



GUIDELINES FOR THE PREPARATION OF AN ENVIRONMENTAL IMPACT STATEMENT

pursuant to the

Canadian Environmental Assessment Act, 2012

James Bay Lithium Mine Project

Galaxy Lithium (Canada) Inc.

February 21, 2018

TABLE OF CONTENTS

GUIDELINES FOR THE PREPARATION OF AN ENVIRONMENTAL IMPACT STATEMENT	I
DISCLAIMER	V
ABBREVIATIONS AND SHORT FORMS	1
PART 1 - KEY CONSIDERATIONS	2
1. INTRODUCTION	2
2. GUIDING PRINCIPLES.....	2
2.1. Environmental assessment as a planning and decision making tool	2
2.2. Public participation	3
2.3. Consultation with Indigenous Nations	3
2.4. Application of the precautionary approach	3
3. SCOPE OF THE ENVIRONMENTAL ASSESSMENT.....	3
3.1. Designated project	3
3.2. Factors to be considered	4
3.2.1. Changes to the environment	5
3.2.2. Valued components to consider	5
3.2.3. Spatial and temporal boundaries	6
4. PREPARATION AND PRESENTATION OF THE ENVIRONMENTAL IMPACT STATEMENT	7
4.1. Guidance	7
4.2. Use of information	8
4.2.1. Government expert advice	8
4.2.2. Community knowledge and Aboriginal traditional knowledge.....	8
4.2.3. Existing information	8
4.2.4. Confidential information.....	8
4.3. Study strategy and methodology	9
4.4. Presentation and organization of the environmental impact statement	11
4.5. Summary of the environmental impact statement.....	11
PART 2 – CONTENT OF THE ENVIRONMENTAL IMPACT STATEMENT	13
1. INTRODUCTION AND OVERVIEW.....	13
1.1. The proponent	13
1.2. Project Overview	13
1.3. Project Location	13
1.4. Regulatory framework and the role of government	14
2. PROJECT JUSTIFICATION AND ALTERNATIVES CONSIDERED	14
2.1. Purpose of the project	14
2.2. Alternative means of carrying out the project.....	14
3. PROJECT DESCRIPTION	15
3.1. Project components	15
3.2. Project activities	16
3.2.1. Site preparation and construction	16
3.2.2. Operation	17

3.2.3.	Decommissioning and abandonment	17
4.	PUBLIC CONSULTATION AND CONCERNS	18
5.	CONSULTATION WITH INDIGENOUS NATIONS AND CONCERNS RAISED	18
5.1.	Aboriginal nations and consultation activities	20
6.	EFFECTS ASSESSMENT	21
6.1.	Project setting and baseline conditions	21
6.1.1.	Atmospheric, Light and Noise Environment	21
6.1.2.	Geology and geochemistry	22
6.1.3.	Topography, terrestrial environments and soil	22
6.1.4.	Riparian and Wetland Environments	22
6.1.5.	Ground water and Surface water.....	23
6.1.6	Fish and fish habitat	24
6.1.7	Migratory birds	25
6.1.8	Species at Risk.....	25
6.1.9	Indigenous peoples	26
6.1.10	Other changes to the environment arising as a result of a federal decision or due to changes on federal lands, in another province or outside Canada	27
6.1.11	Human environment	28
6.2	Predicted changes to the physical environment	28
6.2.1	Changes to atmospheric, sound and light environments	28
6.2.2	Changes to groundwater and surface water	29
6.2.3	Changes to riparian, wetland and terrestrial environments.....	30
6.3	Predicted effects on valued components	30
6.3.1	Fish and fish habitat	30
6.3.2	Migratory birds	31
6.3.3	Species at risk.....	31
6.3.4	Indigenous peoples	32
6.3.5	Other valued components that may be affected as a result of a federal decision or due to effects on federal lands, another province or outside Canada	33
6.4	Mitigation measures	34
6.5	Significance of residual effects.....	35
6.6	Other effects to consider	36
6.6.1	Effects of potential accidents or malfunctions	36
6.6.2	Effects of the environment on the project	36
6.6.3	Cumulative effects assessment.....	36
7	SUMMARY OF ENVIRONMENTAL EFFECTS ASSESSMENT	38
8	FOLLOW-UP AND MONITORING PROGRAMS	38

8.1	Follow-up program.....	39
8.2	Monitoring Program.....	39

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

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

Part 1 - Key Considerations

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 (EA) and provides guidance and general instruction that must be taken into account in preparing the EIS. Part 2 outlines the information that must be included in the EIS.

Section 5 of CEAA 2012 describes the environmental effects that must be considered in an EA, including changes to the environment and effects of changes to the environment. The factors that are to be considered in an EA are described under section 19 of CEAA 2012. The Canadian Environmental Assessment Agency (the Agency) will use the proponent's EIS and other information received during the EA process to prepare a report that will be considered for 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. The EIS must also include a list of key mitigation measures that the proponent proposes to undertake in order to avoid or minimize any adverse environmental effects of the project. 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.

2. GUIDING PRINCIPLES

2.1. Environmental assessment as a planning and decision making tool

Environmental assessment (EA) is a process to predict environmental effects of proposed projects before they are carried out. An EA:

- identifies potential adverse environmental effects;
- proposes measures to mitigate adverse environmental effects;
- predicts whether there will be significant adverse environmental effects, after mitigation measures are implemented; and
- includes a follow-up program to verify the accuracy of the EA and the effectiveness of the mitigation measures.

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

2.2. Public participation

One of the purposes identified in CEAA 2012 is to ensure that opportunities are provided for meaningful public participation during an EA. CEAA 2012 requires that the Agency provide the public with an opportunity to participate in the EA. For EAs led by the Agency the public has an opportunity during Agency consultations to comment on the project description, the draft EIS guidelines of the project, the summary of the Environmental Impact Statement, as well as the draft EA report. Additional opportunities for participation may also be provided.

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. Consultation with Indigenous Nations

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 potentially affected Nations, beginning as early as possible in the project planning process. The proponent shall provide potentially affected Nations with opportunities to learn about the project and its potential effects and to 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 potentially affected Nations to establish an engagement approach. The proponent will make reasonable efforts to integrate Aboriginal traditional knowledge into the assessment of environmental effects. For more information on incorporating Aboriginal traditional knowledge, refer to Part 1, Section 4.2.2 of these guidelines.

In order to fulfill the Crown's constitutional obligations to consult with potentially impacted Nations, the Agency integrates its legal obligation for consultation and accommodation in the EA process. The information gathered by the proponent during its consultation with Nations helps to contribute to the Crown's understanding of any potential adverse impacts on potential or established Aboriginal or treaty rights protected under section 35 of the *Constitution Act, 1982* ("section 35 Aboriginal rights") including title and related interests, and the effectiveness of measures proposed to avoid or minimize those impacts.

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.

3. SCOPE OF THE ENVIRONMENTAL ASSESSMENT

3.1. Designated project

On October 20, 2017, Galaxy Lithium (CANADA) Inc, the proponent of the James Bay Lithium Mine Project, provided a project description to the Agency. Based on this project description, the Agency has determined that an EA is required under CEAA 2012 and will include the construction, operation, decommissioning and abandonment of the following project components:

- open pit;
- operating ramps;
- ore, low grade ore, waste rock, overburden, tailings (dumps or parks), top soil stockpile areas;
- tailings management facility;
- water management, including capture, treatment and disposal infrastructure for both mine water and wastewater;
- ore treatment facility;
- explosive storage and manufacturing;
- effluent treatment;
- clearing, stripping, earthmoving, levelling, drilling and blasting activities;
- transportation corridor construction or improvement (road, rail, bridge);
- transportation of ore, ore concentrate, tailings and waste rock; paste fill plant;
- storage of petroleum and hazardous materials;
- water supply (industrial and drinking);
- power supply;
- borrow areas;
- administrative, maintenance, and storage buildings, camp, medical and emergency services.

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 the EA, 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 the effects referred to above;
- 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 alternative means;
- any change to the project that may be caused by the environment; and
- the results of any relevant regional study pursuant to CEAA 2012.

3.2.1. 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, the proponent 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.

3.2.2. Valued components to consider

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 proponent must conduct and focus its analysis on VCs as they relate to section 5 of CEAA 2012, including the ones identified in Section 6.2 (Part 2) of these guidelines 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 that may be caused to the environment on:
 - ✓ health and socio-economic conditions;
 - ✓ physical and cultural heritage;
 - ✓ the current use of lands and resources for traditional purposes; or
 - ✓ 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 perform a duty or function under another Act of Parliament:
 - ✓ 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 the performance of a duty or function; and
 - ✓ the effect of that change, other than the effects mentioned above, on:
 - health and socio-economic conditions;
 - physical and cultural heritage; or

- any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.

The list of VCs presented in the EIS will be completed according to the evolution and design of the project and reflect the knowledge acquired through public consultation and consultation with Indigenous Nations. The EIS will describe what methods were used to predict and assess the adverse environmental effects of the project on these valued 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 justify the exclusion of a particular VC or piece of information. Justification may be based on, for example, primary data collection, computer modelling, literature references, public consultation or consultation with Indigenous Nations, or expert input 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 (i.e. the public or Indigenous Nations) and the reasons why, including environmental, cultural, historical, social, economic, recreational, and aesthetic considerations, and traditional knowledge. If comments are received on a component that has not been included as a VC, these comments will be summarized and the rationale for excluding the component will address the comments.

3.2.3. Spatial and temporal boundaries

The spatial and temporal boundaries used in the EA may vary depending on the VC and will be considered separately for each VC, including for VCs related to the current use of lands and resources for traditional purposes by Aboriginal peoples, or other environmental effects referred to under paragraph 5(1)(c) of CEAA 2012. The proponent is encouraged to consult with the Agency, federal and provincial government departments and agencies, local government and Indigenous Nations, and take into account public comments when defining the spatial and temporal boundaries used in the EIS.

The EIS will describe the spatial boundaries, including local and regional study areas, of each VC 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 knowledge and Aboriginal traditional knowledge, current or traditional land and resource use by Indigenous Nations, ecological, technical, social and cultural considerations.

The temporal boundaries of the EA will span all phases of the project determined to be within the scope of this EA as specified under section 3.1 above. If impacts are predicted after project decommissioning, this should be taken into consideration in defining boundaries. Community knowledge and Aboriginal traditional knowledge should factor into decisions around defining 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 guidance² on topics to be addressed in the EIS, and to liaise with the Agency during the planning and development of the EIS. The proponent is also encouraged to consult relevant guidance documents from other federal departments, including Environment and Climate Change Canada's "*Guidance for the Preparation of an Environmental Impact Statement and Useful References*" (2017) And Health Canada's "*Useful Information for Environmental Assessment*" (2010)³.

In planning for a mine proposal and in developing the EIS and technical support documentation, the proponent is advised to consider the "Environmental Code of Practice for Metal Mines"⁴, published by Environment and Climate Change Canada in 2009. The recommended practices in the Code include the development and implementation of environmental management tools, the management of wastewater and mining wastes, and the prevention and control of environmental releases to air, water and land. In addition, the parameters and approach of the Environmental Effects Monitoring program under the *Metal Mining Effluent Regulations* (MMER) should be considered when developing a baseline monitoring program for the aquatic environment.

For projects requiring the use of natural water bodies frequented by fish for the disposal of mine waste, including tailings and waste rock and for the management of process water, the MMER would need to be amended to add the affected water bodies to Schedule 2 to designate them as tailings impoundment areas. This regulatory process will not be initiated until a detailed assessment of alternatives for mine waste disposal has been undertaken by the proponent. Conducting this robust and thorough assessment of alternatives during the EA will streamline the overall regulatory review process and minimize the time required to proceed with the MMER amendment process. It also facilitates a thorough and transparent review of the assessment of alternatives as part of the EA process. For further guidance, the proponent should consult Environment and Climate Change Canada's *Guidelines for the Assessment of Alternatives for Mine Waste Disposal* (2011).

In the event that the proponent chooses not to conduct an assessment of alternatives for mine waste disposal during the EA stage pursuant to the MMER requirements, the EA under CEAA 2012 will continue. In these circumstances, the proponent should discuss with Environment and Climate Change Canada how the information requirements and consultation associated with the MMER amendment process can be addressed through other means.

Submission of regulatory and technical information necessary for federal authorities to make their regulatory decisions during the conduct of the EA 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. While the EIS must outline applicable federal authorizations required for the project to proceed, the proponent must provide information relevant to the regulatory role of the federal government. It should be noted that the issuance of these other applicable federal legislative,

² Visit the Canadian Environmental Assessment Agency website: <https://www.canada.ca/en/environmental-assessment-agency/services/policy-guidance.html>

³ http://publications.gc.ca/collections/collection_2015/sc-hc/H128-1-10-599-eng.pdf

⁴ Visit Environment and Climate Change Canada's website at: <https://www.ec.gc.ca/lcpe-cepa/default.asp?lang=En&n=CBE3CD59-1>

regulatory and constitutional requirements are within the purview of the relevant federal authorities, and are subject to separate processes post EA decision.

4.2. Use of information

4.2.1. Government expert 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 must make that information or knowledge available to the Agency. The Agency will advise the proponent of the availability of pertinent information or knowledge or expert and specialist knowledge received from other federal authorities or other levels of government so that it can be incorporated into the EIS.

4.2.2. 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 local community or an Indigenous Nations.

The proponent will incorporate into the EIS the community knowledge and Aboriginal traditional knowledge to which it has access or that is acquired through public consultation and consultation with Indigenous Nations, in keeping with appropriate ethical standards and obligations of confidentiality. It is important that traditional knowledge holders are clearly informed of how the information provided will be used by the proponent. The proponent will integrate Aboriginal traditional knowledge into all aspects of its assessment including both methodology (e.g. establishing spatial and temporal boundaries, defining significance criteria) and analysis (e.g. baseline characterization, effects prediction, development of mitigation measures). Agreement should be obtained from Indigenous Nations regarding the use, management and protection of their existing traditional knowledge information during and after the EA. For more information on how Aboriginal traditional knowledge can be obtained and incorporated 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*”.

4.2.3. 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 using existing information, the proponent should also comment on how the data were 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.

4.2.4. Confidential information

In implementing CEAA 2012, the Agency is committed to promoting public participation in the EA of projects and providing access to the information on which EAs are based. All documents prepared or submitted by the proponent or any other stakeholder in relation to the EA 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 substantial harm to a person or specific 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.

4.3. Study strategy and methodology

The proponent is expected to respect the intent of these guidelines and to consider the environmental 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, Indigenous Nations, 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 VCs;
- identifying technically and economically feasible mitigation measures for any significant adverse environmental effects;
- determining any residual environmental effects;
- considering cumulative effects of the project in combination with other physical activities that have been or will be carried out; and
- determining the potential significance of any residual environmental effect following the implementation of mitigation measures.

For each VC, the EIS will describe the methodology used to assess project-related effects. The EIS could include an analysis of the pathway of the effects of environmental changes on each VC. The EIS will document where and how scientific, engineering, community knowledge and Aboriginal traditional 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, sensitivity and conservativeness of models used to reach conclusions must be indicated.

The EIS will identify all significant gaps in knowledge and understanding related to key conclusions, and the steps to be taken by the proponent to address these gaps. Where the conclusions drawn from scientific, engineering and technical knowledge are inconsistent with the conclusions drawn from Aboriginal traditional knowledge, the EIS will present each perspective on the issue 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. These 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 areas.

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 proponent will provide the references used in creating their approach to baseline data gathering, including identifying where appropriate, the relevant federal or provincial standards. The proponent is encouraged to discuss the timeframe and considerations for its proposed baseline data with the Agency prior to submitting its EIS.

In describing and assessing effects to the physical and biological environment, the proponent will take an ecosystem approach that considers both scientific and community knowledge and Aboriginal traditional knowledge and perspectives regarding ecosystem health and integrity. The proponent will consider the resilience of relevant species populations, communities and their habitats. The assessment of environmental effects on Aboriginal peoples, pursuant to paragraph 5(1)(c) of CEEA 2012, will undergo the same rigour and type of assessment as any other VC (including setting of spatial and temporal boundaries, identification and analysis of effects, identification of mitigation measures, determination of residual effects, identification and a clear explanation of the methodology used for assessing the significance of residual effects and assessment of cumulative effects).

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 and the current use of lands and resources for traditional purposes. Primary sources of information include traditional land use studies, socio-economic studies, heritage surveys or other relevant studies conducted specifically for the project and its EIS. Often these studies and other types of relevant information are obtained directly from Indigenous Nations. 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 Indigenous Nations the opportunity to review and provide comments on the information used for describing and assessing effects on Aboriginal peoples (further information on consultation with Indigenous Nations is provided in Part 2, Section 5 of this document). Where there are discrepancies in the views of the proponent and Indigenous Nations 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.

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. All technical studies prepared by or for the proponent as part of the environmental assessment will be submitted to the Agency.

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; and
- date of submission of the EIS.

The EIS will be written in clear, precise language. A glossary defining technical words, acronyms and abbreviations will be included. The EIS 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. 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 table of content with a list of all tables, figures, and photographs referenced in the text. 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 that will include the followings:

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

- a summary of the consultation with Indigenous Nations, and the consultation of 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, as described under section 5 of CEEA 2012, and proposed technically and economically feasible mitigation measures;
- an overview of how factors under paragraph 19(1) of CEEA 2012 were considered;
- the proponent's conclusions on the residual environmental effects of the project, and the significance of those effects, after the analysis of the mitigation measures.

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

1. Introduction and EA context
2. Project overview
3. Alternative means of carrying out the project
4. Public consultation
5. Consultation with Indigenous Nations
6. Summary of environmental effects assessment for each valued component, including:
 - a. description of the baseline;
 - b. anticipated changes to the environment;
 - c. anticipated effects of changes to the environment on the components listed in section 5 of CEEA 2012;
 - 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 understand the project, any potential environmental effects, proposed 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(ies) 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 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 Part 2, 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 Universal Transverse Mercator (UTM) projection 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;
- description of local communities; and
- traditional territories and/or consultation areas, treaty lands, Indian Reserve lands and Métis harvesting regions and/or settlements.

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;
- legislation and other regulatory approvals that are applicable to the project at the federal, provincial, regional and municipal levels;
- government policies, resource management plans, planning or study initiatives pertinent to the project and/or EA and their implications;
- any treaty, self-government or other agreements between federal or provincial governments and Indigenous Nations that are pertinent to the project and/or EA;
- any relevant land use plans, land zoning, or community plans; and
- 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 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 justifiability⁵ of any significant adverse residual environmental effects as defined in section 5 of CEAA 2012, if such effects are identified.

2.2. Alternative means of carrying out the project

The EIS will identify and consider the environmental effects of alternative means of carrying out the project that are technically and economically feasible. The proponent will complete the assessment of alternative means in accordance with the Agency's Operational Policy Statement entitled "*Addressing "Purpose of" and "Alternative Means" under the Canadian Environmental Assessment Act, 2012*".⁶

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

- operations method, including entirely underground operations;
- material extraction method;
- routes and transportation methods for ore, employees, equipment and material;
- location of main project components, including the location of the ore processing plant, waste rock processing, tailings management facility and various piles of waste/tailings (ore,

⁵ See subsection 52(2) of CEAA 2012.

⁶ Refer to the Operational Policy Statements' " Purpose " and " Alternatives " under the *Canadian Environmental Assessment Act, 2012* on the following website: <https://www.canada.ca/en/environmental-assessment-agency/news/media-room/media-room-2015/addressing-purpose-alternative-means-under-canadian-environmental-assessment-act-2012.html>

waste rock, topsoil, and overburden). With regard to the project infrastructure, the proponent must include in its analysis criteria, the environmental effects of the alternatives to the Project on air quality, wildlife and the practice of traditional activities of Indigenous people;

- energy sources to power the project site;
- management of water supply and waste water ;
- mine water management and location of the final effluent discharge points;
- mine waste disposal and final effluent discharge (methods and sites considered)⁷.

The study should make it possible to visualize the location of the alternatives.

The proponent will need to consider the alternative when analyzing alternatives to the technology or energy source that best responds to climate change adaptation and greenhouse gas emission ceilings imposed by federal, provincial and territorial governments.

The Agency recognizes that projects may be in the early planning stages when the EIS is being prepared. Where the proponent has 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, the proponent shall conduct an environmental effects analysis at the same level of detail for each 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, 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;
- The infrastructure and facilities for the management of ore and low-grade ore, as well as any mine waste (tailings, waste rock, overburden, topsoil) (footprint, volumes, development plans and design criteria);
- the open pit(footprint, location, operating ramps. development plans including pit phases);
- crusher, and processing facilities (footprint, technology, location);
- water management facilities proposed to control, collect and discharge surface drainage and groundwater seepage to the receiving environment from all key components of the mine infrastructure (e.g. underground mine water, mine effluent, polishing ponds, treatment ponds);

⁷ Should an MMER Schedule 2 amendment be required for the project, the proponent is strongly encouraged to include MMER requirements for an assessment of alternatives for mine waste disposal in the EIS. The methodology recommended for the conduct of mine waste disposal alternatives is described in Environment and Climate Change Canada's *Guidelines for the Assessment of Alternatives for Mine Waste Disposal (2011)*. A copy of this guide can be found on Environment and Climate Change Canada's website at www.ec.gc.ca. Proponent should also refer to Part 1, Section 4.1 of the present guidelines.

- systems for the detection of leaks and spills from petroleum equipment or tanks or spills from waste rock/tailings ponds or mine and treatment water ponds;
- permanent and temporary linear infrastructures (road, railroad, pipelines, power supply, bridge), identifying the route of each of these linear infrastructures, the location and types of structure used for stream crossings;
- storage areas for fuels, explosives and hazardous wastes;
- drinking and industrial water requirements (source, quantity required, need for water treatment);
- wastewater and septic tanks;
- borrow pits;
- energy supply (source, quantity);
- waste disposal (types of waste, methods of disposal, quantity);
- administrative and support facilities.

3.2. Project activities

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

This will include detailed 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 concerns identified by the public and Indigenous Nations. 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, Indigenous Nations, 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, stripping and excavation;
- explosives manufacture and storage (location and management);
- blasting (frequency and methods);
- construction or installation of river crossings, the replacement or expansion of bridges or culverts;
- construction or rebuilding of existing roads or access routes;
- borrow material requirements (source and quantity);
- construction of storage and containment areas for ore, waste rock, tailings and overburden;

- construction of water management infrastructure, including watercourse diversions, dewatering or depositions activities required (location, method and timing);
- construction of electrical lines and substations;
- equipment needs (type, quantity);
- construction of buildings (plants, laboratory, warehouses, garages, administrative offices and other related facilities);
- construction camp (location, capacity, wastewater treatment and drinking water supply);
- number of employees and transportation of employees; and
- storage and management of hazardous materials, fuels and residual materials.

3.2.2. Operation

- mining plan, ore production, ore treatment, ore stockpiling, concentrate production;
- facilities and activities related to the management of tailings based on a possible radioactivity, including their processing and discharge;
- storage, handling and transport of materials;
- explosives manufacture, storage and use (storage location and management);
- ore extraction (drilling, blasting (frequency and methods) and loading and hauling of ore and other activities that take place during extraction, such as loading and transportation of waste rock and concentrate);
- dyke construction (maximum height, stability, percolation control and impermeability, storage capacity, filling scheme);
- water management on the project site including mine water, storm water, process water, wastewater, water recycling and effluent treatment (location of points of release of the point(s) of effluent discharge, quantity, treatment requirements, discharge techniques (piping, conduits, pumping, diffuser));
- ore treatment;
- storage and handling of reagents, petroleum products, chemical products, hazardous materials and residual materials;
- characterization and management of ore, waste rock, low grade ore, overburden and tailings (storage, handling and transport of the volumes generated, mineralogical characterization, potential for metal leaching and acid rock drainage);
- waste management and recycling (other than mine waste such as tailings and waste rock);
- characterization and management of workforce, including transportation, work schedules and lodging.

3.2.3. Decommissioning and abandonment

- the preliminary outline of a decommissioning and reclamation plan for any components associated with the project, including with regard to mine waste management (tailings management facility, waste rock, ore and overburden dumps);
- 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 and abandonment could occur.

4. PUBLIC CONSULTATION AND CONCERNS

The EIS will describe the ongoing and proposed public consultation activities that the proponent will undertake or that it has already conducted 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 answers offered by the proponent as well as 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 project and its potential effects to the environment as well as describe any outstanding issues and ways to address them.

5. CONSULTATION WITH INDIGENOUS NATIONS AND CONCERNS RAISED

For the purposes of developing the EIS, the proponent will engage with Indigenous Nations 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 conditions; 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) pursuant to paragraph 5(1)(c) of CEAA 2012; and
- potential adverse impacts of the project on potential or established section 35 (*Constitution Act, 1982*) rights, including title and related interests, in respect of the Crown's duty to consult, and where appropriate, accommodate Aboriginal peoples.

With respect to the effects of changes to the environment on Aboriginal peoples, the assessment requirements are outlined in Part 2, sections 6.1.9 and 6.3.6 of these guidelines. With respect to potential adverse impacts of the project on potential or established section 35 rights, including title and related interests, the EIS will document for each Nation identified in Part 2, Section 5.1 of these guidelines (or in subsequent correspondence from the Agency):

- potential or established section 35 rights⁸, including title and related interests, when this information is directly provided by a Nation to the proponent, the Agency or is available through public records, including:
 - ✓ geographical extent, nature, frequency and timing of the practice or exercise of the right; and

⁸ The 2011 *Updated Guidelines for Federal Officials to Fulfill the Duty to Consult (the Guidelines)* defines Aboriginal rights as: practices, traditions and customs integral to the distinctive culture of the Aboriginal Nation claiming the right that existed prior to contact with the Europeans (Van de Peet). In the context of Métis groups, Aboriginal rights means practices, traditions, and customs integral to the distinctive culture of the Métis group that existed prior to effective European control, that is, prior to the time when Europeans effectively established political and legal control in the claimed area (*Powley*). Generally, these rights are fact and site specific. For greater certainty, the Guidelines also define Aboriginal title as an Aboriginal right. Visit the Indigenous and Northern Affairs Canada website at: <http://www.aadnc-aandc.gc.ca/eng/1100100014664/1100100014675>

- ✓ maps and data sets (e.g., fish catch numbers).
- potential adverse impacts of each of the project components and physical activities, in all phases, on potential or established section 35 rights, including title and related interests. This assessment is to be based on a comparison of the exercise of the identified rights, title and related interests between the predicted future conditions with the project and the predicted future conditions without the project. Include the perspectives of potentially impacted Indigenous Nations where these were provided to the proponent by the latter;
- measures identified to accommodate potential adverse impacts of the project on the potential or established section 35 rights, including title and related interests. These measures will be written as specific commitments that clearly describe how the proponent intends to implement them, and may go beyond mitigation measures that are developed to address potential adverse environmental effects;
- potential adverse impacts on potential or established section 35 rights, including title and related interests that have not been fully mitigated or accommodated as part of the EA and associated consultation with Aboriginal peoples. The proponent will also take into account the potential adverse impacts that may result from the residual and cumulative environmental effects. Include the perspectives of potentially affected Nations where these were provided to the proponent by the Nations.

The information sources, methodology and findings of the assessment of paragraph 5(1)(c) effects under CEAA 2012 may be used to inform the assessment of potential adverse impacts of the project on potential or established section 35 rights, including title and related interests. However, there may be distinctions between the adverse impacts on potential or established section 35 rights, including title and related interests and paragraph 5(1)(c) effects under CEAA 2012. The proponent will carefully consider the potential distinction between these two aspects and, where there are differences, will include the relevant information in its assessment.

In terms of gathering views from potentially affected Indigenous Nations with respect to both environmental effects of the project and the potential adverse impacts of the project on potential or established section 35 rights, including title and related interests, the EIS will document:

- VCs suggested by Nations for inclusion in the EIS, whether they were included, and the rationale for any exclusions;
- specific suggestions raised by each Nation for mitigating the effects of changes to the environment on Aboriginal peoples or accommodating potential adverse impacts of the project on potential or established section 35 rights, including title and related interests;
- views expressed by each Nation on the effectiveness of the mitigation or accommodation measures;
- from the proponent's perspective, any potential cultural, social and/or economic impacts or benefits to each Nation identified that may arise as a result of the project. Include the perspectives of potentially affected Nations where these were provided to the proponent by the latter;
- any other comments, specific issues and concerns raised by potentially affected Nations and how they were responded to or addressed;
- changes made to the project design and implementation directly as a result of discussions with potentially affected Nations;

- where and how Aboriginal traditional knowledge was incorporated into the environmental effects assessment (including methodology, baseline conditions and effects analysis for all VCs) and the consideration of potential adverse impacts on potential or established section 35 rights, including title and related interests, and related mitigation measures; and
- any additional issues and concerns raised by potentially affected Nations in relation to the environmental effects assessment and the potential adverse impacts of the project on potential or established section 35 rights, including title and related interests.

The Agency recommends the proponent create a tracking table of key issues raised by each Nation, including the concerns raised related to the project, proposed mitigation measures, and where appropriate, a reference to the proponent's analysis in the EIS. Information provided related to potential adverse impacts on potential or established section 35 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).

5.1. Aboriginal nations and consultation activities

With respect to consultation activities, the EIS will document:

- the consultation activities undertaken with each Nation prior to the submission of the EIS, including the date and means of engagement (e.g. meeting, mail, telephone);
- any future planned consultation activities; and
- how consultation activities by the proponent allowed Indigenous Nations to understand the project and evaluate its effects on their communities, activities, potential or established section 35 rights, including title and related interests.

In preparing the EIS, the proponent will ensure that the Indigenous Nations have access to timely and relevant information on the project and how the project may adversely impact them. The proponent will structure its consultation activities to provide adequate time for the Indigenous Nations to review and comment on the relevant information. Consultation activities are to be appropriate to the Indigenous Nations' needs, arranged through discussions with the Indigenous Nations and in keeping with established consultation protocols, where available. The EIS will describe all efforts, successful or not, taken to solicit the information required from the Indigenous Nations to support the preparation of the EIS.

The proponent will ensure that views of the Indigenous Nations are recorded and that the latter are provided with opportunities to validate the interpretation of their views. The proponent will keep detailed tracking records of its engagement activities, recording all interactions with the Indigenous Nations, the issues raised by each Nation and how the proponent addressed the concerns raised. The proponent will share these records with the Agency.

For the Indigenous Nations expected to be most affected by the project, the proponent is expected to strive towards developing a productive and constructive relationship based on on-going dialogue with the Indigenous Nations in order to support information gathering and the effects assessment. Presently, the Cree First Nation of Eastmain has been identified.

For the above Indigenous Nations, the proponent will strive to use primary data sources and hold face-to-face meetings to discuss concerns. The proponent will facilitate these meetings by making key EA summary documents (baseline studies, EIS, key findings, plain language summaries) accessible in advance. The proponent will ensure there are sufficient opportunities for individuals and

Nations to provide oral input in the language of their choice. If possible, the proponent should consider translating information for these Indigenous Nations into the appropriate Indigenous languages(s) in order to facilitate consultation activities during the EA.

In addition to the Nation mentioned above, other Nations could be added as new knowledge is acquired 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 Nations that the proponent will engage as additional information is gathered during the EA.

Upon receipt of knowledge or information of potential effects or adverse impacts to a Nation not listed above, the proponent shall provide that information to the Agency at the earliest opportunity.

6. EFFECTS ASSESSMENT

6.1. Project setting and baseline conditions

Based on the scope 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 boundaries to describe the baseline information, refer to Section 3.2.3 (Part 1) of these guidelines. As a minimum, the EIS will include a description of the following environmental components.

6.1.1. Atmospheric, Light and Noise Environment

- a baseline survey of ambient air quality in the project areas and in the airshed likely to be affected by the project, for the mine site, by identifying and quantifying emission sources for, but not limited to, the following contaminants: total suspended particulates, fine particulates smaller than 2.5 microns (PM_{2.5}), respirable particulates of less than 10 microns (PM₁₀), carbon monoxide (CO), sulphur oxides (SO_x), nitrogen oxides (NO_x), and volatile organic compounds (VOCs);
- identify and quantify existing greenhouse gas emissions⁹ by individual pollutant measured as kilotonnes of CO₂ equivalent per year in the project study areas;
- direct and indirect sources of air emissions;
- current provincial/territorial/federal limits for greenhouse gas emission targets;
- current ambient noise levels at key receptor points (e.g. areas used by Indigenous Nations for their traditional activities, communities, cabins), 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; and
- historical records of relevant meteorological information (e.g. total precipitation (rain and snow); mean, maximum and minimum temperatures; and typical wind speed and direction).

⁹ Greenhouse gas emissions include: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), perfluorocarbons (PFCs), hydrofluorocarbons (HFCs), sulphur hexafluoride (SF₆) and nitrogen trifluoride (NF₃).

6.1.2. Geology and geochemistry

- the bedrock and host rock geology of the deposit, including a table of geologic descriptions, geological maps and cross-sections of appropriate scale;
- the geomorphology, topography and geotechnical characteristics of areas proposed for construction of major project components;
- the geochemical characterization of expected mine material with a detailed sampling plan such as waste rock, ore, low grade ore, tailings, overburden and potential construction material in order to predict metal leaching and acid rock drainage¹⁰ including oxidation of primary sulphides and secondary soluble sulphate minerals;
- geological hazards that exist in the areas planned for the project facilities and infrastructure, including:
 - ✓ history of seismic activity in the area;
 - ✓ isostatic rise or subsidence;
 - ✓ landslides, slope erosion and the potential for ground and rock instability, and subsidence during and following project activities.
- baseline concentrations of contaminants of concern within the local, regional and downstream receiving environments;
- geochemical characterization of leaching potential, including, but not limited to, contaminants of concern from waste rock, pit walls, and tailings.

6.1.3. Topography, terrestrial environments and soil

- baseline mapping and description of landforms and soils within the local and regional project areas;
- maps depicting soil depth by horizon and soil order within the mine site area to support soil salvage and reclamation efforts, and to outline potential for soil erosion;
- suitability of topsoil and overburden for use in the rehabilitation of disturbed areas;
- the characterization of soils in the excavation sector in terrestrial and riparian areas, and a description of their past uses;
- topography, drainage, geology and hydrogeology, and the physicochemical characteristics of potential sediment or soil deposition sites in the terrestrial environment.

6.1.4. Riparian and Wetland Environments

- characterization of the shoreline, banks, current and future flood risk areas, and wetlands (fens, marshes, peatlands, mudflats and eelgrass beds, etc.), including the location and extent of wetlands likely to be affected by project activities according to their size, type (class and form), the description of their function¹¹ (ecological, hydrological, wildlife,

¹⁰The 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.

¹¹Hanson, A., L. Swanson, D. Ewing, G. Grabas, S. Meyer, L. Ross, M. Watmough et J. Kirkby. 2008, Wetland Ecological Functions Assessment: An Overview of Approaches, Canadian Wildlife Service, Technical Report Series Number 497, October 2008. Atlantic Region, 70 pp.

socioeconomic, etc.) and species composition of plant species that contribute to the determination of their classification according to a recognized method.¹² To complete the scientific studies, the proponent should seek to collect information on the characterization of these environments from traditional knowledge holders and users of the Cree Nation of Eastmain lands;

- plant and animal species (abundance, distribution and diversity) and their habitats, with a focus on species with special status that are of social, economic, cultural or scientific significance, as well as invasive alien species. To complete the scientific studies, the proponent should seek to collect information on the presence of plant and animal species from traditional knowledge holders and users of the Cree Nation of Eastmain lands.

6.1.5. Ground water and Surface water

- hydrogeology, including:
 - ✓ hydrogeological context (e.g., hydrostratigraphy with aquifers and aquitards, major faults, etc.), including the delineation of key stratigraphic and hydrogeologic boundaries;
 - ✓ physical properties of the hydrogeological units (e.g. hydraulic conductivity, transmissivity, saturated thickness, storativity, porosity, specific yield);
 - ✓ groundwater flow patterns and rates;
 - ✓ a discussion of the hydrogeologic, hydrologic, geomorphic, climatic and anthropogenic controls on groundwater flow;
 - ✓ temporal changes in groundwater flow (e.g. seasonal and long term changes in water levels);
 - ✓ a delineation and characterization of groundwater - surface water interactions including temperature and the locations of groundwater discharge to surface water and surface water recharge to groundwater;
 - ✓ temperature changes in surface water as a result of groundwater-surface water interactions;
 - ✓ changes to surface water quality, including seasonal changes in runoff entering watercourses.
- hydrogeological maps and cross-sections for the mine area to outline the extent of aquifers and aquitards, including bedrock fracture and fault zones, locations and depths of wells and strainers, groundwater types springs, surface waters, and project facilities. Groundwater levels, potentiometric contours, flow directions, groundwater divides and areas of recharge and discharge should be included;
- groundwater levels, piezometric curves, flow directions, groundwater divides, and feeding and draining areas should also be included;
- the location and description of all groundwater monitoring wells in relation to the project area, including data on construction, geology, hydrostratigraphy and piezometry (e.g., depth of surface rock and bedrock, bedrock quality, fracturing zones, piezometric levels, hydraulic conductivity, filter diameter and depth, and intercepted aquifer unit);
- monitoring protocol for collection of existing groundwater and surface water data;

¹² The Canadian Wetland Classification System, National Wetlands Working Group, 1997, See the website http://www.gret-perg.ulaval.ca/fileadmin/fichiers/fichiersGRET/pdf/Doc_generale/WetlandsWetlands.pdf

- an appropriate hydrogeologic model for the project area, which discusses the hydrostratigraphy and groundwater flow systems; a sensitivity analysis will be performed to test model sensitivity to climatic variations (e.g. recharge) and hydrogeologic parameters (e.g. hydraulic conductivity);
- groundwater quality, including lab analytical results for metals, major ions and physical parameters, including temperature, with the interpretation of results for any anomalous values and for contaminants of concern;
- graphs or tables indicating the seasonal variations in groundwater levels, flow regime, and quality;
- local and regional potable groundwater supplies, including their current use and potential for future use;
- bedrock fracture sizes and orientations in relation to groundwater flow;
- 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;
- hydrological regimes, including monthly, seasonal and annual water flow (discharge) data;
- for each affected water body, the total surface area, bathymetry, maximum and mean depths, water level fluctuations, type of substrate (sediments);
- seasonal surface water quality, including analytical results (e.g. water temperature, turbidity, pH, dissolved oxygen profiles) and interpretation for representative tributaries and water bodies including all sites to receive mine effluents or runoff;
- any local and regional potable surface water resource;
- sediment quality analysis for key sites likely to receive mine effluents.

6.1.6 Fish and fish habitat

For potentially affected surface waters directly or indirectly affected by the project:

- a characterization of fish populations on the basis of species and life stage, including information on the surveys carried out and the source of data available (e.g. location of sampling stations, catch methods, date of catches, the recorded species, catch per unit effort). To complete the scientific studies, the proponent should seek to collect information on the presence of fish from traditional knowledge holders and users of the Cree Nation of Eastmain lands;
- a description of primary and secondary productivity in affected water bodies with a characterisation of season variability;
- a list of any fish or invertebrate species at risk that are known to be present;
- a description of the 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;

- a description of natural obstacles (e.g. falls, beaver dams¹³) 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, rearing, nursery, feeding, overwintering, migration routes, etc. Where appropriate, this information should be linked to water depths (bathymetry) to identify the extent of a water body's littoral zone; and
- the description 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.

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.

6.1.7 Migratory birds

- description of birds and their habitats that are found or are likely to be found in the study area. This description may be based on existing sources, but supporting evidence is required to demonstrate that the data used are representative of the avifauna and habitats found in the study area. The existing data must be supplemented by surveys¹⁴, if required. To complete the scientific studies, the proponent should seek to collect information on the presence of birds and their habitats from traditional knowledge holders and users of the Cree Nation of Eastmain lands;
- abundance, distribution, and life stages of migratory birds likely to be affected in the project area based on existing information, or surveys, as appropriate, to provide current field data;
- characterization of various types of habitat found in the project area, likely to be affected, based on existing information (land cover types, vegetation);
- year-round migratory bird use of the area (e.g. winter, spring migration, breeding season, fall migration), based on preliminary data from existing sources and surveys in order to present the data if appropriate.

6.1.8 Species at Risk

- a list of all potential or known federally listed species at risk (fauna and flora) listed in Appendix 1 of the *Species at Risk Act*, present and potentially present in the study area that may be affected by the project, established by means of data and literature as well as surveys to provide current field data. To complement the scientific studies conducted, the proponent should seek to collect information on the presence of species at risk from traditional knowledge holders and users of the Cree Nation of Eastmain lands;

¹³ Note that Fisheries and Oceans Canada does not consider beaver dams as impassable and permanent barriers to fish.

¹⁴ The inventories required should be developed based on the references and recommendations found in ECC's document entitled "Guidance for the Preparation of an Environmental Impact Statement and Useful References" (2017) (available from Environment and Climate Change Canada), and the Canadian Wildlife Service Technical Report No. 508, *A Framework for the Scientific Assessment of Potential Project Impacts on Birds* (Hanson et al., 2009) available at http://publications.gc.ca/collections/collection_2010/ec/CW69-5-508-fra.pdf. Appendix 3 of the Framework provides examples of project types and recommended techniques for assessing impacts on migratory birds.

- a list of all federal species assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) to be listed on Schedule 1 of the *Species at Risk Act*. This will include those species in the risk categories of extirpated, endangered, threatened and of special concern;
- any published studies that describe the regional importance, abundance and distribution of species at risk including recovery programs, action plans and management plans . The existing data must be supplemented by surveys, if required; and
- description of residences, seasonal movements, movement corridors, habitat requirements, key habitat areas, critical habitats and designated recovery habitats (if any), and the life cycle of species at risk or assessed by COSEWIC as likely to be in the study area;
- the description and mapping of potential habitats of species at risk present or potentially present in the study area, taking into account habitat descriptions presented in recovery strategies, action plans, management plans, management and COSEWIC reports.

6.1.9 Indigenous peoples

With respect to potential effects on Indigenous peoples and the related VCs, baseline information will be provided for the Eastmain Cree Nation (and any other Nations identified after these guidelines are finalized). Baseline information will describe and characterize the elements in paragraph 5(1)(c) of CEEA 2012 based on the spatial and temporal scope selected for the EA according to the factors outlined in Part 1, Section 3.3.3 of this document. Baseline information will also characterize the regional context of each of the elements of paragraph 5(1)(c) of CEEA 2012 to support the assessment of project related effects and cumulative effects. Baseline information will be sufficient to provide a comprehensive understanding of the current state of each VC.

Baseline information for the occupation and current use of lands and resources for traditional purposes will focus on the traditional activity (e.g. hunting, fishing, trapping, plant gathering) and include a characterization of all attributes of the activity that can be affected by environmental change. This includes not only identifying species of importance, but also assessing the quality and quantity of preferred traditional resources and locations, timing (e.g. seasonality, access restrictions, distance from community), ambient/sensory environment (e.g. noise, air quality, visual landscape, presence of others) and cultural environment (e.g. historical/generational connections, preferred areas). Specific aspects that will be considered include, but are not limited to:

- location of traditional territory ;
- traditional uses currently practiced or practiced in recent history;
- location of communities;
- location of hunting camps, cabins and traditional gathering or teaching grounds;
- 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;
- access and travel routes for conducting traditional practices;
- frequency, duration or timing of traditional practices; and
- cultural values associated with the area affected by the project and the traditional uses identified.

It will be very important for knowledge and intelligence holders to be clearly informed of how the information provided will be used by the proponent. If confidential information is collected, it will be important to inform the Agency so that the impact study published on the Agency's register is exempt from this information (see 4.2.2).

Baseline information for health¹⁵ and socio-economic conditions will include the functioning and health of the socio-economic environment, encompassing a broad range of matters that affect Aboriginal people communities in the study area in a way that recognizes interrelationships, system functions and the most vulnerable groups. Specific aspects that will be considered include, but are not limited to:

- drinking water sources (permanent, seasonal, periodic, or temporary);
- consumption of country foods (also known as traditional foods) including food that is trapped, fished, hunted, harvested or grown for subsistence or medicinal purposes;
- which country foods are consumed by which Nations, how frequently, and where these country foods are harvested;
- commercial activities (e.g. fishing, trapping, hunting, forestry, outfitting); and
- recreational uses.

Baseline information for physical and cultural heritage¹⁶ (including any site, structure or thing of archaeological, paleontological, historical or architectural significance) will consider all elements of cultural and historical importance to Nations in the area and is not restricted to artifacts considered under provincial heritage legislative requirements. Specific aspects that will be considered include, but are not limited to:

- burial sites;
- cultural landscapes;
- sacred, ceremonial or culturally important places, objects or things; and
- archaeological potential and/or artifact places.

Any other baseline information that supports the analysis of predicted effects on Indigenous peoples will be included as necessary. The EIS will also indicate how input from Nations, including Aboriginal traditional knowledge, 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.

6.1.10 Other changes to the environment arising as a result of a federal decision or due to changes on federal lands, in another province or outside Canada

Should there be the potential for a change to the environment arising as a result of a federal decision(s), or on federal lands, lands in another province or lands outside Canada, the EIS will

¹⁵ 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

¹⁶ 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).

include baseline information on the environmental component likely to be affected (if this information is not already covered in other subsections of these guidelines). For example, if an authorization provided under the *Fisheries Act* was to result in the flooding of key wildlife habitat, baseline information should be provided on the wildlife species likely to be affected.

6.1.11 Human environment

In the case where a section 5(2) decision is involved, for example an authorization under section 35 of the *Fisheries Act*, that could result in a change to the environment and affect non-Indigenous people, then the impact study will include information about:

- the rural and urban settings likely to be affected by the project;
- any federal lands, lands located outside the province or Canada that may 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;
- 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;
- health 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, functions of vulnerable systems and groups;
- 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 EA 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 magnitude, geographic extent, duration and frequency, and whether the environmental changes are reversible or irreversible. As changes to various parts of the physical environment, listed below, may be inter-related as part of an ecosystem, the EIS will explain and describe the connections between the effects described.

6.2.1 Changes to atmospheric, sound and light environments

- changes in air quality: to measure the concentration of contaminants found throughout the territory potentially affected by air emissions, the proponent will carry out atmospheric dispersion modeling of the main contaminants (see Part 2, section 6.1.1) resulting from various project-related activities (sources), including the use of heavy machinery during construction and road transportation. The proponent will be required to compare anticipated air quality against the Canadian Ambient Air Quality Standards (CAAQS) for fine particulate matter and ozone as well as the Quebec standards and criteria for air

quality. The proponent will also be required to consider the new Canadian Ambient Air Quality Standards (CAAQS) for sulfur dioxide (NO₂) that will be in effect in 2020. The proponent will describe all methods or practices that will be implemented to minimize and control air emissions throughout the project life cycle;

- contaminants deposition rate in aquatic and land environment within the zone of influence of the project;
- a specific section of the impact statement should be dedicated to GHGs. The proponent must:
 - ✓ identify, outline and quantify all sources of GHGs during all phases of the project. All estimated emissions and emission factors used should be justified (provide the estimation or derivation method) and assumptions stated. Present the information for each pollutant, expressed in kilotons of CO₂ equivalent per year;
 - ✓ provide an estimate of the contribution of the project emissions at the local, provincial and federal scale. The proponent must indicate the category into which the project falls in terms of the relative magnitude of its contribution to GHG emissions (project with low, medium or high emission rates);
 - ✓ provide a description of all methods or practices that will be implemented to minimize and control GHG emissions throughout the project life cycle;
 - ✓ provide information related to the project's electrical demand and sources of electrical power for facilities and equipment, i.e., the project's main source and any other additional sources (generators, etc.), as appropriate.
- changes in ambient noise levels; and
- changes in night-time light levels.

6.2.2 Changes to groundwater and surface water

- changes to groundwater flow patterns, fluxes, and divides based on the results of groundwater flow modelling that incorporates changes related to mining;
- changes to turbidity, oxygen level, water temperature, ice regime, water quality;
- changes in surface water quality associated with any mine effluent releases or surface runoff;
- changes to the hydrological and hydrometric conditions (including the loss of Lac Kapisikama);
- changes to groundwater recharge/discharge areas and any changes to groundwater infiltration areas;
- changes to groundwater quality associated with storage or release of any mine effluents or drainage including surface runoff;
- changes to water quality attributed to acid rock drainage and metal leaching associated with the storage of waste rock, ore, low grade ore, tailings, overburden and potential construction material, including:
 - ✓ short term metal leaching properties;
 - ✓ longer term rates of acid generation (if any) and metal leaching;
 - ✓ estimates of the potential for mined materials (including waste rock, tailings and low grade ore) to be sources of acid rock drainage or metal leaching;

- ✓ estimates of potential time to the onset of acid rock drainage or metal leaching;
- ✓ quantity and quality of leachate from samples of tailings, waste rock, and ore;
- ✓ quantity and quality of effluent to be released from the site into the receiving waters;
- ✓ quality of humidity cell or column test liquid from acid rock testing;
- ✓ sensitivity analysis to assess the effects of imperfect segregation of waste rock;
- ✓ pit water chemistry during operation and post-closure, and pit closure management measures (e.g. flooding). This will include geochemical modelling of pit water quality in the post-closure period; and
- ✓ surface and seepage water quality from the waste rock dumps, tailings/waste rock impoundment facility, stockpiles and other infrastructure during operation and post-closure.

6.2.3 Changes to riparian, wetland and terrestrial environments

- overall description of the changes related to the disruption of the functions of the to riparian, wetland and terrestrial environments. More specifically:
 - ✓ changes to the habitat of birds, including losses, structural changes and fragmentation of riparian habitat (e.g., aquatic grassbeds) of terrestrial environments and wetlands frequented by birds (types of cover, quantity, diversity, distribution and functions) A specific section will cover changes to habitat functions for waterfowl, given its importance to traditional hunting by the Cree First Nation of Eastmain;
 - ✓ changes to critical habitat or to residence (as defined in the Species at Risk Act) for federally listed wildlife and flora species at risk;
 - ✓ changes to the habitat of wildlife and flora species assessed by COSEWIC or any other species of special status.
- changes to key habitat wildlife and flora species important to current use of lands and resources for traditional purposes and the non-Indigenous.

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. All interconnections between VCs and between effects to multiple VCs will be described:

6.3.1 Fish and fish habitat

- the identification of any potential adverse effects to fish and fish habitat as defined in subsection 2(1) of the *Fisheries Act*, 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. 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 effects 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 conditions;
- ✓ effects on the primary and secondary productivity of water bodies and how mine-related effects may affect fish food sources.
- the effects of changes to the aquatic environment on fish and their habitat, including:
 - ✓ the anticipated changes in the composition and characteristics of the populations of various fish species, including 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;
 - ✓ 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 effects 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

- direct adverse effects on birds, including population level effects that could be caused by all project activities, including habitat loss due to tree clearing, clearing of sites or birds and nests being in contact with contaminated substances (for example by the deposit of harmful substances in ponds) or collision risk of migratory birds with any project infrastructure and vehicles; and
- indirect effects caused by increased disturbance (e.g. noise, light, presence of workers, vehicle movements), and changes in bird habitat, considering the critical breeding and migration, moulting, wintering, etc.

6.3.3 Species at risk

- the potential effects of the project on federally listed species at risk in Appendix 1 of the *Species at Risk Act* 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, including:
 - ✓ direct and indirect effects from increased exposure to contaminants of concern;
 - ✓ direct and indirect effects on the survival or recovery of federally listed species (list species).

6.3.4 Indigenous peoples

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

- current use of lands and resources for traditional purposes¹⁷. This assessment will characterize the effects on the use or activity (e.g. hunting, fishing, trapping, plant gathering) as a result of the underlying changes to the environment (i.e. how will the activity change if the project proceeds). The underlying changes to the environment will also be described, including, but not limited to:
 - ✓ any changes to resources (fish, wildlife, birds, plants or other natural resources) used for traditional purposes (e.g. hunting, fishing, trapping, collection of medicinal plants, use of sacred sites);
 - ✓ any changes or alterations to access into the areas used for traditional purposes, including development of new roads, deactivation or reclamation of access roads and changes to waterways that affect navigation;
 - ✓ any changes to the environment that affect cultural value or importance associated with traditional uses or areas affected by the project (e.g. values or attributes of the area that make it important as a place for inter-generational teaching of language or traditional practices, communal gatherings, integrity of preferred traditional practice areas);
 - ✓ how timing of project activities (e.g. construction, blasting, discharges) have the potential to interact with the timing of traditional practices, and any potential effects resulting from overlapping periods;
 - ✓ consideration of the regional context for traditional use, and the value of the project area in that regional context, including alienation of lands from traditional use;
 - ✓ any changes to environmental quality (e.g. air, water, soil), the sensory environment (e.g. noise, light, visual landscape), or perceived disturbance of the environment (e.g. fear of contamination of water or country foods) that could detract from use of the area or lead to avoidance of the area;
 - ✓ any changes to the environment resulting from the presence of worker or increased access to the area by non-Indigenous peoples (e.g. noise, competition for or pressure on resources);
 - ✓ an assessment of the potential to return affected areas to pre-project conditions to support traditional practices.
- human health, related to potential changes concerning:
 - ✓ air quality¹⁸;
 - ✓ the soundscape owing to the effects of vibration from blasting et à l'exposition au bruit¹⁹;

¹⁷ The proponent should take into account the advice and recommendations provided by the Agency in the following document: *Technical Guidance for Assessing the Current Use of Lands and Resources for Traditional Purposes under CEAA 2012* - <https://www.canada.ca/en/environmental-assessment-agency/services/policy-guidance/technical-guidance-assessing-current-use-lands-resources-traditional-purposes-under-ceaa-2012.html>

¹⁸ The proponent should take into account the advice and recommendations provided by Health Canada in the following document: *Guidance for Evaluating Human Health Impacts in Environmental Assessment: Air Quality* - <https://www.canada.ca/en/health-canada/services/publications/healthy-living/guidance-evaluating-human-health-impacts-air-quality.html>

¹⁹ The proponent should take into account the advice and recommendations provided by Health Canada at the following address: *Guidance for Evaluation Human Health Impacts in Environmental Assessment: Noise* - <https://www.canada.ca/en/health-canada/services/publications/healthy-living/guidance-evaluating-human-health-impacts-noise.html>

- ✓ availability and quality of country foods. The proponent must provide a rationale if it determines that an assessment of the risk of contamination of foods taken from the wild is not required or if certain contaminants are excluded from the assessment;
- ✓ water quality²⁰ (drinking, recreational and cultural uses).

When risks to human health due to changes in one or more of these components are predicted, a complete Human Health Risk Assessment (HHRA) performed according to a recognized methodology, will prove necessary to adequately characterize these risks. Any related effects, such as effects on the current use of lands and resources for traditional purposes, will also be assessed.

- socio-economic conditions, including:
 - ✓ the use of navigable waters;
 - ✓ commercial fishing, hunting, trapping, and gathering activities;
 - ✓ commercial outfitters;
 - ✓ recreational use.

- physical and cultural heritage, and structures, sites or things of historical, archaeological, paleontological or architectural significance to Aboriginal Nations²¹, including, but not limited to:
 - ✓ the loss or destruction of physical and cultural heritage;
 - ✓ changes to access to physical and cultural heritage;
 - ✓ changes to the cultural value or importance associated with physical and cultural heritage.

Other effects of changes to the environment on Nations should be reflected as necessary.

6.3.5 Other valued components that may be affected as a result of a federal decision or due to effects on federal lands, another province or outside Canada

If there is the potential for a change to the environment arising as a result of a federal decision(s), for example an authorization under section 35 of the *Fisheries Act*, the EIS should include a description of the specific project components for which a federal authorization/decision is required, and an assessment of any other VCs (not already covered in other subsections of these guidelines) that may be affected by the changes to the environment caused by these specific project components (e.g. any element relevant to the human environment indicated in section 6.1.11).

If there is the potential for the project to result in environmental changes on federal lands, another province, or another country, then VCs of importance not already identified should be included. For example, if the project will result in the generation of greenhouse gas emissions, the EIS should include a description of the project's greenhouse gas emissions in a regional, provincial, national or international context if applicable.

²⁰ The proponent should take into account the advice and recommendations provided by Health Canada in the following document: *Guidance for Evaluation Human Health Impacts in Environmental Assessment: Water Quality* - <https://www.canada.ca/en/health-canada/services/publications/healthy-living/guidance-evaluating-human-health-impacts-water-quality.html>

²¹ The proponent should take into account the advice and recommendations provided by the Agency in the following document: *Technical Guidance for Assessing Physical and Cultural Heritage or any Structure, Site or Thing* - <https://www.canada.ca/en/environmental-assessment-agency/services/policy-guidance/technical-guidance-assessing-physical-cultural-heritage-or-structure-site-or-thing.html>

6.4 Mitigation measures

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. Under CEAA 2012, mitigation measures includes measures to eliminate, reduce or control the adverse environmental effects of a designated project, as well as restitution for damage to the environment through replacement, restoration, compensation or other means. Measures 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. 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. Mitigation measures will be written as specific commitments that clearly describe how the proponent intends to implement them and the environmental outcome the mitigation measure is designed to address. The EIS will describe mitigation measures in relation to species at risk and/or critical habitat listed under the *Species at Risk Act*. These 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 EIS 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 proponent is also encouraged to identify mitigation measures for effects that are adverse although not significant.

The EIS should 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 measures will be justified. The EIS should 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 technological 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 8 below) 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 above. The residual adverse environmental effects, even if very small or deemed insignificant should be described.

The EIS will then provide a detailed analysis of the significance of the residual environmental effects that are considered adverse following the implementation of mitigation measures, using guidance described in Section 4 of the Agency's Operational Policy Statement, *Determining Whether a Project is Likely to Cause Significant Adverse Environmental Effects under the Canadian Environmental Assessment Act, 2012*²².

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, technical and regulatory agencies, Indigenous Nations, 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:

- magnitude;
- geographic extent;
- timing;
- duration;
- frequency;
- reversibility.

The ecological and social context within which the potential environmental effects may occur should be taken into account when considering the key criteria above in relation to a particular valued component, as the context may help better characterize whether adverse effects are significant.

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.

²² Visit the Canadian Environmental Assessment Agency's website at: <https://www.canada.ca/en/environmental-assessment-agency/news/media-room/media-room-2015/determining-whether-designated-project-is-likely-cause-significant-adverse-environmental-effects-under-ceaa-2012.html>

Where significant adverse environmental 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 this 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, forest fire) could cause major effects. The proponent will therefore conduct an analysis of the risks of accidents and malfunctions, determine their effects, and present a preliminary emergency response 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 CEAA 2012). The proponent will also have to present the worst credible scenarios and their effects on the environment. These scenarios must include, among other things, dam failure involving the discharge of contaminated water and tailings into the receiving environment.

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 CEAA 2012.

For each of the scenarios, the EIS will describe the safeguards that have been established to protect against such occurrences and the contingency and emergency response procedures that would be put 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 effects to the environment (e.g. extreme environmental conditions result in malfunctions and accidental events). These events will be considered in different probability patterns (e.g. 5-year flood vs. 100-year flood).

The longer-term effects of climate change on the project will also need to be analyzed up to the phase following the planned closure of the project. This analysis should include a description of the climate data used, including a study of the sensitivity of the project to changes in climate parameters (for example, the potential impact of climate change on the project and proposed mitigation measures).

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 should also take into account the guide entitled *Technical Guidance for Assessing Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012*²³.

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:

- the implementation of the project may cause direct residual adverse effects on the VC, taking into account the application of technically and economically feasible mitigation measures; and
- the same VC may be affected by other past, present and future physical activities.

VCs 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. 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 VCs that will constitute the focus of the cumulative effects assessment, focussing the cumulative effects 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:
 - ✓ fish and fish habitat;
 - ✓ migratory birds;
 - ✓ each species at risk and assessed by COSEWIC;
 - ✓ Indigenous peoples; and
 - ✓ any VCs associated with subsection 5(2) of CEEA 2012.
- 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. Without limitation, the proponent will consider mineral exploration, abandoned and operating mines and hydroelectric projects. This assessment may consider the results of any relevant study conducted by a committee established under section 73 or 74 of CEEA 2012;
- assess the cumulative effects on each VC selected by comparing the future scenario with the project and without the project. Effects of past activities (activities that have been carried out) will be used to contextualize the current state of the VC. In assessing the

²³ Visit the Canadian Environmental Assessment Agency's website at: <https://www.canada.ca/en/environmental-assessment-agency/services/policy-guidance.html>

cumulative effects on current use of lands and resources for traditional purposes, the assessment will focus on the cumulative effects on the relevant activity (e.g. hunting, fishing, trapping, plant harvesting);

- 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 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; and
- 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 Indigenous Nations 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 summarizing the following key information:

- potential environmental effects on valued components;
- proposed mitigation measures to address the effects identified above;
- 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. 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 VCs (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.

Considerations for developing a follow-up program include:

- whether the project will impact environmentally sensitive areas/VCs or protected areas or areas under consideration for protection;
- the nature of Indigenous and public concerns raised about the project;
- the accuracy of predictions;
- whether there is a question about the effectiveness of mitigation measures or the proponent proposes to use new or unproven techniques and technology;
- the nature of cumulative environmental effects;
- the nature, scale and complexity of the program; and

- whether there was limited scientific or local knowledge about the effects in the EA.

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, 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 to evaluate the effectiveness of the mitigation measures.

The EIS shall present a preliminary follow-up program and 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;
- the arrangements for the production of the monitoring reports (number, frequency content, format, language) to be sent to the authorities concerned;
- mechanism to disseminate follow-up results among the concerned populations;
- accessibility and sharing of data for the general population;
- opportunity for the proponent to include the participation of Indigenous Nations and stakeholders on the affected territory, during the development and implementation of the program; particularly Cree First Nation of Eastmain;
- 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 Program

The proponent will prepare an environmental monitoring program for all phases 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 environmental and/or valued components and the measures and means planned to protect the environment;
- identification of regulatory instruments that include a monitoring program requirement for the valued components;
- 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 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;
- procedures for preparing monitoring reports (number, content, frequency, format, language) that will be sent to the authorities concerned; and
- plans to engage Indigenous Nations in monitoring.

Appendix 1 Example - Summary Table of Environmental Assessment

Valued Component affected	Area of federal jurisdiction ²⁵ (v)	Project Activity	Potential effects	Proposed mitigation	Residual effect	Main criteria to determine the significance of the effects ²⁴						Significance of residual adverse effect
						<i>Magnitude</i>	<i>Geographical Extent</i>	<i>Timing</i>	<i>Duration</i>	<i>Frequency</i>	<i>Reversibility</i>	
Fish and fish habitat												
Migratory birds												
Species at risk												
Current use of land and resource for traditional purpose	√ 5(1)(c)(iii)											
Any other VCs identified												

²⁴ Other key criteria may be used to determine the significance of the effects, if applicable. The ecological and social context within which the potential environmental effects may occur should be taken into account when considering the key criteria above in relation to a particular valued component, as the context may help better characterize whether adverse effects are significant.

²⁵ 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 section 5 is relevant. For example, for the VC “current use of lands and resources for traditional purposes”, the appropriate cell would indicate, section 5(1)(c)(iii) of CEAA 2012.