Environmental Impact Statement – Howse Property Project

Environmental Preview Report

Presented to the Government of Newfoundland and Labrador

- Executive Summary -

HML

Howse Minerals Limited

FINAL VERSION

October 2016

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1 INTRODUCTION AND ENVIRONMENTAL ASSESSMENT CONTEXT

1.1 PROPONENT & THE UNDERTAKING

HML is planning to develop the iron ore deposit at the Howse Property with the support of adjacent mining infrastructure. The deposit is located in Newfoundland and Labrador along the Labrador Trough, between Irony Mountain, Pinette Lake and Timmins 4 (the site of TSMC's current operations) (Figure A). An existing road from past IOCC mining operations (950 m) will be used and 1.2 km of new road will need to be built to link the Howse Property to the existing road network. An existing road will also be upgraded to allow local communities members a full access to the Howells River Valley. HML proposes to use a conventional open pit drill and blast operation mining method. The extracted iron ore will be hauled by truck to the TSMC's DSO project rail loop loading area, crushed and screened, and subsequently shipped by train to Sept-Îles. Therefore, little additional infrastructure will need to be built.

In order to acquire a 100% share of the Howse Property, TSMC created Howse Minerals Limited (HML), a wholly-owned subsidiary based in St. John's, Newfoundland and Labrador. HML has acquired a 100% participating interest in the mineral licenses comprising the Howse Property and is responsible for managing and operating the Howse Property. HML was appointed the operator and legal owner of the Howse Property and is therefore considered the proponent for this undertaking.

The name of the undertaking is "Howse Property Iron Mine – Howse Minerals Limited".

1.2 ENVIRONMENTAL ASSESSMENT CONTEXT

An environmental impact statement (EIS) has been prepared in accordance with

- the Newfoundland and Labrador *Environmental Protection Act* (EPA), SNL 2002;
- *Environmental Assessment Regulations*, 2003; and
- the *Canadian Environmental Assessment Act*, 2012 (CEAA, 2012).

This submission follows:

- Project registration and review, April 6, 2014; and
- Canadian Environmental Assessment Agency (the Agency) has decided that a federal environmental assessment is required for the Howse Property Iron Mine Project pursuant to the Canadian Environmental Assessment Act, 2012 (CEAA 2012), June 2, 2014.

This document has been prepared following the documents:

- Guidelines for the Preparation of an Environmental Impact Statement, pursuant to the Canadian Environmental Assessment Act, 2012; and
- Howse Property Iron Mine and Guidelines for Environmental Preview Report for the Howse DSO Mine Honourable Dan Crummell Minister Department of Environment and Conservation, December 22, 2014.

2 PROJECT OVERVIEW

The mine is expected to be operational from 2017 to 2032, for a total of 15 years. The mine will be operational year-round; however, the ore will only be extracted, crushed, screened and shipped by train from April to mid-October or November, depending on the weather. For the remaining months, crews will work on restoring the overburden and waste rock stockpiles/dumps.

2.1 PROJECT COMPONENTS AND LAYOUT

The new physical works associated with the development of the Howse Property include (Table 1; Figure B):

- open pit;
- stockpiles (topsoil and overburden) and waste rock dumps;
- Howse haul road;
- bypass road;
- water management facilities and general site drainage works;
- diesel, light fuel oil and gasoline; and
- existing facilities.

Details of these Project components are provided in the following sections.

Table 1 Estimated Footprint of the Howse Property Project

INFRASTRUCTURE	2015	2016
	(ha)	
Open Pit	72	78
Overburden Stockpile	66	63.5
Waste Rock Dumps	66	39 (out of pit)
Topsoil Stockpile	4	3
Crushing and Screening Facility	3	1.5
Howse haul road	12	4.8
Sedimentation Ponds	4	9.25
Site Infrastructure (new)	-	1.35
Total	**227**	**200.4**

610000 620000 630000 640000

6110000 6100000 6090000 6080000 6070000

DSO 4
Leroy 1
Goodwood
Sunny 3
Kivivic 1C
Kivivic 2
Kivivic 5
Sunny 2
Kivivic 3N
Kivivic 4
Sunny 1
Kivivic 3S

DSO 3
Barney 1
Barney 2
Timmins 6
Timmins 4
Timmins 8
Timmins 7
Elross 2
Sawmill 1
Snow Lake 2
Snow Lake 1
Timmins 1
Fleming 9
Fleming 7N
Timmins 3N
Aurora
Timmins 3S
Fleming 7X

DSO 2
Fleming 6
Lance Ridge 1
Star Creek 3
Star Creek 2
Ferriman 4

DSO 1
Gill (Ruth 1)
James (Ruth 10)
Knob Lake 1
Bean Lake

Taconite - LabMag

TSMC - DSO Complex

LIM Complex

Redmond 5

QUEBEC

NEWFOUNDLAND AND LABRADOR

Kawawachikamach
Lac John
Matimekush
Schefferville

LABRADOR SEA

QUEBEC

NEWFOUNDLAND AND LABRADOR

LEGEND

Infrastructure and Mining Components

- DSO - Deposit
- LIM Actual or Planned Deposit Operation
- LIM Complex
- TSMC Actual or Planned Deposit Operation
- DSO Complex - TSMC
- DSO - Other Site
- Taconite - LabMag

Howse Infrastructures

- Proposed Howse Pit
- Proposed Topsoil/Overburden Stockpile
- Proposed Site Infrastructure
- Proposed Waste Dump/In-Pit Dump

Basemap

- Town
- Railroad
- Road
- Watercourse
- Water body
- Provincial Boundary

FILE, PROJECT, DATE, AUTHOR:
GH-0571 , PR185-19-14, 2015-10-21, edickoum

N

0 2 4 6 8 10
Kilometers

UTM 19N NAD 83

SCALE: 1:150 000

SOURCES:

Basemap
Government of Canada, NTDB, 1:50,000, 1979
SNC Lavalin, Groupe Hémisphères, Hydrology update, 2013.

Infrastructure and Mining Components
New Millennium Capital Corp., Mining sites and roads
THowse Minerals Limited/ MET-CHEM, Howse Deposit Design for General Layout., 2015

ENVIRONMENTAL IMPACT ASSESSMENT
HOWSE PROPERTY PROJECT

Location

Howse Minerals Limited

GroupeHemispheres
5731, rue Saint-Louis, Bureau 201, Lévis (QC) Canada, G6V 4E2
1453, rue Beaubien est, Bureau 301, Montréal (QC) Canada, H2G 3C6

Figure A

620000

6085000

Howse B

GDR2

GDR1

GDR3

Goodram Creek

Timmins 6

Timmins 4

Waste Dump

Overburden Stockpile

Topsoil Stockpile

Site Infrastructure

Two Ponds

Triangle Lake

Howse A

Howse

In-Pit Dump

PIN 1

Menehik shakainiss

Pinette Lake

Sunset Creek

Burnette Creek

Elross 2

Elross 3

Kauteitnat

(Irony Mountain)

LEGEND

Infrastructure and Mining Components

- Proposed Howse Pit
- Proposed Topsoil/Overburden Stockpile
- Proposed Site Infrastructure
- Proposed In-Pit Dump
- Proposed Waste Dump
- Proposed Mine Haul Road
- Proposed Sedimentation Pond
- Proposed Infrastructure Contour Line (10m)
- Proposed Ditch and Outlet
- Road to DSO Area 4
- Existing Dump
- Existing Pit
- Deposit
- Existing Sedimentation Pond

Basemap

- Permanent Watercourse
- Intermittent Watercourse
- Storm Runoff
- Disappearing Stream
- Artesian Spring
- Water Body
- Contour Line (50 ft)
- Provincial Border
- Existing Road
- Main Access Road
- Wetland

*Hydronyms are oriented along the direction of water flow

FILE, PROJECT, DATE, AUTHOR:
GH-0572b , PR185-19-14, 2015-11-06, edickoum

N

0 200 400 600 800

Meters

UTM 19N NAD 83

SCALE: 1:15 000

SOURCES:
Basemap
Government of Canada, NTDB, 1:50,000, 1979 Government of NL and government of Quebec, Boundary used for claims
SNC Lavalin, Groupe Hémisphères, Hydrology update, 2013

Infrastructure and Mining Components
New Millennium Capital Corp., Mining sites and roads
Howse Minerals Limited/ MET-CHEM Howse Deposit Design for General Layout, 2015

ENVIRONMENTAL IMPACT ASSESSMENT
HOWSE PROPERTY PROJECT

HML Infrastructure and Layout

Howse Minerals Limited

GroupeHemispheres

5731, rue Saint-Louis, Bureau 201, Lévis (QC) Canada, G6V 4E2

1453, rue Beaubien est, Bureau 301, Montréal (QC) Canada, H2G 3C6

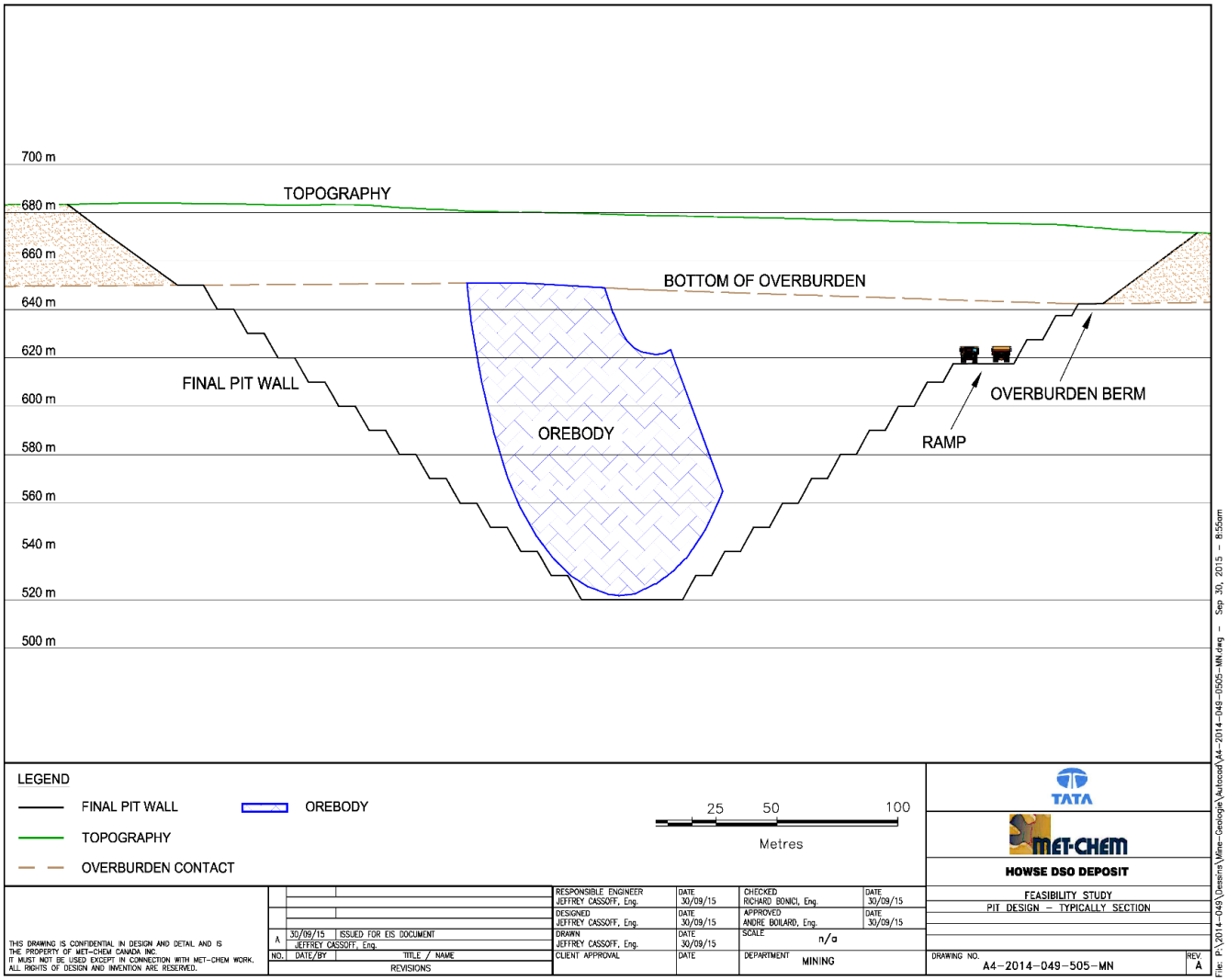
Figure B

2.1.1 Open Pit

Final pit dimensions are approximately 1,600 m long and 450 m wide at the top, with a maximum depth of 195 m. The anticipated footprint of the pit is approximately 78 ha. The optimal pit design for Howse is expected to contain 46 million tons (Mt) of high-grade iron ore (@62.7% Fe), 50 Mt of overburden, 57 Mt of waste rock and 5 Mt of low-grade material. Depending on the final mine design and market value of the ore, the mine's service life is estimated at 15 years. The deposit has a strip ratio of 3.3:1 (calculated based on high-grade ore only).

The high-grade iron ore (80% of the mineral resource) will be crushed and screened at the screening and crushing facility which will be located at the rail loop at a rate of 1.304 ROM Mt in 2018, 3.0 Mt per year between 2019 and 2022, 9.13 Mt per year between 2023 and 2031 and 5.55 Mt in 2032. The finished product will be transported by haul trucks to the DSO product stockyard, where it will be loaded onto conveyors and loaded onto rail cars.

The mine design meets industry standards and complies with applicable provincial and federal legislation. Pit walls have been designed at a 35° slope throughout the overburden layer, at a 45° slope through the iron deposit above the water table and at a 40° slope through the iron deposit below the water table. As shown in Figure C, overburden depth varies between 21 m and >50 m, with an average thickness of 25 m. For stability, 10-m high benches will be built through the iron deposit, with a minimum width of 6.5 m.



Source: Met-Chem (2013)

Figure C Typical Cross Section, Open Pit

2.1.2 Stockpiles and Waste Rock Dumps

As per mining regulations, organic material and topsoil from the pit and any disturbed area will be stripped and stockpiled for site reclamation. Proposed locations, all within the claims but outside of the ore boundary, are shown in Figure B. All of the waste rock disposal area and stockpiles will have a perimeter ditch to capture water runoff that will be directed to sedimentation ponds before being discharged into the environment. Regular monitoring for acid in rocks will identify those that should be stored separately.

Some of the materials will be salvaged for road upgrading and maintenance, thereby proportionally reducing the corresponding dump/stockpile footprints. Measures will be taken to deter birds from nesting in piles of unattended soil. The maximum height of the dumps/stockpiles will be 60 m for the overburden, 70 m for the waste rock and 12 m for the topsoil.

2.1.3 Howse Haul Road

The Howse haul road configuration will take environmental, economic and safety factors into account. The amount of new road construction for the Howse haul road is 1.2 km and 0.95 km of road will be upgraded from existing roads which were built by the Iron Ore Company of Canada (IOCC). The Howse haul road location is presented in Figure B.

Temporary ramps will be built with a maximum grade of 10%. Longitudinal ditches will collect roadside surface water runoff and convey the water affected by mining operations to a settling pond.

The safety berm height will be a minimum of one half the height of the largest truck tire. The diameter of a 100-tonne haul truck's tire is 2.70 m. The safety berm slopes are 1.35 m high and 2.70 m wide with 45° angles (triangular shape). The maximum road grade will be 10% and the design will include a crown of 1% (minimum). The berms will be interrupted every 25 m in length to allow water to run into the ditches.

2.1.4 Bypass Road

The proponent is committed to providing First Nations with access to their land throughout the Howse Project activities to compensate for the loss of a road as a result of the Howse Project location. Access will be provided via a new route to Pinette Lake and Kauteitnat. The exact specifications of the final route are currently being considered and full details are provided in section **Erreur ! Source du renvoi introuvable.**. Final specifications will be decided in consultation with First Nations. In either case, the Proponent plans to conduct upgrades to existing roads and has no plans to build new roads.

Both bypass alternatives are located on Crown Land, were built by IOCC and have been used by First Nations for several decades. Neither TSMC nor HML assume ownership of the road upgrades. However, at the request of the community, the Proponent will maintain the chosen road twice per year during the project duration.

2.1.5 Water Management Facilities and General Site Drainage Works

The Howse Property sits on three different watersheds leading to Pinette Lake, Burnetta Creek and Goodream Creek. The water management strategy aims to manage surface runoff water and pit dewatering water with as little impact as possible on these three watersheds (Figure D).

In order to address the concerns of local stakeholders, no water will be discharged into Pinette Lake. All ditches will be protected against erosion with riprap to avoid any sediment production from the ditches themselves. The water management strategy is as follows:

- runoff from the west part of the in-pit waste rock dump, the topsoil stockpile and from the surrounding area on the south-west side of the site will be collected by a ditch leading to sedimentation pond HOWSEA and then discharged to Burnetta Creek;
- runoff on the waste rock dump, the site infrastructure pad, and the overburden stockpile will be collected by ditches leading to sedimentation pond HOWSEB and then discharged to Goodream Creek;
- underground water will seep into Howse pit and will then be pumped and diverted to a ditch on the north-east side of the pit, leading to sedimentation pond HOWSEB, and then discharged into Goodream Creek. The portion of the ditch receiving the dewatering water along the pit will be waterproofed to avoid infiltration of water directly back into the pit; and
- approximately 2/3 of the surface runoff from the Howse pit will be pumped into the existing Timmins 4 sedimentation pond 3, to take advantage of its full sedimentation capacity, and then discharged into Goodream Creek. The remaining 1/3, like the underground water, will be pumped to a ditch on the north-east site of the pit leading to sedimentation pond HOWSEB and then discharged into Goodream Creek.

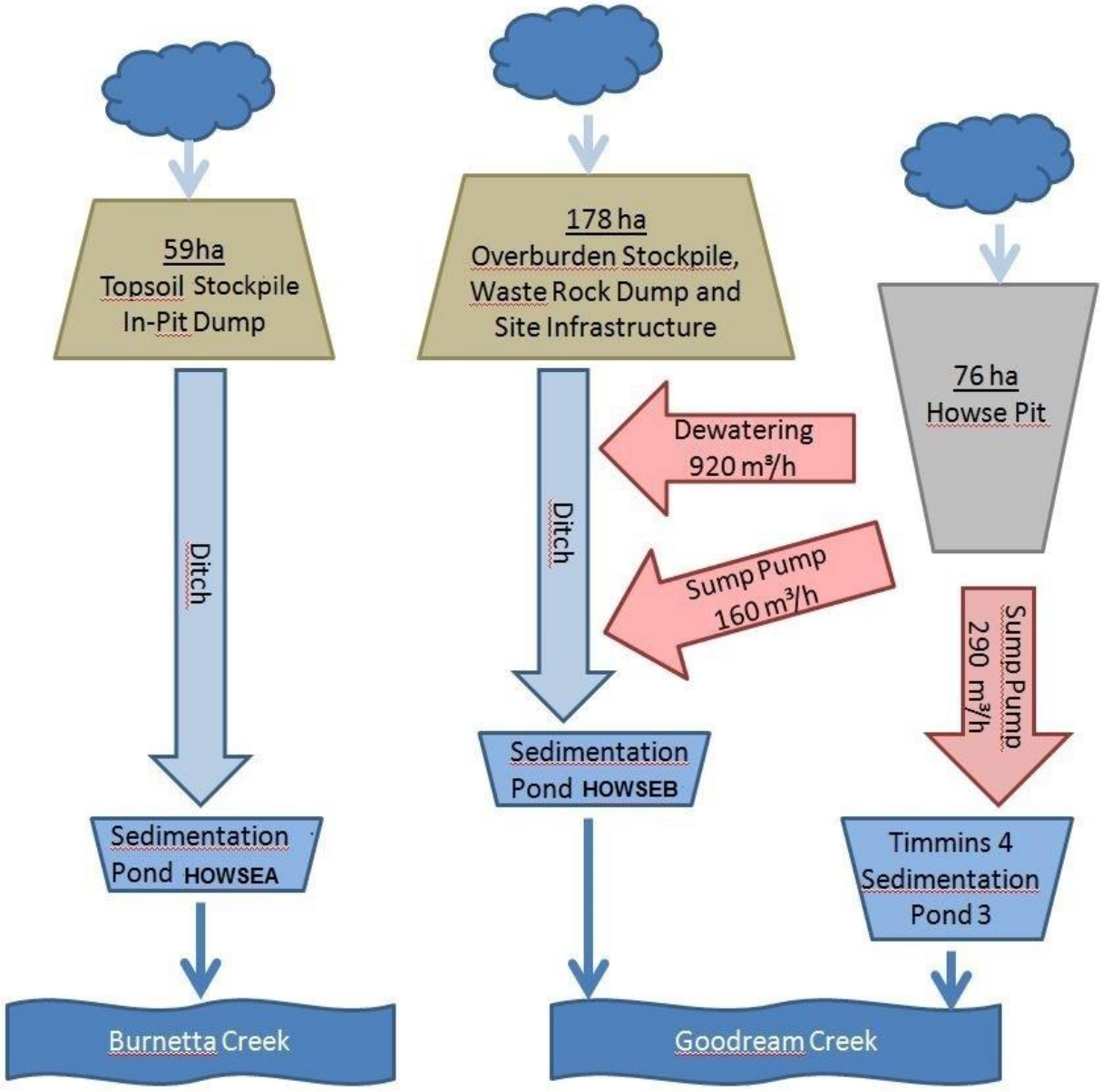


Figure D Water Management Plan Schematic

2.1.5.1 Dewatering

The dewatering rate of the Howse pit was estimated based on historical dewatering data from other similar mines in the area and using a few conservative assumptions. The Howse dewatering rate is expected to be similar to Timmins 3 and LabMag dewatering rates and a conservative dewatering rate of 22 000 m^3/d was adopted for the present study.

Howse deposit water table was found to be between 64 and 90 m deep. The dewatering rate is expected to be lower during the first years of mining operations than for the final pit. During the first years of mining operations, dewatering will be limited to water from precipitation and infiltration through the unsaturated geological units. Later, when pit depth reaches water table depth, dewatering rate will increase gradually,

and reach a maximum value when the pit reaches its final depth. Dewatering will be ongoing all year long once the water table depth will be reached.

2.1.5.2 Water Quality and Treatment

Effluent Quality

Analytical results for water quality from the Timmins 4 mining operation were used to evaluate the expected water quality of the Howse Property since they are located close to each other. The water quality results from sedimentation ponds B and C (samplings COA-SW11 and COA-SW12) are considered to be the most representative of the Howse Property, and were found to have water that generally meets the requirements of the certificate of approval for all parameters except for suspended solids, where the concentration in the water tested is slightly above 30 mg/L.

Consequently, for the purpose of this study, and assuming that any effluent collected on the Howse Property will have similar water quality as that observed at the Timmins 4 site, the main parameter of concern is assumed to be limited to suspended solids.

Types of Effluent

There are three types of effluent that will need to be managed on the Howse Property:

1) **Natural site runoff:** The main parameter of concern for natural site runoff will be suspended matter, specifically during heavy rainfall and snowmelt events. It is assumed that suspended solids will mainly consist of silt, sand and grit.

2) **Runoff from overburden and waste rock dump:** The overburden at the Howse Property is expected to be mainly composed of silt, sand and gravel. The waste rock is expected to be composed of fine rock particles. The waste rock is also expected to be non-acid generative. The main parameter of concern is assumed to be fine suspended matter.

3) **Pit dewatering:** The pit dewatering water will consist mainly of groundwater that infiltrates into the pit, as well as surface runoff that flows into the pit:

    a. **Groundwater:** The groundwater is expected to be of similar quality to the natural site runoff. The groundwater pumped from the wells around the pit is expected to have very few suspended solids.

    b. **Sump water:** The main parameter of concern in the sump water from the pit is assumed to be limited to fine suspended matter. Total suspended solids in the sump water are expected to be high due to the mining activity in the pit.

       Any accident oil and hydrocarbon spills from the machinery will be contained and removed through the use of absorbing pads

Two pumps will be used for mine dewatering, one in the north end and one in the south end.

Treatment Strategy

Sedimentation ponds will remove the suspended solids before the water is returned to the natural receiving streams. The sedimentation ponds will not be lined with any impervious material to prevent or reduce water infiltration into the ground. Ammonia and nitrate residues are expected in the effluent water, but at such a low concentration that specific treatment should not be required. Effluent monitoring will be conducted on a regular basis and specific treatment will be considered if ammonia and nitrate blasting residue

concentrations are above the criteria. The only parameter of concern is suspended matter. Consequently, if some of the runoff water does infiltrate into the ground, it will not have a negative impact on the quality of the underlying groundwater. An allowance of 0.5 m is provided at the bottom of the sedimentation pond for sediment storage. Frequency at which sediments will need to be removed from the pond during the life of mine will be evaluated in the next phase of the project. If sediment removal is required, it will be managed according to all applicable regulations.

At closure, the sedimentation pond will be covered to avoid any leaching of iron. HML will study the different pond covering options, including pond covering or not, of reducing the environmental effects of iron. The Proponent will use available data from discharge quality and will base its methods on approved methodologies.

Table 2 Planned Infrastructure and Watershed Area (Mine End of Life)

INFRASTRUCTURE	WATERSHED AREA
Sedimentation pond HOWSEA	59 ha
Sedimentation pond HOWSEB	178 ha

Sedimentation Pond HOWSEA

Sedimentation pond HOWSEA is used to treat runoff water from the topsoil stockpile, part of the in-pit dump not flowing into the pit, and from the natural area located on the south-west side of Howse pit. This pond will be located on the west side of Howse pit and treated water will be discharged into Burnetta Creek. The pond will be located in a natural slope of about 5% and the downstream side of the pond will have to be confined with a dike.

Sedimentation Pond HOWSEB

Sedimentation pond HOWSEB will receive runoff from the overburden stockpile, the waste rock dump, the site infrastructure pad, water pumped from the peripheral well used for Howse pit dewatering, and approximately one third of the pit runoff. This pond will be located on the north-west side of the overburden stockpile, in a natural slope, and the downstream side of the pond will have to be confined with a dike. Treated water will be discharged into Goodream Creek.

Timmins 4 Sedimentation Pond 3 (Existing)

Timmins 4 sedimentation pond 3 is an existing sedimentation pond located on the east side of the Howse Project. It will be used to treat approximately two thirds of the pit runoff water that will be pumped from the bottom of the pit.

Ditches

A network of ditches will collect contaminated runoff from the whole mine site. The collected contaminated water is conveyed into sedimentation ponds HOWSEA and HOWSEB for treatment.

It was chosen to include the relatively small wetland area located between the overburden stockpile and waste dump in the area collected by the collection ditches and treated into sedimentation pond HOWSEB. This decision was based on the fact that:

- it will not be possible to avoid contamination of this area due to its close location between two stockpiles; and

- it would be technically difficult to cross the outlet of this area with the collection ditch necessary to collect runoff from the most eastern part of the mine site.

Inlet and Outlet Structures

The water inlet structures of sedimentation ponds HOWSEA and HOWSEB will be designed to promote an even distribution of the flow over the pond width. Ditches will be widened at the pond entrance, and water will flow into the pond via an impervious ditch section with the use of a HDPE plastic membrane.

The outflow structure for all sedimentation ponds will be made of a permeable rockfill dike sized to avoid any spill over the emergency spillway during the sedimentation ponds design flood. The emergency spillway will be integrated within the rockfill in a way allowing for the passage of vehicles when the spillway is not in use.

The outlet structure of existing Timmins 4 sedimentation pond 3 will have to be modified into a permeable rockfill dike and an emergency spillway similar to those for sedimentation ponds HOWSEA and HOWSEB. This is necessary to ensure the good functioning of the pond with the additional pumped discharge from the pit, based on the same design criteria as the new ponds. Downstream of the permeable rockfill dike, treated water from the sedimentation ponds will be collected and conveyed toward the receiving stream with ditches.

Dike Construction Material

For this stage of the Project, it is assumed that the dikes on the downstream side of sedimentation ponds HOWSEA and HOWSEB will be built with compacted material, using overburden available on site (cut and fill). The suitability of this material for construction will be confirmed in the next phase of engineering, based on more detailed sieve analyses of the material and its percentage of fines. Permeable rockfill dikes and riprap will be built using non-acid-generating material.

2.1.5.3 Annual Water Balance

Water balance computations were made for an average year consisting of average hydrological conditions. Monthly average values for snowfall, rainfall, lake evaporation and evapotranspiration were used with the considered drainage areas to determine the corresponding monthly average volumes of water.

2.1.6 Diesel, Light Fuel Oil and Gasoline

Fuel for the crushing and screening facility generators and pumps will be stored at the DSO project complex facilities. The Proponent estimates the average amount fuel used to be 13,500 L/day, excluding the generator for the plant, which will be part of the dome. Refueling will be done according to standard practice on the Howse Property Project site: by fuel trucks equipped with fuel spill kits. All of the mining equipment dedicated to the Howse operations (excavators, haul trucks, production drill, dozer and grader) will be diesel-powered. Heavy machinery will be refueled on site, and light vehicles and trucks will be refueled at the DSO project, at the approved TSMC DSO project facility.

2.1.7 Existing Facilities

The proponent will use the approved facilities at TSMC's DSO project plant complex, which is not considered in the scope of the Howse EIS as it was previously assessed under ELAIOM (Project 1a) by the Government of Newfoundland and Labrador. The key infrastructure at this complex that could potentially be used by the Howse Project includes:

- processing plant;
- crushing and screening facilities;
- rail loop loading system. Under the SF and SPF stockpiles, three belt feeders in a tunnel will reclaim the material for loading into rail cars. The system is designed to load at a capacity of 4,000 tph;
- existing railway track;
- camp to accommodate the workers. It has a maximum capacity of 192 workers but the kitchen can feed more people than that. All sewage treatment is managed at the camp;
- administration building, housing office space for all departments, wash facilities, laboratory and a small cafeteria;
- warehouse;
- workshops;
- garages. The mine equipment maintenance garage building is included in the wash plant building. It includes a wash bay, four major equipment maintenance bays, a tire shop and service bay, a drill repair area and a small-vehicle service area; and
- landfill. Solid waste is collected around the site in animal-resistant containers. A contractor disposes of the contents of the containers in a waste management site near Timmins 1. This site meets or exceeds relevant GNL regulatory standards.

The Howse Project is not likely to put any additional pressure on the management of DSO project plant complex activities. No tailings or process water will be generated during the processing of the high-grade product. The capacity of the workers' camp will never exceed its limit of 192 workers, and no increase in domestic waste is therefore expected from the Howse Project.

The ROM ore from the Howse Property pit will be hauled by truck to the DSO rail loop to produce a final product consisting of 15% lumps and 85% sinter fines. The Proponent anticipates using one primary jaw crusher and two secondary cone crushers. Drainage and peripheral ditches will be installed to collect runoff water. Power for the crushing and screening facility will be provided by diesel generators, and will not create any increase in capacity, as the generators are already in continuous operation. Dryers are 4.3 m in diameter and 26 m long, and dryer burners are rated for a maximum capacity of 166 GJ/hour.

Once at the rail loop loading area, the ore will then be transported by train to Sept-Îles and then by ship to markets in Europe, India and Asia. On average, two trains per day will depart from the TSMC loading facility from April to November and, for the rest of the year, when iron ore is extracted only at DSO3, one train every other day (three to four trains per week) will depart from the TSMC loading facility.

2.2 PROJECT ACTIVITIES

HML will ensure that all permits and authorizations from appropriate regulatory agencies are obtained prior to the start of construction in order to comply with laws and regulations from both governments.

Table 3 presents the project activities and the potential sources of effects. In general, potential sources of effects associated with general site preparation and construction phase activities include:

- light emission from the Howse Property site lighting system;
- noise, vibration, emission of air contaminants and dust from heavy machinery use and light vehicle traffic; and
- stripping of vegetation, excavation and sediment runoff from construction activities.

Table 3 Project Activities and Potential source of effects

ACTIVITY	POTENTIAL SOURCE OF EFFECTS
Site Construction Phase	
Upgrading/construction of Howse haul road and upgrade of a bypass road	▪ stripping of vegetation, excavation, sediment runoff; and ▪ increased noise and vibration; and ▪ emission of air contaminants and dust from heavy machinery and light vehicle traffic.
Pit development	▪ stripping of vegetation; ▪ excavation; ▪ minimal use of explosives; ▪ sediment runoff; and ▪ emission of air contaminants (dust); and ▪ increased noise, vibration, and light.
Transportation and traffic	▪ emission of air contaminants, dust, noise, vibration and light; and ▪ handling of petroleum products.
Operation Phase	
Removal and storage of remaining overburden and topsoil	▪ stripping of vegetation and excavation; ▪ emission of air contaminants; ▪ increased noise, vibration, and light; ▪ sediment runoff; and ▪ water and soil contamination from pile runoff
Operation of waste rock dumps	▪ sediment runoff; ▪ emission of air contaminants (dust); ▪ increased noise, vibration, and light.
Blasting and ore extraction	▪ excavation; ▪ use of explosives; ▪ sediment runoff; ▪ emission of air contaminants (dust); ▪ increased noise, vibration, and light; and ▪ nitrate residue generated by blasting has the potential to contaminate the surface water and groundwater.
Mineral processing	▪ emission of air contaminants (dust); ▪ increased noise, vibration, and light; and ▪ handling of petroleum products.
Dewatering	▪ noise, vibration; ▪ emission of air contaminants from diesel generators; ▪ water discharged into the environment will also increase the local flow of nearby streams; and ▪ water contamination by petroleum product is another potential source of effects.
Transportation of ore and other traffic	▪ emission of air contaminants (dust); ▪ noise, vibration and light from loading/unloading of ore; ▪ ore transportation (haul truck, train and boat) and other traffic; and ▪ soil contamination from the handling of petroleum products is another possible effect
Solid waste disposal	▪ emission of air contaminants; ▪ noise and vibration from trucks used to transport the solid waste; and

ACTIVITY	POTENTIAL SOURCE OF EFFECTS
	▪ air quality might also be affected by landfill fumes.
Hazardous waste management	▪ emission of air contaminants; ▪ noise and vibration from hazardous waste transportation; and ▪ water and soil contamination is another possible effect.
Explosives waste management	▪ emission of air contaminants; ▪ increased noise and vibration from trucks used to transport the explosives; and ▪ waste, leaching of explosives waste and possible water and soil contamination.
Treatment of sanitary waste	▪ emission of air contaminants; ▪ increased noise and vibration from trucks used to transport the sanitary waste; ▪ leaching of sanitary waste; and ▪ possible water and soil contamination.
Ongoing site restoration	▪ excavation, and emission of air contaminants; ▪ noise and vibration from heavy machinery and other vehicles; and ▪ However, once completed, restoration will be beneficial for most biophysical components by contributing to soil decontamination, plantation, seeding, and habitat and ecosystem creation.
Decommissioning and Reclamation Phase	
Transportation and traffic	▪ emission of air contaminants (dust); ▪ increased noise, vibration and light from heavy machinery and other vehicles; and ▪ soil contamination from the handling of petroleum products.
Demobilization of Crushing and Screening Facility and Heavy Machinery	▪ emission of air contaminants (dust); and ▪ increased noise, vibration and light from heavy machinery and transportation.

3 ALTERNATIVE MEANS OF CARRYING OUT THE PROJECT

The decision to develop the Howse Property is motivated by the proximity of existing infrastructure, the high cost of maintaining the DSO4 road, ore transportation at current iron prices and the availability and quantity of high-quality iron ore at this location. Consequently, there are no viable alternatives to the Project at the macro scale. The Alternatives for pit wall slope, bench heights, mine production rates, power supply and work scheduling are not considered because HML deems that the current status of these activities is optimal:

- pit wall slope angles (i.e. other than those proposed); The Project design is based on the most conservative, standard methods known. As such, in an effort to produce the safest working environment possible, the Proponent has not considered any alternatives in this component of the mine design;
- bench heights through the iron deposit (i.e. other than those proposed); The Project design is based on the most conservative, standard methods known. As such, in an effort to produce the safest working environment possible, the Proponent has not considered any alternatives in this component of the mine design;
- power supply (i.e. diesel, hydroelectric, wind-diesel, other); The power supply will be generators, as use for the DSO complex; and
- work scheduling (i.e. rotational work schedules on- and off-site); The work schedule for the Howse Project is 12 hour shifts and two weeks' rotations.
- use of a Dryer for the Howse Project: high-humidity material is un-shippable and unusable during the winter months, and thus not a viable economic option for the Proponent.

Within the Howse Project, however, the Proponent has considered the Alternatives for 10 activities. Considerations of financial and logistical costs, environmental effects (with a focus on VCs) and aboriginal concerns were analyzed (Table 4). Final decisions were made where possible, but the Proponent remains adaptable to new situations and has not made final decisions in some cases.

Table 4 Summary of Project Alternatives Considered

ACTIVITY CONSIDERED	ALTERNATIVE SELECTED	EFFECTS ON VC
1. Mine production schedule	The mine production rate for the Howse Project is 3.04 Mt per year (2018-2022) and 9.13 Mt per year (2023-2031) and 5.22 in 2032.	This design reduces effects on the Howse VCs by coordinating activities with adjacent mining operations.
2. Pit method	Mixed Conventional and In-Pit: A large portion of the waste material will be accumulated inside the mined portion of the Howse pit. The remainder will be accumulated in nearby waste piles.	Overall footprint of the Howse Project, traffic and overall disturbance effects will be mitigated.
3. Bypass road location	This Alternative is undecided	
4. Dump size and location	The Proponent has chosen the Alternative with the least adverse environmental effects	Habitat destruction.
5. Crushing and screening facility location	Use existing DSO3 blasting infrastructure.	This Alternative poses no negative effect on biophysical VCs as compared to other Alternatives
6. Water treatment	The Alternative to not treat water is selected (use of sedimentation ponds alone)	The use of coagulant will decrease the size of sedimentation ponds. (habitat destruction)

ACTIVITY CONSIDERED	ALTERNATIVE SELECTED	EFFECTS ON VC
7. Explosives transportation route	The Proponent will use the shortest and safest route proposed.	This Alternative poses no negative effect on biophysical VCs as compared to other Alternatives.
8. Winter blasting	No winter blasting: Blasting will only occur between April and October. (However, the Proponent may require infrequent winter blasting)	This Alternative poses no negative effect on biophysical VCs as compared to other Alternatives.
9. Maintenance site location	Use existing DSO3 facilities.	This Alternative creates a slight increase in traffic and a correspondingly slight depletion of air quality as compared to other Alternatives
10. Water management plan	Almost no infrastructures in Pinette Lake Watershed. Runoff of topsoil stockpile and in-pit dump to Burnetta Creek, Runoff on remaining infrastructures in Goodream Creek. Dewatering in Goodream Creek, Pit runoff in Goodream creek (2/3 in Timmins 4 Pond 3, 1/3 in HOWSEB)	This Alternative requires the smallest watershed area changes, particularly for Pinette Lake. The dewatering water flow allocation is better split between the Burnetta and Goodream watersheds, thereby minimizing effects on VCs.

4 ABORIGINAL ENGAGEMENTS AND PUBLIC CONSULTATIONS

4.1 GOVERNMENT DEPARTMENTS AND AGENCIES

The Proponent has provided Project overview information to, and corresponded and met with, the provincial and federal governments on various occasions in the course of the EIS process. Meetings took place before March 2014, just before the submission of the Project Registration, and during the preparation of the Final EIS in Summer and Fall 2015. Ongoing discussions also occur with some governmental departments, especially those who act as regulators for the EIS.

It is important to note that TSMC has established long term relationships with the federal, NL and Quebec governments, and that discussions are held frequently with various departments, depending on the issue, more particularly with the Environmental Assessment Division of the NL Environment and Conservation Department.

In the context of the EIS process, specific governmental organizations and elected officials of Quebec and Labrador were consulted by letter, informing them of the ongoing EIS consultation process and asking whether they had concerns regarding the Howse Project or suggestions for mitigation measures. The decision to contact them by letter was justified by the fact that the Project will maintain the jobs and contracts associated with the TSMC's DSO project.

The Project will also eventually require a range of additional environmental permits and other authorizations. The post-EIS permitting process will provide the opportunity for relevant regulatory authorities to receive and review additional Project design information, and to establish specific terms and conditions to avoid or reduce environmental effects. The Proponent and/or its contractors will identify, apply for and adhere to all required permits and other authorizations that are required for Project construction and/or operations.

In the case of benefits to the province of Newfoundland and Labrador, TSMC will be responsible for compliance with all applicable obligations under its Newfoundland and Labrador Benefits Plan. For instance, 60% of the labour force will come from NL, as is currently the case of the DSO Project.

In addition, the NL Benefits Plan includes a Women's Employment Plan. This plan which was prepared for the TSMC'S DSO Project will also apply to the Howse Project.

4.2 CONSULTATIONS WITH ABORIGINAL GROUPS

The Proponent is committed to ensuring that Aboriginal communities and organizations are consulted appropriately on the proposed Project and to meaningfully accommodating their rights and interests as required by Section 35 of the Canadian Constitution Act (1982) and as per Impact Benefit Agreements (IBAs) signed with them.

In the context of the EIS, efforts were made to ensure due participation of the potentially affected Aboriginal groups, especially those living in the local study area and who have to deal with mining activities on a daily basis. These groups have also signed IBAs with both TSMC and LIM, and it is in the LIM's IBA that provisions for the Howse Project have been made. The Proponent has been engaged in Project-related consultation activities, through which it has provided information on the proposed Project to identify and discuss the nature of any associated interests, questions or concerns on the part of each group, for consideration as Project planning proceeds.

Overall, in keeping with the spirit of the agreements signed, consultations were carried out with all five groups, but were more extensive with the three former groups (NIMLJ, NNK, ITUM), and this will be applied for the Proponent's longer term engagement activities.

4.2.1 Agreements with Aboriginal Groups

Integrating the environmental and human components of sustainable development in mining is important for HML. In keeping with the founding principles of TSMC, HML is committed to working with and supporting Aboriginal communities impacted by its activities.

As a result of its past and ongoing presence and development activities in Labrador West and Quebec, HML has established respectful and mutually beneficial relationships with Aboriginal communities and organizations in Labrador and Quebec.

In relation to the Howse Project, the following agreements have been signed:

- LIM
  - Innu Nation: IBA dated July 17, 2008
  - NNK: IBA dated September 2, 2010
  - NIMLJ: IBA dated June 6, 2011
  - ITUM: IBA dated February 13, 2012
  - NunatuKavut Community Council (NCC): Economic Partnership Agreement, dated December 14, 2012
- HML
  - NNK: IBA dated June 10, 2010
  - NIMLJ: IBA dated June 6, 2011
  - Innu Nation: IBA dated November 11, 2011
  - ITUM: IBA dated February 9, 2012
  - NCC: Cooperation Agreement dated August 14, 2013.

Initially, the responsible development of the Howse Project was provided for in the LIM agreements. However, as explained above, given the change in circumstances whereby HML acquired 100% of the Howse deposit and LIM obtained Court protection under the CCAA, it is the intention of HML to incorporate the Howse deposit into its agreements with Aboriginal groups. As such, the same commitments made as part of HML DSO Project will apply for the Howse Deposit. These agreements provide for mechanisms and measures for full and effective participation and involvement of said groups in the planning and implementation of the Howse Project so that they obtain socio-economic benefits, their traditional activities and knowledge are respected, and environmental impacts are minimized. These provisions include:

- aboriginal employment targets and training measures during the construction and operation phases;
- targets and processes that encourage and facilitate the participation of Aboriginal businesses in contracting opportunities;
- program dollars for priority areas identified by communities, which vary from one agreement to the next but which generally include:
  - capacity-building;
  - economic development;
  - infrastructure;
  - support for traditional activities;
  - training;
  - education;
  - arts and music; and
  - recreation.
- revenue-sharing;

- environmental monitoring; and
- accommodations for culturally- and gender-specific needs.

HML is committed to fully respecting these confidential agreements.

Proper implementation is essential in meeting the objectives of these agreements, which is why timely and open communication, reporting, and support and involvement in the joint management of matters important to the communities through implementation committees and a Community Health, Safety and Environment committee are vital aspects of positive relationships. The Proponent has already begun integrating these activities into its ongoing engagement activities for the DSO Project, and using them throughout the consultation process for the Howse Project EIS.

Support for local infrastructure, training, education, environmental protection, economic development, traditional activities, arts and music, and revenue sharing have been and will continue to be provided by the proponent. Furthermore, there are clear measures identified for safe, healthy, respectful and culturally cognizant work conditions and arrangements as these relate to counselling, transportation, rotation schedules, cultural leave, harvesting restrictions by workers staying at Camp and country food.

4.2.2 Ongoing Consultations and Engagement Mechanisms

HML has established engagement and participation mechanisms for its projects to maintain an open and transparent dialogue with the Aboriginal groups, and the Howse Project will be integrated into TSMC's ongoing activities. As indicated above, feedback on the Howse Project collected through these mechanisms was communicated for inclusion in the EIS. These mechanisms include:

- The Community Health, Safety and Environment (HSE) Committee, established in Spring 2013, and represented by mandated officials of the NIMLJ, the NNK, ITUM, the Labrador Innu, the NCC and TSMC/HML. The Committee meets three to four times per year.

HML considers this committee as a working group and the preferred forum for open discussions and addressing issues relating to health, safety and the environment. HML provides information transparently to HSE Committee members and encourages members to disseminate the information to their community. HML supports initiatives to assist in the communication flow between the HSE Committee and community members. All documents that relate to the HSE Committee meetings are saved on a shared drive to which all members have access. Many Howse Project documents are also available on this server: meeting minutes, maps, Howse Project Registration, DSO Project environmental studies, internal monthly environmental monitoring reports, pamphlets, environmental follow-up reports, etc. Given that DSO and Howse Projects involve the same stakeholders, HML has included the Howse Project within the work of the HSE Committee.

- Meetings between TSMC and the leadership of each community on a regular basis. These meetings serve as a forum to discuss particular issues with HML executives and Aboriginal community leaders. Yearly meetings also occur with the family trapline holders to discuss any issues related to the Projects (DSO and Howse Project). In particular, TSMC's Community Affairs Manager and Senior Director, Government and Stakeholders Relations make themselves available to meet with community leadership at their convenience or when required;
- Regular Agreement Implementation Committee meetings held separately with each Aboriginal group to review the successes and challenges in the implementation of these agreements;
- An HML Community Affairs group in place and present in the communities to address matters that relate to community needs, requests, and to ensure compliance within HML and its contractors. The TSMC Community Affairs Manager and the Senior Director, Government and Stakeholders Relations remain available to interact with and address concerns raised by community members;

- Regular Radio announcements; and
- Periodic bulletins mailed to community members.

TSMC has engaged with the residents of the Schefferville region for over four years and has been involved in organizing or participating in events to support the community and to strengthen its relationships with the Aboriginal and non-Aboriginal population of the LSA.

These activities for the interest and benefit of the communities have included:

- The renovation and modernization of the MLJ arena – a significant front-end contribution forming part of the LIM and TSMC IBAs;
- Elder's gatherings;
- School career fairs;
- Site tours for students and Elders;
- Interactive workshops for students to strengthen ties with schools and to expose youths in school to the numerous and varied careers that can be pursued relating to the mining sector; and;
- Various community celebrations.

4.2.3 Consultations on Project Registration

A draft copy of the Project Registration was sent to all five Aboriginal organizations at the end of January 2014 for review and comments within a 30-day time frame.

NIMLJ, IN and NCC offered comments to inform the EIS requirements (guidelines). NNK provided questions and comments on the Project Registration itself. Although many questions were raised on technical aspects of the projects, general comments and important issues for NNK can be extracted from this document. ITUM submitted an email in support of the Howse Project dated July 5th 2014, indicating to CEAA and the GNL that it had signed IBAs with both LIM and TSMC, and that ITUM "wishes to convey to both Canada and Newfoundland that ITUM will address its concerns with respect to the development of the Howse mine directly with the proponent".

4.2.4 Consultations on Environmental Impact Statement

Consultations for the EIS took place between September 2014 and November 2015. These included:

- Initial Community Consultations from September to November 2014. These consisted of in-person interviews held in Matimekush, Schefferville, Kawawachikamach and Uashat-Maliotenam, with community representatives and land users relating to potential effects, measures or concerns;
- Aboriginal Consultations on Preliminary Draft between January and November 2015;
- Validation of Mitigation Measures with Local Aboriginal Groups.

Aboriginal communities included in the LSA are the NIMLJ, and the NNK. Three types of interviews took place in Matimekush-Lac John and Kawawachikamach: interviews to obtain feedback and concerns on the Howse Project from community Councils and other representatives (for example, Council elected officials, community administrators, police officers, CLSC and public health, school directors, etc.), interviews with land-users, and interviews for the purpose of data collection, mostly to establish the baseline conditions.

In addition to these meetings, an open-house event was held on September 23rd, 2014, at NML office in Schefferville. Concerns expressed by both First Nations were mostly related to the effects of dust on air quality and the cumulative effects of the different mining projects in the region. Many commented the daily difficulties associated with an ongoing mining operation in the area. Employment in the community is also

a significant issue for the community members: participants considered that the IBAs have not been respected, especially concerning local employment, and were wondering who was going to honor the IBAs signed with LIM given the partnership with HML.

The need for better communication was expressed as well as the need for more employment and overall benefits for community members. Cumulative effects of the various mining projects in the region are also a cause for concern in both communities. Concerns related to IBAs were also expressed members of both community, in particular the lack of transparency and the lack of tangible commitments. The Naskapi particularly welcome initiatives for economic development, yet they believe that more Naskapi could be trained and could work in qualified positions. However, they are concerned about environmental effects of mining activities on air quality, water bodies and on resources.

In April and May 2015, both First Nations submitted written questions on the Preliminary EIS.

4.2.4.1 Comments Received from NIMLJ

A first set of general comments were made, including request to detail the Project justification. Several questions concerned the involvement of NIMLJ in communications and consultations for the EIS, and a question was about the role and efficiency of the HSE Committee and communications during the Howse Project. One question was about how HML intended to communicate with its contractors to ensure that they will also apply the health, safety and environmental policies, as some NIMLJ had noted non-conformities by contractors. No less than 15 questions were about air quality in the area, and 8 questions concerned water quality and fish habitat. A question was raised in relation to work conditions at the mine site, in particular for the inclusion of women in the workforce.

Several questions regarded access to land, traditional activities, and comments were proposed in Annex regarding contemporary land-use of NIMLJ members for inclusion in the EIS. The preservation of Kauteitnat was also raised as a concern, and a few questions were about the visual effects of the Project. Finally, several comments made regarded cumulative effects, and again, the importance of communications relative to cumulative effects was reiterated.

4.2.4.2 Comments Received from NNK

NNK questions dealt with a variety of issues, beginning with technical questions on the project itself, on the mine site, stockpiles, grade of material, and acid rock drainage. Several questions concerned air quality (9), with taking into account questions on climate), and over 15 questions were about water quality, and another five on fish and fish habitat.

Another 16 questions dealt with wildlife, including on caribou, avifauna, and small mammals. A few questions concerned traditional activities, access to land and road safety. Socioeconomic concerns were also expressed, as questions were asked regarding employment and contract opportunities, training, adaptation of work conditions for families, and initiatives for women, youths and cultural awareness. Finally, a few questions tackled IBAs, cumulative effects, monitoring and reporting, as well as site rehabilitation.

4.2.4.3 Comments received from ITUM

As indicated above, Uashat and Mani-Utenam are located far from the Project site (over 500 km), but some of their members have family traplines located on the Project site, and ITUM has signed IBAs with both TSMC and LIM. ITUM members expressed various concerns on the need for an alternative road, economic benefits and the impacts on water quality and the environment. One of the main issues identified was the desire for more spin-offs in employment and contracts. The proximity of the site to Kauteitnat (Irony Mountain) was also mentioned as a concern.

It should also be mentioned that the ITUM leadership has sent a letter to the federal government and the government of NL confirming that in support of the Howse Project and confirming that it will address its concerns with respect to the development of the Howse mine directly with the Proponent.

4.2.4.4 Comments received from IN and NCC

Innu Nation of Labrador and the NCC were also consulted for the Howse EIS, but given their considerable distance from the Project site (close to 500 km), and given their participation in the HSE Committee and Implementation Committee, they were consulted by letter in mid-October 2014. The letters acknowledged the comments previously received from both groups during the Project Registration phase.

Innu Nation has submitted written questions on the Preliminary EIS.

4.2.5 Feedback on Mitigation Measures by Local Aboriginal Groups

In the context of the environmental effect assessment for the Howse Project, a number of mitigation measures were proposed as normally required in EISs. Given that the Project's effects are mostly felt at the local level, discussions with NIMLJ and NNK representatives were held to validate the proposed measures.

4.2.5.1 Feedback Received from the NIMLJ

One meeting was held with NILMJ representatives in August 2015 to discuss the comments made in writing on the EIS draft. The representatives indicated that they were pleased regarding the completion of the Timmins-Kivivik bypass road, although they mentioned that it took a long time for HML to complete it. Many comments were made on the land-use map and these comments are integrated in this current version as previously indicated. The NIMLJ's feedback included corrections on areas of particular concern for waterfowl, wildlife hunting locations that seemed to be missing, and they also clarified their need to extend the bypass road network to maintain easy access to Rosemary Lake area.

Another discussion was held by teleconference at the beginning of November 2015. HML's mitigation measures were generally well-received by NIMLJ representatives, who agreed overall with the measures, without precluding the possibility to suggest other measures in due course. Suggestions made during the discussion for further improvements were noted. HML reiterated during the meeting that it remains open to further suggestions, which can be discussed at upcoming HSE Committee meetings, or at another time that is convenient for them, which was acknowledged and appreciated.

4.2.5.2 Feedback Received from the NNK

A discussion was held by teleconference at the beginning of November 2015. HML's mitigation measures were generally well-received by the NNK representative, who was in agreement with the measures, without precluding the possibility to suggest other measures in due course. Suggestions made during the discussion for further improvements were noted. HML reiterated during the meeting that it remains open to further suggestions, which can be discussed at upcoming HSE Committee meetings, or at another time that is convenient, which was acknowledged and appreciated.

4.2.6 Proponent response to Aboriginal issues

In spring 2015, three Aboriginal groups provided the proponent with a list of concerns regarding the Howse Project. The Proponent followed up to all of these concerns with a written response in February 2016. The following table presents an overall summary of the themes highlighted by Aboriginal groups as concerning, and the Proponent's response to these concerns. A full description of the Proponent's response is available in Chapter 4 of the EIS document.

THEME	ANSWERS / MEASURES
Access to the land	▪ The Timmins-Kivivik bypass road was completed in Summer 2015; and ▪ Access to active mining roads will continue to be controlled for safety reasons, but active mining roads should not be used by the land users since the Timmins-Kivivik bypass road is available.
Agreements	▪ IBAs signed with the local leadership contain a number of tangible commitments, are legally-binding and are confidential.; ▪ Given the change in circumstances and the acquisition of 100% of the Howse deposit by TSMC, it is the intention of HML/TSMC to incorporate the Howse deposit into its IBAs with Aboriginal groups; and ▪ Periodic updates are provided by way of radio announcements and bulletins to community members on the progress of the DSO and Howse Projects, mining activities, and on the numerous benefits to the community.
Air quality and Cleanliness	▪ HML will install an air quality measurement unit in Schefferville once specifications advised by the Government of Québec are confirmed; Dust reduction: ▪ Apply water, via its Innu contractor, Mamu Construction, to road between DSO Project Site and Schefferville during dry periods; ▪ Since Summer 2015, begun transporting freight by train between Schefferville and the DSO site; ▪ Since Summer 2015, coordinated an improved system for transportation of merchandise and workers by bus; ▪ Redesigned the Howse Project to further reduce the height of the waste rock piles and to return a portion of the waste rock to the Howse pit; ▪ A wash bay operated by TSMC at DSO site between May and October, which all vehicles must use; ▪ Been collaborating with the authorities responsible for local road infrastructure within the Government of Québec (Secrétariat au Plan Nord, Ministère des Affaires municipales et Occupation du territoire, Ministère des Transports) and the Town of Schefferville regarding paving of streets. According to information obtained by the government, it is envisaged that the paving will take place in 2016, at same time as works on road to Kawawachikamach.
Caribou and other resources	▪ Since 2009, caribou sightings within the LSA have been rare. The GRCH has experienced unprecedented declines in tandem with other caribou populations across North America, commencing in 2010. Causes for this decline are generally unknown and local activities cannot be directly attributed as the cause of this continental trend; ▪ Some time prior to 2010, caribou calving areas migrated more than 230 km east of Schefferville and so there is negligible potential for the Howse Project to interact with this sensitive life stage; ▪ The Proponent is committed to be aware of any caribou seen within a 100 km radius of Howse activities, conduct surveys if collared caribou are found within 20 km of Howse and cease all activities if caribou are known to be within 5 km of the active pit or the processing complex; ▪ HML/TSMC contributes to a compensation fund and First Nation leadership determines how the funds are allocated and used. This fund contributes to alleviating the financial burden for families who count on subsistence harvesting for its economic and nutritive value; ▪ HML/TSMC, the biggest private contributor to the Caribou Ungava project, will pursue its financial participation in the program to advance research on caribou and on the effects of mining activities on the George River herd decline. Researchers will involve the concerned Aboriginal communities by involving them in the research activities held on their traditional territories; ▪ Sightings of caribou will be reported to the HSE Committee; ▪ In collaboration with the HSE Committee, and in some cases with local authorities, mining activities will be adapted if needed to minimize the effects on traditional activities.
Communication	HML has /will: ▪ Support the work of the IBA Implementation Committees;

THEME	ANSWERS / MEASURES
	▪ Provide Project information via radio updates and newsletter; ▪ Work with the local Councils to improve communication to community members; ▪ Include the Howse Project in TSMC's HSE Committee; ▪ Maximize the presence of Aboriginal personnel for all security shifts to facilitate communication in Innu with local land users; ▪ Provide cultural awareness to all staff and language training to personnel; ▪ Work with the local communities to hold a Security course for its members, so that there are additional Innu personnel at the security post; and ▪ HML contact information may be found in Band Councils. HSE Committee members may also provide contact information.
Cumulative Effects	▪ HML will continue to address all HML/TSMC mining matters under the aegis of the HSE Committee to monitor impacts and cumulative effects of mining operations; ▪ Continue to participate in the Regional Steering Committee on Mining Issues (Schefferville), and the Labrador West Regional Task Force, and collaborate with other mining companies operating in the region to assess, address and monitor cumulative effects relating to mining; ▪ Legislation requires financial guarantees from mining companies to ensure that all rehabilitation works are completed, while the Howse Rehabilitation and Closure Plan will require First Nation approval; ▪ Continue to adhere to the Joint Emergency Preparedness Plan and collaborate with communities and other mining companies in doing so; ▪ Continue to collaborate with the Ungava Caribou research program in order to assess cumulative effects of mining on the GRCH; ▪ Work with mining associations and government to discuss and address cumulative effects issues; and ▪ Work with governments and communities to prepare a map showing all mining projects which will guide land-users in harvesting resources in safe locations.
Economic benefits	HML/TSMC has/will: ▪ In place IBAs that ensure that a share of the economic benefits remain in the Schefferville area, including priority hiring and contracting; ▪ Awarded hundreds of millions of dollars in contracts to local Aboriginal businesses since the beginning of the DSO Project; ▪ Continue to provide information on all employment and contracting opportunities and support the establishment of local businesses and capacity-building; ▪ Continue to adapt the bidding process to the size of some of the local businesses; ▪ Continue to collaborate with the responsible authorities for local road infrastructure within the Government of Québec and the Town of Schefferville regarding paving of streets.; and ▪ Continue to meet with Aboriginal representatives to review IBA implementation.
Employment and Training	HML/TSMC has/will: ▪ Close to 150 Innu and Naskapi were working on the DSO Project, representing close to 15% of the Project workforce. This rate is expected to increase once the construction period ends; ▪ HML/TSMC has a strict zero tolerance policy with regard to discrimination and harassment, which is presented to all workers; ▪ Maintain jobs through the Howse Project; ▪ Continue to train and promote Aboriginal workers in the workplace, and which will continue to be required of all contractors; ▪ Continue to support essential skills training; ▪ Continue to provide access to adequate technical training according to job needs as per IBA commitments; ▪ Provide mechanisms through which Aboriginal workers may access qualified positions and obtain promotions (in progress); ▪ Offer an alternating schedule to local workers when work schedules can allow it; ▪ Continue to provide training equitably for both male and female staff;

THEME	ANSWERS / MEASURES
	▪ Continue to provide Cultural Awareness and Respectful Workplace training program for all its employees; ▪ Delivered a custom-designed training in Process Plant Operations to 3 Québec First Nations in Spring 2015; ▪ Continue to favor women who have the required skills and qualifications; ▪ Employs numerous Aboriginal women in non-traditional roles; ▪ Coordinate more training in collaboration w/ community in fields related to mining industry; ▪ Continue to support Innu staff in improving their English skills on-the-job; ▪ Deliver language training to personnel who require it in their day-to-day tasks; ▪ A clear complaint mechanism; and ▪ Continue to participate in local career fairs.
Kauteitnat	▪ Kauteitnat is considered a sensitive area by the Proponent; ▪ A buffer zone of 500 m will be maintained between the bottom of Irony Mountain and the Howse footprint. This distance was established based on the local of the iron deposit, an on-site meeting with trapline holder family representatives; ▪ HML has optimized the Project design to minimize effects in the vicinity of Kauteitnat through reduced waste rock pile heights and progressive in-pit filling; ▪ It is envisaged that the mining claims covering Irony Mountain will be transferred to the local communities by the GNL and designated as a no-mining area; and ▪ Proper archaeological investigations have been carried out for both DSO and the Howse Project.
Rehabilitation	▪ All rehabilitation and closure works are fully covered as per the requirements of the Newfoundland and Labrador Mining Act; ▪ The rehabilitation and closure plan for the Howse Project will be completed to the satisfaction of the Aboriginal groups prior to HML applying for the release certificate from the GNL; ▪ HML will inform in advance local businesses of contracting opportunities for the decommissioning and reclamation phase; and ▪ Rehabilitation works of DSO pits will begin in 2016 (Timmins 4).
Road safety	HML has/will: ▪ Continue to participate in the Regional Steering Committee on Mining Issues (Schefferville) which has discussed this matter and identified solutions; ▪ Continue to maintain the multi-user road between the Schefferville landfill and the DSO site, including safety signage; ▪ Installed in 2015 road safety signage on the road between Schefferville and the DSO site, including for the new railway. Additional bilingual road safety signs will be installed in Spring 2016. This will assist the SQ in enforcing driving laws; ▪ Speed limit will be maintained at 70 km/hour on the multi-user road north of the Schefferville landfill, and at 50 km/hour between the Schefferville landfill and the town of Schefferville. The speed limit will apply to all road users. Respect of applicable speed limits will be monitored by HML and by the Sûreté du Québec; ▪ Continue to raise awareness among workers on importance of safe driving. Measures are taken for detractors found disobeying traffic laws.
Water quality	▪ The water regime of Pinette Lake was analyzed in 2015. The level of Pinette Lake is not expected to decrease by more than 2 mm in the Spring. The water level in the Summer will continue to vary as before the Project; ▪ Pinette Lake will not receive any discharge water from the Howse mine and the lake will not change colour and its water quality will remain the same. Regarding Rosemary Lake, the discharge water directed to Burnetta and Goodream creeks will flow into it. At its entry point, the discharge water will be highly diluted; ▪ A Human Health Risk Assessment modelled the risk of fish consumption on human health, and concluded that the potential effect to human health was very low. During Howse operations, aquatic fauna (fish and benthic invertebrates) will be monitored in accordance with the Metal Mining Effluence Regulations;

THEME	ANSWERS / MEASURES
	▪ A spill response plan on which HML workers are regularly trained; spill kits are readily available equipped in trucks for spills to be contained quickly; and ▪ As mentioned in the EIS, Section **Erreur ! Source du renvoi introuvable.**, the only risk of groundwater contamination relates to nitrate and nitrite. Numerous current measures have been written to reduce the amount of residual ammonium in surface water following the use of explosives. Ammonium is a form of nitrogen that quickly turns to nitrate.

4.3 ABORIGINAL TRADITIONAL KNOWLEDGE AND LAND USE

Recognizing the importance of ATK and land-use practices, specific interviews for the occupation and land use were carried out in relation to the proposed Howse Project mine site. These interviews allowed taking stock of the many concerns in relation to the environment and wildlife, to harvesting activities, and to the transmission of ATK by the Innu of Schefferville and of ITUM, and by the Naskapi. The summary enables an understanding of the depth of changes that are occurring in land-use patterns, and to the culture of the Innu and Naskapis, and how mining activities have contributed to these changes. While the elders mentioned that they rarely go out in this area anymore, they requested that younger land-users be interviewed. Young harvesters pointed to the difficulties in bridging land-use with full-time employment, and mining activities with safe access to land and resources.

The Country Food Survey that was conducted further to questions and comments received from First Nations and the CEAA, enabled the Proponent to obtain additional information on land and resource use specific to the Project area. This survey confirmed that the Project area is used primarily as a transit zone to reach other areas in the region. Rosemary Lake and its tributary, however, remain important for local First Nations.

4.4 STAKEHOLDER GROUPS AND THE PUBLIC

4.4.1 City of Schefferville

A meeting was organized in April 2014 with the Town Administrator of Schefferville to discuss the Project Registration of the Howse Project. The Town Administrator sent HML a letter, dated April 21st 2014, indicating that, given that the Howse Project will have no additional impacts on Schefferville and the mitigation measures already put in place for environmental protection, that the Town is ready to support the Howse Project. Stakeholders consulted in Schefferville did not have concerns about the Howse Project, but rather about the cumulative effects of the mining industry present in the area, mostly to express the current incapacity and insufficiency of Schefferville to deal with a boom in the mining industry. They have also expressed the difficulties related to the Quebec-Labrador border on a daily basis. In general, the Town would like to be adequately prepared for when the mining industry will flourish again, and for that, governmental participation is requested and necessary.

4.4.2 Business Partners

A few discussions were held with business partners, especially those who may experience a slight change in service demands from the Proponent. However, given that the Howse Project will not increase the level of mineral production already planned for the DSO project, the demands for services are probably not going to increase. However, the Howse Project will secure the need for services for the duration of the Project, which is seen as positive by business partners. However, the purpose of the discussions was to provide business partners with information on the Howse Project, and to ensure that the Project would be in line with business agreements already established. As a Federal Authority under the CEAA, TC has provided

comments on both the Project Description and the Environmental Impact Statement Guidelines. The letter indicated that TC has not identified any potential impacts related to the Wabush Airport operations in reading the Project Description. TC will also have the opportunity to comment on the Environmental Impact Statement during the review process.

4.4.3 Other Stakeholders from Labrador and Quebec

The Proponent, through HML, holds different meetings with various local stakeholders either from the region or in Schefferville on a regular basis, and participates extensively in various conferences through which the public can stay informed of actual and planned mining projects operated by HML. Regular meetings are held with municipal councils, local authorities and the business community from the Quebec-Labrador region. Frequent discussions with the authorities of Sept-Îles are held given the presence of TSMC in the area, more specifically for the use of the Port facilities.

5 SUMMARY OF EFFECTS ASSESSMENT

The identification of valued components is based on several criteria. First, VCs identified by the CEAA under the Howse EIS guidelines. Second, we identify VCs based on their applicability (i.e. having an environmental effect) to the criteria described in section 5 of CEAA act (see below,) and third, according to the criteria described in the Species at Risk Act. The provincial EPR guidelines submitted in December 2014 were also considered.

5.1 EFFECTS ASSESSMENT

Table 5 summarizes the effects assessment for 5 physical components, four biological components and seven socioeconomic components. Details on the baseline condition for each component are provided in the main text, as well as the definitions for the levels of effects (e.g. long, short and moderate), for each criteria, where a specific definition is provided for each VC. A summary of the cumulative effects assessment is also provided below.

Follow up and monitoring measure for all valued components are described in Section 7 below.

5.1.1 Physical Environment

Four valued components of the physical environment were selected based on CEAA criteria and Aboriginal concerns: air quality, noise, water budget, and water quality.

Most of the Howse Project activities affect these components, although blasting is particularly important for air quality and noise. For all of them, adverse effects are expected, including: decrease in air quality, increase in ambient noise, ground vibration and over pressure, modification of water budget and water contamination. Following the application of standard mitigation measures, specific measures are committed to by the Proponent to bring adverse effects to the lowest possible levels. Those measures improve blasting management, erosion control and mine water management. The significance of the residual effects expected are moderate for all component but air quality, for which effects remain high. This latter effect is largely attributed to intermittent blasting events which are inevitable and therefore highly likely to happen.

5.1.2 Biological Environment

Four valued components of the biological environment were selected based on CEAA criteria and Aboriginal concerns: wetlands, migratory tundra caribou, avifauna, and fish.

Most of the Project activities affect these components. For all of them, adverse effects are expected including: loss of wetlands, anthropogenic disturbances, loss of habitat, sublethal effects of water contamination and blasting on fish along with habitat degradation. Habitat loss is the primary cause of the effects on wetlands, caribou and avifauna. Habitat alteration, in the form of water quality effects, is the primary cause of effects on aquatic fauna. Following the application of standard mitigation measures, specific measures are committed to by the Proponent to bring adverse effects to the lowest possible levels. Those measures include scheduling work in order to minimize disturbances, supporting caribou monitoring, reducing light intensity when critical, and limiting explosive charges to protect fish and eggs. The residual effects expected are moderate for all component and even lower for some specific bird species. The significance of the effects on caribou are largely nullified by their absence in the vicinity of the Howse Project. Efforts to monitor caribou presence by the Proponent and the Proponent's commitment to implement specific action if a caribou is found in the vicinity of the Howse area are detailed in section 7.2.2 below.

5.1.3 Socioeconomic

Seven valued components of the socioeconomic environment were selected based on CEAA criteria and Aboriginal concerns: human health, access to the local transportation network, access to land, and road safety, local employment and training and local contracting, subsistence and traditional caribou hunting, subsistence and traditional activities, and preservation of and access to Kauteitnat.

Again, most of the Project activities affect these component. On the other hand, both adverse and beneficial effects are expected. Adverse effects include health risks through contamination, access limitation and road safety, decrease in Aboriginal employment after decommissioning, reduction in the availability of caribou, and alteration of landscape surrounding Kauteitnat. Positive effects all linked to increase employment and contracting of Aboriginals. Following the application of standard mitigation measures, specific measures are will also be deployed to bring adverse effects to the lowest possible levels. Those measures include maintaining good communication with locals and authorities regarding mine activities influencing local life, improving road signs quality and quantity, support training and employment for locals and Aboriginal businesses, contributing to a compensation funds, upgrade of bypass roads, and progressively restoring the mine site so that it looks natural after decommissioning. The significance of the residual effects of the Howse Project on human health has been assessed via a complete Human Health Risk Assessment and the conclusions are that there is no risk to human health as a result of country food consumption in the vicinity of Howse. The significance of the effects of land use are considered to be very low to moderate. The effects on the economy (Local Employment and Training and Local Contracting) are largely positive via the creation of new jobs and economic opportunities as a result of the implementation of the Howse Project.

Table 5 Summary Table of Effects Assessment for Howse EIS

VALUED COMPONENT AFFECTED	PROJECT ACTIVITY	ANTICIPATED CHANGES/ POTENTIAL EFFECT DIRECTION OF EFFECT (+/-)	PROPOSED SPECIFIC MITIGATION MEASURE	TIMING	SPATIAL EXTENT	DURATION	REVERSIBILITY	MAGNITUDE	FREQUENCY	EFFECT SIGNIFICANCE	LIKELIHOOD
				CONSTRUCTION OPERATION DECOMMISSIONING AND RECLAMATION							
Physical											
Air Quality	Upgrade/construction of the Howse haul road and upgrade of the bypass road Pit development Removal and storage of remaining overburden and topsoil Blasting and ore extraction Mineral processing Electricity production Operation of waste rock dumps Transportation of ore and other traffic Solid waste disposal Ongoing site restoration	Atmospheric emissions from Project activities/ Decrease in air quality (-)	Develop a prevention plan to manage blasts generating NOx based on the Code of Good Practice prepared by the Australian Explosives Industry and Safety Group Inc.	UNFAVORABLE TIMING	LOCAL	LONG	REVERSIBLE	MODERATE	INTERMITTENT	HIGH	HIGH
Noise	All activities (without blasting)	Increase noise from all activities/ Increase in the ambient noise level (-)	Review blast design continually to ensure compliance with regulations Maintain detailed blast records Implement a noise complaint process	UNFAVORABLE TIMING	SITE SPECIFIC	LONG	REVERSIBLE	LOW	CONTINUAL	MODERATE	HIGH

VALUED COMPONENT AFFECTED	PROJECT ACTIVITY	ANTICIPATED CHANGES/ POTENTIAL EFFECT DIRECTION OF EFFECT (+/-)	PROPOSED SPECIFIC MITIGATION MEASURE	TIMING	SPATIAL EXTENT	DURATION	REVERSIBILITY	MAGNITUDE	FREQUENCY	EFFECT SIGNIFICANCE	LIKELIHOOD
				CONSTRUCTION OPERATION DECOMMISSIONING AND RECLAMATION							
Noise	Blasting	Increase noise from all activities and ground vibration and overpressure/ Increase in the ambient noise level and ground vibration and overpressure (-)	Monitor a minimum of an initial four blasts with a charge per delay restricted to below 700 kg per delay	UNFAVORABLE	SITE SPECIFIC	LONG	REVERSIBLE	LOW	INTERMITTENT	MODERATE	HIGH
Hydrography and Hydrology: Water Budget	Upgrade/construction of the Howse haul road and upgrade of the bypass road Pit development Removal and storage of remaining overburden and topsoil Dewatering Operation of waste rock dumps Ongoing site restoration Final site restoration	Water diversion/ Modification of water budget (-)	Riprap will be installed on both sides of Burnetta Creek from the discharge point to 600 m downstream.	INCONSEQUENTIAL	LOCAL	LONG	PARTIAL	LOW	INTERMITTENT	MODERATE	-
Water Quality	All activities	Water contamination by SS, color, blasting residues and fuel and oil/ Changes to water quality (-)	Riprap will be installed on both sides of Burnetta Creek from the discharge point to 600 m downstream. Divert sedimentation pond HowseA into the pit	MODERATE	LOCAL	LONG	REVERSIBLE	MODERATE	INTERMITTENT	MODERATE	-

VALUED COMPONENT AFFECTED	PROJECT ACTIVITY	ANTICIPATED CHANGES/ POTENTIAL EFFECT DIRECTION OF EFFECT (+/-)	PROPOSED SPECIFIC MITIGATION MEASURE	TIMING	SPATIAL EXTENT	DURATION	REVERSIBILITY	MAGNITUDE	FREQUENCY	EFFECT SIGNIFICANCE	LIKELIHOOD
				CONSTRUCTION OPERATION DECOMMISSIONING AND RECLAMATION							
Biological											
Terrestrial Ecosystem, Wetlands and Vegetation: Wetlands	Upgrade/construction of the Howse haul road and upgrade of the bypass road Pit development Removal and storage of remaining overburden and topsoil Dewatering Operation of waste rock dumps Ongoing site restoration Final site restoration	Loss land due to footprint due to Project infrastructure/ Habitat loss (-)	Carry out stripping all at once instead of progressively Preserve stripped organic matter for restoration Use temporary protection mats or limit activities to winter for the work needed on Burnetta Creek	MODERATE	LOCAL	LONG	NOT REVERSIBLE	LOW	CONTINUAL	MODERATE	-
Migratory Tundra Caribou	Upgrade/construction of the Howse haul road and upgrade of the bypass road Pit development Transportation and traffic Removal and storage of remaining overburden and topsoil Blasting and ore extraction Mineral processing Dewatering Operation of waste rock dumps Transportation of ore and other traffic Ongoing site restoration Demobilization of the Howse facilities and heavy machinery Final site restoration	Increased noise and light, habitat alteration and habitat loss/ Avoidance (-)	Avoid areas of wildlife concentrations Monitor satellite-collared caribou around the Howse Project Cease activities if caribou are present within 5 km of the active pit or processing complex and contact the NLDEC Wildlife Division for further instructions Reschedule work activities to avoid wildlife encounters if necessary Yield the right-of-way to wildlife Firearms prohibited on site except for security personnel	UNFAVORABLE	LOCAL	LONG	REVERSIBLE	LOW	CONTINUAL	MODERATE	-

VALUED COMPONENT AFFECTED	PROJECT ACTIVITY	ANTICIPATED CHANGES/ POTENTIAL EFFECT DIRECTION OF EFFECT (+/-)	PROPOSED SPECIFIC MITIGATION MEASURE	TIMING	SPATIAL EXTENT	DURATION	REVERSIBILITY	MAGNITUDE	FREQUENCY	EFFECT SIGNIFICANCE	LIKELIHOOD
				CONSTRUCTION OPERATION DECOMMISSIONING AND RECLAMATION							
Avifauna	Upgrade/construction of the Howse haul road and upgrade of the bypass road Pit development Transportation and traffic Removal and storage of remaining overburden and topsoil Blasting and ore extraction Mineral processing Dewatering Operation of waste rock dumps Transportation of ore and other traffic Ongoing site restoration Demobilization of the Howse facilities and heavy machinery Final site restoration	Noise, light, habitat alteration and habitat loss/ Avoidance (-)	Avoid nesting period as much as possible during the construction phase Do all vegetation stripping for areas where activities are planned in a specific year before the month of May of that year so that birds will not breed in those area Respect the Rusty Blackbird mitigation plan developed for the DSO project Reduce light intensity when weather forecasts are extreme during migration periods to minimize light attraction	MODERATE	SITE SPECIFIC TO LOCAL DEPENDING ON SPECIES	LONG	REVERSIBLE	LOW TO MODERATE DEPENDING ON SPECIES	INTERMITTENT	LOW TO MODERATE DEPENDING ON SPECIES	-
Aquatic Fauna: Fish	All activities	Changes to hydrology and water quality/ Sublethal effect of water contamination (-) Degradation of habitat quality by sedimentation (-) Lethal effect of blasting (-)	Limit max. charges of explosives so that blast vibration and overpressure limits respect the NPC-119 guidelines (MOE, 1985). The smallest distance between the pit and a water body (Pinette Lake) is 900 m, which limits the charges to 3,128 kg per delay to protect fish eggs from vibration and to 1,092 kg to protect the fish from overpressure	MODERATE	LOCAL	LONG	PARTIAL	LOW	CONTINUAL	MODERATE	-

VALUED COMPONENT AFFECTED	PROJECT ACTIVITY	ANTICIPATED CHANGES/ POTENTIAL EFFECT DIRECTION OF EFFECT (+/-)	PROPOSED SPECIFIC MITIGATION MEASURE	TIMING	SPATIAL EXTENT	DURATION	REVERSIBILITY	MAGNITUDE	FREQUENCY	EFFECT SIGNIFICANCE	LIKELIHOOD
				CONSTRUCTION OPERATION DECOMMISSIONING AND RECLAMATION							
Socioeconomic											
Human Health	All activities	Deposition of contaminants/ Negative effects on human health through contamination of water, air, soil, and traditional food if consumed or inhaled (-)	None	INCONSEQUENTIAL	SITE SPECIFIC	SHORT	REVERSIBLE	LOW	ONCE	VERY LOW	-

Infrastructure and Services: Access to the Local Transportation Network, Access to Land, and Road Safety	Upgrade/construction of the Howse haul road and upgrade of the bypass road Removal and storage of remaining overburden and topsoil Operation of waste rock dumps Transportation of ore and other traffic Ongoing site restoration Demobilization of the Howse facilities and heavy machinery Final site restoration	Limitation to road access, land access and safety issues / Reduced access (-)	Blasting announcements will be made on the radio 48 h in advance of blast periods, and band councils will also be notified Access to the mine road network will continue to be controlled for safety reasons. HML will provide a safety escort to the land users if needed Speed limit will be maintained at 70 km/h on the main mining road north of the Schefferville landfill, and at 50 km/hour between the Schefferville landfill and the town of Schefferville HML will raise awareness among workers on the importance of safe driving Additional road safety signs will be installed in the Spring of 2016 A new bypass road for land-users was completed in 2015, which provides access to lands to the northwest of the DSO and Howse sites Collaborate with responsible authorities for local road infrastructure within the Government of Québec (Secrétariat au Plan Nord, Ministère des Affaires municipales et Occupation du territoire, Ministère des Transports) and the Town of Schefferville regarding paving of streets, including chemin de la Gare	INCONSEQUENTIAL	LOCAL	SHORT LONG LONG	REVERSIBLE	LOW LOW MODERATE	INTERMITTENT	VERY LOW LOW MODERATE	-
Economy: Local Employment and Training	All activities	Job creation/ Maintenance or increase in current levels of local Aboriginal employment in the LSA (+) Decrease in local Aboriginal employment after	Continue to support the essential skills training and other technical training Provide mechanisms through which Aboriginal workers may access qualified positions Work with communities to support the delivery of early training Offer an alternate schedule to local workers when operational schedules allow it	INCONSEQUENTIAL	LOCAL	SHORT MEDIUM SHORT	REVERSIBLE	LOW MODERATE LOW	CONTINUAL CONTINUAL INTERMITTENT	LOW (+) MODERATE (+) VERY LOW (+)	-

VALUED COMPONENT AFFECTED	PROJECT ACTIVITY	ANTICIPATED CHANGES/ POTENTIAL EFFECT DIRECTION OF EFFECT (+/-)	PROPOSED SPECIFIC MITIGATION MEASURE	TIMING	SPATIAL EXTENT	DURATION	REVERSIBILITY	MAGNITUDE	FREQUENCY	EFFECT SIGNIFICANCE	LIKELIHOOD
				CONSTRUCTION OPERATION DECOMMISSIONING AND RECLAMATION							
		decommissioning and reclamation (-)	Continue to provide on-the-job training equitably for both male and female staff Continue to provide Cultural Awareness and Respectful Workplace training program for workers HML will ensure that all new employees have their beginner's handbook and appropriate health and safety training Continue to support Innu staff in improving their English skills on-the-job Continue to prioritize Aboriginal and local contractors as much as possible; Continue to adapt the bidding process to the size of some of the local businesses Continue to provide support the creation of local businesses Prepare a decommissioning and reclamation plan to relocate workers when possible								

VALUED COMPONENT AFFECTED	PROJECT ACTIVITY	ANTICIPATED CHANGES/ POTENTIAL EFFECT DIRECTION OF EFFECT (+/-)	PROPOSED SPECIFIC MITIGATION MEASURE	TIMING	SPATIAL EXTENT	DURATION	REVERSIBILITY	MAGNITUDE	FREQUENCY	EFFECT SIGNIFICANCE	LIKELIHOOD
				CONSTRUCTION OPERATION DECOMMISSIONING AND RECLAMATION							
Economy: Local Contracting	All activities	Job creation/ Maintenance of current levels of contracts for the local businesses (+) Decrease in the number of contracts for local businesses after decommissioning and reclamation (-)	Continue to give priority to Aboriginal and local contractors Adapt the bidding process to the size of local businesses Support the creation of local businesses Provide start-up training for new businesses Provide training for new businesses and cultural training for contractors hired by TSMC	CONSIDERABLE	LOCAL	SHORT LONG SHORT	REVERSIBLE	LOW MODERATE LOW	CONTINUAL CONTINUAL INTERMITTENT	MODERATE (+) HIGH (+) LOW (+)	HIGH
Land-use and ATK: Subsistence and Traditional Caribou Hunting	Upgrade/construction of the Howse haul road and upgrade of the bypass road Pit development Removal and storage of remaining overburden and topsoil Blasting and ore extraction Mineral processing Dewatering Operation of waste rock dumps Transportation of ore and other traffic Ongoing site restoration Demobilization of the Howse facilities and heavy machinery Final site restoration	Increased noise and other disturbance at the site/ Reduction in the availability of caribou for subsistence hunting (-)	TSMC contributes to a specific compensation fund for subsistence activities through certain IBAs HML/TSMC will pursue its financial participation in the Université Laval Caribou Research Initiative for advance research on caribou Report sighting to the HSE Committee and cease activity if caribou is nearby (details in the section on the caribou VC) HML recognizes that caribou could come back in the area and will respect the proposed mitigation measures for the caribou valued component	INCONSEQUENTIAL	LOCAL	SHORT LONG SHORT	REVERSIBLE	LOW	INTERMITTENT	VERY LOW LOW VERY LOW	-

VALUED COMPONENT AFFECTED	PROJECT ACTIVITY	ANTICIPATED CHANGES/ POTENTIAL EFFECT DIRECTION OF EFFECT (+/-)	PROPOSED SPECIFIC MITIGATION MEASURE	TIMING	SPATIAL EXTENT	DURATION	REVERSIBILITY	MAGNITUDE	FREQUENCY	EFFECT SIGNIFICANCE	LIKELIHOOD
				CONSTRUCTION OPERATION DECOMMISSIONING AND RECLAMATION							
Land-use and ATK: Subsistence and Traditional Activities	Upgrade/construction of the Howse haul road and upgrade of the bypass road Pit development Removal and storage of remaining overburden and topsoil Blasting and ore extraction Mineral processing Dewatering Operation of waste rock dumps Transportation of ore and other traffic Ongoing site restoration Demobilization of the Howse facilities and heavy machinery Final site restoration	Increased noise and other disturbance to the site/ Decrease in accessible subsistence activities and traditional pursuits (-) Increased costs for families' subsistence (-)	Bypass road upgraded Mandate the HSE Committee to do environmental monitoring and oversee and assess the effectiveness of the relevant mitigation measures Report sightings of wildlife to the HSE Committee TSMC contributes to a specific compensation fund for subsistence activities through certain IBAs Maintain communication with local population during decommissioning Any usable wood will be made available for locals Maximize presence of Aboriginal personnel to facilitate communication	MODERATE	LOCAL	SHORT LONG SHORT	REVERSIBLE	LOW	CONTINUAL	LOW MODERATE LOW	-
Land-use and ATK: Preservation of and Access to Kauteitnat	Upgrade/construction of the Howse haul road and upgrade of the bypass road Pit development Removal and storage of remaining overburden and topsoil Blasting and ore extraction Transportation of ore and other traffic Ongoing site restoration Demobilization of the Howse facilities and heavy machinery Final site restoration	Destruction of the access road to Kauteitnat (-) Alteration of the landscape around Kauteitnat (-) Kauteitnat cultural symbol affected (-)	Progressively restore the mine so that it looks natural after decommissioning Asses the pertinence of another bypass road to Kauteitnat	INCONSEQUENTIAL	SITE SPECIFIC	SHORT LONG LONG	PARTIAL	MODERATE	CONTINUAL	LOW MODERATE MODERATE	-

6 CUMULATIVE EFFECTS

Taking into account the large number of projects in the vicinity of the Howse Project area, the cumulative effects assessment focuses on each component's RSA and proposes further mitigation measures, as needed.

6.1 CUMULATIVE EFFECTS ASSESSMENT

Table 6 summarizes the cumulative effects assessment for 8 components. Figure E presents the past, present and future projects taken into account for this exercise. Details on the baseline condition for each component are provided in the main text, as well as the definitions for the levels of effects (e.g. long, short and moderate), for each criteria, where a specific definition is provided for each VC.

6.1.1 Air quality

The significance of the cumulative effects of the Howse Project and surrounding projects on air quality remain high under a scenario with regular blasting. The cause for air quality exceedances is attributed to pit within the DSO3 activities and located close to the Québec border. The proponent is committed to a strict monitoring protocol, which includes limiting blasting events in winter (if necessary) and a network of air monitoring equipment.

6.1.2 Water and Aquatic Fauna

The activities of the Howse Project do not intersect with those of surrounding projects. As such, no cumulative effects are expected for water and aquatic fauna.

6.1.3 Wetlands

The significance of the effects of the Howse Project and surrounding projects on wetlands is expected to be negligible.

6.1.4 Caribou

Largely due to the absence of evidence of caribou occupation of the Howse Project area, the significance of the cumulative effects of the Howse Project is expected to be low. Noise and light are expected to continue to cause caribou avoidance of the area. Never the less, the Proponent is committed to practice adaptive management with the caribou resource, and to participate and cooperate with local caribou monitoring programs. The Proponent is committed to altering/stopping activities in the event that caribou is seen within the Project area (5 km buffer zone).

6.1.5 Avifauna

Habitat loss, noise and light are expected to affect a small number of avifauna in the Howse RSA. Overall, the significance of the cumulative effects of the Howse Project on avifauna is expected to be low, in part due to the small number of birds affected, and also due to the mitigation measure to which the Proponent is committed.

6.1.6 Human Health

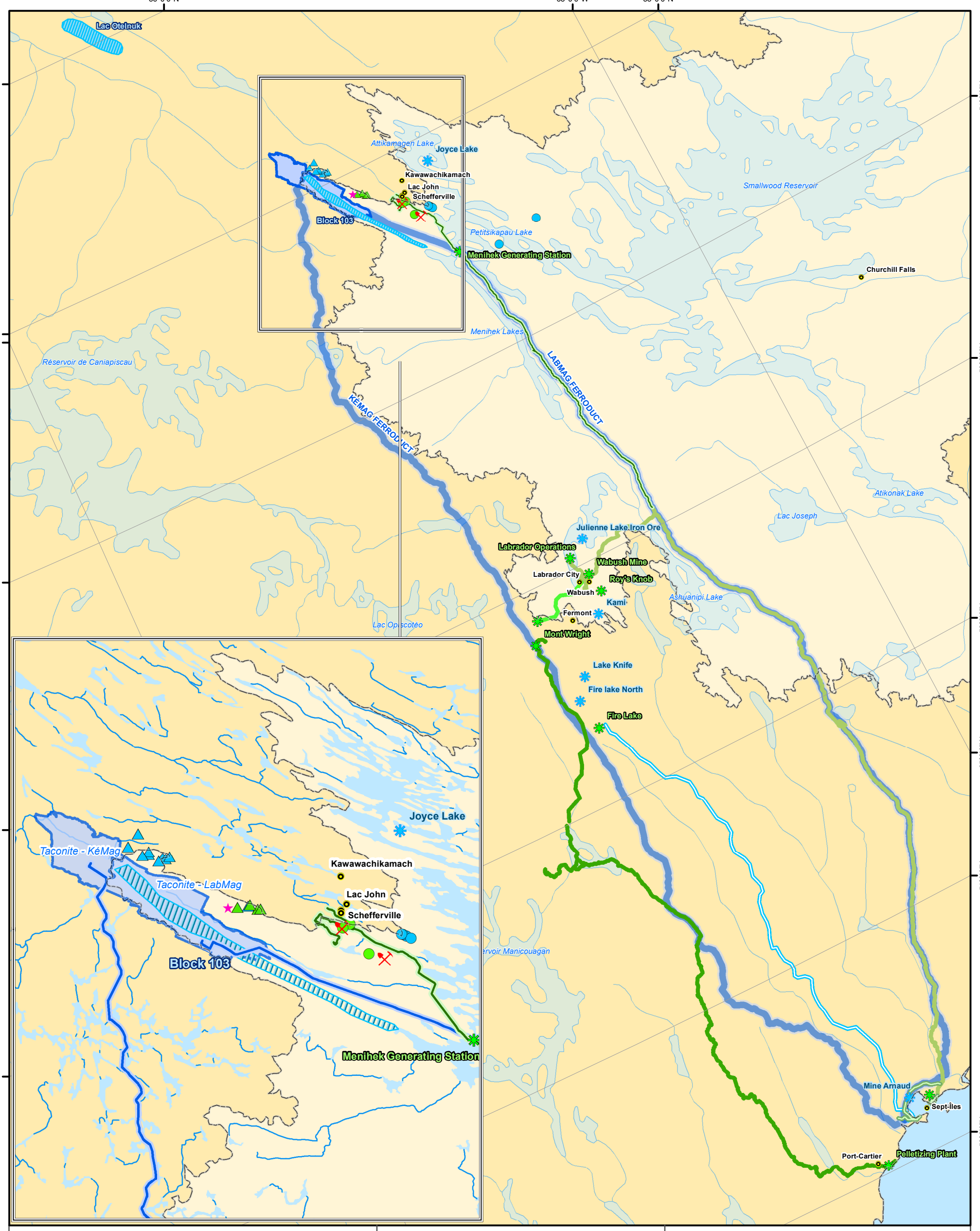
The significance of the cumulative effects of the Howse Project to risk to human health is very low. No mitigation measures are proposed.

6.1.7 Socioeconomic conditions of Aboriginal People

The significance of the Howse cumulative effects on the socioeconomic conditions of aboriginal people is expected to be moderate, and largely positive. The Howse Project and surrounding projects offer numerous economic benefits, which will be optimised through measures focusing on maximization of the economic benefits.

6.1.8 Subsistence and Traditional Activities

The majority of locals conduct harvesting activities outside of the Howse and DSO area, the significance of the cumulative effects of Howse on these activities is expected to be moderate. These effects may intensity with time, however, if new projects are implemented. The Proponent is committed to providing an access road to facilitate access to areas for harvesting activities.



LEGEND

Mining Projects

Past Project/Activity

- Labrador Operations - Schefferville Area

Existing Project/Activities

- Shefferville Iron Ore Mine Stage 1
- DSO 3 - Project 1a (ELAIOM)
- Other Project
- Arnaud Railway
- Bloom Lake Rail Spur
- Cartier Railway
- QNS&L

LEGEND/LEGENDE

- Tshiuetin Rail Transportation

Future Project

- Shefferville Iron Ore Mine Stage 2, 4, 5
- DSO 4 - project 2a, 2b
- Other Project
- Champion Railway
- Other Future Project
- Taconite - KéMag/LabMag
- KéMag/LabMag Ferroduct

Basemap

- Town
- Howse Deposit
- Watercourse
- Water Body
- Provincial Boundary

FILE, PROJECT, DATE, AUTHOR:
GH-0608 , PR185-19-14, 2016-01-29, edickoum

N

0 50 100
Kilometers

UTM 19N NAD 83

SCALE: 1:1 800 000

SOURCES:
Basemap
Atlas of North America, 1:7,500,000
Government of Quebec, BDGA, 1:1,000,000

ENVIRONMENTAL IMPACT ASSESSMENT
HOWSE PROPERTY PROJECT

Other Projects Considered for Cumulative Effects Assessment

Howse Minerals Limited

GroupeHemispheres
5731, rue Saint-Louis, Bureau 201, Lévis (QC) Canada, G6V 4E2
1453, rue Beaubien est, Bureau 301, Montréal (QC) Canada, H2G 3C6

Figure E

Table 6 Summary Table of Cumulative Effects Assessment for Howse EIS

COMPONENT	SCOPING	ANALYSIS/ANTICIPATED EFFECTS	MITIGATION	TIMING	SPATIAL EXTENT	DURATION	REVERSIBILITY	MAGNITUDE	FREQUENCY	EFFECT SIGNIFICANCE	LIKELIHOOD
Air Quality	▪ Cumulative effects considered are Howse and nearby DSO3 and DSO4 ▪ The study area considered encompasses sensitive receptors of the RSA and mining/processing/ hauling activities associated with Howse, DSO3 and DSO4 located within the LSA ▪ The Howse, DSO3 and DSO4 project operations will coincide at one point, requiring a global approach to the air modelling study ▪ Air dispersion modelling report provides explanations on how air emissions sources from the three projects were incorporated in the calculations	▪ "With Blasts" modelling scenario: cumulative impact at Naskapi – Uashat people's camp is 57.5 µg/m3 vs a criterion of 50 µg/m3. The Howse Project contributes at 36.1 µg/m3 because of proximity. However, this exceedance is predicted to occur only once in 5 years ▪ Short-term averaging / "No Blasts" modelling scenario: max. predicted concentration for the Howse Project does not exceed the project's ambient air quality assessment criteria ▪ "With Blasts" modelling scenario: exceedances predicted at nine receptors. The Howse Project is the main contributor at seven, the exceptions being Inukshuk Lake and the Workers' camp. Frequency of exceedances is less than 1% ▪ "With Blasts" scenario: exceedances predicted for averaging periods and pollutants: 24-hr (TPM, PM10, PM2.5, NO2), 1-hr (NO2, SO2, CO). The max. number of predicted exceedances is 2.85% of the time for PM10 (24-hr) at an "Off-Property Limit" grid receptor. The cause of the predicted exceedances is: DSO3 Fleming 7N pit is located close to the Quebec border and air quality modelling perimeter. Combining this short distance and the conservativeness of blasting events by the air model leads to exceedances predictions.	▪ Proponent will practice adaptive management of air quality in vicinity of Howse Project and in DSO areas ▪ Adaptive management based on air quality monitoring plan (AQMP) currently under revision by the NL, QC and Kativik authorities ▪ The AQMP = network of air monitoring equipment at several locations for several air pollutants such as: NOx, TPM, PM2.5, metals and dustfall. A draft version of the AQMP is provided in Air dispersion modelling report	UNFAVORABLE	LOCAL	LONG	REVERSIBLE	MODERATE	INTERMITENT	HIGH	HIGH

COMPONENT	SCOPING	ANALYSIS/ANTICIPATED EFFECTS	MITIGATION	TIMING	SPATIAL EXTENT	DURATION	REVERSIBILITY	MAGNITUDE	FREQUENCY	EFFECT SIGNIFICANCE	LIKELIHOOD
Water and Aquatic Fauna	▪ Cumulative disturbances are restricted to the Howells River watershed (~800 km2) ▪ Past IOCC mining activities modified local hydrography, potentially causing fish habitat loss or alteration and water quality degradation downstream (namely in Elross Creek) ▪ Other ongoing DSO mining activities (TSMC and LIM) contribute to water quality degradation and fish habitat loss ▪ Taconite and Block 103 projects could increase fish habitat loss and water quality degradation in the Howells River watershed	▪ Water quantity: small changes expected locally and water stays in Howells river watershed. No water quantity changes are expected at the Howells River watershed scale. ▪ No cumulative effect between the Howse Project and other projects in the RSA since Howse effects are not expected beyond the LSA and since no other project is planned in the same sub watersheds.	▪ Since no cumulative effect is expected from Howse Project, no mitigation measures are suggested here. ▪ Water quality monitoring program implemented at LSA's limits to confirm that contaminants do not reach beyond the LSA.	Since not cumulative effect is expected from the Howse Project, no significance assessment will be performed for this component.							
Wetlands	▪ Wetlands common regionally and even more in the Howells River and Swampy Bay watersheds	▪ No unique type of wetlands will be loss due to mining operations.	▪ None	Based on the fact that the affected area is non-significant, wetlands are not considered as VC for the cumulative impact assessment and therefore not require further analysis.							
Caribou	▪ Cumulative effects of noise and light from Howse Project and nearby Projects on both migratory and boreal forest ecotypes are considered	▪ Pre-Howse noise levels similar to those expected during Howse activities and only slightly higher under cumulative ▪ Light modelling results: the cumulative effects of Howse and surrounding projects will be highest in winter, due to snow reflectance ▪ The railroad represents functional habitat loss for caribou.	▪ Proponent will practice adaptive management of the caribou in the vicinity of the Howse Project ▪ Cooperation with local caribou monitoring programs to stay informed and proactively act if caribou are seen within buffer zones around Howse and surrounding project ▪ HML/TSMC suggest a Caribou joint committee if other companies (NML, Champion, Adriana) start their operations	UNFAVORABLE	SITE SPECIFIC	MEDIUM	REVERSIBLE	LOW	INTERMITTENT	LOW	-

COMPONENT	SCOPING	ANALYSIS/ANTICIPATED EFFECTS	MITIGATION	TIMING	SPATIAL EXTENT	DURATION	REVERSIBILITY	MAGNITUDE	FREQUENCY	EFFECT SIGNIFICANCE	LIKELIHOOD
Avifauna	▪ Cumulative effects of noise, light and habitat loss from Howse Project and nearby Projects on, grouses, ptarmigans, migrating birds and species at risk considered for the cumulative effect assessment	▪ Cumulative habitat loss caused by mining projects in the Schefferville vicinity remains the main threat for bird survival. In the long term, the increasing number of mining projects in the RSA could pose a more significant threat in terms of habitat loss for the Rusty Blackbird the Gray-cheeked Thrush and the Red-necked Phalarope, three species at risk found in the LSA. The bank swallow is present in the LSA but could eventually benefit by nesting in abandoned pits. ▪ Suitable habitats remain common, both locally and regionally, and most of the territory is still undisturbed. Therefore, no bird species are seriously threatened in the short and medium term ▪ Abandoned pit constitute potential breeding habitats for Bank Swallow and cumulative effects for this species can be considered as beneficial	▪ Proponent will participate to breeding birds and species at risk monitoring surveys as a follow up ▪ Rusty Blackbird, Gray-cheeked Thrush, Red-necked Phalarope and Bank Swallow will be specifically monitored at a local scale to generate better population understanding of their response to the Project	MODERATE	SITE SPECIFIC	MODIUM	REVERSIBLE	LOW	INTERMITTENT	LOW	-
Human Health	▪ Effects of air emissions from Howse Project and nearby projects (e.g. DSO3 and DSO4) on air quality are considered ▪ Study area considered encompasses sensitive receptors of interest in the RSA and mining/ processing/hauling activities associated with Howse, DSO3 and DSO4 located within the LSA ▪ Air dispersion modelling provides explanations on the three projects inclusion in the calculations	▪ Effects on human health were predicted based on air quality modelling performed specifically for the cumulative effects scenario ▪ For annual averages, the project's ambient air quality assessment criteria are all met. The contribution of the Howse Project to the overall predicted ambient air concentrations is generally around 10% of the total	▪ Given that predicted effects to human health were predicted for the cumulative scenario, specific mitigation measures are not warranted, although mitigation measure for air quality are a prudent course of action.	INCONSEQUENTIAL	SITE SPECIFIC	SHORT	REVERSIBLE	LOW	ONCE	VERY LOW	-

COMPONENT	SCOPING	ANALYSIS/ANTICIPATED EFFECTS	MITIGATION	TIMING	SPATIAL EXTENT	DURATION	REVERSIBILITY	MAGNITUDE	FREQUENCY	EFFECT SIGNIFICANCE	LIKELIHOOD
Socioeconomic conditions of aboriginal people	▪ Spatial boundaries for this component are limited to the RSA. The RSA includes three zones of populated areas: Schefferville, Labrador West and Sept-Îles areas ▪ Temporal boundaries go back to the beginning of the IOCC mine construction, which included the construction of the QNS&L railway in the 1940s, and coincide with the progressive sedentarization of the Innu and Naskapi in Schefferville area, as well as with the creation of the municipality of Schefferville. The upper temporal limit corresponds to the end of the Howse Project activities, planned for 2032	▪ Schefferville area benefits economically from the presence of the mining industry ▪ However, local Aboriginal Groups expressed their views that the economic benefits at the local level should be maximized, particularly with regards to training, employment and contract opportunities	Measures will include: ▪ Essential skills and technical training, business tools training and start-up programs, basic accounting and requirements (tax numbers, insurance, etc.), and basic human resource management skills ▪ Security and safety measures put in place in collaboration with local police ▪ Security agents trained on local issues and on inter-cultural interventions ▪ Safety measures and drug and alcohol prevention protocols will be communicated to all employees and local residents ▪ Measures taken for offenders clearly enunciated and respected ▪ A fund put in place to offer support to employees dealing with drug and alcohol issues ▪ All companies operating in the area will adhere to recent joint emergency preparedness plan ▪ All companies will be part of the Regional Steering Committee involving Schefferville, NILMJ and NNK to discuss cumulative effects. At the moment, HML is the only participating member from the mining industry.	MODERATE	LOCAL	LONG	PARTIALY	MODERATE	INTERMITTENT	MODERATE	-

COMPONENT	SCOPING	ANALYSIS/ANTICIPATED EFFECTS	MITIGATION	TIMING	SPATIAL EXTENT	DURATION	REVERSIBILITY	MAGNITUDE	FREQUENCY	EFFECT SIGNIFICANCE	LIKELIHOOD
Subsistence and traditional activities	▪ Spatial boundaries for this component are limited to the RSA. The RSA includes three zones of populated areas: Schefferville, Labrador West and Sept-Îles areas ▪ Temporal boundaries go back to the beginning of the IOCC mine construction, which included the construction of the QNS&L railway in the 1940s, and coincide with the progressive sedentarization of the Innu and Naskapi in Schefferville area, as well as with the creation of the municipality of Schefferville. The upper temporal limit corresponds to the end of the Howse Project activities, planned for 2032	▪ Land-use study indicates harvesting activities in the DSO project area, including Howse Project, are limited. Harvesters either travel through or choose to go elsewhere to avoid disturbance by the mining activities. ▪ Land-users, Innu and Naskapi, have the opportunity to go elsewhere in the vicinity of Schefferville, as other similar harvesting sites can be found nearby. However, these possibilities may be reduced as projects develop in the future. Some of these locations require going farther inland, which partly explains the reliance on the road network, or may be constrained in other ways (other sources of contamination, family trapline holders, etc.). The displacements of land-use activities have several implications	▪ Collaboration required from all mining companies operating in one given area and of local authorities in terms of assessments, implementation of measures, and monitoring ▪ During the summer and fall months, bypass road provides an alternative to crossing the Project site towards the northwest. However, it is only a partial solution: the road to Goodwood and Kivivic, north of the Howse Project, will continue to be shared by multiple users and to provide access to Kauteitnat ▪ TSMC contributes to a compensation fund for subsistence activities ▪ A Regional Steering Committee has been established in Schefferville area to oversee and coordinate mining activities when possible. The Town of Schefferville and directly affected Aboriginal groups (NIMLJ, ITUM and NNK) are part of this committee, as well as HML ▪ A consolidated map of all mining projects and potentially affected areas where locals should refrain from harvesting will be prepared ▪ TSMC is already engaged in and actively maintains relationships with all stakeholders of all concerned areas	MODERATE	SITE SPECIFIC	LONG	PARTIALY	LOW	INTERMITTENT	MODERATE	-

7 ENVIRONMENTAL MONITORING AND FOLLOW-UP

The programs are presented for all VCs of the Howse EIS and they are designed to clarify some of the uncertainties inherent to the assessment process as well to ensure that the Howse Project does not affect the VCs more than anticipated in the present document. Namely, the Proponent is committed to obtaining field data for those components which were assessed based on theoretical data. These uncertainties largely arise from environmental predictions on air emissions, permafrost conditions components.

HML's EPP describes commitments to air, noise, surface/ground water monitoring as well as avifauna, fish and fish habitat, harvested animals, and caribou.

7.1 PHYSICAL ENVIRONMENT

7.1.1 Air Quality

Air quality will be monitored using a combination of standard reference and site-specific sampling methods as per NL guidance document GD-PPD-065 (Guidelines for Ambient Air Monitoring, December 16, 2010). An Ambient Air Monitoring Plan will be prepared by TSMC and submitted to the provincial authorities for approval. Conceptually, this plan will consist of:

- selecting sampling locations based on air modeling results and identified sensitive receptors;
- selecting appropriate sampling equipment and methods allowing for short-term (e.g., 1 hour), medium-term (24 hours) and long-term (monthly) monitoring of dust and NOx;
- obtaining local meteorological information, such as wind speed and direction and temperature;
- applying monitoring methods and equipment that can provide reliable, accurate and representative data, considering the climate in this region; and
- ensuring that monitoring results are actionable and that corrective actions are applied promptly to minimize impacts on air quality, if necessary.

A Draft Air Quality Monitoring Plan and a Draft Plan for the Prevention and Management of Blast Generated NOx were produced.

<u>Greenhouse Gas Emissions</u>

Since 2012, HML has reported its GHG emissions through the National Pollutant Release Inventory (NRPI) on an annual basis as well as for the Government of Newfoundland and Labrador. In addition to continuing with this practice, HML will finalize an action plan for the reduction of GHGs following the acquisition of data on emissions from the Howse Project once the plant is fully operational.

7.1.2 Noise and Vibration

HML has committed to preparing a mitigation plan for the drill, which will be implemented should complaints occur. Example methods of reducing drill noise include:

- Reducing drilling speed;
- Reducing drilling time;
- Using a noise shroud around the drill; and
- Use of a mobile noise screen.

HML is committed to implementing a seismograph for one year to assess vibration speed (peak particle velocity) during blasting. The blasting activity will be upgraded as needed, depending on results. Detailed blast records should be maintained.

7.1.3 Surface and Groundwater Quality

Water quality will be monitored through several means. First, GNL's Real-Time Water Quality Monitoring Network already has Instant Water Monitoring Stations in Goodream Creek and Elross Creek. These stations supply live information on water levels plus a number of water quality parameters. Other stations could be installed in the LSA at the GNL's request. The Howse Project is also subject to the *Environmental Control Water and Sewage Regulations, 2003* (Newfoundland and Labrador Regulation 65/03), under the *Water Resources Act* (O.C. 2003-231), and existing effluent monitoring for physico-chemical parameters at TSMC's DSO projects will be extended to Howse Project. Finally, the mine is subject to the *Metal Mining Effluent Regulations* (SOR/2002-222), under the *Fisheries Act* (R.S.C., 1985, c. F-14); once again, the monitoring program already in place for TSMC's DSO projects will be extended to include the Howse Project. The combination of these programs will ensure proper monitoring of water quality during mine operation.

The environmental monitoring plan has been developed based on preliminary information, and should be considered a conceptual design only. The environmental monitoring plan is subject to change based on the final site plan, consultations, site visits, and feasibility. Figure D shows the proposed water monitoring plan.

7.1.3.1 Surface Water Monitoring Station

There are two types of surface water monitoring stations currently operational in the LSA. There are the instant monitoring stations that were characterized and at which hydrometric and water quality data are manually collected when accessible. There are also the Real-Time Water Quality (RTWQ) monitoring stations, which provide continuous water quality data and thus better insight into the effect of the mining operations on receiving waters than traditional grab samples.

Typical parameters measured by RTWQ stations are: temperature, pH, specific conductivity, dissolved oxygen and turbidity, which can be used to further calculate additional parameters such as total dissolved solids (TDS) and percent saturation. Additional sensors can be added to measure additional parameters, if needed. Water quantity data can also be measured by RTWQ stations (i.e., discharge, using stage height and velocity data). The environmental monitoring program will provide effective real-time monitoring at the Howse Project site in accordance with the Canada-Newfoundland Water Quality Monitoring Agreement.

7.1.3.2 Effluent Monitoring

Effluent Discharge Criteria (EDC) parameters are usually tested weekly in effluent grab samples. Acute Lethality Test (ALT) parameters will only require monthly testing. An overview of the effluent monitoring schedule, including monitoring locations, is presented in Table 7.

Table 7 Effluent Monitoring Schedule

MONITORING LOCATION	PARAMETERS	FREQUENCY
1. Sedimentation Pond HOWSEA discharge into Burnetta Creek 2. Sedimentation Pond HOWSEB discharge into Goodream Creek	EDC (excluding ALT)	Weekly (minimum of 24 hours apart)
	ALT (conducted as per Environment Canada's Environmental Protection	Monthly (minimum of 15 days apart)

3. Timmins 4 Sedimentation Pond 3 discharge into Goodream Creek	Service reference method EPS/1/RM-13 Section 5 or 6)	

Monitoring locations were selected to ensure that all effluent diverted into receiving waters is monitored regularly. All measured parameters will be compared to the EDC specified by the Certificate of Approval from the GNL.

Sampling frequency will decrease or increase depending on the results of previous consecutive tests, as specified by the Certificate of Approval. The conditions that would lead to a change in sampling frequency are outlined in Table 8 below.

Table 8 Changes in Sampling/Testing Frequency

PARAMETER	TEST RESULTS	NEW TESTING FREQUENCY
Arsenic	Parameter's monthly mean concentration in the effluent is less than 10% of the maximum allowed mean concentration for the 12 months immediately preceding the most recent test	Once per calendar quarter
Copper		
Lead		
Nickel		
Zinc		
Radium 224	Concentration of radium 226 is less than 0.037Bq/L in 10 consecutive tests	
ALT	Effluent is not determined to be acutely lethal over a period of 12 consecutive months.	
pH	Parameter testing frequency cannot be reduced.	
TSS	Parameter testing frequency cannot be reduced.	

The Department of Environment and Conservation will be notified in writing at least 30 days prior to a reduction in the testing frequency for any parameter. If during the next testing event, test results no longer meet the requirements for a parameter, that parameter will be tested at the original frequency shown in Table 8.

If an ALT determines that any sample is acutely lethal, a grab sample must be collected from the final discharge point of the failing site and after the third consecutive non-acutely lethal test, the ALTs must be conducted at the original testing frequency. If the results of three consecutive ALTs show that the effluent is acutely lethal, a toxicity identification evaluation must be performed to determine the specific toxin causing the problem. A report outlining measures to prevent or reduce the toxin must then be submitted to the director of the Department of Environment and Conservation within 60 days of the third consecutive failed test.

Flow measurements at the effluent discharge of each sedimentation pond will be monitored through the installation of a Parshall flume in the ditches downstream from the permeable rockfill dikes of the pond. A Parshall flume reading will be taken at the same time that a water sample is collected.

7.1.3.3 Water Chemistry Analysis (Surface and Groundwater)

Groundwater and surface water grab samples will be collected four times a year and analyzed by a laboratory that has been certified by the Canadian Association for Environmental Analytical Laboratories.

Monitoring locations and parameters to be tested are presented in Table 9. As the monitoring program progresses, it may be appropriate to relocate, add or remove monitoring locations as needed.

Table 9 Water Chemistry Analysis Program

SAMPLE TYPE	STATION NUMBER	MONITORING LOCATIONS	PARAMETERS
Surface Water	HSW1	Burnetta Creek, downstream from Sedimentation Pond HOWSEA	General Parameters: temperature, dissolved oxygen (DO), nitrate + nitrite, nitrate, nitrite, pH, TSS, color, sodium, potassium, calcium, sulfide, magnesium, ammonia, alkalinity, sulfate, chloride, turbidity, reactive silica, orthophosphate, phenolics, carbonate ($CaCO_2$), hardness ($CaCO_3$), bicarbonate, TPH. Metals Scan: aluminum, antimony, arsenic, barium, beryllium, bismuth, boron, cadmium, chromium, cobalt, copper, iron, lead, manganese, molybdenum, mercury, nickel, selenium, silver, strontium, thallium, tin, titanium, uranium, radium, vanadium, zinc.
	HSW2	Burnetta Creek, upstream from Sedimentation Pond HOWSEA	
	HSW3	Goodream Creek, downstream from Sedimentation Pond HOWSEB	
	HSW4	Goodream Creek, northeast of Waste Rock Dump 2	
	COA SW12 (Timmins)	North of Timmins 4 Sedimentation Pond 3 (COA SW12 from Timmins Site)	
	HSW5	GDR3 stream between the Overburden Stockpile and Waste Rock Dump 2	
	HSW6	GDR4 stream northeast of Timmins 4 Sedimentation Pond 3	
	HSW7	GDR2 stream flowing into Goodream Creek, northeast of Sedimentation Pond HOWSEB	
	HSW8	Drainage ditch north of the Overburden Stockpile	
	COA SW8 (Timmins)	Goodream Creek, northeast of the Overburden Stockpile (COA SW8 – Timmins Site)	
	COA SW13	Stream north of Pinette Lake (COA SW13 – Timmins Site)	
	HSW9	Drainage ditch north of Waste Rock Dump 2	
Groundwater	HGW1	Northwest of the Howse Pit	
	HGW2	East of the Overburden Stockpile and Goodream Creek	
	HGW3	West of the Overburden Stockpile	
	COA GW5 (Timmins)	Southeast of Timmins 4 Sedimentation Pond 3 (COA GW5 -Timmins Site)	
	HGW3	West of the Howse Pit	
		TSS analysis not required for groundwater samples. TPH analysis to be performed on sedimentation pond samples.	

Groundwater will be sampled using monitoring wells. Depth of groundwater, fluctuations in the water table and changes in groundwater flow direction that could be caused by pit dewatering, and changes in surface drainage will be monitored. Monitoring wells will be selected and installed in areas affected by potential mine influences and also in areas that allow background sample collection. At least one monitoring well will

be required as a reference well within each watershed of concern, up-gradient and away from all potential mine influences.

The number of surface water sampling sites required and their locations were determined based on the hydrological and geological characteristics of the area, the characteristics of the expected contaminants, anthropologic influences and ease of access. Sampling sites will be established downstream from contamination points, and reference sites will also be established up-gradient from potential contamination points.

A minimum of 10% of the samples submitted will be QA/QC samples, such as field duplicates, split samples, trip blanks and/or field blanks.

7.1.4 Permafrost

Two thermistors will be installed in spring of 2016 to monitor ground temperature in strategic locations, e.g. those that are inside an area with (low) potential permafrost potential.

7.2 BIOLOGICAL ENVIRONMENT

Currently, the Proponent is committed to performing wildlife surveys every 5 years on the TSMC / HML proprieties. Further, in addition, the Proponent is analyzing the feasibility of performing water footprint surveys on TSMC proprieties.

7.2.1 Wetlands

Although it is not expected that wetlands be affected by pit dewatering, the Proponent is committed to monitoring of wetlands during the routine site inspections and a wetland disturbance survey will also be conducted every five years.

Water table monitoring wells, consisting of perforated pipe should be installed before the beginning of the construction phase in order to obtain some measures before pit dewatering begins. Measurement should be taken once a month, but once every two weeks from the beginning of operation phase until dewatering ends. The wells should be spaced 50 m apart.

Monitoring for rare plants

Prior to any work in a non-disturbed area, TSMC environmental will perform a screening for rare plants in the area. If a rare plant is discovered, the area will be isolated and specific measure to protect this specie will be implemented

7.2.2 Caribou

Caribou are being monitored for HML under an agreement with the Ungava project and CARMA. This monitoring consists of telemetric data currently available from the CARMA program. Under this program, HML's Environmental Specialist / Permit Manager will be notified when migratory tundra caribou venture within 100 km of the Howse Project. Upon receipt of such a notice, operations will continue with caution. If monitoring data from the radio collars indicate that some of the caribou have moved to within 20 km of the Howse Project, TSMC will institute surveys within that radius to monitor their movements in greater detail.

Survey details will be evaluated during the early years of operation. Initially, preference will be given to fixed-point observations along high ground areas adjacent to the Howse Project activity sites and to snowmobile- and ATV-based searches by members of the local First Nations hired by HML, with instructions to avoid disturbing the animals. It is expected that the inclusion of aboriginal people's help will benefit from the knowledge about the movements of caribou in the area. If ground-based surveys do not prove to be

useful or feasible, HML will initiate aerial surveys. Special care will be taken at all times not to interfere with the activities of First Nation hunters.

The data collected during the surveys (number, age and sex; location of sightings; topography of sighting location) will be communicated frequently to the authorities concerned, who will be asked for advice with respect to the course of action to be followed, the overall goal being to reduce nuisance.

7.2.3 Avifauna

The Proponent will engage in breeding birds and species at risk monitoring surveys every five years. Surveys with point count methods will allow HML to stay informed on avifauna in the area. In order to keep track of possible changes in bird populations, these surveys will be conducted in every habitat present in the Howse area, after the end of the construction phase.

Special attention will be directed on species at risk. Uses of playback in proper habitat will be part of an adapted protocol to ensure that Rusty Blackbird and Gray-cheeked Thrush are still using the remaining habitats. Red-necked Phalarope will be monitored in marshy habitats as Burnetta Creek. A surveillance program will be developed as well in existing pits for Bank Swallows. Finally, uses of wetlands and lakes in the study zone by waterfowl for breeding and staging will also be monitored properly every 5 years by overland flight in helicopter.

The Rusty Blackbird, Gray-cheeked Thrush, Red-necked Phalarope and the Bank Swallow will all be specifically monitored at a local scale.

7.2.4 Aquatic Fauna

Aquatic fauna will be monitored in accordance with the *Metal Mining Effluent Regulations* (SOR/2002-222), under the *Fisheries Act* (R.S.C., 1985, c. F-14). These regulations require rigorous monitoring of fish and benthic invertebrates potentially affected by mine effluent, hence ensuring proper monitoring of this component. They also include an effluent and water quality monitoring program that allows for sound scientific interpretation of the results.

Any worker observations of unusual fish mortality will also be conveyed to local environmental technicians for immediate follow-up, and adequate measures will be taken to eliminate the identified cause.

7.3 SOCIOECONOMIC ENVIRONMENT

HML has put in place various communication and socioeconomic monitoring mechanisms collaboratively with affected Aboriginal communities, which will be maintained for the Howse Project. In addition to complying with all regulatory requirements, and to applying its EPP, HML will continue to carry-out the following monitoring, mitigation and communication measures pertaining to community issues.