁶³ <https://nccdh.ca/resources/entry/tools-and-approaches>

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

- propose mitigation measures to reduce all potential adverse effects to social conditions of all potentially affected Indigenous communities;
- 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;
- identify opportunities for enhancing positive impacts, such as improving infrastructure; and
- take into account local and regional land use and development plans where applicable mitigation or enhancement measures are proposed.

Regarding effects from changes in economic conditions, the Impact Statement must describe the mitigation and enhancement measures that will be implemented for all potential effects on economic conditions of all potentially affected Indigenous communities, including:

- opportunities for enhancing positive effects, such as creation of local employment and Indigenous employment, including:
 - education, training, hiring practices that encourage employment of local people, including the use of the Northern Ontario Network of Indigenous Training Organizations (e.g., the Indigenous Skills and Employment Training network);
 - 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 communities and groups;
 - 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 which includes the use of the Northern Ontario Network of Indigenous Training Organizations (e.g., the Indigenous Skills and Employment Training network). 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);
 - plans to encourage the recruitment, development and retention of underrepresented groups in the Project (e.g., set targets for employment for specific groups); and
 - the Project's diversity and inclusion workforce development plans, policies and practices.
 - cultural competency training plans for non-Indigenous employees to ensure a respectful working relationship with Indigenous contractors;
 - 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 (e.g., bid packaging) that facilitate the opportunities for local companies;
 - describe technology transfer and research and development programs that would facilitate the use of local suppliers of goods and services and local employees, and that would develop new capabilities related to project requirements;
 - elaborate on the potential of the Project to benefit community members in relevant subgroups; and
- describe and justify the need for compensation plans to mitigate potential effects on social and economic valued components related to Indigenous peoples.

11. Effects of potential accidents or malfunctions

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

11.1. Risk assessment

The Impact Statement must:

- identify hazards for each project phase that could lead to events of accidents and malfunctions related to the Project and provide an explanation of how these events were identified (e.g. information sources, recognized risk assessment methodology, professional expertise, similar project, participants' input);
 - take into account the lifespan of different project components, design of different project components, complicating factors such as weather or external events, and the potential for vandalism or sabotage;
- conduct an analysis of the risk of each hazard and adverse event (including likelihood and consequences) and describe the potential consequences (including the environmental, health, social and economic effects and effects to Indigenous peoples);

- assess the potential for minor and major accidental spills of fuel, or loss of containment of dangerous goods;
- describe the magnitude and duration of project-related accidents and/or malfunctions, based on the worst-case scenarios and the more-likely but lower-consequence alternative scenarios, including a description of the:
 - magnitude, duration and extent of effects;
 - the length of time before an accident or malfunction is likely to be reported;
 - quantity, mechanism, rate, form and characteristics of the contaminants, greenhouse gases and other materials likely to be released or spilled into the environment during these scenarios;
 - 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;
 - any potentially adverse environmental, health, social or economic effects, including effects to Indigenous peoples. With respect to human health specifically, consideration should be given to potential pathways of effects associated with surface water, air, country foods, and other relevant media, including short-term and long-term risks to human health;
 - relative locations of sensitive 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 migratory birds, spawning periods for fish, hunting season, tourist season);
 - critical infrastructure such as local drinking water treatment plants or facilities that may treat water sources impacted by the Project and the capacity of the drinking water treatment plant or facilities to treat water sources impacted by an accidental release from the Project during all project phases;
- identify and justify the spatial and temporal boundaries for the effects 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;
- provide environmental sensitivity mapping that identifies site-specific conditions and sensitive receptors adjacent to project activities, including shores, streams and wetland areas frequented by fish and/or by migratory birds, and likely routes to them. Shoreline classification surveys and mapping must be conducted along major waterways where large spills are possible. The characterization criteria established by ECCC contained in the *Field Guide for Intervention in the Event of an Oil Spill on Maritime Shores* constitutes a useful guide in this regard.

11.2. Mitigation measures

The Impact Statement must:

- describe the mitigation measures and design safeguards that will be in place to avoid and prevent accidents and malfunctions, including project design choices and operational considerations, including engineering, safety and risk reduction standards, criteria and approaches to be used (e.g., traffic enforcement, spacing, fire protection);
- describe the mitigation measures for the potential adverse environmental, health, social and economic effects, including effects to Indigenous peoples, in the event of an accident or malfunction;
- provide details of financial liability and compensation in place pursuant to regulations or the proponent's commitment in case of potential accidents or malfunctions associated with the Project;
- describe mutual aid agreements in place 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.

11.3. Emergency management

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

- describe existing emergency preparedness and response systems and existing arrangements and/or coordination with qualified response organizations in the spatial boundaries associated with the Project;
- describe the role of the proponent in the case of spill, collision, grounding or other accidents or malfunctions associated with the Project during all project phases;
- describe emergency response training and exercise programs, including a description of the participation and training agreements with Indigenous groups or communities that could be impacted by accidents or malfunctions;
- describe volunteer management plans;
- document spill response strategies for each type of spill scenario, including strategic locations of spill response equipment relative to likely accident and malfunction sites, consideration of the impacts of seasonality, and/or likely pathways to sensitive environmental receptors;
- detail the equipment that will be available to be deployed to respond to accidents and malfunctions;
- describe emergency communications plans that would provide emergency instructions to surrounding communities, including Indigenous communities, and how these will be informed by the public and Indigenous communities. 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.; and
- describe a waste management plan as it pertains to waste generated during an emergency response.

12. Effects of the environment on the Project

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

The Impact Statement must:

- describe how environmental conditions, including natural hazards such as severe and/or extreme weather conditions and external events, could adversely affect the Project and how this in turn could result in effects to the environment, health, social and economic conditions;
- provide details of planning, design and construction strategies intended to minimize the potential adverse effects of the environment on the Project;
- describe mitigation measures that can be implemented in anticipation or in preparation for effects of the environment on the Project;
- describe possible mitigation measures to address adverse environmental, health, social and economic effects resulting from effects of the environment on the Project;
- describe measures to enhance positive environmental, health, social and economic effects resulting from effects of the environment on the Project.
- describe the Project's climate resilience and how the impacts of climate change effects have been incorporated into the project design (e.g., water crossings) 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;
 - additional guidance related to conducting climate change resilience assessments is included in the most recent versions of the SACC and the SACC technical guide on assessing climate change resilience;¹⁶⁴

¹⁶⁴ SACC website: <https://www.strategicassessmentclimatechange.ca/>

- when describing possible effects from climate change on the Project, describe how considerations from Indigenous peoples on climate change may impact the Project were reflected;
- identify the Project's sensitivities and vulnerabilities to change 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 anticipated to result from climate change (for example, changes to annual freeze-thaw cycles, water levels, break-up season and spring freshet), and incorporate this information in a risk assessment as contributing and complicating factors for possible accidents and malfunctions. Provide mitigation measures (both passive and active) that the proponent is prepared to undertake in order to minimize the frequency, severity and consequences of such projected effects; and
- identify any areas of potential wind or water erosion, slumps and slope instability, geologic hazards, including but not limited to those caused by geologic movements; and
- describe possible mitigation measures to deal with adverse environmental, health, social and economic effects resulting from effects of the environment on the Project.

13. Canada's ability to meet its environmental obligations and its climate change commitments

The Government of Canada, through the IAA, recognizes that the 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 and commitments in respect of climate change, with a focus on Government of Canada obligations and commitments relevant to decision-making.

Federal environmental obligations relevant to the Project include:

- the Convention on Biological Diversity, including the Kunming-Montreal Global Biodiversity Framework, and Canada's supporting national framework (e.g., the Canadian Biodiversity Strategy, Canada's Biodiversity Outcomes Framework and current biodiversity goals and objectives in Canada), and legislation that supports the implementation of Canada's biodiversity commitments, including SARA and the *Canada Wildlife Act*, and guidance documents;
- recovery strategies and action plans developed under SARA for all species at risk potentially affected by the Project, if present. In particular, the Impact Statement should consider effects on Woodland Caribou habitat and population at the range-level, as set out in the Amended Recovery

Strategy for the Woodland Caribou, Boreal Population¹⁶⁵ and reaffirmed in the Agreement for the Conservation of Caribou, Boreal Population in Ontario;

- the Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar), as implemented in part through the *Federal Policy on Wetland Conservation*¹⁶⁶ and supporting guidance such as the North American Waterfowl Management Plan; and
- the Convention for the Protection of Migratory Birds in the United States and Canada, as implemented in part under the *Migratory Birds Convention Act, 1994*, and supporting guidance documents on conservation objectives and strategies specific to Bird Conservation Regions.

The Impact Statement must describe:

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

With respect to climate change commitments related to GHGs, section 8.12 *Climate change* of this document outlines the information required as part of the Impact Statement. The Agency, with the support of federal authorities will provide a supplementary analysis on the Project's GHG emissions in the context of Canada's emissions targets and forecasts (see section 6 of the SACC). The proponent may provide its views in the Impact Statement on the extent to which the effects of the Project would hinder or contribute to the Government of Canada's ability to meet its commitments in respect of climate change in order to inform the impact assessment.

The proponent should refer to the Agency's guidance documents on this topic, including the document *Policy Context: Considering Environmental Obligations and Commitments in Respect of Climate Change under the Impact Assessment Act*¹⁶⁷.

In addition to presenting the proponent's views, the Impact Statement should include how community knowledge and Indigenous Knowledge may be incorporated in assessing whether the project presents a contribution or a hindrance to meeting these obligations/commitments.

¹⁶⁵ <https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/recovery-strategies/woodland-caribou-boreal-2020.html>

¹⁶⁶ <http://publications.gc.ca/collections/Collection/CW66-116-1991E.pdf>

¹⁶⁷ <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/considering-environmental-obligations.html>

14. 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 impact assessment, beginning in the planning phase. Information and data requirements to inform the sustainability analysis should be considered from the outset of the impact assessment.

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

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

The application of the principles will result in better information on the effects of the Project, including long-term effects on future generations and the interaction of effects, and may help to identify additional mitigation measures and enhancements.

The Impact Statement must provide an analysis of the extent to which the Project contributes to sustainability. The analysis should be qualitative but may draw on quantitative data to provide context and should follow the methodology outlined in the Guidance: Considering the Extent to which a Project Contributes to Sustainability¹⁶⁸.

In addition, the Impact Statement must describe:

- how the planning and design of the Project, in all phases, considers the sustainability principles;
- engagement with potentially affected Indigenous communities, and 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 communities;
- the project-specific context, including key issues of importance to Indigenous communities and the public that will inform the sustainability assessment;
- 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

¹⁶⁸ <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/guidance-considering-extent-project-contributes-sustainability.html>

- the planning and design of the Project and the selection of the preferred alternative means and alternatives to the Project.
- all uncertainties and assumptions underpinning the analysis;
- how the precautionary principle was applied in cases where there may be risk of irreversible harm;
- in a summary, the positive and adverse environmental, health, social and economic effects of the Project, with emphasis on potentially affected Indigenous communities, local communities, and disadvantaged populations; and
- how monitoring, management and reporting systems consider the sustainability principles and attempt to ensure continuous progress towards sustainability;

The proponent should refer to Agency guidance on this topic.

15. Follow-up programs

Follow-up programs are put in place by the proponent to verify the accuracy of the impact assessment and evaluate the effectiveness of mitigation measures¹⁶⁹.

Through the conditions in the Decision Statement, the proponent is required to develop a follow-up program in consultation with relevant authorities and Indigenous communities and to submit to the Agency the results of monitoring efforts. Monitoring is a key component of follow-up programs and can identify the potential for environmental, health, social or economic degradation during all phases of project development. Monitoring can also assist in developing clearly defined action plans and emergency response procedures to account for environmental, health, social and economic protection.

The proponent should develop expected outcomes for their follow-up programs, in consultation with relevant authorities and Indigenous communities. 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 valued components. Proponents will be expected to provide information on the extent to which they are achieving their expected outcomes in their annual follow-up program reports.

If the follow-up program indicates that mitigation measures are not working effectively, additional measures may be required and implemented. If, through a follow-up program, it is identified that the predictions of the impact assessment 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 communities. If undertaken collaboratively, they can support solution-oriented approaches to adaptive management

¹⁶⁹ The results of the follow-up program may be used to determine whether additional actions are necessary (i.e., adaptive management) to address unanticipated outcomes. Adaptive management is not considered as a mitigation measure; it is a best management practice in environmental management.

through the early identification of issues in follow-up programs and appropriate solutions incorporating Indigenous Knowledge.

If there is an ongoing or completed regional assessment in the area, the proponent should use the information generated through that process to inform considerations for a follow up program. Follow-up program timing should take into account future activities that will use project infrastructure.

In developing a follow-up program framework for environmental, health, social or economic valued components as applicable, the Impact Statement should take into account the considerations outlined in the Agency guidance on Follow-up Programs under the Canadian Environmental Assessment Act¹⁷⁰ (guidance to be updated).

15.1 Follow-up program framework

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

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

- identification of valued components that warrant a follow-up program and rationale taking into account the guidance on follow-up programs cited above;
- the expected outcome(s) and targets of the follow-up program information describing how the proponent expects to achieve the expected outcome(s);
- preliminary description of follow-up studies planned, as well as their main characteristics (list of parameters to be measured, planned implementation timetable, etc.);
- intervention mechanism used in the event that effects to the environment or impacts on the exercise of rights of Indigenous peoples and cultures attributed to the Project are not as predicted;
- a description of how the monitoring results will be used to trigger the proponent's intervention mechanisms for effects that do not have compliance-based thresholds (e.g., CAAQS for common air pollutants);
- a description of triggers for adaptive management of any unacceptable or unexpected results;
- opportunities for the involvement of identified Indigenous communities, stakeholders, local and regional Indigenous organizations in the follow-up program design and implementation, and the development of a communication mechanism between these interested parties and the proponent;
- mechanism to disseminate follow-up results among the concerned interested parties; and
- accessibility and sharing of data for the general population.

¹⁷⁰ <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/follow-programs-under-canadian-environmental-assessment-act.html>

15.2 Follow-up program monitoring

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

- identification of regulatory instruments that include a monitoring requirement for the valued components;
- description of the methodology for tracking environmental, health, social and economic issues, including how these methodologies were informed by community knowledge and Indigenous Knowledge or specifically impacted subgroups;
- description of the methodology and mechanism for monitoring the effectiveness of mitigation and reclamation;
- description of the characteristics of monitoring where foreseeable (e.g., location of interventions, planned protocols, list of measured parameters, analytical methods employed, schedule, data management, human and financial resources required);
- identification of the monitoring activities that could pose a risk to the environmental, health, social and economic conditions and/or valued components and the measures and means planned to protect these conditions;
- description of the indicators to be used to assess progress towards established objectives and a rationale for their selection;
- identification of opportunities for participation of representatives from Indigenous communities identified in the Indigenous Engagement and Partnership Plan in monitoring programs;
- similar guidance and methodologies should be applied to follow-up monitoring as are applied to establishing baseline conditions;
- post-construction monitoring surveys should be undertaken for:
 - ongoing monitoring of project and control sites to evaluate whether there are changes in the valued component communities following project construction; and
 - evaluating the effectiveness of applied mitigation;
- in relation to wetlands:
 - if reclamation plantings are created, monitor the plantings biannually (i.e., late spring and fall) during consecutive years, and undertake supplementary planting, as necessary, until the vegetation cover becomes established and continues to grow without further intervention; and
 - monitor post-construction effects to wetland functions. A program to monitor wetland functions should be designed in such a way as to ensure that the type and amount of each wetland function would be considered individually in determining recovery success and that each wetland function would be recovered to at least the same type and amount of function as assessed during baseline;
- in relation to caribou:
 - monitor effects on caribou and their critical habitat to verify impact assessment predictions, ensure that mitigation measures are effective, and determine whether any unanticipated effects are occurring within the project study area;

- monitoring methods should follow standardized/established methods and include a robust before-after-control-impact design (or similar field-based approach) to allow for quantitative assessment of potential effects of the Project and identify any adaptive management that may be necessary;
 - the methodology provided should include the monitoring schedule;
 - describe environmental monitoring requirements to ensure that mitigation measures, best management practices, and commitments are being implemented as intended;
 - the methodology should include a description of the performance indicators that will be used to evaluate the effectiveness of the mitigation measures; and
 - identify circumstances and mechanisms under which corrective/adaptive measures may be implemented to address any issue or problem identified through the follow-up programs or environmental monitoring. For example, if unanticipated effects occur or the effects are greater than anticipated;
- 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);
 - an explanation of how any differences in predicted effects versus actual measured effects will be attributed to either uncertainty related to predictions or to effectiveness of the mitigation measures;
 - guidelines for preparing monitoring reports (number, timing, content, frequency, format, duration, geographic extent) that will be sent to the authorities involved; and
 - plans, including funding options, to involve Indigenous communities and local communities in monitoring and follow-up programs, where appropriate.

15.3 Compliance monitoring

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

- identification of those positions accountable and responsible for monitoring and ensuring compliance;
- description of the proponent's intervention mechanisms in the event of the observation of non-compliance with the legal and environmental requirements or with the obligations imposed on contractors by the provisions of their contracts; and
- quality assurance and quality control measures to be applied to monitoring programs.

16. Assessment summary

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

The Assessment Summary provides an opportunity for the proponent to demonstrate correspondence between issues raised during the planning phase and issues addressed in the assessment. This Assessment Summary should be presented by valued component, which allows the proponent to demonstrate the completeness of the assessment and provide the results of the analysis. The summary must include key maps or figures illustrating the project location and key project components and will include locations of townships and municipalities, Indigenous communities, traditional territories and Treaty areas.

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

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

Appendix 1 – Resources and guidance

The proponent should follow guidance prepared under IAA or, where not available, follow guidance developed under the *Canadian Environmental Assessment Act, 2012*. The Agency expects proponents to keep apprised of updated or new practitioner guidance or policies, including those published on the Agency's website, as may be the case over the course of a multi-year impact assessment process. Best practices and current published guidance should be relied upon to the extent possible by proponents in developing their Impact Statement, and the following list of resources may be updated from time to time.

Atmospheric, acoustic and visual environment

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

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

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

ISO 12913-1:2014 Acoustics—Soundscape—Part 1: Definition and conceptual framework. International Organization for Standardization. 2014. Available at <https://www.iso.org/cms/render/live/en/sites/isoorg/contents/data/standard/05/21/52161.html>

Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities. Cheminfo Services Inc. 2005. Available at: <http://www.bv.transports.gouv.qc.ca/mono/1173259.pdf>

Birds, Migratory Birds and their Habitat

Audubon Christmas Bird Count. Audubon. Available at <http://netapp.audubon.org/CBCObservation/Historical/ResultsByCount.aspx>

Atlas of the Breeding Birds of Ontario. Available at <https://www.birdsontario.org>

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.html>

Barker, R. J., Schofield, M. R., Link, W. A., Sauer, J. R. 2018. *On the reliability of N-mixture models for count data*. *Biometrics*, 74(1), 369–377. Available at <https://doi.org/10.1111/biom.12734>

Bird Conservation Regions and strategies. Environment and Climate Change Canada. Available at <https://www.canada.ca/en/environment-climate-change/services/migratory-bird-conservation/regions-strategies.html>

Bird surveys. Environment and Climate Change Canada. Available at <https://www.canada.ca/en/environment-climate-change/services/bird-surveys.html>

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

Canadian Migration Monitoring Network (CMMN). Birds Canada. 2019. Available at <https://www.birdscanada.org/bird-science/canadian-migration-monitoring-network-cmmn/>

eBird Canada. Available at <https://ebird.org/canada/home>

General nesting periods of migratory birds. Environment and Climate Change Canada. Available at <https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/general-nesting-periods.html>

Hanson, A., Goudie, I., Lang, A., Gjerdrum, C., Cotter, R., Donaldson, G. 2009. *A Framework for the Scientific Assessment of Potential Project Impacts on Birds.* Technical report series No. 508. Environnement Canada – Canadian Wildlife Service. Available at http://publications.gc.ca/collections/collection_2010/ec/CW69-5-508-eng.pdf

Milko, R. 1998. *Migratory birds environmental assessment guideline.* Environment Canada – Canadian Wildlife Service. Available at <http://publications.gc.ca/site/fra/9.647049/publication.html>

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

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

Nesting Calendar Query Tool. Birds Canada. Available at <https://www.birdscanada.org/apps/rnest/index.jsp>

North American Waterfowl Management Plan. NAWMP Canada. 2013. Available at <http://nawmp.wetlandnetwork.ca/what-is-nawmp/>

Yip, D. A., L. Leston, E. M. Bayne, P. Sólymos, and A. Grover. 2017. *Experimentally derived detection distances from audio recordings and human observers enable integrated analysis of point count data.* Avian Conservation and Ecology 12(1):11. Available at <https://www.ace-eco.org/vol12/iss1/art11>

Fish and Fish Habitat

A science-based framework for assessing the response of fisheries productivity to state of species or habitats. Fisheries and Oceans Canada. 2013. Available at <https://waves-vagues.dfo-mpo.gc.ca/Library/360944.pdf>.

Bradford, M.J., R.G. Randall, K.S. Smokorowski, B.E. Keatley and K.D. Clarke. 2014. *A framework for assessing fisheries productivity for the Fisheries Protection Program.* Fisheries and Oceans Canada,



Canadian Science Advisory Secretariat. Available at <https://waves-vagues.dfo-mpo.gc.ca/Library/359758.pdf>

Bradford, M.J., Smokorowski, K.E. Clarke, K.D., Keatley, B.E. and Wong, M.C. 2016. *Equivalency metrics for the determination of offset requirements for the Fisheries Protection Program*. Fisheries and Oceans Canada, Canadian Science Advisory Secretariat. Available at <https://waves-vagues.dfo-mpo.gc.ca/Library/364029.pdf>

Braun, D.C., Smokorowski, K.E., Bradford, M.J., and Glover, L. 2019. *A review of functional monitoring methods to assess mitigation, restoration, and offsetting activities in Canada*. Fisheries and Oceans Canada, Canadian Science Advisory Secretariat. Available at <https://waves-vagues.dfo-mpo.gc.ca/library-bibliotheque/40856720.pdf>

Framework for Assessing Ecological Flow Requirements to Support Fisheries in Canada. Fisheries and Oceans Canada, Canadian Science Advisory Secretariat. 2013. Available at <https://waves-vagues.dfo-mpo.gc.ca/Library/348881.pdf>

Pathways of Effects. Fisheries and Oceans Canada. Available at <https://www.dfo-mpo.gc.ca/pnw-ppe/pathways-sequences/index-eng.html>

Fish and fish habitat protection policy statement. August 2019. Available at <https://www.dfo-mpo.gc.ca/pnw-ppe/policy-politique-eng.html>

Timing windows to conduct projects in or around water. Available at <https://www.dfo-mpo.gc.ca/pnw-ppe/timing-periodes/index-eng.html>

Swim Performance Online Tools. Available at <https://fishprotectiontools.ca/>

Policy for applying measures to offset adverse effects on fish and fish habitat under the Fisheries Act. Fisheries and Oceans Canada. 2019. Available at <https://www.dfo-mpo.gc.ca/pnw-ppe/reviews-revues/policies-politiques-eng.html>

Smokorowski, K.E., Bradford, M.J., Clarke, K.D., Clément, M., Gregory, R.S., Randall, R.G. 2015. *Assessing the effectiveness of habitat offset activities in Canada: Monitoring design and metrics*. Canadian Technical Report of Fisheries and Aquatic Sciences 3132. Available at http://publications.gc.ca/collections/collection_2015/mpo-dfo/Fs97-6-3132-eng.pdf

Gender-based Analysis Plus

By the Numbers: Gender Diversity in Canada's Natural Resource Industries and Science, Technology, Engineering and Math (STEM), Submitted Brief. Natural Resources Canada. Available at <https://www.ourcommons.ca/Content/Committee/421/FEWO/Brief/BR8745320/br-external/NRC-e.pdf>

Demystifying GBA+ Job Aid. Women and Gender Equality Canada. Available at https://women-gender-equality.canada.ca/gbaplus-course-cours-acplus/assets/modules/Demystifying_GBA_job_aid_EN.pdf

GBA+ in Impact Assessment Fact Sheet. Impact Assessment Agency of Canada. 2019. Available at <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/gender-based-analysis-plus-impact-assessment-fact-sheet.html>

Gender Diversity and Inclusion: A Guide for Explorers. Prospectors and Developers Association of Canada. 2020. Available at <https://www.pdac.ca/priorities/responsible-exploration/gender/gender-diversity-and-inclusion-guidance-document>

Gender, diversity and inclusion statistics. Statistics Canada. Available at https://www.statcan.gc.ca/eng/topics-start/gender_diversity_and_inclusion

Guidance: Gender-based Analysis Plus in Impact Assessment. Impact Assessment Agency of Canada. 2019. Available at <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/gender-based-analysis.html>

Intersectionality Job Aid. Status of Women Canada. 2018. Available at https://women-gender-equality.canada.ca/gbaplus-course-cours-acspplus/assets/modules/Intersectionality_tool_job_aid_EN.pdf

Tool - Assessing the Quality of a GBA Plus in the Impact Statement. Impact Assessment Agency of Canada. Available at <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/tool-assessing-quality-gba-plus-impact-statement.html>

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IMPACT ASSESSMENT AGENCY OF CANADA

Agency guidance documents are available from the Practitioner's Guide to Federal Impact Assessments under the *Impact Assessment Act* (<https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act.html>).