

**GUIDELINES FOR THE PREPARATION OF  
AN ENVIRONMENTAL IMPACT STATEMENT**

PURSUANT TO THE

*CANADIAN ENVIRONMENTAL ASSESSMENT ACT  
AND  
ONTARIO ENVIRONMENTAL ASSESSMENT ACT*

**for the**

**MARATHON PLATINUM GROUP METALS AND  
COPPER MINE PROJECT**

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### ABBREVIATIONS

ARD/ML	acid rock drainage / metal leaching
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
DFO	Fisheries and Oceans Canada
EA	environmental assessment
EIS	environmental impact statement
EMPs	environmental management plans
EMS	environmental management system
Km	Kilometres
kV	Kilovolt
MMER	Metal Mining Effluent Regulations
PAG	potentially acid-generating
PM	particulate matter
Project	Marathon Platinum Group Metals and Copper Mine Project
Proponent	Stillwater Canada Inc.
QA/QC	quality assurance/quality control
TIA	tailings impoundment area
VEC	valued ecosystem component

## PART 1: BACKGROUND

### 1.1 INTRODUCTION

The purpose of this document is to identify for Stillwater Canada Inc. (the Proponent), the nature, scope and extent of the information that shall be addressed in the preparation of the environmental impact statement (EIS) for its proposed Marathon Platinum Group Metals and Copper Mine (the Project). The Proponent will prepare and submit an EIS that examines the potential environmental effects, including cumulative effects, of the site preparation, construction, operation, modification, decommissioning (closure) and abandonment (post-closure) of the Project and that evaluates the significance of any such effects.

**While the EIS Guidelines provide a framework for preparing a complete EIS, it is the responsibility of the Proponent to provide sufficient data and analysis on any potential environmental effects to permit proper evaluation. The EIS Guidelines outline the minimum information requirements while providing the Proponent some flexibility in selecting methods to compile data for the EIS.**

#### 1.1.1 Background

The Proponent proposes to develop an open-pit platinum group metals and copper mine and mill operation with a mine life of approximately 11.5 years. The mine site would be located 10 kilometres (km) northeast of the Town of Marathon in the Province of Ontario, Canada (Figure 1).

The Project is subject to review under the *Canadian Environmental Assessment Act* given the requirement for Fisheries and Oceans Canada, Transport Canada and Natural Resources Canada to issue permits, approvals, authorizations and/or licences pursuant to the *Fisheries Act*, the *Navigable Waters Protection Act* and the *Explosives Act* respectively.

The Project is also subject to review under the Ontario *Environmental Assessment Act* as components of the Project trigger the requirement for environmental assessment pursuant to Part II.1 of that Act.

A project description was submitted by the Proponent on March 11, 2010. The Notice of Commencement of the comprehensive study was posted on the Canadian Environmental Assessment Registry Internet Site on April 29, 2010 and subsequently amended on July 19, 2010. The Proponent submitted an addendum to the Project description on July 21, 2010.

On August 24, 2010, Fisheries and Oceans Canada (DFO), Natural Resources Canada and Transport Canada responded to a request from the Canadian Environmental Assessment Agency to provide advice and analysis based on their areas of technical expertise and jurisdictional responsibilities as to whether, taking into account any appropriate mitigation measures, the Project may cause significant adverse environmental effects. DFO and Transport Canada provided advice to the Canadian

Figure 1: Project Location



Environmental Assessment Agency that the Project may result in significant adverse environmental effects. Natural Resources Canada indicated that they did not have sufficient information at the time to determine whether there was the potential for the Project to result in significant adverse environmental effects. Taking this advice into consideration, the Canadian Environmental Assessment Agency recommended that the federal Minister of the Environment refer the Project to a review panel. On October 7, 2010, the Honourable Jim Prentice, Minister of the Environment, announced that the Project will undergo a federal environmental assessment (EA) by way of an independent review panel.

The Government of Canada and the Province of Ontario entered into a joint review panel agreement for the EA of the Project. Components of mining project are typically subject to class environmental assessments under the Ontario *Environmental Assessment Act*. On March 24, 2011, the Proponent entered into a voluntary agreement to make the Project subject to the Ontario *Environmental Assessment Act*. Subsequent to this, the Ontario Ministry of the Environment enacted a Harmonization Order that varies or dispenses with various provisions of the Ontario *Environmental Assessment Act*. This Order indicates that the joint review panel process is equivalent to and fulfills the requirements of the Ontario *Environmental Assessment Act*. These Guidelines incorporate requirements that will satisfy both the federal and provincial legislative requirements.

The Project is also subject to the Major Resource Project Initiative led by the Major Projects Management Office, which works collaboratively with federal departments and agencies, and acts as a single window into the federal regulatory process. Similarly, the Project is also subject to the One Window Coordination Process led by the Ontario Ministry of Northern Development, Mines and Forestry.

## **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 and to encourage decision makers to take actions that promote sustainable development and thereby achieve or maintain a healthy environment, healthy communities and a healthy economy.

The EA of this Project shall, in a manner consistent with those purposes:

- consider and evaluate alternatives;
- document consultation activities;
- identify the Project's possible environmental effects (including natural, social, cultural and economic);
- propose measures to avoid activities with the potential for significant adverse environmental effects and to mitigate adverse effects<sup>1</sup>; and

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<sup>1</sup> The EIS Guidelines make reference to mitigation measures. In interpreting this phrase, the Proponent shall consider any actions necessary or that may reasonably be expected to be necessary to prevent, change, mitigate or remedy the effects upon, or the effects that might be reasonably expected upon, the environment.



- predict whether there will be likely significant adverse environmental effects after mitigation measures are implemented.

### **1.2.2 Traditional and Local Knowledge**

Traditional and local 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. This tradition is dynamic, substantive and distinct living knowledge.

Traditional and local knowledge, in combination with other information sources is valuable in achieving a better understanding of potential effects of projects. Traditional and local 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 land and water resources. It may also contribute to project siting and design, identification of issues, the evaluation of potential effects and their significance, the effectiveness of proposed mitigation, cumulative effects and the consideration of follow-up and monitoring programs.

Traditional knowledge, which is rooted in the traditional life of Aboriginal people, has an important contribution to make to an EA. Certain issues relevant to the review process are firmly grounded in traditional knowledge, such as harvesting, use of lands and resources for traditional purposes, cultural well-being, heritage resources, and others. Although the basis for traditional and local knowledge and science-based knowledge can differ, they may on their own or together, contribute to the understanding of these issues.

The Proponent shall incorporate into the EIS the traditional and local 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**

As outlined in the Brundtland Report (1987), sustainable development can be defined as development that seeks to meet the needs of present generations without compromising the ability of future generations to meet their own needs.

Environmental assessment 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. Environmental assessment provides an effective means of integrating environmental factors into 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.

A project that is supportive of sustainable development shall strive to integrate the objective of net ecological, economic and social benefits to society in the planning and decision-making process and shall incorporate citizen participation. The Project, including

its alternative means, shall take into account the relations and interactions among the various components of the ecosystems and meeting the needs of Canadians. The Proponent shall include in the EIS consideration of the extent to which the Project contributes to sustainable development. In doing so, the Proponent shall consider, in particular:

- (a) the extent to which biological diversity may be enhanced or affected by the Project;
- (b) the capacity of renewable resources that are likely to be significantly affected by the Project to meet the needs of present and future generations; and
- (c) the extent to which the Project will enhance the long-term environmental, social, and economic viability of the community.

In addition, the Proponent should consider any specific sustainability objectives or plans made available by communities potentially affected by the Project.

#### **1.2.4 Precautionary Approach**

One of the purposes of EA is to ensure that projects are considered in a careful and precautionary manner before authorities take a course of action in connection with them, in order to avoid or mitigate significant adverse environmental effects. The precautionary principle informs the decision-maker to take a cautionary approach, or to err on the side of caution, especially where there is a large degree of uncertainty or high risk.

The Government of Canada document *A Framework for the Application of Precaution in Science-based Decision Making About Risk* (2003) sets out guiding principles for the application of precaution to science-based decision making in areas of federal regulatory activity for the protection of health and safety and the environment and the conservation of natural resources.

The Proponent shall indicate how the precautionary principle was applied or 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 do not cause serious or irreversible damage to the environment 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 in light of risk avoidance, and adaptive management capacity;
- in designing and operating the Project, demonstrate that priority has been given to strategies that avoid the creation of adverse effects;
- develop contingency plans that explicitly address accidents and malfunctions;
- identify any proposed follow-up and monitoring activities, particularly in areas where scientific uncertainty exists in the prediction of effects or effectiveness of proposed mitigation measures;
- discuss how the design of monitoring programs will ensure rapid response and correction where adverse effects are detected; and
- present public views on the acceptability of all of the above.

In doing so, the Proponent shall consider the guiding principles set out in the *Framework for the Application of Precaution in Science-based Decision Making About Risk* (2003) referenced above.

### **1.3 PREPARATION AND PRESENTATION OF THE ENVIRONMENTAL IMPACT STATEMENT**

In order to facilitate public review of the EIS, the Proponent is encouraged to make all electronic documents that are submitted for review available in a format that is searchable and includes "copy" functionality.

#### **1.3.1 Study Strategy and Methodology**

The Proponent is expected to observe the intent of the EIS Guidelines and to identify all environmental, social, economic, cultural and human health effects that are likely to arise from the Project (including situations not explicitly identified in these Guidelines), the mitigation measures that will be applied, and the significance of any residual effects<sup>2</sup>.

**It is possible that the EIS Guidelines may include matters that, in the judgement of the Proponent, are not relevant or significant to the Project. If such matters are omitted from the EIS, they shall be clearly indicated with appropriate justification so that Aboriginal groups, the public and other interested parties have an opportunity to comment on this judgement. The Proponent may be required to provide additional information where the joint review panel disagrees with the Proponent's decision to omit certain information.**

In describing methods, the Proponent will document how it used scientific, engineering, and traditional and local knowledge to reach its conclusions. Assumptions shall be clearly identified and justified. All data, models and studies will be documented such that the analyses are transparent and reproducible. All data collection methods shall be specified. The uncertainty, reliability and sensitivity of data and models used to reach conclusions will be indicated.

The EIS will identify all significant gaps in knowledge and understanding where they are relevant to key conclusions presented in the EIS. The steps to be taken by the Proponent to address these gaps will also be identified. Where the conclusions drawn from scientific and technical knowledge are inconsistent with the conclusions drawn from traditional knowledge, the EIS will contain a balanced presentation of the issues and a statement of the Proponent's conclusions.

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<sup>2</sup> Residual effects refer to those environmental effects of the Project that remain after the implementation of mitigation measures. The significance of environmental effects is only determined on the residual effects that remain after mitigation measures are implemented.

### **1.3.2 Level of Detail Required in the EIS**

The EIS Guidelines provide a framework and outline the minimum information requirements for preparing a complete EIS. However, it is in the interest of the Proponent to collect and undertake additional detailed information and analysis that may be required for obtaining permits and authorizations from federal and provincial authorities, and to integrate this material into the EIS<sup>3</sup>. This will allow the Proponent to present regulatory information requirements conceptually in the EIS, as required, in support of its conclusions regarding the Project's environmental effects.

## **1.4 OUTLINE OF THE ENVIRONMENTAL IMPACT STATEMENT**

The Proponent shall ensure that the EIS is organized in a logical manner that enables the reader to easily follow the analysis. At a minimum, the organization of the EIS shall include the components outlined in the subsections below.

### **1.4.1 Preface**

The EIS shall include a preface that indicates why the document is being prepared and how it has been developed. It will indicate that the Project is subject to review by the Government of Canada pursuant to the *Canadian Environmental Assessment Act*, SC 1992, c.37 and by the Government of Ontario pursuant to the Ontario *Environmental Assessment Act*, R.S.O. 1990, c. E.18. It will identify the parties involved in developing the EIS.

### **1.4.2 Acknowledgements**

The EIS will identify all the consultants involved in preparing the EIS.

### **1.4.3 Executive Summary**

The EIS will contain an Executive Summary, produced as a stand-alone document describing the environmental effects of the Project and the proposed environmental management and mitigation measures. The Executive Summary will contain the following information:

- a concise description of all key facets of the Project;
- a succinct description of the consultation conducted with Aboriginal groups, the public and government agencies, with a summary of the issues raised and solutions found and/or suggested during these consultations;
- a general overview of the key effects of the Project and proposed mitigation measures; and
- the Proponent's conclusions and significance determinations from the assessment.

### **1.4.4 Abbreviations**

A list of abbreviations and glossary of terms will be included in the EIS. The Proponent is encouraged to minimize the use of abbreviations to the extent possible.

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<sup>3</sup> For example, there are substantial information requirements associated with approvals under the *Lakes and Rivers Improvement Act* (1977), the *Metal Mining Effluent Regulations*, and, if required, requirements associated with applying to obtain an overall benefit under the *Endangered Species Act*, (2007) that could be incorporated into the EIS.

#### **1.4.5 Organization of the EIS**

The Proponent shall avoid repetition by describing, for each valued ecosystem component (VEC)<sup>4</sup>, the Project setting, the anticipated effects on the VEC, the proposed mitigation measures, the significance of residual effects, and where relevant, the proposed compensation, in the same section of the EIS. Consideration shall be given to having a stand-alone section for the cumulative effects assessment.

The Proponent shall present the EIS in the clearest possible language and avoid scientific/technical jargon to the extent possible. The Proponent shall provide charts, diagrams, tables, maps and photographs, where appropriate, to clarify the text. Perspective drawings that clearly convey the various components of the Project shall also be provided. Wherever possible, maps shall be presented in common scales and datum to allow for comparison and overlay of mapped features.

For purposes of brevity, the EIS may make reference to information that has already been presented in other sections of the document, rather than repeating it. Detailed studies shall be provided in separate appendices and shall be referenced by appendix, section and page in the text of the main document of the EIS.

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

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

The EIS shall specify the organization of the document. This shall include a list of all tables, figures, and photographs referenced in the text of the EIS. A complete list of supporting literature and references will be provided.

The contents of the EIS will include the information outlined in Part 2 of these Guidelines.

### **1.5 USE OF EXISTING INFORMATION**

In preparing the EIS, the Proponent is encouraged to make use of existing information relevant to the Project. When relying on existing information to meet the requirements of various sections of the EIS Guidelines, the Proponent shall either include the information

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<sup>4</sup> Valued ecosystem components refer to the environmental element of an ecosystem that is identified as having scientific, ecological, social, cultural, economic, historical, archaeological or aesthetic importance. The value of an ecosystem component may be determined on the basis of cultural ideals or scientific concern. Valued ecosystem components that have the potential to interact with Project components shall be included in the assessment of environmental effects.

directly in the EIS or clearly direct (e.g., through cross-referencing) the reviewers to where they may obtain the information. When relying on existing information, the Proponent shall also comment on how representative the data are, 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 shall be clearly identified and justified;
- all data, models and studies shall be documented such that the analyses are transparent and reproducible;
- the uncertainty, reliability and sensitivity of models used to reach conclusions shall be indicated;
- conclusions shall be substantiated; and,
- the studies shall be prepared using best available information and scientifically defensible methods, to the highest standards in the relevant subject area.

## **1.6 USE OF CONFIDENTIAL INFORMATION**

The EIS that is made available for public and stakeholder comment should not contain:

- information that could cause specific, direct and substantial harm to the Proponent, to a witness, or specific harm to the environment (ecologically or culturally significant sites, species of conservation concern<sup>5</sup>, etc.) by its disclosure;
- information that is confidential (i.e., financial, commercial, scientific, technical, personal or other nature), that is treated consistently as confidential, and the person affected has not consented to the disclosure; or
- information that is likely to endanger the life, liberty or security of a person through its disclosure.

## **1.7 TABLE OF CONCORDANCE**

The EIS will include a Table of Concordance which cross-references the information presented in the EIS (including appendices and reference material) with the information requirements identified in the EIS Guidelines.

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<sup>5</sup> Species of conservation concern includes Committee on the Status of Endangered Wildlife in Canada (COSEWIC) listed species or species listed under the federal *Species at Risk Act* or species listed on the Species at Risk in Ontario listed under the *Endangered Species Act 2007*.

## **PART 2: CONTENTS OF THE ENVIRONMENTAL IMPACT STATEMENT**

### **2.1 INTRODUCTION AND BACKGROUND**

The EIS will include an introduction that orients the reader to the EIS by briefly introducing the geographic setting, the Project, the underlying rationale or need for the Project, the Proponent, the provincial and federal review process and the content, organization and format of the EIS.

#### **2.1.1 The Proponent**

The EIS will describe the Proponent by providing pertinent corporate information, including the following:

- contact information (i.e., name, address, phone, fax, email etc.);
- history of the Proponent;
- the name of the legal entity that would develop, manage and operate the Project;
- an explanation of corporate and management structures, as well as insurance and liability management related to the Project;
- the mechanism used to ensure that corporate policies will be implemented and respected for the Project;
- a description of the Proponent's record of performance pertaining to environmental and socio-economic issues in past operations;
- the policies with regard to Aboriginal consultation, procurement, community engagement, hiring and corporate social responsibility; and
- key personnel, consultants, contractors, and/or sub-contractors responsible for preparing the EIS, where available.

The EIS will provide information on the nature of the Proponent's management structure and organizational accountability for:

- the design, construction, operation, modification, closure and decommissioning of the Project;
- the implementation of Environmental Management Systems and Plans, mitigation and monitoring; and
- key elements of the environmental and health and safety management systems and how the systems will be integrated into the Project.

#### **2.1.2 Legal Framework and Role of Government**

To understand the context of this EA, this section shall identify, for each jurisdiction, the government bodies involved in the EA. The EIS will identify the planning context for the EA of the Project, including government policies, regulations, and land use plans that have a bearing on the Project. The EIS will also identify the local government(s) and applicable official community plans of communities potentially affected by the Project.

The EIS will identify the reasons why the requirements of the *Canadian Environmental Assessment Act* and the Ontario *Environmental Assessment Act* apply. The EIS will identify provincial and federal legislation, agreements, conventions, and key policies and/or guidelines applicable to the Project. The EIS will identify regulatory approvals that may be required for the Project, and which of those approvals, if any, will be requested for concurrent review with the EIS. A table summarizing the regulatory requirements of the Project shall be provided as an appendix to the EIS<sup>6</sup>. Further, the EIS will summarize and discuss the approach, including the role of regulatory bodies, to ensure compliance with existing federal and provincial environmental legislation applicable to the Project.

Appendix A includes a listing of some of the relevant federal and provincial statutes, policies and strategies which are likely to apply to the Project. The Proponent is encouraged to contact the various federal and provincial departments involved in the review of the Project to acquire information regarding potential requirements for permits/authorizations and to assist in meeting the environmental legislative obligations of federal departments and provincial ministries.

## **2.2 PROJECT DESCRIPTION**

### **2.2.1 Need for and Purpose of the Project**

The Proponent shall clearly describe the rationale or need for the Project. This description shall define the problem or opportunity the Project is intending to solve or satisfy. The EIS will identify the main function of the Project. In this context, the EIS will present the fundamental rationale for proceeding with the development at this time within the context of regional, provincial and national economies, as well as global implications of supply and demand on metal prices and markets.

The Proponent is required to clearly describe the purpose of the Project by defining what is to be achieved by carrying out the Project. In addition, the purpose of each of the Project facilities and activities and their relevance to the overall project development plan will also be discussed.

The "rationale or need for" and "purpose of" the Project shall be established from the perspective of the Proponent and provide the context for the consideration of alternatives.

### **2.2.2 Project Setting**

The EIS will include a concise description of the geographic setting in which the Project is proposed to take place and will include site, regional, watershed, and bathymetric maps. The following shall be considered for each map type:

- Site map - shall be to an appropriate scale and show all relevant features of the mine site (e.g., tailings pond, waste rock storage area, etc.);
- Regional map - two shall be provided, one to 1:100 000 scale and a second to a 1:50000 scale;

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<sup>6</sup> This table should include the name of the issuing department/ministry, the pertinent act/regulation, and specific permit/authorization/approval required, and the relationship of the regulatory requirement to the Project.



- Watershed map - shall be appropriately scaled and show discharge and sampling locations;
- Bathymetric maps - shall be provided for potentially impacted and reference lakes; and
- Land Use maps – depicting municipal boundaries, mining tenure, claims and leases, Crown land tenure, private land tenure and land use designations.

In addition to the requested maps, in order to illustrate the regional setting and clearly locate the Project within that setting, the EIS shall include site plans at the appropriate scale and photographs (as necessary).

The description of the Project setting shall be focused on those aspects of the environment important for understanding the potential environmental effects of the Project. This description shall integrate the natural and human elements of the environment in order to explain the interrelationships between the physical and biological aspects and the people and their communities. This description may include the following information:

- main ecological constraints of the environment;
- any existing designated environmentally sensitive areas, such as national, provincial and regional parks, ecological reserves, designated fisheries areas, wetlands, estuaries, and habitats of provincial or federally listed species at risk, habitats of bi-national importance, and other sensitive areas;
  - with regard to woodland caribou, the description will include mapping and attribute details of the typical and non-typical habitat of the costal caribou range, as well as in the adjacent discontinuous distribution that overlaps with the study area delineated for caribou impact and effects assessment;
- physical or cultural heritage resources, and built heritage and cultural heritage landscapes;
- the current land use in the area and the relationship of the Project facilities and components with any existing land use including traditional, private and crown lands;
- regional and/or local planning or policy frameworks that relate to the protection of the environment (e.g., Lake Superior Lakewide Management Plan, Great Lakes Bi-National Toxics Strategy, Peninsula Harbour Area of Concern, Caribou Conservation Plan, Cervid Ecological Framework, etc.)
- detailed land requirements;
- local communities; and
- the environmental significance and value of the surrounding area.

The EIS will describe land uses in the project area, including resource development, fishing, recreational use and registered hunting, trapping and guiding areas.

### **2.2.3 Project Description**

The EIS will describe the general layout of the components of the mine site, the location of the transmission line corridor, the new access roads and areas for road upgrades, and

load-out and any other supporting facilities. The EIS will describe the Project as it is planned to proceed, including project phases and activities (construction, operation, modification (if relevant), closure, post-closure, decommissioning and abandonment (if relevant)).

The EIS will contain sufficient detail to be able to identify major mine components or structures which are likely to have a high failure consequence during construction, operation, closure and post-closure and where monitoring efforts will be required for the purposes of risk analysis. In describing the Project, the Proponent is encouraged to consider relevant recommendations in the *Environmental Code of Practice for Metal Mines*, published by Environment Canada (2009). The recommended practices in the Code include the development and implementation of environmental management tools, the management of wastewater and mining wastes, and the prevention and control of environmental releases to air, water and land. The Code is available at <http://www.ec.gc.ca/lcpe-cepa/default.asp?lang=En&n=CBE3CD59-1>.

The description will include an estimated timeline for all phases of the Project and a discussion of all Project components. This information will be provided in sufficient detail to allow the Proponent to predict potential effects and address concerns of interested parties.

The EIS shall include a description of the phases of the Project, including site preparation, construction, operation, modification (if applicable), closure and post-closure, and decommissioning and abandonment (if applicable)<sup>7</sup> as described in the Marathon Platinum Group Metals and Copper Mine Project – Project Description (July 2010) and any subsequent Project updates. In describing the phases of the Project, the Proponent shall include any relevant socio-economic components, such as estimated employment numbers and worker housing and transportation arrangements. The description of project phases shall include, but not be limited to, the following activities:

#### *Site Preparation*

- clearing, grubbing and stripping of vegetation, topsoil and other organic material;
- grading with topsoil;
- drilling and blasting to develop the open pits and plant site area;
- excavating and pre-stripping to remove mine rock and overburden;
- preparation of construction surfaces and installation of temporary construction facilities;
- site preparation for waste management;
- management of surface water and groundwater on the site, including seepage and run-off;
- maintenance and management of mine rock and overburden stockpiles (including run-off and seepage) to protect groundwater and surface water quality; and
- monitoring of groundwater and surface water quality and quantity.

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<sup>7</sup> The terminology "closure" and "post-closure" is used throughout the EIS Guidelines. However, it is recognized that decommissioning or abandonment activities could occur at any Project phase, in an early closure scenario.

### *Construction*

- construction of administration buildings, storage buildings, other ancillary structures and site services such as parking lots, area fencing, security systems;
- construction of explosives factory and magazine facilities;
- construction of tailings containment dams;
- management of surface water and groundwater on the site, including seepage, run-off, and mill process water;
- maintenance and management of mine rock stockpiles, tailings impoundment areas (TIAs), and the process water pond (including run-off and seepage);
- monitoring of groundwater and surface water quality and quantity;
- construction of water management facilities and drainage works (including but not limited to pipelines, dewatering facilities, storm water management, polishing ponds, and sediment control ponds and mine process water reservoirs);
- dewatering of natural water bodies in the project area;
- construction of new mine site access and haul roads including any water crossings, and water body shoreline works or undertakings;
- upgrading of the existing mine access road(s) and entrance(s) to the project area including any water crossings and water body shoreline works or undertakings;
- construction of a 115kV electrical transmission line within a new right-of-way from the existing sub-station on Highway 626 to the mine site;
- aggregate sources and amounts;
- management of waste;
- fish compensation works; and
- any works or undertakings associated with upgrading a rail load-out facility for mine concentrate.

### *Operation*

- drilling, blasting, loading of mine rock from the pit to mine rock storage areas and the ore to the crusher;
- operation of explosives factory and magazine facilities;
- handling, transportation, use and disposal of explosives;
- transportation of crushed run-of-mine material;
- transportation of mill feed (ore) to the grinding section of the processing facility;
- mill processing;
- transportation of filtered concentrate;
- management and maintenance of the entire mine waste stream, including but not limited to, tailings, waste rock, process water pond, and mine rock;
- decommissioning of the temporary process water pond (proposed during mine operations), including removal or breaching of dams;
- dewatering activities (e.g. open pit);
- management of surface water and groundwater on the site; including seepage, run-off, mill process water and storm water;
- management of surface water on site during dam removal or breaching;
- management of domestic waste from the workers camp;

- management of hazardous waste;
- monitoring activities; and
- environmental safety procedures.

#### *Closure and Post-closure*

- installation of security fencing around the pit perimeters;
- management of inputs from groundwater and surface water run-off into pits;
- decommissioning, dismantling and/or disposal of equipment;
- demolition/removal of surface buildings and associated infrastructure and disposal of resulting rubble;
- decommissioning/removal of explosives factory and magazine facilities;
- removal of power lines and electrical equipment;
- decommissioning of the potable water and sewage treatment systems (e.g., settling ponds associated with mine rock storage, roads and plant site);
- maintenance and management of mine rock stockpiles and TIAs (including runoff and seepage);
- following removal of infrastructure, soil, groundwater, and surface water testing for residual contamination, and disposal of contaminated soils and treatment of groundwater and surface water, as required;
- plans for reclamation and restoration of landscape (including water bodies) to productive capacity including management and monitoring;
- management of flooded pits to protect groundwater and surface water quality during flooding and pit overflow; and
- adaptive management, follow-up, compliance and effects monitoring.

#### **2.2.3.1 Mine Plan**

The EIS will include an accounting of the defined mineral resource, including measured, indicated and inferred categories. The tonnes mined in the reserve mine plan and grades used will also be included.

The EIS will also include:

- the results of geological, geotechnical and geohydrological site investigations, particularly for the location of the mine rock storage area, tailings impoundments, temporary stockpiles, process water and other facilities and open pits;
- as appropriate, the results for geotechnical site investigations for any other mine site infrastructure (other than those listed above) requiring either shallow or deep foundation systems; and
- as appropriate, details of any geotechnical work undertaken to determine the integrity and stability of infrastructure outside of the mine site, such as the access road, transmission line and concentrate transfer station facilities.

#### **2.2.3.2 Mine Development**

Where known, the sequence and scheduling of mine development will be provided, including but not limited to the following components:

- open pit development plan including location, design and production scheduling;

- pit wall management;
- mine rock storage area development plan;
- identification, segregation and management of acid rock drainage / metal leaching (ARD/ML) rock;
- low grade ore stockpile;
- concentrate stockpile;
- overburden storage;
- topsoil storage for reclamation;
- surface and groundwater management activities and facilities (e.g., storm water management ponds, sedimentation ponds, tailings ponds, etc.);
- crushing and conveying ore;
- mine site and access roads and drainage control;
- explosives use, manufacturing and storage facilities;
- dust management and vehicle emissions;
- truck shop and maintenance facilities;
- mine rock storage areas and TIA plan including tailings embankments which will identify location, preliminary designs, preliminary data on geotechnical properties and foundation conditions, seepage and surface water controls. The location and design of major structures will be based on geotechnical investigation and evaluation of foundation condition. Details concerning how these mine components will be maintained throughout all phases will be provided.
- dangerous goods and hazardous material handling, storage and/or distribution;
- borrow sources for dam construction and site preparation;
- condemnation drilling plan in areas of proposed permanent mine structures; and
- construction materials for roads, infrastructure/facilities pads and impoundments.

#### **2.2.3.3 Process Plant**

The EIS will describe the process plant, including but not limited to the following components:

- ore storage for the mill and low grade ore;
- tailings characterization;
- physical and chemical ore processing options;
- reagent handling and storage;
- where known, a list of reagents that will be used, including concentrations and quantities to be kept on site;
- concentrate slurry handling, storage and pumping facility;
- TIA with pipeline and reclaim water facilities;
- process water storage reservoir, intakes pipelines and distribution;
- plant runoff and sedimentation control facilities;
- dust management and fugitive emissions;
- spill contingency plans;
- metallurgical and assay laboratories; and
- water budget along with methods to ensure appropriate water sources and a discussion of contingencies should water quantities not be available for drought or

seasonal reasons. Appropriateness may be determined by evaluating the environmental effects of various water-taking options.

Furthermore, the EIS shall describe any waste water management initiatives to be undertaken by the Proponent with respect to the process plant.

#### **2.2.3.4 Maintenance, Administration and On-Site Support Facilities**

The EIS shall describe ancillary facilities and operations required at the mine site to support the mining of the ore body. The description shall include, but is not limited to the following:

- mine services buildings;
- power generation facilities;
- explosives storage and associated facilities, including:
  - the type of explosives to be manufactured and stored,
  - maximum quantity of explosives at each facility,
  - specified location, with distances to vulnerable features such as dwellings, roads, camps, etc. The Proponent needs to demonstrate that safety distances required have been considered and met. Explosive magazine locations shall also be specified,
  - fuel and ammonium nitrate storage plans (storage of ammonium nitrate to be in conformance with any guidelines),
  - liquid effluent disposal plans,
  - spill contingency plans, and
  - information on any temporary explosive facilities to be used for starting the Project;
- storage and management of fuels for equipment and vehicles;
- storage and management of hazardous materials, domestic and industrial wastes, used oil, recyclable wastes (types, volumes and disposal methods and waste minimization to be employed);
- proposed monitoring systems and maintenance plans;
- conceptual design details of the freshwater intake screen that will be used to ensure fish are not impinged or entrained in the intake system as per the Fisheries and Oceans Canada (DFO) *Freshwater Intake End-of-Pipe Fish Screen Guideline* (1995);
- surface water diversion, collection or storage works (water balances);
- pumping systems and any pipelines;
- all water supply requirements (e.g., source, volumes, temporal usage); and
- potable water sources.

For all proposed new roads and road upgrades, the EIS will describe the following:

- the entrance to the proposed mine site on the existing provincial Highway 17 that will be utilized during construction and operations;
- road use strategy for any portion of roads located on Crown land;
- existing and new road design specifications;
- the location of water body crossings and preliminary design specifications for any required crossings;

- sources of road construction materials (quarriable materials, gravel, fill); and
- management of runoff, stormwater and sediment control.

#### **2.2.3.5 Off-Site Support Infrastructure for Mine Development and Operations**

Support infrastructure for mine development and operations associated with the Project include, a 7km power transmission line and, if required, associated maintenance access routes and the structures for the transport of concentrate.

##### *Electrical Power Supply*

The EIS will describe the design of the transmission line and the proposed right-of-way, including the proposed route, including width, and will list any water body crossing. An outline of the schedule and preliminary construction details will be provided. Details concerning lighting or marking requirements will be discussed and information regarding the need for and location of maintenance access routes will be provided. The EIS will also describe maintenance requirements and techniques for the right-of-way.

##### *Transport of Concentrate*

The EIS will describe the loading, transport and unloading of concentrate from the mine site to the concentrate transfer station facilities. The EIS will identify the anticipated average number of truck or train trips per day (both to and from the associated facilities), and the anticipated load capacity of concentrate trucks or trains. Concentrate handling, storage and transportation measures designed to reduce or eliminate concentrate discharge to the environment will be discussed.

With respect to road upgrades to Highway 17, the results of the Transportation Impact Study undertaken by the Proponent shall be described in the EIS.

#### **2.2.4 Project Development Schedule**

The EIS will provide an estimated timetable and schedule for construction of the Project with an estimate of timing to reach commercial production.

## **2.3 PROJECT SCOPING**

### **2.3.1 Summary of the Project**

Stillwater Canada Inc. proposes to develop and operate the Marathon Platinum Group Metals and Copper Mine Project (the Project) approximately 10 km north of the Town of Marathon. This Project involves the establishment and operation of an open pit mine and mill for the purpose of extracting and processing ore containing copper and platinum group metals and including, but not limited to, any ancillary activities and the activities outlined below:

- the construction and/or use of equipment, buildings and structures;
- the establishment, construction and operation of TIA, explosives factory and magazine facilities, waste rock storage areas, water management facilities, transmission lines, temporary and emergency generation facilities, and activities to mitigate environmental impacts;

- the decommissioning, closure and abandonment of the mine and mine-related infrastructure; and
- the establishment, construction and/or modification and use of transportation infrastructure including access roads, highways and/or rail lines to support the above-mentioned activities and the transport of final mine concentrate(s).

The scope of project shall include all components of the Project as proposed by the Proponent.

### **2.3.2 Factors to be Considered**

The Proponent will include a consideration of the following factors in the EIS. In assessing the environmental effects of the Project, the following definitions of environment and environmental effect, as found in the Joint Review Panel Agreement, shall be used;

“Environment” means,

- (a) air, land or water,
- (b) plant and animal life, including human life,
- (c) the social, economic and cultural conditions that influence the life of humans or a community,
- (d) any building, structure, machine or other device or thing made by humans,
- (e) any solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirectly from human activities, or
- (f) any part or combination of the foregoing and the interrelationships between any two or more of them.

“Environmental effect” means,

- (a) any change that the Project may cause in the environment, and
- (b) any change that the environment may cause to the Project;

Whether such change occurs within or outside Canada.

The assessment by the Joint Review Panel will include a consideration of the factors listed in subsection 16(1)(a) to (d) and 16(2) of the *Canadian Environmental Assessment Act*, subsection 6.1(2) of the *Ontario Environmental Assessment Act*, and as per subsection 16(1)(e) of the *Canadian Environmental Assessment Act* any other matter relevant to the assessment, including:

- a. the purpose of the Project;
- b. the rationale or need for the Project;
- c. alternatives to the Project (including the “do nothing” alternative), the environmental effects of such alternatives to, and the advantages and disadvantages to the environment of such alternatives to;
- d. alternative means of carrying out the Project that are technically and economically feasible, the environmental effects of any such alternative means, and the advantages and disadvantages to the environment of such alternative means;
- e. the significance of the environmental effects, including the following:



- 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;
- f. measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the Project
  - g. measures to enhance any beneficial environmental effects;
  - h. 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;
  - i. extent to which biological diversity (e.g. ecosystems and/or species diversity) is affected by the Project, including any listed wildlife species, its critical habitat or the residences of individuals of that species as those terms are defined in subsection 2(1) of the federal *Species at Risk Act*, as well as any impact it may have on a provincially threatened or endangered species and/or its protected habitat;
  - j. extent of application of the precautionary principle to the Project;
  - k. the need for, and the requirements of, any follow-up program in respect of the Project.
  - l. description of the consultation undertaken by the Proponent with the public and Aboriginal groups during the preparation of the EIS;
  - m. comments from the public and Aboriginal groups that are received during the review; and
  - n. community knowledge and Aboriginal traditional knowledge and the current use of lands and resources for traditional purposes by Aboriginal persons.

### **2.3.3 Scope of the Factors**

Scoping establishes the boundaries of the EA and focuses the assessment on relevant issues and concerns. By defining the spatial and temporal boundaries, a frame of reference for identifying and assessing the environmental effects associated with the Project will be established. Different boundaries may be appropriate for each VEC.

The effects analysis shall consider the magnitude, aerial extent, duration, frequency and reversibility of residual effects. The analysis shall consider both the cumulative effects and assimilative capacity of the receiving environment. The likelihood of the occurrence of effects should be assessed separately.

The Proponent is expected to continue working with review agencies during development of the EIS to discuss and further clarify the methodology to be used.

### **2.3.4 Valued Ecosystem Components**

The EIS shall explain and justify methods used to predict the effects of the Project on each VEC, which includes biophysical and social, economic and cultural components, the interactions among these components and on the relations of these components within the environment. The information presented shall be substantiated. In particular, the Proponent will describe how the VECs were selected and what methods were used to predict and assess the adverse environmental effects of the Project on these

components. The value of a component not only relates to its role in the ecosystem, but also to the value placed on it by humans. The culture and way of life of the people using the area affected by the Project may themselves be considered VECs. The spatial and temporal boundaries used in the assessment may vary as appropriate, depending on the VEC. For example, with respect to woodland caribou, the spatial and temporal boundaries should be broad in order to assess the effects of the Project on woodland caribou habitat and populations of the continuous distribution coastal range and the discontinuous distribution.

The VECs that will be assessed in the EIS will include, at a minimum:

- atmospheric environment;
- climate change;
- acoustic environment;
- water quality and quantity, including surface and groundwater and the Lake Superior watershed;
- fish and fish habitat (as defined by the *Fisheries Act*), aquatic ecosystems, including benthos and sediment quality and federally and provincially listed species at risk, with particular attention to lake sturgeon;
- terrain and soils;
- vegetation, including country food (e.g. wild game, berries, plants);
- wildlife and wildlife habitat including avifauna, federally and provincially listed species at risk with particular attention to woodland caribou, alternate prey species and their associated predators;
- economic and social environment, including resource uses and human health;
- commercial land and resource use;
- navigable waters;
- physical and cultural heritage resources;
- the current use of Crown lands and resources for recreational purposes; and
- the current use of lands and resources for traditional purposes by Aboriginal people and groups.

This list of VECs in the EIS shall be modified as appropriate by the Proponent, as a result of consultation undertaken with Aboriginal groups, the public, federal and provincial government departments and relevant stakeholders.

### **2.3.5 Spatial Boundaries**

A description of the boundaries of the Project in a regional context showing existing and planned future land use, current and proposed resource development projects, and current infrastructure (i.e. transportation routes, urban areas, and proposed improvements to these infrastructure) shall be provided. A description of any traditional land use and any established or asserted Aboriginal and treaty rights from Aboriginal people and groups within the wider regional context shall be provided.

Sensitive areas including national and provincial parks, wetlands, critical habitats as defined under the *Species at Risk Act* and archaeological sites found within the regional context shall be described. General habitat description or habitat regulations as defined

under the *Endangered Species Act*, 2007, and preliminary woodland caribou population ranges as identified through the Caribou Conservation Plan shall also be described. The study area for the EA shall be based on the aerial extent of project facilities and activities and their likely effects. It shall encompass:

- the immediate mine site plus the corridor for the transmission line and access roads;
- those specific areas in which the direct and indirect effects of the Project may be felt; and
- a wider area for comparison purposes when assessing the significance of those effects.

In determining the spatial boundaries to be used in assessing the potential adverse and beneficial environmental effects, the Proponent shall consider, but not be limited to, the following criteria:

- the physical extent of the Project, including any worker camps, offsite facilities or activities, such as the transmission line corridor, new access road and the concentrate transfer station facilities;
- the extent of cultural heritage resources that may be affected by the Project, including potential built heritage resources and cultural heritage landscapes adjacent to the project area<sup>8</sup>;
- the extent of aquatic and terrestrial ecosystems potentially affected by the Project;
- the extent of potential effects arising from noise, light and atmospheric emissions. In assessing the effects of the Project on the atmospheric and acoustic environment, the Proponent shall consider not only the location of potential receptors, but also property lines and other such designations (e.g. land use permit boundaries that are currently zoned for or can otherwise be utilized by sensitive receptors);
- the extent to which species of conservation concern potentially affected by the Project utilize the landscape;
- the extent to which traditional land use, asserted or established Aboriginal and treaty rights could potentially be affected by the Project;
- lands used for residential, commercial, industrial, recreational, cultural, and aesthetic purposes by communities whose areas include the physical extent of the Project; and
- the size, nature and location of past, present and reasonably foreseeable projects and activities which could interact with the items above including any on-going exploration.

These boundaries shall also indicate the range of appropriate scales at which particular baseline descriptions and the assessment of environmental effects are presented. The Proponent is not required to provide a comprehensive baseline description of the environment at each scale, but shall provide sufficient detail to address the relevant

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<sup>8</sup> For the purposes of evaluating potential impacts of the Project, "adjacent" means: contiguous properties as well as properties that are separated from a heritage property by a narrow strip of land used as a public or private road, highway, street, trail, right-of-way, walkway, green space, park or easement or as otherwise defined in the municipal official plan"

environmental effects of the Project and the alternative means. The EIS shall contain a justification and rationale for all boundaries and scales chosen.

The geographic study areas for the EIS shall encompass the areas of the environment that can reasonably be expected to be affected by the Project, or which may be relevant to the assessment of cumulative environmental effects. Study areas shall encompass all relevant components of the environment, including people, non-human biota, land, water, air and other aspects of the natural and human environment, notably, traditional land use. Study boundaries shall be defined taking into account traditional knowledge, ecological, technical, social and political considerations.

### **2.3.6 Temporal Boundaries**

The temporal boundaries of the Project shall cover all phases of the Project as well as decommissioning, abandonment and the reclamation of the sites affected by the Project. If the Proponent does not believe the full temporal boundaries should be used, the EIS shall identify the boundaries used and provide a rationale for the temporal boundaries selected.

In characterizing the environmental effects of the Project, the Proponent shall consider the current baseline environment and environmental trends within the study area. The description of the existing baseline and the environmental trends shall include a consideration of past projects and activities carried out by the Proponent and/or others within the regional study area.

In assessing cumulative environmental effects within the study area, the Proponent shall consider the effects of the Project in combination with other past, present and future projects that are either "certain" or "reasonably foreseeable" as defined in Canadian Environmental Assessment Agency's guidance *Addressing Cumulative Environmental Effects under the Canadian Environmental Assessment Act* (2007).

As is the case for the determination of spatial boundaries, the temporal boundaries shall indicate the range of appropriate scales at which particular baseline descriptions and the assessment of environmental effects are presented.

The approach taken to determine the temporal boundary of assessment shall take into account the following elements:

- hazardous lifetime of the contaminants associated with waste or with releases to the environment during both normal operation and postulated accidents and malfunctions;
- duration of the operational period;
- design life of engineered design elements;
- duration of both active and passive controls;
- frequency and duration of natural events and human-induced environmental changes (e.g., seismic occurrence, flood, drought, climate change, etc.); and
- duration of the potential for foreseeable adverse environmental effects.

## **2.4 PROJECT ALTERNATIVES**

### **2.4.1 Assessment of Alternatives and Selection of the Proposed Project**

The EIS shall include an analysis of alternative means of carrying out the Project that are technically and economically feasible and the environment effects of any alternatives means. Further, the EIS shall include a consideration of the alternatives to the Project. For further guidance, the Proponent is referred to the Canadian Environmental Assessment Agency guidance document *Addressing 'Need for', 'Purpose of', 'Alternatives to' and 'Alternative Means' under the Canadian Environmental Assessment Act* (CEAA 1998) as well as the Ontario Ministry of Environment document *Code of Practice: Preparing and Reviewing Environmental Assessments in Ontario* (MOE 2009). When assessing project alternatives, the Proponent is encouraged to take into account the relations and interactions among various components of the ecosystem, including affected communities. Further, the Proponent is encouraged to demonstrate how the preferred alternative contributes to sustainable development.

### **2.4.2 Alternatives to the Project**

The EIS shall include an analysis of alternatives to the Project, including the “do nothing” alternative, describing functionally different ways to meet the Project’s need or rationale and achieve the Project’s purpose from the perspective of the Proponent. For each identified alternative to the Project, this section of the EIS shall explain how the Proponent developed the criteria to identify the major environmental, social and cultural, economic and technical costs and benefits of those alternatives, and how the Proponent identified the preferred project based on the relative consideration of the environmental, social and cultural, economic and technical benefits and costs. This shall be done to a level of detail which is sufficient to allow government departments and ministries, the public and Aboriginal groups to compare the preferred project with the alternatives.

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

The EIS shall identify and describe alternative means to carry out the various components of the Project that are, from the perspective of the Proponent, technically and economically feasible. If there is more than one alternative means that is technically and economically feasible, the EIS shall also describe the environmental effects of each alternative means. In describing the preferred means, the EIS shall identify the relative consideration of environmental effects, and technical and economic feasibility. The alternative means that were considered but determined not to be technically and economically feasible should be identified and the rationale as to why they were determined not to be feasible should be documented. The criteria used to identify alternative means as unacceptable, and how these criteria were applied, shall be described, as shall the criteria used to examine the environmental effects of each remaining alternative means to identify the preferred alternative.

In addition, the EIS shall identify and describe the alternative means that have been considered to avoid or minimize adverse effects on protected species and habitat. Reasonable alternatives should reflect a broad spectrum of possibilities. An alternative means that would completely avoid adverse effects on the protected species and habitat present on and/or surrounding the activity location must be considered and described.

Alternatives that were considered but were deemed not feasible due to social, economic, technical considerations should also be identified.

#### **2.4.3.1 Assessment of Alternatives for Mine Waste Disposal**

With respect to the assessment of alternative means of disposing of mine waste, the following guidance is intended to assist the Proponent in developing a robust assessment of alternatives. The Proponent is encouraged to utilize the methodology provided by Environment Canada outlined below to conduct a robust and thorough assessment of alternatives means of mine waste disposal. The Proponent will also continue to meet with involved parties to ensure that their concerns and input are addressed in the alternatives analysis.

As per Section 2.4.3, the EIS shall also include an assessment of the alternative means of carrying out the Project, which includes the disposal of mine waste. The Proponent has identified the need to use one or more natural water body(ies) frequented by fish for the disposal of mine waste, including tailings and waste rock, as well as the management of process water. If the Project receives the required approvals through the EA process, the Metal Mining Effluent Regulations (MMER) would need to be amended to add these water bodies to Schedule 2 to designate them as TIAs in order to allow the use of water bodies for mine waste disposal. This regulatory process would not be initiated until a detailed assessment of alternatives for mine waste disposal had been undertaken by the Proponent.

It is recommended that the Proponent undertake the assessment of alternatives for mine waste disposal as a component of the EIS to coordinate consultation requirements for both the EA and MMER processes and minimize the time required to proceed with the MMER amendment process.

The assessment of alternatives for the mine waste disposal should objectively consider all available options for mine waste disposal, including options that do not involve the use of a natural water body(ies) frequented by fish as a TIA. This assessment should qualitatively and quantitatively assess the effects of each alternative on the environment. Both the short term impacts of each alternative and the long term risks through the closure and post-closure phases should be assessed. The assessment of alternatives for mine waste disposal shall include all aspects of the Project that may contribute to the predicted impacts associated with the proposed TIA(s). The economic component of the assessment of mine waste alternatives should consider the full costs of each alternative throughout the mine life cycle, from construction through post-closure, including long term maintenance and monitoring requirements, as well as costs associated with the legislated requirement for a compensation plan to offset fish habitat loss.

For further guidance, the Proponent is encouraged to consult Environment Canada's draft *Guidelines for the Assessment of Alternatives for Mine Waste Disposal* (May 2011).

## **2.5 CONSULTATION**

Meaningful involvement in the EA takes place when all parties involved have a clear understanding of the Project as early as possible in the review process. Therefore, the Proponent is required to continue to provide up-to-date information describing the Project to the public and Aboriginal groups, and especially to the communities likely to be most affected by the Project. The Proponent shall also involve Aboriginal people and groups in determining how best to deliver that information (e.g., the types of information required, translation needs, different formats and the possible need for community meetings). The Proponent will also explain the results of the EIS in a clear and direct manner to make the issues comprehensible to as wide an audience as possible.

### **2.5.1 Aboriginal Consultation**

An objective of the overall review process is to involve potentially affected Aboriginal people and groups in order that the EA can identify any changes that the Project may cause in the environment. It shall therefore identify the resulting effects of any such changes on the current use of lands and resources for traditional purposes by Aboriginal persons, physical and cultural heritage, and on 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 Proponent shall ensure that it engages with Aboriginal people and groups that may be affected by the Project and that have asserted or established Aboriginal and treaty rights.

It is understood that the consultation activities conducted by the Proponent do not release the Crown's own duty to consult Aboriginal people and groups that may be affected by the Project. However, the Crown may delegate the procedural aspects of Aboriginal consultation to a third party and use existing processes to the extent possible. Therefore, the Proponent is expected to gather and include in the EIS information from Aboriginal groups relating to the effects of the Project on the current use of lands and resources for traditional purposes, on physical and cultural heritage, and on 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. Further, information related to the possible impacts of the Project on asserted or established Aboriginal and Treaty rights shall also be included in the EIS, where available.

#### **2.5.1.1 Engagement and Consultation**

For the purpose of developing the EIS, the Proponent will continue to consult with Aboriginal people and groups with respect to their perspectives and opinions about the Project and the potential effects of the Project on their Aboriginal interests.

The EIS will include a summary of the consultations undertaken with Aboriginal people and groups prior to the submission of the EIS. The Proponent will also explain the results of the EIS in a clear and direct manner to make the issues understandable to as wide an audience as possible.

For the purposes of facilitating federal and provincial Crown Consultations, the Proponent is required to describe in the EIS how the concerns respecting Aboriginal people and

groups will be addressed. That description shall include a summary of discussions, the issues or concerns raised, and shall consider and describe any asserted or established Aboriginal and treaty rights. The EIS must document the potential effect of the Project on asserted or established Aboriginal and treaty rights, and the measures to prevent or mitigate those potential effects.

The EIS will:

- describe consultations undertaken prior to the submission of the EIS, the methods used and their rationales, perspectives and opinions expressed about the Project, issues raised and the ways in which the Proponent has responded to these issues; and
- outline a proposal for a consultation process with Aboriginal people and groups which the Proponent, as directed by government, intends to carry out for the purposes of the review of the EIS.

In preparing the EIS, the Proponent shall ensure that Aboriginal people and groups have access to the information that they require in respect of the Project and of how the Project may impact them. The Proponent will provide copies of the EIS to Aboriginal groups for information and consultation purposes and during the EIS review stage. The Proponent will consult with Aboriginal groups in accordance with the consultation process outlined in the EIS.

A summary of the completed, ongoing and future consultation with Aboriginal people and groups will be provided. This summary shall include information from each group respecting concerns related to the Project and which asserted or established Aboriginal and treaty rights are potentially affected by the Project and how such rights may be affected. It shall also include a description of how the concerns of groups or potential impacts to asserted or established Aboriginal and treaty rights have been considered or addressed. There shall also be a summary of any outstanding issues that remain.

#### **2.5.1.2 Aboriginal Traditional Knowledge**

The EIS will describe where and how Aboriginal traditional knowledge is incorporated into the assessment, including in effects prediction, and determining mitigation measures. Where Aboriginal traditional knowledge is not available or not provided in a timely manner the EIS will describe efforts taken to obtain it.

#### **2.5.1.3 Key Issues**

The EIS will include a list and discussion of key issues identified throughout the engagement and consultation activities with Aboriginal people and groups. Information on each issue will be included in a Table of Concordance which in turn will clearly indicate which section of the EIS includes a discussion of the issue.

#### **2.5.1.4 Community Interest and Benefit**

The Proponent shall fully consider the interests, needs and ambitions of local and Aboriginal communities in all aspects of the work proposed as part of the Project. The EIS will include details describing how community and Aboriginal interests and benefit intentions, practices and programs have been and will continue to be carried out. The



Proponent shall consult with local and Aboriginal communities to determine how best to incorporate this information into the EA. Details related to benefits that may be accrued to Aboriginal communities as the result of the Project will only be made public with the agreement of the affected communities.

### **2.5.2 Public Consultation**

Public participation<sup>9</sup> is a central feature of the EA process. Meaningful public participation requires the Proponent to address concerns of the general public regarding the potential environmental effects of the Project. In preparing the EIS, the Proponent is required to engage residents and organizations in all affected communities, other interested organizations, and relevant government agencies. The Proponent must provide in the EIS the highlights of this engagement, including the methods used, the results, and the ways in which the Proponent intends to address the concerns identified, including a summary of issues raised during such engagement.

The EIS will:

- describe public consultations undertaken prior to the submission of the EIS, the methods used, perspectives and opinions expressed about the Project, issues raised and the ways in which the Proponent has responded to these issues;
- outline a proposal for a public consultation program that the Proponent plans to carry out for the purposes of the review of the EIS. The location and timing of the proposed open houses and other consultation activities to be undertaken during the review of the EIS will be specified;
- describe the ongoing public consultation activities and any plans for further public consultation about the Project;
- summarize the comments made by the public to-date with respect to the Project; and
- identify the key issues of concern raised by the public and how the Proponent has, or intends to, address them.

The EIS shall also detail consultations undertaken with local governments, stakeholder organizations, and federal and provincial government organizations.

## **2.6 EXISTING ENVIRONMENT**

The EIS shall provide a baseline description of the environment, including the components of the existing environment and environmental processes, their interrelations and interactions as well as the variability in these components, processes and interactions over time scales appropriate to this EIS.

**The Proponent's description of the existing environment shall be in sufficient detail to permit the identification, assessment and determination of the significance of**

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<sup>9</sup> As described in the Canadian Environmental Assessment Agency's Public Participation Guide (May 2008), terms such as "participation," "consultation," "involvement" and "engagement" are often used interchangeably, although they may mean different things to different people. These guidelines endeavor to use these terms in a manner that is consistent with the 'Public Participation Terminology' described in this guidance.

**potentially adverse environmental effects that may be caused by the Project, to adequately identify and characterize the beneficial effects of the Project, and provide the data necessary to enable effective testing of predictions during the follow-up program.**

The information describing the existing environment may be provided in a stand alone chapter of the EIS or may be integrated into clearly defined sections within the effects assessment of each VEC.

The baseline description shall include results from studies done prior to any physical disruption of the environment due to initial site clearing activities planned as part of the site preparation phase. The baseline description shall include characterization of environmental conditions resulting from historical and present activities in the local and regional study area (see Cumulative Effects section). The EIS shall compare baseline data, in areas on which the assessment will focus, with applicable federal, provincial, municipal or other legislative requirements, standards, guidelines or objectives.

The baseline description shall include those VECs, processes and interactions that are likely to be affected by the Project. The Proponent shall also describe the nature and sensitivity of the area within and surrounding the Project. The Proponent shall also indicate the specific geographical areas or ecosystems that are of particular concern, and their relation to the broader regional environment and economy. Relevant information about the VECs is to be presented graphically to document physical and biological (e.g., home range) characteristics.

If the background data have been extrapolated or otherwise manipulated to depict environmental conditions in the study areas, modeling methods and equations shall be described and shall include calculations of margins of error and other relevant statistical information, such as confidence intervals and possible sources of error. Such information can be included in the main body of the EIS or in supporting documents that are referenced in the EIS.

### **2.6.1 Physical and Biological Environment**

In describing the physical and biological environment, the Proponent shall take an ecosystem approach that considers both scientific and traditional knowledge and perspectives regarding ecosystem health and integrity. The Proponent shall consider the extent to which biological diversity (e.g. ecosystems and/or species diversity) is affected by the Project. The Proponent shall propose and present a rationale for the indicators and measures of ecosystem health, human health, and social health and integrity it uses. These shall be related to project monitoring and follow-up measures.

For the biological environment, baseline data in the form of inventories alone is not sufficient for the purposes of the EIS. The Proponent shall consider the sensitivity/resilience of species populations, communities and their habitats. As appropriate, the Proponent shall summarize pertinent historical information on the size and geographic extent of populations as well as density for both terrestrial and aquatic ecosystems. Habitat at regional and local scales shall also be defined, as appropriate, in

ecological mapping of aquatic and terrestrial vegetation types and species (e.g. ecological land classification mapping). Habitat use shall be characterized by type of use (e.g., spawning, breeding, migration corridors, feeding, nursery, rearing, wintering), frequency and duration. Emphasis shall be on those species, communities and processes identified as VECs. However, the interrelations of these components and their relation to the entire ecosystem and communities of which they are a part shall be indicated. The Proponent shall address issues such as habitat, nutrient and chemical cycles, food chains, productivity, to the extent that they are appropriate to understanding the effect of the Project on ecosystem health and integrity. Range and probability of natural variation over time shall also be considered.

#### **2.6.1.1 Geology**

The EIS will provide the following:

- a discussion of the soils, surficial and bedrock geology of the deposit, host rocks, and overburden units, which includes geological maps and cross-sections of soil units, surficial geology units, and bedrock geology units. Where appropriate, the following geologic parameters will be included:
  - representative lithologic descriptions including age, colour, grain size, mineralogy, physical strength, hardness, weathering characteristics, depositional setting and correlations,
  - representative soil descriptions including, but not limited to: depth, texture, classification, colour, grain size, organic matter, hydraulic conductivity and permeability; borehole and test pit logs,
  - spatial distribution and thickness of lithologic units, or links to vegetation and landforms,
  - alteration styles, mineralogy, occurrence and intensity,
  - structural fabric (e.g. fractures, faults, foliation and lineations, etc.) and structural relationships,
  - ore mineralogy, including sulphide types, abundance, mode of occurrence, extent of previous oxidation and an estimate of relative sulphide reactivity,
  - type and grade of metamorphism, and
  - regional geologic framework including tectonic belt, terrain, regional metamorphism and structure;
- delineate the regional and local geological structures in the project area that may affect the proposed infrastructure, and show their potential effect on the proposed infrastructure as well as links to ARD/ML mitigation geochemistry. This includes major structural features as well as lesser local structures.

This information will be used by the Proponent to assist in developing the surface and groundwater quality predictions for the Project.

#### ***Acid Rock Drainage and Metal Leaching***

Materials at the Project site that shall be investigated for ARD/ML potential include overburden, waste rock, ore and low grade ore, and tailings. Components of the Project that will be assessed for ARD/ML potential include but are not limited to the pit walls,

waste rock dumps, low grade ore and ore stockpiles, tailings/waste rock impoundments, borrow materials, plant site and roads.

The EIS will include:

- a description of the chronology of ARD/ML investigations and the design of an ARD/ML characterization program, including the geological and mine plan context for the additional work;
- predictions of the ARD/ML potential of all materials (bedrock and surficial) to be disturbed or created (i.e. tailings) during all phases (construction, operation, closure and post-closure) of the Project. This will include a discussion of the expected time required for the onset of ARD for each lithological/alteration/waste management unit and mine component, the expected time required to deplete available sources of neutralization, metal leaching and the predicted drainage chemistry for each mine component, including the types and concentrations of major and trace elements;
- a comprehensive discussion of the geology of the deposit and its relationship to ARD/ML potential for all of the lithological units which will be disturbed during mine development, based on the preliminary mine sequence. Where applicable, for each lithological unit, how its origin, field occurrence, alteration, relationship to other lithological units, as well as the mineralogy, textures, structures and materials handling plans affects the potential for ARD/ML will be explained;
- a discussion on how mine sequencing, particularly how changes to sequencing could affect the results of the ARD/ML assessment;
- a description of all the static and kinetic test work conducted to date. This includes a detailed description of the rationale, advantages and disadvantages of the sample selections and the methodology for all test work;
- population assessments for each lithological/alteration/waste management unit. Populations have been assessed in terms of vertical and horizontal distribution and sampling biases to ensure that a waste management unit is properly characterized over its range of variability;
- raw baseline and predictive data from the ARD/ML assessment program that is properly identified and clearly tabulated, with sample calculations, clear interpretations and conclusions for all data. Tabulated data include the number of samples of each lithological/alteration/waste management unit, with minimum, maximum, mean, median, standard deviation, and 10th and 90th percentile values as appropriate;
- clear, concise cross-sections which relate the ARD/ML assessment (static/kinetic sample locations and results), geology and development plans;
- graphical representation of the information collected from the static and kinetic test work. Where appropriate, data presented will include the number of samples of each lithological/alteration/waste management unit and other statistical information, such as minimum, median, maximum, and 10<sup>th</sup> and 90<sup>th</sup> percentile values; and
- delineation of source terms, methods and assumptions utilized in the geochemical modeling.

The manual *Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials* (2009) produced by the Mine Environment Neutral Drainage Program is a recommended reference for use in ARD/ML prediction.

#### **2.6.1.2 Atmospheric Environment**

The EIS shall describe the climate and meteorological conditions at the site, local and regional study areas. Any off-site data used in the description shall be thoroughly discussed, including an analysis of how representative data are of conditions at the project site. Its use would be qualified with an understanding of local and regional variability and the geographic locations of any on-site and off site meteorological stations.

Climate and meteorological information provided should include:

- air temperature, relative humidity, evaporation, precipitation, wind speed and direction, atmospheric pressure, and solar radiation;
- seasonal variation in weather conditions;
- description of current air quality; and
- occurrence of weather phenomena (i.e. tornadoes, lightning, temperature inversions and fog) with special consideration given to extreme and rare meteorological phenomena.

The influence of regional topography or other features that could affect weather conditions in the study areas shall be described.

#### **2.6.1.3 Acoustic Environment**

The EIS shall describe current ambient noise levels at the site and in the local study areas, and include information on its source(s), geographic extent and temporal variations. The description shall also provide ambient noise levels for other areas which could be affected by the Project, such as along the proposed transmission corridor.

#### **2.6.1.4 Water Quality and Quantity**

##### **2.6.1.4.1 Hydrology and Hydrogeology**

###### *Surface Water*

The EIS shall describe surface water hydrology at the site, local and regional study areas. The description shall include delineation of drainage basins at the appropriate scales and a description of hydrological data such as water levels and flow rates collected over the years. The Proponent shall describe hydrological regimes, including monthly, seasonal fluctuations and year-to-year variability of all surface waters. Normal flow, 7Q20 flows<sup>10</sup>, flooding, and drought properties of lakes and streams shall be provided. The interactions between surface water and groundwater flow systems that may produce "coldwater" discharges into streams and lakes shall also be addressed. The Proponent shall establish a conceptual plan for long term monitoring and watershed management. This plan shall include a commitment to establish hydrological stations within areas of concern, and the verification of appropriate methods to validate predicted flows over time.

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<sup>10</sup> 7Q20 refers to the lowest mean flow for seven consecutive days that has a 20-year recurrence interval period (i.e. a 1 in 20 chance of occurring in any one year).

The EIS will include the following baseline information:

- description of hydrometric monitoring program(s) on site including an assessment of completeness and accuracy of data;
- review of regional hydrometric data and assessment of hydrologic similarity with hydrological conditions found at the project site;
- theoretical residence time for lakes; and
- for each drainage basin that may be impacted by the proposed mine site:
  - mean monthly and annual run-off and streamflow,
  - seven-day low flow estimates for mean annual conditions for the 10-yr return period (7Q10),
  - estimates of peak stream flow with a 100, 50 and 10 year return periods, and
  - an estimate of the provincial regulatory flood event.

#### *Groundwater*

This section of the EIS shall provide a detailed description of the hydrogeological environment at the site, local and regional study areas. The description must characterize the physical and geochemical properties of hydrogeological units such as aquitards and aquifers, delineate groundwater flow patterns, identify recharge and discharge areas, and identify groundwater interaction with surface waters. Investigations for the hydrogeological assessment should involve:

- modeling of baseline and anticipated hydrogeological conditions;
- a hydrological model that discusses the hydrostratigraphy and groundwater flow systems;
- intrusive and surface investigations; and
- anticipated or potential changes to groundwater flow and quality related to any surface waters.

These studies shall define the subsurface conditions in enough detail to:

- allow for a reasonable evaluation of the level of groundwater impacts that might occur as a result of the undertaking; and
- predict the main contaminant migration pathways, potential receptors, potential for off-site migration, and expected contaminant attenuation capacities and mitigation.

#### Baseline Monitoring Framework

A baseline groundwater monitoring framework shall be established in sufficient detail to permit the collection of appropriate data to allow for the identification, assessment and determination of the significance of potentially adverse environmental effects that may be caused by the Project. A groundwater monitoring framework shall be developed which:

- considers all phases of the Project;
- establishes background/baseline hydrogeological conditions, groundwater quality and quantity, both at the site and within the regional study area for the proposed project;
- includes the lithology for all wells from which data was collected;
- identifies potential seasonal fluctuations;

- identifies groundwater to surface water discharge;
- takes into consideration the potential for ARD/ML and the potential impacts due to mine dewatering on baseflow to surface water features, including wetland features;
- identifies water quality objectives from the perspective of socio-economic/human health and ecological health; and
- includes ongoing monitoring of planned site activities.

The monitoring framework shall include groundwater monitoring wells within the footprint of the planned operation works, for baseline characterization and later decommissioning; with an aim of having the majority of the groundwater monitoring wells remaining in-place during all phases of the undertaking.

In developing the baseline monitoring framework, consideration should be given to the fact that provincial Certificates of Approval will be required for any facilities which have the potential for groundwater impact (e.g. waste rock piles, tailings facilities, tailings ponds, waste disposal, subsurface sewage disposal)<sup>11</sup>.

#### Hydrogeological Modeling

An appropriate hydrogeologic model (e.g. 3-Dimensional numerical groundwater flow model) shall be presented for the project area, which discusses the hydrostratigraphy and groundwater flow systems. These models will be used in predicting the influence of the mine construction, operation and closure on groundwater flow, quantity and quality, and performing a quantitative assessment of residual effects for the post-closure period.

The models shall be calibrated against baseline conditions and should be physically tested to confirm the generated models with the groundwater monitoring data for the site. The models shall incorporate the anticipated groundwater seepage locations, rates, seepage quality, and direction, into or from:

- open pits;
- mine rock stockpiles and other stockpiles;
- process solids management areas;
- primary sedimentation pond and process water pond; and
- open pits during any future overflow.

#### Additional Groundwater Requirements

The EIS shall also include the following information and items related to the hydrogeological assessment for the project site:

- an inventory of existing information on the hydrogeological conditions in the project area, including: published reports, geological maps, and well record data;

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<sup>11</sup> The Certificates of Approval will be assessed with respect to the Reasonable Use guideline. Under this guideline, Reasonable Use criteria are based on comprehensive background/baseline water quality data of the existing hydrogeological environment, and incorporation of the Ontario Drinking Water Standards, Objectives and Guidelines, including *Incorporation of the Reasonable Use Concept into MOEE Groundwater Management Activities, Guideline B-7* (1994); *Determination of Contaminant Limits and Attenuation Zones, Procedure B-7-1*; *Ontario Drinking Water Quality Standards, Ontario Regulation 169/03* (2002); and *Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines* (revised June 2006).

- review of the physical geography and geology of the area, as it pertains to local and regional groundwater flow systems and aquifer/aquitard systems;
- description of local and regional potable groundwater supplies, including their current use and potential future use;
- measurements of hydraulic conductivity for all hydrogeological units in the project area;
- hydrogeologic maps and cross-sections for the project area, outlining:
  - the extent of aquifers, including bedrock fracture zones,
  - location of groundwater monitoring wells with respect to proposed facilities and works, topography, and surface water features,
  - location of groundwater divides,
  - location of springs,
  - groundwater flow directions, and
  - groundwater contours (piezometric surfaces).

#### **2.6.1.4.2 Water Quality and Aquatic Ecology**

The Proponent shall provide a description of water quality sampling protocols and analytical methods. Where appropriate, maps and figures shall be provided.

The EIS will include the following baseline information:

- description of the monitoring program, including the location of all monitoring locations on site and off site in the receiving systems, and reference sites;
- monitoring protocol for collection of surface water data before and during construction, operation, closure and post-closure;
- details of quality assurance / quality control (QA/QC) protocols;
- analysis of water chemistry, which must include mercury;
- temporal and spatial trends analysis of water quality data, where possible; and
- assessment of productivity measurements (e.g., chlorophyll A).

The Proponent shall describe all surface water sources used for drinking water in the area.

#### **2.6.1.4.3 Sediment Quality and Benthos**

The description of the existing aquatic environment shall include information on sediment quality and benthic invertebrate communities, including characterization of the community diversity, distribution and abundance. The baseline sediment data gathered shall be sufficient to support the development of biological monitoring programs and shall assess variation relative to historical data<sup>12</sup>.

The EIS will include the following baseline information:

- description of the monitoring program, including the on and off site monitoring locations and reference sites;

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<sup>12</sup> The Proponent is encouraged to contact Environmental Canada for specific recommendations regarding the collection of benthic invertebrate community baseline endpoints in relation to the MMER.



- monitoring protocol for collection, including details of timing (for reproducibility of ongoing monitoring) and use of comparable substrates/habitats;
- details of QA/QC protocols;
- details of identification methods for benthos; and
- details of statistical tools and data interpretation.

#### **2.6.1.5 Fish and Fish Habitat**

The EIS will include:

- scientifically defensible baseline data that characterizes fish habitat, fish habitat use and fish community, including aquatic species of conservation concern, within each water body and their inter-connecting channel(s) in the context of the local and regional sub-watershed areas. This shall include, as appropriate to the circumstances:
  - the characterization of fish habitat use as spawning, rearing/nursery, feeding, migratory corridor and overwintering/summer refuge,
  - a quantification of habitat by watercourse reach and/or type within the local watershed, including measures such as direction of flow, length of stream, surface area and/or mean bank full width, depths, monthly/seasonal/annual discharge volumes/velocities and natural or anthropogenic barriers to fish passage, and
  - for each potentially affected water body, measures of: total surface area, water elevation above mean sea level, shoal area, surface area of submerged and emergent aquatic vegetation, maximum and mean depths and water quality parameters (e.g., profiles of water temperature, turbidity, pH, dissolved oxygen);
- distribution, abundance and characterization of fish by species and life stages;
- characterization of existing metal levels, including mercury, in fish muscle and liver in areas that may be impacted by effluent or seepage from the mine; and
- the results of fish and fish habitat surveys along proposed new roads and the transmission line right of way.

The adequacy of aquatic baseline data for each water body shall be evaluated based on, but not limited to, such factors as:

- use of appropriate and varied gear type(s);
- adequacy of sampling effort, across all seasons and over multiple years; and
- distribution of sampling effort both temporally and geographically for different habitat types within each water body.

When making a determination of presence/absence of fin fish in water bodies and watercourses within the project area, the Proponent should follow the methodologies and guiding principles presented in Portt *et al* (2008). Any variation from those methods should be scientifically justified and referenced.

#### **2.6.1.6 Terrain and Soil**

The EIS will include:

- baseline mapping of soils within the project area, including the transmission line and access roads, to support the effects assessment for all terrestrial disciplines;
- map soil depth by horizon within the mine site area to support soil salvage and reclamation efforts;
- details of soil sample analysis completed and the quality assurance/quality control program followed; and
- summary of baseline data on the concentration of trace elements in site soils prior to Project development.

#### **2.6.1.7 Vegetation**

The EIS will characterize the baseline vegetative communities within the area potentially affected by the Project. In particular, the EIS will include information on the following key communities, species groups or ecosystems that have intrinsic ecological or social value:

- forests (e.g. species composition, age, forest unit, volume) including information for all lands to be cleared<sup>13</sup>;
- wetland ecosystems;
- riparian ecosystems;
- plant species and ecological communities of conservation concern; and
- description of current proposed forest management activities that overlap with the Project.

#### **2.6.1.8 Wildlife**

The EIS shall describe and identify:

- the terrestrial species and their habitat at the site and within the local and regional study areas;
- any species of conservation concern and their associated habitat (general, regulated or critical), with particular attention to woodland caribou<sup>14</sup>;
- any wildlife corridors and physical barriers to movement that exist within the project area;
- all protected and conservation areas established by federal, provincial and municipal jurisdictions (e.g. wilderness areas, parks, sites of historical or ecological significance, nature reserves, federal migratory bird sanctuaries and wildlife management areas).

The results of wildlife surveys conducted during the seasons and during times of day which facilitate detection of the target species or species groups will be summarized in the EIS (with further detail provided in accompanying appendices). The following will be provided:

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<sup>13</sup>The Ontario Ministry of Natural Resources Forest Resources Inventory information.

<sup>14</sup> The Boreal Population of Woodland Caribou is listed as Threatened under the federal *Species at Risk Act*, and Environment Canada is currently preparing a National Strategy for this population. The national Woodland Caribou, Boreal Population, Recovery Strategy is expected to be posted on the Species at Risk Public Registry (<http://www.sararegistry.gc.ca>) by the end of summer 2011. Proposed critical habitat will be identified in the Recovery Strategy to extent possible, based on best available information. Once available, the Recovery Strategy should be cited and used in concert with Ontario's Woodland Caribou Conservation Plan.

- identification of species of conservation concern that may occur at any point throughout the year in the project area and information on relative abundance, distribution and habitat use of these species;
- identification of ungulate/cervid species occurring in the project area and along the transmission corridor;
  - the results of aerial surveys to collect data on the relative abundance and distribution of moose, white-tail deer and woodland caribou by season (winter, summer) will be provided and used in conjunction with other data sources (e.g., provincial government surveys and mapping) to verify the habitat mapping and provide a baseline from which to predict and mitigate effects;
- information on the level of use of the mine site area by large carnivores such as black bears and wolves;
- information on furbearer and small mammal species known and potentially occurring in the proposed mine development area. The relative abundance of furbearer species in the area will be described;
- information on raptors and raptor habitat in the proposed mine site area, and their abundance; and
- information on the relative abundance, distribution and density of migratory birds, including:
  - breeding, migration, staging and stopover as well as wintering populations, and
  - available data from Environment Canada and Ontario Ministry of Natural Resources.

#### *Species At Risk*

The EIS shall describe and identify any biological species of conservation status at a federal, provincial, regional or local level and their critical habitats, as outlined in the sections above. This includes information pertaining to species of conservation concern (i.e., species listed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), species listed under the *Species at Risk Act*, the *Endangered Species Act*, 2007, and species at risk in Ontario) that may occur at any point throughout the year in the project area, including their conservation status and the type of habitat protection they receive under legislation<sup>15</sup>.

The EIS shall provide a description of the relative abundance, distribution and habitat use of wildlife species of conservation concern, including a detailed description of the methodology for each species of conservation concern identified. For woodland caribou, the implications of Ontario's Woodland Caribou Conservation Plan in relation to baseline data collection shall be discussed, and, in particular, a discussion of the preliminary caribou population range(s) in which the Project will be located shall be provided (i.e. the Lake Superior Coastal Range and Discontinuous Range). A map which clearly delineates

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<sup>15</sup> The Proponent should note that an authorization may be required from the Ministry of Natural Resources for inventory efforts associated with Species at Risk in Ontario-listed species under the *Endangered Species Act*, 2007, as well as under the *Fish and Wildlife Conservation Act* (i.e. Scientific Collectors permit)

the boundaries of the mine and all associated project components (e.g., road, transmission lines, tailings impoundment areas, etc.) in relation to the preliminary caribou population ranges shall also be provided.

EIS shall include the following information:

- summary of the species at risk surveys employed specific to each species at risk and their habitat;
- the number of species and habitat observations recorded in the project area, the dates, times and where appropriate, the geographic coordinates of each species/habitat observation;
- the habitat features found in the project area. Where available, photos of the habitat areas and key features should be submitted; and
- how the habitat is being used by the species to carry out its life processes (e.g. reproduction, rearing, hibernation, overwintering, migration, feeding), any other life process.

A map that clearly identifies each protected species and habitat occurrence found in the project area using points or polygons should be provided.

#### **2.6.2 Socio-Economics, Culture and Human Health**

In describing the social, cultural, and economic environment and human health, the Proponent shall provide information on the functioning and health of the socio-economic environment, encompassing a broad range of matters that affect the people and communities in the study area in a way that recognizes interrelationships, system functions and vulnerabilities. A description of the rural and urban settings likely to be affected by the Project shall be provided.

The Proponent shall also describe any agreements with partners with respect to emergency plans or protective actions.

The proponent is encouraged to consult Health Canada's document *Useful Information for Environmental Assessments* (2010) for additional details on the types of baseline information required for the assessment of potential Project effects on human health.

##### **2.6.2.1 Economic Issues**

The EIS shall describe the general economic conditions at the local and regional study areas. A description of the local and regional economies shall also be provided, including workforce and employment. Information shall be provided on the available labour supply and rates of employment in the surrounding communities and region.

The EIS will provide a profile of the study area that includes the following information:

- a clear definition, including map representation, of the geographic area under consideration in the effects assessment;
- a general demographic profile of the region, including age groups, gender, family status and social assistance levels;

- a profile of the local labour force and labour market conditions, including a description of the existing labour pool and unemployment rates, particularly as they relate to the types of jobs which will be created by the Project, both during construction and at the operations stage;
- existing economic conditions in the study area; and
- a profile of existing community services.

#### **2.6.2.2 Social Issues**

The EIS shall include information regarding community demographics, including but not limited to the following:

- a map identifying the location of nearest human receptors to the Project, including residents and transient residents (e.g. recreational cabins).
- information on existing and projected population densities and distributions in the Town of Marathon, including resident populations and transient populations. Information shall be presented by both Project phase and for the life of the Project;
- information on housing markets and housing availability in the Town of Marathon;
- a description of the proximity of the Project to affected communities in the regional study area; and
- information on fluctuations in population and population attributes (age groups, employment) in the local and regional study area.

The EIS will identify the existing demand for housing in the project area, the existing traffic volumes and patterns in the project area, including local communities. The EIS shall outline the base case conditions for existing community services (i.e. police, fire, ambulance, social services, recreation, justice, commercial, retail and industrial services) that are available to residents. The EIS will also include information on basic infrastructure that is present, such as transportation, public health, municipal water supply, wastewater treatment, and garbage disposal.

#### **2.6.2.3 Resource Uses**

The EIS shall describe land use in the local and regional study areas. The Proponent shall identify past, current and planned land use(s) of the study areas or beyond, that may be impacted by the Project. The EIS will include the following information:

- current land tenure and land uses within the proposed mine site area and, as applicable, adjacent to the mine site area;
- a description of recreational fisheries that could be affected by the Project, including water body use, catch success, and the importance of the water body in a regional and provincial context;
- estimates of the current and projected value of the recreational and tourist industry (e.g., fishing, hiking, parks, kayaking, and cottages) for the study areas, including commercial recreation tenures and activities located in the project area;
- estimates of the current and projected value of the hunting, trapping, fishing and guiding industry for the study areas, including the number of trapping and guiding territories in the project area;
- current forest resources and activities in the project area;
- current mining projects and existing mining leases/rights; and

- current agricultural resources and activities.

#### **2.6.2.4 Human Health**

The Proponent shall use a broad definition of human health in describing the aspects of human health. The Proponent is encouraged to include all baseline information relevant to human health in one section of the EIS.

The EIS shall describe the current health profiles of the communities likely to be affected by the Project. A description of community and public health services available to the residents of communities and to Aboriginal people and groups in the regional study area shall also be included.

If relevant, the Proponent is encouraged to provide background levels of electric and magnetic fields at selected locations along the proposed transmission corridor for use in the assessment of the potential effects on human health from exposure. If the Proponent is unable to provide this information, a justification or rationale shall be provided in the EIS.

The EIS shall also describe the location of domestic water supplies and any wells used for drinking water within the Town of Marathon, as well as their current and projected use.

#### **2.6.2.5 Navigable Waters**

The EIS shall identify all waterways and water bodies that will be directly affected by components of the Project, including representative width, depth, gradient, and flow. Photographs of all potentially affected waterways shall be included in the EIS.

#### **2.6.3 Physical and Cultural Heritage Resources**

The EIS shall identify any terrestrial and aquatic areas containing features of historical, archaeological, paleontological, architectural or cultural importance. A description of the nature of the features located in those areas shall be provided.

The EIS will include an archaeological assessment by an archaeologist licensed under the Ontario *Heritage Act*, in order to allow for the assessment of the potential effects of on site and off site components of the Project on known and potential archaeological resources.

#### **2.6.4 Aboriginal Considerations**

In keeping with the Guiding Principles of these Guidelines, the EIS shall describe Aboriginal land use at the site and within the local and regional study areas. The EIS shall identify the lands, waters and resources of specific social, economic, archaeological, cultural or spiritual value to Aboriginal people and groups, including Métis, which assert Aboriginal and treaty rights, or in relation to which Aboriginal and treaty rights have been established and that may be affected by the Project.

#### **2.6.4.1 Aboriginal Groups**

The EIS will include a description of each Aboriginal group that may be affected by the Project, and how such groups were identified. Potentially affected Aboriginal people and groups include those:

- where any component of the Project will be located within their identified traditional territory, and/or
- who may have asserted or established Aboriginal and treaty rights that may be impacted by the Project.

Where available, traditional territory maps shall be included in the EIS. The EIS shall also include a map indicating where the Project may intersect or overlap the asserted boundaries of Aboriginal Group traditional territories. If this information is not available, the Proponent will outline the effort taken to obtain the information.

There shall also be an attempt to identify any agreements or understanding between various groups' use of the area. The EIS shall also describe why groups have not been included in discussions, particularly if the group has self-identified as having an interest in the project area.

The geographic limits of the analysis undertaken to address considerations of Aboriginal people and groups will be provided, supported with maps as required. The boundaries of the study area will be determined by considering the traditional territories of each Aboriginal group, relative to the Project footprint.

#### **2.6.4.2 Health of Aboriginal People**

A discussion on Aboriginal people's health-related traditional activities, including the accessibility to spiritual sites within regional study area will also be included, where available. Health-related traditional activities could include gathering of country foods for consumption (hunting, fishing, trapping, planting and harvesting of plants for medicinal purposes) and activities of spiritual importance.

The Proponent shall provide a description of traditional dietary habits and dependence on country foods and harvesting for other purposes, including harvesting of plants for medicinal purposes. Information on current consumption of country foods and its quality by food type, amounts consumed, parts consumed (whole body as opposed to a specific organ) by Aboriginal people and groups shall be provided, where available.

#### **2.6.4.3 Current Use of Lands and Resources for Traditional Purposes**

The EIS will discuss the current use of lands and resources for traditional purposes within the study area, as provided through consultation with Aboriginal groups. Any current use information that is deemed to be sensitive by the respective Aboriginal groups will be described to the level of detail allowed by the group. Confidential data will not be included in the EIS, as outlined in the Guiding Principles.

Potential areas that are of cultural importance to Aboriginal people and groups at the mine site, transmission line corridor and access roads will also be identified.

Current land use areas can include:

- places where animals are harvested;
- places where plants are harvested;
- places where fish are harvested;
- places where rocks and minerals are collected for tools, weapons, medicines, etc...;
- notable animal use areas (ex. salt licks, breeding grounds, staging areas);
- habitation sites;
- burial groups and grave sites;
- spiritual places, includes places where people have died and places used for spiritual training; and
- travel and trade routes, non-timber resources, such as cedar strips, as indicators of timber resource harvesting sites.

Current use areas can relate to the use of certain specific locations within the overall traditional territory of an Aboriginal group.

#### **2.6.4.4 Aboriginal and Treaty Rights**

A discussion of the asserted or established Aboriginal and treaty rights supported with maps, legal cases and treaties as appropriate, will be provided in the EIS.

#### **2.6.4.5 Aboriginal Archaeological Resources**

The EIS shall include a discussion of the archaeological, cultural and historical resources in the project area that are of particular interest to Aboriginal people and groups.

## **2.7 IMPACT ASSESSMENT**

### **2.7.1 Approach to the Effects Prediction, Mitigation Measures and Significance of Residual Effects**

#### **2.7.1.1 Effects Prediction**

The EIS will describe the effects of the Project on the biophysical, social, economic and cultural environments, on human health and on Aboriginal people and groups. Potential effects from all components of the Project included in the scope of Project, and all project phases, shall be discussed. In predicting and assessing the Project's effects, the Proponent shall clearly state the elements and functions of the environment that may be affected, specifying the location, extent and duration of the effects and their overall effect.

The assessment of the effects of the works and activities associated with all phases of the Project shall be based on a comparison between the predicted future conditions with the Project and the predicted future conditions without the Project. The assessment shall describe the environmental effects of the Project, the mitigation measures proposed to be implemented and an assessment of the effectiveness of those measures. Where mitigation measures are proposed to be implemented for which there is little experience or for which there is some question as to their effectiveness, the potential risks and effects to the environment should those measures not be effective shall be clearly and concisely described.



The EIS will consider the broad range of potential environmental effects but will focus on interactions between the Project and the identified VECs. This section shall also discuss changes to the Project caused by the environment. Each environmental change shall be described in terms of whether it is direct or indirect and positive or adverse.

For the areas on which the assessment is focused, the EIS shall include comprehensive analyses of both the short and long term effects of the Project on the environment. The Proponent shall indicate the degree of certainty in predicting the environmental effects identified. When numerical models are used (e.g., a quantitative ecological risk assessment model, a population level ecological risk assessment model), scientific defensibility should be demonstrated by performing model verification (e.g., peer review of model theory), calibration (e.g., adjusting key parameters to site-specific data), validation (e.g., comparison of predicted to observed), sensitivity and uncertainty analysis.

Where appropriate, the Proponent is expected to employ standard ecological risk assessment frameworks that categorize the levels of detail and quality of the data required for the assessment. These categories are as follows:

- Tier 1: Qualitative (Expert opinion, literature review, and existing site information);
- Tier 2: Semi-quantitative (Measured site-specific data and existing site information); and
- Tier 3: Quantitative (Recent field surveys and detailed quantitative methods).

Thus, if the Tier 2 assessment still indicates a potential for significant negative effects, then a Tier 3 assessment would need to be conducted to reduce the level of uncertainty. If the risk characterization component is uncertain this may necessitate probabilistic modeling about the effect. The Proponent is encouraged to use an impact matrix methodology to evaluate the potential effects of the Project. Where appropriate, the Proponent will present the results of risk assessment as a range of values rather than a single value.

The consideration of views from Aboriginal groups and the public, including any perceived changes attributed to the Project, shall be recognized and addressed in the assessment method.

#### **2.7.1.2 Mitigation Measures**

Mitigation is the elimination, reduction or control of the adverse environmental effects of the Project, and includes restitution for any damage to the environment caused by such effects through replacement, restoration, compensation or any other means. As a first step, the Proponent is encouraged to use an approach based on the avoidance and reduction of the effects at the source. Such an approach may include the modification of the design of the Project or relocation of project components.

The Proponent shall describe the standard mitigation practices, policies and commitments that constitute mitigation measures and that will be applied as part of standard practice. The Proponent shall then describe its conceptual environmental protection plan and its environmental management system, through which it will deliver this plan. The plan shall provide an overall perspective on how potentially adverse effects will be minimized and managed over time. As well, the Proponent shall describe its commitments, policies and arrangements directed at promoting beneficial or mitigating adverse social, economic and cultural effects. The Proponent shall discuss the mechanisms it will use to require its contractors and sub-contractors to comply with these commitments and policies and with auditing and enforcement programs. The Proponent shall indicate which measures respond directly to statutory or regulatory requirements.

For all of the adverse biophysical and social, economic and cultural effects, the Proponent shall present the mitigation measures that they intend to implement. Wherever possible, it shall provide detailed information on the nature of these measures, their implementation, their management and the post-installation follow-up.

All proposed mitigation shall be described by project phase, timing and duration. Sufficient detail shall be provided on methods, equipment, procedures and policies associated with the proposed mitigation that allows the identification and analysis of the significance of the environmental effect of the Project. The Proponent shall discuss and evaluate the effectiveness of the proposed measures and assess the risk of mitigation failure and the potential severity of the consequences of such failures. Information shall be provided on similar mitigation methods used with similar projects and the degree of success achieved.

The EIS shall specify the actions, works, minimal disturbance footprint techniques, best available technology, corrective measures or additions planned during the Project's various phases to eliminate or reduce the significance of adverse effects. The EIS shall also present an assessment of the effectiveness of the proposed mitigation measures. The reasons for judging if the mitigation measure reduces the significance of an adverse effect shall be made explicit.

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

For species at risk defined by the federal *Species at Risk Act*, pursuant to subsection 79(1) of that Act, the Canadian Environmental Assessment Agency shall notify the appropriate federal Minister if any listed wildlife species, its critical habitat or the residences of individuals of that species may be adversely impacted by the Project. Pursuant to subsection 79(2) of the *Species at Risk Act*, if the Project is carried out, responsible authorities shall also ensure that measures are taken to avoid or lessen those effects and to monitor them; these measures shall be taken in a way that is

consistent with any applicable recovery strategy and action plans. Therefore, the Proponent shall include information in the EIS that will allow the Canadian Environmental Assessment Agency and responsible authorities to meet this requirement.

For species at risk listed on the Species at Risk in Ontario List under the *Endangered Species Act*, 2007 as endangered or threatened and where an adverse effect of the Project has been identified to protected species or habitat, the Proponent shall include a description of the reasonable steps that will be taken to minimize adverse effects on individual members of the protected species.

In instances where avoidance of adverse effects to protected species or habitat is not possible, authorization under the *Endangered Species Act* will be required to avoid a contravention. Details regarding eligibility and application for authorization under the *Endangered Species Act* are available on the Ontario Environmental Registry (EBR Registry Number #011-2842 – Endangered Species Act (ESA) Submission Standards for Activity Review and 17(2)(c) Overall Benefit Permits).

The EIS shall document the Proponent's plans to verify whether required mitigation measures were implemented. This type of monitoring on its own does not satisfy the requirements for a follow-up program described previously in these Guidelines, but serves to track conditions or issues during the Project lifespan or at certain times. For each environmental component potentially affected by the Project, the EIS shall describe any proposed monitoring programs that will be designed, as outlined in Section 2.8.

#### **2.7.1.3 Compensation**

For certain VECs, where adverse residual effects are anticipated and are unavoidable, the Proponent shall implement compensation measures. These measures shall apply both to the biophysical environment and the human environment. The choice of measures is made in cooperation with the users and relevant authorities. Any compensation measures put in place for the Project, including those provided under agreement, shall be described.

The Proponent shall present a compensation program for losses in fish habitat productive capacity that complies with Fisheries and Oceans Canada's policies (see also Section 2.4.3.1 above). The EIS shall identify and characterize the extent to which fish population and fish habitat, the productive capacity of waterbodies, recreation values, wildlife, wildlife habitat and the habitat of species at risk values may be effected and discuss how these effects can be avoided, reduced or mitigated.

With respect to the fish population, fish habitat, the productive capacity of lakes and the fishery they support, the EIS will include a conceptual fish and fish habitat compensation plan. It is expected that this proposed plan will undergo Aboriginal, public and regulatory agency scrutiny and review before being finalized and implemented.

Where there is an impact to protected species such as lake sturgeon or woodland caribou, the *Endangered Species Act* has a requirement for overall benefit to the species

and compensation does not meet the authorization requirements of the *Endangered Species Act*.

#### 2.7.1.4 Cumulative Effects Assessment

The Proponent shall identify and assess the cumulative environmental effects of the Project, including on site and off site components, in combination with other past, present or reasonably foreseeable projects and/or activities within the study areas.<sup>16,17</sup>

Cumulative effects may result if:

- implementation of the Project would cause residual adverse effects on the environment, taking into account the application of technically and economically feasible mitigation measures; and/or
- the same environmental components are affected by other past, present or reasonably foreseeable future projects or activities.

The components of the environment that will not be affected by the Project or will be affected positively by the Project can, therefore, be omitted from the cumulative effects assessment. A cumulative effect on a component of the environment may, however, be important even if the assessment of the Project's effects on this component reveals that the effects of the Project are minor.

Accordingly, the Proponent shall:

- identify and justify the components of the environment that will constitute the focus of the cumulative effects assessment. The Proponent's assessment shall emphasize the cumulative effects on the main VECs that could potentially be most affected by any components of the Project. To this end, the Proponent shall consider, without limiting itself thereto, the following components likely to be affected by the Project:
  - fish and fish habitat, including sediment and benthos;
  - wildlife and wildlife habitat; including provincially or federally listed species at risk,
  - water quality and quantity, including groundwater and surface water resources, aquatic resources and watersheds,
  - economic and social environment, including resource uses and human health, and
  - asserted or established Aboriginal and treaty rights;
- present spatial and temporal boundaries for the cumulative effect assessment for each VEC selected. The boundaries for the cumulative effects assessments will again depend on the effects being considered (i.e., will generally be different for

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<sup>16</sup> The Canadian Environmental Assessment Agency's Operational Policy Statement OPS-EPO/2- 2007, *Addressing Cumulative Environmental Effects under the Canadian Environmental Assessment Act*, and the *Cumulative Effects Assessment Practitioner's Guide* (CEAA 1999) provide further guidance for conducting cumulative effects assessment.

<sup>17</sup> The Caribou Conservation Plan directs the use of cumulative impact assessment to evaluate the status of caribou population ranges and population health and to determine thresholds of landscape disturbance and make decisions on appropriate types and levels of resource use. The Ministry of Natural Resources can provide further guidance to the Proponent in assessing cumulative impacts on woodland caribou.

- different effects). These cumulative effects boundaries will also generally be different from (i.e. larger than) the boundaries for the corresponding Project effects;
- identify the sources of potential cumulative effects. Specify other projects or activities that have been or will be carried out that could produce effects on each selected VEC within the boundaries defined, and whose effects would act in combination with the residual effects of the Project. In particular, consideration shall be given to the proposed transmission line routing in combination with other proposed routings. Boundaries shall be determined in consultation with the public, Aboriginal groups, federal and provincial government departments and relevant stakeholders;
  - describe the mitigation measures that are technically and economically feasible;
  - determine the significance of the cumulative effects. The Proponent shall assess the effectiveness of the measures applied to mitigate the cumulative effects. In cases where measures exist that are beyond the scope of the Proponent's responsibility that could be effectively applied to mitigate these effects, the Proponent 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; and
  - develop a follow-up program to verify the accuracy of the assessment or to evaluate the effectiveness of mitigation measures for certain cumulative effects.

If the Project is likely to result in improved infrastructure in the area or may facilitate access into the area, the Proponent shall evaluate the likelihood of further development in the area that could result in increased cumulative effects on the same VECs.

The EIS shall describe the analysis of the total cumulative effect on a VEC over the life of the Project, which requires knowledge of the incremental contribution of all projects and activities, in addition to that of the Project. The EIS shall include different forms of effects (e.g., synergistic, additive, induced, spatial or temporal) and identify impact pathways and trends.

The Proponent should also give consideration to developing the cumulative effects assessment as a stand alone document.

#### **2.7.1.5 Determination of the Significance of Residual Effects**

The Proponent is expected to take all reasonable precautions to protect the environment. Hence, all reasonable means (e.g., best available technology and economically achievable) are expected to be used to eliminate or mitigate adverse environmental effects. After having established the mitigation and compensation measures, the EIS shall present any residual effects of the Project on the components of the biophysical and human environments persisting despite the proposed mitigative activities.

The EIS shall include a summary of the Project's residual effects so that the reader clearly understands the real consequences of the Project, the degree of mitigation of the effects and which effects cannot be mitigated or compensated for. A summary table that presents the effects before necessary mitigation measures on the various components of

the environment, the mitigation measures applied and the residual effects shall be included in the study.

This approach implies that the proposed mitigation measures shall be considered an integral part of the Project at the time when the significance of the Project's environmental effects is determined. During the course of the Project, the Proponent shall ensure that these measures are effectively implemented.

The EIS shall identify the criteria used to assign significance ratings to any predicted adverse effects. The EIS shall contain a detailed analysis of the significance of the potential residual adverse environmental effects it predicts. It shall contain clear and sufficient information to enable the joint review panel, Aboriginal groups and the public to understand and review the Proponent's judgment of the significance of effects. The Proponent shall define the terms used to describe the level of significance.

The Proponent shall assess the significance of predicted adverse effects according to the following categories, as applicable:

- magnitude of the effect;
- geographic extent of the effect;
- timing, duration and frequency of the effect;
- degree to which effects are reversible or mitigable;
- ecological and social context, including bio diversity; and
- existence of environmental standards, guidelines or objectives for assessing the effect.

The EIS shall clearly explain the method and definitions used to describe the level of the adverse (e.g., minimal, low, medium, high) for each of the above categories and how these levels were combined to produce an overall conclusion on the significance of adverse effects for each VEC. This method shall be transparent and reproducible. The final ranking of overall effect will be based on the following criteria:

- HIGH = Potential effect could threaten sustainability if the resource within the Project study area and should be considered a management concern;
- MEDIUM = Potential effect could result in a decline in a resource within the study area to lower than baseline, but stable, level in a study area after Project closure and into the foreseeable future;
- LOW = Potential effect may result in a slight decline in resource in the study area during the life of the Project; and
- MINIMAL = Potential effect may result in a slight decline in resource in the study area during construction, operation and closure, but the resource should return to baseline levels.

The analysis of the significance of the effects shall contain sufficient information to allow the authorities concerned, Aboriginal groups and the public to understand and evaluate the reasoning of the Proponent.

In assessing significance against these criteria, the EIS shall, where possible, employ relevant existing regulatory documents, environmental standards, guidelines, or objectives such as prescribed maximum levels of emissions or discharges of specific hazardous agents into the environment or maximum acceptable levels of specific hazardous agents in the environment.

If significant adverse effects are identified, the Proponent shall determine the probability that they will occur. The Proponent shall also address the degree of scientific uncertainty related to the data and methods used within the framework of its environmental analysis.

#### **2.7.1.6 Summary of Effects Assessment**

For all key valued ecosystem components that were assessed, the Proponent will provide in a table format, a summary of the following key information:

- a concise summary of the Project's beneficial and adverse effects;
- a summary of mitigation and compensation measures;
- a brief description of any potential residual effects;
- a brief description of cumulative effects;
- a determination of the significance of residual effects; and
- for those adverse effects found to be significant, a determination of whether the effect is likely to occur.

#### **2.7.2 Physical and Biological Environment**

In conducting the effects assessment on the physical and biological environment, the Proponent shall give consideration to the guidance provided in the following sections.

##### **2.7.2.1 Atmospheric Environment**

The baseline climate data collected as per Section 2.6.1.2 will be used to assist in the air quality dispersion assessment and to assist in the hydrology and water management work.

The following documents will be used for guidance in establishing and operating any meteorological stations that may be established:

- Environment Canada AES, 2004. MSC Guidelines for Co-operative Climatological Autostations, Version 3.0 Meteorological Service of Canada, September 2004; and
- World Meteorological Organization, 2006. Guide to Meteorological Instruments and Methods of Observation. Preliminary seventh edition. WMO-No.8. Secretariat of the World Meteorological Organization, Geneva Switzerland.

##### *Criteria Air Contaminants*

The EIS will identify potential effects on air quality associated with all project phases, including point and mobile sources. Examples include heavy and light-duty vehicle exhaust, fugitive particulate matter, emissions from the diesel fuel generator and particulate from blasting and ore concentrate transportation.

The analysis will include the following:

- an assessment of emissions and short-term air quality effects from site preparation and construction-related activities, including open burning;
- a source emissions inventory table for the mine site describing the source (i.e. mine rock), operating period, pollution control equipment if any, contaminants (i.e. fugitive dust, PM<sub>10</sub>, VOCs, etc) and predicted concentrations;
- a discussion of:
  - measures considered to minimize the release of greenhouse gases and air contaminants (dust - both emissions and fugitive, particulate exhaust fumes and other air contaminants),
  - atmospheric dispersion of emissions with emphasis on PM<sub>2.5</sub> and PM<sub>10</sub> on a local and regional scale,
  - wet and dry acidic deposition resulting from release of gases such as NO<sub>x</sub> and SO<sub>x</sub>,
  - the worst-case dispersion modeling results (including mapping) and noting the location of key and sensitive receptors,
  - combined predicted cumulative air quality concentrations during the various Project phases with suitably conservative estimates of background concentrations to arrive at the worst-case cumulative air quality concentrations,
  - predicted cumulative air quality concentrations compared with the national ambient air quality objectives and Canada wide standards for air quality and any applicable provincial ambient air quality criteria,
  - impact on biological receptors such as vegetation, fish, wildlife and human health, and
  - demonstration of compliance with applicable federal and provincial air quality standards and guidelines;
- use of an appropriate Air Quality Dispersion Model(s) to:
  - predict ground level concentrations for criteria and other air contaminants in accordance with existing dispersion model guidelines, and
  - assess the potential for effects on human health at sensitive and other receptors, including camps where workers temporarily reside.

#### *Dustfall*

The EIS documentation relating to dustfall will consider:

- predicted data for mass of dustfall per area per unit time and predicted metals concentration in the dustfall; and
- measures to mitigate dustfall by exposed tailings beaches, and other sources, during closure and post-closure phases, including the likelihood of establishing and maintaining native plant cover on tailings and other surfaces.

#### *Greenhouse Gases*

With respect to Greenhouse Gases (GHGs), the EIS will:

- discuss the analytical techniques and relevant policies considered in the EIS;
- list and estimate the emissions of GHGs predicted for all relevant project sources and compare to Provincial and National totals;
- discuss possible changes in the climate;



- identify mitigation measures considered to control GHG emissions related to the Project; and
- 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, lake levels and stream flow.

Additional guidance can be obtained from the Canadian Environmental Assessment Agency guidance *Incorporating Climate Change Considerations in Environmental Assessment: General Guidance for Practitioners* (2003).

#### *Light Pollution*

The EIS will identify potential effects on the environment resulting from artificial light pollution at the mine site, and will provide a description of management measures to mitigate any such effects.

#### **2.7.2.2 Acoustic Environment**

The EIS will assess the potential for noise effects resulting from the Project. The EIS will:

- identify and quantify potential noise sources including reference to construction and operational phases as well as to noise associated with loading concentrate into rail cars and increased road traffic;
- identify and evaluate impacts from noise on potential wildlife receptors;
- identify and evaluate impacts from noise on potential human receptors, such as lots zoned for use by traditionally sensitive receptors (e.g. provide residences, cottages, trapper cabins) at property lot lines and/or at land use permit boundaries<sup>18</sup>;
- describe the proximity of identified receptors to Project components; and
- describe mitigation and noise management measures to be incorporated into a conceptual Noise Management Plan, including the conditions for mitigation and evaluate compliance with appropriate noise guidelines.

In completing the assessment of the effects of the Project on the acoustic environment, the Proponent shall use the approach outlined in the Ontario Ministry of the Environment Guidelines, including the following:

- Ontario Ministry of the Environment. October 1995. *Sound Level Limits For Stationary Sources in Class 3 Areas (Rural)* Publication NPC-232 (or its successor).

#### **2.7.2.3 Water Quality and Quantity**

##### **2.7.2.3.1 Hydrology and Hydrogeology**

###### *Surface Water*

Utilizing the results of the baseline data, the EIS shall:

- assist in the development of the site water balance;
- document run-off and sediment control works;

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<sup>18</sup> Ontario Ministry of Environment document *Procedure D-1-3 Land Use Compatibility: Definitions* (1995) provides appropriate definitions of sensitive land for these purposes.

- determine water supply requirements;
- assess impacts on fish and fish habitat due to modification of stream flows and lake levels; and
- assist in the development of water quality predictions and mitigation requirements.

The EIS will:

- provide an assessment of changes to the hydrologic regime resulting from site construction (deforestation, removal of overburden, dewatering, increased drainage, etc.), operation, closure and post-closure, with a focus on lakes and streams that relate to existing fish, fish habitat and proposed fish compensation plans;
- include details about changes in lake levels and the magnitude of stream flow, timing and duration for normal, dry and wet hydrologic conditions;
- include maps that show future basins delineation, drainage direction, proposed diversions channels and runoff management features;
- include consideration of the effects of climate change and variability on the future flow regime and water balance assessment, hydrology, such as peak flow rates and the location of ice jams that could affect the environment or project infrastructure.

With respect to the water balance for the Project, the EIS will include a detailed water balance for the mill, open pits, TIAs and any other associated infrastructure, during various project activities (construction, operation, decommissioning and abandonment) and throughout the life of the Project, including closure and post-closure phases, for a range of hydrological conditions. The water balance model will include the following:

- an evaluation of the average precipitation scenario as well as a full range of possible wet and dry scenarios. The possible effects of each different precipitation sequence on mine water management activities will be tracked, and the results presented in terms of probabilities of occurrence; and
- the predicted water balance for each year of the mine life and all inflows and outflows in tabular format. Appropriate return periods shall be defined and methodologies for the evaluation of wet, dry and expected scenarios shall be discussed.

With respect to water management, the EIS will:

- predict the surface run-off coefficient and rate of run-off for the different areas of the mine site, and describe contingency plans for extreme run-off events and drought conditions;
- recommend measures for dealing with water inflows to the open pits during operation;
- profile the open pits and show levels to which flooding can be achieved after closure based on hydrology and the pit design and contours and provide predictions with respect to flooding rates and ultimate water levels for the open pits after closure;

- provide the conceptual design features of all collector and diversion ditches, culverts, bridges, and water storage facilities (including sediment ponds and seepage collection ponds);
- provide an assessment and prediction for all site water diversions including volumes, discharge structures and locations, and potential effects on the receiving environment hydrology; and
- identify, map and characterize any faults located in the open pits and the extent of the faults beyond the confines of the open pits. Include an assessment of the hydraulic connection between the open pits and the adjacent water courses; and
- recommend measures for mitigating the effects of the Project on any springs that may be found within the transmission line corridor.

#### *Groundwater*

The EIS will:

- provide a groundwater assessment to determine how the Project and related facilities and activities will impact:
    - the local hydrogeological and groundwater units,
    - groundwater flows, quality and quantity, and
    - fish and fish habitat;
- The assessment will outline the need for mitigation and/or monitoring measures, and assist with ARD/ML prediction work;
- provide results of the hydrogeological assessment that determines groundwater seepage location, rates, seepage quality, and direction into or from applicable project features and from the pits during future overflow. Potential seepage to other water bodies will be emphasized and assessed for potential impacts to fish and fish habitat;
  - provide drawings and/or figures showing equipotential contours to determine/illustrate projected seepage conditions for applicable Project components;
  - provide drawings and/or figures showing groundwater contours (piezometric surfaces) to illustrate projected seepage conditions for the applicable Project components;
  - provide a discussion of the potential for off-site migration of impacted groundwater, and an analysis of contaminant attenuation capacities within the hydrogeological units within the project area;
  - provide a description of any proposed mitigation strategies for groundwater seepage within the project area;
  - provide the results of a groundwater flow model of the local catchment for the post-closure period incorporating all major permanent mine components, including the open pits, TIAs, and mine rock stockpiles;
  - include an analysis of the potential for sulphide oxidation within surficial and bedrock units as a result of groundwater drawdown within the project area;
  - demonstrate how and if the withdrawal of groundwater, or the creation of physical changes to the aquifers within the project area, will affect the availability of groundwater for applicable users (e.g. mine site facility operations, on-site drinking

water systems) or baseflows in surface water (surface watercourses), thereby causing surface water impacts;

- include a conceptual Water Management Plan for all dams, including flows and levels during construction, operation, closure and post-closure. The assessment shall include diversions and impacts to aquatic systems from increased and decreased surface flows; and
- include effects of surface infiltration on groundwater flows that may affect discharges into streams and lakes.

#### **2.7.2.3.2 Water Quality and Aquatic Ecology**

In conducting the effects assessment for water quality and aquatic ecology, the EIS shall include the following:

- graphical presentation of key variables and stream flows over time for key sites to illustrate patterns and variability;
- power and confidence calculations for key variables at key sites once the effects have been predicted to guide future monitoring. Key variables are those that the impact assessment indicate may contribute to degraded water quality, and key sites are those sites where the discharge of key variables might take place;
- the entire range of data in addition to mean values, because extreme events that have serious environmental consequences can be lost when using only mean values. For example, high levels of metals or acidity may occur briefly during the first flush of spring freshet, but could wipe out large numbers of sensitive aquatic organisms present in the receiving waters at that time of the year; and
- all of the data in an appendix, including summaries of the maximum, minimum, mean or median, standard deviation and coefficient of variation for each site.

The EIS shall include a discussion on whether the principle of “zero discharge” into Lake Superior can be met as a result of the Project, as outlined in the Lake Superior Lakewide Management Plan. If the Project will result in discharge to Lake Superior, the EIS shall describe how changes in water quality resulting from the Project will impact Lake Superior.

The EIS shall integrate results of the ARD/ML prediction work and surface hydrology and water balance information to develop water quality predictions for input into the impact assessment work. The EIS will include the following:

- information describing how current baseline and ongoing surface and groundwater quality and flow rates are anticipated to be altered by individual mine components. Information will focus particularly on the open pits, ore and low-grade ore stock piles, waste rock piles, and TIAs;
- an assessment and prediction of water quality for major mine components (waste rock stockpiles, open pits, low grade ore stockpiles, etc.) and all site water discharges, including groundwater discharge points in lakes and streams, for the different phases of the Project (i.e. construction, operation, closure, post-closure). This assessment shall include volumes, water quality, discharge structures and location, potential effects on the receiving environment and the description of any mitigation strategies and/or treatment processes;

- a description of contingency plans if there are significant uncertainties or risks associated with the predicted water quality, and for dealing with excessive run-off events and drought conditions if necessary;
- strategies for management of surface run-off from the various mine components, including mitigation strategies to separate contact water from non-contact water and how to prevent erosion and sediment discharge during the construction, operational, closure and post-closure phases; and
- details on additional water requirements (if applicable) necessary to maintain full saturation of the potentially acid generating (PAG) material. If exposure is expected, the results of kinetic test work will be provided to assist in the evaluation of potential effects from exposure.

The ARD/ML prediction information will be used to predict water quality for effects assessment and to determine mitigation requirements for the Project. Additional information will be provided on the following:

- waste rock, tailings and low grade ore characterization, volumes, segregation/disposal methods, mitigation/management plans, contingency plans, operational and post-closure monitoring and maintenance plans;
- assessment of the feasibility to successfully segregate PAG and non-potentially acid generating waste materials during operations, proposed geochemical segregation criteria and identification of operational methods that will be required to achieve geochemical characterization during operations (i.e. geochemical surrogates, on site lab, procedures needed, etc);
- sensitivity analysis to assess the effects of imperfect segregation of waste rock;
- estimates of potential lag time to ARD/ML onset for PAG materials (including various waste rock, tailings, low grade ore) and ability to fully saturate PAG materials during operation and post-closure;
- pit water chemistry during operation and post-closure, and pit closure management measures (e.g. flooding). This will include geochemical modeling of pit water quality in the post-closure period;
- surface and seepage water quality from the waste rock dumps, tailings/waste rock impoundment facility, stockpiles and other infrastructure during operation and post-closure;
- analysis of metal leaching under various pH conditions; and
- ARD/ML prevention/management strategies under a temporary or early closure scenario, including low grade ore.

The EIS will also assess the environmental effects on surface water quality from increased sedimentation resulting from erosion associated with timber harvesting along the proposed transmission line corridor.

In conducting the effects assessment on surface water quality, the Proponent shall consider the following:

- effluent characterization and quality predictions. Predicted effluent quality should be directly compared to toxicity data, where available;

- waste discharge and seepage flows, concentrations, and loadings shall be predicted using data from various sources, which include:
  - quantity and quality of groundwater and surface drainage from the area to be mined,
  - if any lakes are to be drained, quantity and quality of water to be released from those lakes into the receiving water,
  - quantity and quality of tailings pore water from milling process tests,
  - quantity and quality of leachate from samples of tailings, waste rock, and ore,
  - mine effluent management (effluent, run-off, seepage) including where mine effluent would be discharged to the environment,
  - quantity and quality of effluent to be released from the site into the receiving waters. and
  - quantity and quality of humidity cell or column test liquid from acid rock testing;
- use of the predicted waste loads in a mass balance model of the mine area to predict the resulting receiving water quality for all Project phases under normal and worst case conditions (e.g., 1-in-10 year flood and low flows);
  - the EIS shall include predictions of waste loads and water quality on a month by month basis for the critical years of mine site development (critical years are those years when worst-case contaminant loads are expected such as during construction, years when significant construction events or water use change occur, milestone years of operation, and at closure);
- assessment of the spatial extent of effects downstream of the Project (e.g., effluent dilution modeling) down to a magnitude that is indistinguishable from natural variability (e.g. baseline plus or minus 2 standard deviations if outside 95% of measured results or some other, well-rationalized criterion); and
- assessment of the environmental effect of the predicted waste loads and receiving water quality under worst case conditions, and assess the environmental effect of the resulting water quality on aquatic organizations using federal and/or provincial water quality objectives.

Modelling shall be used to determine concentration-based effluent limits. In conducting the effects assessment on surface water quality, the Proponent should refer to Ontario Ministry of the Environment document *Deriving receiving-water based, point-source effluent requirements for Ontario waters* (1994).

If applicable, the EIS will include recommendations for developing watershed-specific water quality objectives for key variables on all watercourses with the potential to be impacted by effluent discharge or seepage, with the intent of meeting the Ministry of Natural Resources' fishery management objectives for the area, and taking into consideration provincial water quality objectives and the Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines for water, sediment and biota, existing baseline conditions for water, sediment and biota quality, and the existing and potential water uses that should be designated for protection, including, if applicable, drinking water.

The EIS will provide details of a surface water quality monitoring program for the mine site. The surface water quality monitoring program shall provide a basis for the formulation of site-specific water quality objectives for the aquatic environment (if applicable), provide the basis for the determination of allowable maximum waste water discharge and seepage rates based on specific water quality objectives and support biological monitoring programs. In particular, any water quality objectives that are developed for the mine site shall be consistent with the goals and objectives that have been developed for the Lake Superior Lakewide Management Plan, including those substances listed in the Lake Superior Zero Discharge Demonstration Program.

The surface water quality monitoring program will include the characterization of the range and measure of water and sediment quality and aquatic ecology characteristics.

The EIS will provide a conceptual surface water quality monitoring program for the transmission line corridor.

#### **2.7.2.3.3 *Sediment Quality and Benthos***

The EIS shall describe the effects of the Project on sediment quality and on biota as follows:

- discuss how potential changes related to construction, operation, closure and post-closure may affect toxicity and physical habitat requirements (e.g., particle size) for benthos and fish eggs, utilizing sediment quality baseline data;
- identify sediment parameters that may be present at elevated levels, in comparison to applicable federal and provincial sediment quality guidelines, and, if necessary, use this information to propose site-specific sediment quality objectives; and
- invertebrate species.

#### **2.7.2.4 *Fish and Fish Habitat***

The EIS will identify potential effects on fish and fish habitat during all phases of the Project. Mitigation strategies for avoiding the harmful alteration, disruption and destruction of fish and fish habitat and a compensation plan for unavoidable losses, based on DFO's policy of the Management of Fish Habitat and the related principle of no net loss of the productive capacity of fish habitat will be included.

The potential effects and planned mitigative strategies for avoiding Harmful Alteration, Disruption and Destruction (HADDs) of fish habitat will be identified for the following:

- footprint of development;
- infrastructure development;
- dewatering activities;
- flow changes from water management and diversions; and
- compensation activities.

The analysis of potential effects will consider:

- productive capacity of aquatic systems. This will include consideration of a comparison with other similar habitat or ecosystems in the region and the province and a variety of other parameters such as fish density, biomass or productivity, biomass and diversity and water quality parameters such as nutrients, pH, dissolved oxygen, or temperature;
- all water bodies that may experience changes to Aboriginal, commercial and/or recreational fisheries resources;
- habitat loss or alteration, including aquatic vegetation and sensitive areas such as spawning grounds, nursery/rearing areas, feeding areas, summer/winter refuges and migration corridors;
- species of cultural, spiritual or traditional use importance to Aboriginal people and groups;
- potential for changes in migratory fish behaviour as a result of changes in water quality and quantity; and
- mortality of fish.

The EIS will outline separate conceptual Fish and Fish Habitat Mitigation and Compensation Plans for sub-section 35(2) authorization(s) under the *Fisheries Act* for the HADD of fish habitat, and under the MMER Schedule 2 requirements for the deposit of deleterious mine waste in natural water bodies frequented by fish. Sufficient detail will be provided in each compensation plan to demonstrate that no net loss of productive capacity of fish habitat can be achieved and that plan measures are technically, economically and biologically feasible. It is anticipated that final details for all compensation plan elements will be provided as appropriate once there are agreed upon plans and sub-section 35(2) authorization(s) under the *Fisheries Act* is/are requested, and when MMER approval is sought.

In developing these plans consideration will be given to the following:

- the extent to which mitigation measures considered for routine Project construction, operation and closure related activities developed and guided by best management practices, operational policy guidance and Project specific Environmental Management Plans will reduce or eliminate potential adverse effects of the Project on fish and fish habitat during all phases of the Project;
- appropriate compensation measures to offset unavoidable losses where it is anticipated that mitigation measures will likely not meet the goal of maintaining or enhancing the productive capacity of fish and fish habitat. These measures shall be developed in accordance with DFO's Policy for the Management of Fish Habitat (1986), Practitioners Guide to Habitat Compensation, and provincial policies, guidelines, and Aboriginal, commercial and/or recreational fisheries management objectives; and
- time delays between loss of habitat productive capacity and when replacement habitat is created and becomes functional as well as uncertainty in whether the replacement habitat is likely to function as intended.

The objective is to achieve No Net Loss of productive capacity of fish and fish habitat supporting Canada's Aboriginal, commercial and/or recreational fisheries resources,



taking into account the implementation of any appropriate mitigation and/or compensation measures. Important factors that shall be considered include:

- the level of productive capacity;
- the actual or potential direct and indirect contribution to sustaining the nation's Aboriginal, recreational and/or commercial fisheries resources consistent with local fisheries management objectives; and
- the extent to which compensation measures are demonstrated to be biologically sound, reasonable, and based upon practical and proven techniques.

In addition to DFO's requirement to develop and implement a fish habitat compensation plan, if a project component affects a species at risk, particularly one with a higher status designation and protection under provincial legislation (as is the case for lake sturgeon), the Proponent shall provide an overall benefit plan. The Proponent shall contact the Ontario Ministry of Natural Resources for details regarding the requirements of the overall benefit plan.

#### *Metal Levels in Fish*

The EIS will provide details of metal levels in fish. Using the baseline data on metal levels in fish muscle and liver in areas that may be impacted by effluent or seepage from the mine, the EIS shall evaluate changes in metal levels due to the Project.

#### **2.7.2.5 Terrain and Soil**

The EIS will identify potential effects on terrain and soil during all phases of the Project. The EIS will provide a terrain and soils survey that will:

- outline a conceptual baseline and monitoring program to assess trace element uptake in soils at mine closure, and where possible, during the mine life;
- outline a conceptual soil erosion and sedimentation plan for the mine site and access road; and
- include details of soil sample analysis completed and the QA/QC program followed.

Based on the results of the terrain and soils survey, the EIS will include an assessment of terrain stability. The information collected from the terrain and soil survey and mapping will be used in the soil salvage and soil erosion control assessments and preparation of the conceptual closure plan. The assessment of terrain stability will also include any maintenance access routes required for the proposed transmission line.

In order to facilitate determination of soil salvage requirements, the rooting depth, soil horizon and depth to growth impediments will be compiled in a tabular form for each profile in each soil management unit. Typical or representative soil profile descriptions shall be appended to the soil survey report.

The terrain and soil survey will be carried out following standard provincial and federal systems. In describing the survey the EIS will reference *The Canadian System of Soil Classification* (Agriculture and Agri-food Canada (1998).

#### **2.7.2.6 Vegetation**

The EIS will identify potential effects on vegetation during all phases and on all the components of the Project, including the mine site, transmission line and access road. The Proponent shall develop appropriate mapping products to assist in assessing the effects of the Project on key vegetative communities, and identifying rare ecosystems and species at risk.

The EIS will include a detailed assessment of key indicator communities, species groups or ecosystems that have intrinsic ecological or social value, are representative of overall ecosystem condition and are sensitive to Project activities. The vegetation key indicators that should be assessed include:

- forests;
- wetland ecosystems;
- riparian ecosystems;
- rare plants;
- ecological communities of conservation concern; and
- specific country foods identified by local and Aboriginal people and groups as being important.

The EIS will:

- assess the potential effects of the Project on vegetation, including species known to be important to Aboriginal people and groups;
- document ambient concentrations of trace elements in wetland and upland vegetation to determine the potential for contamination of vegetation that may be consumed by wildlife or people; and
- develop mitigation measures to minimize or eliminate Project effects on vegetation, ecosystem function and wildlife habitat.

With respect to the proposed transmission line, the EIS shall include a discussion of the following issues:

- the potential effects of invasive vegetation within the corridor and proposed methods of controlling invasive or undesired vegetation;
- whether the proposed corridor will be seeded and any potential effects on range movement; and
- identification of access requirements specific to timber harvesting activities within the transmission line and the identification of whether maintenance access routes will be required.

#### **2.7.2.7 Wildlife**

The EIS will address wildlife issues for the areas potentially affected by the Project, including the mine site, transmission line corridor and access roads and will include the following:

- the identification and assessment of the potential effects of the Project on cervids, large carnivores, furbearers, small mammals, bats, raptors, waterfowl and other birds, reptiles, and amphibians that may be affected by the Project with particular attention to riparian, wetland, cliff and forest ecotone habitats, where applicable;

- a management strategy for dealing with potential human-bear and human-wolf conflicts;
- a summary of the amount and type of wildlife habitat potentially impacted by the Project. These summaries will include wildlife habitat suitability interpretations for cervids, black bear and species of conservation concern that are known or likely to occur in the project area;
- an analysis to predict the anticipated effects on migratory birds based on anticipated changes in habitat;
- identification of mitigation measures to minimize or eliminate any adverse effects on wildlife, including wildlife habitat, and to reduce potential bird loss resulting from collisions with the transmission line, particularly in the vicinity of wetland, lake and riparian habitats and on migratory corridors; and
- an evaluation of the effect of any new road access and the creation of the transmission line corridor on wildlife mortality risk and movement patterns, and where a concern exists.

#### *Species At Risk*

The EIS will address issues related to species at risk for the areas potentially affected by the Project, including the mine site, transmission line corridor and access roads. This will include the identification and assessment of the potential effects of the Project on wildlife species of conservation concern (i.e., COSEWIC-listed species, species listed under the *Species at Risk Act* and/or *Endangered Species Act* and their habitats) including woodland caribou. A description of the reasonable steps that will be taken to minimize adverse effects on individual members of protected species shall be provided.

The EIS shall include an assessment of whether the Project is likely to 'kill', 'harm', or 'harass' an individual member of a protected species and its ability to carry out its life processes. A discussion on the likelihood of the Project to 'damage' or 'destroy' a protected habitat of a species at risk shall also be included.

In addition to those considerations listed in Section 2.7.1.5, when describing the effects the Project may have on species at risk and its habitat, the Proponent should give consideration to the following categories:

- the scale, location, and frequency of all phases of the Project;
- the immediate (short term) and delayed (long term) effects of the Project;
- the availability of the habitat feature(s) (i.e., whether the feature(s) is limited or abundant);
- the sensitivity of the species to changes in these habitat feature(s) / characteristic(s);
- the life history of the species including the active periods for the species, its normal behavior patterns, how it carries out its various life processes, and its natural life span;
- the habitat needs of the species that enables it to carry out its life;
- processes and how they support the life process(es) of the species;
- the fidelity of the species to any habitat feature(s)/characteristic(s); and
- the resiliency of these habitat feature(s).

With respect to woodland caribou, the EIS will discuss the effects of the Project on habitat and population management objectives of the relevant Cervid Ecological Zone and Wildlife Management Unit(s) and on the achievement of the following objectives identified in the Caribou Conservation Plan:

- Ontario will develop a management strategy for the discontinuous range management to enhance connectivity between the northern continuous range and the southern coastal Lake Superior populations. This connectivity will improve the prospects for persistence of the coastal population. Discontinuous range will not be managed broadly for caribou habitat to support self-sustaining populations. Instead it will focus on specific landscapes that may support temporary caribou occupancy or movement between the continuous range and Lake Superior.
- where caribou distribution is discontinuous, Ontario will look for opportunities through forest management planning and other land use planning to improve future connectivity between local caribou populations and isolated populations.
- the Lake Superior coastal population will be managed for population security and persistence. The focus will be to protect and manage habitat and encourage connectivity to caribou populations to the north.

### **2.7.3 Socio-Economics, Culture and Human Health**

The EIS shall include an assessment of potential effects of the Project to the social, economic, and cultural environment and to human health. In conducting the effects assessment, consideration shall be given to the guidance provided in the subsections below.

The social, economic and cultural impact assessment shall measure both the positive and negative and direct and indirect effects of the Project on individuals, organizations, communities and governments. Information on any predicted social, economic and/or cultural benefits of the Project will be considered by the responsible authorities in assessing the justifiability of any significant adverse environmental effects.

The principles regarding establishing baseline conditions outlined in Section 2.6.2 shall be applied to the assessment of potential effects on social, economic and cultural issues.

With respect to socio-cultural and socio-economic conditions, the Proponent is requested to clearly identify which social, economic and cultural issues relate directly to changes the Project may cause in the environment.

#### **2.7.3.1 Economic Issues**

The EIS will assess the economic impacts of the Project. This includes, but is not limited to:

- an estimate of the direct, indirect and induced income for construction, operation, closure and post-closure phases of the Project;
- the effects of the Project on the Town of Marathon, and on regional and provincial economic development including the benefits of economic diversification;
- a description of future economic activity without the Project;

- an estimate of government expenditures that may be required as a result of development of the Project and describe any proposed measures to offset these expenditures (if any);
- where applicable, any education or training program that the Proponent would provide or sponsor; and
- a labour market analysis profiling the Project labour requirements and labour supply in the project area, throughout Ontario and outside the province.

The EIS will clearly document and include supporting analysis, statistics, rationale or examples and assumptions and information sources used. Where appropriate, the assessment of the various economic effects will consider the context in which those effects occur and a clear distinction between effects on the immediate local area and effects on regional centres will be made.

The EIS will estimate taxes that are net gains i.e. mining royalty, corporate income tax, sales tax on major items and incremental personal income tax and remove taxes that are "fee for services" such as fuel, property, water rentals and various municipal taxes. Estimates used in the economic analysis will be based on reasonable assumptions regarding the successful development and operation of the Project. The estimates will reflect reputable, recent research, techniques or approaches used by other similar studies.

The EIS will discuss the direct workforce requirements for each phase (construction, operation, closure and post-closure) of the Project, develop a labour supply profile for the Project describing employment, unemployment and occupational characteristics, education levels, and experience in the project area and will assess the labour supply required over the life of the Project.

#### **2.7.3.2 Social Issues**

Social effects generally include effects on population growth, social characteristics, housing and accommodation, social services, traffic and transportation and community infrastructure.

The EIS will:

- estimate the effects of the Project on the population of the project area, as well as those communities specifically identified, for each major phase (construction, operation, closure and post-closure) of the Project. Family characteristics and local constraints shall be considered in developing refined population increments resulting from the Project;
- estimate the housing requirements and evaluate the settlement options for the construction, operation and closure phases of the Project; and
- provide an assessment of transportation and traffic issues that considers social, economic, health and safety perspectives.

The assessment of workforce settlement and housing will include an assessment of the need for off-site housing and the identification of the type of housing that may be

required. This may include a review of residential development plans in local communities to estimate the future housing supply.

The assessment of traffic and transportation will include the following:

- identification of Project related traffic volumes;
- the identification of the increment of Project traffic to local traffic in affected communities;
- identification and assessment of accident rates along highway routes and potential safety issues and conflicts with existing traffic on access roads;
- evaluation of the new mine site access road in relation to other land uses currently undertaken in the area;
- assessment of the effect of the new access road on other sectors such as the economy and recreation;
- assessment of the demand that will be placed on the rail facilities;
- assessment of the demand for air service; and
- identification of required infrastructure improvements (if applicable).

#### *Community and Health Services*

For community services, the EIS will:

- assess the demands that the Project will place on services in the project area and the effect of that demand;
- describe the increase in demand, where possible and reasonable; and
- where practical, distinguish where the Project has the effect of advancing an expansion of capacity verses creating an incremental increase.

For all services assessed, base case conditions as described in Section 2.6.2 will be compared to the forecasted demand for services over the life of the Project. Specific services that will be addressed include, but are not necessarily limited to: police, health care, fire, ambulance, education, social services, recreation, basic infrastructure (water, sewer, and transportation), justice, commercial, retail and industrial services.

In assessing the effect on community services the EIS will:

- assess the demand for services generated by the Project;
- identify specific types of services that are likely to be in greatest demand;
- identify services that will be available on site;
- compare demand to existing capacity and the schedule for expanding capacity in the Project's absence;
- discuss both service ability to deal with general increased demand as well as with emergency situations; and
- identify areas where significant effects may occur.

The EIS will include an assessment of the health effects resulting from the Project and describe any proposed mitigation. This assessment will consider the facilities and services, including the supply of and demand for community based health services, provision of services at the mine site and the interaction between those services and local community services.

#### **2.7.3.3 Effects on Resource Uses**

The EIS will assess the potential effects of the Project, including both onsite and offsite components, on other regional economic activities identified, such as forestry, recreation and tourism, and agriculture. The EIS will provide relevant data to identify effects of all phases of the Project on current and forecasted land uses in the region for proposed monitoring, mitigation and compensation measures.

The EIS will also identify all land tenures and land uses potentially affected by all phases of the Project and will accurately delineate the boundaries of the mineral claims so that it is apparent where mine facilities are located relative to the claim boundaries. This identification will include asserted or established Aboriginal and treaty rights, where available. For effects related to Aboriginal use, see Section 2.7.5 below. Overlays for the land tenure and land use maps and spatially referenced databases of proposed mine facilities (e.g. pits, waste dumps, plant site, TIA) will be included in the EIS. The EIS shall also:

- compare current and forecasted land tenure and land uses within the proposed mine site area; and
- determine ancillary land uses/site developments that will be placed on Crown land and that are not covered by the permits, licenses or approvals issued by the province.

With respect to fishing, the EIS will provide an assessment of the effects of all phases of the Project on the commercial and/or recreational lake and stream fisheries affected by the Project, and present mitigation and/or compensation plans. This assessment will provide results of visitor and creel surveys conducted to examine lake and streams use, catch success, and the importance of the lake and streams in a regional and provincial context.

With respect to outdoor recreation and tourism provide an assessment of the effects of all phases of the Project on these activities. In addition, the EIS will:

- identify commercial recreation tenures and activities affected by the Project;
- identify areas that have high wilderness recreational value affected by the Project;
- assess the importance of the areas affected, relative to regional use by residents and visitors; and
- provide an estimate of the value of recreation and tourism in both the project area and in the broader area, including Pukaskwa National Park, and assess the effect of the Project on park and recreation features and on tourism and recreation opportunities.

With respect to hunting, trapping and guiding provide an assessment of the effects of all phases of the Project on these activities. In addition, the EIS will:

- identify the number of trapping and guiding territories affected by the Project and describe the nature of the effect in terms of the specific trapline and guiding area affected;

- assess the importance of the areas affected relative to overall area traplines and guiding territories and, to the extent possible, quantify the effect on guide outfitters and trappers;
- propose mitigation measures for diminished wildlife and wilderness values of the guide outfitter territories and registered traplines affected, where appropriate; and
- identify potential effects on recreational hunting opportunities in the immediate and adjacent areas.

With respect to forestry, the EIS will identify the effect of the Project footprint on the forestry values and targets identified in regional and local resource management plans for the project area such as local and landscape effects to the Kenogami, Pic River Ojibway, Black River and Big Pic Forest Management Plans. The assessment will identify how all phases of the Project will affect both current and future forest resources and uses. This assessment will include a determination of current and future forest resources and activities in the project area. These operations will be quantified to the extent practicable to provide a measure of the scale of activities.

With respect to agriculture, the EIS will include an agricultural assessment completed to identify how all phases of the Project could potentially affect both current and future agricultural resources and activities.

#### **2.7.3.4 Navigable Waters**

In order to complete an assessment of the potential effects of the Project on navigable waters, the EIS will:

- identify any Project components that will affect waterways and water bodies, including a description of any activities (e.g., dredging, alteration of water bed and/or water banks) that may affect waterways and water bodies;
- describe any ancillary and temporary works (e.g., cofferdams, detours, fencing, or temporary bridges) including, where available, approximate dimensions;
- describe the anticipated direct and indirect effects on the waterways and water bodies, including, but not limited to, changes in water level and flow; and
- provide information on current and/or historic usage of all waterways and water bodies that will be directly affected by the Project, including current Aboriginal uses, where available.

It is anticipated that upon receipt of the above information, the Navigable Waters Protection Division of Transport Canada will make a determination of the navigability of any waterways or water bodies and appropriate measures or approvals that would be required.

#### **2.7.3.5 Human Health**

The EIS shall include consideration of the potential effects of all project phases (i.e. construction, operation, closure and post-closure) when assessing impacts to human health. The EIS will examine the potential effects of the Project on human health, specifically related to potential chemical releases to the environment. The assessment



will involve both quantitative and qualitative risk assessment methods which will be detailed and include consideration of the following:

- water supply and watersheds, including the effect on water supply and quality for local residents, communities and the mine site, as well as potential site and potential health risks from discharges (if any). Any water designated for drinking will be assessed for potential contamination and shall meet Ontario Drinking Water Quality Standards and guidelines. Use of drinking water treatment systems or drinking water alternatives as appropriate will be discussed;
- the effect of the Project on air quality around the mine site, including worker camps, and in the broader study area, and potential health risks from proposed air emissions and dust generated at the mine and by traffic related to the mine; and
- accepted standards or guidelines for protection of human health (e.g. Canada-wide Standards, National Ambient Air Quality Objectives, provincial regulations) for specific criteria air contaminants, including, but not limited to, the following:
  - sulphur oxides [SO<sub>x</sub>],
  - nitrogen oxides [NO<sub>x</sub>],
  - particulate matter [PM] including total PM, PM<sub>10</sub>, and PM<sub>2.5</sub>,
  - volatile organic compounds [VOCs],
  - carbon monoxide [CO],
  - ammonia [NH<sub>3</sub>],
  - ground-level ozone [O<sub>3</sub>], and secondary particulate matter [secondary PM]),
  - air pollutants on the *List of Toxic Substances* in Schedule 1 of the *Canadian Environmental Protection Act, 1999* (Canadian Environmental Protection Act Registry, 1999), and
  - diesel PM;
- where available, information on possible health effects from electro-magnetic field exposure and as appropriate, descriptions of the measures that will be taken to address public concerns over the possible human health effects of project-related electro-magnetic fields;
- the expected duration of noise due to Project activities during all phases and an evaluation of the severity of predicted changes in noise levels and how they may affect human health;
- mitigative measures and monitoring of air quality, water quality, noise, electric and magnetic fields, and country foods, as appropriate; and
- risks to human health from current consumption by Aboriginal people and hunters/trappers of traditional country foods exposed to:
  - pesticides/herbicides used at the mine site or along the transmission line corridor;
  - metal contaminated dust;
  - seepage;
  - runoff or effluent discharges from the mine site (if any);
  - impounded water at the mine site;
  - metal contaminated vegetation growing within the projected dust fall area surrounding Project operations; and
  - soils contaminated by metals.

The Proponent should refer to Health Canada's document *Useful Information for Environmental Assessments* for more details on assessing human health in the EIS.

#### **2.7.4 Physical and Cultural Heritage Resources**

Physical and cultural heritage resources shall be considered in the EIS. According to Canadian Environmental Assessment Agency guidance document *Reference Guide: Assessing Environmental Effects on Physical and Cultural Heritage Resources* (April 1996), a cultural heritage resource is a human work or a place that gives evidence of human activity or has spiritual or cultural meaning, and that has historic value. Cultural heritage resources are distinguished from other resources by virtue of the historic value placed on them through their association with an aspect(s) of human history. This interpretation of cultural heritage resources can be applied to a wide range of resources, including, cultural landscapes and landscape features, archaeological sites, structures, engineering works, artefacts and associated records.

When undertaking the effects assessment on cultural heritage resources, the Proponent shall follow the Guiding Principles outlined earlier in these Guidelines.

##### **2.7.4.1 Archaeology**

Referencing the recommendations of the archaeological assessment report, the EIS assess the effects of the Project on existing archaeological resources and will include proposed measures to mitigate effects to archaeological resources that conform to the Ministry of Tourism and Culture's *Standards and Guidelines for Consultant Archaeologists* (2011).

These measures may include:

- the identification of archaeological resources that can be preserved intact through project design modifications to avoid and protect archaeological resources;
- site-specific discussions of the process used to select an impact management action from the possible alternative actions;
- justification for selection of preferred mitigation measure; and
- recommendations for a tentative schedule for conducting surveillance or monitoring during project implementations.

##### **2.7.4.2 Built Heritage and Cultural Heritage Landscapes**

The EIS will assess the potential effects of on site and off site components of the Project on known and potential built heritage and cultural heritage landscapes.

#### **2.7.5 Aboriginal Considerations**

The EIS will provide information regarding the effects of the Project on Aboriginal people and groups interests and on asserted or established Aboriginal and treaty rights at the mine site, and along the transmission line corridor and access roads. Where appropriate, the effects assessment for all VECs shall include consideration of issues of concern to Aboriginal peoples and groups, including the effects of the Project on the current use of lands and resources for traditional purposes.

Based on information provided by Aboriginal groups, or, if Aboriginal groups do not provide this information, on available information from other sources, the Proponent will identify:

- any potential social and/or economic effects to Aboriginal groups that may arise as a result of the Project on a group by group basis;
- any potential effects on current and proposed uses of land and resources by Aboriginal groups for traditional purposes including, but not limited to, hunting, fishing, trapping, cultural and other traditional uses of the land (e.g. collection of medicinal plants, use of sacred sites);
- any effects on lifestyle, culture and quality of life of Aboriginal groups;
- measures to avoid, mitigate, compensate or accommodate effects on the current use of lands and resources for traditional purposes;
- any effects of alterations to access into the area on Aboriginal groups, including deactivation or reclamation of access roads;
- any effects of the Project on heritage and archaeological resources in the project area that are of importance or concern to Aboriginal groups;
- the residual impacts of any effects identified above on asserted or established Aboriginal and treaty rights; and
- a discussion of any factors may inhibit or foster the flow of economic and other benefits to Aboriginal communities.

#### **2.7.6 Accidents and Malfunctions**

The EIS will include a discussion of the potential environmental effects that may result from accidents and malfunctions that may occur in connection with the Project. The EIS will:

- identify the probability of potential accidents and malfunctions related to the Project, including an explanation of how those events were identified, potential consequences (including the potential environmental effects), the worst case scenarios and impacts;
- explain the potential magnitude of an accident and/or malfunction, including the quantity, mechanism, rate, form and characteristics of the contaminants and other materials likely to be released into the environment during the malfunction and/or accidental event;
- identify the capabilities, resources and equipment available to safely respond to any accidents and malfunctions; and
- describe the planned response such as communication between stakeholders, and alerting and warning personnel working on the mine site. The EIS will also describe the contingency, clean-up or restoration work that would be required immediately following or in the long-term after the postulated malfunctions and accidents.

The assessment of the environmental effects of potential accidents and malfunctions shall include, but is not limited to those considerations associated with the following Project activities or eventualities:

- the transport of goods which are potentially harmful to the environment, to and from the Project site, including the potential transport of concentrate to an off-site handling facility;
- waste management and disposal (solid and liquid);
- handling and use of chemicals on-site;
- evaluation of worst case scenarios (e.g. tailings impoundment structural failure, accidental explosion);
- premature closure of the Project during any phase;
- controlled and uncontrolled discharges (surface water and groundwater); and
- any other Project component or system that has the potential, through accident or malfunction, to adversely affect the natural environment.

A conceptual Environmental Protection Plan to address potential accidents and malfunctions will be included in the EIS.

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

The EIS shall consider any change to the Project that may be caused by the environment. The assessment shall take into account how local water conditions and natural hazards, such as severe weather conditions and external events could adversely affect the Project. Longer-term effects of climate change shall also be discussed up to the end of the projected post-closure phase of the Project.

The EIS will provide details of a number of planning, design and construction strategies intended to minimize the potential effects of the environment on the Project. The EIS will consider the following types of natural environmental issues or events that could have an effect on the Project:

- climate change, including the potential long term effects of changing groundwater and surface water levels on maintaining an adequate water cover in the TIAs;
- extreme weather (severe rainstorms, snow storms, flood events, wind, drought);
- forest fires; and
- seismic activity.

Consideration of applicable climate elements shall include, but not be limited to:

- an estimate of its importance to the Project;
- an estimate of how sensitive the Project is to variations of this element;
- a discussion of climate data used; and
- changes in lake levels, stream flow.

The sensitivity of the Project to long-term climate variability and effects shall be identified and discussed. The Canadian Environmental Assessment Agency Procedural Guide, *Incorporating Climate Change Considerations in Environmental Assessment: General Guidance for Practitioners* (2003), provides guidance for incorporating climate change considerations in an EA.

### **2.7.8 Capacity of Renewable Resources**

The EIS will include an assessment of 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 those resources likely to be significantly affected by the Project, and describe how the Project could affect their sustainable use. The EIS shall also identify and describe any criteria used in considering sustainable use. Sustainable use may be based on a range of ecological considerations, such as:

- integrity of the ecosystem;
- productive capacity of the resource;
- carrying capacity of the ecosystem;
- assimilative capacity of the ecosystem;
- resilience of the affected ecosystems to respond to internal and external changes; and
- cumulative environmental effects with other projects.

## **2.8 ENVIRONMENTAL MANAGEMENT**

The EIS will describe the Proponent's Environmental Management System (EMS) for the Project. The objective of the EMS is to provide a consistent approach to environmental management through resource allocation, the assignment of responsibilities and ongoing evaluation of environmental practices, procedures and processes. The EMS is part of an overall corporate management system which includes organizational structure, planning and training activities, staff responsibilities, practices, procedures and resources for developing, implementing, reviewing and maintaining environmental policies associated with the Project.

Environmental Management Plans (EMPs) are an essential component of the EMS. The purpose of the EMPs is to ensure that proper measures and controls are in place in order to prevent or decrease the potential for environmental degradation during all phases of project development, and to provide clearly defined action plans and emergency response procedures to account for human and environmental health and safety. Furthermore, analysis of the data obtained as a result of enacting the EMPs can be used to confirm any project specific assumptions and make corrective plans where necessary. The EMPs should also be used as a means of implementing the mitigation measures identified through the environmental assessment and any follow-up requirements. The EMPs will serve to provide guidance on specific actions and activities that will be implemented to decrease the potential for environmental degradation during construction and operation, and to clearly define the Proponent's ongoing environmental commitment.

### **2.8.1 Environmental Management Plans**

The EIS shall describe the conceptual EMPs proposed for all stages of the Project and include a commitment by the Proponent to implement the EMPs should the Project proceed. The finalization of detailed EMPs will occur after the EA through consultation with federal and provincial government agencies, Aboriginal groups, the public and other stakeholders and must be consistent with the information presented in the EIS. The EMPs will incorporate the results of the EIS with respect to identifying areas which would

benefit from the development of an EMP and identifying mitigation and follow-up and monitoring requirements. The EMPs will include direction on the following, as appropriate for the Project phase:

- construction management;
- access management;
- concentrate transfer station management;
- tailings impoundment operations plan;
- materials handling (non-mined materials);
- emergency response and spill contingency, including measures taken to prevent spills, such as policies, procedures and protocols;
- geotechnical stability monitoring;
- soil salvage and storage plan;
- surface erosion prevention and sediment control;
- air quality management;
- noise Management;
- water quality/quantity management and monitoring;
- waste management;
- ARD/ML management;
- vegetation management, including invasive species;
- protection of migratory birds
- bear-human and wolf-human conflict management;
- cultural and heritage protection;
- reclamation and closure;
- occupational health and safety;
- follow-up and monitoring;
- surface water and groundwater quality and quantity management, and monitoring; including controlled and uncontrolled seepage, run-off, and discharge;
- follow-up , compliance and effects monitoring of groundwater and surface water quality and quantity during closure and post-closure; and
- others, as appropriate.

The EIS shall also identify any EMPs or other mitigation tools that can be used to minimize potential effects on Aboriginal people and groups. Such EMPs and/or related mitigation tools will be developed in consultation with the Aboriginal groups, and may include:

- archaeological and heritage resources monitoring plan;
- traditional use monitoring plan; and
- others, as needs are identified.

### **2.8.2 Decommissioning and Closure Plan**

The EIS will include details of a conceptual decommissioning and closure plan for the Project according to the information requirements of the Ontario Regulation 240/00 of the *Mining Act*. This shall include ownership, transfer and control of the different project components as well as the responsibility for monitoring and maintaining the integrity of some of the structures. The plan will include information on:

- short and long term plans for the dams in regard to water flows and levels;
- monitoring of biotic resources affected by the dams or diversions;
- residual soil;
- vegetated areas that will/will not be reclaimed;
- vegetative communities and species to be renewed;
- groundwater, and surface water contamination;
- maintenance and/or management of open pits, mine rock stockpiles, permanent TIAs; and
- anticipated pit overflow.

The full preparation and submission of the plan to appropriate authorities will occur prior to the decommissioning of the temporary components of the Project. The Plan will serve to provide guidance on specific actions and activities that will be implemented to minimize the potential for environmental degradation in the long-term during decommissioning and abandonment activities, and to clearly define the Proponent's ongoing environmental commitments<sup>19</sup>.

### **2.8.3 Monitoring and Follow-up Programs**

The Proponent shall include a framework upon which follow-up and effects monitoring, and compliance monitoring will be based throughout the life of the Project, including the post-closure phase, should the Project proceed.

#### *Compliance Monitoring Program*

The EIS shall discuss the monitoring program for the Project. Compliance monitoring verifies whether the Proponent has implemented the required mitigation measures and fulfilled the provisions of the environmental assessment with respect to public consultation, requirements for additional studies or work to be completed and all other commitments. The Proponent shall describe the compliance monitoring methods to be used, including reporting frequency, methods and format.

The Proponent shall propose a schedule for the compliance monitoring program. The schedule shall indicate the frequency and duration of monitoring. This schedule would be developed after statistical evaluation of the length of time needed to detect effects given estimated baseline variability, likely environmental effect size and desired level of statistical confidence in the results.

The results of the compliance monitoring program shall be used in the follow-up program, as outlined below.

#### *Follow-up and Effects Monitoring Program*

The EIS shall outline a follow-up and effects monitoring program, designed to verify the

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<sup>19</sup> As a condition of the *Mining Act* (Sec. 145), financial assurance is required for all outstanding costs associated with mine reclamation. In the case of company default, the financial assurance would be used by government to effectively manage environmental issues at the site, complete any outstanding reclamation, and continue to monitor and maintain for as long as is required.

accuracy of the conclusions of the environmental assessment and to determine the effectiveness of the measures implemented to mitigate the adverse environmental effects of the Project. The follow-up and effects monitoring program will also support the EMS used to manage the environmental effects of the Project and support the implementation of adaptive management measures to address previously unanticipated adverse environmental effects. The EIS will discuss follow-up and effects monitoring program objectives, which shall include confirming the effectiveness of mitigation measures, confirming that assumptions made in the EIS were appropriate and verifying predicted effects.

The follow-up and effects monitoring program shall be designed to incorporate pre-Project information which would provide the baseline data, compliance data such as established benchmarks, regulatory documents, standards or guidelines, and real time data which would consist of observed data gathered in the field. Environmental assessment effects predictions, assumptions and mitigation actions that are to be tested in the follow-up and effects monitoring program shall be converted into field-testable monitoring objectives, as discussed below.

The description of the follow-up program shall include any contingency procedures/plans or other adaptive management provisions as a means of addressing unforeseen effects or for correcting exceedances as required to comply or to conform to benchmarks, regulatory standards or guidelines.

The follow-up and effects monitoring program shall describe roles and responsibilities for the program and its review process, by both peers and the public.

The EIS shall provide a discussion on the need for, and requirements of, a follow-up and effects monitoring program and include:

- the need for such a program and its objectives;
- a tabular summary and explanatory text of the main components of the program, including:
  - description of each monitoring activity under each component,
  - discussion on which of the program objectives the activity is fulfilling (i.e. confirming mitigation, confirming assumptions; verifying predicted effects),
  - specific statement from the EA that goes along with that generic objective and will be the focus for that activity, such as the example below:
    - follow-up objective: verify predicted effects,
    - environmental assessment effect: no adverse effects at the population level for white-tailed deer because of vehicle strikes due to increased traffic within the site study area,
  - specific monitoring objective for that activity, such as the example below:
    - monitoring objective: record occurrence of vehicular collisions with deer on-site to verify predicted effects;
- how the program would be structured;
- a schedule for the finalization and implementation of the follow-up program;



- roles to be played by the Proponent, regulatory agencies, Aboriginal people and groups and others in such a program;
- possible involvement of independent researchers;
- the sources of funding for the program; and
- information management and reporting.

The follow-up program shall be described in the EIS in sufficient detail to allow independent judgment as to the likelihood that it will deliver the type, quantity and quality of information required to reliably verify predicted effects (or absence of them), confirm assumptions from the environmental assessment and confirm the effectiveness of mitigation.

The EIS shall also include a description of how the Proponent's responses to Aboriginal issues and concerns will be monitored during Project construction and operation, and during decommissioning and abandonment of temporary facilities and will outline any process for handling issues that may arise (e.g. stop work plans, modification of design, etc.).

## **2.9 TABLE OF COMMITMENTS**

The EIS shall summarize the Proponent's key commitments in implementing mitigations, contingency plans, monitoring, taking corrective actions, reclaiming the site and providing offsets for unavoidable Project effects. The summary of commitments shall include:

- a summary of all significant management commitments;
- any applicable standards, legislation and/or policies;
- a discussion of any special management practices or design feature commitments; and
- a table summarizing the timing and responsibility for each of the actions for which a commitment has been made.

## **2.10 ASSESSMENT SUMMARY AND CONCLUSION**

This section of the report shall summarize the overall findings with emphasis on the main environmental issues identified.

## 2.11 REFERENCES

Agriculture and Agri-food Canada. 1998. *The Canadian System of Soil Classification*. 3rd Ed. Agriculture and Agri-Food Canada Publication 1646. National Research Council of Canada Research Press.

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Portt, C.B., Coker G.A., Mandrak N.E., and Ming D.L. 2008. Protocol for the detection of fish Species at Risk in Ontario Great Lakes Area (OGLA). Fisheries and Oceans Canadian. Canadian Science Advisory Secretariat. Research Document 2008/026.

## **APPENDIX A: List of Relevant Legislation, Policies, Strategies and Agreements**

In addition to environmental assessment requirements, relevant statutes, agreements, and policies may include most (if not all) of the following, as well as others:

### **Federal Statutes/Policies:**

- *Fisheries Act*
- *Metal Mining Effluent Regulations*
- *Migratory Birds Convention Act*
- *Species at Risk Act*
- *Navigable Waters Protection Act*
- *Canadian Environmental Protection Act*
- *Explosives Act*
- *Transportation of Dangerous Goods Act*
- *Canada Transportation Act*
- *Radio Telecommunications Act*
- Federal Policy on Wetland Conservation, 1991
- Policy for the Management of Fish Habitat, 1986
- Fish Habitat Referral Protocol for Ontario, 2009

### **Provincial Statutes/Policies:**

- *Ontario Environmental Protection Act*
- *Ontario Water Resources Act*
- *Lakes and Rivers Improvement Act*
- *Public Lands Act*
- *Fish and Wildlife Conservation Act*
- *Crown Forest Sustainability Act*
- *Aggregate Resources Act*
- *Ontario Heritage Act*
- *Public Transportation and Highway Improvement Act*
- *Mining Act*;
- *Safe Drinking Water Act*
- *Endangered Species Act*, 2007
- Area Specific Crown Land Use Policy
- Ontario's Living Legacy Land Use Strategy
- Ontario's Biodiversity Strategy
- Moose Management Policy
- Ontario Woodland Caribou Conservation Plan
- Ontario Lake Trout Lake Policy (per: PL 4.02.01 Application Review and Land Disposition Process)
- Ontario Drinking Water Quality Standards and guidelines
- Water Management Policies, Guidelines, Provincial Water Quality Objectives of the Ministry of Environment and Energy, July 1994 (reprinted February 1999)

- *Transportation and Highway Improvement Act*, and Controlled Access Highway Criteria
- MNR Environmental Guidelines for Access Roads and Water Crossings
- Guidelines for identifying, assessing, and managing contaminated sediment in Ontario: an integrated approach, MOE, 2008
- Strategic Plan for Ontario Fisheries (SPOF II)
- Cervid Ecological Framework: Ontario Dam Safety Guidelines
- MNR Permanent Bridge Design Guideline, 2008
- Procedures for Approval Assessment under the *Lakes and Rivers Improvement Act*
- Bi-national Program to Restore and Protect the Lake Superior Basin

International/ Domestic Agreements:

- Great Lakes Water Quality Agreement
- Canada-Ontario Agreement on Environmental Assessment Cooperation, 2004
- Convention on Biological Diversity, 1993
- Canada-Ontario Agreement Respecting the Great Lakes Basin Ecosystem, 2007
- Lake Superior Lakewide Management Plan
- Canada-Ontario Decision-Making Framework for Assessment of Great Lakes Contaminated Sediment, 2007