

**HARDROCK PROJECT –
Effects of Changes to the
Environment on Aboriginal
Peoples – In Accordance
with Section 6.3.4 of the EIS
Guidelines issued by the CEA
Agency**

Prepared for:
Greenstone Gold Mines GP Inc.
365 Bay St, Suite 500
Toronto ON M5H 2V1



Prepared by:
Stantec Consulting Ltd.
1-70 Southgate Drive
Guelph ON N1G 4P5



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Table of Contents

1.0	INTRODUCTION	1.1
2.0	REGULATORY AND POLICY SETTING.....	2.1
2.1	CANADIAN ENVIRONMENTAL ASSESSMENT ACT, 2012	2.1
2.2	EIS GUIDELINES.....	2.1
2.3	IDENTIFICATION OF ABORIGINAL COMMUNITIES	2.2
2.3.1	Crown's Direction to GGM on Duty to Consult.....	2.3
3.0	METHODS.....	3.1
3.1	IDENTIFICATION OF KEY TOPICS	3.1
3.2	IDENTIFICATION OF RELATED VALUED COMPONENTS.....	3.3
3.3	DISCUSSION OF POTENTIAL EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLE PRIOR TO MITIGATION	3.4
3.4	IDENTIFICATION OF MITIGATION MEASURES	3.4
3.5	DISCUSSION OF RESIDUAL EFFECTS AND SIGNIFICANCE OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLE POST MITIGATION.....	3.4
3.6	CUMULATIVE EFFECTS	3.5
3.7	INFORMATION SOURCES	3.5
3.8	CONSERVATIVE APPROACH.....	3.6
4.0	IDENTIFICATION OF THE KEY TOPICS AND RELATED VALUED COMPONENTS	4.1
4.1	HEALTH CONDITIONS	4.1
4.1.1	Change in Air Quality.....	4.1
4.1.2	Change in Quality and Availability of Country Foods	4.2
4.1.3	Change in Drinking Water Quality or Quantity	4.3
4.1.4	Change in Noise or Vibration Exposure.....	4.3
4.2	SOCIO-ECONOMIC CONDITIONS.....	4.4
4.2.1	Change in Use of Navigable Waters	4.4
4.2.2	Change in Forestry and Logging Operations.....	4.4
4.2.3	Change in Commercial Fishing, Hunting, Trapping, Gathering, and Guide Outfitting Activities	4.4
4.2.4	Change in Recreation	4.5
4.2.5	Change in Labour and Economy	4.6
4.2.6	Change in Community Services and Infrastructure	4.6
4.3	PHYSICAL AND CULTURAL HERITAGE.....	4.7
4.3.1	Change in Physical or Cultural Heritage	4.7
4.4	CURRENT USE OF LANDS AND RESOURCES FOR TRADITIONAL PURPOSES BY ABORIGINAL PEOPLES	4.7
4.4.1	Change in Current Use	4.7

**HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES –
IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY**

5.0	DISCUSSION OF POTENTIAL CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES PRIOR TO MITIGATION	5.1
5.1	POTENTIAL CHANGES IN ATMOSPHERIC ENVIRONMENT PRIOR TO MITIGATION.....	5.1
5.2	POTENTIAL CHANGES IN ACOUSTIC ENVIRONMENT PRIOR TO MITIGATION	5.2
5.3	POTENTIAL CHANGES IN GROUNDWATER PRIOR TO MITIGATION	5.3
5.4	POTENTIAL CHANGES IN SURFACE WATER PRIOR TO MITIGATION.....	5.4
5.5	POTENTIAL CHANGES IN FISH AND FISH HABITAT PRIOR TO MITIGATION	5.5
5.6	POTENTIAL CHANGES IN VEGETATION COMMUNITIES PRIOR TO MITIGATION	5.6
5.7	POTENTIAL CHANGES IN WILDLIFE AND WILDLIFE HABITAT PRIOR TO MITIGATION.....	5.7
5.8	POTENTIAL CHANGES IN LABOUR AND ECONOMY PRIOR TO MITIGATION	5.8
5.9	POTENTIAL CHANGES IN COMMUNITY SERVICES AND INFRASTRUCTURE PRIOR TO MITIGATION	5.9
5.10	POTENTIAL CHANGES IN LAND AND RESOURCE USE PRIOR TO MITIGATION	5.11
5.11	POTENTIAL CHANGES IN HERITAGE RESOURCES PRIOR TO MITIGATION.....	5.15
5.12	POTENTIAL CHANGES IN TRADITIONAL LAND AND RESOURCE USE PRIOR TO MITIGATION.....	5.16
5.13	POTENTIAL CHANGES IN HUMAN AND ECOLOGICAL HEALTH PRIOR TO MITIGATION.....	5.18
6.0	MITIGATION, COMMITMENTS AND FOLLOW-UP MEASURES FOR CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLE.....	6.1
7.0	DISCUSSION OF RESIDUAL EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLE	7.1
7.1	HEALTH CONDITIONS.....	7.1
7.1.1	Change in Air Quality.....	7.1
7.1.2	Change in Quality and Availability of Country Foods	7.2
7.1.3	Change in Drinking Water Quality or Quantity	7.5
7.1.4	Change in Noise or Vibration Exposure.....	7.6
7.1.5	Significance Determination for VCs Related to Health Conditions for Aboriginal People	7.7
7.2	SOCIO-ECONOMIC CONDITIONS.....	7.10
7.2.1	Change in Use of Navigable Waters	7.10
7.2.2	Change in Forestry and Logging Operations.....	7.11
7.2.3	Changes in Commercial Fishing, Hunting, Trapping, Gathering, and Guide Outfitting Activities	7.11
7.2.4	Change in Recreation	7.12
7.2.5	Change in Labour and Economy	7.14
7.2.6	Change in Community Services and Infrastructure	7.15
7.2.7	Significance Determination for VCs Related to Socio-economic Conditions for Aboriginal People	7.16
7.3	PHYSICAL AND CULTURAL HERITAGE.....	7.17

**HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES –
IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY**

7.3.1	Change in Physical or Cultural Heritage	7.17
7.3.2	Significance Determination for Valued Components Related to Physical and Cultural Heritage for Aboriginal People.....	7.18
7.4	CURRENT USE OF LANDS AND RESOURCES FOR TRADITIONAL PURPOSES	7.18
7.4.1	Change in Current Use	7.18
7.4.2	Significance Determination for VCs Related to Current Use of Lands and Resources for Traditional Purposes by Aboriginal People	7.21
8.0	CHANGE IN MENTAL, SOCIAL, AND SPIRITUAL WELL-BEING	8.1
9.0	CUMULATIVE ENVIRONMENTAL EFFECTS	9.1
9.1	CUMULATIVE ENVIRONMENTAL EFFECTS ASSESSMENT	9.1
9.1.1	Introduction	9.1
9.1.2	Selection of VCs for Cumulative Environmental Effects Assessment	9.1
9.2	EFFECTS OF CUMULATIVE CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLE	9.3
9.2.1	Health Conditions	9.3
9.2.2	Socio-economic Conditions	9.4
9.2.3	Physical and Cultural Heritage	9.6
9.2.4	Current Use of Lands and Resources for Traditional Purposes	9.7
10.0	FOLLOW-UP AND MONITORING	10.1
11.0	REFERENCES.....	11.1

LIST OF TABLES

Table 3-1:	Effects of Changes to the Environment on Aboriginal Peoples and related Key Topics	3.2
Table 3-2:	Valued Components Related to Effects of Changes to the Environment on Aboriginal Peoples.....	3.3
Table 5-1:	Potential Effects of a Change in Atmospheric Environment on Aboriginal People Prior to Mitigation.....	5.2
Table 5-2:	Potential Effects of a Change in Acoustic Environment on Aboriginal People Prior to Mitigation.....	5.3
Table 5-3:	Potential Effects of a Change in Groundwater on Aboriginal People Prior to Mitigation.....	5.3
Table 5-4:	Potential Effects of a Change in Surface Water on Aboriginal People Prior to Mitigation	5.5
Table 5-5:	Potential Effects of a Change in Fish and Fish Habitat on Aboriginal People Prior to Mitigation	5.6
Table 5-6:	Potential Effects of a Change in Vegetation Communities on Aboriginal People Prior to Mitigation.....	5.7

**HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES –
IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY**

Table 5-7:	Potential Effects of a Change in Wildlife and Wildlife Habitat on Aboriginal People Prior to Mitigation.....	5.8
Table 5-8:	Potential Effects of a Change in Labour and Economy on Aboriginal People Prior to Mitigation.....	5.9
Table 5-9:	Potential Effects of a Change in Community Services and Infrastructure on Aboriginal People Prior to Mitigation.....	5.10
Table 5-10:	Potential Effects of a Change in Land and Resource Use on Aboriginal People in the Absence of Mitigation.....	5.12
Table 5-11:	Potential Effects of a Change in Heritage Resources on Aboriginal People in the Absence of Mitigation.....	5.15
Table 5-12:	Potential Effects of a Change in Traditional Land and Resource Use on Aboriginal People in the Absence of Mitigation.....	5.17
Table 5-13:	Potential Effects of a Change in Human and Ecological Health on Aboriginal People in the Absence of Mitigation.....	5.18
Table 6-1:	Summary of Mitigation Specific to Aboriginal Communities.....	6.2
Table 10-1:	Conceptual EMMPs Related to Effects of Changes to the Environment on Aboriginal People.....	10.2

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Introduction
June 2017

1.0 INTRODUCTION

Greenstone Gold Mines GP Inc. (GGM, the Proponent) proposes the construction, operation, and closure of an open pit gold mine and associated ancillary activities, collectively known as the Hardrock Project (the Project). The Project is located in northwestern Ontario, approximately 275 kilometres (km) northeast of Thunder Bay, in the Municipality of Greenstone, Ward of Geraldton.

The Project components include an open pit, ore processing facilities including crushing and process plants, waste rock storage areas (WRSAs), tailings management facility (TMF), natural gas-fuelled power plant, and other associated buildings and processes. Project activities include the removal or relocation of existing infrastructure currently located within the Project development area (PDA).

In February 2016, GGM submitted a Draft Environmental Impact Statement/Environmental Assessment (EIS/EA) (Stantec 2016) to government agencies, Aboriginal communities and stakeholders for review and comment. A number of follow-up meetings were held to present the Project and discuss comments/responses received.

As a result of follow-up meetings with the Canadian Environmental Assessment Agency (CEA Agency) in August and October 2016, GGM committed to developing this report (Effects of changes to the environment on Aboriginal peoples). This report consolidates the assessment of effects of the changes to the environment on Aboriginal peoples found throughout the Final EIS/EA (Stantec 2017d) into a single document for ease of readership, and focuses the assessment on the effects identified in section 6.3.4 of the "Guidelines for the Preparation of an Environmental Impact Statement pursuant to the *Canadian Environmental Assessment Act, 2012* – Hardrock Deposit Project: Premier Gold Mines Hardrock Inc." (EIS Guidelines; CEA Agency 2014, 2016).

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Regulatory and Policy Setting
June 2017

2.0 REGULATORY AND POLICY SETTING

2.1 CANADIAN ENVIRONMENTAL ASSESSMENT ACT, 2012

As set out in section 5(1)(c) of *Canadian Environmental Assessment Act, 2012* (CEAA 2012), the environmental effects that are to be considered with respect to Aboriginal peoples include “...an effect occurring in Canada of any change that may be caused to the environment on

- i. health and socio-economic conditions,
- ii. physical and cultural heritage,
- iii. the current use of lands and resources for traditional purposes, or
- iv. any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.”

2.2 EIS GUIDELINES

In addition to these requirements, the CEA Agency released the EIS Guidelines (CEA Agency 2014) on August 5, 2014 which specify the nature, scope and extent of the information required in the Environmental Impact Statement (EIS). On February 12, 2016, the CEA Agency provided an addendum update to the EIS Guidelines for the Project. The revision to the EIS Guidelines (CEA Agency 2016) describes the changes to the CEA Agency's list of Aboriginal communities with which GGM is expected to engage for the environmental assessment (EA). The EIS guidelines require: “...with respect to Aboriginal peoples, a description and analysis of how changes to the environment caused by the Project will affect:

- the current uses of land and resources for traditional purposes, including, but not limited to:
 - any effects on resources (fish, wildlife, birds, plants or other natural resources) used for traditional uses (e.g. hunting, fishing, trapping, collection of medicinal plants, use of sacred sites);
 - any effects of alterations to access into the areas used for traditional uses, including development of new roads, deactivation or reclamation of access roads and changes to waterways that affect navigation;
 - any effects on cultural value or importance associated with traditional uses or areas affected by the project (e.g. inter-generational teaching of language or traditional practices, communal gatherings);
 - how project construction timing correlates to the timing of traditional practices, and any potential impacts resulting from overlapping periods;

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Regulatory and Policy Setting
June 2017

- *the regional value of traditional use of the project area and the anticipated effects to traditional practice of the Aboriginal group, including alienation of lands from Aboriginal traditional use;*
- *indirect effects such as avoidance of the area by Aboriginal peoples due to increased disturbance (e.g. noise, presence of workers); and*
- *an assessment of the potential to return affected areas to pre-disturbance conditions to support traditional practices.*
- *human health, considering, but not limited to potential changes in air quality, quality and availability of country foods, drinking water quality, and noise exposure. When risks to human health due to changes in one or more of these components are predicted, a complete Human Health Risk Assessment (HHRA) examining all exposure pathways for pollutants of concern may be necessary to adequately characterize potential risks to human health;*
- *socio-economic conditions, including but not limited to:*
 - *the use of navigable waters;*
 - *forestry and logging operations;*
 - *commercial fishing, hunting, trapping, and gathering activities;*
 - *commercial outfitters; and*
 - *recreational use.*
- *physical and cultural heritage, and structure, site or thing of historical, archaeological, paleontological or architectural significance to Aboriginal groups, including, but not limited to:*
 - *the loss or destruction of physical and cultural heritage;*
 - *changes to access to physical and cultural heritage; and,*
 - *changes to the cultural value or importance associated with physical and cultural heritage” (CEA Agency 2014).*

For the purposes of this assessment physical and cultural heritage also includes any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.

2.3 IDENTIFICATION OF ABORIGINAL COMMUNITIES

The regulatory guidance documents addressed in Section 2.2 above refer to Aboriginal people, groups and communities. For the purposes of this report, the term “Aboriginal peoples” will be used to refer to Indigenous people generally, regardless of cultural or political affiliation. The term “Aboriginal communities” incorporates Aboriginal groups, and will be used to refer to more than one Aboriginal community identified as potentially interested in, or affected by, the Project. Individual Aboriginal communities will be referred to by their official titles.

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Regulatory and Policy Setting
June 2017

GGM has carried out consultation with Aboriginal communities, including those identified by the provincial and federal agencies, as described below.

2.3.1 Crown's Direction to GGM on Duty to Consult

The Crown has a duty to consult and, where appropriate, accommodate Aboriginal communities when it has knowledge of established or asserted Aboriginal or Treaty rights that might be adversely affected by a Crown decision or action. At the provincial level, although the ultimate responsibility for consultation rests with the Crown, certain procedural aspects of this consultation, such as information sharing and engagement for the Project, may be delegated to project proponents. At the federal level, the CEA Agency has indicated that the Crown retains all responsibilities under the duty to consult during the EA process. However, in both cases GGM's consultation record and outcomes will help to inform the Crown's assessment of whether its duty to consult has been met.

2.3.1.1 Federal Direction on Aboriginal Consultation

The federal Crown has directed GGM to consult with fourteen Aboriginal communities. The Crown's direction to GGM about which Aboriginal communities to consult with on the Project was set out in the following documents:

- "Guidelines for the Preparation of an Environmental Impact Statement pursuant to the *Canadian Environmental Assessment Act, 2012* – Hardrock Deposit Project: Premier Gold Mines Hardrock Inc." (EIS Guidelines) Part 2, section 5, August 2014
- Letter to GGM from the CEA Agency, dated December 17, 2015
- Addendum to the EIS Guidelines, February 12, 2016.

The cumulative direction from the CEA Agency based on these documents identified that GGM is required to "*hold meetings with the following potentially affected Aboriginal groups and facilitate these meetings by making key EA summary documents (baseline studies, EIS, key findings, plain language summaries) accessible*" (EIS Guidelines Addendum; CEA Agency 2016):

- Animbiigoo Zaagi'igan Anishinaabek (AZA)
- Aroland First Nation (AFN)
- Ginoogaming First Nation (GFN)
- Long Lake #58 First Nation (LLFN)
- Métis Nation of Ontario (MNO)

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Regulatory and Policy Setting
June 2017

For the above communities, GGM is required to “ensure there are sufficient opportunities for individuals and groups to provide oral input in the language of their choice, and ensure that these Aboriginal groups’ views are heard and recorded” (EIS Guidelines Addendum; CEA Agency 2016).

The CEA Agency also identified that “there are additional Aboriginal groups that are expected to be less affected by the project and its related effects” (EIS Guidelines Addendum; CEA Agency 2016). GGM is required to “make key EA summary documents (draft/final EIS, key findings, plain language summaries) accessible to these Aboriginal groups and ensure their views are heard, and recorded” (EIS Guidelines Addendum; CEA Agency 2016). These Aboriginal communities include:

- Biigtigong Nishnaabeg
- Biinjitiwaabik Zaaging Anishinaabek (BZA)
- Bingwi Neyaashi Anishinaabek (BNA)
- Constance Lake First Nation (CLFN)
- Eabametoong First Nation (EFN)
- Marten Falls First Nation (MFFN)
- Pays Plat First Nation (PPFN)
- Pic Moberg First Nation (PMFN)
- Red Sky Métis Independent Nation (RSMIN)

2.3.1.2 Provincial Direction on Aboriginal Consultation

This report focuses on demonstrating how the requirements of section 6.3.4 of the EIS Guidelines issued by the CEA Agency have been met in the Final EIS/EA. As the provincial Crown has also provided direction with regard to Aboriginal consultation, the information below is provided for further context.

The provincial Crown has directed GGM to consult with thirteen Aboriginal communities. The provincial Crown’s direction to GGM about which Aboriginal communities to consult with on the Project was set out in the following documents:

- Letter to Premier Gold Mines from the Ministry of the Environment and Climate Change (MOECC), dated November 7, 2014
- Terms of Reference – Notice of Approval, July 24, 2015 (MOECC 2015)
- Letter to GGM from MOECC, dated February 24, 2017
- Letter to GGM from MOECC, dated April 5, 2017

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Regulatory and Policy Setting
June 2017

On November 7, 2014, the MOECC notified GGM that three communities “hold or claim Aboriginal or treaty rights” that “may be adversely impacted by the Project”:

- AFN
- GFN
- LLFN

MOECC delegated aspects of consultation with these three communities to GGM, generally including:

- providing Project information to Aboriginal communities and following up with those communities to confirm they received the information
- gathering information on potential impacts to Aboriginal and/or Treaty rights
- providing potentially affected communities with opportunities to comment about the Project, considering and responding to those comments, and where appropriate discussing potential mitigation strategies with the communities
- maintaining a record of all consultation activities.

On November 7, 2014 (letter), the MOECC also indicated that in addition to GGM's “consultation obligations and delegation of procedural aspects with the Aboriginal communities discussed above, the Environmental Assessment Act also requires consultation with people and/or groups who may have an interest in the Project”. The MOECC identified that consultation activities should include, “at a minimum notifying communities about the Project at key milestones, providing information about the Project, considering comments provided by the communities and providing responses, and maintaining a Consultation Record for each community”. The communities identified on November 7, 2014 are listed below. In addition, on April 5, 2017, the MOECC added the MNO (in addition to the Greenstone Métis Council) to this list:

- | | |
|---------------------------------|-------------------------|
| • AZA | • Biigtigong Nishnaabeg |
| • BZA | • BNA |
| • CLFN | • EFN |
| • Greenstone Métis Council /MNO | • MFFN |
| • PPFN | • RSMIN |

A discussion of how GGM has met the Crown direction on Aboriginal Consultation is presented in section 3.6.1 of the Final EIS/EA (Stantec 2017d).

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Methods
June 2017

3.0 METHODS

This report is structured to reflect how section 6.3.4 of the EIS Guidelines were addressed in the main body of the Final EIS/EA, to discuss the following effects of changes to the environment on Aboriginal peoples':

- health conditions
- socio-economic conditions
- physical and cultural heritage
- current use of lands and resources for traditional purposes.

The following steps were followed to consolidate the assessment of effects of the changes to the environment on Aboriginal peoples into this report:

- Identifying the key topics for each of the identified effects of changes to the environment on Aboriginal peoples as listed in section 5(1)(c) of CEA 2012.
- Determining the valued components (VCs) assessed in the EIS/EA which are relevant to the effects of changes to the environment on Aboriginal peoples, and associated key topics.
- Discussing the changes to the environment identified in the assessment of VCs in the EIS/EA, and the potential effects on Aboriginal peoples resulting from such changes as they relate to the key topics.
- Identifying mitigation measures for reducing potential effects on Aboriginal peoples.
- Discussing residual effects of changes to the environment identified in the assessment of related VCs, and the potential residual effects on Aboriginal peoples.

Each of these steps is discussed further below.

3.1 IDENTIFICATION OF KEY TOPICS

Section 6.3.4 of the EIS guidelines subdivides each of the effects of changes to the environment on Aboriginal peoples. Based on these divisions, key topics have been identified in Table 3-1. Additional key topics have been identified because of the information provided by Aboriginal communities, or that emerged through completion of the EIS/EA. A total of 13 key topics have been identified and are used to structure and inform this report.

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Methods
June 2017

Table 3-1: Effects of Changes to the Environment on Aboriginal Peoples and related Key Topics

Effects of Changes to the Environment on Aboriginal Peoples	Key Topics	Rationale for Inclusion
Health conditions	Change in air quality	As required by EIS guidelines
	Change in quality and availability of country foods	As required by EIS guidelines
	Change in drinking water quality or quantity	As required by EIS guidelines
	Change in noise or vibration exposure	As required by EIS guidelines
Socio-economic conditions	Change in use of navigable waters	As required by EIS guidelines
	Change in forestry and logging operations	As required by EIS guidelines
	Change in commercial fishing, hunting, trapping, gathering, and guide outfitting activities	As required by EIS guidelines
	Change in recreation	As required by EIS guidelines
	Change in labour and economy	New key issue identified because of information provided by Aboriginal communities
	Change in community services and infrastructure	New key issue identified because of information provided by Aboriginal communities
Physical and cultural heritage	Change in physical or cultural heritage	As required by EIS guidelines this includes: loss or destruction of physical and cultural heritage, and changes to access to physical and cultural heritage; and changes to the cultural value or importance associated with physical cultural heritage
Current use of lands and resources for traditional purposes	Change in current use	As required by EIS guidelines, including: effects on resources; effects of alterations to access into the areas used for traditional uses; effects on cultural value or importance associated with traditional uses or areas affected by the Project; and how Project construction timing correlates to the timing of traditional practices

Aboriginal communities also provided comments relating to a change in mental, social, and spiritual well-being. This is discussed separately in Section 8.0 as it overlaps with many of the key issues identified above.

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Methods
June 2017

3.2 IDENTIFICATION OF RELATED VALUED COMPONENTS

The assessment of the effects of changes to the environment on Aboriginal peoples focuses on the interactions between changes to VCs and Aboriginal peoples. Although environmental assessments (EAs) tend to focus their analysis on discreet VCs, the interdependency between VCs plays an important role in how these changes may affect Aboriginal peoples. For example, changes in surface water quality may influence fish health, which could in turn affect health conditions or socio-economic conditions for Aboriginal peoples.

Table 3-2 shows where the most direct relationships exist, with recognition that most VCs are inter-dependent and the assessments are considered in that context throughout this report.

Table 3-2: Valued Components Related to Effects of Changes to the Environment on Aboriginal Peoples

Valued Component	Health Conditions	Socio-economic Conditions	Physical and Cultural Heritage	Current Use of Lands and Resources for Traditional Purposes
Atmospheric Environment	✓	-	-	-
Acoustic Environment	✓	-	-	-
Groundwater	✓	-	-	-
Surface Water	✓	-	-	-
Fish and Fish Habitat	✓	-	-	-
Vegetation Communities	✓	-	-	-
Wildlife and Wildlife Habitat	✓	-	-	-
Labour and Economy	-	✓	-	-
Community Services and Infrastructure	-	✓	-	-
Land and Resource Use	-	✓	-	-
Heritage Resources	-	-	✓	-
Traditional Land and Resource Use	-	-	-	✓
Human and Ecological Health	✓	-	-	-

NOTES:

- ✓ Interaction between changes to VCs and Aboriginal peoples
- No interaction between changes to VCs and Aboriginal peoples

To simplify editorial components of the Final EIS/EA, current use of lands and resources for traditional purposes is referred to as traditional land and resource use (TLRU). Project effects on TLRU are addressed in chapter 18.0 of the Final EIS/EA (Stantec 2017d).

3.3 DISCUSSION OF POTENTIAL EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLE PRIOR TO MITIGATION

There are multiple pathways through which changes to the environment may take place and affect Aboriginal people. For each key issue, a summary of the effect pathways through which a change to the environment may affect Aboriginal people (individually or in combination with other changes to the environment) is provided (see Section 5.0 of this report).

3.4 IDENTIFICATION OF MITIGATION MEASURES

Mitigation measures have been developed in each VC chapter of the Final EIS/EA (Stantec 2017d) to address potential changes to the environment as a result of Project activities. These mitigation measures help to avoid or reduce residual environmental effects and subsequently can help to avoid or reduce effects of changes to the environment on Aboriginal people. To consolidate information assessed in multiple VCs into this report, key mitigation measures from each relevant VC have been identified, including consideration of recommendations for mitigation identified through consultation activities (see Section 6.0 of this report).

3.5 DISCUSSION OF RESIDUAL EFFECTS AND SIGNIFICANCE OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLE POST MITIGATION

For each key issue, the residual environmental effects from each related VC chapter are summarized, and a discussion of how these residual effects may affect Aboriginal people is provided. In some cases, there is a direct relationship between a VC and the key topics (e.g., air quality). In other cases, multiple VCs will contribute information to a single key issue (e.g., quality and availability of country foods will include the results of interactions from multiple VCs).

The determination of significance relies on the characterizations and determinations presented in the assessment of related VCs and their associated environmental effects, and relates those determinations specifically to the effects of changes to the environment on Aboriginal people. The discussions of residual environmental effects and significance incorporate, to the extent possible, information from Aboriginal communities and consider the unique background and context in which Aboriginal people may experience Project effects. It is acknowledged that effects experienced by Aboriginal people may not be reflective of the effects anticipated for any one VC and that effects may also vary between Aboriginal communities. One of the benefits of consolidating the assessments of effects of the changes to the environment found throughout the Final EIS/EA into a single report is that the nuances and variability in the effects experienced by Aboriginal people can be discussed, where information is available to support these discussions. This report will also identify linkages to monitoring and follow-up commitments made for other VCs (see Section 7.0 of this report).

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Methods
June 2017

3.6 CUMULATIVE EFFECTS

Changes to the environment may also take place as a result of cumulative effects of the Project in combination with other past, present, and future projects and physical activities. These changes have the potential to affect the VCs that are related to health conditions, socio-economic conditions, physical and cultural heritage, and current use. A discussion of how cumulative effects may affect Aboriginal people is provided (see Section 9.0 of this report).

3.7 INFORMATION SOURCES

The sources of information from Aboriginal communities considered in this chapter are the same as those used in the preparation of the Final EIS/EA and include:

- Project-specific engagement and consultation
- Project-specific traditional knowledge (TK) and TLRU studies or assessments
- Project-specific socio-economic studies
- comments on the Draft EIS/EA
- cultural impact assessments completed for the exploration phase of the Project
- TLRU studies completed for other developments located near the Project
- Aboriginal communities' websites
- government databases.

GGM recognizes the proprietary nature of certain information provided by Aboriginal communities regarding current use of lands and resources for traditional purposes, and that Aboriginal communities may stipulate one time use of some TRLU information. Confidential studies regarding current use of lands and resources for traditional purposes or those stipulating one-time use were excluded from the literature review conducted for the EIS/EA. AFN has indicated that their Traditional Knowledge and Land Use Study (TKLU Study) conducted for the Project is confidential. AFN has agreed to allow use of a summary document that omits confidential information to inform the effects assessment, but has not approved any documentation to be appended to the Final EIS/EA.

Where applicable, information from Aboriginal communities has been incorporated in the Final EIS/EA. For the VCs, the influence of consultation and consideration of information from Aboriginal communities is summarized at the beginning of each VC chapter.

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Methods
June 2017

3.8 CONSERVATIVE APPROACH

As this report has consolidated information from sections of the Final EIS/EA, the assumptions and conservative approach associated with each related VC are also applicable to this discussion. The information sources listed above provide a snapshot of use and indicate areas or topics that are particularly important to Aboriginal communities. A conservative approach has been applied, whereby activities with a degree of uncertainty have been assumed to contribute to effects of changes of the environment on Aboriginal people. Where the conservative approach identified the effects of changes to the environment on Aboriginal people, mitigation and follow-up have been recommended to reduce these effects.

Where the discussion of environmental effects includes reference to spatial areas such as the PDA, local assessment area (LAA), and regional assessment area (RAA), these refer to the spatial areas associated with the effects assessments for various VCs.

4.0 IDENTIFICATION OF THE KEY TOPICS AND RELATED VALUED COMPONENTS

This section summarizes the input received through consultation with Aboriginal communities as it pertains to the key topics identified for each of the potential effects of changes to the environment on Aboriginal people. Additional information about how input from Aboriginal communities influenced GGM's engagement activities and the assessment process of individual VCs is presented in chapter 3.0 of the Final EIS/EA (Stantec 2017d) and as part of the scope of assessment outlined in each VC chapter (chapters 7.0 to 19.0; Stantec 2017d).

At the direction of AFN, the locations and nature of current use activities, including species relied upon to exercise current use activities, identified in the AFN TKLU Study are confidential and are therefore have not been considered in this report – a summary document provided by AFN was used.

The following sections summarize key comments and information received from Aboriginal communities related to each of key topics identified in Table 3-2. The description of how each of these comments has been addressed by GGM and considered in the EIS/EA is not presented here, as that information is the focus of Section 5.0 of this report. The spatial boundaries and potential Project interactions associated with these comments from Aboriginal communities are also not presented here as that information is afforded a fulsome discussion in Section 5.0 of this report. The key topics identified in Table 3-2 are not mutually exclusive categories. For example, a comment from an Aboriginal community about hunting moose may be related to health conditions, socio-economic conditions, and current use. It is acknowledged that there is overlap in the way key comments and information received from Aboriginal communities is presented in Sections 4.1 to 4.4. This was approach was taken to provide an accurate summary of the key comments and information received from Aboriginal communities.

4.1 HEALTH CONDITIONS

4.1.1 Change in Air Quality

Through the consultation process, the following Aboriginal communities provided key comments on changes to the atmospheric environment, including a change in air quality: AZA, AFN, CLFN, GFN, LLFN, and MNO.

Aboriginal communities provided comments and information requests with respect to a change in air quality (with the specific community or communities that raised the comment identified in brackets), including:

- potential dust effects on local communities and the environment (AFN, GFN, LLFN)
- potential metals deposition in nearby lakes (AFN, GFN, LLFN)

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Identification of the Key Topics and Related Valued Components
June 2017

- effects of disturbing historical tailings on air quality (AFN)
- cumulative effects of air contaminant emissions on vegetation, and completion of air quality monitoring for “parameters of potential concern affecting vegetation” (AFN, CLFN, LLFN)
- potential effects on humans, fish and wildlife from air quality criteria exceedances (LLFN, MNO)
- the importance of including areas used for traditional purposes by Aboriginal communities in the assessment of the atmospheric environment (AFN, GFN, MNO).

4.1.2 Change in Quality and Availability of Country Foods

Through the consultation process, the following Aboriginal communities provided key comments in relation to a change in quality and availability of country foods: AZA, AFN, Biigtigong Nishnaabeg, CLFN, GFN, LLFN, and MNO.

With regard to a change in quality and availability of country foods, Aboriginal communities provided comments on, or requested additional information about, the following key comments (with the specific community or communities that made the comment identified in brackets):

- potential effects on community fishing, plant harvesting, hunting and trapping (AFN, Biigtigong Nishnaabeg, GFN, LLFN, MNO)
- consideration of dietary preference of Aboriginal communities (AFN, Biigtigong Nishnaabeg, LLFN)
- potential effects on humans, fish and wildlife from contamination of food sources (AFN, AZA, Biigtigong Nishnaabeg, CLFN, LLFN, MNO)
- elevated metal concentrations in walleye populations (AFN, Biigtigong Nishnaabeg, LLFN)
- effects on fish and fish habitat from blasting, including potential mitigation (AFN, Biigtigong Nishnaabeg)
- fish consumption, including related to exposure pathways, potential risks to humans who harvest fish, and using fish consumption predictions that are representative of local Aboriginal consumption of fish harvested (Biigtigong Nishnaabeg, GFN, LLFN)
- Project effects on fish and wildlife that are fished and hunted by local communities (AZA, CLFN, GFN, LLFN)
- inclusion of wild game and fish tissue samples in monitoring programs for human and ecological health consumption limits (AFN, Biigtigong Nishnaabeg, LLFN, MNO).

Aboriginal communities identified 12 species of fish, 21 species of wildlife, and 33 species of plants as being of interest to them. A discussion of how each species of interest has been considered in the Final EIS/EA is provided in sections 11.1.3, 12.1.3, and 13.1.3 of the Final EIS/EA (Stantec 2017d).

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Identification of the Key Topics and Related Valued Components
June 2017

4.1.3 Change in Drinking Water Quality or Quantity

Through the consultation process, the following Aboriginal communities provided key comments in relation to a change in drinking water quality or quantity: AFN, AZA, Biigtigong Nishnaabeg, CLFN, GFN, LLFN, and MNO.

With regard to a change in drinking water quality or quantity, Aboriginal communities provided comments on, or requested additional information about, the following key comments (with the community or communities that made the comment identified in brackets):

- groundwater movement in the area and potential effects on AFN's water supply that is groundwater-fed (AFN)
- potential effects on humans from water quality changes as a result of the Project (AFN, Biigtigong Nishnaabeg, GFN, LLFN)
- drinking water ingestion for typical residential receptors (GFN)
- potential effects on fish and wildlife from water quality changes (AFN, Biigtigong Nishnaabeg, CLFN, GFN, LLFN, MNO)
- include sources of drinking water for LLFN (LLFN)
- effects of the Project on drinking water (AFN, Biigtigong Nishnaabeg, GFN, LLFN)
- identified Kenogamisis Lake as an area traditionally used by its members and reported that Elders drink the water from Kenogamisis Lake (AZA)
- compare surface water quality results against drinking water standards instead of Provincial Water Quality Objectives (PWQO) (Biigtigong Nishnaabeg).

4.1.4 Change in Noise or Vibration Exposure

Through the consultation process, the following Aboriginal communities provided key comments on a change in noise or vibration exposure: AFN, Biigtigong Nishnaabeg, GFN, and MNO.

With regard to a change in noise or vibration exposure, Aboriginal communities provided comments on, or requested additional information about, the following key comments (with the community or communities that made the comment identified in brackets):

- effects on drivers along Highway 11 both from a noise and vibration perspective, startling or distracting drivers and causing hazardous driving conditions (GFN)
- the importance of including areas used for traditional purposes by Aboriginal communities in the assessment of the acoustic environment (AFN, GFN, MNO)
- effects on fish and fish habitat from blasting (AFN, Biigtigong Nishnaabeg).

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Identification of the Key Topics and Related Valued Components
June 2017

4.2 SOCIO-ECONOMIC CONDITIONS

4.2.1 Change in Use of Navigable Waters

Through the Aboriginal consultation process, no issues were recorded pertaining specifically to Project interactions with the use of waterways for navigation. However, Aboriginal communities have identified travel routes that make use of navigable waterways outside the PDA (with the community or communities using the waterway identified in brackets):

- along the Southwest Arm of Kenogamisis Lake (LLFN, MNO)
- north end of Wildgoose Lake, through the Southwest Arm of Kenogamisis Lake, and continuing through Kenogamisis Lake (LLFN)
- “there is a canoe route that goes from Pays Plat First Nation to Dickison Lake and eventually to Geraldton” (PPFN).

GGM has considered the potential for these navigable waterways to be affected by Project activities.

4.2.2 Change in Forestry and Logging Operations

Through the Aboriginal consultation process, no comments were recorded pertaining specifically to potential Project interactions with forestry and logging operations. However, the PDA overlaps areas of Crown timber located within the Kenogami forest management unit (FMU). The Kenogami FMU is administered by the Ministry of Natural Resources and Forestry (MNRF) and managed by Ne-Daa-Kii-Me-Naan Inc., a First Nation-owned forest management company that is operated by a Board of Directors representing seven Aboriginal communities in the region (GFN, LLFN, AFN, CLFN, PPFN, AZA, and Red Rock Indian Band) (Nedaak 2016).

4.2.3 Change in Commercial Fishing, Hunting, Trapping, Gathering, and Guide Outfitting Activities

For the purposes of the Final EIS/EA, commercial fishing is limited to commercial bait harvesting. Through the consultation process, the following Aboriginal communities provided key comments on a potential change in commercial fishing, hunting, trapping, gathering, and guide outfitting activities: AZA, AFN, CLFN, GFN, LLFN, MNO, and PMFN.

The following key comments relating to a change in commercial fishing, hunting, trapping, gathering, and guide outfitting activities were identified (with the community or communities that made the comment identified in brackets):

- consideration of commercial, recreational, and Aboriginal (CRA) fisheries (as defined in the *Fisheries Act*), with specific reference to Goldfield Lake, Kenogamisis Lake, and Mosher Lake in the EA (MNO)
- additional information on mitigation measures to control hunting, trapping and fishing by workers (GFN)

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Identification of the Key Topics and Related Valued Components
June 2017

- community members hold the licences for two traplines in the area (AZA):
 - As part of consultation activities, GGM confirmed that trapline GE021 is held by a member of AZA. Additional information about the second trapline has not been disclosed.
- recognizing Aboriginal fisheries and fishing practices in the EA (AFN)
- in a TK study for another project, identified freshwater resources as important to cultural and subsistence practices, and to tourism and commercial fishing and indicated that fishing occurs in an area approximately 7.5 km from the PDA (AZA)
- trapline areas currently held by community members include GE034, GE023 and GE009 (LLFN)
- include detail on the location of Métis communities, Métis regions and harvesting territories, specific uses under the Harvesting Agreement (established in 2004 between MNO and the MNR), species of importance, key areas, and commercially-based activity specific to Métis (MNO)
- in hard economic times, fishing and hunting provide valuable economic input and invaluable cultural, spiritual, and recreational opportunity (AFN, CLFN, GFN)
- additional information about how community harvesting and traditional foods, snowmobile trails and commercial trapline licences will be affected by the Project (AFN)
- commercial trapline licence holders near Caramat Road (PMFN).

The MNR and CEA Agency identified commercial trapline areas held by Aboriginal peoples. These include GE021, GE023, GE034, GE035, GE008, GE009, GE120, and NG089 which are located within and beyond the RAA. The location in relation to the PDA is discussed in Section 5.10. GGM has confirmed, as part of consultation activities, that GE021 is held by a member of AZA and GE009, GE023 and GE034 are held by members of LLFN. The CEA Agency also identified commercial baitfish licence areas held by Aboriginal peoples including areas NI5007, NI5013, NI5019, NI5020, NI5034, NI5035, and NI5055.

4.2.4 Change in Recreation

Through the consultation process, the following Aboriginal communities provided key comments on a change in recreation: AFN, BNA, GFN, LLFN, MNO and RSMIN.

The following key comments relating to a change in recreation were identified (with the community or communities that made the comment identified in brackets):

- access restrictions and controls (AFN, GFN, LLFN, MNO)
- changes to lands currently used for recreation, firewood collection, fishing, and hunting (AFN, GFN, LLFN, RSMIN)
- the golf course has the potential to be affected by the Project (AFN, BNA, GFN, LLFN)

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Identification of the Key Topics and Related Valued Components
June 2017

- recreation services and infrastructure could potentially be affected by the Project (GFN)
- community and recreation services for children could potentially be affected by the Project (GFN, LLFN).

4.2.5 Change in Labour and Economy

Through the consultation process, the following Aboriginal communities provided key comments on changes to labour and economy: AZA, AFN, BNA, BZA GFN, LLFN, MNO, MFFN, and PPFN.

The following key comments relating to a change in labour and economy were identified (with the community or communities that made the comment identified in brackets):

- some community participants indicated that employment in the resource extraction sector provides cash for food and gasoline, which alleviates the pressure to procure food by traditional means (GFN)
- the need for Aboriginal members to have direct or indirect employment opportunities with the Project, including required trades, timelines, training, hiring processes and third party business opportunities (AZA, AFN, BNA, GFN, LLFN, MNO, MFFN, PPFN)
- unique labour force values in relation to the Métis, including labour force participation and unemployment rates, employment by industry and occupation, labour force skill levels, labour availability, income levels and business and economic activities (MNO).

4.2.6 Change in Community Services and Infrastructure

Through the consultation process, the following Aboriginal communities provided key comments on changes to community services and infrastructure: AFN, BNA, GFN and LLFN.

The following key comments relating to a change in community services and infrastructure were identified (with the community or communities that made the comment identified in brackets):

- the Discover Geraldton Interpretive Centre, the Hydro One Longlac Transmission Station, the Ontario Provincial Police (OPP) station and the historical MacLeod-Cockshutt Mining Headframe have the potential to be affected by the Project (AFN, GFN)
- the golf course and Highway 11 have the potential to be affected by the Project (AFN, BNA, GFN, LLFN)
- health care services and infrastructure could potentially be affected by the Project (GFN)
- health care and emergency services, housing / rental stock, and traffic on the highway and railroads could potentially be affected by the Project (LLFN)
- Michael Power Boulevard, the OPP Station, historical MacLeod-Cockshutt Mining Headframe and the Discover Geraldton Interpretive Centre have the potential to be affected by the Project (BNA).

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Identification of the Key Topics and Related Valued Components
June 2017

4.3 PHYSICAL AND CULTURAL HERITAGE

4.3.1 Change in Physical or Cultural Heritage

Through the consultation process, the following Aboriginal communities provided key comments on a change in physical or cultural heritage or associated access: AFN, GFN, LLFN, and MNO.

The following key comments relating to a change in physical or cultural heritage were identified (with the community or communities that made the comment identified in brackets):

- the importance of considering heritage resources as significant or of interest to Aboriginal communities in the effects assessment (AFN, GFN)
- the inclusion of First Nation land use and occupancy studies in the archaeological assessments (AFN)
- further detail to be included in the assessment on heritage sites of importance to LLFN and consideration of TK for sites in the highway footprint (LLFN)
- consideration of the Métis perspective when assessing heritage resources (MNO)
- further discussion of existing conditions, including related to areas of archaeological potential that are not tied to modern water sources, and consideration of heritage resources that may be affected by water level changes (GFN).

The value placed on Aboriginal cultural heritage sites is intrinsically linked with the current use of lands and resources by Aboriginal communities and therefore the key comments and information provided by Aboriginal communities on this topic are presented in Section 4.4.1 of this report.

4.4 CURRENT USE OF LANDS AND RESOURCES FOR TRADITIONAL PURPOSES BY ABORIGINAL PEOPLES

To simplify editorial components of the Final EIS/EA, current use of lands and resources for traditional purposes is referred to as TLRU in chapter 18.0 of the Final EIS/EA (Stantec 2017d).

4.4.1 Change in Current Use

Through the consultation process the following Aboriginal communities provided key comments regarding a change to current use areas, activities, and associated resources: AZA, AFN, Biigtigong Nishnaabeg, BZA, BNA, CLFN, EFN, GFN, LLFN, MFFN, MNO, PPFN and RSMIN.

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Identification of the Key Topics and Related Valued Components
June 2017

The following key comments relating to a change to current use were identified (with the community or communities that made the comment identified in brackets):

- species of importance for current use activities and practices (AFN, Biigtigong Nishnaabeg, EFN, GFN, LLFN, MFFN, MNO, PPFN)
- ability to exercise Aboriginal and/or treaty rights and continued use of traditional territories and historical land use (AZA, AFN, Biigtigong Nishnaabeg, GFN, LLFN, MNO)
- restrictions on harvesting and access to current use areas (AFN, BNA, GFN, LLFN, MNO)
- effects on harvesting areas and resources through Project activities or contamination (AZA, AFN, Biigtigong Nishnaabeg, BNA, CLFN, EFN, LLFN, MFFN, MNO, RSMIN)
- effects on cultural and spiritual areas (AZA, AFN, GFN, LLFN, MNO)
- importance of traditional land use practices for subsistence and economic purposes (AZA, AFN, Biigtigong Nishnaabeg, CLFN, GFN)
- effects on Aboriginal fisheries, fishing practices and fish and fish habitat (AZA, AFN, Biigtigong Nishnaabeg, BZA, CLFN, EFN, GFN, LLFN, MNO, RSMIN).

Through the consultation process, no comments were recorded pertaining specifically to changes to cultural value or importance associated with current use or Aboriginal cultural heritage sites. However, AFN and GFN community members noted that some Elders avoid harvesting in disturbed areas and cease to use areas treated with herbicide. GFN noted “*Less time is being spent on the land by middle age and Elders. There is a loss of connection to the land – mostly because hunting and fishing [is] not as good*”. AFN noted that there is the potential for loss of individual and community TK and skills as a result of loss of lands and resources used for traditional purposes. LLFN noted that the value of heritage resources depends upon the value to the community. Aboriginal communities also identified cultural or spiritual areas, which include: sacred areas (AFN, LLFN, MNO, PPFN), communal gathering areas (AFN, LLFN, MNO), habitation sites (AFN, LLFN, MNO), sites of site of cultural continuity (EFN), and trails or travelways (AFN, LLFN, PPFN). GGM has considered the potential for the cultural value or importance associated with current use, including Aboriginal cultural heritage to be affected by Project activities.

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Discussion of Potential Changes to the Environment on Aboriginal Peoples Prior to Mitigation
June 2017

5.0 DISCUSSION OF POTENTIAL CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES PRIOR TO MITIGATION

The following sections provide a summary of the mechanisms by which the Project may interact with the VCs assessed in chapters 7.0 to 19.0 of the Final EIS/EA (Stantec 2017d), taken directly from those specific VC chapters. Following the summary, a table is provided which outlines the mechanisms by which the Project may interact with Aboriginal peoples (prior to mitigation) as a result of those Project-VC interactions in the context of the potential effects those changes to the environment may have on Aboriginal peoples.

5.1 POTENTIAL CHANGES IN ATMOSPHERIC ENVIRONMENT PRIOR TO MITIGATION

During Project construction, emissions of air parameters of potential concern (PoPC) may result from site preparation activities and the construction of Project components. These emissions would include particulate matter and combustion gases from construction equipment, and particulate matter (dust) emissions caused by the operation of heavy earth-moving equipment and wind erosion. Construction emissions are expected to occur intermittently during daytime hours over the duration of the construction phase.

During Project operation, emissions of air PoPC and volatile organic compounds may result from: the combustion of diesel fuel; natural gas combustion in the power plant; emissions from mill reagents; and particulate or dust emissions generated by operation of the open pit, mining fleet traffic, and the stockpiling, handling and transport of ore, historical tailings, waste rock and overburden.

Active closure emissions are expected to be less than construction emissions, and therefore the construction assessment will implicitly address the active closure phase emissions as well. The post-closure phase is expected to generate limited air contaminant emissions.

A summary of how a Project-related change in atmospheric environment may potentially affect Aboriginal people is provided in Table 5-1.

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Discussion of Potential Changes to the Environment on Aboriginal Peoples Prior to Mitigation
June 2017

Table 5-1: Potential Effects of a Change in Atmospheric Environment on Aboriginal People Prior to Mitigation

Effects of Changes to the Environment on Aboriginal People	Summary of Potential Effects on Aboriginal People
Health conditions – change in air quality	The health conditions of Aboriginal people can be affected by a change in atmospheric environment through a change in air quality and associated inhalation-related health risks. Potential air quality issues associated with the Project that can potentially affect Aboriginal people's health include airborne particulate matter or dust (i.e., total suspended particulate, particulate matter with diameter of 10 micrometers or less (inhalable particulate matter) [PM ₁₀], particulate matter with diameter of 2.5 micrometers or less (respirable particulate matter) [PM _{2.5}] and associated metals in particulate), emissions from the combustion of diesel and natural gas, and emissions from the operation of an open pit mine and ore processing. Aboriginal peoples can be exposed to Project-related emissions and particulate matter while engaged in recreational activities and using lands and resources for traditional purposes. AFN, MNO, and GFN noted the importance of including areas used for traditional purposes by Aboriginal communities in the assessment of the atmospheric environment. In response, 17 special receptors representing areas of TLRU were included in the assessment to provide additional information about a potential change in air quality to which Aboriginal people can be exposed (Figure 7-1 in the Final EIS/EA; Stantec 2017d).

5.2 POTENTIAL CHANGES IN ACOUSTIC ENVIRONMENT PRIOR TO MITIGATION

The primary sources of noise during construction include trucks and trailers, portable air compressors, bulldozers, front end loaders, excavators, graders, gravel and rock trucks, scrapers, compactors, mobile cranes, and concrete pumps. Similar to noise, vibration is caused as a result of construction vehicles, typical machinery for a mining site and roadway realignment work.

The main noise-generating sources associated with operation include blasting in the open pit, process plant equipment such as rock breakers, feeders, and conveyors, moving sources such as trucks, excavators, and dozers, as well as power generation. The main vibration-generating sources associated with Project operation include equipment such as rock breakers and feeders, and moving sources such as trucks, excavators, and bulldozers. Blasting within the open pit will also produce vibration.

Noise generated during active closure is expected to be equal or less than during construction.

A summary of how a Project-related change in acoustic environment may potentially affect Aboriginal people is provided in Table 5-2.

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Discussion of Potential Changes to the Environment on Aboriginal Peoples Prior to Mitigation
June 2017

Table 5-2: Potential Effects of a Change in Acoustic Environment on Aboriginal People Prior to Mitigation

Effects of Changes to the Environment on Aboriginal People	Summary of Potential Effects on Aboriginal People
Health conditions – change in vibration or noise exposure	The health conditions of Aboriginal people can be affected by a change in acoustic environment through Project-related increase in noise or vibration levels. Aboriginal peoples can be exposed to Project-related noise or vibration while engaging in recreational activities and using lands and resources for traditional purposes. AFN, MNO, and GFN noted the importance of including areas used for traditional purposes by Aboriginal communities in the acoustic assessment. In response, Points of Interest (POIs) representing areas of TLRU were included in the assessment to provide additional information about potential Project-related increases in noise or vibration to which Aboriginal people can be exposed. GFN also identified the potential for Project-related blasting to startle or distract drivers and cause hazardous driving conditions (Figure 7-1 in the Final EIS/EA; Stantec 2017d).

5.3 POTENTIAL CHANGES IN GROUNDWATER PRIOR TO MITIGATION

During construction, groundwater quantity and/or flow will primarily be affected by dewatering of the historical underground workings, the Borrow Pit Phase of the open pit, the development and dewatering of aggregate source areas and the diversion of Goldfield Creek. During operation, drawdown resulting from open pit dewatering may potentially affect local groundwater users if located within the predicted zone of influence (ZOI). The removal of portions of historical tailings and changes in groundwater flow during operation has the potential to improve groundwater quality by reducing loadings of PoPC to the environment. During closure groundwater levels will slowly rise and changes to groundwater flow direction and discharge locations are expected. These changes will affect groundwater flow patterns and discharge to surface water features and wetlands. The effects of these changes on surface water and wetlands are further assessed in chapters 10.0 (surface water VC) and 12.0 (vegetation communities VC) of the Final EIS/EA (Stantec 2017d).

A summary of how a Project-related change in groundwater may potentially affect Aboriginal people is provided in Table 5-3 below.

Table 5-3: Potential Effects of a Change in Groundwater on Aboriginal People Prior to Mitigation

Effects of Changes to the Environment on Aboriginal People	Summary of Potential Effects on Aboriginal People
Health conditions – change in drinking water quality or quantity	The health conditions of Aboriginal people can be affected by a change in groundwater through changes in drinking water quality or quantity. Aboriginal people can be affected by dewatering activities if groundwater wells used by Aboriginal peoples are located within the predicted ZOI.

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Discussion of Potential Changes to the Environment on Aboriginal Peoples Prior to Mitigation
June 2017

5.4 POTENTIAL CHANGES IN SURFACE WATER PRIOR TO MITIGATION

Construction activities and the continued expansion of Project facilities have the potential to affect surface water quantity and drainage patterns through: changes in runoff, evapotranspiration and infiltration characteristics; changes in effective contributing catchment areas; watercourse realignment; and surface water extraction. Specific construction activities of note include: treated effluent discharge, site preparation and ground disturbance; realignment of Highway 11; dewatering of the historical underground workings, the Borrow Pit Phase and aggregate sources; temporary dewatering for installation of Project infrastructure; construction of watercourse crossings; diversion/realignment of Goldfield Creek, trenches and excavations; and the development of water management infrastructure.

During operation, surface water quantity may be affected by the development of the WRSAs and TMF, ongoing water management, dewatering of the open pit and historical underground workings, meeting mill demand by internal recycling of contact water, water withdrawals from the Southwest Arm of Kenogamisis Lake to meet processing needs, and linear facilities with accompanied drainage infrastructure.

During construction and operation, surface water quality could be affected by erosion and sedimentation, and contact water. In addition, during operation, discharge of treated effluent may potentially affect surface water quality. Project activities which result in erosion and sedimentation and discharge to surface water features may also affect surface water quality during closure.

Closure activities with the potential to affect surface water quantity include the decommissioning and removal of Project components including water management facilities, the re-establishment of drainage patterns, and the filling of the open pit with water.

A summary of how a Project-related change in surface water may potentially affect Aboriginal people is provided in Table 5-4 below.

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Discussion of Potential Changes to the Environment on Aboriginal Peoples Prior to Mitigation
June 2017

Table 5-4: Potential Effects of a Change in Surface Water on Aboriginal People Prior to Mitigation

Effects of Changes to the Environment on Aboriginal People	Summary of Potential Effects on Aboriginal People
Health conditions – change in drinking water quantity or quality	<p>The health conditions of Aboriginal people can be affected by a change in surface water through a change in drinking water quality or quantity.</p> <p>Aboriginal peoples who rely on municipal water sources will not experience a change in drinking water quality or quantity as the water supply for Geraldton is obtained from Cecile Lake, which is located within the Burrows River watershed, and will not be affected by the Project.</p> <p>Aboriginal peoples can experience a change in drinking water quality or quantity if drinking water is affected from streams and lakes in areas where lands and resources are used consumption. AZA reported that Elders drink the water from Kenogamisis Lake. LLFN and GFN identified Long Lake, which is located downstream of the Project RAA, as a drinking water supply for both communities. LLFN and GFN are serviced by Longlac Water Treatment Plant which draws water from Long Lake.</p> <p>The potable water supply for MacLeod Provincial Park is sourced from a shallow dug groundwater well located just south of the lagoon that connects to Kenogamisis Lake. The Park water supply system is classified as a Groundwater Under the Direct Influence of Surface Water (GUDI) well because the groundwater supply is in direct hydraulic connection with surface water. As a result, a change in surface water quantity and quality of Kenogamisis Lake has the potential to affect this drinking water source.</p>

5.5 POTENTIAL CHANGES IN FISH AND FISH HABITAT PRIOR TO MITIGATION

During construction, operation, and closure potential mechanisms for effects on fish include: the mobilization and transport of sediment to fish habitat; changes to flow; dewatering; destruction of fish eggs; stranding of fish; the introduction of deleterious materials to fish habitat from point (i.e., treated effluent discharge) and non-point sources (i.e., surface run-off, groundwater seepage, and dustfall); and shock waves from explosives usage.

A permanent alteration of fish habitat may occur through changes to water characteristics from treated effluent, groundwater discharge, physical changes, extraction of surface water, changes to the riparian vegetation and structure, and changes to flow regime related to construction, operation, and closure activities.

Fish habitat may be lost as a result of the placement of materials or structures in water during construction. No operation or closure activities have been identified that would results in a loss of fish habitat. Loss of fish habitat that cannot be avoided will be addressed through the implementation of the Fisheries Offset Plan.

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Discussion of Potential Changes to the Environment on Aboriginal Peoples Prior to Mitigation
June 2017

A summary of how a Project-related change in fish and fish habitat may potentially affect Aboriginal people is provided in Table 5-5 below.

Table 5-5: Potential Effects of a Change in Fish and Fish Habitat on Aboriginal People Prior to Mitigation

Effects of Changes to the Environment on Aboriginal People	Summary of Potential Effects on Aboriginal People
Health conditions – change in the quality and availability of country foods	<p>The health conditions of Aboriginal people can be affected by a change in fish and fish habitat through changes in the quality and availability of country foods. Changes to the availability of fish could result from harm, permanent changes to fish habitat, and the permanent loss of fish habitat. This can reduce the numbers of fish that are available for harvest, as well as potentially changing the location of fishing areas, if these are permanently changed or removed as a result of the Project. Changes to access to fishing areas is discussed in Section 5.12 of this report.</p> <p>Changes to fish can result in the uptake of metals in fish tissue which could affect health conditions through a change in the quality of country foods. This potential is considered in Section 5.13 of this report.</p>

5.6 POTENTIAL CHANGES IN VEGETATION COMMUNITIES PRIOR TO MITIGATION

The primary mechanism for change in vegetation communities is the removal of vegetation due to construction activities. Upland and wetland vegetation communities located in the PDA will be removed to accommodate Project components, resulting in the direct loss of approximately 1,133 hectares (ha) of upland and 810 ha of wetland vegetation communities. Additional vegetation clearing beyond that accomplished during construction will not take place during the operation and closure phases.

The function, connectivity, and quality of vegetation communities may be indirectly affected by dust deposition, changes in surface water and groundwater flow, the spread of invasive and exotic species, and fragmentation effects from introducing a large non-vegetated area into the landscape. Construction of Project components will remove wetlands and alter local topography and drainage patterns. Wetlands that are not directly affected by construction may be indirectly affected by changes in surface water flow.

Vegetation communities located within 30 metres (m) of Project components may be indirectly affected by increased dust. Sources of fugitive dust include clearing activities, vehicle traffic on unpaved surfaces, and the initial development of the open pit.

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Discussion of Potential Changes to the Environment on Aboriginal Peoples Prior to Mitigation
June 2017

Invasive and exotic (non-native) plant species can displace native vegetation. Invasive species exist within the Highway 11 right-of-way; however, areas within the PDA and LAA not currently affected may be affected by the spread of these invasive species by new roads, construction equipment and vehicles, or imported fill.

The Project will fragment some vegetation communities by introducing a large non-vegetated area into the landscape. Fragmentation effects are expected to occur along edges of linear corridors and along the edge of the PDA.

A summary of how a Project-related change in vegetation communities may potentially affect Aboriginal people is provided in Table 5-6 below.

Table 5-6: Potential Effects of a Change in Vegetation Communities on Aboriginal People Prior to Mitigation

Effects of Changes to the Environment on Aboriginal People	Summary of Potential Effects on Aboriginal People
Health conditions – change in the quality and availability of country foods	Changes in vegetation and wetlands can potentially affect the health conditions of Aboriginal people through changes in the availability of country foods. During construction, clearing of the PDA will result in a direct loss of existing vegetation, including plant species and potential plant harvesting sites identified by Aboriginal communities. Project activities will fragment vegetation communities, can spread invasive species and can increase dust all of which has the potential to affect availability of country foods. Access to these areas is considered in Sections 5.10 and 5.12 of this report. Changes to vegetation resulting in the uptake of metals in to berries and other plants harvested for consumption could affect health conditions through a change in the quality of country foods. This potential is considered in Section 5.13 of this report.

5.7 POTENTIAL CHANGES IN WILDLIFE AND WILDLIFE HABITAT PRIOR TO MITIGATION

Vegetation removal during site preparation will alter wildlife habitat. The change in wildlife habitat will take place during the construction phase but will be evident throughout the life of the Project and into post-closure. Project activities may change the risk of mortality for wildlife, with traffic and adverse human-wildlife encounters being the primary effect mechanisms. Project features such as the TMF open pit, WRSAs, ditches, site roads and powerline corridors may act as a barrier to wildlife movement. Wildlife may be reluctant to cross these features because of high levels of human activity, sensory disturbance, or because the features are too high or wide to physically move across.

Construction and operation activities also have the potential to affect habitat indirectly as the result of sensory disturbance (through noise, light and vibration) and, to a lesser extent, other indirect effects such as edge effects, dust deposition, and changes to groundwater or surface

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Discussion of Potential Changes to the Environment on Aboriginal Peoples Prior to Mitigation
June 2017

water systems. Noise and light may cause wildlife to avoid or abandon habitat and may cause stress or other physiological effects. The extent of sensory disturbance experienced by wildlife as a result of Project operation will vary with the type of disturbance, the intensity of human use, season and spatial scale. Sensory disturbance may be most pronounced if experienced during key wildlife life cycle periods, such as early in the nesting cycle.

Post-closure activities, such as revegetating areas where disturbance or removal of vegetation has occurred, will restore some wildlife habitat to the PDA. There will be some loss of wildlife habitat that will persist following post-closure, due to permanent Project components such as the open pit, WRSAs, and TMF.

Atmospheric emissions and water discharges (treated effluent and seepage) from Project activities can add concentrations of PoPC in ambient air, soil, surface water and sediment, which in turn may potentially affect the health of wildlife.

A summary of how a Project-related change in wildlife and wildlife habitat may potentially affect Aboriginal people is provided in Table 5-7 below.

Table 5-7: Potential Effects of a Change in Wildlife and Wildlife Habitat on Aboriginal People Prior to Mitigation

Effects of Changes to the Environment on Aboriginal People	Summary of Potential Effects on Aboriginal People
Health conditions – change in quality and availability of country foods	<p>The health conditions of Aboriginal people can be affected by a change in wildlife and wildlife habitat through changes in the quality and availability of country foods. Changes to wildlife habitat can potentially affect health conditions for Aboriginal people due to the potential related decrease in the availability of game species. These changes can be directly linked to the reduction in wildlife habitat within the PDA, and to changes in wildlife movement patterns as a result of Project activities (i.e., avoidance of the area). Changes to access to hunting areas is discussed in Section 5.12.</p> <p>Changes to wildlife resulting in the uptake of metals in wild meat could affect health conditions through a change in the quality of country foods. This potential is considered in Section 5.13.</p>

5.8 POTENTIAL CHANGES IN LABOUR AND ECONOMY PRIOR TO MITIGATION

Labour conditions in the LAA will be affected by Project-related direct, indirect, and induced employment during all Project phases. The hiring of local workers is expected to reduce the local unemployment rate but could reduce the availability of skilled and unskilled workers in the LAA for other employers. The labour force within both the LAA and RAA is expected to expand due to in-migration of Project workers (as well as spouses seeking employment), particularly during the operation phase. The Project's effect on the economy will take place through two

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Discussion of Potential Changes to the Environment on Aboriginal Peoples Prior to Mitigation
June 2017

mechanisms. Project purchases of labour, goods and services from businesses, will result in increased income, and municipal government revenue. Businesses in the LAA and RAA stand to benefit from successful bids to supply the Project with goods and services. Project activities, primarily during construction, have the potential to adversely affect other economic activities in the LAA and RAA, including the tourism and forest industries. The PDA will overlap the MacLeod-Cockshutt Mining Headframe, the Discover Geraldton Interpretive Centre, and the Kenogamisis Golf Club. The PDA is also situated in an area that is managed for forestry activities under the *Kenogami Forest Management Plan*.

A summary of how a Project-related change in labour and economy may potentially affect Aboriginal people is provided in Table 5-8 below.

Table 5-8: Potential Effects of a Change in Labour and Economy on Aboriginal People Prior to Mitigation

Effects of Changes to the Environment on Aboriginal People	Summary of Potential Effects on Aboriginal People
Socio-economic conditions – change in the local labour force and economy	The socio-economic conditions of Aboriginal people can be affected by a change in the local labour force and economy. Aboriginal people are anticipated to be among the local workers hired for the Project and a reduction in the unemployment rate for both Aboriginal and non-Aboriginal people within the LAA for Labour and Economy is expected. Aboriginal-owned businesses within the LAA and RAA stand to benefit from successful bids to supply the Project with goods and services.

5.9 POTENTIAL CHANGES IN COMMUNITY SERVICES AND INFRASTRUCTURE PRIOR TO MITIGATION

An increase in population in the LAA is expected as a result of the Project, which has potential to place additional demands on the local availability of housing and accommodation, and provincial and municipal services and infrastructure (e.g., health services and infrastructure, police and fire services, power, water, education, waste services and recreation). Project construction and operation activities will also affect transportation services infrastructure.

From 2001 to 2011 population in the LAA/RAA declined by 938 people from 5,662 to 4,724. The total Project-related population increase of is anticipated to be 1,050 men, women and children. During construction, the number of personnel will average 650 workers, with a maximum of 975 workers during peak construction activities. During operation, it is estimated that 350 workers will be in-migrant employees, and many employees will bring family members with them, who will place additional demand on services and infrastructure. The addition of 1,050 in-migrant workers and family members during operation, has the potential to increase demands on the need for medical, educational, and recreation services in the area.

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Discussion of Potential Changes to the Environment on Aboriginal Peoples Prior to Mitigation
June 2017

Other emergency services may be required by Project employees and their family members moving into LAA/RAA communities including the potential need for First Responder, fire department services, and policing services.

Additional demands will also be placed on utilities, including power, water and waste services and infrastructure. Hydro One has confirmed there is insufficient capacity for the operation phase of the Project. Heat and power for the Project operation phase will be supplied by an onsite natural gas-fuelled power plant and power generation heat recovery distribution systems. GGM plans to install a water pipeline system that will provide service water to buildings on the mine site. Waste management for the Project is outlined in the "Hardrock Project Conceptual Waste Management Plan" (GGM 2017g) and will be established at the onset of site preparation and construction. In discussions between GGM and the Municipality, it has been confirmed that the Longlac landfill has sufficient capacity to accept anticipated non-hazardous, domestic waste from the Project.

Non-local workers during construction, and in-migrant workers and their families during operation, will also require recreation, education and other services. The following existing recreation facilities will be removed as a result of the Project: the historical MacLeod-Cockshutt Mining Headframe, the Discover Geraldton Interpretive Centre and a municipal park and playground which currently service the MacLeod and Hardrock townsites. The back nine holes of the Kenogamisis Golf Club will also be removed and the front nine holes and the club house will be maintained as long as possible.

Project construction and operation activities will affect transportation services and infrastructure. In addition to personnel, it is expected that four to eight semi-trailer truckloads of construction material and four to ten concrete mixer trucks will travel to the Project each day, via Highway 11. Lahtis Road will be closed to the public at Highway 11 at the start of construction for Project safety. At closure, Lahtis Road is anticipated to be re-opened to the Goldfield Creek diversion.

A summary of how a Project-related change in community services and infrastructure may potentially affect Aboriginal people is provided in Table 5-9 below.

Table 5-9: Potential Effects of a Change in Community Services and Infrastructure on Aboriginal People Prior to Mitigation

Effects of Changes to the Environment on Aboriginal people	Summary of Potential Effects on Aboriginal People
Socio-economic conditions – change in recreation	The socio-economic conditions of Aboriginal people can be affected by a change in recreation. Recreation facilities such as the historical MacLeod-Cockshutt Mining Headframe, the Discover Geraldton Interpretive Centre, the municipal park and playground, and the Kenogamisis Golf Club can be utilised by Aboriginal peoples living on-reserve or in the Municipality of Greenstone. The closure or alteration of these facilities can potentially affect Aboriginal peoples.

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Discussion of Potential Changes to the Environment on Aboriginal Peoples Prior to Mitigation
June 2017

Table 5-9: Potential Effects of a Change in Community Services and Infrastructure on Aboriginal People Prior to Mitigation

Effects of Changes to the Environment on Aboriginal people	Summary of Potential Effects on Aboriginal People
Socio-economic conditions – change in community services and infrastructure	<p>The socio-economic conditions of Aboriginal people can be affected by a change in local community services and infrastructure.</p> <p>Potential effects of changes in community services and infrastructure for Aboriginal people living off-reserve are anticipated to be the same as effects experienced by non-Aboriginal people. The Project-related population increase has the potential to place additional demands on accommodation, health and emergency services and infrastructure, and provincial and municipal services and infrastructure which are relied upon by Aboriginal people living off-reserve. Similarly, Aboriginal people living off-reserve can be affected by the Highway 11 realignment and the safety-related closure of Lahtis Road.</p> <p>For Aboriginal people living on-reserve, Project-related population increases are not expected to interact with availability of accommodation. It is anticipated that construction workers will mostly live in the temporary camp, while some in-migrant workers (and their families) may choose accommodation in the Municipality and will not seek accommodation on reserve lands.</p> <p>Aboriginal people living on-reserve could experience Project changes in health and emergency services and infrastructure. OPP Greenstone Detachment provides support to the Aboriginal Policing Services in Greenstone. In addition to the residents of Greenstone, the Geraldton District Hospital also provides health services to the surrounding Aboriginal communities. If the Project places additional demands on Geraldton District Hospital services and infrastructure or the support the Greenstone OPP Detachment provides to the Aboriginal Policing Services, these effects can be experienced by Aboriginal people living on-reserve.</p>

5.10 POTENTIAL CHANGES IN LAND AND RESOURCE USE PRIOR TO MITIGATION

None of the watercourses in the PDA or LAA are listed on the *Navigation Protection Act* schedule of navigable waters. Navigation has not been confirmed within the PDA through consultation input, TK and TLRU studies or observations made during fieldwork; however, it is conservatively assumed that navigation is possible in the PDA on Goldfield Creek, the Southwest Arm Tributary (downstream of Southwest Arm Tributary Pond 3 [SWP3]), and SWP3.

During construction, operation and active closure, access restrictions to the PDA would prevent use of waterbodies in the PDA where navigation is considered possible. Although there has been no confirmed use of Goldfield Creek for navigation, the diversion will change the channel alignment for possible users. SWP3 forms part of Goldfield Creek diversion. Navigation could also be affected by the construction (and removal at closure) of watercourse crossings across the

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Discussion of Potential Changes to the Environment on Aboriginal Peoples Prior to Mitigation
June 2017

Southwest Arm Tributary and Goldfield Creek Tributary - North Branch. In addition, navigation may also be temporarily affected during the installation and removal of treated effluent discharge and freshwater intake structures along the shoreline of the Southwest Arm of Kenogamisis Lake. Changes to navigation could alter access to areas used for land and resource activities.

Site clearing and access restrictions during construction will result in a loss of commercial trapping, guide outfitting and bait harvesting in the PDA, which will persist through to the end of active closure. Disturbance effects on commercially-based uses outside of the PDA will include potential effects on the availability of wildlife resources of interest to trappers and guide outfitters and sensory disturbance to users within the LRU PDA. Potential Project-related effects on fish and fish habitat could reduce the availability of fisheries resources. Sensory disturbance, increased risk of mortality and disruption of existing wildlife movement patterns may decrease the presence of wildlife. Recreational users in the LAA, including visitors to MacLeod Provincial Park, may be affected by sensory disturbances including changes to: dust and light, noise and vibration, traffic, and the visual landscape.

Timber areas within the PDA would be cleared or flooded as part of site preparation, as well as through the construction of watercourse crossings and realignments, TMF, and linear facilities. The PDA overlaps 342 ha of planned harvesting area within the Kenogami FMU, which is licensed to Ne-Daa-Kii-Me-Naan, an Aboriginal-owned forest management company. These activities would remove Crown timber from future forest management activity. The removal of productive forest is considered permanent.

During construction, site clearing will remove areas used for recreational purposes such as fishing, hunting, snowmobiling, and hiking within the PDA. Access to the PDA or through the PDA via Lahtis Road will be restricted during construction and continue throughout operation, and active closure.

A summary of how a Project-related change in land and resource use may potentially affect Aboriginal people is provided in Table 5-10 below.

Table 5-10: Potential Effects of a Change in Land and Resource Use on Aboriginal People in the Absence of Mitigation

Effects of Changes to the Environment on Aboriginal People	Summary of Potential Effects on Aboriginal People
Socio-economic conditions - change in use of navigable waters	The socio-economic conditions of Aboriginal people can be affected by a change in use of navigable waters. If the watercourses within the PDA are used by Aboriginal peoples, the safety-related access restrictions in the PDA will prevent use of watercourses where it has been conservatively assumed that navigation is possible during construction, operation and active closure. Following closure, the Goldfield Creek diversion will permit navigation between Goldfield Lake and the Southwest Arm of Kenogamisis Lake; the

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Discussion of Potential Changes to the Environment on Aboriginal Peoples Prior to Mitigation
June 2017

Table 5-10: Potential Effects of a Change in Land and Resource Use on Aboriginal People in the Absence of Mitigation

Effects of Changes to the Environment on Aboriginal People	Summary of Potential Effects on Aboriginal People
	<p>change in channel alignment, however, could pose inconveniences to potential users. LLFN identified the Southwest Arm of Kenogamisis Lake, outside of the PDA, as a travel route. The installation and removal of treated effluent discharge and freshwater intake structures in the Southwest Arm of Kenogamisis Lake can temporarily affect navigation for LLFN members or other Aboriginal people who navigate close to the shoreline in the Southwest Arm of Kenogamisis Lake including along the recreational canoe route (see Figure 16-3 in the Final EIS/EA; Stantec 2017d).</p>
<p>Socio-economic conditions - change in forestry and logging operations</p>	<p>A Project-related change in commercially-based land and resource use would have potential to affect socio-economic conditions for Aboriginal people due to involvement in the management of Kenogami forest. Access to the PDA and the harvesting of Crown timber will be removed as part of site preparation. Clearing of the PDA will remove timber from the Kenogami FMU which is licensed to Ne-Daa-Kii-Me-Naan, an Aboriginal-owned forest management company. This 342 ha represents less than 1 percent (%) of the total planned harvesting area within the FMU. Planned harvest areas identified within the <i>Kenogami Forest Management Plan</i> have already received approval through an EA process to allow for removal of the timber.</p>
<p>Socio-economic conditions - change in commercial fishing, hunting, trapping, gathering, and guide outfitting activities</p>	<p>Some commercial plant harvesting by Aboriginal peoples can occur. Changes in the abundance of plant species of interest to Aboriginal communities or vegetation communities that support harvested species is assessed in chapter 12.0 of the Final EIS/EA (Stantec 2017d).</p> <p>Changes to socio-economic conditions for Aboriginal people can occur as a result of changes in fish and fish habitat as well as wildlife and wildlife habitat. Those changes to the environment can, in turn, affect socio-economic conditions for Aboriginal people through changes to commercial fishing, hunting, trapping, bear management areas and guide outfitting activities.</p> <p>Lethal and/or sub-lethal harm to fish, and the permanent alteration or loss of fish habitat, can affect the availability of fish for commercial fishing and guide outfitting activities. This can reduce the number of fish that are available for harvest, as well as potentially changing the location of fishing areas, if these are changed or removed as a result of the Project.</p> <p>Wildlife habitat changes can reduce the presence and availability of wildlife, including game species, within the PDA which could affect hunting and trapping outcomes in the surrounding area. Wildlife movement patterns can also be affected, if wildlife species avoid Project activities. Hunters, trappers, and guides currently using the area may have knowledge of local wildlife movement patterns, and if these change, hunting and trapping success can be reduced, and guiding effectiveness can also be reduced.</p> <p>Trapline GE021 will be affected by the Project and is held by a member of AZA. Twenty hectares of trapline GE021 (i.e., less than 1% of the total trapline area) is overlapped by the PDA and will be lost as a result of site clearing and access restrictions. Disturbance effects, potential effects on the availability of wildlife resources, and altered access conditions can potentially affect portions of trapline GE021 located outside of the PDA.</p>

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Discussion of Potential Changes to the Environment on Aboriginal Peoples Prior to Mitigation
June 2017

Table 5-10: Potential Effects of a Change in Land and Resource Use on Aboriginal People in the Absence of Mitigation

Effects of Changes to the Environment on Aboriginal People	Summary of Potential Effects on Aboriginal People
	<p>Traplines GE009, GE023 and GE034 are held by members of LLFN. MNRF and the CEA Agency identified four additional traplines held by Aboriginal peoples: GE035, GE008, GE120, and NG089 (note the Aboriginal communities with which the trapline holders are affiliated were not disclosed). These seven traplines are located outside of the PDA but can be affected by changes availability of wildlife resources, disturbance effects, and altered access conditions.</p> <p>The trapline identified by PMFN on Caramat Road falls outside of the RAA for the land and resource use VC and is not anticipated to be affected.</p> <p>Seven bait harvesting areas held by Aboriginal people are identified: NI5007, NI5013, NI5019, NI5020, NI5034, NI5035, and NI5055 (note the Aboriginal communities with which the baitfish licence holders are affiliated were not disclosed). One hundred and forty-one hectares of bait harvesting area NI5035 (i.e., approximately 1% of the total bait harvesting area) is overlapped by the PDA and will be lost as a result of site clearing and access restrictions. Disturbance effects and altered access conditions are anticipated to extend beyond the PDA and can potentially affect portions of NI5035 and the other six bait harvesting areas located outside of the PDA.</p> <p>In addition to changes to the resources required to conduct commercial trapping and bait harvesting, the quality of the experience of Aboriginal people engaging in these activities can be affected by creating sensory disturbance (e.g., increased dust, noise and lighting) and changes to the viewscape.</p>
Socio-economic conditions - change in recreation	<p>Project-related changes in recreation has the potential to affect socio-economic conditions for Aboriginal people. The closure of Lahtis Road will prevent access for recreational land and resource use to areas south of the PDA that can be accessed via this route. LLFN and MNO use Lahtis Road for recreation and access to the Southwest Arm of Kenogamisis Lake. In comments made by AFN to the CEA Agency, AFN confirmed they use snowmobile trails, which are operated by the Ontario Federation of Snowmobile Clubs and maintained by the Greenstone Snowmobile Club. Most segments of the snowmobile trails in and near the PDA run parallel to Michael Power Boulevard, Lahtis Road and Old Arena Road. Geraldton Snowmobile Club has confirmed that the trail along Lahtis Road is no longer maintained.</p> <p>Lahtis Road can also be used by other Aboriginal communities. The removal of trails within the PDA is predicted to reduce the ability for Aboriginal people to undertake hiking and snowmobiling in the PDA.,</p> <p>In addition to changes to the resources required to engage in recreational activities, the quality of the experience of Aboriginal people can be affected by creating sensory disturbance (e.g., increased dust, noise and lighting) and changes to the viewscape. The viewscape will be permanently altered to varying degrees due to the WRSAs and TMF.</p>

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Discussion of Potential Changes to the Environment on Aboriginal Peoples Prior to Mitigation
June 2017

5.11 POTENTIAL CHANGES IN HERITAGE RESOURCES PRIOR TO MITIGATION

No archaeological sites were identified within the PDA during the 2014 and 2015 archaeological field program. There is still the possibility, however, that archaeological resources could be recovered during the archaeological field work program that will be completed prior to construction; carrying forward the possibility of archaeological resources being present is a standard contingency approach and is conservative. During construction, the PDA will be subject to soil removal (including site preparation of the open pit area) and other activities that could affect existing archaeological resources that might be present. As areas of archaeological potential in the PDA will have been investigated prior to the construction phase and any chance finds or deeply buried archaeological resources (if they exist) will be documented during construction activities, it is not anticipated that archaeological resources will be affected during the operation or closure phases.

During the construction phase, the PDA will be subject to site preparation (including existing building removal, clearing/grubbing) and other activities that could affect existing architectural and/or historical resources. It is anticipated that the following architectural and/or historical resources will be removed during construction; MacLeod and Hardrock townsites, the MacLeod-Cockshutt Mining Headframe and the Discover Geraldton Interpretive Centre. The Kenogamisis Golf Club will undergo a change in land use as result of waste rock deposition. One identified Euro-Canadian architectural and/or historical resource, cultural heritage resource (CHR) 1 (the property located at 495 Hardrock Road), that is located outside of the PDA will be avoided.

Note that potential effects on Aboriginal cultural heritage such as sacred areas or habitation areas is incorporated in the assessment of effects on TLRU (see chapter 18.0 of the Final EIS/EA; Stantec 2017d) and is discussed in Section 5.12 of this report.

A summary of how a Project-related change in heritage resources may affect Aboriginal people is provided in Table 5-11 below.

Table 5-11: Potential Effects of a Change in Heritage Resources on Aboriginal People in the Absence of Mitigation

Effects of Changes to the Environment on Aboriginal People	Summary of Potential Effects on Aboriginal People
Physical and cultural heritage – change in physical or cultural heritage	The physical and cultural heritage of Aboriginal people can be affected by a change in heritage resources. Aboriginal people can be affected if archaeological resources are recovered during the pre-construction archaeological field work program or if previously undocumented archaeological resources are discovered during construction. The removal of MacLeod and Hardrock townsites, the MacLeod-Cockshutt Mining Headframe, and the Discover Geraldton Interpretive Centre, and the change in land use at the Kenogamisis Golf Club, can also affect Aboriginal people. Note that potential effects on Aboriginal cultural heritage such as sacred areas or habitation areas is discussed in Section 5.12 (TLRU).

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Discussion of Potential Changes to the Environment on Aboriginal Peoples Prior to Mitigation
June 2017

5.12 POTENTIAL CHANGES IN TRADITIONAL LAND AND RESOURCE USE PRIOR TO MITIGATION

Project effects on TLRU are addressed in chapter 18.0 of the Final EIS/EA (Stantec 2017d), which includes an assessment of changes to the environment on Aboriginal people's ability to engage in traditional activities included but not limited to: hunting, fishing, trapping, plant harvesting, and cultural or spiritual practices.

The availability of land, or species relied upon, to hunt, fish, trap, and harvest plants may be affected by the following Project activities:

- During construction, site clearing will result in the removal of plant species of interest to Aboriginal communities (including plants harvested for consumption/subsistence, plants harvested for medicinal purposes, and plants harvested for use as fuel), and/or plant harvesting sites in the PDA. The consequent absence of such plant species may also result in reduced availability of wildlife in the PDA (due to lack of habitat/food source).
- Wildlife habitat changes during construction, and changes in wildlife mortality risks during construction and operation, may reduce the presence and availability of wildlife in the Project area, which could affect hunting and trapping. Wildlife movement patterns may be affected, which could also affect the current use of wildlife resources, as hunting and trapping success may be reduced as a result of a change in knowledge of wildlife movement. These changes may take place as a result of:
 - site clearing, traffic, and adverse human-wildlife encounters
 - sensory disturbance caused during construction and operation
 - the presence of the open pit, TMF and other large Project components.
- Harm to fish during construction and operation, and the permanent alteration or loss of fish habitat arising during construction and persisting through to closure could affect the availability of fish for traditional harvesting, well as potentially changing the location of fishing areas. These changes include:
 - During construction, operation, and closure potential mechanisms for lethal and sub-lethal effects on fish include: the mobilization and transport of sediment to fish habitat; changes to flow; dewatering; destruction of fish eggs; stranding of fish; the introduction of deleterious materials to fish habitat from point (i.e., treated effluent discharge) and non-point sources (i.e., surface run-off, groundwater seepage, and dustfall); and shock waves from explosives usage.
 - A permanent alteration of fish habitat may occur through changes to water characteristics from treated effluent, groundwater discharge, physical changes, extraction of surface water, changes to the riparian vegetation and structure, and changes to flow regime related to construction, operation, and closure activities.

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Discussion of Potential Changes to the Environment on Aboriginal Peoples Prior to Mitigation
June 2017

Fish habitat may be lost as a result of the placement of materials or structures in water during construction. No operation or closure activities have been identified that would result in a loss of fish habitat. Loss of fish habitat that cannot be avoided will be addressed through the implementation of the Fisheries Offset Plan.

Project mechanisms that have potential to affect cultural and spiritual sites include site preparation (removal of existing buildings, timber harvesting, vegetation clearing, earthworks, overburden and topsoil stockpiling, temporary effluent treatment and discharge), isolation due to positioning of Project components, and land use change due to mining. Limiting of Aboriginal communities' ability to engage in cultural or spiritual practices could reasonably be regarded as an effect on TLRU, and therefore changes to access to sites is also considered.

A summary of how a Project-related change in TLRU may potentially affect Aboriginal people is provided in Table 5-12 below.

Table 5-12: Potential Effects of a Change in Traditional Land and Resource Use on Aboriginal People in the Absence of Mitigation

Effects of Changes to the Environment on Aboriginal People	Summary of Potential Effects on Aboriginal People
Current use of lands and resources for traditional purposes - change in current use	<p>Aboriginal communities gather plants, fish in the streams, rivers, and lakes, and harvest wildlife within the RAA. In some cases, site-specific uses were identified which can be affected by the Project mechanisms outlined above. Based on the available sources (see section 18.2 of the Final EIS/EA; Stantec 2017d) the following Aboriginal communities identified site-specific TLRU within the RAA:</p> <ul style="list-style-type: none"> • AFN, EFN, LLFN, and MNO identified plant harvesting sites • AFN, AZA, EFN, GFN, LLFN, and MNO identified fishing areas • AFN, AZA, EFN, GFN, LLFN, and MNO identified hunting and trapping areas • AFN, EFN, LLFN, MNO, and PPFN identified cultural or spiritual sites or areas. <p>These TLRU sites can be affected by the Project mechanisms outlined above. A conservative approach was used to identify potential interactions between the Project and TLRU activities and cultural sites, whereby activities with a degree of uncertainty are assumed to contribute to the environmental effect. As well, in addition to the sites identified above, TLRU sites and activities are assumed to occur within the RAA, even if the Aboriginal communities do not specifically identify these activities or site-specific uses.</p>

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Discussion of Potential Changes to the Environment on Aboriginal Peoples Prior to Mitigation
June 2017

5.13 POTENTIAL CHANGES IN HUMAN AND ECOLOGICAL HEALTH PRIOR TO MITIGATION

Atmospheric emissions (vehicle exhaust and ore dust) and water discharges (treated effluent discharge and seepage) from Project activities can increase chemicals of potential concern (COPCs) concentrations in ambient air, soil, groundwater, and surface water. This can lead to increases of these chemicals in various environmental media including vegetation, wild meat and fish tissue. These potential changes in air, water and country food quality may potentially affect the health of human receptors engaged in hunting, trapping, traditional and recreational activities within the LAA.

A summary of how a Project-related change in human and ecological health may potentially affect Aboriginal people is provided in Table 5-13 below.

Table 5-13: Potential Effects of a Change in Human and Ecological Health on Aboriginal People in the Absence of Mitigation

Effects of Changes to the Environment on Aboriginal People	Summary of Potential Effects on Aboriginal People
Health conditions – change in quality and availability of country foods; change in air quality; change in drinking water quality or quantity	The health conditions of Aboriginal people can be affected by a change in human health risks for the general population potentially affected by the Project. Aboriginal people can be exposed to COPCs through inhalation of COPCs from air emissions, contact with soil, ingestion and inhalation of soil, and ingestion of surface water, vegetation, wild meat and fish. Aboriginal peoples are assumed to consume higher levels of country foods compared to the rest of the population and consume surface water from the LAA. The Aboriginal/High Use Receptors assessed in the human health and ecological risk assessment (HHERA) were assumed to obtain their daily intake of water from Kenogamisis Lake, 100% of their intake of fish from the basins of Kenogamisis Lake, and 100% of their intake of wild meat and traditional plants from the HHERA LAA. Tissue analysis was conducted on Walleye, small mammals (as a proxy for moose tissue), berries, forage, and browse to identify potential effects on species harvested for consumption by Aboriginal peoples. Drinking water guidelines were considered when identifying the assessed COPCs.

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Mitigation, Commitments and Follow-up Measures for Changes to the Environment on Aboriginal People
June 2017

6.0 MITIGATION, COMMITMENTS AND FOLLOW-UP MEASURES FOR CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLE

Mitigation measures proposed to reduce the potential environmental effects on the VCs assessed in the Final EIS/EA will also reduce the potential effects of changes to the environment on Aboriginal people. A full list of mitigation measures is presented in chapter 24.0 of the Final EIS/EA (Stantec 2017d). These mitigation measures are not repeated here but have been considered in the characterization of residual effects presented in Section 7.0 of this report. In some cases, mitigation and follow-up has been recommended as a result of specific interactions with Aboriginal peoples, or because of input received through Aboriginal consultation. These specific recommendations are provided in Table 6-1. Where applicable, the specific community or communities for which the mitigation or follow-up measure applies has been identified.

GGM will continue information sharing with Aboriginal communities, such as the communication of Project activities, locations and timing throughout all phases of the Project.

**HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES –
IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY**

Mitigation, Commitments and Follow-up Measures for Changes to the Environment on Aboriginal People
June 2017

Table 6-1: Summary of Mitigation Specific to Aboriginal Communities

Effects of Changes to the Environment on Aboriginal People	Discussion of Mitigation, Commitments and Follow-up	Applicable Aboriginal Communities	Source of Mitigation or Follow-up Measures
Health conditions, socio-economic conditions, physical and cultural heritage, and current use	Communicate Project activities, locations and timing throughout construction, operation and closure to Aboriginal communities. GGM will consider Aboriginal input in confirming proposed mitigation measures and will continue to consult with local Aboriginal communities on the next iteration of the 14 environmental management and monitoring plans (EMMPs) to advance the concepts as the Project progresses.	AZA, AFN, GFN, LLFN, MNO	Commitment identified in preparation of the EIS/EA, and through various consultation input.
Socio-economic conditions, physical and cultural heritage, and current use	GGM is committed to maintaining alternate access within the PDA to the Southwest Arm of Kenogamis Lake during construction and operation.	AZA, AFN, GFN, LLFN, MNO	Commitment identified in preparation of the EIS/EA, and through various consultation input.
Health conditions, socio-economic conditions, current use	GGM recognizes that Aboriginal communities are interested in participating in a moose health (i.e., tissue sampling) monitoring study in the region. Given the large ranges of these animals and mandate of the MNRF, GGM will participate in an MNRF-led study with local Aboriginal communities during Project operation.	AZA, AFN, GFN, LLFN, MNO	Commitment identified in preparation of the EIS/EA, and through various consultation input.
Socio-economic conditions	GGM will continue to consult Ne-Daa-Kii-Me-Naan Inc. to address, to the extent possible, access to the PDA and the harvest of Crown timber that will be removed as part of site preparation. Timber removal will be completed in accordance with the <i>Crown Forest Sustainability Act</i> and <i>Crown Timber Act</i> .	AZA, AFN, CLFN, GFN, LLFN, PPFN	Commitment identified in preparation of the EIS/EA, and through various consultation input.

**HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES –
IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY**

Mitigation, Commitments and Follow-up Measures for Changes to the Environment on Aboriginal People
June 2017

Effects of Changes to the Environment on Aboriginal People	Discussion of Mitigation, Commitments and Follow-up	Applicable Aboriginal Communities	Source of Mitigation or Follow-up Measures
	Through discussions with Ne-Daa-Kii-Me-Naan Inc., GGM plans to enter into an Overlapping Agreement to harvest under Ne-Daa-Kii-Me-Naan Inc.'s pulp mill licence. Consideration would be given to winter/summer harvest areas and the market for hardwood at the time of harvesting.		
Socio-economic conditions	GGM will continue to meet with affected tenure holders on a regular basis (i.e., semi-annually) to discuss issues and comments and to provide Project updates. GGM will continue discussions regarding accommodation for the lost trapping area, overlapped by the PDA, with the holder of trapline GE021. GGM will continue to meet the holder of bait harvesting area NI5035 which is overlapped by the PDA to discuss issues and comments and to provide Project updates.	AZA, LLFN	Commitment identified in preparation of the EIS/EA, and through various consultation input.
Current use	GGM will continue to consult with LLFN, MNO and other local Aboriginal communities as appropriate to develop site-specific mitigation measures for the cultural and spiritual sites located within the PDA. Through consultation, LLFN has confirmed that sites within the PDA are not sacred sites; further details, however, are confidential. GGM and LLFN have agreed upon a path forward for these sites.	AZA, AFN, GFN, LLFN, MNO	Commitment identified in preparation of the EIS/EA, and through various consultation input.
Physical and cultural heritage	GGM has committed to developing a communication procedure with local Aboriginal communities. These specifically address archaeological and heritage resources and are described within the "Hardrock Project Conceptual Archaeology and Heritage Resources Management Plan" (Conceptual AHRMP; GGM 2017b).	AZA, AFN, GFN, LLFN, MNO	GFN requested consultation and accommodation with regard to GFN archaeological and cultural heritage finds to be established.

**HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES –
IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY**

Mitigation, Commitments and Follow-up Measures for Changes to the Environment on Aboriginal People
June 2017

Effects of Changes to the Environment on Aboriginal People	Discussion of Mitigation, Commitments and Follow-up	Applicable Aboriginal Communities	Source of Mitigation or Follow-up Measures
	<p>Although the presence or absence of archaeological, architectural, and historical resources has been documented during baseline data collection, it is possible that chance finds could be uncovered during the construction phase within the PDA. The Conceptual AHRMP (GGM 2017b) outlines the response and mitigation measures to be implemented.</p>		<p>LLFN requested Aboriginal communities to be contacted and consulted with should archaeological resources be identified.</p> <p>AFN requested Aboriginal community participation related to the development of mitigation measures, monitoring, archaeological and heritage resource identification, and communication in the event of new archaeological finds.</p>
Socio-economic conditions	<p>GGM has prepared a labour and training strategic action plan, which includes partnerships with Aboriginal communities and education institutes, information sharing (e.g., skills databases), and employment preparation and training.</p> <p>GGM will post job qualifications and identify available training programs and providers so that local and Aboriginal residents can acquire the necessary skills and qualify for potential employment and work with communities to develop training programs oriented to operational needs.</p>	AZA, AFN, GFN, LLFN, MNO and communication with others where opportunities exist	AZA, AFN, BZA, BNA, GFN, LLFN, MNO, PPFN and RSMIN expressed interest in employment opportunities for Aboriginal community members, including jobs for youth, and requested information about required trades, qualifications, training, and timelines.

**HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES –
IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY**

Mitigation, Commitments and Follow-up Measures for Changes to the Environment on Aboriginal People
June 2017

Effects of Changes to the Environment on Aboriginal People	Discussion of Mitigation, Commitments and Follow-up	Applicable Aboriginal Communities	Source of Mitigation or Follow-up Measures
Health conditions, socio-economic conditions, current use	<p>Mitigation for changes in ambient air quality, including use of dust suppressants have been developed. Additional detail on mitigation is provided in the “Hardrock Project Conceptual Air Quality Management Plan” (Conceptual AQMMP; GGM 2017a).</p> <p>GGM will consider Aboriginal input in confirming proposed mitigation measures and will continue to consult with local Aboriginal communities on the next iteration of the Conceptual AQMMP to advance the concepts as the Project progresses.</p>	AZA, AFN, GFN, LLFN, MNO	<p>LLFN and MNO requested dust suppression mitigation</p> <p>GFN requested for the inclusion of community monitoring for dust and PM₁₀/PM_{2.5} as part of the overall monitoring plan and participation in the development of air quality mitigation measures.</p>
Health conditions, Socio-economic conditions, current use	<p>A “Hardrock Project - Water Management and Monitoring Plan” (WMMP; Stantec 2017e) has been developed which includes adaptive management practices related to surface water and considers seasonal variation in water quality.</p>	AZA, AFN, GFN, LLFN, MNO	<p>AFN and LLFN requested the development of a surface water monitoring plan to account for unexpected results, and more detailed adaptive management plans/strategies.</p> <p>GFN requested mitigation and adaptive management practices related to: water treatment and the potential for seasonal turnover to affect the ability to discharge water due to quality issues and historical tailings, drainage collection, and the TMF and WRSAs.</p>

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Mitigation, Commitments and Follow-up Measures for Changes to the Environment on Aboriginal People
June 2017

Effects of Changes to the Environment on Aboriginal People	Discussion of Mitigation, Commitments and Follow-up	Applicable Aboriginal Communities	Source of Mitigation or Follow-up Measures
Health conditions, socio-economic conditions, current use	A "Hardrock Project Conceptual Biodiversity Management and Monitoring Plan" (BMMP; GGM 2017c) has been developed which includes mitigation for vegetation communities and adaptive management strategies. The Project has been designed to avoid direct effects on the sparse treed fen community.	AZA, AFN, GFN, LLFN, MNO	LLFN requested mitigation for vegetation and wetlands, including a vegetation management plan. AFN request for the development of contingency plans for upland vegetation and wetland communities in the event that rehabilitation strategies do not result in intended outcomes. AFN and Biigtigong Nishnaabeg requested mitigation measures for effects on groundwater-dependent plant species, including effects and mitigation of TMF seepage on the sparse treed fen.
Health conditions, socio-economic conditions, current use	GGM will continue to consult with local Aboriginal communities on the next iteration of the Conceptual BMMP (GGM 2017c). Monitoring for the Goldfield Creek diversion is discussed in the "Draft Hardrock Project: Fisheries Act, Paragraph 35(2)(b) Authorization and MMER Schedule 2 Draft Fisheries Offset Plan" (Draft Fisheries Offset Plan; AMECFW 2017) and the "Hardrock Project Conceptual Aquatic Management and Monitoring Plan" (Conceptual AMMP; Stantec 2017a).	AZA, AFN, GFN, LLFN, MNO	GFN requested monitoring of vegetation along the Goldfield Creek diversion, including notification and involvement of GFN and other Aboriginal communities in the monitoring.

**HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES –
IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY**

Mitigation, Commitments and Follow-up Measures for Changes to the Environment on Aboriginal People
June 2017

Effects of Changes to the Environment on Aboriginal People	Discussion of Mitigation, Commitments and Follow-up	Applicable Aboriginal Communities	Source of Mitigation or Follow-up Measures
Health conditions, Socio-economic conditions, Current Use	Mitigation measures for species at risk, significant wildlife habitat and other wildlife have been developed and are also included in the Conceptual BMMP (GGM 2017c). This plan also includes further details on monitoring and wildlife management at the site.	AZA, AFN, GFN, LLFN, MNO	AFN and LLFN requested mitigation for species at risk, significant wildlife habitat and species of traditional importance; biodiversity monitoring programs, including contingencies linked to population thresholds. LLFN and MNO identified the need to manage wildlife movement on site.

7.0 DISCUSSION OF RESIDUAL EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLE

7.1 HEALTH CONDITIONS

7.1.1 Change in Air Quality

During construction and closure, concentrations of particulates, criteria air contaminants (CACs) and other PoPC outside the modelled property boundary (an area owned or leased by GGM) are predicted to be below applicable air quality criteria with the exception of benzene and benzo(a)pyrene whose background levels are above the applicable criteria. During operation, areas outside the modelled property boundary (see Figure 7-10 in the Final EIS/EA; Stantec 2017d) concentrations were predicted to be below applicable air quality criteria, with the exception of infrequent exceedances (no more than 2-days in 5-years, or 0.1% of the time) of PM₁₀ concentrations. During operation, exceedances of some PoPC are anticipated for areas inside the modelled property boundary. The maximum predicted exceedance of PoPC is anticipated to occur at the Kenogamisis Golf Club and be infrequent (no more than 2-days in 5-years, or 0.1% of the time for particulates) and short in duration. GGM will implement a best management plan to control fugitive dust from the Project. A Greenhouse Gas (GHG) Management and Monitoring Plan will also be implemented to reduce where possible, GHG emissions from the Project. A “Hardrock Project Conceptual Greenhouse Gas Management and Monitoring Plan” (Conceptual GHGMMP; GGM 2017e) is provided in Appendix M6 of the Final EIS/EA (Stantec 2017d). Aboriginal people may be exposed to these infrequent exceedances of PoPC, including at the Kenogamisis Golf Club.

Seventeen (17) additional TLRU receptors are included in the assessment to provide additional information about potential changes in air quality to which Aboriginal people may be exposed. The Project's contributions to the concentrations of PoPC at TLRU receptor locations are predicted to be below the criteria set by the federal and provincial governments. When combined with the existing background level of PoPC, concentrations of PoPC at TLRU receptor locations are predicted to be below the respective criteria, with the exception of benzene and benzo(a)pyrene, for which the background levels are already above the criteria. The results from modelling at TLRU receptor locations were used to inform the HHERA (chapter 19.0 of the Final EIS/EA; Stantec 2017d).

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Discussion of Residual Effects of Changes to the Environment on Aboriginal People
June 2017

The potential exposure to particulate matter (dust) and non-carcinogenic and carcinogenic COPCs was incorporated in the assessment of inhalation-related health risks, in the HHERA. Dust mitigation will limit or eliminate dust inhalation exposures. The cancer risks associated with inhalation of carcinogenic COPCs are below 1.0, meaning that the incremental lifetime cancer risk associated with emissions from the Project is below the cancer risk acceptability benchmark established by the MOECC. The change in inhalation exposures to the non-carcinogenic CACs and COPCs presents negligible human health risks¹. Potential residual effects associated with particulate deposition in waterbodies are discussed in Section 7.1.3.

7.1.2 Change in Quality and Availability of Country Foods

The availability of country foods considers changes to the distribution and abundance of species harvested for food. Altered or restricted access to harvesting sites is considered as part of the current use discussion provided in Section 7.4 below. Quality of country foods considered the potential changes in the chemical composition of country foods.

7.1.2.1 Availability of Country Foods

There are several mechanisms through which changes in the availability of country foods may take place. Residual effects on vegetation communities, fish and fish habitat, and wildlife and wildlife habitat and access to sites and areas where country foods are harvested (as assessed through TLRU) may contribute to change the availability of country foods. The residual effects on each of these related VCs is presented below.

Vegetation Communities

It is conservatively predicted that Project will result in the long-term loss of approximately 1,133 ha of forest and 810 ha of wetland vegetation communities from the PDA. The majority of areas where vegetation will be removed during construction are not predicted to return to the same upland and wetland community types after closure. The Project is not predicted to remove uncommon features or functions of wetlands, or reduce carrying capacity beyond current or expected future use. The functions and attributes of the system are predicted to remain comparable to what would be expected in a similar landscape. Given that the community types that will be removed are generally common and widespread in the RAA, the loss of the community types in the PDA is not predicted to jeopardize the long-term viability of the community types.

¹ A negligible health risk as defined in the "Technical Data Report: Hardrock Project – Human Health and Ecological Risk Assessment" (HHERA TDR; Stantec 2017f) is health risk is considered negligible when the difference in health risk between Baseline Case and Future Case is less than the applicable benchmark (i.e., 0.2 for hazard quotients, 1E-06 for incremental lifetime cancer risks, 1.0 for concentration ratios, 1.0 for risk quotients, 1.0 for screening ratios).

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Discussion of Residual Effects of Changes to the Environment on Aboriginal People
June 2017

Areas within the PDA and vegetation communities LAA not currently affected by invasive species may be affected by the spread of these species by new roads. If the spread of invasive species is found to be occurring at an unacceptable level within the PDA, GGM will use the system established through the Adaptive Management Framework (chapter 23.0; Stantec 2017d) to mitigate negative effects. Effects from dust deposition due to construction, operation and active closure activities will be localized to 30 m from the PDA.

The removal of habitat that supports plant species of interest to Aboriginal communities from the PDA is not anticipated to affect the viability of populations of these species in the vegetation communities in the LAA and RAA. Where there is interest, GGM will provide opportunities to local Aboriginal communities for harvesting of plants for traditional purposes prior to construction. Given that the plant species of interest to Aboriginal communities are relatively common in the RAA for vegetation communities, the availability of these species for harvest as country foods is not anticipated to be affected by the Project. Progressive rehabilitation activities will commence during operation, as Project components reach design capacities, and during closure. Effects on vegetation communities will be managed and monitored as identified in the Conceptual BMMP (GGM 2017c).

Fish and Fish Habitat

By implementing the offsetting plan and following timing windows to avoid sensitive life stages, salvaging fish prior to construction in a watercourse, adhering to sediment and erosion control measures and blasting mitigation measures, and following measures identified in the EMMPs there will be no residual effect because of permanent alteration of fish habitat during construction. Mitigation will be implemented to reduce the mobilization and deposition of dust from blasting and heavy equipment use. Some mobilization of dust containing PoPC is still anticipated and dust deposition will occur in fish habitat; however, the concentrations of PoPC in the mixing zone will not be acutely lethal to fish. Offsetting will occur within the Goldfield Creek diversion and will consist of a combination of new pond/lake habitat and new channel habitat. Intermittent and ephemeral habitats that will be lost or permanently altered are being replaced with permanent (year-round) habitat.

No changes in mercury and methylmercury concentrations in fish tissue are predicted. An overall improvement in water quality is predicted for Kenogamisis Lake, with reduced concentrations of many parameters on a lake-wide basis. Discharge of treated effluent and non-point source contributions will result in localized, Project-related increases in concentrations of PoPC to levels that exceed water quality objectives and have the potential to cause sub-lethal effects on fish. However due to the geographic range of fish, long-term exposure to these parameters is not anticipated, especially given the overall predictions of improved water quality on a lake-wide basis.

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Discussion of Residual Effects of Changes to the Environment on Aboriginal People
June 2017

Residual effects on the permanent alteration of fish habitat are associated with release of treated effluent into the Southwest Arm of Kenogamisis Lake during operation, given that the increased phosphorus concentrations have the potential to cause some nutrient enrichment. The sustainability and productivity of the CRA fishery, which depends on fish species including those harvested for consumption by Aboriginal people being available to harvest, is not anticipated to change.

Wildlife and Wildlife Habitat

Vegetation clearing and sensory disturbance is predicted to result in a decrease in wildlife habitat; however, the loss of habitat is unlikely to affect the long-term persistence or viability of wildlife in the RAA. Increased mortality will be greatest for small species with limited avoidance capability and wildlife that require and occupy specialized habitat features. Risk for changes in mortality can be reduced through the application of timing windows and will be managed and monitored through the BMMP. The residual adverse effect on wildlife mortality is predicted to be within the normal variability of baseline conditions and is not expected to affect the long-term persistence or viability of wildlife within the RAA.

The open pit, WRSAs, and TMF will result in a loss of habitat availability and connectivity, which may result in changes to daily and seasonal movements of wildlife.

The movement of large mammals in the LAA could be disrupted due to vegetation removal and the presence of Project components. However, large mammals such as moose and bear have large home ranges which may allow them to adapt. Given that large mammal habitat exists throughout the RAA and that large mammals tend to move through and around anthropogenic areas readily within their home range, it is assumed that these species will mostly avoid the PDA and will shift their use to other areas of their ranges. While it is anticipated that large mammals will generally avoid the PDA, there will be no physical barriers that prevent them from crossing the PDA (e.g., perimeter fencing). Progressive rehabilitation activities will also commence during operation, as Project components reach design capacities, and during closure. The predicted change in movement is not expected to affect the long-term persistence or viability of wildlife in the RAA.

As these changes relate to the availability of country foods, the abundance of harvested wildlife is not anticipated to change although the distribution of harvested wildlife may change as large mammals avoid the PDA, which could result in a localized change in availability.

7.1.2.2 Quality of Country Foods

The HHERA evaluated changes in ingestion-related health risks, which were assessed for exposure to arsenic, chromium, cobalt, methylmercury, and thallium. Aboriginal people, considered as part of the Aboriginal/High Use Receptor, were assumed to obtain 100% of their intake of fish from the various basins of Kenogamisis Lake and to obtain 100% of their intake of wild meat and traditional plants from the LAA. There is an existing consumption advisory for fish in

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Discussion of Residual Effects of Changes to the Environment on Aboriginal People
June 2017

Kenogamisis Lake due to presence of mercury in fish tissue (see section 4.5. in the HHERA TDR; Stantec 2017f). The changes in total ingestion exposures to arsenic, chromium, cobalt, methylmercury, and thallium were found to represent a negligible human health risk. The removal of portions of the historical MacLeod and Hardrock tailings, as part of the Project activities, is predicted to result in a decrease in total ingestion risks for arsenic. Overall, unacceptable health risks are not expected for the ingestion of country foods. A complete description of the methods and results for the risk assessment of each chemical of concern and country food source is presented chapter 19.0 of the Final EIS/EA (Stantec 2017d) and the HHERA TDR (Stantec 2017f).

Through consultation, GGM recognizes that Aboriginal communities are interested in participating in a moose health (i.e., tissue sampling) monitoring study in the region. Given the large ranges of these animals and mandate of the MNRF, GGM will participate in an MNRF-led study with local Aboriginal communities during Project operation.

7.1.3 Change in Drinking Water Quality or Quantity

Historical tailings are currently contributing to existing water quality effects in Kenogamisis Lake through runoff and groundwater discharge. The main residual environmental effect on groundwater quality identified is positive. Several Project activities are anticipated to result in improvements to water quality and provide environmental benefits. Removal of portions of the historical MacLeod and Hardrock tailings, placement of an enhanced cover system over the remaining tailings, installation of a seepage collection system for the TMF, and changes in groundwater flow due to the dewatering of the open pit are expected to improve overall water quality in Kenogamisis Lake compared to existing conditions. Arsenic loading to surface water features due to groundwater discharge is predicted to decrease by 99% during operation and 52% during closure.

Over the Project life, water will come in contact with Project components that will be collected and treated by the effluent treatment plant prior to discharge to the environment. The effluent treatment plant will be a conventional and modular plant for metals removal and reduction of total suspended solids prior to discharge and is well suited to the Project. Based on the influent water quality modelling and treatment capacity it is anticipated that the treated effluent will meet PWQO.

Lands contained within the ZOI are owned or under lease by GGM and there are no known Aboriginal or non-Aboriginal groundwater users within the ZOI. As the groundwater within the ZOI is not being used as a drinking water source, the Project is not anticipated change groundwater drinking quality or quantity for Aboriginal people.

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Discussion of Residual Effects of Changes to the Environment on Aboriginal People
June 2017

Residual effects on surface water quantity and quality are anticipated for Goldfield Creek, the Southwest Arm Tributary and Mosher Lake. In Goldfield Creek, surface water flows will be reduced due to the diversion. During operation, the PWQO/Interim PWQOs are exceeded in Goldfield Creek and the Southwest Arm Tributary but are lower than baseline conditions. For larger watersheds, however, such as Barton Bay, the Central Basin and the Southwest Arm of Kenogamisis Lake, residual effects on water quality and quantity are not anticipated. Particulate deposition (dustfall) on the Goldfield Creek diversion and Southwest Arm of Kenogamisis Lake is anticipated to increase by approximately 1% of the total load, which is a very small contribution (see section 10.4.3 of the Final EIS/EA [Stantec 2017] for additional detail). Residual effects will be monitored as identified in the WMMP (Stantec 2017e). To maintain public safety, access to the PDA will be restricted during construction and continue throughout operation and active closure. Effects on the MacLeod Provincial Park GUDI well, which is used for drinking water, are not anticipated as the GUDI well is located outside of the effluent mixing zone and outside of the groundwater ZOI.

AZA reported that Elders drink the water from Kenogamisis Lake and there is potential for Kenogamisis Lake to also be used as a drinking water source by other Aboriginal communities. Control and treatment of runoff during construction will limit or eliminate potential exposures of Aboriginal people to chemicals in Project-related particulate matter in runoff water. In the HHERA, Aboriginal/High Use Receptors were assumed to obtain their drinking water from Kenogamisis Lake three days a week and assessed the potential human health risks associated with exposures to metals in drinking water. The hazard quotients for arsenic associated with ingestion of water for the Aboriginal/High Use Receptors are predicted to decrease compared to background as a result of the removal of portions of the historical tailings area adjacent to Barton Bay East. Overall exposures to metals through the consumption of drinking water from Kenogamisis Lake represent a negligible human health risk for Aboriginal people. Project-related rehabilitation measures are expected to improve overall water quality in Kenogamisis Lake compared to existing conditions. Downstream effects on Long Lake and the drinking water supplies for GFN and LLFN are not anticipated.

7.1.4 Change in Noise or Vibration Exposure

Residual effects on acoustic environment may affect the health conditions of Aboriginal people. However, residual environmental effects for the acoustic environment are predicted to be low and comply with applicable guideline criteria and thresholds selected for assessment. The blast design is predicted to meet the MOECC's criteria and source-specific mitigation measures were not required. The noise and vibration levels at each Pol (special receptors representing areas of TLRU) are anticipated to be within applicable guidelines. With respect to the potential for Highway 11 drivers to become startled/distracted by Project-related noise and vibration effects (thereby causing hazardous driving conditions for Aboriginal people and other highway users), the open pit is located approximately 500 m from the highway, with waste rock and overburden storage providing a buffer in-between; therefore, blasting is not expected to be noticeable by highway users. No residual effects on health conditions for Aboriginal people are anticipated due to exposure to noise or vibration releases from the Project.

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Discussion of Residual Effects of Changes to the Environment on Aboriginal People
June 2017

7.1.5 Significance Determination for VCs Related to Health Conditions for Aboriginal People

The environmental effects assessments for the VCs which are related to health conditions for Aboriginal people (Table 3-2), concluded that Project-related changes are not significant. Below is a discussion of the determinations of significance made by each VC and how they relate to health conditions for Aboriginal people.

The significance thresholds for environmental effects for air CACs and other PoPC and noise were set to align with the related provincial and federal criteria. In the absence of other guidance or regulations federally, provincially and municipally in Canada, the significance threshold for vibration was set to align with the City of Toronto *By-law No.514-2008* for vibration during construction and the International Organization for Standardization publication ISO 2631-2 for vibration during operation. The environmental effects assessments for atmospheric environment and acoustic environment considered effects on Aboriginal people by including 17 additional special receptors which represented areas of TLRU where Aboriginal people may be exposed to Project-related air emissions, noise, or vibration. The assessments of the atmospheric environment and acoustic environment found residual effects for all receptors to be not significant; therefore, with respect to health conditions for Aboriginal people, it follows that residual effects on air quality, noise, or vibration in areas which are used by Aboriginal people are also not significant.

Two significance thresholds were established for the assessment of changes in groundwater: one for changes in groundwater quantity and one for groundwater quality. The following Project-related residual effects on groundwater would be characterized as significant:

- a reduction in the yield (productivity) of an existing water supply well such that it no longer meets the needs of the current users.
- a degradation of the quality of groundwater such that one or more of the health-based standards specified in the *Ontario Drinking Water Quality Standards under the Safe Drinking Water Act* to the extent that a water supply well no longer meets the needs of current users or land owners.

Project-related residual effects on groundwater were found to be not significant as the current users needs for groundwater will be met; therefore, with respect to health conditions for Aboriginal people, it follows that residual effects on groundwater use by Aboriginal people are also not significant. Even though groundwater wells can be used as a sources of drinking water, no groundwater wells are located within the Project predicted ZOI and resource effects on groundwater were determined to be not significant.

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Discussion of Residual Effects of Changes to the Environment on Aboriginal People
June 2017

The assessment of changes in surface water also established two significance thresholds: one for changes in surface water quantity and/or flow and one for surface water quality. The following Project-related residual effects on surface water would be characterized as significant:

- Surface water quantity that is consistently above existing flooding maximums and that affects other users including damage to infrastructure or long-term infringements to riparian rights access and domestic uses, or below minimum environmental flow that affects aquatic ecosystems during fish spawning seasons, over winter and/or during other low flow periods, or affects the uses of local communities.
- Surface water quality which meets the following criteria water quality which consistently exceeds regulatory criteria or guidelines², affects the sustainability of the ecosystem or the uses of local communities, degradation from baseline conditions which may result in effects related to human and ecological health at lower thresholds than the PWQO.

Project-related residual effects on surface water were below these thresholds and have been characterized as not significant; therefore, with respect to health conditions for Aboriginal people, it follows that residual effects on surface water use by Aboriginal persons are also not significant, as residual effects on surface water quality and quantity in local streams and lakes, including all basins of Kenogamisis Lake which were identified as potential sources of a drinking water by Aboriginal communities, have been characterized as not significant.

The fish and fish habitat VC defined a significant adverse effect as one that is not authorized under the *Fisheries Act*, or one that, despite authorization and associated mitigation and offsetting, affects the productivity and sustainability of a CRA fishery. Through avoidance, mitigation and offsetting, the residual effects of the Project on fish and fish habitat are not anticipated to affect the productivity and sustainability of a CRA fishery and are determined to be not significant; therefore, with respect to health conditions for Aboriginal people, it follows that residual effects on the productivity and sustainability of fish, including species harvested as country foods, are also determined to be not significant.

The wildlife and wildlife habitat VC defined a significant adverse effect as one that threatens the long-term persistence or viability of a wildlife species within the RAA for wildlife and wildlife habitat. The residual environmental effects from the Project do not threaten the long-term persistence or viability of a wildlife species and were determined to be not significant; therefore, with respect to health conditions for Aboriginal people, it follows that residual effects on the long-term persistence or viability of wildlife species, including species harvested as country foods, are also determined to be not significant.

² See Section 10.1.7 of the Final EIS/EA (Stantec 2017) for additional information about the threshold set for determining Project-related significant residual effects on water quality.

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Discussion of Residual Effects of Changes to the Environment on Aboriginal People
June 2017

The vegetation communities VC defined a significant adverse effect as one that results in:

- long-term, irreversible loss of a species listed on Schedule 1 of the *Species at Risk Act, 2002* or listed as threatened or endangered under the *Endangered Species Act, 2007*, or identified as Species of Conservation Concern or of interest to Aboriginal communities
- a decrease in the count or area of a vegetation community that threatens the long-term viability of that community in the RAA
- a change in the quality of one or more vegetation communities (upland and/or wetland), compared to baseline conditions, where the change is likely to threaten the long-term functions of that vegetation community in the RAA.

The residual environmental effects from the Project are not anticipated to decrease the area or quality of a vegetation community such that it threatens the long-term viability of that vegetation community in the RAA for vegetation communities. The long-term, irreversible loss of a vegetation species is also not anticipated and the residual adverse effects were determined to be not significant. The assessment of vegetation communities specifically considered effects on the abundance of plant species of interest to Aboriginal communities. The habitat for plant species of interest to Aboriginal communities is predicted to remain widespread and viable, and the change in potential habitat for plant species of interest for Aboriginal communities will not threaten the long-term viability of potential habitats; therefore, with respect to health conditions for Aboriginal people, it follows that residual effects on abundance of plant species of interest to Aboriginal communities, including species harvested as country foods, are also predicted to be not significant.

The human and ecological health VC defined significant adverse residual environmental effect as one that results in the chemical exposures that are predicted to exceed objectives established by the relevant regulatory organization(s), and are likely to result in a long-term, substantive change in the health of the identified receptor(s). Health risks for most COPCs and most species are not anticipated to exceed regulatory thresholds and where exceedances are predicted, this exceedance is due to baseline conditions. When considering the future case some inhalation exposures are predicted to exceed the regulatory thresholds. These predicted exceedances are based on single events and do not represent continuous exposures that would represent potential concerns for human health. Residual effects on human and ecological health not anticipated to result in a long-term, substantive change in the health of the identified receptor(s) and have been determined to be not significant. The assessment of human and ecological health considered effects on Aboriginal people by including an Aboriginal/High Use Receptor. The residual effects on human health conditions, including the Aboriginal/High Use Receptor, were determined to be not significant.

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Discussion of Residual Effects of Changes to the Environment on Aboriginal People
June 2017

7.2 SOCIO-ECONOMIC CONDITIONS

7.2.1 Change in Use of Navigable Waters

None of the watercourses in the LAA are listed on the *Navigation Protection Act* schedule of navigable waters and navigation within the PDA has not been observed or identified through consultation or TK and TLRU studies. However, since it has been conservatively assumed that navigation is possible in the PDA on Goldfield Creek, the Southwest Arm Tributary (downstream of SWP3), and SWP3, Project activities will therefore cause adverse residual environmental effects on the use of watercourses for navigation.

Although there has been no confirmed use of Goldfield Creek for navigation, the diversion will permit navigation by small vessels such as canoes or kayaks, with obstacles (e.g., beaver dams and vegetation obstructions), between Goldfield Lake and the Southwest Arm of Kenogamisis Lake following closure. It is conservatively assumed that the change in the Goldfield Creek channel alignment could pose an inconvenience to potential users. Aboriginal peoples may be among the potential users inconvenienced by the route change between Goldfield Lake and the Southwest Arm of Kenogamisis Lake.

Safety-related access restrictions will prevent use of watercourses in the PDA throughout construction, operation and active closure. Following active closure, access restrictions to the PDA will be lifted allowing for navigation of the Goldfield Creek diversion and Southwest Arm Tributary. Goldfield Creek and the Southwest Arm Tributary are currently only navigable by small vessels such as canoes or kayaks and include a number of barriers (e.g., beaver dams and vegetation obstructions); navigation will still be possible with obstacles for these types of watercraft. If the watercourses within the PDA are used by Aboriginal peoples for navigation, the safety related restrictions may affect patterns of access to lands and resources of socio-economic importance to Aboriginal people.

The installation of watercourse crossings will create obstacles to potential navigation activities within the Southwest Arm Tributary and the Goldfield Creek Tributary – North Branch (downstream of Lake A-322) during construction, operation and active closure. Watercourse crossings will be removed during active closure. Other watercourses in the PDA where crossings will be installed are not navigable. Aboriginal peoples may be among the potential users inconvenienced by the watercourse crossings.

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Discussion of Residual Effects of Changes to the Environment on Aboriginal People
June 2017

Installation and removal of the treated effluent discharge locations and freshwater intake in the Southwest Arm of Kenogamisis Lake may create a short-term disruption to navigation in a small area along the shoreline during construction and active closure. Installation and removal may result in an exclusion area for boats while workers and equipment are present. The temporary disruption during installation and removal of the treated effluent discharge locations and freshwater intake may temporarily affect navigation for LLFN members or other Aboriginal peoples who navigate along the shoreline of the Southwest Arm of Kenogamisis Lake. The area will be properly marked and given the width of the Southwest Arm and the small footprint of the work area, LLFN members or other Aboriginal peoples are anticipated to be able to navigate around these activities.

7.2.2 Change in Forestry and Logging Operations

The Project will result in a very small (0.2%), long-term and irreversible reduction in the forested land base and loss of area associated with forest management activities in the FMU. Access to other planned harvest areas within the LAA for land and resource use will be via Goldfield Road. These residual effects are relevant to Aboriginal peoples as Ne-Daa-Kii-Me-Naan Inc. is an Aboriginal-owned business and holds the enhanced Forest Resource Licence for the Kenogami FMU. As discussed in Section 6.0 of this report, GGM will enter into an Overlapping Agreement to harvest under Ne-Daa-Kii-Me-Naan Inc.'s pulp mill licence.

7.2.3 Changes in Commercial Fishing, Hunting, Trapping, Gathering, and Guide Outfitting Activities

This section focuses on potential changes to commercial fishing (restricted here to bait harvesting), hunting, trapping, bear management, and guide outfitting activities. The current use of lands and resources for traditional purposes is also summarized in Section 7.4.

The Project will result in the restricted access to or loss (removal due to site clearing) of 20 ha of trapline area GE021 (which is held by a member of AZA), and 141 ha of bait harvesting area NI5035 (which is held by an Aboriginal person). The 141 ha of bait harvesting area NI5035 which is overlapped by the PDA includes both terrestrial and aquatic environments. As a result, the area of affected waterways where bait harvesting may take place within NI5035 and which will be affected by the Project is smaller than 141 ha and includes a portion of Goldfield Creek.

Access to harvesting areas located in the LAA for land and resource use may be altered by the closure of Lahtis Road at the start of construction. Licence holders of trapline area GE021 (AZA) and bait harvesting area NI5035 may not be able to access harvesting areas previously accessed via Lahtis Road, which may reduce the ability for trapping and bait harvesting outside of the PDA. The effect may be greatest during the winter when alternate access via Goldfield Road may not be feasible. The other traplines and bait harvesting areas held by Aboriginal people (see Table 5-10) are located outside of the LAA and are not anticipated to be affected by access related changes as alternate roads are available.

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Discussion of Residual Effects of Changes to the Environment on Aboriginal People
June 2017

The change in the availability of wildlife resources due to sensory disturbance and a change in wildlife movement patterns is predicted to reduce the ability undertake hunting in the LAA for land and resource use. The residual effect is predicted to start in construction and continue throughout operation and active closure. The following Aboriginal-held trapline areas are partially overlapped by the LAA for land and resource use and are anticipated to experience disturbance effects and changes availability of wildlife resources: GE021, GE023, GE034, GE035, GE008, GE009, GE120, and NG089 which are located within and beyond the RAA. GGM has confirmed, as part of consultation activities, that GE021 is held by a member of AZA and GE009, GE023 and GE034 are held by members of LLFN. Bait harvesting area NI5035 is also partially overlapped by the LAA for land and resource use, and is anticipated to experience sensory disturbance effects.

No Project-related effects on the sustainability and productivity of CRA fisheries are anticipated. Due to habitat offsetting there will be no net loss of commercial baitfish harvesting; however, areas within the PDA will remain inaccessible to the NI5035 licence holder for the duration of the mine life until the PDA becomes accessible during post-closure. Given the level of fishing activity carried out in the PDA and the other potential fishing areas within NI5035, this loss of access is not expected to substantially reduce the area available for commercial bait harvesting.

Commercially-based harvesting activities may be affected by sensory disturbance, in particular to clients of guide outfitting services. The remoteness and quality of the guide outfitting experience are valued; therefore, construction activities may decrease interest in outfitting services in the vicinity of PDA especially if more intact landscapes and fish and wildlife habitats can be accessed elsewhere.

7.2.4 Change in Recreation

This section focuses on how changes to recreational areas, recreational infrastructure and services, visual setting, the acoustic environment and access may affect Aboriginal recreational use. Current use of lands and resources for traditional purposes (Section 7.4) provides a description of non-commercial hunting and fishing by Aboriginal peoples.

The closure of Lahtis Road will alter access to recreational areas located southwest of the PDA (however this area may be accessed via Goldfield Road), and adjacent to the PDA along the shoreline of the Southwest Arm of Kenogamisis Lake. This includes the Crown land campsite and public access points (boat launch areas also used for launching ice fishing huts). AFN, LLFN and MNO have confirmed use of Lahtis Road for access to the Southwest Arm of Kenogamisis Lake and Lahtis Road may also be used by other Aboriginal communities. At closure, Lahtis Road is anticipated to be re-opened to the Goldfield Creek diversion. GGM is committed to maintaining alternate access within the PDA to the Southwest Arm of Kenogamisis Lake during construction and operation and this commitment is subject to on-going Project planning.

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Discussion of Residual Effects of Changes to the Environment on Aboriginal People
June 2017

The Project is predicted to result in the long-term removal of approximately 10.6 km of snowmobile trails and 1.4 km of the Barton Bay Wildlife Trail in the PDA. Considering the portion of snowmobile trail to be removed has not been maintained for the past several years and the Municipality of Greenstone may relocate the hiking trail, the removal of trails within the PDA is not predicted to reduce the ability for Aboriginal peoples to undertake hiking and snowmobiling.

During construction and operation, workers and their family members will place some additional recreational demands on recreation services and infrastructure which are also used by Aboriginal peoples. This is anticipated to return demand levels towards those experienced prior to recent population declines. An agreement has been signed between the Municipality and GGM to support the Municipality's future plans with respect to the Kenogamisis Golf Course (holes 10-18), MacLeod-Cockshutt Mining Headframe and the Discover Geraldton Interpretive Centre.

Project-related emissions of particulate matter (dustfall) are predicted to meet regulated requirements except for a small area close to the PDA where the exceedance will be infrequent (i.e., no more than 0.1% of the time). The WRSAs and forested areas are predicted to act as a barrier to light from the process plant and mobile equipment. The Project's effect on ambient lighting is predicted to be below the relevant Commission Internationale de L'Éclairage or International Commission on Illumination Guideline levels.

Predicted increases in Project-related noise and vibration will comply with applicable regulations. In general, the predicted sound levels for the areas adjacent to PDA will be characteristic of a rural environment. Exceptions include the area along the shoreline of Southwest Arm of Kenogamisis Lake adjacent to the PDA where sound levels are predicted to be between 45 to 50 decibel, A-weighted (dBA), which is considered consistent with the hum from an urban environment. A forested buffer around the PDA including the shoreline of Southwest Arm of Kenogamisis Lake would attenuate Project sound levels. A discussion of the predicted sounds and vibration levels is presented in chapter 8.0 of the Final EIS/EA (Stantec 2017d). Sensory disturbance to users due to Project-related emissions in the LAA is not anticipated.

Changes to the visual setting will commence during construction with the start of vegetation clearing, timber harvesting and the construction of Project components. Changes to the viewscape will continue throughout the operation phase with the development of the TMF and WRSAs. These two Project components are predicted to be the most visually prominent features. Users of the recreational trail and day-use area (including the beach) within MacLeod Provincial Park will see the WRSA from vantage points within the Park. The viewscape will be permanently altered to varying degrees due to the WRSAs and TMF. From other vantage points in the LAA for land and resource use, Project components may not be visible or will be only partially visible relative to the existing landscape. The existing visual character of the PDA has been effected by mining, forestry and development over the past 90 years.

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Discussion of Residual Effects of Changes to the Environment on Aboriginal People
June 2017

Aboriginal recreational users may be affected by altered viewscape and general increase in human activity at the Project site. There is potential for some Aboriginal recreational users to shift their activities to areas that are further away from the PDA without an altered viewscape.

7.2.5 Change in Labour and Economy

Direct employment during Project construction is estimated to be 1,635 person-years. On average, the construction labour force will consist of 650 workers (inclusive of construction workers plus other labour), and will peak at 975 workers. The total of direct, indirect, and induced person-years of employment for the province is estimated at 5,985 person-years during construction, 1,295 during operation, and 65 during closure. In the LAA, the preliminary estimate is that the total Project expenditure on goods and services during construction, operation, and active closure will be approximately \$480 million, which includes \$110 million during construction, \$20 million in sustaining capital, \$345 during operation and \$5 million during active closure (not including wages and salaries). The Project will affect both the local and regional economies primarily through spending on labour, goods and services. Local and regional businesses, including Aboriginal-owned businesses, stand to benefit from successful bids to supply the Project with goods and services. Based on these employment estimates, construction is expected to have a net positive effect on labour within the LAA and RAA for labour and economy. Project closure will have a net adverse effect on local and regional businesses, with the long-term loss of business associated with operation being partially offset in the short term by Project purchases of goods and services needed for active closure activities.

It is expected that site preparation activities during construction, particularly the removal of the MacLeod-Cockshutt Mining Headframe and the Discover Geraldton Interpretive Centre, and effects on the Kenogamisis Golf Club, will result in an adverse effect on the tourism industry. These changes could reduce tourism interest in the LAA for labour and economy, resulting in reduced revenues for some businesses.

It is expected that the Project will result in positive effects on socio-economic conditions for Aboriginal people by employing Aboriginal workers, reducing the unemployment rate and purchases of goods and services from Aboriginal-owned businesses. GGM will work with local Aboriginal, local communities and government agencies to develop a strategy for addressing adverse economic implications of Project closure.

The benefits of constructing and operating the Project for Ontario and Canada include economic development and diversification, and job creation. The Project will provide tax revenue for the Municipality of Greenstone, as well as for the provincial and federal governments. These revenues can then be used to support public services and infrastructure.

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Discussion of Residual Effects of Changes to the Environment on Aboriginal People
June 2017

7.2.6 Change in Community Services and Infrastructure

Residual changes to recreational facilities and services are included in Section 7.2.4. This section focuses on how changes to housing and accommodations, municipal and provincial services excluding recreation facilities, and transportation services might affect Aboriginal people.

The removal of existing MacLeod Townsite and Hardrock Townsite housing, located in the PDA, is not expected to have an effect on capacity of housing in the LAA/RAA for community services and infrastructure, given the small number of units involved (49) and available housing stock elsewhere in the LAA/RAA. It is expected that the majority of construction workers will live in the temporary camp. For operation, an estimated 350 workers are expected to move to the LAA/RAA from other locations. Population decline in the area has led to an abundant supply of vacant residential properties in Greenstone, such that there is adequate vacant housing to accommodate Project workers who require a place to live.

Construction workers will keep their health service providers in their home communities and will not need to rely on health services and infrastructure in the LAA/RAA for community services and infrastructure. GGM will maintain communication with relevant agencies and organizations, including municipal authorities, health agencies and school boards, to provide Project information, to identify and address potential Project-related implications for services and infrastructure, and to support responsible organizations in planning for, adapting to, or benefitting from changing demand as a result of the Project. Residual effect on health services and infrastructure will be low and capacity is anticipated to be at near to baseline conditions. GGM will also consult with schools to provide Project updates to support planning for changes in demand and educational services. It is assumed that there is capacity to handle increases in demand for policing and fire services; however, GGM will provide Project information upon request to help in preparation efforts for potential Project-related increases in demand. There is adequate existing capacity in the Municipality of Greenstone for power, waste, water and sewer services to handle new demand as a result of Project-related population growth. In-migrant operation employees will be accompanied by an estimated 385 children, creating additional demand for education services and infrastructure. GGM will provide Project information to school boards upon request to help them prepare for potential Project-related increases in demand. With the application of mitigation and management measures, the residual adverse effects on the capacity of municipal services and infrastructure during all Project phases are predicted to be low in magnitude.

The realigned Highway 11 will be constructed prior to closure of the existing Highway. As identified in the “Traffic Impact Study, Premier Gold Mines Limited, Hardrock Property” (Stantec 2014), Highway 11 is operating well within its capacity. It is anticipated that access to the area will be uninterrupted and existing infrastructure will be able to accommodate Project-related traffic increases. Most non-local construction workers will be housed at the temporary camp and bussed to and from the Project. Bussing and carpooling among locally-resident construction and operation workers will limit daily traffic volumes. The traffic associated with the Project can easily

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Discussion of Residual Effects of Changes to the Environment on Aboriginal People
June 2017

be accommodated at both the Highway 11/Michael Power Boulevard and Highway 11/site access intersections. A number of upgrades to the Nakina Airport are under being considered to provide services to new air service companies (see section 15.2.2 of the Final EIS/EA; Stantec 2017d). The residual adverse effects of the Project on transportation services and infrastructure are therefore predicted to be low in magnitude.

Residual effects of changes in community services and infrastructure for Aboriginal people living off-reserve are anticipated to be the same as residual effects for non-Aboriginal people. Community services and infrastructure in the LAA/RAA is also used by Aboriginal peoples living on-reserve but there may be slight differences in the residual effects experienced by Aboriginal peoples living on-reserve.

The LAA/RAA established for the assessment of community services and infrastructure incorporates reserve lands for the following Aboriginal communities: AZA, AFN BZA, BNA, GFN, and LLFN. Population increase is not expected to interact with community services and infrastructure located on Aboriginal community reserve lands (such as housing and accommodations, police services and schools).

The change in capacity of health services and infrastructure, including the Geraldton District Hospital which provides health services to the surrounding Aboriginal communities, will be at or near to baseline conditions after proposed mitigation and management.

The construction and operation workers and their family members will place additional demands on the recreation services and infrastructure (such as the Kenogamisis Golf Course and Geraldton Community Center), which may also be used by Aboriginal people living on-reserve within the RAA. However, the residual change in capacity of recreation services and infrastructure will be at or near to baseline conditions. Residual effects are not anticipated to extend to on-reserve health services.

As noted in Section 7.2.5, the Project will provide tax revenue for the Municipality of Greenstone, as well as for the provincial and federal governments. These revenues can then be used to support public services, such as health care, education, and infrastructure.

7.2.7 Significance Determination for VCs Related to Socio-economic Conditions for Aboriginal People

The environmental effects assessments for the VCs which are related to socio-economic conditions for Aboriginal people (Table 3-2) concluded that Project-related changes are not significant. Below is a discussion of the determinations of significance made by each VC and how they relate to socio-economic conditions for Aboriginal peoples.

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Discussion of Residual Effects of Changes to the Environment on Aboriginal People
June 2017

The land and resource use VC defined a significant adverse effect as one that threatens the long-term viability of the recreational, commercial land use activity or navigation. The residual effects on land and resource use were determined to be not significant as the long-term viability of recreational, commercial land use activity or navigation are not threatened by Project activities. Residual effects on bait harvesting, trapping and forestry activities conducted by Aboriginal people or Aboriginal-owned businesses were considered in the significance determination. The viability of recreational activities and use of navigable waterways, including by Aboriginal people, was determined to be not significant.

The labour and economy VC defined significant adverse effects as those that are distinguishable from current conditions and trends and cannot be managed or mitigated through adjustments to programs, policies, plans, or through other mitigation. Project effects are distinguishable from current conditions and trends; however, these residual effects are positive, can be managed and were determined to be not significant. As such, specifically for socio-economic conditions for Aboriginal people, it follows that residual effects on labour and economy for Aboriginal people are also not significant, as GGM anticipates employing Aboriginal workers and will implement measures to enhance contracting opportunities for local Aboriginal-owned businesses.

The community services and infrastructure VC defined a significant adverse effect as one that results in demands on services or infrastructure above current capacity, such that standards of service are routinely and persistently reduced below current levels for an extended period and are unlikely to recover to existing conditions. Project-related residual effects do not meet this threshold and were determined to be not significant. Specifically, for socio-economic conditions for Aboriginal people, it follows that residual effects on community services and infrastructure used by Aboriginal people are also not significant, as the services and infrastructure which is also relied upon by Aboriginal peoples are not anticipated to be routinely and persistently below current levels for an extended period.

7.3 PHYSICAL AND CULTURAL HERITAGE

7.3.1 Change in Physical or Cultural Heritage

Physical and cultural heritage incorporates archaeological resources and architectural and/or historical resources. For the purposes of the EIS/EA, architectural and/or historical resources were split into two categories; Euro-Canadian resources, which include the MacLeod and Hardrock townsites, MacLeod-Cockshutt Mining Headframe, Discover Geraldton Interpretive Centre and the Kenogamis Golf Club; and Aboriginal resources, which include cultural or spiritual sites or areas such as trails and travelways, sacred areas, communal gathering areas, and habitation sites. The value placed on Aboriginal resources is intrinsically linked with the current use of lands and resources by Aboriginal communities and therefore the assessment of potential effects on these features is considered in Section 7.4.

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Discussion of Residual Effects of Changes to the Environment on Aboriginal People
June 2017

No residual adverse effect on archaeological resources is anticipated. Effects on archaeological resources will be avoided, having carried out archaeological assessment programs in areas of archaeological potential prior to ground disturbance activities in the construction phase. Protocols to protect archaeological resources will be implemented in the event of a chance find.

Residual adverse effects on Euro-Canadian architectural and/or historical resources are not anticipated with the implementation of proposed mitigation (creation of buffer zones, documentation and salvage, and commemoration).

7.3.2 Significance Determination for Valued Components Related to Physical and Cultural Heritage for Aboriginal People

The heritage resources VC defines a significant residual adverse one that results in the loss of, change in access to, or change in cultural heritage value or interest of heritage resources where no appropriate retrieval of the resource has been undertaken and no prior approval from the appropriate agency has been sought. No residual environmental effects on archaeological and Euro-Canadian architectural and/or historical resources are anticipated. Consequently, there are no residual adverse effects carried forward for the determination of significance, and thus residual effects of the Project on the physical and cultural heritage of Aboriginal persons are not significant.

7.4 CURRENT USE OF LANDS AND RESOURCES FOR TRADITIONAL PURPOSES

7.4.1 Change in Current Use

Current use of lands and resources for traditional purposes (sometimes abbreviated herein as “current use”) is referred to as TLRU in chapter 18.0 of the Final EIS/EA (Stantec 2017d).

In addition to the constitutionally protected right for Aboriginal persons to practice traditional activities, Aboriginal communities stressed the value and importance of TLRU activities, sites and resources for: teaching and cultural use, cultural identity and way of life, and customs and traditions (see chapter 18.2 of the Final EIS/EA; Stantec 2017d). The assessment adopts the conservative assumption that TLRU sites and activities may occur near the Project even if not specifically identified by Aboriginal communities in the available information.

The Final EIS/EA concluded that the Project is anticipated to result in residual effects on the availability of TLRU resources and access to TLRU areas within the PDA. AFN, EFN, LLFN, and MNO have identified TLRU activities that take place within the PDA. During construction, residual environmental effects on hunted and trapped wildlife and gathered plants species of interest for Aboriginal people are considered to be adverse due to the removal of vegetation, thereby affecting availability of those resources and loss of wildlife habitat within the PDA. Where there is

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Discussion of Residual Effects of Changes to the Environment on Aboriginal People
June 2017

interest, GGM will provide opportunities to local Aboriginal communities for harvesting of plants for traditional purposes prior to construction. However, the removal of plant species of interest to Aboriginal communities within the PDA is not anticipated to affect the viability or sustainability of these species as the plant species of interest are common throughout the RAA.

Fish habitat that is altered or lost within the PDA will be offset by creating new fish habitat within the Goldfield Creek diversion. More than half of the 6.58 ha of fish habitat that will be altered or lost is comprised of artificial golf course ponds as well as poor quality habitat such as roadside ditches. Excluding the ponded southwest arm tributary areas, the total offset area proposed is 9.1 ha resulting in a net habitat gain of 2.52 ha representing a ratio of approximately 1.4:1.

Access to the PDA, including to TLRU sites within the PDA, will be restricted for the construction, operation and active closure phases in order to maintain safety, but access may be restored during post-closure. GGM is committed to maintaining alternate access within the PDA to the Southwest Arm of Kenogamisis Lake during construction and operation.

The Project is also anticipated to result in residual effects on the availability of resources outside of the PDA that are relied upon to exercise TLRU activities. AFN, AZA, EFN, GFN, LLFN, and MNO have identified TLRU activities within the LAA. Residual effects are anticipated to extend beyond the PDA to wildlife and plant species harvested within the LAA. Mortality risk may affect species important to TLRU as a result of site preparation. With the implementation of the identified mitigation (chapter 13.0 of the Final EIS/EA; Stantec 2017d), direct mortalities are not expected to increase due to the Project and would therefore not affect the long-term persistence or viability of wildlife within the RAA established for wildlife and wildlife habitat assessment.

Change in movement of wildlife important to TLRU will be primarily due to the presence and operation of the open pit and its associated infrastructure, which will act as a local barrier to wildlife movement. Other Project components such as ditches, access roads and transmission/distribution lines also have the potential to alter wildlife movement. During operation, hunted and trapped species will also be affected due to indirect loss or alteration by sensory disturbance that may extend into the LAA (including habitat avoidance or under-utilization due to human activity). Residual effects from dust deposition due to construction, operation, and active closure activities will extend approximately 30 m from the PDA boundary into the LAA.

AZA, GFN, and LLFN noted that too much dust on plants (e.g., berries) may result in less harvesting of traditional plants and medicines. Overall, the residual effects on the distribution and abundance of harvested species are not anticipated to limit the ability of Aboriginal communities to engage in hunting and trapping and plant gathering within the RAA for TLRU.

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Discussion of Residual Effects of Changes to the Environment on Aboriginal People
June 2017

Residual effects are not anticipated for the fish resources within the LAA. AZA, AFN, EFN, GFN, LLFN, and MNO have identified fishing areas within the LAA for TLRU, but there is no predicted residual effect as a result of the Project on the sustainability and productivity of local fish resources at these areas. The fish communities known to inhabit Kenogamisis Lake, the major body of water within the LAA for TLRU, are typical of the predicted habitat type (i.e., mesotrophic habitat) within the effluent mixing zone.

The Project is anticipated to result in residual effects on cultural and spiritual areas that were identified by Aboriginal communities to be present within the PDA. As noted in chapter 18.0 (TLRU VC) of the Final EIS/EA (Stantec 2017d), cultural and spiritual areas include trails and travelways, sacred areas, communal gathering areas, and habitation sites. There is potential for Aboriginal architectural and/or historical resources, including heritage and archaeological artifacts, to be associated with cultural and spiritual sites. However, as noted in chapter 17.0 of the Final EIS/EA (Stantec 2017d), residual effects are not anticipated for heritage resources. Protocols for chance encounters of archaeological resources during construction procedures described in the Conceptual AHRMP (GGM 2017b) will address the potential effects should undiscovered archaeological resources be found in the PDA. Despite this, residual adverse effects are anticipated for cultural and spiritual areas, as sites within the PDA will be permanently removed during construction. The following cultural and spiritual areas sites will experience residual adverse effects:

- Four “land use” sites identified by LLFN in the PDA. The “Traditional Knowledge Assessment Related to the Premier Gold Mines Hardrock Project: prepared for Long Lake #58 First Nation” (Hensel Design Group Inc. 2015) identifies four campsite or cabin areas in the PDA. In addition, comments from LLFN to the CEA Agency identified a heritage site located within the proposed realignment of Highway 11. During GGM and LLFN follow-up meetings on April 18 and 19, 2017, LLFN confirmed there are a total of 4 land use sites within the PDA. LLFN also confirmed that these are not sacred site and further detail is confidential. GGM and LLFN have agreed upon a path forward for these sites.
- A tent or temporary structure, as well as a route connecting Mosher Lake and Highway 11, both within the PDA (MNO). Based on the layout of the PDA, Mosher Lake will remain accessible during all phases of the Project.
- A snowmobile trail through the PDA (AFN). The Lahtis Road portion of the snowmobile trail (maintained by the Greenstone Snowmobile Club) was not open during the 2015 season and as of 2016 the snowmobile club did not have plans to maintain the trail.

The Project is anticipated to result in residual adverse effects on access to TLRU areas (plant gathering, fishing, hunting and trapping and cultural and spiritual sites) within the LAA for TLRU. AZA, AFN, EFN, GFN, LLFN, and MNO have reported that TLRU practices occur within the LAA for TLRU. Access to TLRU practices, sites, or areas in the LAA for TLRU may be affected due to changes in patterns of access because of the realignment of approximately 4.2 km of Highway 11 and diversion of Goldfield Creek. Through Project design, the length and location of roads

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Discussion of Residual Effects of Changes to the Environment on Aboriginal People
June 2017

have been considered to reduce potential access restrictions (see section 5.4.17 of the Final EIS/EA; Stantec 2017d). AFN, LLFN and MNO have confirmed use of Lahtis Road for access to the Southwest Arm of Kenogamisis Lake. The Project will result in the loss of access to the PDA, and, therefore, alter access to the shoreline of the Southwest Arm of Kenogamisis Lake, affecting access to LLFN and MNO cultural sites. Lahtis Road may also be used by other Aboriginal communities to access the Southwest Arm of Kenogamisis Lake. GGM is committed to maintaining alternate access to the Southwest Arm of Kenogamisis Lake during construction and operation.

Effects on air quality, water quality, noise, visual aesthetics, or altered landscapes may result in indirect sensory effects (either real or perceived) on Aboriginal land users that may deter some individuals from practicing TLRU activities in affected areas or locations. Effects on biophysical conditions that may influence sensory disturbances for Aboriginal people are addressed in atmospheric environment, acoustic environment, groundwater, surface water, and land and resource use (chapters 7.0, 8.0, 9.0, 10.0 and 16.0 of the Final EIS/EA, respectively; Stantec 2017d). The mitigation proposed reduces residual effects on access to TLRU sites and resources relied upon to exercise TLRU activities (see Section 6.0 above and chapter 24.0 of the Final EIS/EA; Stantec 2017d).

7.4.2 Significance Determination for VCs Related to Current Use of Lands and Resources for Traditional Purposes by Aboriginal People

The Project may result in a reduced access to land and availability of resources for the pursuit of traditional activities such as plant harvesting, fishing, hunting, trapping, and access to cultural or spiritual sites. The PDA is in a previously disturbed area from historical mining, forestry, aggregate extraction, highway transportation, mineral exploration, residential and industrial land uses, and most TLRU sites were identified outside of the PDA. While access to the PDA will be limited for the lifetime of the Project, rehabilitation will be undertaken during closure and TLRU sites and areas within the LAA, except for Lahtis Road, will continue to be accessible during Project construction, operation, and closure.

The residual environmental effects from the Project on TLRU are determined to be not significant because they do not result in the long-term loss of availability of traditional use resources or access to lands relied on for traditional use practices or the permanent loss of traditional use sites and areas in the LAA and RAA. The ability of Aboriginal communities to maintain TLRU outside of the PDA will be maintained with some access changes, as GGM is committed to maintaining alternate access within the PDA to the Southwest Arm of Kenogamisis Lake during construction and operation.

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Change in Mental, Social, and Spiritual Well-being
June 2017

8.0 CHANGE IN MENTAL, SOCIAL, AND SPIRITUAL WELL-BEING

Mental, social, and spiritual well-being incorporates a living set of customs, behaviours, beliefs, languages, and social settings which are unique to each Aboriginal community and can also be similar among between Aboriginal communities. Through the consultation process, Aboriginal communities provided comments on, or requested additional information about, mental, social, and spiritual well-being including the following key comments (with the specific community that raised the comment identified in brackets):

- healthy and accessible lands and resources are relied upon in order to maintain the health of members through the consumption of a traditional diet and a connection to culture, traditions and land use (GFN)
- land use is important to traditional and cultural life and provides a social fabric to relationships with other AFN members (AFN)
- potential effects on social, cultural, mental, and physical health (AFN, LLFN)
- programs and initiatives currently in place and being developed to address social and health issues in culturally relevant and sustainable ways (AFN)
- psychological and spiritual effects of the Project may cause grief (LLFN)
- current social and health issues communities face and inclusion of social, cultural, mental and physical health indicators in the Final EIS/EA (Biigtigong Nishnaabeg).

Mental, social, and spiritual well-being is a broad and multifaceted topic and changes to these components of well-being can take place through a variety of mechanisms. It is acknowledged, however, that perceptions of what constitute mental, social, and spiritual well-being are at times individual from one person to another, and these experiential conditions present challenges within an EA because of the inherent subjectivity of these individual experiences, perceptions, and beliefs and how they translate into a state of well-being from one individual to another. It is difficult to characterize how these changes may, individually or in combination, alter mental, social, and spiritual well-being as the indirect effect on health conditions, socio-economic conditions and current use also encompass qualitative experiences, beliefs, perceptions and cultures. AFN also noted that changes in substance abuse, mental illness, and depression can affect the well-being of individuals living in a community.

Changes to health conditions have the potential to affect the mental, social, and spiritual well-being of Aboriginal persons and their communities. Changes in exposure to potentially harmful chemicals can alter a person's physical health, which may indirectly affect their mental, social and spiritual well-being.

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Change in Mental, Social, and Spiritual Well-being
June 2017

Changes to socio-economic conditions have the potential to affect the mental, social, and spiritual well-being of Aboriginal persons and their communities. Changes in employment, income, commercial opportunities for Aboriginal businesses, and recreational facilities and services for Aboriginal people can affect mental and social well-being and can be positive as well.

Aboriginal communities also identified the important role that TLRU plays in providing connection to the land, community well-being, social fabric, cultural continuity, and identity (AZA, AFN, EFN, GFN, LLFN, MNO). Changes in TLRU practices (either through changes to TLRU sites, the species, or resources relied upon to engage in specific practices, or access to TLRU sites) may indirectly affect the mental, social, and spiritual well-being of Aboriginal persons or communities.

Project-related changes to health conditions, socio-economic conditions and TLRU have been discussed in detail in Sections 4.0 to 7.0 of this report. In keeping with the conservative approach, because residual adverse effects are anticipated for the VCs related to health conditions, socio-economic conditions, and TLRU, there is a potential for the Project to affect the mental, social, and spiritual well-being of Aboriginal persons.

The mitigation proposed to reduce or eliminate effects on health conditions, socio-economic conditions, and TLRU (see Section 6.0 of this report) will also mitigate residual effects on mental, social, and spiritual well-being. GGM has held and will continue active discussions with local Aboriginal communities to identify potential issues and ways to address them throughout the life of the Project as outlined in the Record of Consultation (Appendix C8; Community-Specific Consultation Plans) of the Final EIS/EA (Stantec 2017).

9.0 CUMULATIVE ENVIRONMENTAL EFFECTS

9.1 CUMULATIVE ENVIRONMENTAL EFFECTS ASSESSMENT

9.1.1 Introduction

The purpose of this section is to consider whether there are cumulative environmental effects resulting from the interaction of residual effects from this Project with the residual effects of other past, present, and reasonably foreseeable future projects or activities that may cause a change to the environment that affects Aboriginal people's health conditions, socio-economic conditions, physical and cultural heritage, or current use of lands and resources for traditional purposes.

The following sections describe how cumulative environmental effects were assessed for the Project (chapter 20.0 of the Final EIS/EA; Stantec 2017d). The conclusions that were drawn in identifying the VCs that would be carried forward for assessment were examined to verify that the perspective of potential effects on Aboriginal persons was considered in these determinations. A summary of the assessment for each VC is provided, and provides the background and context for the discussion of whether the identified cumulative environmental effects would combine to cause a change to Aboriginal health conditions, socio-economic conditions, physical and cultural heritage, or current use of lands and resources for traditional purposes.

9.1.2 Selection of VCs for Cumulative Environmental Effects Assessment

Two conditions were used to determine which VCs would be carried forward for an assessment of cumulative effects in the EIS/EA: 1) that there are adverse residual effects identified for the VC in question; and 2) that the residual effects of the Project overlap spatially or temporally with the residual effects from other past, present, or reasonably foreseeable future projects or activities.

Using these criteria, the six VCs described below were not carried forward for assessment of cumulative effects.

Human and Ecological Health: The assessment of potential Project effects on human and ecological health concluded that residual effects would be negligible from inhalation (air quality), and low from the ingestion of surface water or the consumption of fish. Although a negligible to low level of risk was identified, with appropriate monitoring to confirm both surface water and fish tissue concentrations, it was determined that the Project would not likely result in a change to human or ecological health. In the absence of measurable residual effects, there is no pathway through which the Project could result in overlapping cumulative effects with other projects or activities; therefore, it was determined that no assessment of cumulative effects of human and ecological health was warranted.

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Cumulative Environmental Effects
June 2017

The HHERA (chapter 19.0 of the Final EIS/EA; Stantec 2017d) included consideration of Aboriginal peoples through the inclusion of community receptors for air quality modelling and Aboriginal/High Use Receptors. Therefore, the rationale provided for excluding human and ecological health from the assessment of cumulative environmental effects is reasonable in consideration of the potential effects of changes to the environment on Aboriginal people.

Acoustic Environment: The Project will result in an increase in noise and vibration levels. The predicted noise and vibration levels at each point of reception will be within the quantitative limits as prescribed by the applicable guidelines. With the application of mitigation measures incorporated in the acoustic models, the residual Project effects on the acoustic environment for all phases of the Project are predicted to be not significant. None of the future project or activities are located within the acoustic RAA, as such no spatial overlap could occur and therefore is no pathway for cumulative effects to occur. As such no cumulative effects assessment is warranted.

Heritage Resources: With the proposed mitigation (creation of buffer zones, documentation and salvage, and commemoration), no residual adverse effects on heritage resources are anticipated. In the absence of measurable residual effects, there is no pathway through which the Project could result in overlapping cumulative effects with other future projects or activities; as such, no cumulative effects assessment is warranted. This determination is reasonable in consideration of the potential effects of changes to the environment on Aboriginal people.

Groundwater: Two potential future projects were identified that may have a potential spatial and temporal overlap with the Project (Geraldton subdivision, Union Gas pipeline). The magnitude of any drawdown is anticipated to be low due to the limited depths that these types of infrastructure are typically installed. The effect of drawdown would be confined to the area directly around the infrastructure, and is considered short term as it will only occur during construction. With the implementation of current best management and design mitigation measures, it was determined that neither project is anticipated to result in overlapping residual effects with the Project on groundwater quantity, and therefore cumulative effects with the Project are not anticipated.

Surface Water: One future project, the Bankfield West Mineral Exploration, may have a potential spatial and temporal overlap with the Project. It is assumed that no temporary camp will be required for the exploration project and no Environmental Compliance Approval for discharge will be required. With the implementation of mitigation, this project is not anticipated to result in overlapping residual effects with the Project on surface water quality, and therefore cumulative effects with the Project are not anticipated.

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Cumulative Environmental Effects
June 2017

Fish and Fish Habitat: None of the future activities identified are considered likely to interact cumulatively with the Project because they are either not located within the Kenogamisis River watershed or there is no physical connection to surface water. As there are no identified residual effects from other activities that would overlap with the residual effects of the Project, cumulative effects with the Project are not anticipated.

The remaining seven VCs met both identified criteria and were carried through a cumulative effects assessment.

9.2 EFFECTS OF CUMULATIVE CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLE

A cumulative effects assessment was carried out in the Final EIS/EA for the seven remaining VCs: atmospheric environment; vegetation communities; wildlife and wildlife habitat; labour and economy; community services and infrastructure; land and resource use; and TLRU. The following sections consider how the results of the cumulative effects assessment may contribute to changes in conditions for Aboriginal people.

9.2.1 Health Conditions

The VCs that contribute most directly to potential changes in Aboriginal people's health are atmospheric environment; acoustic environment; groundwater; surface water; fish and fish habitat; vegetation communities; wildlife and wildlife habitat; and human and ecological health. As discussed above, a number of these were not carried forward for consideration of cumulative effects. Therefore, the VCs that are related to Aboriginal health conditions, which were carried forward for the assessment of cumulative effects are: atmospheric environment; vegetation communities; and wildlife and wildlife habitat.

With mitigation, the maximum predicted concentrations of all PoPC were below applicable criteria during operation at all of the assessed property modelling locations with the exception of infrequent 24-hour averages of PM₁₀ and PM_{2.5} close to the modelled property boundary. Given the proximity and description of future physical activities, Project environmental effects will likely act cumulatively with those of other physical activities, but the resulting cumulative effects are unlikely to exceed acceptable levels with the application of management practices and proposed mitigation measures at each project. This assessment included consideration of receptors representing Aboriginal land and resource use; therefore, it is applicable in the consideration of the key topics related to Aboriginal people's health conditions.

A cumulative change in the abundance of plant species of interest to Aboriginal communities is predicted. Potential habitats for the plant species of interest to Aboriginal communities are common and widespread in the RAA (chapter 12.0 of the Final EIS/EA; Stantec 2017d) and the viability and distribution of populations of these species are not expected to be adversely affected in the RAA. The residual adverse cumulative effects on vegetated ecosites supporting vegetation

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Cumulative Environmental Effects
June 2017

species of interest, vegetation communities, and function, connectivity and quality of vegetation communities are predicted to not affect the long-term sustainability of vegetation communities identified in this assessment in the RAA and are therefore predicted to be not significant. This assessment of vegetation communities included consideration of Aboriginal use; therefore, it is applicable in the consideration of the key topics related to Aboriginal people's health conditions.

The residual cumulative environmental effects from the Project and other future physical activities on wildlife and wildlife habitat are determined to be not significant because they do not threaten the long-term persistence or viability of a wildlife species (including species at risk, species of conservation concern, and species of stakeholder concern) within the RAA. The overall cumulative environmental effect on mortality risk and movement within the RAA is expected to have a similar profile to the existing condition. Sources of mortality risk are unlikely to affect the long-term persistence or viability of any species within the RAA. Disruption of wildlife movement from Highway 11 and urban and industrial development in the northern half of the RAA is unlikely to affect the long-term persistence or viability of any species within the RAA. The assessment of wildlife species included consideration of Aboriginal use; therefore, it is applicable in the consideration of the key topics related to Aboriginal people's health conditions.

As the potential cumulative environmental effects for the VCs related to Aboriginal peoples' health conditions have been determined to be not significant, it is expected that cumulative environmental effects on Aboriginal people's health conditions will be not significant.

9.2.2 Socio-economic Conditions

The VCs that contribute most directly to potential changes in Aboriginal people's socio-economic conditions are: labour and economy, community services and infrastructure, and land and resource use. Each of these was carried forward for the assessment of cumulative effects.

The cumulative demands of the Project will not result in an adverse effect on labour in the RAA during construction or operation. The cumulative effects of Project closure on labour conditions in the RAA are difficult to accurately predict and it is assumed that some residual cumulative effects at closure. Construction and operation of the future projects will result in increased opportunities for businesses in the RAA and may generate municipal government revenues, affect the land base that supports forestry operations, and may affect businesses that are dependent on tourism. Based on labour force conditions in the RAA, it is expected that the cumulative effects on the RAA of constructing and operating future projects would likely be positive. While the potential long-term loss of forested land based associated with each of the future projects is unknown, it is expected affected merchantable timber would be salvaged in accordance with provincial requirements. There would be limited adverse effects on businesses that directly or indirectly rely on timber harvesting in the FMU. The assessment of labour and economy is inclusive of the general labour force, regional economies and Aboriginal businesses; therefore, it is applicable in the consideration of labour and economy to the key topics related to Aboriginal people's socio-economic conditions.

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Cumulative Environmental Effects
June 2017

There were no potential cumulative interactions identified between future projects and the potential for change in capacity of municipal and provincial services and infrastructure, or for the potential for change in the capacity of transportation services and infrastructure. These effects were therefore not carried through the assessment. The rationale provided is that the labour requirements needed for projects that overlap spatially or temporally would be minimal and not enough to cause a change to services. Landfill planning and highway upgrades are anticipated to improve the capacity of municipal and provincial services and infrastructure and transportation services and infrastructure in the RAA. The potential for future projects to have an adverse effect on the capacity of housing and accommodations was carried through the assessment. The only project expected to result in an increased demand for accommodations is the planned Geraldton subdivision. Future residential developments are unlikely to lead to an increase in the population of the RAA as they are planned to address current housing needs, and thus an increase in the demand on community services and infrastructure. The assessment of community services and infrastructure is inclusive of the general population, including use by Aboriginal peoples; therefore, it is applicable in the consideration of community services and infrastructure to the key topics related to Aboriginal people's socio-economic conditions.

There were no potential cumulative interactions identified between future projects and the potential for change in navigation, as there are no future projects that overlap with this effect. The residual cumulative effects on recreational land and resource use are expected to result in a loss of area for recreational use that is equivalent to 1.5% of the RAA. The residual cumulative effects consist of loss of accessible area, interruptions to trail use, changes in the availability of wildlife resources and sensory disturbance to resource users. Given the existing level of disturbance in the LAA, it is considered that recreational users are accustomed to the types of disturbance that will result from the interaction of the Project and the identified future physical activities. Given the existing level of disturbance, the abundance of wildlife resources and recreational opportunities, the residual cumulative effects are not anticipated to affect the long-term viability of recreational land and resource use.

Residual cumulative effects will remove area and change access to trapping, guide outfitting, and bait harvesting areas. They will also affect harvesting activity through changes as a result of the displacement of wildlife resources and sensory disturbance to users, similarly to the cumulative effects on recreational land and resource use. The residual cumulative effects will affect a small number of commercially-based land and resource users differently. Potential cumulative effects are expected for the Aboriginally held trapline area GE021 (held by a member of AZA) and GE022 (non-Aboriginal licence holder) and bear management areas GE-19-027 and GE-21A-032. The cumulative loss of accessible area will represent about 15% of trapline area GE022 (non-Aboriginal licence holder), 1% of bear management area GE-21A-032, and less than 1% of trapline area GE021 (held by a member of AZA) and one other affected tenure (non-Aboriginal licence holder). Potential cumulative effects on access may occur in bait harvesting areas NI5036, NI5027 and NI5028, which are held by non-Aboriginal licence holders, and NI5035 which is held by an Aboriginal licence holder.

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Cumulative Environmental Effects
June 2017

Project effects related to loss of access to areas within harvesting and other tenures will be managed by communicating Project activities to tenure holders and entering into negotiations with affected tenure holders. It is reasonably expected that proponents of future physical activities would also communicate activities to local stakeholders and to enter into negotiations, as appropriate. In so doing, the cumulative effects on loss of access to tenure areas will be mitigated. Considering the mitigation proposed, the existing levels of disturbance, the size of tenure areas and access options, and the relatively low level of disturbance to harvesting activities in the RAA, the residual cumulative effects are not anticipated to affect the long-term viability of commercially-based land and resource use. The assessment of land and resource use included consideration of Aboriginal use; therefore, it is applicable in the consideration of the key topics related to Aboriginal people's socio-economic conditions.

Cumulative environmental effects for the VCs related to Aboriginal people's socio-economic conditions (labour and economy, community services and infrastructure, and land and resource use) have been determined to be not significant. It is expected that cumulative environmental effects on Aboriginal people's socio-economic conditions will also be not significant.

9.2.3 Physical and Cultural Heritage

As discussed above, the heritage resources VC did not identify residual Project effects and the VC was not carried forward to a cumulative effects assessment. The heritage resources VC assessment considered potential effects on archaeological resources and Euro-Canadian architectural and/or historical resources. Archaeological resources are evidence of Aboriginal populations' occupation of the area; therefore, this determination is applicable in the consideration of the key topics related to Aboriginal people's physical and cultural heritage.

Project effects on Aboriginal architectural and/or historical resources were assessed as part of the TLRU VC. Aboriginal architectural and/or historical resources such as cabins, campsites, travel routes, ceremonial and sacred areas were considered in the assessment of change to cultural or spiritual practices, sites, or areas, as the value placed on these resources is intrinsically linked with the traditional use of the areas by Aboriginal communities. Cumulative effects on Aboriginal architectural and/or historical resources are addressed in TLRU portion of the Cumulative Effects Assessment (section 20.12 of the Final EIS/EA; Stantec 2017d) and are also discussed in Section 9.2.4 of this report.

Cumulative environmental effects for heritage resources have been determined to be not significant, it is expected that cumulative environmental effects on Aboriginal people's physical and cultural heritage will also be not significant.

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Cumulative Environmental Effects
June 2017

9.2.4 Current Use of Lands and Resources for Traditional Purposes

The assessment of cumulative effects on TLRU is provided in section 20.16 of the Final EIS/EA (Stantec 2017d) and considers the cumulative effects addressed for the following related VCs: atmospheric environment; vegetation communities; wildlife and wildlife habitat; and land and resource use.

The cumulative effects assessment for the atmospheric environment (section 20.3 of the Final EIS/EA; Stantec 2017d) determined that Project residual effects are likely to interact with the environmental effects of other past, present, or reasonably foreseeable future projects or activities. Effects on air quality and visual aesthetics may result in indirect sensory disturbance to Aboriginal land users; however, residual environmental effects and the overall effect on the atmospheric environment within its RAA is determined to be not significant. As a result, the residual adverse cumulative effects on atmospheric environment are not predicted to compromise the sustainability of TLRU within the RAA for the atmospheric environment.

The cumulative effects assessment for vegetation communities (section 20.7 of the Final EIS/EA; Stantec 2017d) predicts that Project residual effects are likely to interact with the environmental effects of other past, present, or reasonably foreseeable future projects or activities. Clearing of vegetation from past, present, and future projects, combined with the Project's clearing during construction, will result in an incremental loss of plant species of interest to Aboriginal communities, upland vegetation communities, and wetlands in the RAA for vegetation communities. However, these losses represent a small proportion of each resource within the RAA and the residual adverse cumulative effects on vegetation communities are not predicted to threaten their long-term viability or sustainability of vegetation, thus cumulative effects are determined to be not significant.

The cumulative effects assessment for wildlife and wildlife habitat (section 20.8 of the Final EIS/EA; Stantec 2017d) identified residual cumulative effects for change in habitat, change in wildlife mortality risk and change in movement. The Project and past, present, and reasonably foreseeable future projects or activities will contribute to change in habitat within the RAA for wildlife and wildlife habitat (primarily through vegetation clearing). With respect to change in mortality risk, the cumulative effects were predicted to be minor relative to existing conditions. For change in wildlife movement, there may be localized effects on the movements of some species, but hunted and trapped wildlife species of interest for TLRU activities are highly mobile and are able to adjust their local movement patterns in response to changes in habitat configuration. Overall, the Project and past, present, and future projects or activities are not anticipated to contribute substantially to change in habitat, change in mortality risk, and change in movement and is not predicted to compromise the sustainability of wildlife and wildlife habitat within the RAA for wildlife and wildlife habitat and cumulative effects are thus determined to be not significant.

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Cumulative Environmental Effects
June 2017

The cumulative effects assessment for land and resource use (section 20.11 of the Final EIS/EA; Stantec 2017d) cumulative effects assessment determined that there are Project residual effects that are likely to interact with the environmental effects of other past, present, or reasonably foreseeable future projects or activities. With respect to residual cumulative effects on change in recreational land, the PDA and LAA for land and resource use include areas disturbed from previous human activity and development that have had existing effects on access, wildlife resources, and sensory disturbance. As a result, recreational land and resource users may already be accustomed to disturbed conditions, although some users may relocate to other areas in the RAA for land and resource use. With respect to residual cumulative effects on change in commercially-based land and resource use, these are related to access, availability, and competition for wildlife resources, and sensory disturbance. These are similar to the cumulative effects for recreational land and resource users for the same reasons of past disturbance. Overall, both recreational and commercially-based land and resource use is predicted to be adversely affected within the LAA for land and resource use. However, given the existing disturbance within the LAA for land and resource use and the abundance and diversity of land and resource opportunities within its RAA, the cumulative effects on recreational land users are not significant.

TLRU information has been shared during consultation activities for the Project. TLRU sites and areas were acknowledged to be within the PDA, LAA and RAA for TLRU, although precise locations were not disclosed, except for in non-confidential TK and TLRU reports. Cumulative effects on TLRU areas may occur where Aboriginal people move across the landscape. Taking the conservative approach, the movement by Aboriginal harvesters will effectively tie together effects on TLRU sites across the RAA and therefore cumulative effects can be assumed to occur throughout the assessment area.

When the effects of past, present, and reasonably foreseeable future projects or activities on the landscape are determined in combination with the residual effects of the Project, the Project's contributions to cumulative effects on TLRU are not anticipated to reduce the ability of Aboriginal people to pursue TLRU activities within the RAA. Considering the cumulative effects assessments for VCs related to TLRU and the characterization of residual effects, the cumulative effects on TLRU are anticipated to be not significant.

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Follow-up and Monitoring
June 2017

10.0 FOLLOW-UP AND MONITORING

Under the CEAA 2012, an EA must consider the need for, and the requirements of, follow-up and monitoring programs. A follow-up program under CEAA 2012 has the following objectives:

- to verify the accuracy of the EA predictions
- to determine the effectiveness of measures taken to mitigate the adverse environmental effects of a project.

These objectives have been expanded to include monitoring for the purpose of determining:

- compliance with environmental approvals, permits and authorizations
- adaptive management measures in the case that environmental effects differ from that predicted, or incorporate new information that becomes available
- support environmental management plans used to manage environmental effects of the Project.

As described in the EIS Guidelines, the goal of the environmental monitoring program is to confirm that the Project is implemented as proposed and that mitigation measures to reduce environmental effects are effectively implemented, and to provide action plans and emergency response procedures.

A number of comments were received from Aboriginal communities that identified the need to include additional information on monitoring and follow-up programs in the Final EIS/EA. As a result, GGM has provided conceptual Project-specific EMMPs, a "Hardrock Project - Conceptual Closure Plan" (Stantec 2017b), and a Draft Fisheries Offset Plan (AMECFW 2017) as appendices to the Final EIS/EA (Stantec 2017d). These plans are associated with VCs that may be linked to potential effects on Aboriginal health conditions, socio-economic conditions, physical and cultural heritage, and current use of lands and resources for traditional purposes (Table 10-1).

**HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES –
IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY**

Follow-up and Monitoring
June 2017

**Table 10-1: Conceptual EMMPs Related to Effects of Changes to the Environment on
Aboriginal People**

Conceptual EMMPs	Associated Valued Components	Related Effects of Changes to the Environment on Aboriginal People			
		Health Conditions	Socio-economic Conditions	Physical and Cultural Heritage	Current Use of Lands and Resources for Traditional Purposes
Conceptual AQMMP	Atmospheric Environment	✓	✓	-	✓
Conceptual AMMP	Fish and Fish Habitat	✓	✓	-	✓
Conceptual AHRMP	Heritage Resources	-	-	✓	-
Conceptual BMMP	Vegetation Communities, Wildlife and Wildlife Habitat	✓	✓	-	✓
Conceptual Closure Plan	All VCs	✓	✓	✓	✓
Draft Fisheries Offset Plan	Fish and Fish Habitat	✓	✓	-	✓
"Hardrock Project Conceptual Emergency Response Plan" (Conceptual ERP)	All VCs	✓	✓	✓	✓
"Hardrock Project Conceptual Erosion and Sediment Control Plan"	Surface Water, Fish and Fish Habitat	✓	✓	-	✓
"Hardrock Project Conceptual Explosives and Blasting Management Plan"	Atmospheric Environment, Acoustic Environment, Groundwater, Surface Water, Fish and Fish Habitat, Heritage Resources	✓	✓	✓	✓
Conceptual GHMMP	Atmospheric Environment	✓	✓	-	✓
"Hardrock Project Conceptual Noise and Vibration Management and Monitoring Plan"	Acoustic Environment	✓	✓	-	✓

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Follow-up and Monitoring
June 2017

Conceptual EMMPs	Associated Valued Components	Related Effects of Changes to the Environment on Aboriginal People			
		Health Conditions	Socio-economic Conditions	Physical and Cultural Heritage	Current Use of Lands and Resources for Traditional Purposes
"Hardrock Project Conceptual Soil Management Plan"	Groundwater, Surface Water	✓	✓	-	✓
"Hardrock Project Conceptual Spill Prevention and Response Plan" (Conceptual SPRP)	All VCs	✓	✓	✓	✓
"Hardrock Project Conceptual Waste Management Plan"	All VCs	✓	✓	✓	✓
"Hardrock Project - Conceptual Waste Rock Management Plan" (Conceptual WRMP)	Groundwater, Surface Water	✓	✓	-	✓
WMMP	Groundwater, Surface Water	✓	✓	-	✓

NOTES:

- ✓ applicable
- not applicable

Input from Aboriginal communities has informed development of the Conceptual EMMPs listed in Table 10-1, as demonstrated by the following examples:

- AFN requested further information on emergency response measures related to certain events which have been incorporated into the Conceptual ERP (GGM 2017d). The Conceptual ERP also defines appropriate communications protocols, including procedures to contact relevant Aboriginal communities related to an accident or malfunction event and follow-up actions that will be taken.
- AFN comments regarding the potential effects of spills and the response methods were considered during development of the Conceptual SPRP (GGM 2017f).
- Further information on waste rock management has been added to the Conceptual WRMP (Stantec 2017c) in response to a request by the MNO.
- Additional downstream monitoring stations were added to the WMMP (Stantec 2017e) to address comments from LLFN during consultation about conditions downstream of Kenogamisis Lake, Kenogamisis River, and outflow to Long Lake.

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

Follow-up and Monitoring
June 2017

- Based on comments from consultation, fish sampling programs in the Conceptual AMMP (Stantec 2017a) will be expanded to obtain data on species Aboriginal communities have identified as being traditionally important (e.g., White Sucker). This will include the analysis of whole bodied fish to reflect the ways Aboriginal peoples prepare and consume fish (AFN, LLFN).
- The Conceptual BMMP (GGM 2017c) and Conceptual Closure Plan (Stantec 2017b) address requests from Aboriginal communities for additional information on the establishment and monitoring for vegetation and response in the event that rehabilitation strategies do not result in intended outcomes.
- A number of comments were received from Aboriginal communities with regard to waterfowl and migratory bird use of the TMF. The Conceptual BMMP (GGM 2017c) includes a discussion regarding monitoring waterfowl activity on the TMF to confirm EIS/EA assumptions, and includes adaptive management measures to deter waterfowl from coming in contact with tailings pond water.
- Wildlife protection measures and monitoring is addressed in the Conceptual BMMP in consideration of comments received from Aboriginal communities with regard to wildlife monitoring.
- In response to the interest expressed during consultation, GGM will participate in an MNRF-led moose health (i.e., tissue sampling) study with local Aboriginal communities during Project operation.
- As a result of Aboriginal consultation input, a AHRMP has been prepared. GGM will also work collaboratively with local Aboriginal communities to develop a protocol for communications should previously undocumented archaeological resources be discovered.

In addition to considering Aboriginal input during Conceptual EMMP development, GGM has also facilitated the participation of local Aboriginal communities in baseline monitoring for the Project and will work with communities to provide the opportunity to form a joint Aboriginal Environment Committee as the Project progresses. If parties are not open to forming a committee, GGM will work with local Aboriginal communities individually throughout the Project.

Consultation has been ongoing prior to and throughout the EA process, and will continue with government agencies, local Aboriginal communities, and stakeholders through the life of the Project. GGM will review the results of TK information received after submission of the Final EIS/EA against the conclusions of the TLRU assessment to determine whether additional mitigation is required with respect to Project design and EMMPs.

HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

References
June 2017

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HARDROCK PROJECT – EFFECTS OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES – IN ACCORDANCE WITH SECTION 6.3.4 OF THE EIS GUIDELINES ISSUED BY THE CEA AGENCY

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June 2017

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