# VERSION 3 UPDATE SUMMARY

## *Supplemental Explanation of Environmental Assessment Methods*

*In response to comments received regarding the consideration projects phases in the assessment of impacts, CMC has amended this Version 3 EIS/EA Report with additional narrative to describe potential impacts for each project phase, where appropriate, following the overall methodology described in the Terms of Reference (ToR), this Chapter 2, and in other sections of the EIS/EA Report as appropriate. Further information regarding the methods used in the EIS/EA and the overall compliance of the EIS/EA Report with the ToR and EIS Guidelines is provided in the response to EAB-3 and EAB-4. Additional clarifying text has been added throughout this Chapter 2 to explain and demonstrate how the project phases were considered and incorporated into the assessment of impacts.*

# 2.0 ENVIRONMENTAL ASSESSMENT METHODS

This chapter provides a description of the methods used to conduct this environmental assessment. The work was completed with the objective of providing sufficient information to achieve conformance of the Environmental Impact Statement/Environmental Assessment Report (EIS/EA Report) with requirements of the Environmental Impact Statement Guidelines (EIS Guidelines) and the Terms of Reference (ToR) issued by the Canadian Environmental Assessment Agency (CEA Agency) and the Ontario Ministry of the Environment (MOE) Environmental Approvals Branch (EAB).

As stated in the EIS Guidelines issued for the Hammond Reef Gold Project (Project), 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. It also serves the purpose to encourage decision makers to take actions that promote sustainable development and thereby achieve or maintain a healthy environment and a healthy economy. This EIS/EA Report was conducted to meet the purposes above and further requirements outlined in the EIS Guidelines as well as ToR.

## 2.1 Overall Assessment Approach

The approach presented within the EIS/EA Report includes the following key steps:

- An initial Project was scoped and a Project Site was defined, within which development activities are planned to take place. Initial study areas were defined for each EA component based on the geographic range over which potential effects of the Project are anticipated to occur.
- Baseline studies were conducted within the defined study areas. Studies are focussed on potential interactions with mine development activities. These studies provide an understanding of the existing environment, and provide the baseline conditions against which potential effects of the Project are assessed. The existing environmental and social conditions are described in Chapter 3.
- Alternative means for carrying out the Project were described and evaluated. The alternatives assessment is described in Chapter 4.
- A Project Description was developed that describes the activities to be undertaken during each Project phase. Project phases include construction, operations, closure and post-closure. The activities to be undertaken in each phase are described in detail in Chapter 5.

- Likely effects of the Project on the environment were assessed for those components where there is a direct or indirect linkage between Project activities and an environmental or social component. The approach to assessing these effects is described in this chapter and the assessment is presented in Chapter 6.
- Significance of effects was determined for effects identified as being adverse. In-design mitigation measures are considered and residual effects are identified (Chapter 6).
- Consultation with Aboriginal communities, government regulators and Project stakeholders is ongoing throughout the environmental assessment. Details of consultation activities are provided in Chapter 7.
- Preliminary or conceptual environmental and social management plans were developed to enhance benefits to local communities and minimize potential effects (Chapter 8).

## 2.2 Definition of the Project

The Project was defined in two stages (1) an initial Project scoping, and (2) the detailed description of the Project used in the effects assessment. Once the alternatives assessment had been completed, preferred alternatives were identified and the Project was fully defined. A detailed description of the Project is provided in Chapter 5.

### 2.2.1 Scope of the Project

The scope of the Project identifies the nature and extent of the Project to be assessed. The scope of the Project is provided in Chapter 1.

### 2.2.2 Scope of the Factors

The scope of the factors to be considered in the environmental assessment are listed in paragraphs 16(1)(a) to (d) and subsection 16(2) of the *Canadian Environmental Assessment Act* (CEAA), as stated in Chapter 1.

#### *2.2.2.1 Temporal Boundaries*

The Project will be undertaken in four distinct phases:

- **Construction Phase:** During the construction phase all of the activities associated with preparing the Project Site and supporting infrastructure for operation of the Mine will be carried out. This phase includes the decommissioning of facilities that will not be required beyond the construction phase. The construction phase is assumed to last 2.5 years.
- **Operations Phase:** During the operations phase, all of the activities associated with mining, ore processing and extraction of the gold will be carried out for the life of mine. The operations phase is assumed to continue for 11 years.
- **Closure Phase:** During the closure phase all of the activities required to close and stabilize the Mine and associated facilities are carried out, as well as the activities required to monitor the effectiveness of closure. Potential for long-term effects is considered during this phase. The closure phase is assumed to last 2 years.
- **Post-closure Phase:** During the post-closure phase no further activities take place at the Project Site. Long-term monitoring of some environmental components is undertaken. The post-closure phase extends from the completion of all closure activities until such time as no further monitoring of the Project Site is required. The post-closure phase is assumed to last for 10 years except for the flooding of the open pits, which is estimated to take an additional 208 years (i.e., 218 years in total).

### 2.2.2.2 Spatial Boundaries

The Project Site encompasses all the Project components except for Aggregate Sites which are subject to a separate permitting process and are not further addressed in this EIS/EA Report. The Project Site delimits the physical boundary of the Project, as shown in Figure 1-3.

The study areas considered in the environmental assessment encompass the environment that can reasonably be expected to be affected by the Project, or which may be relevant to the assessment of cumulative effects.

Four general study areas were considered with respect to assessment of potential effects:

- **Mine Study Area:** The Mine Study Area (MSA) is the area located within the Project Site that encompasses all of the physical works and activities related to the Project. The MSA encompasses the Mine, the Waste Rock Management Facility (WRMF), the Ore Processing Facility, the Tailings Management Facility (TMF), the Water Management System, and the Support and Ancillary Infrastructure (including but not limited to the worker accommodation camp, communications tower and weather station). The MSA is shown in Figure 2-1.
- **Linear Infrastructure Study Area:** The Linear Infrastructure Study Area (LISA) encompasses the footprints of the access road (Hardtack/Sawbill) and the project transmission line. The LISA is represented by a Y-shaped area that extends on either side of the central line of the access road (Hardtack/Sawbill) and the project transmission line. The width of the LISA depends on the environmental component that is being described. The LISA is shown on Figure 2-1.
- **Local Study Area:** The Local Study Area (LSA) is the immediate vicinity of the Project Site that could be directly affected by the Project. The LSA includes the MSA and an area surrounding the Project Site that varies depending on the environmental component that is being described. The Project's LSAs are shown in Figures 2-2A to 2-K.
- **Regional Study Area:** The Regional Study Area (RSA) is an area that provides regional context and environmental setting for the assessment. Some socio-economic effects may be expected within the Regional Study Area, but biological and physical effects are generally not expected to extend into the RSA. The Project's RSAs are shown in Figures 2-3A to 2-3G.

While the MSA is common to all of the disciplines, the LSA and RSA have been modified to recognise the differences inherent in the assessment of effects for each environmental component. Therefore, individual environmental components will have slightly different study areas as a result of the Valued Ecosystem Components (VECs) considered, the natural physical features of the landscape, and the expected extent of potential effects from the Project.

These study areas are used for each environmental component unless modified. A description of any modifications is provided in the respective TSDs and summarized in Chapter 3.

## 2.3 Approach to Baseline Studies

Baseline studies were initiated in April 2010 to provide an understanding of the existing physical, biological and socio-economic conditions in the area containing and surrounding the Project. The baseline studies were conducted using standard protocols and scientifically defensible methods, as described in the individual Technical Support Documents (TSDs).

The objectives of the baseline studies were to:

- Describe the physical, biological and socio-economic conditions and trends in areas potentially affected by the Project. This description is provided in Chapter 3.
- Provide the baseline against which the effects of the Project are predicted and assessed. The assessment is provided in Chapter 6.
- Describe the geochemical characteristics of the mineral resource extraction process and the mine wastes that will be generated by the Project in order to develop an understanding of the factors that could affect the project description and hence the environment. This description is provided in Chapter 5.
- Inform the selection of alternatives to minimize environmental effects of the Project and compare the alternative means for carrying out the Project. Alternatives are identified and described in Chapter 4.
- Establish benchmarks for monitoring programs that will be implemented during the construction, operations, closure and post-closure phases of the Project, such that Project effects can be iteratively addressed if necessary as the Project proceeds. The proposed monitoring program is described in Chapter 8.
- Interact with potentially affected communities, in the course of baseline data collection, in order to exchange information on the Project and to provide people the opportunity to express their concerns and preferences with regard to Project development. The community consultation and Aboriginal engagement programs are described in Chapter 7.

## 2.4 Identifying and Assessing Alternatives

*Version 3 Update: In response to comments received from the government, the Version 3 Alternatives Assessment TSD has been amended to include supplemental information regarding:*

- *Transmission line alignment;*
- *Access road alignment; and,*
- *Assessment process with consideration of all project phases.*

*The methodology for assessing alternatives (see Section 2.2.2 and 2.2.3 in Part 1 of the Version 3 Alternatives Assessment TSD, and in Section 2.0 of the Supplemental Assessment of Access Road and Transmission Line Routing Alternatives (Part 4 of the Alternatives Assessment TSD)) uses indicators and performance objectives that were evaluated based on available data and professional judgement. The preferred alternatives were identified following careful consideration of advantages and disadvantages for all relevant project phases. Performance indicators/objectives (or a subset thereof) included consideration of:*

- *Technical applicability and/or system integrity and reliability;*
- *Ability to service the site effectively;*
- *Effects to the natural environment;*
- *Effects to the human environment, including Aboriginal and treaty rights, cultural heritage*
- *Resources and traditional land use;*
- *Amenability to reclamation;*
- *Consideration of effects from climate change; and*
- *Cost effectiveness, and*
- *Consideration of positive or negative effects to the natural and human environment*

*The methods used to assess alternative means of carrying out the project considered all project phases, are consistent with the ToR and EIS Guidelines as explained in the responses to EAB-3 and EAB-4 (see Addendum Part B; Table B-1) and are appropriate for decision making purposes at the EIS/EA stage of the Project.*

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The purpose of the Project is to extract gold ore for processing at an ore processing facility and to produce gold for sale worldwide. This purpose can only be accomplished through the mining and processing of the ore as proposed for the Project.

The only feasible alternative to the Project is the “do nothing” alternative, which is considered as a benchmark, and will help determine the extent to which the alternatives address the opportunity and the advantages/ disadvantages of proceeding with the Project.

A number of technically and economically feasible alternative means or methods of carrying out the Project were identified and are described in Chapter 4. Alternative means were determined through professional experience and consultation with Project stakeholders, including government, public and Aboriginal communities. A mine waste alternative assessment was also carried out as required by Environment Canada's *Guidelines for the Assessment of Alternatives for Mine Waste Disposal* (September 2011).

Alternative means were evaluated by characterizing the potential method and evaluating the alternative against the environmental, technical, socio-economic and Project-economics characterization as provided in Table 2-1.

The mine waste alternatives evaluation included the additional steps of developing a multiple accounts ledger which measures sub-accounts through the use of weighted indicators. A value-based decision for the siting of mine waste was made by comparing the overall rating of each alternative. A sensitivity analysis was also included to check the results of the evaluation if all weightings are changed to be equal.

The alternatives assessment is summarized in Chapter 4 and detailed in the Alternatives Assessment Report.

## 2.5 Selection of Valued Ecosystem Components

*Version 3 Update: The selection of Valued Ecosystem Components (VECs) included consideration of influences of the Project and Project alternatives throughout all phases of the project including construction, operations, closure and post-closure.*

*Data from the extensive environmental and socioeconomic baseline studies, literature sources, and multiple individual discussions, public consultation sessions and meetings with the government reviewers have been used to identify VECs for the Project.*

*For each phase of the Project, the limits of the Project and its potential to influence the VECs were evaluated as follows:*

- *Review of potential associated activities for each of construction, operations, closure, and post-closure was identified as indicated in the initial project description (Chapter 5), considering also alternatives to various aspects of the project as identified in Chapter 4, also considering the initial project description as provided in the ToR.*
- *For each activity, the Key Issues (Section 2.5.1) and VEC Selection criteria (Sections 2.5.2, through 2.5.6) were identified for relevance to the activity.*
- *VECs were carried forward for assessment (Chapter 6) where they had potential to be impacted in any of the construction, operations, closure or post-closure phases.*

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The potential effects of the Project are considered with respect to specific criteria and indicators that can be used to measure changes to attributes of the environment. These include both ecological and socio-economic attributes, and are referred to as Valued Ecosystem Components and Valued Social Components respectively. These are collectively referred to Valued Ecosystem Components (VECs).

The VECs provide structure and focus for the environmental assessment. A VEC can be an individual component of the environment (e.g., a species), or a collection of components that represent one aspect of the environment (e.g., a wetland ecosystem). VECs for the Project were selected through an issues scoping exercise that identified the particular components of the environment for which there is public, Aboriginal, regulatory or scientific concern.

Since the VECs are assessment endpoints, it is important that the selected VECs as evaluated will provide an appropriate and meaningful indication of the potential effects of the Project. The VECs were selected based on the following considerations:

1) What major or special ecological features of the Project Site or surrounding area should be protected from adverse effects from the Project?

2) What aspects of the physical environment (i.e., air, water or land) could be sensitive to the effects of the Project?

3) What individual species or range of species, of wildlife and plants could be sensitive to the effects of the Project?

4) What aspects of the socio-economic environment should be considered in assessing the Project?

From an ecological perspective, VECs can represent features of the natural environment considered to be culturally or scientifically important (e.g., a local wetland or stream). These ecological feature VECs are complex, comprising several ecological aspects, and affected by a range of pathways (i.e., routes of exposure or effect). Thus, ecological feature VECs may include:

- An aspect of the physical environment (e.g., air or water quality).
- An individual plant or animal species (e.g., wild rice or snapping turtle).

VECs are characterized using indicators; where indicators are the attributes of the VEC that might be affected by the Project. Each indicator requires specific measures that can be quantified and assessed.

### 2.5.1 Identification of Key Issues

The selection of VECs is based on the identification of key issues as determined from a review of baseline environmental and socio-economic conditions, consultations with Aboriginal groups and the public, and consultations with regulatory agencies.

The key ecological issues identified relate to water, air, and biological resources, and particularly include the following:

- **Water quality and quantity** due to discharges from the processing plant and seepage from the waste rock stockpile and low-grade ore stockpile, TMF, and stormwater runoff from disturbed areas.
- **Groundwater quality and flow** (quantity) from mining and infrastructure footprint.
- **Loss of physical habitat** (aquatic and terrestrial) due to infrastructure footprint.
- Effects on **aquatic life** from mining activities, including stormwater runoff, seepage from stockpiles and the TMF, and discharge of domestic sewage.
- **Disruption of wildlife** in the larger local area (e.g., 2 km radius around the Mine).
- **Soil erosion, and slope stability**.
- **Air quality and noise** due to ore processing, dust from vehicles and blasting, vehicle and equipment operation.
- Effects of the **access road** (Hardtack/Sawbill) and **project transmission line**.

## 2.5.2 Physical Environment Valued Ecosystem Component Selection Criteria

Physical components of the environment consist of the following:

- Geology and geochemistry.
- Soils and soil quality.
- Hydrogeology and groundwater quality.
- Hydrology, surface water and sediment quality.
- Air quality, noise and vibration.

The selection of VECs includes physical factors as described in the relevant TSDs. The physical criteria were chosen because they were:

- Measurable and quantifiable.
- Representative of the physical environment.
- Identified as important during consultation activities.
- Susceptible to effects within the spatial context of the Project.

Physical components of the environment are those which lead to or influence the assessment of effects of the Project, but are not in and of themselves the endpoints of the assessment. As such, the effects assessment on the endpoints of changes to the physical environment is presented in the EIS/EA Report through the biological and social components.

## 2.5.3 Biological Environment Valued Ecosystem Component Selection Criteria

*<u>Version 3 Update</u>: Additional details regarding the biological environment VECs are provided in the responses to MNR-Terrestrial 2, and MNRF-11B (selection parameters and indicators of VEC); MNR-Terrestrial 1, MNRF-11A, MNRF-11A-2, MNRF-11 (bat species); MNR-Terrestrial 5 (snapping turtle); A-6 (designation); and MNRF-12 (spatial boundary) [see Addendum Part B; Table B-1].*

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Biological components of the environment include:

- Aquatic habitat (e.g., creeks and rivers).
- Aquatic biota (e.g., algae, plants, invertebrates and fish).
- Terrestrial habitat (e.g., described as forests, grasslands, wetlands, riparian corridors).
- Terrestrial biota (e.g., plants, and “wildlife” including invertebrates, amphibians, reptiles, birds and mammals).

Effects of the Project on biological communities were assessed through the selection of specific receptor species. Since it is usually not possible to consider all of the species that could be affected, it was necessary to choose surrogates from among the environmental receptors present that would provide the best means of measuring effects. This includes species that are most representative of certain ecological functions or resource uses, are particularly sensitive to the effects of certain operations or processes of the Project and/or are socially or culturally important.

Based on existing environmental data, the most suitable biological receptors were those that made extensive use of the most important habitat areas, including: Marmion Reservoir, Lizard Lake and the upland habitats directly affected by the Project Site. VEC species were selected based on their susceptibility to the effects of the Project and their use of the LSA or RSA, particularly during critical life stages (e.g., spawning and rearing). The selection criteria stressed sensitivity and exposure to effects, and are presented in Table 2-2.

The effects on biological communities were typically addressed through consideration of changes that occur at the population level. These effects are typically manifest either through changes in habitat that render certain components of the habitat unavailable or unusable, or through potential direct effects on the organisms, such as increased lethality or reduced fecundity. Effect assessments strive to consider the effects on all of the components of the natural ecosystem. Given the large number of species that could potentially occur within the study area habitats, it is neither possible, nor particularly useful, to attempt to measure effects on all possible receptors.

Given the lack of site specific data for the biological resources in the Project area, the assessment is currently undertaken at the level of biological communities. As such, the effects assessment considers effects on the level of terrestrial plant and animal communities that could reasonably be expected to occur in the area, based on the existing data.

The VECs selected for the biological environment are provided in Table 2-3, along with summary of the rationale for their selection. The detailed rationale for the selection of the VECs is provided in the respective TSDs.

### 2.5.4 Socio-economic Valued Social Components Selection Criteria

Valued Social Components (VSCs) for the socio-economic environment were selected using the following information sources:

- Review of Project information and mapping.
- Consideration of the EIS Guidelines and ToR for this and other similar Projects.
- Initial understanding of communities in the LSA and RSA.
- Professional experience and understanding of socio-economic and land use issues pertaining to other mining projects in Northern Ontario (e.g., Musselwhite Mine, Victor Diamond Mine).
- Input from regulatory and public consultation, and engagement with Aboriginal communities.

Based on these criteria, the VSCs selected are provided in Table 2-3. The detailed rationale for the selection of the VSCs is provided in the Socio-economic Environment TSD.

### 2.5.5 Aboriginal Interests Valued Social Components Selection Criteria

Aboriginal interests VSCs were selected through an issues scoping exercise that identifies the particular components of the environment for which there is public, Aboriginal, regulatory or scientific concern.

The VSCs for the Aboriginal Interests effects assessment were selected based on the following considerations:

- Engagement with Aboriginal communities, as detailed in Chapter 7.
- Literature pertaining to Aboriginal treaties, land claims, fishing and harvesting rights.

- Previously published environmental assessments for mining projects with Aboriginal interests accepted by CEA Agency.

The VSCs were characterized using indicators; where indicators are the attributes of the VSC that might be affected by the Project. Indicators typically are associated with specific measures that can be quantified and assessed.

Based on these criteria, the VSCs selected are provided in Table 2-3. The detailed rationale for the selection of the VSCs is provided in the Aboriginal Interests TSD.

### 2.5.6 Summary of Valued Ecosystem Components used in the Environmental Assessment

Table 2-3 provides a list of the VECs and VSCs selected for the Project. As noted, the table also includes a summary of the rationale for selection of each VEC/VSC and the indicators which were used to measure and predict potential effects of the Project on the identified VEC/VSCs.

### 2.5.7 Environmental and Social Components Considered

The environmental and social components that are considered in the EIS/EA Report are provided in Chapter 1.

## 2.6 Assessment Methodology

*<u>Version 3 Update</u>: CMC acknowledges that additional narrative may be useful to describe potential impacts during each project phase rather than focusing the narrative on the worst case project phase (i.e., bounding phase). As such, additional discussion has been added where appropriate within the annotated text of the EIS/EA Report.*

*To demonstrate how the adopted assessment approach incorporates sufficient consideration of all project phases, the following supplemental information is provided:*

- *The assessment included evaluation of preferred options and alternatives throughout all phases of the project including construction, operations, closure and post-closure. For each phase of the project the influence of a given alternative, were considered and evaluated using methodology as identified in Section 2.6. Performance indicators and criteria were developed and used as described in Sections 2.5, 2.6 and in the Version 3 Alternatives Assessment TSD.*
- *The methodology used for assessment of project phases, alternatives and the preferred alternative evaluation is summarized as follows:*
  - *Review of potential associated activities for each of construction, operations, closure, and post-closure was identified as indicated in the project description (as provided ToR; and as is publicly available in the NI 43-101 Technical Report).*
  - *For each activity and project phase the following was identified:*
    - *Project and environmental interactions that could result in measureable impacts as indicated in the Alternatives Assessment TSD, Chapter 4, and as carried forward into Chapter 6, based a review of the performance indicators and criteria.*

  - *Physical, biological, and socio-economic components that could be affected by project activities in all phases were evaluated in consideration of existing conditions (Chapter 3), as per the Alternatives Assessment TSD, and effects assessment (Chapter 6) for preferred options.*

- *Numerical modelling (Hydrology, Air Quality, Noise, Hydrogeology, Water Quality, and Biology) was conducted where applicable and appropriate (as summarized in Chapter 6, and as presented in TSDs and in the Addendum). All modelling was conducted in consideration of all project phases as follows:*
  - *Initial input values for each project phase and activity were developed*
  - *Models were constructed using conservative assumptions whereby a worst case input condition was assigned for each project phase (the same input condition was applied to multiple phases where input data was considered conservative – i.e. where potential for impact would be over-predicted)*
  - *Model results for the worst case conditions were evaluated relative to each project phase (construction, operations, closure and poste closure) and assessed for potential impact*
  - *Impacts were assigned similar values in each project phase in instances where model results showed that (using worst case input values) results for all phases were not expected to cause impact (see Section 6, impact evaluation tables by project phase)*
  - *Model methods and results were documented and reported in TSDs or within the Addendum.*
  - *Additional narrative as applicable for each project phase has been annotated within specific sections of the EIS/EA or in the IR responses.*
  - *Impact Management - In some instances initial calculations showed that mitigation measures were required as part of the Project. (e.g., cyanide destruction technology). These mitigation measures were assumed as part of the Project and are included in the assessment.*
  - *Residual Effects are provided for each of the construction, operations, closure and post closure phases as indicated in the Alternatives Assessment TSD, Chapter 4 and Chapter 6.*

*Based on the methodology used and described above, CMC is confident that this EIS/EA Report addresses all potential impacts for all project phases in a conservative fashion.*

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The effects assessment followed a stepwise methodology as follows:

- Screening of Project activities with the potential to have interactions with the VECs of the socio-economic environment.
- Prediction (i.e., identification and description) of likely effects of the Project.
- Identification of suitable mitigation measures to reduce or eliminate the identified adverse effects.
- Assessment of whether adverse effects are likely after mitigation (i.e., residual effects).
- Determination of the significance of residual effects. If there is uncertainty of whether an effect remains after mitigation, the effect is forwarded for determination of significance.

The effects assessment is completed within the framework of temporal and spatial boundaries described in Section 2.2.2. The assessment takes into account a precautionary approach and incorporates Aboriginal traditional knowledge, where available.

The effects assessment identifies potential effects of the Project on the environment following a source-pathway-receptor approach. Project activities represent sources of effects, measurable changes to the environment represent pathways, and VECs represent receptors. In some cases, VECs may act as both pathways and receptors.

Project effects may occur through direct or indirect pathways. Direct pathways occur when a VEC is affected by an effect resulting from a Project activity, such as an increase in local employment through Project hiring. Indirect pathways occur when a VEC is affected by an effect on another VEC, for example the resulting change in hunting and fishing as a result of changes to the aquatic environment. The effects assessment recognizes the widest, reasonable range of potential direct and indirect effects without specific regard for their probability of occurrence.

When a likely Project effect is judged as being positive it is not assessed further and no evaluation of significance is conducted. All positive effects are included in Chapter 11 as part of the benefits of the Project.

The identification of potential environmental effects was undertaken on the basis of the identified Project activities and the likely interactions of these with the natural environment, including issues that have been identified in consultation with local communities, regulators and other stakeholders. The process recognizes that only where there is a potential interaction could there be a potential effect.

### 2.6.1 Screening Project and Environment Interactions

Project activities identified in the screening were assessed against existing or baseline attributes of the natural and social environment, including the physical, biological and socio-economic criteria identified for the selection of study areas.

Particular attention was given to surface water resources, and rare or endangered species. Project activities that are not expected to not interact with the environment were not considered further.

The assessment of environmental effects was performed using the following procedure to identify the Project activities that have the potential to be affected by the Project. The approach used in the initial screening was to:

- Identify Project activities based on the detailed project description (Chapter 5).
- Those Project activities that could have an effect on, or interact with, the natural environment were identified and assessed further.

The results of the initial screening helped focus the effects assessment on sensitive and locally significant species or groups of species, with the understanding that effects on other components of the ecosystem would be similar.

### 2.6.2 Prediction and Assessment of Likely Effects

A systematic and consistent approach was employed in the assessment of environmental issues and potential effects. The assessment of potential effects was assessed in consideration of different categories of effect. The categories were:

- **Direction:** The direction of an effect may be positive, neutral or negative with respect to a given issue (e.g., enhancement of a wildlife movement corridor would be classed as a positive direction, whereas habitat loss or fragmentation would be considered a negative direction).
- **Extent:** The spatial area affected by the potential effects of the Project. For the purposes of this assessment *Extent* was classified as: within the MSA, within the LSA, or within the RSA.
- **Magnitude:** The amount of change in a measurable parameter or the predicted/actual level of change relative to an existing or specified condition. *Magnitude* was defined according to the specific nature of the effect. For the purposes of this assessment, magnitude was classified as: low, moderate and high. The definition of magnitude differs for each environmental component.
- **Duration:** This refers to the length of time over which an effect occurs. For the purpose of this assessment, duration was classified as: short-term (i.e., lasting only during the construction period), medium-term (i.e., lasting the entire operational period) and long-term (i.e., extending beyond the closure of the Project, sometimes in perpetuity).
- **Reversibility):** This considers the potential for recovery of a given receptor from the effect. For the purpose of this assessment, reversibility of a potential effect (or degree of irreversibility) was classified as Low for effects that reverse to the pre-effect condition after the source of the effect is removed, Moderate for effects that reverse to achieve 50% or greater of the pre-effect condition, and High for effects in which a greater than 50% change occurs such that the pre-effect condition cannot be substantially achieved.

Magnitude for physical disciplines, such as hydrology, water quality and air quality was assessed relative to existing regulatory standards, criteria or guidelines. Accordingly, physical components, such as air quality, surface water and groundwater quality, and soils and sediment quality were assessed with respect to the environmental standards presented in Chapter 6.

#### 2.6.2.1 Assessment Measures

Assessment methods specific to each environmental component are briefly described in the following sections.

Assessment measures for extent, duration, frequency and reversibility are common to all environmental components, and these are defined in Table 2-4. Measures for magnitude differ among each component and are defined separately for each component as provided in Tables 2-5 through 2-8 and Table 2-10. Magnitude is defined only for the biological, cultural heritage resources, and socio-economic components.

For the physical environment components, the results of predictive modelling are used as direct inputs into the assessment on biological receptors, since the effects of changes in physical conditions have significance only with respect to effects on biological indicators. For example, the magnitude of a change in water level can only be assessed with respect to the terrestrial and aquatic biological resources that would be affected by such a change. Similarly, changes in water quality parameters are assessed directly with respect to the potential for adverse effects on aquatic life, wildlife and human health.

#### 2.6.2.2 Magnitude Levels for Specific Environment Components

Tables 2-5 through 2-8 provide the magnitude levels for the selected VECs.

#### 2.6.2.3 Risk Assessment Framework

The assessment of effects was based on established frameworks for predicting the potential for adverse effects on the environment.

Various agencies including the CCME, MOE and the U.S. EPA have developed risk assessment frameworks that provide a standard approach for assessing effects based on a simple assessment of three factors:

- **Source:** the source of a potential effect must be present. This includes physical disturbances of the environment and exposure to potentially harmful substances.
- **Pathway:** Some means by which the source of the potential effect can affect environmental attributes (attributes can be physical, chemical or biological) must be present.
- **Receptor:** there must be an environmental attribute that the pathway leads to, and thereby can potentially affect.

While risk assessment frameworks were originally developed to specifically assess the effects of exposure to chemical substances on biological receptors, the risk assessment framework is applicable to assessing physical effects as well, since in all cases, the three components defined above must be present in order for a potential effect to occur. Sources of potential effect from the Project include land disturbance that can result in loss of habitat, either temporarily or permanently, exposure to human activity including noise, and potential exposure to emissions and discharges of substances to the environment. These typically include air emissions and discharges of storm water, process water and/or domestic waste water to the environment.

Only where there is a source of a potential effect, a receptor that could be exposed, and a reasonable pathway by which the receptor can be exposed is there a potential for an effect.

The effects are then assessed against established benchmarks associated with a specific adverse response in the environment. The benchmarks are typically based on the scientific literature and experience at other similar sites in order to determine the degree of risk that the source presents to the environmental attributes.

### 2.6.3 Identification of Mitigation Measures

Mitigation measures have been included in the design of the Project where potential effects can be anticipated during the engineering design phase. These design measures are termed “in-design mitigation”. As a result, many Project components include inherent mitigation measures, and the effects assessment assumes that these measures will be in place.

However, in some cases, potential effects cannot be anticipated until the effect assessment has been completed. Where additional mitigation measures were needed to modify the effects of a potential effect, these are identified, and the assessment was repeated with the additional mitigation measures.

### 2.6.4 Identification of Residual Effects

The Project is a complex undertaking that will occur in four phases which differ in their potential interactions with the natural and socio-economic environments and in the potential for occurrence of residual effects. In order to focus the effects assessment, the Project's effect assessment addresses the physical components of the environment identified in Section 2.5.2.

While the effects assessment included predictions of changes to physical environmental components, the focus of determination of significance was generally based on the biological receptors that were subject to those changes. Numerical guidelines are readily available for many physical parameters such as water and air quality, but the significance of any exceedance lies in determination of effects on, or risks to, biological receptors or components of the environment.

Consequently, the environmental assessment focuses on biological resources. Many of the pathways of effects relate to changes in the physical environmental components listed above. Potential effects may also arise from Project activities such as site clearing that physically displace or alter habitat and also from indirect socio-economic factors such as increased human population density and improved access that can result in changes in exploitation of local biological resources. Biological components of the environment are identified in Section 2.5.3.

Human and ecological health was evaluated using a risk assessment approach described in Section 2.6.2. Risk assessment is a scientific tool used to characterize the nature and magnitude of potential risks, if any, associated with the exposure of receptors (e.g., humans, wildlife and aquatic life) to substances.

A Conceptual Site Model was developed by the risk assessors, using physical and biological data provided by the other environmental assessment disciplines. The Model was used to understand which substances (i.e., substances present at concentrations in excess of the applicable guidelines/standards or COPCs) are present in the study area, how receptors may use the areas, and the pathways of contact that are possible between these substances and the receptors. These substances, receptors, and pathways (the environmental risk components) are examined in detail to identify the "reasonably anticipated" combinations corresponding to potentially complete exposure pathways.

Taken together, the physical and biological effect assessments comprise the environmental assessment, and were used to predict any changes to the quality and availability (quantity) of resources in the study areas.

The process of assessing and evaluating the effects of the Project, as described in the following sections, was based on an integration of a number of criteria and sources of information. The process includes both an evaluation of site-specific information, in the form of empirical data from the site, modeling studies and consultation with Aboriginal communities, stakeholders and regulators, as well as a review of the broader technical and scientific literature. The latter includes the published scientific literature, effects assessments and environmental effects studies at similar sites, published best management practices and professional judgement and experience.

## 2.6.5 Significance of Residual Effects

*Version 3 Update: Clarification of the definition of "significance of effects" is provided in response to MNR-14 (see Addendum Part B; Table B-1).*

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The effects assessment is based on the Project Description detailed in Chapter 5, and includes all mitigation measures currently incorporated into the design. Where adverse effects to the environment were identified, additional mitigation measures have been incorporated, where feasible, to minimize or avoid entirely any residual effects. All residual adverse effects were then re-evaluated to determine the final significance of the likely effect.

As noted, residual effects are assessed after all mitigation measures have been identified, including in-design mitigation incorporated into the Project design and further mitigation identified in the assessment. Where mitigation is not possible, for example, the permanent loss of aquatic habitat, compensation measures are identified.

### *2.6.5.1 Method for Determining Significance*

Determination of the significance of an effect is based on an integration of the assessment measures. For example, an effect that has high magnitude, but is confined to the MSA, is of short duration, and is reversible, would be considered to have low significance. In addition, significance is often modified by mitigation measures that serve to lessen the effects, and for many of the components, these are inherent in the engineering design.

Exceedance of a regulatory criterion is not necessarily an indication of a significant effect, and it does not automatically provide a measure of significance to biological receptors. Each environmental change must be interpreted according to the degree of risk of effect to the biological communities based on specific attributes of pathway, exposure and receptor characteristics, as well as the likelihood of measurable effects on populations or communities. This approach recognizes that effects at the community or population level can have much longer lasting effects than effects on individuals.

The significance of an effect is usually assessed relative to a biological endpoint, such as effects on biological communities (VECs) or human health. The determination of significance is based on the potential effects on biological receptors, rather than the physical environment. Since the effects on physical components, such as water quality, are determined with respect to their potential biological effects (e.g., water quality guidelines have been developed with the purpose of protecting biological resources), the assessment of significance is considered within this context.

The assessment was conducted with the use of tables that organized and summarized the process described above into comparable and intuitive presentations for each of the construction, operations, and closure and post-closure phases. The assessment tables are provided in Chapter 6.

The effects assessment uses six criteria to assess the significance of an adverse effect, as following:

- **Direction:** the direction of the effect as positive or negative.
- **Magnitude:** the size or degree of the effect for a given parameter.
- **Geographic extent:** the spatial area over which the effect may occur.
- **Duration:** the length of time over which the effect may occur.
- **Frequency:** the rate of recurrence of the effect (or conditions causing the effect).
- **Degree of Irreversibility:** whether the effect may or may not be reversed.

In order to assess effects, levels are associated to each criterion except direction. Criteria such as geographic extent, duration, frequency and degree of irreversibility use three levels: low, medium and high, as shown in Table 2-9.

A modification of the magnitude levels was used in the socio-economic assessment. VSC-specific magnitude levels were determined as shown in Table 2-10. Four levels are associated to the magnitude criterion: negligible, low, medium and high.

The assessment of significance of an effect was determined using a decision tree specific to the socio-economic environment. In a decision tree magnitude, geographic extent, frequency, duration, and degree of irreversibility are combined to determine the overall significance of the effect. Four levels of significance are differentiated: Negligible, Low, Moderate and High. As noted previously, only adverse residual effects are assessed for significance.

In general for socio-economics and land use, a residual adverse effect was considered of negligible significance if geographic extent is low or magnitude is negligible. If geographic extent was moderate or high and magnitude is low or medium, significance is moderate. If geographic extent was medium or high, and magnitude was high, the level of significance was assesses as being high. Generally frequency, duration and degree of irreversibility were not used to evaluate the significance of an effect on VSC.

The decision tree for the socio-economic environment is shown in Figure 2-4.

## 2.7 Environmental and Social Management Plans

Environmental and Social Management Planning (ESMP) is provided in Chapter 8 and defines the management framework, processes and monitoring requirements for the Project. Analysis of the data obtained through environmental monitoring would be used to confirm predictions included in the EIS/EA Report and make corrective plans where necessary.

The ESMP has been developed to cover all Project phases, including construction, operations and closure/ post-closure and may be updated and revised as the Project is implemented. The ESMP will apply to all Project personnel and contractor/subcontractor personnel as well as visitors to the Project Site.

The ESMP was developed based on the effects summary provided in Chapter 6.

## 2.8 Community Consultation and Aboriginal Engagement

The Government Review Team (GRT), public, and Aboriginal communities have been actively engaged and informed on an ongoing basis through the environmental assessment process. Interested parties will have the ongoing opportunity to comment on the Project and the EIS/EA Report.

Consultation activities were carried out by OHRG's Sustainable Development group as part of the Project planning process. OHRG's approach is to be inclusive with information sharing and listen to concerns from all interested parties. Further, OHRG sought to identify and use a variety of communications methods to provide a range of means for people to be informed about the Project and have the opportunity to provide their input.

### 2.8.1 Government

*Version 3 Update: Subsequent to the submission of the Version 2 EIS/EA Report, the government review team provided additional comments. These comments were reviewed and responses were submitted in an Addendum to the Version 2 EIS/EA Report in June 2015.*

*The government review team provided further comment on the responses provided in the June 2015 Addendum. Through submission of draft responses, meetings and subsequent correspondance with the government reviewers, all comments have been responded to formally to the satisfaction of the government review team. The EIS/EA Addendum has been expanded to include responses to all comments received since the Version 2 EIS/EA Report was submitted. The provided Addendum to this Version 3 EIS/EA Report supercedes the previous Addendum to the Version 2 EIS/EA Report submitted in June 2015.*

*Key concerns expressed by the MOECC regarding the Version 2 EIS/EA Report and subsequent exhange of comments and responses included:*

- *Concern regarding clarity and ability to readily access documentation submitted subseqeunt to the Version 2 EIS/EA Report. This has been addressed through this Version 3 EIS/EA Report and consolidation of all relevant documents in a single electronic submission.*
- *Concern regarding use of bounding scenario approach. This concern has been addressed through a further review (considering the ToR and Code of Practice for Preparing and Reviewing Environmental Assessments in Ontario), and provision of additonal clarifying narrative regarding the assessment process and results for each phase, as requested in EAB-3 and EAB-4 and as discussed within the clarifying text, throughout this Version 3 EIS/EA (see Addendum Part B; Table B-1).*

*An additonal recommendation was provided to allow sufficient time for subsequent permitting. CMC acknowleges this recommendation and will allow for sufficient time for subsequent permitting.*

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Provincial and federal government agencies have been working together to provide a streamlined consultation process where possible. Key contacts for the environmental assessment from provincial and federal governments have been identified as Ministry of Northern Development Mines, Ministry of Environment – Environmental Assessment and Approvals Branch and the Canadian Environmental Assessment Agency. Regular meetings took place with the lead agencies and they were kept informed of consultation with other stakeholders, particularly with a focus on Crown Oversight of Aboriginal consultation.

The GRT was invited to comment on OHRG’s approach throughout the environmental assessment process. The GRT was provided the Project description overview and baseline studies results prior to report publications. A Draft EIS/EA Report was published and presentations of the EIS/EA Results were delivered to the GRT. Discusssions took place on clarification of details, description of assumptions and justification of approach.

The GRT provided over 700 comments on the Draft EIS/EA Report. These comments were reviewed, responses were prepared and presentations were provided to the GRT with draft responses to comments. Additional discussion took place on recommended report revisions and requests for new work. Formal responses to comments on the Draft EIS/EA Report were compiled and are issued as part of the Final EIS/EA Report.

A series of meetings/workshops were held with the GRT to discuss a number of issues specifically related to Aquatic Biology including collection of baseline data, development of fish habitat accounting methodology, discussions regarding federal and provincial regulatory requirements and preliminary discussions regarding compensation for loss of fishing opportunities. OHRG worked with the government review team to finalize a Fish Habitat Accounting methodology for use in the No Net Loss Plan included in the Aquatic Biology TSD Supplemental.

### 2.8.2 Public

*Version 3 Update: Subsequent to the submission of the Version 2 EIS/EA Report, CMC has continued to keep the public informed of the project status through informal communication with the public in Atikokan. In February of 2017 CMC conducted additonal consultation on the updated Alternatives Assessment, including the assessment of accomodation camp location alternatives, through a presentation and meeting in the Town of Atikokan. The record of public consultation documents in Appendix 7.III, has been updated to include consultation that has occurred subsequent to the submission of the Version 2 EIS/EA Report.*

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OHRG has used a variety of methods to engage with the public including publication of Community News Briefs, Community Open Houses, meetings and presentations.

A newspaper column has been published online and in local newspapers (the Atikokan Progress, the Thunder Bay Chronicle Journal, the Ignace Driftwood and the Fort Frances Times) on a bi-weekly basis since November 2010. The objective of the Community News publication is to keep the public and Aboriginal communities with an interest in the Project informed through regular updates.

Six public open houses have been held in Atikokan and Fort Frances throughout the environmental assessment process. The timing of these community events has been tied to regulatory milestones including the Commencement of the EA Process and the Publication of a Draft EIS/EA Report. A community open house is also planned to share the findings of the Final EIS/EA Report publication.

Presentations have been given to the Town of Atikokan and other interested stakeholders on topics including the Project Description, the results of the Baseline Studies, Alternatives Assessment, Closure, Social Management Planning and the Results of the Environmental Assessment.

The Draft EIS/EA Report was circulated and responses have been provided to comments from stakeholders in written form and through presentations and meetings.

A local monitoring committee will be established which will be modelled after the existing Malartic/Osisko Community Committee. The details of the planned committee structure and potential meeting topics are provided in Chapter 8 Social Management Planning.

## 2.9 Aboriginal

*Version 3 Update: Subsequent to the submission of the Version 2 EIS/EA Report, CMC has continued to keep the Aboriginal communities informed of the project status through informal communication with the First Nations communities. In February 2017 CMC conducted additonal consultation on the updated Alternatives Assessment, including the assessment of accomodation camp location alternatives, through a presentation and a meeting with nearby Aboriginal communities. Other recent consultation topics have included planning of the draining of*

*Mitta Lake and the potential influence of increased sulphate loading on methyl mercury generation in Marmion Reservoir. The consultation log and record of aboriginal consultation documents in Appendix 7.V, has been updated to include consultation that has occurred subsequent to the submission of the Version 2 EIS/EA Report.*

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The Project is located within Treaty 3 lands, the traditional territory of the Anishinaabe people. OHRG has developed a relationship with the local First Nations people through ongoing information sharing and the signing of a Resource Sharing Agreement. The First Nations communities with an interest in the Project include the seven-member nations of the Fort Frances Chiefs Secretariat, the Lac de Mille Lacs First Nation and the Wabigoon Ojibway Nation. The closest First Nations community is located approximately 40 km away from the Project site.

The Project is also located within an area recognized by the Métis Nation of Ontario as the Treaty 3/Lake of the Woods/Lac Seul/Rainy River/Rainy Lake traditional harvesting territories. In March 2012, OHRG signed a Memorandum of Understanding with the Métis Nation of Ontario, including four identified Métis community councils (Kenora, Sunset Country, Northwest and Atikokan). The agreement allowed for the formation of a Métis consultation committee for the Project. As of November 2012, the deliverables identified in the agreement were fulfilled and committee members agreed that adequate consultation on the Project had taken place. OHRG is actively planning ongoing communications and partnerships with the Métis Nation of Ontario.

All three key Aboriginal groups have provided letters to government stating that OHRG has provided clear and ongoing communications throughout the Project planning process.

OHRG has used a variety of methods to engage with interested Aboriginal groups including publication Community Visits, Presentations to Chiefs, Elders Forums, Committee Meetings and Community Feasts. Draft and Final Reports have been circulated and responses have been provided to comments from Aboriginal groups.

Traditional knowledge has been incorporated into the environmental assessment through the provision of capacity for traditional protocols during the consultation process and the consideration of information provided into the Project design. OHRG has routinely followed advice provided by elders to include drumming and dancing in Project meetings.

Information provided by First Nations and Metis have allowed OHRG to avoid placing infrastructure in areas that are recognized as being special or sacred sites. The effluent treatment plant discharge location and tailings management facility location have both been adjusted to minimize potential impacts to areas with environmental value as identified by Aboriginal communities. OHRG also plans to use traditional knowledge to inform the development of appropriate fish relocation plan for Mitta Lake and other fish-bearing water bodies that will be affected by the Project.

A detailed record of consultation with public, Aboriginal communities and government review team to date is provided in Chapter 7, as well as details regarding ongoing consultation commitments.