Bending Lake Iron Project

GUIDELINES FOR THE PREPARATION OF AN ENVIRONMENTAL IMPACT STATEMENT

PURSUANT TO THE *CANADIAN ENVIRONMENTAL ASSESSMENT ACT, 2012*

October 4, 2019

Impact Assessment Agency of Canada | Agence d'évaluation d'impact du Canada

Canada

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DISCLAIMER

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

Abbreviations and Short Forms

Abbreviation	Definition
CEAA 2012	*Canadian Environmental Assessment Act*, *2012*
Agency	Impact Assessment Agency of Canada
EA	environmental assessment
EIS	Environmental Impact Statement
MDMER	*Metal and Diamond Mining Effluent Regulations*
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 project[1] to be assessed pursuant to the *Canadian Environmental Assessment Act, 2012* (CEAA 2012). On August 28, 2019, the *Impact Assessment Act* (IAA) came into force and CEAA 2012 was repealed. However, in accordance with the transitional provisions of IAA, the environmental assessment of this project is continuing under CEAA 2012 as if it had not been repealed.

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 Impact Assessment Agency of Canada (the Agency) or a review panel will use the proponent's EIS and other information received during the EA process to prepare a report that will inform the issuance of a decision statement by the Minister of Environment and Climate Change. Therefore the EIS must include a full description of the changes the project will cause to the environment that may result in adverse effects on areas of federal jurisdiction (i.e. section 5 of CEAA 2012) including changes that are directly linked or necessarily incidental to any federal decisions that would permit the project to be carried out. The EIS must also include a list of 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 or review panel.

2. GUIDING PRINCIPLES

2.1. Environmental assessment as a planning and decision making tool

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

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

- 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.

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 to comment on the draft EA report. For EAs by a review panel, CEAA 2012 requires that the review panel hold a public hearing. 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. Engagement with Indigenous groups

The proponent is expected to engage with potentially affected Indigenous groups starting as early as possible in the project planning process in order to:

- fulfil the statutory obligations of CEAA 2012 to assess environmental effects of the proposed Project on Indigenous peoples; and
- assist the Agency in fulfilling the Crown's constitutional obligations to consult with potentially impacted Indigenous groups on potential impacts to Aboriginal and Treaty rights protected under section 35 of the *Constitution Act, 1982*.[2]

The proponent is expected to work with potentially affected Indigenous groups to establish an engagement approach. The proponent will make reasonable efforts to integrate Indigenous knowledge

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

into the assessment of environmental effects. For more information on requirements for the effects assessment, see Part 2, Section 7.1.9 and Section 7.3.4 of these guidelines. For more information on incorporating Indigenous knowledge, refer to Part 1, Section 4.2.2 of these guidelines.

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 July 4, 2019, Ambershaw Metallics Inc., the proponent of the Bending Lake Iron Project (the 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;
- ore, overburden and waste rock stockpile areas;
- crushing, processing and pelletizing or briquetting plant;
- tailings management area;
- pipelines for tailings transport, makeup water, and for freshwater;
- water supply and treatment facility;
- waste and stormwater management and storage facilities;
- dams;
- on-site access roads;
- storage and manufacturing facilities for fuel, explosives, and concentrates;
- fueling stations;
- aggregate plant;
- transmission line;
- storage and load out facilities for finished products;
- infrastructure corridor and associated water crossings for rail line, conveyor, or haul road for transport of finished products; and
- ancillary infrastructure, including administration building, warehouse, garages, maintenance offices and temporary workforce accommodation camp.

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 be examined

Valued components (VCs) refer to environmental, biophysical, socio-economic 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, a valued component may have been identified as having scientific, social, cultural, economic, historical, archaeological or aesthetic importance.

The EIS will identify VCs linked to section 5 of CEAA 2012, including the ones identified in Part 2, Section 6.2 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 Indigenous 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 engagement with Indigenous groups. The EIS will describe what methods were used to predict and assess the adverse environmental effects of the project on these VCs.

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 participation or engagement with Indigenous groups, 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 groups) 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 Indigenous peoples, or other environmental effects referred to under paragraph 5(1)(c) of CEAA 2012. The proponent is expected to engage with Indigenous groups and is encouraged to consult with the Agency and with federal, provincial, and local government departments and agencies, 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 Indigenous knowledge, current or traditional land and resource use by Indigenous groups, 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. Temporal boundaries will be defined taking into account predicted effects after project decommissioning and reclamation, and community knowledge and Indigenous knowledge. If impacts are predicted after project decommissioning, this should be taken into consideration in defining boundaries. Community knowledge and Indigenous 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 shall consult and utilize Agency policy and guidance on topics to be addressed in the EIS, which are available on the Agency's website[3], and liaise with the Agency during the planning and

[3] Visit the Impact Assessment Agency of Canada website: www.canada.ca/iaac

development of the EIS. The proponent is also encouraged to engage with Indigenous groups on the planning and development of relevant sections of the EIS, including effects from changes to the environment and impacts to Aboriginal and Treaty rights as well as assessment of environmental effects as outlined in paragraph 5(1)(c) of CEAA 2012.

The proponent should also consult relevant guidance from other federal departments and ensure that the most up-to-date version is being used.

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 and Diamond Mining Effluent Regulations* (MDMER) should be considered when developing a baseline monitoring program for the aquatic environment.[5]

The proponent has identified the potential need to use natural water bodies frequented by fish for the disposal of mine waste, including tailings and waste rock, and for the management of effluents. Schedule 2 of the MDMER would need to be amended to add the affected water bodies, designating them as tailings impoundment areas (TIAs). This regulatory process will not be initiated until a detailed assessment of alternatives for mine waste disposal and fish habitat compensation plan have 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 MDMER 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* (2013).[6]

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 MDMER 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 MDMER 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

[4] The *Environmental Code of Practice for Metal Mines* can be accessed online at: https://www.canada.ca/en/environment-climate-change/services/canadian-environmental-protection-act-registry/publications/code-practice-metal-mines.html

[5] Technical Guidance for Environmental Effects Monitoring Program can be accessed online at: https://www.canada.ca/en/environment-climate-change/services/managing-pollution/environmental-effects-monitoring/metal-mining-technical-guidance.html

[6] The *Guidelines for the assessment of alternatives for mine waste disposal* can be accessed online at: https://www.canada.ca/en/environment-climate-change/services/managing-pollution/publications/guidelines-alternatives-mine-waste-disposal.html.

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, 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 or the review panel. 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 Indigenous knowledge

Subsection 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, Indigenous knowledge is equivalent to Aboriginal traditional knowledge. Indigenous knowledge[7] refers to the cumulative and dynamic body of knowledge that is held by, and unique to specific Indigenous groups. Community knowledge is information held by community members, such as farmers, hunters, fishers and naturalists, who are familiar with the environment in a specific geographic area.

The proponent is expected to engage with Indigenous groups and the public in developing community-specific baseline conditions and to provide an opportunity to review the information prior to submitting the EIS. The proponent will incorporate into the EIS the community knowledge and Indigenous knowledge, in keeping with appropriate ethical standards and obligations of confidentiality. The proponent will engage in a respectful dialogue with Indigenous groups about the collection and use of Indigenous knowledge and enter into agreements if requested by an Indigenous group regarding the use of information during and after the EA. The proponent should collaborate with Indigenous groups to ensure, where possible, that the Indigenous knowledge is incorporated into the EIS in a way that is appropriate for the Indigenous group. The proponent will integrate Indigenous knowledge into all aspects of its assessment including methodology (e.g., establishing spatial and temporal boundaries, defining significance criteria) and analysis (e.g., baseline characterization, effects prediction, development of mitigation measures, conducting a Human Health Risk Assessment), and document accordingly in the EIS. The proponent is

[7] Indigenous knowledge includes Métis, First Nation and Inuit traditional knowledge.

encouraged to communicate to the Indigenous groups how Indigenous knowledge and community knowledge could be incorporated during collection and, once collected, has been incorporated into the EIS, and what aspects of the project have changed after consideration of the Indigenous knowledge and community knowledge.

For more information on how Indigenous 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. Should there be a lack of Indigenous knowledge available to the proponent, the proponent should document actions taken to gather Indigenous knowledge. In addition, the proponent is still expected to seek information from other sources to complete the assessment of effects of changes to the environment on Indigenous peoples or the assessment of impacts to rights. For more information on requirements for the effects assessment, see Part 2, Sections 7.1.9 and 7.3.4 of these guidelines.

4.2.3. Existing information

In preparing the EIS, the proponent should consider existing information relevant to the Project. When relying on existing information to meet requirements of the EIS Guidelines, the proponent will either include the information directly in the EIS or clearly direct the reader to where it may obtain the information (i.e. through cross-referencing). When relying on existing information, the proponent will also comment on how 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 Impact 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 groups, the public and any other interested party have an opportunity to comment on this decision. Where the Agency or the review panel 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 following the implementation of mitigation measures;
- considering cumulative effects of the project in combination with other physical activities that have been, are, 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 Indigenous 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 Indigenous knowledge, the EIS will present each perspective on the issue (including documentation of Indigenous groups' input) 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 interrelationships would be examined keeping in mind that the significance conclusion on a biophysical component could differ from the significance conclusion on a human receptor. For instance, while fish may not be impacted, there may be impacts to fishing due to loss of preferred fishing locations. The description will include scientific, community knowledge and Indigenous knowledge and be sufficiently detailed to characterize the environment before any disturbances due to the project occur 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 (e.g., previous mining) 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 and affected Indigenous groups 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 Indigenous 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 Indigenous peoples, pursuant to paragraph 5(1)(c) of CEAA 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 groups. 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 groups reasonable opportunity to review and provide comments on the information used for describing and assessing effects on Indigenous peoples, prior to submitting the

EIS (further information on engaging with Indigenous groups is provided in Part 2, Section 5 of this document). The proponent will respond to the comments of Indigenous groups prior to submitting the EIS to ensure that the comments are adequately addressed. Where there are discrepancies in the views of the proponent and Indigenous groups on the information to be used in the EIS, the EIS will document these discrepancies and the rationale for the proponent's selection of information.

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 and 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. For all predictions related to effects on Indigenous groups, the proponent will document Indigenous group involvement. Where there are discrepancies in the views of the proponent and Indigenous groups with respect to the outcomes of assessment(s), the EIS will document and provide a rationale for these discrepancies.

4.4. Presentation and organization of the Environmental Impact Statement

To facilitate the identification of the documents submitted and their placement in the Canadian Impact 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 complete list of

supporting literature and references will also be provided. A table of concordance, which cross references the information presented in the EIS with the information requirements identified in the EIS Guidelines, will be provided. The proponent will provide copies of the EIS and its summary for distribution, including paper and electronic version in an unlocked, searchable (e.g., bookmarked) 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 following:

- a concise description of all key components of the project and related activities;
- a summary of the engagement with Indigenous groups, as verified by each group, and the participation 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 CEAA 2012, and proposed technically and economically feasible mitigation measures;
- an overview of how factors under paragraph 19(1) of CEAA 2012 were considered;
- an overview of the potential impacts to Aboriginal and Treaty rights, as protected under section 35 of the Constitution Act, 1982, and proposed mitigation and/or accommodation measures;
- the proponent's conclusions on the residual environmental effects of the project, and the significance of those effects, after taking into account 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 participation
5. Engagement with Indigenous groups
6. Impacts to Aboriginal and Treaty Rights
7. Summary of environmental effects assessment for each VC, including:
    a. description of the baseline
    b. anticipated changes to the environment
    c. anticipated effects
    d. mitigation measures
    e. significance of residual effects
8. 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 each section of 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, including Turtle River White Otter Lake Provincial Park, ecological and conservation reserves, including Side Lake Conservation Reserve and Campus Lake Conservation Reserve, natural heritage sites, wetlands, estuaries, and habitats of federally listed species at risk and other sensitive areas;
- land ownership (e.g., patents, leases, tenures, etc.);
- description of local communities;
- traditional territories and/or consultation areas, treaty lands, Indian Reserve lands and Métis harvesting regions, locals, and/or settlements (seasonal or permanent); and
- traditional and commercial land uses by Indigenous peoples and the significance of the geographical setting to their culture and rights-based practices and role in their cultural landscape.

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 groups that are pertinent to the project and/or EA;
- any relevant land use plans, land zoning, or community plans (including Indigenous plans);
- information on land ownership, land lease agreement or land tenure; 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.

This information will be considered in assessing the justifiability[8] 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.[9]

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

- mining technique (open pit versus underground);
- location of key project components (open pit, tailings management area, pipelines, dams; crushing, processing and pelletizing or briquetting plant; stockpile areas for ore, overburden, waste rock and lake bottom sediment (if applicable); transmission line; etc.);
- ore processing and beneficiation methods/technologies;
- transportation of ore, intermediate and final product (railroad, conveyor system or haul road and associated water crossings)
- management of water supply (mine and potable) and waste water;
- water management (including water withdrawals, diversions, channelization, dewatering or deposition activities required) and location of the final effluent discharge points;
- mine waste disposal (methods, conveyance and sites considered);
- access to the project site;
- source of construction aggregate;
- fuel storage and distribution;
- power supply; and
- workforce accommodations and transportation.

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.

[8] See subsection 52(2) of CEAA 2012.
[9] Refer to the Agency's Operational Policy Statement entitled *Addressing "Purpose of" and "Alternative Means" under the* Canadian Environmental Assessment Act, 2012 at: https://www.canada.ca/en/impact-assessment-agency/news/media-room/media-room-2015/addressing-purpose-alternative-means-under-canadian-environmental-assessment-act-2012.html

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, proponent-owned lands, leased lands or tenured lands for the project, adjacent land uses and any important environmental features;
- information on the care and control of project components and activities;
- open pit (footprint, location, development plans including pit phases);
- ore, overburden, lake bottom sediment and waste rock stockpiles (footprint and height, locations, volumes, development plans and design criteria including methods to protect stockpiles against erosion as applicable);
- crushing, processing, and pelletizing or briquetting plants (footprint, technology, location);
- tailings management area (footprint, location and preliminary designs);
- treatment facilities for potable water, sewage and effluent (footprint, location, technologies)
- drinking and industrial water requirements (source, quantity required, need for water treatment);
- 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., pit water, mine effluent);
- dams (footprint, location, preliminary designs);
- explosives manufacturing and storage (method, location, licensing, management);
- storage areas for hazardous wastes;
- fuel storage and fueling stations;
- aggregate deposits and aggregate plant (footprint, location, volumes);
- power supply (source, quantity); and
- storage and load out facilities for concentrate and finished product;
- waste disposal (types of waste, methods of disposal, quantity); and
- permanent and temporary linear infrastructures (access roads, rail line, conveyor, haul roads, transmission line, and pipelines), identifying the route of each of these linear infrastructures, the location and types of structure used for stream crossings;
- ancillary infrastructure, including administration building, warehouse, garages, maintenance offices, and temporary workforce accommodation camp.

3.2. Project activities

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

This will include descriptions of the activities to be carried out during each phase, the location of each activity, expected material inputs and 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 groups. Activities that involve periods of increased environmental disturbance or the release of materials into the environment will be highlighted.

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 groups, and the public. In the event that there are changes to the project after the EIS has been submitted, the proponent will clearly outline and summarize the changes in a separate document that will be posted on the Canadian Impact Assessment Registry.

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. Construction, including site preparation

The EIS will include a schedule including time of year, frequency, and duration for all project activities during construction, which includes site preparation, including:

- site clearing/grading and excavation;
- construction of dams;
- storage of overburden and lake bottom sediment;
- explosives storage and manufacturing (facility and magazine locations, products, quantities, processes, method, licensing, and management);
- blasting (frequency and methods);
- construction of access roads, and railroad, conveyor, or haul road, and associated water crossings;
- storage and load out facilities for concentrates and finished product;
- borrow materials, including aggregate, requirement (source and quantity);
- water management, including water withdrawals, diversions, channelization, dewatering or deposition activities required (location, methods, timing);
- effluent management and treatment (quantity, quality, treatment requirements and release point(s))
- equipment requirements (type, quantity) and installation;
- administrative buildings, garages, other ancillary facilities;
- temporary workforce accommodation camp (location, capacity, wastewater treatment);
- characterization of the workforce, including the number and transportation of employees, work schedules, and workforce accommodations;
- storage, handling, transportation and management of hazardous materials, fuels, residues or wastes (other than mine waste);

- construction of the tailings management facility and related pipelines (including those for tailings and return water);
- construction of transmission line; and
- construction of processing facility.

3.2.2. Operation

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

- mining plan, ore production, ore stockpiling, concentrate production;
- storage, handling and transportation of materials;
- shipping and transportation of finished product;
- effluent management and treatment (quantity, quality, treatment requirement, and release point);
- explosives manufacturing and storage (facility and magazine locations, products, quantities, processes, method, licensing, and management);
- drilling and blasting (frequency and methods);
- contribution to atmospheric emissions, including emissions profile (type, rate, and source);
- water management on the project site including mine water, storm water, process water, wastewater, seepage, water recycling and effluent treatment (quantity, quality, treatment requirements, withdrawal and release point(s));
- ore extraction, ore crushing and treatment;
- characterization and management of ore, waste rock, overburden, lake bottom sediments 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);
- storage, handling, transportation and management of hazardous materials, fuels, residues or wastes (other than mine waste);
- initiation of progressive reclamation activities; and
- characterization of the workforce, including the number and transportation of employees, work schedules, and workforce accommodations.

3.2.3. Decommissioning and abandonment

The EIS will include a schedule including time of year, frequency, and duration for all project activities during decommissioning and abandonment, including:

- removal of dams;
- water management on the project site, including mine water, storm water, process water, wastewater, seepage, water recycling and effluent treatment (quantity, quality, treatment requirements, withdrawal and release point(s))
- storage, handling, transportation and management of hazardous materials, fuels, residues or wastes (other than mine waste);
- any progressive reclamation and monitoring planned;
- the preliminary outline of a decommissioning and reclamation/closure plan for any components associated with the project, including timing and unplanned premature closure;

- the ownership, transfer and control of the different project components;
- the responsibility for monitoring and maintaining the integrity of the remaining structures; and
- for permanent facilities or project components such as the open pit, a conceptual discussion on how decommissioning and abandonment could occur.

4. PUBLIC PARTICIPATION AND CONCERNS

The EIS will describe the ongoing and proposed public participation 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 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. ENGAGEMENT WITH INDIGENOUS GROUPS AND CONCERNS RAISED

As noted in Part 1, Section 2.3 of these guidelines, the proponent is expected to engage with potentially affected Indigenous groups. For the purposes of developing the EIS, the proponent will engage with Indigenous groups that may be affected by the Project, to obtain their views on:

- the Project;
- effects of changes to the environment on Indigenous 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;
- the Indigenous knowledge used to support the development of baseline data; and
- potential adverse impacts of the project on Aboriginal and Treaty rights, in respect of the Crown's duty to consult, and where appropriate, accommodate Indigenous groups.

In order to allow the Indigenous groups to engage and provide views on the above, the proponent will provide the Indigenous groups with the following timely and relevant:

- opportunities to learn about the Project including providing information about the proposed project (including but not limited to Project design, location, potential effects, mitigation measures and follow-up and monitoring programs); and
- opportunities to provide input on the overall Project; effects of changes to the environment on Indigenous peoples pursuant to paragraph 5(1)(c) of CEAA 2012 and potential adverse impacts of the project on Aboriginal and Treaty rights.

The proponent will structure its engagement activities to provide adequate time for groups to review and comment on the relevant information. Engagement activities are to be appropriate to the groups' needs, arranged through discussions with the groups 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 groups to support the preparation of the EIS. With respect to engagement activities, the EIS will document:

- the engagement activities undertaken with each group prior to the submission of the EIS, including the date and means of engagement (e.g., meeting, email, mail, telephone);
- document the main issues and comments raised during the engagement activities by each group and the proponent's responses (effort should be made to collating like issues together according to the valued components identified in the EIS);
- any future planned engagement activities including plans to engage Indigenous groups for the life of the Project, should the Project be allowed to proceed;
- where and how Indigenous groups' perspectives were integrated into and/or contributed to decisions regarding the project, design, construction, operation, decommissioning, abandonment, maintenance, follow-up and monitoring and associated potential effects (paragraph 5(1)(c)) and the associated mitigation measures utilized to manage those effects. The effects and mitigation measures should be clearly linked to valued components in the EIS as well as to specific project components or activities; and
- how engagement activities by the proponent allowed groups to understand the project and evaluate its impacts on their communities, activities, and Aboriginal and Treaty rights. Where impacts are identified, provide a discussion of how those would be managed or mitigated (and provide this information for each Indigenous group separately).

To assist with the provision of records as requested above, the Agency recommends the proponent create a tracking table of key issues raised by each Indigenous group and responses provided by the proponent. Information provided related to potential adverse impacts on Aboriginal and Treaty rights will be considered by the Crown in meeting its common law duty to consult obligations as set out in the *Updated Guidelines for Federal Officials to Fulfill the Duty to Consult* (2011).

For the groups 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 groups in order to support information gathering and the effects assessment. These groups include:

- Couchiching First Nation
- Eagle Lake First Nation
- Lac Seul First Nation

- Métis Nation of Ontario[10]
- Mitaanjigamiing First Nation
- Naotkamegwanning First Nation
- Nigigoonsiminikaaning First Nation
- Seine River First Nation
- Wabigoon Lake Ojibway Nation

For the above groups, 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 groups to provide oral input in the language of their choice. If possible, the proponent should consider translating information for these groups into the appropriate Indigenous languages(s) in order to facilitate engagement activities during the EA. For any impacts identified during these engagement activities, the proponent will discuss approaches to manage or mitigate those impacts and make efforts to discuss the degree of those impacts after mitigation (residual effects) with Indigenous groups prior to submitting the EIS to the Agency (see Part 2, Section 7.1.9 and Part 2, Section 7.3.4 of these guidelines).

For groups that may also be affected by the project, but to a lesser degree, the proponent will, at a minimum, ensure these groups are notified about key steps in the EIS development process and of opportunities to provide comments on key EA documents and/or information to be provided regarding their community. The proponent will still ensure these groups are reflected in the baseline information and assessment of potential effects or impacts in the EIS (see Part 2, Section 7.1.9 of these guidelines). These groups include:

- Lac Des Mille Lacs First Nation
- Lac La Croix First Nation

For the groups listed above, if potential effects or impacts are identified, requirements of Part 2, Section 6 and Section 7.3.4 of these guidelines would apply.

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

In addition, for the purposes of good governance, the proponent should also provide information to and discuss potential environmental effects from the Project, as described under subsection 5(1)(c) of CEAA 2012, with Naicatchewenin First Nation.

[10] The Métis Nation of Ontario Region 1 Consultation Committee consists of the Regional Councillor, one representative from each of the four Métis Councils in the Region (Northwest Métis Council, Kenora Métis Council, Sunset Country Métis Council and Atikokan Métis Council) and the Captain of the Hunt.

Upon receipt of knowledge or information of potential effects or adverse impacts to any Indigenous group, even those not listed above, the proponent shall provide that information to the Agency at the earliest opportunity.

With respect to the effects of changes to the environment on Indigenous peoples, the assessment requirements are outlined in Part 2, Sections 7.1.9 and 7.3.4 of these guidelines. With respect to impacts to Aboriginal and Treaty rights, the assessment requirements are outlined in Part 2, Section 6 of these guidelines.

6. IMPACTS TO ABORIGINAL AND TREATY RIGHTS PROTECTED UNDER SECTION 35 OF THE *CONSTITUTION ACT, 1982*

With respect to potential adverse impacts of the Project on Aboriginal and Treaty rights protected under section 35 of the *Constitution Act, 1982*, the EIS will document for each group identified in Part 2, Section 5 of these guidelines (or in subsequent correspondence from the Agency):

- Aboriginal and Treaty rights, when this information is directly provided by a group to the proponent, the Agency or is available through public records, including but not limited to:
- location of the right being practiced or exercised;
- context in which the right is practiced or exercised (including information about which sub-groups of an Indigenous group practice the right (women, elders, youth) and how the right was practiced historically);
- how the Indigenous group's cultural traditions, laws and governance systems inform the manner in which they exercise their rights (the who, what, when, how, where and why);
- the Indigenous group's perspectives on the importance of the land on which the Project is located and how it intersects with any land management uses and/or plans they may have;
- how often the right is practiced or exercised and timing or seasonality of the practice or exercise of the right;
- 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 Aboriginal and Treaty rights, including those raised by Indigenous groups;
- measures identified to accommodate potential adverse impacts of the project on the Aboriginal and Treaty rights. These measures will clearly describe how the proponent intends to implement them, and may go beyond mitigation measures that are developed to address potential adverse environmental effects. Include perspectives and specific suggestions raised of potentially impacted Indigenous groups, as well as any views of Indigenous groups on the effectiveness of accommodation measures;

- potential adverse impacts on Aboriginal and Treaty rights that have not been fully mitigated or accommodated as part of the EA and associated engagement with Indigenous groups. Include perspective of potentially impacted Indigenous groups; and
- potential adverse impacts that may result from the residual and cumulative environmental effects. Include the perspectives of potentially impacted Indigenous groups.

This information and assessment will be informed from engagement with Indigenous groups described in Part 2, Section 5 of these guidelines. 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 Aboriginal and Treaty rights. However, there may be distinctions between the adverse impacts on Aboriginal and Treaty rights 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.

7. EFFECTS ASSESSMENT

7.1. Project setting and baseline conditions

Based on the scope of the project described in Part 1, Section 3, the EIS will present baseline information in sufficient detail to enable the identification of how the project could affect the VCs and an analysis of those effects. Should other VCs be identified during the conduct of the EA, the baseline condition for these components will also be described in the EIS. To determine the appropriate spatial and temporal boundaries to describe the baseline information, refer to Part 1, Section 3.2.3 of these guidelines. As a minimum, the EIS will include a description of the following environmental components.

7.1.1. Atmospheric Environment

- a baseline survey of ambient air quality[11] in the project areas and in the airshed (or representative surrogate(s) if adequately justified). The survey should be site-specific, and include key receptor points used by Indigenous groups or priority areas as described by Indigenous groups that are likely to be affected by the project. The survey would identify and quantify emission sources for, but not limited to, the following contaminants in concentration units comparable to guidelines (i.e. $\mu g/m^3$): total suspended particulates, fine particulates smaller than 2.5 microns ($PM_{2.5}$), respirable particulates of less than 10 microns (PM_{10}), diesel particulate matter including polycyclic aromatic hydrocarbons (PAHs), carbon monoxide (CO), sulphur oxides (SOx), nitrogen oxides (NOx), and volatile organic compounds (VOCs);

[11] The proponent should refer to Health Canada's *Guidance for Evaluating Human Health Impacts in Environmental Assessment: Air Quality (2017)* document in order to include the appropriate baseline information relevant to human health. Available at: https://www.canada.ca/en/health-canada/services/publications/healthy-living/guidance-evaluating-human-health-impacts-air-quality.html

- identify and quantify existing greenhouse gas emissions[12] by individual pollutant, including land use, measured as kilotonnes of carbon dioxide equivalent per year in the project study areas;
- direct and indirect sources of air emissions;
- current provincial and federal limits for greenhouse gas emission targets;
- current ambient day-time and night-time noise[13] and vibration levels at key receptor points (e.g., Indigenous groups or communities) or priority areas as described by Indigenous groups, 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).

7.1.2. 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, including characterization of the abundance of sulfide and carbonate minerals, of expected mine material such as waste rock, ore, low grade ore, tailings, overburden, final pit walls and potential construction material, including borrow materials and aggregate, in order to predict metal leaching and acid rock drainage[14] 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; and
  - ✓ 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; and
- geochemical characterization of leaching potential, including, but not limited to, contaminants of concern such as amphibole minerals from waste rock, pit walls, ore stockpiles, and tailings.

[12] Greenhouse gas emissions include: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), perfluorocarbons (PFCs), hydrofluorocarbons (HFCs), sulphur hexafluoride (SF_6), ozone (O_3), and nitrogen trifluoride (NF_3).

[13] The proponent should refer to Health Canada's *Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise (2017)* document in order to include the appropriate baseline information relevant to human health. Available at: https://www.canada.ca/en/health-canada/services/publications/healthy-living/guidance-evaluating-human-health-impacts-noise.html

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

7.1.3. Topography and soil

- baseline mapping and description of landforms and soils (including soil chemistry), within the local and regional project areas;
- maps depicting soil depth by horizon and soil order within project areas to support soil salvage and reclamation efforts, and to outline potential for soil erosion; and
- suitability of topsoil and overburden for use in the rehabilitation of disturbed areas.

7.1.4. Riparian, Wetland and Terrestrial Environments

- characterization of soils in the excavation area, in terrestrial and riparian environments, with a description of their past use;
- topography, drainage, geology and hydrogeology, and the physicochemical characteristics of potential on-land sediment or soil disposal sites;
- characterization of the shoreline, banks, current and future flood risk areas, and wetlands (fens, marshes, etc.). Wetlands that may be affected by project activities will be characterized according to their location, size, type (wetland class and form), species composition and function (e.g., ecological, hydrological, wildlife, socioeconomic).[15] Efforts should focus on wetlands where changes could affect valued components described in Part 2, Section 7.3 of the present guidelines. An overview of the key plant communities and animals that rely on wetlands will be presented; and
- plant and animal species (abundance, distribution, mortality and diversity) and their habitats, including migration routes. Species at risk or species with special status that are of social, economic, cultural or scientific significance should be included, as well as invasive alien species and species used for traditional purposes by Indigenous groups.

7.1.5. Groundwater and Surface Water

- hydrogeology, including:
  - ✓ hydrometeorological context (e.g., temperature, precipitation, evapotranspiration)
  - ✓ hydrogeological context (e.g., hydrostratigraphy with aquifers, aquicludes 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, specific storage, storativity, porosity, specific yield, as applicable);
  - ✓ groundwater flow patterns, boundaries and rates, and temporal changes in groundwater flow (e.g., seasonal and long-term changes in water levels);

[15] The Canadian Wetland Classification System, National Wetlands Working Group, 1997, See the website http://www.env.gov.yk.ca/animals-habitat/documents/canadian_wetland_classification_system.pdf. The proponent should also consider the Ontario Wetland Evaluation System – Northern Manual, available online at: https://files.ontario.ca/environment-and-energy/parks-and-protected-areas/ontario-wetland-evaluation-system-northern-manual-2014.pdf.

- ✓ a discussion of the hydrogeologic, hydrologic, hydrostratigraphic, geomorphic, climatic and anthropogenic controls on groundwater flow;
- ✓ surface water balance for the local or regional watersheds containing the Project. This should include a delineation and characterization of groundwater - surface water interactions including temperature, identification of groundwater-dependent ecosystems, wetlands, and groundwater discharge and recharge areas;
- ✓ timing of freeze/thaw cycles, ice cover, ice conditions for surface water bodies in the project area; and
- ✓ information on permafrost conditions and taliks and their influence on groundwater – surface water interactions, if applicable.

- hydrogeological maps and cross-sections for the project 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;
- all groundwater monitoring wells, including their location, in relation to the location of project components, including geologic, hydrostratigraphic, piezometric and construction data (e.g., depths of surficial rock and bedrock, bedrock quality, fracture zones, piezometric levels, hydraulic conductivity, diameter and screen depth and intercepted aquifer unit) as well as seasonal and inter-annual water level variations;
- monitoring protocol for collection of existing groundwater and surface water data (e.g., sampling site selection, monitoring duration and frequency, sampling protocol, analytical protocol including quality assurance and quality control measures);
- an appropriate numerical hydrogeologic model for the project area, which:
- discusses the hydrostratigraphy and groundwater flow systems;
- is calibrated to baseline hydrogeological conditions using groundwater level and stream flow monitoring data. The proponent should provide evidence to demonstrate the quality of the calibration;
- includes an analysis of the sensitivity of key model outputs to hydrogeologic properties (e.g., hydraulic conductivity) and climatic variations (e.g., recharge);
- provides a baseline groundwater budget including baseflow discharge to wetlands, streams and rivers, recharge from lakes or streams, and any anthropogenic withdrawals;
- includes a description of the limitations and assumptions in the modelling approach;
- groundwater quality, including analytical results for physico-chemical parameters (e.g., water temperature, pH, electrical conductivity, dissolved oxygen, turbidity) and relevant chemical constituents (trace metals, major and minor ions, radionuclides, nutrients, organic compounds) , with the interpretation of results for any anomalous values and for contaminants of concern;
- graphs or tables indicating the seasonal and inter-annual variations in groundwater levels, flow regime, and quality;
- local and regional potable groundwater supplies (e.g., domestic, communal, or municipal water wells) and their screened hydrostratigraphic unit and piezometric level. Discussion on their current use and potential for future use, and whether their consumption has any Indigenous cultural importance should be included;

- structural geology of the hydrogeological environment including major faults, 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, in relation to 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 for physico-chemical parameters (e.g., water temperature, turbidity, pH, dissolved oxygen profiles, electrical conductivity) and relevant chemical constituents (e.g., trace metals, major and minor ions, radionuclides, nutrients and organic compounds including those of potential concern). The data should illustrate seasonal and inter-annual variability and interpret representative tributaries and water bodies including all sites to receive mine effluents or runoff;
- any local and regional potable surface water resource including description of their current use and potential for future use, and whether their consumption has any Indigenous cultural importance; and
- sediment quality analysis (e.g., total metals, particle size, and total organic carbon content) for key sites likely to receive mine effluents.

7.1.6. Fish and fish habitat

For potentially affected surface waters:

- a characterization of fish populations on the basis of species and life stage, abundance, distribution, and movements, including information on the surveys carried out and the source of data available (e.g., location of sampling stations, catch methods, date of catches, species, catch-per-unit effort);
- a description of primary and secondary productivity of aquatic resources (e.g., benthic communities, feeder species, aquatic plants) in terms of abundance and distribution 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, habitat types and functions, cover components, and photos;
- a description of natural obstacles (e.g., falls, beaver dams) or existing structures (e.g., water crossings) that hinder the free passage of fish;
- a description of any existing effects associated with previous or current activities (e.g., angling pressures);
- 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 sportfish of importance to Indigenous peoples and that are found or are likely to be found in the study areas.

Note that 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.

7.1.7. Migratory birds and their habitat

- birds and their habitats that are found or are likely to be found in the study areas. 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 areas. The existing data must be supplemented by surveys[16], as appropriate, to ensure current data for the project area;
- abundance, distribution, and life stages of migratory and non-migratory birds (including waterfowl, raptors, shorebirds, marsh birds and other land birds) likely to be affected in the project area based on existing information or surveys, as appropriate, to provide current field data for the project area;
- characterization of various ecosystems found in the project area, likely to be affected, based on existing information (land cover types, vegetation); and
- year-round migratory bird use of the areas (e.g., winter, spring migration, breeding season, fall migration), based on preliminary data from existing sources and surveys, as appropriate, to provide current field data.

7.1.8. Species at Risk

- a list of all species at risk listed under the *Species at Risk Act* (fauna and flora) that may be affected by the project, using existing data and literature as well as surveys to provide current field data;
- a list of all species assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as extirpated, endangered, threatened or of special concern[17], using existing data and literature as well as surveys to provide current field data;
- any published studies, including, but not limited to recovery strategies and action plans developed under the *Species at Risk Act*, that describe the regional importance, abundance and distribution

[16] Surveys should be designed in light of the available references and recommendations in the Canadian Wildlife Service's Technical Report No. 508, *A Framework for the Scientific Assessment of Potential Project Impacts on Birds* (Hanson et al. 2009). Appendix 3 of the Framework provides examples of project types and recommended techniques for assessing impacts on migratory birds.

[17] Proponents are encouraged to consult COSEWIC's annual report for a listing of the designated wildlife species. The report from 2017-2018 can be found here: https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/publications/cosewic-annual-report-2017-2018.html

of species at risk (for instance, recovery strategy and action plan for Little Brown Myotis).[18] The existing data must be supplemented by surveys, as appropriate, to provide current field data; and
- information on residences, seasonal movements, movement corridors, habitat requirements, key habitat areas, identified critical habitat and/or recovery habitat (where applicable) and general life history of species at risk that may occur in the project area, or be affected by the Project

7.1.9. Indigenous peoples

The proponent shall gather and document baseline information in the EIS for each Indigenous group identified in Part 2, Section 5 of these guidelines. The baseline information will:

- Describe and characterize the elements in paragraph 5(1)(c) of CEAA 2012 based on the spatial and temporal scope selected for the EA according to the factors outlined in Part 1, Section 3.2.3 of this document.
- Characterize the regional context of each of the elements of paragraph 5(1)(c) of CEAA 2012 to support the assessment of project-related effects. In doing so, the proponent will consider disproportionate baseline conditions for diverse subgroups within an Indigenous group, as appropriate (for example, women, youth, elders, families) and cumulative effects.
- Provide a comprehensive understanding of the current state of each VC related to effects of changes to the environment on Indigenous peoples. Each of the VCs for effects of changes to the environment on Indigenous peoples is interrelated and therefore baseline information will often overlap.

The proponent should engage with Indigenous groups to understand where baseline information and the respective assessment fit appropriately. Note: VCs identified for biophysical assessment (such as fish and fish habitat) may contribute to the assessment and conclusion of VCs related to effects of changes to the environment on Indigenous peoples.

HEALTH AND SOCIO-ECONOMIC CONDITIONS

Baseline information is required for health[19,20] and socio-economic conditions. For socio-economic conditions, as well as the economic and social activities of an individual Indigenous group, the baseline will include contextual information regarding their practices. Specific aspects that will be considered include:

- general information about Indigenous populations and population subgroups;

[18] The proponent should refer to the recovery strategy for Little Brown Myotis prepared by Environment and Climate Change Canada (2018) titled *Recovery Strategy for the Little Brown Myotis (*Myotis lucifugus*), the Northern Myotis (*Myotis septentrionalis*), and the Tri-colored Bat (*Perimyotis subflavus*) in Canada*. The proponent should consult with Environment and Climate Change Canada for further guidance related to Little Brown Myotis (*Myotis lucifugus*).

[19] 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.publications.gc.ca/site/eng/481782/publication.html

[20] The proponent should refer to Health Canada's *Guidance on Health Impact Assessment of Resource Development and Infrastructure Project*. Please contact Health Canada for more information.

- sites or areas that are used by Indigenous peoples either for permanent residences or on a seasonal/temporary basis and the number of people that use each site or area identified;
- drinking and recreational water sources[21] (permanent, seasonal, periodic, or temporary) including their locations and water quality;
- consumption of country foods[22] (also known as traditional foods) including food that is trapped, fished, hunted, harvested or grown for subsistence or medicinal purposes, outside of the commercial food chain;
- which country foods are consumed by which groups, how frequently, where these country foods are harvested, and a description of their quality which includes a discussion of data sources that have been considered;
- commercial activities (e.g., fishing, trapping, hunting, forestry, outfitting, plant gathering); and
- recreational uses.

PHYSICAL AND CULTURAL HERITAGE

Baseline information for physical and cultural heritage[23] (including any site, structure or thing of archaeological, paleontological, historical or architectural significance) will consider all elements of cultural and historical importance to Indigenous groups in the area and is not restricted to artifacts considered under provincial heritage legislative requirements.[24] Baseline information will also consider archaeological assessment reports and their recommendations. Specific aspects that will be considered include, but are not limited to:

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

[21] The proponent should refer to Health Canada's *Guidance for Evaluating Human Health Impacts in Environmental Assessment: Drinking and Recreational Water Quality* (2017) document in order to include the appropriate baseline information relevant to human health. Available at: https://www.canada.ca/en/health-canada/services/publications/healthy-living/guidance-evaluating-human-health-impacts-water-quality.html

[22] The proponent should refer to Health Canada's *Guidance for Evaluating Human Health Impacts in Environmental Assessment: Country Foods* (2018) in order to include the appropriate baseline information relevant to human health. Available at: https://www.canada.ca/en/health-canada/services/publications/healthy-living/guidance-evaluating-human-health-impacts-country-foods.html

[23] 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).

[24] The proponent should refer to CEAA's *Reference Guide on Physical and Cultural Heritage Resources* (April 1996). Available at: https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/reference-guide-physical-cultural-heritage-resources.html

CURRENT USE OF LANDS AND RESOURCES FOR TRADITIONAL PURPOSES[25]

Baseline information for 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 consideration of any land use plans developed and an understanding of the baseline conditions of the quality and quantity of resources (e.g., preferred species and perception of quality, cultural connections to species), access to resources (e.g., physical access, timing, seasonality, distance from community) and overall quality of the experience of the practice (e.g., noise, air quality, visual landscape and presence of others). Specific aspects that will be considered include, but are not limited to:

- location of traditional territory (including maps where available);
- location of reserves and communities, land claims and Treaty areas;
- traditional uses currently practiced or practiced in living memory, including practices that an Indigenous group wants to engage in the future or recently did but cannot given the particular context;
- location of traditional uses including hunting, trapping, and fishing camps, cabins and traditional gathering or teaching grounds;
- fish, wildlife, birds, plants or other natural resources and their habitats of importance for traditional use;
- places where fish, wildlife, birds, plants or other natural resources are harvested, including places that are preferred;
- access and travel routes for conducting traditional practices, including details of water bodies used for navigation;
- frequency, duration or timing of traditional practices;
- cultural values and importance associated with the area affected by the project and the traditional uses identified;
- where known, efforts of the Indigenous groups to bring back traditional practices; and
- other current uses identified by Indigenous groups.

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, including Indigenous knowledge, from groups was used in establishing the baseline conditions related to health and socio-economics, physical and cultural heritage and current use of lands and resources for traditional purposes. Information collected as part of Section 6 Aboriginal and Treaty rights can be used to inform the baseline information for the elements of 5(1)(c) listed above.

[25] The proponent should refer to CEAA's *Technical Guidance for Assessing the Current Use of Lands and Resources for Traditional Purposes under CEAA, 2012* document in order to include the appropriate baseline information relevant to current use. Available at: https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/technical-guidance-assessing-current-use-lands-resources-traditional-purposes-under-ceaa-2012.html

Should there be a lack of Indigenous knowledge available to the proponent, the proponent is still expected to seek information from other sources[26] sufficient enough to allow for a complete assessment of effects to be presented in the EIS. For more information on requirements for the effects assessment, see Part 2, Section 7.3.4 of these guidelines.

7.1.10. Human environment

In the case where a decision related to subsection 5(2) of CEAA 2012 is involved that could result in a change to the environment and affect non-Indigenous peoples, specific aspects that the proponent will consider include, but are not limited to:

- 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 recreational and commercial fishing, hunting, trapping, gathering, outdoor recreation, use of seasonal cabins, lodges, outfitters, including lands within the Turtle River White Otter Lake Provincial Park;
- current, past and potential use of all waterways and water bodies that will be directly affected by the Project, including recreational uses such as wilderness canoe routes and motorboat/canoe-based camping experiences, where available;
- location of and proximity of any permanent, seasonal or temporary residences or camps;
- health[19] and socio-economic conditions, including the socio-economic determinants of health, the functioning and health of the socio-economic environment, encompassing a broad range of matters that affect communities in the study area in a way that recognizes interrelationships, system functions and vulnerabilities (for example effects on subgroups such as workers/job seekers and their families, youth, elders, women, service providers, economically marginalized members of the community, etc.); and
- physical and cultural heritage, including cultural heritage landscapes and any structures, sites or things of historical, archaeological, paleontological or architectural significance.

7.1.11. 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

In a stand-alone section or appendix, the EIS will include baseline information on environmental components (not already covered in other subsections of these guidelines) that would potentially be affected by changes to the environment that are directly linked (direct effects) or necessarily incidental (indirect effects) to each federal decision required for the Project to proceed. For example, if an authorization provided under the *Fisheries Act* or an amendment to Schedule 2 of the MDMER were to

[26] See section *Gathering data and information on VCs of interest* in the Technical Guidance for Assessing the Current Use of Lands and Resources for Traditional Purposes under CEAA 2012 for further guidance. Available at: https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/technical-guidance-assessing-current-use-lands-resources-traditional-purposes-under-ceaa-2012.html#_Toc015

result in the flooding of key wildlife habitat, baseline information should be provided on the wildlife species likely to be affected.

This stand-alone section or appendix will include the following:

- a discussion of the project activities enabled by each federal decision that would be required for the Project (e.g., dams, tailings management area, fish habitat offsetting measures, road culverts, explosives storage and manufacturing facility)
- table and map depicting the project activities enabled by each federal decision that would be required for the Project.
- identify and provide a rationale for the VCs that will constitute the focus of the effects assessment, related to subsection 5(2) of CEAA 2012 (not otherwise covered under subsection 5(1) of CEAA 2012). The proponent must consider, without limiting itself thereto, the following components directly or indirectly affected by the project activities enabled by each federal decision required to proceed with the Project and provide a rationale for excluding any of the following components:
    - ✓ Atmospheric environment (Air quality, noise levels, visual aesthetics and vibration);
    - ✓ Water quality and quantity;
    - ✓ Furbearers and their habitat;
    - ✓ Amphibians and their habitat;
    - ✓ Reptiles and their habitat;
    - ✓ Ungulates and their habitat;
    - ✓ Species at risk and their habitat;
    - ✓ Wetlands;
    - ✓ Non-migratory birds and their habitat;
    - ✓ Human health (not limited to Indigenous peoples);
    - ✓ Socio-economic conditions (not limited to Indigenous peoples);
    - ✓ Physical and cultural heritage including cultural heritage landscapes (not limited to Indigenous peoples); and
    - ✓ Any structure, site or thing that is of historical, archaeological, paleontological or architectural significance (not limited to Indigenous peoples).

- identify and justify the spatial and temporal boundaries for the effect assessment related to subsection 5(2) of CEAA 2012 for each VC selected.

If there is the potential for the Project to result in environmental changes on federal lands, another province, or outside of Canada, then valued components of importance not already identified should be included.

7.2. 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. For each predicted change, the proponent will identify all sensory and observable change indicators (e.g., smells, noise, and smoke) adopted as a result of traditional knowledge in relation to each VC. 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 changes described.

7.2.1. Changes to the atmospheric environment

- an estimate of emissions associated with each phase of the Project, including emissions profile (type, rate and sources), as well as any mitigation measures proposed to minimize emissions;
- changes in air quality for all phases of the Project *(*including sulfur oxides (SOx), nitrous oxides (NOx), total suspended particulates, fine particulates smaller than 2.5 microns ($PM_{2.5}$), respirable particulates of less than 10 microns (PM_{10}) and diesel particulates including polycyclic aromatic hydrocarbons (PAHs) presented in concentration values comparable to guidelines (i.e. µg/m^3)*;*
  - ✓ justify dispersion modeling methods and include relevant input and output files.

- an estimate of the greenhouse gas emissions associated with all phases of the Project as well as any mitigation measures proposed to minimize greenhouse gas emissions.[27] This information is to be presented by individual pollutant and changes in land use, and should also be summarized in CO_2 equivalent per year;
  - ✓ justify all estimates and emission factors used in the analysis;
  - ✓ provide the methods and calculations used for the analysis;
  - ✓ compare and assess the level of estimated emissions of greenhouse gases to the regional, provincial and federal emission targets;

- changes in ambient day-time and night-time noise and vibration levels at key receptor locations; and
- changes in night-time light levels.

7.2.2. Changes to groundwater and surface water

- changes to the physical hydrogeological system, including:

[27] Refer to *Incorporating Climate Change Considerations in Environmental Assessment: General Guidance for Practitioners* (November 2003) at: https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/incorporating-climate-change-considerations-environmental-assessment-general-guidance-practitioners.html

- ✓ changes to groundwater recharge and discharge areas, including mapping of the extent of the groundwater drawdown zone, and any changes to groundwater infiltration areas;
- ✓ estimates of key project fluxes including open pit or mine inflow rates, pit or mine dewatering rates, pit or mine flooding rates, and tailings seepage rates;
- ✓ estimates of changes to surface water and groundwater regimes including effects of mine dewatering on lake levels, effects on baseflow in rivers and streams, effects on wetlands, effects on recharge and discharge, effects on potable supplies, and effects on natural flow divides;
- ✓ discussion of projected seepage patterns for applicable project components (e.g., by using groundwater piezometric contours);
- ✓ an integrated site water balance model incorporating surface and groundwater fluxes to or from all major project components; and
- ✓ a water use assessment identifying and describing the quantity and quality of water resources potentially affected by the Project, including water withdrawn from local waterbodies used as a supply source, the flow or volume of water available in waterbodies, and how and where wastewater would be discharged.

– changes to water quality in the receiving environment, including:
  - ✓ changes to ice regime;
  - ✓ changes to groundwater quality upgradient, downgradient, and cross-gradient of project components including those associated with storage or release of any mine effluents or drainage including surface runoff. Water quality parameters should include physico-chemical parameters (temperature, pH, salinity, dissolved oxygen, turbidity) and chemical constituents (major and minor ions, trace metals, radionuclides, nutrients, organic compounds);
  - ✓ changes to surface water quality due to effluents from the project including changes to physico-chemical parameters (temperature, pH, salinity, dissolved oxygen, turbidity), chemical constituents (major and minor ions, trace metals, radionuclides, nutrients, organic compounds);
  - ✓ any applicable water quality treatment measures and evidence supporting the effectiveness of these measures;
  - ✓ quantity and quality of all effluent streams released from the site to the receiving environment including seepage and surface runoff rates from project components;
  - ✓ estimates of pit water chemistry during operations, decommissioning and abandonment;
  - ✓ an integrated chemical mass balance model incorporating surface and groundwater chemical loads to or from all major project components; and
  - ✓ assessment for off-site migration pathways for impacted groundwater and an analysis of contaminant attenuation capacities within the hydrogeological units of the project area.

– 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 (e.g., borrow materials and aggregate), including:
  - ✓ volume and tonnage of waste rock, tailings and low grade ore including disposal methods;
  - ✓ short term metal leaching properties;
  - ✓ longer term rates of acid generation (if any) and metal(loid) leaching;

- ✓ estimates of the potential for mined materials (including waste rock, tailings, aggregate, borrow materials 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/effluent from samples of tailings, waste rock, aggregate, borrow materials and low grade ore, and of all effluent streams to be released from the site into the receiving environment from these project components;
- ✓ quality of humidity cell or column test liquid from acid rock testing;
- ✓ comparison of results of the acid rock drainage-metal leaching tests to the authorized limits of deleterious substances listed on Schedule 4 of the MDMER;
- ✓ feasibility of segregating potentially-acid generating and non-potentially acid generating waste materials during operations, including description of the proposed geochemical segregation criteria and identification of operational methods to achieve geochemical characterization during operations (i.e. geochemical surrogates, on-site lab, procedures, etc.). Provide a sensitivity analysis to assess the effects of imperfect segregation of waste rock;
- ✓ pit water chemistry during operation, decommissioning and abandonment; and
- ✓ surface and seepage water quality from the waste rock storage area, tailings/waste rock impoundment area, aggregate stockpiles and other infrastructure during operation, decommissioning and abandonment.

Changes in surface water quality associated with any mine effluent releases (including seepage) or surface runoff should be based on the outputs of models.

7.2.3. Changes to riparian, wetland and terrestrial environments

- overall description of changes related to project activities, including landscape disturbance;
- changes to the habitat of migratory and non-migratory birds, with a distinction made between the two bird categories, including losses, structural changes and fragmentation of riparian habitat of terrestrial environments and wetlands frequented by birds (types of cover, ecological unit of the area in terms of quality, quantity, diversity, distribution and functions);
- changes to critical habitat for federally listed species at risk (*Species at Risk Act*) and/or important habitat for species designated by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (for listing on Schedule 1 of the *Species at Risk Act*); and
- changes to key habitat, including migration routes, if applicable, for species important to current use of lands and resources for traditional purposes.

7.3. Predicted effects on valued components

Based on the predicted changes to the environment identified in Part 2, Section 7.2, the proponent is to assess the environmental effects of the project on the following VCs. All interconnections between VCs and between changes to multiple VCs will be described:

7.3.1. 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 alteration, disruption or destruction (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;
  - ✓ changes to water and sediment quality identified in changes to groundwater and surface water, and their potential effects on fish and 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; and
  - ✓ identification of the federal decisions that would be required for carrying out the works, or components of the works, associated with fish and fish habitat (i.e. an authorization under section 35 of the *Fisheries Act* or amendment to Schedule 2 of the MDMER).

- the effects of changes to the aquatic environment, including those identified under changes to groundwater and surface water, 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, and the habitat that supports the fish populations;
  - ✓ any modifications in migration or local movements (upstream and downstream migration, and lateral movements) during and 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 number of people in the project area;
  - ✓ any modifications and use of habitats by federally listed fish species;

- a discussion of how project construction timing correlates to key fisheries windows for freshwater species, and any potential effects resulting from overlapping periods;
- a discussion of how vibration caused by blasting may affect fish behaviour, such as spawning or migrations; and
- a discussion of any potential habitat offset/compensation works related to fish and fish habitat, including:
  - ✓ calculations of the amount of habitat being impacted and the amount of habitat being offset/compensated;
  - ✓ the spatial location of the offsetting/compensation habitat; and

- ✓ identification of the federal decisions under which the habitat offset/compensation works, or components of these works, will likely be administered (i.e. an authorization under section 35 of the *Fisheries Act* or section 27.1 of the MDMER); and
- ✓ potential effects of the habitat offset/compensation works to the physical environment and other valued components.

7.3.2. Migratory birds

- direct and indirect adverse effects on migratory birds including those that are species at risk. The direct and indirect adverse effects will include population level effects that could be caused by all project activities, including, but not limited to:
- site preparation;
- deposit of harmful substances in waters that are frequented by migratory birds (e.g., tailings management area);
- 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) on relative abundance and movements of migratory birds, and losses or changes in migratory bird habitat, considering the critical breeding and migration periods for the birds.

7.3.3. Species at risk

- the potential adverse effects of the Project on species at risk listed under the *Species at Risk Act* and, where appropriate, its critical habitat. The potential adverse effects will include direct and indirect effects on the survival or recovery of species listed under the *Species at Risk Act*.
- the potential adverse effects of the Project on species assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as extirpated, endangered, threatened, or of special concern.

7.3.4. Indigenous peoples

With respect to Indigenous peoples, provide a description and analysis, for each Indigenous group identified in Part 2, Section 5 of these guidelines, of how changes to the environment caused by the Project will affect the health and socio-economic conditions, physical and cultural heritage including any structure, site or thing of historical, archaeological or paleontological importance, and current use of lands and resources for traditional purposes.

HEALTH AND SOCIO-ECONOMIC CONDITIONS

Baseline information gathered as part of the assessment of effects described in 5(1)(c) of CEAA 2012, as well as general information about Indigenous populations and subgroups could inform the assessment of human health.

- The assessment of impacts to human health will be based on effects of changes to the environment on Indigenous peoples' health, focusing on effects on health outcomes or risks in consideration of, but not limited to, potential changes in air quality[11], noise exposure and effects of vibration from blasting[13], current and future availability of country foods[22], and water quality[21]

(drinking, recreational and cultural uses). The EIS will identify on a map sensitive receptors and priority areas as described by Indigenous groups.

- When risks to human health due to changes in one or more of these components are predicted, the proponent is expected to complete a Human Health Risk Assessment (HHRA), examining all exposure pathways for pollutants of concern to adequately characterize potential risks to human health.[28]
- The proponent must provide a justification if it determines that an assessment of the potential for contamination of country foods (or other exposure pathways, such as inhalation) is not required or if some contaminants are excluded from the assessment.
- Consider effects to mental and social well-being of Indigenous peoples. Where adverse health effects are predicted, any incidental effects such as effects on current use of lands and resources for traditional purposes should also be assessed.
- Consider and document how effects of changes to the environment could be experienced disproportionately for diverse subgroups within an Indigenous group (e.g., women, youth, elders, specific families).
- This assessment of impacts to human health will assess effects of changes to the environment on Indigenous peoples' socio-economic conditions, including, but not limited to:
    - ✓ the current, past and potential use of navigable waters (including any water used for Indigenous transport)
    - ✓ forestry and logging operations
    - ✓ commercial fishing, hunting, trapping, and gathering activities
    - ✓ commercial outfitters
    - ✓ recreational use
    - ✓ food security[29]
    - ✓ income inequity
    - ✓ changes at the community level that affect socio-economic conditions for Indigenous peoples as result of increased population, economic activity, cost of living, among other factors
    - ✓ non-commercial / trade economy

PHYSICAL AND CULTURAL HERITAGE

- This assessment will assess effects of changes to the environment on Indigenous peoples' physical and cultural heritage, cultural heritage landscapes and structures, sites or things of historical, archaeological, paleontological or architectural significance to groups, including, but not limited to:
    - ✓ the loss or destruction of physical and cultural heritage
    - ✓ changes to access to physical and cultural heritage

[28] Refer to Health Canada's Risk Assessment Guidance Parts I through VII. Available at: https://www.canada.ca/en/health-canada/services/environmental-workplace-health/contaminated-sites/guidance-documents.html

[29] According to Health Canada and the Food and Agricultural Organisation "food security" is "when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life".

- ✓ changes to the cultural value or importance associated with physical and cultural heritage
- ✓ changes to sacred, ceremonial or culturally important places, objects, or things
- ✓ changes to visual aesthetics over the life of the Project

- This assessment should use the approach described in the Agency's guide entitled *Technical Guidance for Assessing Physical and Cultural Heritage or any Structure, Site or Thing*.[30]

CURRENT USE OF LANDS AND RESOURCES FOR TRADITIONAL PURPOSES

- This assessment will characterize the effects, including cumulative effects, on the use or activity (e.g., hunting, fishing, trapping, plant gathering, and cultural practices) as a result of the underlying changes to the environment (i.e. how will the activity change if the project proceeds), using the approach described in the Agency's guide entitled *Technical Guidance for Assessing the Current Use of Lands and Resources for Traditional Purposes under CEAA 2012*.[25] This assessment should consider how changes caused by the Project through changes to the environment can cause effects to the practice of a current use or activity through the following interactions with:
  - ✓ Resources used, such as changes to the quantity, quality, and availability of resources and habitat, as well as to the sufficiency of resources required to conduct an activity or practice, including perception of effects, avoidance, and consideration of the seasonal round;
  - ✓ Access to areas and resources without difficulty or additional cost used to conduct an activity or practice, as well as the opening up of areas to non-Indigenous populations for access and use, and consideration of preferred areas, timing of harvest, and options of traveling there in the preferred manner(s); and
  - ✓ Experience by Indigenous peoples, including changes that affect the spiritual and cultural experiences of the activity or practice, as well as sense of place and wellbeing, and the applicability and transmission of Indigenous knowledge, laws, customs and traditions.

- Using the interactions listed in the above bullet, the proponent should also consider the following in their assessments:
  - ✓ the 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;
  - ✓ how environmental effects to lands and resources could affect the use and associated activities;

[30] Refer to Technical Guidance for Assessing Physical and Cultural Heritage or any Structure, Site or Thing (March 2015) at: https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/technical-guidance-assessing-physical-cultural-heritage-or-structure-site-or-thing.html

  - ✓ 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; and
  - ✓ an assessment of the potential to return affected areas to pre-project conditions to support traditional practices (including the identification of end land use goals).

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

The proponent is expected to provide mitigation measures for effects of changes to the environment on Indigenous peoples pursuant to subsection 5(1)(c) of CEAA, 2012 (see Part 2, Section 7.4 of these guidelines).

7.3.5. 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

In a stand-alone section or appendix referred to in Part 2, Section 7.1.11, the EIS will assess the changes to the environment that are directly linked (direct effects) or necessarily incidental (indirect effects) to any federal decisions (e.g., authorizations under section 35 of the *Fisheries Act* or amendments of Schedule 2 of MDMER) and potential effects of those changes. The EIS will include a description and analysis of how changes to the environment that are directly linked (direct effects) or necessarily incidental (indirect effects) to each federal decision required for the Project to proceed could affect the following VCs:

- Atmospheric environment (air quality, noise levels, visual aesthetics and vibration);
- Water quality and quantity;
- Furbearers and their habitat;
- Amphibians and their habitat;
- Reptiles and their habitat;
- Ungulates and their habitat;
- Species at risk and their habitat;
- Non-migratory birds and their habitat; and
- Wetlands.

In addition, the EIS will include a description and analysis of how changes to the environment that are directly linked (direct effects) or necessarily incidental (indirect effects) to each federal decision required for the Project to proceed could affect the following VCs:

- Health and socio-economic conditions of non-Indigenous peoples. This analysis should include consideration of:
  - ✓ effects on recreational and commercial fishing, hunting, trapping, plant gathering, outdoor recreation, use of seasonal cabins, tourism outfitters;
  - ✓ changes to the use of waterways and water bodies, including an assessment of effects on navigation that describes current, past and potential future use of the waterway; and
  - ✓ effects on the 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, system functions and vulnerabilities.

- Physical and cultural heritage, including cultural heritage landscapes and any structures, sites, or things of historical, archaeological, paleontological, or architectural significance

If there is potential for the Project to result in environmental changes on federal lands, lands in a province other than Ontario, or outside of Canada as a result of the project, the EIS will include a description of effects will include, but are not limited to, a consideration of:

- an estimate of the greenhouse gas emissions associated with all phases of the project in a provincial and national context, as well as any mitigation measures proposed to minimize greenhouse gas emissions. This information is to be presented by individual pollutant including land use and should also be summarized in CO_2 equivalent per year.

The proponent is expected to provide mitigation measures for effects of changes to the environment directly linked or necessarily incidental to any federal decisions pursuant to subsection 5(2) of CEAA 2012, or see Part 2, Section 7.4 of these guidelines.

7.4. 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 or commitment, 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 proponent will describe criteria used to estimate the technical and economic feasibility of potential mitigation measures and provide rational as to why certain mitigation measures were rejected. 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, including any effects directly linked or necessarily incidental to any federal decisions. 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 identify and describe mitigation measures to avoid, or lessen potential adverse effects on species 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 also identify and describe mitigation measures to avoid or lessen adverse effects on listed COSEWIC species, and species harvested by Indigenous groups.

The EIS will specify the actions, works, minimal disturbance footprint techniques, best available technology, best management practices, 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 will indicate what other technically and economically feasible mitigation measures were considered, and explain why they were rejected. Trade-offs between cost savings and effectiveness of the various forms of mitigation measures will be justified. The EIS will identify who is responsible for the implementation of these measures and the system of accountability.

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

The EIS will document specific suggestions raise by each Indigenous group for mitigating the effects of changes to the environment on Indigenous peoples (paragraph 5(1)(c) of CEAA 2012*).* For those mitigation measures intended to address effects of changes to the environment on Indigenous peoples, the proponent must discuss the residual effects with the Indigenous groups identified in Part 2, Section 5 of these guidelines prior to submitting the EIS.

Adaptive management is not considered as a mitigation measure, but if the follow-up program (refer to Part 2, Section 9 below) indicates that corrective action is required, the proposed approach for managing the action (including resources) should be identified.

7.5. 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 Part 2, Section 7.3 above. For those VCs related to effects of changes to the environment on Indigenous peoples, the proponent must discuss the residual effects with the Indigenous groups identified in Part 2, Section 5 of

these guidelines prior to submitting the EIS. All residual effects, even if very small or deemed insignificant will 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 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 and the guide entitled *Technical Guidance for Determining Whether a Designated Project is Likely to Cause Significant Adverse Environmental Effects* under the Canadian Environmental Assessment Act, 2012.[31]

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 groups, and the public to review the proponent's analysis of the significance of effects. For those predicted adverse effects that relate to effects of the changes to the environment on Indigenous peoples, the proponent will consider the views of the Indigenous groups in the determination of the definitions of the significance criteria. The EIS will document the terms used to describe the level of significance.

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

- magnitude
- geographic extent
- timing
- duration
- frequency
- reversibility
- ecological and social context[32]
- existence of environmental standards, guidelines or objectives for assessing the effect

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.

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

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[31] Refer to Agency's Interim Technical Guidance, *Determining Whether a Project is Likely to Cause Significant Adverse Environmental Effects under the Canadian Environmental Assessment Act, 2012* (March 2018) at: https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/determining-project-cause-significant-environmental-effects-ceaa2012.html

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

7.6. Other effects to consider

7.6.1. Effects of potential accidents or malfunctions

The failure of certain works caused by human error (e.g., tailings dam breach, tailings or return water pipeline rupture) 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 across all phases of the Project. The analysis of each worst case hazard scenario will include a description of the changes to the receiving environment and the resulting effects to the identified VCs, and present preliminary emergency response measures and capacities. This analysis should be provided regardless of the likelihood of the hazard occurring.

Taking into account the lifespan of all different project components and temporal phases, 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 plausible worst case scenarios and the effects of these scenarios. For example, fate and behaviour modelling of potential spills of hazardous substances, such as hydrocarbons, sodium cyanide, and ammonium nitrate to fish-bearing waterways may be considered across all seasons.

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.

The EIS will describe the preventative measures and design 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. Environmental sensitivity mapping, including likely pathways, will identify areas sensitive to accident and malfunction scenarios that are located adjacent to project activities, such as streams and wetland areas frequented by fish and/or migratory birds.

ACCIDENTS OR MALFUNCTIONS RELATED TO RAIL TRANSPORTATION

Further, the proponent will describe and evaluate the potential effects to the environment caused by accidents and malfunctions resulting from rail transportation associated with the Project, including impacts on social, economic or cultural elements of the environment and on people's health in the vicinity of spilled contaminants.

If serious accidents or malfunctions are likely to occur and if the necessary data are available, the proponent will determine whether it is necessary to carry out an assessment of the probability that such an event occur and an assessment of its consequences, taking into account the contributing factors such as weather conditions or external events.

The proponent will also assess the potential of minor and major accidental release of fuel, or loss of dangerous goods. If necessary, the proponent will also provide an analysis of the potential environmental effects of these discharges on aquatic and terrestrial environments and on human health in spatial boundaries described in this document.

The proponent will also describe existing emergency preparedness and response systems and existing arrangements with the responsible response organizations in the rail transportation spatial boundaries associated with the project, including exercise and training plans for spill emergency response. The proponent will describe the role it will play in case of spill, collision, grounding or other accidents or malfunctions related to rail transportation associated with the Project.

7.6.2. 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, 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 that can contribute to and/or complicate malfunctions and accidental events). In doing so, the proponent should consider guidelines prepared by the Federal-Provincial-Territorial Committee on Climate Change and Environmental Assessment.[2727] These events will be considered in different probability patterns (e.g., 5-year flood vs. 100-year flood).

Longer-term effects of climate change will also be discussed. This discussion will include the projected abandonment phase of the project, and it will be particularly focused on the waste management components of the Project such as the tailings impoundment and waste rock storage areas. Climate models and data used to support the discussion will also be included.

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

7.6.3. Cumulative effects assessment

The proponent will identify and assess the project's cumulative effects using the approach described in the Agency's Operational Policy Statement entitled *Addressing Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012* and the guide entitled *Technical Guidance for Assessing Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012*[33].

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:

[33] Refer to *Assessing Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012* (March 2018) at: https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/assessing-cumulative-environmental-effects-ceaa2012.html

- 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, including Lake Trout and other valued fish species;
  - ✓ species at risk;
  - ✓ migratory birds;
  - ✓ human health;
  - ✓ socio-economic conditions;
  - ✓ physical and cultural heritage;
  - ✓ current use of lands and resources for traditional purposes by Indigenous peoples;
  - ✓ any structure, site or thing that is of historical, archaeological, paleontological or architectural significance;
  - ✓ any VCs associated with subsection 5(2) of CEAA 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 and will also generally be larger than the boundaries for the corresponding project effects. The proponent is expected to engage with the Agency and Indigenous groups in establishing spatial and temporal boundaries;
- identify the sources of potential cumulative effects. Indicate the selection criteria and how the criteria were applied to identify other specific projects or activities that have been or that are likely to be carried out that could cause effects on each selected VC within the boundaries defined, and whose effects would act in combination with the residual effects of the project. This assessment may consider the results of any relevant study conducted by a committee established under sections 73 or 74 of CEAA 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 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) and also consider overall effects on Indigenous rights-based activities on their traditional lands and resources. Cumulative effects must consider residual effects across multiple VCs as well as the residual effects from potential accidents or malfunctions;

- 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 provide a rationale for the significance determination of the cumulative effects for each residual effect in each VC; 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 required to engage with key stakeholders and Indigenous groups prior to finalizing the choice of VCs and the appropriate boundaries to assess cumulative effects.

8. SUMMARY OF ENVIRONMENTAL EFFECTS ASSESSMENT

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

- potential environmental effects on VCs;
- proposed mitigation measures to address the effects identified above; and
- potential residual effects and the significance of the residual environmental effects.

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

In a second table, the EIS will summarize all mitigation measures and commitments made by the proponent and 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). The Agency will consider the proponent's identified mitigation measures to form the basis of enforceable conditions of an EA decision statement, should the Project be allowed to proceed. An example of a format for this table is provided in Appendix 2 of this document.

9. 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. Where there is uncertainty about effects outcomes, the proponent will show evidence of detailed follow-up and monitoring programs to identify change, and identify adaptive management measures that will be applied.

Considerations for developing a follow-up program include:

- whether the Project will impact the physical environment, environmentally sensitive areas/VCs, or protected areas or areas under consideration for protection;
- the nature of Indigenous and public concerns raised about the project;
- suggestions from Indigenous groups regarding the design of and involvement in follow-up and monitoring programs;
- incorporation of Indigenous knowledge, where available;
- 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;
- a description of proposed engagement with Indigenous groups in the planning and implementation of follow-up and monitoring;
- identify, with supporting rationale, how long post closure water will need to be managed and monitored; and
- whether there was limited scientific 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 development, and to provide clearly defined action plans and emergency response procedures to account for human and environmental health and safety.

The Agency will consider the proponent's identified follow-up measures to form the basis of enforceable conditions of an EA decision statement, should the Project be allowed to proceed.

9.1. Follow-up program

The follow-up program will explain the uncertainty of the effects outcomes and whether it is related to the EA predictions or the effectiveness of mitigation measures. The duration of the follow-up program shall be as long as required to verify the accuracy of the effects assessment and 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 parameters 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, frequency, duration, etc.);
- measures to be taken in the event EA predictions are not met or the mitigation measures are not effective;
- mechanism to disseminate follow-up results among the concerned populations;
- accessibility and sharing of data for the general population;
- proponent's commitment to include the participation of Indigenous groups and stakeholders on the affected territory and include Indigenous knowledge, during the development and implementation of the program; and
- proponent's commitment to involve local and regional organizations and Indigenous groups in the design, implementation and evaluation of the follow-up results as well as any updates, including a communication mechanism between these organizations, Indigenous groups and the proponent.

9.2. Monitoring

The proponent will prepare an environmental monitoring program for all phases of the project. The proponent is expected to engage with the Agency and Indigenous groups in developing the environmental monitoring program.

Specifically, the EIS 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 VCs and the measures and means planned to protect the environment;
- identification of regulatory instruments that include a monitoring program requirement for the VCs;
- 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 mitigation or adaptive management measures that would be implemented should parameters approach or exceed a defined set of trigger values;
- 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;
- guidelines for preparing monitoring reports (number, content, frequency, format) that will be sent to the authorities and Indigenous groups concerned; and
- plans to engage Indigenous groups in monitoring and intervention mechanisms, where appropriate.

Appendix 1 Example - Summary Table of Environmental Assessment

						Key Criteria for Determining Significance[34]							
Valued Component affected	**Area of federal jurisdiction[35] (√)**	**Project activity**	**Potential effects**	**Proposed mitigation**	**Residual effect**	***Magnitude***	***Geographical extent***	***Timing***	***Duration***	***Frequency***	***Reversibility***	**Significance of residual adverse effect**	**Likelihood of significance of residual adverse effect**
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													

[34] Other key criteria can be used to determine significance, as appropriate. The ecological and social context within which potential environmental effects may occur should be taken into account when considering the key criteria in relation to a particular VC, as the context may help better characterize whether adverse effects are significant.

[35] 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, paragraph 5(1)(*c*)(iii) of CEAA 2012.

Appendix 2 Example - Summary Table of Mitigation Measures and Commitments

Valued Component affected	Description of mitigation measure or commitment	Effect(s) addressed	Project phase(s) for when mitigation measure/commitment will be implemented	Regulator(s) overseeing the implementation of mitigation measure/commitment	Reference(s) of mitigation measure/commitment in EIS
Fish and fish habitat	*e.g. installation of contact water collection ditches around the waste rock storage area to collect the seepage, runoff and groundwater recharge from the waste rock storage area*	*e.g. changes in water quality of Waterbody X due to seepage of arsenic, mercury and other contaminants* *e.g. changes in fish habitat and impact on fish health*			
Migratory birds		*e.g. increase in noise generated during blasting activities at the open pit*			
Species at risk					
Current use of land and resources for traditional purposes					
Any other VCs identified					