APPENDIX N

Fish Habitat Assessment Report,

James Property Unnamed Tributary

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Labrador Iron Mines Limited

Fish Habitat Assessment Report – James Property Unnamed Tributary

Prepared by:

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Date:

December 2008

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December 6, 2008 Project Number:101931

Ms. Linda Wrong
Labrador Iron Mines Limited
220 Bay Street, Suite 700
Toronto, Ontario M5J 2W4

Dear Ms. Wrong:

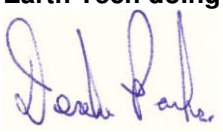
Re: Fish Habitat Assessment Report – James Property, Unnamed Tributary

Please find enclosed a Fish Habitat Assessment Report, prepared by AECOM, with hydrological support from WESA for the Unnamed Tributary located on the James Property. This assessment report contains extracted information from the Environmental Impact Statement currently being prepared on behalf of Labrador Iron Mines Ltd. for the West Central Labrador Iron Ore Project.

The conditions documented herein represent the existing fish habitat before the start of ore extraction at the James Property. Discussions on the potential impacts from mining operations and the proposed mitigation measures to offset any potential harmful alteration, disturbance or destruction (HADD) are discussed.

If you should have any questions with regards to this report, please feel free to contact us.

Sincerely,
Earth Tech doing business as AECOM



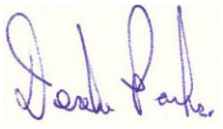
Derek Parks, B.Sc (Hon), M.Sc.
Senior Aquatic Ecologist
derek.parks@aecom

Encl.
cc: Byron O'Connor, WESA

Revision Log

Revision #	Revised By	Date	Issue / Revision Description
0	Derek Parks	November 28, 2008	Issued to Client for comments
1	Derek Parks	December 5, 2008	Revised report issued to Client for comments
2	Derek Parks	December 8, 2008	Final Report distributed to DFO
3	Derek Parks	December 19, 2008	Revisions to WESA 2008 Report (Appendix A)
4	Derek Parks	August 11, 2009	Revisions to Project Description

Signature Page

Report Prepared By:	Report Reviewed By:
	
Derek Parks, B.Sc. (Hon), M.Sc. Senior Aquatic Ecologist	Dean Fitzgerald, Ph. D. Senior Environmental Ecologist

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A. WESA 2008. James Property Hydrology and Water Balance, (Section 4.1.4) of the Environmental Impact Statement for Labrador Iron Mines Ltd. pp.19.

B. Appendix Site Photographs

1. Introduction

Labrador Iron Mines (LIM) plans to reactivate the mining of iron ore deposits in this location of western Labrador, an area of past intensive mining activities. Haematite iron ores will be mined from a number of known deposits where similar activities have previously taken place. Mining activities will be conducted in a sequential manner using conventional open pit mining methods. According to the Newfoundland and Labrador Mining Act (1999), a mill means " a facility in which a substance containing minerals may be concentrated by physical or chemical process or otherwise treated, except by simple washing or crushing. As the proposed beneficiation at the Silver Yard will be conducted using semi-mobile washer and crusher, the use of a mill is not required. Once the rock is mined, washed, crushed and sorted (beneficiated), it will be loaded onto rail cars, at the Silver Yards, located to the North of the James property in Labrador, for shipment south. No chemicals will be used in the beneficiation. The Silver Yards was historically operated as a rock storage, marshalling and loading yard by IOC and, although the former rail spur line was removed, the rail bed is still present in this area and is in good condition. As a result, the project will also included the re-establishment of the spur line rail along this existing rail bed.

The mines will produce lump and sinter ores for direct shipping to end users. As the deposit is a high-grade ore, no further processing aside from the proposed crushing and washing to be carried out in Labrador will be conducted in Canada Mining will initially be at a combined rate of one to two million tones per year at three mine sites at an estimated daily production rate less than 3000t/day per mine location. Rock beneficiation at the Silver Yard will occur during an estimated seven to eight month (approximately 250 days) working season and correspond to camp operations undertaken to complete the required excavation and processing. This process will take advantage of the existing infrastructure, such as the railway line between Schefferville and Sept-Iles, roads and electrical power and, as a result, no development work is proposed within the Province of Quebec. Although some local upgrading of roads and of the railway may be necessary, no major improvements are anticipated and work will be conducted along the existing rail-beds at the Silver Yard.

There is a small coldwater tributary immediately adjacent to the proposed James Mine South Pit (Figure 2) and, although it is outside the pit footprint, proposed dewatering activities have the potential to impact water levels further downstream.. Discussions with the Department of Fisheries and Oceans (DFO) at meetings conducted in St. John's Newfoundland and Labrador in September 2007, February and June 2008 indicated that a fish habitat assessment report would be required to determine whether a *Section 35(2) Harmful Alteration, Disturbance and Destruction* (HADD) *Authorization* would be required for the proposed mining operation. Two components for this fish habitat assessment report include; the actual physical fish habitat present and the role of groundwater contributions to the Unnamed Tributary (this report) as well as a water balance and hydrology report prepared by WESA (2008).(Appendix A). AECOM has been active on the sites, conducting environmental baseline work since 2005, and was retained by Labrador Iron Mines (LIM) to work cooperatively with WESA to complete this fish habitat assessment report for the James Property and provide potential mitigation/compensation strategies for DFO approval.

2. Study Team

The fish habitat assessment study team was lead by Mr. Derek Parks, with logistic support provided by Mr. David Praskey for the physical habitat mapping. Mr. Byron O'Connor (WESA) oversaw the hydrological and hydrogeological programs and provided the hydrological and water balance information for the Unnamed Tributary summarized within this document. Brief biographies are provided below:

Derek Parks, B.Sc. (Hon), M.Sc.

Mr Derek Parks is currently employed as a senior aquatic specialist within AECOM, and has been actively working on behalf of Labrador Iron Mines Ltd. in the Schefferville Area for the past three years. Mr. Parks has more than ten years of experience in fisheries and fish habitat, water-quality; environmental effects monitoring, bioengineering and habitat assessment and enhancement. He also has experience in the use of GIS to evaluate a range of fisheries issues. His previous employment includes AMEC Earth and Environmental, the Ontario Ministry of Natural Resources, the Township of Goulbourn and Niblett and Associates. He is also certified by MNR in the use of electrofishers and the Southern Ontario Rapid Stream Assessment Protocol and has extensive experience with a wide range of environmental studies. With a strong technical and academic background in fisheries resources, Mr Parks has applied this knowledge to plan, design and monitor a variety of projects to meet the needs of the client. He acted as a liaison for the client between regulatory agencies such as; Department of Fisheries and Ocean, Ontario Ministry of Natural Resources, and several Conservation Authorities, to provide the required information to be submitted to the appropriate agency. Once approvals have been granted, Mr. Parks has carried out over 15 monitoring programs to confirm work proposed and compensation and mitigation measures used were successful in protecting fish and fish habitat.

David Praskey, B.Sc.

Mr. Praskey is an aquatic ecologist with AECOM's Ecological Services group in Kitchener, Ontario. He has over six years experience in the aquatic biology field including lake and stream fisheries and habitat assessments, Lake Ontario wetland fish sampling, aquatic habitat mapping, Ontario Benthos Biomonitoring Network sampling, BC stream classification, and aquatic biological toxicity testing. Mr. Praskey's fish sampling experience includes index trapnetting and gillnetting, backpack and boat electrofishing, as well as seine and fyke netting. He also has more than 20 years of safe boating experience and has operated various sized boats for several professional and volunteer projects. He also has experience preparing project and client reports.

Byron O'Connor, P.Eng.

Mr. O'Connor, is a Principal with WESA Inc. and licensed professional engineer in the Provinces of Ontario, New Brunswick, the Northwest Territories and Nunavut, and Newfoundland and Labrador. He has worked in the mineral exploration and environmental fields since 1987. His technical expertise is in mining, hydrology, hydrogeology, contaminated site assessments and remedial assessments of surface water, groundwater and soil. He has conducted site assessments at mine sites and industrial facilities

across the Arctic, throughout Northern and Southern Ontario, New Brunswick, Prince Edward Island, in Labrador and Alberta. He has served as technical advisor on projects outside of Canada in Missouri, Delaware, Jamaica, Turks and Caicos, and St. Lucia. He is currently co-project project principal for a multi-site (15 sites) closure plan groundwater characterization study currently underway for a major mining company in the Sudbury area. His tailings experience includes installation and evaluation of data for inclinometers installed at Brunswick Mining and Smelting near Bathurst, NB, as well as groundwater studies at tailings facilities in Northern Ontario. He has appeared before the Environmental Assessment Board as a technical expert related to waste management systems expansion on several occasions. Mr. O'Connor has instructed groundwater and waste management courses and training sessions in Kingston and Sudbury, Ontario; Kuala Lumpur Malaysia, Kingston Jamaica, and St. Lucia (BWI).

3. Summary of Study Objectives

The study objective for this report is to provide DFO, in combination with the WESA Hydrology and Water Balance report, with sufficient information to determine whether a *Section 35(2) HADD Authorization* will be required for the proposed mining operations at the James Property. This report will outline the physical fish habitat that exists within the Unnamed Tributary on the James Property. The fish habitat assessment will define the existing aquatic habitats associated with the unnamed tributary, and identify historic alterations on the James Property. Anticipated impacts resulting from the proposed mining operations associated with the James North and James South Pits will also be assessed and discussed.

It is strongly believed that the information discussed within this report will enable DFO to make a determination, based on:

- The quantification of fish habitats, as defined by the DFO's McCarthy *et al.* 2007 DRAFT Interim Standard Methods Guide for the Classification and Quantification of Fish Habitat in Rivers of Newfoundland and Labrador, were completed,
- Provide sufficient information for a HADD determination by DFO, when read in conjunction with the WESA (2008) on hydrological interactions. (Appendix A)
- Mitigation measures to be implemented, to ensure no HADD occurs during the construction, operation and abandonment of the James North and South Pits.

4. Description of Study Area

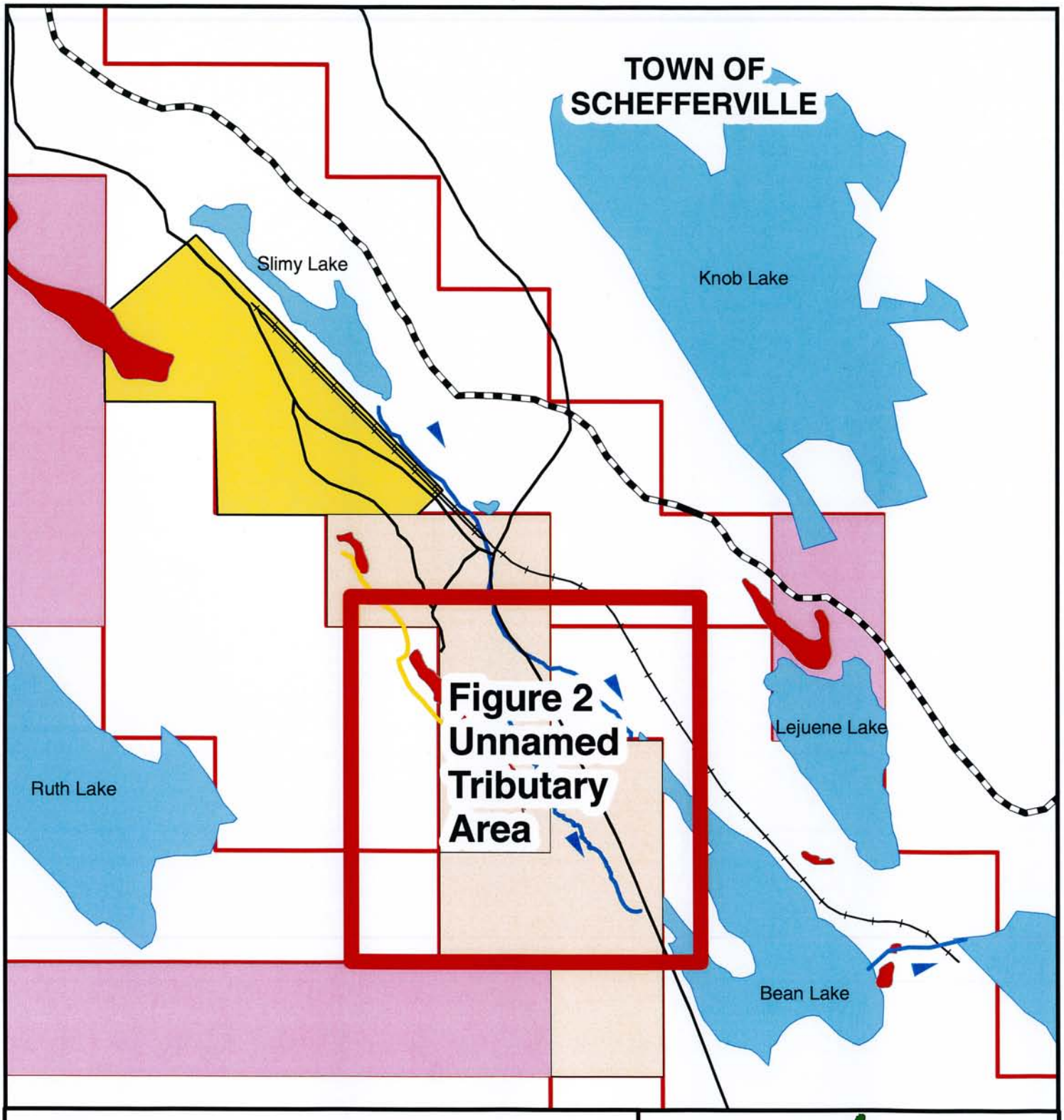
4.1 General

The James Property is located in western Labrador, at a distance of about 5 km from Schefferville, Quebec (Figure 1). The James Property has previous mining-related impacts as a result of historical IOC operations in the area. The James Property is bound by a high rock ridge to the southwest and an existing road connecting Schefferville with the Menihek Hydro Dam to the northeast. The terrain is comprised of parallel ridges and valleys, sparsely forested, trending northwest to southeast.

This area has been approximately 50% disturbed due to past mining activities. Two pits are planned for the area, the James North and James South pits.

4.2 Unnamed Tributary

Within the James Property, a small first order tributary originates from two artesian sources (James North Spring and James South Spring) that are situated between the James North and James South Pits (James North Spring) and at the southern edge of the James South Pit (James Spring South) (Figure 2). This tributary is approximately 1000 metres in length and flows in a south easterly direction and discharges into Bean Lake. Another small spring (James South Spring) originates from the southern end of the James South ore body and flows north easterly to the unnamed tributary, approximately half way between the tributary's origin and Bean Lake



Legend

- Spur Line
- Roads
- **James Watercourses**
- Permanent
- Intermittent
- Labrador-Quebec boundary_polyline
- James Property
- Beneficiation Area (Silver Yard)
- Lakes
- MapStakedClaims
- Estimated Extent of Ore Bodies
- LIM Claims
- Water Flow Direction

1:24,000

FIGURE 1

General Project Area
West Central Labrador Iron Ore Project

JANUARY 2009

Project #: 101931

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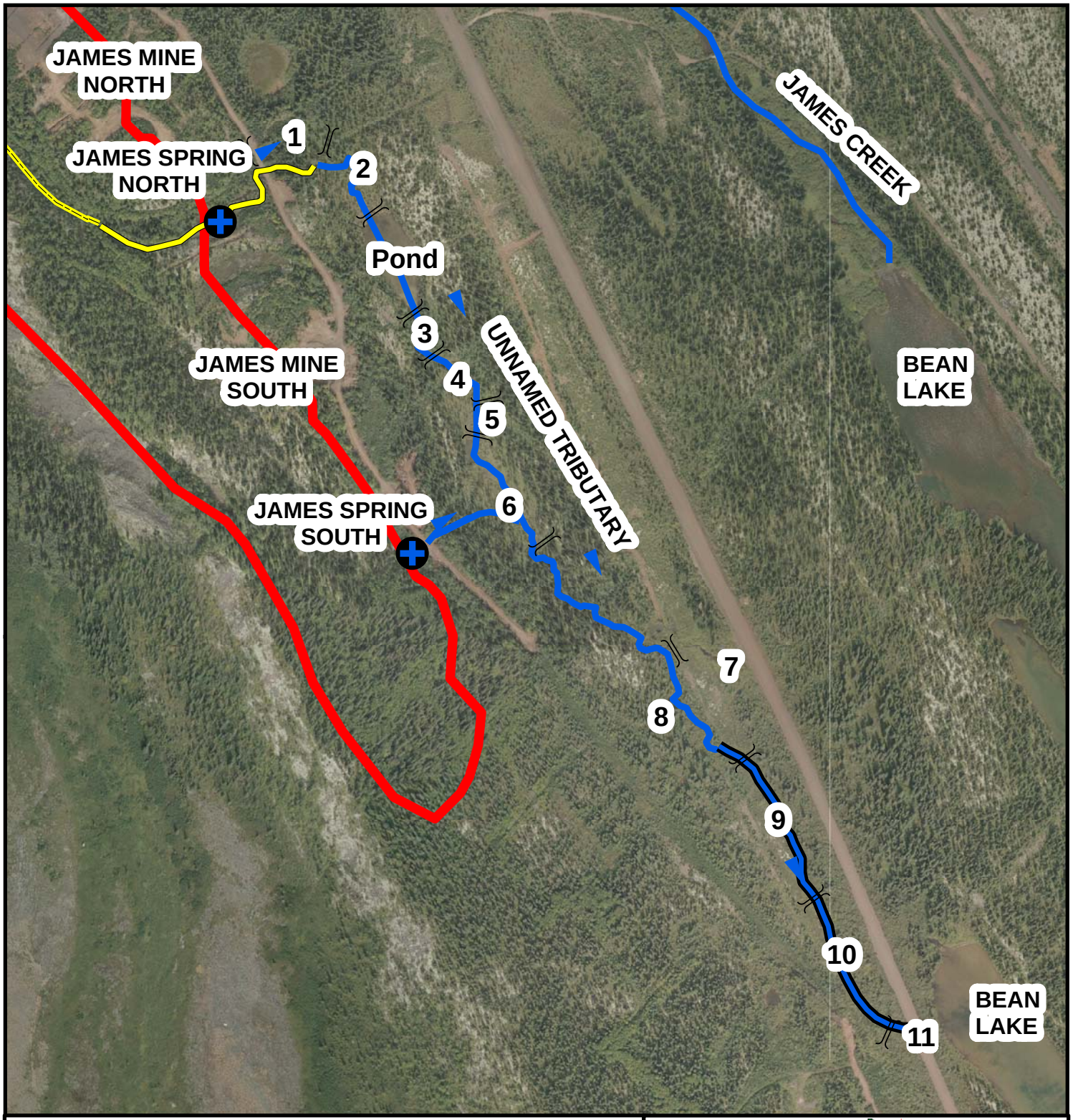

Legend

Habitat Classification

- Intermittent
- Permanent - No Fish
- Permanent - Fish Habitat
- Channelized - Fish habitat

- Water Flow Direction
- Habitat Reach Break (#) (Table 1)
- Maximum Pit Extent

FIGURE 2

Unnamed Tributary
James Property

DECEMBER 2008

Project #: 101931

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5. Methodology

5.1 Background

Information was sought from previous mining documents associated with the James Property. Provincial mapping data provided by the province indicated the origin of the unnamed tributary originated north of the James North Mine location. During winter baseline studies, conducted in late March 2007, spring locations were identified to assist in the summer physical habitat assessments. Seasonal environmental baseline studies ahve been conducted in the study area since 2005.

During the meeting with DFO staff in September 2007, and again in February and June 2008, DFO staff outlined that the fish habitat classification type values to be assessed were based on those described in Tables 4.2 (flow, current, depth and substrate parameters) and 4.2 (general habitat types) from the DRAFT Interim *Standard Methods Guide for Freshwater Fish and Fish Habitat Surveys in Newfoundland and Labrador: Rivers and Streams (2007)*.

5.2 Field Survey

5.2.1 September 2007

A physical habitat survey was conducted on September 21, 2007. Data collected included habitat type, mean wetted depth and width, substrate, % cover and type as well as additional comments including presence of redds, fish observations, etc. The stream was separated into reaches in the field when a typical reach break characteristic was observed. The lengths of the reaches were determined in a desk top exercise using ArcGIS.

Electrofishing was not conducted as young of year (YOY), juvenile and adult brook trout (*Salvelinus fontinalis*) were visually detected from the stream bank by the investigators during the September assessment located at the start of Reach 2 (Figure 2) and was outside of the timing window permitted by the DFO collection permit.

5.2.2 July 2008

On July 8, 2008, flow data were collected at 26 sites using a HydroQual flow meter. Velocity and depth measurements were recorded at distances of ¼, half and ¾ across the stream and a mean flow value of each was derived and follow the methodology outline in the guidance provided by DFO.

5.2.3 Winter 2007, 2008, and Spring 2008

Field sampling for the water quality program was completed in late March/early April 2007 and 2008. General habitat conditions for the tributary were noted during this field program.

6. Results

6.1 Physical Fish Habitat

6.1.1 General

The unnamed tributary consisted predominantly of flats and runs. Riffles and glides were also present but true pools were limited in number. One pool in Reach 8 had an approximated wetted width of 2 metres and maximum depth of 1.12 metres and occurred at an abrupt angular redirection of the stream.

The substrate in the riffles and runs was typically cobbles and gravels and in the flats, sand, silt and detritus dominated. In many flat sections however, gravels occurred under the fines and during the fall 2007 survey, redds that had been excavated down to the gravel were observed in some of these flat sections (Table 1).

Cover for fish in flat sections was dominated by undercut banks and overhanging grasses. In the runs, the dominant cover was typically overhanging alders and willows.

The smaller tributary that flows into the unnamed creek from the west was originally described as having a mean wetted width of 0.5 metres on the field sheets. This value was increased to 1 metre for calculations since the margins of the tributary were choked with watercress and therefore the actual wetted width was functionally a larger value than 0.5.

Available Habitat

The approximate areas of available spawning, rearing, migration and adult resident habitat types are 351 m², 1227 m², 0 m² and 5716 m², respectively (Table 1). We retained the use of glide as a habitat type from the BEAK 1980 and Sooley *et al* 1998, as the DRAFT classification does not identify slow moving water within a wide shallow channel with water velocities below <0.1 m/sec

Figures 3, 4 and 5 provide a representation of the fish habitat conditions noted during the study. Annotated text for each photograph can be found in Appendix B.

6.1.2 Other Observations

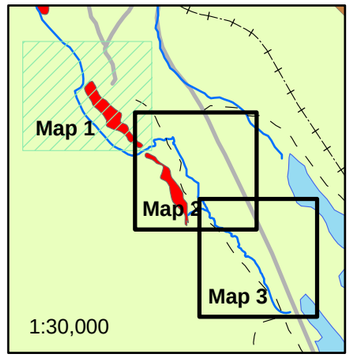
There appeared to be a significant decrease in the volumes of water flowing from the springs during the winter months. Sampling for the James North Spring indicated that flows were markedly reduced, as it took over one minute to fill a 1 litre bottle. Attempts to sample at pond locations along the tributary result in no water sample being collected, as the ponds were frozen solid to the substrate.

During the spring 2008 sampling program, it was noted the brook trout were actively swimming upstream from Bean Lake into the tributary. This observation was noted during the establishment of the hydrology monitoring station at the downstream perched culvert end along the road between the James and

Redmond Properties, as fish were jumping into the culvert during installation of water gauging devices (Figure 5, Photo H).

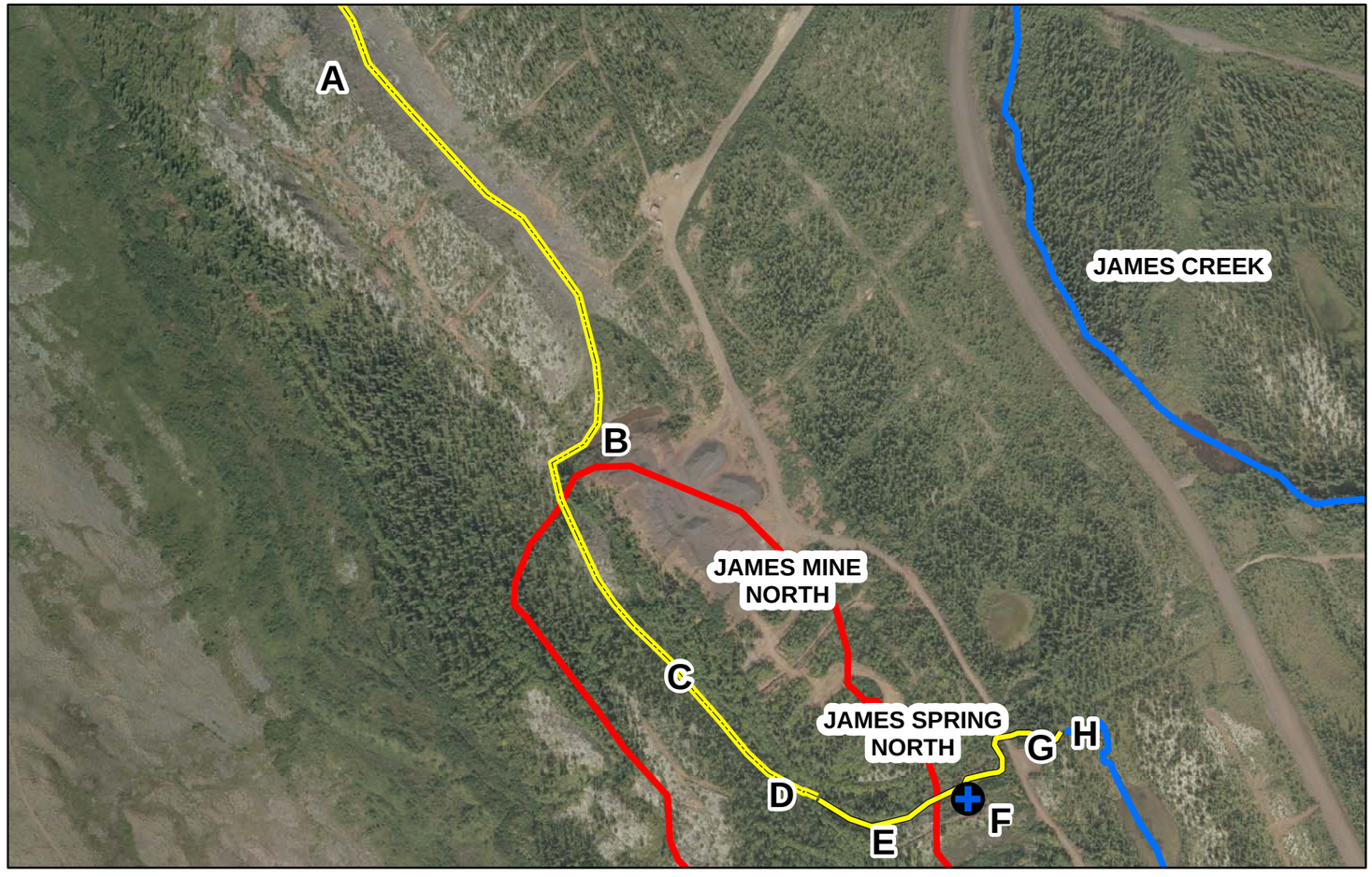
Table 1 Fish Habitat Classifications, Unnamed Tributary, James Property

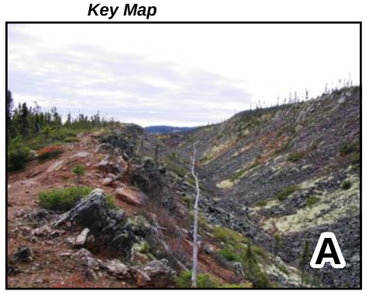
	Reach Number																																										Total Habitat Area
	1			2			pond			3			4			5	6			James S. Spring			7			8			9			10			11									
Habitat Type	Riffle	Flat	Pool	Glide	Flat	Pool				Riffle	Run	Pool	Riffle	Flat	Pool	Glide	Riffle	Flat	Pool	Run	Riffle	Pool	Run	Glide	Pool	Riffle	Run	Pool	Riffle	Run	Pool	Riffle	Run	Flat	Riffle	Flat	Pool							
% Habitat				85	15					20	70	10	5	50	45	100		100		100			20	60	20	20	60	20	50	50			100		100								
Reach Length (m)				92						47			53			53	100			105			231			353			104			230			14								
Habitat Type Length (m)				78	14					9	33	4.7	3	27	24	53		100		105			46	139	46	70	212	70	52	52			230		14								
Mean Wetted Width (m)				2.3	2.9					0.8	1.3	1.7	0.8	6.2	3.4	2.8		3.2		1			1.6	4	7	1.7	2.2	3.8	3.2	2.4			1.8		2.5								
Mean Wetted Depth (m)				0.1	0.4			< 0.5		0	0.1	0.2	0.1	0.1	0.2	0.3		0.2					0.1	0.2	0.2	0.1	0.1	0.5	0.1	0.1			0.2		0.1								
Approximate Area (m^2)				179	40			3522		12	43	6	19	167	149	148		320		105			74	556	322	119	466	266	166	125			414		35								
Mean Velocity at Flow Station (m/s)[1]					0.1									0.1				0		0.4						0.3	0.4	0.1	0.4			0.3										
Mean depth at Flow Station (m)					0.2									0.2				0.2		0						0.1	0.1	0.3	0.1			0.1										
Discharge m^3/s					0.1									0.1				0		0						0.1	0.1	0.1	0.1			0.1										
Spawning										12			19													119			166					35									**351**
Rearing											43									105			74				466			125			414									**1227**
Migration																																											**0**
Adult Resident				179	40			3522				6		167	149	148		320						556	322			266						41									**5716**
%Substrate	underground flow from road to start of Reach 2			80Sand 20Detritus	80sand 20detritus			10Detritus		80Gravels 20Cobbles	80Gravels 15Cobbles 5Sand	45Sand 45Gravels 10Detritus	100Gravels	95Detritus 4Gravels 1Boulder	100Gravels	100Detritus		100Detritus		70Gravels 20Cobbles 10Sand			100Detritus (over gravels/sand)	100Detritus (over gravels/sand)	100Detritus (over gravels/sand)	100Gravels	80Gravels 20Cobbles	80Gravels 20Detritus	80Gravels 20Cobbles	80Gravels 20Cobbles			50Gravels 50Sand		95Gravels 5Cobble								
Habitat types based on DRAFT Interim Riverine Habitat Classifications of Newfoundland Labrador																																										
[1] Flow data collected on July 8 2008; other physical habitat data collected on September 21 2007																																										



Key Map

0 50 100 200 300 400 Meters





JAMES PROPERTY

UNNAMED TRIBUTARY

Legend

Unnamed Tributary Classification

- Intermittent
- Permanent - No Fish
- Permanent - Fish Habitat
- Channelized - Fish Habitat
- Maximum Pit Extent

LHM

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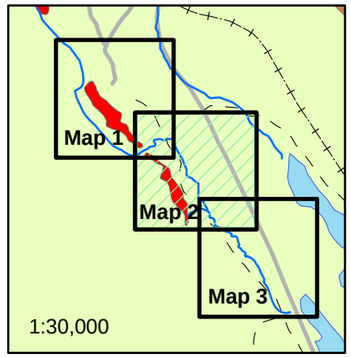
FISH HABITAT CLASSIFICATION

FIGURE 3

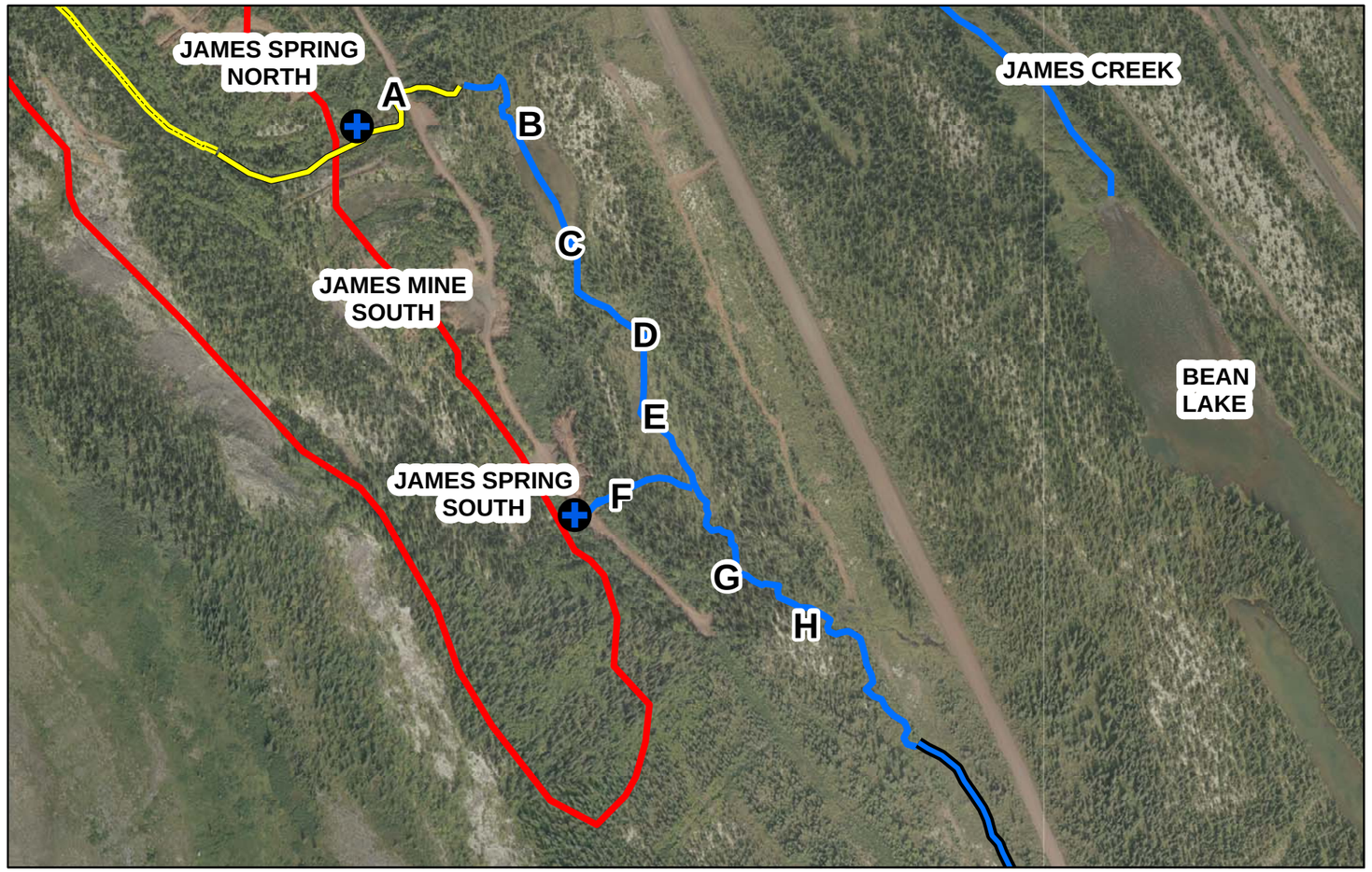
DATE: DECEMBER 2008

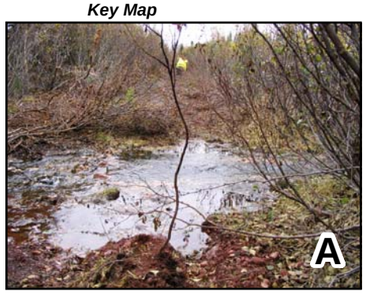
PROJECT NO.: 101931



Key Map

0 50 100 200 300 400 Meters





JAMES PROPERTY

UNNAMED TRIBUTARY

Legend

Unnamed Tributary Classification

- Intermittent
- Permanent - No Fish
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- Maximum Pit Extent

LIM

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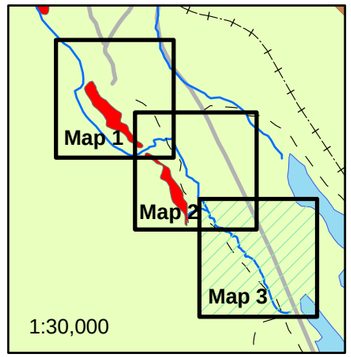
FISH HABITAT CLASSIFICATION

FIGURE 4

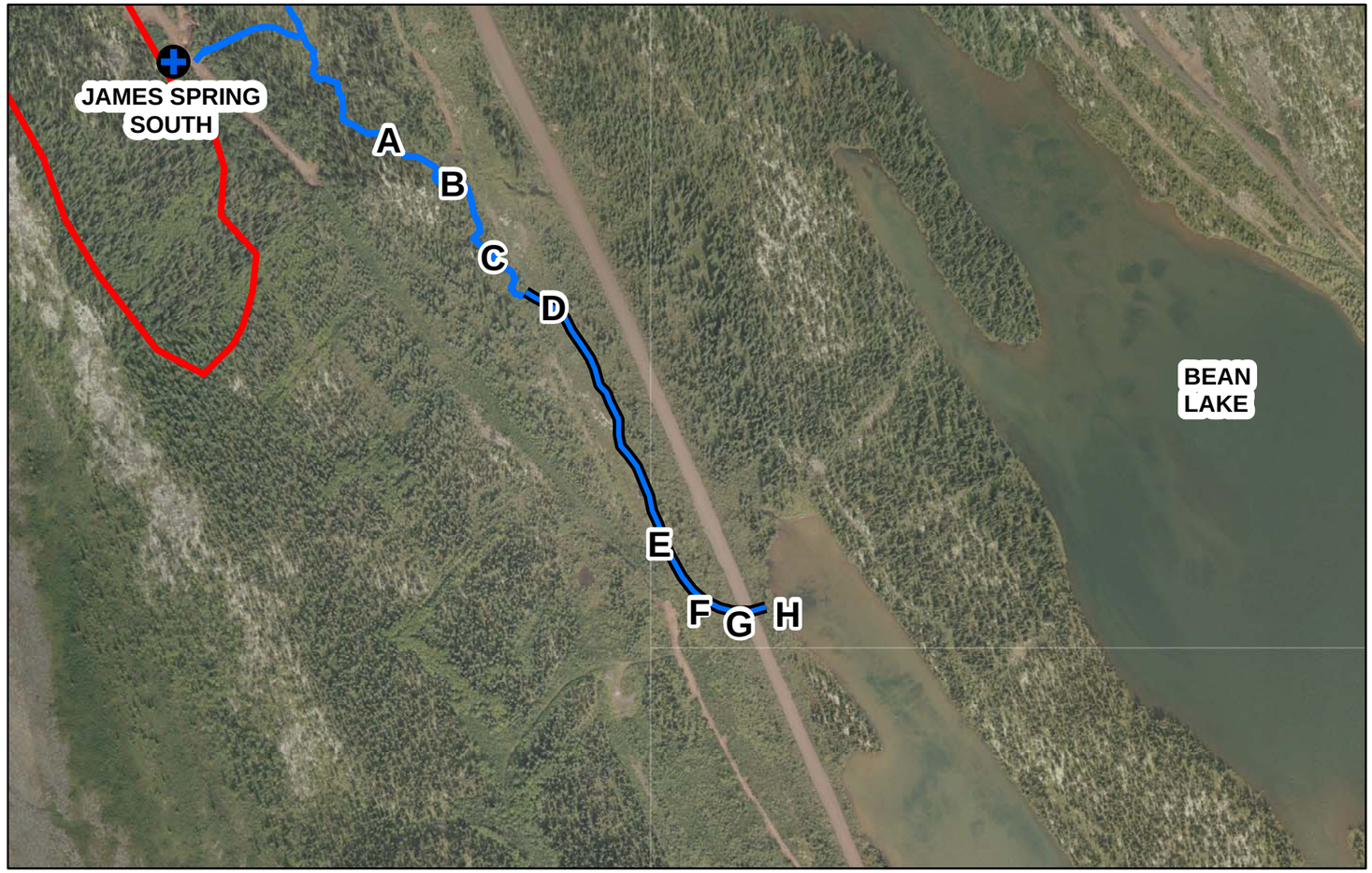
DATE: DECEMBER 2008

PROJECT N0.: 101931



Key Map

0 50 100 200 300 400 Meters



JAMES PROPERTY

UNNAMED TRIBUTARY

Legend

Unnamed Tributary Classification

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- Permanent - Fish Habitat
- Channelized - Fish Habitat
- Maximum Pit Extent

LHM

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FISH HABITAT CLASSIFICATION

FIGURE 5

DATE: DECEMBER 2008

PROJECT N0.: 101931

7. Discussion

Historic information (Drake, 1981) indicated that Bean Lake had been impacted by past mining activities. Habitat assessments made for the Unnamed Tributary indicate that past modifications (channel straightening) has occurred with the lower sections of the tributary, but sediment deposition noted in other historic mine impacted stream environments were not noted.

7.1 James North and South Mine Operations

Based on preliminary information provided by the LIM's engineering team and supporting information collected by WESA (2008) regarding the groundwater interactions with the Unnamed Tributary, the James North and South Springs are expected to be influenced by dewatering activities to facilitate ore extraction from both of the proposed mine sites.

The James North Pit and James South Pits have an estimated operating life of 5 years, with the first year of operation requiring active dewatering to commence late in 2009 to enable ore extraction in 2010. For this project, the mine design team allocated the required 15 m buffers, to satisfy DFO in mitigating active mining activities on the tributary.

7.2 Mitigation

LIM engineers, in combination with SNC Lavalin, have prepared preliminary pit designs and, as such, a mitigations option to maintain the viability of the Unnamed Tributary as viable fish habitat has been developed and includes the following mitigation measures to be implemented:

- Water pumped from groundwater dewatering wells for the James North and South Mine will be diverted into a 24 hour retention pond to allow particulate from the groundwater, if present, to precipitate out prior to maintaining flows in the Unnamed Tributary,
- Water quality from groundwater sampling indicates good water quality, with the exception of elevated total iron associated with suspended solids, as dissolved iron values are not considered to be elevated, based on CCME Guidelines (e.g., CCME, 2003, 2005, 2007) and presented in Section 4.1.5 of the EIS for the West Central Labrador Iron Ore Project
- Groundwater quality being diverted back into the stream will meet provincial water quality regulations and a regular water sample monitoring program will be developed and implemented;

- Should excess groundwater be present, it would be diverted into James Creek. It is also expected that a percentage of the groundwater can be redirected to the beneficiation area and/or used for general site use (dust suppression etc.);
- Pit dewatering and beneficiation area wash water will be directed to the Ruth Pit, an existing historical mining pit that has been tested to show that it is not fish habitat, to ensure that water that has come into contact with pit operations is not conveyed into areas of direct fish habitat,
- Upon closure, the pour point for the surface topography of the closed out mining areas will be directed back into the unnamed tributary to re-establish pre-development flows, and
- A monitoring program will be developed to assess the success of the mitigation outlined above (fish being present).

8. Conclusion

Based on the information provided by WESA 2008, the water that supplies the two springs (James Spring North and James Spring South) will be intercepted during dewatering activities and diverted back into the unnamed tributary, ensuring viable fish habitat during the operations of the mines. Past mining activities on the James Property has had no detectable impact on the unnamed tributary and thus no further detectable impacts to the unnamed tributary would be expected considering the proposed mining operation.

Mitigation measures to maintain viable fish habitat during and after mine operations will ensure that fish and fish habitat associated with the unnamed tributary will not be negatively impacted.

It is strongly believed that the information provided within this report and attached WESA 2008 report (Appendix A), will enable the DFO to determine their departments involvement during the EIS and permitting process.

9. References

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