Project Registration for the Houston 1 and 2 Deposits Mining Project

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Table of Contents

1.0 INTRODUCTION 1
1.1 Identification of the Proponent 1
1.2 Contacts and Address 1
1.3 Nature of the Undertaking 1
1.4 Regulatory Context 5
1.4.1 Environmental Assessment Process 5
1.4.2 Environmental Authorizations 5
1.5 Document Organization 6

2.0 PURPOSE AND ALTERNATIVES 8
2.1 Project Purpose and Rationale 8
2.2 Alternatives to the Undertaking 8
2.3 Alternatives within the Undertaking 8
2.3.1 Construction of Houston-Redmond Haul Road and Rail Siding 8
2.3.2 Beneficiation Site 9

3.0 DESCRIPTION OF THE UNDERTAKING 13
3.1 Previously Registered Undertakings 13
3.2 Geographic Location 13
3.3 Project Description 15
3.3.1 Construction Phase 16
3.3.2 Operation Phase 22
3.3.3 Decommissioning/Post-Decommissioning and Reclamation Phase 27
3.3.4 Potential Accidental Events 27
3.4 Potential Effects of the Environment on the Project 29
3.5 Emissions and Waste Management 30
3.5.1 Effluent 30
3.5.2 Waste Rock, Overburden and Reject Rock Fines 30
3.5.3 Garbage and Litter 30
3.5.4 Hazardous Waste Management 31
3.5.5 Air Emissions 31
3.5.6 Noise 31
3.5.7 Blasting 31
3.6 Monitoring 32
3.7 Environmental Protection Plan 32
3.8 LIM Benefits Plan 34
3.9 Women's Employment Plan 34
3.10 Project Related Documents 35

4.0 SCHEDULE 38

5.0 FUNDING 39

6.0 COMMUNITY AND ABORIGINAL CONSULTATION 39
6.1 Consultation and Accommodation 39
6.1.1 General 39
6.1.2 Aboriginal Consultation 40
6.2 Community Consultation 49
6.3 Traditional Ecological Knowledge 50

7.0 ENVIRONMENTAL SETTING AND EXISTING CONDITIONS 52
7.1 Regional Geology 53
7.1.1 Knob Lake Range Geology 55
7.1.2 Regional Mineralization 56
7.1.3 Deposit Types 57
7.1.4 Geomorphology, Surficial Geology, Soils and Permafrost 61
7.2 Physiography 66
7.3 Temperature and Precipitation 66
7.4 Air Quality 67
7.5 Aquatic Environment 68
7.5.1 Surface Water Quality 68
7.5.2 Hydrology 69
7.5.3 Drainage in the Houston Mine Open Pit Area 72
7.5.4 Drainage in the Houston-Redmond Road Area 72
7.5.5 Fish and Fish Habitat 73
7.6 Groundwater and Hydrogeology 75
7.6.1 Groundwater Quality 75
7.6.2 Hydrogeology 76
7.6.3 General Groundwater Conditions in the Schefferville Area 76
7.7 Vegetation 79
7.7.1 Habitat Types 79
7.7.2 Rare Plants 80
7.7.3 Timber 80
7.8 Wildlife 80
7.8.1 Caribou 80
7.8.2 Wildlife Surveys 85
7.8.3 Species at Risk 86
7.9 Historic Resources 86
7.10 Socio-Economic Environment 87
7.10.1 Methodology 88
7.11 Future Environment 125

8.0 ENVIRONMENTAL ASSESSMENT METHODS AND SCOPING 127
8.1 Scope of the Project 127
8.2 Issues Scoping 128
8.3 Selection of Valued Environmental Components 129
8.4 Boundaries 130

8.4.1 Spatial Boundaries 130
8.4.2 Temporal Boundary 130
8.4.3 Administrative Boundaries and Technical Boundaries 131
8.5 Potential Interactions and Existing Knowledge 131
8.6 Residual Environmental Effects Assessment and Significance Criteria 132
8.7 Cumulative Environmental Effects 133
8.8 Accidental Events 134
8.9 Monitoring and Follow-up 135

9.0 ENVIRONMENTAL EFFECTS ASSESSMENT 136
9.1 Caribou 136
9.1.1 Environmental Assessment Boundaries 137
9.1.2 Potential Environmental Effects 140
9.1.3 Review of Existing Knowledge 141
9.1.4 Residual Environmental Effects Significance Criteria 142
9.1.5 Mitigation Measures 143
9.1.6 Environmental Effects Assessment and Residual Effects Determination 145
9.1.7 Accidental Events 148
9.1.8 Cumulative Environmental Effects 148
9.1.9 Follow-up and Monitoring 149
9.2 Other Wildlife 150
9.2.1 Environmental Assessment Boundaries 150
9.2.2 Potential Environmental Effects 152
9.2.3 Review of Existing Knowledge 153
9.2.4 Residual Environmental Effects Significance Criteria 154
9.2.5 Mitigation Measures 155
9.2.6 Environmental Effects Assessment and Residual Effects Determination 156
9.2.7 Accidental Events 159
9.2.8 Cumulative Environmental Effects 159
9.2.9 Follow-up and Monitoring 160
9.3 Employment and Business 160
9.3.1 Environmental Assessment Boundaries 160
9.3.2 Potential Project-VEC Interactions 161
9.3.3 Residual Environmental Effects Significance Criteria 162
9.3.4 Effects Management 163
9.3.5 Effects Assessment 163
9.3.6 Cumulative Environmental Effects 167
9.3.7 Follow-up and Monitoring 168
9.4 Communities 168
9.4.1 Environmental Assessment Boundaries 169
9.4.2 Residual Environmental Effects Significance Criteria 169
9.4.3 Effects Management 170
9.4.4 Effects Assessment 170
9.4.5 Summary of Effects on Communities 171
9.4.6 Cumulative Environmental Effects 172
9.4.7 Follow-up and Monitoring 173

10.0 CONCLUSION 174

11.0 REFERENCES.....175
11.1 Personal Communications.....175
11.2 Literature Cited.....176

LIST OF APPENDICES

APPENDIX A Schefferville Area Iron Ore Mine EPP
APPENDIX B Schefferville Area Iron Ore Mine ERP
APPENDIX C Regional Groundwater Quality
APPENDIX D Regional and Site Surface Water Quality
APPENDIX E Schefferville Area Iron Ore Mine Waste Management Plan
APPENDIX F Sustainet Consultation Database

LIST OF TABLES

Table 1.1 Potential Permits, Approvals and Authorizations.....5
Table 3.1 Occupations Required During Construction.....21
Table 3.2 Occupations Required During Operation.....27
Table 3.3 Houston 1 and 2 Project: Example Environmental Protection Plan Table of Contents.....33
Table 4.1 Houston 1 and 2 Pre-Production Schedule.....38
Table 4.2 Houston 1 and 2 Production Schedule.....38
Table 7.1 Acid Base Accounting (ABA) Results for the Nearby James and Redmond Deposits and Ruth Pit Waste Rock.....65
Table 7.2 Temperature and Precipitation Data.....67
Table 7.3 Stream Gauge Locations and Measured Stream Velocities – November 13, 2010.....72
Table 7.4 Maximum, Minimum and Mean Flows – November 12th-18th, 2010.....72
Table 7.5 Fishing Effort (by Gear Type), for Tom's Pond, Houston Property 2008-2011.....73
Table 7.6 Recommended Minimum Buffer Zone Requirements for Activities Near Watercourses.....74
Table 7.7 Population of Labrador West, Upper Lake Melville, Labrador and Province, 2006.....92
Table 7.8 Population, Eastern Québec Communities, 2001 and 2006.....93
Table 7.9 Labour Force Characteristics, Labrador, 2006.....97
Table 7.10 Beneficiaries of Employment Insurance, Labrador City and Wabush, 2002 to 2006.....98
Table 7.11 Labour Force Characteristics, Eastern Québec and Comparison to Labrador West, 2006.....102
Table 7.12 Number of Businesses by Employment Size, Hyron Region, 2006.....104
Table 7.13 Number of Businesses by Industry, Hyron Region, 2006.....105
Table 7.14 Major Employers and Number of Employees, Upper Lake Melville.....106
Table 7.15 Number of Businesses, Upper Lake Melville, 2006.....107
Table 7.16 Temporary Accommodations in Schefferville, 2008.....109
Table 7.17 Staff Employed by the Naskapi Local Community Service Centre, 2008.....112
Table 7.18 Staff Employed by the Innu Local Community Service Centre, 2008.....113

Table 7.19 Staff Employed by the Schefferville Local Community Service Centre, 2008 113
Table 7.20 Schools, Enrolment and Number of Teachers, Labrador City and Wabush, 2007/08 114
Table 7.21 Enrolment by Program, College of the North Atlantic, Labrador City Campus, 2008/2009 114
Table 7.22 Student Populations, Primary and Secondary Schools, 2006/2007 115
Table 7.23 College of the North Atlantic, Enrolment by Program, Happy Valley-Goose Bay Campus, 2005/2006 116
Table 7.24 Schools, Enrolment and Number of Teachers, Eastern Québec, 2007/08 .. 117
Table 7.25 Staff Employed by Jimmy Sandy Memorial School, Kawawachikamach, 2008 117
Table 7.26 Staff Employed by École Kanatamat Tahitipetetamunu, Schefferville, 2008 117
Table 8.1 Scope of Project Activities 128
Table 8.2 Potential Project-VEC Interactions (Example) 131
Table 8.3 Example: Summary of Residual Environmental Effects 133
Table 8.4 Projects and Activities Considered in Cumulative Environmental Effects Analysis 134
Table 9.1 Potential Project-VEC Interactions for Caribou 140
Table 9.2 Proposed Mitigation Measures for Caribou 144
Table 9.3 Summary of Residual Environmental Effects for Caribou: Construction 146
Table 9.4 Summary of Residual Environmental Effects for Caribou: Operation 147
Table 9.5 Summary of Residual Environmental Effects for Caribou: Decommissioning 148
Table 9.6 Summary of Residual Environmental Effects for Caribou: Cumulative Environmental Effects 149
Table 9.7 Potential Project-VEC Interactions for Other Wildlife 152
Table 9.8 Summary of Residual Environmental Effects for Other Wildlife: Construction 157
Table 9.9 Summary of Residual Environmental Effects for Other Wildlife: Operation 158
Table 9.10 Summary of Residual Environmental Effects for Other Wildlife: Decommissioning 159
Table 9.11 Summary of Residual Environmental Effects for Other Wildlife: Cumulative Environmental Effects 160
Table 9.12 Potential Project-VEC Interactions for Employment and Business 162
Table 9.13 Summary of Residual Environmental Effects for Employment and Business: All Project Phases 167
Table 9.14 Summary of Residual Environmental Effects for Employment and Business: Cumulative Effects, All Phases 168
Table 9.15 Potential Project- VEC Interactions for Communities 169
Table 9.16 Summary of Residual Environmental Effects for Communities: All Project Phases 172
Table 9.17 Summary of Residual Environmental Effects for Employment and Business: Cumulative Effects, All Phases 172

LIST OF FIGURES

Figure 1-1	Labrador Iron Mines Claims Holdings	3
Figure 2-1	Houston Haul Road and Rail Siding Options	10
Figure 2-2	Houston Haul Road Conceptual Water Crossing - Gilling River Bridge Cross Section	11
Figure 2-3	Houston Haul Road Conceptual Water Crossing -Small Stream Water Crossings Cross Section	12
Figure 3-1	Project Location	14
Figure 3-2	Houston Deposits	18
Figure 3-3	Conceptual Pit Cross-Section – Longitudinal	23
Figure 3-4	Conceptual Pit Cross-Section – Transverse	24
Figure 3-5	Anticipated Houston 1 and 2 Surface Lease	25
Figure 6-1	Labrador Aboriginal Communities Location Map	42
Figure 7-1	Geological Map of Labrador	54
Figure 7-2	Generalized Cross Section-Houston Deposits (developed by IOC)	60
Figure 7-3	Permafrost Distribution in Nouveau-Québec and Labrador (Source Brown, 1979)	62
Figure 7-4	Houston Property Drainage	70
Figure 7-5	Houston Surface Water Sampling Location Plan	71
Figure 7-6	Houston Dewatering Plan Map	78
Figure 7-7	Comparison of genetic components collected from two caribou in the Schefferville area with those from known ecotypes using multivariate analysis (AFC).	83
Figure 7-8	Caribou Survey Area	84
Figure 7-9	Project Location and Economic Zones of Labrador	89
Figure 7-10	Population by Economic Zone, as a Percentage of Labrador's Population, 2006	91
Figure 7-11	Population of Labrador Economic Zones by Age Group, 2006	92
Figure 7-12	Percentage Population of Eastern Québec Communities, 2006 (Statistics Canada)	94
Figure 7-13	Labour Force by Industry, Labrador West, 2006	99
Figure 7-14	Labour Force by Occupation, Labrador West, 2006	99
Figure 7-15	Education Level, Labrador West, 2006	100
Figure 7-16	Employment by Industry, Upper Lake Melville, 2006	101
Figure 7-17	Education Level, Upper Lake Melville, 2006	101
Figure 7-18	Labour Force by Industry, Eastern Québec, 2006	102
Figure 7-19	Labour Force by Occupation, Eastern Québec, 2006	103
Figure 7-20	Education Level, Eastern Québec, 2006	103
Figure 7-21	Employment by Industry Residents of Kawawachikush, Matimekush and Schefferville	104
Figure 9-1	Caribou Assessment Area	139
Figure 9-2	Other Wildlife Assessment Area	151
Figure 9-3	Socio-economic Assessment Area	161

1.0 INTRODUCTION

1.1 Identification of the Proponent

Name of Corporate Body:	Labrador Iron Mines Limited (LIM)
Address:	Suite 700, 220 Bay Street Toronto ON M5J 2W4

Labrador Iron Mines, a wholly owned subsidiary of Labrador Iron Mines Holdings Limited, is proposing to develop iron ore deposits on their Houston 1 and 2 properties, as well as a haul road and rail siding, located in the western central part of the Labrador Trough Iron Range, in the province of Newfoundland and Labrador. The Houston 1 and 2 project is located approximately 10 km from the existing approved Redmond Mine project. Labrador Iron Mines Limited, is an Ontario registered company trading on the TSX Exchange under the symbol of "LIM"

1.2 Contacts and Address

Chief Executive Officer

Name:	John F. Kearney
Official Title:	Chairman and Chief Executive Officer
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Telephone:	647-728-4125

Principal contact for purposes of environmental assessment

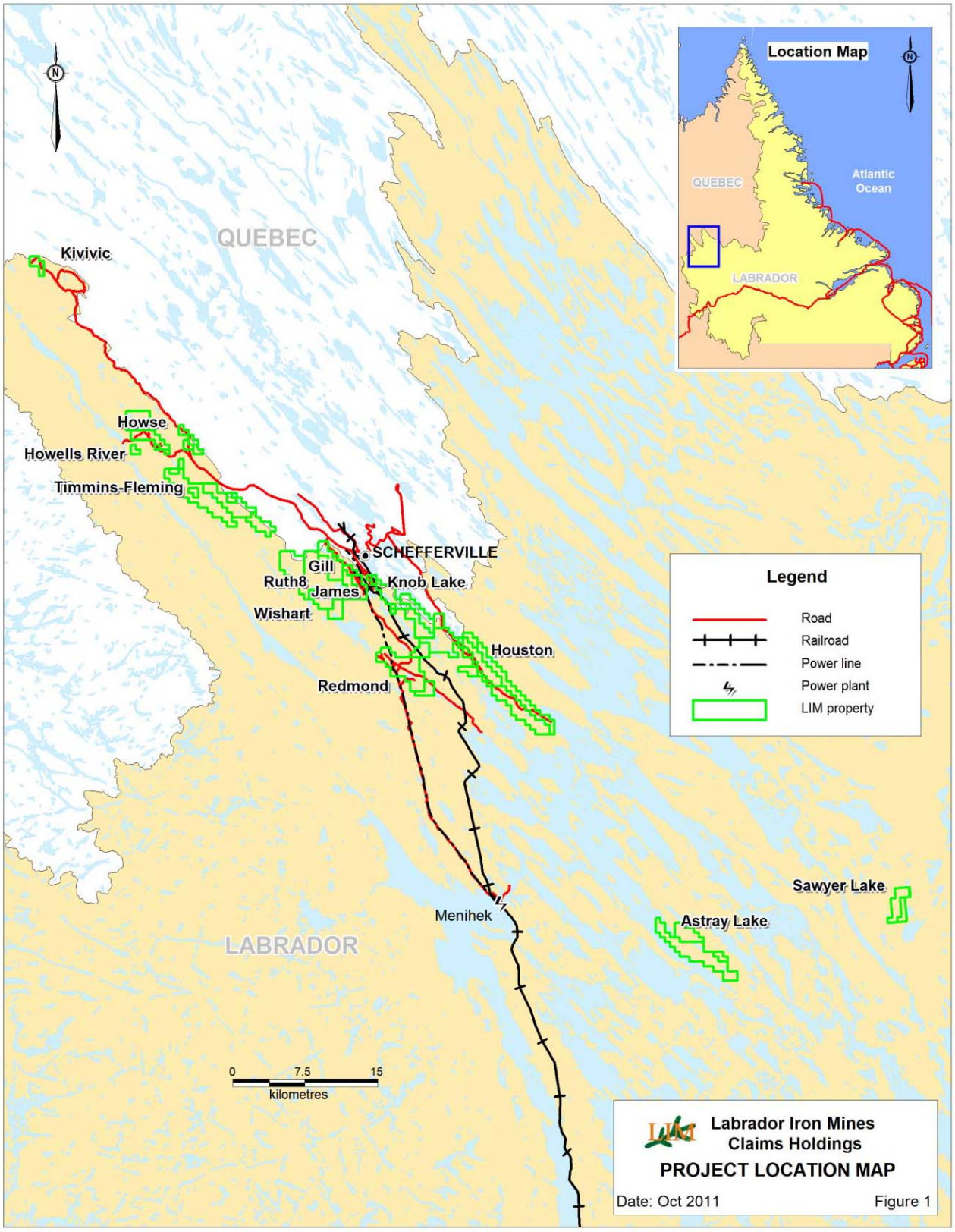
Name:	Linda Wrong, P.Geo.
Official Title:	Vice President, Environment and Permitting
Address:	Suite 700, 220 Bay Street Toronto ON M5J 2W4
Telephone:	647-728-4125

1.3 Nature of the Undertaking

This undertaking, or Project, involves the development and mining of 'direct shipping' iron ore from the Houston 1 and 2 deposits in western Labrador, the construction of a mining haul road that will connect the Houston area to LIM's existing approved Redmond Mine area in an

historical iron ore mining district, and the construction of a 4 km long rail siding near the intersection of the proposed haul road and existing TSH main rail (Project Area) (Figure 1-1). The Houston 1 and 2 ore deposits are located approximately 10 km from the Schefferville Area Iron Ore Mine properties of James and Redmond, which were assessed in the Environmental Impact Assessment submitted to the federal and provincial regulators in August 2009 and released from further environmental assessment in November 2009. The Schefferville Area Iron Ore Mines are currently in operation and in compliance with all applicable permits and approvals. Environmental baseline data for the Project Area, considered to be satellite pits presented as the next phase of development discussed in the Schefferville Area Iron Ore Mine EIS, was initiated in 2008 as part of the overall Schefferville Area Iron Ore Project.

Figure 1-1 Labrador Iron Mines Claims Holdings



Mining will be conducted in a sequential manner using conventional open pit mining methods. Once mined, the ore will be hauled to either the previously approved beneficiation plant at the Silver Yard or, pending approvals, to a new site under consideration at the Redmond 1 mine pit area, where crushing, washing, screening, and gravity separation will take place prior to loading onto rail cars. Direct rail ore (DRO) that does not require any beneficiation will be hauled to a loading area located near the proposed location of a 4 km rail siding, to be located within the existing right-of-way, and loaded on to rail cars for transport south to port. Overburden stripping material, waste rock material, and low grade ore material will be temporarily stockpiled in strategic locations near the open pits and away from any nearby watercourses. The overburden stockpiles would be used for future reclamation purposes. Waste rock piles may be placed back into the pits once mining is completed.

Mining will initially be conducted at an estimated daily production rate of less than 3,000 t/day per pit. As with the James and Redmond properties, minimal blasting is anticipated and no new explosives storage areas will be established as part of this project. Instead, blasting materials will be accessed from the explosive storage area currently in use for the existing nearby James mine. It is expected that mining will commence with three pits to maximize access to the ore. The production will initially start with mining one pit in Houston 1 area and two pits in Houston 2 area, pending exploration results from 2011 drilling campaign and engineering studies.This Project also includes the construction of the Houston-Redmond Haul Road (herein afterwards referred to as “haul road”) and a rail siding along the existing TSH main rail line. The proposed haul road is approximately 10km in length, and will connect the Project area at Houston to the historical Redmond mine area. The Redmond mine area was included in the Schefferville Area Iron Ore Mine EIS (August 2009). The proposed rail siding is expected to measure approximately 4 km and is expected to be located within the existing rail ROW. Temporary ore pile areas will be located near the intersection of the rail siding and the haul road in order to facilitate loading and transport.

Preliminary design informationindicates that minimal water crossings will be required for the development of access routes and, where water crossings are required, they can be constructed without placement of materials below the high water mark and with adequate clearance to provide appropriate clearance for canoes and small boats along the larger watercourse (the Gilling River). Larger crossings are expected to be clear-span structures, less than 30 metres in length and less than 20 metres in width. Smaller water crossings are expected to consist of open-bottom culverts with supports located above the highwater mark. The haul road will require a crossing at the existing TSH main rail line. For the proposed haul road, there are two options available and the final option will be selected in consideration of regulatory and community feedback.

Where required, borrow materials will be accessed either from existing quarries in the area, from benign waste rock sourced from the Redmond Mine area, or sourced from waste rock generated from the Houston area.

The operation will benefit from the presence of existing approved infrastructure, such as the railway line between Schefferville and Sept-Îles, roads, and infrastructure constructed as part of LIM’s previously approved Phase 1a project at the James and Redmond deposits (i.e., Schefferville Area Iron Ore Mine). No major improvements of the local roads or rail are anticipated. Minimal additional infrastructure to be developed is expected to include dewatering

wells, water management features (e.g., sediment control ponds, ditches), a haul road, a rail siding, and internal mine roads. It is anticipated that power requirements for the Houston Mine site will be supplied by diesel generators.

As with LIM's nearby existing Schefferville Area Iron Ore Mine project at the James and Redmond deposits, the final products to be produced from the Houston 1 and 2 areas will include lump and sinter fine ores for direct shipping to end users in Europe and/or Asia. As the deposit is a high-grade iron ore, no further processing will be conducted in Canada, aside from the proposed crushing and washing to be conducted in Labrador.

1.4 Regulatory Context

1.4.1 Environmental Assessment Process

The Houston 1 and 2 Project is subject to Registration pursuant to Part III of the Newfoundland and Labrador Regulations 54/03, *Environmental Assessment Regulations*, 2003, under the *Environmental Protection Act*, SNL 2002 Ce-14.2. Following a review of the registration document, the Minister makes a determination of the undertaking; it may be released; an Environmental Preview Report (EPR) may be required; or an Environmental Impact Statement (EIS) may be required. Based on current project design and initial consultations with federal regulatory agencies, no federal level triggers have been identified.

1.4.2 Environmental Authorizations

Following release from the provincial environmental assessment process, the Project will require various approvals, permits and authorizations prior to Project initiation. In addition, throughout Project construction and operation, compliance with various standards contained in federal and provincial legislation, regulations and guidelines will be required. LIM will also be required to comply with any other terms and conditions associated with the release. Table 1.1 summarizes potential permits, approvals and authorizations that may be required for the Project.

Table 1.1 Potential Permits, Approvals and Authorizations

Permit, Approval or Authorization Activity	Issuing Agency
Provincial	
• Release from environment assessment process	Department of Environment and Conservation (DOEC) – Environmental Assessment Division
• Permit to Occupy Crown Land	DOEC – Crown Lands Division
• Permit to Construct a Non-Domestic Well • Water Resources Real-Time Monitoring • Certificate of Environmental Approval to Alter a Body of Water, Schedule H: Other works within 15m of a body of water (site drainage, dewater pits, settling ponds) • Culvert Installation • Fording	DOEC – Water Resources Management Division

Table 1.1 Potential Permits, Approvals and Authorizations (continued)

Permit, Approval or Authorization Activity	Issuing Agency
Provincial	
• Certificate of Approval for Construction and Operation • Certificate of Approval for Generators • Approval of MMER Emergency Response Plan • Approval of Environmental Contingency Plan (Emergency Spill Response) • Approval of Environmental Protection Plan	DOEC – Pollution Prevention Division
• Permit to Control Nuisance Animals	DOEC – Wildlife Division
• Blasters Safety Certificate • Approval for Storage & Handling Gasoline and Associated Products • Temporary Fuel Cache • Fuel Tank Registration • Approval for Used Oil Storage Tank System (Oil/Water Separator) • National Building Code Fire, Life and Safety Program • Building Accessibility	Government Service Centre (GSC)
• Approval of Development Plan, Closure Plan, and Financial Security • Mining Lease • Surface Rights Lease	Department of Natural Resources (DNR) – Mineral Lands Division
• Operating Permit to Carry out an Industrial Operation During Forest Fire Season on Crown Land • Permit to Cut Crown Timber • Permit to Burn	DNR – Forest Resources
Federal (Not expected, however, shown for information purposes only)	
• *Authorization for Works Affecting Fish Habitat, or* • *Letter of Advice regarding Protection of Fish Habitat*	*Fisheries and Oceans Canada (DFO)*
• *Approval to interfere with navigation*	*Transport Canada*

1.5 Document Organization

The document is organized as follows:

Chapter 1 Identifies the Proponent, describes the nature of the undertaking, the environmental setting of the project, the regulatory context and environmental authorization.

Chapter 2 Describes the purpose, rationale and need for the undertaking as well as Project alternatives.

Chapter 3 Includes physical features of the Project; schedule for construction and implementation; details on operation and maintenance; and decommissioning information. The chapter concludes with a discussion of environmental management planning for the Project.

Chapter 4 Reiterates the overall project schedule.

Chapter 5 Discusses the funding sources for the Project.

Chapter 6 Describes the Community and Aboriginal Consultation that has been conducted to date by LIM, including a listing of issues identified, and where Impact Benefits Agreements or other agreements, such as Memoranda of Understanding have been reached.

Chapter 7 Describes the existing biophysical and socio-economic conditions of the study area, which serves to inform the issues scoping exercise and environmental assessment.

Chapter 8 Describes the scope and methods of the environmental assessment, including details on the issue scoping process and the issues and concerns raised during public consultation sessions and other scoping activities. The Valued Environmental Components (VECs) are identified.

Chapter 9 Discusses environmental effects assessment for each VEC, including fish and fish habitat, caribou, wildlife and habitat, employment and business, and communities, and addresses accidental events that could occur. Mitigation and monitoring requirements are discussed as well as significance of residual effects.

Chapter 10 Presents concluding statements regarding the anticipated environmental effects that may result from the Project, a summary of specific mitigation measures and monitoring and follow-up commitments.

Chapter 11 References and personal communications cited in the environmental assessment are provided.

2.0 PURPOSE AND ALTERNATIVES

2.1 Project Purpose and Rationale

The purpose of the Project is to satisfy market demand for high-grade direct shipping iron ore products. The continuation and expansion of LIM mining activity in the Houston 1 and 2 area, initiated with the successful Schefferville Area Iron Ore Mine projects nearby, will extend the positive economic stimulus to the economy of western and central Labrador. The Project will contribute to the long-term economic stability in the area.

2.2 Alternatives to the Undertaking

There are no alternatives to the proposed undertaking.

2.3 Alternatives within the Undertaking

2.3.1 Construction of Houston-Redmond Haul Road and Rail Siding

The construction of the Houston-Redmond haul road is required to connect the Houston 1 and 2 deposits to the Redmond 1 mine site. Two options for the routing of the haul road between these two areas are currently under evaluation, as shown in Figure 2-1 (Alternative Routes A and B). All options will require the placement of a clear span-type bridge across the Gilling River, however, the maximum length of this bridge would be less than 30 metres and the maximum width would be less than 20 metres. The clearspan bridge would be constructed outside of the highwater mark and with sufficient clearance to provide access to canoes and small boats. Therefore, potential impacts to fish habitat and navigation of the river by small watercraft are not expected.

The two main haul road options both consider crossing the Gilling River at one of its most narrow locations using a clearspan “Mabey/Bailey”-type panel bridge that will be constructed without having to do any in-stream work. The proposed bridge will have a double layer of timber deck with geotextile sandwiched in between to reduce the potential for debris falling from the bridge into the river. The bridge will be less than 30 metres in length, less than 20 meters in width and will provide a minimum clearance of 1.5m above the water level to permit navigation by small boat or canoe. Conceptual cross-sections are presented in Figure 2-2.

Smaller watercourses in the area are not traditionally used for navigation and will be bridged by use of an open-bottom culvert type structure or structural steel plate arches that can span the river with concrete footings used on each side of the river to support the steel arch (as shown in Figure 2-3). Fish habitat will not be disturbed or altered. Prior to the selection of the preferred haul road route and siding location, an options evaluation program will be completed. Additional assessment of preferred options will be conducted in consultation with communities and in consideration of environmental, traditional environmental knowledge, engineering and best management practices.

There are currently two options for a proposed rail siding, to be located within the existing TSH Right of Way, under consideration (Options A and B) and the final location will be selected pending selection of the preferred haul route option.

2.3.2 Beneficiation Site

Iron ore production from the Houston 1 and 2 deposits will be beneficiated at one of two areas, either the currently approved Silver Yard Beneficiation area or the proposed Redmond Beneficiation Area, which is located in the previously disturbed historical Redmond mine area, included as part of the previously EA-released and permitted Schefferville Area Iron Ore Mine (August 2009). The selection of the preferred option will be conducted upon the completion of the beneficiation options evaluations study.

Figure 2-1 Houston Haul Road and Rail Siding Options

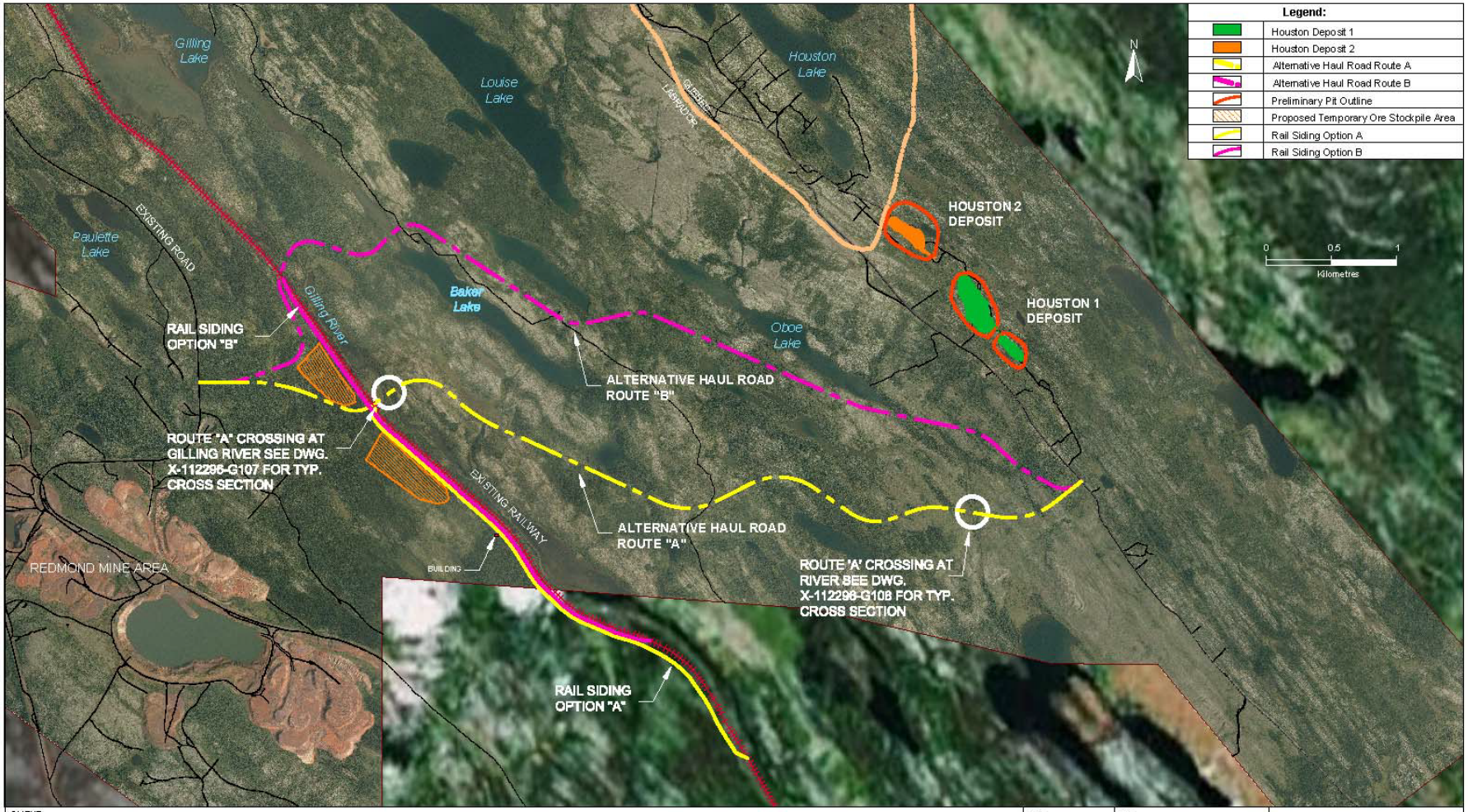


Figure 2-2 Houston Haul Road Conceptual Water Crossing - Gilling River Bridge Cross Section

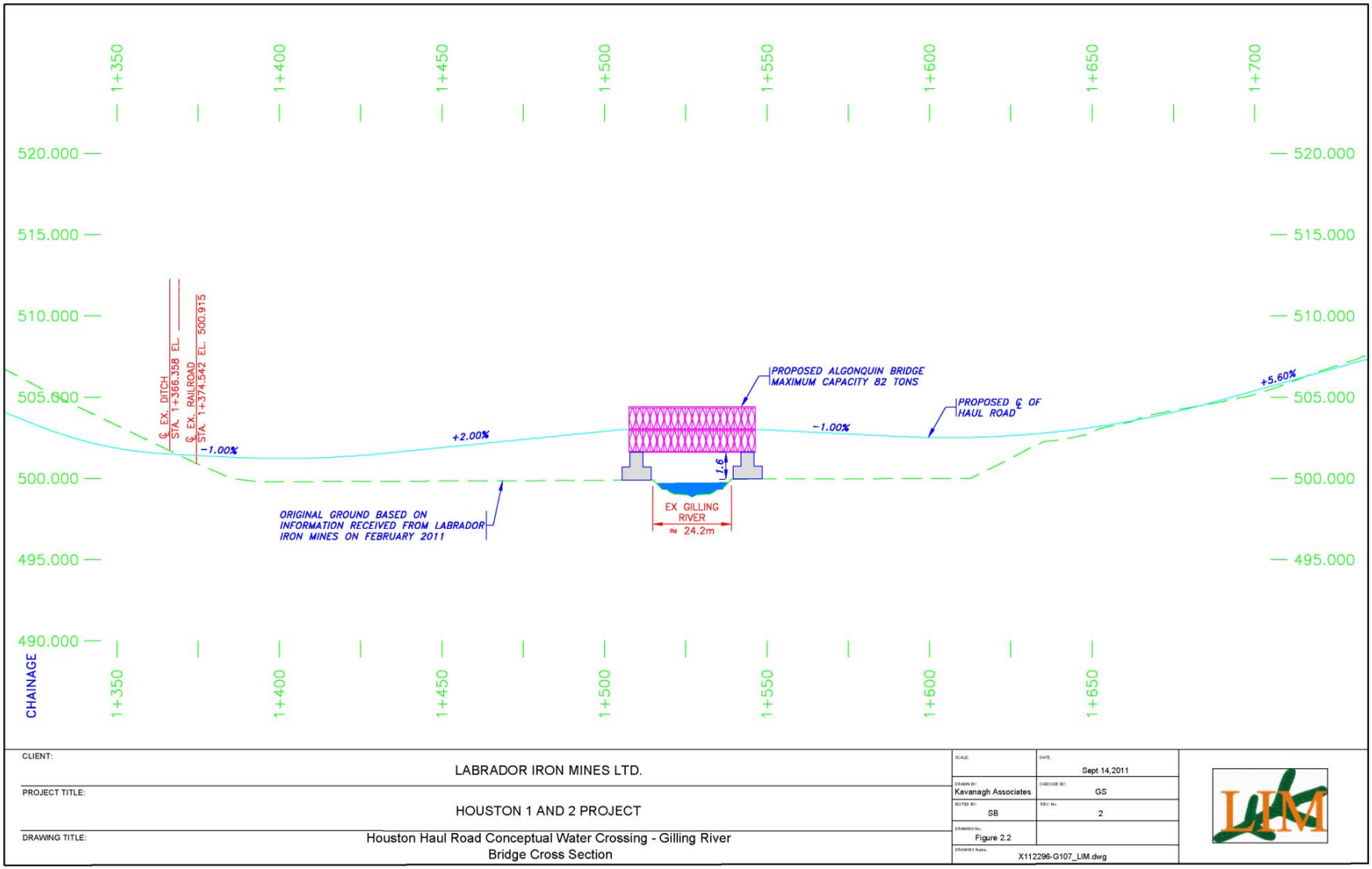
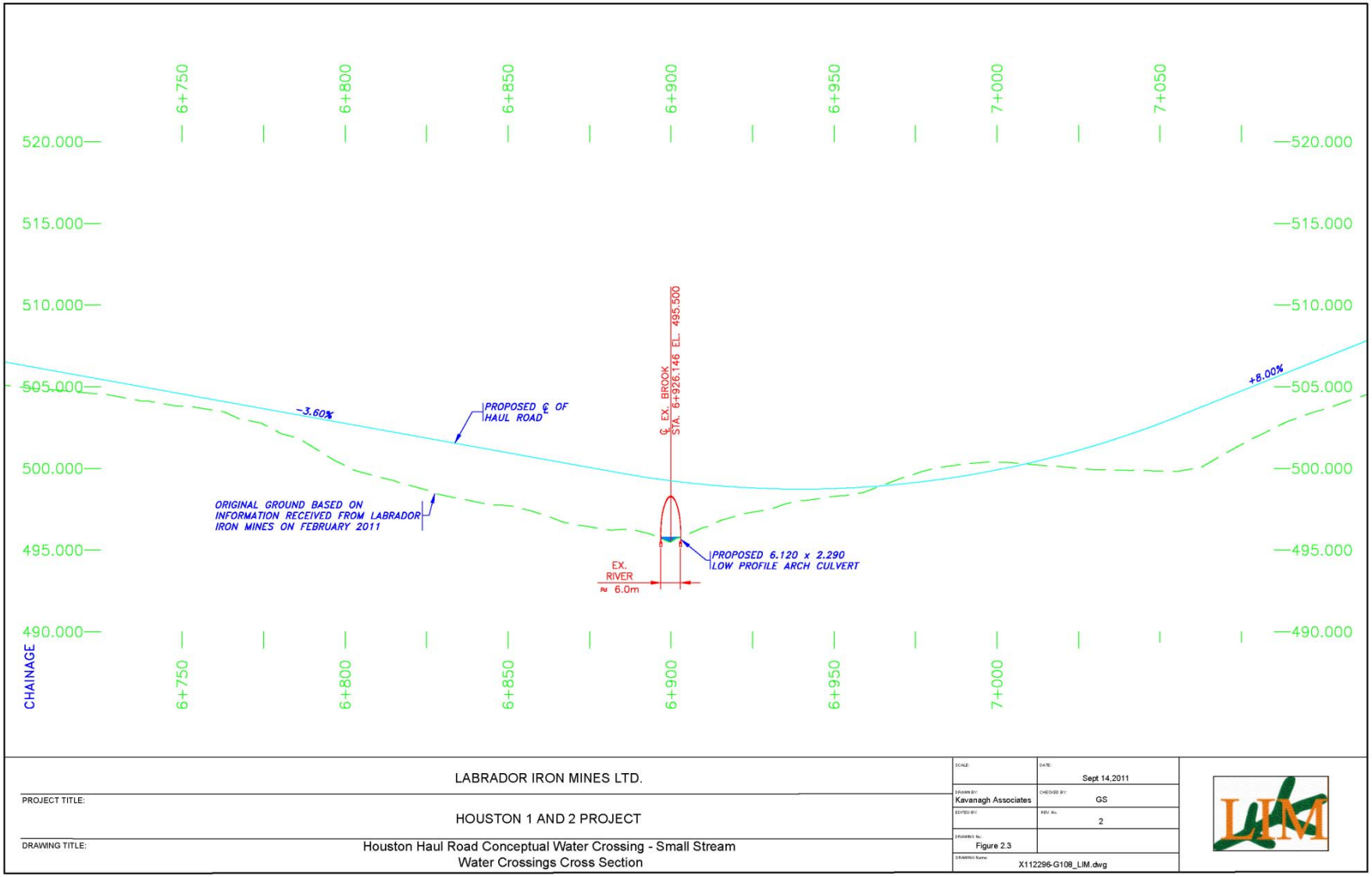


Figure 2-3 Houston Haul Road Conceptual Water Crossing -Small Stream Water Crossings Cross Section



3.0 DESCRIPTION OF THE UNDERTAKING

3.1 Previously Registered Undertakings

Dating back to 2005, LIM initiated ongoing environmental baseline data collection programs in the Schefferville project area, including programs in traditional environmental knowledge, heritage and archaeological resources, wildlife, avifauna, fish and fish habitat, air quality, noise and vibration, acid rock drainage (ARD) potential, surface and groundwater quality and geochemistry. This information formed the basis of the Schefferville Area Iron Ore Mine Project Registration Document (also known as the Schefferville Area Iron Ore Mines), formally submitted to the Newfoundland and Labrador Department of Environment and Conservation (NL DOEC) by LIM in April 2008, as well as the revised Environmental Impact Statement (EIS) submitted to NL DOEC in August, 2009.

In November 2009, LIM was advised by the NL Minister of Environment and Conservation that the EIS complied with the *Environmental Protection Act* and required no further work under the Provincial environmental assessment process. On February 12, 2010, LIM was informed that, under authority of Section 67(3)(a) of the *Environmental Protection Act*, the Lieutenant Governor in Council released the Schefferville Area Iron Ore Mine Project (James and Redmond deposits and Silver Yards processing site) from further environmental assessment.

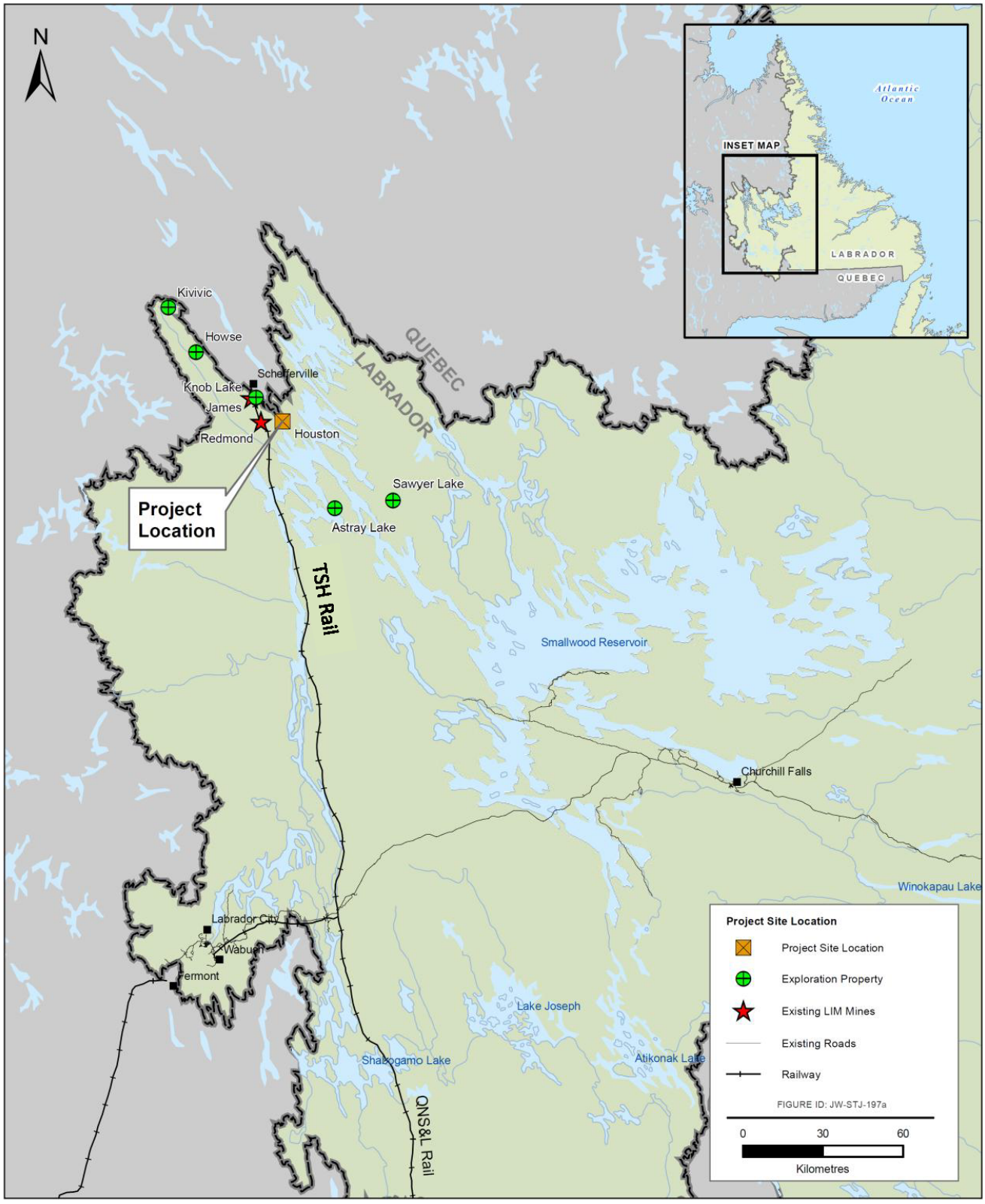
Upon release from the environmental assessment processes, LIM initiated the submission of related construction and operation permit applications to various regulatory agencies. All major approvals to construct and operate the James and Redmond Mines, as well as associated infrastructure, were received by August 2010 and mine construction was initiated in September 2010. The first phase of the beneficiation and processing plant has been constructed at the Silver Yards site and is operational.

The James North and South pit areas and the Silver Yards processing site are now fully operational and shipments of iron ore have been transported offsite to market.Full scale mining operations are conducted on an annual basis and beneficiation is conducted on a seasonal basis, from approximately April to November of each year.

3.2 Geographic Location

The Houston Project area is located in Labrador, at a distance of approximately 10 km from LIM's approved Schefferville Area Iron Ore Mine project and 20km southeast from the town of Schefferville. The general location of LIM's claims holdings is shown in Figure 3-1. The relative location of the properties is shown in Figure 3-1, together with the location of the LIM's beneficiation area and the local community of Schefferville.

Figure 3-1 Project Location



The Houston 1 and 2 Project Area is located in the Schefferville region, situated at the southern edge of the forest tundra (Hustich 1949; Hare 1950; Waterway et al. 1984). The Project Area has been subject to surface disturbance associated with historical IOC activities. Where not disturbed, the Project area contains varied land classes from exposed tundra/exposed bedrock with lichen and very scattered trees and shrubs to low wetland areas (including bogs). Intermediate land classes consist of varied forest types with spruce-moss and spruce-lichen predominating although merchantable timber was not noted. Observed canopy closure for all forest sites ranged from 0 to 80 percent, with most in the range of 30 to 60 percent.

The terrain is comprised of parallel ridges and valleys trending northwest to southeast, is thinly forested, with bare rock exposures and moose barrens.

3.3 Project Description

LIM proposes to advance the Houston Mine Project in a number of Phases. The Houston 1 and 2 deposit development will follow the Schefferville Area Iron Ore Mines and will benefit from much of the approved and exising infrastructure developed for that project. It is expected that the first phase will involve the development and production from the Houston 1 and 2 deposits.

Development of the Houston 1 and 2 deposits will require construction of an approximately 10km haul road from the Houston area to connect with the Silver Yards-Redmond road and the old Redmond 1 mine site as well as the establishment of a 4 km rail siding within the existing ROW to facilitate loading of ore.

Major features of the anticipated Houston 1 and 2 Mine Project include:

- All development will be located within Labrador in a region of historical IOC activity;
- Nearby existing and permitted infrastructure, including the Silver Yard laboratory, beneficiation area, maintenance shed and warehouse facilities, Menihek road, and the Bean Lake accommodation camp will be used to service the Houston Mine Project, as required;
- Mining will be carried out using conventional open truck and shovel pit mining methods, employing drilling and blasting operations, as required;
- Additional small excavations that may be required may include side-hill cuts associated with the construction and maintenance of access roads, mine haulage roads, sumps and settling ponds;
- Where required, borrow materials will be accessed either from existing quarries in the area, from benign waste rock sourced from the Redmond Mine area, or sourced from waste rock generated from the Houston area;
- As demonstrated at the James mine area, minimal explosives use is expected and, as such, no new explosives storage areas are planned for the Houston project. Instead, the Houston project will access any required explosives from the storage areas used by the currently permitted James mine.and,

- A 10km haul road to be constructed between the Houston and Redmond areas which will require the placement of a clearspan-type bridge above Gillings River and smaller bottomless-type culverts across the smaller watercourse crossings. No work will be conducted below the high water mark and adequate clearance will be provided at the Gillings River crossing for small watercraft. A haul road options evaluation program is being completed to select the preferred route alignment.
- The establishment of an approximately 4 km long rail siding along the existing TSH main line, near its intersection with the proposed haul road. Currently, two options for locating the siding (Siding Option A and Option B) are proposed and will be finalized upon selection of the preferred harul road option. Temporary ore stockpiles will be established at this location to facilitate ore loading.

3.3.1 Construction Phase

The Houston 1 and 2 Mine development (Project Area) will benefit from the presence of extensive and approved infrastructure in the area. Iron ore production from the Project Area will be beneficiated at one of two areas, either the currently approved Silver Yard Beneficiation area or the proposed Redmond Beneficiation Area, which is located in a disturbed area that was previously included in the approved EA for the Schefferville Area Iron Ore Mine (August 2009). The selection of the preferred option will be conducted upon the completion of the beneficiation options evaluations study.

The primary construction activity for the development of the open-pit mines at the Project area will include:

- Clearing the area of trees and brush;
- Grubbing the footprints of the open pits, haul roads, service roads, waste disposal areas, stockpile areas, laydown areas, and water management features, and stockpiling overburden material;
- The mine construction will not impact areas of fish habitat;
- Excavation and construction for the water management features (example ditches and sediment control ponds); and
- Construction of the haul road, internal mine service roads and rail siding;

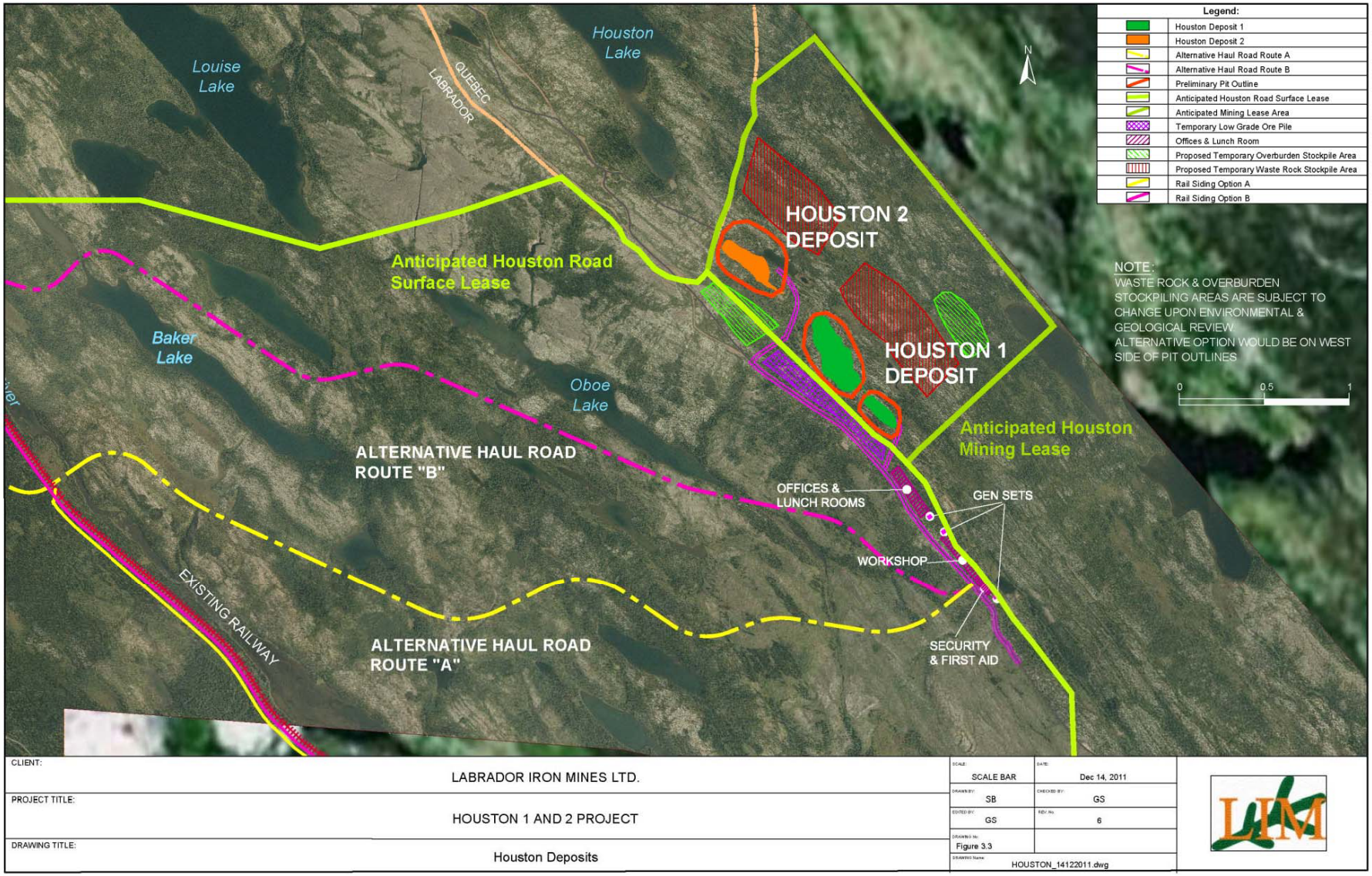
The construction period is expected to be relatively short, probably within a period of three months. Pending the completion of the regulatory and approvals process, LIM anticipates that this work will be completed by the fourth quarter of 2012. The proposed locations of the overburden stockpile area and temporary waste rock stockpiles as well as the preliminary pit outlines at the Houston 1 and 2 mine area are shown in Figure 3-2.

3.3.1.1 Site Facilities

3.3.1.1.1 Supporting Infrastructure

It is not anticipated that any permanent structures will be erected for the mining operations at the Project site. A workshop and warehouse may be established, as well as a portable office which will include services such as washrooms and a first aid room. All of the buildings are expected to be pre-fabricated modular units, i.e. trailers, and will be removed upon completion of operations. General services and infrastructures will be shared with the contractor.

Figure 3-2 Houston Deposits



3.3.1.1.2 Laboratory

The existing LIM laboratory at the Silver Yards area will be used for the Project. An onsite laboratory will not be established at the Project Area.

3.3.1.1.3 Explosives Storage and Mixing Facilities

Mechanical methods will be used, where possible, to break up the rock but this may also require the use of explosives. No new explosives storage facilities are planned for the Houston project. It is currently planned that the existing explosives storage at the James Mine area will be used to source any blasting materials and blasting activities will follow all provincial regulations, including the *Occupational Health and Safety Regulation*, under the *Newfoundland and Labrador Occupational Health and Safety Act 1165* and the *Mine Safety of Workers under Newfoundland and Labrador Regulation 1145/96*.

3.3.1.1.4 Lighting

All buildings will include sufficient perimeter lighting with outdoor fixtures. Exterior lighting will be timer or photocell-controlled. Lighting will also be provided at doorways and overhead doors. Portable lighting plants and lights on mobile equipment will be used within the pit areas to illuminate working areas.

3.3.1.1.5 Camp

The existing camp accommodations at LIM's Bean Lake site will be used for workers.

3.3.1.1.6 Water Use

Initially, it is anticipated that potable water will be tanked to the site and/or bottled water will be transported to the Project. It is also recognized that existing ground water testing has shown that the water may be of suitable quality upon completion of well development and so it is possible that groundwater may be considered at some point in the future. If so, testing and use of groundwater for potable water use will be taken in accordance with applicable regulations and permit requirements. Testing of the potable water quality will be conducted regularly in accordance with provincial requirements. Portable toilets will be installed and emptied on a regular basis.

3.3.1.1.7 Domestic and Solid Waste Disposal

There is no on-site landfill proposed for the Project. In accordance with the existing LIM Schefferville Area Iron Ore Mine approved Waste Management Plan (Appendix E), it is planned that garbage and litter will be collected on-site and delivered to an experienced Labrador-based contractor and placed in a landfill facility in Labrador West, in accordance with applicable regulations. Any food or organic garbage onsite will be held in animal-proof containers to prevent attracting bear, birds, and other wildlife.

No wastes will be deposited in or near watercourses or wetlands. A recycling program is being considered for the area and LIM will support and participate in this initiative, where possible.

3.3.1.1.8 Hazardous Waste

It is not expected that the mine will generate large quantities of hazardous waste. Should any hazardous wastes be generated, they will be stored, transported, and disposed of according to Federal and Provincial waste disposal regulations.

Discarded tires will be handled according to the requirements of the provincial tire recycling program established by the *Waste Management Regulations* and used oil will be collected for recycling or reuse according to the *Used Oil Control Regulations*. In addition, any scrap metals will be taken to a scrap metal recycling operation.

3.3.1.1.9 Power Supply

It is anticipated that power requirement for the Houston Mine site will be supplied by diesel generators.

3.3.1.1.10 Roads, Rail Siding and Water Crossings

There are no roads connecting the area to southern Labrador. Access to the area is by rail from Sept-Îles to Schefferville or by air from Montreal, Sept-Îles or Wabush to the Schefferville airport.

Primary access to the Houston 1 and 2 deposits will be by a new haul road to be developed between Houston 1 and 2 and the Redmond area. The proposed Houston-Redmond haul road is approximately 10km long. Although there are existing roads from the community of Schefferville to the Project area, these roads will be avoided for ore transport to reduce potential impacts on the local community. A rail siding is also proposed to be established alongside the existing TSH main line ROW, near its intersection with the proposed haul road, to facilitate rail transport of the ore and reduce truck-related transport. There are currently two options corresponding to the two haul road options (Options A and B), and the siding location option will be selected once the haul road route option is finalized.

This area currently has several bush roads, used for historical exploration and, where possible, these exploration roads will be incorporated into the haul road construction to reduce the Project footprint. A clear-span-type bridge is proposed for the crossing at the Gilling River and will reduce the need to place any structures below the high water mark of the watercourse. It will be less than 30 metres in length and 20 metres in width. The bridge could be removed upon completion of mining activities in the area, pending regulatory review and further community discussions. Smaller water courses will be crossed using a bottomless culvert or other similar structure, and will also be constructed outside of the high water mark to avoid any potential interactions with fish habitat.

Extensive environmental baseline data has been collected road and rail siding areas, including water course crossings, and this information, in combination with community consultation and incorporation of traditional environmental knowledge, will be used to evaluate the preferred road

option. There are currently two proposed road alignment options (Alternative Routes A and B) as outlined later in this section.

The haul road will be designed and built to permit the safe travel of all of the vehicles in regular service and will follow Section 27 of the *Mines Safety of Workers Regulations*.

Internal mine roads will be engineered and built to permit the safe travel of all vehicles and in accordance with provincial regulations (CNLR 1145/96). These roads will be limited to only mine personnel within the pits.

3.3.1.2 Environmental Protection Procedures during Construction

Monitoring will be conducted during all phases of the work program from construction to closure. Environmental data collection will be conducted to support the requirements for environmental protection. LIM's nearby Schefferville Area Iron Ore Mine currently has an approved Environmental Protection Plan (EPP), including emergency spill response and contingency programs, in place and it is expected that this document will be reviewed and redrafted for use at the Houston 1 and 2 Mine. A copy of this document is presented in Appendix A.

3.3.1.3 Employment and Occupations During Construction

Occupations required during the construction phase are provided in Table 3.1. Certain management positions will be required throughout construction and may overlap with positions at LIM's existing operating mines at the James and Redmond Properties and may only be required on-site for limited periods of time.

As demonstrated at the existing approved Schefferville Area Iron Ore Mine, LIM is committed to the creation and implementation of employment equity practices to help achieve maximum employment and training benefits for the region, including the recruitment, training, and advancement of qualified visible minorities and women, and, as such, will prepare and implement a Women's Employment Plan in association with the development and operation of the Project. LIM is also committed to ensuring maximum benefit to Newfoundlanders and Labradorians who reside nearest the resources.

Table 3.1 Occupations Required During Construction

National Occupational Classification	Number	Position Description
0711	1	Site Manager
0721	1	Lead Foreman
2254	1	Surveyor
7421	2	Equipment Operator - Heavy
7421	2	Equipment Operator – Light
7411	3	Truck Driver
7611	2	Labourer – Specialised
7612	2	Labourer
Total Construction Employment	**14**	

3.3.2 Operation Phase

LIM will perform all mine planning and resource/grade control with its own personnel. All mining operations will be by conventional open pit mining methods. Longitudinal and transverse conceptual pit cross-sections for Houston 1 and 2 are shown in Figure 3-3 and Figure 3-4. The anticipated surface required for the Project is shown in Figure 3-5.

Figure 3-3 Conceptual Pit Cross-Section – Longitudinal

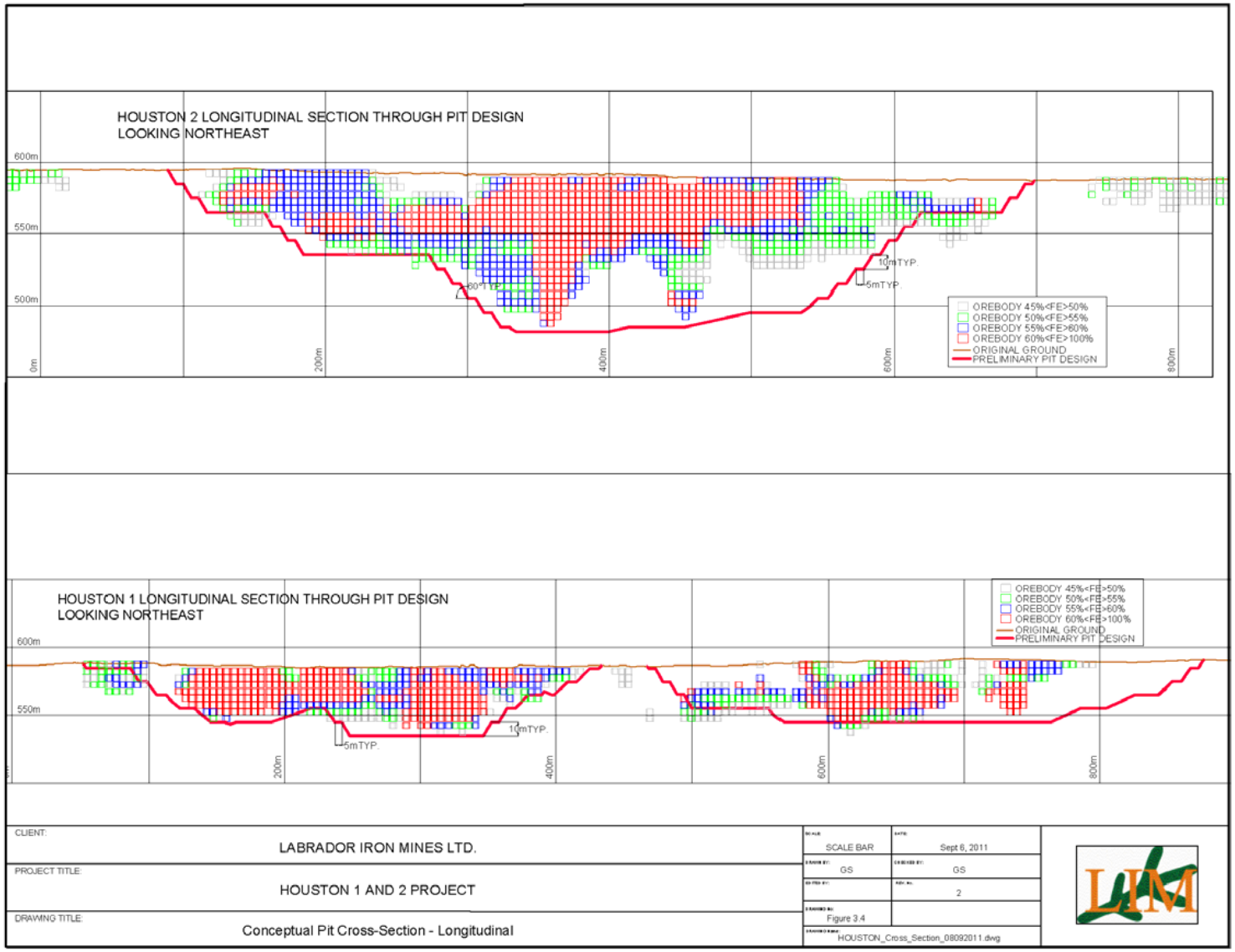


Figure 3-4 Conceptual Pit Cross-Section – Transverse

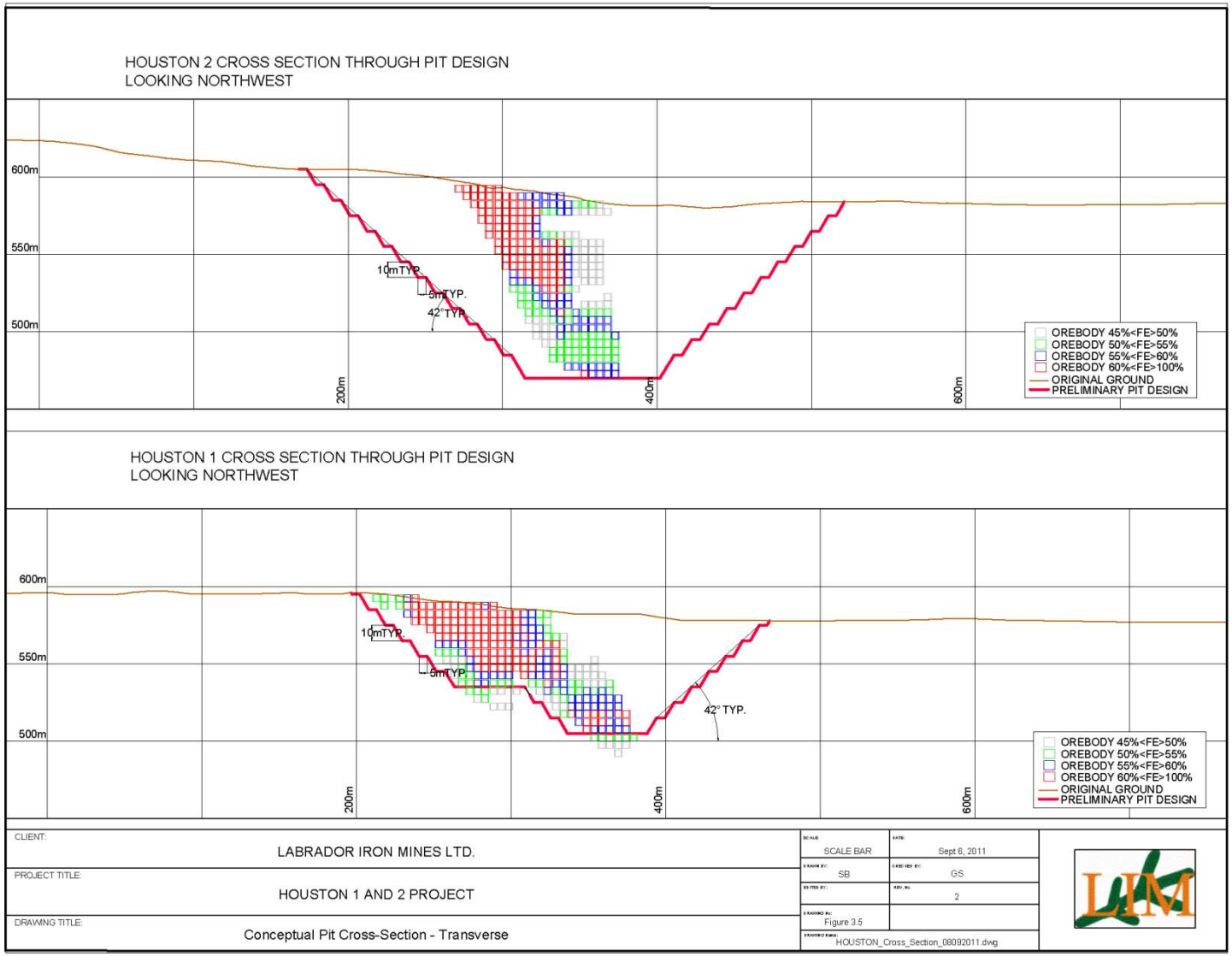
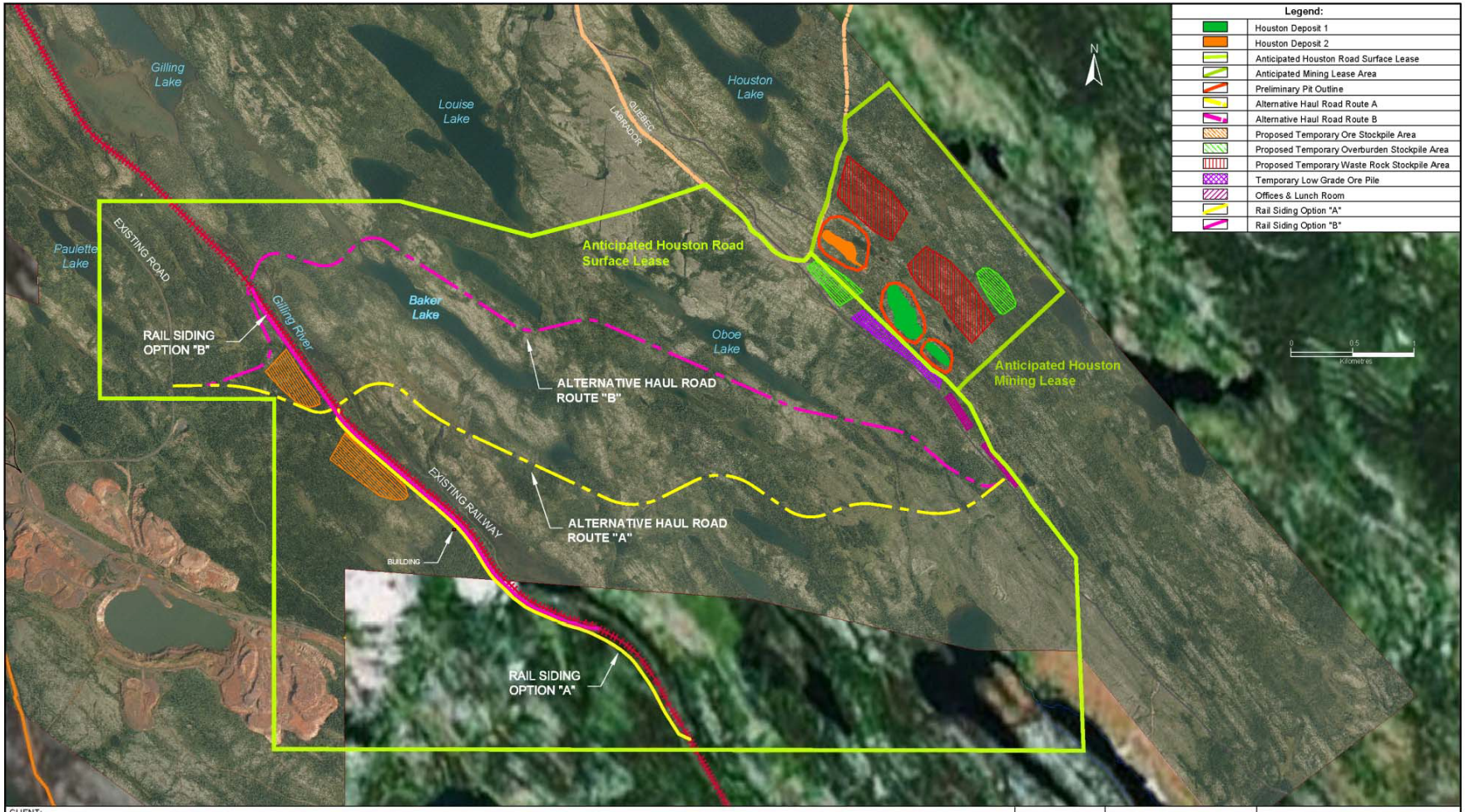


Figure 3-5 Anticipated Houston 1 and 2 Surface Lease



LIM will drill, blast, load and haul ore, waste rock and topsoil to the designated locations. The waste will be hauled to the specific waste dump sites. Upon completion of mining, temporary waste stockpiles may be placed back into the pits from which they originated. Temporary ore stockpiles will also be placed near the rail siding to facilitate loading. Some waste rock may be used for construction of the proposed haul road.

Mining will be conducted year-round and beneficiation will be conducted seasonally, from approximately April to November each year.

3.3.2.1 Maintenance during Operation

Vehicle maintenance will be conducted at the existing approved and permitted LIM facilities, developed as part of the James and Redmond mines (Schefferville Area Iron Ore Mine).

3.3.2.2 Environmental Protection during Operation

Monitoring will be conducted during all phases of the work program from construction to closure.

LIM's nearby Schefferville Area Iron Ore Mine currently has an approved Environmental Protection Plan (EPP), including emergency spill response and contingency programs, in place and it is expected that this document will be updated for use at the Houston 1 and 2 Mine. A copy of this document is presented in Appendix A.

3.3.2.3 Employment and Occupations during Operation

LIM plans to conduct all of the mining operations for the Houston Project – pre-stripping, stockpiling of overburden rock and low-grade ore. LIM currently plans to contract out all transportation services including ore haulage, waste haulage, including service and maintenance of transportation equipment.

The company estimates that approximately 32 full-time direct or sub-contract positions will be created when the mine is in operation. The number of positions may change based on the equipment size selected for mining.

The categories of such permanent positions including contractors, as per the National Occupational Classification are listed below in Table 3.2.

As demonstrated at its nearby approved Schefferville Area Iron Ore Mines (James and Redmond mine areas), LIM is committed to the creation and implementation of employment equity practices to help achieve maximum employment and training benefits for the region, including the recruitment, training, and advancement of qualified visible minorities and women.

Table 3.2 Occupations Required During Operation

National Occupational Classification	Number	Description
1221	1	Administration Officer
1411	1	General Office Clerk
1475	1	Dispatcher/Radio Operator
2113	1	Geologist
2148	1	Professional Engineer
2154	1	Land Surveyor
2212	2	Geological Technologist and Technician
6651	2	Security Guard
7372	2	Driller, Blaster (Surface Mining)
7411	8	Truck Driver
7421	8	Heavy Equipment Operator
8221	2	Supervisor – Mining and Quarrying
8614	2	Mine Labourer
Total Operation Employment	**32**	

3.3.3 Decommissioning/Post-Decommissioning and Reclamation Phase

A Development Plan will be submitted prior to operation to the satisfaction of the Minister, an operational plan will be submitted annually, and a Rehabilitation and Closure Plan will be submitted to provincial Mines Branch before the Project commences. Financial assurance in accordance with applicable regulations will be established, if required.

Progressive rehabilitation will be integrated into mine operations to allow an economical and environmentally effective method of reducing disturbance and potential pollution. At the conclusion of operations, the full plan will be implemented to the satisfaction of the appropriate regulators.

Each mine site will be closed after depletion of mineable reserves and restored according to the approved Rehabilitation and Closure Plan. The aim is to carry out the final closures in a manner that reduces the requirements for long-term monitoring. The rehabilitation measures as established in the rehabilitation and closure plans are to be started as early as practical during the operating mine life, leaving the final closure activities to a minimum.

3.3.4 Potential Accidental Events

LIM is committed to the early identification of potential risks and hazards and addressing these before issues can occur. LIM demonstrates this approach everyday at the nearby Schefferville Area Iron Ore operations through the implementation of Environmental Protection and monitoring programs and Emergency Response Plans.

It is noted that the proper planning, environmental management and monitoring will reduce the potential for such incidents to occur; however, for the purposes of hazard assessment, LIM is aware of the potential for the following accidental events:

- sedimentation events due to slope failure, flooding,
- pollution from vehicular accidents, spills, and
- fire.

LIM has created comprehensive Environmental Protection Plans, Environmental and Emergency Response Plans and training programs to avert the occurrence of such incidents and has proven its ability to manage mine sites in the area in an environmentally sustainable manner through its example at the Schefferville Area Iron Ore mines area. As detailed in Section 3.7, Project-specific Environmental Protection Plans and Environmental monitoring will be implemented to minimize likelihood and significance of any accidents and malfunctions.

A copy of LIM's H&S Policy is presented as follows:

LABRADOR IRON MINES
LIMITED

HEALTH & SAFETY POLICY

Labrador Iron Mines Limited (LIM) and its management are committed to conducting operations in a professional manner in pursuit of excellence in business practices and in compliance with all applicable health and safety legislation. LIM has adopted a Health and Safety Policy to express its commitment to its own and its contractor workforce. During operations LIM is further committed to conducting its operations in a manner that delivers maximum health and safety protection of workers as well as the general public.

In support of excellent business practices, LIM will provide positive avenues for dialogue, communication and training and will work in cooperation with employee representatives from health and safety committees, supervisory personnel, workers and contractors to ensure proper understanding and competency to safely and efficiently perform the work assigned. LIM will further work in cooperation with government representatives and regulatory agencies on all matters related to health and safety compliance.

Routine monitoring and reporting of health and safety performance will form a key part of LIM stewardship and management systems. Where appropriate and necessary LIM will take proactive corrective action to ensure health and safety objectives are attained in support of the overall corporate plan and related regulatory obligations.

LIM will include health and safety performance as an important factor of its management and employee review process and will provide training, resources and staffing so that all employees, contractors and suppliers understand, and are able to conduct their work, in accordance with this Health and Safety Policy.

All LIM executives and their employees and contractors will fulfil their duties and exercise their individual and collective responsibilities in a manner that supports defined health and safety goals and clearly demonstrates compliance with LIM policies, procedures, applicable laws, regulations and industry standards.

John Kearney
Chairman & CEO

Bill Hooley
President & COO

3.4 Potential Effects of the Environment on the Project

LIM demonstrates a daily commitment to the protection of the environment through its sustainable mining practices being conducted at the Schefferville Area Iron Ore Mine. This approach will be implemented at the Houston 1 and 2 deposit area, however, for assessment purposes, the range of potential effects on the Project due to the physical environment can range from minor facility improvement to catastrophic failure. A significant effect of the environment on the Project would be one that results in:

- A substantial delay in construction (e.g., more than one season);
- A long-term interruption in mining operations;
- Damage to infrastructure that compromises public safety; or
- Damage to infrastructure that would not be economically and technically feasible to repair.

The primary mitigation tool to avoid a significant effect of the environment on the Project is the use of sound planning. All engineering design will be done to National and Provincial standards. These standards document the proper engineering design for site-specific extreme physical environmental conditions and provide design criteria, which the federal government considers satisfactory to withstand potential physical environmental conditions.

Based on a climate change analysis conducted for the Schefferville Mine EIS which followed guidance issued by Canadian Environmental Assessment Agency (CEAA 2003), all components of this Project will be designed to avoid any adverse affect to the public or the environment due to the predicted future climate. The Project will be designed and built to safely withstand current climatic conditions in accordance with building codes and standard good practice. All materials specified for this Project will be in compliance with applicable building codes for anticipated temperatures, winds and precipitation levels and as such will maintain the integrity and ductility to function as they were designed. All components of the mine will also be designed to support the structural loadings created by extreme snow and ice events. All erosion and sediment control measures for the mine will be designed to handle extreme participation and sudden snow melt. In particular, settling ponds should be designed with consideration for the predicted increase in extreme precipitation events and overall increase in precipitation.

A site specific weather station was established at the Houston area in 2008 and data from this station, as well as from the nearby Schefferville Airport, have been collected and analysed during this period. Weather forecasts will continue to be monitored during mine construction and operations. If extreme weather conditions in any way compromise a safe operation, accident prevention measures will be taken, including the temporary suspension of operations, as required. Prior to and following extreme precipitation events, all erosion and sediment control structures will be inspected to ensure integrity. Permafrost has not been identified in the Project Area and, therefore the Houston 1 and 2 development is not expected to affect, nor be affected by, permafrost.

The mitigative strategies described above can adequately address potential effects of the environment on the Project such that there will not be a significant adverse effect of the environment on the Project.

3.5 Emissions and Waste Management

3.5.1 Effluent

LIM is committed to environmental protection and monitoring during all phases of the mine development. However, for assessment purposes, there is potential for precipitation infiltration and site drainage during construction to result in run-off water containing suspended solids. To mitigate this, stockpile construction and mine design will incorporate standard prevention strategies for control and treatment of the suspended solids, as required (e.g., ditch blocks, filter cloths, settling ponds).

Storage and management/disposal of sanitary wastewater and greywater will be conducted in accordance with applicable legislation.

Onsite storage of small quantities of hydraulic oils and other materials may be required for limited mine vehicle/equipment maintenance. In addition, diesel storage associated with local or emergency back-up power generation will be required. Petroleum/oil/lubricant (POL) transport, storage, use and disposal will be conducted in accordance with applicable legislation and workers involved in these activities will be trained in the appropriate Environmental, Health & Safety (EHS) approach to working with these materials. Spill kits will be available at key locations on site and workers will be trained in their use and other emergency response procedures. Any required fuel storage would be constructed and operated in accordance with applicable regulations and secondary containment methods, including the use of double-walled tanks and berms to 110 percent of total volume, where appropriate.

3.5.2 Waste Rock, Overburden and Reject Rock Fines

The waste rock disposal plan for the Houston mining area includes an option of temporarily storing the waste rock at the Houston pit areas and then subsequently placing this material back into the mined-out pits upon completion of mining in the area. Should in-pit disposal not be possible, appropriate storage locations will be selected. Waste rock may also be sourced for construction projects, including the haul road, pending confirmation of the preferred routing. Permanent waste rock and overburden materials will be stockpiled and contoured in a manner that conforms to provincial guidelines and regulations. Where applicable, waste rock storage areas will be built up in lifts to limit the overall dumping height. The stockpiled materials will be managed to limit the possibility of suspended solids being introduced into site drainage or adjacent waterbodies. Overburden will be used during site reclamation to support re-vegetation.

3.5.3 Garbage and Litter

There is no on-site landfill proposed for the Project. In accordance with the approved Waste Management Plan for LIM's nearby Schefferville Area Iron Ore Mine (Appendix E), it is planned that garbage and litter will be collected on-site and delivered to an experienced Labrador-based

contractor and placed in a landfill facility in Labrador West, in accordance with applicable regulations and with the approval of the operator of the landfill. Any food or organic garbage onsite will be held in animal-proof containers to prevent attracting bear, birds, and other wildlife. No wastes will be deposited in or near watercourses or wetlands. A recycling program is being considered for the area and LIM will support and participate in this initiative, where possible.

3.5.4 Hazardous Waste Management

It is not expected that the development of these pits will generate large quantities of hazardous waste. However, should any hazardous wastes be generated, they will be stored, transported, and disposed of according to federal and provincial regulations. Licensed contractors, located in Schefferville and experienced in the management and transportation of these types of waste to an approved facility, have indicated availability to offer this service to LIM operations, if needed. LIM will require contractors to follow provincial waste diversion regulations or policies, including provincial programs for beverage containers, tires and waste oil and other petroleum waste products.

Discarded tires will be handled according to the requirements of the provincial tire recycling program established by the *Waste Management Regulations* and used oil will be collected for recycling or reuse according to the *Used Oil Control Regulations*. In addition, any scrap metals will be taken to a scrap metal recycling operation.

3.5.5 Air Emissions

Most roads are unpaved and experience in the area from the start of exploration activities in 2005, as well as information gathered through baseline air monitoring work and consultation with members of the local Schefferville community, indicates that the existing unpaved roadways can be dusty in the summer months, therefore appropriate dust reduction strategies, including water spray, will be conducted and an appropriate method will be selected to control airborne dust, when required. All on-site vehicles and fuel–powered equipment will have all required emissions control equipment and will be maintained in good working order.

3.5.6 Noise

Noise is not expected to represent an issue, as the Project areas are distant from the nearest communities and the road access and rail connections already exist. Proper noise suppression equipment during operation will be maintained in good working order on all vehicles and equipment.

3.5.7 Blasting

As observed at the existing nearby approved Schefferville Area Iron Ore mines, minimal blasting is required in the unique geology of the region. It is currently planned for the Houston 1 and 2 development to not have its own separate explosives storage facility, and to benefit from the blasting and explosives storage being used for the nearby James and Redmond mines.

3.6 Monitoring

Monitoring will be conducted during all phases of the work program from construction to closure. Several monitoring studies already initiated for the nearby approved Schefferville Area Mine Project, including, but not limited to air quality monitoring, caribou and wildlife monitoring, avifauna monitoring, groundwater and surface water quality monitoring, Real Time Water Monitoring and traditional environmental knowledge (TEK) consultation, are anticipated to be expanded to include the Houston properties, as applicable.

LIM has in place, an approved Caribou monitoring and mitigation strategy and, through monitoring and ongoing data collection, LIM will continue to enhance the understanding of caribou activities in the Project area. LIM will comply with the approved Caribou Mitigation Strategy, developed during the Schefferville Area Iron Ore mine EIS, and may also update this plan to provide consideration of the absence of woodland caribou in the area. In accordance with this Plan, LIM will implement an advisory to mine management staff should any herd enter the Assessment Area. Caribou movements, and LIM observations and actions, implemented will be recorded and communicated to the Wildlife Division.

3.7 Environmental Protection Plan

LIM has an existing approved Environmental Protection Plan program (EPP) for the existing nearby Schefferville Area Iron Ore Mine program and undertakes EPP orientation onsite with all new staff. As demonstrated at LIM's existing approved James and Redmond mine sites, environmental protection procedures and measures will be implemented for all stages of the Project. The environmental protection measures summarized below will provide the basis for environmental planning and design of the various physical aspects and environmental characteristics of the Project. Detailed environmental protection procedures are described in the Environmental Protection Plan (EPP) which will be developed prior to commencement of construction for the Project.

Table 3.3 presents a revised table of contents for the Houston 1 and 2 Project based on a minor revision of LIM's approved EPP for the nearby Schefferville Area Iron Ore Mines. A copy of the complete currently approved Schefferville Area Iron Ore Mine EPP document is presented in Appendix A.

Table 3.3 Houston 1 and 2 Project: Example Environmental Protection Plan Table of Contents

1.0	**INTRODUCTION**
1.1	Purpose of the Environmental Protection Plan
1.2	Environmental Protection Plan Organization
1.3	Roles and Responsibilities
1.4	Environmental Orientation
2.0	**PROJECT OVERVIEW**
2.1	Development of Houston Mine
2.2	Operation of Houston Mine
3.0	**REGULATORY REQUIREMENTS AND COMMITMENTS**
3.1	Approvals, Authorizations and Permits
3.2	Environmental Compliance Monitoring
3.3	Rehabilitation of Construction Work Sites
3.4	Reporting
4.0	**ENVIRONMENTAL PROTECTION PROCEDURES**
4.1	Surveying
4.2	Buffer Zones
4.3	Laydown and Storage Areas
4.5	Clearing Vegetation
4.6	Grubbing and Disposal of Related Debris
4.7	Overburden
4.8	Excavation, Embankment and Grading (including cutting and filling)
4.9	Erosion Prevention and Sediment Control
4.10	Trenching
4.11	Watercourse (Stream) Crossings
4.12	Exploration Drilling, Water Well Drilling, and Pump Tests
4.13	Pumps and Generators
4.14	Dewatering Work Areas/Trenches and Site Drainage
4.15	Equipment Installation, Use and Maintenance
4.16	Storage, Handling and Transfer of Fuel and Other Hazardous Material
4.17	Propane
4.18	Waste Disposal
4.19	Hazardous Waste Disposal
4.20	Vehicle Traffic
4.21	Dust Control
4.22	Noise Control
4.23	Civil Works
4.24	Mine, Open Pit and Mine Road Construction and Maintenance
4.25	Installation of Pre-fabricated Buildings
4.26	Site Water Management
4.27	Drilling and Blasting
4.28	Caribou
5.0	**CONTINGENCY PLANS**
5.1	Fuel and Hazardous Material Spills
5.2	Wildlife Encounters
5.3	Forest Fires
5.4	Discovery of Historic Resources
6.0	**Environmental Protection Plan Control Revisions**
7.0	**Contact List**
8.0	**Reference Material**
9.0	**Signature Page**
Appendices	List of Abbreviations and Acronyms Controlled Copy Distribution List Revision Request Form and Revision History Log Site Check List Form Background Information on Caribou in Western Labrador

3.8 LIM Benefits Plan

LIM understands the importance of the Project to the Province of Newfoundland and Labrador and in line with the principles described in this policy will provide full and fair opportunity and first consideration for the people, businesses and companies of the Province to secure employment and to participate in and benefit from the business opportunities associated with the Project. LIM has established a Labrador Iron Mines Limited Newfoundland and Labrador Benefits Policy. LIM will review and revise the Benefits Policy to tailor it to the Houston 1 and 2 Project will develop a Benefits Plan to implement the Benefits Policy.

Subject to the various IBAs and agreements in place, LIM is committed to:

- The delivery of associated benefits, including employment, education, training and business and economic development to the Province and in particular to Labrador on a full and fair opportunity and first consideration basis;
- The encouragement and assistance of residents of the Province, and in particular of Labrador, to receive the education and training necessary to maximize their opportunities for employment, retention and advancement on the Project;
- The procurement of goods and services from within the Province and, in particular from Labrador. Provincial suppliers will be provided full and fair opportunity and first consideration for the supply of goods and commercial services to the Project on a competitive basis;
- The implementation of policies and practices in connection with the procurement of goods and services for the Project that enhance economic and business opportunities in Labrador, including the identification and support of industry businesses that would generate long-term economic benefits to Labrador; and
- The provision of timely Project-related information to encourage the participation of all potential employees, businesses and contractors in the economic opportunities of the Project.

In addition LIM will also comply with the provisions of LIM's existing approved Women's Employment Plan and undertakings, commitments and obligations of Impact Benefits Agreements (IBAs) entered into with Innu Nation of Labrador, the Naskapi Nation of Kawawachikamach, and the Innu of Matimekush-Lac John as well as the Memorandum of Understanding with the Innu Takuaikan Uashat Mak Mani-Utenam. These include, amongst others, employment of approved Aboriginal/First Nations persons and the use of suitable Aboriginal/First Nations Contractors and supplies from all affected communities.

3.9 Women's Employment Plan

The Women's Employment Plan details LIM's approach to employment equity, identifies occupations in which women are under-represented, establishes appropriate initiatives and targets and describes a process for achieving these targets, outlines a monitoring approach, and reviews and revises equity initiatives where appropriate.

The Women's Employment Plan describes:

- The responsibilities of LIM and its main contractors, the process for identifying and implementing targets and initiatives, and the process for monitoring and reporting the implementation of those initiatives and success in achieving targets;
- The types of information and communications, employee recruitment and selection, employee development, working environments, and community outreach initiatives that LIM and its contractors will use to achieve employment equity for women;
- Specific LIM initiatives such as an anti-harassment program, community sensitivity program, and a review of childcare services available; and
- LIM will maintain an ongoing liaison and communication with the Women's Policy Office, the Department of Natural Resources Women's Policy Group and the Women in Resource Development Committee (WRDC), so that they are informed about Project employment requirements, opportunities, and plans.

3.10 Project Related Documents

The following is a list of the various project-related documents used in the preparation of this document:

- Annual Report, 2010-11, 1 April 2010 to 31 March 2011, Naskapi Nation of Kawawachikamach
- Registration Form Pursuant to Section 6 of The *Environmental Assessment Act* – James Mine Project, Prepared by La Fosse Platinum Group Inc., May 4, 1990
- Houston Road Concept Design Report, Kavanaugh Associates, November 7, 2011
- Schefferville Area Iron Ore Mine Registration, August 2009
- Labrador Iron Mines Limited Environmental and Engineering Baseline Work Plan, Prepared for Labrador Iron Mines Limited by Earth Tech Canada Inc., 2006.
- High Level Review of Transportation Options, Prepared for Labrador Iron Mines Limited by Met-Chem Canada Inc., January 24, 2006
- Scoping Study For The Labrador Iron Mountain Iron Ore Project, Prepared for Labrador Iron Mines Limited by T.N. McKillen, January 25, 2006
- Information Review, Property Status Report and Strategy Development, Prepared for Labrador Iron Mines Limited by Earth Tech Canada Inc., March 2006
- Iron Mountain Project 2006/2007 Environmental and Engineering Program - James, Houston and Knob Lake Sites, Health and Safety Plan. Prepared for Labrador Iron Mines Limited by Earth Tech Canada Inc., August 2006
- Assessment of Rail Infrastructure Conditions of the Menihek Subdivision of Tshiuetin Rail Transportation Inc., Prepared for Labrador Iron Mines Limited by Hatch Mott MacDonald, September 13, 2006

- Feasibility Study for the Labrador Iron Ore Project, Prepared by Labrador Iron Mines Limited, September 28, 2006
- Iron Mountain Project Environmental Reconnaissance Program, Prepared for Labrador Iron Mines Limited by Earth Tech Canada Inc., March 2007
- Technical Report of an Iron Project in Northwest Labrador, Prepared for Labrador Iron Mines Limited by SNC Lavalin, October 2007
- Iron Mountain Project. Schefferville Socio-Economic Background Information, Prepared for Labrador Iron Mines Limited by Earth Tech Canada Inc., 2008
- Labrador Iron Mines Baseline Limited Terrestrial Report – James, Redmond & Silver Yards, Prepared for Labrador Iron Mines Limited by AECOM, 2008
- Spring Survey of Caribou in the Vicinity of Schefferville, April - May 2009 (Final Report), Prepared for New Millennium Capital Corp. and Labrador Iron Mines Limited, Groupe Hemispheres and Stassinu Stantec Limited Partnership, November 2009
- Spring Survey of Caribou in the Vicinity of Schefferville (Final Report), Prepared for New Millennium Capital Corp. and Labrador Iron Mines Limited, Groupe Hemispheres and Stassinu Stantec Limited Partnership, May 2010
- Air Quality Technical Study, Prepared for Labrador Iron Mines Limited by Jacques Whitford Limited, January 29, 2009
- Socio-economic Baseline Report, Prepared for Labrador Iron Mines Limited, by Jacques Whitford Limited, June 26, 2009
- Labrador Iron Mines Technical Report of an Iron Project in Northwest Labrador, Province of Newfoundland and Labrador
- Environmental Impact Statement (Revised): Schefferville Area Iron Ore Mine (Western Labrador), Prepared by Labrador Iron Mines Limited. 2009
- Avifauna Management Plan for Activities Associated with the James, Silver Yard, and Redmond Properties, Prepared for Labrador Iron Mines by Stassinu Stantec Limited Partnership, August 2010
- Environmental Protection Plan for Construction and Operation Activities, Schefferville Area Iron Ore Mine (Western Labrador), by Labrador Iron Mines Holdings Ltd., 2010
- Schefferville Area Iron Ore Mine Development Plan, by Labrador Iron Mines Limited, April 2010
- Schefferville Area Iron Ore Mine Rehabilitation and Closure Plan, by Labrador Iron Mines Limited, July 2010
- Waste Management Plan, Schefferville Area Iron Ore Mine, by Labrador Iron Mines Holdings Ltd., 2011
- Classification of Wildlife Habitat Suitability for Houston and Howse Mineral Claims Blocks for the Schefferville Area Iron Ore Mine, Prepared for Labrador Iron Mines Limited by Stassinu Stantec Limited Partnership, 2010

- Stage 1 Historic Resources Assessment – Labrador Iron Mines 2008 Exploration Activities, Report prepared for Labrador Iron Mines Limited by Jacques Whitford Stantec Limited, 2009
- Desktop Review of Historic Resources Potential Labrador Iron Mines Ruth 8 and Gill Properties, Prepared for Labrador Iron Mines Limited by Stassinu Stantec Limited Partnership, May 2010

4.0 SCHEDULE

Subject to regulatory and environmental approvals, construction is expected to start at the Houston 1 and 2 deposits and on the Houston-Redmond haul road in 2012 or early 2013.

Mobilization to the site and set-up of basic site services and access will commence once the required permits are in place. Site preparation, infrastructure construction and full start-up (ready for production) are anticipated to take at least three months. Production is preliminary scheduled to commence in the last quarter of 2013 (Table 4.1). The estimated production schedule predicts production out to the year 2019 as shown in Table 4.2.

Table 4.1 Houston 1 and 2 Pre-Production Schedule

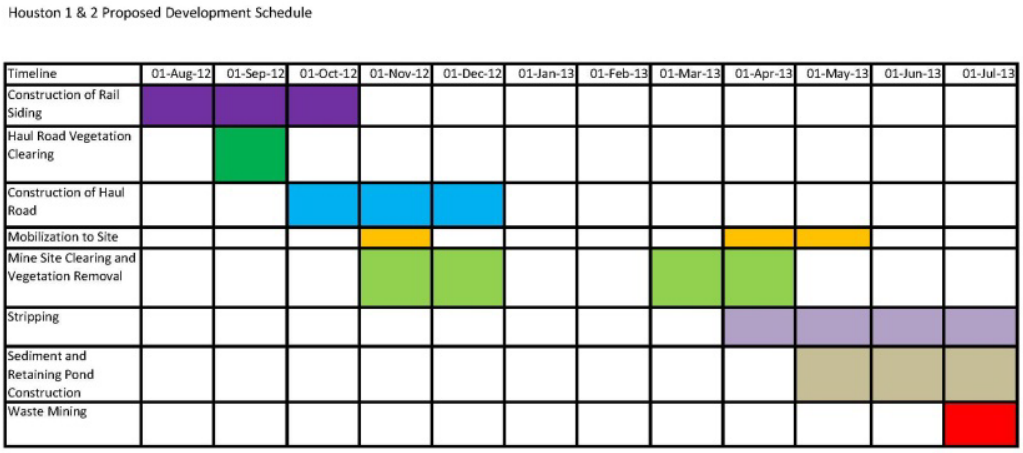


Table 4.2 Houston 1 and 2 Production Schedule

Period	Waste Tonnes	Ore Tonnes	Total Tonnes
2,013	750,000	500,000	1,250,000
2,014	4,525,000	1,500,000	6,025,000
2,015	5,500,000	3,500,000	9,000,000
2,016	5,500,000	3,500,000	9,000,000
2,017	5,500,000	3,500,000	9,000,000
2,018	5,500,000	3,500,000	9,000,000
2,019	1,000,000	750,000	1,750,000
OVERALL	28,275,000	16,750,000	45,025,000

5.0 FUNDING

The Project will be funded internally and will not involve any government funding. The estimated cost for Project development is less than$20 million CAD.

6.0 COMMUNITY AND ABORIGINAL CONSULTATION

6.1 Consultation and Accommodation

6.1.1 General

The closest community to the Project is Schefferville, Quebec which is located less than 2 km from the border with Labrador, on the northern shore of Knob Lake. It was established by the Iron Ore Company of Canada in 1954 to support mining operations in the area.

Iron ore mining at Schefferville ceased in 1982 and many of the 4,000 non-Aboriginal occupants left at that time, leaving a primarily Aboriginal community comprised of people who had settled there in the preceding 30 years. Some houses and public facilities have been demolished since this time, but some new homes have been built. The median age is 39.2 years, with approximately 60 families residing within the community.

Since early exploration activities in 2005, LIM has been in continual contact with the communities located nearthe development area and with the Innu Nation of Labrador and other Aboriginal/First Nation communities having a stated interest or historic connection to the area. For example, LIM has initiated communications with occupants of cabins identified within the region, although not within the Project Area, and will continue communications with them as the Project develops.

As well, LIM maintains contact with the civic administration of the towns of Labrador City, Wabush, Happy Valley-Goose Bay and the town of Schefferville. In these communities stakeholder consultation activities have included frequent meetings with Band Councils, Mayors and Councils, local businesses, local political representatives, local interest groups, provincial and federal regulators, educators and a wide variety of consultants that are involved with stakeholders.

LIM has opened community relations offices at the existing Schefferville Area Iron Ore Mine – Silver Yards, Labrador City and Happy Valley-Goose Bay. LIM is dedicated to providing early and clear information to the community and working with all communities towards the common goal of positive, respectful and sustainable development in the area.

Project design and implementation will include consideration of information resulting from ongoing consultation with the communities, traditional environmental knowledge, environmental and engineering considerations and best management practices. These consultations and agreements will ensure a close working relationship with the local communities with respect to their involvement in the provision of labour, goods and services to the Project.

LIM's nearby Schefferville Area Iron Ore Mine went into full production in 2011, marking the first mining and production of iron ore from this historic mining area in over 30 years. This

development has brought many positive and direct benefits and the Houston 1 and 2 project will build on this work, Direct and indirect economic benefits for various communities and stakeholders are expected from the proposed mine development. The ongoing economic impact of such employment and contracting business will be very positive and lead to the development of other support and service sector jobs, education and training, and consistent and planned development and growth.

6.1.2 Aboriginal Consultation

Consultation is a central objective of the environmental assessment process. Aboriginal consultation has a similar objective as public consultation in which to identify and address issues and concerns related to the Project.

The Quebec-Labrador Peninsula area probably has one of the most complicated patterns of aboriginal settlement in eastern Canada with six or possibly seven Aboriginal or First Nation peoples claiming traditional and native rights to all or part of the area underlain by LIM's Iron Ore Project. Several of the communities have conflicting territorial or land claims. This regional complication of Aboriginal/First Nation issues has recently prompted the Government of Canada to establish an Overlapping Commission on November 2010. This Commission will provide a forum for addressing the issues of jurisdictional overlap for the territories and the sharing of economic development initiatives as a result of mining and hydro-electric development in the region.

The Aboriginal groups of the Quebec-Labrador Peninsula most directly affected by the Project are the Innu Nation of Labrador, the Naskapi Nation of Kawawachikamach (NNK), the Innu Nation of Matimekush-Lac John (MLJ), the Innu Nation of Takuaikan Uashat Mak Mani-Utenam (ITUM) and NunatuKavut (formerly the Labrador Métis Nation). These groups may have overlapping land claims issues or traditional claims covering western Labrador. The Naskapi Nation is the only group with a finalized comprehensive land claim agreement; the others are in various stages of negotiation with the federal and provincial governments. However, the land claims of Quebec Aboriginal groups in Labrador have not been accepted for negotiation by the Government of Newfoundland and Labrador.

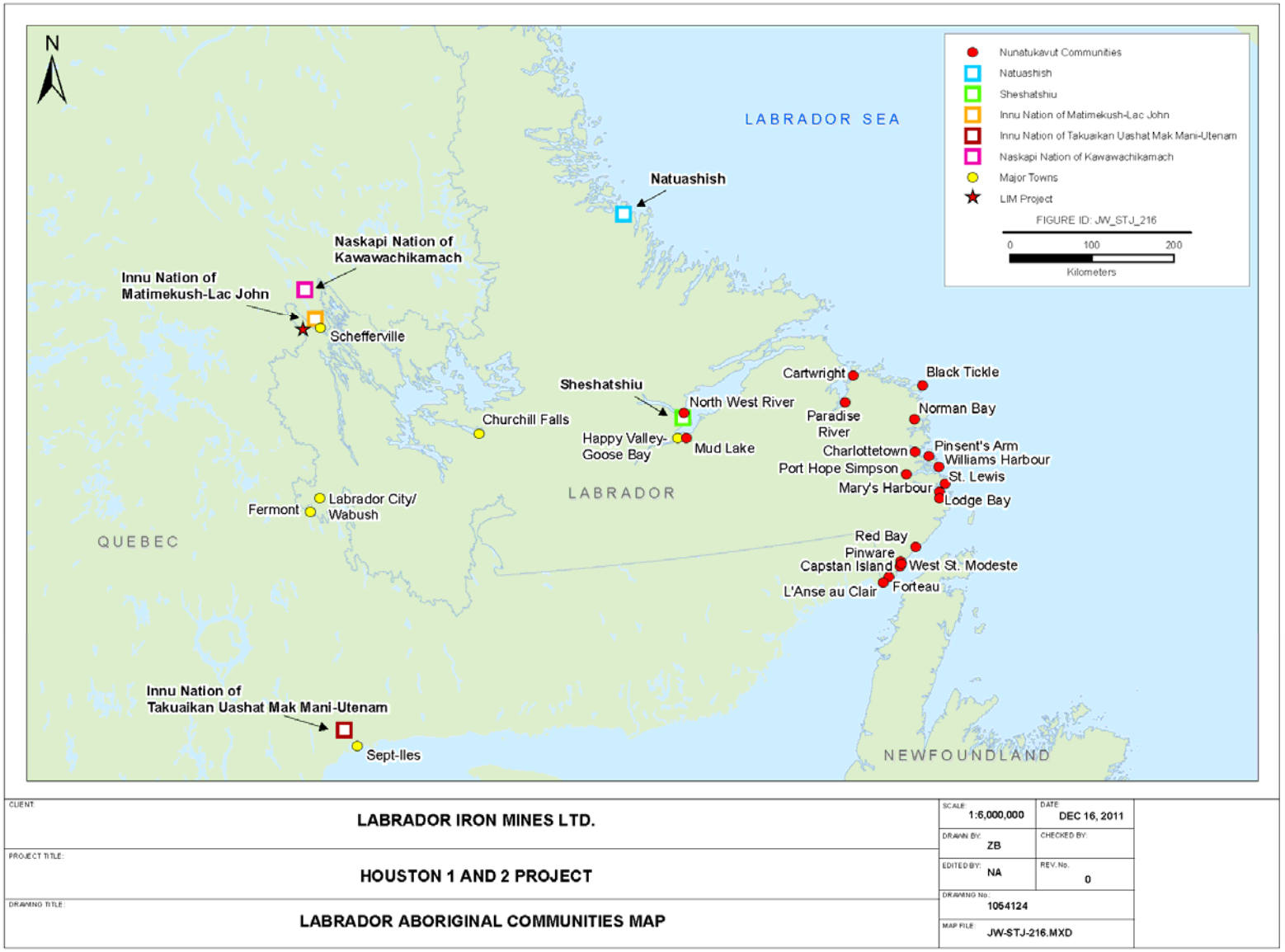
LIM has pursued an extensive and proactive engagement with all of the aboriginal communities living close to the project location or having traditional claims to the surrounding territory and commenced such consultations respecting the Schefferville Area Iron Ore Mine (Western Labrador) Project with a meeting between LIM and Naskapi Nation in Kawawachikamach in May 2005. Between May 2005 and June 2011 many consultation meetings were held in Newfoundland and Labrador (Labrador City/Wabush, Happy Valley-Goose Bay and St. John's), Nova Scotia (Halifax), Quebec (Schefferville, Kawawachikamach, Uashat, Matimekush, Montreal and Quebec City) and Ontario (Ottawa and Toronto) with the leadership and negotiating teams representing the various communities. Participants and summaries of each meeting are provided in Appendix F.

These consultations have resulted in the signing of IBA agreements with the Innu Nation of Labrador, the Naskapi Nation of Kawawachikamach, and the Innu Nation of Matimekush-Lac John, as well as the development of a draft IBA agreement withthe Innu Nation of Takuaikan Uashat Mak Mani-Utenam. These agreements relate to the establishment of a positive ongoing

relationship between LIM and these Aboriginal/First Nation relating to the development and operation of the Project and to the economic benefits that will accrue to the aboriginal communities.

Refer to Figure 6-1 for locations of the Aboriginal communites in Labrador.

Figure 6-1 Labrador Aboriginal Communities Location Map



6.1.2.1 Labrador Innu Nation

The Innu of Labrador live primarily in two communities in central and coastal Labrador: the coastal community of Natuashish, and the Upper Lake Melville community of Sheshatshiu. Residents of Natuashish are known as the Mushuau Innu, and residents of Sheshatshiu as Sheshatshiu Innu. Each community is administered by an elected Chief and Band Council. Politically, the two communities are represented by the Labrador Innu Nationwhich is led by an elected Grand Chief.

The Labrador Innu claim Aboriginal rights and title to most of Labrador, referring to it as Nitassinan. Their land claim was accepted for negotiation by the federal and provincial governments, with formal negotiations beginning in 1991. An Agreement-in-Principle is presently being negotiated.

In 1998, the Mushuau and Sheshatshiu Band Councils formed Innu Development Limited Partnership, a for profit corporation registered with the Province. It is committed to creating opportunities for employment and economic development for private Innu businesses by creating and managing equity ownership and partnerships in strategic industries.

The Premier of Newfoundland and Labrador and the Grand Chief of Innu Nation, announced on September 26, 2008 the signing of the Tshash Petapen Agreement (The New Dawn Agreement). This Agreement resolves key issues relating to matters between the province and Innu Nation surrounding the Innu Rights Agreement, the Lower Churchill Impacts and Benefits Agreement (IBA) and Innu redress for the Upper Churchill hydroelectric development. The final agreements based on the Tshash Petapen Agreement were ratified by the Innu people on June 30, 2011.

6.1.2.1.1 Issues

The main issues raised by the Innu Nation of Labrador during the IBA negotiations and the consultation process for the Schefferville Area Iron Ore Mine (Western Labrador) Project (the James and Redmond) mine development were:

- economic benefits and revenue sharing;
- the provision of sustainable economic development within the region in order to provide employment and business opportunities for its members;
- protection for the environment;
- training and education programmes so that Innu Nation members might fully participate in available opportunities;
- cultural and heritage protection and development.

Through discussion and negotiation during and subsequent to the Impact Benefits Agreement process, the parties reached satisfactory agreement on all of these issues, including the processes for implementation, coordination and oversight of mitigation strategies to address these issues. The communities will directly participate and/or be actively consulted as follows:

- Implementation committee;
- Community collaboration committee;
- Training and education committee;
- Establishing employment and workplace conditions;
- Business and contracting opportunities;
- Environmental monitoring;
- Traditional knowledge collection;
- Heritage resource and cultural protection;
- Financial participation

6.1.2.1.2 Impact Benefits Agreement

In July 2008, LIM entered into an Impact Benefits Agreement with the Innu Nation of Labrador, replacing an earlier Memorandum of Understanding. This life-of-mine agreement establishes the processes and sharing of benefits that will ensure an ongoing positive relationship between the LIM and the Innu Nation. In return for their consent and support of the Project, the Innu Nation and their members will benefit through training, employment, business opportunities and financial participation in the Project.

6.1.2.2 Innu Nation of Matimekush-Lac John

The Innu Nation of Matimekush-Lac John, also known as the Montagnais Innu, live primarily in the northeastern Quebec towns of Matimekush and Lac-John, near Schefferville. The community is governed by an elected Band Council consisting of a Chief and Councillors.

The Montagnais Innu voluntarily moved to the Schefferville region in the early 1950s when the Quebec North Shore & Labrador (QNS&L) Railroad was completed. The people were traditionally members of the Innu Nation of Takuaikan Uashat Mak Mani-Utenam located adjacent to Sept-Iles. Initially they shared the community at Lac-John with the Naskapi who arrived in the region at the same time. The Montagnais have historical and traditional interests in the region, having historically travelled to the region from Sept-Iles to trap and hunt. The community includes the reserve of Matimekush, adjacent to Schefferville, and the reserve of Lac-John, 3.5 km from Matimekush. When IOC's Schefferville mines closed in the early 1980s, the Montagnais extended the reserve of Lac-John into the town of Schefferville, to avail of the existing infrastructure no longer in use by the town (sewer and water system, school, arena).

The Montagnais' comprehensive land claim, filed in association with the Atikamekw of southern Quebec, was accepted federally in 1979 and provincially in 1980. The two Aboriginal groups were represented by the Atikamekw-Montagnais Council (AMC) until 1994. After dissolution of the AMC, the Montagnais formed three negotiation groups: the Mamuitun mak Natashquan Tribal Council, the Mamu Pakatatau Mamit Assembly, and the Ashuanipi Corporation.

Together with the Naskapi Nation of Kawawachikamach and the Innu Nation of Takuaikan Uashat Mak Mani-Utenam, the Montagnais have acquired in interest in Tshiuetin Rail Transportation Inc. (TSH), an aboriginal-owned corporation which owns and operates the northern portion of the former QNS&L rail line between Ross Bay Junction and Schefferville. Operations include passenger service twice weekly and weekly freight service between Schefferville and Sept-Iles. The Montagnais are also partially responsible for maintenance at the Schefferville Airport and operate construction businesses.

6.1.2.2.1 Issues

The main issues raised by the Innu Nation of Matimekush-Lac John during IBA negotiations and the consultation process for the Schefferville Area Iron Ore Mine (Western Labrador) Project (the James and Redmond) mine development were:

- Sustainable economic development in order to provide employment and business opportunities for its members. The community comprises a significant un- or under-employed young population with little or no available employment base;
- Economic benefits;
- Environmentally and culturally sustainable development;
- Desire to see the commercial development of TSH Railway without impact on the existing passenger service;
- Training and education programmes so that members of the community might fully participate in available opportunities;

Through discussion and negotiation during a Memorandum of Understanding and IBA process, the parties have openly discussed all of these issues and a cooperation and impact agreement include the processes for implementation, coordination and oversight of mitigation strategies to address these issues. It is expected that the communities will directly participate and/or be actively consulted as follows:

- Implementation committee;
- Training and education;
- Employment, business and contracting opportunities;
- Traditional knowledge collection;
- Heritage resource and cultural protection;
- Economic benefits;

6.1.2.2.2 Agreements

In March 2008 LIM signed a Memorandum of Understanding and in June 2011 a full IBA agreement was signed with the Innu Nation of Matimekush-Lac John following community ratification. This life-of-mine agreement establishes the processes and sharing of benefits that will ensure an ongoing positive relationship between the LIM and the Innu Nation of Matimekush-Lac John. In return for their consent and support of the Project, the Nation and their

members will benefit through training, employment within the limits of the Newfound Land and Labrador's benefit agreement, business opportunities and financial participation in the Project.

6.1.2.3 Innu Nation of Takuaikan Uashat Mak Mani-Utenam

The Innu Nation of Takuaikan Uashat Mak Mani-Utenam are closely related to the Montagnais Innu of Matimekush-Lac John. They have historical and traditional interests in the Project area, having traditionally used the area for hunting and trapping. They are one of the largest Innu communities in Quebec, living in two settlements within their reserve, Uashat and Maliotenam, both on the Quebec North Shore, near Sept-Iles. The communities are administered by a Band Council comprised of an elected Chief and Councillors. In addition to typical administrative duties, the Band Council also operates the local police force.

The Innu of Takuaikan Uashat Mak Mani-Utenam joined the Matimekush-Lac John Innu in 2005 to create the Ashuanipi Corporation initially to represent them in comprehensive claims negotiations. This arrangement has been dissolved but the corporation has been revived by the Innu Nation of Takuaikan Uashat Mak Mani-Utenam to pursue economic development opportunities.

Together with the Naskapi Nation of Kawawachikamach and the Montagnais, the Innu Nation of Takuaikan Uashat Mak Mani-Utenam have acquired in interest in Tshiuetin Rail Transportation Inc. (TSH), an aboriginal-owned corporation which owns and operates the northern portion of the former QNS&L rail line between Ross Bay Junction and Schefferville.

6.1.2.3.1 Issues

The main issues raised by the Innu Nation of Takuaikan Uashat Mak Mani-Utenam during the consultation process for the current Schefferville Area Iron Ore Mine (Western Labrador) Project (the James and Redmond) mine development and IBA negotiations were:

- economic benefits;
- employment and business development opportunities for its members;
- commercial development of TSH Railway;
- environmentally and culturally sustainable development;
- protection of the trapping activities of the Uashaunnaut families holding Beaver Lots in the region;
- Training and education programmes so that its members might fully participate in available opportunities;
- cultural and heritage protection and development.

The parties have openly discussed all of these issues and have developed agreementsthat will include the processes for implementation, coordination and oversight. It is expected that the community will directly participate and/or be actively consulted as follows:

- Implementation committee;

- Training and education;
- Employment, business and contracting opportunities;
- Environmental monitoring committee;
- Traditional knowledge collection;
- Foundation for Ushaunnaut families and traditional heritage protection;
- Economic benefits.

6.1.2.3.2 Agreements

Negotiations toward an Impact and Benefit Agreement (IBA) between LIM and the Innu Nation of Takuaikan Uashat Mak Mani-Utenam were conducted between September 2005 and April 2011. The parties reached draft agreement on the terms and scope of an impact benefits agreement in April 2011. This life-of-mine agreement establishes the processes and sharing of benefits that will ensure an ongoing positive relationship between the LIM and the Innu Nation of Takuaikan Uashat Mak Mani-Utenam. In return for their consent and support of the Project, the Nation and their members will benefit through training, employment, business opportunities and financial participation in the Project. The agreement has yet to be ratified by the Council and Community.

6.1.2.4 Naskapi Nation of Kawawachikamach

The Naskapi Nation of Kawawachikamach was originally a small nomadic tribe, settling in Fort Chimo in the mid-1800s, before moving to Schefferville in the 1950s. The Naskapi relocated to the present site of Kawawachikamach, approximately 16 km north of Schefferville in the 1980s following the James Bay Settlement.

Between 1981 and 1984, self-government legislation was negotiated with the federal government. These negotiations resulted in the Cree-Naskapi (of Quebec) Act and led to the formation of the Naskapi Band of Quebec in 1984. The Naskapi Band of Quebec was one of the first self-governing Bands in Canada. The name was changed to Naskapi Nation of Kawawachikamach in 1999.

The community of Kawawachikamach is administered by the Band Council, consisting of an elected Chief and Councillors. In addition to typical municipal duties, the Band Council is responsible for maintaining the local police force, the local volunteer fire department, local childcare centre, and local school.

The Naskapi Nation, through the Band Council, operate several corporate entities within Kawawachikamach and Schefferville including the Naskapi Landholding Corporation, Garage Naskapi, Kawawachikamach Energy Services Inc., Naskapi Imun Inc (an internet service and software company), Naskapi Caribou Meat Inc., and Naskapi Development Corporation. In addition, they hold contracts for maintenance of the Schefferville Airport, local road maintenance, and own interests in Tshiuetin Rail Transportation Inc.

6.1.2.4.1 Issues

The main issues raised by the Naskapi Nation of Kawawachikamach regarding the project during IBA negotiations and the consultation process for the Schefferville Area Iron Ore Mine (Western Labrador) Project (the James and Redmond) mine development were:

- economic benefits;
- the provision of sustainable economic development in order to provide employment and business opportunities for its members. The community comprises a significant un- or under-employed young population with no significant employment base;
- environmentally and culturally sustainable development including specific emphasis on the protection of any caribou observed;
- training and education programmes so that its members might fully participate in available opportunities;
- interest in the commercial development of TSH Railway;
- cultural and heritage protection and development.

Through discussion and negotiation during the Memorandum of Understanding and IBA agreement processes, the parties have openly discussed all of these issues and the cooperation and impact benefits agreement includes the processes for implementation, coordination and oversight of mitigation strategies to address these issues. The community will directly participate and/or be actively consulted as follows:

- Implementation committee;
- Community collaboration committee;
- Training and education committee;
- Establishing employment and workplace conditions;
- Business and contracting opportunities;
- Environmental monitoring committee;
- Traditional knowledge collection;
- Heritage resource and cultural protection;
- Economic benefits.

6.1.2.4.2 Agreements

In April 2008 LIM signed a Memorandum of Understanding and in August 2010 an Impact Benefits Agreement with the Naskapi Nation of Kawawachikamach. This life-of-mine agreement establishes the processes and sharing of benefits that will ensure an ongoing positive relationship between the LIM and the Naskapi Nation of Kawawachikamach in Labrador. In return for their consent and support of the Project, the Nation and their members will benefit through training, employment, business opportunities and financial participation in the Project.

6.1.2.5 NunatuKavut Community Council

TheNunatuKavut Community Council (NCC), also identified as NunatuKavut, comprises those peoples of Inuit and mixed Inuit/European ancestry residing in the southern part of Labrador, from the Churchill River, south to Lodge Bay and west to the extent of the official border between Quebec and Labrador. NunatuKavut states that its 6,000 members live in 23 Labrador communities, seventeen of which are on the southeast coast from Paradise River to L'Anse au Clair. It also states that members reside in six other communities in central and western Labrador, including Happy Valley-Goose Bay and Labrador City.

This area is referred to as NunatuKavut, meaning "Our ancient land" in the Inuktitut dialect of the NunatuKavummuit people. NCC asserts that its members are the ancestors of the southern Inuit of Labrador who have continuously occupied and used the region for almost a thousand years. During the 18th century, some European men, settled, took Inuit wives, and permanently assimilated into the local culture. The descendents of these two cultures can be seen within the communities that line the southern coastal and interior waterways of Labrador. Although influenced in many ways by prolonged contact with seasonal workers and merchants, the culture and way of life has remained distinctly Inuit. There are more than 6,000 Inuit-Métis of Labrador. Membership in the LMN is open to people of Native ancestry, originally from Labrador.

NunatuKavut is led by a President and Council. Since its formation as a society in 1981 (as LMN), and its incorporation under provincial law in 1985, NunatuKavut has grown to become the largest Aboriginal group in Labrador. As a not-for-profit organization, NunatuKavut is committed to promoting and ensuring the basic human rights of its members as Aboriginal persons, and the collective recognition of these rights by all levels of government. The LMN is an affiliate of a national Aboriginal representative body, the Congress of Aboriginal Peoples.

NunatuKavuthas filed a comprehensive land claim with the province of Newfoundland and Labrador as well as with the Federal government of Canada.

6.1.2.5.1 Issues

LIM's consultation with LMN has been somewhat limited and sporadic in comparison with the Aboriginal/First Nation communities. The issues raised by the Labrador Métis Nation are similar to those of other aboriginal groups in the area and revolve around the sharing of economic benefits and the provision of sustainable economic development in order to provide employment and business opportunities for its members.

6.2 Community Consultation

Since early exploration activities in 2005, LIM has also been in continual contact with the non-aboriginal communities situated near the development area as well as with the Aboriginal/First Nation communities. LIM maintains regular contact with the civic administration of the towns of Labrador City, Wabush, Happy Valley-Goose Bay, Schefferville and Kawachicamach. These community and stakeholder consultation activities have included frequent meetings with Mayors

and Councils, local businesses, Chiefs and Councils, local political representatives, local interest groups, provincial and federal regulators, educators and a wide variety of stakeholders.

As there are no nearby established communities in Labrador, LIM has opened community relations offices in Schefferville, Labrador City and Happy Valley-Goose Bay. LIM is dedicated to providing early and clear information to the community and working with all communities towards the common goal of positive, respectful and sustainable development in the area.

The Community Consultation process has already been described in detail in the Environmental Impact Statement for the Schefferville Area Iron Ore Mine (Western Labrador) Project August 2009, which refers specifically to the development of the James and Redmond deposits in the first phase of LIM's proposed sequential development of the deposits making up its Western Labrador Iron Ore Project.

Subsequent to the preparation of that document, discussions and negotiations with the non-Aboriginal communities has been detailed and ongoing and each community has been appraised of the totality of LIM's direct shipping iron ore Project and the decision to develop the constituent iron ore deposits in a sequential manner commencing first with the James and Redmond deposits to be followed by other deposits in the area, including the Houston 1 and 2 deposits, with additional plant construction and related facilities and the subsequent future development to be determined as deposit resource evaluation is completed.

Through regular meetings with Mayors and Councils or town administrators and other representatives and community organisations, the communities are being kept appraised of the on-going development of each stage of the Project. Each community will be consulted in detail during the Environmental Assessment or similar process for each new part of the Project development.

Consultation communications are tracked using the Sustainet consultation database management system.A comprehensive cataloguing of the consultation process is included in Appendix F.

6.3 Traditional Ecological Knowledge

A Traditional Ecological Knowledge (TEK) program, including the collection of hunting, trapping, berry-picking and other traditional activities, has been undertaken by LIM. This program includes consultation with an Elder's Committee as well as a mail-out of letters and summary reports prior to and after the 2009 and 2010 Caribou Surveys.

The TEK program includes the following components:

- A significant portion of environmental baseline work has been conducted by Stassinu, a joint venture company between Stantec and the Labrador Innu Nation, facilitating the onsite collaborative involvement of the Labrador Innu in the various environmental programs.
- Copies of government submissions and reports have been out to all four involved communities for their review and approval before finalization and issuance of any approvals.

- Meetings have been conducted with the Councils and representatives of the involved communities to present and discuss the proposed environmental baseline programs, present details of proposed development programs for discussion, and to collect information on the natural and social environment for consideration in program design.
- In areas of existing development, such as the current Schefferville Area Iron Ore mine (James and Redmond properties), discussions have been initiated with local communities to discuss environmental initiatives and to incorporate local knowledge and observations into the environmental program. Valuable information collected during these programs will be incorporated into future development program rehabilitation efforts, including that of the Houston site.
- During environmental baseline work, LIM has continually sought to partner local community representatives with environmental consultants during their field work to facilitate collaborative sharing of information and technology transfer and training.

Direct and indirect economic benefits for various communities and stakeholders are expected and this will continue the positive developments initiated by LIM as part of its Schefferville Area Iron Ore Mines at James and Redmond deposits. The ongoing economic impact of such employment and contracting business will be very positive and lead to the development of other support and service sector jobs, and consistent and planned development and growth.

7.0 ENVIRONMENTAL SETTING AND EXISTING CONDITIONS

The Houston area is located in the Province of Newfoundland and Labrador in the western central part of the Labrador Trough iron range, approximately 20km southeast of the town of Schefferville, Quebec, and approximately 10km from the approved Redmond mine area. The Houston 1 and 2 properties (Project Area) comprise twelve Mineral Rights Licenses, representing 112 mineral claims, covering approximately 2,800 hectares (ha). The Houston deposits comprise three separate deposits currently identified as Houston 1, 2 and 3.

There are no roads connecting the Project area to southern Labrador or southern Quebec. Access to the area is by rail from Sept-Îles to Schefferville, and by air from Montreal and Quebec City via Sept-Îles and Wabush.

The Project Area is located in the Schefferville mining district which consists of bedrock-controlled deposits with the average elevation of the properties varying between 500m and 700m above sea level (asl). The Project Area shows evidence of surface disturbance related to historic exploration and mine activities.The Schefferville region is situated at the southern edge of the forest tundra (Hustich 1949; Hare 1950; Waterway et al. 1984).The Properties contain varied land classes from exposed tundra/exposed bedrock with lichen and scattered trees and shrubs to low wetland areas, including bogs. Intermediate land classes consist of varied forest types with spruce-moss and spruce-lichen predominating although merchantable timber was not noted. Observed canopy cover for all forest sites ranged from 0 to 80 percent, with most in the range of 30 to 60 percent. The terrain is comprised of parallel ridges and valleys trending northwest to southeast, is thinly forested, with bare rock exposures and moose barrens.

Environmental baseline work, initiated in the Project area in 2005, includes:

- Geology and Preliminary ARD Assessment;
- Surface water sampling, geochemistry, and general water quality;
- Aquatic habitat mapping (lake, pits and streams);
- Benthic community and sediment surveys;
- Vegetation surveys;
- Avifauna and Wildlife Surveys;
- Traditional Environmental Knowledge programs;
- Caribou surveys;
- Snow and ice pack;
- Bathymetry Studies;
- Air quality;
- Noise and vibration;
- Climatology (temperature and precipitation) surveys;

- Fish community surveys;
- Fish tissue sampling;
- Hydrology and hydrogeology;
- Detailed fish habitat assessments of watercourse crossings;
- Traditional Environmental Knowledge (TEK) programs; and
- Cultural resources and archaeological assessment.

Relevant information from selected programs is summarized below to provide a better understanding of the existing conditions in the Project area.

7.1 Regional Geology

At least 45 hematite-goethite ore deposits have been discovered in an area 20 km wide that extends 100 km northwest of Astray Lake, referred to as the Knob Lake Iron Range, which consists of tightly folded and faulted iron-formation. The iron deposits occur in deformed segments of iron-formation, and the ore content of single deposits varies from one million to more than 50 million tonnes.

The Knob Lake properties are located on the western margin of the Labrador Trough adjacent to Archean basement gneisses. The Labrador Trough, known as the Labrador-Québec Fold Belt, extends for more than 1,000 km along the eastern margin of the Superior craton from Ungava Bay to Lake Pletipi, Québec. The belt is about 100 km wide in its central part and narrows considerably to the north and south.

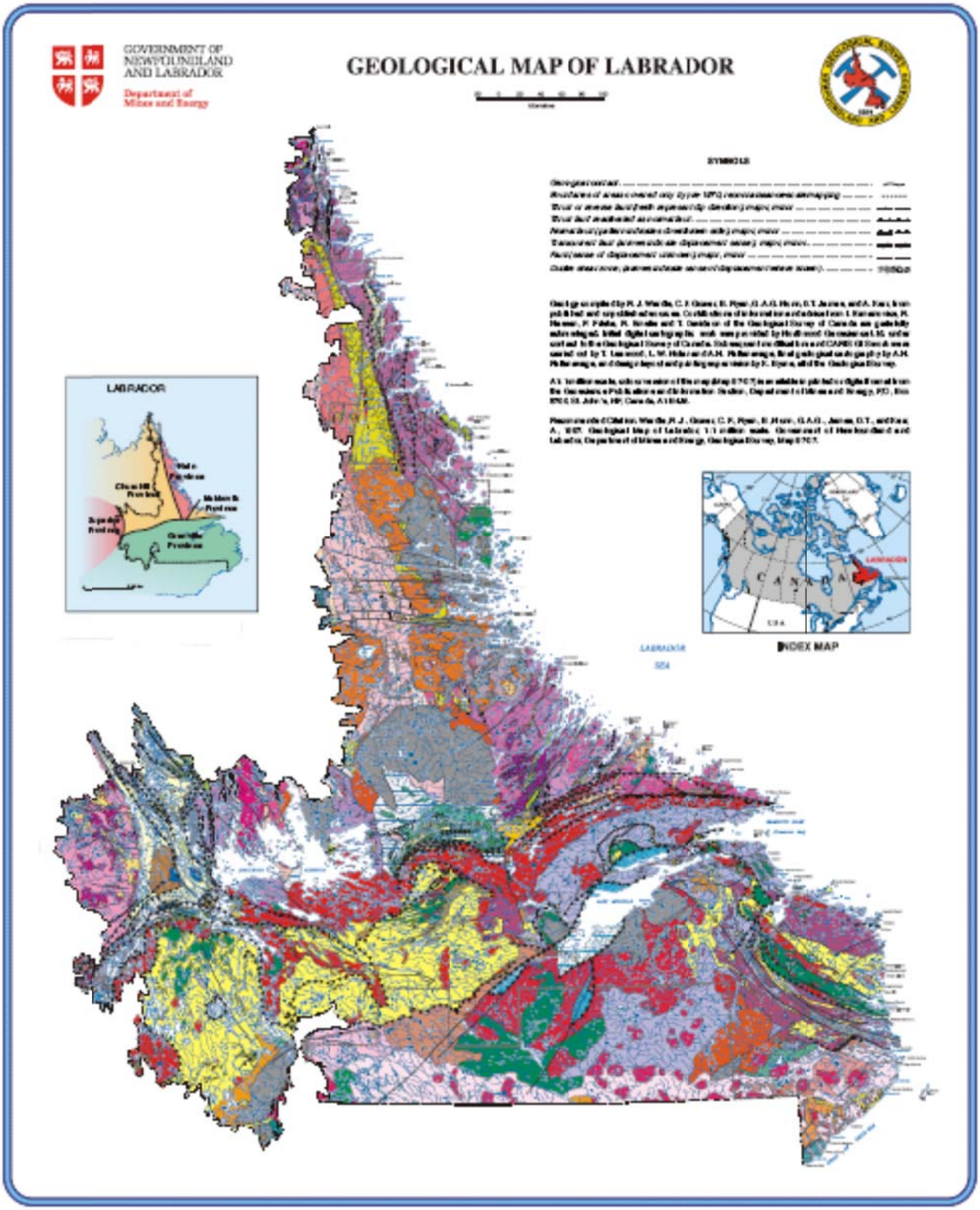
The western half of the Labrador Trough can be divided into three sections based on changes in lithology and metamorphism (North, Central and South). The Trough is comprised of a sequence of Proterozoic sedimentary rocks including iron formation, volcanic rocks and mafic intrusions known as the Kaniapiskau Supergroup (Gross, 1968). The Kaniapiskau Supergroup consists of the Knob Lake Group in the western part of the Trough and the Doublet Group, which is primarily volcanic, in the eastern part.

The Central or Knob Lake Range section extends for 550 km south from the Koksoak River to the Grenville Front located 30 km north of Wabush Lake. The principal iron formation unit, the Sokoman Formation, forms a continuous stratigraphic unit that thickens and thins from sub-basin to sub-basin throughout the fold belt.

The southern part of the Trough is crossed by the Grenville Front. Trough rocks in the Grenville Province to the south are highly metamorphosed and complexly folded, which has caused recrystallization of both iron oxides and silica in the primary iron formation to meta-taconites.

Geological conditions throughout the central division of the Labrador Trough are generally similar to those in the Knob Lake Range.

Figure 7-1 Geological Map of Labrador



7.1.1 Knob Lake Range Geology

The general stratigraphy of the Knob Lake area is representative of most of the range, except that the Denault dolomite and Fleming Formation (described below) are not uniformly distributed. The Knob Lake Range occupies an area 100 km long by 8 km wide. The sedimentary rocks including the cherty iron formation of this area are weakly metamorphosed to greenschist facies. In the structurally complex areas, leaching and secondary enrichment have produced earthy textured iron deposits. Unaltered banded magnetite iron formation (taconite) occurs as gently dipping beds west of Schefferville in the Howells River deposits.

Most of the secondary earthy textured iron deposits occur in canoe-shaped synclines with some as tabular bodies. In the western part of the Knob Range, the iron formation dips gently eastward over the Archean basement rocks for about 10 km to the east, then forms an imbricate fault structure with bands of iron formation.

Subsequent supergene processes converted some of the iron formations into high-grade ores, preferentially in synclinal depressions and/or down-faulted blocks. Original sedimentary textures are commonly preserved by selected leaching and replacement of the original deposits. Jumbled breccias of enriched ore and altered iron formations, locally called rubble ores, are also present.

The stratigraphy of the Schefferville area is represented by the following formations.

Attikamagen Formation. It consists of argillaceous material that is thinly bedded, fine grained, greyish green, dark grey to black, or reddish grey. Calcareous or arenaceous lenses occur locally interbedded with the argillite and slate, and lenses of chert are common.

Denault Formation. The Denault Formation consists primarily of dolomite being more clastic at its base and cherty at its top. Leached and altered beds near the iron deposits are rubbly, brown or cream coloured.

Fleming Formation. It occurs a few kilometres southwest of Knob Lake and only above dolomite beds of the Denault Formation. It consists of rectangular fragments of chert and quartz within a matrix of fine chert.

Wishart Formation. The Wishart Formation is a sandstone formation (quartzite and arkose) cemented by quartz and minor amounts of hematite and other iron oxides. It is well differentiated from the iron ore bearing overlaying formations by its texture and color.

Ruth Formation. It is a black, grey-green or maroon ferruginous slate, 3 to 36 metres thick. This thinly banded material contains lenses of black chert and various amounts of iron ore.

Sokoman Formation. More than 80 percent of the ore in the Knob Lake Range occurs within this formation. Lithologically, the iron formation varies in detail in different parts of the range and the thickness of individual members is not consistent.

A thinly bedded, slatey facies at the base of the formation consists largely of fine chert with an abundance of iron silicates and disseminated magnetite and siderite. Fresh surfaces are grey to

olive green, and weathered surfaces brownish yellow to bright orange. Thin-banded oxide facies of iron formation occurs above the silicate-carbonate facies in nearly all parts of the area. The thin (<1.25cm) jasper bands are mostly deep red, but in some places are greenish yellow to grey, and are interbanded with hard, blue layers of fine-grained hematite and a minor magnetite.

The thin jasper beds are located underneath thick massive beds of grey to pinkish chert and beds that are very rich in blue and black iron oxides, and make up most of the Sokoman Formation. The upper part of the Sokoman Formation comprises discontinuous beds of dull green to grey or black massive chert.

Menihek Formation. A thin-banded, grey to black argillaceous slate conformably overlies the Sokoman Formation in the Knob Lake area. Thicknesses are unknown since the slate is found in faulted blocks in the main ore zone.

7.1.2 Regional Mineralization

The earthy bedded iron deposits are a residually enriched type within the Sokoman iron formation that formed after two periods of intense folding and faulting, followed by the circulation of meteoric waters in the fractured rocks. The enrichment process was caused largely by leaching and the loss of silica, resulting in a strong increase in porosity. This produced a friable, granular and earthy-textured iron ore. The siderite and silica minerals were altered to hydrated oxides of goethite and limonite. The second stage of enrichment included the addition of secondary iron and manganese which appear to have moved in solution and filled pore spaces with limonite-goethite. Secondary manganese minerals, i.e., pyrolusite and manganite, form veinlets and vuggy pockets. The types of iron ores developed in the deposits are directly related to the original mineral facies. The predominant blue granular ore was formed from the oxide facies of the middle iron formation. The yellowish-brown ore, composed of limonite-goethite, formed from the carbonate-silicate facies, and the red painty hematite ore originated from mixed facies in the argillaceous slaty members. The overall ratio of blue to yellow to red ore is approximately 70:15:15. The proportion of each varies widely within the deposits.

Only the direct shipping ore is considered beneficial to produce lumps and sinter feed and will be part of the resources for the LIM Project. The direct shipping ore was classified by IOC in six categories based on their chemical, mineralogical and textural compositions. This classification is still used in the evaluation of the mineralization. The following ore categories and other mineralization categories, not part of the potential economic mineralization, are:

- High Non-Bessemer (HNB);
- Lean Non Bessemer (LNB);
- High Silica (HiSiO2) (waste); and
- Treat Rock (TRX) (waste but previously stockpiled for possible later treatment).

The blue ores, which are composed mainly of the minerals hematite and martite, are generally coarse grained and friable. They are usually found in the middle section of the iron formation.

The yellow ores, which are made up of the minerals limonite and goethite, are located in the lower section of the iron formation. These ores have the unfavourable characteristic of retaining high moisture content.

The red ore is predominantly a red earthy hematite. It forms the basal layer that underlies the lower section of the iron formation. Red ore is characterized by its clay and slate-like texture.

Direct shipping ores and lean ores mined in the Schefferville area during the period 1954-1982 amounted to some 150 million tons. Based on the original ore definition of IOC (+50% Fe <18% SiO2 dry basis), approximately 250 million tonnes of iron resources remain in the area, exclusive of magnetite taconite. LIM has acquired rights to approximately 50 percent of this remaining iron resource.

7.1.3 Deposit Types

The Labrador Trough contains four main types of iron deposits:

- soft iron ores formed by supergene leaching and enrichment of the weakly metamorphosed cherty iron formation; they are composed mainly of friable fine-grained secondary iron oxides (hematite, goethite, limonite);
- taconites, the fine-grained, weakly metamorphosed iron formations with above average magnetite content and which are also commonly called magnetite iron formation;
- more intensely metamorphosed, coarser-grained iron formations, termed metataconites which contain specular hematite and subordinate amounts of magnetite as the dominant iron minerals; and
- minor occurrences of hard high-grade hematite ore occur southeast of Schefferville at Sawyer Lake, Astray Lake and in some of the Houston deposits.

The Labrador Iron Mountain deposits are composed of iron formations of the Lake Superior-type. The Lake Superior-type iron formation consists of banded sedimentary rocks composed principally of bands of iron oxides, magnetite and hematite within quartz (chert)-rich rock, with variable amounts of silicate, carbonate and sulphide lithofacies. Such iron formations have been the principal sources of iron throughout the world.

The Sokoman iron formation was formed as chemical sediment under varied conditions of oxidation-reduction potential (Eh) and hydrogen ion concentrations (pH) in varied depth of seawater. The resulting irregularly bedded, jasper-bearing, granular, oolite and locally conglomeratic sediments are typical of the predominant oxide facies of the Superior-type iron formations, and the Labrador Trough is the largest example of this type.

The facies changes consist commonly of carbonate, silicate and oxide facies. Typical sulphide facies are poorly developed. The mineralogy of the rocks is related to the change in facies during deposition, which reflects changes from shallow to deep-water environments of sedimentation. In general, the oxide facies are irregularly bedded, and locally conglomeratic, having formed in oxidizing shallow-water conditions. Most carbonate facies show deep-water features, except for the presence of minor amounts of granules. The silicate facies are present

in between the oxide and carbonate facies, with some textural features indicating deep-water formation.

Each facies contains typical primary minerals, ranging from siderite, minnesotaite, and magnetite-hematite in the carbonate, silicate and oxide facies, respectively. The most common mineral in the Sokoman Formation is chert, which is closely associated with all facies, although it occurs in minor quantities with the silicate facies. Carbonate and silicate lithofacies are present in varying amounts in the oxide members.

The sediments of the Labrador Trough were initially deposited in a stable basin which was subsequently modified by penecontemporaneous tectonic and volcanic activity. Deposition of the iron formation indicates intraformational erosion, redistribution of sediments, and local contamination by volcanic and related clastic material derived from the volcanic centers in the Dyke-Astray area.

The consolidation of the sediments into cherty banded iron formation is due to diagenesis and low grade metamorphism, which only reached the greenschist rank. The iron may be a product of erosion. It is unlikely that the Nimish volcanism made a significant contribution.

The Project currently involves the Houston 1 and 2 deposits.

Houston 1 and 2 Deposits

The Houston 1 and 2 Project is composed of two separate areas of iron enrichment with a continuously mineralized zone of over 2 km in strike length which remains open to the south. These areas of enrichment are referred to as the Houston 1 and 2 deposits. Iron ore of direct shipping (DSO) quality strikes to the northwest, dips to the northeast, and extends northwest-southeast for up to 2 km with a lateral extent of up to 150m in its wider section. The Houston DSO iron deposits are stratigraphically and structurally controlled, and consist of hard and friable banded, blue and red hematite that locally becomes massive. Manganese mineralization occurs in relatively low concentrations throughout the Houston 1 and 2 deposits.

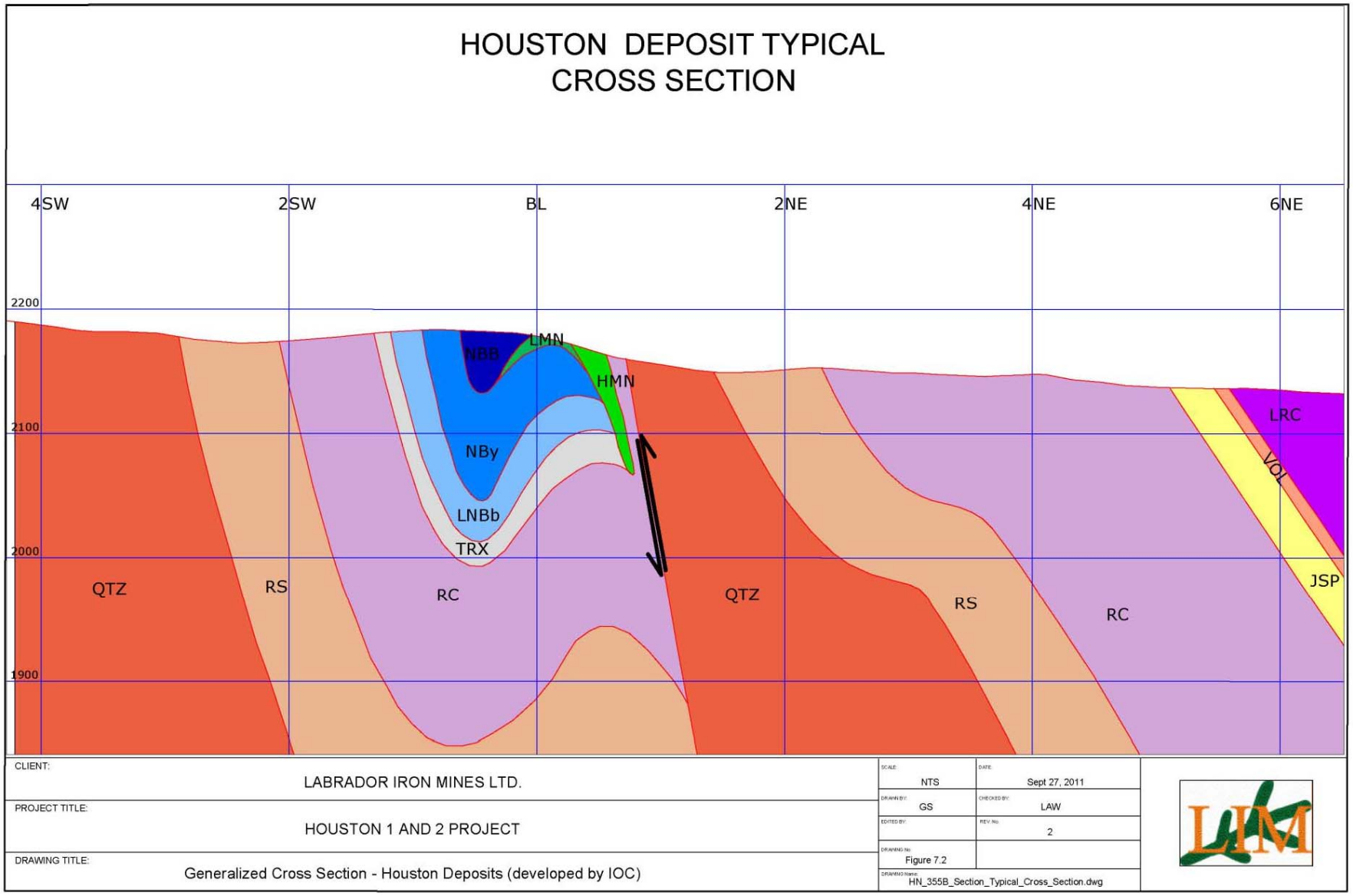
Drilling programs conducted between 2006 and 2011 indicate that the majority of the potentially economic iron mineralization in the Houston area occurs within the very lower horizon of the iron formation, the unit historically referred to as the Ruth Formation. A band of blue ore up to 50m thick occuring in the iron formation makes Houston distinct from most other deposits in the Schefferville area. The Middle Iron Formation (MIF) and Upper Iron Formation are, for the most part, unenriched.

In cross sections of the Houston deposit composed by IOC, there is evidence of a reverse fault system striking northwest through the Houston 1 and 2 deposits. Along the western margin of this reverse fault system, sporadic concentrations of up to 24% manganese mineralization occurs within the Middle Iron formation (MIF), and is structurally controlled by folding and faulting.

Houston 1 and 2 mineralization has been found to extend down dip to the northeast. Mineralization is still open to depth and remains a potential for additional resources.

For the purposes of this Project, the Houston 1 and 2 deposits form the Project Area. Houston 3 is currently under exploration, as is the Malcolm property located to the north of the Houston 2 deposit, in Quebec, and additional assessment of these deposits will be conducted in the future. A representative cross section of the Houston deposit is presented in Figure 7-2.

Figure 7-2 Generalized Cross Section-Houston Deposits (developed by IOC)



7.1.4 Geomorphology, Surficial Geology, Soils and Permafrost

There are dominant surficial materials within the area surrounding the Project deposits of drift-poor areas, glacial till and other surficial deposits (undifferentiated), with occasional areas of glaciofluvial deposits.

The till and other surficial deposits (undifferentiated), are predominantly nonstratified, poorly sorted, silty to sandy diamicton, gravel, and sandy gravel, deposited either directly from ice or by meltout during ablation and includes glaciofluvial, glaciolacutrine, marine, and fluvial deposits of either minor areal extent or thin (less than two m) and discontinuous.

The drift-poor areas are described as greater than 80 percent bedrock; including areas of till and other surficial materials generally < 1 m thick and discontinuous.

The glaciofluvial deposits are classified as proglacial or ice contact sand and gravel, forming ice contact fans and deltas, outwash plains and terraces, pitted outwash, crevasse fillings, kames and kame terraces, commonly associated with eskers and including areas of extensive, thick fluvial sediments derived from pre-existing glaciofluvial deposits.

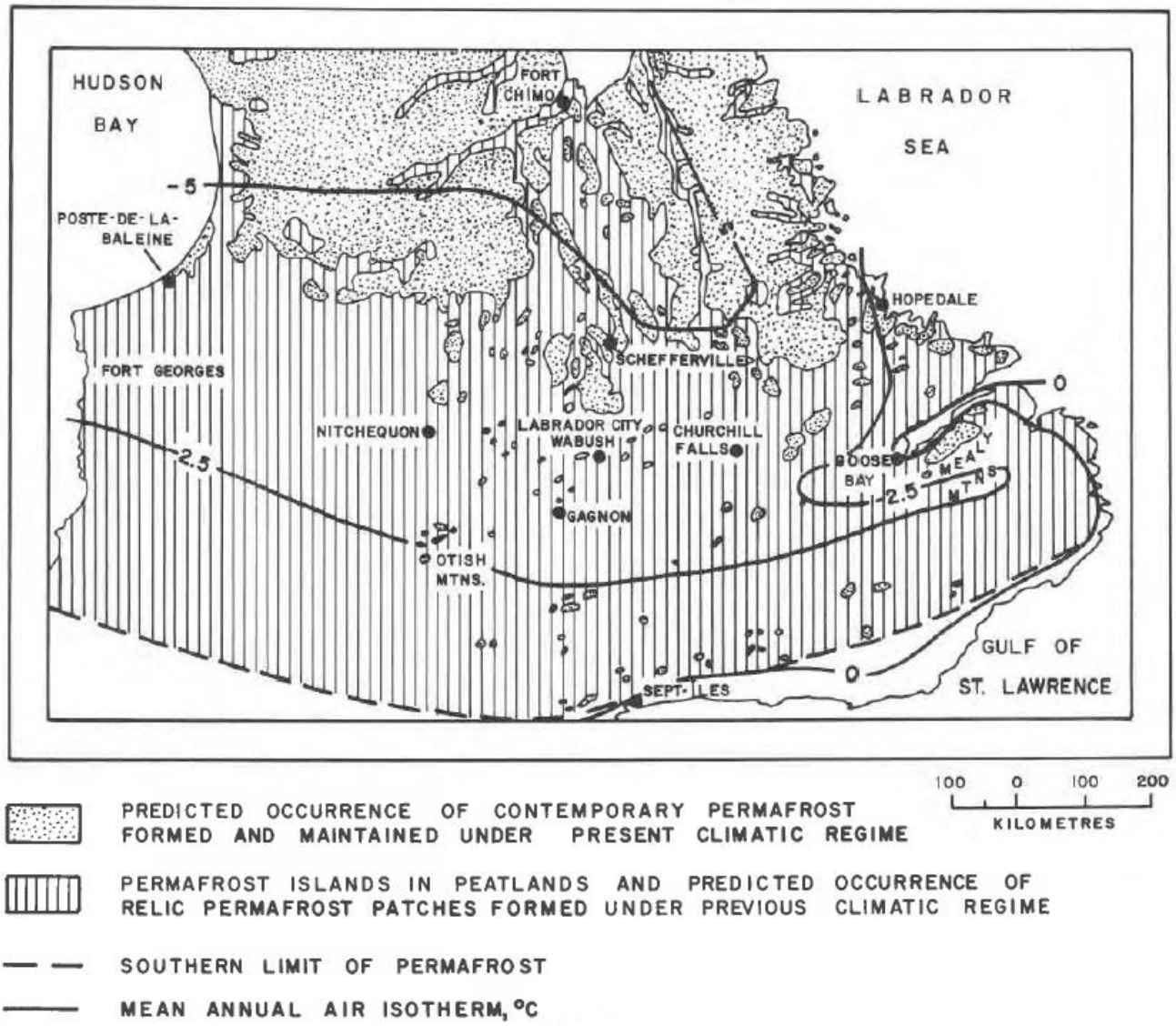
The areas in and surrounding the deposits associated with the Project being predominantly greater than 80 percent bedrock, and a previously mined area, do not possess a high number of identifiable landforms. There is evidence of striae, indicating direction of flow known and unknown, as well as identified eskers (esker ridge; kame or splay deposit) in the area (R.A. Klassen et al. 1992).

7.1.4.1 Permafrost

Although permafrost is reported within the Fleming-Timmins group of deposits, 25 km northwest of Schefferville (Garg 1982), permafrost has not been identified within the current Houston 1 and 2 Project area. Although the Schefferville area has been previously identified as the “tentative southern limit of continuous permafrost”, Jenness (1949), then later as the “approximate southern limit of permafrost”, Thomas (1953), it was later concluded that there were no continuous zones of permafrost in the Labrador-Ungava and boundaries of discontinuous and sporadic zones were specified (Black 1951). An area 160 km north of Schefferville was indicated as the southern limit of discontinuous permafrost and extending to within 80 km of the Gulf of St. Lawrence was the sporadic zone (Pryer 1966). There have been observations of permafrost of 120 m in thickness in the Schefferville region (Brown 1979).

Various studies on permafrost refer to vegetation and snow cover as having correlation with permafrost presence and thickness. Snow depth and density changes with relief, weather and vegetation (Thom 1969). Thom suggests thick permafrost (up to 60 m) is likely in areas where snow cover is less than 0.4 m during the winter months of January and February.

Figure 7-3 Permafrost Distribution in Nouveau-Québec and Labrador (Source Brown, 1979)



Research on permafrost distribution at numerous sites in the Schefferville area has been conducted by Nicholson (February 1978). Two sites at a great distance north of the Project included Timmins 4 and Fleming 7, at an elevation of 700 m, between 1973 and 1975. It was determined that deep permafrost underlies areas of high elevation, which were exposed and vegetation cover consisted of tundra. The permafrost ranged from 60 to 100 m in depth, and entirely unfrozen areas occurred in valleys on the edge of these sites. No permafrost was present on less exposed and low-lying wood covered ground surfaces (Nicholson and Lewis 1976). Permafrost was expected to be absent beneath water bodies in the area that are so deep they do not freeze solid during winter, due to the water bodies' ability to produce higher ground temperatures. Permafrost is not expected to occur within 30 m from permanently covered shoreline (Nicholson February 1978).

Permafrost has not been observed in the Houston 1 and 2 Project Area and therefore it is not anticipated that permafrost will interfere with mining at the Houston deposit areas.

7.1.4.1.1 Acid Rock Drainage

The Houston 1 and 2 property is located approximately 20 km southeast of Schefferville and approximately 10 km from the Redmond deposit which, together with the James deposit, currently forms part of LIM's first phase mine development. Based on the geology associated with iron ore deposits and specifically the geology associated with the previously assessed James and Redmond deposits, the geological materials to be excavated, exposed and processed during mining of the Houston 1 and 2 deposits are anticipated to have a low to no potential for Acid Rock Drainage (ARD). Due diligence requires that ARD potential for any new mine site be fully evaluated and LIM has committed to ensuring the long term chemical stability of the Project through all stages of the mine life through the initiation of an ARD assessment program during the Fall 2011.

Based on sampling of representative materials obtained from the James and Redmond deposits, similar in geology to those at Houston, sufficient historical and baseline data, as well as current laboratory test work, exists to suggest that ARD potential is extremely low for this Project. The following sections summarize the available data and the ongoing test work that will be completed.

Historical and Baseline Water Quality

Exploration and mining activities have occurred at the Project site dating back to the 1950s. IOC excavated large open pits and stockpiled considerable waste rock, low grade ore and other materials around the site. These materials have been exposed to both water and air (both required conditions for acid generation from rock) for decades and to date there is no evidence of poor or deteriorating water quality (lowered pH, elevated metals) in the flooded pits, stockpile drainage areas, or the surrounding natural water bodies.

Water quality monitoring on and around the Houston area has been completed annually since 2008 and indicates generally good water quality with pH ranging from 6.24 to 8.01.

ARD Sampling and Testing Program

A phased ARD sampling and testing program has been initiated to investigate and confirm the ARD potential for all geological materials (ore and waste) to be exposed at the Houston 1 and 2 Project area.

To provide regional perspective, the results of the acid base accounting test work completed to date on the geologically similar deposits at the nearby James and Redmond Mine areas are compiled in Table 7.1. These samples contain very low concentrations of sulphur and the NP/AP ratios for these samples tested range from 37 to 44 over seven samples. Based on the static ARD test results available to date, it is not anticipated that any of the ore or waste materials for this Project will be acid generating.

Bulk metals analysis was completed on seven samples by strong acid digestion (4 Acid) for trace metals (ICP-AES and ICP-MS). These results are shown in Table 7.1 and show generally typical element composition with the exception of iron, as would be expected.

Additional ARD test work will be completed as additional samples from LIM's 2011 sampling (trenching and boreholes) program become available. Additional test work will be designed to provide coverage of all geological materials and spatial extents of the planned mine workings.

Table 7.1 Acid Base Accounting (ABA) Results for the Nearby James and Redmond Deposits and Ruth Pit Waste Rock

Deposit	Sample Method	Material Type	Paste pH	Total Sulphur	Acid Leachable SO_4-S	Sulphide -S	Total Carbon	Carbonate	NP (t $CaCO_3$/ 1000t)	AP (t $CaCO_3$/ 1000t)	Net NP (t $CaCO_3$/ 1000t)	NP/AP Ratio
			(units)	(%)	(%)	(%)	(%)	(%)				
James	Bulk	HGO	6.98	< 0.005	< 0.1	< 0.01	0.040	0.127	12.5	0.31	12.2	40.3
James	Bulk	LGO	7.10	< 0.005	< 0.1	< 0.01	0.091	0.024	12.5	0.31	12.2	40.3
Redmond 2	Bulk	LGO	7.55	< 0.005	< 0.1	< 0.01	0.048	0.029	13.0	0.31	12.7	41.9
Redmond 2	Bulk	Waste	6.95	< 0.005	< 0.1	< 0.01	0.047	0.119	11.6	0.31	11.3	37.4
Redmond	Bulk	HGO	7.04	< 0.005	< 0.1	< 0.01	0.141	0.228	13.4	0.31	13.1	43.2
Redmond 5	Bulk	HGO	7.41	< 0.005	< 0.1	< 0.01	0.081	0.017	13.7	0.31	13.4	44.2
Ruth	Bulk	Waste	8.03	0.121	0.3	< 0.01	0.026	0.031	12.1	0.31	11.8	39.0

7.2 Physiography

The terrain in the area of the Houston property is comprised of parallel ridges and valleys trending northwest to southeast, with bare rock exposures and barrens. Ground elevation along the longitudinal axis of the proposed Houston 1 and 2 open pits ranges approximately from 560 600 masl.

The physiography of the Schefferville area, as described in the independent report entitled "*Technical Report, Silver Yards, Direct Shipping Iron Ore Projects in Western Labrador, Province of Newfoundland and Labrador ad North Eastern Quebec, Province of Quebec* (Prepared by Maxime Dupere, P.Geo. and Justin Taylor, P.Eng., April 15, 2011: "The topography of the Schefferville mining district is bedrock controlled with the average elevation of the properties varying between 500m and 700m above sea level. The terrain is generally gently rolling to flat, sloping north-westerly, with a total relief of approximately 50 to 100m. In the main mining district, the topography consists of a series of NW-SE trending ridges while the Astray Lake and Sawyer Lake areas are within the Labrador Lake Plateau. Topographic highs in the area are normally formed by more resistant quartzites, cherts and silicified horizons of the iron formation itself. Lows are commonly underlain by softer siltstones and shales. Generally, the area slopes gently west to northeast away from the land representing the Quebec – Labrador border and towards the Howells River valley, parallel to the dip of the deposits….The mining district is within a "zone of erosion" in that the last period of glaciations has eroded away any pre-existing soil/overburden cover, with the zone of deposition of these sediments beings well away from the area of interest. Glaciation ended in the area as little as 10,000 years ago and there is very little subsequent soil development. Vegetation commonly grows on glacial sediments and the landscape consists of bedrock, a thin veneer of till as well as lakes and bogs".)

The proposed Houston pits 1 and 2 will be developed within an elongate area approximately 350m, at its widest, by approximately 1.5km in total length.

7.3 Temperature and Precipitation

Temperature and precipitation data for the site area are presented in Table 7.2. LIM established an independent weather station at the Houston area in 2007 and has collected data from this station since that time. The location of the LIM weather station is presented on Figure 7-4. As well, LIM has collected climtate information from Environment Canada's National Climate and Information Archive with data collected at the Schefferville airport from 1971 to 2000

The climate in the Schefferville area, as described in the independent report entitled "*Technical Report, Silver Yards, Direct Shipping Iron Ore Projects in Western Labrador, Province of Newfoundland and Labrador ad North Eastern Quebec, Province of Quebec* (Prepared by Maxime Dupere, P.Geo. and Justin Taylor, P.Eng., April 15, 2011: "The Schefferville area and vicinity have a sub-arctic continental taiga climate with very severe winters. Daily average temperatures exceed 0°C for only five months a year. Daily mean temperatures for Schefferville average -24.1°C and -22.6°C in January and February respectively. Mean daily average temperatures in July and August are 12.4°C and 11.2°C, respectively. Snowfall in November,

December and January generally exceeds 50 cm per month and the wettest summer month is July with an average rainfall of 106.8 mm".)

Table 7.2 Temperature and Precipitation Data

Parameter	Source	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily Avg. Temperature (°C)	Environment Canada	-24.1	-22.6	-16	-7.3	1.2	8.5	12.4	11.2	5.4	-1.7	-9.8	-20.6
	LIM Weather Station	-20.4	-13.4	-12.1	-2.1	2.0	11.3	14.4	13.3	7.1	-0.1	-6.3	-17.3
Daily Max. Temperature (°C)	Environment Canada	-19	-16.9	-9.8	-1.5	6	13.7	17.2	15.8	8.9	1.3	-6.1	-15.9
	LIM Weather Station	2.5	7.0	15.2	17.5	21.3	39.2	34	30.7	32.2	16.4	8.6	0.7
Daily Min. Temperature (°C)	Environment Canada	-29.2	-28.1	-22.2	-13.1	-3.6	3.3	7.6	6.5	1.7	-4.6	-13.5	-25.2
	LIM Weather Station	-38	-36.5	-32.5	-20.2	-12.3	-5.8	2	-0.2	-4.8	-18.1	-24.3	-36.5
Rainfall (mm)	Environment Canada	0.2	0.2	1.6	8.4	27.7	65.4	106.8	82.8	85.3	24.4	4.5	0.9
	LIM Weather Station	1.6	15.2	13.7	30.4	26.6	56.3	125.8	90.3	63.6	64.4	17.6	0.1
Snowfall (cm)	Environment Canada	57.4	42.6	56.6	54.8	22.9	8	0.5	1.7	12.7	57.2	70.7	55.4
Precipitation (mm)	Environment Canada	53.2	38.7	53.3	61.4	52.1	73.7	107.2	84.5	98.4	80.5	69.4	50.7

7.4 Air Quality

There is no industry in the area of the Houston Project area, and background concentrations of air contaminants are expected to be minimal. Fugitive dust levels in the area may be slightly higher due to the use of predominantly dirt roads for transportation in the area.

An ambient air quality monitoring program was conducted between August and October 2009 to monitor average daily concentrations of Total Suspended Particulate (TSP) levels at the Houston deposits. Sampling was generally conducted every six days. A total of nine 24-hour TSP samples were obtained. All but one of the nine samples were well below (no more than 41 percent of) the Newfoundland and Labrador Department of Environment and Conservation (NLDEC) ambient air quality standard for TSP (120 $\mu g/m^3$). The remaining sample, from October 7th, 2009, was slightly above the NLDEC TSP standard (139 $\mu g/m^3$). It should be noted that there was no test drilling at the Houston site on this day and is therefore considered to represent ambient conditions.

A search of the National Air Pollution Surveillance (NAPS) Network data records indicated that there was limited data available to determine background air quality for other air contaminants in the vicinity of the proposed operations. The nearest available sources of ambient air quality monitoring data are in Happy Valley-Goose Bay and Labrador City, both of which are more than 300km from the site location.

Based on the results of the ambient monitoring and the remote location of the site, it is expected that background air quality in the area would generally be within National Ambient Air Quality Objectives "Desirable" levels.

7.5 Aquatic Environment

The following presents the hydrological and hydrogeological field data that were collected in 2010, a preliminary site characterization, and a preliminary assessment of potential surface water and groundwater impacts that may result from the proposed open pits and from the Houston-Redmond Road. The existing conditions and mitigation for the local fish populations and fish habitat are also presented.

7.5.1 Surface Water Quality

Background surface water quality sampling was initiated at the Houston 1 and 2 area in 2007. The following locations were sampled as part of the baseline surface water quality monitoring program and the resulting data is presented in Appendix D of this document:

- HP-6: Houston Property, Tom's Pond
- HP-M: Houston Creek, Middle Section
- HP3: Houston Creek, South End
- MT: Mike's Tributary
- GR: Gilling River

The Houston 1 and 2 mine property has two surface water features, Tom's Pond (HP6) and Houston Creek (HP-M and HP-3) (Figure 7-5). Tom's pond is a small surface water feature with no connection to any other surface water systems. Surface water from Tom's Pond indicates that in-situ water quality parameters during late winter months are extremely anoxic and correspond to freshwater criteria exceedances for the protection of aquatic life (CCME CWQG) in aluminum, iron, copper, magnesium, nickel and zinc. The pH values for Tom's Pond range from 6.24 to 6.91.

Houston Creek surface water samples (HP-M and HP-3) indicate that the aesthetic value for colour and magnesium Drinking Water Quality (GCDWG) is occasionally exceeded at various times of the year (Appendix D) and can be attributed to the seasonality of the associated wetlands. The pH value for the Houston Creek samples range from 6.73 to 7.29.

Surface water features sampled along the proposed haul road corridor (i.e., samples collected from MT and GR sample locations) were found to contain total zinc in exceedance of Freshwater Criteria (CCME CWQG) during the course of the sampling program. There has been no known disturbance within the road corridor that could explain the noted zinc values (Appendix D) and so this value is considered to be representative of naturally-occurring baseline conditions. The pH values for the Gilling River and Mike's Tributary samples, located in the proposed haul road corridor, range from 7.76 to 8.01.

7.5.2 Hydrology

7.5.2.1 Drainage Patterns

The drainage system in the area is strongly influenced by the underlying geology. Streams and lakes tend to be oriented northwest to southeast to match the strike of the bedrock units. A major watershed flow divide exists between Houston Lake and the proposed Houston open pit areas. Drainage in the Houston Lake catchment area flows northwest as part of the Knob Lake catchment, which is part of the larger Ungava Bay drainage basin watershed. Drainage from the Houston open pit areas and the area of the Houston-Redmond road is within the Astray Lake catchment and within the Petitsikapau catchment, both part of the Churchill River drainage basin watershed.

The local drainage patterns in the vicinity of the Houston Mine open pit area and the Houston-Redmond Road area have been based on topographical contours and mapping of streams and lakes. These drainage patterns are shown on Figure 7-4 and a description is provided in the following subsections.

Figure 7-4 Houston Property Drainage

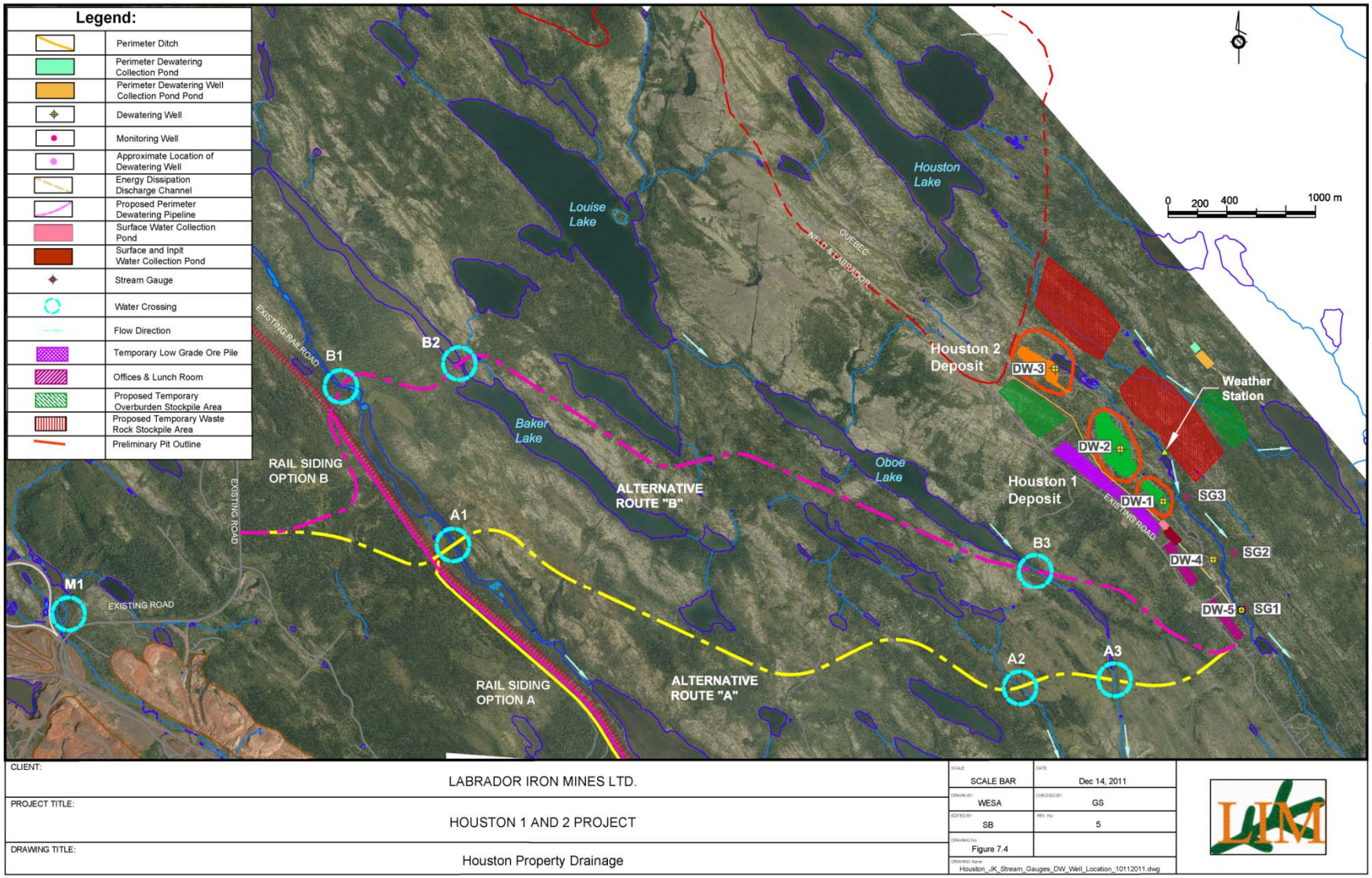
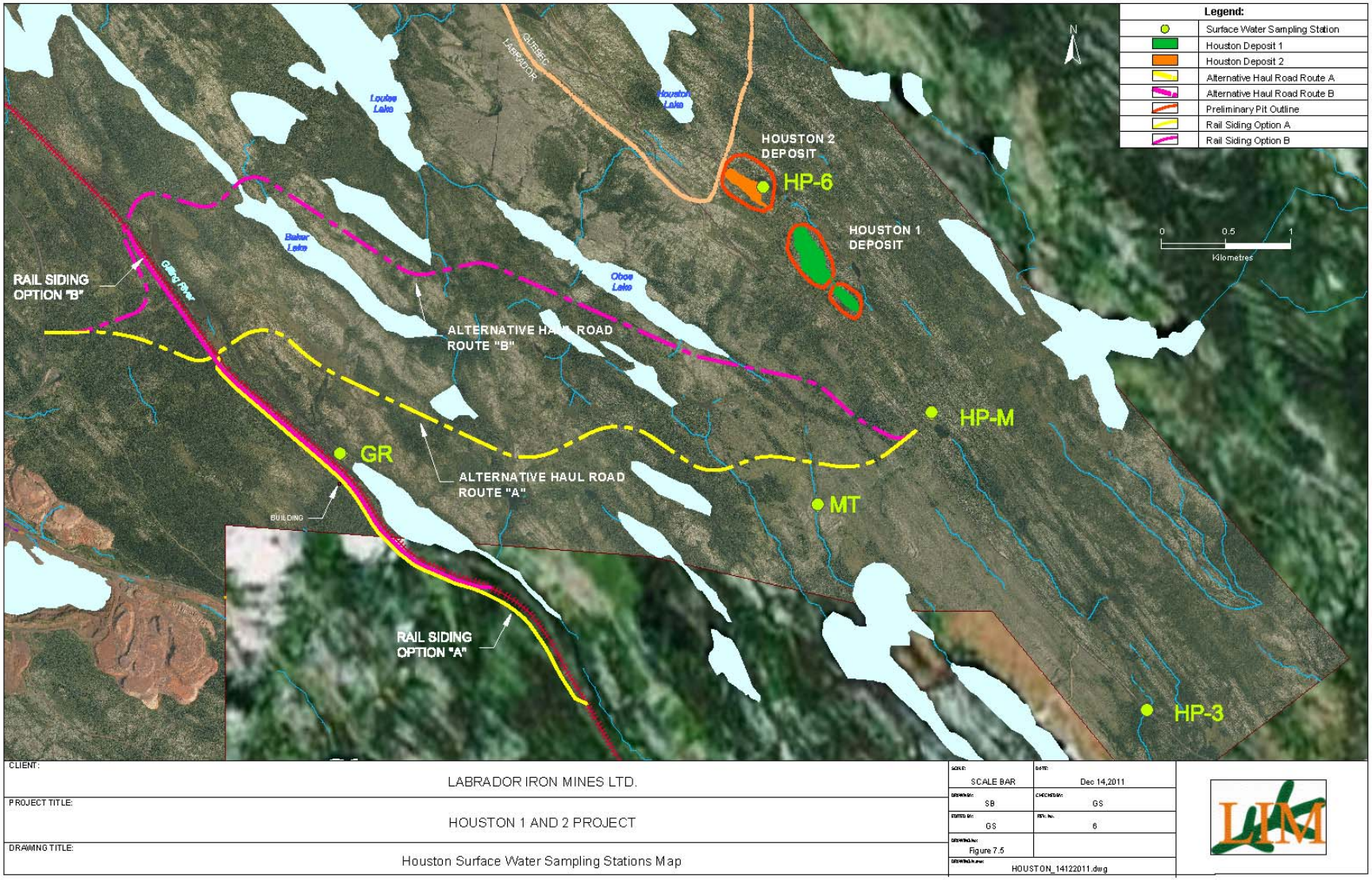


Figure 7-5 Houston Surface Water Sampling Location Plan



7.5.3 Drainage in the Houston Mine Open Pit Area

On the northeast side of the proposed Houston 2 open pit area, drainage flows southeast within a stream and its associated wetlands and then passes through two unnamed lakes that drain into a creek which eventually discharges into Petitsikapau Lake (Figure 7-4). Drainage northeast of Houston 1 is within a stream and its associated wetland areas that runs parallel to the longitudinal axis of the pits, with surface water eventually discharging into a northern part of Astray Lake, located directly downgradient from Mike Lake (Figure 7-4).

7.5.4 Drainage in the Houston-Redmond Road Area

Drainage in the vicinity of the proposed Houston-Redmond Road area is to the southeast with eventual discharge into Astray Lake via either Mike Lake or Gilling River (Figure 7-4). Major tributary lakes and streams include Louise Lake to Oboe Lake to Mike Lake and Baker Lake to Gilling Lake to Gilling River.

7.5.4.1 Stream Gauges and Stream Velocities and Flows

Three stream gauges were installed by WESA at the Houston site on November 12, 2010 in order to measure surface water flow rates in the stream that flows in a south-easterly direction and runs on the east side of Houston 1 and then south with eventual discharge into Astray Lake. The location of the stream gauges are shown on Figure 7-4. Stream velocities were measured on November 13, 2010 (Table 7.3), while flow measurements were recorded between November 12 and 18, 2010 (Table 7.4).

Table 7.3 Stream Gauge Locations and Measured Stream Velocities – November 13, 2010

Stream Gauge	Stream Width	Location	Velocity	
			Mechanical Flow Meter	Stingray
SG-1	0.36 m	6063353N 652217E	0.27	0.33 – 0.40
SG-2	0.36 m	6063845N 651852E	0.58	0.78
SG-3	0.41 m	6064402N 651551E	Flow too low to record manually.	0.055

Table 7.4 Maximum, Minimum and Mean Flows – November 12th-18th, 2010

Stream Gauge	Max	Min	Mean
	m^3/min	m^3/min	m^3/min
SG-1	4.51	3.60	4.01
SG-2	5.79	4.68	5.31
SG-3	2.61	0	0.37

7.5.5 Fish and Fish Habitat

7.5.5.1 Houston Deposits

The proposed pit development is not expected to impact existing fish habitat and will maintain a 15m buffer from fish-bearing habitat observed at Houston Creek that originates to the northeast of the deposits. Houston Creek contains a low productive coldwater fishery with the presence of brook trout being noted during various field surveys in this first order stream (AECOM 2010). If access is required across this small watercourse, an open bottom culvert constructed above the high watermark will be constructed to ensure no physical impediment to fish habitat will occur.

There is one small surface water feature situated within the pit limit of Houston 2. The historic prospecting data provided by IOC refer to this as Tom's Pond. Late winter site inspections during March 2007 and April 2009 indicate the maximum depth of the pond is 2m and exhibits anoxic conditions during the late winter.

Efforts by AECOM in September 2008 consisted of six baited minnow traps (250 hours); electrofishing (2,500 shocking seconds); and seine netting (100 m^2), with no fish being captured or observed. Additional fishing effort was exerted by Parks Environmental Inc. by electrofishing with 1,432 electrofishing seconds, on September 14th, 2010, and by AECOM in the summer 2011, with no fish captured or observed. Parks Environmental also utilized minnow traps (136 hours) during the late summer 2011 and, again, no fish were captured.

Sampling efforts in Tom's Pond are detailed in Table 7.5

Table 7.5 Fishing Effort (by Gear Type), for Tom's Pond, Houston Property 2008-2011

Method	Dates	Total Effort	Total Fish Captured	CPUE*
Minnow Traps				
	June 4 to 6, 2008	250	0	0
	September 11 to 14, 2011	136	0	0
Electrofishing (Shocking Seconds)				
	June 7, 2008	2500	0	0
	September 12, 2010	1432	0	0
Seine Net (m^2)				
	June 7, 2008	100	0	0
*CPUE is Total Fish Captured/Total Effort				

Information provided to DFO regarding Tom's Pond indicates that severe anoxic conditions have been identified in the late winter 2007, indicating a hostile environment as fish habitat. DFO staff acknowledged that would limit the area as fish habitat; however, to provide additional confirmation, DFO requested that fish presence/absence sampling be conducted to further assess whether Tom's Pond could be considered fish habitat, as described by Section 34 of the federal *Fisheries Act*. This requested work was completed in 2011 and additional information supplied to DFO in October 2011 to support a review and decision regarding this matter.

With the noted anoxic conditions and the remoteness of this pond with no surface connectivity to any fish bearing habitat, it is highly unlikely that this pond contains fish habitat. LIM is preparing a detailed submission documenting these conditions to the Federal Department of Fisheries and Oceans and will continue current discussions to assist in their determination on the applicability of the *Fisheries Act* to this location.

7.5.5.2 Water Crossings Habitat Assessment

Although a final haul road route has not yet been determined, an assessment of fish-bearing watercourses within the proposed route options consist of a coldwater fishery with the presence of brook trout being noted at various watercourse crossings (AECOM 2010). Habitat assessments along proposed route alternatives indicate that minor watercourses, 1st through 4th order streams, can be spanned with open bottom culverts, which can be constructed above the high watermark, to minimize impacts to fish habitat. The largest watercourse crossing is at Gilling River. This can be traversed at the reviewed stream crossing locations with a span/bailey bridge measuring less than 30 metres in length and less than 20 metres in width and with supporting abutments constructed above the high watermark, to ensure that no physical impacts to fish habitat occur.

Activities associated with construction of the haul road will include clearing of vegetation, grubbing, and grading. Standard road construction mitigation will be applied throughout the construction process to ensure that the local environment is protected. Construction activities will be done in accordance with the Houston Project EPP. Clearing and removal of trees will be kept to a minimum and will be done in accordance with applicable permits. Clearing will avoid wetlands where possible and chain saws or other hand-held equipment will be used except where alternatives are approved. A minimum 15m buffer will be maintained, where possible, between the development area and waterbodies. If a 15m vegetation buffer cannot be maintained, LIM will notify Water Resources Management Division and apply for a permit under Section 48 of the *Water Resources Act*. Where possible, additional buffer widths will be maintained (Table 7.6).

Table 7.6 Recommended Minimum Buffer Zone Requirements for Activities Near Watercourses

Activity	Recommended Buffer Width
Development around watercourses in urban or other developed area	15m depending upon site-specific considerations
Resource roads or highways running adjacent to water bodies	20m + 1.5 x slope (%)
Piling of wood and Slash Grubbing	30 m
Placement of Site Trailers Fuel Storage	100 m
Source: Gosse et al. 1998	

7.5.5.3 Haul Road and Siding Potential Impacts and Mitigation

The potential surface water impacts resulting from the Houston-Redmond haul road include the disturbance of streambeds or wetlands, erosion of banks and sedimentation of water during construction of water crossings. Water crossings for the two proposed routes are shown in Figures 7-4 and 7-5.

Mitigation efforts will include the implementation of environmental monitoring and sediment control efforts during the construction period to reduce any potential for sediment to be directed into nearby watercourses. Workers will be trained in an Environmental Protection Plan orientation program and onsite LIM Environmental Managers will conduct environmental monitoring. Environmental monitoring will also be conducted during operations to ensure that sediment control efforts are succeeding and to implement additional measures, if required.

All work will be conducted outside of the high water mark and the clearspan bridge proposed for the Gillings River haul road crossing will be designed with sediment control features to reduce any potential for sediment to enter the watercourse from vehicle traffic. Bottomless culverts will be used for smaller crossings and, again, all work including supports will be placed outside of the high water mark. Should the proposed siding require any crossings, similar approaches will be undertaken.

7.6 Groundwater and Hydrogeology

7.6.1 Groundwater Quality

A total of five groundwater test wells, TW1 through TW5, were installed on the Houston property in 2010 and 2011 (Figure 7-4). Test wells TW1, TW2, TW4, and TW5 are low yielding wells, with yields ranging between less than 1 and 30 USGPM. TW3 is a very good producing well, with an estimated yield of approximately 1000 USGPM.

On September 29, 2011 a six hour pumping test was conducted on HS-TW5 at a pumping rate of 40 to 50 USGPM. On October 1, 2011 a step drawdown pumping test was conducted at HS-TW4. A 72 hour constant discharge pumping test was conducted on TW3 from October 7 to October 10, 2011 at a pumping rate of 500 USGPM. Water levels were recorded in the pumping well and in six nearby observation wells.

The water was very clear for the duration of the test at both TW3 and TW5. Water samples were collected at Houston well TW3 just before the pump was turned off and the results are presented in Appendix C. The pumping test data is currently being analyzed.

As well, to provide a regional context, groundwater chemistry results for the nearbyJames and Redmond Properties hydrogeological assessment wells are also included in Appendix C. The regional groundwater chemistry, as demonstrated by the results from the test wells installed at James, Houston and Redmond wells, show general consistency amongst most parameters, although pH is shown to be quite variable. The chemistry data for TW3 presented in Appendix C is generally consistent with the results collected historically at the James and Redmond wells.

7.6.2 Hydrogeology

7.6.3 General Groundwater Conditions in the Schefferville Area

Ore-grade iron deposits are often found on the ridge flanks, where groundwater flowing down through higher-permeability fault zones leaches the silica from the iron silicate Sokoman Iron Formation. Because of this leaching process, the ore and the country rocks in the immediate vicinity of mines are soft, friable and porous. These characteristics have been observed in the field. The presence of alternating bands of hard rock and more friable rock, as well as red, blue and yellow ore in the area, appear to contribute to the presence of particulate in the water.

Depending on the degree of alteration, the hydrogeological and strength properties of the rock units vary widely. In Garg and Kalia (1975), the following relative permeability ranges are listed for the different formations:

Stratigraphy	Relative Permeability Range	
	Unaltered State	Altered State
Cretaceous Rubble	Very Low to Low	Low
Menihek Slate	Low	Very Low
Sokoman Formation	Low to Medium	Medium to High
Ruth Formation	Low to Medium	Very Low
Wishart Formation	Low to Medium	Medium to High
Fleming Formation	Low to Medium	Low
Denault Formation	Medium	Medium to High
Attikamagen	Low	Very Low

Hydrostratigraphic units acting as aquifers include the Sokoman, Wishart and Denault formations while aquitards include the slate and shales of the Knob Lake Group, and the Attikamagen, Ruth and Menihek slates.

Static water levels on ridges are generally far below ground surface (>30 m) while static water level in the valleys, where there are many lakes and wetlands, is near ground level. Although the ridges are usually recharge zones and the valleys are discharge zones, small springs are found of the side of some ridges at the base of the Sokoman Formation.

7.6.3.1 Preliminary Hydrogeological Investigation

A total of five groundwater test wells, TW1 through TW5, were installed on the Houston property in 2010 and 2011 (Figure 7-4). Test wells TW1, TW2, TW4, and TW5 are low yielding wells, with yields ranging between less than 1 and 30 USGPM. TW3 is a very good producing well, with an estimated yield of approximately 1000 USGPM.

On September 29, 2011 a six hour pumping test was conducted on HS-TW5 at a pumping rate of 40 to 50 USGPM. Water levels were taken over the six hours and a maximum drawdown of 61.01 m was reached at the end of the six hours. The discharge water was red at the start of the test but began to clear as the test progressed. The pumping test data is currently being analyzed.

On October 1, 2011 a step drawdown pumping test was conducted at HS-TW4. A drawdown of 65.02 m was reached after 45 minutes of pumping at an estimated pumping rate of 0.5 USGPM.

The discharge water was clear for the 45 minutes of pumping during the optimization test. As a result of the low yield produced at this well, a six hour pumping test could not be conducted.

A 72 hour constant discharge pumping test was conducted on TW3 from October 7 to October 10, 2011 at a pumping rate of 500 USGPM. Water levels were recorded in the pumping well and in six nearby observation wells. The water was very clear for the duration of the test. Water samples were collected just before the pump was turned off and the chemistry results are presented in Appendix C. The pumping test data is currently being analyzed.

The preliminary hydrogeological information suggests that the Houston 1 pit may not encounter significant amounts of water while the Houston 2 pit may encounter significant water infiltration. Water quality observations made during the long term pumping test at Houston indicate that groundwater is very clear.

7.6.3.2 Preliminary Surface Water and Groundwater Impact Assessment and Mitigative Measures

7.6.3.3 Houston 1 and 2 Open Pits

The development of the Houston 2 open pit will entail the loss of a small pond located partially in the southeastern portion of the pit area. The pond has been characterized aquatic specialists (AECOM 2008 and PEI, 2010 and 2011) as a non-fish habitat body of water and, pending review by DFO of the detailed report currently in preparation, it is anticipated that the proposed development will not be considered to result in fish habitat impact.

Open pit dewatering operations at Houston 1 and 2 may reduce stream baseflow in the two main identified drainage routes toward Petitsikapau Lake, and toward Astray Lake (downgradient of Mike Lake). To mitigate, pit perimeter dewatering water will be discharged into these streams to compensate for loss of flow. This mitigation strategy was developed for the James Mine, approved by DFO, and has been effectively implemented at James mine.

A drainage ditch will run along the west side of the pit to collect water draining from higher elevations to the west to prevent it from entering the pit. Water collected from in-pit sumps will also flow into this ditch. The ditch will flow to the south to a proposed collection pond. The collection pond will be sized and designed to collect maximum flow during spring run-off for retention of the water. Should it be required, appropriate systems will be developed to treat water for any suspended solids prior to testing and discharge. It is currently planned that clear water will be released to the stream east of the pit (see Figure 7-6).

Dewatering wells will be drilled and installed at the perimeter of and within the pits, if required. The water pumped from these wells is expected to be clean and not require treatment. The dewatering water will flow to a collection pond to the east of the pits and then will be released towards the unnamed lake to the southeast. In the event that the dewatering water is not clear, appropriate systems will be developed to treat water for any suspended solids prior to testing and discharge towards the unnamed lake to the south-east.

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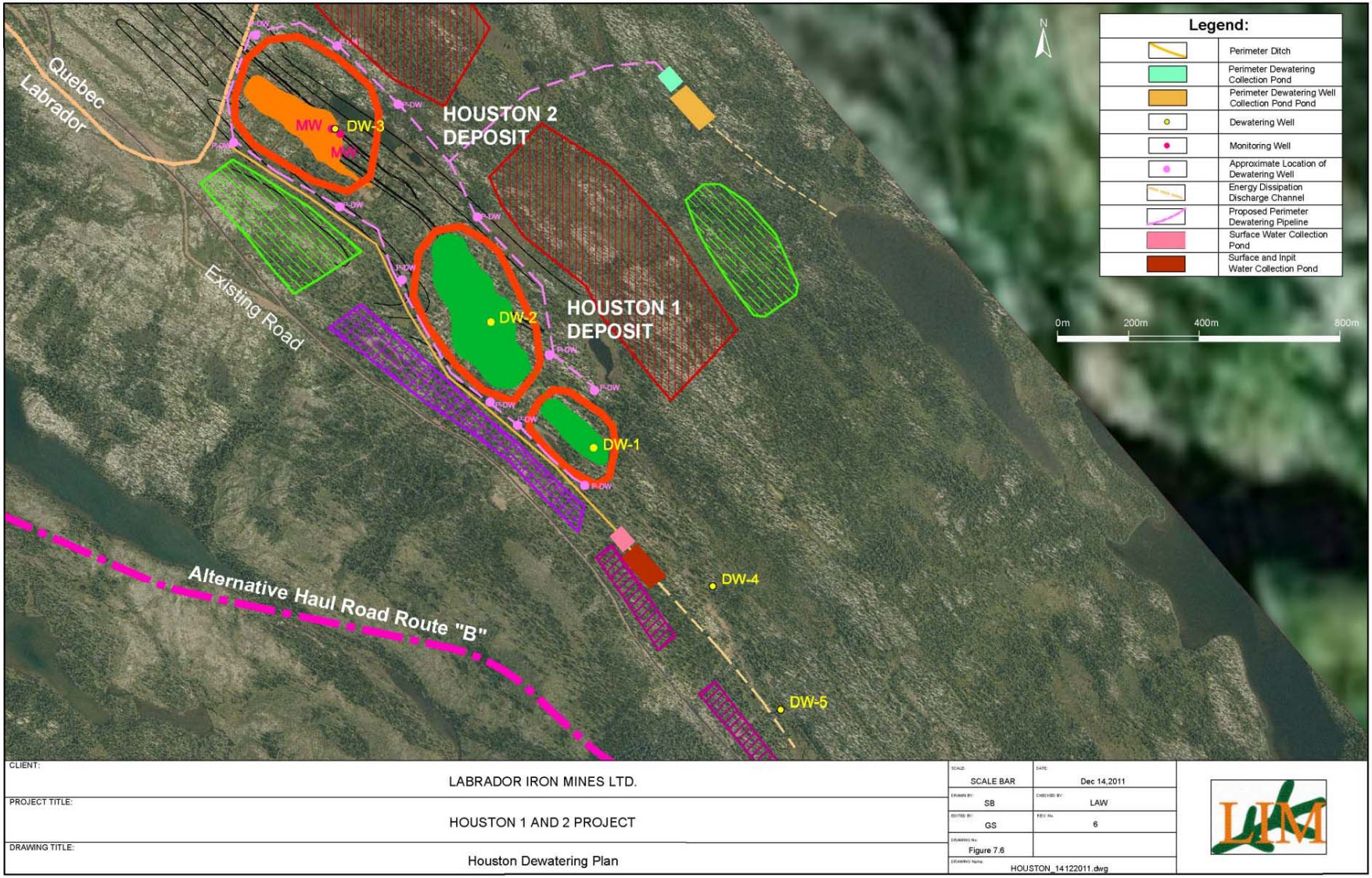
Figure 7-6 Houston Dewatering Plan Map



7.7 Vegetation

7.7.1 Habitat Types

Information related to vegetation and vegetation communities (including wetlands) occurring within the Houston Property has been based on baseline data collected in the region since 2008 and reported in the Schefferville Area Iron Ore Mine EIS (August 2009) as well as site-specific baseline data collected since 2009 by AECOM and a Wildlife Habitat Suitability Study (Stassinu Stantec 2010) based on Canada's National Ecological Land Classification (ELC) Framework.

At a continental scale, the Houston Property is contained within the Eastern Taiga Shield Ecozone (Environment Canada 2010). This Ecozone extends across the Canadian sub-Arctic at the northern edge of the boreal forest. In general terms, cool temperatures, a short growing season and thin, acidic soils are the main features of this Ecozone. Within the Eastern Taiga Shield Ecozone are several Ecoregions which are defined mainly on the basis of distinctive regional climate (Environment Canada 2010). The Houston Property occurs primarily within that of the Smallwood Reservoir-Michikamau (SRM) Ecoregion, bordering the Ungava Bay Basin Ecoregion along the properties northern boundary.

The SRM Ecoregion extends right across central Labrador and is marked by cool summers and very cold winters. The mean annual temperature is approximately -3.5°C. The mean summer temperature is 9°C and the mean winter temperature is -16°C. Mean annual precipitation ranges from 700 mm in the north to 1,000 mm along the Quebec/Labrador border in the south. The Ecoregion is classified as having a low subarctic ecoclimate. Its open coniferous forests are transitional, both to tundra and alpine tundra vegetation communities to the north, and to the closed cover of typical coniferous boreal forests to the south. Open stands of black/white spruce -lichen woodland with an understory of feathermoss, are dominant. Humo-Ferric Podzolic soils are dominant with significant inclusions of Ferro-Humic Podzols, Mesisols, and Organic Cryosols. Permafrost occurs in isolated patches, mainly in wetlands.

Ecodistricts are the next level of division in the ELC framework. These are characterized by distinctive assemblages of topography, landform, geology, soil, vegetation, water bodies, and fauna.

Habitat Types, the final level of division in the ELC framework, are defined as distinct assemblages of plant species that can often be associated with particular environmental conditions and given the right conditions, reoccur predictably within a particular habitat. In total, nine vegetated ELC Habitat Types were identified (Stassinu Stantec 2010), including: Black Spruce/Lichen Woodland, Spruce/Feathermoss Forest, Black Spruce/Dwarf Birch/Lichen/ Feathermoss Forest, Black Spruce/Sphagnum Woodland, Dwarf Birch/Blueberry Shrubland, Tamarack-Spruce/Feathermoss Forest, Tamarack/Sphagnum Woodland, Low Shrub Bog, and Fen.

The predominant upland Habitat Type observed throughout the property was Black Spruce/Lichen Woodland. This Habitat Type was found primarily on well to rapidly drained, sandy and/or stony glacial till deposits, as well as on shallow soils overlying bedrock. It also occurs on sandy glaciofluvial deposits and sandy/stony colluvium deposits. Overall, this Habitat

Type tends to be dry (xeric to sub-mesic moisture regime) and of poor fertility. Vegetative cover is characterized by small patches of black spruce (*Picea mariana*) imbedded in a carpet of lichens dominated largely by grey (*Cladina rangiferina*) and star-tipped (*Cladina stellaris*) reindeer moss (lichen). Other commonly occurring ground species include red-stemmed feathermoss moss (*Pleurozium schreberi*), bunchberry (*Cornus canadensis*), lesser green reindeer moss (*C. mitis*), grey reindeer moss (*C. rangiferina*), and broom moss (*Dicranum* sp.). Shrub cover consists mainly of stunted black spruce and dwarf birch (*Betula glandulosa*), along with black crowberry (*Empetrum nigrum*), alpine blueberry (*Vaccinium uliginosum*), common Labrador tea (*Rhododendron groenlandicum*) and northern blueberry (*Vaccinium borealae*). Shrub-size black spruce (as well as red-stemmed feathermoss) is mainly associated with patches of mature black spruce, while the dwarf birch is more widely distributed.

Bogs occur to a lesser extent on the Houston property, with the majority concentrated in peat filled depressions occurring between parallel formations of sinuous bedrock ridges and valleys. Low Shrub Bog Habitat Types are relatively uniform in species composition, typically with a sparse tree cover consisting of scattered black spruce and tamarack (*Larix laricina*). Shrub cover is stunted and forms a low patchy cover composed largely of bog rosemary (*Andromeda glaucophylla*), bog willow (*Salix pedicellaris*) and blueberry. The ground vegetation consists of a mixture of sphagnum mosses, sedges, cottongrass (*Eriophorum* spp.) and small cranberry (*Vaccinium oxycoccus*).

Additionally, two Non-habitat Areas (non-vegetated) were also observed; these include Exposed Earth/Anthropogenic/Disturbed and Open Water.

7.7.2 Rare Plants

Rare plants are categorized as those species listed in Schedule 1 of the federal *Species at Risk Act* (SARA) and designated endangered or threatened under the Newfoundland and Labrador *Endangered Species Act* (NLESA). The SARA Public Registry, ACCDC and the Annotated Checklist of the Vascular Plants of Newfoundland and Labrador (Meades 2010) were reviewed for information on the potential presence of rare plants within or in proximity to the Houston Project area. No listed plant species, protected federally under Schedule 1 of SARA or provincially pursuant to the NLESA, have been identified or are suspected to occur in the Houston Project area.

7.7.3 Timber

There are insufficient timber volumes to consider the Project area suitable for the harvest of merchantable timber.

7.8 Wildlife

7.8.1 Caribou

The Project overlaps with the range of the migratory George River Caribou Herd (GRCH). Specifically, this area of western Labrador overlaps a portion of the herd's winter range (Jacobs et. al 1996). Straddling the Quebec-Labrador peninsula (Ungava peninsula), the George River Herd was once one of the world's largest caribou populations, with estimates peaking at almost

800,000 individuals in the 1980's (Couturier et al. 1996; Russell et al. 1996; Rivest et al. 1998). More recently, a 2004 survey estimated the GRCH at 300,000 animals (Courturier et al. 2004) and a 2010 survey of the herd noted a substantial decline to approximately 74,000 animals (NLDEC 2010). This decline can likely be attributed to wolf predation and both legal and illegal hunting (Hearn et al. 1990). Emigration to other herds has also been suggested as a possible reason for the decline (Boulet et al. 2007).

Although there is no evidence of sedentary caribou near the Project area at present, they were reported historically (e.g., Caniapiscau or McPhadyen Herds) (LWCRT 2005; Bergerud et al. 2008). The sedentary herds of this region have declined or disappeared since the 1960s with the advent of the snowmobile allowing greater access for hunting.

The Committee on the Status of Endangered Wildlife in Canada listed the sedentary caribou populations of Labrador as "Threatened" (COSEWIC 2008, SARA 2008). Hunting of sedentary herds is illegal; however, the hunting of the GRCH is legal within the seasons and quotas defined by the provincial government (NLDEC 2008). The decline of the GRCH has resulted in the implementation of conservation measures restricting the hunt for Labrador residents and suspending the non-resident and commercial hunt (NLDEC 2010).

For the migratory George River herd, habitat can be described as tundra, forest-tundra and boreal forest habitat characteristic of the Boreal and Taiga Shield Ecozones. Habitat use is affected seasonally as the ranges change from winter to summer. Following an increase in herd population, summer habitat is considered spatially limited and alternative summer range is not available (Messier et al. 1988). Animals tend to avoid areas grazed during the previous winter and select alternate sites with more abundant lichen cover (Schmelzer and Otto 2003) having a preference for Cladina spp. (Cote 1998).

Woodland caribou do not make migratory movements but there is a seasonal shift during calving and post-calving periods to such forest types as black spruce forest, scrub or bog (Nalcor Energy 2009).

To complete the requirements of the environmental assessment for the James and Redmond properties, LIM and New Millennium Capital Corp (NML) were asked to perform a spring survey of the area within a specified radius of their properties in 2009 and 2010 to assess the presence of sedentary caribou herds. In 2009, only three sightings of caribou totaling seven individuals were confirmed over a 50km radius. One adult female was fitted with a satellite telemetry collar and on February 6, 2010 was legally shot on the Naskaupi River in the Grand Lake Extension Zone of the Caribou Management Area (D'Astous and Trimper 2009). Based on the migratory route of the GRCH during this time and the caribou's body length (192 cm), the Senior Wildlife Biologist in Labrador considered this animal to belong to the migratory ecotype rather than to the sedentary ecotype (D'Astous and Trimper 2009). This location was over 400 km distant from the capture location and its movements were consistent with the migratory George River Caribou Herd.

In addition to these surveys and marking efforts, D'Astous and Trimper (2009) collected caribou tissue samples for genetics analysis. Samples of ear dermis were collected from the same lone adult female that was collared by the field team, and from a recently killed (by wolf) adult

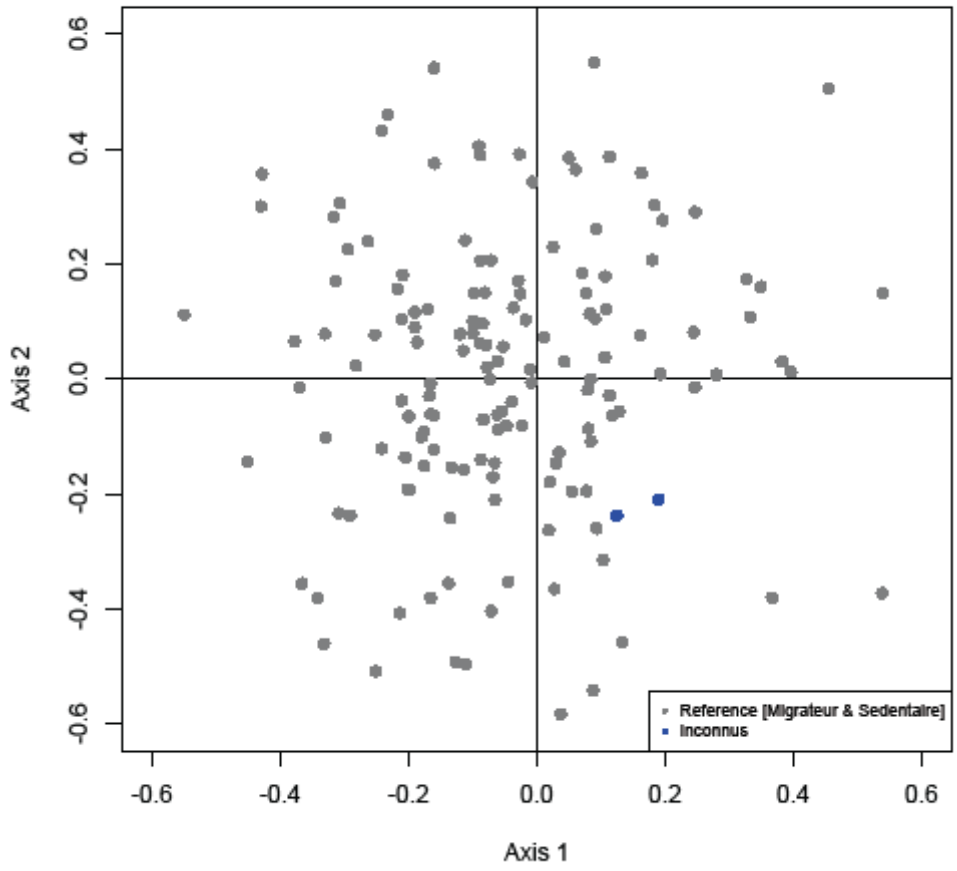
female. These samples were stored frozen at Laval University, Québec, until they could be analyzed at the specialized laboratory directed by Dr. Steeve Côté.

The genetic analysis and comparison to on-file genetic reference samples from known individuals were completed in May 2011 by Mr. Glenn Yannic. Several multivariate techniques (e.g., Factor Correspondence Analysis, Bayesian STRUCTURE) were used to compare the tissue samples to those collected from known ecotypes and herd affiliations in northeastern Quebec and Labrador such as the George River and Leaf River Herds (migratory ecotype), the Red Wine Mountains and Lac Joseph Herds (woodland ecotype) and the Torngat Mountains Herd (montane ecotype) [as described in Bergerud et al. (2008)] (Figure 7-7).

The results indicated the samples could not be assigned to any of the ecotypes or herds in the reference collection (below). Both caribou sampled are genetically similar, suggesting that they belong to the same ecotype. As a result of the extensive variability observed in the genetic testing, attributable to gene flow between the different migratory herds of caribou in the Quebec-Labrador Peninsula (Boulet et al. 2007), a clear assignment of the sampled individuals to a known reference herd, based solely on genetics, is not possible at this time. However, efforts expended to date indicate that the sampled caribou were of the migratory ecotype based on the following (D'Astous and Trimper 2010).

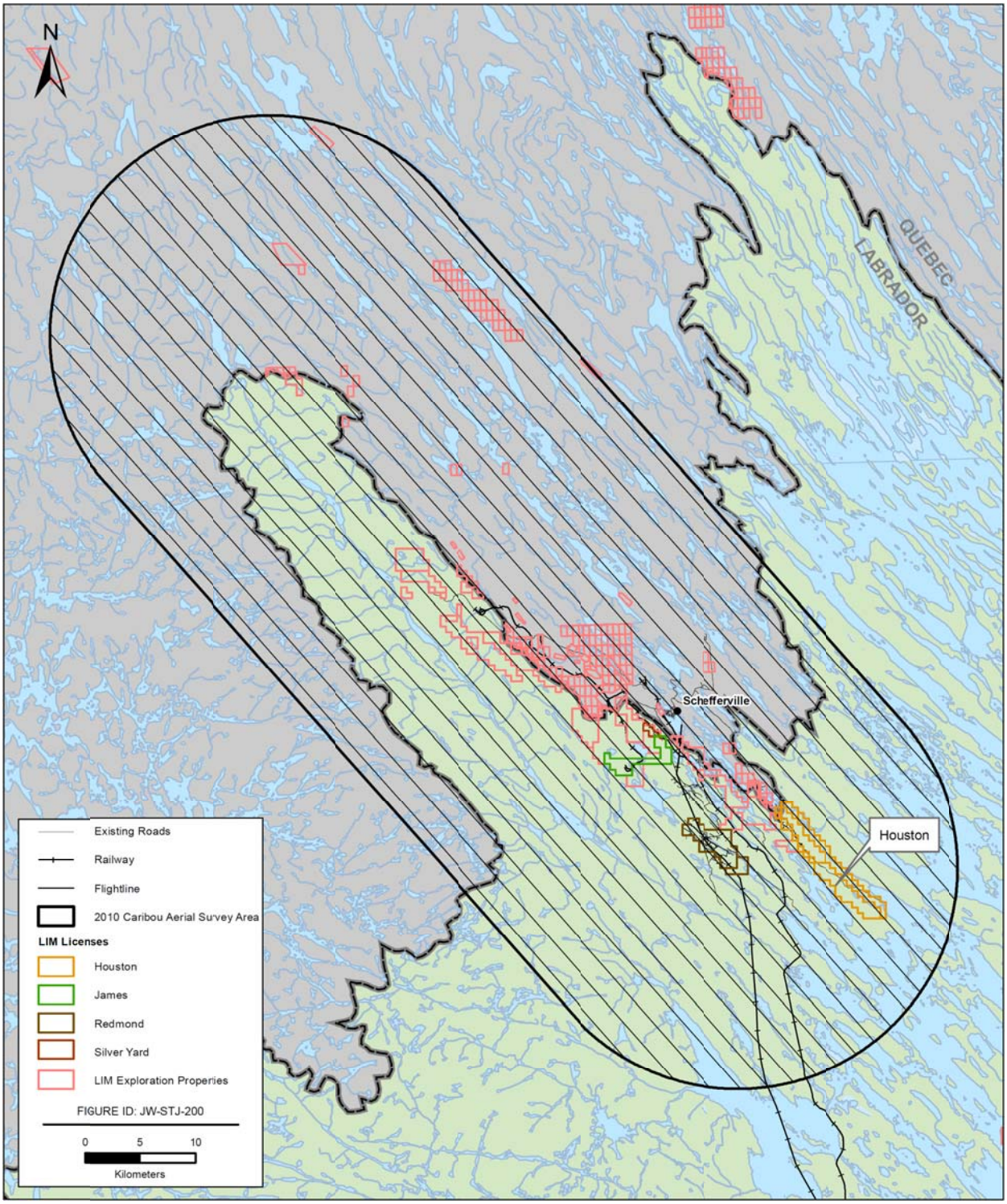
- body measurements;
- subsequent behaviour and movement of the collared caribou to a distance of over 400 km from the capture area prior to its demise from hunting on February 6, 2010 (D'Astous and Trimper, 2009 and 2010);
- statements from a Senior Wildlife Biologist that, based on the migratory route of the George River Caribou Herd in the fall of 2009 and winter of 2010, this caribou was considered to belong to the migratory ecotype rather than to the sedentary type (T. Chubbs, pers. comm.); and
- no other evidence of sedentary caribou has been identified during this period.

Figure 7-7 Comparison of genetic components collected from two caribou in the Schefferville area with those from known ecotypes using multivariate analysis (AFC).



The 2010 survey was completed between April 26 and May 1 and the survey area was a radius of 20km centered on the James and Redmond properties. This survey area also included the Houston Project area. The survey was completed under good tracking conditions, yet no Woodland caribou were observed. The results from both years' surveys indicate that it is unlikely that sedentary caribou are present in the Project area during the pre-calving period (D'Astous and Trimper 2010).

Figure 7-8 Caribou Survey Area



7.8.2 Wildlife Surveys

Various field surveys have been undertaken to identify the presence of wildlife species in the vicinity of the Houston Project area. These include wildlife and vegetation surveys conducted on the Houston Property in August 2009 (Stassinu Stantec 2010), two caribou surveys conducted in May 2009 (D'Astous and Trimper 2009) and May 2010 (D'Astous and Trimper 2010), and additional surveys conducted by AECOM during the summer 2011

Caribou surveys conducted in May 2009 and May 2010 showed no use of the area by caribou at this time (Figure 7-8). During the caribou surveys, incidental observations of moose (*Alces alces)*, black bear (*Ursus americanus*), wolf (*Canis lupus*), river otter (*Lutra candensis*), lynx (*Lynx canadensis*), porcupine (*Erethizon dorsatum*), snowshoe hare (*Lepus americanus*), red squirrel (*Tamiasciurus hudsonicus*), Spruce Grouse (*Falcipennis canadensis*), Willow Ptarmigan (*Lagopus lagopus*), Golden Eagle (*Aquila chrysaetos*), Osprey (*Pandion haliaetus*), Bald Eagle (*Haliaeetus leucocephalus*) and American Crow (*Corvus brachyrhynchos*) were recorded (D'Astous and Trimper 2009; 2010). There was no marten (*Martes americana*) sign observed during the surveys in the Houston Project area.

Porcupine may find adequate cover within the Houston Project area but may lack summer forage in pure conifer forest. The occasional occurrence of stony patches within the dominant Habitat Types on the Houston Property may be selected for denning sites (Morin et al. 2005). Evidence of porcupine was found in all Habitat Types sampled within the Houston Project area, reflective of their generalist nature (Schmelzer and Fenske ND), but predominantly in coniferous-dominated forests. Porcupine display seasonal changes in their foraging ranges (Sweitzer 1996) and shift from a diet containing conifer bark in the winter to one containing leaves and other foliage in the summer and fall (Woods 1973; Banfield 1974). Given the nature of conifer browse versus leaf browse during studies such as this (100 percent of observations were of browse dominated by evidence on coniferous trees), results are likely reflective of winter habitat use in the region.

The dominant Habitat Types also provide cover and winter forage for snowshoe hare (Dodds 1960; Wolff 1978; Newbury and Simon 2005). Snowshoe hare were detected in black spruce/lichen woodland, and spruce/feathermoss forest Habitat Types. It is well documented that lynx favour snowshoe hare as prey and their cycles follow closely. The habitat potential for lynx would be rated the same as snowshoe hare because of this connection. Winter tracking data collected during the winter of 2007 and 2008 indicate that red fox (*Vulpus vulpus*) and snowshoe hare were abundant throughout the vicinity of the Project area.

There were many small mammal trails and holes found during field surveys. Voles, shrews and mice occupy a range of niches within main habitats encountered at the Houston Project area. The importance of small mammals and snowshoe hare as a keystone species in both Arctic and boreal ecosystems is recognized: Pearce and Venier 2004; Hinterland Who's Who 2006; International Arctic Science Committee 2010). They are a major prey species for many northern carnivores and cyclic fluctuations in the abundance of small mammals and hares are shown in the repeated fluctuations in the abundance of their predators.

7.8.3 Species at Risk

No species at risk were identified within the Project area during the field surveys. The breeding territory of the Short-eared Owl (*Asio flammeus*) (recognized by the Committee on the Status of Endangered Wildlife in Canada COSEWIC as a Species of Special Concern) extends all across Canada although they avoid forested areas and are attracted to areas with local microtine outbreaks (COSEWIC 2008). Large open habitats with dense grasses or taiga with willows in close proximity to small mammal populations may be selected as breeding sites from March to May. Nesting begins in June. Open stony areas within the four dominant Habitat Types, where present, may meet hunting requirements for some species of owl, although no evidence of owls was found during field surveys in August 2009. Short-eared Owls require a minimum habitat size of approximately 20 ha and use open areas for hunting small mammals and occasionally small birds (I. Schmeltzer pers. comm.). Environmental baseline data collection which began in 2005 and continued until August 2009 has not identified the presence of limiting or critical habitats that would be essential for Short-eared owls within the Houston Project area.

Ongoing baseline programs will continue to assess habitats and presence for non-listed species, but designated as vulnerable and/or threatened by the Newfoundland and Labrador *Endangered Species Act* or COSEWIC. These include Harlequin Duck (*Histrionicus histrionicus*), Common Nighthawk (*Chordeiles minor*), Rusty Blackbird (*Euphagus carolinus*), Olive-sided Flycatcher (*Contopus cooperi*), and Gray-cheeked Thrush (*Catharus minimus*). An Avifauna Management Plan consistent with the *Migratory Birds Convention Act* has been prepared and approved for the nearby Schefferville Area Iron Ore Mine and it is expected that this document will be implemented prior to the start of construction to address any Project interactions.

7.9 Historic Resources

No archaeological or cultural sites are known or registered in the Houston Project area. A Stage 1 Historic Resources Overview Assessment (Stage 1 HROA) was completed in June 2008 prior to commencement of proposed exploration activities. Based on a site visit, no sites or materials of historic resources significance, or any areas of potential, were observed. Therefore, no mitigation measures were required or recommended in the assessment report prepared for LIM and the Provincial Archaeology Office (PAO) of the Newfoundland and Labrador Department of Tourism, Culture and Recreation (Jacques Whitford Limited 2009b).

In 2011, an archaeological assessment was conducted of the proposed Houston-Redmond haul road Route Options A and B by Stantec (formerly Jacques Whitford) on behalf of LIM. Based on the review of available information, including published and unpublished literature, archaeological reports, the Archaeological Site Record Inventory at the PAO and aerial photography, it was determined that given the nature and extent of ground disturbances that have occurred in the area from past mining activities as well as the prevalent topographic and hydrographic features, the majority of locations researched have Low historic resources potential:

- Route A crosses terrain that is considered to have Low potential for human settlement. Thus no assessment of the route is recommended. According to this assessment, Route

A of the Houston Road Options is approximately 8 km in length and runs roughly southeast to northwest along the west side of Oboe Lake, across the north end of Baker Lake to an existing access road. Site assessments conducted since 2008 shows that this access road option intersects waterways at the southeast end of Oboe Lake and at the northeast end of Baker Lake. However, neither of the waterways appears to be significant and it is unlikely they were used for human settlement in the distant or recent past. Therefore the historic resources potential of Route appears to be low and assessment of the corridor is not warranted.

- Route B is also approximately 10 km in length. It runs northwest from an existing access road situated to the southeast of to an existing access on the west side of Gilling River. The route crosses a number of minor watercourses at the southern end of Oboe Lake and continues northwest through forested terrain. The historic resources potential of Route B is generally low, except in the area where it crosses Gilling River. In this area the potential is considered moderate. Therefore assessment at this river crossing will be conducted prior to the initiation of construction at this water crossing.

7.10 Socio-Economic Environment

It is anticipated that this Project will provide sustainable social and economic benefits to the region. The area most likely to be affected are the primary places of residence of the Project labour force: Matimekush-Lac John, Schefferville, Kawawachikamach, Labrador West and Upper Lake Melville,. While all Project activity will occur in Labrador, the baseline conditions in central Labrador and parts of Quebec are included because Project labour, goods and services will also potentially be drawn from these areas. The communities of Matimekush-Lac John, Schefferville, Kawawachikamach are located in Quebec in close proximity to the Quebec-Labrador border and the Project. All three can be reached by air, through the Schefferville Airport, or by train from Sept-Îles.

This section provides information on the existing socio-economic conditions, including demography, community infrastructure and services, and employment and business. The geographic extent of the discussion varies by subject. Most aspects of the socio-economic environment will be examined for the Assessment Area, which includes both western and central Labrador, defined geographically as the Hyron (Labrador West) and Central Labrador (Upper Lake Melville) Economic Zones (Figure 7-9). The Project will make use of some municipal facilities and the airport, and will employ some workers and services located in these communities.

Baseline information is presented at the provincial, Labrador, and Assessment Area levels as appropriate, with further detail for communities within the Assessment Area provided where necessary. Selected data are also presented for Schefferville and other Québec communities adjacent to the Project site.

7.10.1 Methodology

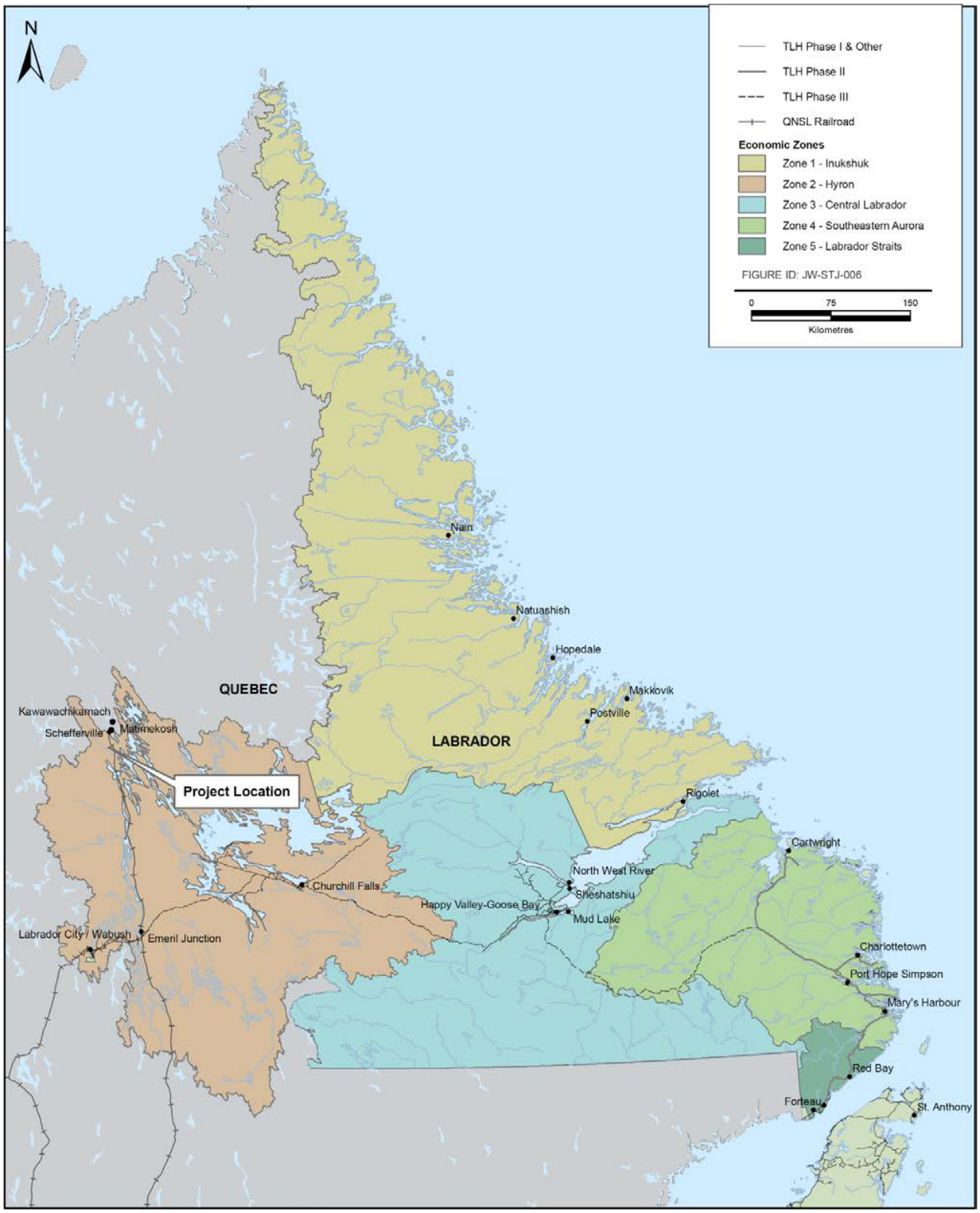
The baseline data presented in this section were drawn from a wide range of secondary sources including:

- Statistics Canada and other agencies and departments of the Government of Canada;
- Newfoundland and Labrador Statistics Agency and other agencies and departments of the Government of Newfoundland and Labrador; and
- Municipal governments and local and regional authorities and boards.

Not all information is available for the same geographic areas. For instance, census data are available for some communities in the Upper Lake Melville Area (for example, Happy Valley-Goose Bay and North West River, which are located in Census Division 10, Subdivision C), but data for Sheshatshiu and Mud Lake are aggregated and classified as Census Division 10, Subdivision C, SUN. Other data are only available by Economic Zone and not for individual communities. The communities in Labrador West fall under Economic Zone 2 – Hyron Regional Economic Development Corporation and the communities of the Upper Lake Melville Area comprise Economic Zone 3 – Central Labrador Economic Development Board.

In addition to data from the above secondary sources, primary information was collected through personal and telephone interviews with key informants with groups and agencies at the community, regional and provincial levels.

Figure 7-9 Project Location and Economic Zones of Labrador



7.10.1.1 Demography

An understanding of the demographic structure and its potential for change without the Project provides a basis for determining Project-related changes. The following discussion focuses on the demography of western and central Labrador and, where relevant, that of Labrador and the Province. There is also an overview of the Québec communities in close proximity to the Project site.

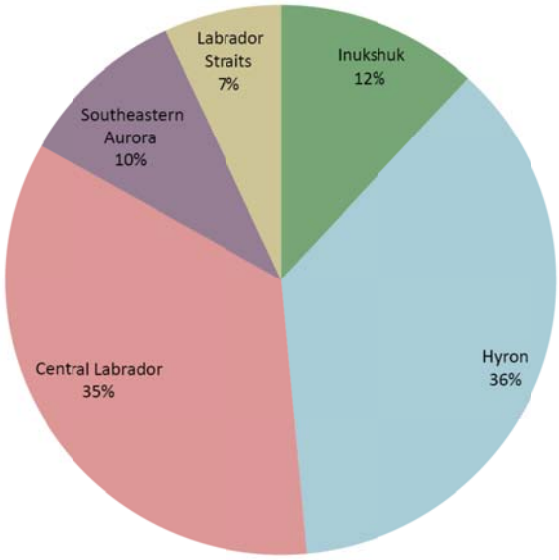
7.10.1.1.1 Labrador

The 2006 Census reports that there are 26,364 people residing in 32 communities across Labrador, of which 50.7 percent are male and 49.3 percent are female. In 2006, Labrador's population made up 5.2 percent of the provincial total (Statistics Canada 2006). In Labrador and the Province in 2006, the majority of the population was between the ages of 35 and 64 (44.4 and 46.2 percent, respectively) Those aged 15 to 34 represented the smallest portion of the Province's population (6.1 percent), while the 65 plus age group represented the smallest portion of Labrador's population (6.3 percent) (Statistics Canada 2006). Thirty-five percent of the people living in Labrador have Aboriginal ancestry, self-identifying as Innu, Inuit or Métis (Newfoundland and Labrador Department of Labrador and Aboriginal Affairs [NLDLAA] 2006).

Between 1991 and 2006 Labrador's population fell by 13.1 percent, from 30,375 to 26,364. This was slightly greater than the overall provincial decline of 11.1 percent (Statistics Canada 2006).

For the purposes of economic analysis and planning, Newfoundland and Labrador is divided into 20 economic zones, five of which are in Labrador (Figure 7-9). In 2006, the economic zones in Labrador with the largest populations were those that are the focus of concern in this assessment: Hyron, comprised of Labrador City and Wabush, and Central Labrador, which comprises Upper Lake Melville with populations of 9,660 and 9,175, respectively (Figure 7-10). The zone with the smallest population was Zone 5 ('Labrador Straits') with 1,825 people (Newfoundland and Labrador Statistics Agency 2006).

Figure 7-10 Population by Economic Zone, as a Percentage of Labrador's Population, 2006

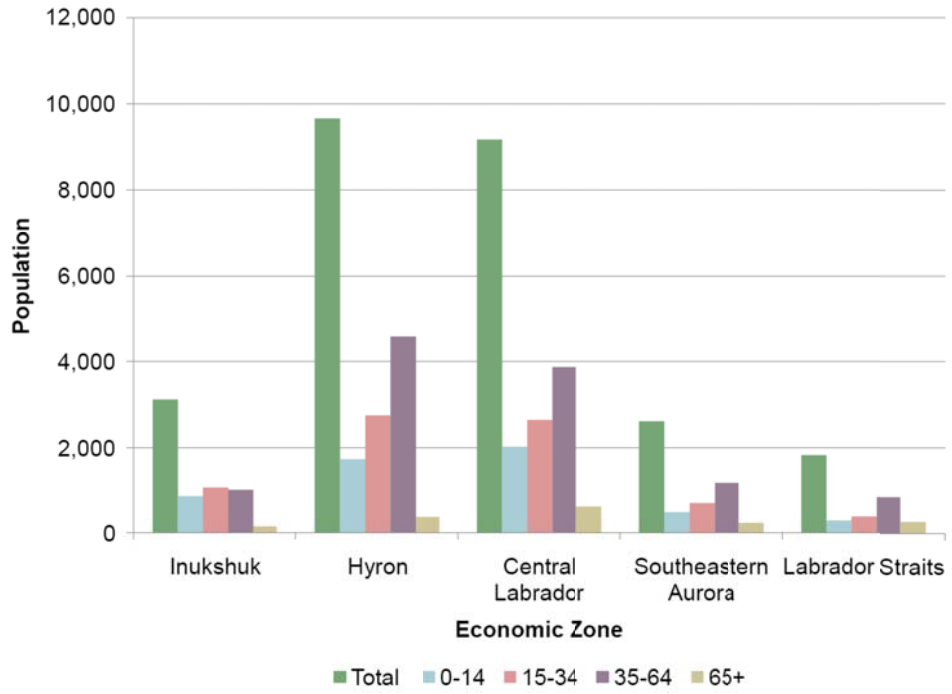


Source: Newfoundland and Labrador Statistics Agency 2006

The populations of all but one of the economic zones in Labrador decreased between 1991 and 2006 (Newfoundland and Labrador Statistics Agency 2006). The greatest declines occurred in Hyron (Labrador West and Churchill Falls) and Labrador Straits. The population of Hyron fell by 20.8 percent, from 12,200 to 9,660, and Labrador Straits decreased from 2,185 to 1,825 (16.5 percent). Inukshuk (the North Coast of Labrador), however, increased by 4.5 percent from 2,985 to 3,120, but it too has declined between 2001 and 2006.

The age-structure of the populations of the economic zones is illustrated in Figure 7-11 Inukshuk is unique insofar as the proportion of younger people in the 0 to 14 and 15 to 34 categories is much higher than for the other zones (Newfoundland and Labrador Statistics Agency 2006).

Figure 7-11 Population of Labrador Economic Zones by Age Group, 2006



Source: Newfoundland and Labrador Statistics Agency 2006

7.10.1.1.2 Labrador West

In 2006, the population of Labrador West was 8,979, with the majority living in Labrador City (Table 7.7). The area represents 34.1 percent of Labrador's population with slightly more men (51.6 percent) than women (48.4 percent) (Statistics Canada 2006).

Table 7.7 Population of Labrador West, Upper Lake Melville, Labrador and Province, 2006

	Total Population	Male	Female
Labrador City	7,240	3,740	3,505
Wabush	1,739	895	845
Labrador West Total	**8,979**	**4,635**	**4,350**
Happy Valley-Goose Bay	7,572	3,740	3,835
North West River	492	240	250
Sheshatshiu and Mud Lake (Census Division 10, Subdivision C)	1,112	560	555
Upper Lake Melville Total	**9,176**	**4,540**	**4,640**
Labrador	**26,364**	**13,380**	**12,985**
Province	**505,469**	**245,735**	**259,735**
Source: Statistics Canada 2006			

Compared to other parts of Labrador, a relatively small proportion of the population of Labrador West is identified as Aboriginal. In 1996, Aboriginal people represented only 1.5 percent of the population. However, by 2006, this had increased to 6.6 percent (Statistics Canada 1991; 1996; 2001; 2006). Visible minorities (persons who are identified according to the *Employment Equity*

Act as being non-Caucasian in race or non-white in colour, with the exception of Aboriginal people) made up only 1.2 percent of Labrador West population.

7.10.1.1.3 Upper Lake Melville

With a population of 9,176, Upper Lake Melville has 34.8 percent of the total population of Labrador (Table 7.7) (Statistics Canada 2006). In 2006, there were slightly more women (50.6 percent) than men (49.4 percent) living in the area and 82.5 percent of residents lived in Happy Valley-Goose Bay, the area's largest community.

As in Labrador West, the population of Upper Lake Melville has been in decline. It fell from 10,050 in 1991 to 9,654 in 2001, a decline of 3.9 percent. By 2006, the population had decreased a further 5.0 percent to 9,176, with Happy Valley-Goose Bay and North West River experiencing declines of 12.0 percent and 6.8 percent respectively. However, Census Division 10, Subdivision C (Sheshatshiu and Mud Lake) experienced a population increase of 21.9 percent. It should be noted that Statistics Canada data combine information for Sheshatshiu (approximately 1,050 people) with that for the much smaller community of Mud Lake (approximately 60 people), and few disaggregated data are available.

Sheshatshiu is an Innu community, and many Innu, Inuit and Métis live in Happy Valley-Goose Bay, North West River and Mud Lake. The Aboriginal population of the Upper Lake Melville Area increased from 2,035 to 4,130 between 1991 and 2001 and then decreased to 4,095 in 2006. Most (66.4 percent) Aboriginal people in that area reside in Happy Valley-Goose Bay. Of the 1,112 people in Sheshatshiu and Mud Lake in 2006, 1,035 (93 percent) were Aboriginal. In North West River, 340 (68.7 percent) of the population were Aboriginal, as were 2,720 (35.9 percent) of those in Happy Valley-Goose Bay.

Visible minorities comprised only 0.4 percent of the 2006 population in Upper Lake Melville, all of them living in Happy Valley-Goose Bay (Statistics Canada 2006).

7.10.1.1.4 Québec Communities

In 2006, there were 1,315 people residing in the four communities near the Project that are located in Eastern Québec (Statistics Canada 2006) (Table 7.8). In contrast with most of Labrador, the population rose in these communities between 2001 and 2006 by 5.8 percent from 1252 in 2001 to 1315 in 2006 (Statistics Canada 2006).

Table 7.8 Population, Eastern Québec Communities, 2001 and 2006

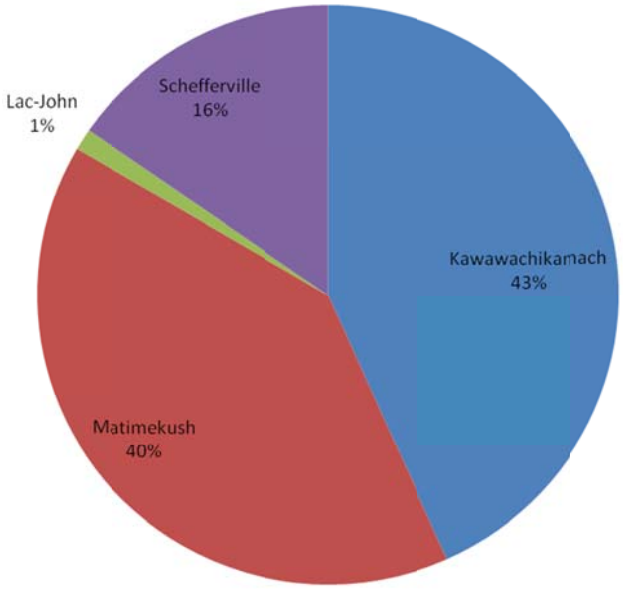
	Kawawachikamach	Matimekush	Lac-John	Schefferville	Total
Population in 2006	569[1]	528	16	202	1315
Population in 2001	540	449	23	240	1252
2001 to 2006 population change (%)	5.37	17.59	-30.43	-15.83	5.03

Source: Statistics Canada 2001, 2006
[1] The total population of Kawawachikamach in March 2011 was 842 (NNK 2011)

The Naskapi Nation of Kawawachikamach is comprised of the Village of Kawawachikamach, approximately 16 kilometres northeast of Schefferville, and a larger uninhabited area to the northeast of the Village. Kawawachikamach is largest community in the area. With a population of 842 people, it contains approximately 43.2 percent of the total population of the Québec communities (NNK Annual Report, 2011) (Figure 7-12).

In 2011, there were slightly less women (48.8 percent) than men (51.2 percent) living in the area. The compounded annual growth rate of the Naskapi general population between 1986 and 2011 has been 3.83% (NNK Annual Report, 2011).

Figure 7-12 Percentage Population of Eastern Québec Communities, 2006 (Statistics Canada)



Matimekush Innu community has approximately 544 people (Statistics Canada 2006). It is divided into two territories: the reserve of Matimekush (528 people), on the edge of Pearce Lake adjacent to the Schefferville Municipality; and the reserve of Lac-John (16 people), which is 3.5 kilometres from Matimekush and the centre of Schefferville. With a population of 528 people, Matimekush contains approximately 40 percent of the total population of the Québec communities (Statistics Canada 2006) (Figure 7-12). In 2006 there were more women (52.83 percent) than men (47.17 percent) living in the area. Of the 528 people in Matimekush, 495 (93 percent) were Aboriginal. Between 2001 and 2006, its population saw the largest increase in the Québec communities, growing by approximately 18 percent from 449 people in 2001 to 528 people in 2006 (Statistics Canada 2006).

Lac-John, which is located 3.5 kilometres from Matimekush, will be considered a part of the analysis for Matimekush due to information being suppressed due to confidentially issues. Where disaggregated data exist, Lac-John will be presented separately. It is the smallest of the four Québec communities with 16 people (Statistics Canada 2006). The population has decreased by 30 percent from 23 people in 2001 to 16 people in 2006.

Schefferville is approximately 2 kilometres from Labrador on the north shore of Knob Lake. It was established by IOC in 1954 to support mining operations in the area. The Municipality and Matimekush Reserve are adjacent and closely linked to it. With a population of 202, the Municipality of Schefferville contains approximately 16 percent of the total population of the Québec communities (Statistics Canada 2006) (Figure 7-12). In 2006, there were more men (55 percent) than women (45 percent) living in the area. Of the 202 people in the Municipality of Schefferville, 90 (44.5 percent) were Aboriginal. Between 2001 and 2006, its population decreased by approximately 15 percent from 240 people in 2001 to 202 people in 2006 (Statistics Canada 2006).

7.10.1.2 Employment and Business

7.10.1.2.1 Outlook

A recent publication by the Newfoundland & Labrador Department of Human Resources, Labour and Employment entitled Outlook 2020 (Labour Market Outlook Study)[1] has concluded that the historical challenge of too many people and not enough work is now giving way to a new reality of increased jobs and opportunities and not enough people to fill the positions. It has been noted that the long-standing history of net out-migration has turned to a net in-migration of the past two years and this trend will have to be accelerated to keep pace with labour demand over the next ten years.

The document forecasts that total employment will grow by 2.8% from 2011 to 2010, representing approximately 7,700 new jobs in the Labrador economy. In 2010, the Province recorded the highest level of employment in the past 35 years. The sectors that are expected to grow faster than average over the forecast period include utilities, health, trade and mining. Further, job openings that will arise due to retirements and deaths will account for a significant number of job openings over the next ten years with over 70,000 job openings being anticipated to arise between 2011 and 2020, with attrition accounting for up to 89% of these openings.

The study forecasts that skill demands will continue to increase with approximately 67% of all job openings in the 2011 to 2020 period being in management occupations or will require some form of post-secondary education.

7.10.1.2.2 The Mining Industry

Mining has provided a valuable foundation and cornerstone for economic development and growth in Labrador West, with a primary focus on iron ore. Large scale mining development projects are generally long term and capital intensive and often result in major economic and employment benefits similar to operations already existing in Labrador West (NLDLAA 2008).

Production mining is the main activity in Labrador West. IOC operates its Carol Lake Mine out of Labrador City, and Wabush Mines operates its Scully Mines from Wabush. The situation has not changed substantially since 1993 in terms of both mines being dependent on the fluctuations in the international market for steel and subsequently iron ore. In June 2011, the Company

1 Newfoundland and Labrador Department of Human Resources, Labour and Employment, 2011

(Labrador Iron Mines Limited) commenced mining operations at its James Mine, located near the proposed project.

The Iron Ore Company of Canada (IOC) began production from the Carol Lake Mine in 1962. IOC is Canada's largest iron ore pellet producer and operates a mine, concentrator, and pellet plant at Carol Lake, port facilities in Sept-Iles, Québec and a 420-km rail line that links the mine and the port. Total resources at Carol Lake are estimated to be 5.5 billion tonnes. Proven and probable reserves are 1.4 billion tonnes; indicated and referred reserves are 4.1 billion tonnes. Annual mine production at the open pit operation is in the 35 to 38 million tonne range at an average grade of approximately 40 percent total iron. Annual production capacity is 18 million tonnes of concentrate of which 12.5 million tonnes can be pelletized. In 2005 and 2006, IOC shipped a total of 15 million tonnes of iron ore, up 30 percent from 2004 (AMEC Earth and Environmental Ltd and Gardner Pinfold 2008).

IOC announced a $500 million expansion in March 2008, and a further $300 million expansion in September 2008. However these plans, which would have increased production to 25 million tons per year by 2011, have been postponed and have not yet be introduced into the environmental assessment process.

Wabush Mines began mining iron ore from the Scully Mine in Labrador in 1965 and now operates a mine and concentrating plant at Wabush and a pellet plant and shipping facilities in Point Noire, Québec. All ore is mined by open pit and sent through the Scully Mine concentrator. The final concentrate is transported 443 kilometres by rail to the port at Pointe Noire for pelletizing and shipment. The majority of ore is loaded onto ships bound for the Canadian and US Great Lakes region while the remainder is loaded for the US East Coast, Europe and more recently China. In 2005, Wabush Mines shipped five million tonnes of concentrate, up almost 29 percent from 2004. In 2006 it shipped 4.2 million tonnes, a drop of 17.9 percent from the previous year. In 2006 it spent more than $18 million on capital projects (AMEC Earth and Environmental Ltd and Gardner Pinfold 2008). However, in December 2008, Wabush Mines cut its production target for 2009 in half, and announced it was eliminating 160 jobs in February 2009. Other materials of interest in Labrador West are aggregate, nickel, gold and graphite (AMEC Earth and Environmental Ltd and Gardner Pinfold 2008).

Labrador Iron Mines commenced development of its James and Redmond Mine project (Schefferville Area Iron Ore Mine), located in Western Labrador in 2010 following receipt of all approvals from the Province and shipped the first production of direct-shipping iron ore from the James Mine and the Silver Yard beneficiation plant to the Port of Sept-Iles by train on June 29, 2011. Labrador Iron Mines expects to ship 500,000 tonnes of DSO during 2011 building up to 2,500,000 tonnes in 2012 and increasing gradually to a steady state of 5,000,000 tonnes a year by 2015.

During LIM's Schefferville Area Iron Ore mine construction and operation phases, numerous jobs were created and filled by residents of Newfoundland and Labrador and local communities. A further 25 to30 jobs have been created in exploration and base-line environmental data collection and management and these programs will be ongoing during the assessment, development and rehabilitation of LIM's future phases of development

On October 25th, 2011, Alderon Iron Ore Corp. announced that it initiated the Federal and Provincial Environmental Assessment processes for the 100% owned Kamistiatusset ("Kami") Iron Ore Project in western Labrador. The Registration Documents include provision to produce up to 16 million tonnes of iron ore concentrate annually as part of a second phase capital expansion. Alderon believes that on the completion of definition drilling planned for the winter 2012 drill program, that it will be able to upgrade a substantial portion of its currently defined inferred resources to the indicated resource category.

The Labour Market Outlook Study has concluded that 67% of all job openings in the 2011 to 2020 period will be in management occupations or will require some form of post-secondary education. By contrast, the jobs likely to be created in the resource sector, particularly in open cast mining operations, and specifically in the mining of DSO type iron deposits being developed by the Company, can to a greater extent be classified as “entry level” jobs requiring no more than a secondary level of education. Consequently, the creation of additional full time jobs will be of significant advantage to the Province.

Labour Market Outlook Study forecasts a very significant tightening in the labour supply-demand situation throughout the Province over the next decade. Elsewhere in Canada labour force growth is supported by immigration. However, traditionally, Newfoundland and Labrador attracts only 0.2%[2] of all immigrants to Canada and retains only 36% of these immigrants.

7.10.1.2.3 Employment and Labour Force

Labrador

The current employment situation in Labrador is considered to be robust. Participation rates have been higher, unemployment rates have beenlower, and the average annual income has been higher in Labrador West. Although the most recent data, provided below, is from the Statistics Canada report produced in 2006 (Table 7.9), current conditions are even more prosperous in 2011 with expected growth to continue.

Table 7.9 Labour Force Characteristics, Labrador, 2006

	Labrador City	Wabush	Total Labrador West	Upper Lake Melville	Labrador	Province
Total Population, 15 years and older	5,935	1,460	7,395	7,045	20,815	422,385
Labour Force	4,325	1,045	5,370	5,105	14,340	248,685
Participation Rate (%)	72.9	71.6	72.3	64.3	63.2	58.9
Unemployment Rate (%)	8.9	8.1	8.5	20.4	24.5	18.6
Median Income, 2005	$30,884	$36,091	$33,488	$24,196	$21,845	$19,573
Source: Statistics Canada 2006						

In 2006, the labour force (i.e., individuals who have, or are seeking employment) of Labrador West consisted of 5,370 individuals (Table 7.9), an increase from 4,395 in 2001. The participation rate, which is the percentage of the work-age population that is working or actively

2 Building Healthy Labour Markets, Doug May (MUN) and Pamela Toope (HRLE), Oct. 2006

looking for employment, is much higher in Labrador West (72.3 percent in 2006, up from 67.5 percent in 2001) than in the Province (58.9 percent) or Upper Lake Melville (64.3 percent). Between 2001 and 2006, the unemployment rate in Labrador West fell from 9.1 to 8.5 percent.

Wages in Labrador West are higher on average than in the rest of the Province. In 2005, the median income from employment for residents of Labrador West averaged $33,488, substantially higher than the provincial figure of $19,573, and the Upper Lake Melville average of $24,196 (Table 7.9) (Statistics Canada 2001; 2006).

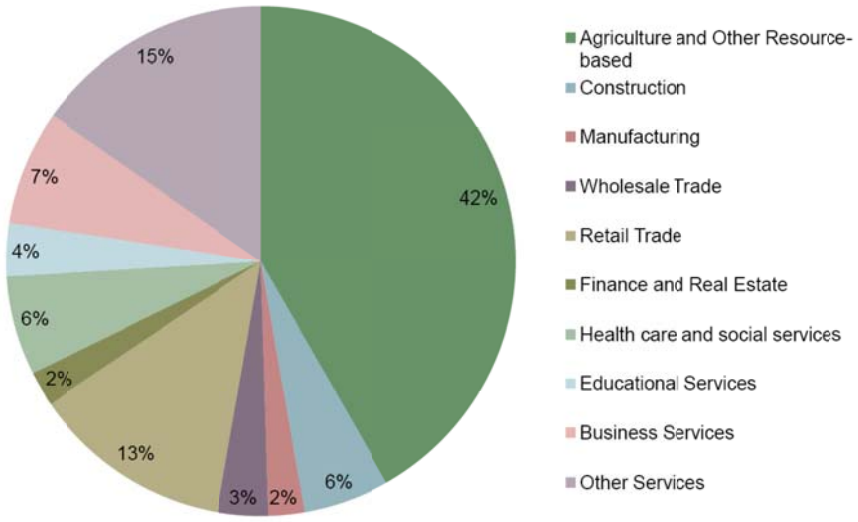
The number of individuals in Labrador West receiving employment insurance (EI) benefits decreased by 6.3 percent between 1996 and 2006. During the same period, the number of EI beneficiaries in the Upper Lake Melville decreased by 10.9 percent and the provincial beneficiaries decreased by only 4.7 percent (Table 7.10).

Table 7.10 Beneficiaries of Employment Insurance, Labrador City and Wabush, 2002 to 2006

	1996			2006			*% Change*		
	Labrador West	**Upper Lake Melville**	**Province**	**Labrador West**	**Upper Lake Melville**	**Province**	**Labrador West**	**Upper Lake Melville**	**Province**
EI Beneficiaries (Individuals)	1,370	1,605	102,825	1,155	1,430	98,025	*-15.7%*	*-10.9%*	*-4.7%*
EI Incidence (% of labour force)	21.4%	28.8%	39.9%	18.0%	25.5%	35.5%	*-15.9%*	*-11.5%*	*-11.0%*
Source: Newfoundland and Labrador Statistics Agency 2008									

The occupational structure of Labrador is weighted toward goods-producing and seasonal industries. The main source of employment by industrial sector in 2006 was agriculture and other resource-based industries (including mining) which employed 42 percent of the area's population (Figure 7-13). Other services and retail trade employed 15 percent and 13 percent of the population, respectively, while health care and construction each employed 6 percent of the area's residents. Few Labrador West residents worked in wholesale trade (three percent), manufacturing (two percent) or finance and real estate (two percent) (Statistics Canada 2006).

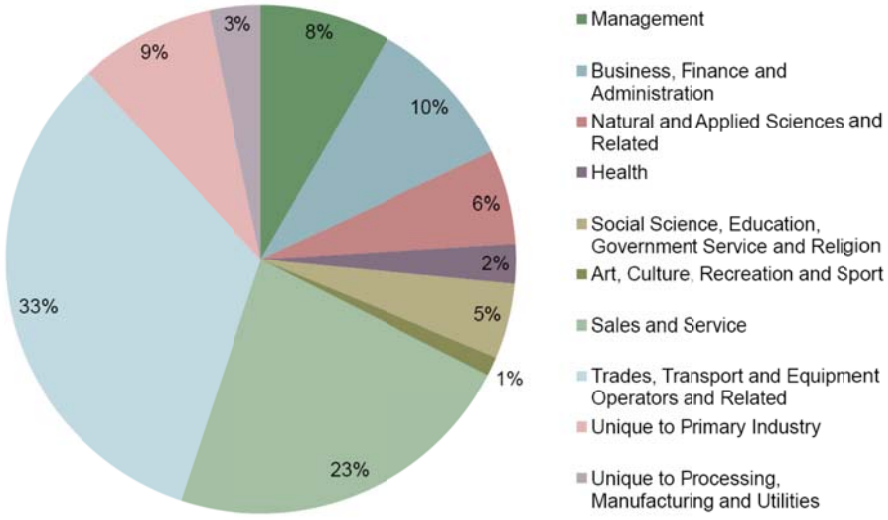
Figure 7-13 Labour Force by Industry, Labrador West, 2006



Source: Statistics 2006

The main occupations of residents of Labrador City and Wabush are trades, transport and equipment operation (33 percent) and sales and service (23 percent) (Figure 7-14). Occupations unique to primary industry and positions in business, finance and administration are held by nine percent of the area's population (Statistics Canada 2006).

Figure 7-14 Labour Force by Occupation, Labrador West, 2006

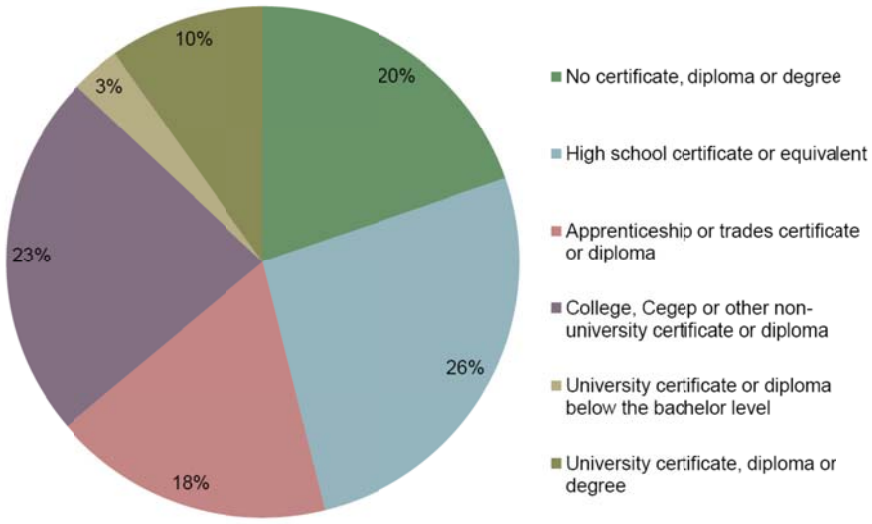


Source: Statistics 2006

The main occupations of residents of Kawawachikush, Matimekush and Schefferville are sales and services (30 percent), and trades, transport and equipment operation (21 percent) (Figure 7-21). (Statistics Canada 2006).

In Labrador West, approximately half of the population (54 percent) has some form of post-secondary training, while only 20 percent have less than a high school education (Figure 7-15). Thirteen percent of Labrador West residents have a university degree, and an additional 23 percent hold a post-secondary certificate or diploma. In Upper Lake Melville ten percent of the population holds a university degree, and 33 percent have not completed a high school education (Figure 7-17); Statistics Canada 2006).

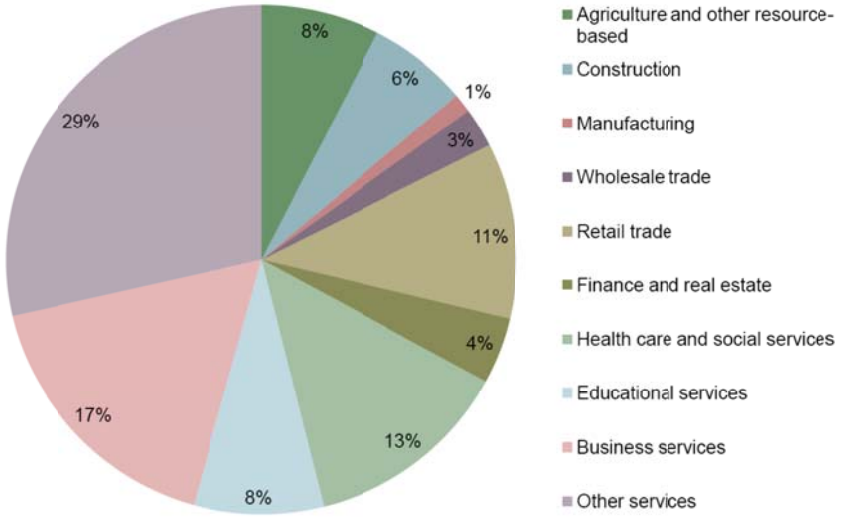
Figure 7-15 Education Level, Labrador West, 2006



Source: Statistics 2006

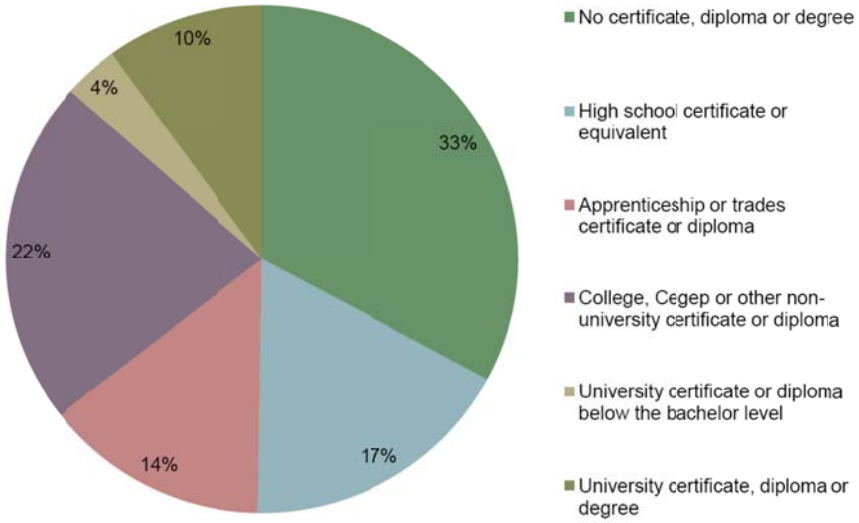
In 2006, 5,035 people aged 15 and over were employed in Upper Lake Melville. The main sources of employment, by industry (Figure 7-16), were Business Services, which employed 860 people, Health Care and Social Services (660), Retail Trade (565) and Other Services (1,435). There were few people employed in Finance and Real Estate (280), Wholesale Trade (125) or Manufacturing (60). The main occupations of Upper Lake Melville Area residents were Sales and Service (1,420), Trade, Transport, and Equipment Operation (970), and Business, Finance and Administration (875) (Statistics Canada 2006).

Figure 7-16 Employment by Industry, Upper Lake Melville, 2006



Source: Statistics 2006

Figure 7-17 Education Level, Upper Lake Melville, 2006



Source: Statistics 2006

Eastern Quebec

In the Eastern Québec communities (Kawawachikamach, Matimekush, and Schefferville), the 2006 labour force consisted of 855 people (Table 7.11). The participation rate is lower for the Eastern Québec towns (35.6 percent) when compared to Labrador West (72.3 percent) (Table 7.14). The unemployment rate for Eastern Québec is also higher at 19.4 percent compared to Labrador West, which is 8.5 percent (Table 7.11). Wages in Eastern Québec ($10,648) were also lower on average when compared to Labrador West ($33,488) (Table 7.11).

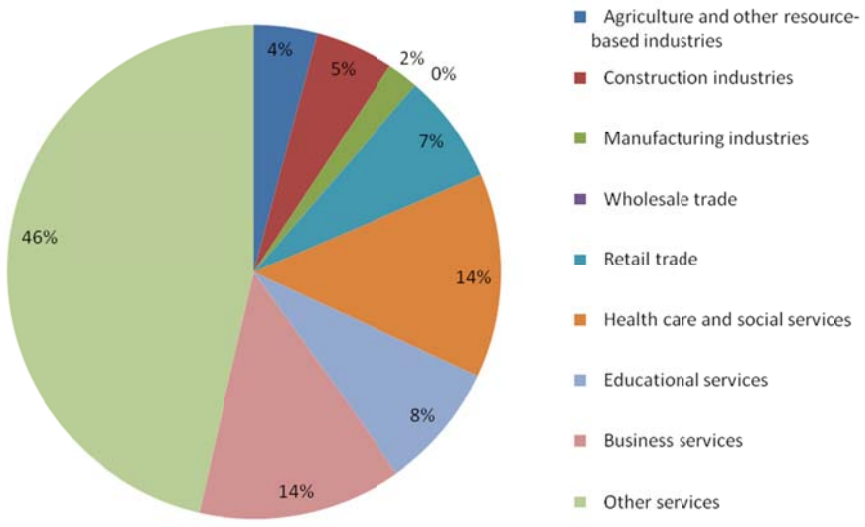
Table 7.11 Labour Force Characteristics, Eastern Québec and Comparison to Labrador West, 2006

	Kawawachikamach	Matimekush	Schefferville	Québec Total	Labrador West Total
Total Population, 15 years and Older	360[1]	335	160	855	7,395
Labour Force	170	200	120	490	5,370
Participation Rate (%)	47.2	59.7	75	35.6	72.3
Unemployment Rate (%)	20.6	37.5	12.5	19.4	8.5
Median Income, 2005	$12,768	$8,528	$0.00[2]	$10,648	$33,488

Source: Statistics Canada 2006
[1]Kawawachikamach workforce was 512 in 2008 (NNK 2008)
[2] Data is suppressed. Statistics Canada suppresses income data in census areas with populations less than 250 persons, or where the number of private households is less than 40. All suppressed data and associated averages, medians and standard errors of average income are replaced with zeros, but are included in the appropriate higher-level aggregate subtotals and totals. This practice has been adopted to protect the confidentiality of individual respondents' personal information.

The occupational structure of Eastern Québec is weighted to other services. The main source of employment by industrial sector in 2006 was other services which employed 46 percent of the area's population (Figure 7-18). Health care and social services and business services employed 14 percent of the population, each, while education, retail trade and construction each employed eight, seven and five percent of the area's residents respectively. Few Eastern Québec residents worked in agriculture and other resource based industries (four percent), or manufacturing (two percent).

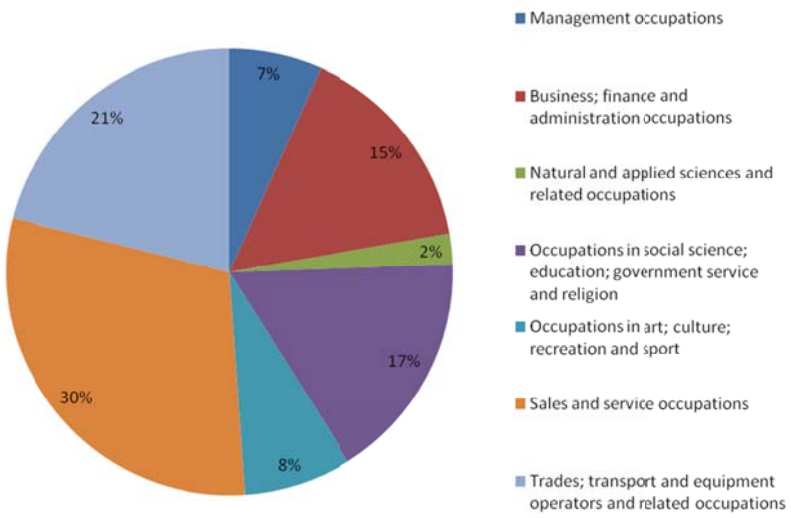
Figure 7-18 Labour Force by Industry, Eastern Québec, 2006



Source Statistics Canada 2006

The main occupations of residents of Kawawachikush, Matimekush–Lac John, and Schefferville are sales and services (30 percent), and trades, transport and equipment operation (21 percent) (Figure 7-19) (Statistics Canada 2006).

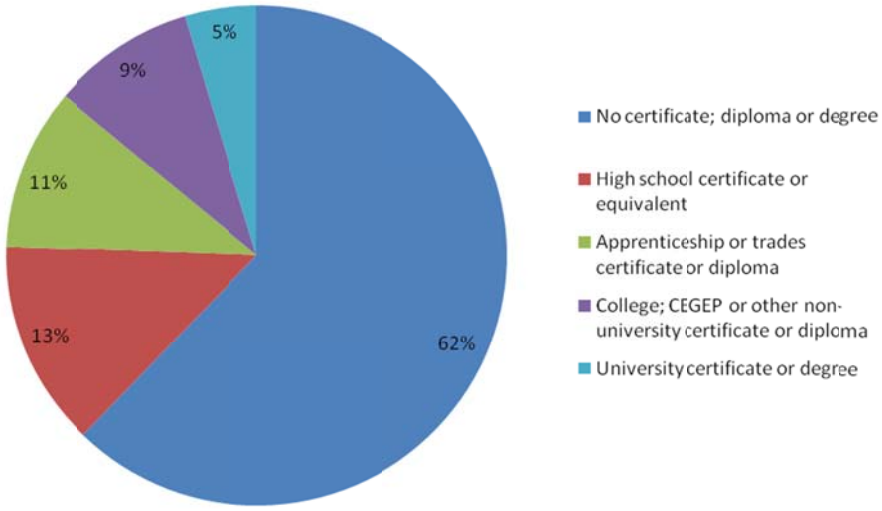
Figure 7-19 Labour Force by Occupation, Eastern Québec, 2006



Source Statistics Canada 2006

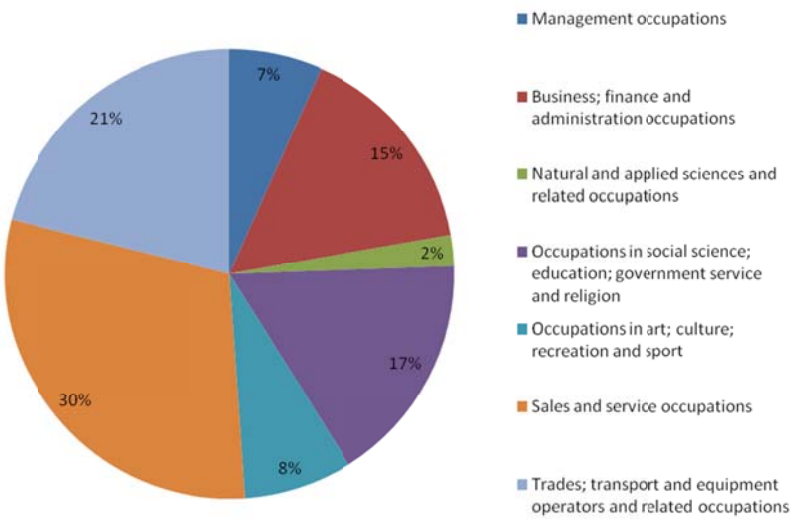
In the Québec communities, over half of the population (62 percent) has less than a high school education, while approximately 30 percent has some form of post secondary education. Five percent of the Eastern Québec residents have a university degree, and an additional 20 percent hold a post-secondary certificate or diploma (Figure 7-20).

Figure 7-20 Education Level, Eastern Québec, 2006



Source Statistics Canada 2006

Figure 7-21 Employment by Industry Residents of Kawawachikush, Matimekush and Schefferville



Source Statistics Canada 2006

7.10.1.2.4 Business

Western Labrador

The business community of Labrador West includes 311 companies, approximately two percent of all businesses in the Province (Statistics Canada Business Register). Most of them have one to four employees (Table 7.12). These businesses, categorized by North American Industrial Classification System (NAICS) Industry Code, are presented in Table 7.13.

Table 7.12 Number of Businesses by Employment Size, Hyron Region, 2006

Number of Employees	Number of Businesses
1-4	139
5-19	121
20-99	43
Total	311
Source: Statistics Canada Business Register	

Table 7.13 Number of Businesses by Industry, Hyron Region, 2006

Industry Code	Number of Businesses
Agriculture, Forestry, Fishing and Hunting	X
Mining and Oil and Gas Extraction	6
Utilities	X
Construction	21
Manufacturing	7
Wholesale Trade	25
Retail Trade	64
Transportation and Warehousing	17
Information and Cultural Industries	5
Finance and Insurance	7
Real Estate and Rental Leasing	16
Professional, Scientific and Technical Services	10
Management of Companies and Enterprises	X
Administrative and Support, Waste Mgmt, and Remediation Services	16
Educational Services	X
Health Care and Social Assistance	26
Arts, Entertainment and Recreation	8
Accommodation and Food Services	27
Other Services (Except Public Admin.)	45
Public Admin	4
Total	**311**

Note: x = data not available
Source: Economics and Statistics Branch (Newfoundland and Labrador Statistics Agency)
http://www.stats.gov.nl.ca/Statistics/Trade/PDF/BR_Zone_NAICS_2006.pdf

The major employers in Labrador West include IOC, which employs more than 2,000 individuals in Labrador City and Sept-Îles, Wabush Mines, with 300 to 400 employees, and the provincial government, including healthcare workers, education employees, and other government employees (B. Jerrett pers. comm.).

Upper Lake Melville

Upper Lake Melville is the government service centre for Labrador. Offices of many provincial and federal government departments are located and staffed in Happy Valley-Goose Bay. Regional governments and Aboriginal groups also provide opportunities for employment in the area. The main employers and number of employees for each are listed in Table 7.14.

Table 7.14 Major Employers and Number of Employees, Upper Lake Melville

Employer	Number of Employees
Regional Agencies	
Labrador-Grenfell Regional Integrated Health Authority	370
Labrador School Board and six public schools	192
College of the North Atlantic	125
Regional Governments and Aboriginal Groups	
Sheshatshiu Innu First Nation and Social Services	214
Town of Happy Valley-Goose Bay	51 permanent and 30 seasonal
Nunatsiavut Government	53
Labrador Métis Nation	12 permanent and 4 seasonal
Private Employers	
SERCO	350-400 full-time and seasonal
Vale Inco	250
Woodward's Group of Companies	200 full-time and seasonal
NorthMart and affiliated businesses	130
Terrington Consumers Co-operative	47
Labrador Friendship Centre	32 permanent and 40 seasonal
Source: CLEDB 2006.	

Historically, the main employer and most important driver of the economy in Upper Lake Melville has been 5 Wing Goose Bay, the military base. Currently, it employs approximately 400 civilians and 100 military personnel and in 2006-07, total wages and salaries were estimated at $14.9 million (AMEC Earth and Environmental Ltd. and Gardner Pinfold 2008). The largest employer associated with the base is SERCO, providing base operation services, including maintenance and catering. SERCO employs approximately 350 of the 400 civilians. Spending by those employed in base-related activities has also had beneficial employment multiplier effects on the local retail sector (CLEDB 2006).

As of 2006, there were 329 businesses in Upper Lake Melville (Table 7.15), representing 35.8 percent of businesses in Labrador. The majority of businesses in the Upper Lake Melville Area (145) were small, with one to four employees. There were 42 businesses with 20 to 99 employees (Newfoundland and Labrador Statistics Agency 2007).

Table 7.15 Number of Businesses, Upper Lake Melville, 2006

Industry	Number of Businesses
Agriculture, Forestry, Fishing and Hunting	X
Mining and Oil and Gas Extraction	-
Utilities	-
Construction	40
Manufacturing	9
Wholesale Trade	10
Retail Trade	77
Transportation and Warehousing	14
Information and Cultural Industries	X
Finance and Insurance	6
Real Estate, Rental and Leasing	15
Professional, Scientific and Technical	16
Management of Companies and Enterprises	X
Administrative and Support, Waste Management and Remediation	9
Educational Services	6
Health Care and Social Assistance	50
Arts, Entertainment and Recreation	10
Accommodation and Food Services	34
Other Services	28
Public Administration	5
Source: Newfoundland and Labrador Statistics Agency 2007a Note: x = data not available	

The majority of businesses in the area fall into the in the same five sectors as for the Province and Labrador as a whole, with construction firms ranking third by number (Table 7.15). At least a quarter of all local firms are self-described as tourism businesses (CLEDB 2007).

Québec Communities

Retail businesses in Schefferville include the Northern Store, which employees 16 people on a part-time and full-time basis providing food, alcohol and general merchandise, as well as Duberco, Inc and Radio which both provide fuel services including aircraft and diesel. Both Duberco, Inc. and Radio employ one person full-time and hire up to an additional two seasonal workers. National Automobile Rentals are also located in Schefferville, employing a single person. There is also a hardware store and a convenience store, each with two employees, in Schefferville.

Within Kawawachikamach, the majority of businesses are owned, either wholly or through joint-ventures, by members of the Naskapi Nation or the Naskapi Band. These businesses include Naskapi Imuun Inc., a wholly-owned Naskapi company responsible for internet services and cellular telephone services, Garage Naskapi Inc. which operates a gas bar, and Kawawachikamach Energy Services Inc., which operates the Menihek Generating Station, manages utility billing to Schefferville regionand maintains the associated transmission lines and Naskapi Hwavy Machinery Limited Partnership, a new heavy machinery rental business recently established to provide services to the mining activities in the Kawachicamach-Schefferville region (NNK 2011). Communities and Services

This section describes the current situation and recent trends with respect to housing, health care, education, recreation, transportation, utilities and security services in Labrador West, Upper Lake Melville and the Eastern Québec communities.

7.10.1.2.5 Housing

Labrador West

In Labrador City, the number of occupied dwellings increased by 3.2 percent between 1991 and 2006, from 2,695 to 2,780. In 2006, 78.8 percent of these were owned and 21.4 percent were rented. The average value of a home in Labrador City in 2006 was $107,604 and the average monthly rent was $521 (Statistics Canada 2006).

Between 1991 and 2006, the number of occupied private dwellings in Wabush increased from 680 to 690 (1.5 percent). The majority (84.1 percent) was owned and 15.2 percent was rented in 2006. The average value of a home in Wabush was $86,216 in 2006 and average monthly rent was $401 (Statistics Canada 2006).

Upper Lake Melville

The number of occupied private dwellings in the Upper Lake Melville increased from 2,820 in 1991 to 3,130 in 1996, and rose again to 3,180 in 2001. In 2006, the number decreased to 3,130, of which 1,870 (59.7 percent) were owned and 1,145 (36.6 percent) were rented. Most occupied dwellings were in Happy Valley-Goose Bay and most of those were single detached homes (Statistics Canada 2006).

Happy Valley-Goose Bay had 2,725 occupied private dwellings, 59.4 percent of which were owned and 40.1 percent rented. Of the total occupied dwellings, 61.8 percent were single detached homes, 18.2 percent were semi-detached and 5.7 percent were apartments. In 2006 the average value of owned dwellings in Happy Valley-Goose Bay was $133,504 and median monthly rent was $611 (Statistics Canada 2006).

Québec Communities

In total, the Québec communities near the Project site contained 370 occupied dwellings in 2006 (Statistics Canada 2006). Of these, approximately seven percent were owned and 21 percent rented, with the remaining 72 percent being band housing (Statistics Canada 2006).

There is a shortage of housing in Kawawachikamach. The housing stock comprises approximately 154 single-family dwellings, duplexes, apartments, maisonettes, and cottages, including five units constructed in 2007-2008. All of these units are owned by the Naskapi Nation of Kawawachikamach (NNK) and maintained with funds from its operations and maintenance budget. They are allocated on a first-come-first-served basis. The NNK maintains a chronological list of housing requests, and at the close of the 2007-08 fiscal year, there were 96 names on this list, the oldest from January 1997 (NNK 2008).

In 2006, there were 197 private dwellings in Schefferville; however, only 95 were occupied, down from 110 in 2001, a decrease of approximately 14 percent. Of these occupied dwellings,

15 are privately owned with an approximate average value of $54,700, and 60 are rented (Statistics Canada 2001; 2006). Almost half (47 percent) of the dwellings in Schefferville are single-detached houses. The remaining housing consists of semi-detached houses (approximately 32 percent) and small apartment buildings (approximately 21 percent) (Statistics Canada 2006). Some small cabins are present in the area.

In 2006-2007, there were 172 residential units in Matimekush and 12 in Lac-John (INAC Matimekush/Lac John First Nation 2008).

There are also three hotels with a total of 42 rooms in the Schefferville region (Table 7.16). The Hôtel Royale also offers a 200-person conference hall and 20-person meeting room (S. Fortier pers. comm.).

Table 7.16 Temporary Accommodations in Schefferville, 2008

Hotel	Number of Rooms
Hôtel Auberge	12
Hôtel-Motel Royale	24
Hotel-Bla-Bla	6

7.10.1.2.6 Healthcare

Labrador West

Facilities and Services

The Captain William Jackman (CWJ) Memorial Hospital, located in Labrador City, is a fully accredited health facility which serves Labrador West. It has 20 beds, six of which are designated long-term care beds for levels three and four nursing care. Fourteen beds are for acute care. Inpatient units provide care to medical, surgical, obstetrical, pediatric, respite, palliative and intensive care patients. Maternity care is provided by family physicians and nurses.

The hospital is served by six family physicians, a general surgeon, and an anaesthesiologist. There are also a number of visiting specialists who come to the hospital on a regular basis (Labrador-Grenfell Health 2007). There are two dentists in the area with one other who visits for two weeks each month (O. Simpson, pers. comm.).

The 2008 provincial budget includes plans to spend $59 million on construction of a new Labrador West Health Centre to replace the CWJ. This is expected to be complete in 2011 (NLDF 2008).

There is a Medical Clinic in Wabush which is staffed by one doctor, who is also the physician for Wabush Mines.

Community Service Programs

Labrador-Grenfell Health has a Child, Youth and Family Services office in Labrador West. It has the mandate to provide child protective intervention services, youth services, adoption services,

family and rehabilitative services, community corrections, child care services and residential services (Labrador Grenfell Health 2007).

Mental Health Services are provided at the CWJ. It has two addictions counsellors, one addictions coordinator/officer, 4.5 mental health counsellors as well as the regional mental health and addictions clinical manager. Churchill Falls employs one part time mental health nurse. Wait times for mental health counselling in Labrador City are up to four to six weeks, as position vacancies are a challenge to the department (Aura Environmental Research and Consulting Ltd., 2008).

Shelters

Hope Haven, a shelter and resource facility for women and children escaping domestic abuse, opened in 2004. The building can accommodate up to 225 women and children each year. It was expected to expand with the addition of ten new affordable housing units during the summer of 2008, but plans were put on hold due to construction delays (CBC 2008).

Ambulance Service

Labrador-Grenfell Health operates a provincial air ambulance service out of St. Anthony. In addition, it operates road ambulances, has specialized equipment to facilitate medical evacuation by snowmobile and provides physician/nursing escorts and paramedic services (Labrador-Grenfell Health 2007).

IOC also services Labrador City and surrounding area with an industrial ambulance that serves as a back up to the town's ambulance (A. Johnson, pers. comm.).

Upper Lake Melville

Facilities and Services

There is one hospital in Upper Lake Melville, the Labrador Health Centre in Happy Valley-Goose Bay. The Labrador Health Centre offers full diagnostic and rehabilitative services and it is the referral centre for the community clinics in North West River, Mud Lake and Sheshatshiu. It is equipped with 26 beds and has a 24-hour Emergency Department, as well as out-patient clinics. When fully staffed, the Labrador Health Centre has 12 full-time physicians.

Specialists at the hospital include a general surgeon, an anaesthetist, and an obstetrician and gynecologist. Special clinics offered by the hospital include a well-woman clinic and several clinics offered by visiting specialists (D. Rashleigh, pers. comm.).

There is one long-term care facility in Upper Lake Melville. The Harry L. Paddon Memorial Home in Happy Valley-Goose Bay offers Level 2, 3, and 4 nursing care to residents (T. Dyson, pers. comm.). The Paddon Home has 29 rooms, including seven single-occupancy, 20 double-occupancy, one respite and one special care. A senior citizens' home located on the grounds of the Paddon Home is staffed by registered nurses, licensed practical nurses and personal care attendants on a 24-hour basis. Seniors' care is supplemented by visiting doctors and other services are available from various visiting professionals (Healthy Newfoundland and Labrador

ND). The Paddon Home is more than 30 years old and not designed for patients with high care needs. In 2003 a need was identified to construct a new long-term care facility in Happy Valley-Goose Bay (NLDLAA 2006) which is under construction and should be completed in 2009.

Mental health and addictions services are located in the Labrador Health Centre and are staffed by a regional director, an addictions counsellor, an addictions coordinator, four mental health counsellors, an adolescent services coordinator and a community youth network coordinator. The Happy Valley-Goose Bay office is primarily responsible for services in other communities in Labrador, with the exception of Labrador City and Wabush.

Shelters

Libra House, located in Happy Valley-Goose Bay, has 10 beds and provides support programs and safe shelter for women and children in Upper Lake Melville and those from North Coast communities. In Sheshatshiu, the Nukum Munik Shelter provides 24-hour service and is funded by Indian and Northern Affairs Canada, the CMHC, and is sponsored by the Sheshatshiu Innu Band Council. Both shelters are sufficient to meet current demand, but are frequently at capacity.

Public Health

The Public Health Unit in the Labrador Health Centre is responsible for providing health clinics to the public including childbirth education, postnatal, child health and school health. It employs three public health nurses. It also employs a discharge planner and community supports coordinator, a regional home nursing coordinator, and a full-time communicable disease control nurse. A full-time medical officer of health, a regional cervical screening coordinator, a regional health promotion coordinator and a regional director are also on staff. The Public Health Unit is presently recruiting another continuing care nurse due to increasing demands related to acute care services (T. Dyson, pers. comm.). Labrador-Grenfell Health, under the direction of the medical officer of health, also offers a variety of programs that are aimed at health protection. Programs include Environmental Health, Communicable Disease Control, and Health Emergency Management (Labrador-Grenfell Health 2007).

Emergency Services

The Labrador Health Centre in Happy Valley-Goose Bay has an Emergency Department that is open 24 hours a day, seven days a week. On average, the Emergency Room sees 60 clients in a 24-hour period and approximately one-third of these are seen during the day (S. Jesseau, pers. comm.). Labrador-Grenfell Health operates a provincial air ambulance service out of St. Anthony on the Northern Peninsula and the Labrador Health Centre has its own plane in Happy Valley-Goose Bay to move patients to and from the Labrador coast. Labrador-Grenfell Health also operates road ambulances, has specialized equipment to facilitate medical evacuation by snowmobile and provides physician and nursing escorts and paramedic services (Labrador-Grenfell Health 2007).

The Labrador Ambulance Service in Happy Valley-Goose Bay is privately owned and operates two vehicles that service Happy Valley-Goose Bay and Mud Lake (albeit, in the latter case, only

once patients have been transported across the river). The Labrador Ambulance Service is staffed by nine emergency response technicians, two of whom are full-time. The Service responded to 743 calls in 2007, up from 685 calls in 2004. Labrador Ambulance Service personnel believe that they could support additional demands (J. Squire, pers. comm.; J. Stacey, pers. comm.).

North West River has one ambulance, which is operated by the Labrador Health Centre, to serve people in North West River and Sheshatshiu. 5-Wing Goose Bay also has an ambulance that responds only to airfield emergencies.

Québec Communities

Since 2001, healthcare and social services in Kawawachikamach have been provided by the Naskapi Local Community Service Centre (CLSC) (Naskapi Nation 2008 – Naskapi Corporate Organizations List; M-S Lapointe, pers. comm.). The CLSC is administered by a board of directors composed mainly of Naskapis, overseen by the Council of the Nation, and jointly funded by Health Canada and the Government of Québec (Naskapi Nation 2008 – Naskapi Corporate Organizations List).

The CLSC employs 18 staff, including six nurses, three part-time physicians and one part-time dentist (Table 7.17). It offers minor emergency services, sampling and diagnostic services, nurse/physician consultation, home care, childhood prevention and promotion services, pharmacological services, pre- and post-natal services, psycho-social services, immunization, medical transportation of patients, and specialist services for dentistry, opthamology, otorhinolaryngology, nutrition, psychology, ergotherapy, and occupational therapy.

Table 7.17 Staff Employed by the Naskapi Local Community Service Centre, 2008

Position	Number of Employees
Nurses, full-time	2 nurses
Nurses, part-time	4 nurses
Physicians, full-time	1
Physicians, part-time	3
Dentists, part-time	1
Social Workers	2
Other, full-time	1 physio-therapist,
Other, part-time	2 Secretarial, 3 Support staff
Source: Marcel Lortie, pers. comm.	

CLSC medical services are provided exclusively to the Naskapi. However, emergency services are provided to people outside of the community, with the cost for such services billed to the Québec provincial government (L.M. Lortie, pers. comm.). The CLSC's medical centre and social services currently operate at capacity, and the CLSC has incurred a deficit each year since 2007. Current staffing levels cannot accommodate the growth of Kawawachikamach, which is expected to see a doubling of population within 15 years (L.M. Lortie, pers. comm.).

Schefferville Aboriginal healthcare and social services have been provided by the Innu Local Community Service Centre (CLSC) (M-S Lapointe, pers. comm.). The CLSC is an incorporated body administered by a board of directors composed mainly of and jointly funded by Health

Canada and the Québec provincial government. The Innu CLSC employs 16 staff (Table 7.18). The dispensary provides the following services for the Innu community: minor emergency services; pharmacological services; sampling and diagnostic services; pre- and post-natal services; nurse/physician consultation; psycho-social services; home care; immunization; childhood prevention and promotion services; medical transportation of patients; specialization in diabetes treatment and prevention; and specialist services for dentistry, opthamology, otorhinolaryngology, nutrition, psychology, ergotherapy, and occupational therapy.

Table 7.18 Staff Employed by the Innu Local Community Service Centre, 2008

Position	Number of Employees
Nurses, full-time	2
Nurses, part-time	2
Physicians, full-time	3
Physicians, part-time	1
Dentists, part-time	1 (up for 2 weeks at a time)
Social Workers	2 child protection services
Other, full-time	2 psychologists come up for 2 weeks per month
Other, part-time	3 support staff
Source: Marie-Sylvie Lapointe, pers. comm.	

The Dispensarie de Shefferville provides the non-Aboriginal community with the following health care services: minor emergency services; pharmacological services; sampling and diagnostic services; pre- and post-natal services; nurse/physician consultation; medical transportation of patients; and immunization. The Schefferville CLSC has six staff, including four nurses, one full-time physician and one part-time dentist, but no psychologists or child care workers (Table 7.19).

Table 7.19 Staff Employed by the Schefferville Local Community Service Centre, 2008

Position	Number of Employees
Nurses, full-time	3
Nurses, part-time	1
Physicians, full-time	1 (1 to 2 month full time rotation
Dentists, part-time	1 (up for 2 weeks at a time)
Social Workers	None listed
Source: Helen Littlejohn, pers. comm.	

7.10.1.2.7 Education

Labrador West

Childcare and Early Childhood Education

The one early child care facility in Labrador West is located in Labrador City. Wee College Childcare Centre accepts children aged 2 to 6 years and can accommodate 32 children on a part-time basis (NLDHCS 2004).

Primary, Elementary and High School

There are four schools in Labrador City and Wabush (Table 7.20). Three are managed by the Labrador School Board and one is managed through the Conseil Scolaire Francophone Provincial de Terre-Neuve-et-Labrador. Between the 2000-01 and 2007-08 school years, the total student enrolment in Labrador West increased by 8.9 percent, from 1,387 to 1,510. During that time, the number of full-time teacher equivalents increased by only 0.3 percent (Newfoundland and Labrador Statistics Agency 2008). The Labrador School Board has had problems with the recruitment and retention of teachers (The Aurora, 2007).

Table 7.20 Schools, Enrolment and Number of Teachers, Labrador City and Wabush, 2007/08

School	Location	Grades	Enrolment 2007/08[A]	Full-Time Equivalent Teachers 2007/08	Pupil-Teacher Ratio	School Capacity
A.P. Low Primary	Labrador City	K-3	402	24.0	14.7	6
Menihek High	Labrador City	8-12	594	35.5	17.1	800[C]
Centre Educatif L'ENVOL	Labrador City	K-8, 10, 12	31	4.0	7.8	
J. R. Smallwood Middle	Wabush	4-7	485	30.8	15.3	1000[D]

[A] T. Pye pers. comm.
[B] S. Kennedy pers. comm.
[C] L. Simmons pers. comm.
[D] H. Costa pers. comm.

Post-Secondary

Post-secondary education is available in Labrador West through the College of the North Atlantic, which has a campus in Labrador City. Approximately 200 full-time and part-time students are registered there each semester (Table 7.21). An additional 200 students participate in continuing education evening courses (College of the North Atlantic 2008). The Labrador West CNA campus is the only campus in the Province to offer a two-year Mining Technician program and has been designated CNA's Mining Centre of Excellence. In 2007, a millwright and an electrical program began to be offered. In 2008, a welder program was added to the campus' trades offerings.

Table 7.21 Enrolment by Program, College of the North Atlantic, Labrador City Campus, 2008/2009

Trade Program	Number of Seats	Capacity
Welder	15	15
Construction/Industrial Electrician	16	16
Industrial Mechanic (Millwright)	16	16
Mining Technician (1st-year)	33	60
Mining Technician (2nd year)	66	75
Adult Basic Education	18	18
CAS Transfer: College- University	20	60
Engineering Technology (First Year)	5	30
Total Number of Students	**189**	**290**

Source: R. Sawyer pers. comm.

There is one private training institution, RSM Safety Institute, Inc., in Labrador City. It is a subsidiary of RSM Mining Services and offers 40 to 50 occupational health and safety training services for the mining and construction industries. These include Accident Investigation, Forklift Operation and Safety, Excavation and Trenching Safety and Safety for Supervisors. Class sizes at the Institute range from one to 40 participants, depending on the type of course and time of year. Courses are offered on a monthly schedule but are also available on an as-needed basis and typically are no longer than two days. Courses are generally offered in English, and some are offered in French (K. McCarthy, pers. comm.; K. Lee, pers. comm.).

Upper Lake Melville

Primary, Elementary and High School

There are six primary and secondary schools in Upper Lake Melville, including one francophone school (Table 7.22). Four are in Happy Valley-Goose Bay, while North West River, Sheshatshiu and Mud Lake each have one. Kindergarten through Grade 12 is offered in all of the communities except Mud Lake, which provides only Kindergarten through Grade 9 (Our Labrador 2004). The schools in the area have a total enrolment of 1,901 and the physical capacity to accommodate 2,340 students (Table 7.22).

Table 7.22 Student Populations, Primary and Secondary Schools, 2006/2007

School	Location	Grades	Service Areas	Number of Registered Students	Physical Capacity of School	Number of Full-time Equivalent Teachers
Peacock Primary	Happy Valley-Goose Bay	K-3	Happy Valley-Goose Bay	394	500	25
Queen of Peace Middle School	Happy Valley-Goose Bay	4-7	Happy Valley-Goose Bay	425	525	29
Mealy Mountain Collegiate	Happy Valley-Goose Bay	8-12	Upper Lake Melville Area	594	700	36
Lake Melville School	North West River	K-12	North West River and Sheshatshiu	118	200	11
Mud Lake School	Mud Lake	K-9	Mud Lake	4	15[A]	1
Peenamin Mackenzie School	Sheshatshiu	K-12	Sheshatshiu	351	400	34.5
École Boréale de Goose Bay	Happy Valley-Goose Bay	K-12	Happy Valley-Goose Bay and Sheshatshiu	15	N/A	3
Total				**1,901**	**2,340**	**139.5**

Note:
[A] The capacity of the school is 15 students, depending on the number of grades being taught in a given academic year.
Source: Newfoundland and Labrador Statistics Agency 2008.

The 2007 provincial budget includes $4 million to construct a new school in Sheshatshiu and $1.3 million to replace the francophone school in Happy Valley-Goose Bay (NLDF 2007).

Post-Secondary

Each year, the Happy Valley-Goose Bay campus of the CNA admits approximately 300 full-time students in a variety of programs, including Adult Basic Education, Automotive Service Technician and Office Administration (Table 7.23).

The CNA has recently expanded its Happy Valley-Goose Bay campus by adding six classrooms and a new library. The Labrador Institute is also co-located on the CNA campus. These changes will allow CNA to accommodate 200 additional students and will add to its overall service capacity to the Upper Lake Melville area (W. Montague, pers. comm.).

Table 7.23 College of the North Atlantic, Enrolment by Program, Happy Valley-Goose Bay Campus, 2005/2006

Program	Number of Students
Adult Basic Education	51
Office Administration	12
Office Administration (Executive)	10
Computer Support Specialist	5
Early Childhood Education	10
Millwright/Industrial Mechanic	16
Welding	15
Automotive Service Technician	16
Heavy Duty Equipment Technician	17
Carpentry	10
Construction/Industrial Electrical	14
Integrated Nursing Access	17
Comprehensive Arts and Sciences: Transition [A]	31
Comprehensive Arts and Sciences: College University Transfer	32
Orientation to Trades and Technology	15
Total [B]	**271**

Source: S. Cochrane, pers. comm.
Notes:
[A] This program is for students that graduate from high school but may not have the requirements to get into a program
[B] These do not include figures for Adult Basic Education for the coastal Learning Centres, other contract programs, or advanced trades training.

Québec Communities

The Sachidun Childcare Centre in Kawawachikamach has Naskapi as its operational language and delivers the Aboriginal Head Start program. Funded by Health Canada, it prepares Aboriginal children for school by meeting their emotional, social, nutritional, and psychological needs (NNK 2008). The Centre is administered by a Board of Directors and employed more than 15 individuals, including six permanent educators, during 2007-08 (NNK 2008). It is presently operating at its capacity of 26 children, including two spaces reserved for emergency cases referred by Social Services (NNK 2008; M. Mameanskum pers. comm.).

The Garderie Matimekush daycare is located in Schefferville within the reserve of the Matimekush/Lac John Nation and currently provides places for 26 Innu children, which is its legal capacity. The Garderie employs five early childhood educators and two support staff.

Two schools, both managed by the Central Québec School Board, serve the Québec communities (Tables 7.24 and 7.25).

Table 7.24 Schools, Enrolment and Number of Teachers, Eastern Québec, 2007/08

School	Location	Grades	Enrolment 2007/08	Full-Time Equivalent Teachers 2007/08	Pupil-Teacher Ratio
Jimmy Sandy Memorial School	Kawawachikamach	K-11	238	23.0	10.34
École Kanatamat Tahitipetetamunu	Schefferville	K-11	130	23	5.7

Table 7.25 Staff Employed by Jimmy Sandy Memorial School, Kawawachikamach, 2008

Position	Number of Employees
Teachers	23
Guidance Counsellor	1
Librarian	1
Liaison Officer	2
School Administration	6
Bus Transportation	2
Janitorial	2
Total	37

There are 238 students attending the school, providing an average of 10.34 students per teacher. The school also employs a special education teacher (NNK 2007: 92-93). The Government of Québec has approved further funding for the Adult Education Programme, which will facilitate the addition of more adult education resources (NNK 2007: 92).

Matimekush/Lac-John is served by a single K-11 school, École Kanatamat Tahitipetetamunu, in Schefferville (Table 7.26). During the 2007/08 academic year its enrollment was 130, an increase from 115 students in 2006/07 (C. Basque pers. comm.; INAC 2008 – Matimekush/Lac John First Nation). The school has 23 teachers, with a student-teacher ratio of 5.7:1 (Table 7.26). There is also a resource specialist, an administrator serving as Principal and Vice-Principal, a secretary, and two psychologists. The Principal has stated that the school structure could accommodate up to an additional 50 students (C. Basque pers. comm.).

Almost all of the École Kanatamat Tahitipetetamunu students are Innu; only two are non-Aboriginal. The languages of instruction are French and Innu, in keeping with the mandates of the provincial education authority (C. Basque, pers. comm.). The school currently has 30 adolescents who have dropped out without achieving Secondary 3 (M. Beaudoin, pers. comm.).

Table 7.26 Staff Employed by École Kanatamat Tahitipetetamunu, Schefferville, 2008

Position	Number of Employees
Teachers	23
Resource Specialist	1
Psychologists	2
Secretary	1
Principal/Vice-Principal	1
Bus Transportation	1
Janitorial	1
Total	30

7.10.1.2.8 Recreation

Labrador West

There are a number of indoor recreational facilities in Labrador City and Wabush. The Labrador City Arena is a gathering point for recreation in Labrador City. The building can accommodate 1,800 people and it has one rink which hosts large tournaments, games and activities. It has five dressing rooms, a meeting room and is also home of the Polaris Figure Skating Club and Labrador West Minor Hockey Association. Wabush also has an arena that is used by the Wabush Figure Skating Club, Labrador West Minor Hockey, Recreational and Olympic Hockey (Labrador West 2008). Other indoor recreational facilities in Labrador City and Wabush include the Carol Lake Curling Club and the Mike Adam Recreation Complex.

Outdoor activities are also popular in Labrador West as it has a number of walking trails, softball fields, soccer pitches and Labrador's only 18-hole golf course. The Jean Lake recreational area in Wabush is used extensively by local organizations for their outings. Outdoor sport clubs in the area include the Menihek Nordic Ski club and the White Wolf Snowmobile Club (Labrador West 2008).

Upper Lake Melville

Happy Valley-Goose Bay has indoor and outdoor recreation facilities. NLDTCR operates the Labrador Training Centre in the town which houses the only swimming pool in Eastern Labrador, a gymnasium which is used for numerous community activities, a fitness room, and a judo room. Other sport facilities in Happy Valley-Goose Bay include a 1,000 seat arena, soccer and softball fields operated by the Town Council and four school gymnasiums (DND 2008). The Amaruk Golf and Sports Club operates a nine-hole golf course in the Summer.

5 Wing Goose Bay also has recreational facilities, including a full-scale gymnasium, an exercise room, two squash courts, a fully equipped weight room and two sauna baths. Other recreation facilities administered by the Base include a 10-bay auto hobby shop, a wood hobby shop and a softball field. Cultural recreation opportunities have also been increased with the development of a new theatre located adjacent to the new high school.

Québec Communities

The Kawawachikmach Recreation Facility provides an indoor pool (supervised), supervised indoor gym, and a snack bar. It provides employment to 13 staff including one recreation and sports coordinator, one manager, two lifeguards (two trainees), four games room attendants, and two janitors.

The community centre (NNK 2007) provides space for clubs to meet, community feasts and gatherings, family reunions, dances and fundraising activities. The centre has a multi-purpose room, a community library, a youth centre with couches, pool table, ping-pong table, big-screen television, a stereo and board and electronic games and three public-use computers with Internet access. It provides employment to 14 staff.

Other recreation facilities in the Kawawachikmach area include an open area hockey rink, basketball court and softball field.

The only recreation facility in Schefferville is an arena that is paid for by the Town and the Nation Innu Matimekush-Lac John. It provides ice hockey and skating on the indoor rink, with a snack bar and change rooms, and employs a recreation director and a support/maintenance person. In 2010 and 2011, LIM provided assistance to the community to undertake repairs and restoration at the arena.

7.10.1.2.9 Transportation

Labrador West

Roads

The Trans Labrador Highway (TLH) is the primary public road in Labrador. Phase I of the TLH (Route 500) runs between Labrador West and Happy Valley-Goose Bay. In Labrador West it connects with Québec Route 389, which runs 570 kilometres north from Baie-Comeau to the Québec-Labrador border. This section of the TLH is a two-lane gravel highway between Labrador City and Happy Valley-Goose Bay. It has a service level of "A" (free-flowing traffic), with a capacity to carry 1,000 vehicles per hour. Currently, the highway carries 200 vehicles per day (D. Tee, pers. comm.).

The 2007-08 provincial budget allocated $15 million to commence hard-surfacing of Phase I of the TLH. In June 2007, tenders were issued to widen three sections of road in preparation for hard-surfacing, including a section in Labrador West and a section from Churchill Falls to the Churchill Falls Airport. Crews managed to widen 37 kilometres of road and complete 1.8 kilometres of hard-surfacing by March 31, 2008 (NLDTW 2008).

Airport

Labrador City and Wabush are serviced by the Wabush Airport, which is located within 5 kilometres of each town's centre. A number of air carriers operate scheduled flights, including Air Labrador, Air Canada Jazz and Provincial Airlines Ltd. (Labrador West 2008). The paved runway strip is 1948 m in length.

In 2006, Wabush Airport reported the highest percentage gain in airport passenger movements (16 percent) mainly due to a rise in mining activity. Between 2006 and 2007, the number of passenger movements at the airport in Labrador West increased by 6.2 percent, from 67,180 to 71,344 (NLDTCR 2007).

Railway

IOC operates the 420-km Québec North Shore and Labrador Railway (QNS&L), which IOC built to move iron ore to Sept-Îles. It also provides regularly scheduled, year-round, passenger service (NLDTW 2006). In 2005, Tshiuetin Rail Transportation Inc. (TRH) acquired the northern section of the QNS&L Railway line (the Menihek Subdivision), which runs between Emeril Junction, situated on the Trans Labrador Highway, 63 kilometres from Labrador West, and

Schefferville, Québec. TRH now operates this portion of the rail line for passenger and freight rail services.

Upper Lake Melville

Roads

The local road system in Upper Lake Melville links Happy Valley-Goose Bay with North West River and Sheshatshiu. Mud Lake is not accessible by road but can be reached by boat in summer and by snowmobile in winter. The roads in Happy Valley-Goose Bay are paved, as are some in North West River, but those in Sheshatshiu are not.

Construction on Phase III of the TLH, a 280-km section connecting Cartwright Junction and Happy Valley-Goose Bay, is scheduled to be completed in 2009. As a result of these road improvements, established trucking companies may face increased competition from other companies moving into the area (AMEC Earth and Environmental Ltd. and Gardner Pinfold 2008).

Ports

The Port of Goose Bay is on the western end of Lake Melville in an area known as Terrington Basin and has two industrial docks. Infrastructure includes storage sheds, asphalt and fuel tanks and a transshipment warehouse. There is also a substantial area of laydown space. There is a large area of land within easy access of these docks that could be converted to suit a variety of industrial needs.

Terrington Basin cannot handle large freight or passenger vessels and would require significant dredging for expansion of services (CLEDB 2006). The dock receives three to four oil tankers each year and one freighter every two weeks between mid-June and mid-November, which is the current operating season (D. Tee, pers. comm.).

Airports

Both civilian and military aircraft use the Goose Bay Airport, at 5 Wing Goose Bay. Operated by the Goose Bay Airport Corporation, it is one of the largest airports in eastern Canada. A number of air carriers operate scheduled flights, including Air Labrador, Air Canada Jazz and Provincial Airlines Ltd. (which operates Innu Mikun Airlines), as well as Universal Helicopters and Canadian Helicopters (NLDTW 2006).

The airport has two runways, 3,367 m and 2,920 m in length, both capable of handling large aircraft. DND spent approximately $20 million on resurfacing and concrete replacement during the summer of 2006. The airport terminal was constructed in 1972 and has a design capacity of 32,000 people per year, but it is now handling more than three times this capacity. The number of passengers flying into the Goose Bay Airport in 2003 was 83,430 and in 2005, the number increased to 104,612, an increase of 15.1 percent. However, in 2006, only 94,422 passenger movements were recorded for the Goose Bay Airport, a decrease of 9.7 percent from 2005. They increased again in 2007 by 1.6 percent to 95,921 (NLDTCR 2007).

The Goose Bay Airport Corporation has hired a design and engineering firm to complete the plans for an improved and expanded terminal facility at its current location. Construction of the new terminal will begin in April 2009 and should be completed by the fall of 2010. The new facility will be able to accommodate an annual flow of 100,000 passengers, with further expansion capabilities incorporated into the design (G. Price, pers. comm.).

Québec Communities

Schefferville has an 8 km municipal road network, including access roads to such transport infrastructure as the airport and railway station. A municipal road also connects to the provincial highway, giving access to the community of Kawawachikmach. The municipal limits also contain approximately 200 kilometres of former mining roads constructed by IOC. These are on government land and give access to resources mostly in Labrador. They also lead to the resort area of Squaw Lake, Chatal Lake and Maryjo Lake. The municipality has no obligation to maintain these access roads (M. Beaudion, pers. comm.).

Several companies fly into Schefferville Airport, including Air Saguenay, Aviation Québec, Air Labrador and Air Inuit. The airport has a 1500 m runway, and employs four people. It is owned by Transport Canada and managed by the Societe aeroportuaire de Schefferville, representing the Naskapi Nation of Kawawachikamach, the Municipality of Schefferville and the Innu Nation of Matimekosh Lac-John (M. Beaudion, pers. comm.)

Schefferville is also served by the Menihek subdivision of the Québec North Shore and Labrador Railway, which delivers most of the freight that comes into the community, because there are no roads linking it to external communities.

7.10.1.2.10 Water, Sewer, Solid Waste, Power and Communications

Labrador West

Water

Beverly Lake, which is located northeast of Labrador City, is the Town's only municipal water supply.

The municipal water supply in Wabush comes from Ouananiche Lake, which is located south of the town. The Town of Wabush has a grid distribution network which services approximately 700 households and businesses (Labrador West 2008).

Sewer

The Town of Labrador City maintains two separate primary Sewage Treatment Plants and three sewage lift stations (Labrador West 2008).

The Town of Wabush maintains one primary Sewage Treatment Plant. The town is in the process of upgrading the plant to better serve the residents of Wabush.

Solid Waste

The garbage from both towns is currently sent to an incinerator, however, in accordance with the Province's waste management plan it is scheduled to close by December 21, 2008. A study was commissioned in early 2008 to determine whether Labrador should develop one super-site to accommodate all of the garbage from Labrador West and Labrador East. In the meantime, the Labrador West regional waste management committee is considering setting up a temporary landfill at an old dump site (Morrissey 2008).

Power and Communications

Power is provided to Labrador West by Newfoundland and Labrador Hydro. Labrador City and Wabush are equipped with technological and telecommunications infrastructure with advanced fibre optic cables throughout communities and industrial sites. Internet service is provided to the communities by Sympatico and CRRS (Labrador West 2008).

Upper Lake Melville

Water

Happy Valley-Goose Bay, North West River and Sheshatshiu have piped water systems, while Mud Lake has ground wells that are fed by seepage from the Churchill River. Happy Valley-Goose Bay receives its water from two sources: the Water Treatment Plant and Spring Gulch, each of which provide 50 percent of the water to the town (Town of Happy Valley-Goose Bay 2001). The water system can support a population of about 12,000 people, but is currently serving only approximately 9,150 (S. Normore, pers. comm.).

Sewer

Happy Valley-Goose Bay and North West River have piped sewage systems that serve all dwellings. Most houses in Sheshatshiu and Mud Lake have septic systems. (S. Normore, pers. comm.)

Solid Waste

The landfill in Happy Valley-Goose Bay (3 kilometres north of Goose Bay Airport) has the capacity to last another 12 to 15 years at current use levels. Sheshatshiu and North West River have their own garbage collection services, but use the landfill in Happy Valley-Goose Bay. This may change in the future as the provincial government is in the process of setting up regional landfill sites (S. Normore, pers. comm.).

Power and Communications

Newfoundland and Labrador Hydro provides electricity to all communities in Upper Lake Melville with power generated at Churchill Falls. The communities of Mud Lake, North West River and Sheshatshiu are all part of the Happy Valley-Goose Bay interconnected service area. Aliant Telecom (Aliant) provides telephone service to Labrador through a microwave radio network.

Québec Communities

Waste Disposal

The present landfill opened in 1997 and services the three communities of Kawawachikamach, Lac-John and Schefferville. The lifespan of the landfill was originally 21 years although due to an absence of a waste management plan for discarded electrical appliances and other scrap metals, the life span has been reduced to approximately 15 years. Under Québec legislation, waste materials generated outside Québec cannot be disposed of in a landfill in Québec. Consequently, mining companies operating in Labrador have to have their own management plan for the disposal of all waste material including vehicles, tires of all size and scrap metals (M. Beaudoin. pers. comm.).

Water Supply and Sewage

In Schefferville, drinking water is taken from Lac Knob which lies within the municipal boundary. The chlorination and pumping station is gravity fed, with water being distributed to the community at large via waterlines that serve both Schefferville and the Matimekosh reserve. The sewer and water systems were both originally installed in 1955. A physico-chemical wastewater treatment system was installed in 1999.

In Kawawachikamach, water is supplied to households from two community wells with a pump station, while sewage is pumped to a community septic tank and lagoon.

7.10.1.2.11 Police and Emergency Response Services

Labrador West

Police services are provided to Labrador City and Wabush by the Royal Newfoundland Constabulary (RNC). In 2007, there were 22 police officers in Labrador West, 18 of whom were male and four of whom were female (Statistics Canada 2007).

The Labrador City Fire Department provides fire protection services to that community and answers an average of 60 calls each year (Labrador West 2008). The Town of Wabush operates a volunteer fire department consisting of 28 firefighters. They protect the residents of Wabush and offer backup to the Town of Labrador City. This department also provides services to Wabush Mines and the Wabush Airport.

Upper Lake Melville

The Royal Canadian Mounted Police (RCMP) is responsible for policing Upper Lake Melville and other parts of Labrador, with the exception of Labrador West. The Labrador District RCMP Headquarters in Happy Valley-Goose Bay has a staff of three. The Happy Valley-Goose Bay detachment is staffed by a Sergeant, two Corporals, 11 General Duty Constables, a District Support Services member, two General Investigation Section (GIS) Investigators and a Community Constable. Sheshatshiu is policed by the RCMP with consultation with and input from the community (RCMP 2008).

There are three fire departments in Upper Lake Melville. There is a municipal department in Happy Valley-Goose Bay with 34 firefighters, 30 of whom are volunteers and four of whom are full-time firefighters (D. Webber, pers. comm.).

5-Wing Goose Bay also has a fire department operated by DND and staffed by 39 paid firefighters. It provides 24-hour crash and emergency rescue services and general fire protection services for the Base.

Québec Communities

As for other remote areas of Québec, police services are ensured by the Surete du Québec through an outpost station. Of the four positions allocated for Schefferville, there are usually only two full-time police officers at the station considering assignments, training and vacation benefits. Upon request, they provide support to the native police forces of NIMLJ and Kawawachikmach (M. Beaudoin, pers. comm.).

For Schefferville and Matimekush-Lac John, policing is provided by the Surete du Québec, with an agreement to co-ordinate with the Naskapi police of Kawawachikamach when necessary. There are five employees including one support worker, three officers on patrol with one exchange person. At least two of the officers are available specifically to provide police services for the Innu reserve. For Kawawachikamach, policing is provided by the Naskapi Police Force. It has nine employees, including a director, an assistant director, five full-time officers, and a secretary/janitor.

For Schefferville and the Nation Innu Matimekush-Lac John, fire services are administered by the Town of Schefferville (Boudreau, pers. comm. and Securite Publique Québec website). There is a part-time fire chief as well as 15 volunteer firefighters. In Kawawachikamach, the Fire Department provides fire suppression and rescue, fire prevention and public fire safety education. It employs a full-time fire chief, one deputy fire chief, three team captains and 11 volunteer firefighters.

All ambulance services for Schefferville, Innu Matimekush-Lac John reserve and Kawawachikamach are handled by Ambulance Porlier, which provides continual coverage via dispatch for ambulance services throughout Eastern Québec. It employs three dispatchers and on-call drivers using two ambulances on rotation.

7.10.1.2.12 Local Government

Labrador West

Both Labrador City and Wabush are municipalities, each with a mayor and a town council.

Upper Lake Melville

Happy Valley-Goose Bay is an incorporated municipality administered by a mayor, town council and town manager. Mud Lake, 5 kilometres east of Happy Valley-Goose Bay, is a small unincorporated community of around 60 residents administered by a volunteer Local Improvement Committee.

North West River is 33 kilometres northeast of Happy Valley-Goose Bay. It is an incorporated municipality administered by a mayor, town council and town manager or clerk.

Sheshatshiu is approximately 25 kilometres northeast of Happy Valley-Goose Bay and adjacent to the settlement of North West River. It is an Innu community which acquired Federal Reserve status in 2006 and is administered by a Band Council.

Québec Communities

The Innu Nation community of Matimekush-Lac John is governed by an elected Band Council consisting of a Chief and Councillors. The community of Kawawachikamach is administered by the Band Council, consisting of an elected Chief and Councillors.

The town of Schefferville has an incorporated area of 25.11 square kilometres (9.70 sq mi) and is located within the Caniapiscau Regional County Municipality or Municipalité Régionale de Comté (MRC). The regional county municipality seat is Fermont. Schefferville completely surrounds the autonomous community of Matimekush and it abuts the small community of Lac-John Reserve. The Town is administered by members of the Administrative Council of the CLD and the current Adminstrator is Madam Marcella Beaudoin.

7.11 Future Environment

The following describes the likely future environmental conditions in the proposed Project area if the Project did not proceed. This information is provided to help distinguish Project-related environmental effects from environmental change due to natural and/or other anthropogenic processes and trends in the Project area.

Some wildlife species in the Project area are subject to natural cycles and will likely undergo some natural changes over the designated time period in the absence of the Project. Air quality in the area is generally good, except for the generation of dust along unpaved existing local roads during the summer months, and in the absence of the Project, air quality could be expected to remain generally the same, perhaps with some marginal improvements resulting from improved air quality regulations and controls in other parts of Canada and the United States that provide some long-range transport of airborne contaminants to the Project area. The effects of climate change on the Project area (as described in Section 7.7.1) will likely result in changes to the existing environment whether or not the Project goes forward.

Without the Project, current trends in the region's socio-economic environment will continue. The populations of the local area communities will continue to decrease (in the absence of other influences or projects), as has been the trend in recent years.

The construction and expansion of other projects in the region are expected to continue with or without the Project.

LIM will use their existing accommodations camp located at Bean Lake for this Project, and there will be minimal demand for additional housing.

LIM has engaged the communities in its proposed development and will continue to work closely with community representatives. A community outreach office has been established in Schefferville, and an Elder's Committee has been organized in order to facilitate the sharing of information between LIM and the community.

8.0 ENVIRONMENTAL ASSESSMENT METHODS AND SCOPING

The environmental assessment (EA) methods for this Project Registration document are consistent with those used in the Shefferville Area Mine EIS (LIM 2009) and are intended to:

- Focus on issues of greatest concern;
- Address regulatory requirements;
- Address issues raised by the public and other stakeholders during Project-specific consultation; and
- Integrate engineering design, mitigation, and monitoring programs into a comprehensive environmental management planning process.

The approach and methods used are based largely on the work of Beanlands and Duinker (1983), the CEA Agency (1994; 1999), and Barnes et al. (2000), as well as the study team's experience in conducting environmental assessments. The EA methods provide a systematic evaluation of the potential environmental effects that may arise from each Project phase (construction, operation, and decommissioning) as well as malfunctions and accidents, with regard to each of the identified VECs. Project related environmental effects are assessed within the context of temporal and spatial boundaries established for each VEC. The evaluation of potential cumulative environmental effects includes past, present and likely future projects and activities that may interact with Project-related environmental effects. The specific steps involved in the environmental assessment for each VEC include:

- Determination of the assessment boundaries;
- Identification of potential project-vec interactions;
- Overview of existing knowledge and mitigation or effects management measures;
- Definition of the significance criteria for residual environmental effects;
- Assessment of the environmental effects, including mitigations or effects management measures;
- Determination of the significance of project residual environmental effects;
- Assessment of accidental events;
- Cumulative effects assessment; and
- Identification of any monitoring or follow-up requirements.

8.1 Scope of the Project

As discussed in Section 3.2, LIM proposes to advance the Houston Mine Project in a number of phases. The scope of this assessment includes the first phase which involves development and production from the Houston 1 and 2 deposits. Table 8.1 lists the key Project activities to be assessed for biophysical and/or socio-economic interactions.

Table 8.1 Scope of Project Activities

Construction Activities
Site Preparation (grubbing, clearing, and excavating)
Haul and Service Road and Rail Siding Construction
Employment and Expenditures
Operation
Iron Ore Extraction (excavation – primarily mechanical, minimal blasting)
Iron Ore Beneficiation – offsite
Stormwater Management
Transportation (on-site trucking, hauling, rail transport)
Operations (on-site power generation, solid waste, grey water, human presence)
Employment and Expenditures
Decommissioning
Removal of Facilities and Equipment
Site Reclamation (grading, re-vegetation)

8.2 Issues Scoping

An important part of this preliminary environmental assessment process conducted in support of the Project Registration is the identification of a concise list of those components of the environment that are considered "valued" (socially, economically, culturally, and/or scientifically) and thus of interest when considering the potential environmental effects of a project. Valued Environmental Components (VECs) are defined as broad components of the biophysical and human environments that if altered by the Project, would be of concern to regulators, resource managers, scientists and the public.

VECs were identified through issues scoping activities that included:

- A review of regulatory requirements;
- Field programs and preliminary background research;
- Public meetings and presentations including those undertaken for the Schefferville Area Mine Project (section 6.0 of this report provides an overview of the public consultation program undertaken by the proponent);
- A review of listed species and/or species at risk found within the area using existing regional information and baseline surveys; and
- The professional judgment of the Study Team.

The Houston Mine Project contains many of the same project description components and potential environmental and socio-economic interactions as LIM's nearby approved Schefferville Area Mine Project. Therefore, issues scoping conducted for the Schefferville Area Mine Project has provided the foundation for issues scoping for this Project.

Many issues raised during previous consultations around the Scheffervile Area Iron Ore Mine development as well as the EIS scoping guidelines for that project (NLDEC 2008) remain relevant for the Houston Project and have influenced issues scoping. These include:

- Economic benefits;

- Employment and business development opportunities for Aboriginals, including Aboriginal training and education programs to enhance participation in available opportunities;
- Protection of traditional land use (e.g., trapping, hunting);
- Cultural and heritage protection and development;
- Alterations to waterbodies;
- Waste management;
- Fish and fish habitat;
- Caribou species and habitat; and
- Cumulative effects.

8.3 Selection of Valued Environmental Components

Based on the issues scoping exercise, the following VECs were selected to form the basis of the environmental assessment:

- Caribou was selected as a VEC based on the knowledge that the large and migratory George River Caribou Herd historically occured in the Project area on a seasonal basis, although their movements locally are difficult to predict year to year. Despite the dramatic decline in numbers of migratory Caribou since the 1980's, and the apparent absence of Woodland Caribou in the Project area, Caribou was selected as a VEC as it has important cultural and recreational benefits for residents.
- Other Wildlife includes terrestrial wildlife, avifauna, and unique or uncommon habitats. Protection of terrestrial habitats and wildlife are mandated by the *Migratory Birds Convention Act*, *Species at Risk Act*, Newfoundland and Labrador's *Endangered Species Act*, *Newfoundland and Labrador Wildlife Act*, and Newfoundland and Labrador's *Water Resources Act*.
- Employment and Business was selected as a VEC based on potential concern that economic benefits accrue to local communities, Labrador and the Province as a whole. This includes benefits to the population and economy as a whole, and to under-represented groups.
- Communities are another aspect of the socio-economic environment that may be affected by the Project. The communities most likely to be affected are the primary places of residence of the Project labour force: Labrador West, Upper Lake Melville, Schefferville, and Kawawachikamach.

Further to confirmation from DFO regarding Tom's Pond, the proposed pit development is not expected to impact existing fish habitat and a 15 m buffer from fish-bearing habitat will be maintained. Houston Creek, which is not within the development footprint, but is located in the vicinity, contains a low productive coldwater fishery with the presence of brook trout being noted during various field surveys in this first order stream (AECOM 2010). If access is required across this small watercourse, an open bottom culvert constructed above the high watermark

will be constructed to ensure no physical impediment to fish habitat will occur. Therefore, the effects of the Project on fish and fish habitat are predicted to be not significant, and are not assessed further.

Similarly, baseline surveys at the Houston area have indicated there are no historic resources at that site. Therefore further assessment is not required. Where the potential has been rated as moderate along one of the two haul road routes, a site investigation will be conducted prior to project construction to ensure the project does not interact with historic resources.

8.4 Boundaries

This preliminary EA effort in support of the Project Registration document considers the potential effects of the proposed Project within the spatial and temporal boundaries defined for each VEC. These boundaries may vary with each VEC but generally reflect consideration of:

- The proposed schedule/timing of the construction, operation, maintenance, and abandonment phases;
- The natural variation of a VEC;
- The timing of sensitive life cycle phases in relation to the scheduling of proposed Project activities;
- Interrelationships/interactions between and within VECs;
- The time required for recovery from an effect and/or return to a pre-effect condition, including the estimated proportion, level, or amount of recovery; and
- The area within which a VEC functions and within which a Project effect may be felt.

8.4.1 Spatial Boundaries

This preliminary EA effort in support of the Project Registration documente will be limited to the development of the Houston property. Spatial boundaries may be limited to the immediate Project area (e.g., project “footprint” or zone of influence) or may be regional or larger in extent in consideration of the distribution and/or movement of some VECs. The geographic limits and migration patterns of wildlife populations, for example, are important considerations in determining spatial boundaries and may influence the extent and distribution of an environmental effect.

For this assessment, the area that could potentially be affected by Project activities and interact with VECs is referred to as the Assessment Area. The Assessment Area is also developed in consideration of the timing and type of Project activity being considered and the sensitivities within the particular VEC being assessed. The assessment of potential Project effects and determination of the significance of those effects occurs within the Assessment Area.

8.4.2 Temporal Boundary

Project effects for this preliminary EA effort in support of the Project Registration documente have been assessed from construction through to decommissioning and abandonment. Construction is scheduled to take place in 2012. With the exception of those activities which will occur seasonally, effects of Project operations activities have been assessed as “year-round” for

the period 2013-2020. The effects of decommissioning, abandonment and site rehabilitation will be assessed and are assumed to occur after 2020. Potential accidental events will be considered and could occur at any point during the life of the Project.

8.4.3 Administrative Boundaries and Technical Boundaries

Administrative boundaries refer to the spatial and temporal dimensions imposed on the assessment for political, socio-cultural or economic reasons. Administrative boundaries can include such elements as the legislation, regulations, and government agencies that govern Project-related activities and the VECs selected for the assessment. Administrative boundaries can also include pertinent government guidelines and wildlife management zones. These boundaries are defined for each VEC individually.

Technical Boundaries include data and information gaps with a focus on data gaps important to environmental effects predictions and determination of significance or to satisfaction of the assessment guidelines. Such boundaries could include limits on availability of existing information and/or field surveys.

8.5 Potential Interactions and Existing Knowledge

A list of potential interactions between the Project activities and each VEC is presented in Table 8.2. These interactions represent the pathways/mechanisms through which the Project could have environmental effects on the VECs being considered in the assessment. Existing knowledge concerning these potential interactions is also reviewed and summarized.

Table 8.2 Potential Project-VEC Interactions (Example)

Project Activities and Physical Works	Environmental Effects	
	Environmental Effect 1	Environmental Effect 2
Construction (Project activities in 2012)		
Site Preparation (grubbing, clearing, and excavating)		
Haul and Service Road and Rail Siding Construction		
Employment and Expenditures		
Operation (Project activities starting in 2013)		
Iron Ore Extraction (excavation – mechanical, blasting)		
Iron Ore Beneficiation		
Stormwater Management		
Transportation (on-site trucking, hauling, rail transportation)		
Operations (on-site power generation, solid waste, grey water, human presence)		
Employment and Expenditures		
Abandonment and Decommissioning		
Removal of Facilities and Equipment		
Site Reclamation (grading, re-vegetation)		
x = Interaction		

8.6 Residual Environmental Effects Assessment and Significance Criteria

Significant adverse environmental effects are those effects that will cause a change that will alter the status or integrity of a VEC beyond an acceptable level. The significance of environmental effects is determined according to criteria defined for each of the VECs.

The definitions for significant adverse environmental effects are based primarily on key factors such as: magnitude (i.e., the portion of the VEC population affected); potential changes in VEC distribution and abundance; effect duration (i.e., the time required for the VEC to return to pre-project levels); frequency; and geographic extent. They also consider other important considerations such as interrelationships between populations and species, as well as any potential for changes in the overall integrity of affected populations.

A positive effect is one that may enhance a population or socio-economic component.

Effects are analyzed qualitatively and, where possible, quantitatively using existing knowledge, professional judgment and appropriate analytical tools. The assessment of accidental events and cumulative effects will be considered within each individual VEC chapter.

Potential environmental effects on each VEC are characterized using the following six descriptors:

- Magnitude – the nature and degree of the predicted environmental effect. Rating depends on the nature of the VEC and the potential effect.
- Geographical Extent – describes the area within which an effect of a defined magnitude occurs;
- Frequency – the number of times during the Project or a specific Project phase that an effect may occur (i.e., one time, multiple);
- Duration – typically defined in terms of the period of time required until the VEC returns to its baseline condition or the effect can no longer be measured or otherwise perceived. It is defined specifically for each VEC. At a minimum, it is divided into three timeframes: short-term, mid-term and long-term;
- Reversibility – the likelihood that a VEC will recover from an effect, including through active management techniques such as habitat restoration works; and
- Ecological Context – the general characteristics of the area in which the project is located; typically defined as limited or no anthropogenic disturbance (i.e., not substantially affected by human activity) or anthropogenically developed (i.e., the area has been substantially disturbed by human development or human development is still present).

Based on the potential interactions identified for each VEC, technically and economically feasible mitigation measures will be identified to reduce or eliminate potentially significant adverse effects.

Where possible, a proactive approach to mitigating potential environmental effects has been taken by incorporating environmental management considerations directly into program design

and planning; these are noted in the Project Description (Section 3.0). Additional mitigation measures are identified in the environmental assessment to further mitigate potential adverse effects where economically and technically feasible. These mitigation measures are identified and discussed within each individual VEC chapter. Residual environmental effects predictions are made taking into consideration these identified mitigation measures.

A summary of the environmental assessment for each VEC is presented for Project construction and operation as noted in Table 8.3.

Table 8.3 Example: Summary of Residual Environmental Effects

Proposed Mitigation	
Significance Determination	
Geographic Extent	
Frequency of Occurrence	
Duration of Effect	
Magnitude of Effect	
Permanence/Reversibility	
Significance	
Confidence	
Likelihood of Occurrence	
Proposed Follow-up and Monitoring	

The evaluation of the significance of the predicted residual environmental effects is based on a review of relevant literature and professional judgment. In some instances, assessing and evaluating potential environmental effects is difficult due to limitations of available information. Ratings are therefore provided to indicate the level of confidence in each prediction. The level of confidence ratings provide a general indication of the confidence within which each environmental effects prediction is made based on professional judgment and the effects recorded from similar existing projects. The likelihood of the occurrence of any predicted significant adverse effects is also indicated, based on previous scientific research and experience.

8.7 Cumulative Environmental Effects

Cumulative effects are considered as part of the Project-specific environmental effects analyses described above (i.e., the overall effect of each project on a VEC). Other projects or activities that could interact cumulatively with the Houston Mine Project have been identified based on their current status in the Environmental Assessment process and include the New Millenium Elross Lake Mine, increased railway traffic as a result of the Bloom Lake Railway, Alderon's proposed Kami development, and LIM's mine operations at James, Redmond and Silver Yards.

Consistent with CEAA guidance, the scope of cumulative effects includes those projects that have entered a formal approval process. As a result, some projects such as the recently announced expansion of IOC in Western Labrador have not been included in the assessment of cumulative effects because they have not entered a formal approval process.

Projects that will be considered in the cumulative effects assessment are detailed in Table 8.4.

Table 8.4 Projects and Activities Considered in Cumulative Environmental Effects Analysis

Project	Status
Elross Lake Iron Ore Mine Proponent: New Millenium Capital Corporation • New Millenium Capital Corporation is planning to develop an iron ore mine at a previously mined site in Western Labrador, approximately 10km northwest of Schefferville, QC. • Ore will be transported via rail to a marshalling yard in Schefferville and then sent via rail to Sept-Îles , QC, for shipment to customers.	Existing Project
Bloom Lake Railway Proponent: Consolidated Thompson Iron Mines Ltd. • Consolidated Thompson Iron Mines has constructed and operates a new 31.5km-long single-track railway line to connect the company's new load-out facilities within Labrador with the existing railway line between Wabush Mines and the Quebec North Shore & Labrador Railway.	Existing Project
Schefferville Area Iron Ore Mine Proponent: Labrador Iron Mines • LIM is in operation at the James and Redmond mines and Silver Yard beneficiation site.	Existing Project
Kami Iron Ore Project Proponent: Alderon Iron Ore Corp • Alderon is proposing to develop an iron ore mine in western Labrador. The minue will produce up to 16 million metric tonnes of iron ore concentrate annually and is currently scheduled to begin construction in Q4 2013.	Potential Future Project
Mining Exploration Proponent: Labrador Iron Mines • LIM is conducting on-going mineral exploration at several properties in western Labrador. These properties are all within 50km of the Houston deposits.	Potential Future Project

The assessment of cumulative environmental effects will be consistent with the Schefferville Area Mine assessment. It will involve consideration of the following:

- Temporal and spatial boundaries;
- Interactions among the Project's environmental effects;
- Interactions between the Project's environmental effects and those of existing projects and activities;
- Interactions between the Project's environmental effects and those of planned projects and activities; and
- Mitigation measures employed toward a no-net-loss or net-gain outcome (e.g., recovery and restoration initiatives pertinent to a VEC that can offset predicted effects).

8.8 Accidental Events

The potential environmental effects resulting from malfunctions or accidental events that may occur in connection with the Project will be assessed for each VEC. These shall be discussed with respect to risk, severity and significance.

8.9 Monitoring and Follow-up

The purpose of a follow-up program is to:

- Verify the accuracy of the environmental assessment; and
- Determine the effectiveness of mitigation measures.

As part of the environmental effects analysis, monitoring and follow-up programs are described where warranted. Monitoring and follow-up is considered where there are important Project-VEC interactions, where there is a high level of uncertainty, where significant environmental effects are predicted, or in areas of particular sensitivity.

9.0 ENVIRONMENTAL EFFECTS ASSESSMENT

9.1 Caribou

Caribou was chosen as a VEC based on the importance of caribou to the local communities and the understanding that, although there has been a significant reduction in caribou herds across the Canadian North since the early 1980's, the migratory George River Caribou Herd (GRCH) has been historically reported in the Region on a seasonal though unpredictable basis. No evidence of Woodland caribou has been noted in the Project Area since environmental baseline programs were initiated in 2007.

There is no recent evidence to suggest that other caribou herds potentially overlap the Houston Property at this time. The nearest other herd of consequence is the Lac Joseph herd, a sedentary population of woodland Labrador, that has been observed more than 100km south of the Project. This population, along with Labrador's other sedentary populations located at greater distances, are designated as "Threatened" by the Committee on the Status of Endangered Wildlife in Canada since May 2002 (COSEWIC 2008; SARA 2008) due the population decrease throughout most of the range. Formerly sedentary caribou existed also to the west and were known as the McPhayden and Caniapiscau Herds (Bergerud et al. 2008).

To learn more of the status of caribou in the vicinity of their properties, LIM embarked on original research in the area, including aerial and ground surveys for caribou and other wildlife. The results of an extensive aerial survey in May 2009 indicated that some caribou (three sightings over a two-day period totalling seven individuals) were observed in the area at a distance greater than 20 km from the project area (D'Astous and Trimper 2009). Anecotoal evidence provided by local hunters indicated that they were not aware of these caribou at the time of sighting and their records indicated that there had been no sightings of the GRCH during that winter (R. McKenzie, pers. comm.). To assist in identifying the herd affiliation of these animals, one adult female caribou who was located in a group of 4 caribou, was fitted with an Argos GPS collar (PTT 53572, VHF signal 149.970 MHz) on 6 May 2009 (D'Astous and Trimper 2009). While no signal was received from the collar (due to a technical malfunction), this animal was shot by a hunter on the Naskaupi River (about 400km east of the capture location) on 6 February 2010 (T. Chubbs and J. Neville, pers. comm.). Based on the migratory route of the GRCH during the fall and winter of 2009-2010, the Senior Wildlife Biologist for Labrador considered this animal to belong to the migratory ecotype (i.e., affiliated with the GRCH) rather than to the sedentary ecotype (T. Chubbs, pers. comm.). This animal's body length (192 cm) (D'Astous and Trimper 2009) was consistent with this interpretation (T. Chubbs, pers. comm.).

The 2009 body measurements also supported the interpretation that the two caribou measured in the study area probably belonged to the migratory ecotype (D'Astous and Trimper 2009). Based on the absence of caribou observations during a similar aerial survey in 2010 and the 2009 results accumulated to date, and the fact that there has been no evidence that the study area is used by sedentary caribou during the pre-calving period in recent years, it was concluded that sedentary caribou do not exist in the vicinity of the Project.

In addition to these surveys and marking efforts, D'Astous and Trimper (2009) collected caribou tissue samples for genetics analysis. Samples of ear dermis were collected from the same lone

adult female that was collared by the field team, and from a recently killed (by wolf) adult female. These samples were stored frozen at Laval University, Québec, until they could be analyzed at the specialized laboratory directed by Dr. Steeve Côté.

The genetic analysis and comparison to on-file genetic reference samples from known individuals were completed in May 2011 by Mr. Glenn Yannic. Several multivariate techniques (e.g., Factor Correspondence Analysis, Bayesian STRUCTURE) were used to compare the tissue samples to those collected from known ecotypes and herd affiliations in northeastern Quebec and Labrador such as the George River and Leaf River Herds (migratory ecotype), the Red Wine Mountains and Lac Joseph Herds (woodland ecotype) and the Torngat Mountains Herd (montane ecotype) [as described in Bergerud et al. (2008)].

The results indicated the samples could not be assigned to any of the ecotypes or herds in a reference collection (below). Both caribou sampled are genetically similar, suggesting that they belong to the same ecotype. As a result of the extensive variability observed in the genetic testing, attributable to gene flow between the different migratory herds of caribou in the Quebec-Labrador Peninsula (Boulet et al. 2007), a clear assignment of the sampled individuals to a known reference herd, based solely on genetics, was not possible at that time. However, efforts expended to date indicate that the sampled caribou were of the migratory ecotype based on the following (D'Astous and Trimper 2010):

- body measurements;
- subsequent behaviour and movement of the collared caribou to a distance of over 400 km from the capture area prior to its demise from hunting on February 6, 2010 (D'Astous and Trimper, 2009 and 2010);
- statements from a Senior Wildlife Biologist that, based on the migratory route of the George River Caribou Herd in the fall of 2009 and winter of 2010, this caribou was considered to belong to the migratory ecotype rather than to the sedentary type (T. Chubbs, pers. comm.); and
- no other evidence of sedentary caribou has been identified during this period.

Ongoing monitoring for the GRCH will be conducted because the Project overlaps with its historical seasonal range (i.e., during winter).

A full description of the existing conditions regarding the caribou population, historical seasonal movements, and habitat use are presented in Section 7.7.1.

9.1.1 Environmental Assessment Boundaries

9.1.1.1 Temporal Boundaries

Temporal boundaries for the GRCH and possible woodland caribou herd effects assessment comprise three timeframes: construction phase (approximately three months), operation phase, and decommissioning phase (post-operation phase).

The range of the migratory GRCH occupies over 800,000km^2 in Labrador and Northern Quebec. Caribou from this herd travel large distances over the Quebec-Labrador peninsula and

aggregate on traditional calving grounds each June demonstrating strong site fidelity (i.e., returning to similar locations annually) (Schmelzer and Otto 2003). The GRCH has historically been known to rut and overwinter in the region, but there is no evidence to demonstrate calving occurs in the Assessment Area.

The nearest sedentary herd known to exist in the Schefferville area is the Caniapiscau Herd, located approximately 100km west. The recognized range of this herd and of the Lac Joseph Herd (Bergerud et al. 2008), located southeast of the Project area (200km), are not believed to interact with the Project. Historically, RRCS (1989) indicated that the McPhadyen River Herd was known to have overlapped the Schefferville area. There has been no recent evidence since this time to indicate whether caribou from this sedentary herd (or other sedentary herd) still exist. Prior to the May 2009 and 2010 surveys (D.Astous and Trimper 2009 and 2010), the most recent documented search effort was from the mid-1980s (Phillips 1982; St. Martin 1987).

9.1.1.2 Administrative and Technical Boundaries

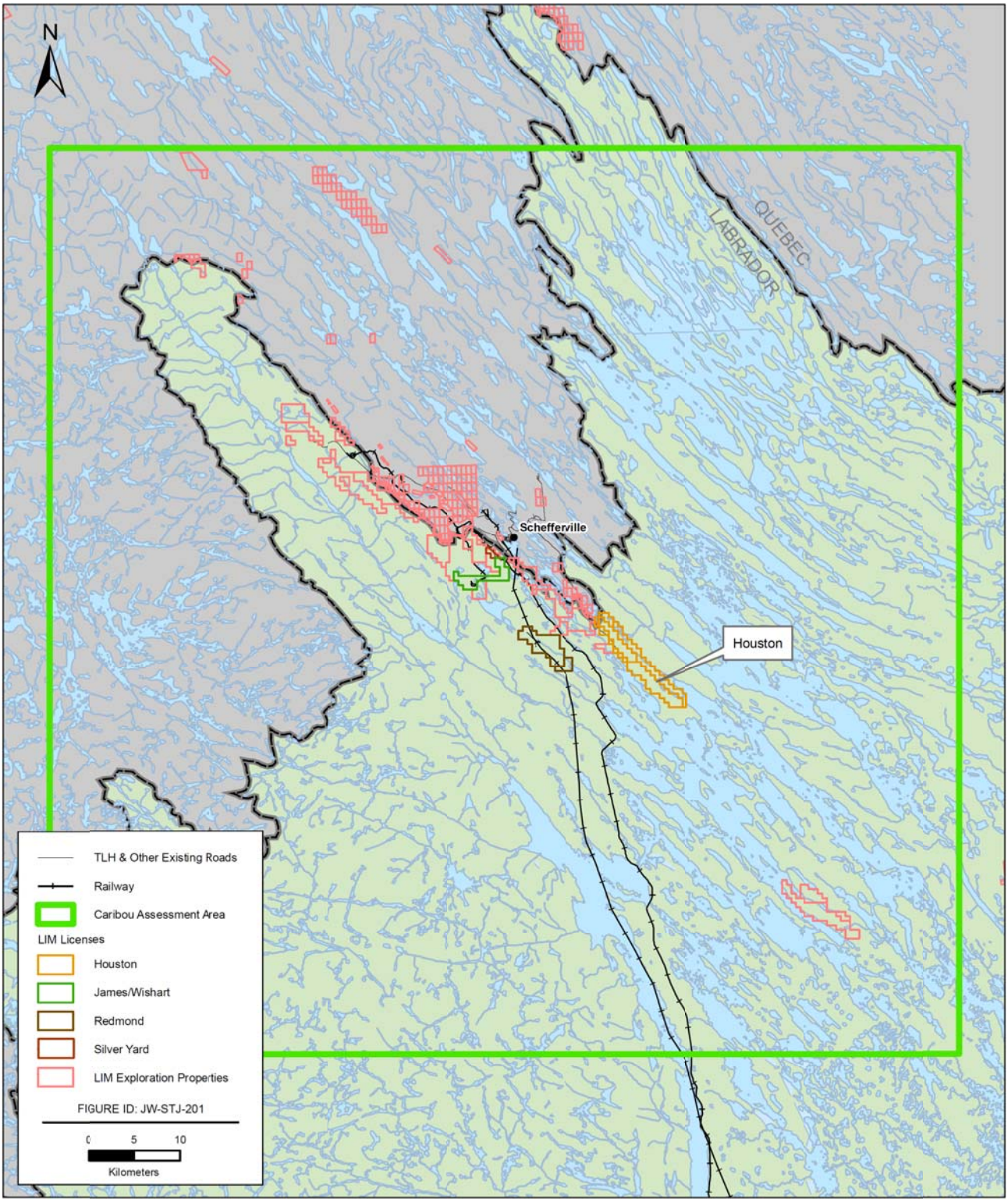
Hunting of sedentary caribou herds is illegal; however, the hunting of the migratory GRCH is legal within the seasons (August 10 through April 30) and established quotas. Quotas for the GRCH are defined by the provincial government and, as previously noted, hunting bans have been put into effect as a result of dramatic drops in the caribou population.

Given the available information from the literature and from the results of the May 2009 and 2010 aerial surveys, there is sufficient information available on the migratory caribou population (i.e., the GRCH) of the area to assess the potential interactions and environmental effects of the Project in light of the proposed mitigation (ongoing) and monitoring efforts associated with this Project.

9.1.1.3 Assessment Area

The Caribou Assessment Area is delineated in Figure 9-1. This area includes Houston 1 and 2 as well as the James and Redmond properties and Silver Yard beneficiation area. It is also the boundary used for the 2009 and 2010 aerial caribou surveys conducted by LIM and New Millenium (D'Astous and Trimper 2009; 2010).

Figure 9-1 Caribou Assessment Area



9.1.2 Potential Environmental Effects

Potential issues and concerns relating to Caribou and the Project can be considered within two effects:

- Change in Habitat – related to the loss or reduction of potential caribou habitat from site clearing, and/or sensory (e.g., noise) disturbance associated with the presence and operation of people and equipment. This change in habitat can also result in an alteration of movements and distribution into lower quality habitat, and enhanced susceptibility to predation; and
- Mortality – directly related to increased hunting pressure as a result of improved access, and collisions with vehicles or other equipment.

9.1.2.1 Potential Project-VEC Interactions

The potential interactions between Caribou (from the GRCH) and each Project activity during construction, operations, and decommissioning comprise the scope of the environmental assessment for this VEC (Table 9.1).

Table 9.1 Potential Project-VEC Interactions for Caribou

Project Activities and Physical Works	Environmental Effects	
	Habitat Change	Mortality
Construction (Project activities in 2009)		
Site Preparation (grubbing, clearing, excavating)	X	
Haul and Service Road and Rail Siding Construction	X	
Employment and Expenditures		
Operation (Project activities starting in 2010)		
Iron Ore Extraction (excavation – mechanical, blasting)	X	X
Iron Ore Beneficiation		
Stormwater Management		
Transportation (on-site trucking, hauling, rail transportation)	X	X
Operations (on-site power generation, solid waste, grey water, human presence)	X	
Employment and Expenditures		
Decommissioning		
Removal of Facilities and Equipment	X	
Site Reclamation (grading, re-vegetation)	X	

Construction

Project activities that involve some level of alteration and/or loss of habitat in the vicinity of the deposits have the potential to interact with caribou. This includes site preparation and road construction. These activities may result in some habitat loss through clearing and removal of vegetation or through disturbance associated with noise, dust and/or visual changes that can displace caribou from suitable habitats that may exist near the development sites. It is noted that several portions of the Assessment Area were previously disturbed by historical mining operations. Caribou also react to vehicle movements based on the rate of approach, and proximity (Horesji 1981). In most instances, caribou flee for a short period, once the perceived

threat is removed. Temporary or longer-term displacement can result in a functional loss of habitat.

Mortality of caribou related to the Project may occur as a result of collisions with increased vehicular traffic and may also occur in association with transportation during operations. New roads may also result in increased mortality through increased access and harvest. However, there are already numerous roads in the area remaining from development.

Operation

During the operation phase of activity, there is further potential for interactions with caribou, given the relative length of operation in comparison to the more short-term construction phase. Activities such as blasting will create noise levels that will likely have disturbance effects on caribou.

Decommissioning

During decommissioning, removal of facilities and equipment will result in further sensory disturbance to caribou in the area. In addition, site reclamation, including grading and re-vegetation, will result in conditions that would eventually be attractive to caribou. Following decommissioning, the quality of habitat for caribou will improve over the long-term.

9.1.3 Review of Existing Knowledge

9.1.3.1 Change in Habitat

Mining and similar resource development projects on the landscape have been the subject of many assessments in relation to caribou. Bergerud et al. (1984) studied eight caribou populations exposed to industrial activities or transportation corridors and found that there was no evidence that disturbance activities or habitat alteration affected caribou productivity. They observed caribou's resilience to human disturbance and also concluded that seasonal movement patterns and extent of range occupancy appear to be a function of population size as opposed to disturbance (Bergerud et al. 1984). Weir et al. (2007) looked at the impacts of Hope Brook gold mine in southwest Newfoundland on the La Poile Caribou Herd and concluded that prior to mine development, caribou were dispersed throughout the study area, but the number of caribou increased linearly with distance away from the mine over all five seasons during both construction and operation phases. Within 6km of the mine center, group size and the number of caribou decreased as mine activity increased, indicating an avoidance of the development (Weir et al. 2007).

Monitoring of the Buchans Plateau Caribou Herd, another Newfoundland herd, during the development of a hydroelectric project indicated that caribou densities were lower within 3km of the site during the first year of construction (Mahoney and Schaefer 2002). The lowered caribou densities of this herd (particularly females with calves) within 3km of the site persisted for at least two years after the construction phase had been completed. In addition to the change in distribution, they concluded that the development caused a disruption of migration timing during the construction phase and longer-term through operations (Mahoney and Schaefer 2002).

Other reported distances of lower density around developments for caribou (usually females) include: 100 to 150m for seismic lines (Dyer et al. 2001), and 1.2 to 50km for forest harvesting (Chubbs et al. 1993; Smith et al. 2000; Mahoney and Schaefer 2002; Vors et al. 2007). This avoidance is cited as being related to the removal of suitable forage, increased susceptibility to predation particularly by wolves, and/or sensory disturbance associated with the presence of workers and equipment. Studies on the impacts of noise on wildlife indicate that the threshold above which potential negative effects are expected is 90 dBA (Manci et al. 1988). Noises at this level are associated with a number of behaviours such as retreat from the sound source, freezing, or a strong startle response. Caribou react to noise and display startle reflexes, such as running or ceasing feeding, but these reactions are relatively short-term, resuming normal activities 5 to 15 minutes later (Harrington 2003). It is the extended period of noise that bring about concerns such as “masking”, or the inability of an animal to hear important environmental signals, such as noises made by potential mates, predators, or prey (Manci et al. 1988).

9.1.3.2 Mortality

Increased access through the development of expanding road networks may result in increased legal and illegal hunting (Dzus 2001; Vistnes and Nelleman 2001). Hunting is normally not considered to be a population limiting factor but could become so if the caribou herd is in decline (Messier et al. 1988; Thomas and Gray 2002). Most mortality from hunting is therefore considered additive and not compensatory to other mortality factors (Bergerud et al. 2008).

Although statistics are unavailable, Nalcor Energy (2009) report that caribou are known to be struck by vehicles when attempting to cross the Trans-Labrador Highway. Collisions with trains are cited by Goldwin (1990) as a significant source of mortality for caribou in northwestern Ontario.

9.1.4 Residual Environmental Effects Significance Criteria

Residual environmental effects are those which are predicted to affect caribou populations, once mitigation measures have been applied. Each prediction is described according to:

- Geographic extent (i.e., site-specific, within the assessment area, throughout the assessment area and beyond);
- Frequency of occurrence (i.e., once, infrequently, continuous, not likely to occur);
- Duration (i.e., less than one generation, over several generations, permanent);
- Magnitude (i.e., low - no measurable change relative to baseline conditions, moderate - measurable change that does not cause management concern, high - measurable change that does cause management concern);
- Reversibility (i.e., reversible or irreversible);
- Confidence (i.e., low or high confidence regarding the significance prediction; and
- Likelihood (i.e., significant effect is likely or unlikely).

A significant adverse residual environmental effect is one in which the Project would cause a population decline, such that the viability or recovery of the herd is threatened.

9.1.5 Mitigation Measures

The results of the caribou surveys completed in 2009 and 2010 (and other information) indicate that that it is unlikely that sedentary caribou are present in the area surveyed (Figure 7-8), which includes the Assessment Area, during the pre-calving period. Despite this conclusion, LIM has already undertaken a caribou mitigation strategy for the James and Redmond mining operations which protects all ecotypes of caribou, including the potential for sedentary caribou to exist. This mitigation strategy will be expanded to include the Houston Project area, however, additional discussions will be conducted with the Wildlife Division to determine the validity of applying a woodland caribou mitigation strategy in context of the lack of evidence of their presence in the Project Area.

The appropriate level of action for any encounter with a caribou is one that removes risk to the caribou and personnel with a minimal amount of disturbance to the caribou. Mitigation of disturbance may involve the potential for modification or adjustment of construction, mining and operational activities. All caribou management actions will be reported to the Wildlife Division. In order to mitigate potential effects of the Project on caribou, activities during all phases of the Project will be planned with three main considerations:

- Any activity that may potentially affect caribou habitat will be implemented with appropriate mitigation regardless of whether caribou are actually present.
- In the event that caribou are observed by personnel, a set of procedures will be incorporated to reduce or eliminate disturbance and avoid encounters with caribou; and
- This caribou mitigation strategy will be employed by on-site personnel until such time that this plan is revised or replaced by mutual agreement between LIM and Wildlife Division. A joint review of the current mitigation strategy by LIM and Wildlife Division to be conducted annually at the end of Year 1 to accommodate the inclusion of any new data and to assess the strategy for appropriateness.

LIM is firmly committed to ensuring no animals are disturbed, harmed, or killed as a result of this Project. LIM is also concerned that delays in Project activities could occur due to caribou or other wildlife being present and remaining within a certain distance, seemingly tolerant of the localized industrial activity. Therefore it is proposed that if caribou approach the Project there be a progressive level of heightened awareness by Project personnel and increased interaction with Wildlife Division, to ensure both objectives are met.

A Caribou Mitigation Strategy for LIM's James and Redmond properties has been approved by Wildlife Division. This strategy will be reviewed for application at this site. Specific caribou mitigation and monitoring measures associated with the Project include but are not limited to:

- Sightings as a result of this survey or reports of caribou, e.g., through co-ordination with Wildlife Division authorities and/or other stakeholders, within 20km of Project infrastructure and activities will be described in a one-page update of mining activity and wildlife observations and will be sent immediately to the Wildlife Division. When caribou are known to occur within 20km, a 5km buffer around each area of activity will be monitored on a weekly basis by scanning for tracks or animals from road-accessible vantage points within this radius. Observations reported by personnel or others will also

be recorded and investigated within this area. Reporting to the Wildlife Division would be increased to a weekly basis in this scenario. Note that if caribou are not seen within the 20km radius during the aerial survey or otherwise, the 5km buffer would be monitored on a bi-weekly basis (from road-accessible vantage points) over the course of the calving and post-calving period.

- If caribou are observed at a distance of less than 5km from Project infrastructure and activities, LIM will issue an advisory of their proximity to personnel to be alert and that activities that would potentially disturb or otherwise harm these animals may need to be curtailed until these animals have left the area. Construction and operation of the Project will not be audible beyond a short distance (i.e., less than 1km) and would not need to be delayed if caribou are within 5km. The monitoring from road accessible vantage points will occur on a daily basis.
- Should caribou be observed within 3km of Project facilities and/or by site personnel, activities that would potentially disturb or otherwise harm these animals will be assessed and, if required, curtailed until these animals have left the area.
- While caribou are within 5km of Project infrastructure and activities, all sightings of caribou will be reported to the LIM Labrador Site Manager, and will be immediately communicated to all vehicle operators. There will be no hunting or other harassment of these animals at any time. The monitoring from road accessible vantage points will occur on a daily basis and reported bi-weekly unless caribou are observed whereby the Wildlife Division is to be contacted immediately
- Ongoing traditional knowledge reports, including documentation of animal movements and activities, will be conducted by LIM with local communities to provide further information on caribou behaviour and locations.

Other mitigation measures to be implemented with Project activities are outlined in Table 9.2.

Table 9.2 Proposed Mitigation Measures for Caribou

Project Activities	Mitigation Measures
Construction	
Site Preparation (grubbing, clearing, excavating)	Clear vegetation in a pattern that does not leave a recognizable trail, where practical. This reduces accessibility and visibility to humans and predators. These activities would be restricted to the physical footprint of the Project. Fire prevention and response procedures, training and equipment will be implemented.
Haul and Service Road and Rail Siding Construction	The width, density and length of access roads and rail lines will be minimized. Where possible, any new disturbance will be reduced by locating these facilities adjacent to existing areas of surface disturbance. Ensure that linear facilities such as rail lines and roads are separated by more than 100 m, where practical. Personnel authorized to operate company vehicles will possess a valid driver's license, undergo employee orientation and safety training, and be briefed on seasons of greater risk of wildlife-vehicle collisions. Speed limits of 50km/hr (daylight) and 30km/hr (darkness) and wildlife caution signs will be posted and enforced along Project roads. Traffic reduction/convoying would be implemented through sensitive caribou areas such as crossings in the event of caribou being reported in the area. All observations of caribou by staff will be recorded (including observer, time and location) and submitted to wildlife monitors and LIM management to determine appropriate mitigation.

Table 9.2 Proposed Mitigation Measures for Caribou (continued)

Project Activities	Mitigation Measures
Construction	
Employment and Expenditures	Enforce a "no hunting and firearms' policy among all personnel. Use monitors to keep construction staff and management informed on the presence of caribou at the mine site as described above.
Operation	
Iron Ore Extraction (excavation – mechanical, blasting)	Note that caribou were not observed within a 20km radius of proposed activities during the aerial survey of 26 April to 1 May 2010. Therefore, a 5km buffer will be monitored on a bi-weekly basis (from road-accessible vantage points) over the course of the calving and post-calving period (i.e., 28 May to 20 September). If caribou are observed at a distance of less than 5km from Project infrastructure and activities, LIM will issue an advisory of their proximity to personnel to be alert and that activities that would potentially disturb or otherwise harm these animals may need to be curtailed until these animals have left the area.
Transportation (on-site trucking, hauling, rail transportation)	Personnel operating company vehicles will possess a valid driver's license, undergo employee orientation and safety training, and be briefed on potential for and strategies for avoiding, wildlife-vehicle collisions. All mine roads will be limited to Project personnel only. Speed limits of 50km/hr (daylight) and 30km/hr (darkness) and wildlife caution signs will be posted along Project roads.
Operations (on-site power generation, solid waste, grey water, human presence)	Observations of caribou (and other wildlife) by staff will be recorded (including observer, time and location) and submitted to monitors and LIM management to determine appropriate mitigation.
Employment and Expenditures	Enforce a "no hunting and firearms' policy among all personnel. Use monitors to keep construction staff and management informed on the presence of caribou at the mine site as described above.
Decommissioning	
Removal of Facilities and Equipment	Personnel operating company vehicles will possess a valid driver's license, undergo employee orientation and safety training, and be briefed on potential for and strategies for avoiding wildlife-vehicle collisions. Enforce a "no hunting and firearms" policy among all personnel. Use monitors to keep staff and management informed on the presence of caribou at the mine site. Mine roads will be restricted to Project personnel only. Speed limits of 50km/hr (daylight) and 30km/hr (darkness) and wildlife caution signs will be posted along mine roads and rail lines.
Site Reclamation (grading, re-vegetation)	Reclamation techniques will emphasize the re-vegetation of the pre-disturbance vegetated areas of the site with local plants that would encourage growth of caribou winter forage.

Throughout construction and operations, LIM will maintain liaison with the Wildlife Division, and other stakeholders and officials regarding the movements of the GRCH in the Project area. Through existing satellite collar monitoring and other monitoring activities (e.g., community networking, traditional knowledge programs, and incorporation of recent observations into Project planning), LIM will implement an advisory to mine management staff should any caribou enter the Project area. Such caribou movements, observations and actions implemented by LIM would be recorded and reported to the Wildlife Division immediately.

9.1.6 Environmental Effects Assessment and Residual Effects Determination

The determination of residual environmental effects examines the potential change in habitat and/or mortality as a result of the interactions identified in Table 9.3, for each phase of the Project.

9.1.6.1 Construction

Measures will be implemented to limit the amount of surface disturbance (e.g., limit the width, density and length of access roads). In addition, no harassment policies will reduce the potential amount of sensory displacement associated with the Project during construction.

Vehicle operators will be instructed to yield to all wildlife, including caribou. Reduced speed limits will be maintained regardless of the presence of caribou. Potential entrance points at open pits, potentially dangerous construction areas, and steep slopes will be fenced.

The clearing associated with the Project will be minimal as the development area is within a currently disturbed former mining area. The geographic extent of construction activities will be site-specific, will occur continuously, and will be reversible. As a result, the Project effect is not at a level that would cause management concerns. Therefore, the effects associated with the LIM Project development are not significant (Table 9.3).

Table 9.3 Summary of Residual Environmental Effects for Caribou: Construction

Proposed Mitigation	
Monitor movements of caribou. Reduce speed limits, fencing construction sites, patterns of vegetation clearing, no hunting policy, reduce construction activities while caribou are present within 3km of construction	
Significance Determination	**George River Caribou Herd**
Geographic extent	Site-specific
Frequency of occurrence	Continuous
Duration of effect	Less than one generation
Magnitude of effect	Moderate
Reversibility	Reversible
Significance	**Not Significant**
Confidence	High
Likelihood of occurrence	Not Applicable
Proposed Follow-up and Monitoring	
See Section 9.1.9	
Note – As residual environmental effect is not significant, description of Likelihood of Occurrence is Not Applicable	

9.1.6.2 Operation

No further habitat loss will occur during operation. Controlled speed limits, yielding to wildlife and no-harassment policies will limit sensory disturbance resulting from the road. Furthermore, alerts to LIM workers when caribou enter the Assessment Area and communication with the Wildlife Division, particularly when blasting activities are planned, will limit disturbance during operations.

As with construction, the mitigation measures (Table 9.2) to reduce the possibility of mortality related to the Project will be in place. Speed limits will be posted, a no harassment policy will remain in place, no hunting in work areas, and onsite access will be restricted to personnel.

The geographic extent of Project effects during the Operation phase will be site-specific, will occur continuously, and will be reversible. Therefore, the effect of the Project is not at a level that would cause management concern, and is not significant (Table 9.4).

Table 9.4 Summary of Residual Environmental Effects for Caribou: Operation

Proposed Mitigation	
Monitor movements of caribou. Reduce speed limits, fence work areas, no hunting policy, delay blasting while caribou are present	
Significance Determination	**George River Caribou Herd**
Geographic extent	Site-specific
Frequency of occurrence	Continuous
Duration of effect	Over Several Generations
Magnitude of effect	Moderate
Reversibility	Reversible
Significance	**Not Significant**
Confidence	High
Likelihood of occurrence	Not Applicable
Proposed Follow-up and Monitoring	
See Section 9.1.9	
Note – As residual environmental effect is not significant, a description of Likelihood of Occurrence is Not Applicable	

9.1.6.3 Decommissioning

One of the main objectives of decommissioning will be to restore the LIM Project work areas to a usable state that meets the requirements of the Rehabilitation and Closure Plan. Areas will be sloped, and/or re-vegetated, and/or left in a situation that would allow re-vegetation such that there would be a net gain in available habitat. There will be some ongoing sensory disturbance associated with the site reclamation but this will be temporary. Should caribou be present at the time, a similar avoidance of at least 3km could be expected. Again, the mitigation measures (Table 9.2) to reduce the possibility of mortality related to the Project will be in place. Speed limits will be posted, a no harassment policy will remain in place, no hunting will be allowed by Project workers in work areas, and onsite access will be restricted to personnel.

Decommissioning activities will be of a relatively short-term nature, and once completed, no further presence of vehicles or personnel will occur. During this relatively brief period, appropriate monitoring and mitigation measures for caribou will remain in place. The surface disturbance during the reclamation and associated sensory disturbance would continue to be site-specific in terms of geographic extent. The continuous activities during this phase would result in enhanced conditions for encouraging a return to natural conditions. While the recovery would take several generations, the eventual natural state would be permanent. While measurable, these activities will not be at a level that would cause management concern. The adverse residual Project effects will be not significant (Table 9.5).

Table 9.5 Summary of Residual Environmental Effects for Caribou: Decommissioning

Mitigation	
Monitor movements of caribou during decommissioning. Reduce speed limits, and implement no hunting policy	
Significance Determination	**George River Caribou Herd**
Geographic extent	Site-specific
Frequency of occurrence	Continuous
Duration of effect	Permanent
Magnitude of effect	Moderate
Reversibility	Reversible
Significance	**Not Significant**
Confidence	High
Likelihood of occurrence	Not Applicable
Follow-up and monitoring	
No longer required following decommissioning	
Note – As residual environmental effect is not significant, a description of Likelihood of Occurrence is Not Applicable	

9.1.7 Accidental Events

Accidental events and malfunctions for this Project could result in change in habitat and/or mortality for caribou. Provided that the effects management measures, as described in previous sections, are adhered to, the risk of an accidental event and the extent of its influence would be minimized. The most probable accidental event would be that of a forest fire related to Project activities or a hazardous material spill. Fire prevention and response measures will be in place throughout the Project. The geographic extent of a forest fire could extend beyond the site (within the Assessment Area), but is not likely to occur. The effects could last for several generations (Foster 1985; review by Bergerud et. al 2008), and be of a magnitude that would cause management concern. Although a forest fire is not likely to result from the Project, the effect of such an event could be significant.

A hazardous material spill would be confined to the site and would not be expected to interact in a measurable manner with caribou. This event would be considered not likely to occur and would result in no measurable change to baseline conditions. The adverse environmental effect would be reversible and not significant.

9.1.8 Cumulative Environmental Effects

The boundaries for cumulative environmental effects assessment are the same temporal and spatial boundaries for caribou as defined above.

Other projects that are included in the cumulative effects assessment are Alderon Iron Ore Corp's proposed Kami Iron Ore Mine, Elross Lake Iron Ore Mine, the Bloom Lake Railway, the operation of LIM's existing mine at the James and Redmond properties and beneficiation operations at Silver Yards, and exploration at LIM's remaining properties in the region.

As discussed above, caribou observed in the Assessment Area are likely to be part of the George River Herd (Schmelzer and Otto 2003; Bergerud et al. 2008). The Assessment Area of

7,850km^2 represents approximately one percent of the range of the GRCH, and the physical disturbance associated with the Project would represent less than one percent of the Assessment Area. The other projects have been or will be subject to the same scrutiny, regulatory environment and codes of best practice as LIM and therefore it is anticipated they will reduce their respective effects as much as possible. These activities would be continuous, and persist over several generations. Regardless, and based on the extensive range of the GRCH and the location of the Assessment Area at its periphery, it is expected that the development of the Houston deposits within the context of other regional activities would result in a negligible change that would not cause management concern. These effects are considered reversible and not significant (Table 9.6).

Table 9.6 Summary of Residual Environmental Effects for Caribou: Cumulative Environmental Effects

Proposed Mitigation	
Existing and likely future projects would be subject to applicable federal and provincial regulations	
Significance Determination	**George River Caribou Herd**
Geographic extent	Assessment Area
Frequency of occurrence	Continuous (throughout Project)
Duration of effect	Over several generations
Magnitude of effect	Measurable change that does not cause management concern
Reversibility	Reversible
Significance	**Not Significant**
Confidence	High
Likelihood of occurrence	Not Applicable
Proposed Follow-up and Monitoring	
LIM will not conduct follow-up or monitoring of caribou on a regional scale.	
Note – As residual environmental effect is not significant, description of Likelihood of Occurrence is Not Applicable	

9.1.9 Follow-up and Monitoring

Effects of mining activities on caribou is “fragmentary” (Wier et al. 2007) and it is therefore important to understand herd affiliation, distribution of caribou within and around the Project, and to understand the usage of these areas - whether as a travel corridor, overwintering foraging area, or as year-round habitat in the event that sedentary woodland caribou occur.

In May 2009, the Project conducted a strip-transect aerial survey of a 12,900km^2 area that included the 7,850km^2 Assessment Area and overlapped both Labrador and northeastern Quebec. The objective of the survey was to determine if caribou are present in this area at a time when the GRCH was not expected to be present. The single collared caribou from this survey was shot months later and 400km east indicating that it was of the migratory ecotype. A subsequent aerial survey in May 2010 did not identify any sightings or sign of caribou. Based on this effort, D’Astous and Trimper (2010) concluded that any caribou observed in the vicinity of Schefferville are likely to be of the migratory ecotype and affiliated with the GRCH.

Throughout the life of the Project, LIM proposes to maintain liaison with Wildlife Division, community representatives and Elders, and other stakeholders and officials regarding the movements of any caribou in the Project area. Mitigation strategies will be implemented to ensure no harm or harassment of caribou occurs. Through monitoring and ongoing data

collection, LIM will continue to enhance the understanding of caribou activities in the Project Area and will implement an advisory to mine management staff should any caribou enter the Assessment Area. Caribou movements, and LIM observations and actions implemented will be recorded and communicated to the Wildlife Division.

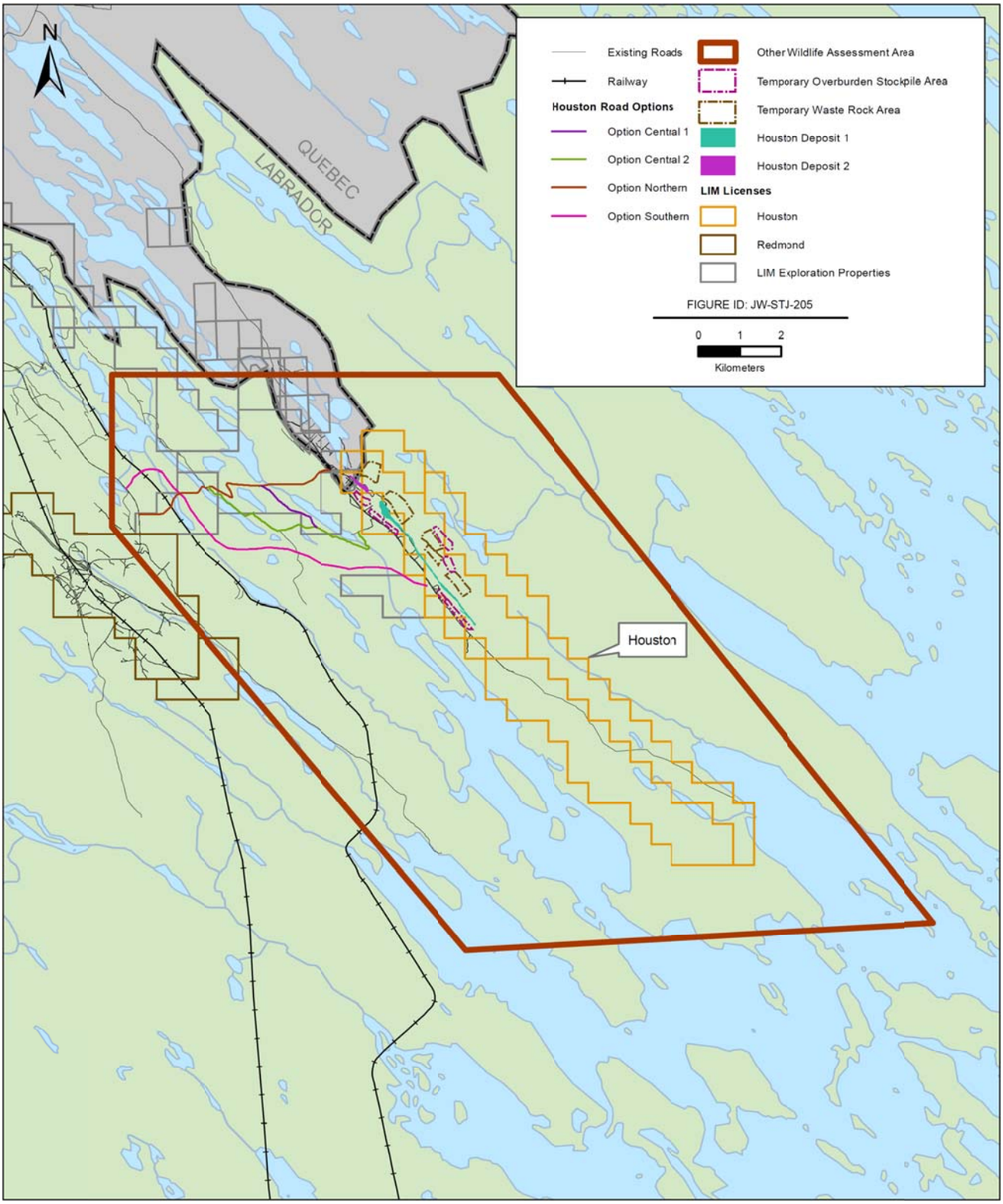
9.2 Other Wildlife

Other Wildlife (i.e., common wildlife species other than caribou) was chosen as a VEC because of the ecological importance of the various species, their importance to area residents, and the potential for project interactions to occur.

9.2.1 Environmental Assessment Boundaries

The ecological and administrative boundaries for Other Wildlife varies in accordance with each species. The selection of the Assessment Area was informed by the different boundaries, and was based, in part, in providing an appropriate scale for the effects assessment. The Assessment Area for Other Wildlife is a 160km^2 area shown in Figure 9-2. It includes the entire Houston property and route options, and incorporates the area surveyed for the Classification of Wildlife Habitat Suitability study (Stassinu Stantec 2010).

Figure 9-2 Other Wildlife Assessment Area



9.2.2 Potential Environmental Effects

Issues relating to wildlife and the proposed Project can be considered within two effects:

- Change in Habitat – related to the loss or reduction of wildlife habitat from site clearing and/or sensory disturbance (e.g., noise) associated with the presence and operation of people and equipment.
- Mortality – directly related to increased hunting pressure and collisions with vehicles or other equipment.

9.2.2.1 Potential Project-VEC Interactions

The potential interactions between wildlife and each Project activity during construction, operation, and decommissioning comprise the scope of the environmental assessment for this VEC (Table 9.7).

Table 9.7 Potential Project-VEC Interactions for Other Wildlife

Project Activities and Physical Works	Environmental Effects	
	Habitat Change	Mortality
Construction (Project activities in 2009)		
Site Preparation (grubbing, clearing, excavating)	X	
Haul and Service Road and Rail Siding Construction	X	
Employment and Expenditures		
Operation (Project activities starting in 2010)		
Iron Ore Extraction (excavation – mechanical, blasting)	X	X
Iron Ore Beneficiation		
Stormwater Management		
Transportation (on-site trucking, hauling, rail transportation)	X	X
Operations (on-site power generation, solid waste, grey water, human presence)	X	
Employment and Expenditures		
Decommissioning		
Removal of Facilities and Equipment	X	
Site Reclamation (grading, re-vegetation)	X	

Construction

Project activities that involve some level of alteration and/or loss of habitat in the vicinity of the deposits have the potential interact with wildlife. This includes site preparation and road construction. These activities may result in some habitat loss through clearing and removal of vegetation or through disturbance associated with noise, dust and/or visual changes that can displace caribou from suitable habitats that may exist near the development sites. However, portions of the Assessment Area were previously disturbed by historical mining operations, and therefore loss of habitat will be limited to previously undisturbed areas.

Mortality of wildlife related to the Project may occur as a result of collisions with increased vehicular traffic and may also occur in association with transportation during operations. Related to this potential interaction is the possibility of increased hunting due to the increased accessibility resulting from road construction.

Operation

During the operation phase of the Project, there is further potential for interactions with Other Wildlife, given the relative length of operation to the comparatively short-term construction phase. Although no further habitat will be lost, activities such as blasting will create noise levels that can be expected to have disturbance effects on Other Wildlife.

Decommissioning

During decommissioning, removal of facilities and equipment will result in further sensory disturbance to Other Wildlife in the area. However, site reclamation, including grading and re-vegetation of roads and other disturbed areas, will result in conditions that would eventually be attractive to wildlife. Following decommissioning, the quality of habitat for wildlife will improve over the long-term.

9.2.3 Review of Existing Knowledge

9.2.3.1 Change in Habitat

Project activities that result in the alteration of vegetation influence wildlife populations through habitat loss and fragmentation. Whereas such influences are typically adverse, the resiliency of wildlife to landscape change is largely species-specific. For example, although certain boreal songbird populations have been found to alter movement behaviour in response to moderate changes in landscape structure such as forest harvesting, some species experience reduced local survival from vegetation clearing (Whitaker et al. 2008). The influence of habitat modification on individual species varies with the spatial and temporal context. For example, whereas snowshoe hare will avoid recently cleared areas, their abundance typically increases following initial regeneration and the creation of vegetative cover and this can ultimately lead to greater prey availability for species such as lynx and coyote (Harron 2003).

Project activities are likely to adversely influence wildlife through sensory disturbance, including visual stimuli and noise. In terms of sound, two main primary effects include auditory changes (e.g., hearing loss or threshold shift) and the masking of key auditory signals, such as mating calls and prey sounds. Secondary effects are non auditory in nature, including increased stress levels and changes in mating and feeding patterns (Manci et al. 1988). Masking becomes an issue when the noise levels are able to mask acoustic signals on which an animal relies for survival, such as defending territory, attracting mates, or delivering distress calls (Warren et al. 2006). Noise levels that have an effect on wildlife vary with the species, the time of day, habitat, season and other potentially masking sounds in the area. However, studies on the impacts of noise on wildlife indicate that the threshold above which potential negative effects are expected is 90 dBA (Manci et al. 1998). Noises at this level are associated with a number of behaviours such as retreat from the sound source, freezing, or a strong startle response. Such activities could influence the fitness levels of individuals in a variety of ways, including through displacement to less productive feeding areas or through increased stress levels.

The importance of sensory disturbances varies with the different life stages of wildlife. For example, because denning black bears are dependent on fat reserves and use the reduced

energetic costs of torpor and thermal insulation of the den to survive, noise during this phase of the life cycle could have much greater costs in terms of survival and reproduction than at other times of the year (Tietje and Ruff 1980; Linnell et al. 1996). Additionally, although bald eagles are quite sensitive to disturbances throughout the breeding and nesting period, they are most sensitive during the courtship and nest building phase and disturbance during this period is typically manifested in nest abandonment (USFWS 2010). The sensitivity of wildlife also varies among individuals of a species. Osprey show a wide range in tolerance to human disturbance (Ruddock and Whitfield 2007) and in much of its range, they nest close to human activity and appear unaffected by moderate levels of disturbance (Vana-Miller 1987). Similarly, some pairs of bald eagles nest successfully near human activity, while others abandon nest sites in response to activities much farther away. Such variability is likely attributable to a number of factors, including visibility of the activity, its duration and noise level, extent of the area affected by the activity, the pair's prior experiences with humans, and tolerance of the individuals (USFWS 2010).

As a result of human presence, Project activities also have potential to alter wildlife habitat through accidental fires. The response of wildlife to fire will vary according to the type of fire, its frequency, forest composition and age. Infrequent fires can provide long-term ecological benefits by enhancing nutrient recycling but if fires occur too frequently, forests are unable to reproduce, creating barren areas that are slow to re-vegetate. Wildlife species can be affected positively or negatively by fires according to their respective habitat requirements. Although the short-term loss in cover generally represents an adverse influence, species such as black bears generally benefit from improved foraging opportunities in burned areas, (Jonkel and Cowan 1971; Rowe and Scotter 1973).

9.2.3.2 Mortality

Project activities have potential to result in the direct mortality of wildlife through a variety of interactions. Collisions with vehicles are a potential issue for wildlife during the operations of the Project. In particular, avifauna is well known to be susceptible to collisions with vehicles (Hirvonen 2001), with low-flying birds such as upland game species and many passerines being particularly sensitive (Erickson et al. 2005). Spills of fuels and associated products/hazardous or controlled products during Project activities could also lead to the direct or indirect mortality of wildlife, such as through contamination of habitat and food sources. Additionally, increased access through the development of expanding road networks or other linear corridors such as railways has potential to result in increased legal and illegal hunting and trapping.

9.2.4 Residual Environmental Effects Significance Criteria

Residual environmental effects are those which are predicted to affect wildlife, once mitigation measures have been applied. Each prediction is described according to:

- Geographic extent (i.e., site-specific, within the Assessment Area, throughout the Assessment Area and beyond);
- Frequency of occurrence (i.e., once, infrequently, continuous, not likely to occur);
- Duration (i.e., less than one generation, over several generations, permanent);

- Magnitude (i.e., low - no measurable change relative to baseline conditions, moderate - measurable change that does not cause management concern, high - measurable change that does cause management concern);
- Reversibility (i.e., reversible or irreversible);
- Confidence (i.e., low or high confidence regarding the significance prediction; and
- Likelihood (i.e., significant effect is likely or unlikely).

A significant adverse residual environmental effect is one in which the Project would cause a population decline, such that the viability or recovery of a wildlife population is threatened.

9.2.5 Mitigation Measures

LIM is firmly committed to ensuring that no animals are disturbed, harmed, or killed as a result of this Project. LIM has worked with Wildlife Division and Canadian Wildlife Service (CWS) to develop mitigation and management approaches for wildlife. Specific plans have been developed for avifauna at the James and Redmond mines to ensure that the local populations of these species are not affected by those mines. Activities at the Houston Project area will also be subject to these management plans and standard wildlife mitigation.

Labrador Iron Mines' Avifauna Management Plan was designed for the James and Redmond operating mines, and will be implemented at the Houston site, to reduce the possibility of incidental take of active nests, resulting from habitat clearing, consistent with the recommendations of Canadian Wildlife Service (CWS 2007). Labrador Iron Mines (LIM) is aware of the requirements of the *Migratory Birds Convention Act* and its regulations and has prepared the Avifauna Management Plan for James and Redmond mines accordingly. LIM has consulted with Environment Canada (CWS) during development of the Plan and the most effective mitigation measure, which is temporal avoidance (J. Goulet, pers. comm. in Stantec 2010). There are three main mitigation measures that LIM will implement during the construction of this Project to reduce and attempt to eliminate incidental take during vegetation clearing:

- Monitoring: The environmental monitor overseeing construction activities will direct clearing activities and be empowered to adjust clearing activities to address possibilities for incidental take. The environmental monitor will survey areas to be cleared in advance of any disturbance using the guidance provided above in terms of the species known or suspected to breed in each area. The habitat associations for each in each property will be used as a guide during the advance monitoring. If a bird nest is identified, an area of 30m radius will be implemented and left undisturbed until nesting is completed (i.e., at least after the young have fledged). Where LIM is not able to avoid such nests, LIM will consult directly with Environment Canada before any disturbance to the site occurs.
- Temporal Avoidance: LIM will complete as much vegetation clearing as possible after the period when migratory birds may be breeding in a particular habitat.
- Spatial Avoidance: LIM will avoid disturbing and/or clearing sensitive wildlife areas (e.g., riparian vegetation) during site preparation, where possible to minimize the physical footprint of the Project. Vegetation buffers (approximately 30m) will be maintained around natural water bodies except where crossings of such features are

required. Disturbance to wetlands will also be avoided or minimized. Maintaining vegetated buffer zones will aid in managing suspended solids in watercourses and reduce erosion and sedimentation.

Consistent with standard mitigation practice, clearing of vegetation around active nests of Osprey or Bald Eagle that may breed in the Project area, will be limited to 800m. Should such a nest site occur within the footprint of the Project, it would be removed after the breeding season (mid-May through end of August (Jacques Whitford 1998)). The alternative artificial nest structure would be similar to that used by other proponents in Newfoundland and Labrador, and designed in consultation with Wildlife Division. It would be established in the immediate area and maintained over the life of the Project. Standard mitigation measures regarding construction and operation-related activities for active Osprey nests are to avoid such areas by at least 200m.

Other standard mitigation measures that will benefit wildlife include:

- Wildlife encounters may impose risk to both wildlife and Project personnel. There will be no fishing, hunting, or trapping by personnel at the Project site. Additional 'bear aware' measures will be in place to reduce attraction of wildlife, such as black bears, other predators, or avifauna, to the site including storage of all food and organic waste in animal-proof containers.
- Hydrocarbon (fuels) and hazardous materials required during construction and operation will be stored pursuant to all applicable regulations. Hazardous materials will be stored in appropriate locations/facilities with proper containment and ventilation as required for each product;
- Controlled speed limits on Project roads;
- Dust from construction activities will be controlled by using water if required; and
- Noise associated with blasting and heavy equipment will be addressed by adherence to all permits and approvals.
- Consistent with standard procedures advocated by the provincial Wildlife Division, clearing of vegetation around active nests of Osprey or Bald Eagle that may be breeding in the Project area, will be limited to 800m. Should such a nest site occur within the footprint of the Project, it would not be removed until after the breeding season. An alternative artificial nest structure would be established in the immediate area.

9.2.6 Environmental Effects Assessment and Residual Effects Determination

The determination of residual environmental effects examines the potential change in habitat or mortality as a result of the interactions in Table 9.8, for each phase of the Project.

Table 9.8 Summary of Residual Environmental Effects for Other Wildlife: Construction

Proposed Mitigation	
• Implementation of the Avifauna Management Plan • No hunting and no harassment policies for workers on-site • Reduce speed limits on Project roads • Standard dust and noise control • Buffer around Osprey and Eagle Nests	
Significance Determination	**Other Wildlife**
Geographic extent	Site-specific
Frequency of occurrence	Continuous
Duration of effect	Over Several Generations
Magnitude of effect	Low
Reversibility	Reversible
Significance	**Not Significant**
Confidence	High
Likelihood of occurrence	Not Applicable
Proposed Follow-up and Monitoring	
See Section 9.2.9	
Note – As residual environmental effect is not significant, a description of Likelihood of Occurrence is Not Applicable	

9.2.6.1 Construction

Clearing and construction activities will result in loss of vegetative cover and noise and dust emissions, which will reduce habitat quality for other wildlife. Implementation of LIM's Avifauna Management Plan will reduce potential adverse effects on avifauna primarily through temporal and spatial avoidance (e.g., avoidance of clearing during breeding activities, minimizing disturbance to wetlands and other sensitive habitats, and maintaining vegetative buffers). Project personnel will take measures to minimize wildlife encounters.

Road construction and increased traffic through the area may contribute to mortality of wildlife directly through collisions with vehicles and indirectly through increased accessibility and potential increased hunting activity. Several measures will be in place to restrict personnel from hunting on the Houston Property and to restrict others from accessing. Reduced speed limits will be maintained. Project construction activities are considered minimal when compared to the current state of historical disturbance in the Assessment Area. The effects are considered reversible and are not significant.

9.2.6.2 Operation

No further habitat loss will occur during operation. Controlled speed limits, yielding to all wildlife and no-harassment policies will limit the sensory disturbance and associated avoidance of the Project area by wildlife. These measures will also minimize Project-related mortality.

The geographic extent of this phase will continue to be site-specific and will occur continuously over several generations. The magnitude is considered low because measurable changes in wildlife populations are not likely. The Project effects are not significant due to the localized nature of the interactions, the low magnitude and the reversibility of the effects (Table 9.9).

Table 9.9 Summary of Residual Environmental Effects for Other Wildlife: Operation

Proposed Mitigation	
• Implementation of the Avifauna Management Plan • No hunting and no harassment policies for workers on-site • Reduce speed limits on Project roads • Standard dust and noise control	
Significance Determination	**Other Wildlife**
Geographic extent	Site-specific
Frequency of occurrence	Continuous
Duration of effect	Over Several Generations
Magnitude of effect	Low
Reversibility	Reversible
Significance	**Not Significant**
Confidence	High
Likelihood of occurrence	Not Applicable
Proposed Follow-up and Monitoring	
See Section 9.2.9	
Note – As residual environmental effect is not significant, a description of Likelihood of Occurrence is Not Applicable	

9.2.6.3 Decommissioning

One of the main objectives of decommissioning will be to restore the Project site to a more natural state. Areas will be sloped, and/or re-revegetated, and/or left in a situation that would allow natural re-vegetation such that there would be a net gain in available wildlife habitat. There will be some sensory disturbance associated with site reclamation, but this will be temporary. Mitigation measures related to the operation of equipment and the responsibility of LIM and its workforce regarding wildlife will be in place throughout the decommissioning period. Active work sites will continue to be posted as no hunting areas and workers will be required to adhere to LIM's no hunting and no wildlife harassment policies.

Decommissioning activities will be of a relatively short-term nature, and once completed no further presence of vehicles or personnel will occur. During this relatively brief period, appropriate mitigation measures for wildlife will remain in place. The surface disturbance during the reclamation and the associated sensory disturbance would continue to be site-specific in terms of geographic extent. The activities during this phase would result in enhanced conditions for encouraging a return to natural conditions. Therefore, the adverse residual environmental effects are predicted to be not significant (Table 9.10).

Table 9.10 Summary of Residual Environmental Effects for Other Wildlife: Decommissioning

Proposed Mitigation	
• Implementation of the Avifauna Management Plan • No hunting and no harassment policies for workers on-site • Reduce speed limits on Project roads • Standard dust and noise control	
Significance Determination	**Other Wildlife**
Geographic extent	Site-specific
Frequency of occurrence	Continuous
Duration of effect	Over Several Generations
Magnitude of effect	Low
Reversibility	Reversible
Significance	**Not Significant**
Confidence	High
Likelihood of occurrence	Not Applicable
Proposed Follow-up and Monitoring	
No longer required following decommissioning	
Note – As residual environmental effect is not significant, a description of Likelihood of Occurrence is Not Applicable	

9.2.7 Accidental Events

Accidental events and malfunctions for this Project could result in a change to habitat and/or mortality for wildlife. Provided that the effects management measures, as described in Sections 3.3.4 and 3.7, are adhered to, the risk of an accidental event and the extent of its influence would be minimized. The most probable of accidental events would be that of a forest fire related to Project activities or a hazardous material spill. Fire prevention and response measures will be in place throughout the Project. The geographic extent of a forest fire could extend beyond the site (within the Assessment Area), but is unlikely to occur also due to the presence and implementation of Project-specific Environmental Protection Plan. Depending on the time of year and extent of a forest fire, the environmental effect could be significant.

A hazardous material spill would be confined to the site and would not be expected to measurably interact (if at all) with wildlife. This event would be considered not likely to occur and would result in no measurable change to baseline conditions. The adverse environmental effect would be reversible and not significant.

9.2.8 Cumulative Environmental Effects

The boundaries for cumulative environmental effects assessment are the same temporal and spatial boundaries for caribou as defined above.

Other projects for this area include the construction of Alderon Iron Ore Corp's proposed Kami Iron Ore Mine, Elross Lake Iron Ore Mine, the Bloom Lake Railway, the operation of LIM's existing mine at the James and Redmond properties and beneficiation operations at Silver Yards, and exploration at LIM's remaining properties in the region.

The area of physical disturbance associated with the Project is approximately 2km^2, approximately one percent of the Assessment Area (160km^2). Each of the other projects have been or will be subject to the same scrutiny, regulatory environment and codes of best practice as LIM and therefore will reduce their respective effects as much as possible. These activities would be continuous, and persist over several generations. Based on the extensive area of undisturbed wildlife habitat in Labrador west as a whole, it is expected that the development of the Houston deposits within the context of other regional activities would not likely affect population levels of wildlife species at the population level. These effects are considered reversible and not significant (Table 9.11).

Table 9.11 Summary of Residual Environmental Effects for Other Wildlife: Cumulative Environmental Effects

Proposed Mitigation	
Existing and potential future projects would be subject to applicable federal and provincial regulations	
Significance Determination	**Other Wildlife**
Geographic extent	Assessment Area
Frequency of occurrence	Continuous (throughout Project)
Duration of effect	Over several generations
Magnitude of effect	Low
Reversibility	Reversible
Significance	**Not Significant**
Confidence	High
Likelihood of occurrence	Not Applicable
Proposed Follow-up and Monitoring	
See Section 9.2.9	
Note – As residual environmental effect is not significant, a description of Likelihood of Occurrence is Not Applicable	

9.2.9 Follow-up and Monitoring

Follow-up and monitoring is not required for Other Wildlife because the proposed mitigation measures have been shown to be effective for similar projects.

9.3 Employment and Business

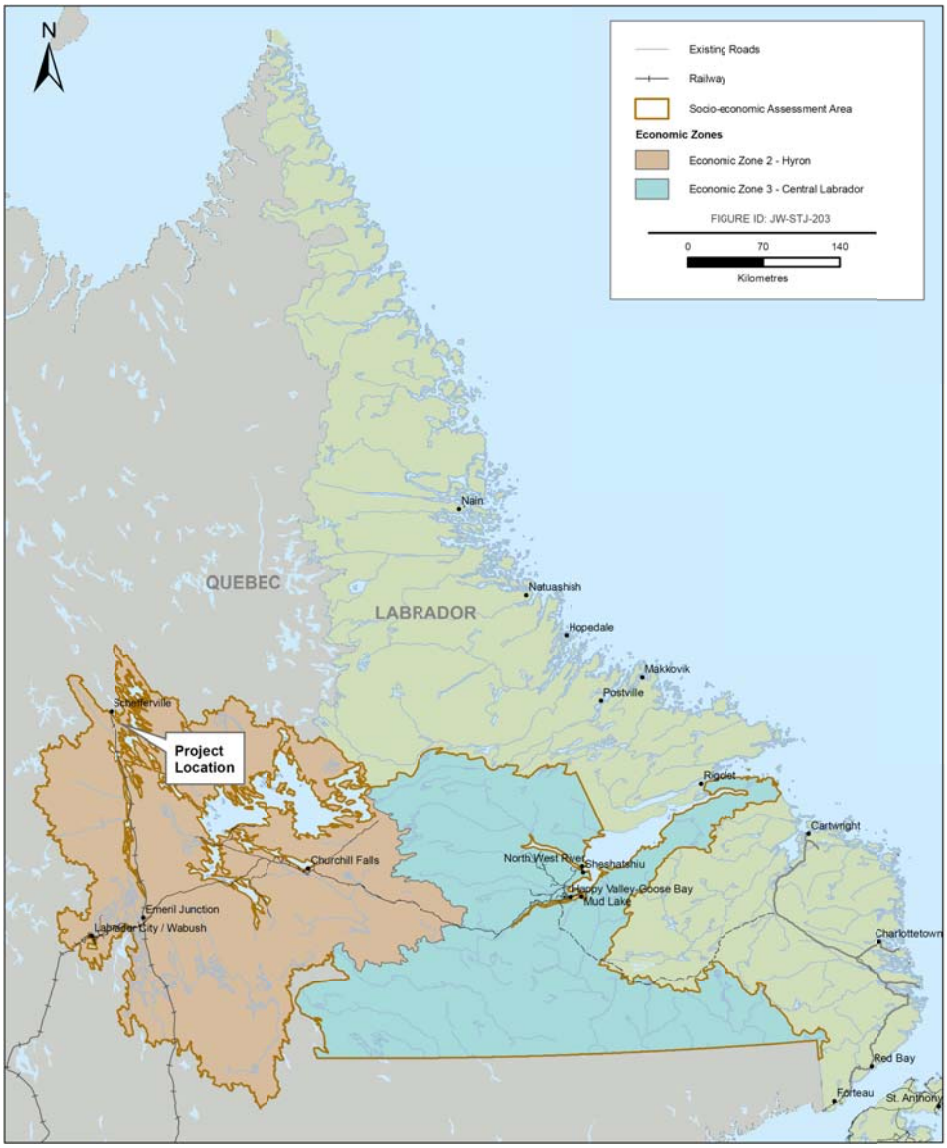
Employment and business was chosen as a VEC based on public concern that economic benefits accrue to local communities, Labrador and the Province. This includes benefits to the population and economy as a whole, and to such under-represented groups as the Aboriginal groups in the region and women. The effects on employment and business have been assessed on other recent projects including the Schefferville Area Mine EIS for the James and Redmond properties.

9.3.1 Environmental Assessment Boundaries

The Province compiles statistical data based on defined economic development zones. While all Project activity will occur in Labrador West, the baseline conditions in central Labrador and parts of Quebec must be considered because Project labour, goods, and services are going to be drawn from these areas. Therefore the Assessment Area for Employment and Business is

defined as the Hyron (Labrador West) and Central Labrador (Upper Lake Melville) Economic Zones (Figure 9-3).

Figure 9-3 Socio-economic Assessment Area



9.3.2 Potential Project-VEC Interactions

Issues relating to employment and business were recorded during stakeholder consultation sessions and public meetings held for the Schefferville Area Mine EIS. These include:

- The creation of employment for residents of the Province, including Labradorians, Aboriginal groups, and women;
- Training requirements associated with Project employment, in support of the above employment objective;

- The creation of business opportunities for Newfoundland and Labrador companies, and especially those located in Labrador; and
- Inflationary effects on the costs of labour, goods and services.

It is anticipated these issues will also apply to this Project.

The potential interactions between Employment and Business and the Project will be limited to employment and expenditures. These interactions during construction and operations comprise the scope of the assessment for this VEC (Table 9.12).

Table 9.12 Potential Project-VEC Interactions for Employment and Business

Project Activities and Physical Works	Environmental Effect
	Employment and Business
Construction (Project activities in 2009)	
Site Preparation (grubbing, clearing, excavating)	
Haul and Service Road and Rail Siding Construction	
Employment and Expenditures	X
Operation (Project activities starting in 2010)	
Iron Ore Extraction (excavation – mechanical, blasting)	
Iron Ore Beneficiation	
Stormwater Management	
Transportation (on-site trucking, hauling and rail transportation)	
Operations (on-site power generation, solid waste, grey water, human presence)	
Employment and Expenditures	X
Decommissioning	
Removal of Facilities and Equipment	
Site Reclamation (grading, re-vegetation)	

There will be direct and indirect employment and business impacts resulting from, first, the construction of the Project and, second, from its operation. These will include the employment of, and income to, those working directly on the Project, indirect employment and income impacts to workers providing goods and services to the Project, and induced impacts, which are generated when those working directly and indirectly on the Project spend their incomes in the economy. These Project and Project-related expenditures have the potential to have inflationary effects.

9.3.3 Residual Environmental Effects Significance Criteria

Residual environmental effects are those which are predicted to affect the local labour market and business community once mitigation measures have been applied. Predictions are described according to:

- Geographic extent (i.e., Assessment Area, Labrador, the Province);
- Frequency of occurrence (i.e., once, infrequently, continuous, not likely to occur);
- Duration (i.e., short term - less than two years, medium term - two to ten years, long term - more than ten years);

- Magnitude (i.e., low – no measurable change relative to baseline conditions, moderate – measurable change that does not cause inflationary effects in the cost of labour and goods and services throughout the Assessment Area, high – change that causes inflationary effects in the cost of labour and goods and services throughout the Assessment Area and beyond);
- Reversibility (i.e., reversible or irreversible);
- Confidence (i.e., low or high confidence regarding the significance prediction); and
- Likelihood (i.e., significant effect is likely or unlikely).

A significant adverse residual effect on Employment and Business will result if the Project causes substantial decreases in income, level of employment and business access over the life of the Project.

9.3.4 Effects Management

The effects management for Employment and Business will be achieved primarily through the Houston Project Benefits Policy and the related Houston Benefits Plan initiatives. These initiatives include a commute work system, a Project Women's Employment Plan, and IBAs and other agreements with local Aboriginal groups. These are discussed in further detail in Section 9.3.5.

9.3.5 Effects Assessment

9.3.5.1 Construction

Direct Impacts

There will be substantial short-term employment benefits during the construction phase of the Project. This will involve a total of approximately 14 workers employed over the three-month construction period. The direct construction phase employment is described, by NOC Code, in Table 3.1. LIM will fill all positions not filled locally through a commute system. Commute arrangements include air and rail from Happy Valley-Goose Bay, Wabush and Labrador City, and elsewhere as appropriate. Workers who are required to commute to the Project site from outside the Schefferville area will be housed on-site at the existing Bean Lake accommodations complex.

Employment of workers, including women, will be promoted through the various agreements that LIM has entered into with the affected communities.

LIM will continue to liaise with the College of the North Atlantic to investigate training for local residents for construction employment. However, it is recognized that the opportunities for training specifically for employment during construction of the Houston Mine Project are limited given the small number of positions, short duration of employment, and short time period before construction begins.

Project construction will be completed in advance of the construction labour requirements of other proposed Labrador projects such as the Lower Churchill Hydroelectric Generation Project

(peak employment of 1,700, construction scheduled to begin in 2012) and will not likely compete with them for labour. A discussion of other projects planned for Western Labrador is included in the assessment of cumulative effects. The Project will also provide workers with an opportunity to further develop their skills and employment experience, thereby assisting in the development of the labour force for subsequent projects.

It is anticipated that a number of the Project-specific engineering, design and specialized Project management positions will be filled from outside the Province. Targets and initiatives with respect to Project employment are discussed in the Houston NL Benefits Plan and Women's Employment Plan.

Indirect Impacts

Local supply and service contracts will be maximized through the LIM Houston Benefits Policy and Plan. This will build on, and is consistent with, LIM's past performance of delivering local benefits. For example, the following contracts have been awarded to Newfoundland and Labrador companies in the past:

- SNC-Innu conducted an engineering study on the Project;
- Cartwright Drilling carried out an exploration drilling program in 2006;
- RSM Engineering carried out a bulk-sampling, crushing, and screening program in 2008;
- Jacques Whitford (now Stantec) prepared the environmental assessment, EPPs, Mine Development Plan, and Rehab and Closure Plan for the Schefferville Mine Project.
- Stassinu Stantec has conducted baseline surveys, Caribou and Avifauna Management Plans, and has also been retained to support the preparation of this enhanced registration;
- Kavanaugh and Associates was retained to evaluate haul road conceptual design and routing options;
- Davidson Drilling was retained as the hydrogeological drilling contractor;
- Innu Municipal was awarded the contract for mining and operations at the Schefferville Area Iron Ore Mines; and,
- N.E. Parrot Surveys to execute legal land surveys.

In addition, preliminary discussions have been conducted with other Newfoundland and Labrador-based companies and this work may be awarded at the appropriate phase of the Project.

The construction of the mine will require procurement of a wide range of goods and services, the majority of which are available In the Province:

- earthworks;
- site construction;
- mine preliminary works and overburden stripping;

- fuel and refuelling services;
- land surveying;
- blasting;
- road construction; and
- independent environmental monitoring.

Induced Impacts

The use of a commute system will deliver Project-related economic benefits to those parts of the Province in which workers and their families live. Similarly, expenditures by employees of the companies contracted by LIM will benefit the Province and the region and communities in which they live.

9.3.5.2 Operation

Direct Impacts

The Project will also help build the capacity of, and support, the local labour market and businesses during operations. For example, the operating plan of the mine will generate a smaller level of longer-term seasonal employment benefits to Labrador. In total, the mine will directly require 32 positions (Table 3.2), mostly for approximately eight months per year.

Given the nature of the occupations involved, the lead time available to train local people for them, and the LIM Houston Benefits Policy, the majority of the mine operation workers will be hired from Labrador. The Houston Benefits Policy (see Section 2.2.3), which will apply to LIM and Project contractors, will give employment preference to, first, qualified residents of Labrador, and then qualified residents of the Province as a whole subject to IBA's and agreements in place. Specific targets for operations employment and with respect to women's employment will be provided in the Benefits Plan and Women's Employment Plan.

LIM will continue to liaise with the College of the North Atlantic to investigate training opportunities for local residents for these positions. However, it is recognized that there are few senior and experienced mine operation personnel in Labrador who are unemployed or under-employed, and these positions may have to be filled from elsewhere.

While some workers will be hired from, and live in, Schefferville, some of the Project operations workers and their families will be hired from Labrador and contribute to its economy and community life. As during construction, these Labrador residents may commute from Happy Valley-Goose Bay, Wabush, and Labrador City.

Indirect Impacts

Mine operations will also require a range of goods and services, the majority of which are available locally. For example, a review of local capabilities indicates that the following will be available on a commercial basis from within western Labrador:

- Fuel and refuelling services;
- Welding and machining goods and services;
- Vehicle rental, rail passenger and air transportation services;
- Maintenance operations;
- Hardware stores miscellaneous tools and small equipment;
- Heavy equipment rental (e.g. Cranes, excavators and loaders);
- Local contracting services (e.g. Construction, electrical and mechanical); and
- Power supply.

Some other goods and services will be available from elsewhere in the Province.

9.3.5.3 Decommissioning

The amount of employment and business opportunities associated with decommissioning of the Project will depend upon the specific techniques employed, but will likely involve grading, material transportation, monitoring and other activities that Labradorians and Labrador-based companies are well qualified to undertake. These opportunities will only be better defined closer to decommissioning.

9.3.5.4 Accidental Events

Any cessation of Project activity as a result of accidental events or malfunctions will have a negative effect on Project-related employment and business. However, such cessations would be anticipated to be short-term and resulting adverse socio-economic effects would not likely be significant.

9.3.5.5 Summary of Effects on Employment and Business

The Project will make a substantial contribution to the economic development of the Province and, in particular, Labrador, through:

- Providing local employment and incomes during construction and operations;
- Providing local business during construction and employment;
- Providing an important opportunity for participation by the Innu Nation of Labrador and women in the provision of services, businesses, employment and training;
- Increasing the capacity and skills of local labour force and businesses, in advance of Lower Churchill, proposed IOC expansion, Alderon's recently registered Kami project, and other projects; and

- Facilitating further mining development by putting in place these new labour and business capabilities, thereby making existing and new Labrador projects more competitive globally.

The residual effects on Employment and Business are summarized in Table 9.13. Given that the numbers of workers and expenditures are not likely to result in inflationary effects within the Assessment Area (low magnitude), and that the Project will increase the labour and business capacity within the Assessment Area, providing employment for more than 10 years, the adverse residual effects associated with the Project are not significant.

Table 9.13 Summary of Residual Environmental Effects for Employment and Business: All Project Phases

Proposed Mitigation	
• LIM and its contractors will include a copy of the LIM Houston Benefits Plan in all Project calls for expressions of interest, requests for proposals, and contracts; • LIM will liaise with provincial, and especially Labrador, educational institutions and human resources agencies so that they are informed about employment requirements and plans; • LIM will liaise with provincial, and especially Labrador, business groups and economic development agencies so that they are informed about goods and services requirements and plans; • LIM will implement the provisions of its Women's Employment Plan	
Significance Determination	**Employment and Business**
Geographic extent	Assessment Area
Frequency of occurrence	Continuous
Duration of effect	Long-term
Magnitude of effect	Low
Reversibility	Reversible
Significance	**Not Significant**
Confidence	High
Likelihood of occurrence	Not Applicable
Proposed Follow-up and Monitoring	
• LIM will monitor the Project labour force to establish the percentage of positions held by residents of • the Province; • LIM will monitor the award of Project contracts to establish the percentage of the work, by value, awarded to companies based in the Province; • LIM will, on an annual basis, compile the above monitoring data, assess them relative to Project benefits targets and, if necessary, review and revise its benefits approach, initiatives and targets; and • Make the above annual compilation of benefits data available to government departments and agencies, upon request	
Note – As residual environmental effect is not significant, a description of Likelihood of Occurrence is Not Applicable	

9.3.6 Cumulative Environmental Effects

Existing and future projects for this area include the construction of Alderon Iron Ore Corp's proposed Kami Iron Ore Mine, Elross Lake Iron Ore Mine, the Bloom Lake Railway, the operation of LIM's existing mine at the James and Redmond properties and beneficiation operations at Silver Yards, and exploration at LIM's remaining properties in the region.As described above, the Project will employ approximately 14 workers for a construction period of three months. The Elross Lake Project could employ up to 150 people over a 15-month

construction phase. This project received release from the provincial EA process in January 2011.

The numbers employed in operations are smaller than construction for the other projects. It has been indicated that during the operation of the three-year Phase 1 of Elross Lake, 150 people will be employed (New Millennium 2008). The operation of the Bloom Lake Railway project began in 2009 and employs 12 full-time positions (Consolidated Thompson 2008). LIM's operating mines, currently require 140 positions including direct employees and contractors (LIM 2011). In conjunction with the Houston Project, this results in a total operations employment of approximately 140 + 32jobs. This should make a valuable contribution to the economy through continuity of employment while not resulting in labour shortages or wage inflation.

The cumulative business effects of the indicated projects will be important to the contracting companies involved, but not place any undue demands resulting in wage and price inflation in western Labrador. Given the duration of the operations phases, activity on these projects may also result in some expansion of business capabilities. Therefore, the adverse residual effects are not significant (Table 9.14).

Table 9.14 Summary of Residual Environmental Effects for Employment and Business: Cumulative Effects, All Phases

Proposed Mitigation	
Existing projects would be subject to applicable federal and provincial regulations.	
Significance Determination	**Employment and Business**
Geographic extent	Assessment Area
Frequency of occurrence	Continuous
Duration of effect	Long-term
Magnitude of effect	Low
Reversibility	Reversible
Significance	**Not Significant**
Confidence	High
Likelihood of occurrence	Not Applicable
Proposed Follow-up and Monitoring	
See Table 9.13	
Note – As residual environmental effect is not significant, a description of Likelihood of Occurrence is Not Applicable	

9.3.7 Follow-up and Monitoring

LIM will monitor Project employment and expenditures, including the proportions of work going to Labrador and the Innu of Labrador. This information will be compiled on an annual basis and made available to government upon request.

Provisions respecting the employment of women are specified in the Women's Employment Plan.

9.4 Communities

The communities most likely to be affected by the Project are the primary places of residence of the Project labour force. This includes: Matimekush-Lac John, Kawawachikamach, Schefferville,

Labrador West, and Upper Lake Melville. Labrador West is also the home of many contracting companies providing goods and services to the Project. This assessment of the effects of the Project on Communities is focused on physical infrastructure and social services. LIM has an office in Happy Valley-Goose Bay and in Labrador West. In addition, the Goose Bay and Wabush Airports, and the Tshiuetin Rail Transportation (TSH) railroad from Emeril Junction will be used in the provision of some labour and supplies.

9.4.1 Environmental Assessment Boundaries

While all Project activity will occur in Labrador West, the baseline conditions in central Labrador and parts of Quebec must be considered because the Project and the people it employs may make use of social and physical infrastructure in these areas. The Assessment Area for Communities is defined as the Hyron (Labrador West) and Central Labrador (Upper Lake Melville) Economic Zones (Figure 9-3).

9.4.1.1 Potential Project-VEC Interactions

Issues relating to Communities include provision of health services and commute/housing arrangements for workers. The potential interactions between Communities and the Project will be limited to employment and expenditures. These interactions during construction and operations comprise the scope of the assessment for this VEC (Table 9.15).

Table 9.15 Potential Project- VEC Interactions for Communities

Project Activities and Physical Works	Environmental Effect
	Communities
Construction (Project activities in 2009)	
Site Preparation (grubbing, clearing, excavating)	
Haul and Service Road and Rail Siding Construction	
Employment and Expenditures	X
Operation (Project activities starting in 2010)	
Iron Ore Extraction (excavation – mechanical, blasting)	
Iron Ore Beneficiation	
Stormwater Management	
Transportation (on-site trucking, hauling, rail transportation)	
Operations (on-site power generation, solid waste, grey water, human presence)	
Employment and Expenditures	X
Decommissioning	
Removal of Facilities and Equipment	
Site Reclamation (grading, re-vegetation)	

9.4.2 Residual Environmental Effects Significance Criteria

Residual environmental effects are those which are predicted to affect Communities (social and physical infrastructure) once mitigation or management measures have been applied. Predictions are described according to:

- Geographic extent (i.e., Assessment Area, Labrador, the Province);
- Frequency of occurrence (i.e., once, infrequently, continuous, not likely to occur);

- Duration (i.e., short term - less than two years, medium term - two to ten years, long term - more than ten years);
- Magnitude (i.e., low – no measurable change relative to baseline conditions, moderate – measurable change that does not result in capacity exceedances in physical infrastructure or provision of social services throughout the Assessment Area, high – change that results in capacity exceedances in the physical infrastructure or provision of social services throughout the Assessment Area and beyond);
- Reversibility (i.e., reversible or irreversible);
- Confidence (i.e., low or high confidence regarding the significance prediction); and
- Likelihood (i.e., significant effect is likely or unlikely).

A significant adverse residual effect on Communities will result if the Project causes substantial increases in demand for social services and demand on physical infrastructure over the life of the Project.

9.4.3 Effects Management

Adverse effects will be managed through limiting worker interaction with the local communities. A commute system will be implemented to minimize the amount of time that workers will spend in the local communities while en route to the Project site. This system will also include accommodations of workers at LIM's existing Bean Lake Accommodations Camp. To minimize impacts on the local healthcare services in Schefferville and Labrador West communities, any minor injuries or health issues will be addressed through provision of first-aid at the worksite. If additional care is required, workers will use the health clinic in Schefferville. If specialized care is required, workers will be transported to Labrador City.

9.4.4 Effects Assessment

9.4.4.1 Construction

The construction of the Project will have a negligible short-term direct effect on the physical infrastructure or provision of social services by communities of Labrador West and Upper Lake Melville. It will only employ approximately 14 workers for three months, and some of these workers will already be residents of these communities when hired. As a result, it is very unlikely that any workers will move to these communities as a result of Project construction, and hence unlikely that there will be a longterm effect on public or community health services, or other community social or physical infrastructure or services, as a result of Project-related population increase.

The commute system for construction workers will be designed to transport construction workers to and from their communities as efficiently as possible. As a result, there will be few occasions when commuting workers will spend more than a short period in Labrador West and Upper Lake Melville communities while en route to or from the workplace. There is a very small likelihood of negative interactions between workers and local residents that might place longterm demands on policing or healthcare services and infrastructure.

Most workers will continue to receive general healthcare in their home communities. Any minor injuries or health problems will be addressed through the provision of first-aid at the worksite. If additional care is required, workers will use the health clinic in Schefferville, Quebec. If more specialized care is needed, workers will be transported to the Captain William Jackman Memorial Hospital in Labrador City. However, the effects of the construction phase on local healthcare services and infrastructure will also be minor because the labour force will be small, the workers will mostly be in the prime of life, and accidents will be minimized through rigorous enforcement of LIM's occupational health and safety standards. As a result, no substantial new Project-related demand on health services and infrastructure is anticipated.

9.4.4.2 Operation

The Project will also help build the capacity of, and support, local labour market and businesses during operations. In total, the mine will directly require 32 positions (Table 3.2), mostly for approximately eight months per year.

As with the construction phase, the commute system for non-local workers will be designed to minimize the possibility of negative interactions between workers and local residents that might place demands on policing or healthcare services and infrastructure. Furthermore, most workers will continue to receive general healthcare in their home communities, minor injuries or health problems will be addressed through worksite first-aid, and if additional care is required, workers will utilize the health clinic in Shefferville. Only when more specialized care is needed, workers will be transported to the Captain William Jackman Memorial Hospital in Labrador City, but the workers will again mostly be in the prime of life, and accidents will be minimized through rigorous enforcement of LIM's occupational health and safety standards. As a result, no substantial new Project-related demand on health services and infrastructure is anticipated.

9.4.4.3 Decommissioning

The employment associated with decommissioning will depend upon the specific techniques employed, but Labradorians are likely to be well qualified for this work. However, the scale of such employment will likely be smaller and of shorter duration than operations, and hence is not expected to result in substantial new Project-related demand on health, or other community, social, or physical services and infrastructure.

9.4.4.4 Accidental Events

All Labrador communities are at such a distance from the Project site that they will not be directly affected by any accidental effects and malfunctions, and therefore the adverse effects are not likely significant.

9.4.5 Summary of Effects on Communities

Given the predicted low level of increased demand on social and physical infrastructure, including health care, and use of a commute system and accommodations camp for non-local workers, the adverse effects on Communities associated with the Project are considered

reversible and not significant. The residual environmental effects of the Project on communities are summarized in Table 9.16.

Table 9.16 Summary of Residual Environmental Effects for Communities: All Project Phases

Proposed Mitigation	
• Use a commute system and camp accommodations for Project workers • Minimize time that commuting workers spend in communities while en route • Rigorous occupational health and safety provisions and implementation	
Significance Determination	**Employment and Business**
Geographic extent	Assessment Area
Frequency of occurrence	Continuous
Duration of effect	Long-term
Magnitude of effect	Low
Reversibility	Reversible
Significance	**Not Significant**
Confidence	High
Likelihood of occurrence	Not Applicable
Proposed Follow-up and Monitoring	
The monitoring of demands on community services and infrastructure is the responsibility of the relevant government departments and agencies, as part of their normal planning processes. LIM will assist by liaising with them, as requested, and through the timely provision of information about Project activities and plans.	
Note – As residual environmental effect is not significant, a description of Likelihood of Occurrence is Not Applicable	

9.4.6 Cumulative Environmental Effects

Likely future projects in this area include the construction of Alderon Iron Ore Corp's proposed Kami Iron Ore Mine, Elross Lake Iron Ore Mine, the Bloom Lake Railway, the operation of LIM's existing mine at the James and Redmond properties and beneficiation operations at Silver Yards, and exploration at LIM's remaining properties in the region. Given the scale of these projects, it is not expected that they will have or are having significant effects on healthcare or other community services or infrastructure in Labrador West or Upper Lake Melville (Table 9.17).

Table 9.17 Summary of Residual Environmental Effects for Employment and Business: Cumulative Effects, All Phases

Proposed Mitigation	
Existing projects would be subject to applicable federal and provincial regulations.	
Significance Determination	**Employment and Business**
Geographic extent	Assessment Area
Frequency of occurrence	Continuous
Duration of effect	Long-term
Magnitude of effect	Low
Reversibility	Reversible
Significance	**Not Significant**
Confidence	High
Likelihood of occurrence	Not Applicable
Proposed Follow-up and Monitoring	
The monitoring of demands on community services and infrastructure is the responsibility of the relevant government departments and agencies, as part of their normal planning processes. LIM will assist by liasing with them, as requested, and through the timely provision of information about Project activities and plans	
Note – As residual environmental effect is not significant, description of Confidence and Likelihood of Occurrence is Not Applicable	

9.4.7 Follow-up and Monitoring

The monitoring of demands on community services and infrastructure is the responsibility of the relevant government departments and agencies, as part of their normal planning processes. LIM will assist by liaising with them, as requested, and through the timely provision of information about Project activity and plans.

10.0 CONCLUSION

Based on the environmental effects assessment undertaken in support of the Project Registration document, considering the mitigation and effects management measures, overall Project construction, operation and decommissioning are not likely to result in significant adverse environmental effects on any of the VECs identified. The potential residual effects of accidental events will likely not be significant and are unlikely to occur. No significant adverse cumulative effects have been identified for the Project.

However, the Project will result in socio-economic benefits. It will continue the considerable direct and indirect employment and business opportunities that LIM has already contributed to the economy of the local region as well as that of the Provinces as a whole.

11.0 REFERENCES

11.1 Personal Communications

Beaudoin, M. Administrator, Town of Schefferville

Boudreau, G. Fire Chief and Director of Transport - Town of Schefferville

Chubbs, T. Senior Wildlife Biologist, Wildlife Division, Newfoundland and Labrador Department of Environment and Conservation and Neville. J. Wildlife Biologist, Wildlife Division, Newfoundland and Labrador Department of Environment and Conservation, 2010

Dyson, T. Regional Director of Community Health and Wellness, Labrador-Grenfell Regional Integrated Health Authority, Happy Valley-Goose Bay, NL. E-mail, August 20, 2007.

Goulet, J. Environment Canada, Environmental Assessment Co-ordinator, St. Johns, NL. Conversation on 7 May 2010.

Jerrett, B. Economic Development Director, Town of Labrador City, Email, November 17, 2008.

Jesseau, S. Regional Director Acute Care Services, Labrador Health Centre, Happy Valley-Goose Bay, NL. Telephone conversation. January 12, 2007.

Johnson, A. IOC Security, Telephone conversation. December 5th, 2008.

Lapointe, M-S. CLSC. Schefferville, QC. E-mail. August 20, 2008.

Lee, K. Assistant Director, RSM Safety Institute, Labrador City, NL. E-mail. August 28, 2008.

Lortie, M. Director General – CLSC Health Centre.

McCarthy, K. Director, RSM Safety Institute, Labrador City, NL. E-mail. October 30, 2006.

McKenzie, R. Hunting and Fishing in Schefferville, December 5, 2008.

Montague, W. Campus Administrator, College of the North Atlantic, Happy Valley-Goose Bay, NL. E-mail. July 16, 2008.

Normore, S. Superintendent of Works-Water and Sewer, Town of Happy Valley- Goose Bay, Happy Valley- Goose Bay, NL. E-mail. December 21, 2006 and February 1, 2008.

Price, G. General Manager, Goose Bay Airport Corporation, Happy Valley-Goose Bay, NL. e-mail, May 6, 2008

Rashleigh, D. Chief of Medical Staff, Labrador Health Centre, Happy Valley- Goose Bay, NL. Email, no date.

Schmeltzer, I. Senior Wildlife Biologist, Wildlife Division, Newfoundland and Labrador Department of Environment and Conservation.

Simpson, O. Chief Operation Officer (West), Labrador-Grenfell Health, Captain William Jackson Memorial Hospital, E-mail, November 27, 2008.

Squire, J. Supervisor, Labrador Ambulance Service, Happy Valley- Goose Bay, NL. Telephone conversation. February 13, 2007.

Stacey, J. Supervisor, Labrador Ambulance Service, Happy Valley-Goose Bay, NL. E-mail. January 21, 2008 and August 26, 2008.

Tee, D. NLDTW, Happy Valley-Goose Bay, NL. Telephone conversation. November 8, 2007.

Webber, D. Full-time Fire Fighter, Happy Valley- Goose Bay Fire Department, Happy Valley-Goose Bay, NL. Telephone conversation. November 2007.

11.2 Literature Cited

AECOM. 2008. Labrador Iron Mines Baseline Terrestrial Report – James, Redmond & Silver Yards.

AECOM. 2010. Houston Fisheries Report – Draft in Preparation.

AMEC Earth & Environmental Ltd. and Gardner Pinfold. 2008. *Economic Impact of Flight Training on Labrador, Final Report.* Prepared for the Institute for Environmental Monitoring and Research by AMEC Earth & Environmental and Gardner Pinfold Consulting Economists Limited, St. John's, NL and Halifax, NS.

Aura Environmental Research and Consulting Ltd. 2008. *Lower Churchill Hydroelectric Generation Project: Community Health Study*, prepared for Minaskuat Limited Partnership, Happy Valley-Goose Bay, NL.

Banfield, A.W.F. 1974. *The Mammals of Canada.* National Museum of Natural Sciences, University of Toronto Press. Reprinted 1981.

Barnes, J.L., M. Stephenson and L. Davey. 2000. *An Integrated Approach to Cumulative Environmental Effects Assessment, Meeting the Requirements of the Canadian Environmental Assessment Act.* Presentation, 27th Annual Aquatic Toxicology Workshop, St. John's, Newfoundland. October 2000.

Beanlands, G.E. and P.N. Duinker. 1983. *An Ecological Framework for Environmental Impact Assessment in Canada.* Institute for Resource and Environmental Studies, Dalhousie University. Halifax, NS.

Bergerud, A. T., Jakimchuk, R.D., and Carruthers, D.R. 1984. *The Buffalo of the North: Caribou (Rangifer tarandus) and human developments.* Arctic: 37 (1): 7-22.

Bergerud, A.T. 1996. *Evolving perspectives on caribou population dynamics, have we got it right yet?* Rangifer 9: 95-116.

Bergerud, A.T., Luttich, S.N., & Camps, L. 2008. *The Return of Caribou to Ungava*. McGill-Queen's. Native and Northern Series 50. McGill-Queen's University Press, Canada.

Black, R.F. 1951. *Permafrost.* Smithsonian Inst. Rept. 1950. Cited in Pryer (1966).

Boulet, M., Couturier, S., Côté, S.D., Otto, R.D., Bernatchez, L., 2007. *Integrative use of spatial, genetic, and demographic analyses for investigating genetic connectivity between migratory, montane, and sedentary caribou herds.* Molecular Ecology. 16(20): 4,223-4,240.

Brown, R.J.E. 1979. *Permafrost Distribution in the Southern Part of the Discontinuous Zone in Québec & Labrador*. Geotechnical Division, Division of Building Research, National Research Council of Canada.

CBC News. 2008. *Affordable housing shortage pushes families out of Lab West.* August 28, 2008. Available at: http://www.cbc.ca/canada/newfoundland-labrador/story/2008/08/28/housingdelay.html?ref=rss.

Canadian Environmental Assessment Agency (CEAA). 1994. *Responsible Authority's Guide.* CEAA, Hull, PQ.

Canadian Environmental Assessment Agency (CEAA). 1997. *Voisey's Bay Mine and Mill Environmental Assessment Panel Report.* Available at: http://www.ceaa.gc.ca/010/0001/0001/0011/0002/contents_e.htm

Canadian Environmental Assessment Agency (CEAA). 1999. *Cumulative Environmental Effects Practitioners Guide.* Prepared by the Cumulative Environmental Assessment Working Group. CEAA, Hull, PQ.

Canadian Environmental Assessment Agency (CEAA). 2003. *Incorporating Climate Change Considerations in Environmental Assessment: General Guidance for Practitioners*. Available at: http://www.ceaa.gc.ca/012/014/index_e.htm

Canadian Wildlife Service. 2007. Migratory Bird Conservation. *Incidental take of migratory birds in Canada. Environment Canada background document on the management of incidental take of migratory birds: towards and unregulated approach.* A document to help with preliminary consultations, October 25, 2007.

Chubbs, T.E., Keith, L.B., Mahoney, S.P., and McGrath, M.J. 1993. *Responses of woodland caribou (Rangifer tarandus caribou) to clear-cutting in east central Newfoundland.* Canadian Journal of Zoology 71: 487-493.

CLEDB (Central Labrador Economic Development Board). 2006. *Central Labrador Economic Development Board Business Plan 2006-2008.* Submitted to ACOA November 2006.

CLEDB (Central Labrador Economic Development Board). 2007. The Central Labrador Region. Available at URL: http://www.cledb.ca/home/10.

College of the North Atlantic. 2008. Labrador West Campus. Available at: http://www.cna.nl.ca/campus/lw/.

Committee on the Status of Endangered Wildlife in Canada (COSEWIC). 2008. Available at: http://www.cosewic.gc.ca/eng/sct1/searchdetail_e.cfm

Consolidated Thompson Iron Mines Ltd. 2008. Environmental Preview Report. Bloom Lake Railway (Resubmission). Available at: http://www.env.gov.nl.ca/env/ENV/EA%202001/Project%20Info/1378.htm

Cote, S. D. 1998. *In vitro Digestibilities of Summer Forages Utilized by Riviere George Caribou Herd.* Arctic 51(1): 48-54.

Couturier, S., Courtois, R., Leproux, H., Rivest, L.-P., Luttich, S., 1996. *Calving photocensus of the Rivière George Caribou herd and comparison with an independent census.* Rangifer Special Issue 9: 283-296.

Couturier, S., D. Jean, R. Otto, and S. Rivard. 2004. *Demography of the Migratory Tundra Caribou.*

Curatolo, J.A. and Murphy, S.M. 1986. *The effects of pipeline, roads and traffic on the movements of caribou, Rangifer tarandus.* Canadian Field-Naturalist 100(2): 218-224.

D'Astous, N. and P. Trimper. 2009. *Spring survey of caribou in the vicinity of Schefferville, May 2009.* Prepared for New Millennium Capital Corp. and Labrador Iron Mines Limited. Final report – Without prejudice. November 2009. 19 p. and appendix.

D'Astous, N. and P. Trimper. 2010. *Spring survey of caribou in the vicinity of Schefferville, May 2009. Addendum concerning Blue 331.* Prepared for New Millennium Capital Corp. and Labrador Iron Mines Limited. Final report – Without prejudice. April 2010. 3 p.

DND (Department of National Defence). 2008. Community. Available at: http://www.airforce.forces.gc.ca/5wing/community/community_e.asp.

Dodds, D.G. 1960. *Food competition and range relationships of moose and snowshoe hare in Newfoundland.* Journal of Wildlife Management 24: 52-60.

Drake, J.J., 1983. *"Groundwater Chemistry in the Schefferville Quebec Iron Deposits"* in Catena, Vol.10, p.149-158.

Dyer, S.J., J.P. O'Neill, S.M. Wasel and S. Boutin. 2001. *Avoidance of industrial development by woodland caribou.* Journal of Wildlife Management 65(3): 531-542.

Dyer, S.J., O'Neill, J.P., Wasel, S.M. and Boutin, S. 2002. *Quantifying barrier effects of roads and seismic lines on movements of female woodland caribou in Northeastern Alberta.* Canadian Journal of Zoology 80: 839-845.

Dzus, E. 2001. *Status of the woodland caribou (Rangifer tarandus caribou) in Alberta.* Alberta Wildlife Status Report No. 30.

Environment Canada. 2010. Website accessed on 8 May 2010. Available at: http://www.ec.gc.ca/paomitmb/default.asp?lang=En&n=A633AC-1

Erickson, W.P., G.D. Johnson and D.P. Young Jr. 2005. *A summary and comparison of bird mortality from anthropogenic causes with an emphasis on collisions.* USDA Forest Service General Technical Report PSW-GTR-191:1029-1042.

Ferguson, S.H. and Elkie, P.C. 2005. *Use of lake areas in winter by woodland caribou.* Northeastern Naturalist 12(1): 45-66.

Fortier, A. Hotel Royal. Schefferville, QC. E-mail. August 21, 2008.

Foster, D.R. 1985. *Vegetation development following fire in Picea mariana (black spruce) – Pleurozium forests of south-eastern Labrador, Canada.* Journal of Ecology 73(2): 517-534.

Garg, O.P. 1982. Recently Developed Blasting Techniques in Frozen Iron Ore at Schefferville, QC. Engineering Applications in Permafrost Areas. 4TH Canadian Permafrost Conference.

Garg, O., & Kalis, T. Slope Stability Studies in the Schefferville Area.

Goldwin, L. 1990. *Woodland caribou in Northern Ontario: Why are they so different?* OMNR.NW Ont. For. Tech. Dev. Unit. Thunder Bay, TN-07. 7pp.

Government of Northwest Territories. n.d. Small Mammal and Hare Surveys. Available at: http://www.enr.gov.nt.ca/_live/pages/wpPages/small_mammal_and_hare_surveys.aspx

Gross, GA. 1968 *General Geology of Iron Deposits in Canada,* Vol. III, Iron Ranges of the Labrador Geosyncline, Geological Survey of Canada, Econ. Geol. Report, 22.

Hare, F.K. 1950*. Climate and zonal divisions of the boreal forest formation in eastern Canada.* The Geographical Review 40: 615-635.

Harrington, F. H. 2003*. Caribou, military jets and noise: The interplay of behavourial ecology and evolutionary psychology.* Rangifer Special Issue 14: 73-80.

Harron, D. 2003. Potential effects of transmission lines and other linear developments on wildlife in Manitoba. May 2003 Working Draft.

Hearn, B. J., Luttich, S.N., Crete, M. and Berger, M.B. 1990. *Survival of radio-collared caribou (Rangifer tarandus caribou) from the George River herd*, Nouveau-Québec – Labrador. Canadian Journal of Zoology 68: 276-283.

Hirvonen H. 2001. *Impacts of highway construction and traffic on a wetland bird community.* IN: Proceedings of the 2001 International Conference on Ecology and Transportation, Eds. Irwin CL, Garrett P, McDermott KP. Center for Transportation and the Environment, North Carolina State University, Raleigh, NC: pp. 369-372.

Horesji, B.L. 1981. *Behavioural response of barren ground caribou to a moving vehicle*. Arctic 34: 180-185.

HRLE (Department of Human Resources, Labour and Employment). 2011. Newfoundland and Labrador Labour Market: Outlook 2020.

Hustich, I. 1949. *On the forest geography of the Labrador peninsula.* Acta Geographica 10: 1-63

International Arctic Science Committee (Lead Author); Mark McGineley (Topic Editor) *Arctic Boreal Forest Environments* In Encyclopedia of Earth. Eds. Cutler J. Clevland (Washington D.C.: Environmental Information Coalition, National Council for Science and Environment). First published in the Encyclopedia of Earth. May 30, 2010. Retrieved December 1, 2010. Available at:

http://www.eoearth.org/article/Arctic_boreal_forest_environments

Jacobs, J. D., A. R. Maarouf and E. A. Perkins. 1996. *The recent record of climate on the range of the George River Caribou Herd, northern Quebec and Labrador, Canada.* Rangifer 9: 23-31.

Jacques Whitford. 1998. 1997 Osprey monitoring program – Environmental Mitigation Program supporting Military Flying Activity in Goose Bay, Labrador. Jacques Whitford Environment Limited report prepared for the Goose Bay Office, National Defence Headquarters, Ottawa, ON. Study GB 575-03.

Jacques Whitford Stantec Limited. 2009a. Socio-economic Baseline Report. Prepared for Labrador Iron Mines.

Jacques Whitford Stantec Limited. 2009b. Stage 1 Historic Resources Assessment – Labrador Iron Mines Exploration Activities. Prepared for Labrador Iron Mines.

Jenness, J.L. 1949. *Permafrost in Canada.* Arctic, Vol. 2. Cited in Pryer (1966).

Jonkel, C.J. and I. Cowan. 1971. *The black bear in the spruce-fir forest.* Wildlife Monographs 27. 57 p.

Kavanaugh Associates. November 7, 2011.Houston Road Concept Design Report

Klassen, R.A., Paradis, S., Bolduc, A.M. and Thomas, R.D. 1992. *Glacial landforms and deposits, Labrador, Newfoundland and eastern Québec.* Geological Survey of Canada, "A" Series Map, 1814A.

Labrador-Grenfell Health. 2007. http://www.lghealth.ca/.

Labrador Iron Mines (LIM). 2009. Environmental Impact Statement (Revised): Schefferville Area Iron Ore Mine (Western Labrador), Prepared by Labrador Iron Mines Limited.

Labrador Iron Mines (LIM). 2010. Avifauna Management Plan for Activities Associated with the James, Silveryard and Redmond Properties. 29pp

Labrador West. 2008. Available at: http://www.labradorwest.com/default.php?ac=changeSite&sid=3.

Labrador Woodland Caribou Recovery Team (LWCRT) 2005. Available at: http://www.sierraclub.ca/national/programs/biodiversity/wilderness/endangered-species/labradorresponse.pdf

Linnell, J.D.C., J. Swenson, B. Barnes, and R. Andersen. 1996. *How Vulnerable are Denning Bears to Disturbance? A review. A study in connection with plans for the establishment of a military training area in Østlandet, Norway.* Part 2-NINA Oppdraqsmelding 413:1-19.

Loring, S. 2008. *At home in the Wilderness: The Mushuau Innu and Caribou.* In Bergerud, A.T., Luttich, S.N., & Camps, L. (eds). The Return of Caribou to Ungava. McGill-Queen's Native and Northern Series 50. McGill- Queen's University Press, Canada, pp.123-134.

Mahoney, S. P. and Schaefer, J.A.. 2002. *Hydroelectric development and the disruption of migration in caribou.* Biological Conservation 107: 147-153.

Manci, K. M., Gladwin, D.N., Villella, R. and Cavendish, M.G. 1988. *Effects of aircraft noise and sonic booms on domestic animals and wildlife: a literature synthesis.* U.S. Fish and Wildlife Service, National Ecology Research Center, Fort Collins, CO. NERC-88/29. 88pp.

Mckillen, T.N., B.A. (Mod), M.A., M.Sc., P.Geo., May 2010. Resource Estimate & Technical Report On The Houston Iron Ore Deposit Western Labrador Province Of Newfoundland And Labrador Canada.

Meades, S.J. 2010. Updated Checklist of Vascular Plants in Labrador. Internal report to Stantec. 127 pp.

Messier, F., Huot, J., Le Henaff, D., and Luttich, S. 1988. *Demography of the George River caribou herd. Evidence of population regulation by forage exploitation and range expansion.* Arctic 41(4): 279-287.

Morin, P., Berteaux, D. and I. Klvana. 2005. *Hierarchical habitat selection by North American porcupines in southern boreal forest.* Canadian Journal of Zoology 83: 1,333–1,342.

Morrissey, P. 2008. *Time ticking for Labrador waste management plan, temporary remedy.* Article in The Aurora, 11 August 2008. Available at: http://www.theaurora.ca/index.cfm?sid=160897&sc=298.

Nalcor Energy. 2009. Lower Churchill Hydroelectric Generation Project Environmental Impact Statement.

Newbury, T.L. and N.P.P. Simon. 2005. *The effects of clearcutting on snowshoe hare (Lepus americanus) relative abundance in central Labrador.* Forest Ecology and Management 210: 131-142.

Newfoundland and Labrador Statistics Agency/Community Accounts. 2006. Community Accounts. Available at: http://www.communityaccounts.ca/communityaccounts/onlinedata/getdata.asp

New Millennium Capital Group, in collaboration with Paul F. Wilkinson and Assoc. Inc. 2008. Project Registration, Direct Shipping Ore Project.

Nicholson, F.H. 1978. N.R.C. Special Project. Prediction of Permafrost Distribution for Subarctic Mining Operations. Final Report. McGill Subarctic Research Station, Schefferville, Québec.

Nicholson, F.H. and Lewis, J.S. 1976. Active Layer and Suprapermafrost Groundwater Studies, Schefferville, Québec. Reprinted from Proceedings of the 2nd Conference on Soil Water Problems in Cold Regions, September 1-2, 1976. Edmonton, Alberta. p. 15-30.

NLDLAA (Newfoundland and Labrador Department of Labrador and Aboriginal Affairs). 2006. A Northern Strategic Plan for Labrador, Public Discussion Paper, July 2006.

NLDLAA (Newfoundland and Labrador Department of Labrador and Aboriginal Affairs). 2008. A Northern Strategic Plan for Labrador. Available at: http://www.laa.gov.nl.ca/laa/nspl/nspl.pdf.

NLDEC (Newfoundland and Labrador Department of Environment and Conservation). 2008. Newfoundland and Labrador Hunting Guide 2008-09. Available at: http://www.env.gov.nl.ca/env/HuntingTrappingGuidePgs.pdf

NLDEC. 2010. Conservation Measures Announced for George River Caribou. News Release, 9 November 2010. Government of Newfoundland and Labrador. St. John's, NL. Available at: http://www.releases.gov.nl.ca/releases/2010/env/1109n03.htm. Accessed: 23 November 2010

NLDF (Newfoundland and Labrador Department of Finance). 2008. *The Economy 2008*. Available at: http://www.economics.gov.nl.ca/E2008/.

NLDHCS (Newfoundland and Labrador Department of Health and Community Services). 2004. Stepping into the Future Strengthening Children, Families and Communities. Newfoundland and Labrador's Early Childhood Development and Early Learning and Child Care, Annual Report 2003-04.

NLDTCR (Newfoundland and Labrador Department of Tourism, Culture and Recreation). 2007.Backgrounder Year-End Provincial Tourism Performance 2006 and Tourism Outlook 2007. Available at at: http://www.stats.gov.nl.ca/Statistics/Tourism/PDF/TourismPerformance_2006.pdf

NLDTW (Newfoundland and Labrador Department of Transportation and Works). 2006. The Development of a Sustainable Transportation Plan for Labrador, Consultation Document.

NLDTW (Newfoundland and Labrador Department of Transportation and Works). 2008. *Annual Report 2007-08.* Available at: http://www.tw.gov.nl.ca/AnnualReports/TWAnnRep200708.pdf.

NNK (Naskapi Nation of Kawawachikamach). 2007. Naskapi Nation of Kawawachikamach Annual Report 2006-2007.

NNK (Naskapi Nation of Kawawachikamach). 2011. Annual Report, 2010-11.

Our Labrador. 2004. Towns and Groups. Available at: http://www.ourlabrador.ca/member.php?show=communities.

Pearce, J. and L. Venier. 2004. *Small mammals as bioindicators of sustainable boreal forest management.* Forest Ecology and Management Volume 208, Issues 1-3, 5 April 2005, Pages 153-175.

Phillips, F. 1982. Late Winter 1981 *Distribution of McPhadyen River Caribou*. Newfoundland and Labrador Wildlife Division. Project No. 4204.

Pryer, R.W.J. 1966. Mine Railroads in Labrador-Ungava. Québec North Shore and Labrador Railway Co., Canada.

RCMP (Royal Canadian Mounted Police). 2008. RCMP Homepage. Available at: http://www.rcmpgrc.gc.ca/.

RRCS (Renewable Resources Consulting Services). 1989. *Late winter aerial surveys of woodland caribou and moose in Labrador and northeastern Quebec.* Technical Report 4-B. Prepared by S. Fudge and Associates Ltd., St. John's, Newfoundland.

Rivest, L.P., S. Couturier and H. Crepeau. 1998. *Statistical methods for estimating caribou abundance using postcalving aggregations detected by radio telemetry.* Biometrics 54: 865-876.

Rowe, J.S. and G.W. Scotter. 1973. *Fire in the boreal forest.* Quaternary Research 3(3): 444-464.

Ruddock, M. and D.P. Whitfield. 2007. *A Review of Disturbance Distances in Selected Bird Species.* A report from Natural Research (Projects) Ltd. to Scottish Natural Heritage, UK.

Russell, J., Couturier, S., Sopuck, L.G., and Ovaska, K. 1996. *Postcalvingphoto-census of the Rivière George caribou herd in July 1993.* Rangifer Special Issue No. 9: 319–330.

Saint-Martin, Guy. 1987. *The Ecology of the East-Central Quebec and Western Labrador Caribou Population As It Relates to a Proposed Road Development.* Thesis, University of Waterloo. Ontario, Canada.

Schmelzer, I. and J. Fenske. No date. *Life at the limit: an intraspecific analysis of home range variation for a wide-ranging rodent, the North American porcupine (Erethizon dorsatum) in central Labrador, Canada.* Newfoundland and Labrador Wildlife Division, Happy-Valley- Goose Bay.

Schmelzer, I. and Otto, R. 2003. *Winter range drift in the George River Caribou herd: a response to summer forage limitation?* Rangifer Special Issue No. 14: 113-122.

Smith, K.G., Ficht, E.J., Hobson, D., Sorensen, T.C., and Hervieux, D. 2000. *Winter distribution of woodland caribou in relation to clear-cut logging in west central Alberta.* Canadian Journal of Zoology 78: 1,433-1,440.

Species at Risk Public Registry (SARA). 2008. Species Profile: Woodland Caribou Boreal Population. Available at:
http://www.sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=636

Stassinu Stantec 2010. Classification of Wildlife Habitat Suitability for Houston and Howse Mineral Claims Blocks for the Schefferville Area Iron Ore Mine. Prepared for Labrador Iron Mines. August 2010.

Statistics Canada. 1991. *1991 Census of Canada*. Statistics Canada: Ottawa, ON.

Statistics Canada. 1996. *1996 Census of Canada*. Statistics Canada: Ottawa, ON.

Statistics Canada. 2001. *2001 Census of Canada*. Statistics Canada: Ottawa, ON.

Statistics Canada. 2006. 2006 Census of Canada. Statistics Canada: Ottawa, ON.

Sweitzer, R.A. 1996. *Predation or starvation: Consequences of foraging decisions by porcupines (Erethizon dorsatum*). Journal of Mammalogy 77: 1,068−1,077.

Thomas, M. K. 1953. Climatological Atlas of Canada. Ottawa: Natl. Res. Counc., Div. Buildg. Res. NRC 3151,253 pp.

Thomas, D.C. and Gray, D.R. 2002. Update – COSEWIC status report on the woodland caribou *Rangifer tarandus caribou in Canada.* Committee on the Status of Endangered Wildlife in Canada. Ottawa, ON. 98 pp.

Tietje, W.D. and R.L. Ruff. 1980. *Denning behaviour of black bears in the boreal forest of Alberta.* Journal of Wildlife Management 44:858-870.

Town of Happy Valley-Goose Bay. 2001. *Happy Valley-Goose Bay*. Available at: http://www.happyvalley-goosebay.com/.

USFWS (United States Fish and Wildlife Service). 2010. Bald Eagle Management Guidelines and Conservation Measures, Bald Eagle Natural History and Sensitivity to Human Activity Information. Website: http://www.fws.gov/midwest/eagle/guidelines/baea_nhstry_snstvty.html. Last updated March 31, 2010. Accessed April 2011.

Vana-Miller, S.L. 1987. Habitat suitability models: Osprey. US Fish and Wildlife Service Biological Report 82: 46 pp.

Vistnes, I. and Nelleman, C. 2001. *Avoidance of cabins, roads, and power lines by reindeer during calving*. Journal of Wildlife Management 65(4): 915-925.

Vistnes, I., Nelleman, C., Jordhøy, P., and Strand, O. 2004. *Effects of infrastructure on migration and range use of wild reindeer.* Journal of Wildlife Management 68(1): 101-108.

Vors, L.S., Schaefer, J.A., Rodgers, A.R., and Patterson, B.R. 2007. *Woodland caribou extirpation and anthropogenic landscape disturbance in Ontario.* Journal of Wildlife Management 71(4): 1249- 1256.

Warren, P.S., M. Katti and A. Brazel. 2006. *Urban Bioacoustics: It's not just noise.* Animal Behavior 71: 491-502.

Waterway, M.J., M.J. Lechowicz, and T.R. Moore. 1984. *Vegetation of the Schefferville Region, NouveauQuébec,* pages 7-20 in Moore, T.R. (ed.) *Future Directions for Research in Nouveau-Québec*, McGill Subarctic Research Paper No. 39, Centre for Northern Studies and Research, Montréal, Québec.

Weir, J.N., Mahoney, S.P., McLaren, B. and Ferguson, S.H. 2007. *Effects of mine development on Woodland caribou Rangifer tarandus distribution.* Wildlife Biology 13: 66-74.

Whitaker, D.M., P.D. Taylor, and I.G. Warkentin. 2008. *Survival of adult songbirds in boreal forest landscapes fragmented by clearcuts and natural openings*. Avian Conservation and Ecology 3(1): 5.

Wolfe, S.A., Griffin, B. and Wolfe, C. 2000. *Response of reindeer and caribou to human activities.* Polar Research 19(1): 63-73.

Wolff, J.O. 1978. *Food habits of snowshoe hares in interior Alaska.* Journal of Wildlife Management 42 (1): 148-153.

Woods, C.A. 1973. *Erethizon dorsatum*. Mammalian Species 29: 1−6.