



**ENVIRONMENTAL IMPACT STATEMENT DRAFT GUIDELINES**

**for the**

**JOYCE LAKE DIRECT SHIPPING IRON ORE PROJECT**

Prepared by:

The Newfoundland and Labrador Department of Environment and Conservation

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## Glossary of Acronyms and Abbreviations

ACCDC	Atlantic Canada Conservation Data Centre
ARD	Acid Rock Drainage
BACT	Best Available Control Technology
CEAA	<i>Canadian Environmental Assessment Act</i>
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
EA	Environmental Assessment
EC	Environment Canada
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EPP	Environmental Protection Plan
EPR	Environmental Preview Report
HC	Health Canada
NLDOEC	Newfoundland and Labrador Department of Environment and Conservation
NLEPA	Newfoundland and Labrador <i>Environmental Protection Act</i>
NLESA	Newfoundland and Labrador <i>Endangered Species Act</i>
NPAG	Non-Potentially Acid Generating
NO <sub>x</sub>	Nitrogen Oxides
PAH	Polycyclic Aromatic Hydrocarbon
PAG	Potentially Acid Generating
PM <sub>2.5</sub> , PM <sub>10</sub>	Particulate Matter (subscript indicates size threshold, in microns)
t/d	Tonnes per day
t/yr	Tonnes per year
TMF	Tailings Management Facility
SAR	Species at Risk
SARA	<i>Species at Risk Act</i>
SO <sub>2</sub>	Sulphur Dioxide
VOC	Volatile Organic Compounds

## 1.0 INTRODUCTION

Labec Century Iron proposes to develop a direct shipping iron ore mine in western Labrador (the Project). The mine property is located approximately 20 kilometres northeast of the Town of Schefferville, Québec.

The Project is located entirely within Labrador and includes construction, operation and rehabilitation and closure of an open pit, water management, waste rock disposal areas, processing infrastructure, a tailings management facility (TMF), ancillary infrastructure to support the mine and process plant and a rail transportation component.

The mine will produce up to four million tonnes of iron ore fine and ore concentrate per year. The iron ore products will be transported via a new haulage road and new rail loop which will tie into the existing rail (owned by Tshiuetin Rail Transportation Inc) to the port Sept-Îles.

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

### 1.1 Purpose of the Environmental Impact Statement Guidelines

These guidelines have been prepared by the Government of Newfoundland and Labrador to identify for the proponent the nature, scope and minimum information and analysis required in preparing its EIS. The EIS is intended to address the legislative requirements of the province.

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. The provincial government is prepared to provide advice and assistance throughout the preparation of the EIS with regard to the identification of environmental concerns and appropriate assessment methodology.

"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 (e) and the interrelationships between 2 or more of them.

“Environmental effect” means:

a change in the present or future environment that would result from an undertaking;

“Minister” means the provincial Minister of Environment and Conservation.

## 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 and alternative means of carrying out the Project that are technically and economically feasible;
- document public and Aboriginal consultation activities in a manner that is transparent and accessible;
- propose measures to avoid or mitigate adverse environmental effects;
- propose measures to enhance or prolong beneficial environmental effects;
- describe residual 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 significant 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 or through discussions with Aboriginal groups 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 Local Knowledge and Aboriginal Traditional Knowledge*

Local knowledge and Aboriginal traditional knowledge refers to the broad base of knowledge held by individuals and collectively by communities that may be based on spiritual teachings, personal observation and experience or passed on from one generation to another through oral and/or written traditions.

Local knowledge and Aboriginal traditional knowledge, in combination with other information sources, can help in achieving a better understanding of potential effects of projects. Local knowledge and Aboriginal traditional knowledge may, for example, contribute to the description of the existing physical, biological and human environments, natural cycles, resource distribution and abundance, long and short-term trends and the use of lands and water resources. It may also contribute to project site selection and design, identification of issues, the evaluation of potential effects and their significance, the effectiveness of proposed mitigation, cumulative effects assessment and the consideration of follow-up and monitoring programs.

Aboriginal traditional knowledge, which is rooted in the traditional life of Aboriginal people, has an important contribution to make to an EA. Certain issues relevant to the review process are firmly grounded in Aboriginal traditional knowledge such as harvesting, use of lands and resources for traditional purposes, cultural well-being, land use and heritage resources.

Although the basis for Aboriginal traditional knowledge and science-based knowledge can differ, they may on their own or together, contribute to the understanding of these issues.

The EA will promote and facilitate the contribution of local knowledge and Aboriginal traditional knowledge to the review process and recognize that approaches to local knowledge or Aboriginal traditional knowledge, customs and protocols may differ among communities and persons with respect to the use, management and protection of this knowledge.

The proponent shall incorporate into the EIS the local knowledge and Aboriginal traditional knowledge to which it has access or that it may reasonably be expected to acquire through appropriate due diligence, in keeping with appropriate ethical standards and without breaching obligations of confidentiality.

### ***1.2.3 Sustainable Development***

Sustainable development, as defined in the *Newfoundland and Labrador Sustainable Development Act*, 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. Moreover, a project that is supportive of sustainable development strives to incorporate citizen participation into decision-making.

The EA of the Project, including its alternative means, 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.

#### ***1.2.4 Precautionary Approach***

One of the purposes of EA is to ensure that proponents consider the Precautionary Principle. If a project has the potential to cause a threat of serious or irreversible damage to the environment, the proponent must 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 in order to ensure that they would not cause 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;
- 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 Contacts for the Environmental Assessment**

Newfoundland and Labrador contacts for the EA are:

Brenda Rowe (Chair)  
Environmental Scientist  
Environmental Assessment Division  
Department of Environment and Conservation  
PO Box 8700

John Pennell (Co- Chair)  
Environmental Scientist  
Environmental Assessment Division  
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## 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*. The Environmental Assessment Division of the Newfoundland and Labrador Department of Environment and Conservation (NLDOEC) 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 subject to the NLEPA is required to be registered for examination by the NLDOEC. The registration outlines the proposed project and describes how it will affect the bio-physical and socio-economic environments. The Registration is circulated to provincial and federal government departments for review and is made publicly available for comment. At the conclusion of the review period, the Minister advises the proponent whether the undertaking has been released from further assessment or will require an Environmental Preview Report (EPR), an EIS, or if it has been rejected. On December 13, 2012, the Minister advised Labec Century Iron that an EIS is required.

### 2.2.2 *Québec*

The mine will be located entirely within Newfoundland and Labrador, and therefore, the Project is not subject to EA under the laws of the Province of Québec.

### 2.2.3 *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. Once completed, the proponent shall submit printed and electronic copies of the EIS to the involved provincial agencies (number of copies to be determined).

In accordance with the requirements of NLDOEC, Component Studies will be conducted 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.

### 2.3 Provincial - Federal Cooperation

The Governments of Newfoundland and Labrador and Canada intend to conduct respective EA reviews in a cooperative manner, but retain separate decision making. The process will feature separate EIS guidelines, separate public comment periods and a singular EIS that is intended to fulfill the requirements of both jurisdictions.

### 2.4 Public Consultation

The public will have several opportunities to participate in the EA and provide their views on the environmental effects of the Project. These are outlined in Table 1.

*Table 1 Public Participation Opportunities*

Opportunity	Duration	Newfoundland and Labrador
Comment on Draft EIS guidelines and the Project	40 days	Yes (draft EIS Guidelines only)
Comment on Component Studies	35 days	Yes
Comment on Proponent's EIS	50 days	Yes

Documents for public review will be made available by NLDOEC. Electronic and hard copy versions will be available. Key documents will be available on the NLDOEC Environmental Assessment webpage.

Public comment periods will be announced in newspapers and on the NLDOEC Environmental Assessment webpage mentioned above. Interested parties may contact the Newfoundland and Labrador EA contacts 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 to facilitate all parties achieving an understanding of the proposed project and ensuring continued involvement in the EA. During the preparation of the EIS, the

proponent must hold public information sessions to provide information concerning the Project to the people whose environment may be affected by the undertaking. The Proponent must record and respond to the concerns of the local community regarding the environmental effects of the Project. Appendix A provides additional information on the notification requirements for the information sessions.

### **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 construction, operation, rehabilitation and closure of the proposed Project, as described in the proponent's project description dated October 2012, amended November 2012 and February 2013 including, but not limited to, the activities listed in Section 3.1.1.

##### ***3.1.1 Labrador***

The mine and associated facilities and infrastructure will be located wholly within Labrador. The Labrador component of the project will include construction, operation, rehabilitation and closure of the following components:

- an open pit including dewatering infrastructure to dewater Joyce Lake and to manage groundwater levels;
- waste rock disposal areas and overburden stockpiles;
- low grade ore stockpiles, run of mine ore stockpiles and final product stockpiles;
- dry processing infrastructure (crushing and screening system);
- wet processing infrastructure (to be determined);
- tailings management facility (TMF);
- ancillary infrastructure to support the mine and process plant (gate and guardhouse, reclaim water pumphouse, truck wash bay and shop, fuel and used oil storage, fuel distribution system, power generation, transmission lines, explosives magazine storage, administration/office buildings, maintenance offices, warehouse area and employee facilities, sewage and water treatment units);
- mobile mining and support equipment;
- floating and overland conveyer system option (to be determined);
- access and haulage roads, including ice bridges;

- rail transportation component including rail loop construction to connect the haulage road to the Tshuetin Rail Transportation Inc. rail system; and

### **3.2 Factors to be Considered**

The EIS shall consider:

- the 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 projects or activities that have been or will be carried out;
- the significance of the environmental effects;
- comments from the public, including Aboriginal groups, that are received in accordance with NLEPA regulations;
- measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the Project;
- the need for the Project;
- alternatives to 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;
- local knowledge and Aboriginal traditional knowledge;
- the requirements of a follow-up program for the Project; and
- the capacity of renewable resources that are likely to be significantly affected by the project to meet the needs of the present and those of the future.

### **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, Aboriginal 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 must 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;
- the time required for recovery from an impact; and
- cumulative effects of other projects and activities to VECs.

The VECs to be considered must include:

- atmospheric environment;
- landforms, soils, snow and ice;
- water resources (surface water and ground water);
- wildlife;
- species at risk and designated species;
- historic and cultural resources;
- current use of lands and resources for traditional purposes by Aboriginal persons;
- other current use of lands and resources;
- community services and infrastructure;
- health and community health; and
- economy, employment and business.



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 EIS shall describe, in detail, study methods and analytic methods, including incorporation of information gathered through consultation and Aboriginal traditional knowledge.

#### **4.0 PREPARATION OF THE EIS**

The EIS is a statement of the proponent's environmental conclusions and commitments related to the Project; it must 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 EIS shall be a stand-alone document 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 impacts 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. If a different sequence is used, 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 studies shall use System International (SI) units of measure and terminology throughout.

The following sections describe the different topics to be addressed in the EIS. The EIS must provide sufficient information to allow readers to understand the potential environmental effects of the Project, focusing on the most significant potential effects as identified by the proponent and through these guidelines. The EIS must provide an acceptable rationale for not fully addressing any issue identified in the guidelines and must highlight key impacts that require more intensive investigation.

Section 4 is organized into two parts:

- PART I: CONTENT OF THE EIS describes the layout and required content of the EIS; and
- PART II: DETAILED GUIDANCE ON SELECT ENVIRONMENTAL COMPONENTS provides an overview of the recommended studies and approach for each VEC.

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

## ***PART I: CONTENT OF THE EIS***

### **4.1 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.

### **4.2 Project Introduction**

#### ***4.2.1 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, Aboriginal relations 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, contractors and/or sub-contractors responsible for preparing the EIS. The qualifications of 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.

#### *4.2.2 Project Overview*

The EIS shall briefly summarize the development proposal. If the Project is part of a larger sequence of projects, 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 4.3.4 of this document.

#### *4.2.3 Regulatory Framework and the Role of Government*

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 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 policies and guidelines of potentially affected Aboriginal groups that are pertinent to the Project and discuss their implications;
- identify any relevant Land Use Plans, Land Zoning and/or Community Plans;
- describe land tenure in the vicinity of the Project;
- 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.

#### *4.2.4 Non-Government Participants in the Environmental Assessment*

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

#### *4.2.5 Land Claims Agreements and Interim Agreements*

The EIS shall identify any publicly available agreements or arrangements entered into between the Proponent and/or the Government of Newfoundland and Labrador and/or Aboriginal group(s) in the context of land claims and, where applicable, address how they may affect or be affected by the Project. This includes the Tshash Petapen (New Dawn) Agreement and the Labrador Innu Land Claims Agreement-in-Principle, which is not legally binding but forms the basis of negotiation of a final agreement.

#### *4.2.6 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.

### **4.3 Project Description**

#### *4.3.1 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 iron ore 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 benefits at the regional, provincial and national levels.

#### *4.3.2 Alternatives to the Project*

The EIS must 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 must 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.

In assessing alternatives, the proponent is encouraged to take into account any potentially adverse impacts of the technically and economically feasible alternatives on asserted Aboriginal and Treaty rights.

#### *4.3.3 Project Location*

The EIS shall provide a concise description of the geographical 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; wetlands; riverine and lacustrine fish habitats; mature and interior forest habitat for migratory birds; and habitats of provincially designated species, 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 land use including traditional, private and crown lands; and
- a description of the nearest potentially sensitive human receptors such as residences, cabins, sacred sites, places of worship, etc. and of local communities that may be affected by project activities.

The location of the mine site and transportation corridors 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, major existing infrastructure, municipal drinking water supply areas (protected and unprotected) if applicable, 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.

#### *4.3.4 Project Description*

##### 4.3.4.1 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). As appropriate to convey the information (i.e., environmental interactions), the EIS shall present descriptions, locations, plans, figures and/or drawings for each facility, including:

- tailings management facilities;
- waste rock storage (including discussion of ore contaminants (e.g. manganese) that may affect processing and volume of waste rock);
- 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 (e.g. diesel generators, equipment, roads, waste rock/tailings lift-off, crushing, grinding, process heaters, blasting, conveyors, etc.);
- ambient air sampling stations and their locations;
- noise sources, expected noise levels and noise monitoring locations;
- sources and frequency of vibrations;
- water control structures or diversions that may be required to facilitate the project.
- transmission lines, including towers, poles and aerial crossings over water bodies;
- bridges and watercourse crossings (including conveyors) along proposed access roads and railway, including any preliminary designs for crossing structures;
- permanent and temporary access infrastructure (including road and rail) to be constructed;
- fuel storage systems, including secondary containment (dykes) and a list of fuels;
- any quarries that are contemplated as part of the Project; and
- viewscales that could be affected by the Project.

#### 4.3.4.2 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 must 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 (t/yr);
- solid waste, hazardous waste and waste reduction strategies;
- spill potentials and prevention strategies (e.g. hydraulic hose ruptures, fuelling mishaps, tank failure); and
- re-vegetation strategy for tailings storage or other areas.

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

The EIS should describe any regular maintenance that may be required for proposed bridges, transmission lines and conveyors installed over navigable waterways. 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.

#### 4.3.4.3 Labour Force Requirements

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

- the National Occupation Classification (NOC) codes (at the 4-digit level) associated with each position for all phases of the project, including the number of positions associated with each NOC code;
- 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 approximate timelines for each of the positions during the construction and operations phases of the project, including the number of positions for each 4-digit NOC code throughout the project at specified time intervals (monthly, or at least quarterly) to show levels of employment throughout the Project timeline;
- whether the positions are full-time equivalent or actual positions. If they are actual positions, the breakdown of full-time and part-time or full-year and part-year positions;



- an estimate of the number of apprentices (by level) and journeypersons required;
- the estimated percentage of the hired workforce from Newfoundland and Labrador;
- the estimated percentage of hired workforce from Labrador, by gender;
- the estimated percentage of hired Aboriginal workforce, by gender; and
- strategies for recruitment.

#### *4.3.5 Alternative Means of Carrying out the Project*

The EIS must identify and describe alternative means of carrying out the Project that are technically and economically feasible. The analysis shall describe:

- the alternative means considered, whether they are technically and economically feasible 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 technically and economically feasible alternatives, in sufficient detail to allow comparison with the effects of the Project; and
- the preferred means of carrying out the Project based on the relative consideration of environmental effects including the criteria and rationale for their selection.

Any potentially adverse impacts of the technically and economically feasible alternative means on asserted Aboriginal and Treaty rights must also be identified.

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:

- tailings management;
- waste rock storage management and location;
- transportation, including alternative rail routes outside municipal water supply areas;
- power;
- dewatering options at Joyce Lake
- contracting or lengthening of the operations;

- labour supply; and
- mining methods (e.g., open pit versus others).

#### 4.4 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, assess and determine the significance of 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.

The baseline description shall characterize environmental conditions resulting from historical 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 both scientific and traditional knowledge and perspectives regarding ecosystem health. The EIS must 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 impacts 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 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 must 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. breeding, migration, feeding, nursery, rearing, wintering), frequency and duration. Emphasis must be on those species, communities and processes most sensitive to project impacts. However, the

interrelations of these components to the greater ecosystem and communities of which they are a part must be indicated. The EIS must address issues such as habitat, 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 must also be considered.

The EIS must provide a description of the rural, Aboriginal and urban 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 EIS shall indicate the Project's proximity to sensitive features such as residences, cabins, public drinking water supplies, sacred sites, places of worship and locations of hunting and gathering activities (i.e. country foods collection). Depending on the type of potential effect the project may have on these receptors, appropriate baseline evaluation should be undertaken (e.g. baseline noise, air quality, drinking water, country foods evaluation).

The EIS must also describe existing geology, geochemistry, soils and terrain at the mine site and in the immediate vicinity.

The EIS must 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.

#### **4.5 Effects 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 have been or will be carried out. The assessment shall include, but not be limited to the effect of any environmental change on

health, socio-economic conditions and heritage values and on the current use of land and resources by Aboriginal people. 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 must 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 must either include the information directly in the EIS or clearly direct (e.g. through cross-referencing) the reader to where it may obtain the information. When relying on existing information, the proponent must 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 must be documented such that the analyses are transparent and reproducible;
- the uncertainty, reliability and sensitivity of models used to reach conclusions must be indicated;
- conclusions should be substantiated; and,
- the studies should be prepared using best available information and methods.

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

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 and Aboriginal groups relative to the EA, including any perceived changes in the environment from the Project, must be acknowledged and considered. In considering the local social and economic effects of the Project, the Proponent shall have due regard for the attitudes, beliefs and perceptions of local residents and how these are grounded in their culture, social organizations and historical experience. The EIS shall clearly articulate how relevant issues raised by the public or Aboriginal groups have been considered, including any changes to the Project, or mitigation or follow-up measures arising from such consideration.

#### *4.5.1 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), worst case scenarios and the effects of these scenarios and assess the significance of associated environmental effects. It 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 during loading of ships, train derailments and fuel transportation and storage, resource road conflicts with wildlife and other users as well as the probabilities and hazards associated with them; the 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 impacts associated with accidents and malfunctions must be assessed.

Given the potential for accidents and malfunctions to impact the province, the EIS should discuss how an accident scenario would be handled (e.g., notification, response etc.).

#### *4.5.2 Capacity of Renewable Resources*

The EIS shall consider the capacity of renewable resources that are likely to be significantly 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 significant adverse residual environmental effects, describe how the Project could affect their sustainable use and describe the criteria used in the analysis.

#### 4.6 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 must consider measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the Project. 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 relocating its components, where technically and economically feasible.

The EIS shall describe the standard mitigation practices, policies and commitments that constitute technically and economically feasible 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) and the environmental management system through which it will be delivered. The EPP shall provide an overall perspective on how potentially adverse effects would be minimized and managed over time. In addition, the EIS shall describe the relationship between the EPP and the waste and tailings management plans. 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, 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 significance of adverse effects. The EIS shall also present an assessment of the effectiveness of the proposed technically and economically feasible 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 1.2.4.

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

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

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

#### **4.7 Cumulative Effects Assessment**

The EIS must include an analysis of cumulative effects of the Project in combination with other projects or activities that have been or will be carried out . The objective of an EA is not to define two classes of environmental effects. Rather, a single set of environmental effects that take into account the aggregate effect of the Project in the context of other foreseeable developments and activities acting upon the environment should ultimately be identified.

The analysis of cumulative effects must consider different types of effects (e.g., synergistic, additive, induced, spatial or temporal) and identify impact pathways and trends. The EIS shall assess the significance of the residual cumulative environmental effects that remain after mitigation has been implemented. Baselines for cumulative should attempt to describe the changes to the environment with regards to a pre-industrial development starting point. Notably, a cumulative effect on a VEC may be important even if the effects of the Project on the VEC are not significant.

The EIS shall:

- identify and justify the VECs that will constitute the focus of the cumulative effects assessment. For greater certainty, cumulative effects must be assessed in relation to each VEC for which a residual impact of the Project is predicted to be adverse and likely (regardless of the significance of the impact). 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 projects and selected 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 mitigation measures that are technically and economically feasible;
- determine the significance of the residual cumulative effects; 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.

The following projects (as well as planned expansions and extensions) may interact cumulatively with the Project:

- Iron Ore Company of Canada (Labrador Operation);
- Kami Iron Ore Project- Alderon
- Wabush Mines - Cliffs Resources;
- Mount Wright Mine - ArcelorMittal;
- Bloom Lake Mine- Cliffs Resources;



- Schefferville Area Iron Ore Mines (James, Redmond and Houston Properties) - Labrador Iron Mines;
- DSO Iron Ore Project - Tata Steel Minerals Canada; and
- Lower Churchill Generation Project.

These and other projects and activities (e.g., road development, tourism 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 impacts should be clearly described in the EIS, demonstrating how conclusions have been reached.

#### **4.8 Effects of the Environment on the Project**

The EIS should 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 must be described. An analysis of the data to determine the degree the data represents the conditions at the Project site must 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 must be provided. Climate data should also be provided and taken into account when evaluating impacts of the project on air quality, hydrology 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. mine open pit, infrastructures, cutting and tunnelling locations along the railway route etc.);

- Hydrogeological context: hydrogeological characteristics of the different geological units (hydraulic conductivities, porosity, storage coefficients) ; groundwater geochemistry and groundwater levels for the areas that will be disturbed by major project components;
- Streamflow data records (levels and yields) of surroundings lakes, rivers and brooks;
- Geotechnical properties of Quaternary sediments, such as slope stability and bearing capacity of facility foundations and the railway line route under both static and dynamic conditions, including ground ice and thermal conditions.

The EIS must predict how local conditions and natural hazards, such as severe and/or extreme weather conditions and external events (e.g., flooding, 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.

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 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 railway embankments, tunnels, major watercourse crossings and open pits; and
- potential effects of the groundwater level on mining operations.

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

## 4.9 Environmental Management

### *4.9.1 Planning*

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

The EIS shall also outline a preliminary decommissioning and reclamation plan for the Project. The plan must 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.

### *4.9.2 Follow-Up Program*

The EIS must include a framework upon which follow-up, including effects monitoring, would be based throughout the life of the Project, including the post-closure phase. A follow-up program must be designed to verify the accuracy of the effects predictions and to determine the effectiveness of the measures implemented to mitigate the adverse environmental effects of the Project.

The follow-up program must be designed to incorporate pre-project baseline information, 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 must 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.

A schedule for follow-up frequency and duration is to 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 (Type 1 and Type 2 errors).

The description of the follow-up program should include;

- the requirements and objectives of the follow-up program;
- a description of the main components of the program, each monitoring activity under that component and the objectives of each monitoring activity (i.e., confirmation of mitigation, confirmation of assumptions and verification of predicted effects);
- a schedule for the finalization and implementation of the follow-up program;
- a description of the roles and responsibilities for the program and its review process, by government, Aboriginal people and the public;
- a discussion of possible involvement of independent researchers;
- any contingency procedures/plans or other adaptive management provisions for dealing with unforeseen effects, or situations where benchmarks, regulatory standards or guidelines are exceeded; and
- a description of how results will be managed and reported.

Sufficient detail shall be provided to allow independent judgment as to the likelihood that the follow-up program will provide the quantity and quality of information required to achieve its objectives.

In addition, the NL *Endangered Species Act* contains provisions requiring that measures are taken to monitor adverse effects of a project on wildlife species or critical habitat of a species that is designated as threatened, endangered, or extirpated.

If potential adverse effects on a listed wildlife species or its critical habitat are identified, a monitoring plan must 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 questions would be engaged in reviewing proposed adaptive management measures, in the event that mitigation measures are not effective.

#### **4.10 Significance of Residual Adverse Environmental Effects**

The EIS must describe any expected residual (post-mitigation) effects of the Project on the biophysical and human environments, after technically and economically feasible mitigation measures have been applied. The residual effects, even if deemed not significant, 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 the significance of the residual effects (including cumulative effects) shall be described, including pre-defined significance thresholds for each VEC (e.g. existing provincial regulatory and industry standards and guidelines). 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 must contain enough detail to enable readers to follow the reasoning and process by which the proponent assessed the significance of effects.

The EIS must 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 significant adverse effects. Residual effects significance criteria shall be presented for each VEC in the EIS along with the analysis to support the conclusion of significance.

#### **4.11 Consultation**

##### ***4.11.1 Aboriginal Consultation***

The Government of Newfoundland and Labrador (NL) is committed to consulting Aboriginal organizations when NL contemplates making land and resource development decisions that have the potential to adversely impact asserted Aboriginal rights or asserted treaty rights.

NL strives for a practical consultation process that helps to ensure that land and resource development decisions minimize or, where reasonably practicable, eliminate potentially adverse impacts on asserted rights.

NL also aims to maintain, foster and improve effective working relationships among Aboriginal organizations, project proponents and NL.

In particular, NL's consultation process is intended to produce better communication, stronger relationships and easier resolution of issues among Aboriginal organizations, the project proponent, and NL.

Consultation should be conducted with the objective of helping ensure that land and resource development decisions minimize or, where reasonably practicable, eliminate adverse impacts on asserted rights.

To assist the consultation processes, the EIS must describe the concerns raised by Aboriginal organizations in respect of the Project and where applicable, how they have been or will be considered and, where appropriate, addressed. This should include a summary of discussions, as well as issues or concerns raised and any asserted Aboriginal rights, as conveyed to the proponent by Aboriginal representative organizations or NL.

The proponent must ensure that it engages with Aboriginal organizations whose asserted Aboriginal rights or any rights established pursuant to a final land claim agreement to which NL is a party may be adversely impacted by the Project. In preparing the EIS, the proponent must ensure that it provides sufficient, early notification; and timely, updated information to Aboriginal organizations to ensure they are reasonably informed about the Project. The proponent shall also discuss with Aboriginal organizations the most practical and appropriate method of consultation.

The EIS must document any potentially adverse environmental effects on asserted Aboriginal rights or on any rights established pursuant to a final land claim agreement to which NL is a party that would be caused by a Project-induced change in the environment, as well as any measures taken or recommended that would prevent, mitigate, or otherwise address these effects. NL will use this information towards fulfilling its duty to consult Aboriginal organizations about the Project. In addition to proponent-involved Aboriginal engagement, NL may undertake additional engagement activities directly with Aboriginal representative organizations.

#### ***4.11.2 Public Consultation***

The EIS must describe all public consultation activities undertaken by the proponent prior to, during, or planned after 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.

#### **4.12 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 the Government in assessing the justifiability of any significant adverse environmental effects, if necessary.

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

#### **4.13 Benefits of the EA to Newfoundland and Labrador**

The EIS must describe how the EA process for the Project benefits to Newfoundlanders and Labradoreans, focusing on aspects such as:

- maximized environmental benefits: What expected environmental benefits will be created as a result of the project being assessed
- 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: How is public participation in the EA expected to influence the project design and the environmental effects analysis?;
- technological innovations: Are new technologies expected to be developed to address environmental impacts that could be used for other projects?;
- increases in scientific knowledge: Is any new scientific information expected to be collected through the EA or follow-up that could benefit the assessment of other projects?; and
- community and social benefits: Describe any expected changes in project design that would result in indirect benefits to communities and/or social benefits (e.g., enhanced access to wilderness areas for recreation).

#### **4.14 Assessment Summary and Conclusions**

The EIS must summarize the overall findings of the EA, with emphasis on the main environmental issues identified. It must predict the likely significance of adverse environmental effects, including accidents and malfunctions, caused by the Project.

For all VECs, the EIS must 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;
- comments from Aboriginal groups and individuals and responses;
- relationship of the VEC to an Aboriginal group's asserted Aboriginal and Treaty right; and
- commitments made by the proponent, including the timing and responsibility of each.

## ***PART II: DETAILED GUIDANCE ON SELECT ENVIRONMENTAL COMPONENTS***

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

### **4.15 Atmospheric Environment**

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.

#### ***4.15.1 VEC Definition and Rationale for Selection***

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

- protection of human health and safety, as well as ecological health and aesthetics;
- potentially sensitive human and wildlife receptors;
- provisions of the *Air Pollution Control Regulations* under the NLEPA; and



- the potential for greenhouse gas emissions.

#### *4.15.2 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 (including the of rail lines);
  - particulate matter (e.g. dust) and other contaminant releases during the operations phase including those potentially caused by:
    - mining operations;
    - fines and concentrate storage;
    - handling or loading and unloading;
    - road dust (e.g., vehicle use on-site and off-site);
    - dust along rail lines;
    - emissions from blasting;
    - tailings dust lift-off; and
    - vehicle emissions, including rail locomotives;
- Effects on ambient sound levels associated with:
  - construction activities (both at the mine and off-site);
  - mining and concentrating operations (including blasting) and transportation of fines and concentrate on-site;
  - vehicles/trucks in noise-sensitive areas;
  - transportation of fines and concentrate from the site to the rail loop; and
- Effects as a result of vibrations associated with:
  - construction-related activities, such as blasting or heavy equipment movement on-site or off-site;
  - mining and concentrating operations (including blasting) and transportation of fines and concentrate; and
- Effects of artificial lighting at the project site during operation on nearby residents and the environment.

#### ***4.15.3 Existing Environment***

The EIS must 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 the contaminants PM<sub>2.5</sub>, PM<sub>10</sub> and NO<sub>x</sub>;
- current ambient noise levels at both sites and within the local area, including the results of a baseline ambient noise survey. Information on typical sound sources, geographic extent and temporal variations must be included; and
- existing ambient light levels at the Project site and at any other areas where Project activities could have an effect on light levels. The EIS should describe night-time illumination levels during different weather conditions and seasons.

#### ***4.14.4 Effects Assessment and Mitigation***

The adverse environmental effects of the Project on the atmospheric environment must 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, must be assessed.

All potential Project emissions must be estimated, including greenhouse gases (GHG) and an emissions inventory table must be included in the EIS, listing emission sources, operating periods, pollution control equipment (where applicable), predicted stack concentrations and total emissions. Typical construction and operation-related emissions include, but are not limited to, particulates (PM<sub>10</sub> and PM<sub>2.5</sub>) and metals in dusts and fuel combustion by-products such as sulphur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs) and metals. Potential odours from Project emissions at a local level (i.e. near Project equipment) must be discussed and assessed. GHG quantities are to be expressed in carbon dioxide equivalents (t/yr) and should be compared with provincial and national totals and mining sector totals.

Modeling shall be conducted in accordance with the requirements of the *Air Pollution Control Regulations* of the NLEPA and the following NLDOEC guidance documents:

- *Guidance for Plume Dispersion Modeling* (GD-PPD-019.2); and

- *Determination of Compliance with the Ambient Air Quality Standards (GD-PPD-009.4)*

Air dispersion modelling conducted in accordance with the above guidelines shall be summarized in the EIS. Air quality modeling shall provide meteorological data (e.g., wind data - for example wind roses) and examine scenarios whereby air quality in nearby communities that could be affected by the cumulative effects of the Project in combination with other projects and activities in the area.

Modeling shall include the PM<sub>2.5</sub> and PM<sub>10</sub> fraction of particulate matter, NO<sub>x</sub> emissions from operational equipment and any other emissions of concern that are identified. The modeling should specify all assumptions with respect to emission rates and dust control applications. The analysis must reflect the requirements and standards contained in pertinent legislation, policies, guidelines and directives relating to the atmospheric environment (e.g. National Ambient Air Quality Objectives, Canada Wide Standards, applicable provincial ambient air quality criteria).

The crusher plant and any other significant particulate emission sources will be required to have Best Available Control Technology (BACT) for dust suppression. A description of proposed emission controls should be included in the EIS.

The EIS should indicate whether and how air quality in local municipalities will be monitored and with whom any resulting data would be shared.

The EIS must assess potential noise and vibration impacts to the environment and local communities. Specifically, the EIS must:

- identify and quantify potential noise and vibration sources during construction and operation phases;
- identify potential receptors and describe the proximity of identified receptors to the Project area, including identifying and describing whether particular receptors may have a heightened sensitivity to noise and vibration exposure (e.g., workers accommodations near the mine installations and residents along the Tshiuetin Rail Transportation Inc. rail line) or expectation of peace and quiet (e.g., recreational areas);
- include a map illustrating estimated noise and vibration levels from the Project at key receptors;

- describe whether there is a potential for adverse effects associated with Project-related vibrations (e.g., potential for damage to nearby residences, domestic wells, ice cover on nearby lakes); and
- describe mitigation and management measures related to noise and vibration including the conditions for mitigation and evaluate Project compliance with appropriate noise guidelines.

The EIS must 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. In addition, the EIS must evaluate how light disturbances could impact individuals and communities and their commercial and recreational activities, including tourism.

Technically and economically feasible mitigation measures must be proposed to reduce or minimize adverse effects. The EIS will provide a prediction of adverse residual effects, including cumulative effects and their significance.

#### 4.16 Landforms, Soils, Snow and Ice

##### *4.16.1 VEC Definition and Rationale for Selection*

Landforms, soils and snow are defined as the landforms, soils, snow and ice 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 impacted by Project activities.

##### *4.16.2 Potential Project-VEC interactions*

Potential Project-VEC interactions include:

- Acid Rock Drainage/Metal Leaching arising from Project activities;
- impacts to the quality or quantity of soils;
- impacts to snow and ice; and
- impacts of landform and soils on the Project.

##### *4.16.3 Existing Environment*

The description of the existing environment in the EIS shall include:

- existing unique or valuable landforms (e.g., eskers, fragile landscapes, wetlands), including details regarding their ecological functions and distribution in the local study area;
- geomorphology and topography at areas proposed for construction of major project components, including the type, thickness and distribution of soils as applicable;
- bedrock lithology, morphology, geomorphology and soils where earthworks are proposed;
- potential for ground and rock instability (e.g., slumping, landslides and potential slippage) at areas planned for Project facilities and infrastructure;
- suitability of topsoil and overburden for use in the re-vegetation of surface-disturbed areas; and
- sites of palaeontological or palaeobotanical significance.

#### 4.16.3.1 Acid Rock Drainage and Metal Leaching

If there is a potential for Acid Rock Drainage/Metal Leaching (ARD/ML) to occur as a result of the Project, the EIS should include an investigation of the associated potential from overburden, mine waste rock, ore and tailings. This investigation should include:

- population assessments for each lithological/alteration/waste management unit. Assessments should account for vertical and horizontal distribution, as well as sampling biases, to proper characterization over the unit's range of variability;
- a chronology of ARD/ML investigations and the design of an ARD/ML and mineralogy and elemental analysis characterization program, including all static and kinetic test work conducted to date. The rationale, advantages and disadvantages of, detailed description, sample selections and methodology for all test work;
- predictions of the ARD/ML potential of all materials (bedrock and surficial) to be disturbed or created during all phases (construction, operation, decommissioning, reclamation and post-closure) of the proposed project. This must include an interpretation of the results, an estimation of risk for the onset of ARD for each lithological/alteration/waste management unit and mine component, metal leaching and the predicted drainage chemistry for each mine component, 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 development plans and reference Mine Environment Neutral Drainage (MEND) guidelines.

#### *4.16.4 Effects Assessment and Mitigation*

In conducting the analysis, the EIS shall consider pertinent acts, best practices, policies, guidelines and directives. The EIS shall provide a description of measures to mitigate effects and list potential residual effects and their significance. The discussion should include a list of:

- rehabilitation measures for borrow sources;
- an erosion and sediment control plan; and
- measures to mitigate changes to local drainage patterns.

Specifically, the EIS shall discuss the following:

- general impact on landform as a result of Project development, borrow resource extraction, with a focus on sensitive landforms and those serving as wildlife habitat;
- implications to the Project planning and design of baseline information related to terrain conditions;
- potential impacts on the stability of terrain in the vicinity of Project facilities and infrastructure. Discussion should focus on the potential for impacts arising from surface disturbances due to construction (e.g., overburden stripping, cuts/fills) and any associated implications for Project design and management of project components, including railway embankments, tunnels, access roads, watercourse crossings, ore/waste rock piles, etc.;
- the potential for the occurrence, frequency and distribution of terrain hazards, including snow drifts and snow banks, as a result of construction activities (e.g. cut/fill, extraction of construction materials);
- potential for soil erosion, including stream bank erosion, resulting from surface disturbances associated with the construction, operation and maintenance of Project components;
- proposed commitments to preserve, store and reuse soil (including humus layers and organic soils), as applicable for site rehabilitation;
- potential contamination of soils due to the deposition of air emissions and airborne fugitive dust-fall from the Project;

- potential contamination of snow (e.g., due to runoff from tailings, emissions or other sources); and
- potential for the Project to impact ice on local lakes (e.g., impact of the ice road and the potential for blasting to cause cracking).

#### 4.16.4.1 Acid Rock Drainage and Metal Leaching

The ARD/ML prediction information (based on MEND guidelines) and historical site databases and experience will be used to assess the potential leachate risks and determine mitigation requirements for the project. Additional information should be provided for:

- mine waste rock, tailings, ore characterization, volumes, segregation/disposal methods, mitigation/management plans, contingency plans, operational and post-closure monitoring and maintenance plans;
- the feasibility of successfully segregating Potentially Acid Generating (PAG) and Non-Potentially Acid Generating (NPAG) 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 waste rock;
- estimates of potential lag time to ARD/ML onset for PAG materials (including various waste rock, tailings, ore) and ability to fully saturate appropriate PAG materials during operation and post-closure based on regional experience, if any;
- pit 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/management strategies under a temporary or early closure scenario, including ore.

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* will be used to formulate ARD/ML prediction.

## 4.17 Water Resources

The effects of the Project on water resources will be assessed within the local 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.

### *4.17.1 VEC Definition and Rationale for Selection*

Water resources include the quality and quantity of groundwater and surface water resources in the vicinity of the Project. It has been selected as a VEC because of:

- its importance to ecosystem function and human use (including potable water supplies; 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); and,
- provisions of the NL *Water Resources Act*.

### *4.17.2 Potential Project-VEC Interactions*

Potential Project-VEC interactions include:

- 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 of accidents and malfunctions; and
- erosion and sedimentation, including dust deposition.

### *4.17.3 Existing Environment*

#### 4.17.3.1 Groundwater

For the mine site, the EIS must describe the hydrogeologic conditions at the mine site. It must examine all available existing hydrogeology information required to assess the effects of the



Project. Where knowledge gaps exist, the proponent must collect additional baseline information and provide it in the EIS.

The EIS must include:

- a review of the physical geography and the geology of the mine site project area as it pertains to local and regional groundwater flow systems in the mine area (see list in Section 4.8);
- the physical and geochemical properties of hydrogeological units, such as aquitards and aquifers (see list in Section 4.8);
- groundwater levels and a piezometric map for each aquifer;
- bedrock fracture sizes and orientations in relation to groundwater flow, including any preferential flow paths for groundwater (both shallow and deep);
- hydrogeologic maps and cross-sections for the mine 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;
- evaluation of discharge rates;
- assessment of groundwater quality in the different aquifers; and

Baseline information must include existing water supply wells (if any) identified within the area of influence of the Project property.

#### 4.17.3.2 Surface Water

The EIS should describe surface water quality, hydrology and sediment quality 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 and sediment quality and surface water hydrology. A time-series graph of key variables and stream flows must be provided to illustrate patterns and variability. The full range of stream flow characteristics, in addition to mean values, should be described.

Furthermore, the EIS must:

- include delineation of drainage basins, at appropriate scales;

- describe and present monitored hydrological data, such as water levels and flow rates in local streams and selected local lakes;
- 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, bridge and culvert design at stream crossings for access roads and railway lines and an assessment of potential ice problems;
- describe the interactions between surface water and groundwater flow systems under pre-development conditions and potential impacts on these interactions during the various phases of the Project;
- describe any local and regional potable surface water if any; and
- 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.

#### *4.17.4 Effects Assessment and Mitigation*

The adverse environmental effects of the Project on Water Resources must be assessed for all phases of the Project and potential accident scenarios. With respect to accident scenarios, the discussion of impacts to both ground and surface water resources must include an analysis of impacts of malfunctions and accidents events, taking into account:

- the proposed ice roads across Iron Arm;
- transportation of fuel for the Project (e.g., mine trucks, boilers). The EIS must describe potential accidents and malfunctions associated with the transportation and storage of fuel along the rail and on the Project site; and
- the management, storage and disposal of used oil and associated potential for malfunctions and accidents events.

##### 4.17.4.1 Groundwater

The EIS must 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 and streams, 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 pit, overburden/waste rock/ore stockpiles, TMF, 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 pit and withdrawal rates from the open pit;
- 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 4.17.3.1 to show effects); and
- a description of potential cumulative and residual effects of the overall Project on water resources and their significance.

The EIS must 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 must 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 must describe measures to mitigate effects on groundwater quality and quantity and predict adverse residual effects and their significance.

#### 4.17.4.2 Surface Water

The EIS must assess the effects of the Project on surface water quality and quantity within the Project's zone of influence]. Potential watershed management impacts associated with the creation of the tailings management facility must 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 impacts to surface water should include malfunctions and accidents events. The EIS 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 Joyce Lake open pit, waste rock and low grade ore storage areas, tailings disposal area and processing area. 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* for and the *Guidelines for Canadian Drinking Water Quality*, as applicable;
- provide a overview on the closure plans at Joyce Lake;
- describe the potential for the phenomenon known locally as "Red Water" to be associated with tailings management and associated impacts to water; and
- 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 EIS must describe technically and economically feasible measures to mitigate effects to surface water quality and quantity and predict adverse residual effects and their significance. The EIS should also

address what measures would be taken by the proponent if water quality or quantity were to be affected by the Project.

#### **4.18 Wildlife and Their Habitats and Protected Areas**

The effects of the Project on wildlife and their habitats will be assessed within the Project footprint (i.e. cleared areas) and areas that could reasonably be affected by the Project activities. The effects of the Project on protected areas that could be affected by the Project will also be assessed. 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.

##### ***4.18.1 VEC Definition and Rationale for Selection***

Wildlife and their habitat refers to migratory and non-migratory species that are potentially feeding, breeding, moving and/or migrating through the Project area. Protected areas include all lands protected by municipal, provincial or federal legislation, policy or agreements. It has been selected as a VEC because of the need to protect ecosystems, species diversity, important habitats and ecosystems. In addition, 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.

##### ***4.18.2 Potential Project-VEC Interactions***

Potential Project-VEC interactions include:

- habitat loss or degradation due to construction and operation of Project facilities and associated infrastructure;
- effects on the physical condition of individuals due to emissions/discharges from the Project;
- mortality due to construction, operation and/or decommissioning and/or accidents and malfunctions during these Project phases;
- disruption of feeding, breeding, movement and/or migratory patterns due to noise, lights and/or presence of Project facilities and;
- impacts of the Project to protected areas.

### *4.18.3 Existing Environment*

The EIS must describe migratory and non-migratory birds (including waterfowl, raptors, shorebirds, marsh birds and other landbirds), ungulates, furbearers, amphibians, small mammals and their habitat at the Project site and within the local and regional areas. The results of any baseline surveys must be included.

#### 4.18.3.1 Wildlife

Wildlife includes:

- Non-migratory birds include waterfowl, raptors, shorebirds, marsh birds and other landbirds.
- Ungulates include boreal sedentary or migratory caribou populations in the region and moose.
- Small mammals and furbearers eg. species such as black bear, wolf, marten, red fox, beaver and otter.

Other wildlife and their habitat that could be impacted by Project activities must be characterized using existing data, supplemented by surveys as appropriate. The proponent should contact the NLDOEC for further detail on the information requirements.

The EIS should give particular consideration to areas of concentration of migratory animals, such as breeding, denning and/or wintering areas, as well as breeding areas of species low in number and high in the food chain (e.g. furbearers such as black bear and wolf).

#### 4.18.3.2 Protected Areas

The description of the existing environment must include consideration of existing or proposed protected areas, special management areas and conservation areas in the regional study area. The EIS must note the size of protected areas, the ecological region(s) they represent and any important biotic or abiotic feature(s) which may be affected by the Project (e.g., as a result of noise or visual stimulus). In addition, the EIS shall address the value of the protected areas, relating both to their environmental attributes and to the value placed on them by humans (e.g., cultural and social values, aesthetics).

#### *4.18.4 Effects Assessment and Mitigation*

The adverse environmental effects of the Project on wildlife and their habitats should be assessed for all phases of the Project and for malfunctions and accidental events. The EIS 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 must be considered in the EIS. The EIS must:

- quantify and describe overall loss or alteration of terrestrial habitat that could result from the Project and its effect on key species. Where possible, rank habitat quality for each VEC species so that the loss of high-quality habitat can be assessed in the context of its regional availability. Regional boundaries for assessment of relative habitat loss should be based on major watershed boundaries and eco-sections;
- 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);
- assess the potential effects on species known to be important to Aboriginal people;
- describe the potential siltation associated with tailing management and the impacts on wildlife and habitat.

The EIS must describe technically and economically feasible measures to mitigate effects on wildlife and their habitats and predict adverse residual effects and their significance. This includes plans and predictions for re-vegetation of the Project area, taking into account growth rates of local vegetation.

The EIS must evaluate the potential environmental effects of the Project on the environmental, cultural, social and aesthetic values of the protected areas that could be affected by the Project. The analysis should include consideration of:

- effects on protected areas and their abiotic and biotic features, including impacts of dust and tailings on waterbodies in and flowing in/out of protected areas;
- the potential for isolation of flora and fauna within protected areas, due to habitat alteration and loss; and
- measures to mitigate the effects of the Project on the environmental, cultural and social benefits of protected areas.

#### **4.19 Species at Risk and Designated Species**

The effects of the Project on animal and plant Species at Risk (SARs) and Designated Species under the NLESA will be assessed within the Project footprint (i.e. cleared areas) and areas that could reasonably be affected by the Project activities. 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.

##### ***4.19.1 VEC Definition and Rationale for Selection***

SARs include:

- species that are listed under the *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 (ACDC) as S1, S2, or S3 or general status (NL Department of Environment and Conservation - Wildlife Division General Status of Wildlife Ranks )as maybe 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. For example, the NLESA requires Eas to identify any adverse effects on a listed species or its critical habitat be identified and that measures be taken to mitigate and monitor those effects. Measures undertaken must be consistent with applicable federal recovery strategies, federal action plans, or provincial recovery plans.

##### ***4.19.2 Potential Project-VEC Interactions***

Potential Project-VEC interactions for SARs include:



- habitat loss or degradation due to construction and operation of Project facilities and associated infrastructure;
- effects on the physical condition of individuals due to emissions/discharges from the Project;
- mortality associated with construction, operation and/or decommissioning and/or accidents and malfunctions during all Project phases; and
- disruption of feeding, breeding, movement and/or migratory patterns due to noise, lights and/or presence of Project facilities.

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.

#### *4.19.3 Existing Environment*

As background for the analysis of the Project's effects on SARs, the EIS must:

- 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:

- SARA ([www.sararegistry.gc.ca](http://www.sararegistry.gc.ca));
- NLESA;
- COSEWIC;
- SSAC;
- NLDOEC - Wildlife Division General Status of Wildlife Ranks;
- ACCDC;
- Québec *Loi sur les espèces menacées ou vulnérables*;
- Relevant Government agencies;
- Local naturalist and interest groups; and
- Aboriginal groups and First Nations.

#### ***4.19.4 Effects Assessment and Mitigation***

The EIS should identify the adverse effects of the Project on SARs, including individuals, critical habitat, recovery habitat, important habitat and residences of species listed under SARA and 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 EIS 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 must include project-specific impacts and cumulative effects on SARs and their critical habitat, recovery habitat, important habitat and/or residences. The likely significance of the Project's potential adverse environmental effects on SARs and species of conservation concern must be predicted.

Analysis must 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 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 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 (Environment Canada - Parks Canada 2010);*
- *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.*

#### 4.20 Historic and Cultural Resources

The effects of the Project on historic and cultural resources must be assessed.

##### 4.20.1 VEC Definition and Rationale for Selection

Historic resources are defined pursuant to the NL *Historic Resources Act*, as 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.

The Project must give consideration of the effect of any change in the environment caused by the project on physical and cultural heritage, as well as any structure, site or thing that is of historical, archaeological, palaeontological or architectural significance. Palaeontological resource means a construct, structure or work of nature consisting of or being evidence of prehistoric multi-cellular organisms and palaeontological resources that are designated by regulation. These resources are important for their historic, cultural, spiritual and scientific value.

##### 4.20.2 Potential Project-VEC Interactions

Potential Project-VEC interactions are related to disturbance to and loss of, archaeological sites resulting from site clearing, grubbing and grading activities.

##### 4.20.3 Existing Environment

The EIS must identify any terrestrial and aquatic areas within the project footprint that are known to contain features of historical, archaeological, palaeontological, architectural, spiritual or cultural significance. A description of the nature of the features located in those areas must be provided. Informant interviews must be conducted with individuals familiar

with the Project Area. Particular attention must be given to Aboriginal cultural, archaeological and historic resources, in consultation with Aboriginal people. The potential for archaeological and historic resources to be present in the project areas must be assessed and presented.

#### ***4.20.4 Effects Assessment and Mitigation***

The adverse environmental effects of the Project on historic and cultural resources will be assessed for all phases of the Project, as well as for accidents and malfunctions. The analysis should include an archaeological impact assessment of the Project area. The EIS must provide technically and economically feasible measures to mitigate effects and predict adverse residual effects and their significance, taking into consideration pertinent legislation (i.e., NL *Historic Resources Act*), policies, guidelines and directives. The analysis should include an archaeological impact assessment of the proposed Project areas, with particular emphasis on the mine site and associated infrastructure (i.e., roads, railway).

#### **4.21 Other Contemporary Use of Lands and Resources**

The effects of the Project on other contemporary use of lands and resources will be assessed within the Project property boundaries and along the right-of-way of associated infrastructure.

##### ***4.21.1 VEC Definition and Rationale for Selection***

Other contemporary use of lands and resources is defined as use of land and resources, including industrial uses, within the Project property boundaries and along the right-of-way of associated infrastructure. It was selected as a VEC due to its socio-economic importance. In particular, the Project area in Labrador is important to cabin owners and to area residents for recreational purposes.

##### ***4.21.2 Potential Project-VEC Interactions***

Potential Project-VEC interactions will result from construction and operation activities that alter or destroy wildlife and fish habitat, contaminate country foods, contaminate drinking water supplies, result in restricted access, or modify the existing use of the Project area as a result of diminished air quality, changes to viewscapes, noise and other disturbances. At Sept-Îles, potential Project-VEC interactions could result from the exclusion / promotion of industrial development at the site.

#### ***4.21.3 Existing Environment***

The EIS must describe land use at the Project sites and within the regional areas. It should identify past, contemporary and any known planned land use(s) of the Project area that may be affected by the Project. Local land and resource users should be consulted to help characterize existing land and resource use patterns. The aspects listed below are to be considered to the extent that they are applicable to the site of either the Project in Labrador, or Port operations at Sept-Îles:

- **Residential and Recreational Property:** The EIS must identify any property whose value may be adversely affected by any change in the environment caused by the Project. The occurrence of houses and cabins in the vicinity of the proposed mine site should be described, as well as any land identified for potential housing development. The discussion should include any impacts of the Project to local residents.
- **Outdoor Recreation and Tourism:** An overview of the current access and use of the mine site and surrounding areas for recreation and the tourist industry (e.g., berry picking, plant harvesting, hiking, snowshoeing, snowmobiling and snowmobile trails, parks, camping, recreational use of water bodies must be provided;
- **Hunting, Trapping and Guiding:** the current and projected value of the hunting, trapping and guiding industry close to or within the mine site must be provided;
- **Forestry:** The current forest resources and activities at the mine site should be identified;
- **Mineral Exploration:** The current mineral resources and exploration activities in the mine area must be identified;
- **Agriculture:** The EIS must identify current agricultural resources and activities, if any, that could be affected by the mine;
- **Labrador Rail Transportation:** Identify any railway construction and/or operation that is subject to the NL *Rail Service Act*;
- **Float Planes:** The EIS should describe current use of local lakes; and
- **Communication Towers:** The EIS should describe any potential impacts to communications towers.

#### ***4.21.4 Effects Assessment and Mitigation***

The EIS must describe the adverse effects, including impacts of potential malfunctions and accidental events on existing and planned land and water uses, including the components

identified in the previous section, that may arise from changes in the environment caused by the Project (e.g., noise/vibrations, air and water quality, visual and topographic characteristics of the area). The discussion should include consideration of:

- increased industrialization and changes to the visual landscapes for local communities, surrounding areas and along provincial roads and highways;
- the effects of noise, dust and visual impacts to recreation.

The analysis should take into consideration pertinent legislation, policies, guidelines and directives relating to land and resource use. The EIS must describe technically and economically feasible measures that would be employed to mitigate effects on other current use of lands and resources, as well as predicted adverse residual effects.

#### **4.22 Economy, Employment and Business**

The effects of the Project on economy, employment and business will be assessed at the provincial scale, in accordance with Newfoundland and Labrador requirements.

##### ***4.22.1 VEC Definition and Rationale for Selection***

Economy, employment and business is defined as:

- economy of Labrador and the rest of the Province;
- taxes and royalties;
- gross domestic product (GDP);
- employment in Labrador and in the rest of the Province;
- skilled and unskilled labour supply in Labrador and the rest of the Province;
- expenditures in Labrador and the rest of the Province;
- employment equity and diversity including under-represented groups (e.g., women, persons with disabilities, aboriginal groups);
- business capacity: goods and services; and
- economic activities related to tourism.

Understanding the Project's effects on economy, employment and business is fundamental to assessing socio-economic implications for the lives of residents and of revenues to governments.

#### *4.22.2 Potential Project-VEC Interactions*

The interaction of the Project with economy, employment and business is related to the Project's expenditures, employment and environmental impacts.

#### *4.22.3 Existing Environment*

Baseline conditions for economy, employment and business will be determined through a review of information from the Governments of Newfoundland and Labrador, and Canada and other relevant agencies and organizations (e.g., Chambers of Commerce and Boards of Trade; Statistics Canada 2006 census) within the region and potentially-affected Aboriginal communities. Where additional information is required, studies and/or interviews shall be conducted.

Baseline conditions will be characterized for:

- existing employment (e.g., by sector) and income conditions;
- skilled and unskilled labour supply;
- employment equity and diversity including potentially under-represented groups (e.g., women, Aboriginal persons, persons with disabilities);
- GDP for Newfoundland and Labrador;
- income levels;
- sources of income;
- labour force indicators including labour force, employment, unemployment and employment, unemployment and participation rates;
- business and industry profile (including industries of specific importance such as mineral exploration and mining);
- tourism related activities; and
- business capacity, including Aboriginal business capacity.

#### *4.22.4 Effects Assessment and Mitigation*

The EIS must assess the effects of Project-related effects on economic, employment and business conditions and opportunities, as described in the above sections, focusing on the region, and potentially affected Aboriginal communities. The discussion should describe proposed grants or other benefits which could accrue to local towns/municipalities as a result of the Project.

Given the large number of workers required to complete the project, the EIS must provide:

- expected impacts on the local labour force in Labrador, by gender, including impacts on the Aboriginal labour force; and
- technically and economically feasible measures to mitigate adverse effects and to optimize beneficial effects.

The EIS should describe potential impacts to tourism activities in local municipalities.

The EIS must include commitments to:

- develop Gender Equity and Diversity Plans that meet the approval of the Minister of Natural Resources and the Minister Responsible for the Status of Women. The plans will include an employment plan and a business access strategy for women and for other under represented groups, including Aboriginal groups;
- provide quarterly reports to that meet the approval of the Minister of Advanced Education and Skills, during the construction phase, as well as for the duration of the operations phase, including information by gender on the following;
  - the number employed (by 4-digit NOC),
  - the number of full-time/part-time employees,
  - the number of apprentices (by level) and journeypersons,
  - Aboriginal group, and
  - source of the workforce; and
- develop a Newfoundland and Labrador Benefits Plan that meets the approval of the Minister of Natural Resources.

Pertinent acts, policies, guidelines and directives relating to economy, employment and business must be taken into account.

#### **4.23 Commitments Made in the EIS**

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

#### **4.24 Component Studies**

Due to the complexity particular to a number of the VECs likely to be affected by the Project, it has been determined that stand alone baseline studies will be required to support the



evaluation of environmental effects, the development of mitigation measures and monitoring and follow up programs. Baseline studies will be required for:

- Water Resources (fresh water quality and quantity for groundwater and surface water);
- Air Quality Monitoring; and
- Socio-economics (including housing, labour force, community services, employment demands, local infrastructure).
- Species At Risk

Where new information becomes available, additional component studies may be required.

Component studies should generally have the following format:

- Rationale/Objectives: In general, the baseline studies should be conducted to obtain all required data for use in determining the potential for significant effects on a the VEC as well as for monitoring and follow-up programs.
- Study Area: The boundaries of the study area shall be defined depending on the characteristics of the VEC being investigated.
- 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.
- Study Outputs:
  - Study outputs shall be proposed by the Proponent. Information and data generated shall be sufficient to adequately predict the effects on the VEC and to determine monitoring and follow-up requirements.
  - Identification of information sources.
  - Appendix of raw data in electronic tabular form for the bio-physical baseline studies.

The component studies, in their entirety should be submitted the NLDOEC in accordance with Section 12 of the *Environmental Assessment Regulations*, 2003 under the NLEPA.

## Data and Information Sources

Canadian Environmental Assessment Agency. 2012. *Canadian Environmental Assessment Act and Regulations*. <http://laws-lois.justice.gc.ca/eng/acts/C-15.21/index.html>

Guidelines for Canadian Drinking Water Quality. 1996. ([http://www.hc-sc.gc.ca/ewh-smemt/pubs/water-eau/2010-sum\\_guide-res\\_recom/index-eng.php](http://www.hc-sc.gc.ca/ewh-smemt/pubs/water-eau/2010-sum_guide-res_recom/index-eng.php))

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 - 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>

Newfoundland and Labrador Department of Environment and Conservation. *Guidance for Plume Dispersion Modeling* (GD-PPD-019.2)

Newfoundland and Labrador Department of Environment and Conservation. *Determination of Compliance with the Ambient Air Quality Standards* (GD-PPD-009.4)

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 *Mineral Act*:

<http://assembly.nl.ca/Legislation/sr/statutes/m12.htm>

Newfoundland and Labrador *Rail Service Act*:

<http://assembly.nl.ca/Legislation/sr/statutes/r01-2.htm>

Newfoundland and Labrador *Sustainable Development Act*:

<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>

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](http://www.registrelep-sararegistry.gc.ca/document/dspDocument_e.cfm?documentID=2100)

## Appendix A: Public Notices

Under the provisions of the *Environmental Assessment Regulations 2003*, Section 10 and where the approved Guidelines require public information session(s), the following specified public notification requirements must be met by the proponent prior to each meeting:

<p style="text-align: center;">Public Notice</p> <p style="text-align: center;">Public Information Session on the Proposed</p> <p style="text-align: center;"><i>Name of undertaking</i></p> <p style="text-align: center;"><i>Location of undertaking</i></p> <p style="text-align: center;">Shall be held at</p> <p style="text-align: center;"><i>Date and Time</i></p> <p style="text-align: center;"><i>Location</i></p> <p style="text-align: center;">This session shall be conducted by the Proponent,</p> <p style="text-align: center;"><i>Proponent name and contact phone number,</i></p> <p style="text-align: center;">as part of the environmental assessment for this Project,</p> <p style="text-align: center;">to describe the activities associated with and to provide an opportunity for all interested persons to request information or state their concerns.</p> <p style="text-align: center;"><b>ALL ARE WELCOME</b></p>
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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 must receive prior written approval of the Minister of Environment and Conservation.