



ENVIRONMENTAL IMPACT STATEMENT DRAFT GUIDELINES

for the

Wabush 3 Open Pit Mine Project

Prepared by:

The Newfoundland and Labrador Department of Environment and Conservation

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Table of Contents

GLOSSARY OF ACRONYMS AND ABBREVIATIONS	VI
1.0 INTRODUCTION.....	1
1.1 Purpose of the Environmental Impact Statement Guidelines.....	2
1.2 Guiding Principles.....	3
1.2.1 <i>Environmental Assessment as a Planning Tool.....</i>	<i>3</i>
1.2.2 <i>Local Knowledge and Aboriginal Traditional Knowledge</i>	<i>4</i>
1.2.3 <i>Sustainable Development.....</i>	<i>4</i>
1.2.4 <i>Precautionary Approach.....</i>	<i>5</i>
2.0 THE ENVIRONMENTAL ASSESSMENT PROCESS	6
2.1 CONTACT FOR THE ENVIRONMENTAL ASSESSMENT	6
2.2 Environmental Assessment Requirements.....	6
2.2.1 <i>Newfoundland and Labrador Environmental Protection Act</i>	<i>6</i>
2.2.2 <i>Delegated EIS Preparation.....</i>	<i>7</i>
2.3 Consultation 8	
2.3.2 <i>Record of Aboriginal & Public Consultation.....</i>	<i>10</i>
3.0 SCOPE OF PROJECT, FACTORS TO BE CONSIDERED AND SCOPE OF THE FACTORS... 10	
3.1 Scope of Project.....	10
3.2 Factors to be Considered	11
3.3 Scope of the Factors to be Considered.....	12
4.0 PREPARATION OF THE EIS.....	13
PART I: CONTENT OF THE EIS	14
4.1 Executive Summary.....	14
4.2 Plain Language Summary	15
4.3 Project Information.....	16
4.3.1 <i>The Proponent</i>	<i>16</i>
4.3.2 <i>Project Overview.....</i>	<i>17</i>
4.3.3 <i>Regulatory Framework and the Role of Government.....</i>	<i>17</i>
4.3.4 <i>Non-Government Participants in the Environmental Assessment</i>	<i>18</i>
4.3.5 <i>Land Claims Agreements and Interim Agreements.....</i>	<i>18</i>
4.3.6 <i>Other Registrations</i>	<i>18</i>

4.4	Project Description	18
4.4.1	<i>Purpose of and Need for the Project</i>	18
4.4.2	<i>Alternatives to the Project.....</i>	19
4.4.3	<i>Project Location</i>	19
4.4.4	<i>Project Description</i>	20
4.4.4.1	<i>Facilities and Components.....</i>	20
4.4.4.2	<i>Activities.....</i>	21
4.4.4.3	<i>Labour Force Requirements</i>	22
4.4.5	<i>Alternative Means of Carrying out the Project.....</i>	22
4.5	Description of the Existing Environment	23
4.6	Effects Assessment.....	25
4.6.1	<i>Accidents and Malfunctions</i>	26
4.6.2	<i>Capacity of Renewable Resources.....</i>	27
4.7	Avoidance and Mitigation Measures.....	27
4.8	Cumulative Effects Assessment.....	28
4.9	Effects of the Environment on the Project.....	30
4.10	Environmental Management.....	32
4.10.1	<i>Planning.....</i>	32
4.10.2	<i>Follow-Up Program.....</i>	32
4.11	Significance of Residual Adverse Environmental Effects	34
4.12	Economic and Social Benefits of the Project.....	34
4.13	Benefits of the EA to Newfoundland and Labrador	34
4.14	Assessment Summary and Conclusions.....	35
PART II: DETAILED GUIDANCE ON SELECT ENVIRONMENTAL S.....		36
4.15	Baseline Studies	36
4.16	Atmospheric Environment.....	36
4.16.1	<i>VEC Definition and Rationale for Selection</i>	37
4.16.2	<i>Potential Project-VEC Interactions</i>	37
4.16.3	<i>Existing Environment</i>	38
4.16.4	<i>Effects Assessment and Mitigation.....</i>	38
4.17	Landforms, Soils, Snow and Ice.....	41
4.17.1	<i>VEC Definition and Rationale for Selection</i>	41
4.17.2	<i>Potential Project-VEC interactions</i>	41
4.17.3	<i>Existing Environment</i>	41
4.17.3.1	<i>Acid Rock Drainage and Metal Leaching.....</i>	41
4.17.4	<i>Effects Assessment and Mitigation.....</i>	42
4.17.4.1	<i>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</i>	

leachate risks and determine mitigation requirements for the project. Additional information should be provided for:.....	43
4.18 Water Resources.....	44
4.18.1 VEC Definition and Rationale for Selection	44
4.18.2 Potential Project-VEC Interactions	44
4.18.3 Existing Environment	45
4.18.3.2 Surface Water	46
4.18.4 Effects Assessment and Mitigation	47
4.18.4.1 Groundwater	47
4.18.4.2 Surface Water	48
4.19 Wetlands 49	
4.19.1 VEC Definition and Rationale for Selection	49
4.19.2 Potential Project-VEC Interactions	50
4.19.3 Existing Environment	50
4.19.4 Effects Assessment and Mitigation	51
4.20 Fish, Fish Habitat and Fisheries	51
4.20.1 VEC Definition and Rationale for Selection	51
4.20.2 Potential Project-VEC Interactions	52
4.20.3 Existing Environment	53
4.20.4 Effects Assessment and Mitigation	53
4.21 Birds, Other Wildlife and Their Habitats.....	54
4.21.1 VEC Definition and Rationale for Selection	54
4.21.2 Potential Project-VEC Interactions	55
4.21.3 Existing Environment	55
4.21.3.1 Migratory Birds	55
4.21.3.2 Other Wildlife	56
4.21.4 Effects Assessment and Mitigation	56
4.22 Species at Risk and Species of Conservation Concern.....	57
4.22.1 VEC Definition and Rationale for Selection	58
4.22.2 Potential Project-VEC Interactions	58
4.22.3 Existing Environment	59
4.22.4 Effects Assessment and Mitigation	59
4.23 Other Current and Future Use of Lands and Resources.....	60
4.23.1 VEC Definition and Rationale for Selection	60
4.23.2 Potential Project-VEC Interactions	61
4.23.3 Existing Environment	61
4.23.4 Effects Assessment and Mitigation	62
4.24 Community Services and Infrastructure	62
4.24.1 VEC Definition and Rationale for Selection	62
4.24.2 Potential Project-VEC Interactions	63
4.24.3 Existing Environment	63

4.24.4	Effects Assessment and Mitigation	63
4.25	Health and Community Health.....	64
4.25.1	VEC Definition and Rationale for Selection	64
4.25.2	Potential Project-VEC Interactions.....	65
4.25.3	Existing Environment	65
4.25.4	Effects Assessment and Mitigation	65
4.26	Economy, Employment and Business	66
4.26.1	VEC Definition and Rationale for Selection	66
4.26.2	Potential Project-VEC Interactions.....	66
4.26.3	Existing Environment	66
4.26.4	Effects Assessment and Mitigation	67
4.27	Commitments made in the EIS	68
	DATA AND INFORMATION SOURCES.....	69
	APPENDIX A: PUBLIC NOTICES.....	74

Glossary of Acronyms and Abbreviations

ACCDC	Atlantic Canada Conservation Data Centre
ANFO	Ammonium Nitrate/Fuel Oil
ARD	Acid Rock Drainage
BACT	Best Available Control Technology
CEAA	<i>Canadian Environmental Assessment Act</i>
CEPA	<i>Canadian Environmental Protection Act (1999)</i>
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
DFO	Fisheries and Oceans 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
mg/m ³	Milligrams per cubic metre
ML	Metal Leaching
ENVC	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
NWPA	<i>Navigable Waters Protection Act</i>
NO _x	Nitrogen Oxides
PAH	Polycyclic Aromatic Hydrocarbon
PAG	Potentially Acid Generating
PLS	Plain Language Summary
PM _{2.5} , PM ₁₀	Particulate Matter (subscript indicates size threshold, in microns)
TC	Transport Canada
t/d	Tonnes per day
t/yr	Tonnes per year
SAR	Species at Risk
SARA	<i>Species at Risk Act</i>
SO ₂	Sulphur Dioxide
SSAC	Species Status Advisory Committee
VEC	Valued Ecosystem Component
VOC	Volatile Organic Compounds

1.0 INTRODUCTION

The Iron Ore Company of Canada (IOCC) proposes to construct and operate a new open pit mine at its Labrador West mine site. The Wabush 3 open pit mine will be a conventional open pit mine that will serve IOCC operations in two ways:

- provide iron ore feed to its existing concentrator plant to achieve and maintain production of iron concentrate at the mill's rated capacity
- provide a new source of iron ore to extend the life of the Carol Project

IOCC's mining operations in Labrador West consists of five existing operating open pits – Luce, Sherwood, Humphrey Main, Humphrey South and Lorraine South, one open pit to be reactivated, (Spooks) and the proposed Wabush 3 pit. IOCC also operates a concentrator plant and a pellet plant in Labrador West and transports its products along a 418 km railway to its port facilities in Sept-Îles, Quebec.

The Project is located in Western Labrador and the Wabush 3 footprint (approximately 464 ha) is within IOCC's existing property boundaries (Mining Lease 15-Block 22-5). The site is situated to the south of and adjacent to the Smokey Mountain Alpine Lodge and sections of the Menihek Nordic Ski Club trails and the entire footprint is within the Town of Labrador City's Planning Boundary. The Project will be developed in four phases that will include a mix of site development, operations and decommissioning.

The Project will consist of an open pit containing an estimated 900 M tonnes of iron ore, an overburden storage area, a waste rock disposal pile, haulage roads, a pole line, a groundwater extraction system and a mine water collection, treatment and disposal system. The Project proposes the removal of two waterbodies, Pumphouse Pond and Drum Lake, and occurs to the west of the protected Beverley Lake watershed. Phase four will include site closure and rehabilitation. In addition, a stream will be removed as it flows through the open pit footprint and as the Project progresses, a third watershed, Leg Lake, will be affected.

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

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" means the components of the Earth, and includes:

- a) air, land and water, including all layers of the atmosphere;
- b) plant and animal life, including human life;
- c) the social, economic, recreational, cultural and aesthetic conditions and factors that influence the life of humans or a community;
- d) a building, structure, machine or other device or thing made by humans;
- e) a solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirectly from the activities of humans; or
- f) a part or a combination of those things referred to in subparagraphs (a) to (f) and the interrelationships between 2 or more of them.

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

"Follow-up Program" means a program for:

- (a) verifying the accuracy of the EA of the Project/Undertaking; and,
- (b) determining the effectiveness of any measures taken to mitigate the adverse environmental effects of the Project/Undertaking;

"Minister" means the provincial Minister of the Department 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, or its components, and alternative means of carrying out the Project, or its components, 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 (post-mitigation) environmental effects that are beneficial or harmful that are likely to be caused by the undertaking regardless of the proper application of all control, mitigation, enhancement and remedial measures to be proposed in the EIS;
- assess the cumulative environmental effects of the Project in combination with other projects and activities that have been or will be carried out;
- predict whether or not the project, in combination with other projects or activities that have been or will be carried out, is likely to cause 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 consultations with Aboriginal organizations 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 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, can be an important contribution 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* (to be proclaimed), 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 analysis of alternatives, shall take into account the relationships and interactions among the various components of the ecosystems, including the extent to which biological diversity may be affected by the Project, and how the Project meets the needs of the present as well as future populations.

1.2.4 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, e.g., environmental emergency plans;
- identify any proposed follow-up and monitoring activities, particularly in areas where scientific uncertainty exists, in the prediction of effects or effectiveness of proposed mitigation measures; and
- present public views on the acceptability of all of the above.

2.0 THE ENVIRONMENTAL ASSESSMENT PROCESS

2.1 Contact for the Environmental Assessment

Ivy Stone (Chair)
 Environmental Scientist
 Environmental Assessment Division
 Department of Environment and Conservation
 PO Box 8700
 St. John's NL A1B 4J6
 (709)729-0090
 IvyStone@gov.nl.ca

2.2 Environmental Assessment Requirements

2.2.1 Newfoundland and Labrador Environmental Protection Act

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

- consulting at every stage with interested government departments, the public and Aboriginal organizations;
- evaluating submissions by Proponents and reviewers, including Aboriginal organizations;
- 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 ENVC. The registration outlines the proposed project and describes how it will affect the bio-physical and socio-economic environments. The Registration is referred to provincial and federal government departments and to appropriate Aboriginal governments and organizations for review and comment. The Registration is also 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 July 23, 2013 the Minister advised IOCC that an EIS was required.

2.2.2 Delegated EIS Preparation

Pursuant to the requirements of Section 51(1)(b) of the NLEPA, the Proponent has been delegated the task of preparing the EIS. The EIS should be prepared according to these guidelines and, once completed, the Proponent shall submit printed and electronic copies of the EIS to the involved provincial agencies in the quantities specified in Table 2. In addition, the Proponent shall make printed copies of the EIS and the Plain Language Summary (PLS) of the EIS available at public viewing centers (to be designated) in the project vicinity.

In accordance with the requirements of the Government of Newfoundland and Labrador, baseline studies will be required to define baseline conditions, and to support the evaluation of environmental effects and/or the development of mitigation measures as well as monitoring and follow up programs.

Table 1 Environmental Impact Statement Copy Requirements

Organization	Electronic Copies *		Printed copies	
	EIS	PLS	EIS	PLS
ENVC	15	1	15	5
DFO	1	1	1	1
EC	2	2	1	1
TC	1	1	1	1
HC	1	1	1	1
Public Viewing Locations (TBD)	NA	NA	NA	1 at each location

*Electronic copies to be provided on CD

Baseline studies are discussed further in section 4.15.

2.3 Consultation

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

Table 2: Aboriginal and Public Participation Opportunities

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

Electronic and hard copy versions of documents will be provided to ENVC and these will be made available for Aboriginal and public review. Key documents will be available on the ENVC Environmental Assessment webpage.

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

The Proponent is required to provide current information about the project to the public and especially to the communities likely to be most affected by the project as early as possible in the review process. This will ensure that all parties have an opportunity to gain an understanding of the proposed Project and may facilitate their continued involvement in the EA process. During the preparation of the EIS, the Proponent 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 communities regarding the potential environmental effects of the Project. Appendix A provides additional information on the notification requirements for the information sessions.

2.3.1 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 or proven Aboriginal 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 or proven Aboriginal 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 or proven Aboriginal rights.

For clarity, Government will consult only those Aboriginal organizations which have asserted or proven Aboriginal rights in the Project area.

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. This will require the Proponent to provide up-to-date information describing the project to the relevant Aboriginal organizations, and especially to the communities likely to be most affected by the Project. The Proponent shall also involve

Aboriginal organizations in determining how best to deliver that information (e.g., the types of information required, formats, and the number of community meetings required).

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.

For further information on Aboriginal consultation, please refer to the Government of Newfoundland and Labrador's Aboriginal Consultation Policy on Land and Resource Development Decisions ("The Policy") April 2013 for more detailed information.

http://www.exec.gov.nl.ca/exec/igas/publications/aboriginal_consultation.pdf

2.3.2 Record of Aboriginal & Public Consultation

The EIS must describe all Aboriginal and 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 Aboriginal organizations and the public and the Proponent's responses.

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

3.1 Scope of Project

The EIS will examine all activities and physical works associated with the construction, operation, rehabilitation and closure of the proposed Project, as described in the Proponent's project description dated May 2013 including, but not limited to, the activities listed below.

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

- an open pit including dewatering infrastructure to dewater and to manage groundwater levels;
- waste rock disposal areas
- overburden stockpiles;
- ancillary infrastructure to support the mine and process plant (e.g., gate and guardhouse, reclaim water pumphouse, transmission lines, explosives magazine storage, sewage and water treatment units, etc.);
- mobile mining and support equipment;
- access and haulage roads;

The Proponent is to confirm in the EIS that the Wabush 3 Open Pit Mine Project will simply be adding additional reserves to the overall processing operation and not increasing the overall annual production levels. For this reason, tailings management and its associated impacts are not being scoped into these Guidelines.

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 Aboriginal organizations and from the public that are received in accordance with NLEPA regulations or practice;
- 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 or components of 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 groundwater);

- wetlands;
- freshwater fish, fish habitat and fisheries;
- birds, other wildlife and their habitats;
- Species at Risk and species of conservation concern;
- other current and future 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 Proponent must also prepare a Plain Language Summary (PLS) to accompany the EIS. The PLS is described in Section 4.2 and will be used to facilitate Aboriginal consultation and aid public review of the conclusions of the EIS.

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.

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 Plain Language Summary

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

Introduction

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

Project Description

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

Scope of the Assessment

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

Project Alternatives

- Alternatives to the Project
- Alternative Means of Carrying out the Project
 - Description of Alternative Means
 - Environmental Effects of Technically and Economically Feasible Alternative Means
 - Selection of a Preferred Alternative Means

Consultation

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

Existing Environment

Environmental Effects Assessment

- Method and Approach
- VECs (impact matrix should be provided)
 - Potential Environmental Effects
 - Mitigation Measures
 - Residual Environmental Effects
 - Government, Public and Aboriginal Comments and Proponent's Response
- Effects of the Environment on the Project
 - Method and Approach
 - Potential Effects
 - Mitigation
 - Residual Effects
 - Government, Public and Aboriginal Comments and Proponent's Response
- Effects of Possible Accidents or Malfunctions
 - Method and Approach
 - Potential Effects
 - Mitigation
 - Residual Effects
 - Government, Public and Aboriginal Comments and Proponent's Response
- Effects on Capacity of Renewable Resources
- Cumulative Environmental Effects
 - Approach
 - Scoping
 - Potential Cumulative Effects
 - Mitigation Measures
 - Residual Effects
 - Government, Public and Aboriginal Comments and Proponent's Response

Follow-Up Program

Benefits of the EA to Newfoundlanders and Labradoreans

Overall Conclusions of the Proponent

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

4.3 Project Information

4.3.1 *The Proponent*

The EIS shall:

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

4.3.2 *Project Overview*

The EIS shall briefly summarize the development proposal. If the Project is a component of a larger operation, the EIS shall outline the larger context and present the relevant references, if available. The Project location should be described in the context of surrounding land uses and infrastructure. The intent of this overview is to provide the key components and the location of the Project, rather than a detailed description, which shall follow as described in Section 4.4.4 of this document.

4.3.3 *Regulatory Framework and the Role of Government*

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

- identify the environmental regulatory approvals and legislation that are applicable to the Project at provincial and municipal levels, including:
 - activities requiring regulatory approval;
 - names of permits or regulatory approvals;
 - names of legislation applicable in each case; and
 - names of the regulatory agencies responsible for each permit or approval;
- identify environmental government policies, resource management, planning or study initiatives pertinent to the Project and discuss their implications;
- identify any relevant Land Use Plans, Land Zoning and/or Community Plans;

- describe land tenure in 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.

4.3.4 Non-Government Participants in the Environmental Assessment

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

4.3.5 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 organization(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.

4.3.6 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.

4.4 Project Description

4.4.1 Purpose of and Need for the Project

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

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

- current and forecasted 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.

4.4.2 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 or proven Aboriginal rights.

4.4.3 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 designated species at risk, including critical habitat for the designated species; areas of concentration of other wildlife; and other sensitive areas and habitat including recreational areas used for alpine and Nordic skiing, golfing, skeet shooting, snowmobiling, mountain biking, hiking and running;
- the current and future land use in the area and the relationship of the Project facilities and components with any existing or future 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, Labrador Regional Health Centre 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.

4.4.4 Project Description

4.4.4.1 Facilities and Components

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

- waste rock storage (including discussion of ore contaminants that may affect processing and volume of waste rock);
- overburden storage areas;
- 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, 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.
- all utility installations, including transmission lines, towers and poles;
- all infrastructure construction, including haulage roads and ancillary structures;
- fuel storage systems, including secondary containment (dykes) and a list of fuels;
- any quarries that are contemplated as part of the Project; and
- viewscapes that could be affected by the Project; and
- water quality sampling locations in the watersheds potentially impacted by the project. This will ensure good baseline data prior to start of the project

4.4.4.2 Activities

The EIS shall include descriptions of the construction, operation, maintenance, foreseeable modifications, including the expansion and lengthening of the operations and, where relevant, rehabilitation and closure of sites and facilities associated with the Project. Detailed descriptions of activities to be carried out during each phase of the Project should include the location, magnitude and scale of each activity, including labour force requirements. A schedule 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 (use units of t/yr and mg/m³);
- solid waste, hazardous waste and waste reduction strategies;
- spill potentials and prevention strategies (e.g., hydraulic hose ruptures, fuelling mishaps, tank failure); and
- rehabilitation strategy for waste rock, overburden 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 inspection and maintenance that may be required for the open pit mine, associated facilities and infrastructure. Activities involving periods of increased environmental disturbance or the release of materials into the environment are to be highlighted.

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

4.4.4.3 Labour Force Requirements

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

- the National Occupation Classification (NOC) 2006 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 2006 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 2006 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 trade) and journeypersons (by trade) required;
- the identification of any specialized training required, such as post-journey training;
- the estimated percentage of the hired workforce from Newfoundland and Labrador;
- the estimated percentage of hired workforce from Labrador, by gender;
- a commitment to provide two summary reports (one at the halfway point of construction phase and one at construction end) indicating all of the above; and
- strategies for recruitment- if applicable

4.4.5 *Alternative Means of Carrying out the Project*

The EIS must identify and describe alternative means of carrying out the Project, or components of 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 or its components 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 or proven Aboriginal 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:

- waste rock storage management and location;
- overburden storage and management;
- a discussion of the scenario whereby the adjacent recreational facilities are unable to coexist with the mine as proposed due to safety, environmental, aesthetic, or operational (e.g. showering of trails with blast debris, etc.) concerns and have to be relocated;
- pit dewatering options;
- contracting or lengthening of the operations;
- labour supply;
- mining methods ; and
- reclamation methods

4.5 Description of the Existing Environment

The EIS shall provide a description of the biophysical and socio-economic environments that could be affected by the Project, both in the immediate vicinity and beyond. This shall include the components of

the existing environment and environmental processes, their interrelations and interactions, as well as their variability over time scales appropriate to the effects analysis. The level of detail shall be sufficient to:

- identify, assess and determine the significance of adverse environmental effects that may be caused by the Project;
 - include a discussion of how the Project is expected to co-exist with the existing nearby recreational facilities and the Labrador Regional Health Centre, a sensitive receptor located close to 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., spawning, 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, surface soil, air quality, drinking water, groundwater resources, country foods evaluation etc.).

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.

4.6 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 and future use of land and resources by Aboriginal organizations. 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 include the information directly in the EIS or clearly direct (e.g., through cross-referencing) the reader to where it may obtain the information. With respect to pre-existing baseline studies, the Proponent will append these to the EIS as distinct appendices. When relying on existing information, the Proponent 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 Aboriginal organizations and the public 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 Aboriginal organizations and the public have been considered, including any changes to the Project, or mitigation or follow-up measures arising from such consideration.

4.6.1 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. The EIS should identify potential accidents, malfunctions, unplanned events (e.g., premature or permanent shutdown), or emergency situations that could be associated with all phases of the Project, including product spills, 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. Special consideration must be given to the potential of malfunctions and accidental events that could impact local potable surface water and groundwater supplies (e.g., Beverley Lake, Dumbell Lake).

Given the potential for accidents and malfunctions to impact potable surface water and groundwater supplies in the region, the EIS should discuss how an accident scenario would be handled (e.g., notification, response, backup water supply etc).

4.6.2 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.

4.7 Avoidance and Mitigation Measures

Mitigation is the elimination, reduction or control of the adverse environmental effects of the Project. It includes restitution for any damage to the environment caused by such effects through replacement, restoration, compensation or any other means. The EIS 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 its components as well as relocation of certain 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. 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 listed or 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.

4.8 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. 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 Operations);
- Joyce Lake Direct Shipping Iron Ore Project;
- 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 DSO Properties) - Labrador Iron Mines;
- DSO Iron Ore Project – Tata Steel Minerals Canada; and
- Lower Churchill Generation Project; and
- Labrador-Island Transmission Link 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.

4.9 Effects of the Environment on the Project

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

- potential effects of the groundwater level on mining operations;
- potential effects of climate change on the Project.

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

4.10 Environmental Management

4.10.1 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 consultation with government agencies, Aboriginal organizations, 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.

4.10.2 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 (including modeling data), as well as compliance data (e.g., established benchmarks, regulatory documents, standards or guidelines) and real-time data (e.g., observed data gathered in the field). Effects predictions, assumptions and mitigation actions that will be tested as part of the follow-up program 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 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 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 organizations 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.

The NL *Endangered Species Act* and the federal *Species at Risk Act* (SARA) contain provisions requiring that measures be taken to monitor adverse effects of a project on listed wildlife species or their habitat. 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 question would be engaged in reviewing proposed adaptive management measures, in the event that mitigation measures are not effective.

4.11 Significance of Residual Adverse Environmental Effects

The EIS must describe any expected residual 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 government 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.

4.12 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 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;
- Aboriginal consultation: How is Aboriginal consultation throughout the EA expected to influence the project design and the environmental effects analysis?;
- 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.

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 organizations and individuals and responses;
- relationship of the VEC to an Aboriginal organization's asserted or proven Aboriginal rights; and
- commitments made by the Proponent, including the timing and responsibility of each.

PART II: DETAILED GUIDANCE ON SELECT ENVIRONMENTAL S

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 Baseline Studies

Due to the complexity of a number of 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. ENV C acknowledges that a number of baseline studies have already been undertaken for the Project area and, in the interest of completeness, those studies will also be included in the EIS submission as stand alone appendices. Where new information becomes available, additional baseline studies may be required.

Baseline 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 baseline studies, in their entirety, should be incorporated into the EIS document as appendices.

4.16 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.

4.16.1 VEC Definition and Rationale for Selection

Atmospheric environment is defined as ambient air quality and the acoustic and visual environments (e.g., 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 *Canadian Environmental Protection Act (1999)*(CEPA), and provisions of the *Air Pollution Control Regulations, 2004* under the NLEPA; and
- the potential for greenhouse gas emissions.

4.16.2 Potential Project-VEC Interactions

Potential Project-VEC interactions include:

- Effects on ambient air quality due to;
 - particulate matter (e.g., dust) and other potential air contaminants during construction activities ;
 - particulate matter (e.g., dust) and other contaminant releases during the operations phase including those potentially caused by:
 - mining operations;
 - fines and concentrate storage;
 - handling or loading and unloading;
 - road dust (e.g., vehicle use on-site and off-site);
 - dust along hydro lines ;
 - emissions from blasting; and
 - vehicle emissions;
- Effects on ambient sound levels associated with:
 - construction activities (both at the mine and off-site, including at the Labrador Regional Health Centre);
 - mining and concentrating operations (including blasting) and transportation of fines and concentrate on-site;

- vehicles/trucks in noise-sensitive areas (e.g., residential areas, Labrador Regional Health Centre);
- 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 (including at the Labrador Regional Health Centre);
 - 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.

4.16.3 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, but not limited to, metals and the contaminants PM_{2.5}, PM₁₀ and NO_x;
- blast particulate fall-out baseline impact study for the adjacent Alpine and Nordic ski facilities;
- current ambient noise levels at the mine site and within the local area, including the results of a baseline ambient noise survey. Information on typical sound sources, geographic extent and temporal variations must be included;
- results from existing noise and vibration studies (S.S. Wilson, 2007 and Jacques Whitford, 2008) referencing potential impacts on the Labrador Regional Health Centre; 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.

4.16.4 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 (PM₁₀ and PM_{2.5}) and metals in dusts and fuel combustion by-products such as sulphur dioxide (SO₂), nitrogen oxides (NO_x), 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 mg/m³ 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 ENVC 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., for wind data – wind roses) and examine scenarios whereby air quality in nearby communities (e.g., Labrador City and Wabush) could be affected by the cumulative effects of the Project in combination with other projects and activities in the area. Dispersion modelling for operations will be required which includes emissions from the major sources operated by the Proponent, as well as the emission from neighbouring operational and proposed facilities. It is unlikely that this work can be done using existing and available knowledge from existing air quality monitoring programs.

Modeling shall include the PM_{2.5} and PM₁₀ fraction of particulate matter, NO_x emissions from operational equipment and any other emissions of concern that are identified, (e.g., metals in dust, CO, SO₂, VOCs, PAHs etc.) 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).

Any significant particulate emission source 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 also indicate whether and how air quality in local municipalities will be monitored and with whom any resulting data will be shared.

A blast particulate fall-out impact study will be required to determine impacts on for the adjacent recreational facilities, particularly the Alpine and Nordic ski facilities as their operations are more sensitive to particulate fall-out. This may be done using computer modeling, field measurements, case studies, and/or any other suitable methods.

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., schools, childcare centres, the Labrador Regional Health Centre, workers accommodations near the mine installations, Alpine and Nordic ski trails, snowmobile trails) 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 such as those provided by Health Canada (see Health Canada's *Useful Information for Environmental Assessments* at http://www.hc-sc.gc.ca/ewh-semt/pubs/eval/environ_assess-eval/index-eng.php for more information).

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 and migratory birds. 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.

4.17 Landforms, Soils, Snow and Ice

4.17.1 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.

4.17.2 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.

4.17.3 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;
- baseline soil chemistry (particularly with respect to background metals in soils);
- suitability of topsoil and overburden for use in the re-vegetation of surface-disturbed areas; and

4.17.3.1 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 and ore. 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, metal leaching and the predicted drainage chemistry for each mine, 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.

4.17.4 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 landforms 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 access roads, 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, 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 due to runoff from waste rock, emissions or other sources; and
- potential for the Project to impact ice on local lakes.

4.17.4.1 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, ore characterization, volumes, segregation/disposal methods, mitigation/management plans, contingency plans (e.g., environmental emergency contingency plans) operational and post-closure monitoring and maintenance plans;
- the feasibility of successfully segregating 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, 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.

4.18 Water Resources

The effects of the Project on water resources will be assessed within the local and regional drainage areas that can be reasonably expected to be affected by the Project. Boundaries for assessing the cumulative effects of the Project in combination with other projects and activities that have been or will be carried out may be different from (larger than) the boundaries for assessing the effects of the Project.

4.18.1 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, etc); and,
- provisions of the NL *Water Resources Act*.

4.18.2 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 of dewatering Pumphouse Pond and Drum Lake;
- effects related to mine water use (demand);
- effects of accidents and malfunctions; and

- erosion and sedimentation, including dust deposition.

4.18.3 Existing Environment

4.18.3.1 Groundwater

The EIS must describe the hydrogeologic conditions at the Project site, including a conceptual model of groundwater flow at the site. This should include a groundwater flow model to evaluate how the project will affect groundwater flow in the vicinity of the site, and whether or not there is any adverse affect on surface water. 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 Project area as it pertains to local and regional groundwater flow systems in the Project area (see list in Section 4.9);
- the physical and geochemical properties of hydrogeological units, such as aquitards (see list in Section 4.9);
- 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 Project area that outline the extent of aquifers, including stratigraphy, piezometric levels at different depths (to estimate vertical hydraulic gradients and show confined aquifers)/ potentiometric contours; locations of wells, boreholes, springs, lakes and streams; groundwater flow direction;
- groundwater flow patterns and chemistry, identifying recharge and discharge areas and identifying groundwater interaction with surface waters;
- evaluation of discharge rates;
- assessment of groundwater quality in the different aquifers; and
- a description of any local and regional potable groundwater resource in the area.

Baseline information must include existing water supply wells (if any) identified within the area of influence of the Project property. A representative number of wells should be analyzed for general chemistry parameters.

4.18.3.2 Surface Water

The EIS should describe existing surface water quality, hydrology, bathymetry, 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 pre-development drainage basins, at appropriate scales;
- include delineation of drainage basins altered by development including direction of flow;
- describe and present monitored hydrological data, such as water levels, bathymetry and flow rates in local streams and selected local lakes, including Pumphouse Pond, Dumbell Lake, Leg Lake, Drum Lake and White Lake;
- ensure that monitoring stations are included in the receiving environment as well as at end of pipe;
- consideration should be given to the installation of Real Time Water Quality Stations in all potentially impacted watersheds;
- describe and assess hydrological regimes, including monthly, seasonal and year-to-year variability, normal flows, low flows, environmental (maintenance) flows and flood flows for selected return period flood events;
- include flows or design peak flows for selected periods for the Project area, including an estimate of runoff to delineated altered drainage basins from diverting flows around the pit area
- 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;
- identify a feasible backup drinking water supply for the Town of Labrador City or identify alternative plans to address the loss of Dumbell Lake as a backup drinking water supply;
- identify any local surface water users (i.e., potable or recreational use);
- provide seasonal water quality field and lab analytical results and interpretation at several representative local stream and lake monitoring stations established at the Project site.
- establish precipitation monitoring at higher elevations above MASL to assist with runoff assessments;

- estimate the projected water level in Harrie Lake with increased inflow in the drainage basin and during flood flows for selected return period flood events; and
- estimate loss of groundwater recharge to Beverly Lake and Dumbell Lake.

4.18.4 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. The EIS will describe the potential impacts to waterbodies within the Project footprint, including Pumphouse Pond and Drum Lake.

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 transportation routes through the Project site (e.g., roads, overland conveyor);
- The use of explosive products (e.g., emulsion explosives, ANFO);
- Transportation of fuel for the Project (e.g., mine equipment). The EIS must describe potential accidents and malfunctions associated with the transportation of fuel on the Project site; and
- the management, storage and disposal of used oil and associated potential for malfunctions and accidents events.

4.18.4.1 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, 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 4.18.3.1 to show effects); and
- a description of potential cumulative and residual effects of the overall Project on regional 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. It should also refer to the Municipal Plans for the Towns of Labrador City and Wabush.

4.18.4.2 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 impacts associated with the dewatering and the creation of waste rock and overburden storage areas 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 accident 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 Wabush 3 open pit, waste rock and overburden storage areas. For Project areas whose footprint will expand over time, the EIS will assess the respective change in environmental water balance over Project life including the decommissioning and post-closure period;

- provide a detailed operational and post-closure water balance for mine water management plan identifying Project water demands/uses and water source(s), potential effects on water sources and proposed mitigation to avoid or minimize effects;
- identify water and sediment quality objectives, including the receiving water criteria of the Canadian Council of Ministers of the Environment (CCME) including the *Canadian Environmental Quality Guidelines for the Protection of Aquatic Life* and the *Guidelines for Canadian Drinking Water Quality*, as applicable;
- provide an overview on the closure plans at Wabush 3 Mine Pit;
- describe the potential for the phenomenon known locally as “Red Water” to be associated with tailings management and associated impacts to water;
- include a description of potential cumulative and residual effects of the overall Project on surface water resources and their significance; and
- assess predicted wastewater effluent quality in relation to the requirements of the *Metal Mining Effluent Regulations* of the *Fisheries Act*. The assessment should detail how proposed effluent is predicted to mix in the receiving environment for effluents discharged from the Project.

In conducting the analysis, the Proponent should consider pertinent acts, policies, guidelines and directives relating to surface water quality and quantity. The 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.

4.19 Wetlands

The effects of the Project on wetlands must be assessed within the Project footprint and for areas that could 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 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

Wetlands are defined as lands having the water table at, near, or above ground surface, or are saturated long enough to promote wetland aquatic processes (i.e., bogs, fens, marshes, swamps, shallow water), as

indicated by wet soils, hydrophilic vegetation and various kinds of biological activity that are adapted to wetland environments (NL *Water Resources Act*).

Wetlands help maintain ecological integrity and contribute to ecological, hydrologic (water quantity), biochemical (water quality) and habitat (as habitat for waterfowl, fish and other wildlife) functions and processes.

4.19.2 Potential Project-VEC Interactions

Wetlands may be affected by Project activities associated with the open pit mine and infrastructure associated with the Project that will result in clearing of or disturbance to natural vegetation, or ground disturbance (e.g., grubbing, grading, and excavation).

Potential Project-VEC interactions include:

- alteration or loss of wetland quantity due to vegetation clearing, infilling, heavy equipment use and other vehicle traffic;
- alteration of wetland quality (including ecosystem integrity and ability to function) due to changes in surface water hydrology, such as ponding or surface water diversion; and
- alteration of surface water and/or groundwater quality resulting from construction and/or operation (e.g. siltation, effluent discharge, spills) and subsequent indirect effects to plant communities.

4.19.3 Existing Environment

Wetlands that may be affected by Project activities must be characterized according to their location, size, type (wetland class and form), species composition and ecological function.

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

An overview of the key plant communities and animals that rely on wetlands must be presented.

4.19.4 *Effects Assessment and Mitigation*

The adverse environmental effects of the Project on wetlands must be assessed for all phases of the Project, as well as accidental events. Wetland alteration is defined as changes to the wetland class or form, or changes to the performance of wetland functions resulting from disturbance to vegetation, soils, or hydrology. Wetland loss is defined as conversion of wetland to non-wetland (e.g., upland, lake, pond or watercourse) due to infilling, excavation or alteration to the hydrology. Wetland loss and wetland alteration must be assessed within the context of wetland supply and wetland function.

The EIS must describe the technically and economically feasible measures that will be applied to mitigate effects on wetlands and predict residual adverse effects and their significance. Proposed mitigation should be consistent with the provincial policy directive, *Policy for Development in Wetlands*. The EIS should provide justification for situations where avoidance of wetlands is not possible.

The EIS must assess the potential impacts of accidents and malfunctions during the construction and operations phases of the Project to wetlands (e.g., fuel spills).

In conducting the analysis, the EIS should consider pertinent federal, provincial, municipal and local acts, policies, guidelines and directives relating to Wetlands, including the Town of Labrador City's Municipal Plan.

Further guidance related to the assessment of effects to wetlands can be found in the Environment Canada publication *Wetland Ecological Functions Assessment: An Overview of Approaches* (Hanson *et al.*, 2008) and in *Wetland Mitigation in Canada: A Framework for Application* (Cox and Grose, 2000).

4.20 *Fish, Fish Habitat and Fisheries*

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

4.20.1 VEC Definition and Rationale for Selection

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

Fish habitat is defined as “spawning grounds and nursery, rearing, food supply and migration areas on which fish depend directly or indirectly in order to carry out their life processes. Fishery includes the area, locality, place or station in or on which a pound, seine, net, weir or other fishing appliance is used, set, placed or located, and the area, tract or stretch of water in or from which fish may be taken by the said pound, seine, net, weir or other fishing appliance, and also the pound, seine, net, weir, or other fishing appliance used in connection therewith.

Fisheries are defined as the commercial, recreational and Aboriginal, fisheries which have the potential to be impacted at the Project site.

Aboriginal, in relation to a fishery means that fish is harvested by an Aboriginal organization or any of its members for the purpose of using the fish as food, for social or ceremonial purposes or for purposes set out in a land claims agreement entered into with the Aboriginal organization

Commercial, in relation to a fishery, means that the fish is harvested under the authority of a licence for the purpose of sale, trade or barter.

Recreational, in relation to a fishery, means that fish is harvested under the authority of a licence for personal use of the fish or for sport.

Serious harm to fish is defined as the death of fish or any permanent alteration to, or destruction of, fish habitat, (Currently defined as the Harmful Alteration, Disruption or Destruction(HADD) of fish habitat).

4.20.2 Potential Project-VEC Interactions

Potential Project-VEC interactions include:

- serious harm to fish affecting fisheries associated with:
 - the construction of Project facilities or infrastructure including but not limited to; open pits, waste rock disposal sites, overburden storage areas, haul roads and surface and groundwater management activities;

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

4.20.3 Existing Environment

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

- provide necessary baseline data to support assessment of effects on the recreational, commercial and Aboriginal fisheries
- contribute to the development of mitigation measures and offsetting (i.e., fish habitat compensation) to avoid serious harm to fish that are part of or support a commercial, recreational or Aboriginal fishery for the Project;
- contribute to the development of a conceptual reclamation and closure plan;
- provide necessary baseline data to support on-going monitoring programs that assess the effectiveness of mitigation measures and compensation plans; and

Furthermore, the EIS must:

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

4.20.4 Effects Assessment and Mitigation

The adverse environmental effects of the Project on fish and fish habitat must be assessed for all phases of the Project, as well as for accidents and malfunctions. The EIS must describe technically and economically feasible measures to mitigate effects to fish and fish habitat and predict residual adverse effects and their significance, including:

- measures to mitigate adverse effects to fish and fish habitat due to project related construction and operation related activities including but not limited; open pits, waste rock disposal sites, overburden storage areas, haul roads, dewatering, blasting and surface and groundwater management activities;
- measures to prevent adverse effects to fish, fish habitat and water quality resulting from site water run-off or soil erosion;
- measures to mitigate flow changes resulting from open mine pits, dewatering activities, ground water management, stockpiling and waste management, and diversions, including upstream and downstream; and
- a description and quantification of fish and fish habitat where Project activities may result in serious harm to fish that are part of or support a fishery and the provision of offsetting measures (i.e. fish habitat compensation strategy) to offset the serious harm to fish by maintaining or improving the productivity in the area of the affected fishery.

4.21 Birds, Other Wildlife and Their Habitats

The effects of the Project on birds, other 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. 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.

4.21.1 VEC Definition and Rationale for Selection

Birds, other wildlife and their habitat refers to migratory and non-migratory species that are potentially feeding, breeding, moving and/or migrating through the Project area. 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.

4.21.2 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 and loss of productivity 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;

4.21.3 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.

4.21.3.1 Migratory Birds

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

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

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

4.21.3.2 Other Wildlife

Other wildlife includes:

- Amphibians and small mammals;
- Non-migratory birds;
- Ungulates include boreal sedentary or migratory caribou populations in the region, and moose; and
- Furbearers refer to 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 ENVC 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).

4.21.4 Effects Assessment and Mitigation

The adverse environmental effects of the Project on birds, other 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 organizations;

The EIS must describe technically and economically feasible measures to mitigate effects on birds, other wildlife, and their habitats and predict adverse residual effects and their significance. This includes plans and predictions for rehabilitation 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 any 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 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.

4.22 Species at Risk and Species of Conservation Concern

The effects of the Project on animal and plant Species at Risk (SARs) and species of special conservation concern will be assessed within the Project 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.

4.22.1 VEC Definition and Rationale for Selection

SARs include:

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

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

4.22.2 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 and loss of productivity 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.

4.22.3 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);
- NLESA;
- COSEWIC;
- SSAC;
- ENVC – Wildlife Division General Status of Wildlife Ranks;
- ACCDC;
- Relevant Government agencies;
- Local naturalist and interest groups; and
- Aboriginal organizations and First Nations.

4.22.4 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 the NLESA, species

recommended for legal listing by COSEWIC, the SSAC, as well as adverse effects on species of conservation concern ranked by the ACCDC as S1, S2, or S3.

The 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;*
- *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.*

4.23 Other Current and Future Use of Lands and Resources

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

4.23.1 VEC Definition and Rationale for Selection

Other current 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. If there are potential resource conflicts relative to access and alienation of resources held under Mining Leases 157 and 178 due to the Project location and activities, IOC must address these in the EIS. It is also important to note that, the Project area is

important to area residents for recreational purposes, (e.g., Smokey Mountain Alpine Ski Lodge, Menihek Nordic Ski Trails, White Wolf Snowmobile Trails, mountain biking and hiking trails etc.).

4.23.2 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.

4.23.3 Existing Environment

The EIS must describe land use at the Project site and within the regional areas. It should identify past, current 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:

- **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 (e.g., dust on clothes hanging on clotheslines, noise, aesthetic changes);
- **Fishing:** Aboriginal, commercial, recreational and subsistence fisheries at the Project site are addressed under the freshwater fish, fish habitat and fisheries VEC (Section 4.20);
- **Outdoor Recreation and Tourism:** A baseline study 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, recreational fishing, hiking, mountain biking, trail running, snowshoeing, snowmobiling and snowmobile trails, alpine/Nordic skiing, parks, camping, recreational use of water bodies must be provided. Recreational usage of the ski hill and trails has expanded seasonally and serves communities in Quebec as well;
- **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;
- **Navigation:** The EIS should provide an overview of the current and past navigational use in waters that could be affected in the Project area, including Pumphouse Pond and Drum Lake);
- **Sea Planes:** The EIS should describe current use of local lakes; and
- **Communication Towers:** The EIS should describe any potential impacts to communications towers.

4.23.4 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 (including along access roads, rail line through sand pits near Wabush, Labrador City, Beverley Lake, etc.).

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, including cumulative effects, and their significance.

4.24 *Community Services and Infrastructure*

The effects of the Project on the community services and infrastructure of Wabush and Labrador City (in accordance with Newfoundland and Labrador requirements) will be assessed.

4.24.1 VEC Definition and Rationale for Selection

Community Services and Infrastructure includes:

- employment and social services;
- health services and social programs;

- training and education services and programs;
- safety and security;
- housing and accommodation (residential and tourist);
- municipal administrative capacity;
- municipal services and infrastructure; and
- transportation infrastructure.

The listed services and infrastructure are important to area residents and their availability may be reduced due to the Project.

4.24.2 Potential Project-VEC Interactions

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

4.24.3 Existing Environment

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

4.24.4 Effects Assessment and Mitigation

The EIS must describe:

- the existing inventory of infrastructure for both men and women in the community;
- the effects of Project-related demand on community services and infrastructure, including water and sewage treatment;

- the potential traffic increase due to the Project, and associated health and safety implications;
- assess the decrease in lifespan of physical infrastructure based on increased use that can be attributed to the project and its spinoffs;
- quantify the value of any lost lifespan for infrastructure as a factor of overall replacement cost of that infrastructure (e.g., if a road has an estimated 10 years of wear remaining before it must be re-constructed, and the project will reduce the lifespan of that road to 8 years, there should be quantification of the value of the lost two years of road use);
- potential increase in passenger and freight traffic through the Wabush Airport due to the Project and potential to impact airfares;
- plans for supplying worker accommodations during construction and operation of the Project, including consideration of accommodations for supporting contractors and potential for supplying low-income and senior housing; and
- the potential for blasting from the Project to impact municipal and/or residential infrastructure.

The EIS must describe technically and economically feasible measures to mitigate effects on community services and infrastructure for both the construction and operation phases, as well as predicted adverse residual effects and their significance. That Plan should reduce, to the extent possible, acceleration of the effective lifespan of infrastructure. This should include specific consideration of mitigation to prevent displacement of current residents by Project employees/contractors from existing accommodations. Safety zones established in relation to Project blasting should be described.

Pertinent acts, policies, guidelines and directives relating to community services and infrastructure must be considered, including the Municipal Plans of the Towns of Wabush and Labrador City.

4.25 Health and Community Health

The effects of the Project on the health of nearby human receptors including nearby cabin/cottage users and community health in Wabush and Labrador City will be assessed.

4.25.1 VEC Definition and Rationale for Selection

Health and Community Health includes human health, wellness and family life. Human health includes perceptions related to *quality of life*.

4.25.2 Potential Project-VEC Interactions

Individual and community health may be affected by environmental changes caused by the Project (e.g., dust, noise, light, recreational land use and/or aesthetic changes).

4.25.3 Existing Environment

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

4.25.4 Effects Assessment and Mitigation

The EIS should describe and evaluate changes to human health and well-being (e.g., physical and mental health) that may occur as a result of Project-related impacts to the environment, including concern about potential changes to the quality of life as a result of the Project. This discussion should include consideration of the following:

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

The EIS must describe technically and economically feasible measures to mitigate effects to Health and Community Health for both the construction and operation phases and predict the potential for adverse residual effects and their significance. Safety zone established in relation to Project blasting should be described. Pertinent acts, policies, guidelines and directives relating to health must be considered.

4.26 Economy, Employment and Business

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

4.26.1 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, visible minorities and Aboriginal organizations);
- 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.

4.26.2 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.

4.26.3 Existing Environment

Baseline conditions for economy, employment and business will be determined through a review of information from the Government of Newfoundland and Labrador and other relevant agencies and organizations (e.g., Chambers of Commerce, Boards of Trade; Statistics Canada 2006 census) within Economic Development Zone 2 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, visible minorities, 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); and
- tourism related activities.

4.26.4 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 Economic Development Zone 2 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.

It is understood that significant employment opportunities will be realized during the construction and development phases of the Project through contracts to third parties. IOC has indicated that there will be no net increase in operations employment at IOC as a result of this Project. Notwithstanding this information, the EIS must provide:

- a clear and accurate description of labour force requirements for both construction and operation phases for the Project (including for third party contracts);
- a rationale that explains how Wabush 3 can operate without any additions to staffing levels (either employed directly by IOC or through third party contracts);
- 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 (e.g., Labrador City, Wabush) including, but not limited to, impacts to the Smokey Mountain Alpine Lodge and the Menihek Nordic Ski Trails.

The EIS must include statements by the operator indicating their acknowledgement that the following documents must be finalized prior to the granting of EA release:

- A Gender Equity and Diversity Plan that meets the approval of the Minister of Natural Resources and the Minister Responsible for the Status of Women. The plan must include an employment plan and a business access strategy for women and for other underrepresented groups, including Aboriginal persons, persons with disabilities and visible minorities. These plans will document IOC's strategy to maximize Newfoundland and Labrador's participation for these groups in the development of the Wabush 3 iron ore deposit and existing and future operations at IOC; and
- 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.

4.27 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.

Data and Information Sources

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

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

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

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

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

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

Environment Canada, 1991. *Birds Protected in Canada under the Migratory Birds Convention Act*, Canadian Wildlife Service Occasional Paper No. 1.

<http://www.ec.gc.ca/Publications/default.asp?lang=En&xml=97AC4B68-69E6-4E12-A85D-509F5B571564>

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

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

Environment Canada. Sept 2003 (updated: March, 2004). Implementation Guidelines for Part 8 of the Canadian Environmental Protection Act, 1999 - Environmental Emergency Plans. 58 pages. <http://www.ec.gc.ca/lcpe-cepa/default.asp?lang=En&n=D6ADAD2D-1>

Environment of Canada. 1991. The Federal Policy on Wetland Conservation. Canadian Wildlife Services, Environment Canada, Ottawa, Ontario. 15 pages.

<http://www.ec.gc.ca/Publications/default.asp?lang=En&xml=BBAAE735-EF0D-4F0B-87B7-768745600AE8>

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

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

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

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

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

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

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Municipal Plan for the Town of Labrador City, 2007-2017. <http://www.labradorwest.com/modules/Documents/documents/Labrador%20City%20Municipal%20Plan%202007%202017%20August%2029%202007.pdf>

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

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

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

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

Newfoundland and Labrador *Endangered Species Act*:

<http://assembly.nl.ca/Legislation/sr/statutes/e10-1.htm>

Newfoundland and Labrador *Environmental Protection Act*:

<http://assembly.nl.ca/Legislation/sr/statutes/e14-2.htm#58>

Newfoundland and Labrador *Historic Resources Act*:

<http://assembly.nl.ca/Legislation/sr/statutes/h04.htm>

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

Newfoundland and Labrador *Municipalities Act, 1999*:

<http://assembly.nl.ca/Legislation/sr/statutes/m24.htm>

Newfoundland and Labrador *Urban and Rural Planning Act, 2000* :

<http://assembly.nl.ca/Legislation/sr/statutes/u08.htm>

Newfoundland and Labrador *Sustainable Development Act*: (to be proclaimed)

<http://assembly.nl.ca/Legislation/sr/statutes/s34.htm>

Newfoundland and Labrador *Water Resources Act*:

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

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

SARA-CEAA Guidance Working Group (Canada). 2010. *Addressing Species at Risk Act considerations under the Canadian Environmental Assessment Act for Species Under the*

Responsibility of the Minister Responsible for Environment Canada and Parks Canada.
http://www.registrelep-sararegistry.gc.ca/document/dspDocument_e.cfm?documentID=2100

The Government of Newfoundland and Labrador's Aboriginal Consultation Policy on Land and Resource Development Decisions ("The Policy") April 2013
http://www.exec.gov.nl.ca/exec/igas/publications/aboriginal_consultation.pdf

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

Appendix A: Public Notices

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;">ALL ARE WELCOME</p>

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.

