



Canadian Environmental
Assessment Agency

Agence canadienne
d'évaluation environnementale

DRAFT GUIDELINES FOR THE PREPARATION OF AN ENVIRONMENTAL IMPACT STATEMENT

pursuant to the

Canadian Environmental Assessment Act, 2012

RED MOUNTAIN GOLD MINE PROJECT

IDM MINING LTD.

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DISCLAIMER

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

Abbreviations and Short Forms

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

Part 1 - Background

1. INTRODUCTION

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

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

2. GUIDING PRINCIPLES

2.1. Environmental assessment as a planning tool

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

2.2. Public participation

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

2.3. Aboriginal engagement

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

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

effects, make their concerns known about the project's potential effects and discuss measures to mitigate those effects. The proponent is strongly encouraged to work with Aboriginal groups in establishing an engagement approach. The proponent will make reasonable efforts to integrate traditional Aboriginal knowledge into the assessment of environmental impacts.

Information gathered through the EA process and associated engagement by the proponent with Aboriginal groups will be used to inform decisions under CEAA 2012. In providing information to the Agency, the proponent will respect any confidentiality commitments made to Aboriginal groups (see section 4.3.2 for further information on this subject). This information will also contribute to the Crown's understanding of any potential adverse impacts of the project on potential or established Aboriginal or Treaty rights and the effectiveness of measures proposed to avoid or minimise those impacts.

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

2.4. Application of the precautionary approach

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

3. SCOPE OF THE ENVIRONMENTAL ASSESSMENT

3.1. Designated Project

On September 16, 2015, IDM Mining, the proponent of the Red Mountain Gold Mine Project, provided a project description to the Agency. Based on this project description, the Agency has determined that an environmental assessment is required under CEAA 2012 and will include the construction, operation, decommissioning and abandonment of the following project components and activities:

- underground mine including portals, stopes, and underground works and activities;
- surface mill and mineral processing activities including effluent treatment and discharge;
- waste rock, overburden, topsoil, low grade ore, and ore storage and stockpiles;
- tailing management facility and activities including dam, pond, and drainage control;
- water management infrastructure and activities including diversions and treatment (if applicable);
- explosives mixing and storage facility and blasting activities;
- reagent and fuel storage and handling;
- water supply and distribution (industrial and drinking);
- sewage and septic works;
- borrow areas;
- concrete batch plant;
- site clearing, earthmoving, and levelling activities;

- access road construction or improvement;
- power supply including powerlines, rights-of-way, and step-down facilities;
- transportation of doré, employees, equipment and supplies on the mine access road to the connection with Highway 37A; and
- administrative and support facilities including offices, assay lab, warehouse, and mine dry and maintenance facilities.

3.2. Factors to be considered

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

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

3.3. Scope of factors

3.3.1. Changes to the Environment

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

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

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

3.3.2. Valued components to be examined

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

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

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

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

The VCs will be described in sufficient detail to allow the reviewer to understand their importance and to assess the potential for environmental effects arising from the project activities. The EIS will provide a rationale for selecting specific VCs and for excluding any VCs or information specified in these guidelines. Challenges may arise regarding particular exclusions, so it is important to document the information and the criteria used to make each determination. Examples of justification include primary data collection, computer modelling, literature references, public consultation, or expert input. The EIS will identify those VCs, processes, and interactions that either were identified to be of concern during any workshops or meetings held by the proponent or that the proponent considers likely to be affected by the project. In doing so, the EIS will indicate to whom these concerns are important and the reasons why, including environmental, Aboriginal, social, economic, recreational,

and aesthetic considerations. If comments are received on a component that has not been included as a VC, these comments will be summarised.

The EIS will also include a separate, standalone chapter that summarizes the effects, mitigation, residual effects and their significance to VCs linked to CEAA 2012.

3.3.3. Spatial and temporal boundaries

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

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

The temporal boundaries of the EA will span the construction, operation, decommissioning and abandonment phases of the project. Community and Aboriginal traditional knowledge should factor into decisions around temporal boundaries.

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

4. PREPARATION AND PRESENTATION OF THE ENVIRONMENTAL IMPACT STATEMENT

4.1. Guidance

The proponent is encouraged to consult relevant Agency policy and guidance² on topics to be addressed in the EIS, and with the Agency during the planning and development of the EIS.

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”³, published by Environment Canada in 2009. The recommended practices in the Code include the development and implementation of environmental management tools, the management of wastewater and mining wastes, and the prevention and control of environmental releases to air, water and land. In addition, the parameters and approach of the Environmental Effects Monitoring program under the *Metal Mining Effluent Regulations (MMER)* should be considered when developing a baseline monitoring program for the aquatic environment.

For projects requiring the use of natural water bodies frequented by fish for the disposal of mine waste, including tailings and waste rock and for the management of process water, the MMER would need to be amended to add the affected water bodies to Schedule 2 to designate them as tailings impoundment areas. This regulatory process will not be initiated until a detailed assessment of alternatives for mine waste disposal has been undertaken by the proponent. Conducting this robust

Visit the Canadian Environmental Assessment Agency website: ² www.ceaa-acee.gc.ca/default.asp?lang=En&n=F1F30EEF-1
Visit Environment Canada’s website at: ³ www.ec.gc.ca/lcpe-epa/default.asp?lang=En&n=CBE3CD59-1

and thorough assessment of alternatives during the EA will streamline the overall regulatory review process and minimize the time required to proceed with the MMER amendment process. It also facilitates a thorough and transparent review of the assessment of alternatives as part of the EA process. For further guidance, the proponent should consult Environment Canada's Guidelines for the Assessment of Alternatives for Mine Waste Disposal (2011).

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

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

4.2. Study strategy and methodology

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

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

The assessment will include the following general steps:

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

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

The EIS will identify all 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 traditional knowledge, the EIS will contain a balanced presentation of the issues and a statement of the proponent's conclusions.

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

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

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

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

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

assumptions. The proponent will describe how each assumption has been tested. With respect to quantitative models and predictions, the EIS will document the assumptions that underlie the model, the quality of the data and the degree of certainty of the predictions obtained.

4.3. Use of information

4.3.1. Scientific advice

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

4.3.2. Community knowledge and Aboriginal traditional knowledge

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

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

4.3.3. Existing information

In preparing the EIS, the proponent is encouraged to use 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 explain 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.

4.3.4. Confidential information

In implementing CEAA, 2012, the Agency is committed to promoting public participation in the environmental assessment of projects and providing access to the information on which environmental assessments are based. All documents prepared or submitted by the proponent or any other stakeholder in relation to the environmental assessment are included in the Canadian Environmental Assessment Registry and made available to the public on request. For this reason, the EIS will not contain information that:

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

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

4.4. Presentation and organization of the Environmental Impact Statement

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

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

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

For purposes of brevity and to avoid repetition, cross-referencing is preferred. The EIS may make reference to the information that has already been presented in other sections of the document, rather than repeating it. The exception to this preference is the cumulative effects assessment, which should be provided in a stand-alone section. Detailed studies (including all relevant and supporting data and methodologies) will be provided in separate appendices and will be referenced by appendix, section and page in the text of the main document. The EIS will explain how information is organized in the document. This will include a list of all tables, figures, and photographs referenced in the text. A complete list of supporting literature and references will also be provided. A table of concordance, which cross references the information presented in the EIS with the information requirements identified in the EIS Guidelines, will be provided, and will indicate the chapter, section and page number of the EIS where the information is located.

The proponent will provide copies of the EIS and its summary for distribution, including paper and electronic versions in an unlocked, searchable PDF format, as directed by the Agency. The proponent must confirm that all members of the working group have received a copy of the EIS prior to the document being sent to the Agency.

4.5. Summary of the Environmental Impact Statement

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

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

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

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

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

The summary must be sufficiently detailed for members of the public to learn and understand the project, potential environmental effects, mitigation measures, and the significance of the residual effects. The summary will include key maps illustrating the project location and key project components.

Part 2 – Content of the Environmental Impact Statement

1. INTRODUCTION AND OVERVIEW

1.1. The proponent

In the EIS, the proponent will:

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

1.2. Project Overview

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

The overview is to identify the key components of the project, rather than providing a detailed description, which will follow in Section 3 of Part 2 of this document.

1.3. Project Location

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

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

1.4. Regulatory framework and the role of government

The EIS will identify:

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

2. PROJECT JUSTIFICATION AND ALTERNATIVES CONSIDERED

2.1. Purpose of the project

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

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

2.2. Alternative means of carrying out the project

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

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

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

- location and processing technology at mill;
- location of waste rock storage;
- location and type of explosives;

- location of fuel storage;
- location of water management infrastructure;
- methods and location of tailing management including the dam, pond, and disposal⁴;
- methods and means of water management;
- means for water supply;
- routing of the access road;
- route and means for power supply; and
- route and means for transportation of gold doré, employees, equipment and supplies.

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

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

3. PROJECT DESCRIPTION

3.1. Project components

The EIS will describe the project by presenting the project components, associated and ancillary works, and other characteristics that will assist in understanding the environmental effects. This will include:

- maps at an appropriate scale of: project location, project components, boundaries of the proposed site with UTM coordinates, major existing infrastructure, adjacent land uses and any important environmental features;
- underground mine (footprint, location, and development plans);
- mineral processing facilities (footprint, technology, and location);
- waste rock, overburden, topsoil, low grade ore storage and stock piles (footprint, locations, volumes, development plans and design criteria);
- tailings management facility including the dam and pond (footprint, location and preliminary designs);
- water management infrastructure for underground mine water and surface water;

⁴ Should an MMER Schedule 2 amendment be required for the project, the proponent is strongly encouraged to include MMER requirements for an assessment of alternatives for mine waste disposal in the EIS. The methodology recommended for the conduct of mine waste disposal alternatives is described in Environment Canada’s Guidelines for the Assessment of Alternatives for Mine Waste Disposal (2011). A copy of this guide can be found on Environment Canada’s website at www.ec.gc.ca. Proponent should also refer to Part 1, section 4.1 of this document.

- explosives storage facility;
- reagent and fuel storage facility;
- drinking and industrial water supply infrastructure (source and quantity);
- sewage and septic works;
- borrow areas;
- concrete batch plant;
- permanent and temporary linear infrastructures (access road and power lines), identifying the route of each of these linear infrastructures, including the location and types of structure used for stream crossings;
- energy supply (source and quantity); and
- administrative and support facilities.

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 outputs and an indication of the activity's magnitude and scale.

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

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

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

The EIS will include a description of the following project activities as they relate to project components:

3.2.1. Site preparation and construction

- site clearing, earthmoving and leveling activities;
- blasting activities including the frequency, methods, and type of explosives;
- borrow materials requirements (source and quantity);
- water management activities including drainage, water diversions and treatment (if applicable);
- construction of structures for mill, warehouse and other infrastructure;
- construction of batch plant for concrete;
- construction of watercourse crossings for access road and power line;

- transportation of employees, equipment and supplies including the number of trips to and from the site; and
- equipment requirements (type, quantity).

3.2.2. Operation

- mining activities including mining sequence, ore production, and doré production;
- mineral processing activities;
- tailings management activities including the quantity, treatment and release;
- type and quantity of operational equipment;
- blasting activities including the frequency, methods and type of explosives;
- water management activities including a detailed water budget, water recycling, water diversions and treatment (if applicable);
- explosives, reagent and fuel management (including the volumes, storage, types);
- characterization and management of waste rock, overburden, topsoil, and low grade ore (quantity, mineralogical characterization, and potential for metal leaching and acid rock drainage);
- contribution to atmospheric emissions, including emissions type, rate and source;
- environmental monitoring;
- waste management and recycling activities for waste other than tailings and waste rock;
- transportation of employees, equipment and supplies along access road; and
- grading and brushing access road as required to maintain it.

3.2.3. Decommissioning and abandonment

- backfilling;
- the preliminary outline of a decommissioning and reclamation plan for any components associated with the project;
- covering of Tailings Management Facility;
- removal of surface structures and concrete foundations;
- deactivation of road and power line right of ways including removal of bridges and culverts;
- environmental monitoring;
- the ownership, transfer and control of the different project components; and
- for permanent facilities, a description of how decommissioning would occur.

4. PUBLIC CONSULTATION AND CONCERNS

The EIS will describe the ongoing and proposed consultations and the information sessions that the proponent will hold or that it has already held on the project. It will provide a description of efforts made to distribute project information and provide a description of information and materials that were distributed during the consultation process. The EIS will indicate the methods used, where the consultation was held, the persons and organizations consulted, the concerns voiced and the extent

to which this information was incorporated in the design of the project as well as in the EIS. The EIS will provide a summary of key issues raised related to the environmental assessment as well as describe any outstanding issues and ways to address them.

5. ABORIGINAL ENGAGEMENT AND CONCERNS

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

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

With respect to the above matters and in addition to information requirements outlined in Part 2, Sections 6.19 and 6.35, of these guidelines, the EIS will include:

- any VCs suggested by Aboriginal groups for inclusion in the EIS, whether they were included, and the rationale for any exclusions;
- each group's potential or established rights (including geographical extent, nature, frequency, timing), including maps and data sets (e.g. fish catch numbers) when this information is provided by a group to the proponent or available through public records;
- based on the proponent's perspective, the potential adverse impacts of each of the project components and physical activities, in all phases, on potential or established Aboriginal or Treaty rights. This assessment is to be based on a comparison of the exercise of the identified rights between the predicted future conditions with the project and the predicted future conditions without the project. Include the perspectives of Aboriginal groups where these were provided to the proponent by the groups;
- based on the proponent's perspective, the measures identified to mitigate or accommodate potential adverse impacts of the project on the potential or established Aboriginal or Treaty rights. These measures will be written as specific commitments that clearly describe how the proponent intends to implement them;
- based on the proponent's perspective, the effects of changes to the environment on Aboriginal peoples or potential adverse impacts on potential or established Aboriginal or Treaty rights that have not been fully mitigated or accommodated as part of the environmental assessment and associated engagement with Aboriginal groups, including the potential adverse effects that may result from the residual and cumulative environmental effects. Include the perspectives of Aboriginal groups where these were provided to the proponent by the groups;
- specific suggestions raised by Aboriginal groups for mitigating the effects of changes to the environment on Aboriginal peoples or accommodating potential adverse impacts of the project on potential or established Aboriginal and Treaty rights;
- views expressed by Aboriginal groups on the effectiveness of the mitigation or accommodation measures;

- from the proponent’s perspective, any potential cultural, social and/or economic impacts or benefits to Aboriginal groups that may arise as a result of the project. Include the perspectives of Aboriginal groups where these were provided to the proponent by the groups;
- comments, specific issues and concerns raised by Aboriginal groups and how the key concerns were responded to or addressed;
- changes made to the project design and implementation directly as a result of discussions with Aboriginal groups;
- where and how Aboriginal traditional knowledge was incorporated into the environmental effects assessment (including baseline conditions and effects analysis for all VCs) and the consideration of potential adverse impacts on potential or established Aboriginal or Treaty rights and related mitigation measures; and
- any additional issues and concerns raised by Aboriginal groups in relation to the environmental effects assessment and the potential adverse impacts of the project on potential or established Aboriginal and Treaty rights.

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

5.1. Aboriginal Groups to Engage & Engagement Activities

With respect to engagement activities, the EIS will document:

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

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

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

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

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

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

- *Nisga'a Nation*
- *Tsetsaut/Skii km Lax Ha*

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

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

- *Métis Nation BC*

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

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

The proponent will specifically assess whether the project can reasonably be expected to have adverse environmental effects on residents of Nisga'a Lands, Nisga'a Lands, or Nisga'a interests set out in paragraph 8 (e), Chapter 10 of the *Nisga'a Final Agreement* and, where appropriate, make recommendations to prevent or mitigate those effects. The proponent will also assess the effects of the project on the existing and future economic, social and cultural well-being of Nisga'a citizens who may be affected by the project as set out in paragraph 8 (f), Chapter 10 of the *Nisga'a Final Agreement*. The Agency strongly encourages the proponent to use the Economic, Social and Cultural Guidelines⁶ dated November 2010 to complete the 8(f) assessment.

The Agency will provide additional instructions to the proponent in cases where further research and/or engagement effort by the proponent is required to support Canada's ability to fulfil the obligations under the *Nisga'a Final Agreement*.

6. EFFECTS ASSESSMENT

6.1. Project setting and baseline conditions

⁶ The Economic, Social and Cultural Impact Assessment Guidelines are available upon request from the Nisga'a Nation or the Agency.

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

6.1.1. Atmospheric environment

- ambient air quality in the project areas and, for the mine site, the results of a baseline survey of ambient air quality, including the following contaminants: total suspended particulates, fine particulates (PM_{2.5}), particulate matter up to 10 micrometers in size (PM-10), sulfur oxides (SO_x), volatile organic compounds (VOCs) and nitrogen oxides (NO_x);
- current ambient noise levels at key receptor points (e.g. Aboriginal communities), including the results of a baseline ambient noise survey. Information on typical sound sources, geographic extent and temporal variations will be included; and
- historical records of total precipitation (rain and snow), mean, maximum and minimum temperatures.

6.1.2. Geology and geochemistry

- the bedrock and host rock geology of the deposit, including a table of geologic descriptions, geological maps and cross-sections of appropriate scale;
- geomorphology, topography and geotechnical characteristics of areas proposed for construction of major project components;
- the geochemical characterization of expected mine material such as waste rock, ore, low grade ore, tailings, overburden and potential construction material in order to predict metal leaching and acid rock drainage⁷; and
- 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
 - ✓ landslides, avalanches, slope erosion and the potential for ground and rock instability, and subsidence following project activities.

6.1.3. Topography and soil

- baseline mapping and description of landforms and soils within the local and regional project area;

⁷ 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.

- maps depicting soil depth by horizon and soil order within the mine site area to support soil salvage and reclamation efforts, and to outline potential for soil erosion; and
- suitability of topsoil and overburden for use in the rehabilitation of disturbed areas.

6.1.4. Groundwater and surface water

- the hydrogeology, including:
 - ✓ the hydrogeological context (e.g., hydrostratigraphy with aquifers and aquitards, major faults, etc.) including the delineation of key stratigraphic and hydrogeologic boundaries;
 - ✓ the physical properties of the hydrogeological units (e.g., hydraulic conductivity, transmissivity, saturated thickness, storativity, porosity, specific yield);
 - ✓ the groundwater flow patterns and rates;
 - ✓ a discussion of the hydrogeologic, hydrologic, geomorphic, climatic and anthropogenic controls on groundwater flow;
 - ✓ temporal changes in groundwater flow (e.g., seasonal and long term changes in water levels); and
 - ✓ a delineation and characterization of groundwater surface water interactions including the locations of groundwater discharge to surface water and surface water recharge to groundwater.
- hydrogeological maps and cross-sections for the mine area to outline the extent of aquifers and aquitards, including bedrock fracture and fault zones, locations and depths of wells, 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 respect to the project area, including geologic, hydrostratigraphic, piezometric and construction data (e.g., depths of surficial and bedrock units, water level, hydraulic conductivity, diameter and screen depth and intercepted aquifer unit);
- monitoring protocol for collection of existing groundwater data;
- an appropriate hydrogeologic model for the project area, which discusses the hydrostratigraphy and groundwater flow systems; a sensitivity analysis will be performed to test model sensitivity to climatic variations (e.g., recharge) and hydrogeologic parameters (e.g., hydraulic conductivity);
- graphs or tables indicating the seasonal variations in groundwater levels, flow regime, and quality;
- local and regional potable groundwater supplies, including their current use and potential for future use;
- bedrock fracture sizes and orientations in relation to groundwater flow;
- the delineation of drainage basins, at appropriate scales (water bodies and watercourses), including intermittent streams, flood risk areas and wetlands, boundaries of the watershed and subwatersheds, overlaid by key project components;
- hydrological regimes, including monthly, seasonal and annual water flow (discharge) data;

- for each affected water body, the total surface area, bathymetry, maximum and mean depths, water level fluctuations, type of substrate (sediments);
- seasonal water quality field and lab analytical results (e.g. water temperature, turbidity, pH, dissolved oxygen profiles) and interpretation at several representative local stream and water body monitoring stations established at the project site;
- any local and regional potable surface water resource; and
- sediment quality analysis for sites likely to receive mine effluents;

6.1.5. Fish and fish habitat

For potentially affected surface waters:

- a characterization of fish populations on the basis of species and life stage, including information on the surveys carried out and the source of data available (e.g. location of sampling stations, catch methods, date of catches, species);
- a list of any fish or invertebrate species at risk that are known to be present;
- a description of the habitat by homogeneous section, including the length of the section, width of the channel from the high water mark (bankful width), water depths, type of substrate (sediments), aquatic and riparian vegetation, and photos;
- a description of natural obstacles (e.g. falls, beaver dams) or existing structures (e.g. water crossings) that hinder the free passage of fish;
- maps, at a suitable scale, indicating the surface area of potential or confirmed fish habitat for spawning, nursery, feeding, overwintering, migration routes, etc. This information should be linked to water depths (bathymetry) to identify the extent of a water body's littoral zone; and
- the description and location of suitable habitats for fish species at risk that appear on federal and provincial lists and that are found or are likely to be found in the study area.

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

6.1.6. Migratory birds and their habitat⁸

- the various ecosystems found in the project area likely to be affected based on existing information;
- migratory and non-migratory birds (including waterfowl, raptors, shorebirds, marsh birds and other land birds); and
- year-round migratory bird use of the area (e.g., winter, spring migration, breeding season, fall migration).

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

6.1.7. Species at risk

- a list of all potential or known federally listed species at risk that may be affected by the project (fauna and flora), using existing data and literature as well as surveys to provide current field data;
- a list of all federal species designated by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) for listing on Schedule 1 of the *Species at Risk Act*. This will include those species in the risk categories of extirpated, endangered, threatened and special concern⁹;
- any published studies that describe the regional importance, abundance and distribution of species at risk; and
- residences, seasonal movements, movement corridors, habitat requirements, key habitat areas, identified critical habitat and recovery habitat (where applicable) and general life history of species at risk that may occur in the project area, or be affected by the project.

6.1.8. Aboriginal peoples

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

- location of traditional territory (including maps where available);
- location of reserves and communities;
- location of hunting camps and cabins;
- drinking water sources (permanent, seasonal, periodic, or temporary);
- reliance on country foods;
- commercial activities (e.g. fishing, trapping, hunting, forestry, outfitting);
- recreational uses;
- traditional uses currently practiced or practiced in recent history;
- fish, wildlife including moose, birds, plants or other natural resources of importance for traditional use;
- places where fish, wildlife, birds, plants and other natural resources are harvested;
- access and travel routes for conducting traditional practices;
- frequency, duration or timing of traditional practices;
- health¹⁰ and socio-economic conditions;
- cultural values associated with the area affected by the project and the traditional uses identified; and

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

¹⁰ The proponent should refer to Health Canada's Useful Information for Environmental Assessments document in order to include the appropriate baseline information relevant to human health. This document can be obtained at http://www.hc-sc.gc.ca/ewh-semt/pubs/eval/environ_assess-eval/index-eng.php

- physical and cultural heritage¹¹ (including any site, structure or thing of archaeological, paleontological, historical or architectural significance).

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

6.2. Predicted Changes to the Physical Environment

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

6.2.1. Changes to the atmospheric environment

- Changes in air quality; and
- Changes in ambient noise levels.

6.2.2. Changes to groundwater and surface water

- Changes to turbidity, oxygen level, water temperature, ice regime, water quality;
- Changes to the hydrological and hydrometric conditions;
- Changes to groundwater recharge/discharge areas and any changes to groundwater infiltration areas; and
- Changes to water quality attributed to acid rock drainage and metal leaching associated with the storage of waste rock, ore, low grade ore, tailings, overburden and potential construction material, including:
 - ✓ short term metal leaching properties;
 - ✓ longer term rates of acid generation (if any) and metal leaching;
 - ✓ estimates of the potential for mined materials (including waste rock, tailings and low grade ore) to be sources of acid rock drainage or metal leaching;
 - ✓ estimates of potential time to the onset of acid rock drainage or metal leaching;
 - ✓ quantity and quality of leachate from samples of tailings, waste rock, and ore;
 - ✓ quantity and quality of effluent to be released from the site into the receiving waters;
 - ✓ quality of humidity cell or column test liquid from acid rock testing;
 - ✓ sensitivity analysis to assess the effects of imperfect segregation of waste rock;

¹¹ 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).

- ✓ underground water chemistry during operation and post-closure, and underground closure management measures (e.g. flooding). This will include geochemical modelling of underground water quality in the post-closure period; and
- ✓ surface and seepage water quality from the waste rock dumps, tailings/waste rock impoundment facility, stockpiles and other infrastructure during operation and post-closure.

6.2.3. Changes to terrestrial landscape

- Overall description of changes related to landscape disturbance;
- Changes to migratory bird habitat, including losses, structural changes, fragmentation of habitat and wetlands (cover types, ecological land unit in terms of quality, quantity, diversity, distribution and functions) used by migratory birds;
- Changes to critical habitat for federally listed species at risk; and
- Changes to key habitat for species important to Aboriginal current use of resources.

6.3. Predicted Effects on Valued Components

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

6.3.1. Fish and fish habitat

- the identification of any potential harmful alteration, disruption or destruction of fish habitat, including the calculations of any potential habitat loss (temporary or permanent) in terms of surface areas (e.g. spawning grounds, fry-rearing areas, feeding), and in relation to watershed availability and significance. The assessment will include a consideration of:
 - ✓ the geomorphological changes and their effects on hydrodynamic conditions and fish habitats (e.g. modification of substrates, dynamic imbalance, silting of spawning beds);
 - ✓ the modifications of hydrological and hydrometric conditions on fish habitat and on the fish species' life cycle activities (e.g. reproduction, fry-rearing, movements);
 - ✓ potential impacts on riparian areas that could affect aquatic biological resources and productivity taking into account any anticipated modifications to fish habitat;
 - ✓ any potential imbalances in the food web in relation to baseline;
- the effects of changes to the aquatic environment on fish and their habitat, including;
 - ✓ the anticipated changes in the composition and characteristics of the populations of various fish species, included shellfish and forage fish;
 - ✓ any modifications in migration or local movements (upstream and downstream migration, and lateral movements) following the construction and operation of works (physical and hydraulic barrier);
 - ✓ any reduction in fish populations as a result of potential overfishing due to increased access to the project area; and
 - ✓ any modifications and use of habitats by federally or provincially listed fish species.
- a discussion of how project construction timing correlates to key fisheries windows for freshwater and anadromous species, and any potential impacts resulting from overlapping periods; and

- a discussion of how vibration caused by blasting may affect fish behaviour, such as spawning or migrations.

6.3.2. Migratory birds

- mortality to migratory birds such as those that could be caused by clearing of sites or birds and nests being in contact with contaminated waters (e.g., tailing impoundment area);
- collision risk of migratory birds with any project infrastructures; and
- indirect effects caused by increased disturbance (e.g. noise, light, presence of workers), relative abundance movements and changes in migratory bird habitat.

6.3.3. Species at risk

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

6.3.4. Aboriginal peoples

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

- the current uses of land and resources for traditional purposes, including, but not limited to:
 - ✓ any effects of changes to resources (fish, wildlife, birds, plants or other natural resources) used for traditional uses (e.g. hunting, fishing, trapping, collection of medicinal plants, use of sacred sites);
 - ✓ any effects of alterations to access to the areas used for traditional uses, including development of new roads, and deactivation or reclamation of access roads;
 - ✓ any effects on cultural value or importance associated with traditional uses or areas affected by the project (e.g. inter-generational teaching of language or traditional practices, communal gatherings);
 - ✓ how project construction timing correlates to the timing of traditional practices, such as seasonal rounds, and any potential impacts resulting from overlapping periods;
 - ✓ the regional value of traditional use of the project area and the anticipated effects to traditional practice of the Aboriginal group, including alienation of lands from Aboriginal traditional use;
 - ✓ indirect effects such as avoidance of the area by Aboriginal peoples due to increased disturbance (e.g. noise, presence of workers); and
 - ✓ an assessment of the potential to return affected areas to pre-disturbance conditions to support traditional practices.
- human health, considering, but not limited to potential changes in air quality, quality and availability of country foods, drinking water quality, and noise exposure. When risks to human health due to changes in one or more of these components are predicted, a complete Human Health Risk Assessment (HHRA) examining all exposure pathways for pollutants of concern may be necessary to adequately characterize potential risks to human health;

- socio-economic conditions, including but not limited to;
 - ✓ the use of navigable waters;
 - ✓ forestry and logging operations;
 - ✓ commercial fishing, hunting, trapping, and gathering activities;
 - ✓ commercial outfitters; and
 - ✓ recreational use.
- physical and cultural heritage, and structure, site or thing of historical, archaeological, paleontological or architectural significance to Aboriginal groups, including, but not limited to:
 - ✓ the loss or destruction of physical and cultural heritage;
 - ✓ changes to access to physical and cultural heritage; and
 - ✓ changes to the cultural value or importance associated with physical and cultural heritage.

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

6.3.5. Effects outside of Canada

- the identification of any potential effects on areas outside of Canada including:
 - ✓ water quality and quantity;
 - ✓ air quality; and
 - ✓ organic, inorganic and living organisms;

6.4. Mitigation

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

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

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

The EIS will then describe mitigation measures that are specific to each environmental effect identified. Measures will be written as specific commitments and with an adequate level of specificity that clearly describe how the proponent intends to implement them and the environmental outcome

the mitigation is designed to address. Where mitigation measures have been identified in relation to species and/or critical habitat listed under the *Species at Risk Act*, the mitigation measures will be consistent with any applicable recovery strategy and action plans.

The EIS will specify the actions, works, minimal disturbance footprint techniques, best available technology, corrective measures or additions planned during the project's various phases to eliminate or reduce the significance of adverse effects. The impact statement will also present an assessment of the effectiveness of the proposed technically and economically feasible mitigation measures. If there is uncertainty to whether a mitigation measure would be required either due to uncertainty in the effects assessment or uncertainty in the effectiveness of other mitigation measures, the EIS must specify the threshold or criteria that would trigger implementation of the mitigation measure. The reasons for determining if the mitigation measure reduces the significance of an adverse effect will be made explicit.

The EIS will indicate what other technically and economically feasible mitigation measures were considered, and explain why they were rejected. Trade-offs between cost savings and effectiveness of the various forms of mitigation will be justified. The EIS will identify who is responsible for the implementation of these measures and the system of accountability.

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

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

6.5. Significance of residual effects

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

The EIS will then provide an analysis of the significance of the residual environmental effects that are considered adverse, using guidance described in section 4 of the Agency's reference guide *Determining Whether a Project is Likely to Cause Significant Adverse Environmental Effects*¹².

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, Aboriginal groups and the public to review the proponent's analysis of the significance of effects. The EIS will document the terms used to describe the level of significance.

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

- magnitude;

¹² Visit the Canadian Environmental Assessment Agency's website at: www.ceaa-acee.gc.ca/default.asp?lang=En&n=D213D286-1&offset=&toc=hide

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

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

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

6.6. Other effects to consider

6.6.1. Effects of potential accidents or malfunctions

The failure of certain works caused by human error or exceptional natural events (e.g. flooding, earthquake) could cause major effects. The proponent will therefore conduct an analysis of the risk of each accident or malfunction, determine their effects and present preliminary emergency measures. At a minimum, the following potential accidents and malfunctions will be considered:

- failure of the tailings management facility;
- failure of waste rock storage;
- spills and release of hazardous materials; and
- fires and explosions.

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

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

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

6.6.2. Effects of the environment on the project

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

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

6.6.3. Cumulative effects assessment

The proponent will identify and assess the project's cumulative effects using the approach described in the Agency's Operational Policy Statement entitled *Assessing Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012* and the guide entitled *Cumulative Effects Assessment Practitioners' Guide, 1999*¹³.

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

- implementation of the project being studied may cause direct residual adverse effects on the VCs, taking into account the application of technically and economically feasible mitigation measures; and
- the same VCs may be affected by other past, present or reasonably foreseeable 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, emphasizing this assessment on the VCs most likely to be affected by the project and other project and activities. To this end, the proponent must consider, without limiting itself thereto, the following components likely to be affected by the project:
 - ✓ fish and fish habitat, including salmon and other valued fish species;
 - ✓ migratory birds; and
 - ✓ Aboriginal peoples.
- Identify and justify the spatial and temporal boundaries for the cumulative effect assessment for each VC selected. The boundaries for the cumulative effects assessments

¹³ Visit the Canadian Environmental Assessment Agency's website at: www.ceaa-acee.gc.ca/

will generally be different for each VC considered. These cumulative effects boundaries will also generally be larger than the boundaries for the corresponding project effects;

- Identify the sources of potential cumulative effects. Specify other projects or activities that have been or that are likely to be carried out that could cause effects on each selected VC within the boundaries defined, and whose effects would act in combination with the residual effects of the project. This assessment may consider the results of any relevant study conducted by a committee established under section 73 or 74 of CEEA 2012;
- Describe the mitigation measures that are technically and economically feasible. The proponent shall assess the effectiveness of the measures applied to mitigate the cumulative effects. In cases where measures exist that are beyond the scope of the proponent's responsibility that could be effectively applied to mitigate these effects, the proponent will identify these effects and the parties that have the authority to act. In such cases, the EIS will summarize the discussions that took place with the other parties in order to implement the necessary measures over the long term;
- Determine the significance of the cumulative effects; and
- Develop a follow-up program to verify the accuracy of the assessment or to dispel the uncertainty concerning the effectiveness of mitigation measures for certain cumulative effects.

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

7. SUMMARY OF ENVIRONMENTAL EFFECTS ASSESSMENT

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

- potential environmental effects;
- proposed mitigation measures to address the 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. An example of a format for the key summary table is provided in Appendix 1 of this document.

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

8. FOLLOW-UP AND MONITORING PROGRAMS

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

8.1. Follow-up Program

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

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

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

8.2. Monitoring

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

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

- description of the characteristics of the monitoring program (e.g., location of interventions, planned protocols, list of measured parameters, analytical methods employed, schedule, human and financial resources required);
- description of the proponent's intervention mechanisms in the event of the observation of non-compliance with the legal and environmental requirements or with the obligations imposed on contractors; and
- guidelines for preparing monitoring reports (number, content, frequency, format) that will be sent to the interested authorities.

Appendix 1 Example - Summary Table of Environmental Assessment

Valued Component affected	Area of federal jurisdiction ¹⁴ (v)	Project Activity	Potential effects	Proposed mitigation	Residual effect	<i>Magnitude</i>	<i>Extent</i>	<i>Duration</i>	<i>Frequency</i>	<i>Reversibility</i>	<i>Other criteria used to determine significance</i>	Significance of residual adverse effect
Fish and fish habitat												
Migratory birds												
Species at risk												
Current use of land and resource for traditional purpose	v 5(1)(c)(iii)											
Any other VCs identified												

¹⁴ Indicate by a check mark which VCs can be considered “environmental effects” as defined in section 5 of CEAA 2012, and specify which subsection of this Act is relevant. For example, for the VC “Use of land and resources by Aboriginal people”, the appropriate cell would indicate, section 5(1)(c)(iii).