APPENDIX 1A

Federal EIS Guidelines

Canadian Environmental Assessment Agency | Agence canadienne d'évaluation environnementale

GUIDELINES FOR THE PREPARATION OF AN ENVIRONMENTAL IMPACT STATEMENT

pursuant to the

Canadian Environmental Assessment Act, 2012

VALENTINE GOLD PROJECT

MARATHON GOLD CORPORATION

July 2019

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

CEAA 2012	*Canadian Environmental Assessment Act*, *2012*
Agency	Canadian Environmental Assessment Agency
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). This document specifies the nature, scope and extent of the information required. Part 1 of this document defines the scope of the environmental assessment (EA) and provides guidance and general instruction that must be taken into account in preparing the EIS. Part 2 outlines the information that must be included in the EIS.

Section 5 of CEAA 2012 describes the environmental effects that must be considered in an EA, including changes to the environment and effects of changes to the environment. The factors that are to be considered in an EA are described under section 19 of CEAA 2012. The Canadian Environmental Assessment Agency (the Agency) 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 the 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:

- 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

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

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.

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 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 April 5, 2019, Marathon Gold Corporation, the proponent of the Valentine Gold 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 mines
- Ore, low grade ore, waste rock, overburden, top soil stockpile areas
- Tailings management facility
- Water management facilities
- Ore treatment facility
- Explosive storage and manufacturing
- Effluent treatment

- Potable water treatment
- Site clearing, earthmoving, leveling, drilling and blasting activities
- Transportation corridor construction or improvement (road)
- Ore and concentrate transportation
- Storage of petroleum products and reagents
- Water supply (industrial and drinking)
- Wastewater treatment
- Power supply including a new high-voltage transmission line
- Borrow areas
- Accommodation camp
- Administrative, workshop, warehouse, maintenance, storage, laboratory and security buildings

3.2. Factors to be considered

Scoping establishes the parameters of the EA and focuses the assessment on relevant issues and concerns. Part 2 of this document specifies the factors to be considered in 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 or human features that may be impacted by a project. The value of a component not only relates to its role in the ecosystem, but also to the value people place on it. For example, it may have been identified as having scientific, social, cultural, economic, historical, archaeological or aesthetic importance.

The proponent must conduct and focus its analysis on VCs as they relate to section 5 of CEAA 2012, including the ones identified in Section 7.3 (Part 2) of these guidelines that may be affected by changes in the environment, as well as species at risk and their critical habitat as per the requirement outlined in section 79 of the *Species at Risk Act*. Section 5 of CEAA 2012 defines environmental effects as:

- a change that may be caused to fish and fish habitat, marine plant and migratory birds;
- a change that may be caused to the environment on federal lands, in another province or outside Canada;
- with respect to 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:
    - o health and socio-economic conditions,
    - o physical and cultural heritage, or
    - o 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 encouraged to consult with the Agency, federal and provincial government departments and agencies, local government and Indigenous groups, and take into account public comments when defining the spatial and temporal boundaries used in the EIS.

The EIS will describe the spatial boundaries, including local and regional study areas, of each VC to be used in assessing the potential adverse environmental effects of the project and provide a rationale for each boundary. Spatial boundaries will be defined taking into account the appropriate scale and spatial extent of potential environmental effects, community knowledge and Aboriginal traditional knowledge, current or traditional land and resource use by Indigenous 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. If effects are predicted after project decommissioning, this should be taken into consideration in defining boundaries. Community knowledge and Aboriginal traditional knowledge should factor into decisions around defining temporal boundaries.

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

4. PREPARATION AND PRESENTATION OF THE ENVIRONMENTAL IMPACT STATEMENT

4.1. Guidance

The proponent should consult the Agency policy and guidance on topics to be addressed in the EIS, which is available on the Agency's website, and liaise with the Agency during the planning and development of the EIS. The proponent should also consult relevant guidance from other federal departments and ensure that the most up to date version is being used.

The proponent is 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 Indigenous interests as well as assessment of environmental effects as outlined in paragraph 5(1)(c) of CEAA 2012.

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, published by Environment and Climate Change Canada. 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.

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 MDMER would need to be amended to add the affected water bodies to Schedule 2 to designate them as tailings impoundment areas. This regulatory process will not be initiated until a detailed assessment of alternatives for mine waste disposal has been undertaken by the proponent. Conducting this robust and thorough assessment of alternatives during the EA will streamline the overall regulatory review process and minimize the time required to proceed with the 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.

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 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 Aboriginal traditional knowledge

Sub-section 19(3) of CEAA 2012 states that "the environmental assessment of a designated project may take into account community knowledge and Aboriginal traditional knowledge". For the purposes of these guidelines, community knowledge and Aboriginal traditional knowledge refers to knowledge acquired and accumulated by a local community or an Indigenous group.

The proponent will incorporate into the EIS the community knowledge and Aboriginal traditional knowledge to which it has access or that is acquired through public participation and engagement with Indigenous groups, 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 where necessary 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 Aboriginal traditional knowledge into all aspects of its assessment including both methodology (e.g. establishing spatial and temporal boundaries, defining significance criteria) and analysis (e.g. baseline characterization, effects prediction, development of mitigation measures). Agreement should be obtained from Indigenous groups regarding the use, management and protection of their existing traditional knowledge information during and after the EA. For more information on how Aboriginal traditional knowledge can be obtained and incorporated in the preparation of the EIS, please refer to the Agency's reference guide on the topic. Should there be a lack of Indigenous knowledge, 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 Indigenous interests. For more information on requirements for the effects assessment, see Part 2, Section 7.1.9 and 7.3.4 of these guidelines.

4.2.3. Existing information

In preparing the EIS, the proponent is encouraged to make use of existing information relevant to the project. When relying on existing information to meet requirements of the EIS Guidelines, the proponent will either include the information directly in the EIS or clearly direct the reader to where it may obtain the information (i.e. through cross-referencing). When 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 Environmental Assessment Registry and made available to the public on request. For this reason, the EIS will not contain information that:

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

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

4.3. Study strategy and methodology

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

It is possible these guidelines may include matters which, in the judgement of the proponent, are not relevant or significant to the project. If such matters are omitted from the EIS, the proponent will clearly indicate it, and provide a justification so the Agency, federal authorities, Indigenous 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;
- ✓ considering cumulative effects of the project in combination with other physical activities that have been or will be carried out; and
- ✓ determining the potential significance of any residual environmental effect following the implementation of mitigation measures.

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

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

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

If the baseline data have been extrapolated or otherwise manipulated to depict environmental conditions in the study areas, modelling methods and equations will be described and will include calculations of margins of error and other relevant statistical information, such as confidence intervals and possible sources of error. The proponent will provide the references used in creating their approach to baseline data gathering, including identifying where appropriate, the relevant federal or provincial standards. The proponent is encouraged to discuss the timeframe and considerations for its proposed baseline data with the Agency prior to submitting its EIS.

In describing and assessing effects to the physical and biological environment, the proponent will take an ecosystem approach that considers both scientific and community knowledge and 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 the opportunity to review and provide comments on the information used for describing and assessing effects on Indigenous peoples (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. 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. 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 Environmental Assessment Registry, the title page of the EIS and its related documents will contain the following information:

- project name and location;
- title of the document, including the term "environmental impact statement";
- subtitle of the document;
- name of the proponent; and
- date of submission of the EIS.

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

For purposes of brevity and to avoid repetition, cross-referencing is preferred. The EIS may make reference to the information that has already been presented in other sections of the document, rather

than repeating it. Detailed studies (including all relevant and supporting data and methodologies) will be provided in separate appendices and will be referenced by appendix, section and page in the text of the main document. The EIS will explain how information is organized in the document. This will include a table of content with a list of all tables, figures, and photographs referenced in the text. A complete list of supporting literature and references will also be provided. A table of concordance, which cross references the information presented in the EIS with the information requirements identified in the EIS Guidelines, will be provided. The proponent will provide copies of the EIS and its summary for distribution, including paper and electronic version in an unlocked, searchable PDF format, as directed by the Agency.

4.5. Summary of the environmental impact statement

The proponent will prepare a summary of the EIS in both of Canada's official languages (French and English) to be provided to the Agency at the same time as the EIS 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, 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; and
- 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. Summary of environmental effects assessment for each VC, including:
    a. description of the baseline
    b. anticipated changes to the environment
    c. anticipated effects
    d. mitigation measures

e. significance of residual effects

7. Follow-up and monitoring programs proposed

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

Part 2 – Content of the Environmental Impact Statement

1. INTRODUCTION AND OVERVIEW

1.1. The proponent

In the EIS, the proponent will:

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

1.2. Project overview

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

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

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 settings that are important in order to understand the potential environmental effects of the project. The following information will be included:

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

- traditional territories, Indian Reserve lands and Mi'kmaq harvesting regions and/or settlements.

1.4. Regulatory framework and the role of government

The EIS will identify:

- any federal power, duty or function that may be exercised that would permit the carrying out (in whole or in part) of the project or associated activities;
- legislation and other regulatory approvals that are applicable to the project at the federal, provincial, regional and municipal levels;
- government policies, resource management plans, planning or study initiatives pertinent to the project and/or EA and their implications;
- any treaty, self-government or other agreements between federal or provincial governments and Indigenous groups that are pertinent to the project and/or EA;
- any relevant land use plans, land zoning, or community plans;
- information on land lease agreement or land tenure, when applicable; 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[2] 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 on this topic.

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

[2] See subsection 52(2) of CEAA 2012.

- transportation of gold concentrate (means and routing considered);
- processing of ore material;
- access to the project site;
- location of key project components;
- energy sources to power the project site;
- routing of the high-voltage transmission line;
- management of water supply and waste water;
- water management and location of the final effluent discharge points; and
- mine waste disposal and final effluent discharge (methods and sites considered)[3].

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

3. PROJECT DESCRIPTION

3.1. Project components

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

- maps, at an appropriate scale, of the project location, the project components, boundaries of the proposed site with UTM coordinates, the major existing infrastructure, proponent lands properties or leases lands used for the project, adjacent land uses and any important environmental features;
- information on the care and control of project components;
- tailings management facility (footprint, location and preliminary designs, including the proposed infilling or dewatering of an unnamed navigable body of water located within the proposed footprint of the tailing management facility);
- waste rock, overburden, topsoil, low grade ore storage and stock piles (footprint, locations, volumes, development plans and design criteria);
- open pit mines (footprint, location, development plans including pit phases);
- crusher, and processing facilities (footprint, technology, location);

[3] 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 can be found on the Environment and Climate Change Canada website Proponent should also refer to Part 1, Section 4.1 of the present guidelines.

- 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);
- water treatment infrastructure;
- permanent and temporary linear infrastructures (road, pipelines, power supply), identifying the route of each of these linear infrastructures, the location and types of structure used for stream crossings;
- storage areas for fuels, explosives and hazardous wastes;
- drinking and industrial water requirements (source, quantity required, need for water treatment);
- energy supply including new high-voltage transmission line (source, quantity);
- waste disposal (types of waste, methods of disposal, quantity);
- accommodation camp; and
- administrative, workshop, warehouse, maintenance, storage, laboratory and security buildings.

3.2. Project activities

The EIS will include descriptions of the construction, operation, decommissioning and abandonment 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 concerns identified by the public and Indigenous groups. Highlight activities that involve periods of increased environmental disturbance or the release of materials into the environment.

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

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

The information will include a description of:

3.2.1. Site preparation and construction

- site clearing and excavation;
- blasting (frequency and methods);
- construction or upgrades of access roads;
- construction of a high-voltage transmission line;

- explosives manufacture and storage (location and management);
- borrow materials requirement (source and quantity);
- water management, including water diversions, dewatering or deposition activities required (location, methods, timing);construction of infrastructure associated with power generation and communications;
- equipment requirements (type, quantity);
- administrative buildings, garages, other ancillary facilities;
- accommodation camp (location, capacity, wastewater treatment);
- number of employees and transportation of employees; and
- storage and management of hazardous materials, fuels and residues.

3.2.2. Operation

- mining plan, ore production, ore stockpiling, concentrate production;
- storage, handling and transport of materials;
- explosives manufacture, storage and use (storage location and management);
- drilling and blasting (frequency and methods);
- water management on the project site including mine water, storm water, process water, wastewater, water recycling, effluent treatment and potable water treatment (quantity, treatment requirements, release point(s));
- ore extraction, ore crushing and treatment;
- storage and handling of reagents, petroleum products, chemical products, hazardous materials and residual materials;
- characterization and management of ore, waste rock, low grade ore, overburden and tailings (storage, handling and transport of the volumes generated, mineralogical characterization, potential for metal leaching and acid rock drainage);
- waste management and recycling (other than mine waste such as tailings and waste rock); and
- characterization and management of workforce, including transportation, work schedules and lodging.

3.2.3. Decommissioning and abandonment

- the preliminary outline of a decommissioning and reclamation plan for any components associated with the project;
- 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, 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; and
- 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.

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 Indigenous interests.

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, 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 along VCs identified in the EIS);
- any future planned engagement activities;

- 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 utilized to manage those effects. The effects and mitigation measures should be clearly linked to VCs 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 interests. 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.

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:

- Qalipu First Nation
- Miawpukek First 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).

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. For the groups listed above or subsequently identified by the Agency, if potential

effects or impacts are identified, requirements of Part 2, Section 6 and Section 7.3.4 of these guidelines would apply.

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 Part 2, 7.3.4 of these guidelines. With respect to the assessment requirements are outlined in Part 2, Section 7 of these guidelines.

6. IMPACTS TO INDIGENOUS INTERESTS

With respect to potential adverse impacts of the project on Indigenous interests, the EIS will document for each group identified in Part 2, Section 5 of these guidelines (or in subsequent correspondence from the Agency):

- ✓ 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;
- ✓ 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 Indigenous interests, including those raised by Indigenous groups;
- ✓ potential adverse impacts on Indigenous interests that have not been fully mitigated 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 Indigenous interests. However, there may be distinctions between the adverse impacts on Indigenous interests and paragraph 5(1)(c) effects under CEAA 2012. The proponent will carefully consider the potential distinction between these two aspects and, where there are differences; will include the relevant information in its assessment.

7. EFFECTS ASSESSMENT

7.1. Project setting and baseline conditions

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

7.1.1. Atmospheric environment

- a baseline survey of ambient air quality in the project areas and in the airshed likely to be affected by the project, for the mine site, by identifying and quantifying emission sources for, but not limited to, the following contaminants: total suspended particulates, fine particulates smaller than 2.5 microns (PM2.5), respirable particulates of less than 10 microns (PM10), carbon monoxide (CO), sulphur oxides (SOx), nitrogen oxides (NOx), and volatile organic compounds (VOCs);
- identify and quantify existing greenhouse gas emissions[4] by individual pollutant measured as kilotonnes of CO_2 equivalent per year in the project study areas;
- direct and indirect sources of air emissions;
- current provincial/territorial/federal limits for greenhouse gas emission targets;
- current ambient noise levels at key receptor points (e.g. Indigenous groups or communities), including the results of a baseline ambient noise survey. Information on typical sound sources, geographic extent and temporal variations will be included;
- existing ambient night-time light levels at the project site and at any other areas where project activities could have an effect on light levels. The EIS will describe night-time illumination levels during different weather conditions and seasons; 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 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 drainage[5] 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;

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

[5] 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.

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

- baseline concentrations of contaminants of concern[6] within the local, regional and downstream receiving environments; and
- geochemical characterization of leaching potential, including, but not limited to, contaminants of concern from waste rock, pit walls and tailings.

7.1.3. Topography and soil

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

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, peatlands, mudflats and eelgrass beds, etc.), including the location and extent of wetlands likely to be affected by project activities according to their size, type (class and form), the description of their ecological function (ecological, hydrological, wildlife, socioeconomic, etc.) and species composition[7]; and
- plant and animal species (abundance, distribution and diversity) and their habitats, with a focus on species at risk or with special status that are of social, economic, cultural or scientific significance, as well as invasive alien species.

7.1.5. Groundwater and surface water

- hydrogeology, including:
  - ✓ hydrogeological context (e.g. hydrostratigraphy with aquifers and aquitards, major faults, etc.), including the delineation of key stratigraphic and hydrogeologic boundaries;
  - ✓ physical properties of the hydrogeological units (e.g. hydraulic conductivity, transmissivity, saturated thickness, storativity, porosity, specific yield);
  - ✓ groundwater flow patterns and rates;
  - ✓ a discussion of the hydrogeologic, hydrologic, geomorphic, climatic and anthropogenic controls on groundwater flow;

[6] Contaminants of concern include, but are not limited to, selenium, sulphate, cadmium, nitrate and calcite.
[7] Refer to the Canadian Wetland Classification System of the National Wetlands Working Group for more information.

- ✓ temporal changes in groundwater flow (e.g. seasonal and long term changes in water levels);
- ✓ a delineation and characterization of groundwater - surface water interactions including temperature and the locations of groundwater discharge to surface water and surface water recharge to groundwater;
- ✓ temperature changes in surface water as a result of groundwater-surface water interactions;
- ✓ changes to surface water quality, including seasonal changes in runoff entering watercourses.

- hydrogeological maps and cross-sections for the mine area to outline the extent of aquifers and aquitards, including bedrock fracture and fault zones, locations and depths of wells and strainers, groundwater types springs, surface waters, and project facilities. Groundwater levels, potentiometric contours, flow directions, groundwater divides and areas of recharge and discharge should be included;
- 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 rock and bedrock, bedrock quality, fracture zones, piezometric levels, hydraulic conductivity, diameter and screen depth and intercepted aquifer unit);
- monitoring protocol for collection of existing groundwater and surface water 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);
- groundwater quality, including lab analytical results for metals, major ions and physical parameters, including temperature, with the interpretation of results for any anomalous values and for contaminants of concern;
- graphs or tables indicating the seasonal variations in groundwater levels, flow regime, and quality;
- local and regional potable groundwater supplies, including their current use and potential for future use;
- bedrock fracture sizes and orientations in relation to groundwater flow;
- the delineation of drainage basins, at appropriate scales (water bodies and watercourses), including intermittent streams, flood risk areas and wetlands, boundaries of the watershed and subwatersheds, overlaid by key project components;
- hydrological regimes, including monthly, seasonal and annual water flow (discharge) data;
- for each affected water body, the total surface area, bathymetry, maximum and mean depths, water level fluctuations, type of substrate (sediments);
- seasonal surface water quality, including analytical results (e.g. water temperature, turbidity, pH, dissolved oxygen profiles) and interpretation for representative tributaries and water bodies including all sites to receive mine effluents or runoff;
- any local and regional potable surface water resource;

- sediment quality analysis for key sites likely to receive mine effluents.

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, 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 in affected water bodies with a characterisation of season variability;
- a list of any fish or invertebrate species at risk that are known to be present;
- a description of the habitat by homogeneous section, including the length of the section, width of the channel from the high water mark (bankful width), water depths, type of substrate (sediments), aquatic and riparian vegetation, and photos;
- a description of natural obstacles (e.g. falls, beaver 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, rearing, nursery, feeding, overwintering, migration routes, etc. Where appropriate, this information should be linked to water depths (bathymetry) to identify the extent of a water body's littoral zone; and
- the description and location of suitable habitats for fish species at risk that appear on federal and provincial lists and that are found or are likely to be found in the study area.

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

7.1.7. Migratory birds and their habitat

- birds and their habitats that are found or are likely to be found in the study area. This description may be based on existing sources, but supporting evidence is required to demonstrate that the data used are representative of the avifauna and habitats found in the study area. The existing data must be supplemented by surveys[8], if required;
- 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;

[8] Surveys should be designed in light of the available references and recommendations in Environment and Climate Change Canada's document entitled "*Guidance for the Preparation of an Environmental Impact Statement and Useful References*" (2016) (available from the Department of Environment and Climate Change Canada), and 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.

- 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 area (e.g. winter, spring migration, breeding season, fall migration), based on preliminary data from existing sources and surveys to provide current field data if appropriate.

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, including Newfoundland marten, 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 and of special concern[9], including caribou;
- any published studies that describe the regional importance, abundance and distribution of species at risk including recovery strategies or plans. The existing data must be supplemented by surveys, as required; 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 (and any groups identified after these guidelines are finalized). 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, including consideration of the differences of experiences by sub-populations within an Indigenous group, as appropriate (for example, women, youth, elders, families) and cumulative effects.
- Be sufficient to 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.

[9] Proponents are encouraged to consult COSEWIC's latest annual report for a listing of the designated wildlife species posted on their website.

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 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[10] and socio-economic conditions. For health this includes the state of physical, mental and social well-being. 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 sub-populations;
- sites or areas that are used by Indigenous people either for permanent residences or on a seasonal/temporary basis and the number of people that use each site or area identified;
- drinking water sources (permanent, seasonal, periodic, or temporary);
- consumption of country foods (also known as traditional foods) including food that is trapped, fished, hunted, harvested or grown for subsistence or medicinal purposes, outside of the commercial food chain;
- which country foods are consumed by which groups, how frequently, and where these country foods are harvested;
- commercial activities (e.g. fishing, trapping, hunting, forestry, outfitting); and
- recreational uses.

Physical and Cultural Heritage

Baseline information for physical and cultural heritage (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. Specific aspects that will be considered include, but are not limited to:

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

Current Use of Lands and Resources for Traditional Purposes[11]

[10] The proponent should refer to Health Canada's guidance documents in order to include the appropriate baseline information relevant to human health.
[11] The proponent should refer to CEAA's guidance documents related to current use of lands and resources for traditional purposes in order to include the appropriate baseline information relevant to current use.

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 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;
- 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;
- frequency, duration or timing of traditional practices;
- cultural values and importance associated with the area affected by the project and the traditional uses identified;
- 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 5 can be used to inform the baseline information for the elements of 5(1)(c) listed above.

Should there be a lack of Indigenous knowledge; the proponent is still expected to seek information from other sources[12] sufficient enough to allow for a complete the 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.

[12] The proponent should refer to CEAA's guidance documents related to current use of lands and resources for traditional purposes in order to include the appropriate baseline information relevant to current use.

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

Should there be the potential for a change to the environment arising as a result of a federal decision(s), or on federal lands, lands in another province or lands outside Canada, the EIS will include baseline information on the environmental component likely to be affected (if this information is not already covered in other subsections of these guidelines). For example, if an authorization provided under the *Fisheries Act* was to result in the flooding of key wildlife habitat, baseline information should be provided on the wildlife species likely to be affected.

7.1.11. Human environment

- the rural and urban settings likely to be affected by the project;
- any federal lands, lands located outside the province or Canada that may be affected by the project;
- the current use of land in the study area, including a description of hunting, recreational and commercial fishing, trapping, gathering, outdoor recreation, use of seasonal cabins, outfitters;
- current use of all waterways and water bodies that will be directly affected by the project, including recreational uses, where available;
- location of and proximity of any permanent, seasonal or temporary residences or camps;
- health[13] 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; and
- physical and cultural heritage, including structures, sites or things of historical, archaeological, paleontological or architectural significance.

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. 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

[13] The proponent should refer to Health Canada's guidance documents in order to include the appropriate baseline information relevant to human health.

- conduct of an atmospheric dispersion modelling of the main contaminants in order to estimate the contaminant concentrations present in the entire area that could potentially be affected by atmospheric emissions (Section 7.1.1, above) resulting from various project-related activities (sources);
- comparison of anticipated air quality concentration against the *Canadian Ambient Air Quality Standards* (CAAQS) for fine particulate matter;
- an estimate of the direct greenhouse gas emissions associated with all phases of the project as well as any mitigation measures proposed to minimize greenhouse gas emissions. This information is to be presented by individual pollutant and should also be summarized in CO_2 equivalent per year. The proponent is responsible for the following:
  - ✓ 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 noise levels; and
- changes in night-time light levels.

7.2.2. Changes to groundwater and surface water

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

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

7.2.3. Changes to riparian, wetland and terrestrial environments

- overall description of changes related to landscape disturbance;
- changes to the habitat of migratory and non-migratory birds, with a distinction made between the two birds category, including losses, structural changes and fragmentation of riparian habitat (aquatic grassbeds, intertidal marshes) 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; and
- changes to key habitat 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 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 loss (temporary or permanent) in terms of surface areas (e.g. spawning grounds, fry-rearing areas, feeding), and in relation to watershed availability and significance. The assessment will include a consideration of:
  - ✓ the geomorphological changes and their effects on hydrodynamic conditions and fish habitats (e.g. modification of substrates, dynamic imbalance, silting of spawning beds);
  - ✓ the modifications of hydrological and hydrometric conditions on fish habitat and on the fish species' life cycle activities (e.g. reproduction, fry-rearing, movements);
  - ✓ potential effects on riparian areas that could affect aquatic biological resources and productivity taking into account any anticipated modifications to fish habitat;
  - ✓ any potential imbalances in the food web in relation to baseline conditions;
  - ✓ effects on the primary and secondary productivity of water bodies and how project-related effects may affect fish food sources.
- the effects of changes to the aquatic environment on fish and their habitat, including:
  - ✓ the anticipated changes in the composition and characteristics of the populations of various fish species, including shellfish and forage fish;

- ✓ any modifications in migration or local movements (upstream and downstream migration, and lateral movements) following the construction and operation of works (physical and hydraulic barriers);
- ✓ any reduction in fish populations as a result of potential overfishing due to increased access to the project area;
- ✓ any modifications and use of habitats by federally or provincially listed fish species.

- a discussion of how project construction timing correlates to key fisheries windows for freshwater and anadromous species, and any potential effects resulting from overlapping periods; and
- a discussion of how vibration caused by blasting may affect fish behaviour, such as spawning or migrations.

7.3.2. Migratory birds

- direct and indirect adverse effects on migratory birds, including population level effects that could be caused by all project activities, including but not limited to:
- site preparation; construction and presence of project-associated infrastructure;
- deposit of harmful substances in waters that are frequented by migratory birds (e.g. tailing impoundment area);
- risk of collision of migratory birds with any project infrastructure and vehicles; and
- indirect effects caused by increased disturbance (e.g. noise, light, presence of workers), relative abundance movements, 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; i.e. direct and indirect effects on the survival or recovery of species listed under the *Species at Risk Act*, including the Newfoundland marten; and
- the potential adverse effects of the project on 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.

7.3.3.1. Caribou

- the assessment of the potential adverse effects on caribou that could be caused by all project activities will include a consideration of:
  - ✓ direct or indirect effects to caribou populations;
  - ✓ direct effects to caribou migration caused by alteration/destruction of caribou migratory routes; and
  - ✓ indirect effects to caribou migration caused by increased disturbance (e.g. noise, light, presence of workers).

7.3.4. Indigenous peoples

With respect to Indigenous peoples, provide a description and analysis, for each Indigenous group, 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 sub-populations 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' human health, focusing on effects on health outcomes or risks in consideration of, but not limited to, potential changes in air quality, noise exposure and effects of vibration from blasting, current and future availability of country foods, and water quality (drinking, recreational and cultural uses).
- 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.
- 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 different for particular sub-populations within an Indigenous group (for example, 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 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[14]

[14] 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".

- ✓ 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, 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
  - ✓ 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

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.[15] This assessment should consider 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 preferred manner; 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:

[15] The proponent should refer to CEAA's guidance documents related to current use of lands and resources for traditional purposes.

- ✓ 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;
- ✓ 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 section 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

If there is the potential for a change to the environment arising as a result of a federal decision(s), for example an authorization under section 35 of the *Fisheries Act*, the EIS should include a description of the specific project components for which a federal authorization/decision is required, and an assessment of any other VCs (not already covered in other subsections of these guidelines) that may be affected by the changes to the environment caused by these specific project components. This could include, for example, terrestrial species or habitat such as caribou or wetlands. If there is the potential for the project to result in environmental changes on federal lands, another province, or another country, then VCs of importance not already identified should be included. For example, if the project will result in the generation of greenhouse gas emissions, the EIS should include a description of the project's greenhouse gas emissions in a regional, provincial, national or international context, if applicable.

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, interpretation and implementation. Mitigation measures may be considered for inclusion as conditions in the EA decision statement and/or in other compliance and enforcement mechanisms provided by other authorities' permitting or licensing processes.

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

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

The EIS will then describe mitigation measures that are specific to each environmental effect identified. Mitigation measures will be written as specific commitments that clearly describe how the proponent intends to implement them and the environmental outcome the mitigation measure is designed to address. The EIS will 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.

The EIS will specify the actions, works, minimal disturbance footprint techniques, best available technology, corrective measures or additions planned during the project's various phases to eliminate or reduce the significance of adverse effects. The EIS will also present an assessment of the effectiveness of the proposed technically and economically feasible mitigation measures. The reasons for determining if the mitigation measure reduces the significance of an adverse effect will be made explicit. The proponent is also encouraged to identify mitigation measures for effects that are adverse although not significant.

The EIS 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 raised by each Indigenous group for mitigating the effects of changes to the environment on Indigenous peoples (section 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 Section 8 below) indicates that corrective action is required, the proposed approach for managing the action 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 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 6 of these guidelines prior to submitting the EIS. The 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 guidance on determining whether a Project is likely to cause significant adverse environmental effects.

The EIS will identify the criteria used to assign significance ratings to any predicted adverse effects. It will contain clear and sufficient information to enable the Agency or review panel, technical and regulatory agencies, 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[16]
- existence of environmental standards, guidelines or objectives for assessing the effect

[16] 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.

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.

7.6. Other effects to consider

7.6.1. Effects of potential accidents or malfunctions

The failure of certain works caused by human error or exceptional natural events (e.g. flooding, earthquake, forest fire) could cause major effects. The proponent will therefore conduct a qualitative analysis of the risks of accidents and malfunctions across all phases of the Project, determine their effects, and present preliminary emergency response measures.

Taking into account the lifespan of different project components, the proponent will identify the probability of potential accidents and malfunctions related to the project, including an explanation of how those events were identified, potential consequences (including the environmental effects as defined in section 5 of CEAA 2012), the plausible worst case scenarios and the effects of these scenarios. Fate and behaviour modelling of potential spills of hydrocarbons, sodium cyanide and ammonium nitrate to waters frequented by fish should be considered for 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.

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, landslides, avalanches, erosion, subsidence, fire, outflow conditions and seismic events), could adversely affect the project and how this in turn could result in effects to the environment (e.g. extreme environmental conditions result in/ contribute to and/or complicate malfunctions and accidental events). These events will be considered in different probability patterns (e.g. 5-year flood vs. 100-year flood).

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 guidance documents related to cumulative environmental effects.

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

- the implementation of the project may cause direct residual adverse effects on the VC, taking into account the application of technically and economically feasible mitigation measures; and
- the same VC may be affected by other past, present and future physical activities[17].

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 salmon and other valued fish species;
  - ✓ migratory birds;
  - ✓ species at risk, including caribou and Newfoundland marten;
  - ✓ Indigenous peoples; and
  - ✓ 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. 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 CEAA 2012.

[17] Definitions of these terms can be found in the Agency's technical guidance on cumulative environmental effects.

- 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).
- 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.
- develop a follow-up program to verify the accuracy of the assessment or to dispel the uncertainty concerning the effectiveness of mitigation measures for certain cumulative effects.

The proponent is encouraged to consult with key stakeholders and Indigenous 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 key summary table is provided in Appendix 1 of this document.

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

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. Considerations for developing a follow-up program include:

- whether the project will impact environmentally sensitive areas/VCs or protected areas or areas under consideration for protection;

- the nature of Indigenous and public concerns raised about the project;
- 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; 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.

9.1. Follow-up program

The duration of the follow-up program shall be as long as required to evaluate the effectiveness of the mitigation measures.

The EIS shall present a preliminary follow-up program and shall include:

- objectives of the follow-up program and the VCs targeted by the program;
- list of elements requiring follow-up;
- number of follow-up studies planned as well as their main characteristics (list of parameters to be measured, planned implementation timetable, etc.);
- intervention mechanism used in the event that an unexpected deterioration of the environment is observed;
- mechanism to disseminate follow-up results among the concerned populations;
- accessibility and sharing of data for the general population;
- opportunity for the proponent to include the participation of Indigenous groups and stakeholders on the affected territory, during the development and 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.

9.2. Monitoring

The proponent will prepare an environmental monitoring program for all phases of the project.

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

- identification of the interventions that pose risks to one or more of the environmental and/or 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 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 concerned; and
- plans to engage Indigenous groups in monitoring, where appropriate.

Appendix 1 Example - Summary Table of Environmental Assessment

						Key Criteria for Determining Significance[18]							
Valued Component affected	Area of federal jurisdiction[19] (√)	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													

[18] 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.

[19] Indicate by a check mark which valued components can be considered "environmental effects" as defined in section 5 of CEAA 2012, and specify which subsection of section 5 is relevant. For example, for the VC "current use of lands and resources for traditional purposes", the appropriate cell would indicate, section 5(1)(*c*)(iii) of CEAA 2012.

APPENDIX 1B

Provincial EIS Guidelines

ENVIRONMENTAL IMPACT STATEMENT GUIDELINES

for the

Valentine Gold Project

Prepared by:

The 2015 Environment Assessment Committee for the Minister of the Department of Municipal Affairs and Environment, Government of Newfoundland and Labrador

January 2020

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Glossary of Acronyms and Abbreviations

ACCDC	Atlantic Canada Conservation Data Centre
ANFO	Ammonium Nitrate/Fuel Oil
ARD	Acid Rock Drainage
BACT	Best Available Control Technology
CCME	Canadian Council of Ministers of the Environment
CEAA	*Canadian Environmental Assessment Act*
CEPA	*Canadian Environmental Protection Act* (1999)
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CWCS	Canadian Wetland Classification System
DFO	Fisheries and Oceans Canada
EA	Environmental Assessment
ECCC	Environment and Climate Change Canada
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EEMP	Environmental Effects Monitoring Plan
EPP	Environmental Protection Plan
EPR	Environmental Preview Report
GHG	Greenhouse Gas
GNL	Government of Newfoundland and Labrador
HC	Health Canada
MAE	Municipal Affairs and Environment
MBCA	*Migratory Birds Convention Act*
MEND	Mine Environment Neutral Drainage Program
mg/m^3	Milligrams per cubic metre
ML	Metal Leaching
MDMER	*Metal and Diamond Mining Effluent Regulations*
NL	Government of Newfoundland & Labrador
NLEPA	Newfoundland and Labrador *Environmental Protection Act*
NLESA	Newfoundland and Labrador *Endangered Species Act*
NO_x	Nitrogen Oxides
NWWG	National Wetlands Working Group
PAG	Potentially Acid Generating
PLS	Plain Language Summary
$PM_{2.5}$, PM_{10}	Particulate Matter (subscript indicates size threshold, in microns)
t/d	Tonnes per day
t/yr	Tonnes per year
SAR	Species at Risk
SARA	*Species at Risk Act*
SO_2	Sulphur Dioxide
SSAC	Species Status Advisory Committee
VEC	Valued Ecosystem Component

1.0 INTRODUCTION

The proponent is proposing to develop a gold mine approximately 55 kilometres southwest of Millertown in the west-central region of the Island of Newfoundland. The project includes four potential mining deposits: Leprechaun, Sprite, Marathon, and Victory deposits. Standard surface mining techniques will be used in open pit construction and operation. The project will involve waste rock disposal piles; crushing and stockpiling areas; heap leach processing; conventional milling; processing facilities; and a tailings management area. It will require personnel accommodations and supporting infrastructure including roads; power lines; buildings; and water and sewage effluent management facilities. The construction period is expected to last 18-24 months followed by an estimated mine operation life of 13 years. The project will operate 24 hours per day, seven days a week on a 12-hour shift basis.

The Project requires Environmental Assessment (EA) under the Newfoundland and Labrador *Environmental Protection Act* (*NLEPA*), specifically, the preparation of an Environmental Impact Statement (EIS). These requirements are discussed in further detail in Section 2.2.

The Project is also undergoing EA under the *Canadian Environmental Assessment Act* and the final guidelines can be found at the Impact Assessment Agency of Canada's (formerly the Canadian Environmental Assessment Agency) website at https://ceaa-acee.gc.ca/050/evaluations/proj/80169?culture=en-CA.

1.1 Purpose of the Environmental Impact Statement Guidelines

On June 13, 2019, the Minister of Municipal Affairs and Environment (MAE) informed the proponent that an environmental impact statement (EIS) is required for the proposed Valentine Gold Project undertaking. The purpose of these guidelines is to identify for the proponent the nature, scope, and minimum information and analysis required in preparing the EIS.

These guidelines shall not be regarded as either restrictive or exhaustive. Concerns other than those identified herein may arise during the investigations associated with the EIS and additional detail, studies, and/or examination of components may be required. The provincial government is prepared to provide advice and assistance throughout the preparation of the EIS and the required baseline studies with regard to the identification of environmental concerns and appropriate assessment methodology.

The EIS is a statement of the proponent's environmental conclusions and commitments related to the undertaking, and shall be explicitly endorsed by the proponent.

For the purpose of these guidelines:

"Environment" includes:

a) air, land and water;

b) plant and animal life, including human life;

c) the social, economic, recreational, cultural and aesthetic conditions and factors that influence the life of humans or a community;

d) a building, structure, machine or other device or thing made by humans;

e) a solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirectly from the activities of humans; or

f) a part or a combination of those things referred to in subparagraphs (a) to (f) and the interrelationships between two or more of them.

"Environmental effect" means a change in the present or future environment that would result from an undertaking.

"Follow-up Program" means a program:

(a) to determine the effectiveness of mitigation measures, and

(b) for compliance with terms and conditions applicable to the release.

"Minister" means the provincial Minister of the Department of Municipal Affairs and Environment.

"Undertaking" means an enterprise, activity, project, structure, work or proposal and a modification, abandonment, demolition, decommissioning, rehabilitation and an extension of them that may, in the opinion of the minister, have a significant environmental effect. The term undertaking refers to a project that shall be registered for environmental assessment. The terms "project" and "undertaking" are used interchangeably in these guidelines.

A "proponent" may be a person, corporation or government department that owns, manages, or controls a proposed project.

1.2 Guiding Principles

1.2.1 Environmental Assessment as a Planning Tool

Environmental assessment is a planning tool used to ensure that projects are considered in a careful and precautionary manner in order to avoid or mitigate the possible adverse effects of development on the environment. EA also encourages decision makers to take actions that promote sustainable development and thereby achieve or maintain a healthy environment and a healthy economy.

The EA of this project shall, in a manner consistent with the purposes above:

- consider and evaluate alternatives to the Project, or its components, and alternative means of carrying out the Project, or its components, and assess their technical and economic feasibility;
- document public consultation activities in a manner that is transparent;
- propose measures to avoid or mitigate adverse environmental effects;
- propose measures to enhance or prolong beneficial environmental effects;
- describe residual (post-mitigation) environmental effects that are beneficial or harmful that are likely to be caused by the undertaking regardless of the proper application of all control, mitigation, enhancement and remedial measures to be proposed in the EIS;
- assess the cumulative environmental effects of the Project in combination with other projects and activities that have been or will be carried out;
- predict whether or not the project, in combination with other projects or activities that have been or will be carried out, is likely to cause adverse environmental effects after mitigation measures are implemented;
- specifically list and cite all sources of information in the EIS;
- outline the design of studies necessary to provide additional information for the preparation of the EIS;
- address concerns identified during the public information sessions by including within the EIS specific responses to those concerns and, where appropriate, specific proposals for measures to deal with them; and
- as soon as they have been completed, provide copies of all reports or studies undertaken in order to satisfy these guidelines.

1.2.2 Sustainable Development

Sustainable development means development that meets the needs of the present, without compromising the ability of future generations to meet their own needs. The EIS shall consider the extent to which the Project would meet this objective.

EA provides a systematic approach for identifying, predicting and evaluating the potential environmental effects of projects before decisions are made. In addition, EA provides the means to identify mitigation measures for adverse effects. EA enables the integration of environmental factors into the planning and decision-making process in a manner that promotes sustainable development and contributes to decision making that can ultimately provide net ecological, economic and social benefits to society.

The EA of the Project, including its analysis of alternatives, shall take into account the relationships and interactions among the various components of the ecosystems, including the extent to which biological diversity may be affected by the Project, and how the Project meets the needs of the present as well as future populations.

1.2.3 Precautionary Approach

One of the purposes of EA is to ensure that Proponents consider the Precautionary Principle. If an undertaking has the potential to cause a threat of serious or irreversible damage to the environment, the Proponent shall take all reasonable environmental protection measures to protect the environment, even if full scientific knowledge is lacking.

The Proponent shall indicate how the Precautionary Principle was considered in the design of the Project in at least the following ways:

- demonstrate that all aspects of the Project have been examined and planned in a careful and precautionary manner to prevent or minimize serious or irreversible damage to the environment, especially with respect to environmental functions and integrity, considering system tolerance and resilience, and/or the human health of current or future generations;
- outline and justify the assumptions made about the effects of all aspects of the Project and the approaches to minimize these effects;
- evaluate alternative means of carrying out the Project and compare them in light of risk avoidance and adaptive management capacity;

- in designing and operating the Project, demonstrate that priority has been given to strategies that avoid the creation of adverse effects;
- develop contingency plans that explicitly address accidents and malfunctions, e.g., environmental emergency plans;
- identify any proposed follow-up and monitoring activities, particularly in areas where scientific uncertainty exists, in the prediction of effects or effectiveness of proposed mitigation measures; and
- present public views on the acceptability of all of the above.

2.0 THE ENVIRONMENTAL ASSESSMENT PROCESS

2.1 Contact for the Environmental Assessment

Eric Watton (EAC Chair)
Environmental Scientist
Environmental Assessment Division
Department of Environment and Climate Change
PO Box 8700
St. John's NL A1B 4J6
Telephone: (709) 729-0834
Email: ericwatton@gov.nl.ca

2.2 Environmental Assessment Requirements

2.2.1 Newfoundland and Labrador *Environmental Protection Act*

Any mining of a mineral as defined in the *Mineral Act* in Newfoundland and Labrador is subject to EA under the *NLEPA* and *Environmental Assessment Regulations, 2003.* The Environmental Assessment Division of the Newfoundland and Labrador Department of Municipal Affairs and Environment (MAE) administers the process including:

- consulting at every stage with interested government departments and the public;
- evaluating submissions by Proponents and reviewers;
- advising the Minister on potential environmental effects prior to decisions; and

- monitoring released projects to ensure compliance and effectiveness of mitigation.

An undertaking that is triggered under the *Environmental Assessment Regulations* is required to be registered for examination by MAE. The registration outlines the proposed project and describes how it will affect the bio-physical and socio-economic environments. The Registration is referred to provincial and federal government departments for review and comment. The Registration is also publicly available for comment. At the conclusion of the review period, the Minister has four options: release the undertaking from further assessment, require an Environmental Preview Report (EPR), require an EIS, or notify the Lieutenant-Governor in Council if the undertaking is contrary to law or to a policy that the Lieutenant-Governor in Council has declared to be the policy of the government of the province. On June 13, 2019 the Minister advised Marathon Gold Corporation that an EIS was required.

2.2.2 Delegated EIS Preparation

Pursuant to the requirements of Section 51(1)(b) of the *NLEPA*, the Proponent has been delegated the task of preparing the EIS. The EIS should be prepared according to these guidelines and, once completed, the Proponent shall submit printed and electronic copies of the EIS to the involved government agencies in the quantities specified in Table 1. In addition, the Proponent shall make printed copies of the EIS and the Plain Language Summary (PLS) of the EIS available at public viewing centers (to be designated) in the project vicinity.

Baseline studies will be required to define baseline conditions, and to support the evaluation of environmental effects and/or the development of mitigation measures as well as monitoring and follow up programs.

Table 1 Environmental Impact Statement Copy Requirements

Organization	**Electronic Copies ***	**Printed copies**	
	EIS	**EIS**	**PLS**
MAE	10	10	10
DFO	1	1	0
ECCC (federal)	2	1	0
Public Viewing Locations (TBD)	NA	1 at each location	1 at each location

*Electronic copies to be provided on CD or thumb drive

The required baseline studies are discussed further in section 4.2.

2.3 Consultation

The public will have several opportunities to participate in the EA and provide their views on the potential environmental effects of the Project. These are outlined in Table 2.

Table 2: Public Participation Opportunities

Opportunity	Duration
Comment on Draft EIS Guidelines	40 days
Comment on Proponent's EIS or Plain Language Summary (PLS)	50 days
Comment on any additional EIS requirements, i.e., Addendum (if required by the Minister)	50 days

Electronic and hard copy versions of documents will be provided to MAE and these will be made available for public review. Key documents will be available on the MAE Environmental Assessment webpage for this EA, https://www.mae.gov.nl.ca/env_assessment/projects/Y2019/2015/index.html .

Public comment periods will be announced in newspapers and on the MAE Environmental Assessment webpage mentioned above. Interested parties may contact the EA Committee Chair identified in Section 2.1 for further information regarding comment periods.

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 as early as possible in the review process. This will ensure that all parties have an opportunity to gain an understanding of the proposed Project and may facilitate their continued involvement in the EA process. During the preparation of the EIS, the Proponent hold public information sessions to provide information concerning the Project to the people whose environment may be affected by the undertaking. The Proponent record and respond to the concerns of the local communities regarding the potential environmental effects of the Project (see Section 4.1.15). Appendix A provides additional information on the notification requirements for the information sessions.

2.3.1 Record of Public Consultation

The EIS describe all public consultation activities undertaken by the Proponent during, the EA. It should describe key stakeholder groups, summarize comments heard, identify key issues of concern raised by the public and the Proponent's responses.

3.0 SCOPE OF PROJECT, FACTORS TO BE CONSIDERED AND SCOPE OF THE FACTORS

3.1 Scope of Project

The EIS will examine all activities and physical works associated with the different phases of this Project, i.e., construction, development, production, operation and maintenance, rehabilitation and closure of the proposed Project, as described in the Proponent's registration document dated April 5, 2019 and registered on April 16, 2019. These activities and physical works include but are not limited to, the activities listed below.

- all open pits, including dewatering infrastructure to dewater and to manage groundwater levels;
- all upgrades to existing access roads and details on the alternate access road(s);
- transmission line from Star Lake to the project area;
- waste rock disposal areas;
- organics and overburden piles;
- storm water management infrastructure;
- process plant facilities;
- ROM stockpile;
- heap leach process facilities;
- tailings management facility (TMF), including treatment plant and CN destruction plant;
- ancillary infrastructure to support the mine (e.g., administrative and dry buildings, substation and distribution lines, communication lines, pumphouse, sewage and water treatment units, fuel supply and storage, etc.);
- progressive rehabilitation, closure and reclamation activities;
- accommodation camp facilities and related structures;
- all effluent generation, treatment systems, handling and discharge locations, as well as all anticipated effluents and contaminants, including ammonia residue from blasting operations;

- air emission sources including dust lift-off (e.g., diesel generators, heavy equipment, roads, waste rock, crushing, grinding, process heaters, dryers, blasting, roads, pits, laydown areas, stockpiles, waste rock storage, parking lots, etc.);
- greenhouse gas (GHG) emissions sources;
- noise sources, expected noise levels and noise monitoring locations;
- sources and frequency of vibrations including seismic loading (Victoria Dam and wildlife);
- water management control structures or diversions that may be required to facilitate the project;
- all other infrastructure construction;
- fuel storage systems, including secondary containment (dykes) and a list of fuels and quantities;
- storage, transport, preparation and usage, quantities, and final discharge of all process reagents and effluents;
- storage, transport, preparation, quantities, usage and management of explosives;
- water quality sampling locations in the watersheds potentially affected by the project;
- locations for real time water monitoring stations including hydrometric (water level/flow); water quality, groundwater and climate stations to be established in partnership with GNL;
- any quarries that are contemplated as part of the Project;
- viewscapes that could be affected by the Project;
- sources of lighting emissions associated with the project; and
- cyanide management.

3.2 Factors to be Considered

The EIS shall consider:

- the purpose of the Project;
- alternatives to the Project;
- the need for the Project;
- alternative means of carrying out the Project or components of the Project and assess their technical and economic feasibility, and the environmental effects of any such alternative means;
- the environmental effects of the project, including the environmental effects of malfunctions, spills 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 projects or activities that have been or will be carried out in relation to the identified valued ecosystem components;
- measures that would mitigate any adverse environmental effects of the Project;

- measures that would enhance or prolong beneficial environmental effects;
- residual (post-mitigation) environmental effects that are beneficial or harmful that are likely to be caused by the undertaking regardless of the proper application of all control, mitigation, enhancement and remedial measures to be proposed in the EIS;
- whether or not the project, in combination with other projects or activities that have been or will be carried out, is likely to cause significant adverse environmental effects after mitigation measures are implemented;
- comments from the public that are received in accordance with NL*EPA* and regulations by including within the EIS specific responses to those concerns and, where appropriate, specific proposals for measures to deal with them;
- local knowledge;
- the capacity of renewable resources that are likely to be affected by the Project to meet the needs of the present and those of the future; and
- the requirements of a follow-up program for the Project.

3.3 Scope of the Factors to be Considered

In addition to the factors listed above, the EIS shall document any additional issues or concerns that may be identified through regulatory, stakeholder, and public consultation.

The assessment of environmental effects shall focus on valued ecosystem components (VECs). A VEC is a component or attribute that is important for its ecological, legal, scientific, cultural, economic or aesthetic values. VECs for the project should be selected based on defined criteria and their selection justified. The assessment shall consider potential environmental effects that the Project may have on each VEC.

In considering VECs, the Proponent will recognize that:

- the value of a component not only relates to its role in the ecosystem, but also to the value placed on it by humans;
- culture and way of life of those using the area affected by the Project may also be considered as VECs; and
- functional relationships within the environment may also be considered as VECs.

The EIS will define the study areas and time frames, or spatial and temporal boundaries used in the analysis of environmental effects, including cumulative effects. It is expected that the spatial and temporal

boundaries shall vary between VECs to reflect the nature of both the VEC and the predicted effects. Temporal and spatial boundaries reflect:

- the geographic range over which the project's environmental effects may occur, recognizing that some effects shall extend beyond the project area;
- timing/scheduling of project activities;
- natural variations of each VEC (e.g. species ranges and/or habitat suitability);
- the time required for recovery from an effect; and
- cumulative effects of other projects, land use, and activities on VECs.

The VECs to be considered shall include:

- Victoria Dam and reservoir;
- wildlife including caribou, avifauna, and other wildlife and their habitats (including Sensitive Wildlife Areas);
- water bodies (surface water and groundwater including wetlands);
- freshwater fish, fish habitat and fisheries;
- landforms and soils;
- atmospheric environment including Greenhouse Gases (GHG);
- Species at Risk and species of conservation concern;
- economy, employment and business; including outfitter businesses;
- community services and infrastructure (including other downstream dams); and
- health and community health.

The Proponent may add other VECs. In addition, the EIS shall include a consideration of key organisms that live off or rely on bio-physical VECs during their life cycle. Rationale for the selection of the above VECs, as well as a proposed study approach, is provided in Section 4 of these guidelines and is to be presented in the EIS for all VECs. The required baseline studies in Section 4 serve to provide additional information to one or more VECs in the list above. The baseline study may or may not have the same name as the VEC depending on the nature of the additional information required. The baseline studies shall describe, in detail, study methods and analytic methods, including incorporation of information gathered through public consultation.

4.0 PREPARATION OF THE EIS

The EIS is a statement of the Proponent's environmental conclusions and commitments related to the Project; it be explicitly endorsed by the Proponent.

The EIS shall employ the clearest language possible. However, where the complexity of the issues addressed requires the use of technical language, a glossary defining technical words and acronyms shall be included. The Proponent shall also prepare a Plain Language Summary (PLS) to accompany the EIS. The PLS is described in Section 4.1.2 and will be used to aid public review of the conclusions of the EIS.

The EIS shall be a stand-alone document with reference to the required baseline studies upon which a critical review can be undertaken. Where external sources of information or data are used, they shall be referenced within the body of the EIS and listed completely at the end. Where conclusions that are critical to the assessment of environmental effects are cited from other reports, the EIS shall provide sufficient detail of the originating data and analysis to enable a critical review of that material and submit reference material as an appendix to the EIS.

It is recommended that the EIS be presented in the sequence outlined in these Guidelines. The EIS shall include a Table of Concordance to these Guidelines, so that information requirements identified herein can be easily located in the EIS. The EIS shall refer to, rather than repeat, information previously presented in other sections of the document. However, it is important that underlying limitations, uncertainties and assumptions of all environmental predictions, especially those that support major statements or conclusions, be described in the body of the EIS rather than simply referencing supporting studies. A key subject index is to be provided giving locations in the text by volume, section and sub-section.

The EIS shall provide charts, diagrams and maps wherever useful to clarify the text, including a depiction of how the developed Project sites will appear from both an aerial and terrestrial perspective. Where possible, maps shall use common scales to allow for comparison and overlay of mapped features and shall indicate common and accepted local place names. Where technically feasible, provide geographic information in standard Geographic Information System (GIS) mapping (digital) format. The EIS and all associated reports and required baseline studies shall use System International (SI) units of measure and terminology.

The following sections describe the different topics to be addressed in the EIS. The EIS shall provide sufficient information to allow readers to understand the potential environmental effects of the Project, as identified by the Proponent and through these guidelines.

Section 4 is organized into two parts:

- Section 4.1 is the Content of the EIS and describes the layout and required content of the EIS; and
- Section 4.2 is the Detailed Guidance on Select Environmental Components which provides an overview of the required baseline studies and approach.

The information included in this document is not intended to be exhaustive and additional detail, studies, or examination of additional components may be required.

4.1 Content of the EIS

4.1.1 Executive Summary

The EIS should begin with an Executive Summary, including a concordance table that describes where each information requirement of the EIS Guidelines has been addressed in the EIS.

4.1.2 Plain Language Summary

In order to enhance understanding of the EIS and facilitate consultation activities, a Plain Language Summary (PLS) of the EIS shall be prepared. The PLS will summarize the Project and the major findings and conclusions of the EIS. It shall be a stand-alone document no longer than approximately 50 pages, excluding annexes and appendices. It should clearly describe the Proponent, the Project (including rehabilitation and closure activities), and the environmental effects of the Project. Maps at appropriate sizes and scales shall be included to clearly show the location of all Project components and/or environmental components. As the name implies, the PLS should avoid unnecessary use of technical terms or jargon and be written so that an average reader with no specialist knowledge of mining or EA can comprehend the Project, the analysis of environmental effects, the conclusions reached, and the supporting rationale. The PLS should be organized as follows:

Introduction

- Project Overview
- Environmental Assessment Process
    - Purpose of the EIS
    - Provincial EA Requirements

Project Description

- Purpose of and Need for the Project
- Project Description
    - Location
    - Components
    - Activities
    - Schedule

Scope of the Assessment

- Scope of the Project
- Factors to be Considered
- Scope of the Factors
    - Identification of VECs
    - Spatial and Temporal Boundaries

Project Alternatives

- Alternatives to the Project
- Alternative Means of Carrying out the Project
    - Description of Alternative Means
    - Environmental Effects of Alternative Means
    - Technical and Economic Feasibility of Alternative Means
    - Selection of a Preferred Alternative Means

Consultation

- Public Consultation and Engagement Activities undertaken for the EA (Proponent and Government)

Existing Environment

Environmental Effects Assessment

- Method and Approach
- VECs
    - Potential Environmental Effects
    - Mitigation Measures
    - Residual Environmental Effects

- Government, Public Comments and Proponent's Response
- Effects of the Environment on the Project
    - Method and Approach
    - Potential Effects
    - Mitigation
    - Residual Effects
    - Government and Public Comments and Proponent's Response
- Effects of Possible Accidents or Malfunctions
    - Method and Approach
    - Potential Effects
    - Mitigation
    - Residual Effects
    - Government, Public Comments and Proponent's Response
- Effects on Capacity of Renewable Resources
- Cumulative Environmental Effects
    - Approach
    - Scoping
    - Potential Cumulative Effects
    - Mitigation Measures
    - Residual Effects
    - Government, Public Comments and Proponent's Response

Follow-Up Program

Benefits of the EA to Newfoundlanders and Labradoreans

Overall Conclusions of the Proponent

It is understood that the Proponent can only provide Government, Public comments and the Proponent's responses to the extent known at the time of writing, as there will be further comment periods after the EIS.

4.1.3 Project Information

4.1.3.1 The Proponent

The EIS shall:

- identify the Proponent and the name of the legal entity that would develop, manage and operate the Project;
- provide contact information for the Proponent (e.g., name, address, telephone, facsimile, e-mail);
- explain corporate and management structures, as well as insurance and liability management related to the Project;
- explain corporate environmental and community relations policies;

- specify how the Proponent would ensure that corporate policies are implemented and respected for the Project;
- summarize key elements of its environmental management system and how it would be integrated into the Project; and
- identify key personnel and consultants responsible for preparing the EIS. The qualifications of all contracted scientific experts, including biologists conducting surveys for migratory birds, species at risk and species of conservation concern and wetland delineations should be provided in an appendix to the EIS.

4.1.3.2 Project Overview

The EIS shall briefly summarize the development proposal. If the Project is a component of a larger operation, the EIS shall outline the larger context and present the relevant references, if available. The Project location should be described in the context of surrounding land uses and infrastructure. The intent of this overview is to provide the key components and the location of the Project, rather than a detailed description, which shall follow as described in Section 4.1.4 of this document.

4.1.3.3 Regulatory Framework and the Role of Government

The EIS should identify the EA process and the government bodies involved in the assessment. It should also describe the process used to determine the requirement for the provincial EA. In addition, the EIS shall:

- identify the environmental regulatory approvals and legislation that are applicable to the Project at federal, provincial and municipal levels, including:
    - activities requiring regulatory approval;
    - names of permits or regulatory approvals;
    - names of legislation applicable in each case; and
    - names of the regulatory agencies responsible for each permit or approval;
- identify environmental government policies, resource management, planning or study initiatives pertinent to the Project and discuss their implications;
- identify any relevant Land Use Plans, Land Zoning and/or Community Plans;
- describe land tenure in and adjacent to the Project area;
- identify and delineate major components of the Project and identify those being applied for and constructed within the jurisdiction of these approvals processes under provincial legislation; and

- provide a summary of the 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.

4.1.3.4 Non-Government Participants in the Environmental Assessment

The EIS shall identify the main participants in the EA including community groups and environmental organizations.

4.1.3.5 Other Registrations

The Proponent shall indicate whether any other registrations have previously been submitted in relation to this Project, or are to be submitted for EA in the future as a result of this Project.

4.1.4 Project Description

4.1.4.1 Purpose of and Need for the Project

The EIS shall state the purpose of the Project, from the Proponent's perspective and clearly describe the need for the Project (i.e., the problem or opportunity the Project is intended to solve or satisfy). This is the fundamental rationale for the Project and provides the context for the consideration of alternatives to the Project.

The statement of the Project's justification shall be presented in economic terms, shall provide a clear description of methods, assumptions and conclusions used in the analysis and shall include an evaluation of the following:

- current and forecasted gold demand;
- market opportunities, forecasts and expected evolution;
- risks to the Project, including market prices and schedule delays, interest rates and other risk factors relevant to the decision to proceed with the Project; and
- projected financial costs and benefits at the regional, provincial and national levels.

4.1.4.2 Alternatives to the Project

The EIS shall include an analysis of alternatives to the Project; describing functionally different ways to meet the Project's need and purpose. The EIS shall:

- identify the alternatives to the Project that were considered;
- develop criteria to identify the major environmental, economic and technical costs and benefits of the alternatives; and
- identify the preferred alternatives to the Project based on the relative consideration of the environmental, economic and technical costs and benefits

The level of detail for this analysis shall be sufficient to allow the reader to understand the alternatives and how they compare to the Project. The analysis of alternatives to the Project is to provide clearly described methods and criteria for comparing alternatives and sufficient information for the reader to understand the reasons for selecting the preferred alternative and for rejecting others. This analysis shall include a description of the conditions or circumstances that could affect or alter these choices, such as market conditions, regulatory changes and other factors, either prior to construction or during the life of the Project.

The EIS shall include a comparative analysis of the environmental effects and technical and economic feasibility of alternatives that led to the choice of the selected Project alternative. The EIS shall demonstrate how the preferred alternative contributes to sustainable development. The Proponent shall include an evaluation of the thresholds for economic viability of the Project and considerations respecting the timing of phases and components of the Project.

4.1.4.3 Project Location

The EIS shall provide a concise description of the geographic setting in which the Project shall take place. The description shall focus on aspects of the environment that are important for understanding the potential environmental effects of the Project, including:

- any existing, designated or planned environmentally sensitive or significant areas; national, provincial and regional parks; protected natural areas and watersheds; ecological reserves; impacted watersheds from the project; watersheds, sub-watersheds, waterbodies, and wetlands directly impacted by the project footprint; riverine and lacustrine fish habitats; mature and interior forest habitat for migratory birds; habitats of designated species at risk, including critical habitat for the designated species; areas of concentration of other wildlife; and other sensitive areas and habitat;
- the current land use in the area and the relationship of the Project facilities and components with any existing or future land use including private and crown lands; and

- a description of the nearest potentially sensitive human receptors (e.g. residences, cabins, outfitters, etc.) and of local communities that may be affected by project activities.

The location of the mine site, power transmission lines, transportation corridors, and watersheds shall be described and clearly indicated on maps of appropriate scale. The location map should include the boundaries of the proposed site and transportation corridors, any existing infrastructure, adjacent land uses and important environmental features. In addition, site plans/sketches and photographs showing project location, site features and the intended locations of project components should be included.

4.1.4.4 Project Description

4.1.4.4.1 Facilities and Components

The EIS shall describe all of the Project's facilities and components in detail, focusing on those with the most potential for environmental interactions and risk (e.g., Project "footprint" wastes and emissions and associated zones of influence). The EIS shall present descriptions, locations, plans, figures and/or drawings for each facility, as appropriate, to convey information on potential environmental interactions, including:

- waste rock storage (including discussion of ore contaminants that may affect processing and volume of waste rock) including a description of any water bodies (streams, wetlands, etc.) within the footprint and whether they are waters frequented by fish or have any connectivity to waters frequented by fish;
- overburden storage areas including a description of any water bodies (streams, wetlands, etc.) within the footprint and whether they are waters frequented by fish or have any connectivity to waters frequented by fish;
- tailings management area and associated dams (the tailings and polishing pond dams) shall be classified, designed, operated and closed out according to the Canadian Dam Association (CDA), *Dam Safety Guidelines*, including the CDA *Technical Bulletin: Application of Dam Safety Guidelines to Mining Dams*. Dam break inundation modeling and mapping (including examination of a cascade failure of the Victoria Dam and other downstream dams) and a determination of whether the tailings are acid generating or not will be needed in order to help determine the dam consequence classification. Depending on the dam consequence classification this may entail requirements for dam safety reviews; an operation, maintenance and surveillance manual; and an emergency preparedness and response plan.). This shall include a description of any water bodies (streams, wetlands, etc.) within the footprint and whether they are waters frequented by fish or have any connectivity to waters frequented by fish;

- processing facility;
- heap leach facility;
- all effluent generation, treatment systems, handling and discharge locations, as well as all anticipated effluents and contaminants, including ammonia residue from blasting operations;
- air emission sources including dust lift-off (e.g., diesel generators, heavy equipment, roads, waste rock, crushing, grinding, process heaters, dryers, blasting, roads, pits, laydown areas, stockpiles, waste rock storage, parking lots, etc.);
- ambient air sampling stations and their locations;
- noise sources, expected noise levels and noise monitoring locations;
- water control structures or diversions that may be required to facilitate the project;
- all utility installations, including transmission lines and generators;
- all infrastructure construction, including haulage roads and ancillary structures;
- fuel and chemical storage systems, including secondary containment (dykes and double piping) and a list of fuels and chemicals to be stored;
- any quarries that are contemplated as part of the Project;
- sources of lighting emissions associated with the project;
- explosive storage facilities;
- worker accommodations and related facilities;
- viewscapes that could be affected by the Project; and
- water quality sampling locations and real time water monitoring station locations in the watersheds potentially affected by the project. This will ensure baseline data prior to start of the project.

4.1.4.4.2 Activities

The EIS shall include descriptions of the construction, operation, maintenance, foreseeable modifications, including the expansion and lengthening of the operations and, where relevant, rehabilitation and closure of sites and facilities associated with the Project. Detailed descriptions of activities to be carried out during each phase of the Project should include the location, magnitude and scale of each activity, including labour force requirements. A schedule shall be provided, showing time of year, frequency and duration of project activities.

The description of the construction and operation activities shall include:

- estimates of emission quantities (use units of t/yr and mg/m^3);

- solid waste, hazardous waste and waste reduction strategies;
- spill potentials and prevention strategies (e.g., hydraulic hose ruptures, fueling mishaps, tank failure, failure of heap leach pad liner system, fuel and chemical transmission piping failure, etc.);
- long-term operation, maintenance and surveillance of the tailings management area (including the closure phase);
- long-term operation, maintenance, rehabilitation, closure and surveillance of the heap leach pile; and
- rehabilitation strategy for open pits, waste rock, overburden storage or other areas.

Operation activities shall make use of best available control technology and utilize best practices in the industry. The proponent shall demonstrate how the Heap Leach process of extracting gold from low-grade ore meets these criteria (best available technology and best practices).

The EIS shall describe proposed means to treat waste resulting from the Project and/or the capacity of contractors to do so.

The EIS shall describe any regular inspection and maintenance that may be required for the open pit mine, any underground workings, associated facilities and infrastructure. Activities involving periods of increased environmental disturbance or the release of materials into the environment are to be highlighted.

The level of detail in the description of the Project's facilities and activities shall be sufficient to enable prediction of environmental effects.

4.1.4.4.3 Labour Force Requirements

The EIS shall include descriptions of the construction, operations, rehabilitation and closure labour force requirements, including:

- National Occupation Classification (NOC 2011) codes at the 4-digit level associated with each position for construction and operations phases of the project (including the number of positions associated with each NOC code);
- A commitment to develop a Gender Equity and Diversity Plan (GEDP) to improve employment and training opportunities for women and other underrepresented groups. The Plan's main components should include a women's employment plan, a diversity plan for

other underrepresented groups (i.e. people with disabilities, Indigenous people and visible minorities) and a business access strategy for these target populations;

- The approximate time lines for each of the positions during the construction phase of the project. This would include the number of positions for each 4-digit NOC 2011 code throughout the project at specified time intervals (monthly or at least quarterly) which would show levels of employment throughout the project timeline;
- The approximate time lines for each of the positions during the operations phase of the project. This would include the number of positions for each 4-digit NOC 2011 code throughout the project at specified time intervals (monthly or at least quarterly) which would show levels of employment throughout the project timeline;
- An indication of whether the positions are full-time equivalent or if they are the actual number of positions; if they are indeed the actual number of positions, how many are full-time vs. part-time;
- An estimate of the number of apprentices (by level and trade/4-digit NOC code) and journeypersons required;
- Qualifications, certifications and other requirements, including the need for, location and availability of related training opportunities (e.g., post-journeyperson training) associated with key positions for all phases of the project;
- The anticipated source of the workforce, including an estimate of local employment (local area, provincial) and any strategies for recruitment. This should also include clarification on which positions would be direct hires, and which would be from companies contracted to carry out project work; and
- A commitment to provide quarterly summary reports for each phase of the project. These reports would include information on the number employed by 4-digit NOC, the number of full-time/part-time employees, the number of apprentices (by level) and journeypersons for each applicable 4-digit NOC code, gender and source of the workforce.

4.1.4.5 Alternative Means of Carrying out the Project

The EIS shall identify and describe alternative means of carrying out the Project or components of the Project, and assess their technical and economic feasibility. The analysis shall describe:

- the alternative means considered, an assessment of their technical and economic feasibility, and the rationale for rejecting alternatives;

- a description of the conditions or circumstances that could affect or alter these choices, such as market conditions, regulatory changes and other factors, either prior to construction or during the life of the Project;
- the environmental effects of the alternatives, in sufficient detail to allow comparison with the effects of the Project;
- the costs associated with failure of key components of the Project including failure of the tailings management area and heap leach process (to inform the viability of the alternate means), and;
- the preferred means of carrying out the Project or its components based on the relative consideration of environmental effects including the criteria and rationale for their selection.

The EIS shall analyze and compare the design alternatives for the Project in relation to their environmental and social costs and benefits, including those alternative means that cost more to build and/or operate but which result in reduced adverse environmental effects or more durable social and economic benefits.

At a minimum, the discussion of alternative means of carrying out the Project shall include:

- waste rock storage management and location;
- location of the tailings management area;
- all options for methods of tailings disposal, including dry stacking and in-pit disposal;
- specifications, design, operation, closure and post-closure monitoring of the engineered tailings management facility (TMF);
- overburden storage and management;
- specifications, design, operation, closure and post-closure monitoring of the heap leach processing facility;
- all options for the processing of ore, including not requiring the use of heap leach in the gold extraction process;
- pit dewatering options;
- contracting or lengthening of the operations;
- labour supply;
- working conditions, including shift and rotation lengths;
- mining methods; and
- reclamation methods.

Mapping indicates there are water bodies within the proposed project footprint. If those water bodies are frequented by fish then those water bodies may need to be added to Schedule 2 of the Metal and Diamond

Mining Effluent Regulations under the federal *Fisheries Act.* Environment and Climate Change Canada (ECCC) will require a detailed assessment of alternatives before considering the addition of the waterbodies to Schedule 2. A copy of the ECCC Guidelines for Alternatives Assessment is attached as an Appendix. Compliance with the ECCC Guidelines is required if the project intends to use waters frequented by fish or waters that may enter waters frequented by fish for the purpose of tailings disposal or other infilling.

4.1.5 Description of the Existing Environment

The EIS shall provide a description of the biophysical and socio-economic environments that could be affected by the Project, both in the immediate vicinity and beyond. This shall include the components of the existing environment and environmental processes, their interrelations and interactions, as well as their variability over time scales appropriate to the effects analysis. The level of detail shall be sufficient to:

- identify and assess any adverse environmental effects that may be caused by the Project;
- identify and characterize the beneficial effects of the Project; and
- provide the data necessary to enable effective follow-up.

A description of the existing environment shall be developed for the following environmental components:

- atmospheric environment;
- geology (bedrock and surficial), geomorphology and geochemistry;
- bodies of water (wetlands, streams, etc.) including water quality and quantity;
- topography;
- hydro dams including the Victoria Lake reservoir and Victoria Lake dam, dykes and canal;
- land and resource use;
- Species at Risk and species of conservation concern;
- caribou habitat and migratory behaviour;
- fish and fish habitat;
- avifauna (migratory and non-migratory), other wildlife birds and their habitats (including Sensitive Wildlife Areas);
- heritage resources;
- tourism and outfitting resources (operators, assets, viewscapes, etc.);
- communities;
- community services and infrastructure; and
- population health status including but not limited to:

- demographics;
- rates of chronic disease (e.g. cancer, heart disease, chronic pain, and others);
- rates of communicable disease (e.g. hepatitis, sexually transmitted infections, influenza, enteric illness, and others);
- healthy living indicators;
- rates of disability;
- mental health status;
- rates of substance use;
- rates of domestic violence and crime; and
- economy, employment, household incomes, and business.

VECs for each environmental component shall be described.

The baseline description shall characterize environmental conditions resulting from historic and present activities in the local and regional study area. The physical and biological environments shall be described based on an ecosystem approach that considers scientific knowledge and perspectives regarding ecosystem health. The EIS shall identify and justify the selected indicators and measures of ecosystem health (i.e., measurable parameters). These indicators should be transferable to future project monitoring and other follow-up.

In assessing effects to the biological environment, the EIS shall consider the resilience of relevant species populations, communities and their habitats. It shall summarize all pertinent historical information on the size and geographic extent (i.e. ranges) of relevant animal or floral populations as well as density, based on best available information. Where little or no information is available, and when appropriate, specific studies shall be designed to gather information on species populations and densities that could be adversely affected by the Project. Habitat at regional and local scales shall be defined when mapping aquatic and terrestrial vegetation types and/or communities.

Habitat use at regional and local scales should be characterized by type of use (e.g., spawning, breeding, migration, feeding, nursery, rearing, wintering), frequency and duration. Emphasis shall be on those species, communities and processes most sensitive to project effects. However, the interrelations of these components to the greater ecosystem and communities of which they are a part shall be indicated. The EIS shall address issues such as habitat, migratory behavior, nutrient and chemical cycles, food chains and productivity, to the extent that they are appropriate to understanding the effects of the Project. Range and probability of natural variation over time shall also be considered.

The EIS shall provide a description of the communities likely to be affected by the Project, including demographic, economic, social and community health information. If the information available from government or other agencies is insufficient or no longer representative, the Proponent shall complete the description of the environment with current surveys and studies. The Proponent shall outline how the potential negative impacts of the "boomtown effect" on neighbouring communities may be mitigated.

The EIS shall indicate the Project's proximity to sensitive features such as dams, residences, cabins, outfitters, tourism assets and operators, and locations of hunting and gathering activities (i.e., country foods collection). Depending on the type of potential effects the Project may have on these receptors, appropriate baseline evaluation should be undertaken (e.g., seismic loading, hydrometric loading, baseline noise, current levels of access. surface soil, air quality, drinking water, groundwater resources (including any private water supply wells), etc.).

The EIS shall also describe existing geology, geochemistry, geomorphology, soils and terrain at the project site and in the immediate vicinity.

The EIS shall explain any extrapolation, interpolation or other manipulation applied to the baseline data used to describe environmental conditions in the study area. Any information gaps from a lack of previous research or practice shall be described indicating information that is not available or existing data that cannot accurately represent environmental conditions in the study area over four seasons. If data gaps remain, the Proponent shall describe its efforts to resolve the data gaps, including any direct consultation with groups, individuals and others.

4.1.6 Environmental Effects and Assessment

The EIS shall contain a comprehensive analysis of the Project's predicted effects on the environment, including cumulative effects that are likely to result from the Project in combination with other projects or activities that have been or will be carried out. The assessment shall include, but not be limited to, the effect of any environmental change on health and socio-economic conditions. Potential effects from all components of the Project at the site and within the Project's zone of influence shall be discussed. The EIS shall predict the Project's effects during all project phases (e.g., construction, operation, maintenance, foreseeable modifications, closure, decommissioning and reclamation) and describe them using appropriate criteria.

The environmental effects assessment in the EIS shall be based on best available information and methods. The methods employed shall be clearly explained. All conclusions shall be substantiated and the supporting logic clearly traceable. The Proponent is encouraged to make use of existing information relevant to the project. When relying on existing information to meet the requirements of various sections of the EIS Guidelines, the Proponent shall include the information directly in the EIS or clearly direct (e.g., through cross-referencing) the reader to where they may obtain the information. With respect to pre-existing baseline studies, the Proponent will append these to the EIS as distinct appendices. When relying on existing information, the Proponent shall also comment on how the data have been applied to the project, clearly separate factual lines of evidence from inference and state any limitations on the inferences or conclusions that can be drawn from them according to the criteria for information quality set out in the EIS Guidelines. For instance:

- assumptions should be clearly identified and justified;
- all data, models and studies shall be documented such that the analyses are transparent and reproducible;
- the uncertainty, reliability and sensitivity of models used to reach conclusions shall be indicated;
- conclusions should be substantiated; and,
- the studies should be prepared using best available information and methods.

Modeling methods and equations presented shall include information on margins of error and other relevant statistical information (e.g., confidence intervals, possible sources of error, etc.).

The Proponent shall prepare a table describing the proposed Project's anticipated effects, which shall enable the reader to review and consider those effects.

Views of the public relative to the EA, including any perceived changes in the environment from the Project, shall be acknowledged and considered. The EIS shall clearly articulate how relevant issues raised by the public have been considered, including any changes to the Project, or mitigation or follow-up measures arising from such consideration.

4.1.6.1 Predicted Future Condition of the Environment if the Undertaking Does Not Proceed

The EIS shall describe the predicted future condition of the environment with respect to the key issues, if the project does not proceed. The predicted future condition of the environment shall help to distinguish project-related effects from environmental change due to natural processes.

4.1.6.2 Accidents and Malfunctions

The EIS shall identify and describe accidents and malfunctions that may occur as a result of project activities, including:

- an explanation of how those events were identified, potential consequences (including potential environmental effects);
- a quantitative analysis of the risks of accidents and malfunctions across all phases of the Project; and
- the plausible worst case scenarios and the effects of these scenarios and associated environmental effects.

The EIS should identify potential accidents, malfunctions, unplanned events (e.g., premature or permanent shutdown), or emergency situations that could be associated with all phases of the Project, including:

- product spills,
- fires,
- floods,
- potential impacts on hydro dams, including the Victoria Dam (seismic loading effects from blasting, effects of a tailings dam failure),
- fuel transportation and storage,
- resource road conflicts with wildlife and other users as well as the probabilities and hazards associated with them, and
- the preventive measures and design safeguards that have been established to protect against such occurrences and the contingency/emergency response procedures in place in the event that an accident/malfunction occurs.

Factors which contribute to the uncertainty of detecting and mitigating effects associated with accidents and malfunctions shall be assessed.

The proponent should conduct a quantitative analysis of the risks of accidents and malfunctions across all phases of the Project, determine their effects, and present preliminary emergency response measures and associated capacities.

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, the plausible worst case scenarios and the effects of these scenarios. Fate and behaviour modelling of potential spills of hazardous materials, including hydrocarbons and sodium cyanide, to waters frequented by fish should be considered for all seasons.

The EIS will describe the preventive 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, including streams and wetland areas frequented by fish and/or by migratory birds.

4.1.6.3 Capacity of Renewable Resources

The EIS shall consider the capacity of renewable resources that are likely to be affected by the Project to meet the needs of the present and those of the future. The EIS shall identify any VECs predicted to experience adverse residual environmental effects, describe how the Project could affect their sustainable use and describe the criteria used in the analysis.

4.1.7 Avoidance and Mitigation Measures

Mitigation is the elimination, reduction or control of the adverse environmental effects of the Project. It includes restitution for any damage to the environment caused by such effects through replacement, restoration, compensation or any other means. The EIS shall consider measures that would mitigate adverse environmental effects of the Project. Such measures should also be assessed for their technical and economic feasibility. The approach to mitigation shall be premised on a preference for avoidance and reduction of effects at their source, including modifying the Project design or its components as well as relocation of certain components, and assess their technical and economic feasibility.

The EIS shall describe the standard mitigation practices, policies and commitments and the mitigation measures and that will be applied. The Proponent, where possible, should refer to similar situations where the proposed mitigation has proven to be successful. Mitigation failure should be discussed with respect to risk and severity of consequence.

The EIS shall describe the Proponent's Environmental Protection Plan (EPP) which shall provide an overall perspective on how potentially adverse effects would be minimized and managed over time. The Proponent shall describe its commitments, policies and arrangements directed at promoting beneficial or mitigating adverse socioeconomic effects and explain how it will ensure compliance among its contractors and sub-contractors and how compliance will be audited and enforced.

The EIS shall specify the actions, works, minimal disturbance footprint techniques, best available technology, monitoring and surveillance, corrective measures or additions planned during the Project's phases (construction, operation, modification, decommissioning, abandonment or other undertaking related to the Project) to eliminate or reduce the magnitude of adverse effects. The EIS shall also present an assessment of the effectiveness of the mitigation measures. The Proponent shall discuss the application of the Precautionary Principle in the identification of mitigation measures. The Precautionary Principle is defined in Section 1.2.3.

If there are mitigation measures that were considered and rejected, the EIS shall discuss these and explain why they were rejected. Trade-offs between cost savings and effectiveness of the various forms of mitigation shall be justified. The Proponent shall identify who is responsible for the implementation of these measures and the system of accountability.

Should the Project be released, the Proponent shall ensure that measures are taken to avoid or lessen any potential adverse effects on listed or designated species, their critical habitat or the residences of individuals of those species. Potential effects shall be monitored and mitigation shall be consistent with any applicable recovery strategy and action plans. The EIS shall include information that will allow the Province to meet this requirement.

In addition, the EIS shall identify the extent to which technology innovations will help mitigate environmental effects. Where possible, it shall provide detailed information on the nature of these measures, their implementation and management, as well as whether follow-up will be required.

4.1.7.1 Acid Rock Drainage and Metal Leaching

If there is a potential for ARD/ML to occur, the proponent's ARD/ML program report investigation shall include the following:

- the design of the ARD/ML program and, if a phased program, the chronology of ARD/ML investigations (include all mineralogy, elemental analysis, static and kinetic test work conducted to date);
- determination of the distribution of sample test results for each lithological/alteration/waste management unit. The assessment should account for vertical and horizontal distribution, as well as sampling biases, to permit proper characterization of the unit including the units range of variability;
- the rationale, advantages and disadvantages including a description, for all test work;
- predictions of the ARD/ML potential of all material management units (ore, waste rock, overburden, quarry materials and tailings) to be disturbed or created during all phases (construction, operation, decommissioning, reclamation and post-closure) of the proposed project. This shall include an interpretation of the results, an estimation of risk for the onset of ARD for each lithological/alteration/waste management unit and the predicted drainage chemistry for each unit (including the types and concentrations of major trace elements); and
- clear, concise cross-sections which relate the ARD/ML assessment (static/kinetic sample locations and results), geology, and Project development plans.

4.1.8 Cumulative Effects Assessment

The EIS shall include an analysis of cumulative effects of the Project in combination with other projects or activities that have been or will be carried out. An effective cumulative effects assessment will take into account the aggregate effect of the Project in the context of other foreseeable developments and activities.

The analysis of cumulative effects shall consider different types of effects (e.g., synergistic, additive, induced, spatial or temporal) and identify impact pathways and trends. The EIS shall assess any residual cumulative environmental effects that remain after mitigation has been implemented.

The EIS shall:

- identify and justify the VECs that will constitute the focus of the cumulative effects assessment. For greater certainty, cumulative effects shall be assessed in relation to each VEC for which a residual effect of the Project is predicted to be adverse and likely. The assessment should examine the likelihood, nature and extent of the predicted cumulative effects of the Project in combination

with other projects and activities that have been or will be carried out. It may be appropriate, during the course of the EA, to refine the definition of VECs selected for cumulative effects assessment;

- present a justification for the spatial and temporal boundaries of the cumulative effects assessment. The boundaries for the cumulative effects assessment will depend on the VECs being considered (e.g., will generally be different for different VECs). The boundaries for the cumulative effects assessment will also generally be different from (larger than) the boundaries for assessing effects of the Project;
- describe and justify the choice of activities for the cumulative effects assessment. These shall include past activities and projects, those being carried out and future projects or activities likely to be carried out;
- describe the cumulative effects on neighbouring communities and/or other large development projects in other regions of the province with regards to community services, and health and social impacts;
- describe the mitigation measures and assess their technical and economic feasibility; and
- 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 shall identify these effects and the parties that have the authority to act. In such cases, the Proponent shall summarize the discussions that took place with the other parties in order to implement the necessary measures over the long term.

Other projects and activities (e.g., hydro development, transmission lines, road development, tourism, outfitters, etc.) should be considered in assessing cumulative effects to VECs. Notably, the cumulative effects assessment should be focused on key VECs and their potential stressors, rather than on providing detailed descriptions of other projects.

The methods used to scope and assess cumulative effects should be clearly described in the EIS, demonstrating how conclusions have been reached.

4.1.9 Effects of the Environment on the Project

In addition to describing environmental effects on the environment as a result of the undertaking, the EIS should also describe the climatic conditions at the project site and in local and regional study areas and provide a description of seasonal variations and trends in climatic conditions, to allow the assessment of effects on the Project. Any use of off-site data shall be described and an analysis of its degree of

representativeness for Project conditions shall be included. The use of the data should be qualified with an understanding of local and regional variability and the geographic locations of any onsite and offsite meteorological stations. The geographic locations of any onsite and offsite meteorological stations shall be provided. Climate data should also be provided and taken into account when evaluating effects of the project on air quality, hydrology, hydrogeology, and water management. The influence of local and regional topography or other features that could affect conditions in the study area should also be considered, as appropriate. Specifically, the EIS shall include a description of the following components:

- Physiography: topography, drainage network;
- Climate: historical records of total precipitation (rain and snow), mean, maximum and minimum temperatures;
- Geological context: bedrock and surficial cover stratigraphy and composition, geotechnical properties and structural geology features such as fractures and faults in the mine area and where major project infrastructures and earthworks are proposed (e.g., open pits, heap leaching facility, TMF, etc.);
- Hydrogeological context: hydrogeological characteristics of the different geological units (hydraulic conductivities, porosity, storage coefficients); groundwater geochemistry and groundwater levels for the areas that are adjacent to, and/or will be disturbed by project activities; occurrence of wetlands in the vicinity of the project, and potential effect of activities on wetlands;
- Streamflow data records (levels and yields) of surroundings lakes, rivers and brooks; and
- Geotechnical properties of the area, such as slope stability and bearing capacity of facility foundations under both static and dynamic conditions, including ground ice and thermal conditions.

The EIS shall predict how local conditions and natural hazards, such as severe and/or extreme weather conditions and external events (e.g., flooding, dam breach, ice jams, rock slides, landslides, fire, outflow conditions and seismic events) could adversely affect the project and how this in turn could affect the environment (e.g., environmental emergencies due to extreme environmental conditions). The EIS should describe measures that will be implemented to prevent and respond to such events. The EIS should discuss the sensitivity of the project to changes in specific climate and related environmental parameters, including total annual rainfall, total annual snowfall, frequency and/or severity of precipitation extremes, watercourse levels and stream flow, groundwater flow and potential effect on wetlands.

In addition, the EIS shall discuss:

- potential geotechnical and geophysical hazards within the Project area, including potential seasonal subsidence, seismicity and faulting, risks associated with tailings dam, polishing pond dam and Victoria Dam, cut/fill slopes and constructed facilities. Where appropriate, the assessment should be supplemented by illustrations such as maps, figures, cross sections and borehole logs;
- potential effects on foundation stability of major Project components from geological fractures and faults and associated implications of these features on project planning and engineering design. Those Project components assessed shall include, but are not limited to: tailings management facility, waste rock stockpiles, heap leach pad, overburden and organic stockpiles, tunnels, stopes and open pits;
- potential effects of the groundwater level on mining operations or potential effects of mining operations on groundwater flow and occurrence; and
- potential effects of climate change on the Project.

The EIS shall provide measures and strategies to mitigate the potential effects of the environment on the project.

4.1.10 Environmental Management

4.1.10.1 Planning

The EIS shall describe the proposed Environmental Effects Monitoring Plans (EEMPs) for all stages of the Project and include a commitment by the Proponent to implement the EEMPs, should the Project proceed. EEMPs shall be developed in consultation with government agencies, the public and other stakeholders. This may occur after the EA, but shall be consistent with the information presented in the EIS. Pertinent legislation, regulations, industry standards, documents and legislative guides shall be used when developing EEMPs.

The entire project should be designed with closure in mind.

The EIS shall also outline a preliminary decommissioning and reclamation plan for the Project. The plan shall address ownership, transfer and control of the different Project components, as well as the responsibility for monitoring and maintaining structures. The EIS shall include a conceptual discussion of how decommissioning of permanent facilities may occur.

4.1.10.2 Monitoring and Follow-up Programs

The EIS shall describe the environmental and socio-economic monitoring, rehabilitation studies and follow-up programs (collectively environmental effects monitoring programs or EEMP) to be incorporated into the Project (planning, design, construction, operation, closure and post-closure phases) in order to determine the effectiveness of mitigation measures and to restore the affected environment to ecologically and socially acceptable levels.

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

The purpose of the follow-up program is to verify the accuracy of the predictions made in the assessment of the effects as well as the effectiveness of the mitigation measures. The follow-up program shall be designed in consultation with the Environmental Assessment Committee members for this project to incorporate project baseline information (including modeling data), as well as compliance data (e.g., established benchmarks, regulatory documents, standards or guidelines) and real-time data (e.g., observed data gathered in the field). Effects predictions, assumptions and mitigation actions that will be tested as part of the follow-up program shall be framed as field-testable monitoring objectives. The monitoring design should include a statistical evaluation of the adequacy of existing baseline data, to provide a benchmark against which to test for project effects and the need for any additional pre-construction or pre-operational monitoring to augment baseline data. The duration of the follow-up program shall be as long as is needed to evaluate the effectiveness of the mitigation measures.

If either of these programs identifies unforeseen adverse environmental effects, the Proponent shall commit to adjust existing mitigation measures, or, if necessary, develop new mitigation or compensation measures. The Proponent shall describe how the results of monitoring and follow-up programs will be used to refine or modify the design and implementation of management plans, mitigation measures and Project operations. The Proponent shall distinguish as appropriate between monitoring (compliance) and effects follow-up programs.

A schedule for follow-up frequency and duration is required after an evaluation of the length of time needed to detect effects, given estimated baseline variability, likely magnitude of environmental effect and desired level of statistical confidence in the results.

The proposed approach for monitoring shall be described and shall include:

(a) The objectives of the monitoring program and a schedule for collection of the monitoring data required to meet these objectives;
(b) The sampling design, methodology, selection of the subjects and indicators to be monitored, and their selection criteria;
(c) The frequency, duration and geographic extent of monitoring, and justification for the extent;
(d) The application of the principles of Adaptive Environmental Management;
(e) Reporting and response mechanisms, including criteria for initiating a response and procedures;
(f) The approaches and methods for monitoring the cumulative effects of the Project with existing and future developments in the Project area;
(g) Integration of monitoring results with other aspects of the Project including adjustments to operating procedures and refinement of mitigation measures;
(h) Experience gained from previous and existing monitoring programs;
(i) The advisory roles of independent experts, government agencies, communities, and renewable resource users;
(j) Procedures to assess the effectiveness of monitoring and follow-up programs, mitigation measures and recovery programs for areas disturbed by the Project; and
(k) A communications plan to describe the results of monitoring to interested parties.

The Proponent shall explain how the public shall continue to be involved, including participation in the design and implementation of environmental management and monitoring and follow-up programs.

The Proponent shall describe plans to maintain communications and working relationships with the affected communities, municipalities and government agencies throughout the life of the Project. The intent of these plans is to involve those groups in monitoring and follow-up programs, including in the identification and work towards the reduction of adverse physical, biological or socio-economic effects, and the enhancement of beneficial effects.

To design complete and comprehensive program proposals, the Proponent shall prepare and submit these documents subsequent to the completion of the environmental assessment, but before the initiation of the Project itself.

An example is seen in the NL *Endangered Species Act* and the federal *Species at Risk Act* (SARA) that contain provisions requiring that measures be taken to monitor adverse effects of a project on listed wildlife species and their habitat. If potential adverse effects on a listed wildlife species or its habitat are identified, a monitoring plan shall be developed to identify the circumstances under which corrective measures may be needed to address any issue or problem identified through the monitoring (i.e., if unanticipated effects occur or the importance of effects is greater than anticipated). The monitoring plan should clearly describe how government departments responsible for the species in question would be engaged in reviewing proposed adaptive management measures, in the event that mitigation measures are not effective.

4.1.11 Residual Adverse Environmental Effects

The EIS shall describe any expected residual effects of the Project on the biophysical and human environments, after mitigation measures have been applied. The residual effects should be described. The EIS shall provide sufficient detail so that the environmental effects of the Project and the degree to which they can be mitigated, can be clearly understood.

The criteria for evaluating residual effects (including cumulative effects) shall be described. The criteria may include: magnitude; duration and frequency; ecological or socioeconomic context; geographic extent; and degree of reversibility. Professional expertise and judgment may also be applied. The EIS shall contain enough detail to enable readers to follow the reasoning and process by which the Proponent assessed effects.

The EIS shall state the Proponent's conclusion, for each VEC, as to whether the Project in combination with the cumulative effects of other projects and activities is likely to cause adverse effects.

4.1.12 Economic and Social Benefits of the Project

Information on the predicted economic and social benefits of the Project should be presented. This information shall be considered by Government in assessing the justifiability of any adverse environmental effects, if necessary.

The Proponent shall demonstrate prudent resource management in compliance with Section 6.(1b) of the *Mining Act*, to the satisfaction of the Minister of Natural Resources.

4.1.13 Benefits of the EA to Newfoundland and Labrador

The EIS shall describe how the EA process for the Project benefits Newfoundlanders and Labradorians, focusing on aspects such as:

- maximized environmental benefits: describe the expected environmental benefits as a result of the project;
- contribution of the EA to sustainable development: describe how the EA process for the project is expected to contribute to the concept of sustainable development for a healthy environment and economy;
- public participation: describe how public participation in the EA is expected to influence the project design and the environmental effects analysis;
- technological innovations: describe new technologies expected to be developed to address environmental effects that could be used for other projects;
- increases in scientific knowledge: describe any new scientific information expected to be collected through the EA or follow-up that could benefit the assessment of other projects;
- community and social benefits: describe any expected changes in project design that would result in indirect benefits to communities and/or social benefits; and
- a commitment to develop a Benefits Agreement and Gender Equity and Diversity Plan that meets the approval the Minister of Natural Resources and Minister for the Status of Women.

4.1.14 Assessment Summary and Conclusions

The EIS shall summarize the overall findings of the EA, with emphasis on the main environmental issues identified. For all VECs, the EIS shall include a table that summarizes:

- the Project's potential adverse environmental effects;
- proposed mitigation and compensation measures;
- proposed follow-up;
- potential residual effects;
- potential cumulative effects;
- potential effects of accidents and malfunctions on the VEC;
- applicable standards or guidelines;

- comments from the public and responses; and
- commitments made by the Proponent, including the timing and responsibility of each.

4.1.15 Public participation

The EIS shall describe a planned program of public participation and consultation, including, but not limited to the following:

a) an opportunity for interested members of the public to meet with the proponent at a place adjacent to or within the geographical area of the undertaking, or as the minister may determine, in order to:
   i. provide information concerning the undertaking to the people whose environment may be affected by the undertaking;
   ii. describe the rationale for the gold mine, impacts to wildlife, impacts to tourism, and any other pertinent details to address public concerns;
   iii. record and respond to the concerns of the local community raised during the public meeting regarding the environmental and socioeconomic effects of the undertaking, and to describe those concerns and the proponent's response to those concerns in a separate section of the EIS; and
   iv. conduct the meeting in compliance with the legislation and with divisional policy included in Appendix A.

4.1.16 Environmental Protection Plan (EPP)

The proponent shall prepare an EPP for construction and operation of the Valentine Gold Project, for approval by the Minister of Municipal Affairs and Environment, prior to commencing any construction. The EPP shall be a stand-alone document that targets the site foreperson, the proponent's occupational health and safety staff, the proponent's environmental staff and any government environmental surveillance staff. The EPP shall address construction, operation and maintenance activities associated with the project. A proposed Table of Contents and an annotated outline for the EPP is to be presented in the EIS which shall address the major construction and operational activities, permit requirements, mitigation measures and contingency plans, as follows:

- proponent's environmental policies,
- environmental compliance monitoring,
- environmental protection measures,
- mitigation measures,

- permit application and approval planning,
- contingency planning for accidental and unplanned events,
- statutory requirements, and
- revision procedures and contact lists.

The proponent shall prepare and submit the EPP for approval subsequent to the completion of the EIS, and prior to the initiation of project construction.

4.1.17 References

The proponent shall include a complete and detailed bibliography of all data and information sources used to prepare the EIS. The same requirement applies to each baseline study.

4.2 Detailed Guidance on Select Environmental Studies

The following section provides an overview of the baseline studies and approach to be undertaken in the EIS for each VEC. Detailed study approaches and analytic methods and assumptions shall be provided in each baseline study.

4.2.1 Baseline Studies

Baseline studies are required for this EIS. The baseline studies shall describe and provide data on specific components such as to address baseline data requirements to support the evaluation of one or more VECs, environmental effects and/or to develop mitigation measures and follow-up monitoring programs. Each baseline study shall be a stand-alone document which may be appended to the EIS upon submission. The results of each baseline study shall be included and referenced in the EIS. Where new information becomes available, additional baseline studies may be required.

Baseline studies should generally have the following format:

(a) Rationale/Objectives: In general, the baseline studies should be conducted to obtain all required data for use in determining the potential for effects on one or more VEC as well as for monitoring and follow-up programs.

(b) Study Area: The boundaries of the study area shall be defined depending on the characteristics of one or more VECs being investigated.

(c) Methods: Methods shall be proposed by the Proponent, in consultation with resource agencies, as appropriate. The methods used in each baseline study shall be described in the EIS.

(d) Study Outputs:

- Study outputs shall be proposed by the Proponent. Information and data generated shall be sufficient to adequately predict the effects on one or more VEC and to determine monitoring and follow-up requirements;
- All maps are to be presented using Geographic Information System (GIS) with shape files;
- Raw data shall be included in the Appendices in electronic tabular form and shape files for GIS; and
- Identification of all information sources.

Baseline studies shall be prepared for the following:

- dam safety (Project dams and potential effects on the Victoria Lake reservoir, dam, dykes and canal);
- woodland caribou (including habitat, migratory behaviour, and cumulative effects);
- water resources;
- fish, fish habitat and fisheries;
- acid rock drainage and metal leaching (ARD/ML) assessment, prediction, and mitigation;
- atmospheric environment including greenhouse gas (GHG) emissions;
- avifauna (migratory and non-migratory), other wildlife and their habitats (including Sensitive Wildlife Areas);
- species at risk and species of conservation concern;
- population health and community services infrastructure; and
- historic resources.

4.2.1.1 Dam Safety

Dam safety relates to the actions taken to protect the public and the environment from the effects of dam failure, as well as the release of any or all of the retained fluids or materials behind the dam. The standard of care to be exercised in the management of dam safety shall be commensurate with the consequences of a dam failure and due diligence shall be exercised at all stages of a dam's life cycle. A dam owner shall establish dam safety management systems that incorporates polices, responsibilities, plans and procedures, documentation, training, and review and correction of deficiencies and non-conformances. The potential effects of tailings management area dams and other dams of the Project shall be assessed properly so that suitable mitigative measures can be established.

4.2.1.1.1 Definition and Rationale for Selection

Dam safety has been included in the baseline studies because of the potential impact project dams may have on a number of different identified VECs. Dam safety has the potential to have significant impacts on the downstream public and environment. A dam is a barrier constructed for the retention of water or other substances including tailings. VECs potentially impacted by dam safety include the Victoria Dam and reservoir, waterbodies, fish and fish habitat, the economy, community services and infrastructure, and community health.

4.2.1.1.2 Potential Project-VEC Interactions

Potential Project-VEC interactions include:

- proximity of the Project site to the Victoria Dam owned and operated by Nalcor;
- effects of a possible tailings dam failure and cascade effects on the Victoria Lake reservoir, Victoria dam, other downstream dams, downstream communities, infrastructure and the environment;
- impacts of non-tailings dam failures;
- impact on the operational reservoir levels of the Victoria Lake reservoir;
- impact of blasting activities at the Project site on the Victoria Dam;
- need for communication, coordination and cooperation between the Proponent and Nalcor concerning dam safety, site access, etc.; and
- impacts of the Project on water quality in the Victoria Lake reservoir and downstream watersheds, and whether this may impact Nalcor dams.

4.2.1.1.3 Existing Environment

The baseline study shall describe natural site conditions and the proposed Project site with any dams. The description of the existing environment in the EIS shall include:

- information on the Proponent's existing dam safety management practices and programs covering the life cycle of a dam from design to closure;
- description of the foundation material proposed dams shall be constructed upon;
- current level of communication, coordination and cooperation with Nalcor concerning dam safety;

4.2.1.1.4 Effects Assessment and Mitigation

The adverse environmental effects of the Project on dam safety shall be assessed for all phases of the Project and potential accident scenarios including dam failure. In conducting the analysis on dam safety, the EIS shall consider best practices as per the Canadian Dam Association, Dam Safety Guidelines and Bulletins. The EIS shall provide a description of measures to mitigate effects and list potential residual effects.

The Dam Safety Baseline Study shall describe the design for any proposed Project site dams including dam location, an assessment of alternate locations, dimensions, embankment slopes, materials, number of construction phases and phased construction type (upstream, centerline, or downstream raise). Project site dams may include tailings dams, polishing pond dams, containment dams, solution pond dams, and stormwater management dams. A determination of the dam consequence classification as per the Canadian Dam Association, *Dam Safety Guidelines*, shall be provided for all dams as this will form the basis of the dam design and requirements for the dam safety management program to be established by the Proponent.

The Dam Safety Baseline Study shall include:

- rationale and justification for the selected tailings management area site and design including an assessment of potential impacts and associated costs at alternative site locations;
- dam break inundation modelling and mapping to help determine the consequence classification of any dams associated with the Project and for inclusion in a future Emergency Preparedness and Response Plan;
- an assessment of Project impacts on the Victoria Dam, other water control structures on the Victoria Lake Reservoir, other downstream dams on both the Exploits River system and Bay d'Espoir system, downstream communities, infrastructure and environments in consultation with 3rd party dam owners (Nalcor), including a possible cascade failure of the Victoria Dam and other downstream dams. The Proponent should discuss the development of a cascade failure analysis model of the tailings dam on the Victoria Dam, other Victoria Reservoir control structures, and

other downstream dams on both the Exploits River system and Bay d'Espoir system using existing dam break model information developed by the dam owner;

- an assessment of water quality impacts from regular discharge from the tailings management area, or a leak or failure of the tailings dam on the Victoria Lake reservoir and dam;
- the provision of input parameters (e.g., seismic loads, ground acceleration, dam break flood flows, etc.) to be used in hydrologic, hydraulic and geotechnical models by 3rd party dam owners (Nalcor) whose dams may be impacted by the Project to help determine possible impacts in consultation with 3rd party dam owners;
- determination if tailings are acid generating or not, as this will inform the closure phase of the tailings management area, and provide details on plans for closure of the tailings management area that also incorporate consideration for climate change;
- provide an overview of the closure plans for other Project dams and associated infrastructure that also incorporate consideration for climate change. Outline who will be responsible for long-term closure activities in the event of changes to the status of the Proponent (e.g., bankruptcy, change in ownership) and how closure activities will be financed;
- identification of components of the dam safety program to be established by the Proponent based on the consequence classification of Project dams including the Emergency Preparedness and Response Plan, frequency of inspections and Dam Safety Reviews, annual inspection reports, training of staff, monitoring and surveillance instrumentation to be installed and operated, operations curves, etc. Provide a plan for how the Proponent will prove and validate the safety of its dam structures to regulators and affected 3rd party dam owners (Nalcor); and
- a plan for how communication and the transfer of information between the Proponent and affected 3rd party dam owners (Nalcor) will be achieved including but not limited to updates to Emergency Preparedness and Response Plans, notification of spilling, notification of blasting, joint emergency exercises, updating of dam break flood mapping, access road issues, and review of reports and design drawings.

4.2.1.2 Woodland Caribou (Habitat, Migratory Behaviour and Cumulative Effects)

The effects of the Project on woodland caribou, including their habitat and migratory behaviour will be assessed within the Project study area and throughout the range of affected caribou herds. A cumulative effect is defined as a change in the environment caused by multiple interactions among human activities and natural processes that accumulate across space and time and a cumulative effects assessment is a systematic process of identifying, analyzing, and evaluating cumulative effects. Boundaries for assessing the cumulative effects of the Project in combination with other projects and activities that have been or will be carried out will generally be different from (larger than) the boundaries for assessing the effects of the Project.

4.2.1.2.1 Definition and Rationale for Selection

Woodland caribou, in the context of VEC definition, refers to woodland caribou that are potentially using, breeding, moving and/or migrating through the Project area and potentially impacted by the Project and associated infrastructure/activities, including from cumulative effects due to other land use in the area. Woodland caribou are important to local residents, regional stakeholders, and regulatory authorities (i.e. municipal, provincial and federal) for recreation, economic and/or management considerations.

The Newfoundland population of caribou are of significant conservation concern for the Province, with population levels declining from a peak of 93,000 (in the mid-1990's) to just over 30,000 today. The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) recommended listing the herds as Special Concern in 2014. The herds will be reassessed by COSEWIC in 2024. There are four woodland caribou herds that interact with the proposed Project, specifically the Buchans, Grey River, Gaff Topsails and Lapoile caribou herds. These herds represent approximately 32 to 35 per cent of the island of Newfoundland caribou population, and represent approximately 89 per cent of the South Coast Study Area caribou population. The Project is located directly within the migration corridor between spring/summer/fall and winter ranges for the Buchans and Gaff Topsails caribou herds and is located within the spring, summer and fall ranges for the Grey River, Lapoile and Buchans caribou herds. Migration corridors are also paralleled by the proposed transmission line and intersected by the proposed road. Caribou are known to avoid industrial mining activities and migration routes are extremely sensitive to disturbance.

4.2.1.2.2 Potential Project-VEC Interaction

Potential Project-VEC interactions include:

- Habitat loss and avoidance, or degradation due to construction and operation of Project facilities and associated infrastructure;
- Impacts of increased access and related land use;
- Effects of emissions/discharges (including dust) from the Project and associated infrastructure/activities on habitat quality and habitat use;
- Direct and indirect effects (e.g. mortality, avoidance, calf recruitment, etc.) of construction, operation and/or decommissioning and/or accidents and malfunctions during these Project phases; and
- Effects of noise, lights, and/or presence of the Project and associated infrastructure/activities on migratory corridors and connectivity between seasonal habitats, and implications to seasonally important habitats.

Cumulative effects of the Project and associated infrastructure/activities in relation to other land use through space and time in the Project region and within the affected caribou ranges.

4.2.1.2.3 Existing Environment

The Woodland Caribou Baseline Study shall describe woodland caribou, their habitat and migratory behavior within the Project study area and throughout the range of the affected caribou herds. Caribou, their habitat, and migratory behaviour that could be affected by the Project and associated infrastructure/activities shall be characterized using existing data, supplemented by surveys as appropriate. The Proponent is required to contact the Department of Fisheries and Land Resources for further detail on the information requirements and to access existing caribou information/data.

The Woodland Caribou Baseline Study should give particular consideration to migratory corridors and seasonal connectivity between spring/summer/fall and winter ranges; and seasonally important habitats such as breeding, calving/post-calving, and wintering areas.

4.2.1.2.4 Effects Assessment and Mitigation

The adverse environmental effects of the Project on woodland caribou, their habitat and migratory behavior shall be assessed for all phases of the Project. In addition, the effects of potential accidents and malfunctions

and cumulative effects associated with other industrial use (e.g. hydro reservoirs) of the area, including roads and transmission lines, shall be assessed.

The Woodland Caribou Baseline Study shall present an analysis of the Project's effects on caribou, their habitat and migratory behaviour, giving consideration to, and demonstrating linkages to, predicted physical and biological changes resulting from the Project. Management tools (i.e. federal and provincial laws and policies, guidance, and provincial or regional strategies and plans) applicable to the protection of caribou and caribou habitat shall be considered in the EIS. The Woodland Caribou Baseline Study shall:

- assess the Project's effects of noise, light, and/or presence of the Project and associated infrastructure/activities on migratory corridors and connectivity between seasonal habitats, and implications to seasonally important habitats, and to also include:
    - Creation of zones of avoidance,
    - Physical hazards and attractants for wildlife (e.g. roads, pits, and other structural features), and
    - Chemical hazards and attractants for wildlife (e.g. identified contaminants of potential concern).
- quantify and describe overall loss, avoidance or alteration of caribou habitat that could result from the Project and its effect on caribou. Where possible, rank habitat value for caribou so that the loss of high-value areas can be assessed in the context of their regional availability and significant/uniqueness. Regional boundaries for assessment of relative habitat loss should be based on the population ranges for the affected caribou herds.

The Woodland Caribou Baseline Study shall describe measures to mitigate effects on caribou, their habitat and migratory behaviour and predict adverse residual effects. Such measures should also be assessed for their technical and economic feasibility. This includes plans and predictions for rehabilitation of the Project area, taking into account growth rates of local vegetation. The Woodland Caribou Baseline Study shall:

- Outline mitigations that resolve the Project's effects on caribou migratory corridors and connectivity between seasonally important habitats based on clearly defined scientific research and literature, and best industry practices;
- Outline mitigations that resolve the Project's effects on seasonally important caribou habitat;
- Contain original research to refine timing and duration of spring and fall migration periods, connectivity between seasonal habitats and migratory behavior of local caribou herds; and
- Contain original research to refine timing and duration of calving and post-calving periods of local caribou herds.

4.2.1.3 Water Resources

The effects of the Project on water resources will be assessed within the local and regional drainage areas that can be reasonably expected to be affected by the Project. Boundaries for assessing the cumulative effects of the Project in combination with other projects and activities that have been or will be carried out may be different from (larger than) the boundaries for assessing the effects of the Project. The water resources baseline study shall be comprised of three parts: i) groundwater, ii) surface water, iii) and wetlands. This baseline study shall act as a water resources management plan that includes information requirements pursuant to the Water Resources Act, SNL2002 cW-4.01 and its regulations and policies.

4.2.1.3.1 Definition and Rationale for Selection

Water resources include the quality and quantity of groundwater and surface water resources in the vicinity of the Project, including wetlands. It has been selected because of:

- its importance to ecosystem function (including recreational use and protection of aquatic life);
- concerns regarding potential for release of hazardous materials on-site and potential contamination associated with mine and process water management;
- possible lowering of water table and effects on surface water / groundwater interactions (e.g., wetlands, baseflow from headwaters of two major watersheds, etc.); and,
- provisions of the NL *Water Resources Act*.

4.2.1.3.2 Potential Project-VEC Interactions

Potential Project-VEC interactions include:

- the potential loss of natural waterbodies as part of the project;
- effects related to mine water management as well as effects on water quality from effluent discharges and seepage;
- potential ammonia contamination from incomplete combustion of exploded materials (e.g., directly to surface waters, or to groundwater via bedrock fractures);
- effects on water quantity and hydrology/hydrogeology;
- effects related to mine water use (demand);

- effects to wetlands within the Project footprint and for areas that could be reasonably expected to be affected by the Project; alteration or loss of wetland quantity due to vegetation clearing, infilling, heavy equipment use and other vehicle traffic;
- alteration of wetland quality (including ecosystem integrity and ability to function) due to changes in surface water hydrology, such as ponding, disruption of baseflow or surface water diversion; and
- alteration of surface water and/or groundwater quality resulting from construction and/or operation (e.g. siltation, effluent discharge, spills) affecting wetlands and subsequent indirect effects to wetland plant communities;
- wetlands that may be affected by Project activities according to their location, size, type (wetland class and form), species composition and ecological function;
- effects of accidents and malfunctions; and
- erosion and sedimentation, including dust deposition.

4.2.1.3.3 Existing Environment

4.2.1.3.3.1 Groundwater

The Water Resources Baseline Study shall describe the hydrogeologic conditions at the Project site, including a complete assessment of groundwater resources within the project property. This should include a) a conceptual model of groundwater flow at the site both plan view and cross-sectional b) identification of locations for installation of monitoring wells to further delineate the shallow and deep groundwater regimes; and a groundwater flow model to use as a planning tool to evaluate the effects of the project on groundwater and vice versa. This computer model should be calibrated to evaluate whether or not there is any adverse effect on groundwater or surface water quality or quantity. It shall examine all available existing hydrogeology information required to assess the effects of the Project. Where knowledge gaps exist, the Proponent shall collect additional baseline information and provide it in the EIS.

The Water Resources Baseline Study shall include:

- a review of the geology of the Project area as it pertains to local and regional groundwater flow systems in the Project area (see list in Section 4.1.9);
- the physical and geochemical properties of hydrogeological units, such as aquitards (see list in Section 4.1.9);
- groundwater levels and a piezometric map for both shallow and deep groundwater regimes;
- identifying any preferential flow paths for groundwater (both shallow and deep);

- hydrogeologic maps and cross-sections for the Project area that outline the extent of aquifers, including stratigraphy, piezometric levels at different depths (to estimate vertical hydraulic gradients and show confined aquifers)/potentiometric contours; locations of wells, boreholes, springs, lakes and streams; groundwater flow direction;
- groundwater flow patterns and chemistry, identifying recharge and discharge areas and identifying groundwater interaction with surface waters including for Long Lake, Valentine Lake, and Victoria Lake;
- evaluation of aquifer characteristics and discharge rates;
- assessment of groundwater quality; and
- a description of any local and regional potable groundwater resource in the area.

Baseline information shall include existing water supply wells (if any) identified within the area of influence of the Project property. In the event there are existing wells, baseline water quality should be documented.

4.2.1.3.3.2 Surface Water

The Water Resources Baseline Study should describe existing surface water quality, hydrology, bathymetry, sediment quality and transport within the area of influence of the Project. The baseline should provide the basis for the assessment of potential effects to surface water, presenting the range of water quality, sediment quality and transport, and surface water hydrology. A time-series graph of key variables and stream flows shall be provided to illustrate patterns and variability. The full range of stream flow characteristics, in addition to mean values, should be described. An assessment should be undertaken for watersheds and sub-watersheds within the footprint of the Project and regional watersheds potentially affected by discharge from the Project including Valentine Lake, Victoria Lake, Victoria River, Red Indian Lake, Exploits River, Bay d'Espoir drainage system and White Bear River.

The Water Resources Baseline Study shall:

- include delineation of pre-development drainage basins, at appropriate scales;
- include delineation of drainage basins altered by development including direction of flow;
- describe and present monitored hydrological data, such as water levels, bathymetry and flow rates in local streams and selected local lakes;
- ensure that monitoring stations are included in the receiving environment as well as at end of pipe;

- outline plans for the installation of Real Time Water Monitoring Stations (including possible quality, quantity, groundwater and climate stations) in all potentially affected watersheds and prior to the start of construction;
- describe and assess hydrological regimes, including monthly, seasonal and year-to-year variability, normal flows, low flows, environmental (maintenance) flows and flood flows for selected return period flood events;
- include flows or design peak flows for selected periods for the Project area, including an estimate of runoff to delineated altered drainage basins from diverting flows around the pit and underground workings area;
- describe the interactions between surface water and groundwater flow systems under pre-development conditions and potential effects on these interactions during the various phases of the Project;
- identify any local surface water users (i.e., potable or recreational use);
- provide seasonal water quality field and lab analytical results and interpretation at several representative local stream and lake monitoring stations established at the Project site; and
- establish precipitation monitoring at higher elevations above mean annual sea level to assist with runoff assessments.

4.2.1.3.3.3 Wetlands

Wetlands are defined as the wetlands within the vicinity of the Project or that could be affected by the Project. They have been included as a VEC because of their importance to project planning and potential to be affected by Project activities.

Wetlands within the Project areas will be classified according to the *Canadian Wetland Classification System* (CWCS) (National Wetlands Working Group [NWWG] 1997). Efforts should focus on collection of data for wetlands with the greatest potential to be affected (i.e., within the Project footprint), while collecting data at the appropriate scale for regional comparisons.

An overview of the key plant communities and animals that rely on wetlands shall be presented.
Wetlands may be affected by Project activities associated with the open pit mine and infrastructure associated with the Project that will result in clearing of or disturbance to natural vegetation, site drainage or ground disturbance (e.g., grubbing, grading, and excavation).

4.2.1.3.4 Effects Assessment and Mitigation

The adverse environmental effects of the Project on water resources shall be assessed for all phases of the Project and potential accident scenarios. The Water Resources Baseline Study will describe the potential effects to any waterbodies within the Project footprint.

With respect to accident scenarios, the discussion of effects to both ground and surface water resources shall include an analysis of effects of malfunctions and accidents events, taking into account:

- the proposed transportation routes through the Project site (i.e., roads);
- the use of explosive products (e.g., emulsion explosives, ANFO);
- possible failure of heap leach or other harmful chemical containment;
- transportation of fuel for the Project. The EIS shall describe potential accidents and malfunctions associated with the transportation of fuel on the Project site; and
- the management, storage and disposal of used oil and associated potential for malfunctions and accidents events.

4.2.1.3.4.1 Groundwater

The Water Resources Baseline Study shall assess the effects of the Project on groundwater at the mine site. The effects assessment should provide a quantitative groundwater analysis to determine how Project-related facilities and activities will affect groundwater flows, quality and quantity, such as any effects to nearby lakes, streams and wetlands, during all Project phases, including day-to-day operations and for malfunctions and accidental events. The assessment should describe the duration, frequency, magnitude and spatial extent of any effects and outline the need for mitigation and/or monitoring measures. Seepage rates, locations, quality and direction into or from the pits, underground workings, overburden/waste rock/ore stockpiles, settling pond and effects on groundwater stream flows and groundwater quality within the Project area should be assessed. Potential seepage to existing water bodies should be assessed (in relation to potential effects to fish and fish habitat, including baseflow recharge from groundwater). Mitigation strategies should be proposed.

The environmental considerations, including effects on groundwater resources that have influenced the location and management of proposed groundwater monitoring and water supply wells, shall be provided.

In summary, the following components should be provided:

- a monitoring plan for groundwater levels and quality, before, during and after the Project;
- estimation of water inflows into the open pits and underground workings and withdrawal rates from the open pits and underground workings;
- assessment of a hydrological budget, including runoff, evapotranspiration and recharge rates under the various operation phases of the mine;
- a description of the duration, frequency, magnitude and spatial extent of any effects to surface and groundwater resources caused by the Project (e.g., use maps and cross-sections developed in Section 4.18.3.1 to show effects); and
- a description of potential cumulative and residual effects of the overall Project on regional water resources.

The Water Resources Baseline Study shall also specify what groundwater supply wells, if any, are proposed on site as part of the Project and how they will be constructed and located in relation to the various mining activities in order to minimize effects on groundwater quality.

The analysis shall be based on acts, policies, guidelines and directives relating to groundwater quality and quantity, such as the *Guidelines for Canadian Drinking Water Quality (*1996*)*. The EIS shall describe measures to mitigate effects on groundwater quality and quantity and predict adverse residual effects.

4.2.1.3.4.2 Surface Water

The Water Resources Baseline Study shall assess the effects of the Project on surface water quality and quantity within the Project's zone of influence. Potential watershed effects associated with the dewatering, the creation of waste rock and overburden storage areas, water diversion, chemical storage, and the heap leach process shall be described. The assessment should describe the duration, frequency, magnitude and spatial extent of any effects and outline the need for mitigation and/or monitoring measures. The analysis of effects to surface water should include malfunctions and accident events.

The Water Resources Baseline Study shall:

- include a detailed environmental water balance for the mine site, focused on predicted water balance inputs/outputs for a climate normal condition, dry- and wet- year conditions undertaken for major Project facilities including the open pits, underground workings, waste rock, tailings management facility, and overburden storage areas. For Project areas whose footprint will expand

over time, the EIS will assess the respective change in environmental water balance over Project life including the decommissioning and post-closure period;

- provide a detailed operational and post-closure water balance for mine water management plan identifying Project water demands/uses and water source(s), potential effects on water sources and proposed mitigation to avoid or minimize effects;
- identify water and sediment quality objectives, including the receiving water criteria of the Canadian Council of Ministers of the Environment (CCME) including the *Canadian Environmental Quality Guidelines for the Protection of Aquatic Life* and the *Guidelines for Canadian Drinking Water Quality*, as applicable;
- provide details on stormwater management infrastructure design including ditching and detention ponds for the Project site;
- identify potential risks and impacts of the mine development on water quality and quantity from construction, operation, decommissioning, and long-term tailings storage;
- include modeling of water quality contaminant plumes from various failure scenarios and spills, including failure of the tailings management area and heap leach process, on affected watersheds including watersheds to the north (Exploits River) and south (Bay d'Espoir system and associated spillway rivers including White Bear River and Grey River);
- provide details on potable drinking water and sewage infrastructure design for the proposed work camp;
- outline plans for the long-term operation and maintenance of Real Time Water Monitoring Stations (including possible quality, quantity, groundwater and climate stations) in all potentially affected watersheds over the life time of the project (in consultation with MAE);
- provide an overview of the closure plans for the mine site and associated water related infrastructure;
- include a description of potential cumulative and residual effects of the overall Project on surface water resources; and
- assess predicted wastewater effluent quality in relation to the requirements of the *Metal and Diamond Mining Effluent Regulations (MDMER)* of the *Fisheries Act.* The assessment should detail how proposed effluent is predicted to mix in the receiving environment for effluents discharged from the Project.

In conducting the analysis, the Proponent should consider pertinent acts, policies, guidelines and directives relating to surface water quality and quantity. The Water Resources Baseline Study shall describe measures to mitigate effects to surface water quality and quantity and predict adverse residual effects. The Water

Resources Baseline Study should also address what measures would be taken by the Proponent if water quality or quantity were to be affected by the Project and how real time water monitoring stations will be used for this purpose.

4.2.1.3.4.3 Wetlands

In conducting the analysis, the Water Resources Baseline Study shall consider pertinent acts, best practices, policies, guidelines and directives. The Water Resources Baseline Study shall provide a description of measures to mitigate effects and list potential residual effects.

Specifically, the Water Resources Baseline Study shall discuss the following:

- The adverse environmental effects of the Project on wetlands shall be assessed for all phases of the Project, as well as accidental events. Wetland alteration is defined as changes to the wetland class or form, or changes to the performance of wetland functions resulting from disturbance to vegetation, soils, or hydrology. Wetland loss is defined as conversion of wetland to non-wetland (e.g., upland, lake, pond or watercourse) due to infilling, excavation or alteration to the hydrology. Wetland loss and wetland alteration shall be assessed within the context of wetland supply and wetland function.
- The study shall describe the measures that will be applied to mitigate effects on wetlands and predict residual adverse effects. Proposed mitigation should be consistent with the provincial policy directive, *Policy for Development in Wetlands.* The EIS should provide justification for situations where avoidance of wetlands is not possible.
- The study shall assess the potential effects of accidents and malfunctions during the construction and operations phases of the Project to wetlands (e.g., fuel spills).
- In conducting the analysis, the Water Resources Baseline Study should consider pertinent federal, provincial, municipal and local acts, policies, guidelines and directives relating to wetlands.
- Further guidance related to the assessment of effects to wetlands can be found in the Environment Canada publication *Wetland Ecological Functions Assessment: An Overview of Approaches* (Hanson *et al*., 2008) and in *Wetland Mitigation in Canada: A Framework for Application* (Cox and Grose, 2000).

4.2.1.4 Fish, Fish Habitat and Fisheries

The upstream and downstream effects of the Project on fish, fish habitat and fisheries will be assessed for all potentially-affected water bodies. Boundaries for assessing the cumulative effects of the Project in combination with other projects and activities that have been or will be carried out will generally be different from (larger than) the boundaries for assessing the effects of the Project.

4.2.1.4.1 Definition and Rationale for Selection

Fish includes parts of fish, shellfish, crustaceans, marine animals and any parts of shellfish, crustaceans or marine animals, and the eggs, sperm, spawn, larvae, spat and juvenile stages of fish, shellfish, crustaceans and marine animals.

Fish habitat means water frequented by fish and any other areas on which fish depend directly or indirectly to carry out their life processes, including spawning grounds and nursery, rearing, food supply and migration areas.

Fishery with respect to any fish, includes,

(a) any of its species, populations, assemblages and stocks, whether the fish is fished or not,
(b) any place where fishing may be carried on,
(c) any period during which fishing may be carried on,
(d) any method of fishing used, and
(e) any type of fishing gear or equipment or fishing vessel used.

There is a recreational fishery which has significant financial impact linked to this area.

4.2.1.4.2 Potential Project-VEC Interactions

Potential Project-VEC interactions include:

- Potential impacts, including non-compliance with the Fish and Fish Habitat protection Provisions of the Fisheries Act, associated with:
    - the construction of Project facilities or infrastructure including but not limited to; open pits, underground workings, tailings management facility, waste rock disposal sites, overburden storage areas, haul roads and surface and groundwater management activities;

    - water use and mining activities during operations; and
- turbidity, siltation and other contamination from surface runoff.

4.2.1.4.3 Existing Environment

The Fish, Fish Habitat and Fisheries Baseline Study shall describe the limnology, hydrology, freshwater biota, fish species, associated habitats and habitat distribution that have the potential to be affected by project activities. Information can be based on available published data, community consultation, and results of on-site baseline surveys. Baseline surveys should be conducted in accordance with direction as provided by DFO and shall be designed to:

- provide necessary baseline data to support assessment of effects on the recreational fishery;
- contribute to the development of mitigation measures to avoid non-compliance with the Fish and Fish Habitat protection Provisions of the Fisheries Act, and an offsetting plan to mitigate and compensate for the harmful impacts of the Project;
- contribute to the development of a conceptual reclamation and closure plan; and
- provide necessary baseline data to support on-going monitoring programs that assess the effectiveness of mitigation measures and offsetting plans.

Furthermore, the Fish, Fish Habitat and Fisheries Baseline Study shall:

- characterize fish, fish populations and habitat where project activities have the potential to result in non-compliance with the Fish and Fish Habitat protection Provisions of the Fisheries Act (i.e., project footprint, upstream and downstream);
- classify and quantify fish habitat, as per the:
    - *Standards Methods Guide for the Classification/Quantification of Lacustrine Habitat in Newfoundland and Labrador; and*
    - *Standards Methods Guide for the Classification and Quantification of Fish Habitat in Rivers of Newfoundland and Labrador for the Determination of Harmful Alteration, Disruption or Destruction of Fish Habitat (Draft).*
- enumerate stream discharge measurements and water quality parameters upstream and downstream of affected water bodies; and
- list any rare fish species that are known to be present.

4.2.1.4.4 Effects Assessment and Mitigation

The adverse environmental effects of the Project on fish and fish habitat shall be assessed for all phases of the Project, as well as for accidents and malfunctions. The Fish, Fish Habitat and Fisheries Baseline Study shall describe measures to mitigate effects to fish and fish habitat and predict residual adverse effects including:

- measures to mitigate adverse effects to fish and fish habitat due to project related construction and operation related activities including but not limited; open pits, underground workings, waste rock disposal sites, overburden storage areas, haul roads, dewatering, blasting and surface and groundwater management activities;
- measures to prevent adverse effects to fish, fish habitat and water quality resulting from site water run-off or soil erosion;
- measures to mitigate flow changes resulting from open mine pits, underground workings, dewatering activities, ground water management, stockpiling and waste management, and diversions, including upstream and downstream; and
- a description and quantification of fish and fish habitat where Project activities may result in non-compliance with the Fish and Fish Habitat protection Provisions of the Fisheries Act, the provision of offsetting measures (i.e. fish habitat compensation strategy) to compensate for the potential impacts of the project, by maintaining or improving the productivity in the proposed offsetting area.

4.2.1.5 Acid rock drainage and metal leaching (ARD/ML) assessment, prediction, and mitigation

Acid Rock Drainage and Metal Leaching (ARD/ML) resulting from mining activities can have serious environmental effects long into the future and shall be considered throughout the life of the project as well as at the environmental assessment stage.

4.2.1.5.1 Definition and Rationale for Selection

ARD/ML has been included as a component because of the potential impact acidic drainage and metal leaching may have on the surrounding and downstream environment. Waste rock materials from mining, mineral processing and related operations, which contain sulphide minerals such as pyrite, have the potential to be the source of acidic contamination and elevated metals in the environment. Such contamination is termed acid rock drainage / metal leaching (ARD/ML). The VECs that may be impacted by ARD/ML include dam safety surface waters, fish and fish habitat, and soils and vegetation.

4.2.1.5.2 Potential Project-VEC Interactions

As described in 4.2.1.5.1, VECs that may be impacted by ARD/ML include dam safety, surface waters, fish and fish habitat, and soils and vegetation.

4.2.1.5.3 Existing Environment

ARD/ML occurs naturally within some environments as part of the rock weathering process but is exacerbated by large-scale disturbances characteristic of mining activities that may expose rocks containing an abundance of sulfide minerals to oxidation processes that create acid drainage and metal leaching.

In a mining setting it is leading practice to carry out a geochemical assessment of mine materials during the early stages of a project to determine the potential for ARD/ML. The geochemical assessment aims to map the distribution and variability of key geochemical parameters, acid generating and element leaching characteristics.

An ARD/ML program report for the project shall be established and approved by the Department of Natural Resources (NR) prior to the submission of the EIS. The phased ARD/ML sampling and testing program shall address characterization, prevention, mitigation, and monitoring of ARD/ML for all project phases

(construction, operation, closure, post-closure), mining methods (open pit and underground), and material management units (ore, heap leach material, waste rock, overburden, quarry materials and tailings). The ARD/ML shall follow the "Prediction Manual for Drainage Chemistry from Sulphidic Geological Materials", MEND Report 1.20.0 December, 2009.

The results of the ARD/ML program shall be interpreted by an ARD/ML qualified person (QP) and the conclusions shall clearly state the potential for ARD/ML (using MEND, 2009 terminology) for each project phase, mining method and management unit. All QP recommendations regarding ARD/ML prevention, mitigation, and management strategies shall be carried out by the proponent and shall be integrated into the project design. The proponent should contact NR for details on QP qualifications.

The ARD/ML report shall address the types of tests conducted on the samples, recommendations for further testing and investigation, and provide specific details regarding the ongoing testing and monitoring program used to verify the initial ARD/ML program results. The ARD/ML report shall include the geologic unit and spatial distribution (x,y,z) for each sample to ensure that an adequate number of samples were taken from each unit. The results shall be representative of the unit in question considering the unit's variability and/or homogenous nature. As per the MEND (2009) guidelines, the QP should use the Neutralization Potential Ratio (NPR) in assessing ARD potential. Considerations in setting NPR criteria for classification of Potentially Acid Generating (PAG) vs Non-PAG material shall include site specific factors that may alter the relative magnitude of acid generating potential and neutralizing potential as well as safety factors that account for limitations in the precision and accuracy of sampling.

4.2.1.5.4 Effects Assessment and Mitigation

The QP's ARD/ML report shall assess the potential leachate risks and make recommendations regarding ARD/ML prevention, mitigation and management strategies. These strategies shall be carried out by the proponent and shall be integrated into the project design. The QP's ARD/ML report shall provide specific details regarding the ongoing testing and monitoring program to verify the initial ARD/ML program results as well as recommendations for further testing, including:

- the ARD/ML prediction information (based on MEND guidelines) and historical site databases (if available) and experience that will be used to assess the potential leachate risks and determine mitigation requirements for the project. Site specific information should be provided for: mine waste rock, ore characterization, volumes, segregation/disposal methods, mitigation/management

plans, contingency plans (e.g., environmental emergency contingency plans) operational and post-closure monitoring and maintenance plans;

- the feasibility of successfully segregating PAG and Non-PAG waste materials during operations, proposed geochemical segregation criteria and identification of operational methods that will be required to achieve geochemical characterization during operations (i.e., geochemical surrogates, on site lab, procedures needed etc.);
- sensitivity analysis to assess the effects of imperfect segregation of PAG rock;
- estimates of potential lag time to ARD/ML onset for PAG materials (including various waste rock, ore) and ability to fully saturate appropriate PAG materials during operation and post-closure based on regional experience, if any;
- open pit and underground water chemistry (existing, during operation & post-closure) and pit closure management measures (e.g., flooding). This should include geochemical modeling of pit water quality in the post-closure period;
- surface and seepage water quality from the mine waste rock stockpiles, other stockpiles and other infrastructure during operation and post-closure; and
- ARD/ML prevention and management strategies under a temporary or early closure scenario, including for ore.

4.2.1.6 Atmospheric Environment including Greenhouse Gas (GHG) Emissions

The effects of the Project on atmospheric environment will be assessed within the area that can reasonably be affected by the Project, based on the distance to sensitive receptors. Boundaries for assessing the cumulative effects of the Project in combination with other projects and activities that have been or will be carried out may be different from (larger than) the boundaries for assessing the effects of the Project.

The Atmospheric Environment including Greenhouse Gas (GHG) Emissions Baseline Study will provide information relative to the predicted effects of climate change on the project, e.g., the possibility of flooding or other infrastructure damage. Provincial climate change projections for Port Aux Basques, Burgeo, Bay d'Espoir and Exploit's Dam should be considered when constructing and upgrading the access and haul roads, pit, underground workings and buildings.

Although global in scale, greenhouse gas (GHG) emissions will be considered under this study. Both the federal government, as part of the 2015 Paris Agreement, and the provincial government, as part of The Way Forward on Climate Change (2019), have committed to reducing GHG emissions by 30 percent below 2005 levels by 2030. These GHG reduction targets are linked to carbon pricing. The 2016 Pan-Canadian Framework on Clean Growth and Climate Change included commitments to introduce carbon pricing in all provinces and territories. The Province's carbon system went into effect on January 1, 2019 and includes performance standards for large industrial facilities and large scale electricity generation, measured in terms of GHG emissions per unit of output within a facility boundary, and a carbon tax on fuels combusted outside regulated facilities' boundaries. Certain new industrial facilities are also required to utilize best available control technologies (BACT). The *Management of Greenhouse Gas Act* (MGGA) and its regulations are the mechanisms to implement performance standards and BACT, and the *Revenue Administration Act* (RAA) and its regulations are the mechanisms to implement a carbon tax.

Using a project boundary as defined in section 2(c) of the MGGA and the reporting requirements described in sections 4 to 6 and 7(4)(q) of the *Management of Greenhouse Gas Reporting Regulations*, the Atmospheric Environment including Greenhouse Gas (GHG) Emissions Baseline Study will provide details on projected annual production by type and annual materials moved, annual energy consumption by type during construction, operating and decommissioning phases (i.e., on-site stationary combustion, electricity generation, mobile transportation and blasting but excluding purchased electricity generated off-site), and associated annual GHG emissions by source during construction, operating and decommissioning phases. This information will determine whether the facility will be regulated under the MGGA (sections 4 and

either 5 or potentially 5.1) and its regulations, and specifically whether it will be subject to BACT requirements of the *Management of Greenhouse Gas Regulations* (section 12.1). If GHG emissions within the project boundary are not regulated under a performance standard pursuant to the MGGA (section 5 or 5.1), they will be subject to RAA carbon tax provisions.

The Atmospheric Environment including Greenhouse Gas (GHG) Emissions Baseline Study should separately provide details on annual energy consumption by type and annual GHG emissions by source for activities outside the project boundary such as on-road, air and marine transportation, purchased electricity (i.e., from Newfoundland and Labrador Hydro), and significant purchased services from providers outside the project boundary (e.g., a marine port facility). These GHG emissions will be subject to RAA carbon tax provisions.

4.2.1.6.1 Definition and Rationale for Selection

Atmospheric environment is defined as air quality and the acoustic and visual environments (e.g., noise, vibrations, light) within the vicinity of the Project. Atmospheric environment has been selected based on:

- protection of human health and safety, as well as ecological health and aesthetics;
- potentially sensitive human and wildlife receptors;
- provisions of the *Canadian Environmental Protection Act (1999)*(CEPA), and provisions of the *Air Pollution Control Regulations, 2004* under the NL*EPA*;
- potential effects of climate change on the project and its infrastructure; and
- potential for GHG emissions, under the *Management of Greenhouse Gas Act, 2016.*

GHG emissions have been included within this study because total annual project emissions will result in an increase in provincial GHG emissions totals while, at the same time, the provincial government has committed to significant reductions in GHG emissions by 2030. (The Province also has a 2020 GHG reduction target; however, project activities will not occur until after this date.). GHG emissions, both within and outside the project boundary, will be subject to provincial carbon pricing regulations.

4.2.1.6.2 Potential Project-VEC Interactions

Potential Project-VEC interactions include:

- Effects on ambient air quality due to;

- particulate matter (e.g., dust) and other potential air contaminants during construction activities;
- particulate matter (e.g., dust) and other contaminant releases during the operations phase including those potentially caused by:
    - mining operations;
    - handling or loading and unloading;
    - road dust (e.g., vehicle use on-site and off-site);
    - dust along hydro lines;
    - emissions from blasting; and
    - vehicle emissions.

- Effects on ambient sound levels associated with:
    - construction activities (both at the mine and off-site); and
    - mining and concentrating operations (including blasting).
- Effects of artificial lighting at the project site during operation on the environment;
- Effects of climate change, i.e., predicted increases in precipitation and more frequent extreme weather events, on the project and risks to its activities and infrastructure; and
- GHG emissions generated within and outside the project boundary during the construction, operations and decommissioning phases of the project.

4.2.1.6.3 Existing Environment

The Atmospheric Environment including Greenhouse Gas (GHG) Emissions Baseline Study shall describe the following:

- ambient air quality in the Project areas and, for the mine site, the results of a baseline survey of ambient air quality, focusing on, but not limited to the contaminants $PM_{2.5}$,PM_{10}, CO, SO_2 and NO_x;
- current ambient noise levels at the mine site and within the local area, including the results of a baseline ambient noise survey. Information on typical sound sources, geographic extent and temporal variations shall be included;
- existing ambient light levels at the Project site and at any other areas where Project activities could have an effect on light levels. The study should describe night-time illumination levels during different weather conditions and seasons;

- provincial climate change precipitation projections for Port Aux Basques, Burgeo, Bay d'Espoir and Exploit's Dam (nearest regional sites);
- historical and current provincial GHG emissions including emissions specifically from the industrial sector; and
- compare and assess project GHG emissions in the context of the MGGA, the RAA and the provincial GHG reduction target for 2030.

4.2.1.6.4 Effects Assessment and Mitigation

The adverse environmental effects of the Project on the atmospheric environment shall be assessed for all phases of the Project. In addition, the effects of potential accidents and malfunctions and cumulative effects associated with other industrial use of the area, shall be assessed.

All potential Project emissions shall be estimated and an emissions inventory table shall be included in the Atmospheric Environment including Greenhouse Gas (GHG) Emissions Baseline Study, listing emission sources (e.g., jaw crusher, the gyratory cone crushers, ball mills and associated conveyors, emergency backup generator etc.), operating periods and pollution control equipment (where applicable). A Best Available Control Technology (BACT) analysis may be required pending the details of the air pollution controls. Typical construction and operation-related emissions include, but are not limited to, particulates (PM_{10} and $PM_{2.5}$) and metals in dusts and fuel combustion by-products such as sulphur dioxide (SO_2), nitrogen oxides (NO_x), carbon monoxide (CO) and carbon dioxide (CO2).

Potential odours from Project emissions at a local level (i.e., near Project equipment) shall be discussed and assessed. Quantities are to be expressed in mg/m^3 and should be compared with provincial and national totals and mining sector totals.

The Atmospheric Environment including Greenhouse Gas (GHG) Emissions Baseline Study shall identify sources and types of variation in Project-related light levels by providing information on duration, frequency and levels of light emissions. It should provide an assessment of effects of night-time light levels on wildlife and migratory birds. Include light emissions during different weather conditions and seasons.

Mitigation measures shall be proposed to reduce or minimize adverse effects. The EIS will provide a prediction of adverse residual effects, including cumulative effects.

The effects of the project on provincial GHG emissions levels shall be assessed for all phases of the project and mitigation measures proposed to minimize GHG emissions during the operations phase of the project.

Annual estimates of production and materials moved, energy consumption by type and associated GHG emissions by source for all phases of the project should be provided as described in the *Management of Greenhouse Gas Reporting Regulations*. GHG emission for activities outside the project boundary should be reported separately from GHG emissions inside the project's boundary. GHG emissions should be measured as tonnes of CO_2 equivalent per year as per section 4 and Schedule C of the *Management of Greenhouse Gas Reporting Regulations.*

If a facility emits at least 15,000 tonnes GHG emissions per year within the project boundary during the operations phase of a project, it may be regulated under either section 5 or 5.1 of the MGGA and the *Management of Greenhouse Gas Regulations,* and it will therefore be subject to BACT requirements for activities inside the project's boundary as outlined in section 12.1 of the *Regulations*. With respect to section 12.1, the EIS should propose a range of mitigation measures to reduce or minimize GHG emissions within the context of other regulatory requirements such as air pollutant, occupational health and safety, and fire and life safety regulations, and identify the recommended approach for consideration by the Minister.

4.2.1.7 Avifauna (migratory and non-migratory), Other Wildlife and Their Habitats (Including Sensitive Wildlife Areas and any Protected Areas)

The effects of the Project and associated infrastructure/activities on birds, and other wildlife and their habitats (including Sensitive Wildlife Areas and any Protected Areas) will be assessed within the Project study area and areas that could reasonably be affected by the Project activities in consultation with the Department of Fisheries and Land Resources. Boundaries for assessing the cumulative effects of the Project in combination with other projects and activities that have been or will be carried out will generally be different from (larger than) the boundaries for assessing the effects of the Project.

4.2.1.7.1 Definition and Rationale for Selection

Birds, and other wildlife and their habitat refers to migratory and non-migratory species that are potentially feeding, breeding, moving and/or migrating through the Project area and impacted by the Project and associated infrastructure/activities. Species and other ecosystem components are important to local residents, regional stakeholders, and regulatory authorities (i.e., municipal, provincial and federal) for recreation, economic and/or management considerations.

4.2.1.7.2 Potential Project-VEC Interactions

Potential Project-VEC interactions include:

- Habitat loss, avoidance or degradation due to construction and operation of Project facilities and associated infrastructure;
- Impacts of increased access and related land use;
- Effects of emissions/discharges (including dust) from the Project on habitat quality and use;
- Direct and indirect effects (e.g. mortality, avoidance, etc.) of construction, operation and/or decommissioning and/or accidents and malfunctions during these Project phases; and
- Impacts of noise, light and presence of Project facilities and associated infrastructure/activities on feeding, breeding, movement and/or migratory patterns.

4.2.1.7.3 Existing Environment

The Avifauna, Other Wildlife and Their Habitats Baseline Study shall describe migratory and non-migratory birds (including waterfowl, raptors, shorebirds, marsh birds and other landbirds), small mammals, furbearers, and their habitat at the Project site and within the local and regional areas.

4.2.1.7.4 Migratory Birds

Migratory birds are protected under the *Migratory Birds Convention Act* (MBCA) and associated Regulations. Birds protected under the *Migratory Birds Convention Act* are specifically named in the Environment Canada publication, "Birds Protected in Canada under the Migratory Birds Convention Act, Canadian Wildlife Service Occasional Paper No. 1." Preliminary data from existing sources should be gathered on year-round migratory bird use of the area (e.g., winter, spring migration, breeding season, fall migration). In addition to information obtained from the Atlantic Canada Conservation Data Centre (ACCDC) and naturalists, other relevant datasets should be consulted, such as those available from:

- Bird Studies Canada's "Nature Counts" web portal (http://www.birdscanada.org/birdmon/default/datasets.jsp);
- the Quebec Breeding Bird Atlas 1984-89 (Les oiseaux nicheurs du Québec: atlas des oiseaux nicheurs du Québec méridional). A copy of this atlas is available at: http://www.atlasoiseaux.qc.ca/1eratlas_en.jsp; and
- other data and projects, based on consultation with government and other agencies.

Existing data should be supplemented by surveys, where necessary. Surveys should be designed with reference to the Canadian Wildlife Service's Technical Report No. 508, A Framework for the Scientific Assessment of Potential Project Impacts on Birds (Hanson et al. 2010). Appendix 3 of the Framework provides examples of project types and recommended techniques for assessing effects on migratory birds. Survey protocols for migratory birds should be reviewed by ECCC-CWS prior to implementation.

4.2.1.7.5 Other Wildlife

Other wildlife includes:

- Small mammals;
- Large mammals; e.g., moose
- Furbearers

Other wildlife and their habitats that could be affected by Project activities shall be characterized using existing data, supplemented by surveys as appropriate. The Proponent is required to contact Fisheries and Land Resources for further detail on the information requirements. The study must give particular consideration to areas, such as breeding, denning and/or wintering areas.

4.2.1.7.6 Effects Assessment and Mitigation

The adverse environmental effects of the Project on birds, and other wildlife and their habitats should be assessed for all phases of the Project, and for malfunctions and accidental events. The Avifauna, Other Wildlife and Their Habitats Baseline Study shall present an analysis of the Project's effects on habitats, giving consideration to, and demonstrating linkages to predicted physical and biological changes resulting from the Project. Management tools (i.e., federal and provincial laws and policies, guidance, and provincial or regional strategies and plans) applicable to the protection of wildlife and/or wildlife habitat shall be considered in the study. The Avifauna, Other Wildlife and Their Habitats Baseline Study shall:

- Quantify and describe overall loss, avoidance or alteration of terrestrial habitat that could result from the Project and its effect on key species. Where possible, rank habitat value for each VEC species so that the loss of high-value areas can be assessed in the context of their regional availability and significance/uniqueness. Regional boundaries for assessment of relative habitat loss should be based on population ranges and/or regional assessment area; and
- Assess the Project's potential effects on wildlife behaviour, such as feeding, breeding, migration and movement, with respect to:
    - physical hazards and attractants for wildlife (e.g., roads, pits, and other structural features),
    - chemical hazards and attractants for wildlife (e.g., identified contaminants of potential concern), and
    - sensory disturbance causing wildlife attraction or deterrence (e.g., noise, light, and human presence.

The Avifauna, Other Wildlife and Their Habitats Baseline Study shall describe measures to mitigate effects on birds, and other wildlife, and their habitats and predict adverse residual effects. This includes plans and predictions for rehabilitation of the Project area, taking into account growth rates of local vegetation.

4.2.1.8 Species at Risk and Species of Conservation Concern

The effects of the Project on animal and plant Species at Risk (SARs) and species of special conservation concern will be assessed within the Project study area and areas that could reasonably be affected by the Project activities in consultation with the Department of Fisheries and Land Resources. Boundaries for assessing the cumulative effects of the Project in combination with other projects and activities that have been or will be carried out will generally be different from (larger than) the boundaries for assessing the effects of the Project.

4.2.1.8.1 Definition and Rationale

The definition and selection for SARs include:

- Species that are listed under the federal *Species at Risk Act* (SARA) and relevant provincial legislation such as the NL *Endangered Species Act* (ESA), and
- Species recommended for legal listing by COSEWIC, the NL Species Status Advisory Committee (SSAC), and ranked by the Atlantic Canada Conservation Data Centre (ACCDC) as S1, S2, or S3 or general status (Fisheries and Land Resources– Wildlife Division General Status of Wildlife Ranks) as may be at risk or undetermined.

Preservation of SARs is important for maintaining ecological integrity and species biodiversity. There are also legislative and policy requirements to protect SARs and their habitats. Any measures undertaken to mitigate and monitor effects must be consistent with applicable federal recovery strategies, federal action plans, or provincial recovery plans.

4.2.1.8.2 Potential Project-VEC Interactions

Potential Project-VEC interactions for SARs include:

- Habitat loss, avoidance or degradation due to construction and operation of Project facilities and associated infrastructure;
- Impacts of increased access and related land use;
- Effects of emissions/discharges (including dust) from the Project on habitat quality and use;
- Direct and indirect effects (e.g. mortality, avoidance, etc.) of construction, operation and/or decommissioning and/or accidents and malfunctions during all Project phases; and

- Impacts of noise, lights, and presence of Project facilities and associated infrastructure/activities on disruption of feeding, breeding, movement and/or migratory patterns.

Project activities that will result in clearing of or disturbance to natural vegetation, or ground disturbance (e.g., grubbing, grading, and excavation) may affect rare plant species by:

- Altering or destroying individual rare plants, or habitat capable of supporting rare plant species;
- Altering preferred habitat due to changes in surface water hydrology (e.g., ponding, surface water runoff patterns);
- Destroying plants, or reducing health conditions of individuals and /or their habitat due to soil erosion, structural soil changes, or soil contamination; or
- Displacing rare plants due to non-native and invasive species introduction.

4.2.1.8.3 Existing Environment

As background for the analysis of the Project's effects on SARs, the Species at Risk and Species of Conservation Concern Baseline Study shall:

- Identify all SARs that may be affected by the Project, using existing data and literature as well as surveys to provide current field data, as appropriate;
- Provide assessments of regional importance, abundance and distribution that optimize the ability to detect all species at risk and sufficient survey effort to obtain comprehensive coverage; and
- Identify residences, seasonal movements, movement corridors, habitat requirements, key habitat areas, identified critical habitat and/or recovery habitat (where applicable) and general life history of SARs that may occur in the Project area, or be affected by the Project.

The following information sources on species at risk and species of conservation concern should be consulted:

- *Species at Risk Act* (SARA (www.sararegistry.gc.ca));
- Newfoundland and Labrador *Endangered Species Act* (NLESA);
- Committee on the Status of Endangered Wildlife in Canada (COSEWIC);
- Species Status Advisory Committee (SSAC);
- Department of Fisheries and Land Resources (FLR) – Wildlife Division General Status of Wildlife Ranks;
- Atlantic Canada Conservation Data Centre (ACCDC);
- Relevant Government agencies; and

- Local naturalist and interest groups.

4.2.1.8.4 Effects Assessment and Mitigation

The Species at Risk and Species of Conservation Concern Baseline Study should identify the adverse effects of the Project and associated infrastructure/activities on SARs, including individuals, critical habitat, recovery habitat, important habitat, and residences of species listed under SARA and the NLESA, species recommended for legal listing by COSEWIC, the SSAC, as well as adverse effects on species of conservation concern ranked by the ACCDC as S1, S2, or S3.

The Species at Risk and Species of Conservation Concern Baseline Study should describe specific measures that will be taken to avoid or reduce adverse effects and to monitor them (consistent with any applicable federal recovery strategy, federal action plans, and/or provincial recovery/management plan). The effects analysis shall include project-specific effects and cumulative effects on SARs and their critical habitat, recovery habitat, important habitat, and/or residences.

The analysis shall take into account pertinent acts, policies, guidelines and directives relating to species at risk, such as:

- Addressing Species at Risk Act Considerations Under the *Canadian Environmental Assessment Act* for Species Under the Responsibility of the Minister responsible for Environment and Climate Change Canada and Parks Canada (SARA-CEAA 2010),
- The *Species at Risk Act* Environmental Assessment Checklists for Species Under the Responsibility of the Minister Responsible for Environment and Climate Change Canada and Parks Canada,
- Environmental Assessment Best Practice Guide for Wildlife at Risk in Canada (Environment Canada 2004), and
- Newfoundland and Labrador: A Provincial Policy Regarding the Conservation of Species at Risk.

4.2.1.9 Population Health and Community Services Infrastructure

The effects of the Project on the health of nearby human receptors including nearby cabin/cottage users and population health and community services infrastructure in the nearby communities of Millertown, Buchans, Badger, Grand Falls-Windsor and any other affected community (in accordance with Newfoundland and Labrador requirements) will be assessed.

4.2.1.9.1 Definition and Rationale for Selection

Health and Community Health includes human health, wellness and family life, and can be influenced by socioeconomic factors as well as the programs and services available to promote and protect health. Human health includes perceptions related to quality of life. Community services and infrastructure includes:

- employment and social services;
- health services and social programs;
- training and education services and programs;
- safety and security;
- housing and accommodation (residential and tourist);
- municipal administrative capacity;
- recreational services (e.g. walking trails);
- transmission lines and other infrastructure;
- municipal services and infrastructure; and
- transportation infrastructure.

Health is a resource for living, and can be positively or negatively impacted by changes to the physical and socioeconomic environment. The services and infrastructure listed above are important to maintaining and promoting the health of area residents and their availability may be reduced or otherwise impacted by the Project.

4.2.1.9.2 Potential Project-VEC Interactions

Individual and population health may be affected by physical environmental changes caused by the Project (e.g., dust, noise, light, recreational land use and/or aesthetic changes) as well as changes to the socioeconomic environment (e.g. income, education and housing). The interaction of the Project with

community services and infrastructure is related to the Project's labour force. Project employment related effects will likely incur demographic change, and a subsequent increase in demand on services and infrastructure.

4.2.1.9.3 Existing Environment

4.2.1.9.3.1 Population Health

Baseline conditions for applicable measures of population health shall be defined through a review of information from the Government of Newfoundland and Labrador and other relevant agencies and organizations. Where additional information is required, studies and/or interviews with local individuals shall be conducted.

4.2.1.9.3.2 Community Services Infrastructure

Baseline conditions for population demographics and labour force, as well as existing community services and infrastructure, including housing and accommodations shall be defined through a review of information from the Government of Newfoundland and Labrador and other relevant agencies and organizations (e.g., municipalities, Indigenous governments and organizations, emergency service providers and tourism and accommodation agencies). Where additional information is required, field surveys and/or interviews with local individuals shall be conducted. In establishing the baseline for community services and infrastructure, particular attention should be paid to the capacity to handle any Project-induced increase in demand. Information relative to expected lifespan of infrastructure such as roads, water and sewer distribution and treatment facilities should be included in those baseline studies.

4.2.1.9.4 Effects Assessment and Mitigation

The Population Health and Community Services Infrastructure Baseline Study shall describe and evaluate both positive and negative changes to population health and well-being (e.g., physical and mental health) and community services infrastructure that may occur as a result of Project-related effects to the environment, including concern about potential changes to the quality of life as a result of the Project.

4.2.1.9.4.1 Population Health

This Population Health and Community Services Infrastructure Baseline Study shall describe and assess the following:

- characterization of all possible sources of contaminants/emissions, exposure pathways and consumption patterns that may generate health effects (e.g., respiratory concerns for sensitive components of the population), if any;
- the potential for health effects that may arise from changes in water quality and quantity;
- the potential for health effects that may arise from noise or vibrations;
- the effects of the Project on the health and safety of Project workers, and those working in the areas affected by the Project, including the possible effects of any accidents or spills;
- effects of the Project on social factors such as social connectivity, family cohesion, substance use, domestic violence and crime; and
- implications of the Project on residents' perceptions of quality of life (e.g., from changes in recreational patterns and country foods consumption, light, noise, changes in landscape etc.).

The Population Health and Community Services Infrastructure Baseline Study shall describe measures to mitigate negative effects, and to promote positive effects, to Population Health for both the construction and operation phases and predict the potential for adverse residual effects and their significance. Such measures should also be assessed for their technical and economic feasibility. Safety zones established in relation to Project blasting should be described. Pertinent acts, policies, guidelines and directives relating to health shall be considered.

4.2.1.9.4.2 Community Services Infrastructure

The Population Health and Community Services Infrastructure Baseline Study shall describe:

- the existing inventory of infrastructure for both men and women in the community;
- the effects of Project-related demand on community services and infrastructure, including water and sewage treatment;
- plans for electrical power requirements for the Project and the impact on existing infrastructure and residents;
- the potential traffic increase due to the Project, and associated health and safety implications;
- assess the decrease in lifespan of physical infrastructure based on increased use that can be attributed to the project and its spinoffs;

- quantify the value of any lost lifespan for infrastructure as a factor of overall replacement cost of that infrastructure (e.g., if a road has an estimated 10 years of wear remaining before it shall be re-constructed, and the project will reduce the lifespan of that road to 8 years, there should be quantification of the value of the lost two years of road use);
- potential increase in passenger and freight traffic on the Trans-Canada Highway and through Gander International Airport or other nearby landing strips;
- potential increase in passenger and freight traffic on ferry services across the Strait of St. Lawrence;
- plans for supplying worker accommodations during construction and operation of the Project, including consideration of accommodations for supporting contractors and potential for supplying low-income and senior housing; and
- the potential for blasting from the Project to effect municipal and/or residential infrastructure.

The Population Health and Community Services Infrastructure Baseline Study shall describe measures to mitigate effects on community services and infrastructure for both the construction and operation phases, as well as predicted adverse residual effects and their significance. Such measures should also be assessed for their technical and economic feasibility. That Plan should reduce, to the extent possible, acceleration of the effective lifespan of infrastructure. This should include specific consideration of mitigation to prevent displacement of current residents by Project employees/contractors from existing accommodations. Safety zones established in relation to Project blasting should be described.

Pertinent acts, policies, guidelines and directives relating to community services and infrastructure shall be considered, including the Municipal Plans of nearby communities, as applicable.

4.2.1.10 Historic Resources

The impact of the Project on Historic Resources within the area of the development shall be subject to archaeological assessment. Such assessment will by conducted by the proponent who is required to hire an archaeological consultant to conduct the necessary archaeological impact studies to the satisfaction of the Provincial Archaeology Office.

4.2.1.10.1 Definition and Rationale for Selection

"Historic Resource" means a work of nature or of humans that is primarily of value for its archaeological, prehistoric, historic, cultural, natural, scientific or aesthetic interest, including an archaeological, prehistoric, historic or natural site, structure or object. Historic Resource is included based on the potential effect of the Project upon historic resources as protected by RSNL1990 CHAPTER H-4 *Historic Resources Act.*

4.2.1.10.2 Assessment and Mitigation Requirements

The proponent shall assess, protect, and where necessary, mitigate the impact of the development upon historic resources. This shall require, but not be limited to, a commitment to undertake the following:

- Archaeological overflight surveys to identify high-potential locations not evident in aerial imagery.
- Archaeological surveys including ground-truthing of selected areas as having enhanced archaeological potential within the Project Development Area.
- Intensive ground-truthing of any archaeological sites that may be discovered within the project area.
- Testing of power corridor, road routes and other infrastructure requirements (new and upgraded) at selected river crossings and lakeshores.
- Archaeological assessment outside of the Project Area at locations where new development is, or may be, proposed.

4.3 Commitments made in the EIS

The EIS should provide a list of all commitments made regarding environmental mitigation, monitoring and follow-up. Each commitment shall be cross-referenced to the section of the EIS where it has been made.

5.0 EIS GUIDELINE DATA AND INFORMATION SOURCES

Canada Transportation Act: http://laws.justice.gc.ca/eng/acts/C-10.4/index.html

Canadian Environmental Assessment Agency. 1992. *Canadian Environmental Assessment Act* and Regulations. http://laws-lois.justice.gc.ca/eng/acts/C-15.2/

Canadian Environmental Assessment Agency. 1996. *Reference Guide on Physical and Cultural Heritage Resources*. http://www.ceaa.gc.ca/default.asp?lang=En&n=1BE75513-1

Canadian Environmental Assessment Agency. 2003. *Incorporating Climate Change Considerations in Environmental Assessment: General Guidance for Practitioners*. http://ceaa.gc.ca/default.asp?lang=En&n=DACB19EE-1

Cox, K. and Grose, A., 2000. *Wetland Mitigation in Canada: A Framework for Application.* Sustaining Wetlands Issues paper, No, 2000-1. Published in partnership with Ontario Ministry of Natural Resources, Environment Canada, Ducks Unlimited Canada, and the Joint Ventures of the North American Waterfowl Management Plan, North American Wetlands Conservation Council Canada, Ottawa, Ontario. http://www.wetlandscanada.org/Wetland%20Mitigation%202000-1.pdf

Environment Canada – Parks Canada. 2010. *The Species at Risk Act Environmental Assessment Checklists for Species Under the Responsibility of the Minister Responsible for Environment Canada and Parks Canada – Support Tool for the Required Information Elements Under the Species at Risk Act for Environmental Assessments Conducted Under the Canadian Environmental Assessment Act*: http://www.ec.gc.ca/Publications/default.asp?lang=En&xml=DA30C3BC-F7ED-45F2-868B-17A0B33B6FDF

Environment Canada, 1991. Birds Protected in Canada under the Migratory Birds Convention Act, Canadian Wildlife Service Occasional Paper No. 1. http://www.ec.gc.ca/Publications/default.asp?lang=En&xml=97AC4B68-69E6-4E12-A85D-509F5B571564

Environment Canada. 2004. Environmental Assessment Best Practice Guide for Wildlife at Risk in Canada. First Edition, Canadian Wildlife Service, Environment Canada. 68 Pages.

Environment Canada. 2008. Environment Canada Guidance Related to the Environmental Assessment of Aggregate Pit Mines and Quarries in the Atlantic Provinces. 13 Pages.

Environment Canada. *Implementation Guidelines for the Environmental Emergency Regulations 2011*. https://www.canada.ca/en/environment-climate-change/services/canadian-environmental-protection-act-registry/publications/implementation-guidelines-emergency-regulations.html

Environment of Canada. 1991. The Federal Policy on Wetland Conservation. Canadian Wildlife Services, Environment Canada, Ottawa, Ontario. 15 pages. http://www.ec.gc.ca/Publications/default.asp?lang=En&xml=BBAAE735-EF0D-4F0B-87B7-768745600AE8

Explosives Act: http://laws.justice.gc.ca/eng/acts/E-17/index.html

Fisheries and Oceans Canada. 1986. *Policy for the Management of Fish Habitat* http://www.dfo-mpo.gc.ca/habitat/role/141/1415/14155/fhm-policy/index-eng.asp

Government of Canada. 2003. *A Framework for the Application of Precaution in Science-based Decision Making About Risk*.

Guidelines for Canadian Drinking Water Quality. 1996. (http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/2010-sum_guide-res_recom/index-eng.php)

Hanson, A., I. Goudie, A. Lang, C. Gjerdrum, R. Cotter and G. Donaldson. 2009. *A Framework for the Scientific Assessment of Potential Project Impacts on Birds*. Canadian Wildlife Service's Technical Report Series No. 508. Atlantic Region. 61 pp.

Hanson, A., L. Swanson, D. Ewing, G. Grabas, S. Meye, L. Ross, M. Watmough, and J, Kirby. 2008. *Wetland Ecological Functions Assessment: An Overview of Approaches*. Canadian Wildlife Service Technical Report Series No. 497. Atlantic Region. 59 pp. http://www.ec.gc.ca/Publications/default.asp?lang=En&xml=B8737F25-B456-40ED-97E8-DF73C70236A4

Health Canada. 2010. *Useful Information for Environmental Assessments*. Ottawa, Ontario. 17 pages. http://www.hc-sc.gc.ca/ewh-semt/pubs/eval/environ_assess-eval/index-eng.php

MEND Report 1.20.0, "Prediction Manual for Drainage Chemistry from Sulphidic Geological Materials", December, 2009 (MEND (2009). http://mend-nedem.org/mend-report/prediction-manual-for-drainage-chemistry-from-sulphidic-geologic-materials/

Minister of the Department of Indian Affairs and Northern Development. March 2011. *Aboriginal Consultation and Accommodation - Updated Guidelines for Federal Officials to Fulfill the Duty to Consult*. http://www.ainc-inac.gc.ca/eng/1100100014664

National Wetlands Working Group (NWWG). 1997. *The Canadian Wetland Classification System, second edition*, B.G. Warner and C.D.A. Rubec (ed.). Wetlands Research Centre, University of Waterloo, Waterloo. 68 p.

Navigable Waters Protection Act: http://laws.justice.gc.ca/eng/acts/N-22/

Newfoundland and Labrador Department of Environment and Conservation. *Guidance for Plume Dispersion Modeling* (GD-PPD-019.1).

Newfoundland and Labrador Department of Environment and Conservation. *Determination of Compliance with the Ambient Air Quality Standards (*GD-PPD-009.3*)*.

Newfoundland and Labrador *Endangered Species Act*: http://assembly.nl.ca/Legislation/sr/statutes/e10-1.htm

Newfoundland and Labrador *Environmental Protection Act*: http://assembly.nl.ca/Legislation/sr/statutes/e14-2.htm#58_

Newfoundland and Labrador *Historic Resources Act*: http://assembly.nl.ca/Legislation/sr/statutes/h04.htm

Newfoundland and Labrador *Management of Greenhouse Gas Act:* https://assembly.nl.ca/Legislation/sr/statutes/m01-001.htm

Newfoundland and Labrador *Management of Greenhouse Gas Regulations:* https://assembly.nl.ca/Legislation/sr/regulations/rc180116.htm

Newfoundland and Labrador Mining Act: https://www.assembly.nl.ca/legislation/sr/statutes/m15-1.htm

Newfoundland and Labrador *Mineral Act*: http://assembly.nl.ca/Legislation/sr/statutes/m12.htm

Newfoundland and Labrador *Municipalities Act, 1999*: http://assembly.nl.ca/Legislation/sr/statutes/m24.htm

Newfoundland and Labrador *Revenue Administration Act:* https://www.assembly.nl.ca/Legislation/sr/statutes/r15-01.htm

Newfoundland and Labrador *Sustainable Development Act*: (to be proclaimed) http://assembly.nl.ca/Legislation/sr/statutes/s34.htm

Newfoundland and Labrador *Urban and Rural Planning Act, 2000* : http://assembly.nl.ca/Legislation/sr/statutes/u08.htm

Newfoundland and Labrador *Sustainable Development Act*: (to be proclaimed) http://assembly.nl.ca/Legislation/sr/statutes/s34.htm

Newfoundland and Labrador *Water Resources Act*:

http://assembly.nl.ca/Legislation/sr/statutes/w04-01.htm

Ramsar Convention Secretariat. 2006. The Ramsar Convention Manual, 4th edition. *A Guide to the Convention on Wetlands*. http://www.ramsar.org/pdf/lib/lib_manual2006e.pdf

SARA-CEAA Guidance Working Group (Canada). 2010. *Addressing Species at Risk Act considerations under the Canadian Environmental Assessment Act for Species Under the Responsibility of the Minister Responsible for Environment Canada and Parks Canada*. http://www.registrelep-sararegistry.gc.ca/document/dspDocument_e.cfm?documentID=2100

The Government of Newfoundland and Labrador's Policy for Development in Wetlands, 2001 http://www.env.gov.nl.ca/env/waterres/regulations/policies/wetlands.html

APPENDIX A: PUBLIC NOTICES AND MEETINGS

The purpose of this section is to clarify for proponents and the public, the format, scheduling, number, notification requirements, etc. for public consultations in relation to undertakings required under the Environmental Protection Act, SNL 2002 cE-14.2, (Section 58) to prepare an Environmental Impact Statement (EIS).

1. The proponent is required to conduct a public meeting(s)/information session(s) under an EIS process as specified in the legislation. This requirement shall be specified in the project EIS guidelines.
2. A public meeting shall normally be held in the largest local population centre within the project area. This shall be the minimum requirement. In addition, when demonstrated public interest or concern warrants, additional meetings may be required. This may take the form of additional meetings to be held in major regional or provincial population centres, or possibly additional meetings within the original community. Such requirements are at the discretion of the Minister based on consensus advice from the environmental assessment committee (EAC) chairperson, and based upon public interest as evidenced by public submissions received.
3. The format of the public meeting may be flexible, and the proponent is free to propose a suitable format for approval by the EAC. The format may range from formal public meetings chaired by the proponent or representative with presentations followed by questions and answers, to a less formal open house forum where the public may discuss the proposal with the proponent or representatives. Other formats may be considered by the EAC. The purpose of the public information session is to 1) provide information concerning the proposed undertaking to those who may be affected, and 2) to record the concerns of the local community regarding the undertaking. Any format shall meet these objectives.
4. The proponent shall ensure that each public meeting is advertised in accordance with the following specified public notification requirements, which shall form part of the project guidelines when appropriate (proponent to substitute appropriate information for italicised items):

Public Notice

Public Information Session on the Proposed

Name of undertaking

Location of undertaking

Shall be held at

Date and Time

Location

This session shall be conducted by the Proponent,

Proponent name and contact phone number,

as part of the environmental assessment for this Project,

to describe the activities associated with and to provide an opportunity for all interested persons to request information or state their concerns.

ALL ARE WELCOME

Minimum information content of public advertisement - (Proponent to substitute appropriate information for italicized items).

Minimum newspaper ad size: 2 column widths.

Minimum posted ad size: 7" x 5"

Minimum newspaper ad coverage: Weekend preceding meeting and 3 consecutive days prior to meeting date; to be run in newspaper locally distributed within meeting area or newspaper with closest local distribution area.

Minimum posted ad coverage: Local Town or City Hall or Office and local Post Office, within town or city where meeting is held, to be posted continually for 1 full week prior to meeting date.

Any deviation from these requirements for any reason shall receive prior written approval of the Minister of Municipal Affairs and Environment.

APPENDIX 1C

Marathon Gold Corporation Policies

Marathon Gold's Policies

Marathon Gold Corporation ("Marathon" or the "Company") has developed operating policies related to health and safety, environment, communities, Indigenous groups, and business governance which flow from our values and our commitment to the responsible development of a modern mining business. These policies are as follows:

Health and Safety Policy

Environmental Management Policy

Community Relations Policy

Indigenous Relations Policy

Code of Business Conduct and Ethics

Diversity Policy

Procurement Policy

Whistleblower Policy

Marathon's policies are based on fundamental principles which are derived from the Company's core operating values. These principles are:

- Compliance with all relevant laws, legislation and applicable industry rules, codes and ethical standards;
- Avoidance, mitigation and remediation of adverse risk towards employee well-being, the environment, and communities, and the proactive identification and management of such risks;
- Constant consideration for the dignity, well-being, and safety of our employees;
- Constant consideration for the well-being of the local communities that existed before our business commenced and will exist after our business has ended;

Marathon Gold's Policies

- Constant commitment to gender equality, diversity and inclusivity;
- Respect for the rights, values, culture and practices of Indigenous peoples;
- Ongoing, meaningful engagement with Indigenous groups, communities and civil society groups to build mutually beneficial relationships and contribute to the creation of lasting socio-economic benefits and sustainable development;
- The adoption of the highest professional standards in science and engineering and their application to our business;
- The willingness to adapt our operating procedures to the best practices learned from our peers and partners;
- The development and maintenance of comprehensive rules-based management systems;
- Continuous measurement and improvement of operating performance in our business practices;
- The adoption of the best standards in business governance through effective Board, management and third party oversight of our operations; and
- The maintenance of ongoing, open, honest and transparent communications with internal and external stakeholders.

Marathon's policies are living documents, subject to review and modification as our business evolves. They are to be clearly communicated to employees, contractors, consultants and visitors to the Valentine project site, and will be available on our website for external stakeholders. Elements of these corporate policy statements will be integrated as appropriate into tender documents for 3rd party suppliers of goods and services, and compliance with these standards will be made a condition of contract awards. On-site contractors may be required to demonstrate their compliance with policy, in particular with respect to health and safety and environmental and compliance, through regular reporting.

Health and Safety Policy

Marathon Gold Corporation ("Marathon" or the "Corporation") is committed to the successful development and operation of the Valentine Gold Project (the "Project"). Our vision is an enterprise balancing commercial success with a safe working environment, effective environmental management, and the creation of lasting social benefit.

The health and safety of people is an utmost priority for Marathon. We are committed to providing a safe working environment for all employees, contractors and visitors. Marathon's Health and Safety Policy has been developed with a view to identifying, assessing and managing risks to our people, and fostering a culture of safety in our workplaces.

Scope of the Policy

Marathon's objective is to identify, assess and manage risks to the health and safety of its people expressed in five primary commitments:

- Commitment to a workplace culture of zero harm;
- Commitment to the avoidance of injury and occupational illness;
- Commitment to the promotion of employee wellness and healthy lifestyles;
- Commitment to active safety leadership; and,
- Commitment to continuous improvement.

Marathon's Health and Safety Policy is a living document, subject to review and modification as our business evolves and based on evolving best-practice standards for health and safety performance in the Canadian mining industry. Marathon's Health and Safety Policy should be read in conjunction with individual operating standards for specific site-activities established for the Project.

The "Courage to Care"

Marathon understands that health and safety in the workplace is a shared responsibility, and that all parties, whether employees, contractors or stakeholders, have roles in hazard identification, risk assessment, and risk management. Ultimately, the establishment of effective controls and practices for a zero-harm workplace is achieved through collaboration, transparency, and the "Courage to

Care" for others. Marathon acknowledges this shared responsibility through the following measures:

- Communication of our safety values, programs and policies to all employees, contractors, visitors and the public;
- Establishing clear accountability for heath and safety management and performance;
- Open engagement with employees in the development and implementation of standards and encouraging an open dialog with internal and external stakeholders at all times;
- The willingness to adapt our health and safety procedures to the best practices learned from our peers and partners;
- Integration of health and safety considerations into operational decision-making, planning and activities;
- The establishment of relevant and measurable Key Performance Indicators ("KPIs") of health and safety outcomes, with both leading and lagging indicators, to evaluate organizational performance;
- The measurement of health and safety indicators in an objective and transparent fashion, and the assessment of outcomes against comparable Canadian mining industry data;
- A focus on continuous improvement in the assessment of leading indicators and accident prevention initiatives, and incentivising near-miss reporting;
- The disclosure of the Company's health and safety outcomes publicly, and in a timely manner;
- Promotion of healthy lifestyles through employee awareness and training, fitness for work standards, and occupational health programs;
- The equal application of safety standards to board directors, company executives, employees, contractors and visitors;
- Ensuring that supplies of personal protective equipment (PPE) appropriate to the task are readily available;
- Incorporation of health and safety outcomes into annual executive compensation reviews; and
- Compliance with all applicable laws, regulations, standards, and relevant industry best practices.

Communication and Compliance

This Health and Safety Policy shall be clearly communicated to both internal and external stakeholders, including employees, 3rd party suppliers of goods and services, Indigenous groups, local communities, regulators and civil society groups, and published on Marathon's website.

Training and orientation on this Policy, as well as individual operating standards for specific site-activities, will be provided for all employees and on-site contractors. Completing such training and orientation will be a condition for on-site access. All employees and 3rd party suppliers of goods and services at the Project will be required to adhere to Marathon's Health and Safety Policy. Notices of expected compliance will be made at the time of employment and in tender documents for supply and service contracts. On-site contractors may be required to demonstrate their compliance with this policy through regular reporting and adherence to Marathon's Occupational Health and Safety Management System. Non-compliance with this policy, and any associated operating standards for specific site-activities, may result in employee termination, or the termination of supply and service contracts.

Marathon welcomes and encourages dialogue to enhance our understanding of health and safety concerns or risks throughout all phases of the Project.

Occupational Health and Safety Management System

Marathon will develop an integrated and comprehensive Occupational Health and Safety Management System, with associated safe work policies, procedures and practices, which will be implemented prior to the start of construction. The management system will also include industry standard elements such as maintaining and supporting a site-based Occupational Health and Safety Committee; incident reporting and investigation, including determining the root cause and identifying and implementing corrective actions; conducting internal audits and regular workplace inspections; ensuring appropriate use of PPE; and requiring daily toolbox talks and mandatory pre-job safety checklists. The Occupational Health and Safety Management System will be regularly reviewed and revised as necessary to incorporate evolving standards and best practices.

Continuous Improvement

Marathon is committed to continuous improvement of its health and safety performance, measures and practices, through employing the continuous improvement cycle (plan, do, check, act). To achieve this, Marathon will continually strive to improve health and safety performance based on defined targets, performance indicators and objectives for monitoring, measuring and reporting.

Marathon will monitor activities through each phase of the Project with timely and effective follow-up, and will report openly, honestly and in a timely manner on our progress to achieving responsible development.

Environment Policy

Marathon Gold Corporation ("Marathon" or the "Corporation") is committed to the successful development and operation of the Valentine Gold Project (the "Project"). Our vision is an enterprise balancing commercial success with a safe working environment, effective environmental management, and the creation of lasting social benefit.

Marathon shall implement high standards of environmental performance in all aspects of our work as part of our commitment to safe and responsible environmental, social and economic development. Marathon's Environment Policy has been developed with a view to preventing and reducing the adverse effects of our activities and maximizing the positive benefits and impacts upon people, communities and the biophysical environment.

Scope of the Policy

As part of our ongoing exploration activities and throughout all phases of the development, construction, operation and rehabilitation of the Valentine Gold Project, Marathon will implement a responsible approach to social, economic and environmental performance that is aligned with the evolving priorities of Indigenous groups, stakeholders and regulators, and which complies with standards established by law, regulation, and the Company's operating permits for the Project.

Our actions will be consistent with Marathon's Values that will inform and guide the development of measures to protect the natural environment and enhance socio-economic benefits. Marathon will proactively engage with Indigenous groups, communities, stakeholders and regulators to identify and manage environmental risks and opportunities as part of Project planning and execution.

Marathon's Environment Policy is a living document, subject to review and modification as our business evolves and based on evolving best-practice standard for environmental performance in the Canadian mining industry.

Marathon's Environment Policy should be read in conjunction with individual operating standards for specific site-activities established for the Project.

Compliance with Laws, Rules and Regulations

Marathon will comply with all applicable environmental laws, regulations and standards and ensure that effective systems, practices and plans, based on industry best practices, are in place to prevent, mitigate and manage environmental risks. This policy should be read in conjunction with Marathon's Code of Business Conduct and Ethics.

Communication and Compliance

This Environment Policy shall be clearly communicated to both internal and external stakeholders, including employees, 3rd party suppliers of goods and services, Indigenous groups, local communities, regulators and civil society groups, and published on Marathon's website.

Training and orientation on this Policy, as well as individual operating standards for specific site-activities, will be provided for all employees and on-site contractors. Completing such training and orientation will be a condition for on-site access.

All employees and 3rd party suppliers of goods and services at the Project will be required to adhere to Marathon's Environment Policy. Notices of expected compliance will be made at the time of employment and in tender documents for supply and service contracts. On-site contractors may be required to demonstrate their compliance with this policy through regular reporting and adherence to Marathon's Environmental Management System. Non-compliance with this policy, and any associated operating standards operating standards for specific site-activities, may result in employee termination, or the termination of supply and service contracts.

Marathon welcomes and encourages dialogue to enhance our understanding of environmental concerns or risks throughout all phases of the Project.

Environmental Management System

Marathon will develop, implement, document and maintain a comprehensive environmental management system which will be integrated into all aspects of our activities. We will employ a graduated approach to the management of environmental risks, which emphasizes avoidance of adverse effects as the first priority, followed by reduction / mitigation measures, with remediation as the last option.

Consistent with this focus, we will develop, design and operate our facilities in a manner that promotes the best and most efficient use of energy, technology, resources and materials. Our environmental management plans will include processes to avoid unnecessary uses of energy and water, control emissions including those linked with climate change, reduce waste, and structure activities to reduce our environmental footprint to the extent possible.

Marathon places a high priority on the avoidance or reduction of lasting adverse effects on the environment, including to fish and fish habitat, wildlife and land use. We will employ a progressive approach to rehabilitation and reclamation to avoid or reduce adverse legacy environmental consequences and will integrate rehabilitation and reclamation requirements into Project planning.

Continuous Improvement

Marathon is committed to continuous improvement of its environmental performance, measures and practices, through employing the continuous improvement cycle (plan, do, check, act). To achieve this, Marathon will continually strive to improve environmental performance based on defined targets, performance indicators and objectives for monitoring, measuring and reporting. Marathon will monitor activities through each phase of the Project with timely and effective follow-up, and will report openly, honestly and in a timely manner on our progress to achieving responsible development.

Community Relations Policy

Marathon Gold Corporation ("Marathon" or the "Corporation") is committed to the successful development and operation of the Valentine Gold Project (the "Project"). Our vision is an enterprise balancing commercial success with a safe working environment, effective environmental management, and the creation of lasting social benefit.

Scope of the Policy

Marathon Gold understands that exploration and mining activity can bring positive social and economic benefits to communities and regions when potential environmental and socio-economic impacts are understood and well-managed.

We believe that effective management of potential environmental and socio-economic impacts is best achieved through listening, collaboration and cooperation with communities and stakeholders. We are committed to meaningful and ongoing community engagement. Early development of constructive relationships with local communities based on respectful dialogue with community leaders and residents is critical to responsible development and will help to ensure our projects are sustainable and successful in all aspects.

Marathon's Commitments

Marathon acknowledges that it is responsible, together with government and other partners, to mitigate the adverse impacts of our operations and to maximize local benefits. Marathon's Values inform and guide an approach to engagement that acknowledges, considers, and responds to the concerns of people and their communities. Through engagement we will:

- Acknowledge that our business fundamentally impacts people and communities;
- Acknowledge that people and communities existed on the land before our business commenced, and will exist after our business has ceased;
- Work proactively with communities to identify and manage risks and opportunities and achieve long-term, mutual success;
- Deal with communities in an inclusive, transparent, culturally appropriate manner;

- Maintain open and honest lines of two-way communication so that communities are provided with the necessary information, including information relating to our environmental performance and employment and business opportunities, on an ongoing basis;
- Collaborate with communities to prevent or mitigate adverse effects and promote responsible social and economic development;
- Take the values, needs and priorities of communities into account in our planning and decision-making processes;
- Seek to maximise employment and contracting opportunities within local communities;
- Recognize local community business capacities when formulating procurement packages;
- Work with communities to foster community health and well-being through a program of investment and sponsorship that leaves a lasting, positive legacy;
- Continually assess and seek improvement of our community relations; and,
- Formalize our commitments with local communities through cooperation or partnership agreements.

Effective community communication and engagement is critical to obtaining and preserving our social licence to operate. Building community trust and support is a normal part of the way we do business. We are committed to working with local communities to develop projects which create value for our stakeholders and shareholders.

Marathon's Community Relations Policy is a living document, subject to review and modification as our business evolves and based on evolving best-practice standards for community and stakeholder engagement in the Canadian mining industry.

Indigenous Relations Policy

Marathon Gold Corporation ("Marathon" or the "Corporation") is committed to the successful development and operation of the Valentine Gold Project (the "Project"). Our vision is an enterprise balancing commercial success with a safe working environment, effective environmental management, and the creation of lasting social benefit.

Scope of the Policy

Marathon acknowledges the unique culture and history of Indigenous Peoples in the Central Region of Newfoundland and Labrador and understands that they may have interests and concerns that differ from, or are in addition to, those of stakeholder groups. We are committed to working constructively and in a spirit of good faith with these Indigenous Peoples to achieve mutually beneficial outcomes.

Marathon's approach to engagement with Indigenous Peoples will apply over the life of the Project, including development, construction, operation, and rehabilitation.

Marathon's Indigenous Relations Policy is a living document, subject to review and modification as our business evolves and based on evolving best-practice standards for the engagement with, and participation of, Indigenous Peoples in the Canadian mining industry.

Marathon's Commitments

Marathon's Values inform and guide the development of measures to (1) protect the natural environment; (2) minimize cultural and social impacts on communities and Indigenous Peoples; and, (3) enhance socio-economic benefits for all stakeholders. We recognize that the success of our enterprise includes the successful participation of Indigenous people in employment and contracting opportunities at all stages of the Project's life.

Marathon acknowledges these responsibilities through the following measures:

- Acknowledgement of potential or established Indigenous or treaty rights and compliance with the requirements of any applicable treaties, laws, and regulations;
- Protection of cultural and heritage sites;

- Provision of opportunities for Indigenous Peoples to share traditional knowledge and information on land and resource use in the Project area;
- Consideration of traditional knowledge and land and resource use information in the identification and assessment of Project effects;
- Working cooperatively with Indigenous Peoples to identify Project effects and develop and implement appropriate mitigation measures;
- Working cooperatively with Indigenous Peoples to identify and manage environmental risks and opportunities as part of Project planning and execution;
- Integration of traditional knowledge and land and resource use information into the Project decision-making process as appropriate;
- Provision of opportunities for Indigenous Peoples to participate in the Project through employment and/or the supply of goods and services;
- Working cooperatively with Indigenous Peoples to identify and remove barriers to the participation of Indigenous people in the Project; and,
- Implementation of an effective, respectful and meaningful engagement which:
  - Provides accurate and relevant Project information in a timely and culturally appropriate manner;
  - Provides sufficient opportunities to identify issues and concerns; and,
  - Enables consideration of, and response to, Indigenous issues and concerns.

Marathon will maintain constructive dialogue with Indigenous Peoples to ensure that their views are taken into consideration as the Project progresses. We recognize that Indigenous interests and activities in relation to the Project may evolve with time, and we acknowledge the need to conduct ongoing assessment of the impact of the Project on Indigenous people.

Code of Business Conduct and Ethics

The Code of Business Conduct and Ethics (the "Code") has been adopted by the Board of Directors of the Corporation. This Code embodies the commitment of the Corporation and its subsidiaries to conduct our business in accordance with all applicable laws, rules and regulations and high ethical standards.

The actions of all the Corporation's employees, consultants, officers and directors shall reflect honesty, integrity and impartiality that is beyond doubt and all business should be done in a manner that:
(i) complies with laws, rules and regulations;
(ii) avoids conflicts of interest;
(iii) protects confidential information; and
(iv) adheres to good disclosure practices, in accordance with applicable legal and regulatory requirements.

The Corporation encourages all employees, consultants, officers and directors to submit good faith complaints or concerns regarding accounting or auditing matters to the Corporation without fear of reprisal.

Those who violate the standards in this Code will be subject to disciplinary action, up to and including termination. If a situation exists or arises where an individual is in doubt, the individual should seek the advice from the Chief Financial Officer ("CFO").

Compliance with Laws, Rules and Regulations

The Corporation is committed to compliance with all applicable laws, rules, and regulations in each jurisdiction in which it does business. All employees, consultants, officers and directors must respect and obey the laws, rules and regulations of the cities, states and countries in which we operate.

Employees, consultants, officers and directors should educate themselves on the laws, rules and regulations that govern their work, and seek advice from supervisors, managers or other appropriate individuals at the Corporation. Employees, consultants, officers and directors who have access to confidential information are not permitted to use or share that information for stock trading

purposes or for any other purpose except the conduct of our business. All non-public information about the Corporation (or about any other company) should be considered confidential information. To use non-public information for personal financial benefit or to "tip" others, including family members, who might make an investment decision on the basis of this information, is not only unethical but also illegal. The Corporation has adopted an Insider Trading Policy in order to prevent improper trading of securities of the Corporation and the improper communication of undisclosed material information regarding the Corporation. All employees, consultants, officers and directors are expected to thoroughly understand and comply with such policy.

Conflicts of Interest

All employees, consultants, officers and directors have an obligation to act in the best interests of the Corporation. Employees, consultants, officers and directors should not be involved in any activity that creates or gives the appearance of a conflict of interest between the interests of the Corporation and their personal interest or the interests of a third party they are involved with. A conflict of interest occurs when an individual's private interest (or the interest of a member of his or her family) interferes, or even appears to interfere, with the interests of the Corporation. Employees and consultants must notify the CFO and officers and directors must notify the Chair of the Audit Committee and the Chair of the Board of the existence of any actual or potential conflict of interest.

If a conflict of interest exists, and there is no failure of good faith on the part of the employee, consultant, officer or director, the Corporation's policy generally will be to allow a reasonable amount of time for the employee, consultant, officer or director to correct the situation in order to prevent undue hardship or loss. However, all decisions in this regard will be at the discretion of the Chief Executive Officer ("CEO") (and in the case of the CEO, the Board of Directors), whose primary concern in exercising such discretion will be what is in the best interests of the Corporation.

Examples of a potential conflict of interest include:
(i) Employment/Outside Employment. In consideration of your employment with the Corporation, you are expected to devote your full attention to the business interests of the Corporation. You are prohibited from engaging in any activity

that interferes with your performance or responsibilities to the Corporation or is otherwise in conflict with or prejudicial to the Corporation. Our policies prohibit any employee, consultant, officer or director from accepting simultaneous employment with a corporation, supplier, customer, developer or competitor, or from taking part in any activity that enhances or supports a competitor's position. Additionally, you must immediately disclose to the Corporation any interest that you have that may conflict with the business of the Corporation. If you have any questions on this requirement, you should contact the CFO.

(ii) Outside Directorships. It is a conflict of interest to serve as a director of any company that competes with the Corporation. Although you may serve as a director of a company, supplier, customer, developer or other business partner, our policy requires that such position not conflict or otherwise interfere with your duties to the Corporation and that you first obtain written approval from the Corporation's CEO in the case of an employee or consultant of the Corporation or the Chair of the Board in the case of an officer or director of the Corporation, before accepting a directorship. Any compensation you receive should be commensurate with your responsibilities in your capacity as a director. Such approval may be conditioned upon the completion of specified actions.

(iii) Business Interests. If you are considering investing in a customer, supplier, developer or competitor of the Corporation, you must first take great care to ensure that these investments do not compromise your responsibilities to the Corporation. Many factors should be considered in determining whether a conflict exists, including the size and nature of the investment; your ability to influence the Corporation's decisions; your access to confidential information of the Corporation or of the other company; and the nature of the relationship between the Corporation and the other company. You should generally try to avoid even the appearance of impropriety or conflict.

(iv) Property Interests. The direct or indirect ownership of mineral properties or claims by an employee, consultant, officer or director of the Corporation creates a potential conflict of interest and any such interest must be disclosed to the CFO immediately upon commencement of employment with the Corporation and thereafter prior to the acquisition of such interest.

(v) Related Party Transactions. As an absolute rule, you should avoid conducting Corporation business with a relative or significant other, or with a business in which a relative or significant other is associated in any significant role. Relatives include spouse, sister, brother, daughter, son, mother, father, grandparents, aunts, uncles, nieces, nephews, cousins, step relationships, and in laws. Significant others include persons living in a spousal or familial fashion with an employee, consultant, officer or director.

If a related party transaction is unavoidable, you must fully disclose the nature of the related party transaction to the Corporation's CFO. If determined to be material to the Corporation by the CFO, the Corporation's Audit Committee must review and approve in writing in advance such related party transactions. The most significant related party transactions, particularly those involving the Corporation's directors or executive officers, must be reviewed and approved in writing in advance by the Corporation's Board of Directors. The Corporation must report all such material related party transactions under applicable accounting rules, Federal securities laws, SEC rules and regulations, and securities market rules. Any dealings with a related party must be conducted in such a way that no preferential treatment is given to this business.

Willful withholding of information regarding a prohibited relationship/reporting arrangement may be subject to corrective action, up to and including termination. If a prohibited relationship exists or develops between two employees, the employee in the senior position must bring this to the attention of his/her supervisor. The Corporation retains the prerogative to separate the individuals at the earliest possible time, either by reassignment or by termination, if necessary.

(vi) Related Party Employment. The employment of related parties (as defined above), whether as full-time employees, seasonal or student employees, or independent contractors, is permitted only with the prior consent of the CEO.

(vii) Other Situations. Since other conflicts of interest may arise, it would be impractical to attempt to list all possible situations. If a proposed transaction or situation raises any questions or doubts in your mind you should consult the CFO. If you are aware of a conflict or potential conflict of interest, as an employee or consultant you should bring the matter to the attention of a supervisor or manager

or report the matter in accordance with the Corporation's whistleblower policy. If you are aware of a conflict or potential conflict as an officer or director, you should promptly bring the matter to the attention of the Chair of the Audit Committee or report the matter in accordance with the Corporation's whistleblower policy.

Confidentiality

To avoid a breach of confidentiality, all employees, consultants, officers and directors should maintain all confidential information in strict confidence, except when disclosure is authorized by the Corporation or legally mandated. Confidential information includes, among other things, any non-public information concerning the Corporation, including its business, financial performance, results or prospects, and any non-public information provided by a third party with the expectation that the information will be kept confidential and used solely for the business purpose for which it was conveyed. The obligation to keep information confidential also extends beyond your employment or directorship with the Corporation.

Corporate Opportunities

Employees, consultants, officers and directors are prohibited from taking for themselves, personally or for the benefit of others, opportunities that are discovered through the use of corporate property, information or position, except to the extent that a waiver has been granted under this Code. No employee, consultant, officer or director may use corporate property, information, or position for improper personal gain or for the improper personal gain of others, and no employee, consultant, officer or director may compete with the Corporation directly or indirectly. Employees, consultants, officers and directors owe a duty to the Corporation to advance the Corporation's interests when the opportunity to do so arises.

Protection and Proper Use of Company Assets

All employees, consultants, officers and directors should protect the Corporation's assets and ensure their efficient use. The Corporation's assets should be protected from loss, damage, theft, misuse, and waste. Corporate assets include your time at work and work product, as well as the Corporation's equipment and vehicles, computers and software, trading and bank accounts, company information and the Corporation's reputation, trademarks and name. The Corporation's telephone, email, voicemail and other electronic systems are primarily for business purposes.

Personal communications should be kept to a minimum. Unauthorized use or distribution of this information would violate corporate policy. It is also illegal and could result in civil or even criminal penalties.

Competition and Fair Dealing

Each employee, consultant, officer and director should endeavor to deal fairly with the Corporation's counterparties, suppliers, competitors and employees. The Corporation seeks to outperform its competition in a fair and honest manner. No employee, consultant, officer or director should take unfair advantage of anyone through unlawful manipulation or concealment, abuse of privileged information, misrepresentation of material facts or any other intentional unfair-dealing practice. Each employee, consultant, officer or director is required to maintain impartial relationships with corporate suppliers and customers.

Gifts, Favours, Entertainment and Payments Received by Employees

Employees are expected to act and make decisions based on an impartial and objective assessment of each situation, free from the influence of gifts and similar favours that might compromise judgment. The Corporation avoids both the fact and the appearance of improperly influencing relationships with the organizations or individuals with whom it deals.

Employees shall not seek or accept gifts, payments, fees or services, valuable privileges, vacations, trips without a business purpose, loans (other than conventional loans from lending institutions), or other favours, from any person or business organization that does business with or is a competitor of the Corporation, except as provided below.

No employee is permitted to accept anything of value in exchange for referral of third parties to any such person or business organization. The following guidelines should be followed:

(i) Employees may accept gifts and entertainment usually associated with accepted business practices for themselves and members of their families if:

1. they are infrequent;
2. they legitimately serve a definite business purpose;
3. they are appropriate to the business responsibilities of the individuals involved; and
4. they are within the limits of reciprocation as a normal business expense.

(ii) Employees should neither give nor receive gifts with more than a nominal value. Employees must inform their immediate superior of gifts and entertainment received within a reasonable period not exceeding one month from receipt.

(ii) A strict standard is expected with respect to gifts, services or considerations of any kind from suppliers. Entertainment at the expense of suppliers, which exceeds the limits set out in the guidelines presented above, should not be accepted in any circumstances.

(iii) It is never permissible to accept a gift in cash or cash equivalents (i.e. stocks or other form of marketable securities) of any amount.

(iv) The propriety of employees keeping valuable gifts with a value substantially in excess of Canadian accepted business practices, versus turning them over to the Corporation should be discussed with the CFO.

Gifts, Favours, Entertainment and Payments Given by the Corporation

Gifts, favours, and entertainment may be given to others at the Corporation's expense only if they meet all the following criteria:

(i) They are consistent with accepted business practices;

(ii) They are of sufficiently limited value, and in a form that could not be construed as a bribe or payoff;

(iii) They are not in violation of applicable laws and generally accepted ethical standards; and

(iv) Public disclosure of the facts will not embarrass the Corporation.

Anti-Bribery and Corruption

Corruption is the misuse of public power for private profit, or the misuse of entrusted power for private gain. Bribery is the offer, promise, or payment of cash, gifts, or even excessive entertainment, or an inducement of any kind offered or given to a person in a position of trust to influence that person's views or conduct or to obtain an improper advantage. Bribery and corruption can take many forms, including the provision or acceptance of:

(i) Cash payments;

(ii) Phony jobs or "consulting" relationships;

(iii) Kickbacks;

(iv) Political contributions;

(v) Charitable contributions;

(vi) Social benefits; or

(vii) Gifts, travel, hospitality, and reimbursement of expenses.

The Corporation's personnel and agents are strictly prohibited from offering, paying, promising, or authorizing any payment or other thing of value to any person directly, or indirectly through a third party for the purpose of:

(i) causing the person to act or fail to act in violation of a legal duty;

(ii) causing the person to abuse or misuse their position; or

(iii) securing an improper advantage, contract or concession for the Corporation or any other party.

Monitoring of payments that could enable such transactions, including through the use of lawyers, agents and consultants, will be specifically identified and monitored on a regular basis to ensure compliance with anti-bribery legislation and the Criminal Code of Canada.

Employee Harassment and Discrimination

The Corporation is committed to fair employment practices in which all individuals are treated with dignity and respect. To that end, the Corporation will adopt the Respectful Workplace Policy & Harassment Prevention Plan which each employee, officer and director will be required to comply with.

Environmental, Safety, and Occupational Health Practices

The Corporation believes that sound environmental, safety and occupational health management practices are in the best interests of the Corporation, its employees, consultants, officer, directors and its shareholders and the communities in which it operates. The Corporation is committed to conducting its business in accordance with recognized industry standards and to meeting or exceeding all applicable environmental and occupational health and safety laws and regulations. Achieving this goal is the responsibility of all employees, consultants, officers and directors.

Whistleblower Policy

The Corporation is committed to maintaining the highest standards of business conduct and ethics, as well as full compliance with all applicable government laws, rules and regulations, corporate reporting and disclosure, accounting practices, accounting controls, auditing practices and other matters relating to fraud against shareholders (collectively "Governance Concerns").

Pursuant to its charter, the Audit Committee of the Board of Directors of the Corporation is responsible for ensuring that a confidential and anonymous process exists whereby persons can report any Governance Concerns relating to the Corporation and its subsidiaries. In order to carry out its responsibilities under its charter, the Audit Committee has adopted this Whistleblower Policy (the "Whistleblower Policy").

For the purposes of the Whistleblower Policy, "Governance Concerns" is intended to be broad and comprehensive and to include any matter, which in the view of the complainant, is illegal, unethical, contrary to the policies of the Corporation or in some other manner not right or proper.

Examples would include, but are not limited to:

(i) Violation of any law or regulation that relates to corporate reporting and disclosure;

(ii) Fraud or intentional acts of misstatement in the preparation, evaluation and review of the Corporation's financial statements and other continuous disclosure documents;

(iii) Fraud or deliberate error in the recording and maintenance of the Corporation's financial records;

(iv) Violations of the Corporation's internal policies; and

(v) False statements by or to a director, officer or employee of the Corporation with respect to matters reflected in the Corporation's financial records and financial reporting, or other elements of the Corporation's continuous disclosure.

Any person with an accounting concern, or any other concern, relating to the Corporation of any of its subsidiaries may submit his/her concern on a confidential and anonymous basis directly to the Chair of the Audit Committee in accordance with the Whistleblower Policy.

Waivers of the Code

From time to time, the Corporation may waive certain provisions of this Code. Waivers generally may only be granted by the CEO. However, any waiver of the provisions of this Code for officers, directors, including the CEO and CFO may only be made by the Board of Directors or its designee and will be disclosed to shareholders as required by applicable rules and regulations.

Diversity and Inclusivity Policy

Marathon Gold Corporation ("Marathon" or the "Corporation") is committed to the successful development and operation of the Valentine Gold Project (the "Project"). Our vision is an enterprise balancing commercial success with a safe working environment, effective environmental management, and the creation of lasting social benefit.

Marathon seeks to foster a diverse and inclusive corporate culture that acknowledges and values difference. Our workplaces shall reflect the business environment and geographic locations in which we operate, where all employees, regardless of age, gender, beliefs, language, race, ethnicity, Indigenous identity or physical abilities, are appreciated and respected for the talent and knowledge they bring to the Corporation.

Marathon understands that the inclusion of diverse ideas, talents, skills and perspectives at all levels within the workforce promotes creativity and thought-provoking discussions and solutions. Maintaining a corporate culture where all voices and points of views are heard and considered builds a stronger, more representative, engaged and competitive workforce.

Marathon recognizes that barriers to creating a diverse and inclusive workplace are common, and can be promulgated through indifference in leadership or systemic bias. We are committed to identifying and removing barriers wherever they exist. Our commitment to diversity and inclusion is reflected in all levels of the company, beginning with our Board of Directors and executive team.

We aim for a workforce which is comprised of talented and dedicated individuals who bring a wide mix of knowledge, expertise, experience, skills and backgrounds to their positions and to the team. Our employee selection and advancement processes will be founded on Marathon's Values. They will be equitable, non-discriminatory and free from bias, conscious or unconscious.

We consider all individuals based on merit, having due regard to the benefits of diversity and corporate needs and priorities.

DIVERSITY AND INCLUSIVITY POLICY

Marathon's commitment to diversity and inclusion aligns with our core corporate Values and is explicitly reflected in our Indigenous Relations Policy and Community Relations Policy. It informs our strategic planning and is incorporated into all aspects of our corporate structure.

Marathon's Diversity and Inclusivity Policy is a living document, subject to review and modification as our business evolves and based on evolving best-practice standards for human resource development in the Canadian workplace.

Whistleblower Policy

Marathon Gold Corporation ("Marathon" or the "Corporation") is committed to maintaining high standards of business conduct and ethical behavior, as well as complying fully with applicable laws, rules and standards applying to corporate reporting and continuous disclosure, accounting practices and controls, and processes for the prevention and detection of fraud, bribery or other improper activities.

MI 52-110 Requirement

Pursuant to Multilateral Instrument 52-110, the Corporation's Audit Committee is required to establish procedures for:
a) the receipt, retention, and treatment of complaints received by the Corporation regarding accounting, internal accounting controls, or auditing matters; and
b) the confidential, anonymous submission by employees of the Corporation of concerns regarding questionable accounting or auditing matters.

This procedures policy is designed to achieve this purpose and to address more generally any Governance Concerns, as described below, raised by directors, officers, employees and service providers working at any level within the Corporation (each a "Relevant Individual").

Governance Concerns Explained

For the purposes of this Policy, "Governance Concerns" are intended to be applied broadly and to encompass any matter or behavior which, in the reasonable and genuinely held belief of a complainant, represents professional malpractice; is illegal, unethical, or criminal in nature; is in violation of any promulgated policy of the Corporation; or is in some other manner improper. It is not intended to deal with personal grievances or employment-related disputes.

Examples of a Governance Concern addressable by this policy include, but are not limited to, allegations of the following:

- Violation of any law or regulation including those related to corporate reporting and disclosure.
- Fraud or intentional acts of misstatement including in the preparation, evaluation

and review of the Corporation's financial statements and other continuous disclosure documents.

- Fraud or deliberate error related to the Corporation's operations or finances including in the recording and maintenance of the Corporation's financial records.
- Violation of the Corporation's internal policies including the Corporation's Code of Business Conduct and Ethics.
- False statements by or to a director, officer or employee of the Corporation with respect to matters reflected in the Corporation's financial records and financial reporting, or other elements of the Corporation's continuous disclosure.

This policy should not be used to report any personal grievance. Any complaints about a Relevant Individual's own personal circumstances (for example an employment dispute) should be pursued with the appropriate line manager through the ordinary grievance channels.

Reporting Governance Concerns

Relevant Individuals should report a Governance Concern as soon as they have a reasonable suspicion, unease or disquiet regarding a situation or matter. A Relevant Individual is not expected to investigate the matter personally before reporting it.

Relevant Individuals are encouraged to submit a Governance Concern (the "Governance Complaint") in writing to the Chair of the Corporation's Audit Committee using the contact details set out below. Submissions may be made anonymously and in confidence. Relevant Individuals may also contact the Chair of the Audit Committee to discuss the applicability of this policy or concerns regarding a business practice. If a Relevant Individual is uncomfortable reporting a Governance Concern to the Chair of the Audit Committee, the Relevant Individual may report a matter to the Corporation's external legal counsel using the contact details set out below.

Responding to Governance Complaints

Upon receiving a Governance Complaint, the Chair of the Audit Committee will, depending upon the apparent urgency of the matter, call a meeting of the Audit Committee or add the Governance Complaint to the agenda for consideration at the next regularly scheduled meeting of the Audit Committee.

The Audit Committee shall review and discuss, on a preliminary basis, the nature of the Governance Complaint and the accounting, auditing, control or other matters that are called into question. In conducting this review, the Audit Committee will hold an in camera session, and then may request the attendance, at its discretion, of the Chief Executive Officer, the Chief Financial Officer, the Corporation's auditor, the Corporation's external legal counsel, the person making the Governance Complaint (if known and if such person is amenable) or such other persons as it deems necessary. The purpose of the meeting and the nature of the Governance Complaint shall have been communicated to all such attendees by notice prior to the meeting.

If the Audit Committee is satisfied upon a preliminary review that the Governance Complaint has merit, the Audit Committee shall investigate such Governance Complaint with the assistance of such internal and external resources and advisors as it deems appropriate. Following the conclusion of its review, the Audit Committee shall meet to determine the merit of the Governance Complaint and to formulate recommendations on any action to be taken in respect of the Governance Complaint. Minutes of such meeting shall be kept in the normal course in order to ensure a record of the nature and treatment of the Governance Complaint.

Upon reaching such determination, the Audit Committee will communicate its findings and recommendations to the Board. The Board shall consider and implement such recommendations, as it deems advisable, to rectify any deficiencies identified in the Governance Complaint and shall communicate same to management.

The Audit Committee shall ensure that confidentiality will be maintained throughout the investigatory process to the extent practicable and appropriate under the circumstances; and the person who makes the Governance Complaint (if known) shall receive a written summary of the final determination.

The Audit Committee shall retain all documentation regarding the Governance Complaint, its preliminary review, any investigation, determination and implementation of recommendations for a period of no less than ten (10) years.

Administration

The Corporation, through the Chief Executive Officer shall be responsible for the dissemination of this Policy to all Relevant Individuals.

No Retaliation

The Corporation will not allow or pursue retaliation of any kind in respect of a Governance Complaint, or for assistance or information provided to applicable authorities in connection with an investigation of breaches of applicable securities law, where such are made or provided in good faith. In addition, no employee may be adversely affected because the employee refused to carry out a directive which, in fact, constitutes corporate fraud, is a violation of this Policy, a violation of the law, or presents a substantial and specific danger to the public's health and safety. Any retaliatory action should immediately be reported to the Chair of the Board or any other member of the Corporation's Board of Directors.

Contact

Chair of the Audit Committee

In writing:
Julian Kemp
75-11 Pirie Drive
Dundas, Ontario
L9H 6Z6
By phone: 647-554-5367
By email: Jkemp.director@bell.net

External Legal Counsel

In writing:
Alison Babbitt
45 O'Connor Street, Suite 1500,
Ottawa, ON K1P 1A4, Canada
By phone: 613-780-8665
By email: alison.babbitt@nortonrosefulbright.com

APPENDIX 1D

Table of Key Personnel

Appendix 1D Project Team Key Members

EIS Component	Personnel
EIS Management, Senior Direction, and Review, Planning Chapters	James Powell (Marathon Gold) M.Eng., P.Eng. Project Role: VP Regulatory and Government Affairs Years of Experience: 22
	Tara Oak (Marathon Gold) B.Sc. Project Role: Manager, Environmental Assessment Years' Experience: 22
	Mary Hatherly (Marathon Gold) LL.B, LL.M Project Role: Manager, Stakeholder Engagement Years of Experience: 30
	Katherine Fleet (Stantec) B.A., M.E.S, Project Role: Project Manager Years of Experience: 25
	Elizabeth Way (Stantec) M.Sc. Project Role: Independent Reviewer Years of Experience: 18
	Paige Glenen (Stantec) M.Sc. Project Role: Project Coordinator Years of Experience: 14
	Christine Walsh (Stantec) MCIP, LPP Project Role: Project Coordinator Years of Experience: 12
Atmospheric Environment	Gillian Hatcher (Stantec) M.A.Sc. Role: Atmospheric Team Lead Years of Experience: 15
	Melanie Fillingham (Stantec) M.A.Sc., EIT Role: Author Years of Experience: 3
	Vicki Corning (Stantec) P.Eng. Role: Author Years of Experience: 16
	Chris Lyons (Stantec) B.Sc.E., P.Eng. Role: Author Years of Experience: 15
	Gillian Hatcher (Stantec) M.A.Sc. Role: Atmospheric Team Lead Years of Experience: 15
	Mike Murphy (Stantec) Ph.D, P.Eng Role: Quality Reviewer Years of Experience: 35
Water Resources	Jonathan Keizer (Stantec) M.Sc.E., P.Eng. Role: Water Resources Team Lead/ Groundwater Quality Reviewer Years' Experience: 20
	Aaron Power (Stantec) B.Sc.Eng., EIT Role: Groundwater Chapter Author Years of Experience: 6
	Andrew Sullivan (Stantec) P. Eng., M.Phil., ENV SP Role: Surface water Chapter Author Years of Experience: 10
	Sheldon Smith (Stantec) MES., P.Geo. Role: Surface water Quality Reviewer Years of Experience: 25

Appendix 1D Project Team Key Members

EIS Component	Personnel
Fish and Fish Habitat	Barry Wicks (Stantec) B.Sc. Role: Aquatic Team Lead/ Author Years of Experience: 25
	Mary Murdoch (Stantec) M.Sc. Role: Quality Reviewer Years of Experience: 31
Terrestrial Environment	Rebecca Jeffery (Stantec) M.Sc., B.Sc. Role: Terrestrial Team Lead/ Caribou and Other Wildlife Chapter Author Years of Experience: 21
	Mike Preston (Stantec) M.Sc., R.P.Bio. Role: Caribou Chapter Quality Reviewer Years of Experience: 23
	Heather Button (Stantec) B.Sc., P.Biol. Role: Avifauna Chapter Author Years of Experience: 15
	Krystal Mathieson (Stantec) M.Sc. Role: Author Years of Experience: 19
	Jennifer Randall (Stantec) B.Sc., MES Role: Other Wildlife Chapter Author Years of Experience: 8
	Mike Crowell (Stantec) M.Sc. Role: Avifauna, Wetlands and Other Wildlife Quality Reviewer Years of' Experience: 37
Socio-Economic Components	Hilary Janes (Stantec) B.Sc. Role: Socio-Economic Team Lead/ Communities and Infrastructure and Community Health Chapter Author Years of Experience: 14
	Tania Noble (Stantec) M.Eng., P. Eng Role: Community Health Chapter Author Years of Experience: 25
	Stephen Roberts (Stantec) B.Comm., MREM Role: Employment, Economy and Business Chapter Author/ Communities and Infrastructure Quality Reviewer Years of Experience: 12
	Frank Bohlken (Stantec) B.Sc., MRM Role: Employment, Economy and Business Chapter Quality Reviewer Years of Experience: 26
	Christine Walsh (Stantec) MCIP, LPP Role: Land and Resource Use and Indigenous Groups Chapter Author Years of Experience: 12
	Robert Federico (Stantec) MPA Role: Socio-Economic Quality Reviewer Years of Experience: 32
	Fred Schwarz (Stantec) B.A. (hons), M.A., Ph.D Role: Heritage Resources Chapter Author Years of Experience: 40
	Chris Blair (Stantec) B.A. Role: Heritage Resources Chapter Quality Reviewer Years of Experience: 33
Dam Infrastructure	James Powell (Marathon Gold) M.Eng., P.Eng. Role: Dam Infrastructure Chapter Author Years of Experience: 22