SEPTEMBER 2015

ENVIRONMENTAL ASSESSMENT REGISTRATION REPORT

FerroQuartz Labrador Quartzite Mine at Roy's Knob, Labrador

Submitted to:
Newfoundland and Labrador Department of Environment and Conservation, Environmental Assessment Division
P.O. Box 8700
St. John's, NL, A1B 4J6

Submitted by:
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FerroQuartz Labrador Inc.

Environmental Assessment (EA) Registration

FerroQuartz Labrador Quartzite Mine

Roy's Knob, Labrador

Prepared for:

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This document was prepared by Golder Associates Ltd. in collaboration with FerroQuartz Labrador Inc.

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PREFACE

FerroQuartz Labrador Inc. (FerroQuartz Labrador) is proposing to re-start, expand, operate, decommission, and reclaim a former mine operation (Roy's Knob's quartz mine, Shabogamo Mining and Exploration Ltd.) located north of Labrador City, NL. The Project includes the extraction and mineral processing of high-grade quartzite for metallurgical purposes.

The Environmental Assessment Regulations, pursuant to Newfoundland and Labrador's (NL) *Environmental Protection Act,* requires that proponents of projects and activities that could have a significant impact on the natural, social or economic environment (i.e., undertakings) present the project for review (i.e., register) by the Department of Environment and Conservation (DOEC). The environmental assessment (EA) legislation includes the following:

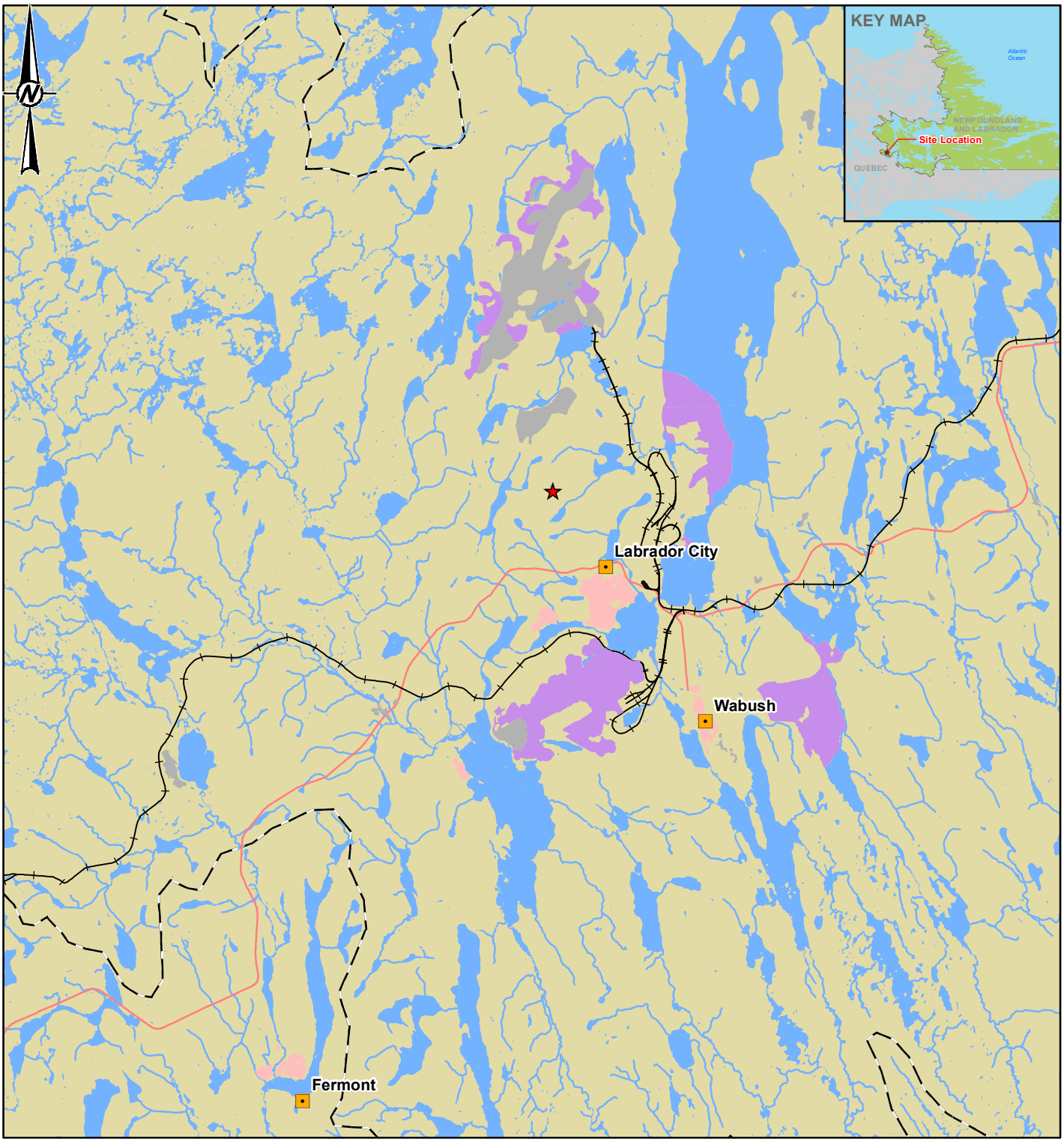
> *33 (2) An undertaking that will be engaged in the mining, beneficiating and preparing of a mineral as defined in the Mineral Act whether or not these operations are to be performed in conjunction with a mine or at mills that will be operated separately shall be registered.*

According to the *Environmental Assessment Regulations*, the *Mineral Act*, and the *Quarry Materials Act* of NL, the proposed Project is a mine and is required to register.

Roy's Knob's quartz mine was registered and released from EA in 1999 (Appendix A). The mine was in operation during the period 1999-2008 and has been dormant since 2008. After discussions with the NL DOEC, re-registration was suggested due to the fact that the mine has been dormant for 7 years. This EA Registration Document has been prepared by Golder Associates Ltd. (Golder) on behalf of FerroQuartz Labrador and has been prepared in accordance with the Government of Newfoundland and Labrador 2012 publication: *Environmental Assessment…A Guide to the Process*.

1.0 NAME OF THE UNDERTAKING

The name of the proposed undertaking is the Roy's Knob Quartzite Mine (the Project or undertaking). The Project, as proposed by FerroQuartz Labrador, consists of the expansion, operation, decommissioning and reclamation of a former quartzite mine approximately 6 km north northwest of Labrador City, NL (see Figure 1). The existing mine was in operation from 1999 to 2008 by Shabogamo Mining & Exploration Ltd. (SME) and had an approved mining lease covering a surface area of approximately 17 hectares (ha). The high grade quartzite was crushed and screened onsite then transported by truck to a processing facility in Wabush where the material was washed and sorted. The final product was transported by railway to Sept-Îles and shipped to a quartzite smelter in Quebec (QC). FerroQuartz Labrador proposes to expand the previous operation to include crushing, screening, washing and sorting onsite. The footprint may also be expanded by an additional 18.4 ha within the mineral licence 000678M (see Figure 2) to accommodate material storage and processing, if required.



Legend

- Site Location
- Town / City
- Pit / Quarry / Mine
- Industrial Waste
- Residential Area
- Railway Network
- Major Road
- Rivers
- Waterbodies
- Provincial Boundary

0 1,875 3,750 7,500
METRES

NOTE(S)
THIS FIGURE IS TO BE READ IN CONJUNCTION WITH THE ACCOMPANYING GOLDER ASSOCIATES LTD. REPORT NO. 1411113/2000

REFERENCE(S)
CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE – CANADA.
PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83
COORDINATE SYSTEM: UTM ZONE 19 VERTICAL DATUM: CGVD28

CLIENT
FERROQUARTZ LABRADOR

PROJECT
ENVIRONMENTAL ASSESSMENT REGISTRATION
ROY'S KNOB QUARTZITE MINE

TITLE
PROJECT LOCATION

CONSULTANT
Golder Associates

YYYY-MM-DD	2015-08-26
DESIGNED	RRD
PREPARED	RRD
REVIEWED	EL
APPROVED	CG

PROJECT NO.	CONTROL	REV.	FIGURE
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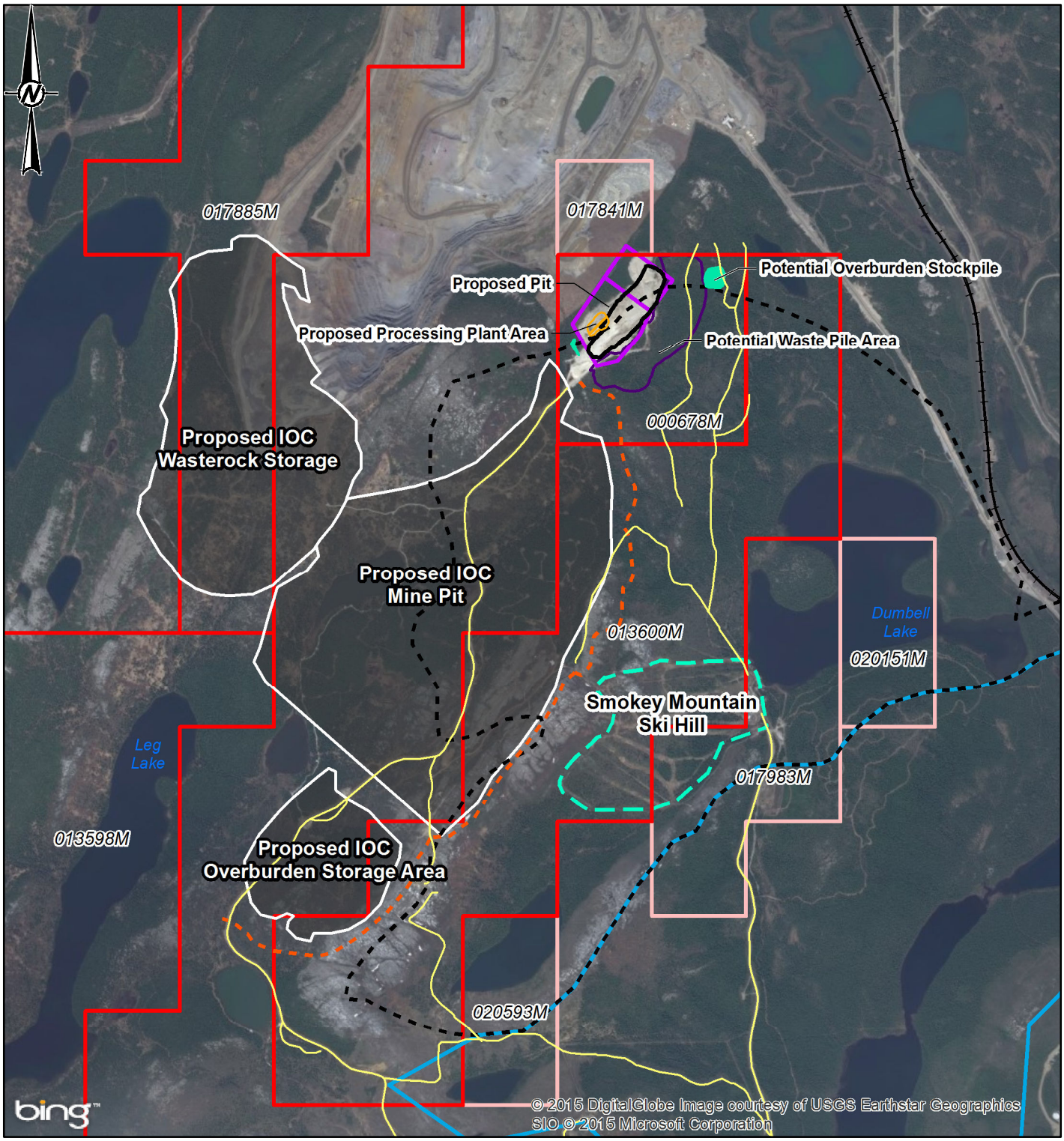

Legend

- Roads - Trails
- *IOC Proposed Revised Access to Roy's Knob*
- Proposed Pit
- Protected Municipal Watershed
- Protected Watershed
- Mineral Rights Licenses
- Other SME Licenses
- Smokey Mountain Ski Resort
- Current Mining Lease
- Wasterock Stockpile Outline
- Proposed IOC Wabush 3 Mine Features
- Railway Network

0 250 500 1,000
METRES

NOTE(S)
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REFERENCE(S)
CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE – CANADA.
PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83
COORDINATE SYSTEM: UTM ZONE 19 VERTICAL DATUM: CGVD28

CLIENT
FERROQUARTZ LABRADOR

PROJECT
ENVIRONMENTAL ASSESSMENT REGISTRATION
ROY'S KNOB QUARTZITE MINE

TITLE
PROJECT LOCATION:
AERIAL IMAGERY

CONSULTANT
Golder Associates

YYYY-MM-DD	2015-08-31
DESIGNED	RRD
PREPARED	RRD
REVIEWED	EL
APPROVED	CG

PROJECT NO.	CONTROL	REV.	FIGURE
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2.0 PROPONENT

FerroQuartz Labrador is the mining subsidiary of FerroAtlántica Group established to promote, explore and develop mining operations in Newfoundland Labrador, Canada.

FerroAtlántica is a major supplier of metallurgical quartz worldwide through the following subsidiaries:

- Cuarzos Industriales / Rocas Arcillas y Minerales (Spain): 400,000 tonnes metallurgical quartz with three operating mines and four ongoing projects.
- Thabachueu Mining (South Africa): 400,000 tonnes metallurgical quartz (and 400,000 tonnes for glass industry) with three operating mines and three ongoing projects.
- CuarzoVen (Venezuela): 100,000 tonnes metallurgical quartz with two operating mines.
- FerroQuartz (China): two ongoing projects.

FerroAtlántica is a world-leading producer of silicon metal, manganese and ferrosilicon alloys and also manufactures foundry products and additional products for the steel industry. FerroAtlántica currently operates fifteen production centres (i.e., five in Spain, six in France, one in Venezuela, two in South Africa, and one in China) working in the field of electrometallurgy, energy, mining, and photovoltaic solar power.

Proponent contact information is as follows:

Table 1: Project Contact Information

Contact and Title	Address	Email and Phone
Javier Fernandez Bescós, Chief Mining Officer	FerroAtlántica Group Torre Espacio Paseo de La Castellana 250 – 45º 28046 – MADRID - Spain	javier.fernandez@ferroatlantica.es Tel: +34 915903518
Fernando Alonso Campanero Mining Director Canada	FerroQuartz Labrador Inc. 16 Forest Road Suite 200 St. John's, NL A1C 2B9 Canada	fernando.alonso@ferroatlantica.es Tel: +1 418 768 6017

3.0 NATURE AND PURPOSE OF THE UNDERTAKING

3.1 Overview of the Undertaking

FerroQuartz Labrador proposes to re-start, expand, operate, decommission, and reclaim a former quartzite mine operation north of Labrador City, NL. The Project includes the extraction and mineral processing of quartzite for the purpose of producing coarse, high grade quartzite for metallurgical purposes. The blasted quartzite will be crushed, screened, washed, and sorted onsite, and transported to ArcelorMittal's railway in Mont Wright, QC, or IOC's railway in Wabush NL. The material will then be shipped by rail directly to Port-Cartier or Sept-Îles, QC. Excess (low grade / undersized) material will be stored on site and used during reclamation.

3.2 Purpose, Rationale and Need for the Undertaking

The rationale for this Project is rooted in the market of quartzite. FerroAtlántica is a major producer of metallurgical quartz worldwide. Based on the information currently available, the resource estimate at the site is approximately 2.27 million tonnes. FerroQuartz Labrador will continue to explore the deposit and other adjacent sites to identify and confirm additional resources (i.e., quantity and grade).

4.0 DESCRIPTION OF THE UNDERTAKING

4.1 Geographic Location

The Roy's Knob deposit is approximately 6 km north (NNW) of Labrador City, 11 km north (NNW) of Wabush (Labrador) and 25 km NE of Fermont, Quebec (Figure 1). The majority of the deposit is located on two mining leases within the boundaries of the mineral licence 00678M. The center of existing/historic operation is at Latitude 52°59' N and Longitude 66°55' W.

The Project is located in an established area where iron mining is currently taking place. As such, transportation, power and experienced manpower are available. Most of the mining claims in the area are held by Iron Ore Company of Canada (IOC) which is part of the Rio Tinto Group. The Roy's Knob Mine is located 0.5 km south of the Luce Lake iron ore deposit which is held and operated by the IOC. Other mining companies in the area include Wabush Mines (part of Cliffs Natural Resources) and Alderon Iron Ore Corporation.

At present, access to the Roy's Knob Mine is via an 8 km, well maintained gravel haul road (initially developed by IOC, and improved and developed by Shabogamo Mining & Exploration with permission of IOC and LIORC) which connects to the paved Trans Labrador Highway (Route 500). Access to the site is expected to change if/when the proposed IOC Wabush 3 development proceeds. IOC will construct new roads to connect their operations. FerroQuartz Labrador is currently negotiating with IOC for the use of these roads for this Project.

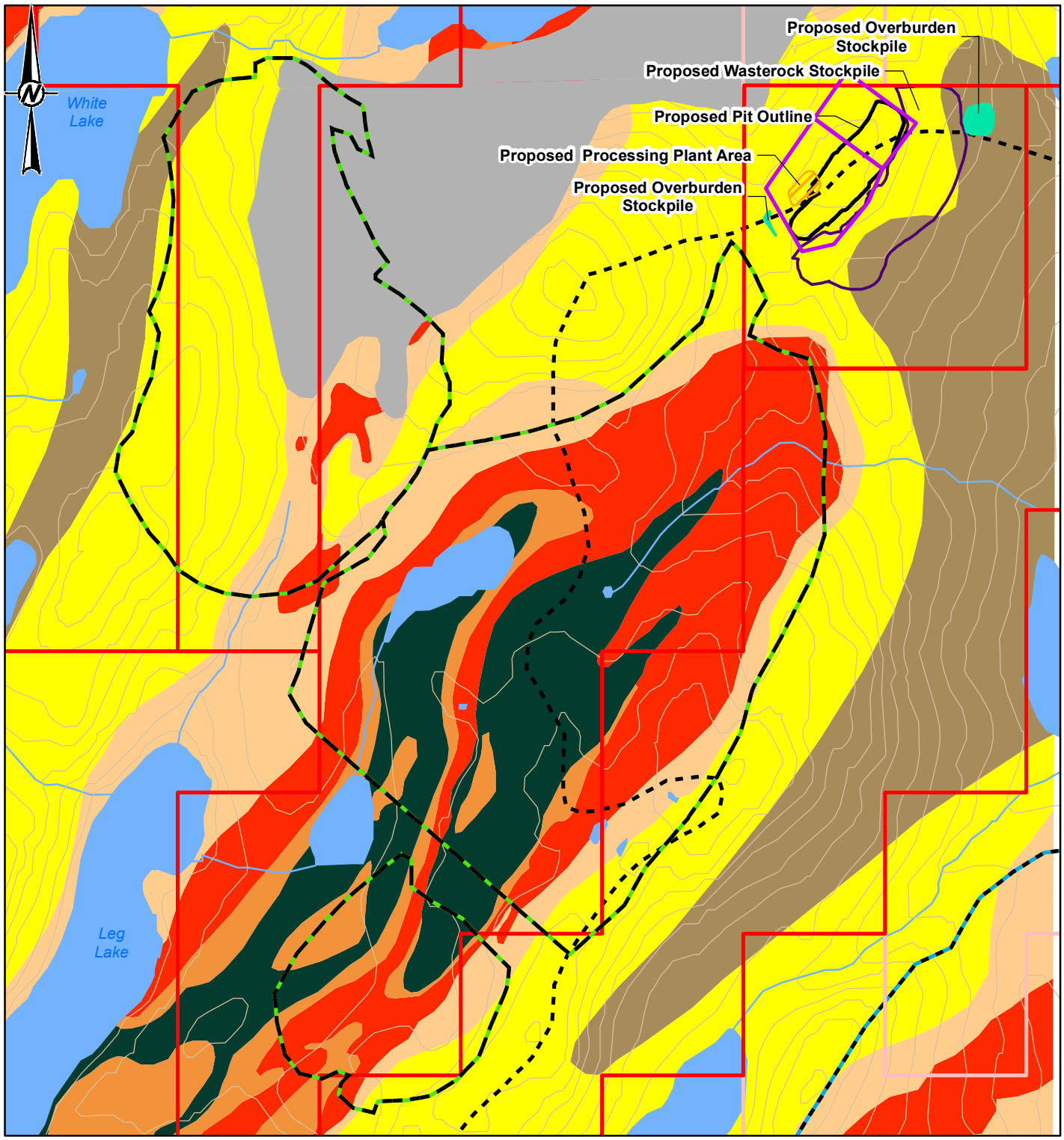
4.2 Physical Features

The properties of interest are contained within the Labrador Trough: a Proterozoic sequence including sedimentary rock, volcanics, mafic intrusions, quartzite, dolomite and iron formations. The quartzite ridges are part of the metamorphosed sequence of the Wishart Formation. The Wishart Formation is geologically assigned to the Knob Lake Group within the Labrador Trough (Figure 3). This formation is thought to have been a lateral, near shore, intertidal beach and sand formation. The Wishart Formation is overlain by the iron-bearing Sokoman Formation, and underlain by the Attikamagan micaeous schist. The lithological contacts are well defined.

The existing quarry was mined to an elevation of about 742 m above sea level (masl). Most of the hilltops are barren due to climate conditions. Quartzite deposits are prominent physiographic units as it is resistant to weathering. The quartzite forms ridges that are trending NE-SW. Additional information related to the physical, biological, and socio-economic setting is provided in Section 5.

The project components associated with this undertaking will consist of the open pit and working face (which have already been established during the previous operation); a laydown area for the crushing equipment (i.e., likely in the established open pit); overburden, raw, and processed material stockpiles; a wash plant, weigh scales, and a sedimentation pond. The site will also include a portable office (i.e., trailor) and portable washroom.

On-site processing will be limited to crushing, screening, washing and sorting. Crushing equipment will consist of a mobile primary / jaw crusher, mobile screens, conveyor, hopper and surge pile. The wash plant will consist of a conveyor, mobile washer/scrubber spray, and a settling pond. Figure 2 presents a proposed general layout for the mine.



Legend

- Wabush 3 Project
- Overburden Stockpile Outline
- Current Mining Lease
- Mineral Rights Licenses
- Other SME Licenses
- Proposed Pit
- Protected Municipal Watershed
- Protected Watershed
- Wasterock Stockpile Outline
- Contours
- Rivers
- Waterbodies

Local Geology

Formation

- Attikamagan
- LIF
- MIF
- Shabogamo
- UIF
- Wishart

0 187.5 375 750

METRES

NOTE(S)

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REFERENCE(S)

CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE – CANADA.
PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83
COORDINATE SYSTEM: UTM ZONE 19 VERTICAL DATUM: CGVD28
PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83

CLIENT
FERROQUARTZ LABRADOR

PROJECT
ENVIRONMENTAL ASSESSMENT REGISTRATION
ROY'S KNOB QUARTZITE MINE

TITLE
LOCAL GEOLOGY

CONSULTANT
Golder Associates

YYYY-MM-DD	2015-08-31
DESIGNED	RRD
PREPARED	RRD
REVIEWED	EL
APPROVED	CG

PROJECT NO.	CONTROL	REV.	FIGURE
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4.3 Construction Activities

Given the presence of the former mine operation, construction activities are limited to clearing and grubbing, setting up the crushing and screening equipment, and establishing the washing and sorting process. Since most of the development areas have already been pre-stripped, the access has been established, and some of the waste dump locations have been established, there is minimal site preparation required to recommence mining. Site preparations include clearing of trees, removal and stockpiling of overburden, levelling of wash plant area, road maintenance, and construction of safety berms. New access road will be built by IOC for Wabush 3 development which connects with Roy's Knob. The construction phase will occur concurrently with the operations phase.

Clearing and grubbing at the site will be limited to what may be required to accommodate stockpiles of undersized and low grade material. To the extent possible, previously disturbed areas will be used for stockpiling. The footprint of the area to be mined has been previously disturbed; that is, the proposed project will excavate material within the existing footprint to an elevation of 710 masl from the current elevation of approximately 742 masl.

To minimize the potential for erosion and sedimentation, grubbing and removal of overburden will be conducted on an as needed basis, to accommodate the required activities. It is anticipated that new areas for storage of undersized / low-grade rock will be required. Given the boundaries of the mining lease and those of adjacent mineral licences and surface rights, as well as proximity to the existing IOC operation, the majority of this excess material will be placed on the southeast side of the pit, as indicated in Figure 2. Any topsoil, vegetation, and overburden that will be stripped will be stabilized against erosion and stored on-site for subsequent use during site reclamation.

FerroQuartz Labrador will hire a licensed contractor to provide clean water (i.e., via water truck) for material washing on an as needed basis. The wash water along with any surface drainage collected in the settling pond will be recycled and reused for material washing to minimize water withdrawal and transport.

In the event that the trucking of surface water becomes inefficient, FerroQuartz Labrador will identify a local surface water supply to accommodate material washing. Water from a nearby lake or pond will be extracted and transported to the site to fill the wash pond on an as needed basis. Alternatively, a non-potable groundwater supply well will be drilled onsite near the location of the wash plant. In either instance, FerroQuartz Labrador will make application to DOEC for the appropriate permits for water use pursuant to the *Water Resource Act* (Section 48: surface water resources; Section 58: groundwater wells) Fines will be removed from the wash pond on an as needed basis, stored onsite, and stabilized against erosion, as required.

4.4 Operations

Production begins with drilling and blasting. It is anticipated that blasting could occur once or twice a week. Crushing will be ongoing while the mine is in operation. Using a front end loader, the blasted rock will be delivered to the mobile jaw crusher where it will be crushed to a size of less than 120 mm and screened. Oversized material will be returned to the crusher. Undersized material will be stockpiled on site for use in reclamation of the site. The material will be sorted into two size fractions (i.e., 20 – 40 mm and 40 – 120 mm) and transported, using a front end loader, to the mobile wash plant. Discharge from the wash plant will be collected in a settling pond and recycled. The final product will be loaded into trucks and transported to either

ArcelorMittal's railway in Mont Wright, QC, or IOC's railway in Wabush NL. The material will then be shipped by rail directly to Port-Cartier or Sept-Îles, QC.

Drilling and blasting will begin at the previously established working face which is approximately 10 m high and at an elevation of ~ 742 m. A qualified and licensed subcontractor will be engaged to conduct and oversee all drilling and blasting activities. The rock face will be developed in benches approximately 10 m in height. The mine will be developed to an elevation of ~ 710 masl. Based on available groundwater data from IOC (see Section 5.1.1), the mine is not anticipated to be developed below the groundwater table. Field work is currently ongoing to confirm the groundwater table level at the Project site.

Weather permitting, the potential operating schedule is 12 hrs/day and five days/week between May and October (i.e., approximately 25 weeks/year). The production rate and operating schedule are expected to produce approximately 500,000 tonnes per year of ore and ultimately 300,000 tonnes per year of saleable product. This equates to approximately 75 loaded trucks per day hauling material to the railway spur. It is expected that the product will be generated at a consistent rate throughout the operating months.

To date, the resource has been delineated to the extent that the mine will operate at the proposed rate for 4.5 - 5 years. Additional exploration and resource delineation may further extend the life of the mine.

Fueling of mobile equipment will be conducted on-site on a regular basis. The fueling and vehicle maintenance area will consist of a lined containment area enclosed within side curbs and a sloping floor. This will contain any spills or leaks during fueling and / or vehicle maintenance. Equipment operators will remain with the equipment at all times during fueling.

4.5 Reclamation

Given that exploration and resource delineation is ongoing, the ultimate extent of the mine is not known at this time. However; FerroQuartz Labrador is committed to undertaking progressive reclamation as production progresses to the extent practical. Reclamation will consist of preparing slopes, site grading and drainage, revegetation, and long-term site safety such as fencing and signage.

All areas affected by mining will be eventually rehabilitated or otherwise stabilized. Any topsoil, root mat and overburden will be placed in an area of pit that is no longer in use or in a designated storage area at surface. This material will be stabilized against erosion using stripped root mat or hydroseed. Low grade material and undersized material will be stockpiled in an inactive area onsite and used for reclamation.

At the request of DNR, a reclamation and closure plan will be developed for the mine. The reclamation plan will include details related to the final topography, maximum slopes, revegetation plans and an outline of the plan for progressive reclamation at the site. It is anticipated that the reclamation plan will consider future and adjacent land uses.

4.6 Waste, Emissions and Discharges

The wastes, emissions, and discharges associated with the Project are indicated below along with standard and relevant practices and mitigative measures to minimize and manage them.

- Surface runoff: runoff controls will be in place to ensure that precipitation and surface runoff is managed appropriately. Surface runoff at the site will be directed towards the wash plant and/or the sedimentation

pond via drainage ditches to the extent possible. Overflow from the pond, if any, will be directed to the pit to allow for further settling or storage. A sump at the lowest elevation of the pit will pump water to the settling pond as needed. It is not expected that much water will accumulate at the bottom of the pit. As the pit is excavated, the sump will be re-established on each bench, once there is sufficient room.

The wash plant and settling pond(s) will operate in a closed loop with no expected offsite discharge. Surface drainage from the undersized / low-grade rock pile will be directed to a vegetated area for further filtration. Given the coarse nature of this material, elevated levels of suspended sediments are not anticipated. Runoff from the rock piles will be monitored and sampled for suspended solids at the request of the DOEC.

- Combustion emissions: all vehicles and equipment will be equipped with proper exhaust systems and emissions will be reduced through proper maintenance and inspection practices to ensure efficient operation. Consideration will be given to methods to reduce idling, as feasible.
- Fugitive dust: dust emissions will be controlled by adjusting the crushing rate and the blast size and, if required, the application of water obtained from the wash plant and/or the sedimentation pond. To minimize the generation of dust, the working areas and laydown areas will be covered with blasted rock. Dust generated by truck movement along the access road will be minimized by speed control, proper truck loading, application of dust suppressants, proper construction of on-site roads, and/ or other means.
- Noise and vibrations: attenuation (distance between the source and receptor) and vertical separation will be the primary means of control of noise and vibrations resulting from the operation.
- Solid waste: waste generated onsite will be generally limited to office and domestic refuse. All solid waste will be properly collected and stored onsite until such a time that it can be transported to a provincially approved waste disposal facility. Where possible, the Proponent will reuse or recycle waste materials. Waste rock (i.e., low grade or undersized) will be sold as construction aggregate or stored on site for use during reclamation.
- Hazardous waste: used oil and filters will be removed from the site for proper disposal and recycling. Other than petroleum products and small amounts of solvents for parts cleaning, there will be no hazardous substances stored at the site. Any and all petroleum products will be handled as per the Storage and Handling of Gasoline and Associated Products Regulations pursuant to the *Environmental Protection Act*. The handling, transportation, storage and use of explosives will be conducted by a licensed subcontractor employing trained and qualified individuals and will be done in compliance with all applicable laws, regulations, and permit conditions.

4.7 Labour Requirements

As described in Section 4.3, construction activities are limited and will be completed concurrently with the operations phase. Construction activities are currently planned to be completed by contractors and labour requirements for that phase, if any, will be determined as part of ongoing planning for the Project.

The anticipated labor requirements and associated National Occupational Classification (NOC) codes for the operations phase of the Project are indicated in Table 2. Employment during the estimated 5 years of operations

will result in the creation of 27 full-time positions. Human resources planning for operations is ongoing and consideration will be given to employment equity and diversity.

Table 2: Operations Phase Anticipated Labour Requirements

Occupation	NOC Code (2011)	Number of Occupations
Mine Manager	0811	1
Surveyor	2154	1
Geologist	2113	1
Assayer	2212	1
Driller	7372	1
Loader/Excavator Operator	7521	4
Haul Truck Driver	7511	6
Bulldozer Operator	7521	1
Grader Operator	7521	1
Water Truck Driver	7511	1
Mechanic	7612	1
Labourer	9611	4
Plant Operator	9231	1
First Aid Attendant	3413	1
Security Guard	6541	1
Mine Foreman	8221	1
Total		**27**

4.8 Project Resource and Reference Materials

A detailed list of Project related documents and reference material is provided in Appendix A.

5.0 ENVIRONMENTAL SETTING

The following sections describe existing physical, biological, and socio-economic conditions within which the Project is located. The description of the environmental setting is based on existing and available regional data collected from a variety of publicly available data sources and assessments of adjacent properties and habitats.

5.1 Physical Environment

5.1.1 Physical Environment

The regional topographical relief and drainage network covers an area approximately 247 km^2. This area was glaciated and the last period of glaciation has eroded away most of the overburden cover leaving only thin overburden and exposed bedrock. The topography of this area is bedrock controlled with the average elevation varying between 520 m and 875 masl. The terrain is generally rolling, sloping toward the east. The topographic highs generally trend north-south and are typically formed by more resistant quartzites, cherts and silicified horizons of the iron formation. The lows are commonly underlain by softer shale and siltstone bedrock.

The regional distribution of surficial deposits consists mainly of drift poor areas of >80% exposed bedrock and areas of “undifferentiated till” described as a silty sand to silty sand with gravel (Newfoundland Geosciences Ltd., 2001).

The properties of interest are contained within the Labrador Trough: a Proterozoic sequence including sedimentary rock, volcanics, and mafic intrusions. The southern part of the Trough, where the Roy’s Knob deposit is located, is crossed by the Grenville Front which is highly metamorphosed and complexly folded. Within this structure are the iron ore mining districts of western Labrador and eastern Quebec.

The quartzite ridges are part of the metamorphosed sequence of the Wishart Formation. The Wishart Formation is geologically assigned to the Knob Lake Group within the Labrador Trough (Figure 3). This formation is thought to have been a lateral, near shore, intertidal beach and sand formation. The Wishart Formation is overlain by the iron-bearing Sokoman Formation, and underlain by the Attikamagan micaeous schist. The lithological contacts are well defined.

Regionally, the groundwater table is influenced by the existing streams and lakes, existing and past pit excavation, and dewatering activities. Groundwater levels within the Project site are unknown. Data from the closest IOC drill hole indicates that the ground water table is about 694 masl (Golder 2012) and at nearby Wabush 3, the recorded groundwater levels in the Sokoman Formation are at over 700 masl. Over 1 km south east, Dumbell Lake is at 580 masl which implies a steep hydraulic gradient suggesting the hard quartzite of the Wishart Formation has a relatively low hydraulic conductivity.

There are no surface water bodies in the proposed Project footprint or within 250 m of it. Surface drainage is generally contained within the footprint with the exception of surface runoff from the rock storage pile which drains southeast toward Dumbell Lake. The Dumbell Lake watershed is zoned as a Protected Municipal Watershed (see Section 5.3.6). With appropriate surface runoff control as indicated in Section 4.6, the potential effects on the water quality of Dumbbell Lake, more than 1 km away are considered negligible.

5.1.2 Climate

The study area has a sub-arctic continental boreal climate with very severe winters. Meteorological data was obtained for the Wabush Airport station from Environment Canada (Climate ID 8504175) for the period of record of 1981-2010 (Environment Canada 2014). Daily average temperatures exceed 0°C for 6 months of the year.

Daily mean temperatures at the Wabush Airport average - 22.2°C in January. Mean daily average temperatures in July are 13.8°C.

Mean snowfall from November to March exceeds 50 cm per month and the wettest summer month is July, with an average rainfall of 113.9 mm. The average annual precipitation for the region is 839.5 mm based on the Wabush Airport period of record from 1981-2010.

The prevailing winds direction is west, although winds prevail from the north for the months of April, May and from the south in June. The average wind speed is 14.0 km/hr over the year and is consistent throughout the year ranging from a low monthly average of 12.7 km/hr in July to a high of 15.2 km/hr in October. A maximum gust of 130 km/hr was monitored in February and August 1991 (Environment Canada 2014).

5.1.3 Air Quality and Noise

5.1.3.1 Air quality

The primary industry of Labrador City and Wabush is the iron mining industry and would be the main source of atmospheric emissions affecting the local air quality (use of truck and machinery, blasting, wind erosion from tailings sites, crushers, concentrators, pelletizers, etc.). The Project area is surrounded by mining infrastructure: the Luce pit is located to the North and West of the Project area; an IOC tailings disposal area is located to the East; and an IOC processing facility is located to the South-East. The mining activities are sources of particulate matter (PM), SO_2, NO_x, CO and greenhouse gases. Other source of local atmospheric emissions comes from the use of vehicles at Labrador City and Wabush, activities at the Wabush airport and forest fires.

A significant amount of air quality information exists in the Project area resulting from ambient air monitoring programs operated by the IOC Mines since the 1990s. Table 3 shows the monthly range of air contaminants in 2012 in Labrador City.

Table 3: Maximum monthly range of air contaminants measured in Labrador City in 2012

Monitoring station		Indian Point	Town depot / Tamarack Drive	Smokey Mountain	Bartlett Drive	Hudson Drive	Regulatory standards	Regulatory Exceedances
SO_2 ($\mu g/m^3$)	1 hr	38-97*	13-122**	17-51***	-	-	900	0
	3 hrs	24-86*	12-107**	13-49***	-	-	600	0
	24 hrs	8-24*	2-35**	3-8***	-	-	300	0
$PM_{2.5}$ ($\mu g/m^3$)	24 hrs	0-42	8-20	5-11	-	-	25	1
NO_x ($\mu g/m^3$)	1 hr	66-164	0-220	40-266	-	-	400	0
	24 hrs	24-64	0-81	16-104	-	-	200	0
NO_2 ($\mu g/m^3$)	1 hr	38-80	23-156	31-200	-	-	400	0
	24 hrs	12-48	8-53	11-71	-	-	200	0
TPM ($\mu g/m^3$)	24 hrs	42-242	38-234	20-297	17-160	32-197	120	28

** Data from January to May and December*
*** Data from January, November and December*
**** Data from January to May*
Data taken from NLDEC, 2013

During 2012, there was one exceedance for the $PM_{2.5}$ and 28 exceedances of the 24 hour TPM (total particulate matter) standard, but no exceedances to the criteria for SO_2 and NO_2.

5.1.3.2 Noise

The noise level in the Project area is already affected by IOC operation sources associated with equipment powered by internal combustion engines, impact equipment, open pit mining activities (drilling, blasting, excavation and loading), and mill activities (crushing, grinding, transport).

5.2 Biological / Ecological Environment

5.2.1 Vegetation

The Project falls within the mid Subarctic forest ecoregion. This ecoregion encompass the flat to rolling upland plateaus of central and Western Labrador. It is dominated by moist woodland and string bogs and string fens occur over large areas (DOEC 2014). Black spruce (*Picea mariana*) is the most commonly occurring tree. It is typically found in lichen woodlands – open, park-like wooded areas with an understory of lichen and shrubs such as Labrador tea (*Ledum groenlandicum*) and dwarf birch (*Betula* spp).

A vegetation survey was conducted on adjacent sites and similar habitats (i.e., the Wabush 3 project) in 2012 (AMEC, 2012a). That study area encompassed a portion of the Roy's Knob Mine proposed footprint. A total of 98 plant species, subspecies and varieties were found during this survey (AMEC 2012a). No plant species listed and protected under federal *Species at Risk Act* (SARA) or NL *Endangered Species Act* (ESA) were found during field surveys. Additionally, none of the plant species identified during the surveys have been designated by Committee on the Status of Endangered Wildlife in Canada (COSEWIC 2008).

5.2.2 Mammals

Various mammal surveys have been conducted in the general area of the Project (IOC Canada and AMEC 2013). Table 4 show the list of direct observation of mammals or evidence recorded in the vicinity of the Project. None of the species observed are federally or provincially listed.

Table 4: Mammals recorded during surveys conducted close to the Project area

Common name	Scientific name
Moose	*Alces americanus*
Wolf	*Canis lupus*
Beaver	*Castor canadensis*
Porcupine	*Erethizon dorsatum*
Northern flying squirrel	*Glaucomys sabrinus*
Snowshoe hare	*Lepus americanus*
River otter	*Lontra canadensis*
Lynx	*Lynx lynx*
Marten	*Martes americana*
Meadow vole	*Microtus pennsylvanicus*
Weasel	*Mustela erminea*
Red-backed vole	*Myodes gapperi*
Mink	*Neovison vison*

Common name	Scientific name
Red squirrel	*Tamiasciurus hudsonicus*
Black bear	*Ursus americanus*
Red fox	*Vulpes vulpes*

Three species of mammals are listed under the ESA and the SARA in Labrador: polar bear, wolverine and woodland caribou.

Polar bear is only found along the coast of Labrador and are very unlikely to be found close to the Project area.

The wolverine is either extremely rare or extirpated in Labrador. There are unconfirmed wolverine reports each year, but there have been no verified reports of wolverine in Québec or Labrador for approximately 25 years (NLDEC, 2011).

The forest-dwelling caribou is designated as threatened under the ESA and the SARA (Boreal population) (NLDEC, 2014; SARA, 2014). The Lac Joseph population is found in western Labrador and Quebec, east of the Project area. However, no caribou was observed during any of the surveys undertaken for the Wabush 3 project in or near the Project area, including aerial and ground surveys (IOC and AMEC, 2013). Considering the human disturbance from the mining activities and the associated infrastructures, it is expected that caribou are likely to avoid the Project area.

5.2.3 Birds

Based on a review of available information sources, there are records for over 160 bird species in the vicinity of Labrador City, including ten federally and/or provincially listed species at risk. The listed ten species potentially occurring within or around the Project area are indicated below (Table 5).

Table 5: Species at risk with potential to occur within the Project area

Common name	Scientific name	ESA status[1]	SARA status[2]
Harlequin Duck	*Histrionicus histrionicus*	Vulnerable	Special Concern
Barrow's Goldeneye	*Bucephala islandica*	Vulnerable	Special Concern
Peregrine Falcon	*Falco peregrinus tundrius*	Vulnerable	Special Concern
Red Knot	*Calidris canutus rufa*	Endangered	Endangered
Short-eared Owl	*Asio flammeus*	Vulnerable	Special Concern
Common Nighthawk	*Chordeiles minor*	Threatened	Threatened
Olive-sided Flycatcher	*Contopus cooperi*	Threatened	Threatened
Gray-cheeked Thrush	*Catharus minimus*	Vulnerable	No status
Rusty Blackbird	*Euphagus carolinus*	Vulnerable	Special Concern
Red Crossbill	*Loxia curvirostra percna*	Endangered	Endangered

[1] *NLDEC, 2014*
[2] *SARA, 2014*

Of the ten listed species reported in the Labrador City area, only one, the Rusty Blackbird, was observed during the fall migration survey. Potential breeding habitat this species and two other listed species, the Grey-cheeked Thrush and the Short-eared Owl, was identified during the surveys. None were observed during the breeding surveys; however, they are considered to be potentially breeding in the Labrador City area (AMEC 2012b).

The various baseline surveys for the Wabush 3 project (AMEC 2012b) identified more than 150 species of birds within and around the Project area. Species most commonly observed during the various seasons include:

- Winter species: Common Raven, Pine Grosbeak, Boreal Chickadee, Spruce Grouse, and Grey Jay;
- Spring/summer breeding species: White-throated Sparrow, American Robin, Swainson's Thrush, Dark-eyed Junco, Fox Sparrow, Hermit Thrush, Yellow-rumped Warbler, Lincoln's Sparrow, Red-breasted Nuthatch, Yellow Warbler and Common Raven; and
- Fall migration: Boreal Chickadee, Common Raven, Dark-eyed Junco, American Pipit, Ruby-crowned Kinglet and American Robin.

Osprey and red-tailed Hawk nests were also recorded in vicinity of the Project during the aerial surveys. The location of the Osprey nest is approximately 800 m southeast from the existing site. Like all raptor species, Osprey and Red-tailed Hawk are protected by provincial regulations; a buffer zone to new construction of 800 m is recommended around active nests and 200 m around nests outside of the active period.

5.2.4 Fish and Fish Habitat

Brook trout (*Salvelinus fontinalis*), lake trout (*Salvelinus namaycush*), lake chub (*Couesius plumbeus*), burbot (*Lota lota*), and sculpins (*Cottus* spp.) inhabit the lakes and watercourse around the Project area (IOC and AMEC 2013). However, no fish habitat is found within the proposed Project footprint.

5.3 Socio-Economic Setting

5.3.1 Demography

According to the 2011 Statistics Canada Census profiles, 1,861 individuals were residents of the Town of Wabush and 7,367 individuals were residents of Labrador City, both of which were increases from the 2006 census (7% and 1.8% respectively). The median age of both Wabush and Labrador City residents is 36 years. Figure 4 below illustrates the population of each community for both sexes, per five-year age group (Statistics Canada 2012).

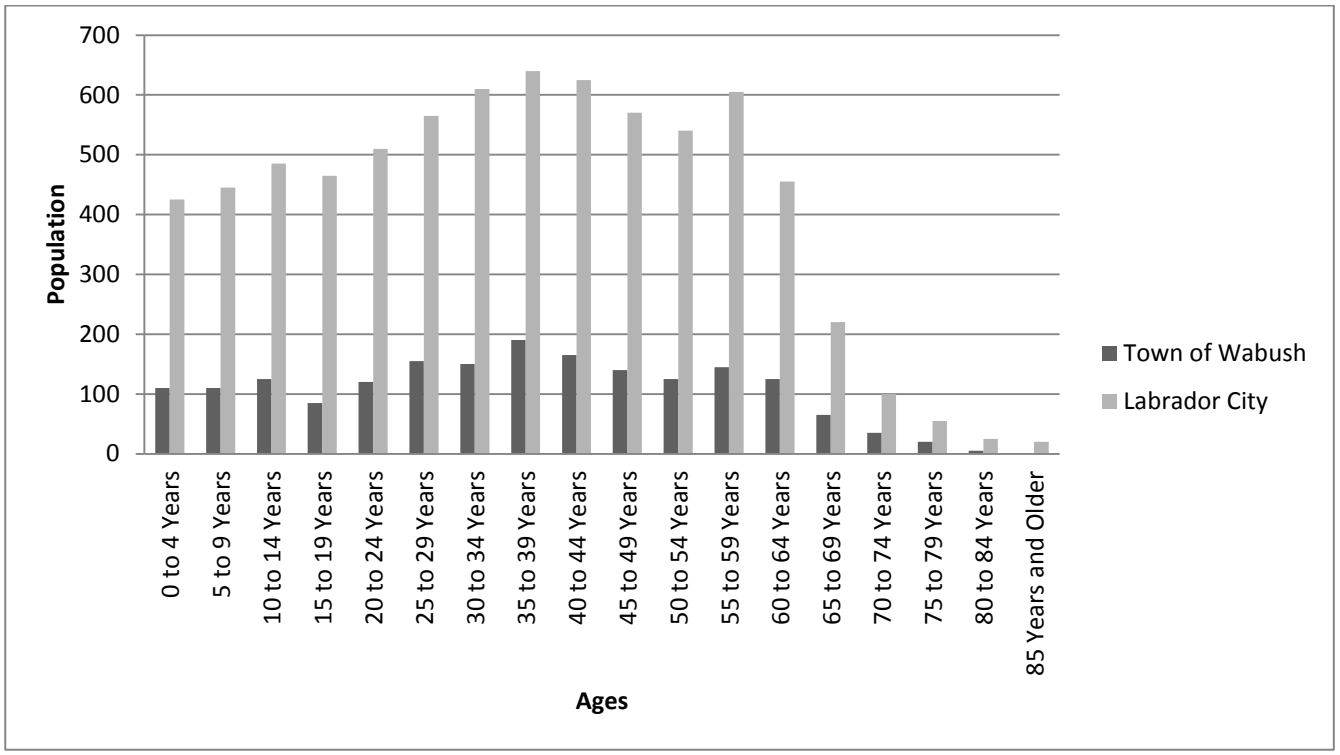


Figure 4: Wabush and Labrador City Demographics.

5.3.2 Employment and Economy

Historically, the mining industry has been the most prevalent employer in Labrador West, which is located in a region of rich iron ore deposits. Both the communities of the Wabush and Labrador City were developed in the early 1960's to accommodate employees of the local mines; Wabush Mine and the Iron Ore Company (IOC).

Wabush Mine is located approximately 3 km west of the Town of Wabush and approximately 8 km south of the proposed Project. Wabush Mine is managed by the Cliffs Mining Company who began work at the Scully Mine Project in 1965 (Labrador West 2014). The Hay Lake (Labrador West) Reclamation Project, which would allow for the continued excavation of the open pit mining operation at the Scully Mine, was released from the provincial environmental assessment process in 2005 (Department of Environment and Conservation 2005); however, in February 2014, Cliffs announced plans to immediately idle the mine (CBC 2014) and Wabush mine is now closed.

IOC began mining the Carol Lake Project in Labrador West in 1962. The Carol Lake Project is located adjacent to the proposed Project, to the north, northeast and west. Resources within the site are estimated to be on the order of 4.4 billion tonnes and extraction of that resource is ongoing (Labrador West 2014). An Environmental Impact Statement (EIS) to allow construction and operation of a new open pit mine (Wabush 3) is currently under regulatory review. If approved, the Wabush 3 pit would be located immediately west and southwest of the proposed Project.

Currently, the main employers in region support the industries of mineral extraction, processing and provision of services to the mining sector. Iron ore is the primary resource extracted in the region; however, other resources

are also extracted, including dolomite, quartzite, aggregate, graphite and nickel. Other leading economic sectors for Labrador West include industrial supply / services, hydro-electric generation projects (e.g., Churchill Falls), and secondary processing (e.g., iron ore concentrate and pellets). In addition, Labrador West is a strategic distribution centre for other areas of the province and Canada's north and is an adventure and eco-tourism destination (Labrador West 2014)

According to the 2011 Statistics Canada National Household Survey (NHS) for Labrador City, 4,645 individuals of the 7,367 residents are considered to be in the labour force. Of these individuals, 4,410 persons or 95% were employed at the time of the census. The top employment industries in Labrador City were listed as mining, quarrying, and oil and gas extraction, followed by retail trade (Statistics Canada 2013).

In 2010, the average income in Labrador City was $58,041, which is above the provincial average of $35,089. In Labrador City, 18% of families had incomes of more than $100,000 (Statistics Canada 2013). NHS data was not available for the Town of Wabush.

5.3.3 Transportation

The Trans-Labrador Highway Route 500 and Route 503 connect the communities of Labrador West. Smokey Mountain Road is the only named, public road leading from Labrador City, north, towards the Project area. The Provincial Department of Transportation maintains the Trans-Labrador Highway, while public roads are the responsibility of the municipality.

There are private roads, used to access the IOC mine site, located near the Project. Currently, access to the former mine is via an 8 km, well maintained gravel haul road (owned and operated by IOC) which connects to the paved Trans-Labrador Highway (Route 500). Access to the mine may change if the Wabush 3 Project is approved. Continued access to the site is under negotiation with IOC.

Private transportation is the principal method of transportation in Labrador West, with most residents owning vehicles. There is very little public transportation in the area, with the exception of a few bus services operated by private employers (e.g., IOC) who transport their employees back and forth from work sites to the communities of Labrador City and the Town of Wabush (Labrador West 2014).

The airport servicing Labrador West is the Wabush Airport. According to a 2012 Transport Canada Decision Record, the Wabush Airport has experienced unprecedented growth in recent years (Transport Canada 2012). In 2010, the Wabush Airport had a 28% increase in traffic volume from the previous year, triggered by the opening of the Bloom Lake Iron Mines and continued growth of the ore mining industry (PWGSC 2011). The airport will expand to accommodate the increase in demand and Transport Canada is currently working on a Master Plan to address the many associated challenges (Transport Canada 2011, 2012).

The Quebec and North Shore and Labrador Railway (QNS&L) maintains service between Sept-Iles, Quebec and Emeril Junction (located approximately 60 km from Labrador West. The main line of the QNS&L is owned by IOC and runs from Labrador West to Ross Bay Junction before going to Quebec. The line is used to transport iron ore from the local mines to the coast where it is shipped to markets beyond. Passenger service is provided by the Schefferville portion of the railway to Ross Bay (owned and operated by Tshiuetin Rail Transportation Inc. [TRT]) (Labrador West 2014). It provides passenger services twice weekly in each direction between Schefferville and Sept-Îles and transports iron ore from Schefferville to Ross Bay from the Labrador Iron Mines

and Tata Steel Minerals via Western Labrador Rail Services, owned by Genesee & Wyoming (Railways in Labrador and Québec North Shore 2012).

Both QNS&L and TST are common carriers. The various users operating on the railway own their rail cars. The railway is used to ship iron concentrate and pellets, heavy equipment, fuels, bulk inventory products, vehicles, building supplies and passengers.

5.3.4 Other Infrastructure and Services

The Labrador West Regional Landfill Site Is located on Trans-Labrador Highway Route 500. The municipal water supply for Labrador West is the Beverly Lake Water Supply System. The Harrie Lake Sewage Treatment Plant and the Drake Sewage Treatment Plant service the residents of Labrador West.

The Public Works Department provides municipal services throughout Labrador City and the Town of Wabush. The Department is responsible for the street and road network, street signage, water and sewer services including the sewerage treatment plants, waste collection services, snow and ice removal. The Department ensures maintenance is conducted on local streets and roadways, water and sewer mains, storm drains, electrical and street lighting, public buildings and lands, the Department's vehicle fleet, fire hydrants, and water and sewer treatment systems. Furthermore, the Department plans, designs, constructs, supervises and approves capital works projects, as well as modifications to municipal infrastructure.

The Public Works Department is responsible for fire protection and rescue services in Labrador West. Both Labrador City and the Town of Wabush operate Fire Departments; Labrador City Fire and Rescue and the volunteer based, Wabush Fire Department. Labrador West has 911 service and protective services are the responsibility of the Royal Newfoundland Constabulary (Labrador West 2014).

All of Labrador is under the responsibility of the Labrador-Grenfell Regional Health Authority. As of November, 2014, all departments, services and staff are located in the new Labrador West Health Centre, relocated from the Captain William Jackman Memorial Hospital. The Labrador West Health Centre is located in Happy Valley-Goose Bay and provides only emergency services.

The hospital has 25 beds, 24-hour emergency department, outpatient clinics, resident and visiting specialists, and is operated under an educational agreement with Memorial University of Newfoundland (Labrador-Grenfell Health 2014).

Labrador West falls under the jurisdiction of the Labrador School Board, where the school system includes the following: A. P. Low Primary School (kindergarten to grade 3), J.R. Smallwood Middle School (grades 4 to 7), Menihek High School (grades 8 to 12) and Le Centre éducatif l'ENVOL (francophone, all grades) (Labrador West 2014).

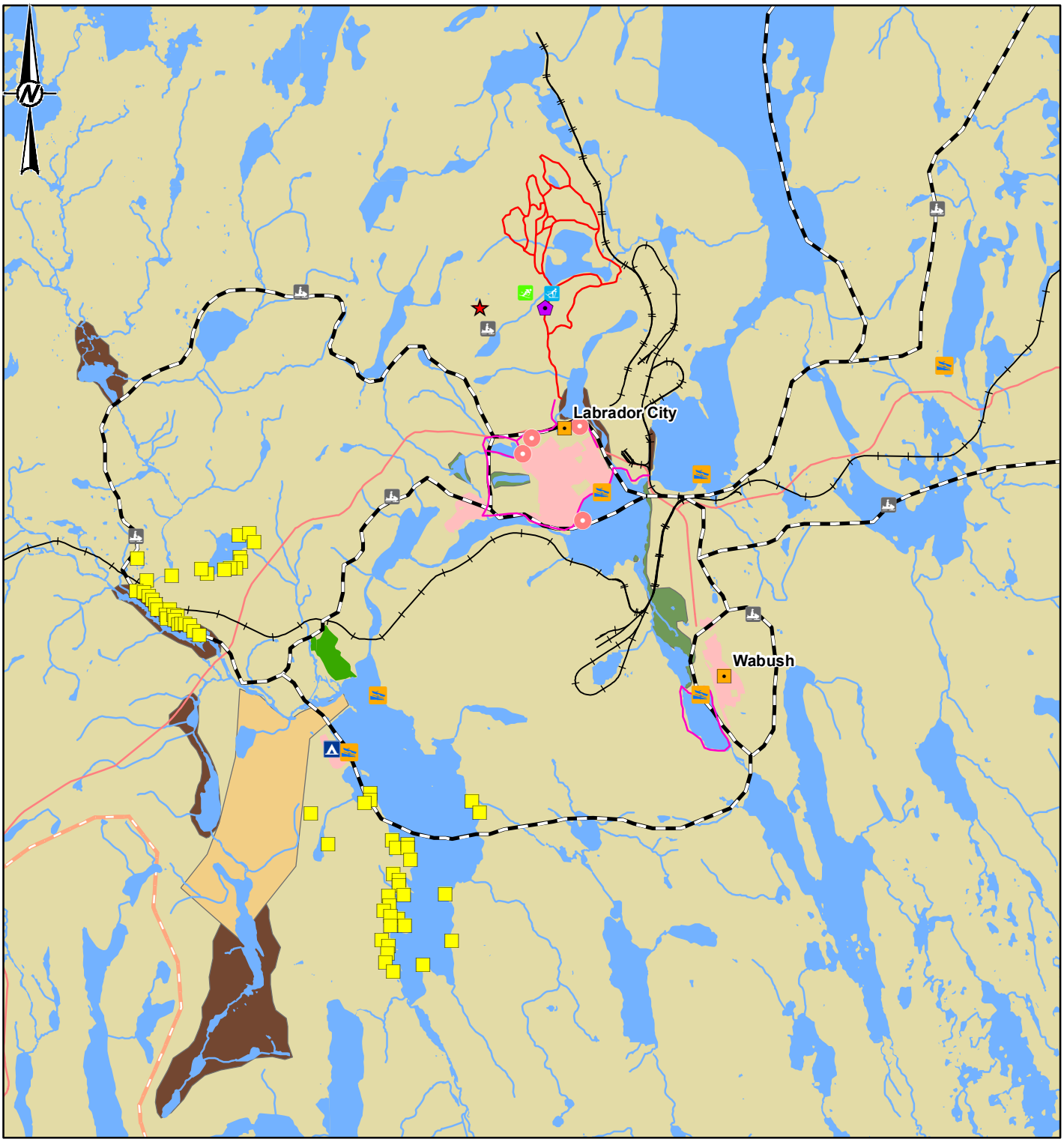
5.3.5 Recreation and Tourism

In general, recreation and tourism in Newfoundland and Labrador is centred on the natural environment and as such is ideal for outdoor activities such as camping, hiking, snowmobiling and boating. There are a number of established outfitters and exploration companies in the province providing opportunities for tourists and locals alike to experience eco-tourism adventures. There are a number of Departments and Associations responsible for recreation and tourism in Labrador, including the provincial Department of Tourism, Culture and Recreation, Gateway Labrador Inc. / Labrador Heritage Society, and Hospitality Newfoundland and Labrador.

Within Labrador West, recreation facilities include arenas, the Labrador West Arts and Culture centre, beaches, Carol Curling Club, dog parks, fitness centres, community gardens, parks and playgrounds, Mike Adam Recreation Complex, bowling alley, gymnasium, swimming pool, weight room, Sk8Board Park, Stan Jackowski Soccer Pitch, softball fields, Wabush Teen Centre, and hundreds of kilometres of walking and skiing trails.

Tourism attractions, which are also used by recreational users, include the Labrador West Gateway Complex, Royal Newfoundland Constabulary Display, annual Labrador West Regatta on Lake Jean, tours of Canada's largest iron ore mine and the Churchill Falls hydro-electric project, Winter Lights Celebrations, Tamarack Golf Club, Smokey Mountain Ski Club, Menihek Nordic Ski Club, Labrador Trap and Skeet Club, and the White Wolf Snowmobile Club and the Labrador Winter Trials network, as well as forests and lakes for hunting, fishing and boating (Labrador West 2014).

Additionally, there are Conservation Zones at Tanya Lake (west of Labrador City), Little Wabush Lake and Jeans Lake (west of the Town of Wabush), Habitat Management Units at Beverly Lake (east of Labrador City), Walsh River (west of Wabush Mines), and an unnamed water body approximately 10 km southwest of the Project, and Duley Lake Provincial Park Reserve, located approximately 10 km from Labrador City. Many of these features / attractions and their proximity to the Project are illustrated on Figure 5.



Legend

- Site Location
- Town / City
- Railway Network
- Major Road
- Menihek Nordic Ski Club Area Trail
- Snowmobile Trail
- Walking Trail
- Rivers
- Waterbodies
- Cottage
- Recreation Area
- Labrador Trap and Skeet Club
- Boat Launch
- Campgrounds
- Menihek Nordic Ski Club
- Smokey Mountain Ski Resort
- Snowmobile Chalet
- Residential Area
- Golf Course
- Conservation Zones
- Duley Park Private
- Habitat Management Unit
- Provincial Boundary

0 1,150 2,300 4,600
METRES

NOTE(S)
THIS FIGURE IS TO BE READ IN CONJUNCTION WITH THE ACCOMPANYING GOLDER ASSOCIATES LTD. REPORT NO. 1411113/2000

REFERENCE(S)
CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE – CANADA.
PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83
COORDINATE SYSTEM: UTM ZONE 19 VERTICAL DATUM: CGVD28

CLIENT
FERROQUARTZ LABRADOR

PROJECT
ENVIRONMENTAL ASSESSMENT REGISTRATION
ROY'S KNOB QUARTZITE MINE

TITLE
RECREATION AND TOURISM ATTRACTIONS

CONSULTANT
Golder Associates

YYYY-MM-DD	2015-08-26
DESIGNED	RRD
PREPARED	RRD
REVIEWED	EL
APPROVED	CG

PROJECT NO.	CONTROL	REV.	FIGURE
1411113	2000	3	5

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 1 in 0

Path: A:_Clients\FERROATLANTIC\AR\Roy_Knob\89_PROJ\1411113\40_PROD\CM-Mining\0003\1411113-0003-GM-0004.mxd

5.3.6 Land Use

As indicated above, Labrador West has been the location of on-going mining activities beginning in the early 1960's. The proposed Roy's Knob Mine was in operation from 1999 to 2008 by Shabogamo Mining & Exploration Ltd. (SME).

The provincial Department of Municipal Affairs, through the Land Use Planning Division, is responsible for planning within Newfoundland and Labrador's incorporated municipalities. The current (i.e., 2007 to 2017) Municipal Plan for Labrador City governs development within the Labrador City municipal planning area and provides the basis for the development of regulations. Largely, lands outside of the city centre are zoned as mining reserve, within which mineral exploration and extraction as well as other industrial land uses are permitted (Town of Labrador City 2010).

The footprint of the existing mine is located in part within Labrador City's Planning Boundary. According to the land use zoning map, a portion of the Project is zoned as a Protected Municipal Watershed (PMW). The municipality acknowledges that the PMW designation is a municipal designation and not a provincial designation afforded protection under *Water Resources Act*. The PMW was established for the protection of the Dumbell Lake watershed, which the municipality has designated as a backup water supply for the City.

According to the latest version of the Municipal Plan (accessed June, 2015), the relevant permitted uses for the PMW zone include maintenance and operation of existing uses; mineral exploration and transportation. The municipality has been informed of the proposed Project and will continue to consult with and advise the planning department regarding potential development permits that may be required for the Project as it may extend into the PMW.

The majority of the proposed Project is located within the boundaries of the mineral licence 00678M. FerroQuartz Labrador will make application to DNR extend the boundaries of the existing mining leases to accommodate all the components associated with the Project.

6.0 APPROVAL OF THE UNDERTAKING

Table 6: Additional Permits and Approvals

Approval Required	Legislation / Regulation	Project Component or Activity	Department or Agency
Mining Lease	Mineral Act	To allow for re-opening and expansion of the mine by a new operator	Mineral Development Division, DNR
Surface Lease	Mineral Act	To obtain title to the surface rights to the area of the mining lease and areas for siting required infrastructure	Mineral Development Division, DNR
Mineral Exploration Approval	Mineral Act and Mineral Regulations	All mineral exploration and geotechnical activities within a Mining Lease or Mineral Licence Requires an Exploration Approval.	Mineral Lands Division, DNR
Water Use Licence	Water Resources Act	Water withdrawal for use for wash plant	Water Resources Division, DOEC
Cutting Permit	Forestry Act	Clearing trees for extraction, laydown and stockpile areas	Forestry Branch, DNR
Development Permit and Building Permit	Town of Labrador City Municipal Plan and Development Regulations	Development within the Municipal Planning Area	Community Council

7.0 SCHEDULE

Construction and operation of the Roy's Knob Quartzite Mine will begin once all necessary permits are in place. Weather permitting, the potential operating schedule is 12 hrs/day, five days/week, and 25 weeks/year or more.

8.0 FUNDING

The Roy's Knob Quartzite Mine Project will be 100% funded by FerroQuartz Labrador. The capital cost for the Project is estimated to be approximately $4,500,000.

Fernando Alonso Campanero
Mining Director, Canada

August 31, 2015

Report Signature Page

GOLDER ASSOCIATES LTD.

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Christine Guay, B.Sc., M.Sc.
Associate - Senior EA Specialist

JR/EL/CG/kl

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APPENDIX A

Roy’s Knob Quartzite Quarry EA Release Letter

Copy to File

GOVERNMENT OF
NEWFOUNDLAND AND LABRADOR

Department of
Environment and Labour
Office of the Minister

February 15, 1999

Mr. Edward Hearn
Shabogamo Mining and Exploration Ltd.
P.O. Box 699
Wabush, NF
A0R 1B0

Dear Mr. Hearn:

RE: Roy's Knob Quartzite Quarry

Your proposal has been reviewed and an opportunity to comment has been given to the public and government agencies, as required by the Environmental Assessment Act RSN 1990, c. E-14. Upon consideration of the comments received, please be advised that this undertaking is released from further environmental assessment, as per the requirements of the Act.

You may proceed with the undertaking described in your registration document, subject to any other Act or regulations. Please be aware that you are obliged to inform this Department of any significant changes to your proposal.

A summary of comments from the reviewing agencies received during the review period is attached for your consideration. Please note that the list of permits and approvals may not be complete, and that you are required to comply with all relevant legislation.

I understand that you have reached an agreement with I.O.C.C., Labrador Royalty Ltd., and the Mehihek Ski Club for the use of this area.

If you have any questions concerning these matters, please contact Phil Graham, Director of the Environmental Assessment Division, at 729-2562.

Thank you for your co-operation with our Environmental Assessment Process.

Sincerely yours,

OLIVER LANGDON
Minister

Attachment

cc: Mr. Randy Collins, MHA
District of Labrador West

P.O. Box 8700, St. John's, Newfoundland, Canada, A1B 4J6. Office: (709) 729-2574, Facsimile (709) 729-0112

ATTACHMENT 1

(Edited comments to be forwarded to the proponent)

COMMENTS RECEIVED DURING THE REVIEW OF THE PROPOSED ROY'S KNOB QUARTZITE QUARRY

DEPARTMENT OF MINES AND ENERGY -Regulatory Requirement:
A mining lease is required before production begins.
A reclamation plan should be completed at least to coincide with the 10 year mining plan provided.

DEPARTMENT OF GOVERNMENT SERVICES AND LANDS
Land Mgt. Division - Regulatory Requirements:
Crown Lands Application will be required for any structures, easements, power lines or access roads to or on the site if Crown Land is required for the development.

Government Services Centre (GSC) - Regulatory Requirements:
The proponent must contact the GSC for appropriate permits and approvals. See attached "Information List of Permits, Fees and Referral Agencies".

DEPARTMENT OF ENVIRONMENT AND LABOUR
Water Resources Mgt. Division - Regulatory Requirements:
To comply with section 11 of the ***Environment Act, SN 1995 c E-13.1,*** approvals will be required for ***new or upgraded bridge and culvert crossings, settling basins and for any other construction activity within 15m of a body of water.*** In addition, water use authorization ***may be required for the withdrawal of water for consumptive or processing*** purposes.

Pollution Prevention Division - Environmental Control Water and Sewage Regulations:
All water released from the operation must be in compliance with the ***Environmental Control Water and Sewage Regulations.*** This includes any excess water which may be required to reduce dust emissions as well as runoff from the quarry and stockpiles. Measures must also be taken to ensure runoff water from stockpiles of fines, which may have increased TSS levels, are in compliance with the regulations.
Storage and Handling of Gasoline and Associated Products Regulations:
- All petroleum storage tanks will require compliance with the ***Storage and Handling of Gasoline and Associated Products Regulations, CNR 775/96.***
- All "used" oils from facility equipment must be collected, transported and disposed in a manner acceptable to the Department. Used oil may not be used as a dust suppressant.

Waste Material Disposal Act:
All waste materials shall be disposed at an approved waste disposal site contact the GSC.
Other:
- The project will require approval under Section 8 of the ***Environment Act.*** As such, more specific details on wastewater treatment systems for wash water and quarry dewatering is required.
- An Environmental Protection Plan for the project, including a reclamation plan should be prepared. This, along with a contingency plan may be incorporated into the certificate of approval.
- All efforts must be made to reduce noise levels and dust emissions.
- Overburden and topsoil removed should be stockpiled to facilitate rehabilitation upon termination of the project. The overburden and topsoil must be secured to prevent scavenging and erosion.
- Any open buring during site clearing must abide by the guidelines stipulated in the Environmental Code of Practice for Open Burning issued by this Division.
- Upon termination, the site must be rehabilitated to the satisfaction of the Department. All material, equipment, buildings and waste is to be removed from the site and disposed of in accordance with the ***Waste Material Disposal Act, RSN 1990***, as amended. This site must also be vegetated by placing organic material, if necessary, and seeding as required.

ENVIRONMENT CANADA - Environmental Protection - Regulatory Requirements:
The proponent should be aware of the general applicability of Section 36(3) of the federal *Fisheries Act* to the proposed operation. Deleterious substances (e.g. sediment laden drainage, quartzite, petroleum products, etc.,) cannot be deposited into water frequented by fish. Drainage from construction, operational drainage, settling ponds or treatment systems must not be harmful to fish.

Information Required on the Project and/or Environmental Planning of the Project:
The proponent should develop an environmental protection plan (EPP) that outlines mitigation measures for all phases of the quarry operation (construction, operation and abandonment).The following are examples of recommended mitigation practices that should be employed to ensure compliance with the *Fisheries Act.*

Erosion and Drainage Control:
It will be necessary to prevent sediment-laden drainage, associated with site preparation and any site clearing, grubbing, scarification and general activities, from entering surface waters. The following mitigative measures are recommended to prevent the introduction of this runoff into surface waters in the area, as well as to prevent any chronic erosion problems.

- Disturbed areas should be covered with a thin layer of brush or slash, and exposed soil stabilized with anti-erosion devices, such as rip rap, filter fabrics, gravel or wood chip mulches.
- Revegetation is recommended for disturbed areas in order to prevent erosion.
- A vegetated buffer zone should be maintained between the access road and surface waters.
- Control devices such as filter fabrics, sediment traps and/or settling ponds should be in place to receive all drainage from areas disturbed by site preparation and any site clearing, grubbing, scarification and general construction activities. Solids which accumulate in a settling pond or behind a sediment trap should be removed on a regular basis, and disposed of in an approved manner, to ensure such devices remain effective.

Transport, Storage, Use and Disposal of Petroleum Products and Toxic Substances:
It will be necessary to provide for the proper transport, storage, use and disposal of all substances which may be harmful to fish, (e.g., fuel, oils, and other petroleum products. etc.,), so as to minimize the risk of chronic or accidental releases and to prevent a release from entering surface waters. The following recommended mitigations are examples to prevent petroleum products and other toxic substances from entering waterbodies.

- Refuelling and maintenance activities should be undertaken on level terrain, at least 100m from any surface water, on a prepared impermeable surface with a collection system to ensure oil, gasoline and hydraulic fluids do not enter surface waters. Waste oil should be disposed of in an approved manner.
- Drums of petroleum products or chemicals should be tightly sealed against corrosion and rust and surrounded by an impermeable barrier in a dry, water-tight building or shed with an impermeable floor.
- Spill response equipment should be readily available on-site. Response equipment, such as adsorbents and open-ended barrels for collection of cleanup debris, should be stored in an accessible location on-site. Personnel working on the project should be knowledgeable about response procedures. The proponent should develop a contingency plan specific to the proposed undertaking.

Contacts:
Mailing Address Environment Canada, 6 Bruce Street, Mount Pearl, NF, A1N 4T3
Ms. Kim Coady, Environmental Assessment Officer (772-4087)
Mr. Kevin Power, P.Eng., Head, Pollution Prevention (772-4005)
Mr. Graham Thomas, Environmental Emergencies Coordinator (772-4285)
Environmental Emergencies 24-Hour Report Line:St. John's 772-2083 Other 1-800-563-2444

FISHERIES AND OCEANS - Regulatory Requirements:
This project may require approval under Section 5 (1) of the *Navigable Waters Protection Act* (NWPA) and under the *Canadian Environmental Assessment Act.* The proponent is advised to submit an application for all stream crossings associated with the access road.

Contact Mr. Paul Nippard, A/Regional Superintendent, NWPA, Coast Guard (Department of Fisheries and Oceans, PO Box 5667, St. John's, NF, A1C 5X1 (tel:709-772-0606; fax:709-772-3072)) regarding NWPA.

Contact Ms. Annette Rumbolt, A/Area Habitat Coordinator - Labrador (Department of Fisheries and Oceans, P.O. Box 7003, Stn. A, Bldg. 307, CFB Goose Bay, Goose Bay, NF, A0P 1S0, (ph.709-896-6151)) regarding works or activities which may impact upon fish or fish habitat.

APPENDIX B

List of Project Related Documents

Table 7: Project Related Documents

Document Title	File Name	Date	Author	Format	Content
Documents Related to the Mining Plan and Compliance with the Mining Act of Newfoundland and Labrador					
Operational Mining Plan – Roy's Knob Quartzite Quarry	*SME 2012.pdf*	April 2012	Shabogamo Mining & Exploration Ltd.	PDF 30 p.	Description of the property, geology, purity of the product, mining method, environmental considerations. Review of 2011 financial statements.
Shabogamo Mining and Exploration Ltd – Roy's Knob Quartzite Quarry	*2013_04_07_SME Roy's Knob Quarry.pdf*	April 17, 2013	NL Department of Natural Resources	Letter 1 p.	Acknowledgement of receipt of Operational Mining Plan. Request for Development Plan, Rehabilitation and Closure Plan, financial assurance.
Comments on the "Operational Mining Plan – Roy's Knob Quartzite Quarry"	*2013_04_24_SME Development Plan Comments.pdf*	April 24, 2013	NL Department of Natural Resources	Letter 4 p.	Comments on the Operational Mining Plan. Request for several modifications and additions.
Mining Act Guidelines	*Draft Mining Act Guidelines- 28-Jul-10.pdf*	July 28, 2010	Unknown	PDF 21 p.	Summary of requirements for Development Plan, Rehabilitation & Closure Plan, Operational Plan, Annual Report, Financial Assurance and Mill Licence
Documents Related to Legal Aspects					
Mining Leases	*Mineral Rights.pdf*	April 9, 1999 October 25, 2000 May 29, 2012	NL Department of Natural Resources	PDF 42 p. (scan)	Legal document describing the mining and surface leases.
Map NTS 23B/15 – Claim disposition	*Shabogamo Claim Disposition Sep11.pdf*	September 2011	Shabogamo Mining & Exploration Ltd.	PDF 1 p.	Map showing SME claims, and adjacent claims by IOC, Wabush Mines, Alderon, Altius.
Documents Giving General Information on the Mining Project					
Introduction to mining project	*SME LWQ introduction.doc*	Unknown	Shabogamo Mining & Exploration Ltd.	Word 14 p.	General information on SME, LWQ, materials handling, processing and shipping.

Presentation to FerroAtlántica	*Shabogamo Mining & Exploration Ltd.pptx*	October 4, 2012	Shabogamo Mining & Exploration Ltd.	PPT 38 p.	Material handling at Roy's Knob Quarry. Overview of the silicon market.
Presentation to FerroAtlántica	*Shabogamo Oct 2012.ppt*	October 2012	Shabogamo Mining & Exploration Ltd.	PPT 44 p.	Photos of Roy's Knob, Smokey Mountain and Leg Lake properties. Maps of material handling.
Cuarcita Shabogamo	*Informe Canada.docx*	October 2012	FerroAtlántica	Word 14 p.	Description of the potential acquisition of Shabogamo properties.
Technical Documents (Site Investigation)					
Diamond Drilling Reports – Roy's Knob and Leg Lake Deposits	*Diamond Drilling Reports – Roy's Knob and Leg Lake Deposits.pdf*	Report dated October 2012; drilling and assays were done in 1996-97	Shabogamo Mining & Exploration Ltd.	PDF 30 p.	Description of drilling programs for 2 Roy's Knob and Leg Lake
High Purity Silica Analysis	*High Purity Silica Analysis.pdf*	October 15, 1997	Lakefield Research Limited	PDF 7 p.	Analysis of 2 quartzite samples – location unclear.
Report on Drilling Program – Roy's Knob 678M	*DOC004 to FerroAtlántica (sondeos).pdf*	March 2000	Shabogamo Mining & Exploration Ltd.	PDF 14 p.	Description of drill holes, results of chemical analysis, reserves estimation, chemical logs of RK11 to RK18.
Geological Assessment Report	*Geological Assessment Report.pdf*	October 2011	Shabogamo Mining & Exploration Ltd.	PDF 17 p.	Document to help in decision to keep licences. Concerns only Leg Lake North + other licences. Results of chemical analyses and samples locations.
Quartzite Sampling Program	*Quartzite Sampling Program.pdf*	October - November 2012	Shabogamo Mining & Exploration Ltd.	PDF 6 p.	Location and sample numbers of 39 samples from 3 deposits (Roy's Knob, Smokey Mountain and Leg Lake Same document as *Quartzite Assessment Report.pdf*
Supplemental Assessment Report	*Supplemental Assessment Report.pdf*	October - November 2012	Shabogamo Mining & Exploration Ltd.	PDF 16 p.	Same info as *above* + location map of 39 samples.

Notes for a presentation to FerroAtlántica	*Labrador Mineral Licenses.pdf*	October 2012	Shabogamo Mining & Exploration Ltd.	PDF 27 p.	General site description, access, geology, topography, infrastructure) Samples location and chemical analysis results of 123 samples from Roy's Knob, Smokey Mountain, Leg Lake.
Certificado de Analysis	*Shabogamo Analysis.xls*	November 2012	FerroAtlántica	Excel 4 p.	Chemical analyses from Roy's Knob, Leg Lake and Reflector Hill
Calidad Shabogamo	*Calidad Shabogamo.docx*	May 2013	FerroAtlántica	Word 4 p.	Same pages as in *(14)* about grade analysis
Documents from Newfoundland and Labrador Government					
Industrial Minerals in Labrador	*Industrial Minerals in Labrador.pdf*	1986	J.R. Meyer and P.L. Dean, NL Department of Mines and Energy	PDF 8 p.	Description of the potential industrial minerals in Labrador, particularly quartzite, dolomite, alumina and dimension stone in Labrador West.
Silica in Western Labrador	*Silica in Western Labrador.pdf*	1987	J.R. Meyer and P.L. Dean, NL Department of Mines and Energy	PDF 5 p.	Preliminary analyses of the quartzite ridges in the Wabush-Labrador City area showing potential for high-value silica products.
Silicon Metal Smelter – The Labrador Advantage	*silicon.pdf*	August 2000	NL Government	PDF 11 p.	Promotional document from the NL government about investment in a silicon metal smelter
Newfoundland Labrador – it's happening here	*Shabogamo Mining - Presentation Deck for FerroAtlántica BOD Meeting.ppt*	May 7-8, 2013	NL Government	PPT 35 p.	Presentation to the Board of Director's Meeting of FerroAtlántica to sell NL as attractive investment ground.
Letter from government	*Shabogamo Mining - Letter of Support for FerroAtlántica BOD Meeting.pdf*	May 3, 2013	NL Department of Innovation, Business and Rural Development	PDF 1 p.	Letter of support to the project, accompanying the presentation.
Documents Related to Geology					
Geological Mapping of the Wabush-Labrador City Area, Southwestern Labrador	*Geological Mapping in the Wabush-Labrador City Area - Southwestern Labrador.pdf*	1978	T. Rivers, NL Department of Mines and Energy	PDF 7 p.	Description of the geological mapping of the Wabush-Labrador City area

Wabush Lake – Sawbill Lake Map Area, Western Labrador	*Wabush Lake - Sawbill Lake Map Area, Western Labrador.pdf*	1979	T. Rivers and N. Massey, NL Department of Mines and Energy	PDF 6 p.	Description of the geological mapping of the Wabush Lake area, north of the area.
T. Rivers – Project Geologist	*T Rivers - Project Geologist.pdf*	1979	T. Rivers, NL Department of Mines and Energy	PDF 4 p.	Summary of preceding work by T. Rivers
Geological Mapping in the Wabush Lake Area, Southwestern Labrador	*Geological Mapping in the Wabush Lake Area - Southwestern Labrador.pdf*	Unknown	T. Rivers, NL Department of Mines and Energy	PDF 6 p.	Summary article of preceding work by T. Rivers
Additional References					
Environmental Assessment Registration	*N/A*	May 2013	IOC, prepared by AMEC	PDF 207 p.	Environmental assessment of IOC planned Wabush 3 open pit
Submission to Wabush 3 Open Pit Mine Project in Labrador West (Reg 1711)	*N/A*	June 4, 2013	SME	PDF 3 p.	Email to the NL government to discuss the business impact of the Wabush 3 project on SME activities.
Environmental Assessment Bulletin	*http://www.releases.gov.nl.ca/releases/2013/env/0724n06.htm*	July 24, 2013	NL Government	Website	Public release requiring an Environmental Impact Statement (EIS) for the Wabush 3 project
Common Boundary Issue with the Iron Ore Company of Canada	*N/A*	July 31, 2013	NL Government	PDF 1 p.	Letter to SME confirming waste material from IOC has been dumped on SME claim.
Wabush 3 development and other concerns	*N/A*	July 4, 2013	SME	PDF 1 p.	Email to IOC requesting a meeting.
FerroAtlántica /SME	*N/A*	May 15, 2013	SME	PDF 4 p.	Email to NL government to request approval for FA acquisition.

Acquisition of Shabogamo Mining & Exploration by FerroAtlántica	*N/A*	May 30, 2013	NL Government	PDF 1 p.	Letter to SME
Approximate Diamond Drill Costs at Roy's Knob Quarry	*N/A*	April 29, 2013	Ed Montague	PDF 1 p.	Letter to SME with a cost estimate for a 300 m drilling program.
Permit Application No. 13 – 668	*N/A*	June 25, 2013	Town of Labrador City	PDF 2 p.	Letter to SME – Approval of exploration program
Exploration Approval (Bulk Sample) for SME of the Roy's Knob Property	*N/A*	July 18, 2013	NL Government	PDF 3 p.	Letter to SME – Approval of exploration program
2006 Annual Report of Operations – Roy's Knob Quartzite Quarry	*N/A*	October 19, 2006	SME	PDF 4 p.	Report of 2006 quarrying operations at Roy's Knob Quarry.
Quality Overview	*N/A*	September 2000	SME	PDF 8 p.	Quality control procedures at Roy's Knob.