



Canadian Environmental
Assessment Agency

Agence canadienne
d'évaluation environnementale

GUIDELINES FOR THE PREPARATION OF AN ENVIRONMENTAL IMPACT STATEMENT

pursuant to the

Canadian Environmental Assessment Act, 2012

AMISK HYDROELECTRIC PROJECT

AHP DEVELOPMENT CORPORATION

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DISCLAIMER

This document is not a legal authority, nor does it provide legal advice or direction; it provides information only, and must not be used as a substitute for the *Canadian Environmental Assessment Act, 2012* (CEAA 2012) or its regulations. In the event of a discrepancy, CEAA 2012 and its regulations prevail. Portions of CEAA 2012 have been paraphrased in this document, but will not be relied upon for legal purposes.

Abbreviations and Short Forms

CEAA 2012	<i>Canadian Environmental Assessment Act, 2012</i>
Agency	Canadian Environmental Assessment Agency
EA	environmental assessment
EIS	environmental impact statement
VC	valued component

Part 1 - Background

1. INTRODUCTION

The purpose of this document is to identify for the proponent the minimum information requirements for the preparation of an Environmental Impact Statement (EIS) for a designated project¹ to be assessed pursuant to the *Canadian Environmental Assessment Act, 2012* (CEAA 2012). This document specifies the nature, scope and extent of the information required. Part 1 of this document defines the scope of the environmental assessment and provides guidance and general instruction on the preparation of the EIS. Part 2 outlines the minimum information that must be included in the EIS.

CEAA 2012 requires an assessment of the potential effects of a proposed project as identified in section 5 of CEAA 2012. The Canadian Environmental Assessment Agency (the Agency) or a review panel will use the proponent's EIS and other information received during the EA process to prepare an EA Report that will inform the issuance of a decision statement by the Minister of Environment and Climate Change. Therefore the EIS must include a full description of the changes the project will cause to the environment that may result in adverse effects on areas of federal jurisdiction (i.e. section 5 of CEAA 2012) including changes that are directly linked or necessarily incidental to any federal decisions that would permit the project to be carried out. It is the responsibility of the proponent to provide sufficient data and analysis on potential changes to the environment to ensure a thorough evaluation of the environmental effects of the project by the Agency or a review panel.

2. GUIDING PRINCIPLES

2.1. Environmental assessment as a planning tool

Environmental Assessment (EA) is a planning tool used to ensure that projects are considered in a careful and precautionary manner in order to avoid or mitigate possible environmental effects and to encourage decision makers to take actions that promote sustainable development.

2.2. Public participation

One of the purposes identified in CEAA 2012 is to ensure opportunities for meaningful public participation during an EA. CEAA 2012 requires that the Agency or review panel provide the public with an opportunity to participate in the EA and an opportunity to comment on the draft EA report or the draft conditions. Meaningful public participation is best achieved when all parties have a clear understanding of the proposed project as early as possible in the review process. The proponent is required to provide current information about the project to the public and especially to the communities likely to be most affected by the project.

2.3. Aboriginal engagement

A key objective of CEAA 2012 is to promote communication and cooperation with Aboriginal peoples which includes, First Nations, Inuit and Métis. The proponent is expected to engage with Aboriginal groups that may be affected by the project, as early as possible in the project planning process. The

1 In this document, "project" has the same meaning as "designated project" as defined in the *CEAA, 2012*.

proponent will provide Aboriginal groups with opportunities to learn about the project and its potential effects, make their concerns known about the project's potential effects, and discuss measures to mitigate those effects. The proponent is strongly encouraged to work with Aboriginal groups in establishing an engagement approach. The proponent will integrate community and Aboriginal traditional knowledge to which it has access or that it has acquired through engagement activities into the assessment of environmental impacts.

Information gathered through the EA process and associated engagement by the proponent with Aboriginal groups will be used to inform decisions under CEAA 2012. In providing information to the Agency or to a review panel, the proponent will respect any confidentiality commitments made to Aboriginal groups (see section 4.3 for further information on this subject). This information will also contribute to the Crown's understanding of any potential adverse impacts of the project on potential or established Aboriginal or Treaty rights and related interests and the effectiveness of measures proposed to avoid or minimize those impacts.

For more information on how Aboriginal traditional knowledge can aid in the preparation of the EIS, please refer to the Agency's reference guide entitled "Considering Aboriginal traditional knowledge in environmental assessments conducted under the *Canadian Environmental Assessment Act, 2012*".

2.4. Application of the precautionary approach

In documenting the analyses included in the EIS, the proponent will demonstrate that all aspects of the project have been examined and planned in a careful and precautionary manner in order to avoid significant adverse environmental effects or impacts to Aboriginal and Treaty rights to the extent possible.

3. SCOPE OF THE ENVIRONMENTAL ASSESSMENT

3.1. Designated Project

On November 30, 2015, AHP Development Corporation, the proponent of the Amisk Hydroelectric Project provided a project description to the Agency. Based on this project description, the Agency has determined that an environmental assessment is required under CEAA 2012 and will include the construction, operation, decommissioning and abandonment of the following project components and activities:

Main Works

- Headworks, including powerhouses, spillway, and gravity dams
- Headpond
- Substation
- Transmission line
- Access roads, including new roads and any upgrading to existing roads
- Fish passage, including any alternatives considered
- Boat passage, including any alternatives considered

Associated Works and Activities

- Site clearing, earthmoving, leveling, excavation and blasting activities

- Borrow areas
- Explosives storage and handling
- Construction and subsequent removal of cofferdams and any other temporary construction works
- Construction activities and accommodations, including waste disposal, temporary work areas, laydowns, and camp facilities
- Power supply
- Works for erosion control
- Water management facilities, including ditches, embankments, and containment ponds
- Filling of the headpond
- Waste disposal for all waste streams
- Administrative, maintenance, and storage buildings

3.2. Factors to be considered

Scoping establishes the parameters of the EA and focuses the assessment on relevant issues and concerns. Part 2 of this document specifies the factors to be considered in this environmental assessment, including the factors listed in subsection 19(1) of CEAA 2012:

- environmental effects of the project, including the environmental effects of malfunctions or accidents that may occur in connection with the project and any cumulative environmental effects that are likely to result from the project in combination with other physical activities that have been or will be carried out;
- the significance of effects;
- comments from the public;
- mitigation measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the project;
- the requirements of the follow-up program in respect of the project;
- the purpose of the project;
- alternative means of carrying out the project that are technically and economically feasible and the environmental effects of any such alternatives;
- any change to the project that may be caused by the environment;
- the results of any relevant regional study pursuant to CEAA 2012; and
- any other matter relevant to the EA that the Minister of Environment and Climate Change requires to be taken into account, should the EA be referred to an environmental assessment by review panel².

² Any additional factors to be considered that the Minister may require to be taken into account would be included in the Terms of Reference for the Review Panel

3.3. Scope of factors³

3.3.1. Changes to the Environment

Environmental effects occur as interactions between actions (the carrying out of the project or decisions made by the federal government in relation to the project) and receptors in the environment, and subsequently between components of the environment (e.g., change in water quality that may affect fish).

Under CEAA 2012, an examination of environmental effects that result from changes to the environment as a result of the project being carried out or as a result of the federal government exercising any power duty or function that would allow the project to be carried out must be considered in the EIS.

In scoping the potential changes to the environment that may occur, proponents should consider any potential changes in the physical environment such as changes to air quality, water quality and quantity, and physical disturbance of land that could reasonably be expected to occur.

3.3.2. Valued components to be examined

Valued components (VCs) refer to environmental biophysical or human features that may be impacted by a project. The value of a component not only relates to its role in the ecosystem, but also to the value people place on it. For example, it may have been identified as having scientific, social, cultural, economic, historical, archaeological or aesthetic importance.

The EIS will identify the VCs linked to section 5 of CEAA 2012, including the ones identified in Part 2 (section 6.2) that may be affected by changes in the environment, as well as species at risk and their critical habitat as per the requirement outlined in section 79 of the *Species at Risk Act*. Section 5 of CEAA 2012 defines environmental effects as:

- A change that may be caused to fish and fish habitat, marine plant and migratory birds;
- A change that may be caused to the environment on federal lands, in another province or outside Canada;
- With respect to aboriginal peoples, an effect of any change caused to the environment on:
 - ✓ health and socio-economic conditions;
 - ✓ physical and cultural heritage;
 - ✓ the current use of lands and resources for traditional purposes;
 - ✓ any structure, site or thing that is of historical, archaeological, paleontological or architectural significance;
- For projects requiring a federal authority to exercise a power or function under another Act of Parliament;

³ Should the project be referred to an environmental assessment by review panel, section 19(2) of CEAA 2012 indicates that the Minister of Environment and Climate Change shall set the scope of the factors to be considered in the environmental assessment. In addition to the information contained in the EIS Guidelines, the Minister may provide additional direction in the Terms of Reference for the Review Panel.

- ✓ a change, other than the ones mentioned above, that may be caused to the environment and that is directly linked or necessarily incidental to the exercise of the federal power or function.
- ✓ the effect of that change, other than the ones mentioned above, on:
 - ✓ health and socio-economic conditions;
 - ✓ physical and cultural heritage; and
 - ✓ any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.

The final list of VCs to be presented in the EIS will be completed according to the evolution and design of the project and reflect the knowledge acquired on the environment through public consultation and Aboriginal engagement. The EIS will describe what methods were used to predict and assess the adverse environmental effects of the project on these components.

The VCs will be described in sufficient detail to allow the reviewer to understand their importance and to assess the potential for environmental effects arising from the project activities. The EIS will provide a rationale for selecting specific VCs and for excluding any VCs or information specified in these guidelines. Challenges may arise regarding particular exclusions, so it is important to document the information and the criteria used to make each determination. Examples of justification include primary data collection, computer modelling, literature references, public consultation, expert input Aboriginal traditional knowledge or professional judgement. The EIS will identify those VCs, processes, and interactions that either were identified to be of concern during any workshops or meetings held by the proponent or that the proponent considers likely to be affected by the project. In doing so, the EIS will indicate to whom these concerns are important and the reasons why, including environmental, Aboriginal, social, economic, recreational, and aesthetic considerations. If comments are received on a component that has not been included as a VC, these comments will be summarised and a rationale for their exclusion provided.

3.3.3. Spatial and Temporal boundaries

The spatial and temporal boundaries used in the EA may vary depending on the VC. The proponent is encouraged to consult with the Agency, federal and provincial government departments and agencies, local government and Aboriginal groups, and take into account public comments when defining the spatial boundaries used in the EIS.

The EIS will describe the spatial boundaries to be used in assessing the potential adverse environmental effects of the project and provide a rationale for each boundary. Spatial boundaries will be defined taking into account the appropriate scale and spatial extent of potential environmental effects, community and Aboriginal traditional knowledge, current land and resource use by Aboriginal groups, ecological, technical and social and cultural considerations. Spatial boundaries should be described using maps or other visual representations whenever possible.

The temporal boundaries of the EA will span all phases of the project determined to be within the scope of this environmental assessment as specified under section 3.1 above. Community and Aboriginal traditional knowledge should factor into decisions around temporal boundaries.

If the temporal boundaries do not span all phases of the project, the EIS will identify the boundaries used and provide a rationale.

4. PREPARATION AND PRESENTATION OF THE ENVIRONMENTAL IMPACT STATEMENT

4.1. Guidance

The proponent is encouraged to consult relevant Agency policy and guidance⁴ on topics to be addressed in the EIS, and with the Agency during the planning and development of the EIS.

Submission of regulatory and technical information necessary for federal authorities to make their regulatory decisions during the conduct of the environmental assessment is at the discretion of the proponent. Although that information is not necessary for the EA decision, the proponent is encouraged to submit it concurrent with the EIS.

4.2. Study strategy and methodology

The proponent is expected to respect the intent of these guidelines and to consider the effects that are likely to arise from the project (including situations not explicitly identified in these guidelines), the technically and economically feasible mitigation measures that will be applied, and the significance of any residual effects. Except where specified by the Agency, the proponent has the discretion to select the most appropriate methods to compile and present data, information and analysis in the EIS as long as they are justifiable and replicable.

It is possible these guidelines may include matters which, in the judgement of the proponent, are not relevant or significant to the project. If such matters are omitted from the EIS, the proponent will clearly indicate it, and provide a justification so the Agency, federal authorities, Aboriginal groups, the public and any other interested party have an opportunity to comment on this decision. Where the Agency disagrees with the proponent's decision, it will require the proponent to provide the specified information.

The assessment will include the following general steps:

- ✓ identifying the activities and components of the project;
- ✓ predicting potential changes to the environment
- ✓ predicting and evaluating the likely effects on identified valued components;
- ✓ identifying technically and economically feasible mitigation measures for any significant adverse environmental effects;
- ✓ determining any residual environmental effects; and
- ✓ determining the potential significance of any residual environmental effect following the implementation of mitigation.

For each VC, the EIS will describe the methodology used to assess project-related effects. The EIS will document how scientific, engineering, traditional and local knowledge were used to reach conclusions. Assumptions will be clearly identified and justified. All data, models and studies will be documented such that the analyses are transparent and reproducible. All data collection methods will be specified. The uncertainty, reliability and sensitivity of models used to reach conclusions must be indicated.

The EIS will identify all significant gaps in knowledge and understanding related to its conclusions, and the steps taken by the proponent to address these gaps. Where the conclusions drawn from

⁴ Visit the Canadian Environmental Assessment Agency website: www.ceaa-acee.gc.ca/default.asp?lang=En&n=F1F30EEF-1

scientific, engineering and technical knowledge are inconsistent with the conclusions drawn from traditional knowledge, the EIS will contain a balanced presentation of the issues and a statement of the proponent's conclusions.

The EIS will include a description of the environment (both biophysical and human), including the components of the existing environment and environmental processes, their interrelations as well as the variability in these components, processes and interactions over time scales appropriate to the likely effects of the project. The description will be sufficiently detailed to characterize the environment before any disturbance to the environment due to the project and to identify, assess and determine the significance of the potential adverse environmental effects of the project. This data should include results from studies done prior to any physical disruption of the environment due to initial site clearing activities. The information describing the existing environment may be provided in a stand-alone chapter of the EIS or may be integrated into clearly defined sections within the effects assessment of each VC. This analysis will include environmental conditions resulting from historical and present activities in the local and regional study area.

In describing and assessing effects to the physical and biological environment, the proponent will take an ecosystem approach that considers both scientific and traditional knowledge and perspectives regarding ecosystem health and integrity. The proponent will consider the resilience of relevant species populations, communities and their habitats.

In describing and assessing effects related to Aboriginal peoples, the proponent will consider the use of both primary and secondary sources of information regarding baseline information, changes to the environment and the corresponding effect on health, socio-economics, physical and cultural heritage or current use of lands and resources for traditional purposes. Primary sources of information include traditional land use studies, information obtained directly from Aboriginal groups, socio-economic studies, heritage surveys or other relevant studies conducted specifically for the project and its EIS. Secondary sources of information include previously documented information on the area, not collected specifically for the purposes of the project, or desk-top or literature-based information. The proponent will provide Aboriginal groups the opportunity to review and provide comments on the information used for describing and assessing effects on Aboriginal peoples (further information on engaging with Aboriginal groups is provided in Part 2, Section 5 of this document). Where there are discrepancies in the views of the proponent and Aboriginal groups on the information to be used in the EIS, the EIS will document these discrepancies and the rationale for the proponent's selection of information.

Where the proponent has used primary sources of information, it should demonstrate its efforts to seek free, prior and informed consent from the Aboriginal group to use and present the data in the environmental assessment.

If the baseline data have been extrapolated or otherwise manipulated to depict environmental conditions in the study areas, modelling methods and equations will be described and will include calculations of margins of error and other relevant statistical information, such as confidence intervals and possible sources of error.

The assessment of the effects of each of the project components and physical activities, in all phases, will be based on a comparison of the biophysical and human environments between the predicted future conditions with the project and the predicted future conditions without the project. In undertaking the environmental effects assessment, the proponent will use best available information

and methods. All conclusions will be substantiated. Predictions will be based on clearly stated assumptions. The proponent will describe how each assumption has been tested. With respect to quantitative models and predictions, the EIS will document the assumptions that underlie the model, the quality of the data and the degree of certainty of the predictions obtained.

4.3. Use of information

4.3.1. Scientific advice

Section 20 of CEAA 2012 requires that every federal authority with specialist or expert information or knowledge with respect to a project subject to an EA make that information or knowledge available to the Agency or review panel. The Agency will advise the proponent of the availability of any pertinent information or knowledge so that it can be incorporated into the EIS, along with, as appropriate, expert and specialist knowledge provided by other levels of government.

If an expert opinion is used as a rationale for a conclusion or decision in the EIS, the proponent will identify the relevant expert(s) and provide any relevant professional credentials.

4.3.2. Community knowledge and Aboriginal traditional knowledge

Sub-section 19(3) of CEAA 2012 states that “the environmental assessment of a designated project may take into account community knowledge and Aboriginal traditional knowledge”. For the purposes of these guidelines, community knowledge and Aboriginal traditional knowledge refers to knowledge acquired and accumulated by a community or an Aboriginal community, through generations of living in close contact with nature.

The proponent will incorporate into the EIS the community and Aboriginal traditional knowledge to which it has access or that is acquired through Aboriginal and public engagement activities, in keeping with appropriate ethical standards and obligations of confidentiality. Agreement should be obtained from Aboriginal groups regarding the use, management and protection of their existing traditional knowledge information during and after the EA.

4.3.3. Existing information

In preparing the EIS, the proponent is encouraged to make use of existing information relevant to the project. When relying on existing information to meet requirements of the EIS guidelines, the proponent will either include the information directly in the EIS or clearly direct the reader to where it may obtain the information (i.e., through cross-referencing). When relying on existing information, the proponent will also comment on how that information was applied to the project, separate factual lines of evidence from inference, and state any limitations on the inferences or conclusions that can be drawn from the existing information.

4.3.4. Confidential information

In implementing CEAA, 2012, the Agency is committed to promoting public participation in the environmental assessment of projects and providing access to the information on which environmental assessments are based. All documents prepared or submitted by the proponent or any other stakeholder in relation to the environmental assessment are included in the Canadian

Environmental Assessment Registry and made available to the public on request. For this reason, the EIS will not contain information that:

- is sensitive or confidential (i.e., financial, commercial, scientific, technical, personal, cultural or other nature), that is treated consistently as confidential, and the person affected has not consented to the disclosure; or,
- may cause harm to a person or harm to the environment through its disclosure.

The proponent will consult with the Agency regarding whether specific information requested by these guidelines should be treated as confidential.

4.4. Presentation and organization of the Environmental Impact Statement

To facilitate the identification of the documents submitted and their placement in the Canadian Environmental Assessment Registry, the title page of the EIS and its related documents will contain the following information:

- project name and location
- title of the document, including the term “environmental impact statement”
- subtitle of the document
- name of the proponent
- the date

The EIS will be written in clear, precise language. A glossary defining technical words, acronyms and abbreviations will be included. It will include charts, diagrams, tables, maps and photographs, where appropriate, to clarify the text. Perspective drawings that clearly convey the various components of the project will also be provided. Wherever possible, maps will be presented in common scales and datum to allow for comparison and overlay of mapped features.

For purposes of brevity and to avoid repetition, cross-referencing is preferred. The EIS may make reference to the information that has already been presented in other sections of the document, rather than repeating it. The exception to this preference is the cumulative effects assessment, which should be provided in a stand-alone section. Detailed studies (including all relevant and supporting data and methodologies) will be provided in separate appendices and will be referenced by appendix, section and page in the text of the main document. The EIS will explain how information is organized in the document. This will include a list of all tables, figures, and photographs referenced in the text. A complete list of supporting literature and references will also be provided. A table of concordance, which cross references the information presented in the EIS with the information requirements identified in the EIS Guidelines, will be provided. The proponent will provide copies of the EIS and its summary for distribution, including paper and electronic version in an unlocked, searchable PDF format, as directed by the Agency.

4.5. Summary of the Environmental Impact Statement

The proponent will prepare a summary of the EIS in both of Canada's official languages (French and English) to be provided to the Agency at the same time as the EIS and which will include the following:

- A concise description of all key components of the project and related activities;

- A summary of the consultation conducted with Aboriginal groups, the public, and government agencies, including a summary of the issues raised and the proponent's responses;
- An overview of expected changes to the environment
- An overview of the key environmental effects of the project and proposed technically and economically feasible mitigation measures; and
- The proponent's conclusions on the residual environmental effects of the project after taking mitigation measures into account and the significance of those effects.

The summary is to be provided as a separate document and should be structured as follows:

1. Introduction and environmental assessment context
2. Project overview
3. Alternative means of carrying out the project
4. Public consultation
5. Aboriginal engagement
6. Summary of environmental effects assessment for each VC, including:
 - a. description of the baseline;
 - b. anticipated changes to the environment
 - c. anticipated effects
 - d. mitigation measures
 - e. significance of residual effects
7. Follow-up and monitoring programs proposed

The summary will have sufficient details for the reader to learn and understand the project, potential environmental effects, mitigation measures, and the significance of the residual effects. The summary will include key maps illustrating the project location and key project components.

Part 2 – Content of the Environmental Impact Statement

1. INTRODUCTION AND OVERVIEW

1.1. The proponent

In the EIS, the proponent will:

- provide contact information (e.g. name, address, phone, fax, email);
- identify itself and the name of the legal entity that would develop, manage and operate the project;
- describe corporate and management structures;
- specify the mechanism used to ensure that corporate policies will be implemented and respected for the project; and
- identify key personnel, contractors, and/or sub-contractors responsible for preparing the EIS.

1.2. Project Overview

The EIS will describe the project, key project components and associated activities, scheduling details, the timing of each phase of the project and other key features. If the project is a part of a larger sequence of projects, the EIS will outline the larger context.

The overview is to identify the key components of the project, rather than providing a detailed description, which will follow in Section 3 of this document.

1.3. Project Location

The EIS will contain a description of the geographical setting in which the project will take place. This description will focus on those aspects of the project and its setting that are important in order to understand the potential environmental effects of the project. The following information will be included:

- the UTM coordinates of the main project site;
- current land use in the area;
- distance of the project facilities and components to any federal lands;
- the environmental significance and value of the geographical setting in which the project will take place and the surrounding area;
- environmentally sensitive areas, such as national, provincial and regional parks, ecological reserves, wetlands, estuaries, and habitats of federally or provincially listed species at risk and other sensitive areas;
- planning zones and areas;
- local and Aboriginal communities; and,

- traditional Aboriginal territories, treaty lands, Indian reserve lands.

1.4. Regulatory framework and the role of government

The EIS will identify:

- any federal power, duty or function that may be exercised that would permit the carrying out (in whole or in part) of the project or associated activities;
- the environmental and other regulatory approvals and legislation that are applicable to the project at the federal, provincial, regional and municipal levels;
- government policies, resource management, planning or study initiatives pertinent to the project and/or EA and their implications;
- any treaty or self-government agreements with Aboriginal groups that are pertinent to the project and/or EA;
- any relevant existing or draft land use plans, land zoning, or community plans; and
- any regional, provincial and/or national objectives, standards or guidelines that have been used by the proponent to assist in the evaluation of any predicted environmental effects.

2. PROJECT JUSTIFICATION AND ALTERNATIVES CONSIDERED

2.1. Purpose of the project

The EIS will describe the purpose of the project by providing the rationale for the project, explaining the background, the problems or opportunities that the project is intended to satisfy and the stated objectives from the perspective of the proponent. If the objectives of the project are related to, to broader private or public sector policies, plans or programs, this information will also be included.

The EIS will also describe the predicted environmental, economic and social benefits of the project. This information will be considered in assessing the justifiability of any significant adverse residual environmental effects, if such effects are identified.

2.2. Alternative means of carrying out the project

The EIS will identify and consider the effects of alternative means of carrying out the project that are technically and economically feasible. The proponent will complete the following procedural steps for addressing alternative means:

- Identify the alternative means to carry out the project.
- Identify the effects of each technically and economically feasible alternative means.
- Select the approach for the analysis of alternative means (i.e., identify a preferred means or bring forward alternative means).
- Assess the environmental effects of the alternative means.

In its alternative means analysis, the proponent will address, at a minimum, the following project components:

- location of the headworks
- type and number of turbines

- dam height
- fish passage
- boat passage
- routing of transmission line
- routing of access roads
- construction methods for instream components
- fill types and borrow sites
- operational flow and storage regime
- any other relevant key project components

For further information regarding the “purpose of” and “alternative means”, please consult the Agency’s Operational Policy Statement entitled “Addressing “Purpose of” and “Alternative Means” under the *Canadian Environmental Assessment Act, 2012*”.

The Agency recognizes that projects may be in the early planning stages when the EIS is being prepared. Where proponents have not made final decisions concerning the placement of project infrastructure, the technologies to be used, or that several options may exist for various project components, they are strongly encouraged to conduct an environmental effects analysis at the same level of detail assessment of the various options available (alternative means) within the EIS.

3. PROJECT DESCRIPTION

3.1. Project components

The EIS will describe the project, by presenting the project components (as identified in section 3.1), associated and ancillary works, and other characteristics that will assist in understanding the environmental effects. This will include maps, at an appropriate scale, of the project location, the project components, boundaries of the proposed site with UTM coordinates, the major existing infrastructure, adjacent land uses and any important environmental features.

3.2. Project activities

The EIS will include descriptions of the construction, operation, decommissioning and abandonment associated with the proposed project.

Descriptions for each project phase will include information on environmental management plans (e.g. sediment and erosion, waste management, site water management, mercury / methylmercury, ammonia, monitoring plans, metal leaching / acid rock drainage).

This will include descriptions of the activities to be carried out during each phase, the location of each activity, expected outputs and an indication of the activity's magnitude and scale.

Although a complete list of project activities should be provided, the emphasis will be on activities with the greatest potential to have environmental effects. Sufficient information will be included to predict environmental effects and address public concerns identified. Highlight activities that involve periods of increased environmental disturbance or the release of materials into the environment.

The EIS will include a summary of the changes that have been made to the project since originally proposed, including the benefits of these changes to the environment, Aboriginal peoples, and the public.

The EIS will include a schedule including time of year, frequency, and duration for all project activities.

The information will include a description of:

3.2.1. Site preparation and construction

- site clearing, excavation
- blasting (frequency and methods, type of explosive used, ammonia management)
- borrow material requirements and composition (source and quantity, metal leaching/acid rock drainage potential)
- water diversion required (location, methods, timing)
- Sediment and erosion management (in-water construction and roads)
- Water impoundment (headpond characterization, including aspects relevant to mercury issues)
- equipment requirements (type, quantity)
- construction camp (location, capacity, wastewater treatment)
- number of employees and transportation of employees
- effluent management and treatment (quantity, treatment requirement, release point, effluent criteria, monitoring, retention)
- contribution to atmospheric emissions, including emissions profile (type, rate and source)
- waste management (including hazardous waste) and recycling
- number of employees, transportation of employees, work schedule, lodging requirement on site and off site

3.2.2. Operation

- equipment requirements
- water management on the project site, including a detailed water management plan that includes ramping rates and changes
- water impoundment (frequency of water levels, residence time, stratification, operational flow and storage regime)
- maintenance activities, including planned or unexpected shutdowns of the facility that may lead to ramping rate changes
- sediment and erosion management
- contribution to atmospheric emissions, including emissions profile (type, rate and source)
- waste management and recycling
- number of employees, transportation of employees, any other relevant work requirements
- requirements for emergency response planning

3.2.3. Decommissioning and abandonment

- the preliminary outline of a decommissioning and reclamation plan for any components associated with the project
- the ownership, transfer and control of the different project components
- the responsibility for monitoring and maintaining the integrity of the remaining structures
- for permanent facilities, a conceptual discussion on how decommissioning could occur
- the objectives of reclamation, including consideration of the potential for use of lands and resources by Aboriginal groups post-reclamation

4. PUBLIC CONSULTATION AND CONCERNS

The EIS will describe the ongoing and proposed consultations and the information sessions that the proponent will hold or that it has already held on the project. It will provide a description of efforts made to distribute project information and provide a description of information and materials that were distributed during the consultation process. The EIS will indicate the methods used, where the consultation was held, the persons and organizations consulted, the concerns voiced and the extent to which this information was incorporated in the design of the project as well as in the EIS. The EIS will provide a summary of key issues raised related to the environmental assessment as well as describe any outstanding issues and ways to address them.

5. ABORIGINAL ENGAGEMENT AND CONCERNS

For the purposes of developing the EIS, the proponent will engage with Aboriginal groups that may be affected by the project, to obtain their views on:

- Effects of changes to the environment on Aboriginal peoples (health and socio-economic issues; physical and cultural heritage, including any structure, site or thing that is of historical, archaeological, paleontological or architectural significance; and current use of lands and resources for traditional purposes), and
- Potential adverse impacts of the project on potential or established Aboriginal or Treaty rights.

With respect to the above matters and in addition to information requirements outlined in Part 2, Sections 6.1.9 and 6.3.5, of these Guidelines, the EIS will document:

- VCs suggested by Aboriginal groups for inclusion in the EIS, whether they were included, and the rationale for any exclusions;
- each group's potential or established rights (including geographical extent, nature, frequency, timing), including maps and data sets (e.g. fish catch numbers) when this information is provided by a group to the proponent or available through public records;
- based on the proponent's perspective, the potential adverse impacts of each of the project components and physical activities, in all phases, on potential or established Aboriginal or Treaty rights. This assessment is to be based on a comparison of the exercise of the identified rights between the predicted future conditions with the project and the predicted

future conditions without the project. Include the perspectives of Aboriginal groups where these were provided to the proponent by the groups;

- based on the proponent’s perspective, the measures identified to avoid, mitigate, or accommodate potential adverse impacts of the project on the potential or established Aboriginal or Treaty rights. These measures will be written as specific commitments that clearly describe how the proponent intends to implement them;
- based on the proponent’s perspective, the effects of changes to the environment on Aboriginal peoples or potential adverse impacts on potential or established Aboriginal or Treaty rights that have not been fully mitigated or accommodated as part of the environmental assessment and associated engagement with Aboriginal groups, including the potential adverse effects that may result from the residual and cumulative environmental effects. Include the perspectives of Aboriginal groups where these were provided to the proponent by the groups;
- specific suggestions raised by Aboriginal groups for mitigating the effects of changes to the environment on Aboriginal peoples or accommodating potential adverse impacts of the project on potential or established Aboriginal and Treaty rights;
- views expressed by Aboriginal groups on the effectiveness of the avoidance, mitigation or accommodation measures or on the analysis of alternative means;
- from the proponent’s perspective, any potential cultural, social and/or economic impacts or benefits to Aboriginal groups that may arise as a result of the project. Include the perspectives of Aboriginal groups where these were provided to the proponent by the groups;
- comments, specific issues and concerns raised by Aboriginal groups and how the key concerns were responded to or addressed;
- changes made to the project design and implementation directly as a result of discussions with Aboriginal groups;
- where and how Aboriginal traditional knowledge was incorporated into the environmental effects assessment (including baseline conditions and effects analysis for all VCs) and the consideration of potential adverse impacts on potential or established Aboriginal or Treaty rights and related mitigation measures; and
- any additional issues and concerns raised by Aboriginal groups in relation to the environmental effects assessment and the potential adverse impacts of the project on potential or established Aboriginal and Treaty rights.

Information provided related to potential adverse impacts on potential or established Aboriginal or Treaty rights will be considered by the Crown in meeting its common law duty to consult obligations as set out in the *Updated Guidelines for Federal Officials to Fulfill the Duty to Consult* (2011)⁵.

5.1. Aboriginal Groups to Engage & Engagement Activities

With respect to engagement activities, the EIS will document:

⁵ Visit the Aboriginal Affairs and Northern Development Canada website at: www.aadnc-aandc.gc.ca/eng/1100100014680/1100100014681

- the engagement activities undertaken with Aboriginal groups prior to the submission of the EIS, including the date and means of engagement (e.g., meeting, mail, telephone);
- any future planned engagement activities; and,
- how engagement activities by the proponent allowed Aboriginal groups to understand the project and evaluate its effects on their communities, activities, potential or established Aboriginal or Treaty rights and other interests.

In preparing the EIS, the proponent will ensure that Aboriginal groups have access to timely and relevant information on the project and how the project may adversely impact them. The proponent will structure its Aboriginal engagement activities to provide adequate time for Aboriginal groups to review and comment on the relevant information. Engagement activities are to be appropriate to the groups' needs and should be arranged through discussions with the groups. The EIS will describe all efforts, successful or not, taken to solicit the information required from Aboriginal groups to support the preparation of the EIS.

The proponent will ensure that views of Aboriginal groups are recorded. The proponent will keep detailed tracking records of its engagement activities, recording all interactions with Aboriginal groups, the issues raised by each Aboriginal group and how the proponent addressed the concerns raised. The proponent will share these records with the Agency.

The proponent should consider translating information for Aboriginal groups into the appropriate Aboriginal language(s) in order to facilitate engagement activities during the environmental assessment.

The proponent will hold meetings with the following potentially affected Aboriginal groups and facilitate these meetings by making key EA summary documents (baseline studies, EIS, key findings, plain language summaries) accessible :

- Blueberry River First Nation;
- Dene Tha' First Nation;
- Doig River First Nation;
- Duncan's First Nation;
- Fairview Métis Local
- Horse Lake First Nation;
- Métis Nation British Columbia - Region 7;
- Métis Nation of Alberta – Region 6;
- Sucker Creek First Nation; and
- Woodland Cree First Nation

For the above groups, the proponent will ensure there are sufficient opportunities for individuals and groups to provide oral input in the language of their choice. The proponent will ensure that these Aboriginal groups' views are heard and recorded.

There are additional Aboriginal groups that are expected to be less affected by the project and its related effects. The proponent will make key EA summary documents (draft/final EIS, key findings, plain language summaries) accessible to these Aboriginal groups and ensure their views are heard and recorded. These Aboriginal groups include:

- Athabasca Chipewyan First Nation;

- Beaver First Nation;
- Fort Chipewyan Metis Local 125;
- Fort Nelson First Nation;
- Halfway River First Nation;
- Kelly Lake Metis Settlement Society;
- Little Red River Cree Nation;
- Metis Nation of Alberta – Region 5;
- Mikisew Cree First Nation;
- Paddle Prairie Metis Settlement;
- Prophet River First Nation;
- Saulteau First Nation;
- Sturgeon Lake Cree Nation;
- Tallcree First Nation; and
- West Moberly First Nation.

The groups referenced above may change as more is understood about the environmental effects of the project and/or if the project or its components change during the EA. The Agency reserves the right to alter the list of Aboriginal groups that the proponent will engage as additional information is gathered during the assessment.

Upon receipt of knowledge or information of potential effects to an Aboriginal group not listed above, the proponent shall provide that information to the Agency or review panel at the earliest opportunity.

6. EFFECTS ASSESSMENT

6.1. Project setting and baseline conditions

Based on the definition of the project described in section 3 (Part 1), the EIS will present baseline information in sufficient detail to enable the identification of how the project could affect the VCs and an analysis of those effects. Should other VCs be identified during the conduct of the EA, the baseline condition for these components will also be described in the EIS. To determine the appropriate spatial and temporal boundaries to describe the baseline information, refer to section 3.3.3 (Part 1). As a minimum, the EIS will include a description of:

6.1.1. Atmospheric Environment

- ambient air quality in the project area and the results of a baseline survey of ambient air quality, including the following contaminants where appropriate: total suspended particulates, fine particulates (PM_{2.5}), particulate matters up to 10 micrometers in size (PM-10), sulfur oxide (SO_x), volatile organic compounds (VOCs) and nitrogen oxide (NO_x), carbon monoxide (CO);
- if regional ambient air quality monitoring data is used where the data collected is not within the regional study area, please provide a rationale as to the appropriateness of its use and any limitation to its representation to the local and regional study areas;
- include any mobile or temporary monitoring that was conducted for baseline collection purposes including the time period and representation of seasonal variations;

- current ambient noise levels at key receptor points (e.g. Aboriginal communities), including the results of a baseline ambient noise survey. Information on typical sound sources, geographic extent and temporal variations will be included;
- existing ambient night-time light levels at the project site and at any other areas where project activities could have an effect on light levels. The EIS will describe night-time illumination levels during different weather conditions and seasons;
- historical records of relevant meteorological information (e.g., total precipitation (rain and snow, mean, maximum and minimum temperatures and typical wind speed and direction), including frequency and severity of extreme weather events; and
- GHG baseline information to provide an understanding of the potential net contribution of the Project to GHG levels by using site specific mass balance models to account for net GHG emissions under current conditions using CO₂ equivalents.

6.1.2. Geology and geochemistry

- the bedrock and geology of the river channel and surrounding area, including a table of geologic descriptions, geological maps and cross-sections of appropriate scale;
- bedrock lithology, geomorphology and geotechnical characteristics of areas proposed for construction of major project components;
- the geochemical characterization of excavated materials such as waste rock and potential construction material in order to predict metal leaching and acid rock drainage⁶;
- geological hazards that exist in the areas planned for the project facilities and infrastructure, including:
 - ✓ landslides, slope erosion and the potential for ground and rock instability, and subsidence following project activities;
 - ✓ history of seismic activity in the area;
 - ✓ isostatic rise or subsidence;
- sites that may be of paleontological and paleobotanical interest; and
- a description of regional and local geological structures, including major and local features, their formation, and general distribution.

6.1.3. Topography and soil

- baseline mapping and description of landforms and soils within the local and regional project area;
- soil maps depicting soil type distribution and diversity and properties (soil pH, organic matter, depths of horizon);
- potential for soil instability and erosion; and

⁶ The manual produced by the Mine Environment Neutral Drainage (MEND) Program, entitled, MEND Report 1.20.1, "Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials", Version 0 - December 2009 is a recommended reference for use in acid rock drainage and metal leaching prediction.

- suitability of topsoil and overburden for use in the rehabilitation of disturbed areas;

6.1.4. Groundwater and Surface Water

- local and regional hydrogeology, including:
 - ✓ the hydrogeological context, including the delineation of key stratigraphic and hydrogeologic boundaries, spatial distribution of major features, flow characteristics;
 - ✓ the physical properties of the hydrogeological units (e.g., hydraulic conductivity, transmissivity, saturated thickness, storativity, porosity, specific yield);
 - ✓ water quality and composition);
 - ✓ mercury and methylmercury concentrations, stores, mobility and fate in groundwater (including pre-development);
 - ✓ the groundwater flow patterns and rates;
 - ✓ a delineation and characterization of groundwater surface water interactions including the locations of groundwater discharge to surface water and surface water recharge to groundwater;
 - ✓ temporal changes in groundwater flow (e.g., seasonal and long term changes in water levels);
 - ✓ a discussion of the hydrogeologic, hydrologic, geomorphic, climatic and anthropogenic controls on groundwater flow;
 - ✓ any local and regional groundwater resource use, including potable water and agricultural water uses, and a description of their current use and potential for future use;
 - ✓ all groundwater monitoring wells that may provide data relevant to the project, including their locations; and
 - ✓ any monitoring protocols in place for collection of existing groundwater data; and
 - ✓ an appropriate hydrogeologic model for the project area, including major structures such as the headpond and headworks, that discusses hydrogeological systems, flow regimes, analyses sensitivity to climatic variations (e.g. seasonal recharge) and hydrogeologic parameters (e.g. hydraulic conductivity) and includes a discussion of model assumptions.
- hydrology of the Peace River⁷ watershed, including:
 - ✓ the delineation of drainage basins, at appropriate scales (water bodies and watercourses), including intermittent streams, flood risk areas and wetlands, boundaries of the watershed and subwatersheds, overlaid by key project components;
 - ✓ regional and local hydrology, including maps and relevant diagrams;
 - ✓ historic hydrology conditions, and a discussion of how the regulation of the Peace River by BC Hydro's W.A.C.Bennett Dam and Peace Canyon Dam has altered that hydrology;
 - ✓ a discussion of how hydrology conditions may change with existing and currently approved hydroelectric dams;

⁷ Consideration of the Peace River should include the entire river, from its headwaters at Williston Lake in British Columbia to its confluence with Lake Athabasca, including the Peace-Athabasca Delta; as well as major tributaries contributing to flows along the Peace River's course.

- ✓ for each affected water body and watercourse, the total surface area, bathymetry, maximum and mean depths, water level fluctuations, type of substrate (sediments), mean and extreme discharge data for watercourses at monthly, seasonal and annual timescales, mean and extreme water level data for water bodies at monthly, seasonal and annual timescales,, sediment transport characteristics, and sediment quality data;
- ✓ any seasonal water quality data (e.g. water temperature, turbidity, pH, dissolved oxygen, suspended sediments, chemistry, trace metals, nutrient load) and analytical interpretation at several representative local stream and water body monitoring stations established at the project site;
- ✓ any local and regional potable surface water resource;
- ✓ ice formation and mechanical and dynamic break-up processes on the Peace River and associated tributaries, including any ice formation modelling done that describes seasonal variation, climatic variability, ice thickness and abundance and includes a discussion of model assumptions;
- ✓ organic carbon stores within water impoundment area; and
- ✓ mercury and methylmercury concentrations, stores, mobility and fate in surface waters and sediments (including pre-development).

6.1.5. Fish and fish habitat

For potentially affected surface waters:

- fish populations on the basis of species and life stage, abundance, distribution, and movements, including information on the surveys carried out and the source of data available (e.g. location of sampling stations, catch methods, date of catches, species);
- aquatic resources (e.g. benthic communities, aquatic invertebrates, feeder species, aquatic plants) in terms of abundance, distribution, general life cycles, movements, and seasonal availability;
- habitat by homogeneous section, including the length of the section, width of the channel from the high water mark (bankful width), water depths, type of substrate (sediments), aquatic and riparian vegetation, and photos;
- instream flow needs and habitat preferences for resident fish species in the Peace River;
- natural obstacles (e.g. falls, beaver dams) or existing structures (e.g. water crossings) that hinder the free passage of fish;
- maps, at a suitable scale, indicating the surface area of potential or confirmed fish habitat for spawning, nursery, feeding, overwintering, migration routes, etc. This information should be linked to water depths (bathymetry) to identify the extent of a water body's littoral zone;
- fish or invertebrate species at risk that are known to be present;
- type and location of suitable habitats for fish species at risk that appear on federal and provincial lists and that are found or are likely to be found in the study area; and
- mercury and methylmercury concentrations, stores, mobility and fate in the aquatic ecosystem, including fish and fish habitat.

Note that certain intermittent streams or wetlands may constitute fish habitat or contribute indirectly to fish habitat. The absence of fish at the time of the survey does not irrefutably indicate an absence of fish habitat.

6.1.6. Migratory birds and their habitat⁸

- bird populations (including non-migratory birds) and their habitat, including waterfowl, landbirds, shorebirds, waterbirds and raptors, and detailing abundance, distribution, movements and seasonal habitat use and presence;
- various ecosystems found in the project area likely to be affected based on existing information (land cover type, vegetation);
- year-round migratory bird use of the area (e.g., winter use, spring migration, breeding season, fall migration); and
- type and location of suitable habitats for bird species at risk that appear on federal and provincial lists and that are found or are likely to be found in the study area.

6.1.7. Species at Risk

- a list of all potential or known federally listed species at risk that may be affected by the project (fauna and flora), using existing data and literature as well as surveys to provide baseline data;
- a list of all federal species designated by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) for listing on Schedule 1 of the *Species at Risk Act*. This will include those species in the risk categories of extirpated, endangered, threatened and special concern.⁹
- any published studies that describe the regional importance, abundance and distribution of species at risk; and,
- residences, seasonal movements, movement corridors, habitat requirements, key habitat areas, identified critical habitat and/or recovery habitat (where applicable) and general life history of species at risk that may occur in the project area, or be affected by the project.

6.1.8. Aboriginal peoples

With respect to potential effects on Aboriginal peoples and the related VCs, baseline information will be provided for each Aboriginal group identified in section 5 (and any groups identified after these guidelines are finalized). Baseline information will describe and characterize the following, based on the spatial and temporal scope selected for the assessment:

- location of traditional use areas (including maps where available);
- location of reserves and communities;
- location of hunting camps and cabins;

⁸ Surveys should be designed with reference to the Canadian Wildlife Service's guidance such as Technical Report No. 508, *A Framework for the Scientific Assessment of Potential Project Impacts on Birds* (Hanson *et al.* 2009). Appendix 3 of the Framework provides examples of project types and recommended techniques for assessing impacts on migratory birds.

⁹ Proponents are encouraged to consult COSEWIC's annual report for a listing of the designated wildlife species: http://www.cosewic.gc.ca/eng/sct0/index_e.cfm#sar

- drinking water sources (permanent, seasonal, periodic, or temporary);
- consumption or other uses of country foods;
- commercial activities (e.g. fishing, trapping, hunting, forestry, outfitting);
- recreational uses;
- traditional uses currently practiced or practiced in recent history;
- fish, wildlife, birds, plants or other natural resources of importance for traditional use;
- places where fish, wildlife, birds, plants or other natural resources are harvested, including migration routes where applicable;
- access, transportation methods and travel routes for conducting traditional practices;
- frequency, duration or timing of traditional practices;
- cultural values associated with the area affected by the project and the traditional uses identified; and,
- physical and cultural heritage¹⁰ (including any site, structure or thing of archaeological, paleontological, historical or architectural significance)
- areas of concentration of migratory animals, such as breeding, denning and/or wintering areas;
- ungulates, furbearers, amphibians, small mammals, and their habitat;
- existing or proposed protected areas, special management areas, and conservation areas in the regional study area;
- wetlands most likely to be affected by project activities according to their location, size, type (wetland class and form), species composition and ecological function (Canadian Wetland Classification System, National Wetlands Working Group, 1997);
- key plant communities and animals that rely on wetlands; and
- any culturally important or unique ecotype (e.g. old growth forest).

Any other baseline information that supports the analysis of predicted effects on Aboriginal peoples will be included as necessary. The EIS will also indicate how input from Aboriginal groups was used in establishing the baseline conditions related to health and socio-economics, physical and cultural heritage and current use of lands and resources for traditional purposes.

6.1.9. Human environment

- the rural and urban settings likely to be affected by the project;
- transportation infrastructure likely to be affected by the project;
- the current use of land in the study area, including a description of hunting, recreational and commercial fishing, trapping, gathering, outdoor recreation, use of seasonal cabins, outfitters;

¹⁰ Heritage resources to be considered will include but not be limited to, physical objects (e.g. middens, culturally-modified trees, historic buildings), sites or places (e.g. burial sites, sacred sites, cultural landscapes) and attributes (e.g. language, beliefs).

- current use of all waterways and water bodies that will be directly affected by the project, including recreational uses, where available;
- location of and proximity of any permanent, seasonal or temporary residences or camps;
- health¹¹ and socio-economic conditions, including the functioning and health of the socio-economic environment, encompassing a broad range of matters that affect communities in the study area in a way that recognizes interrelationships, system functions and vulnerabilities;
- physical and cultural heritage, including structures, sites or things of historical, archaeological, paleontological or architectural significance.

6.2. Predicted Changes to the Physical Environment

The assessment will include a consideration of the predicted changes to the environment as a result of the project being carried out or as a result of any powers duties or functions that are to be exercised by the federal government in relation to the project. These predicted changes to the environment are to be considered in relation to each phase of the project (construction, operation, decommissioning, and abandonment) and are to be described in terms of the geographic extent of the changes, the duration and frequency of change, the magnitude of change and whether the environmental changes are reversible or irreversible.

6.2.1. Changes to the Atmospheric Environment

- Changes in air quality;
- Changes in ambient noise levels;
- Changes in night-time light levels;

6.2.2. Changes to Groundwater, Surface Water and Fluvial Morphology¹²

- Changes to water quality (including turbidity, dissolved oxygen and other gases, water temperature, pH, suspended sediments, chemistry, trace metals, nutrient load);
- Changes to the hydrological and hydrometric conditions including instream flow conditions such as velocity, quantity, depth, seasonal changes and flooding stages;
- Changes to the ecological functions provided by the Peace River (such as flooding recharge to waterbodies, sediment transport, quantity or quality);
- Changes to fluvial geomorphology, including the changes to the channel, bed and erosion processes contributing to channel stability;
- Changes in thermal regime of the Peace River, including a description of the thermal regime of the proposed headpond;

¹¹ The proponent should refer to Health Canada's Useful Information for Environmental Assessments document in order to include the appropriate baseline information relevant to human health. This document can be obtained at http://www.hc-sc.gc.ca/ewh-semt/pubs/eval/envIRON_assess-eval/index-eng.php

¹² When describing changes to the Peace River, the proponent should indicate whether the change is measured against conditions prior to hydroelectric development on the river or against a current baseline regulated river system.

- Changes to ice regime, including ice thickness and strength during break-up and freeze-up (formation), the hydrologic processes associated with ice jamming and the implications of these changes to other processes in the Peace River, for example flooding;
- Changes to groundwater recharge/discharge areas, groundwater/surface water interactions, and any changes to groundwater infiltration areas, including changes to groundwater quality; and
- Changes to mercury and methylmercury concentrations in surface water, groundwater, sediments and submerged soils/matter.

6.2.3. Changes to Terrestrial Landscape

- Overall description of changes related to landscape disturbance;
- Changes to migratory bird habitat, including losses, gains, structural changes, fragmentation of habitat and wetlands (cover types, ecological land unit in terms of quality, quantity, diversity, distribution and functions) used by migratory birds;
- Changes to habitat for federal listed species at risk listed in Part 2, section 6.1.7;
- Changes to key habitat for species important to Aboriginal groups.

6.3. Predicted Effects on Valued Components

Based on the predicted changes to the environment identified in section 6.2, the proponent is to assess the environmental effects of the project on the following VCs:

6.3.1. Fish and Fish Habitat

- the identification of any potential serious harm to fish or fish habitat, including the calculations of any potential habitat loss (temporary or permanent) in terms of surface areas (e.g. spawning grounds, fry-rearing areas, feeding), and in relation to watershed availability and significance and estimates of direct mortality or morbidity due to entrainment and impingement associated with the intake structures. The assessment will include a consideration of:
 - ✓ the geomorphological changes and their effects on hydrodynamic conditions and fish habitats (e.g. modification of substrates, dynamic imbalance, silting of spawning beds);
 - ✓ the modifications of hydrological and hydrometric conditions on fish habitat and on the fish species' life cycle activities (e.g. reproduction, fry-rearing, movements);
 - ✓ potential impacts on riparian areas that could affect aquatic biological resources and productivity taking into account any anticipated modifications to fish habitat;
 - ✓ any potential imbalances in the food web in relation to baseline; and
 - ✓ the potential risk of methylmercury production, release, bioaccumulation and biomagnification in fish habitat and fish.
- the effects of changes to the aquatic environment on fish and their habitat, including:
 - ✓ changes to water quality or quantity, including nutrient availability, turbidity, temperature, and dissolved gases;

- ✓ the anticipated changes in the composition and characteristics of the populations of various fish species, included shellfish and forage fish;
 - ✓ any modifications in migration or local movements (upstream and downstream migration, and lateral movements) following the construction and operation of works (physical and hydraulic barriers);
 - ✓ any reduction in fish populations as a result of potential overfishing due to increased access to the project area; and
 - ✓ any modifications and use of habitats by federally or provincially listed fish species.
- a discussion of how project construction timing correlates to key fisheries windows for freshwater and anadromous species, and any potential impacts resulting from overlapping periods; and
 - a discussion of how vibration caused by blasting may affect fish behaviour, such as spawning or migrations.

6.3.2. Migratory Birds

- the identification of any potential impacts to migratory birds or their habitat, including staging and nesting areas, foraging grounds, and landing sites. The assessment will include a consideration of:
 - ✓ any potential for direct migratory bird mortality or morbidity;
 - ✓ changes to the environment that may impact migration patterns and flyways;
 - ✓ any direct habitat loss or gain, including a discussion of ecosystem availability and ecological context;
 - ✓ the potential for habitat fragmentation, loss of connectivity or other change causing a reduction of habitat quality;
 - ✓ changes to predator/prey relationships (including non-migratory predators) and species composition balance and how that may impact bird populations;
 - ✓ effects caused by increased disturbance (e.g. noise, light, presence of workers, electrical transmission lines); and
 - ✓ water quality including the risk of methylmercury production and accumulation in migratory birds.

6.3.3. Species at Risk

- for each habitat unit, the potential effects of the project on federally listed species at risk and those species listed by the Committee on the Status of Endangered Wildlife in Canada classified as extirpated, endangered, threatened or of special concern (flora and fauna) and their critical habitat.
- identify any potential direct or indirect effects on those identified species at risk.

6.3.4. Aboriginal peoples

With respect to Aboriginal peoples, a description and analysis of how changes to the environment caused by the project will affect:

- the current uses of land and resources for traditional purposes, including, but not limited to:

- ✓ any effects on resources (fish, wildlife, birds, plants or other natural resources) used for traditional uses or cultural importance/activities (e.g. hunting, fishing, trapping, collection of medicinal plants);
 - ✓ any effects of alterations to access into the areas used for traditional uses, including development of new roads, deactivation or reclamation of access roads and changes to waterways that affect navigation;
 - ✓ any effects on cultural value or importance associated with traditional uses or areas affected by the project (e.g. inter-generational teaching of language or traditional practices, communal gatherings);
 - ✓ how project construction timing correlates to the timing of traditional practices, and any potential impacts resulting from overlapping periods;
 - ✓ the regional value of traditional use of the project area and the anticipated effects to traditional practice of the Aboriginal group, including alienation of lands from Aboriginal traditional use;
 - ✓ indirect effects such as avoidance of the area by Aboriginal peoples due to increased disturbance (e.g. noise, presence of workers); and
 - ✓ an assessment of the potential to return affected areas to pre-disturbance conditions to support traditional practices.
- human health, considering, but not limited to potential changes in air quality, quality and availability of country foods, drinking water quality, and noise exposure. When risks to human health due to changes in one or more of these components are predicted, a complete Human Health Risk Assessment (HHRA) examining all exposure pathways for pollutants of concern may be necessary to adequately characterize potential risks to human health;
 - socio-economic conditions, including but not limited to:
 - ✓ the use of navigable waters;
 - ✓ forestry and logging operations;
 - ✓ commercial fishing, hunting, trapping, and gathering activities;
 - ✓ commercial outfitters; and
 - ✓ recreational use.
 - physical and cultural heritage, and any structure, site or thing of historical, archaeological, paleontological or architectural significance to Aboriginal groups, including, but not limited to:
 - ✓ the loss or destruction of physical and cultural heritage;
 - ✓ changes to access to physical and cultural heritage; and,
 - ✓ changes to the cultural value or importance associated with physical and cultural heritage.
 - Other effects of changes to the environment on Aboriginal peoples should be reflected as necessary.
- 6.3.5. Other VCs (Selected because of federal lands, interprovincial, international concerns or related to issuance of a permit (if relevant))

Based on the changes to the environment that have been identified in section 6.2, additional VCs are to be selected based on the following:

- Interprovincial transboundary impacts
- Federal decisions under the *Navigation Protection Act* and the *Fisheries Act*

If there is the potential for the project to result in environmental changes on another province, then VCs of importance not already identified above are to be listed in this section.

6.4. Mitigation

Every EA conducted under CEAA 2012 will consider measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the project. Each measure will be specific, achievable, measurable and verifiable, and described in a manner that avoids ambiguity in intent, interpretation and implementation. Mitigation measures may be considered for inclusion as conditions in the EA decision statement and/or in other compliance and enforcement mechanisms provided by other authorities' permitting or licensing processes.

As a first step, the proponent is encouraged to use an approach based on the avoidance and reduction of the effects at the source. Such an approach may include the modification of the design of the project or relocation of project components.

The EIS will describe the standard mitigation practices, policies and commitments that constitute technically and economically feasible mitigation measures and that will be applied as part of standard practice regardless of location (including the measures directed at promoting beneficial or mitigating adverse socio-economic effects). The EIS will then describe the project's environmental protection plan and its environmental management system, through which the proponent will deliver this plan. The plan will provide an overall perspective on how potentially adverse effects would be minimized and managed over time. The EIS will further 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.

The EIS will then describe mitigation measures that are specific to each environmental effect identified. Measures will be written as specific commitments that clearly describe how the proponent intends to implement them and the environmental outcome the mitigation is designed to address. Where mitigation measures have been identified in relation to species and/or critical habitat listed under the *Species at Risk Act*, the mitigation measures will be consistent with any applicable recovery strategy and action plans.

The EIS will specify the actions, works, minimal disturbance footprint techniques, best available technology, corrective measures or additions planned during the project's various phases to eliminate or reduce the significance of adverse effects. The impact statement will also present an assessment of the effectiveness of the proposed technically and economically feasible mitigation measures. The reasons for determining if the mitigation measure reduces the significance of an adverse effect will be made explicit.

The EIS will indicate what other technically and economically feasible mitigation measures were considered, and explain why they were rejected. Trade-offs between cost savings and effectiveness of

the various forms of mitigation will be justified. The EIS will identify who is responsible for the implementation of these measures and the system of accountability.

Where mitigation measures are proposed to be implemented for which there is little experience or for which there is some question as to their effectiveness, the potential risks and effects to the environment should those measures not be effective will be clearly and concisely described. In addition, the EIS will identify the extent to which technology innovations will help mitigate environmental 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.

Adaptive management is not considered as a mitigation measure, but if the follow-up program (refer to section 9) indicates that corrective action is required the proposed approach for managing the action should be identified.

6.5. Significance of residual effects

After having established the technically and economically feasible mitigation measures, the EIS will present any residual environmental effects of the project on the VCs identified in section 6.3. The residual effects, even if very small or deemed insignificant will be described.

The EIS will then provide an analysis of the significance of the residual environmental effects that are considered adverse, using guidance described in section 4 of the Agency's reference guide *Determining Whether a Project is Likely to Cause Significant Adverse Environmental Effects*¹³.

The EIS will identify the criteria used to assign significance ratings to any predicted adverse effects. It will contain clear and sufficient information to enable the Agency or review panel, technical and regulatory agencies, Aboriginal groups and the public to review the proponent's analysis of the significance of effects. The EIS will document the terms used to describe the level of significance.

The following criteria should be used in determining the significance of residual effects:

- magnitude;
- geographic extent;
- duration;
- frequency;
- reversibility;
- ecological and social context; and
- existence of environmental standards, guidelines or objectives for assessing the impact.

In assessing significance against these criteria the proponent will, where possible, use relevant existing regulatory documents, environmental standards, guidelines, or objectives such as prescribed maximum levels of emissions or discharges of specific hazardous agents into the environment. The EIS will contain a section which explains the assumptions, definitions and limits to the criteria mentioned above in order to maintain consistency between the effects on each VC.

¹³ Visit the Canadian Environmental Assessment Agency's website at: www.ceaa-acee.gc.ca/default.asp?lang=En&n=D213D286-1&offset=&toc=hide

Where significant adverse effects are identified, the EIS will set out the probability (likelihood) that they will occur, and describe the degree of scientific uncertainty related to the data and methods used within the framework of its environmental analysis.

6.6. Other effects to consider

6.6.1. Effects of potential accidents or malfunctions

The failure of certain works caused by human error or exceptional natural events (e.g. flooding, earthquake, dam failure) could cause major effects. The proponent will therefore conduct an analysis of the risks of accidents and malfunctions, determine their effects and present preliminary emergency measures.

Taking into account the lifespan of different project components, the proponent will identify the probability of potential accidents and malfunctions related to the project, including an explanation of how those events were identified, potential consequences (including the environmental effects as defined in section 5 of CEEA 2012), the plausible worst case scenarios and the effects of these scenarios.

This assessment will include an identification of the magnitude of an accident and/or malfunction, including the quantity, mechanism, rate, form and characteristics of the contaminants and other materials likely to be released into the environment during the accident and malfunction events and would potentially result in an adverse environmental effect as defined in section 5 of CEEA 2012.

The EIS will describe the safeguards that have been established to protect against such occurrences and the contingency and emergency response procedures in place if such events do occur.

6.6.2. Effects of the environment on the project

The EIS will take into account how local conditions and natural hazards, such as severe and/or extreme weather conditions and external events (e.g. flooding, drought, ice jams, landslides, avalanches, erosion, subsidence, fire, outflow conditions and seismic events) could adversely affect the project and how this in turn could result in impacts to the environment (e.g., extreme environmental conditions result in malfunctions and accidental events). These events will be considered in different probability patterns (i.e. 5-year flood vs. 100-year flood). Longer-term effects of climate change will also be discussed up to the projected post-closure phase of the project. This discussion will include a description of climate data used.

The EIS will provide details of planning, design and construction strategies intended to minimize the potential environmental effects of the environment on the project.

6.6.3. Cumulative effects assessment

The proponent will identify and assess the project's cumulative effects using the approach described in the Agency's Operational Policy Statement entitled *Addressing Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012* and the guide entitled *Technical Guidance*

*for Assessing Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012*¹⁴.

Cumulative effects are defined as changes to the environment due to the project combined with the existence of other past, present and reasonably foreseeable physical activities. Cumulative effects may result if:

- implementation of the project being studied may cause direct residual adverse effects on the valued components, taking into account the application of technically and economically feasible mitigation measures; and,
- the same valued components may be affected by other past, present or reasonably foreseeable physical activities.

Valued components that would not be affected by the project or would be affected positively by the project can, therefore, be omitted from the cumulative effects assessment, with a rationale for the omission of these VCs. A cumulative effect on an environmental component may, however, be important even if the assessment of the project's effects on this component reveals that the effects of the project are minor.

In its EIS, the proponent will:

- Identify and provide a rationale for the valued components that will constitute the focus of the cumulative effects assessment, emphasizing this assessment on the VCs most likely to be affected by the project and other project and activities. To this end, the proponent must consider, without limiting itself thereto, the following components likely to be affected by the project:
 - ✓ Peace River¹⁵, including its hydrology and ice formation processes;
 - ✓ fish and fish habitat, including bull trout and other valued fish species;
 - ✓ migratory birds
 - ✓ species at risk; and
 - ✓ Aboriginal peoples.
- Identify and justify the spatial and temporal boundaries for the cumulative effect assessment for each VC selected. The boundaries for the cumulative effects assessments will generally be different for each VC considered. These cumulative effects boundaries will also generally be larger than the boundaries for the corresponding project effects;
- Identify the sources of potential cumulative effects. Specify other projects or activities that have been or that are likely to be carried out that could cause effects on each selected VC within the boundaries defined, and whose effects would act in combination with the residual effects of the project. This assessment may consider the results of any relevant study conducted by a committee established under section 73 or 74 of CEEA 2012.
- Describe the mitigation measures that are technically and economically feasible. The proponent shall assess the effectiveness of the measures applied to mitigate the cumulative effects. In cases where measures exist that are beyond the scope of the proponent's

¹⁴ Visit the Canadian Environmental Assessment Agency's website at: www.ceaa-acee.gc.ca

¹⁵ See footnote 7

responsibility that could be effectively applied to mitigate these effects, the proponent will identify these effects and the parties that have the authority to act. In such cases, the EIS will summarize the discussions that took place with the other parties in order to implement the necessary measures over the long term;

- Determine the significance of the cumulative effects;
- Develop a follow-up program to verify the accuracy of the assessment or to dispel the uncertainty concerning the effectiveness of mitigation measures for certain cumulative effects.

The proponent is encouraged to consult with key stakeholders and Aboriginal groups prior to finalizing the choice of VCs and the appropriate boundaries to assess cumulative effects.

7. SUMMARY OF ENVIRONMENTAL EFFECTS ASSESSMENT

The EIS will contain a table summarising the following key information:

- potential environmental effects;
- proposed mitigation measures to address the potential environmental effects; and
- potential residual effects and the significance of the residual environmental effects;

The summary table will be used in the EA Report prepared by the Agency or review panel. An example of a format for the key summary table is provided in Appendix 1 of this document.

In a second table, the EIS will summarize all key mitigation measures and commitments made by the proponent which will more specifically mitigate any significant adverse effects of the project on valued components (i.e., those measures that are essential to ensure that the project will not result in significant adverse environmental effects).

8. FOLLOW-UP AND MONITORING PROGRAMS

A follow-up program is designed to verify the accuracy of the effects assessment and to determine the effectiveness of the measures implemented to mitigate the adverse effects of the project. The goal of a monitoring program is to ensure that proper measures and controls are in place in order to decrease the potential for environmental degradation during all phases of project development, and to provide clearly defined action plans and emergency response procedures to account for human and environmental health and safety.

8.1. Follow-up Program

The duration of the follow-up program shall be as long as required for the environment to regain its equilibrium and to evaluate the effectiveness of the mitigation measures.

The EIS shall present a preliminary follow-up program in particular for areas where scientific uncertainty exists in the prediction of effects. This program shall include:

- objectives of the follow-up program and the VCs targeted by the program;
- list of elements requiring follow-up;

- number of follow-up studies planned as well as their main characteristics (list of the parameters to be measured, planned implementation timetable, etc.);
- intervention mechanism used in the event that an unexpected deterioration of the environment is observed;
- mechanism to disseminate follow-up results among the concerned populations;
- accessibility and sharing of data for the general population;
- opportunity for the proponent to take advantage of the participation of Aboriginal groups and stakeholders on the affected territory, during the implementation of the program; and
- involvement of local and regional organizations in the design, implementation and evaluation of the follow-up results as well as any updates, including a communication mechanism between these organizations and the proponent.

8.2. Monitoring

The proponent will prepare an environmental monitoring program for all phases of the project. This program will help ensure that the project is implemented as proposed, that the mitigation or compensation measures proposed to minimize the project's environmental effects are effectively implemented, and that the conditions set at the time of the project's authorization and the requirements pertaining to the relevant laws and regulations are met. The monitoring program will also make it possible to check the proper operation of works, equipment and facilities. If necessary, the program will help reorient the work and possibly make improvements at the time of construction and implementation of the various elements of the project.

Specifically, the environmental impact statement shall present an outline of the preliminary environmental monitoring program, including the:

- identification of the interventions that pose risks to one or more of the components and the measures and means planned to protect the environment;
- description of the characteristics of the monitoring program where foreseeable (e.g., location of interventions, planned protocols, list of measured parameters, analytical methods employed, schedule, human and financial resources required);
- description of how monitoring results will be incorporated into forecasting tools and estimation methods (water quality models, loading estimates) in order to evaluate and update predictions;
- description of the proponent's intervention mechanisms in the event of the observation of non-compliance with the legal and environmental requirements or with the obligations imposed on contractors by the environmental provisions of their contracts; and
- guidelines for preparing monitoring reports (number, content, frequency, format) that will be sent to the authorities concerned.

Appendix 1 Example - Summary Table of Environmental Assessment

Valued Component affected	Area of federal jurisdiction ¹⁶ (v)	Project Activity	Potential effects	Proposed mitigation	Residual effect	<i>Magnitude</i>	<i>Extent</i>	<i>Duration</i>	<i>Frequency</i>	<i>Reversibility</i>	<i>Other criteria used to determine significance</i>	Significance of residual adverse effect
Fish and fish habitat												
Migratory birds												
Species at risk												
Current use of land and resource for traditional purpose	v 5(1)(c)(iii)											
Any other VCs identified												

¹⁶ Indicate by a check mark which valued components can be considered “environmental effects” as defined in section 5 of CEAA 2012, and specify which subsection of this Act is relevant. For example, for the VC “Use of land and resources by Aboriginal people”, the appropriate cell would indicate, section 5(1)(c)(iii).