

**TECHNICAL REPORT**

**On the**

**Jean Property**

**Thunder Bay Mining District  
Northwestern Ontario, Canada**

**Prepared for:**

**AsiaBaseMetals Inc.  
Suite 2560 - 200 Granville Street  
Vancouver, BC, Canada V6C 1S4**

**Prepared by:**

**Afzaal Pirzada, P.Geo.  
Consulting Geologist  
Geomap Exploration Inc.  
12430 - 76 Avenue  
Surrey, BC V3W 2T5**

**October 1<sup>st</sup>, 2014**



## TABLE OF CONTENTS

1.0	SUMMARY .....	8
2.0	INTRODUCTION .....	13
2.1	Purpose of Report .....	13
2.2	Sources of Information .....	13
3.0	RELIANCE ON OTHER EXPERTS.....	14
4.0	PROPERTY DESCRIPTION AND LOCATION.....	14
5.0	ACCESS, CLIMATE, PHYSIOGRAPHY, LOCAL RESOURCES, AND INFRASTRUCTURE.....	19
5.1	Access.....	19
5.2	Climate .....	19
5.3	Physiography.....	20
5.4	Local Resources and Infrastructure .....	21
6.0	HISTORY .....	21
6.1	Gunflint Iron Mines Ltd. (1943) .....	22
6.2	Great Lakes Resources Ltd. (2011-12) .....	24
6.2.1	<i>Prospecting and Sampling May 2011</i> .....	24
6.2.2	<i>August 2011 Exploration</i> .....	24
6.2.3	<i>2012 Exploration Work</i> .....	25
7.0	GEOLOGICAL SETTING AND MINERALIZATION .....	34
7.1	Regional Geology .....	34
7.2	Local Geology .....	36
7.2.1	Archean Basement Rocks.....	36
7.2.2	Aphebian Animikie Group.....	36
7.3	Property Geology .....	43
7.4	Mineralization .....	44
8.0	DEPOSIT TYPES.....	45
8.1	Deposit Types.....	45
8.2	Deposit Models .....	45
9.0	EXPLORATION .....	47
10.0	DRILLING .....	47
11.0	SAMPLE PREPARATION, ANALYSES AND SECURITY .....	47
12.0	DATA VERIFICATION.....	48
13.0	MINERAL PROCESSING AND METALLURGICAL TESTING .....	54
14.0	MINERAL RESOURCE ESTIMATES.....	54
23.0	ADJACENT PROPERTIES.....	54
23.1	Llyod K. Johnson Exploration (1952-1953) .....	54
23.2	ODM-Report 69 (1960) .....	61
23.3	Flint Rock Mines Ltd.....	61

23.4	Raytech Metals Corp. (2007-08) .....	65
23.5	Canada Iron Inc. (2010) .....	65
24.0	OTHER RELEVANT DATA AND INFORMATION .....	67
24.1	Environmental Concerns .....	67
24.2	Aboriginal Issues .....	67
25.0	INTERPRETATION AND CONCLUSIONS .....	67
26.0	RECOMMENDATIONS .....	70
27.0	REFERENCES .....	73
28.0	SIGNATURE PAGE .....	75
29.0	CERTIFICATE OF AUTHOR .....	76

**LIST OF FIGURES**

Figure 1: Property Location Map .....	17
Figure 2: Mineral Claim Map.....	18
Figure 3: Climate Data.....	20
Figure 4: Location of Historical Drill Holes.....	32
Figure 5: Regional geological map showing location of iron ranges (G.A Gross 2009). .....	35
Figure 6: Local Geological Map.....	40
Figure 7: Adjacent Property showing location of LKJE and Flint Rock Mining Work Location .....	66

**LIST OF TABLES**

Table 1: Claim Data .....	16
Table 2: Drill logs – 1943 drill program.....	23
Table 3: Magnetic tube tests – 1943 drill program .....	23
Table 4: Co-ordinates and Lengths of Drill holes - May-June 2012 Drilling Program.....	26
Table 5: Weighted Assay: Lower Taconite Member -May-June 2012 Drilling Program.....	30
Table 6: Davis Tube Test: Recovery and Assays of Lower Taconite Member - May-June 2012 Drilling Program .....	31
Table 7: Generalized stratigraphic column of the area.....	36
Table 8: Stratigraphy of Gunflint Iron Formation .....	37
Table 9: Average Iron and Silica Content of Mineralized Members in Gunflint Iron Formation .....	44
Table 10: Description of Samples (May 21, 2011 property visit) .....	48
Table 11: List of core samples collected during Sep 21-22, 2013 property visit .....	49
Table 12: Results of Davis Tube Recovery – 2011 Sampling.....	50
Table 13: Highlights of Sample Assay Results – XRF (2011 Sampling).....	50
Table 14: Assay results for drill core samples collected during Sep 21-22, 2013 Property visit .....	51
Table 15: Magnetic tube tests - 1952 .....	57
Table 16: Drill logs 1952 exploration .....	58
Table 17: Assay results of Drillhole 1 – 1952 exploration.....	59
Table 18: Assay results of Drillhole 2 – 1952 exploration.....	60
Table 19: Drill logs – FR Drill Program 1960.....	63
Table 20: Drill logs summary – FR Drill Program 1962 .....	64
Table 21: PHASE 1 BUDGET – Ground Geophysical Survey, Mapping, Trenching and Sampling.....	71



## 1.0 SUMMARY

Afzaal Pirzada of Geomap Exploration Inc. (“the author”) was retained by AsiaBaseMetals Inc. (“ABZ” or “the Company”) to prepare an independent Technical Report on the Jean Property (“the Property”). The report was prepared as part of the Company’s due diligence to support the Property acquisition and secure future financing.

The Jean Property consists of 17 mineral claims in 114 units covering 2,596 hectares land located in Thunder Bay Mining District of Northwestern Ontario, Canada. The Property is located about 65 kilometers to the southwest of Thunder Bay, approximately 2 kilometers north of the Whitefish Lake on Highway 588. The Property can be accessed via the Trans-Canada Highway 11/17, about 20 km west from the Highway 61 junction to Highway 588 (Stanley access), and then a further 45 km southwest along Highway 588. A network of gravel roads and trails traverse the mineral claims and areas of rock exposures.

Great Lakes Resources Ltd. (“Great Lakes”) owns 100 % of the Mineral Claims. The Property was optioned by ABZ through an agreement under which the Company can acquire 100% ownership of the Property by: issuing a total of 1.6 million shares, making cash payments totalling \$300,000 and incurring aggregate expenditures of \$160,000. Great Lakes will retain a 2% NSR of which one percent can be purchased for \$2-million.

The Jean Property area is underlain by an Archean granitic basement, which is unconformably overlain by gently southerly-dipping sedimentary rocks of the Aphebian (lower Proterozoic) Animikie group. These sediments are capped by a Helikian (1.0 Ga) Keweenawan diabase sill. Unconsolidated rocks are Pleistocene age glacial till debris which forms an extensive mantle over low-lying parts of the area.

Gunflint Iron formation of Animikie Group is part of extensive Lake Superior-type iron formation (LSTIF) ranges developed along the margins of cratons or epicontinental platforms between 2.4 Ga and 1.9 Ga. It is banded iron formation (BIF) mainly comprised of taconite rocks, and is characterized by unusually high iron content, as well as by a variety of textures, of which the granular texture of the taconite rock being most distinctive. The Gunflint formation, approximately 145 m thick, is divided into lower and upper cycles. Each cycle contains a sequence of members, most of which are common to both. The uppermost member, a limestone bed, is unique to the formation and marks the top of the iron-bearing rocks. The key economic parameters for magnetite iron being economic in BIF are the crystallinity of magnetite, the grade of the iron in the host rock, and the contaminant elements which exist within the magnetite concentrate. The typical grade of iron at which a magnetite-bearing banded iron formation becomes economic is roughly 25% Fe, which can generally yield a 33% to 40% recovery of magnetite by weight, to produce a concentrate grading in excess of 64% iron by weight.



ABZ has not carried out any exploration work on the Property. The historical exploration data available for the Property area includes geophysical surveys, geological mapping, diamond drilling, bulk surface sampling, and magnetic tube testing of core and surface samples. This work was carried out during the period from 1943 to 1962. The total Fe% obtained through magnetic tube separation and acid roasting with magnetic concentration range from 23.95% to 39.85% for feed, from 38.66% to 54.21% for minus 100-mesh and from 43.42% to 56.77% for minus 200-mesh.

In 2011, Great Lakes Resources Ltd. (GLR) re-activated exploration work on the current Property with two-phase geologic exploration and surface sampling program. The first phase program conducted in May 2011, consisted of field geological prospecting, collection of selective grab samples to verifying historical information, assaying for iron content and Davis Tube Test (DTT) for magnetic concentrates. The second phase program was followed in August 2011 and consisted of systematic channel and bulk sampling, DTT test, Mineral Liberation Analysis (MLA) test and geological report writing.

In May-June 2012, GLR followed-up previous year surface sampling program with diamond drilling program. A grid totaling 3.5km was planned and cut according to iron formation stratigraphy. The base line, 2km in length, trends 055° azimuth with perpendicular 0.5km tie-lines.

The diamond drilling program was planned to adequately understand the third depth dimension of iron formation stratigraphy and to correlate with surface geology and sampling. The program includes eight vertical NQ-size drill holes totaling 492.88m bounding 3km by 0.5km area. The drilling program started on May 15, 2012 and completed on June 6, 2012. Geology obtained from the diamond drill program verified known surface geology with additional detailed stratigraphic information. The drill area is underlain by northeast trending (approximately 055° azimuth) gently 4-5° southeast dipping Lower Gunflint Formation. Lower Taconite Member of Lower Gunflint Formation was the main economically-interesting stratigraphic horizon investigated in this program. All eight holes intersected iron bearing Lower Taconite Member, whereas two complete Lower Taconite Member vertical intersections were delineated in holes JN12-03 (56.81m) and JN12-05 (57.75m). The average true thickness is estimated to be 57.06m.

Only Upper Shale, Upper Jasper and Upper Algae Chert Member composing lower portion of Upper Gunflint Formation was encountered in two holes, JN12-03 and JN12-05, located on the higher ground and on baseline or southern portion of the drilled area. No Upper Taconite Member was intersected during the program. Both Upper Gunflint and Lower Gunflint Formation within the Property contain no diluting diorite sills. Narrow diorite sills less than a meter in thickness, are only recorded in JN12-02 and JN12-04 at the contact of the base of Lower Gunflint Formation and underlying Archean Basement. A total of 84 drill core samples with varying length from 0.33m to 12.00m based on geology were collected and assayed for iron content. In addition, Davis Tube Test (DTT) on two composite samples combined from drill core samples of Lower Taconite Member of Lower Gunflint Formation,

one from JN12-03 and the other from JN12-05 was performed. The results indicated 23.44 percent weighted average iron (Fe). For DTT, the weighted average feed grade was 24.08% Fe. For minus 200-mesh size, the magnetic concentrates recovery averaged 7.48% with the magnetic concentrates grade of 57.79% Fe. The non-magnetic concentrate values for this size fraction were 91.45% for recovery and 22.55% Fe for grade.

Mineral Liberation Test results on two samples indicated that the Lower Taconite Members samples are mineralogically fairly similar with average magnetic content of 8.34% and average magnetic grain size of 23 microns. The non-magnetic goethite/siderite averaged 4.1%. The sample from Lower Shale contains <0.1% magnetite with main iron minerals as pyrite (14.3%) and goethite/siderite (combined 17.3%).

Finding more areas with natural concentration of iron in GIF is a key exploration criterion for further development of the Property. Previous exploration and geological work indicate that there is no direct evidence for natural concentrations of iron within the Jean Property area. Rocks of the Lower Taconite member appear to have been weathered more than the other parts of the formation, particularly in the ridges and mounds north of the Whitefish River. The Upper Taconite rocks show the least signs of oxidation and leaching. The member typically occupies a high topographic position beneath diabase sills of considerable thickness, and oxidizing activity may have been restricted for this reason.

The economic future of the iron-bearing rocks of Jean Property also appears to depend upon a process that will produce a commercial concentrate. More detailed metallurgical testing might reveal such a process.

The data presented in this report is based on published assessment reports available from Great Lake Resources, Ontario MNDMF, the Geological Survey of Canada, and the Ontario Geological Survey.

A part of the field data presented in this report was collected by the author during May 21, 2011 and September 21-22, 2013 Property visits. The geological work performed in order to verify the existing data consisted of surface rock and drill core sampling, and visiting accessible rock outcrops. The sampling approach for this reconnaissance work was to collect representative surface rock and drill core samples from each of the dominant rock type present on the Property. A total of five representative grab rock and eight drill core samples were collected and placed in marked poly bags, and shipped to the laboratory for analysis. The magnetic tube separation of grab rock samples indicated that the percent values of magnetics are 41.1% and 58.3% in samples GE-JP11-01 and GE-JP11-05, respectively. These samples are from upper taconite member of Gunflint Iron formation. The drill core samples were collected from Lower Gunflint formation and their results indicated indicate iron oxide ( $\text{Fe}_2\text{O}_3$ ) in the range of 28.53% to 73.17%. Two values of relatively higher iron content are shown in samples JN12-03-32.5m (61.46%  $\text{Fe}_2\text{O}_3$ ) and JN12-05-29.5m (73.17%).

Based on its favourable geological setting indicating surface and subsurface presence of Gunflint Iron formation (GIF), and the results of present study, it is concluded that the Property is a property of merit and possess a good potential for discovery of economic concentration of iron bearing rocks through further exploration and improvement of beneficiation processes. Good road access, availability of exploration and mining services in the vicinity makes it a worthy mineral exploration target. The historical exploration data collected by previous operators on the Property provides the basis for a follow-up work program. The author is of the opinion that the present study has met its original objectives.

### ***Recommendations***

In the qualified person's opinion the character of the Jean Property is sufficient to merit the following phased work program, where the second phase is contingent upon the results of the first phase.

#### ***Phase 1 – Ground Geophysical Survey, Drilling, Trenching and Sampling***

This work includes carrying out ground magnetic survey in the area adjacent to the southeast and southwest of 2012 drill program carried out by Great Lake Resources. Extension of line cutting grid of 2012 will be a good option to tie up historical data with new survey lines. Geological mapping, prospecting, trenching and sampling work should also be carried out alongside the geophysical survey. A 1,000 metres diamond core drilling program should follow-up ground geophysics and trenching work.

Phase 1 work program will be of six weeks duration with a budget of \$202,950, and includes the following tasks:

- Ground Total Field Magnetometer survey at 100 m line spacing and 25 metres survey spacing;
- Detailed geological mapping, sampling and trenching of all accessible rock units of Gunflint Iron Formation with special emphasis on the area in the vicinity of 2012 drill program;
- Drilling eight to ten holes in the extension of 2012 drilling grid, with a total drilling of 1,000 metres; and
- Sample assaying for XRF and Davis tube separation.

#### ***Phase 2 – Step-out and Infill Exploratory Drilling and Beneficiating Tests***

If results from the first phase are positive, then a step-out and infill drilling program would be warranted. This work will help to define the trends and continuity of the favourable taconite units of Gunflint Iron formation within and adjacent to the past exploratory drilling area. This drilling program, if successful will provide basis of iron resource estimation. The metallurgical testing will help in defining the potential for economic concentration of iron in taconite. The scope of work and location of drill holes would be

determined based on the findings of Phase 1 investigations. Initially a 3,000 metres diamond core drilling is proposed in 20-25 drill holes.

Estimated cost of this program is \$450,000.

## **2.0 INTRODUCTION**

### **2.1 Purpose of Report**

Afzaal Pirzada of Geomap Exploration Inc. (“the author”) was retained by AsiaBaseMetals Inc. (“ABZ” or “the Company”) to prepare an independent Technical Report on the Jean Property (“the Property”). The report was prepared as part of the Company’s due diligence to support the Property acquisition and secure future financing.

### **2.2 Sources of Information**

The present report is based on published assessment reports available from the Ministry of Northern Development, Mines and Forestry (MNDMF) Ontario, and published reports by the Ontario Geological Survey (OGS), the Geological Survey of Canada (“GSC”), various researches, websites, and personal observations during the Property visits. All consulted sources are listed in the References section. The sources of the maps are noted on the figures.

The author carried out two visits of the Property, the first visit was carried out on May 21, 2011, and the second visit was on September 21-22, 2013. The scope of Property inspections was to verify historical information about: the Property geology, mineralization, and structures; past exploration work on the Property, Property accessibility and location; and location of sources of water, electricity and utilities. The geological work performed in order to verify the existing data consisted of rock chip and drill core sampling and visiting reported approachable historical exploration work areas.

The author was retained to complete this report in compliance with National Instrument 43-101 of the Canadian Securities Administrators (“NI 43-101”) and the guidelines in Form 43-101 F1. The author is a “qualified person” within the meaning of National Instrument 43-101.

The information, opinions and conclusions contained herein are based on:

- Information available to the author at the time of preparation of this report;
- Assumptions, conditions, and qualifications as set forth in this report; and
- Data, reports, and other information supplied by ABZ and other third party sources.

The author has no reason to doubt the reliability of the information provided by ABZ. The author reserves the right, but will not be obliged to revise the report and conclusions if additional information becomes known subsequent to the date of this report.

### 3.0 RELIANCE ON OTHER EXPERTS

For the purpose of the report the author has reviewed and relied on ownership information provided by ABZ which to the author's knowledge is correct. A limited search of tenure data on the MNDMF Database Online website on September 3<sup>rd</sup>, 2014, conforms to the data supplied by ABZ. However, the limited research by the author does not express a legal opinion as to the ownership status of the Jean Property. This disclaimer applies to ownership information relating to the Property, and the information is available in Section 1 (Summary) and Section 4 (Property Description and Location) of this report.

### 4.0 PROPERTY DESCRIPTION AND LOCATION

The Jean Property consists of 17 mineral claims in 114 units covering 2,596 hectares land located in Thunder Bay Mining District of Northwestern Ontario, Canada (Figure 1 and 2). It is located about 65 kilometers to the southwest of Thunder Bay, approximately 2 kilometers north of the Whitefish Lake on Highway 588. 0864479 BC Ltd. which changed its name to Great Lakes Resources Ltd. ("Great Lakes") owns 100 % of the Mineral Claims.

The Property was optioned by ABZ through an agreement announced by the Company on August 26, 2014. Under the terms of the option agreement AsiaBaseMetals Inc. may earn a 100-per-cent interest in the project by:

1. Issuing to Great Lakes a total of 1.6 million common shares of AsiaBaseMetals Inc. as follows:
  - I. 50,000 shares within two business days of TSX Venture Exchange acceptance;
  - II. 50,000 shares on or before Nov. 30, 2015;
  - III. 500,000 shares on or before the later of: (i) the date of completion of a second National Instrument 43-101-compliant technical report on the project addressed to AsiaBaseMetals Inc. (the technical report date); and (ii) March 31, 2017;
  - IV. 500,000 shares on or before the commencement of a drilling program of over \$100,000 on the project (the drilling date);
  - V. 500,000 shares on or before the date of completion of an NI 43-101-compliant technical report on the project containing a resource estimate of over 100 million tonnes (the resource estimate date);
2. Making cash payments to Great Lakes totaling \$300,000 as follows:
  - I. \$100,000 on or before the later of: (i) the technical report date; and (ii) March 31, 2017;
  - II. \$100,000 on or before the drilling date;
  - III. \$100,000 on or before the resource estimate date; and,

3. Incurring at least \$160,000 in expenditures on the project as follows:

- I. \$10,000 on or before March 31, 2015;
- II. \$50,000 on or before Sept. 30, 2015;
- III. \$100,000 on or before Sept. 30, 2016.

Any expenditures incurred in excess of the requirements for any period set out above will be credited against the requirements of the next succeeding period, and any shortfall in such expenditures can be made up with a cash payment in lieu of work. Great Lakes will retain a 2-per-cent net smelter return royalty (NSR) from commercial production of mineral products from the project. AsiaBaseMetals Inc. will be entitled to purchase one-half of the royalty (1 per cent) for \$2-million. There are no other known royalties or encumbrances attached to the Property.

The Property claims were registered on November 16, 2009 for a period of two years. Great Lakes carried out exploration work which was applied as assessment credits to extend the claims due date to November 16, 2015. An assessment work of \$45,600 would be required to be spent on these claims before the expiry date of November 16, 2015. The Ministry of Northern Development and Mines Ontario (MNDM) keeps an online record of mineral claims information. The MNDM records show an exploration work reserve of \$18,168 which can be applied towards the next claim renewal and reduces the assessment work cost required to \$27,432. The claims were staked on ground by erecting physical posts as required by claim staking regulations in Ontario. In Ontario all mineral claims staked are subject to \$400 per unit worth of eligible assessment work to be undertaken before year 2 anniversary, followed by \$400 per unit per year thereafter.

There is no past producing mine on the Property and there were no historical mineral resource or mineral reserve estimates documented.

There are no known environmental liabilities and no permits have been applied for or acquired for the Property. Exploration work permits are required for the exploration work recommended in this report. Surface rights owners must be notified when applying for a permit. Aboriginal communities potentially affected by the exploration permit activities will be consulted and have an opportunity to provide comments and feedback before a decision is made on the permit by MNDM.

Claim data is summarized in the Table 1, while a map showing the claims is presented in Figure 2.

Township/Area	Claim Number	UNITS	SIZE (Hectares)	Recording Date	Claim Due Date	Status	Percent Option	Work Required	Total Applied	Total Reserve
JEAN	4252101	6	96	2009-Nov-16	2015-Nov-16	A	100%	\$2,400	\$9,600	\$0
JEAN	4252102	2	32	2009-Nov-16	2015-Nov-16	A	100%	\$800	\$3,200	\$0
JEAN	4252103	1	16	2009-Nov-16	2015-Nov-16	A	100%	\$400	\$1,600	\$0
JEAN	4252104	16	256	2009-Nov-16	2015-Nov-16	A	100%	\$6,400	\$25,600	\$0
JEAN	4252105	8	128	2009-Nov-16	2015-Nov-16	A	100%	\$3,200	\$12,800	\$0
HARDWICK	4252106	8	128	2009-Nov-16	2015-Nov-16	A	100%	\$3,200	\$12,800	\$0
JEAN	4252107	6	96	2009-Nov-16	2015-Nov-16	A	100%	\$2,400	\$9,600	\$0
JEAN	4252108	16	256	2009-Nov-16	2015-Nov-16	A	100%	\$6,400	\$25,600	\$0
JEAN	4252109	2	32	2009-Nov-16	2015-Nov-16	A	100%	\$800	\$3,200	\$0
JEAN	4252110	16	256	2009-Nov-16	2015-Nov-16	A	100%	\$6,400	\$25,600	\$6,510
JEAN	4252111	4	64	2009-Nov-16	2015-Nov-16	A	100%	\$1,600	\$6,400	\$1,628
JEAN	4252112	1	16	2009-Nov-16	2015-Nov-16	A	100%	\$400	\$1,600	\$0
JEAN	4252113	8	128	2009-Nov-16	2015-Nov-16	A	100%	\$3,200	\$12,800	\$3,254
JEAN	4252114	3	48	2009-Nov-16	2015-Nov-16	A	100%	\$1,200	\$4,800	\$1,220
JEAN	4252115	3	48	2009-Nov-16	2015-Nov-16	A	100%	\$1,200	\$4,800	\$1,220
WABINDON LAKE AREA	4252116	2	32	2009-Nov-16	2015-Nov-16	A	100%	\$800	\$3,200	\$0
WABINDON LAKE AREA	4252117	12	192	2009-Nov-16	2015-Nov-16	A	100%	\$4,800	\$19,200	\$4,336
TOTAL		114	1824					\$45,600		\$18,168

Table 1: Claim Data



Figure 1: Property Location Map

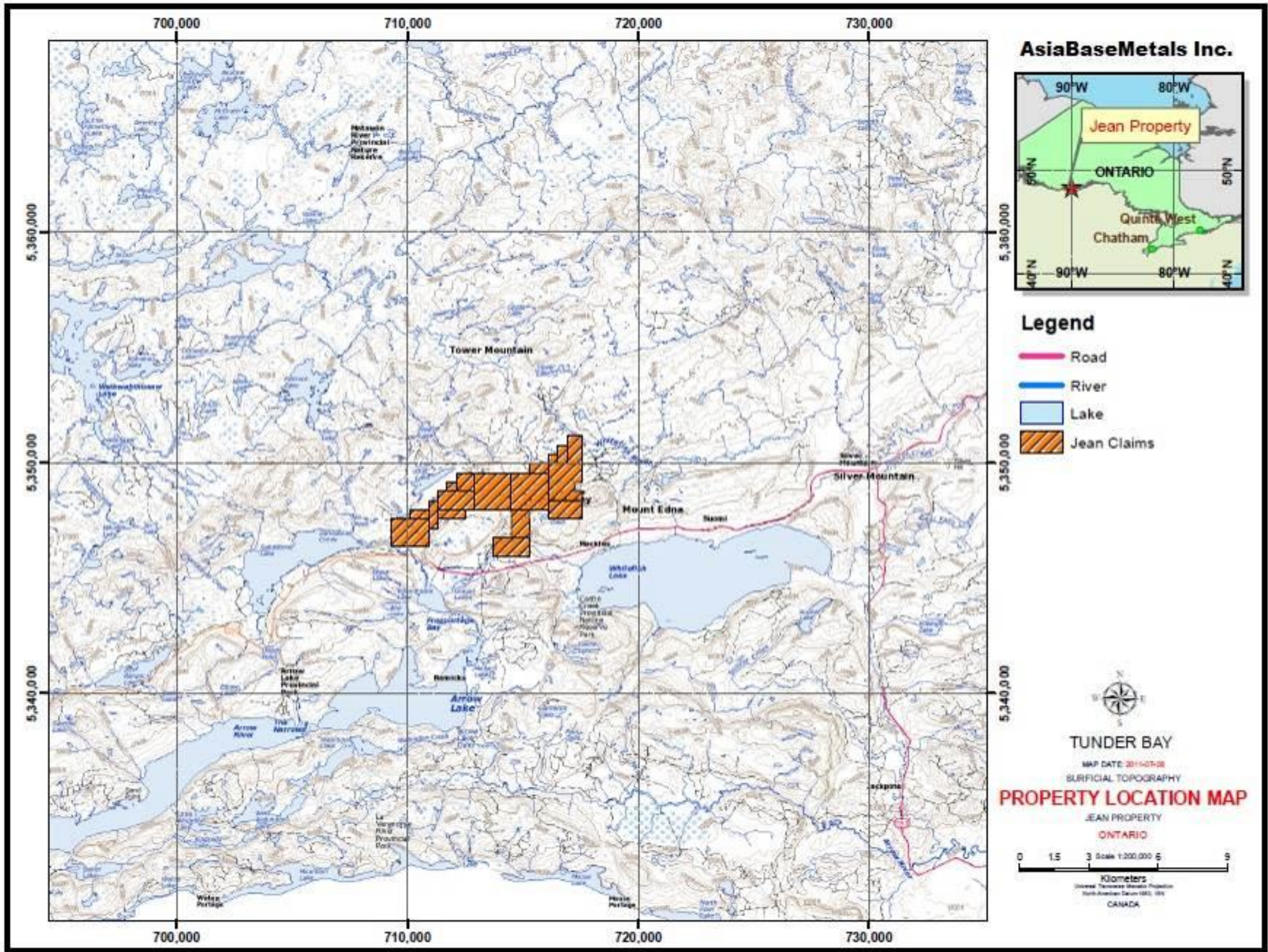
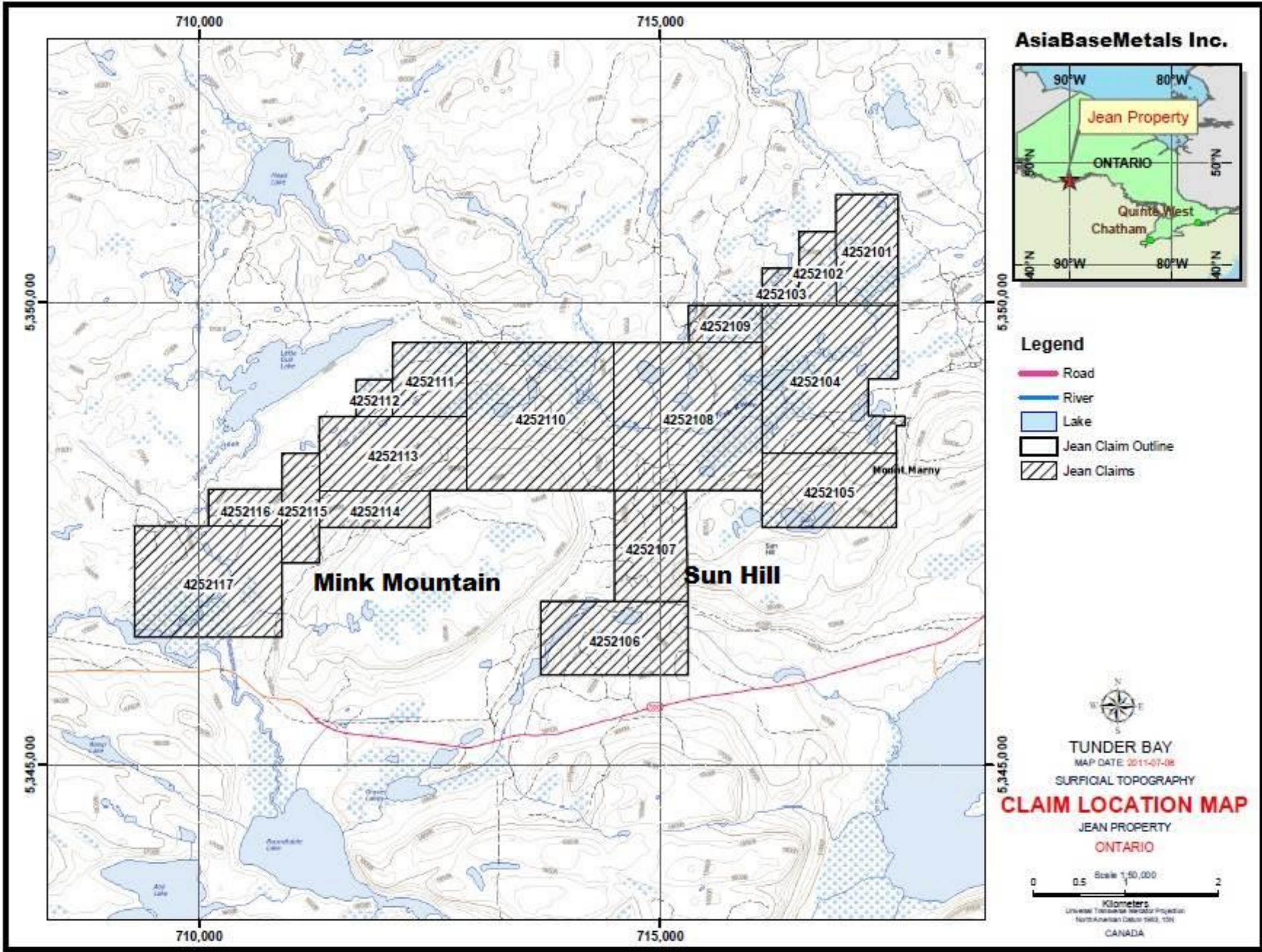




Figure 2: Mineral Claim Map



## **5.0 ACCESS, CLIMATE, PHYSIOGRAPHY, LOCAL RESOURCES, AND INFRASTRUCTURE**

### **5.1 Access**

The Jean Property has good year round road access from the town of Thunder Bay, Ontario (Figure 1). Highway 588, located immediately to the south of the Property is a paved all season road. The Property can be accessed via the Trans-Canada Highway 11/17, about 20 km west from the Highway 61 junction to Highway 588 (Stanley access), and then a further 45 km southwest along Highway 588. Travel time by road from Thunder Bay to the Property is approximately one hour. A network of gravel roads and trails traverse the mineral claims and areas of rock exposures.

### **5.2 Climate**

The climate of Thunder Bay region including the Jean Property area is influenced by Lake Superior, resulting in cooler winter temperatures and warmer summer temperatures for an area extending inland as far as 16 km. The average daily temperatures range from a high of 17.6 °C in July and a low of -14.8 °C in January. The summer period is approximately 97 days in length extending from the beginning of June to the beginning of September; fall lasts about 60 days and extends to November. The winter season lasts approximately 6 months extending from November through to May. Although the area normally has about six months of snow-free conditions, exploration and mining work can be carried out throughout the year.



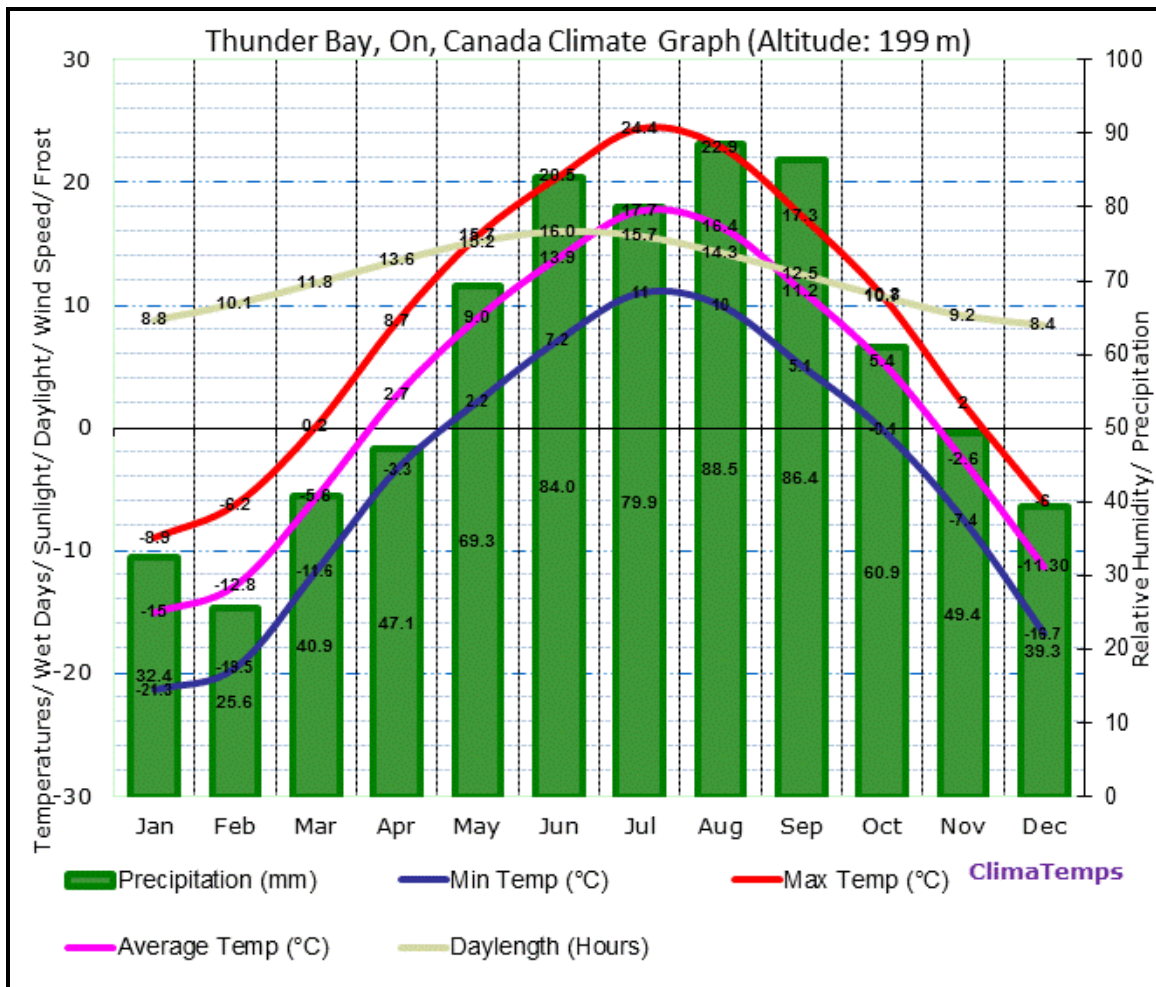


Figure 3: Climate Data

### 5.3 Physiography

The maximum relief in the area is about 110 metres (from 470 m to 580 m above sea level). Topography is generally flat with the exception of hills located in the southern part of the Property and were formed due to the presence of diabase sill rocks that has resisted erosion and now stands above the surrounding flat lying terrain in the form of large round mesas such as Mink Mountain and Sun Hill (Figures 2 and 4). The southern and western areas of the Property drain southward by the tributaries of the Pigeon River, which enters Lake Superior at Pigeon Point. Drainage in the eastern part of the Property mostly runs through tributaries of the Whitefish River, which joins the Kaministiquia River, and thence flows through Fort Williams to Lake Superior.

The Property area is a part of the Whitefish River watershed. Some of the more common wildlife species that live in the area include otters, beavers, whitetailed deer, black bear, muskrat, pileated woodpecker and various migratory birds. The Whitefish River watershed includes many other mammals, birds, fish and insects that are commonly found in the Great Lakes and Boreal Forest Regions. Most of the watershed is dominated by white spruce,

trembling aspen, black ash and balsam fir (Zago 2012). The Property area is mostly covered by forest and bush mostly of second growth.

Exposures of iron-bearing rocks are scarce in the low-lying country adjoining streams and lakes because of drift cover. Beneath the diabase capping of hills and ridges, however, the rocks are well exposed.

#### **5.4 Local Resources and Infrastructure**

The town of Thunder Bay, located about 65 kilometres from the Property, is the largest city in Northwestern Ontario, serving as a regional commercial Centre. The town is a major source of workforce, contracting services, and transportation for the forestry, pulp and paper and mining industry. Thunder Bay is a transportation hub for Canada, as the TransCanada highways 11 and 17 link eastern and western Canada. It is close to the Canada-U.S. border and highway 61 links Thunder Bay with Minnesota, United States. Thunder Bay has an international airport with daily flights to Toronto, Ontario and Winnipeg, Manitoba and the United States. There is a large port facility on the St. Lawrence Seaway System which is a principal north-south route from the Upper Midwest to the Gulf of Mexico.

The city of Thunder Bay has most of the required supplies for exploration work including drilling and geophysical survey companies, grocery stores, hardware stores, exploration equipment supply stores, restaurants, hotels, and a hospital. The population of the city of Thunder Bay was 109,140 people in 2006 (Statistics Canada, [www.statcan.gc.ca](http://www.statcan.gc.ca)). Many junior exploration and mining companies are based in Thunder Bay, and thus the city is a source of skilled mining labour.

There are several lakes, rivers and creeks in and around the Jean Property area which can be a source of water. Power lines are also within a few kilometres range.

(Source: [http://www.thunderbaydirect.info/about\\_thunder\\_bay](http://www.thunderbaydirect.info/about_thunder_bay)

[http://www.thunderbay.ca/Doing\\_Business/About\\_Thunder\\_Bay.htm](http://www.thunderbay.ca/Doing_Business/About_Thunder_Bay.htm))

### **6.0 HISTORY**

The Jean Property is underlain by Gunflint Iron Formation (GIF) which was first discovered in 1850. The earliest recorded geological investigation of the Gunflint was conducted by E. O. Ingall in 1887 who briefly described the iron-bearing strata near Silver Mountain and Whitefish Lake. Other early accounts were made by Smith (1905) and Silver (1906). Van Hise and Leith in 1911 presented a general overview of the iron bearing rocks in the Thunder Bay district. In 1924 J. E. Gill was the first to describe the Gunflint Iron Formation in detail, and in 1926, its stratigraphy northeast of Silver Mountain. T. L. Tanton described the iron prospects at Mink Mountain in 1923, and in 1931 gave an overview of the general geology in the vicinity of Thunder Bay (Pufahl 1996). The Property was part of historical exploration work carried out by various operators in this area. The historical exploration and geological work documented on

the Property area is summarized in the following sections, and the work on adjoining properties is summarized in Section 23 of this report.

## **6.1 Gunflint Iron Mines Ltd. (1943)**

Gunflint Iron Mines Ltd. (GIML) in 1943 staked and explored southern portion of Mink Mountain which is now located within the Jean Property with 10-hole diamond drilling program out of which only one was located on the Property. The assessment report on their work is not available. However, drill logs of 10 holes were attached in the 1952 assessment report of Lloyd K. Johnson Exploration.

During 10-hole drilling program, four holes were abandoned because of thick overburden and only six holes, No. 1, No. 3, No. 4, No. 5, No.7 and No. 8, were completed. A compilation of drill hole data indicated that hole number 7 is located on the Jean Property claim 4252106 (Figure 4). The original drill logs were pre-Moorehouse and Goodwin's 1960 stratigraphic classification and nomenclature, and were just purely lithologic descriptions.

In 1960, Moorehouse and Goodwin re-interpreted five (No. 1, No. 3, No. 4, No. 5 and No.7) of six drill logs of completed holes using their adopted stratigraphic classification and nomenclature system and included in their Ontario Department of Mines (ODM)-Report ORV 69.

The oriented summarized drill logs based on information obtained from ODM-Report ORV 69 is shown in Tables 2 and 3. In 1952, ODM collected four drill core samples belonging to Lower Taconite by their interpretation, from one hole located west of Mink Mountain and Lloyd K. Johnson Exploration conducted minus 100- and minus 200-mesh magnetic tube test for determining total iron content (Fe%).

The total Fe% obtained range from 22.18% to 26.86% for feed, 34.68% to 52.26% for minus 100-mesh and 50.08% to 62.26% for minus 200-mesh, and was published as representative for Lower Taconite in ODM-Report 69 (Table 3).

Oriented Summarized Drill Logs															
Gun Flint Mines Ltd: Drill Program 1943															
Member	South of Mink Mountain														
	Hole No. 4 (West)			Hole No. 5			Hole No. 3			Hole No. 1			Hole No. 7 (East)*		
	From (m)	To (m)	Interval (m)	From (m)	To (m)	Interval (m)	From (m)	To (m)	Interval (m)	From (m)	To (m)	Interval (m)	From (m)	To (m)	Interval (m)
Overburden	0.00	44.53	44.53	0.00	64.66	64.66	16.69	68.93	52.24	16.65	71.37	54.72	0.00	54.595	54.60
Upper Taconite				64.66	80.52	15.86	68.93	71.07	2.14	71.37	76.86	5.49	54.60	89.06	34.47
Upper Shale				EOH			71.07	71.83	0.76	76.86	78.385	1.53	89.06	90.585	1.52
Upper Jasper	44.53	58.10	13.57				71.83	88.45	16.62	78.39	93.94	15.56	90.59	106.75	16.17
Upper Algae							88.45	100.04	11.59	93.94	156.77	62.83	106.75	125.05	18.30
Lower Taconite	58.10	113.77	55.66				EOH			156.77	166.53	9.76	EOH (Located on the Property)		
Lower Shale															
Lower Algae Chert															
Basal Conglomerate															
Archean Granite	113.77	114.07	0.30							166.53	169.28	2.75			

*\*Note: Only Hole No. 7 (East) is located on the Property)*

Table 2: Drill logs – 1943 drill program

Magnetic Tube Tests on Drill Cores																		
Gunflint Iron Mines Ltd: Drill Program 1943																		
Sample Information			minus 100-mesh								minus 200-mesh							
No.	Interval (m)	Total Fe%	Magnetic Concentrate					Non-Magnetic Tails			Magnetic Concentrate					Non-Magnetic Tails		
			Weight %	Total Fe%	Percent Total Fe	Phos. %	Fusion Silica %	Weight %	Total Fe%	Percent Total Iron	Weight %	Total Fe%	Percent Total Fe	Phos. %	Fusion Silica %	Weight %	Total Fe%	Percent Total Iron
20'-40'	6.10	22.98	24.83	38.87	41.99	0.010	35.40	75.17	17.73	58.01	14.28	54.44	33.81	0.009	19.84	85.72	17.73	66.19
40'-60'	6.10	22.18	24.43	34.68	38.19	0.009	38.46	75.57	18.14	61.81	11.51	50.08	25.97	0.008	23.08	88.49	18.55	74.03
60'-100'	12.20	26.86	25.21	48.07	45.12	0.010	23.30	74.79	19.71	54.88	15.13	59.92	33.77	0.009	12.20	84.87	20.97	66.23
100'-125'	7.63	25.48	18.23	52.26	37.40	0.010	16.91	81.77	19.51	62.60	12.64	62.26	30.89	0.009	9.00	87.36	20.16	69.11

Table 3: Magnetic tube tests – 1943 drill program

## **6.2 Great Lakes Resources Ltd. (2011-12)**

Great Lakes Resources Ltd. (GLR) staked the Jean Iron Property in 2009 and started exploration work in 2011 with two-phase geologic exploration and surface sampling programs, one in May 2011 and the other in August 2011. A diamond drill program was completed in May-June 2012.

### ***6.2.1 Prospecting and Sampling May 2011***

The first phase program consisted of field geological prospecting, collection of selective grab samples to verify historical information, assaying for iron content, Davis Tube Test (DTT) for magnetic concentrates, literature search, data compilation and geological report writing.

Five grab samples from lower portions of Upper Gunflint Formation, namely Upper Shale, Upper Jasper, Upper Algae Chert Member, were collected and assayed. The assay returns range from 5.58% to 41.06% iron (Fe) and 27.14% to 90.10% Silica (SiO<sub>2</sub>).

DTT using -150 mesh size fraction, were also conducted on these grab samples. The size fraction used was -150 mesh and magnetic recoveries ranging from 2.8% to 58.3% were obtained.

### ***6.2.2 August 2011 Exploration***

The second phase program, based on geologic information obtained from May 2011 program, was followed in August 2011 and consists of systematic channel and bulk sampling, DTT tests, Mineral Liberation Analysis (MLA) test.

A total of 25 saw-cut channel samples, 2.5cm by 2.5cm and of varying length and three 25-kg bulk samples were collected on Lower Taconite and Lower Shale members belonging to Lower Gunflint Formation during the program. In addition, three bulk samples were also collected from Lower Taconite Member exposures. All samples were assayed for iron content.

Lower Taconite Member of Lower Gunflint Formation is the main economically interested stratigraphic horizon. Assays of channel samples obtained from Lower Taconite Member averaged 25.60% Fe and bulk samples of Lower Taconite Member averaged 26.16% Fe.

A total of four, three from bulk sampling from Lower Taconite Member and one from made-up composite sample from two of those three bulk samples were contracted to same laboratory for Davis Tube Test (-200 and -325 mesh).

DTT conducted on four bulk samples, having average 24.58% Fe feed grade, at minus 200-mesh size indicated the magnetic concentration weight% or recovery% averaged 9.12%, 53.50% Fe respectively for magnetic concentrates and 21.80% Fe for non-magnetic concentrates. The corresponding values for minus 325-mesh sizes were 7.57% for magnetic concentrates recovery, 60.67% Fe for magnetic concentrates and 21.69% Fe for non-magnetic concentrates.



MLA test using two fractions, -106 and +106 mesh, were also conducted on composite sample. The salient information obtained indicated that the sample is composed of 22% combined hematite and magnetite (magnetite estimated as 4%), 61% quartz and 7% Fe-silicates (minnesotite predominantly) and 6% calcite with traces of apatite, feldspars, Fe-chlorite and kaolinite. MLA test also suggested the average grain size of combined Fe-oxides is between 24 and 53 microns (Aung 2011).

### **6.2.3 2012 Exploration Work**

During the month of May-June 2012, Great Lakes conducted a diamond drilling program on the Property to test the depth dimension of iron formation stratigraphy, and to correlate with surface geology and surface sampling assays obtained from Y2011 program.

As preparation to diamond drilling program, GLR contracted Canadian Exploration Services Ltd., 14579 Government Road, Larder Lake, Ontario, for line-cutting and grid layout in the main central exposed and elevated portion of the property.

The grid totaling 3.5km was planned and cut according to iron formation stratigraphy. The base line, 2km in length, trends 055° azimuth with perpendicular 0.5km tie-lines. The southwestern-most point of the grid, L10E/00N, was initially plotted on map and located in field at GPS: NAD 83-Z15, 711275E/5347270N using hand-held Garmin GPS 60CSx (Figure 4). The line-cutting work was carried out between May 07, 2012 and May 15, 2012.

The diamond drill program consists of eight vertical NQ-size diamond drillholes totaling 492.88m. The drilled area bounded by the eight drillholes measured 3km in length and 0.5km in width covering 1.5sq.km.

The drilling program commenced, immediate after line-cutting and grid lay out, on May 15, 2012 and ended in June 6, 2012.

All drillholes were located on the grid with 1000m spacing along baseline and 400-500m along tie-line. Both GPS and grid co-ordinates of drillholes and their lengths are tabulated in Table 4. They were also plotted on the property geology map (Figure 4)

**Table 4: Co-ordinates and Lengths of Drill holes - May-June 2012 Drilling Program**

<b>Hole Number</b>	<b>NAD83-Z15</b>			<b>Grid + Map Elev. (m)</b>	<b>Attitude</b>	<b>Depth (m)</b>
	<b>Easting</b>	<b>Northing</b>	<b>Elev. (m)</b>			
JN12-01	711270	5347265	485	10E/00N 480m	Vertical	102.00
JN12-02	710989	5347679	477	10E/5N 475m	Vertical	30.00
JN12-03	712073	5347856	541	20E/00N 540m	Vertical	96.00
JN12-04	711865	5348200	513	20E/4N 515m	Vertical	36.88
JN12-05	712910	5348412	538	30E/00N 535m	Vertical	87.00
JN12-06	712665	5348750	518	30E/4N 515m	Vertical	39.00
JN12-07	713705	5349014	498	40E/00N 495m	Vertical	60.00
JN12-08	713591	5349219	500	40E/2+50N 500m	Vertical	42.00

(GPS Reading by Garmin 60CSx)

### **Drill Hole Geology**

Geology obtained from the diamond drill program verified known surface geology with additional detailed stratigraphic information.

The drill area is underlain by northeast trending (approximately 055° azimuth) gently 4-5° southeast dipping Lower Gunflint Formation. Lower Taconite Member of Lower Gunflint Formation was the main economically-interested stratigraphic horizon investigated in this program.

The summary drill logs of 2012 diamond drilling program is provided as follows:

#### **JN12-01**

0.00-3.00m: Casing/Overburden

**3.00-59.40m: Lower Gunflint Formation (56.40m)**

3.00-52.68m: Lower Taconite Member

52.68-55.60m: Lower Shale Member

55.60-58.26m: Lower Algae Chert Member

58.26-59.40m: Basal Conglomerate

**59.40-102.00m: Archean Basement**

**102.00m- End of Hole (EOH)**

**JN12-02**

0.00-3.00m: Casing/Overburden

**3.00-19.25m: Lower Gunflint Formation (16.5m)**

3.00-13.50m: Lower Taconite Member

13.50-15.75m: Lower Shale Member

15.75-19.25m: Lower Algae Chert Member

**19.25-19.50m: Diorite Sill**

**19.50-30.00m: Archean Basement**

**30.00m-EOH**

**JN12-03**

0.00-10.00m: Casing/Overburden

**10.00-31.89m: Upper Gunflint Formation (21.89m)**

10.00-15.50m: Upper Shale Member

15.50-29.48m: Upper Jasper Member

29.48-31.89m: Upper Algae Chert Member

**31.89-95.20m: Lower Gunflint Formation (63.31m)**

31.89-88.70m: Lower Taconite Member

88.70-90.77m: Lower Shale Member

90.77-95.00m: Lower Algae Chert Member

95.00-95.20m: Basal Conglomerate

**95.20-96.00m: Archean Basement**

**96.00m-EOH**

**JN12-04**

0.00-3.00m: Casing/Overburden

**3.00-36.00m: Lower Gunflint Formation (33.0m)**

3.00-32.62m: Lower Taconite Member

32.62-35.70m: Lower Shale Member

35.70-36.00m: Lower Algae Chert Member

**36.00-36.88m: Diorite Sill**

**36.88m-EOH**

**JN12-05**

0.00-21.00m: Casing/Overburden

**21.00-23.12m: Upper Gunflint Formation (2.12m)**

21.00-23.12m: Upper Algae Chert Member

**23.12-86.87m: Lower Gunflint Formation (63.75m)**

23.12-80.90m: Lower Taconite Member

80.90-82.82m: Lower Shale Member

82.82-86.87m: Lower Algae Chert Member

**86.87-87.00m: Archean Basement**

**87.00m-EOH**

**JN12-06**

0.00-1.50m: Casing/Overburden

**1.50-36.67m: Lower Gunflint Formation (35.17m)**

1.50-31.17m: Lower Taconite Member

31.17-33.45m: Lower Shale Member

33.45-36.32m: Lower Algae Chert Member

36.32-36.67m: Basal Conglomerate

**36.67-39.00m: Archean Basement**

**39.00m-EOH**

**JN12-07**

0.00-3.00m: Casing/Overburden

**1.50-57.20m: Lower Gunflint Formation (55.7m)**

5.00-52.05m: Lower Taconite Member

52.05-53.40m: Lower Shale Member

53.40-57.05m: Lower Algae Chert Member

57.05-57.20m: Basal Conglomerate

**57.20-60.00m: Archean Basement**

**60.00m-EOH**

**JN12-08**

0.00-3.00m: Casing/Overburden

**1.50-40.90m: Lower Gunflint Formation (39.4m)**

3.00-35.70m: Lower Taconite Member

35.70-36.88m: Lower Shale Member

36.88-40.90m: Lower Algae Chert Member

**40.90-42.00m: Archean Basement**

**42.00m-EOH**

All eight holes intersected iron bearing Lower Taconite Member, whereas two complete Lower Taconite Member vertical intersections were delineated in JN12-03 (56.81m) and JN12-05 (57.75m). The average true thickness is estimated to be **57.06m**.

Lower Shale and Lower Algae Chert Member of Lower Gunflint Formation consistently underlie Lower Taconite Member. However, Basal Conglomerate Member is not universally persistent and lacking in some drill holes.

Only Upper Shale, Upper Jasper and Upper Algae Chert Member composing lower portion of Upper Gunflint Formation was encountered in two holes, JN12-03 and JN12-05, located on the higher ground and on baseline or southern portion of the drilled area. No Upper Taconite Member was intersected during the program.

Both Upper Gunflint and Lower Gunflint Formation within the Property contain no diluting diorite sills. Narrow diorite sills less than a meter in thickness, are only recorded in JN12-02 and

JN12-04 at the contact of the base of Lower Gunflint Formation and underlying Archean Basement.

The monoclinical structure is evident in all holes with consistently 4-5° by core angles. Graded bedding where observed suggested upright sequence and tectonic deformation is virtually absent.

Glacial overburden is generally thin to non-existence in elevated ground as much as 10m in low swampy lands. The depth of surface oxidation is average 3m.

The presence of talus fan deriving from Mink Mountain is evident as approach south. The overburden of 21m in JN12-05 may include main portion of talus fan.

### **Drill Core Sampling and Assaying**

Drill core sampling during this program was continuous. The entire length of the Gunflint Formation stratigraphy intersected in all drill holes sampled.

Drill core samples were collected by sawing one-sixth (one cm) of the NQ-4.6 cm diameter radius rather than conventional half to control weight-volume of sample sizes and to retain as much for future metallurgical tests. Three-tag sample recording system was used with one tag placing at start of sample site in core box, another in sample bag and the last one as duplicate reference. A total of 84 drill core samples with varying length from 0.33m to 12.00m based on geology were collected.

Samples were shipped to ISO-accredited ActLabs Laboratories, Thunder Bay. All samples were assayed for iron and associated element content particularly silica and manganese using ActLabs Laboratories Code-C4C.

Sample preparation at the ActLabs Laboratories was done according to standard industry practice. Samples were crushed to -10 mesh followed by pulverizing a 250-gram split to -150 mesh (95%). Each sample was analyzed for Iron Ore Analysis XRF. A rigorous series of in-laboratory duplicate, reference and blank sample analyses are routinely carried out.

Lower Taconite Member is the main iron bearing interested stratigraphic horizon within the Jean Iron Property and the weighted assay information obtained from drill core samples from Lower Taconite Member is summarized in Table 5.

**Table 5: Weighted Assay: Lower Taconite Member -May-June 2012 Drilling Program**

<b>DDH No.</b>	<b>Length (m)</b>	<b>Fe%</b>	<b>Mn%</b>	<b>SiO<sub>2</sub>%</b>	<b>P<sub>2</sub>O<sub>5</sub>%</b>
JN12-01	49.71	<b>21.65</b>	0.346	43.40	0.03
JN12-02	10.50	<b>24.36</b>	0.299	44.10	0.05
JN12-03	56.81 (complete)	<b>24.39</b>	0.337	47.54	0.03
JN12-04	29.62	<b>24.31</b>	0.259	50.53	0.04
JN12-05	57.722 (complete)	<b>23.88</b>	0.287	47.76	0.04
JN12-06	29.67	<b>25.02</b>	0.364	46.24	0.04
JN12-07	49.05	<b>22.03</b>	0.529	47.37	0.03
JN12-08	31.87	<b>23.37</b>	0.570	44.92	0.04
<b>Weighted Average</b>		<b>23.44</b>	<b>0.377</b>	<b>46.66</b>	<b>0.04</b>

**Davis Tube Test**

In addition to assaying, DTT on two composite samples combined from drill core samples of Lower Taconite Member of Lower Gunflint Formation, one from JN12-03 and the other from JN12-05, were also contracted to and conducted at ActLabs Laboratories, Ancaster, Ontario.

Sample designated DT Composite #1 is a combination of eight drill core samples, #1078091 to #1078098 from drillhole JN12-03 and DT Composite #2 resulted from nine drill core samples, #1078102 to #1078111 from JN12-05. DTT were performed on two size fractions, minus 200-mesh and minus 325-mesh, and assaying were again done on both magnetic portions and non-magnetic portions of DTT.

The weighted average feed grade is 24.08% Fe. For minus 200-mesh size, the magnetic concentrates recovery averaged 7.48% with the magnetic concentrates grade of 57.79% Fe. The non-magnetic concentrates values for this size fraction were 91.45% for recovery and 22.55% Fe for grade.

In regard to minus 325-mesh, the magnetic concentrates recovery was 7.20% and the concentrates grade was 53.62% Fe. The non-magnetic concentrates values are 91.55% and 22.42% Fe respectively.

The breakdown of DTT recovery percent and assays for two end-members, magnetic and non-magnetic portions, are shown in Table 6.

**Table 6: Davis Tube Test: Recovery and Assays of Lower Taconite Member - May-June 2012 Drilling Program****Minus 200-mesh**

Sample ID	Head		Magnetic Concentrates -200 mesh			Non-Mag Concentrates -200 mesh		
	gm	Fe%	gm	Fe%	Wt. %	gm	Fe%	Wt. %
DT Composite #1	30.0	24.39	2.441	52.33	8.1	27.240	22.66	90.8
DT Composite #2	30.0	23.88	2.045	63.25	6.8	27.625	22.45	92.1

**Minus 325-mesh**

Sample ID	Head		Magnetic Concentrates -325 mesh			Non-Mag Concentrates -325 mesh		
	gm	Fe%	gm	Fe%	Wt. %	gm	Fe%	Wt. %
DT Composite #1	30.0	24.39	2.110	51.59	7.0	27.568	22.17	91.9
DT Composite #2	30.0	23.88	2.220	55.64	7.4	27.360	22.66	91.2

**Mineral Liberation Analysis (MLA test)**

MLA test was also conducted on three samples. Two samples, DT Composite #1 and DT Composite #2 were from Lower Taconite Member. The remaining #1078112 was from Lower Shale Member of Lower Gunflint Formation and was included to determine mineralogy of associate iron minerals that elevated Fe% in this member.

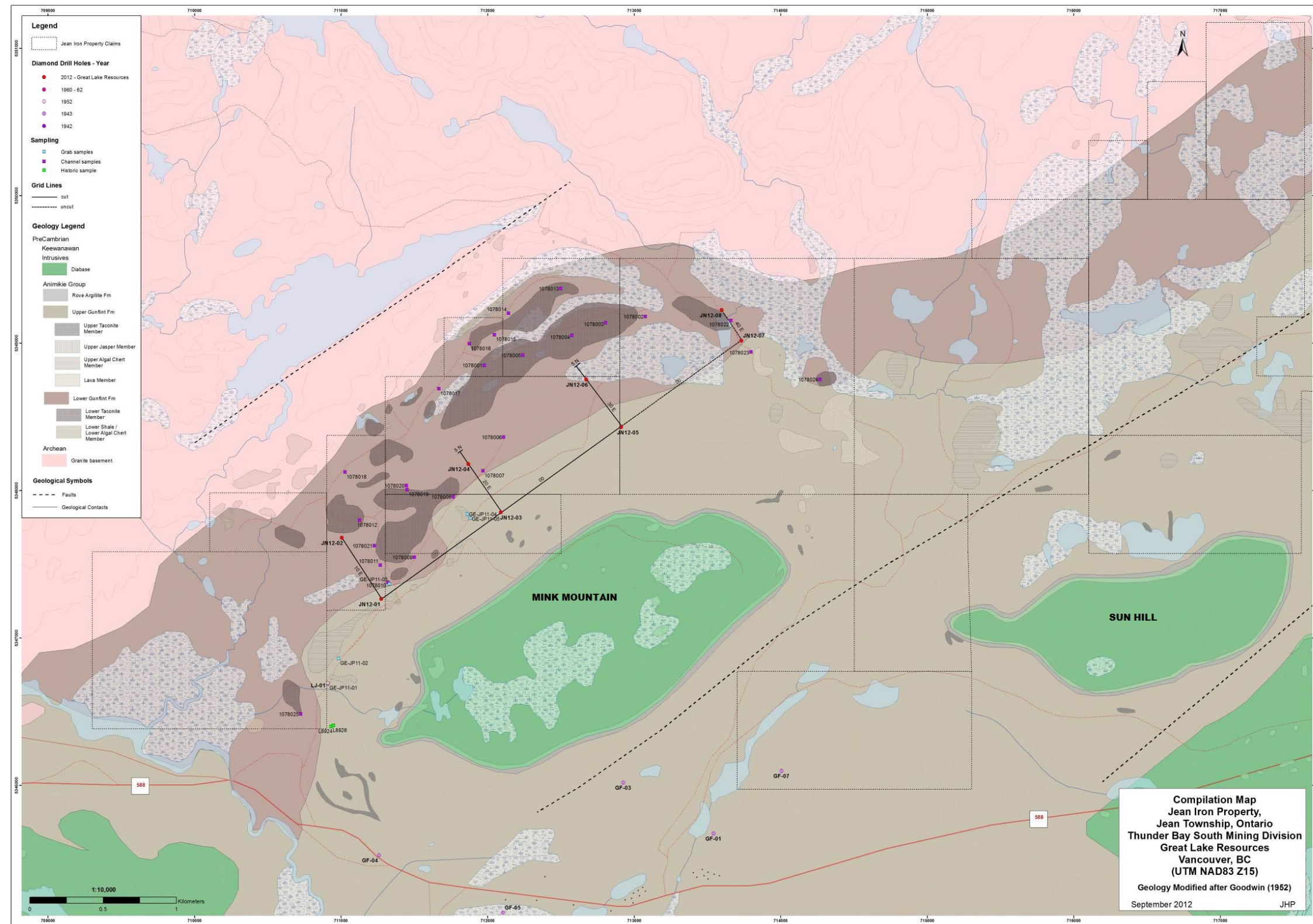
Highlights of MLA test report provided by Actlabs Laboratories, Ancaster, Ontario are provided below:

1. Two samples, DT Composite #1 and DT Composite #2 are mineralogically fairly similar. DT Composite #2 has higher magnetite content (9.5%) than DT Composite #1 (7.14%). The difference corresponds to slightly higher magnetite grain size (26 microns) in the former in compare to latter (20 microns). Goethite/Siderite accounts for between 3.8% and 4.4% in these two samples.
2. Sample from Upper Shale Member, #1078112 contain <0.1% magnetite. The main iron minerals are pyrite (14.3%) and high goethite/siderite contents (combined 17.3%).

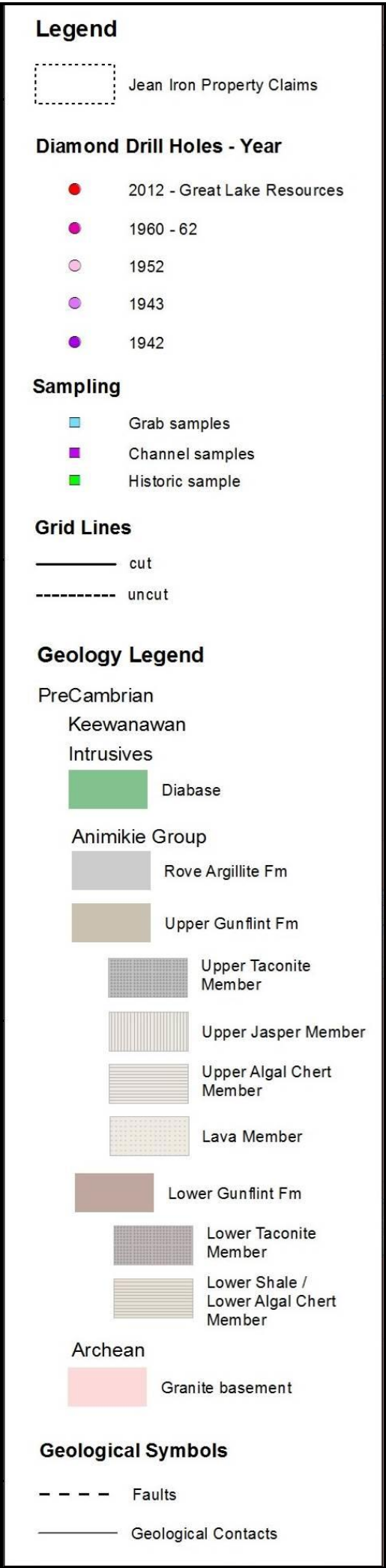
In essence, Lower Taconite Members samples are mineralogically fairly similar with average magnetic content of 8.34% (from 9.5% to 7.14%) and average magnetic grain size of 23 microns (20 to 26 microns). The non-magnetic goethite/siderite averaged 4.1% (3.8%-4.4%). The other sample, Lower Shale contains <0.1% magnetite with main iron minerals as pyrite (14.3%) and goethite/siderite contents (combined 17.3%) (Aung 2012).



**Figure 4: Location of Historical Drill Holes**







Legend for Figure 4

## 7.0 GEOLOGICAL SETTING AND MINERALIZATION

### 7.1 Regional Geology

The Paleoproterozoic iron formations in the seven iron ranges of the Lake Superior region crop out in northwestern Ontario, east-central and northern Minnesota, northern Wisconsin, and the Upper Peninsula of Michigan as an oval shaped region encompassing 220,000 km<sup>2</sup>. Iron formation strata in the Lake Superior region were the first to be mined on a large scale in North America and to have their geology described in detail (Figure 5). Iron formations in other parts of the world were compared to the Lake Superior ranges and genetic concepts were developed with direct reference to the sedimentary basins in this classical area. Similar iron formation lithofacies and stratigraphic- tectonic settings have been reported on all continents. The iron ranges of the Lake Superior region have provided an excellent type-area for reference and study of iron formation and other stratafer sediments in continental shelf and platform settings (Gross 2009).

Extensive Lake Superior-type iron formation (LSTIF) ranges were developed along the margins of cratons or epicontinental platforms between 2.4 Ga and 1.9 Ga (Figure 5). Thicker iron formations were deposited in shallow basins on continental shelves and platforms in neritic environments, interbedded with mature dolostone, quartz arenite, black shale and argillite. Iron formation units in the Animikie basin were the first examples of LSTIF to be described in detail and remain as the principal type area for reference (area around L. Superior and L. Michigan on Figure 5).

The Paleoproterozoic sedimentary rocks deposited in the Animikie Basin form: a southward-thickening wedge covering the southern margin of the Superior province, which is truncated in east-central Minnesota and northern Wisconsin by: the 'Penokean' magmatic terranes". Sedimentation began approximately 2.1 Ga ago and ceased roughly 1.85 Ga ago. The nature of the sediment varies from volcanic and clastic to the chemical precipitates which form the thick successions of iron formation. The termination of the Penokean orogeny marked the onset of an intrusive igneous phase which emplaced subduction related tonalitic and granitic plutons into the Animikie sediments and the arc related volcanics of the Wisconsin magmatic terranes. The present form of the basin was achieved around 1 Ga ago when a north-northwest trending branch of the Midcontinental Rift System separated the Animikie sediments into a northwestern and southeastern segment. The northwestern segment of the Animikie Group unconformably overlays the Superior Province and consists of a basal sandstone-siltstone (Pokegama Quartzite, Mahanomen Formation), iron formation (Gunflint, Biwabik, Trommald iron formations), and a thick, upper, shale-siltstone sequence (Rove, Virginia and Rabbit Lake Formations)(Gross 2009).

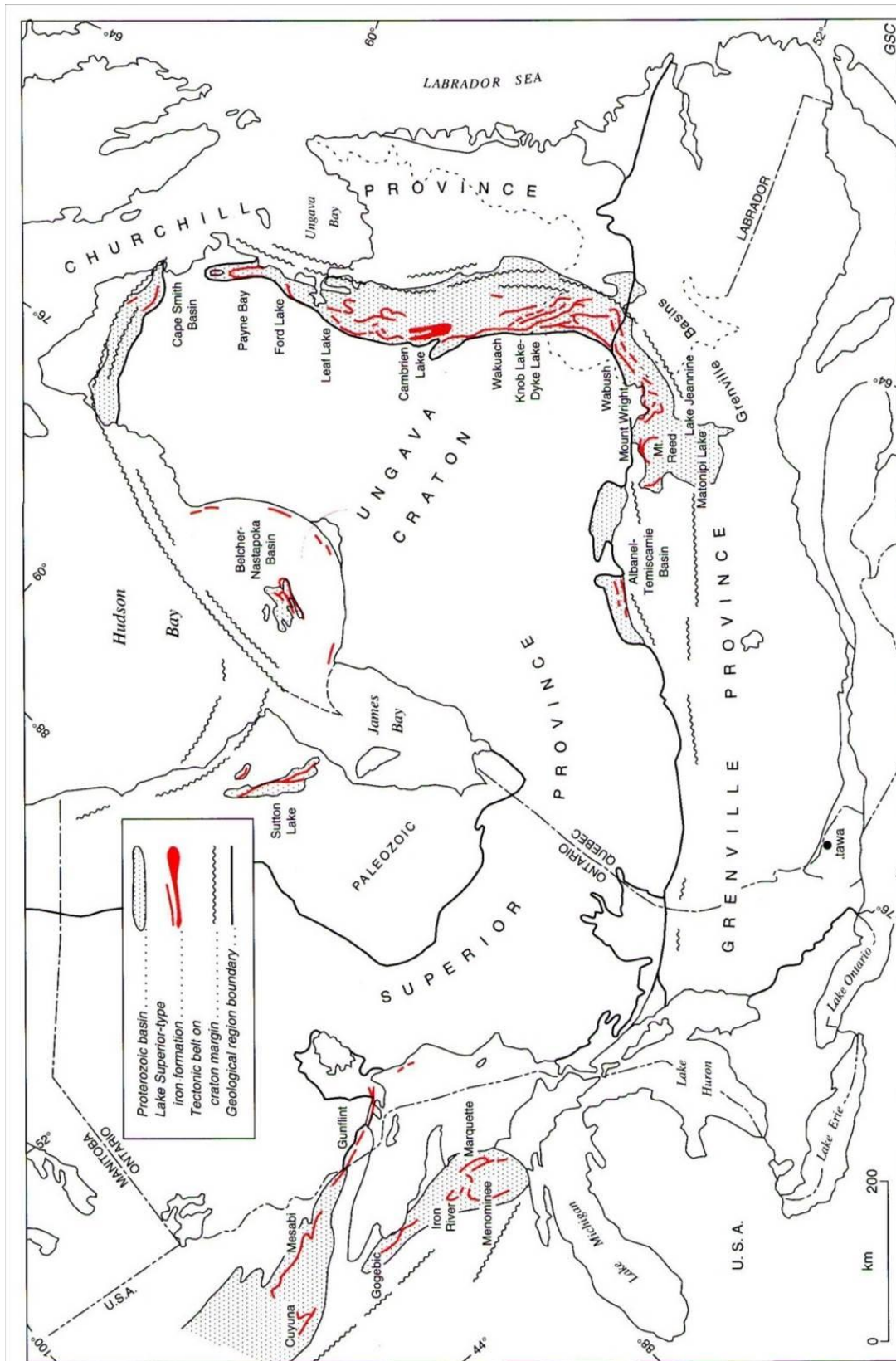


Figure 5: Regional geological map showing location of iron ranges (G.A Gross 2009).

## 7.2 Local Geology

Locally, the Jean Lake Property area is underlain by an Archean granitic basement, which is unconformably overlain by gently southerly-dipping sedimentary rocks of the Aphebian (lower Proterozoic) Animikie group. These sediments are capped by a Helikian (1.0 Ga) Keweenawan diabase sill. Unconsolidated rocks are Pleistocene age glacial till debris which forms an extensive mantle over low-lying parts of the area (Figure 6 and Table 7).

**Table 7: Generalized stratigraphic column of the area**

<b>Era</b>	<b>Group</b>	<b>Formation/ Rocks</b>
Pleistocene and Recent	Glacial Till	Unconsolidated gravel, sand, and clay
<b><i>Unconformity</i></b>		
Helikian (1.0 GA)	Keweenawan Group	Diabase sill and related rocks
<b><i>Intrusive Contact</i></b>		
Aphebian (Lower Proterozoic)	Animikie Group	Rove Formation argillites Gunflint Iron Formation
<b><i>Unconformity marked by Kakabeka Formation Conglomerate</i></b>		
Archean	Algoman	Granite, granite gneiss, with inclusion of chlorite and mica schist

Source: Goodwin, A.M. (1952)

### 7.2.1 Archean Basement Rocks

Basement related Algoman-type granitic rocks consist predominantly of normal, pink granite and granite gneiss. The texture ranges from conspicuously gneissic to coarsely pegmatitic. Numerous inclusions of chloritic and micaceous schist, and gneiss of various shapes and sizes, occur within the granite.

### 7.2.2 Aphebian Animikie Group

Sedimentary and volcanic rocks of Animikie Group consist of two formations: the lower Gunflint iron formation, and the upper, the Rove argillite formation. These rocks gently dip south at an average angle of 5 degrees.

#### **Gunflint Iron Formation**

The Gunflint iron formation consists mainly of sedimentary rocks that are unusually rich in iron. Zircon dating of the Gunflint formation yielded an age of  $1878.3 \pm 1.3$  million years. The formation is characterized by unusually high iron content, as well as by a variety of textures, the granular texture of the taconite rock being most distinctive. The Gunflint formation is approximately 145 m thick is divided into lower and upper cycles. Each cycle contains a sequence of members, most of which are common to both. The uppermost

member, a limestone bed, is unique to the formation and marks the top of the iron-bearing rocks. The general stratigraphy of Gunflint formation is presented in the following table.

**Table 8: Stratigraphy of Gunflint Iron Formation**

Cycle	Member	Thickness (metres)
Upper Gunflint	Upper Limestone	1.5 – 6
	Upper Taconite	45 – 55
	Upper Shale	1.5 – 5
	Upper Jasper	12 – 20
	Upper Algal Chert	2.5 – 6.5
	Lava Flow Locally	0 – 12
	<b>Total Upper Gunflint</b>	<b>62.5 – 104.5</b>
Lower Gunflint	Lower Taconite	46 – 64
	Lower Shale	1 – 6
	Lower Algal Chert	0.6 – 4.5
	Basal Conglomerate	0 – 0.3
	<b>Total Lower Gunflint</b>	<b>47.6 – 74.8</b>
<b>Total Thickness of Gunflint Iron Formation</b>		<b>110.1 – 179.3</b>

*Source: Goodwin (1952)*

### **Basal Conglomerate**

The pebbles of the conglomerate are formed of white vein quartz, milky white chert, and occasionally jasper. Most pebbles are around 2.5 centimeter in diameter, although several with diameters of 15 centimeters are present, and the majority is well rounded. The matrix consists of sandy quartz grains with considerable admixed chloritic material.

### **Lower Algal Chert**

The algal chert is commonly in the form of reef-like mounds, which are roughly elliptical in plan view and average 3 meter long, 1.5 meter wide, and 0.6 meter thick. The chert forming the mounds is finely contorted in the manner typical of algal structures. Small brown, white, and red granules are often closely associated. The algal chert typically grades upwards into green and white banded chert with massive texture.

### **Lower Shale**

The shale is soft, black and typically fissile. Thin-section examination carried by previous workers revealed much fine-grained clastic material together with carbonaceous matter. Bands of grey to black chert, commonly flecked with pyrite, are present near the top of the member.

### **Lower Taconite**

The lower taconite is approximately 60 m thick and contains roughly 26% iron 46% silica. The upper unit is 40-50m thick and averages 31% iron with 43% silica (Goodwin 1961). Weathered rocks of the member are characterized by a shingly appearance due to numerous closely spaced parting planes, rusty colour, and finely granular texture. Under the microscope, the typical rock of this member is seen to consist of small granules up to 2 millimeters in diameter, in a fine-grained chert or carbonate matrix. The granules consist of a mixture of fine-grained chert, a green silicate mineral (probably greenalite), and iron oxide. The iron oxide is commonly an intimate mixture of hematite and magnetite, or near the weathered surfaces, the hydrated equivalents. The oxides often form the rims of granules.

The matrix to the granules is fine-grained chert or ferruginous carbonate. Where the carbonate is present the granules are not well formed. Carbonate nodules are common in certain beds. In cross-section, the nodules are characteristically round and occasionally slightly elliptical. The individual nodule when fresh is typically composed of salmon pink, finely crystalline carbonate, commonly with a rim of greenalite. The carbonate shows rusty weathering, the colour being yellow, orange, brown, or black, depending on the degree of oxidation and hydration. There is a variation in the relative proportions of chert, greenalite, hematite, and magnetite, within the unweathered beds of the member. Some beds are unusually rich in the iron oxide minerals, whereas adjacent beds contain a high proportion of chert and greenalite.

### **Upper Algal Chert**

This member can be further divided into three parts based on the mode of occurrence of chert; which include from bottom to top: i) Granular chert with jasper veinlets (0.6m – 3m thick); ii) Algal-oolitic chert, lava flow locally (1.2m – 15m thick); and iii) Coarse granular ferruginous chert (0.6m – 2m thick).

Hematite bearing veinlets are present in the flow rock. Thin-section study reveals oolitic granules formed of concentrically banded red hematite and chert up to 5 millimetres in diameter, in a fine-grained chert matrix (Goodwin 1952).

### **Upper Jasper Member**

The rocks of this member grade upwards by increase in shaly material to shale of the overlying member. The jasper lenses consist of abundant, close-packed, small red granules in a chert matrix having a granular texture. Not all granules are red; occasionally a lens has a local concentration of green granules or a general intermixture of red and green. There is an increase of green granules relative to red granules towards the top of the member, and the uppermost lenses are predominantly green. The lower beds of the member are characterized by granules and small lenticles, or beads, of jaspery chert; this

grades upwards into beds consisting of thick lenses of granular jaspery chert with shaly partings.

### **Upper Shale Member**

The member consists largely of black, fissile shale. Locally, small concretions are present; they are generally 5-7 cm in diameter and composed of black sideritic carbonate. A prominent feature of the Shale member, and a good horizon marker, is the presence of a pisolite layer near the top of the member. The layer is 22-45 cm thick. It consists of pisolites averaging 1/8 inch in diameter that are somewhat flattened along the bedding plane. They weather characteristically to a rusty brown colour and are easily noticed against the background of black shale.

### **Upper Taconite Member**

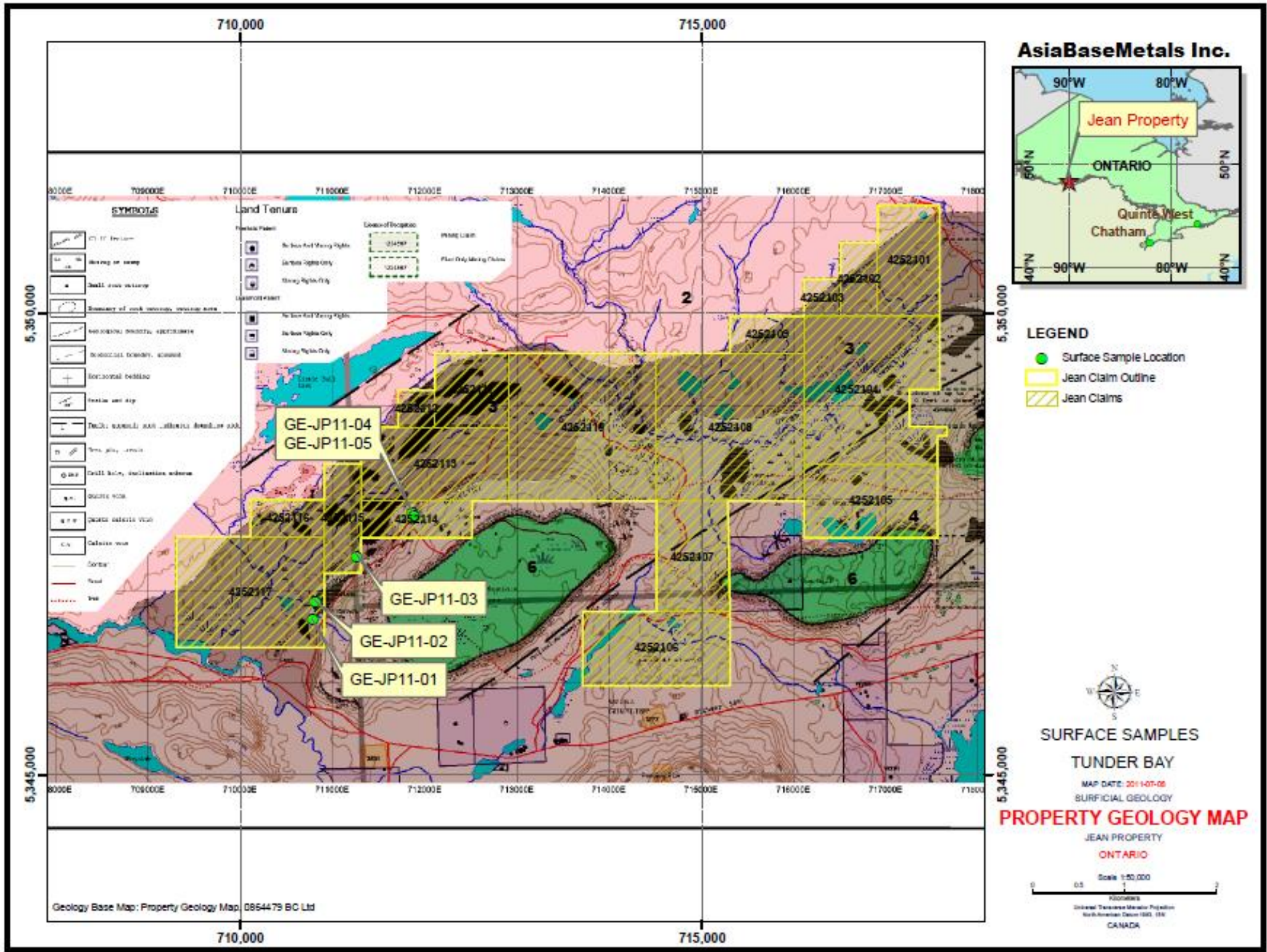
The rocks of this member consist of thick-bedded granular chert with shaly partings. The chert layers are commonly green in colour, due to abundant greenalite granules. The thickness of the chert layers ranges from 12 to 60 centimeters. An occasional layer is of uniform thickness, but most are noticeably wavy banded; such bands pinch and swell within a lateral distance of 3-7 metres. Within a vertical section, chert lenses are arranged so that the thick part of a particular lens rests in the hollow formed by the tapered extensions of subjacent lenses. The plan view of a lens is typically circular to elliptical, so far as was determined.

The shaly partings that separate chert beds range in thickness from 2-30 centimetres, most commonly about 10 cm. The partings are dark-brown to black and very fine grained. They consist of an intermixture of ferruginous carbonate, magnetite, and occasional fragmental grains. Beds within 25 metres of the diabase sills have considerably higher magnetite content than normal. In such beds, the magnetite grains are up to 3 millimetres in diameter; they occur in both the chert layers and shaly partings, but more abundantly in the partings. Bands up to 12 cm thick, rich in magnetite were observed; however, cherty material is usually intimately associated.

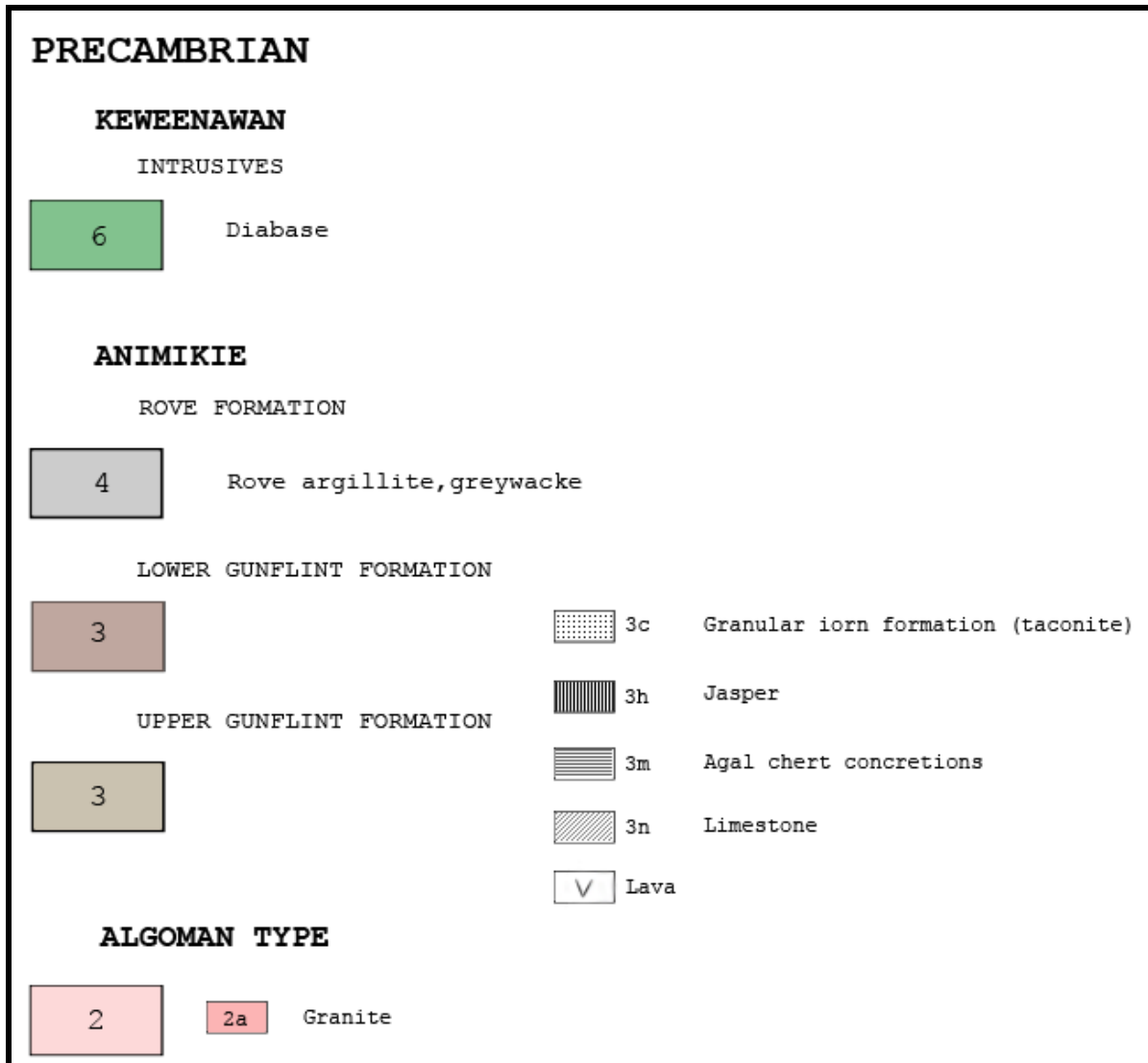
The upper 7 metres of this member consists locally of beds that have been highly contorted and brecciated. The rock now consists of chert fragments, up to 15 cm thick and 60 cm long, within a matrix of magnetite, secondary iron bearing amphibole minerals, and calcite. The chert of the fragments is commonly dark-grey to black and finely laminated. The rock appears to have consisted originally of thinly inter-banded chert and ferruginous carbonate.



Figure 6: Local Geological Map







Legend for Figure 6

**Upper Limestone Member**

The limestone of this member is typically dark-grey to black and very fine grained. It is easily confused with the finer-grained phases of diabase. There are usually thin inter-bandings of grey-to-black massive chert up to 5 cm thick.

**Rove Formation**

The Rove formation consists typically of thinly-bedded, black to dark-grey argillite. They are several hundreds of metres thick, intruded by the Keweenaw diabase sills and cut by steeply dipping northwest and northeast trending normal faults. Within the Rove formation, quartz carbonate veins emplaced along these faults in a belt extending northeast and southwest of Thunder Bay are mineralized with native silver, argentite,

sphalerite, galena, pyrite, pyrrhotite, and chalcopyrite. The veins are predominantly hosted in the flat-lying Rove formation sediments, but also occur in the diabase sills and rarely in the Archean basement. This type of mineralization supported several mines, the largest of which were the Beaver, Silver Mountain, and Badger.

### **7.2.3 Helikian Keweenawan Group**

Rocks of the Keweenawan in the Jean Property area consist of diabase intrusives dipping gently southward, conforming more or less with the attitude of enclosing sedimentary rocks.

### **7.2.4 Pleistocene and Recent**

Unconsolidated sand and gravel of Pleistocene and Recent age are widespread and in places very thick. Most of the material is unsorted and appears to represent glacial debris; along the river banks, however there has been considerable reworking and sorting. The thickness of the debris ranges from a thin discontinuous mantle of boulders on top of the diabase-capped hills to sand and boulder deposits up to 75 metres thick, such as occur on the southeast side of Mink Mountain.

### **Structure**

The Animikie sedimentary rocks are essentially flat-lying and rest upon a granite terrain of low relief. The principal disturbance has been due to normal gravity faults which are common throughout the area. The beds of Gunflint iron formation are gently dipping southward with an average angle of 5 degree. Local folding and brecciation occur in the uppermost part of the Gunflint iron formation due to violent volcanic disturbances that occurred towards the end of the deposition of iron-bearing rocks.

There appear to be two principal systems of normal gravity faults within the map area. One system strikes northeast; the other, generally northward. The age relationship between them was not determined, as individual faults cannot be traced with certainty for more than a few kilometres.

One example of an east-trending fault is located between Silver Bluff and Divide Ridge, in which the north side appears to have moved down about 30 m relative to the south side. Another example is the fault southeast of Mink Mountain, where the south side has moved down about 75 m.

The north-trending system is illustrated by the two faults, one on either side of the North River, that together have formed a down-faulted block, or graben. Movement has been about 60 m.

A fault is indicated between Silver Bluff and Silver Mountain. The diabase capping rocks at both localities are at the same elevation, but whereas the capping rock at Silver Bluff is underlain by iron-bearing rocks of the Gunflint formation, there is 60 m of Rove argillite beneath the capping rock of Silver Mountain. There are probably many other faults in the area but with such limited vertical movement that they are not readily discernible.

### **7.3 Property Geology**

The Jean Property is underlain by an Archean granitic basement, which is unconformably overlain by gently southerly-dipping sedimentary rocks of the Aphebian (lower Proterozoic) Animikie group. These sediments are capped by a Helikian (1.0 Ga) Keweenaw diabase sill which covers the entire south slope of the hill north of Whitefish Lake (Figure 4).

The basal conglomerate member of Gunflint Iron formation is well exposed along the north fringe of the iron formation, where it forms a thin skin on top of the basement complex. The thickness of the conglomerate is seldom more than 30 centimetres, even where completely preserved, and is usually only a few centimetres. Algal chert rests directly upon the basal conglomerate, or where this is absent, upon the granitic basement. There are excellent exposures north of Burnt Bridge on the Whitefish River. The total thickness of the member ranges from 0.6 to 4.5 metres.

The algal chert member is commonly in the form of reef-like mounds, which are roughly elliptical in plan view and average 3 m long, 1.2 m wide, and 0.6 m thick. The chert forming the mounds is finely contorted in the manner typical of algal structures. Small brown, white, and red granules are often closely associated. The algal chert typically grades upwards into green and white banded chert with massive texture.

Rocks of the Lower Taconite member are exposed along the north slope of Mink Mountain, on the banks of the Whitefish River, and on numerous small hills and ridges north of this river.

Rocks of the Upper Algal chert member are exposed on the west and east flanks of Mink Mountain, beneath the diabase sill of Divide Ridge, along the banks of the Whitefish River, and within the North River down-faulted block. The thickness of the member ranges from 2.5 to 7 metres. There is a scattering of large boulders containing considerable amounts of hematite and magnetite, distributed over the area that is apparently underlain by flow rock. The boulders are up to 2 metres in diameter, and typically contain hematite and magnetite in the form of large granules up to 0.5 cm in diameter, and lenticles as much as 5 cm long (Goodwin 1961). Under the microscope, the granules and lenticles are seen to consist of an intimate intergrowth of specular hematite and magnetite.

Beds of Upper Jasper Member are exposed the east and west sides of Mink Mountain. There are also good exposures beneath the capping sill of Divide Ridge. The member ranges in thickness from 12 m to 20 m.

The Upper Shale member is exposed in the same localities as the underlying Jasper member. It ranges in thickness from 1.5m to 5m and is persistent throughout the Property area.

Upper Taconite beds are exposed beneath the capping sills of the hills and ridges of the area. There are particularly good exposures on the north face of Silver Bluff. The member is 45-55 metres thick. The Upper Limestone member is exposed immediately north of the abandoned railway on the south slope of Sun Mountain; the thickness is estimated to range from 1.3 to 6 m.

#### ***Interpretation of Geology from Flint Rock Drill Holes***

In this relatively flat-lying sedimentary sequence, drilling is really the only way to get a good review of the Gunflint formation in the Property area. Drilling conducted by the past operators indicates that the taconite sequence averages in the order of 60 m and ranges up to 90 m true thickness. Logging in the Flint Rock holes has differentiated between upper and lower taconite units. The upper taconite unit is composed largely of hematite dominant shales and jasper, and the lower taconite composed predominantly of magnetite dominant chert and shale. Both units have similar total iron contents, and there is no significant barren zone between the two.

## **7.4 Mineralization**

Partial analyses are available to determine the average composition of mineralized beds of the Gunflint iron formation. The members considered in this respect are the Lower Taconite member, Upper Jasper member, and the Upper Taconite member. The other members of the formation are relatively thin and contain less iron.

**Table 9: Average Iron and Silica Content of Mineralized Members in Gunflint Iron Formation**

Member	Number of Historical Assays	Iron (Fe) (Percent)	Silica (SiO <sub>2</sub> ) (Percent)
Lower Taconite	18	25.71	46.44
Upper Jasper	20	25.50	46.36
Upper Taconite	20	30.70	43.16

*Source: Goodwin 1961*

## **8.0 DEPOSIT TYPES**

### **8.1 Deposit Types**

There are four major types of iron deposits around the world being worked currently, depending on the mineralogy and geology of the deposits. These are magnetite, titanomagnetite, massive hematite and pisolitic ironstone deposits. Banded Iron Formation (BIF) also known as taconite in North America are metamorphosed sedimentary rocks composed predominantly of thinly bedded iron minerals and silica (as quartz). Jean Property is mainly underlain by Gunflint Iron Formation, a BIF which is mainly comprised of taconite rocks. The formation is similar to the taconite deposits of the Mesabi Iron Range in northern Minnesota, where iron mining occurred for over 100 years and continues to expand into the future.

The key economic parameters for magnetite ore being economic in BIF are the crystallinity of the magnetite, the grade of the iron in the host rock, and the contaminant elements which exist within the magnetite concentrate. Non-economic rock types interbedded with the iron formation must be sufficiently segregated from the economic iron-bearing areas. At the Jean Property, however, hematite appears to be the dominant iron species rather than magnetite. The thin magnetite bands are mixed with chert, limestone and shale.

The typical grade of iron (Fe) at which a magnetite-bearing banded iron formation becomes economic is roughly 25% Fe, which can generally yield a 33% to 40% recovery of magnetite by weight, to produce a concentrate grading in excess of 64% Fe by weight. The typical magnetite iron ore concentrate has less than 0.1% phosphorus, 3–7% silica and less than 3% aluminum. Generally most magnetite BIF deposits must be ground to between 32 and 45 micrometres in order to provide a low-silica magnetite concentrate. Magnetite concentrate grades are generally in excess of 63% Fe by weight and usually are low phosphorus, low aluminum, low titanium and low silica and demand a premium price (USGS 2010).

### **8.2 Deposit Models**

Stratigraphically, to the southwest, the Gunflint Iron formation of Jean Property strikes into Minnesota where it is known as the Biwabik formation. In Canada the formation is relatively undeformed, but in Minnesota it was folded during the Penokean Orogeny (1.85 Ga). In this deformed part of the belt the cherty iron formation was sporadically oxidized and leached creating zones of enrichment containing between 50 and 70% iron. It is a similar setting and age to the iron deposits in the Labrador trough. These high-grade ore deposits in Minnesota were known as the Iron Range, the largest of which was the Mesabi Iron Range. Since their discovery in 1890, they have produced in excess of 3.6 billion tonnes of iron ore, 2.3 billion of which was from the high grade lenses. It is the largest iron

resource in the United States and still produces significant portion of the nation's iron output. Shortly after the Second World War the high grade resource was largely exhausted. There was still, however, a huge resource of what was called "taconite" ore. Taconite was a term given to the unoxidized (unweathered) cherty iron formation (as occurs in the Gunflint formation on Jean Property) grading in excess of 25% iron. This taconite ore became economic with the development of a beneficiation process. The ore is ground, concentrated with magnetic separators, mixed with clay and dolomite, and roasted into pellets. The final grade of these pellets is typically 60-65% iron.

The taconite ore in the Biwabik formation in Minnesota appears texturally to be of fine-grained cherty fragmental or sandstone. Although it appears to be clastic sediment, it is felt that 95% of this material was deposited as a chemical precipitate. Iron was probably precipitated as an "oxy-hydroxyl carbonate gel" with minimal clastic component. The clastic textures observed are probably due to reworking of the precipitate; possibly by wave or current action, or by slumping (turbidity currents). Magnetite distribution appears in some cases to be related to porosity and permeability of the host rocks. Fine-grained, silty, and presumably less permeable, horizons are typically barren.

To be of value as concentrating material, the iron-bearing rock must be of appropriate chemical and textural composition and readily available in large quantities. The iron-bearing rocks of the Lower and Upper Taconite members on the Jean Property are considered with this in mind. There are widespread exposures of Lower Taconite rocks in the general area north of Mink Mountain and Whitefish River. Thicknesses in the range of 15 m to 70 m have been encountered in drill holes. Furthermore, the material is relatively soft and friable, and is exposed over a large area without capping rock to hinder extraction.

The analyses of Upper Taconite rocks indicate that they contain more iron and less silica than the Lower Taconite rocks, and the magnetite content in proximity to diabase sills is considerably higher.

#### **Exploration Criteria:**

Since the average composition of the iron-bearing rock contains too much silica for its use as ore material, good exploration criteria is to search for parts of the iron-bearing rock that have been concentrated by natural processes, or are amenable to commercial beneficiating methods.

There is no direct evidence that natural concentrations of iron have formed within the Jean Property area. The iron-bearing rocks show little evidence of oxidation of the iron minerals and leaching of the silica content.

Rocks of the Lower Taconite member appear to have been weathered more than other parts of the formation, particularly in the ridges and mounds north of the Whitefish River. However, close inspection of the outcrops reveals that alteration is restricted to a rim 2-5

cm thick. The chemical analyses demonstrate that there has been little, if any, removal of silica and other impurities.

Outcrops and drill core of Upper Jasper rocks apparently give indication of slight surface alteration, and hold little promise of large scale, natural concentrations. A 30 cm bed of soft hematite ore, assaying 52 percent iron and 3-8 percent silica, was reported to have been encountered at a depth of 250 feet, in the region south of Mink Mountain, by Gunflint Iron Mines Limited, in 1943 (Goodwin 1961).

It is possible that rocks of the Upper Taconite member that formerly overlay the diabase sill underwent oxidation and leaching of impurities before removal. Such iron-enriched material might have been concentrated in low-lying areas, such as Whitefish Lake and vicinity, and thus protected from erosion. However, there is no direct evidence that such a concentration exists.

Concentrations of iron-rich material can also occur along fault planes. Fault zones that might repay investigation lie between Silver Bluff and Divide Ridge, between Silver Bluff and Silver Mountain east of North River where the iron-bearing rocks abut on granite, and southeast of Mink and Sun mountains.

In conclusion, the economic future of the iron-bearing rocks appears to depend upon a process that can produce a commercial concentrate. More detailed experimental investigation might reveal such a process.

## **9.0 EXPLORATION**

ABZ has not carried out any exploration work on the Property. The historical, geological and exploration work on the Property was carried out during the period from 1850 to 2012 by various operators and researchers is discussed in Section 6 of this report.

## **10.0 DRILLING**

No drilling was done on the Jean Property by ABZ. The historical drilling on the Property carried out by various operators is discussed in Section 6 of this report.

## **11.0 SAMPLE PREPARATION, ANALYSES AND SECURITY**

For the present study the grab rock samples were collected in May 2011 from the outcrops, and core samples from 2012 drilling by Great Lakes were collected in September 2013 from the core boxes stored at Maki Resort, White Fish Lake, located approximately 10 kilometres to the east of the Property on Highway 588. The sampling approach for this reconnaissance work was to collect representative samples from each

of the dominant rock type present on the Property. A total of five grab surface samples and eight core samples were collected and placed in marked poly bags and shipped to the laboratory for analysis. The sample location from May 2011 property visit is shown on Figure 5. All samples were under the care and control of the author and a witness sample of each rock sample was retained and is available for viewing.

All the rock samples collected for the present study work were prepared and analyzed by Activation laboratories (Actlabs) in Thunder Bay and Toronto. Actlabs is ISO 17025 accredited and/or certified to 9001: 2008, and is independent of ABZ and Great Lakes. All rock samples were crushed to -10 mesh followed by pulverizing a 250-gram split to -150 mesh (95%). Each sample was analyzed for Iron Ore Analysis or XRF, and several samples were tested for Davis Tube Magnetic Separation. All samples from 2011-12 exploration work by Great Lakes were also analyzed at Actlabs. All of the samples are recorded in Excel spreadsheets.

For the present study, the sample preparation, security and analytical procedures used by the laboratories are considered adequate. No officer, director, employee or associate of Great Lakes and ABZ was involved in sample preparation and analysis.

## 12.0 DATA VERIFICATION

The author visited the property on May 21, 2011 and September 21-22, 2013 to verify the historical exploration work, mineralized outcrops and collect necessary geological data. The data consisted of rock and drill core sampling, comparing drill core with drill hole logs, and onsite discussions. The drill core from 2012 drill program is stored at Maki Resort near White Fish Lake.

Field description and assays of the samples collected during the property visits is provided in the following tables.

**Table 10: Description of Samples (May 21, 2011 property visit)**

Sample ID	Easting	Northing	Elevation	Type	Description
GE-JP11-01	0710911	5346690	494 m	Grab, outcrop/ subcrop	Dark brown, mostly hematite bearing chert and limestone, with thinly bedded magnetic seams.
GE-JP11-02	0710984	5346860	492 m	Grab, outcrop	Brown taconite, mainly hematite bearing chert and sediments with concentration of magnetite at places. No visible control of magnetic and nonmagnetic minerals concentration.
GE-JP11-03	0711332	347366	489 m	Grab, outcrop	Dark brown outcrop of banded iron formation with algal chert concretion mostly hematitic.



GE-JP11-04	0711863	5347839	514 m	Grab, outcrop	Brown taconite outcrop with upper layer of magnetite bearing chert, rest of the bedding is hematite / limonite dominant sandy and calcareous material.
GE-JP11-05	0711884	5347811	515 m	Grab, outcrop	Brownish thinly bedded argillites dominated with 1-5 cm thick magnetite bearing layers.

**Table 11: List of core samples collected during Sep 21-22, 2013 property visit**

Sample ID	Depth (m)	Total Length Sampled (m)	Description
JN 12-01-8m	8	0.5	Brown weathered silty sand, moderately to strongly magnetic, also include fresh greenish siltstone with pyrite nodules (Lower Taconite Member)
JN 12-02-9m	9	0.5	Greenish grey siltstone, thinly laminated, mostly un-weathered, magnetic (Lower Taconite Member)
JN 12-03-32.5m	32.5	0.5	Grey to brown silty sand plus siltstone, thinly laminated, mostly un-weathered, weathered along lineation, strongly magnetic (Lower Taconite Member)
JN 12-04-6m	6	0.5	Grey sandstone, fine grained with silt, thinly bedded, brown weathering along bedding, strong magnetic (Lower Taconite Member)
JN 12-05-29.5m	29.5	0.5	Greenish grey siltstone, thinly laminated, mostly un-weathered, slight weathering along lamellae, strongly magnetic (Lower Taconite Member)
JN 12-06-33m	33	0.5	Dark grey to greenish grey silty shale, thinly laminated, weakly magnetic (Lower Shale Member)
JN 12-07-54m	54	0.5	Dark grey silty shale, moderately magnetic, trace pyrite, thinly to massive bedded (belongs to Lower Algae Chert Member)
JN 12-08-12m	12	1	Greenish grey siltstone with brown coarse sandy texture volcanic fragments mm to 3 cm wide, reddish brown (Lower Taconite Member)

The samples from May 21, 2011 property visit were delivered by the author to ActLabs in Toronto, and for September 21-22, 2013 visit to ActLabs in Thunder Bay. ActLabs is an accredited laboratory in Canada. The core samples were assayed using lab packages: Iron

Ore Analysis XRF for core samples and for Davis Tube Magnetic Separation and Iron Ore Analysis XRF for grab samples.

Highlights of the assay results are provided in the following tables.

**Table 12: Results of Davis Tube Recovery – 2011 Sampling**

Samples	Client ID	Start Mass (g)	Magnetics (g)	Non-Magnetics (g)	% Magnetics (of start mass)
1	GE-JP11-01	30.0	12.34	17.2	41.1
2	GE-JP11-02	30.0	0.83	28.9	2.8
3	GE-JP11-03	30.0	6.67	23.1	22.2
4	GE-JP11-04	30.0	1.103	28.8	3.7
5	GE-JP11-05	15.0	8.74	5.3	58.3
<b>** The start weights of all samples were 30g except sample 5 (15g)</b>					

As shown in Table 12, percent values of magnetics are 41.1% and 58.3% in samples GE-JP11-01 and GE-JP11-05 respectively. These samples are from upper taconite member of Gunflint Iron formation.

**Table 13: Highlights of Sample Assay Results – XRF (2011 Sampling)**

Analyte Symbol	Unit	Detection Limit	Analysis Method	GE-JP11-01	GE-JP11-02	GE-JP11-03	GE-JP11-04	GE-JP11-05
SiO <sub>2</sub>	%	0.01	FUS-XRF	37.68	90.10	27.14	83.22	35.28
TiO <sub>2</sub>	%	0.01	FUS-XRF	0.03	0.02	0.02	0.03	0.07
Al <sub>2</sub> O <sub>3</sub>	%	0.01	FUS-XRF	0.54	0.20	0.10	0.30	0.97
Fe <sub>2</sub> O <sub>3</sub> (T)	%	0.01	FUS-XRF	50.89	7.98	40.79	13.69	58.71
MnO	%	0.01	FUS-XRF	0.17	0.08	0.31	0.29	0.14
MgO	%	0.01	FUS-XRF	4.14	0.07	0.58	0.12	0.61
CaO	%	0.01	FUS-XRF	4.42	0.07	16.09	0.15	0.23
Na <sub>2</sub> O	%	0.01	FUS-XRF	0.11	0.02	0.04	0.03	0.06
K <sub>2</sub> O	%	0.01	FUS-XRF	0.06	0.05	0.02	0.10	0.09
P <sub>2</sub> O <sub>5</sub>	%	0.01	FUS-XRF	0.27	0.02	0.01	0.02	0.05
Cr <sub>2</sub> O <sub>3</sub>	%	0.01	FUS-XRF	0.01	<0.01	<0.01	<0.01	<0.01
LOI	%	0.01	FUS-XRF	1.49	0.93	14.31	1.86	3.54
Total	%	0.01	FUS-XRF	99.81	99.54	99.41	99.81	99.76
Fe	%	0.003	ICP-OES	48.4	60.4	52.7	63.7	58.2

Results for iron oxide (Fe<sub>2</sub>O<sub>3</sub>) total in Table 13 are showing consistency with Davis Tube testing results for GE-JP11-01 and GE-JP11-05 in Table 12. For sample GE-JP11-03 nonmagnetic iron is dominating over the magnetic iron.

**Table 14: Assay results for drill core samples collected during Sep 21-22, 2013 Property visit**

Analyte Symbol	SiO <sub>2</sub>	TiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	Fe <sub>2</sub> O <sub>3</sub> (T)	MnO	MgO	CaO	Na <sub>2</sub> O	K <sub>2</sub> O	P <sub>2</sub> O <sub>5</sub>	Cr <sub>2</sub> O <sub>3</sub>	LOI	V <sub>2</sub> O <sub>5</sub>	Total
Unit Symbol	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Detection Limit	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01		0.003	0.01
Analysis Method	FUS-XRF	FUS-XRF	FUS-XRF	FUS-XRF	FUS-XRF	FUS-XRF	FUS-XRF	FUS-XRF	FUS-XRF	FUS-XRF	FUS-XRF	FUS-XRF	FUS-XRF	FUS-XRF
JN12-01-8m	38.3	0.01	0.22	28.53	0.3	0.54	16.4	0.03	0.01	0.02	< 0.01	14.64	< 0.003	99
JN12-02-9m	47.94	0.02	0.24	35.66	0.15	1.59	5.77	0.04	0.02	0.04	< 0.01	8.04	< 0.003	99.51
JN12-03-32.5m	33.52	0.07	0.47	61.46	0.13	0.68	0.75	0.06	0.15	0.07	< 0.01	2.02	< 0.003	99.38
JN12-04-6m	48.01	0.02	0.18	42.62	0.09	0.38	4.09	0.05	0.02	0.02	< 0.01	4.3	< 0.003	99.78
JN12-05-29.5m	20.15	0.05	0.35	73.17	0.2	0.94	1.92	0.04	0.08	0.08	< 0.01	3.27	< 0.003	100.3
JN12-06-33m	46.02	0.2	3.53	30.44	1	3.76	1.18	0.06	0.08	0.05	< 0.01	13.02	< 0.003	99.34
JN12-07-54m	41.29	0.04	0.32	29.92	2.4	2.51	5.76	0.05	0.02	0.07	< 0.01	17.02	< 0.003	99.4
JN12-08-12m	46.87	0.01	0.06	36.82	0.65	2.34	4.74	0.03	0.01	0.02	< 0.01	8.44	< 0.003	99.98

The assay results from core samples indicate iron oxide ( $\text{Fe}_2\text{O}_3$ ) in the range of 28.53% to 73.17%. Two values of relatively higher iron content are shown in samples JN12-03-32.5m (61.46%  $\text{Fe}_2\text{O}_3$ ) and JN12-05-29.5m (73.17%) (Table 14).

For the present study, the sample preparation, security and analytical procedures used by the laboratories are considered adequate. No officer, director, employee or associate of Great Lakes and ABZ was involved in sample preparation and analysis. Historical grades and assay data for the present study are taken from MNDM assessment reports and OGS geological reports which are deemed reliable. Historical geological descriptions taken from the above mentioned sources were prepared and approved by the professional geologists or engineers and are deemed reliable.



Photo 1: Drillhole location for 2012 drill program (Photo taken during Sep 2013 Property Visit)



Photo 2: Drill core photo and location of sample interval (Photo taken during Sep 2013 Property Visit)

## 13.0 MINERAL PROCESSING AND METALLURGICAL TESTING

No metallurgical testing was done on the property by ABZ. The historical metallurgical test work on the Property was carried out by various operators is discussed in Section 6 of this report.

## 14.0 MINERAL RESOURCE ESTIMATES

No mineral resource estimates were carried out by ABZ.

***Items 15 to 22 are not applicable.***

## 23.0 ADJACENT PROPERTIES

Seven mineral claims located adjacent to the east of the Jean Property are held by 1401385 Ontario Inc. Historical work on adjacent claims and the area immediately south and west of the Jean Property is summarized in the following sections. The following information is taken from the publically available sources which are identified in the text and in Section 27. The writer has not been able to independently verify the information contained although he has no reason to doubt the accuracy of the descriptions. The information is not necessarily indicative of the mineralization on the Jean Property, which is the subject of this technical report.

### 23.1 Lloyd K. Johnson Exploration (1952-1953)

Exploration on the Gunflint Iron Formation (GIF) was carried out by Lloyd K. Johnson Exploration (LKJE) during the year 1952 and 1953. LKJE staked the area underlain by GIF extending from the village of Nolalu in the east-northeast to the North Lake in west-southwest, including current Jean Property and carried out a regional iron exploration program. Mr. M. W. Bartley, Geologist, managed the overall exploration program consisting of reconnaissance geological mapping, aeromagnetic survey, ground magnetic survey, surface bulk sampling and diamond drilling.

**Reconnaissance Geologic Mapping:** A geological field party supervised by Dr. M. W. Bartley and Dr. W. L. C Greer covered the whole claim block and started with systematic one-mile interval traverse lines. However, due to extensive overburden cover this initial plan was replaced by exposure mapping using aerial photographs. Based on this geological mapping, the main Gunflint Iron Formation was first time separated into two successions, the Lower Gunflint Formation (LGF) and the Upper Gunflint Formation (UGF). However, the program was unable to conduct sub-divisions into smaller member units.

**Aeromagnetic Survey:** Canadian Aero Services was contracted to conduct aeromagnetic survey of the property and contiguous area. A quarter mile line spacing was used in this survey. A series of high and low anomalies were obtained over the claim. The magnetic highs followed

the escarpments formed by northern boundary of resistant diabase cappings. During the survey it was reported that constant detection of flight height had not been able to maintain and this may also affect magnetic susceptibility recorded.

**Ground magnetic survey:** was selective and was conducted by geophysical technicians from Pickards Mather & Co. Only 19 ground survey lines were run to check high magnetic anomalies obtained from aeromagnetic survey.

**Surface Sampling:** During field program, a total of 19 surface bulk samples were collected from exposures having 3.0 m or more vertical face. They were shipped to Erie Mining Company Laboratory for analyses and for minus 100-mesh and minus 200-mesh magnetic tube tests. ODM geological team interpreted that these surface samples belonged to Upper Taconite and the results obtained were published as representative for Upper Taconite in ODM-Report ORV 69. The total Fe% obtained range from 20.09% to 39.85% for feed, from 38.66% to 54.21% for minus 100-mesh, and from 43.42% to 56.77% for minus 200-mesh. No flotation was involved in the test.

**Diamond drilling:** program consisting of 8 holes was conducted in later part of the program based on geological and geophysical information obtained. Boyles Brothers Drilling Ltd. was contracted for drilling. The cores recovered were all sent to Erie Mining Company Laboratory for analyses and tests. ODM reviewed and classified the lithologic description of original drill logs into members of Upper Gunflint Formation and Lower Gunflint Formation, and included in ODM-Report ORV 69. The oriented summarized drill logs based on information obtained from ODM-Report ORV 69 is shown in Table 16.

Hole No. 1 exhibiting complete succession is located immediately to the east of the Jean Property claim 4252117 north of Mink Mountain and Hole No. 2, another hole with complete GIF succession was drilled to the eastern side of the Jean Property. The intervening area between these two holes is least overburden-covered and contains all three iron-bearing Upper Taconite (approximately 50 m), Upper Jasper (approximately 20 m) and Lower Taconite Member (approximately 60 m). All remaining drill holes were located outside to the northeast or southwest of the Jean Property.

The drill cores from this drilling program were shipped to Erie Mining Company Laboratory for analyses and magnetic tube tests. Only minus 100-mesh size test was done on these samples. The results obtained were first correlated with ODM's stratigraphic system and later weighted for representative Fe% for iron-bearing Upper Taconite, Upper Jasper and Lower Taconite. The summary weighted for iron-bearing members are as follows:

<u>Member</u>	<u>Upper Taconite</u>		<u>Upper Jasper</u>		<u>Lower Taconite</u>	
	<u>Feed</u> (Fe%)	<u>Conc.</u> (Fe%)	<u>Feed</u> (Fe%)	<u>Conc.</u> (Fe%)	<u>Feed</u> (Fe%)	<u>Conc.</u> (Fe%)
Hole 1	21.83	46.58	23.55	42.49	25.06	48.02
Hole 2	23.27	38.85	19.60	40.56	23.51	48.66

Hole 3	n.a	n.a	23.38	46.76	23.83	47.02
Hole 4	25.30	48.03	24.46	46.36	25.34	48.67
Hole 5	25.11	40.85	22.70	42.52	23.92	45.48
Hole 6	n.a	n.a	n.a	n.a	19.03	43.34
Hole 7	n.a	n.a	n.a	n.a	24.14	n.a
Hole 8	n.a	n.a	n.a	n.a	24.97	59.82

The total iron (Fe%) of samples from Hole No. 1 and Hole No. 2 located adjacent to the Jean Property and at eastern border ranges from 21.38% to 23.27 for Upper Taconite, from 19.60% to 23.55% for Upper Jasper and 23.51% to 25.06% for Lower Taconite. The total iron obtained for corresponding minus 100-mesh magnetic concentrates are 38.85% to 46.58%, 40.56% to 42.49% and 48.02% to 48.66% respectively. Results of holes 1 and 2 are provided in tables 17 and 18.



Magnetic Tube Tests on Surface Samples (1952)																		
Llyod K. Johnson Exploration: Surface Sampling Program																		
Sample Information			minus 100-mesh									minus 200-mesh						
No.	Interval (m)	Total Fe%	Magnetic Concentrate					Non-Magnetic Tails			Magnetic Concentrate					Non-Magnetic Tails		
			Weight %	Total Fe%	Percent Total Fe	Phos. %	Fusion Silica %	Weight %	Total Fe%	Percent Total Iron	Weight %	Total Fe%	Percent Total Fe	Phos. %	Fusion Silica %	Weight %	Total Fe%	Percent Total Iron
8915	3.3	32.34	53.31	49.33		0.064	28.360	46.69	12.94		47.23	53.61		0.066	22.97	52.77	13.30	
8916	3.3	30.36	35.11	45.58		0.168	42.780	64.89	22.13		27.11	50.36		0.189	23.00	72.89	22.92	
8917	3.3	34.08	32.48	52.10		0.144	38.070	67.52	25.11		30.17	54.01		0.144	16.40	69.83	25.47	
8918	3.3	33.91	40.96	49.00		0.152	35.690	59.04	23.44		35.24	50.93		0.147	17.36	64.76	24.65	
8924	3.3	33.89	43.77	54.21		0.180	35.890	56.23	18.07		40.86	56.77		0.168	12.05	59.14	18.08	
8926	3.3	39.20	62.61	52.96		0.268	31.460	37.39	16.16		56.87	56.55		0.221	12.13	43.13	16.32	
8936	3.3	26.97	-	-		-	44.080	-	-		-	-		-	-	-	-	
8938	3.3	32.24	43.80	49.68		0.014	44.960	56.19	18.64		36.48	55.50		0.012	15.50	63.52	18.88	
8939	3.3	26.89	35.28	47.60		0.014	49.160	64.72	15.60		29.03	51.95		0.012	22.78	70.97	16.64	
8960	3.3	23.33	-	-		-	46.240	-	-		-	-		-	-	-	-	
8961	3.3	20.74	-	-		-	46.440	-	-		-	-		-	-	-	-	
8962	3.3	20.09	-	-		-	51.400	-	-		-	-		-	-	-	-	
8963	3.3	23.95	18.40	51.76		0.021	51.410	81.60	17.68		14.38	54.13		0.022	15.33	85.62	18.88	
8964	3.3	26.41	48.49	38.66		0.026	46.500	51.51	14.88		39.55	43.42		0.026	29.83	60.45	15.28	
8994	3.3	29.89	38.37	50.66		0.075	43.960	61.63	16.96		33.51	54.77		0.062	16.73	66.49	17.35	
9004	3.3	32.24	22.91	49.20		0.189	40.900	77.09	27.20		16.24	51.63		0.163	17.70	83.76	28.48	
9005	3.3	28.03	22.73	46.08		0.165	43.160	77.27	22.72		17.32	49.94		0.15	19.49	82.68	23.44	
Special		39.85	30.17	50.24		0.038	33.240		35.36		23.51	53.16		0.044	20.20	76.49	35.76	

Table 15: Magnetic tube tests - 1952

Oriented Summarized Drill Logs																								
Lloyd K Johnson Explorations: Drill Program 1952																								
Member	Iron Range Lake Area to Nolalu Area																							
	Hole No. 5 (West)			Hole No. 6			Hole No. 3			Hole No. 1			Hole No. 2			Hole No. 4			Hole No. 7			Hole No. 8 (East)		
	From (m)	To (m)	Int. (m)	From (m)	To (m)	Int. (m)	From (m)	To (m)	Int. (m)	From (m)	To (m)	Int. (m)	From (m)	To (m)	Int. (m)	From (m)	To (m)	Int. (m)	From (m)	To (m)	Int. (m)	From (m)	To (m)	Int. (m)
Overburden	0.00	7.47	7.47	0.00	8.24	8.24	0.00	11.29	11.29	0.00	5.03	5.03	0.00	0.92	0.92	0.00	0.52	0.52	0.00	0.79	0.79	0.00	2.93	2.93
Diabase Capping										5.03	6.56	1.53	0.92	13.03	12.12	0.52	17.08	16.56						
Upper Limestone										5.03	6.56	1.53	0.92	13.03	12.12	0.52	17.08	16.56						
Upper Taconite	6.56	59.93	53.37							13.03	33.25	20.22	17.08	27.54	10.46									
Upper Shale	59.93	62.43	2.50				33.25	35.78	2.53	27.54	29.22	1.68												
Upper Jasper	62.43	82.11	19.68				35.78	46.67	10.89	29.22	48.71	19.49												
Upper Algae	70.61	73.20	2.59	26.54	32.45	5.92	82.11	88.91	6.80	46.67	48.50	1.83	48.71	53.38	4.67	0.79	4.06	3.27						
Lower Taconite	73.20	132.37	59.17	8.24	51.12	42.88	32.45	89.52	57.07	88.91	148.9	59.99	48.50	112.9	64.40	53.38	115.84	62.46	4.06	74.51	70.45	2.93	49.65	46.72
Lower Shale	132.37	135.12	2.75				89.52	94.55	5.03	148.90	152.35	3.45	112.90	113.77	0.86	115.84	119.35	3.51				49.65	50.72	1.07
Lower Algae Chert	135.12	139.09	3.97	51.12	52.03	0.91	94.55	99.22	4.67	152.35	153.08	0.73	113.77	114.38	0.61	119.35	120.44	1.09	74.51	75.64	1.13	50.72	54.87	4.15
Basal Conglomerate																								
Archean Granite	139.09	143.35	0.30	52.03	55.51	3.48	99.22	105.23	6.01	153.08	184.22	31.14	114.38	140.91	26.54	120.44	123.37	2.93	75.64	89.21	13.57	54.87	59.17	4.30

Table 16: Drill logs 1952 exploration

Lloyd K. Johnson 1952: Hole No. 1								minus 100-mesh						Weighted Fe %			
Lithology				Sample Information				Concentrates				Tailings		Feed Fe		minus 100-mesh	
Member	From (m)	To (m)	Int. (m)	From (m)	To (m)	Int. (m)	Feed Fe%	Weight %	Total Fe%	Phos. %	Si %	Weight %	Total Fe%	Int*Fe%	Weighted %	Int*Fe%	Weighted %
Overburden	0	5.03	5.03	0.00	4.27	4.27	-	-	-	-	-	-	-	-	-	-	-
Upper Taconite	5.03	59.93	54.90	4.27	6.10	1.83	12.90	20.59	25.32	-	12.12	79.41	9.68	23.61	21.83	521.34	46.58
				6.10	13.73	7.63	18.14	21.46	47.34	-	10.35	78.54	10.16	138.32		1015.92	
				13.73	21.35	7.63	16.45	19.51	51.05	-	8.84	80.49	8.06	125.43		995.99	
				21.35	28.98	7.63	16.61	16.91	53.07	-	10.67	83.09	9.19	126.65		897.41	
				28.98	36.60	7.63	26.61	30.22	53.79	-	14.25	69.78	14.84	202.90		1625.53	
				36.60	43.01	6.41	28.47	19.48	50.13	0.246	19.66	80.52	23.23	182.35		976.53	
				43.01	48.80	5.79	28.15	23.84	43.93	0.192	19.75	76.16	23.21	163.13		1047.29	
				48.80	54.90	6.10	23.87	-	-	-	-	100.00	23.87	145.61		-	
				54.90	62.07	7.17	21.45	0.07	-	-	-	99.93	-	153.74		-	
Upper Shale	59.93	62.43	2.50	62.07	62.43	0.37	-	-	-	-	-	-	-	-	-	-	-
Upper Jasper	62.43	82.11	19.68	62.43	68.63	6.19	21.47	3.02	-	-	-	96.98	-	132.93	23.55	0.00	42.49
				68.63	76.25	7.63	23.95	4.12	44.45	-	-	95.88	23.07	182.62		183.13	
				76.25	82.11	5.86	25.24	20.97	48.23	0.033	24.24	79.03	19.14	147.81		1011.38	
Upper Algae	82.11	88.91	6.80	82.11	84.03	1.92	20.37	19.68	50.70	0.018	20.67	80.32	12.94	-	-	-	-
				84.03	85.61	1.59	7.68	3.46	-	-	-	96.54	-	-	-	-	-
				85.61	88.91	3.29	17.30	9.95	59.76	0.030	14.07	90.05	12.61	-	-	-	-
Lower Taconite	0.00	148.9	148.90	88.91	96.08	7.17	25.30	23.98	50.15	0.013	22.52	76.02	17.46	181.34	25.06	1202.60	48.02
				96.08	103.70	7.63	21.99	19.55	39.97	0.012	33.56	80.45	17.62	167.67		781.41	
				103.70	111.33	7.63	22.31	17.48	41.01	0.02	29.07	82.52	18.35	170.11		716.85	
				111.33	118.95	7.63	23.47	16.62	50.37	0.01	20.87	83.38	18.11	178.96		837.15	
				118.95	127.49	8.54	27.74	19.88	56.56	0.01	14.46	80.12	20.59	236.90		1124.41	
				127.49	135.12	7.63	27.72	7.77	50.62	-	-	92.23	25.79	211.37		393.32	
				135.12	141.83	6.71	26.43	0.27	-	-	-	99.73	-	177.35		-	
				141.83	148.90	7.08	25.39	0.07	-	-	-	99.93	-	179.66		-	
Lower Shale	148.90	152.35	3.45	148.90	152.35	3.45	24.99	5.49	56.64	-	-	94.51	23.15	-	-	-	-
Lower Algae Chert	152.35	153.08	0.73	152.35	153.08	0.73	9.77	5.10	57.43	-	-	94.90	7.21	-	-	-	-
Basal Conglomerate														-	-	-	-
Archean Granite	152.35	184.22	31.87	153.08	184.22	31.14	-	-	-	-	-	-	-	-	-	-	-
Member	Weighted Fe%																
	Feed	Conc															
Upper Taconite	21.83	46.58															
Upper Jasper	23.55	42.49															
Lower Taconite	25.06	48.02															

Table 17: Assay results of Drillhole 1 – 1952 exploration

Llyod K. Johnson 1952: Hole No. 2								minus 100-mesh						Weighted Fe %			
Lithology				Sample Information				Concentrates				Tailings		Feed Fe		minus 100-mesh	
Member	From (m)	To (m)	Int. (m)	From (m)	To (m)	Int. (m)	Feed Fe%	Weight %	Total Fe%	Phos. %	Si %	Weight %	Total Fe%	Int*Fe%	Weighted %	Int*Fe%	Weighted %
Overburden	0.00	0.92	0.92	0.00	0.92	0.92	-	-	-	-	-	-	-				
Diabase	0.92	13.03	12.11	0.92	6.10	5.19	12.16	6.99	34.37	-	21.68	93.01	10.49				
				6.10	14.03	7.93	12.00	3.40	34.44	-	-	96.60	11.21				
Upper Taconite	13.03	33.25	20.22	14.03	18.30	4.27	25.52	27.35	52.46	0.134	15.57	72.65	15.38	108.97	23.27	1434.78	38.85
				18.30	22.27	3.97	19.68	28.24	35.08	0.020	41.60	71.76	13.62	78.03		990.66	
				22.27	22.88	0.61	-	-	-	-	-	-	-	-		-	
				22.88	25.32	2.44	22.48	38.62	30.84	0.050	46.62	61.38	17.22	54.85		1191.04	
				25.32	25.93	0.61	-	-	-	-	-	-	-	-		-	
				25.93	30.50	4.58	24.00	18.81	37.12	0.020	37.65	81.19	20.96	109.80		698.23	
				30.50	34.47	3.97	24.08	18.97	42.88	0.012	28.06	81.03	19.68	95.48		813.43	
Upper Shale	33.25	35.78	2.53	34.47	34.86	0.40	-	-	-	-	-	-	-				
				34.86	38.74	3.87	24.32	20.24	44.48	0.015	25.40	79.75	19.20				
Upper Jasper	35.78	46.67	10.89	38.74	44.23	5.49	19.60	23.17	40.56	0.012	33.50	76.83	13.28	107.60	19.60	939.78	40.56
Upper Algae	46.67	48.50	1.83	44.23	48.50	4.27	21.76	14.04	46.24	0.014	24.87	85.96	17.76				
Lower Taconite	48.50	112.90	64.40	48.50	54.90	6.41	20.00	7.56	46.40	0.010	21.09	92.44	17.84	128.10	23.51	350.78	48.66
				54.90	61.00	6.10	18.34	3.43	-	-	-	96.57	-	111.87		-	
				61.00	64.66	3.66	20.16	0.87	-	-	-	99.13	-	73.79		-	
				64.66	68.63	3.97	25.12	6.48	45.91	0.021	28.06	93.52	23.68	99.60		297.50	
				68.63	76.25	7.63	23.68	8.16	50.91	0.024	21.92	91.84	21.26	180.56		415.43	
				76.25	84.18	7.93	25.44	2.52	55.18	-	-	97.48	24.67	201.74		139.05	
				84.18	91.50	7.32	26.24	0.20	-	-	-	99.80	-	192.08		-	
				91.50	99.13	7.63	25.60	0.07	-	-	-	99.93	-	195.20		-	
				99.13	106.75	7.63	24.88	0.07	-	-	-	99.94	-	189.71		-	
				106.75	112.09	5.34	22.88	0.07	-	-	-	99.93	-	122.12		-	
Lower Shale	112.90	113.77	0.87	112.09	112.64	0.55	28.32	0.13	-	-	-	99.87	-				
Lower Algae Chert				112.64	113.77	1.13	27.36	1.81	-	-	-	98.19	-				
Basal Conglomerate	113.77	114.38	0.61	113.77	114.38	0.61	5.68	0.13	-	-	-	99.87	-				
Archean Granite	114.38	140.91	26.53	114.38	140.91	26.54	-	-	-	-	-	-	-				
Member	Weighted Fe%																
	Feed	Conc															
Upper Taconite	23.27	38.85															
Upper Jasper	19.60	40.56															
Lower Taconite	23.51	48.66															

Table 18: Assay results of Drillhole 2 – 1952 exploration

## 23.2 ODM-Report 69 (1960)

Dr. A. M. Goodwin, in ODM-Report ARV69, reported additional analytical information on the above work (Section 23.2) for Upper Taconite, Upper Jasper and Lower Taconite member. Partial chemical analyses for determination of Fe% were made on drill cores and surface samples of Upper Taconite, Upper Jasper and Lower Taconite member.

The results obtained are as follows:

<u>Member</u>	<u>Upper Taconite</u>	<u>Upper Jasper</u>	<u>Lower Taconite</u>
	<u>Partial Fe%</u>	<u>Partial Fe%</u>	<u>Partial Fe%</u>
	25.71	25.50	30.70

These partial iron contents, supposed to be lower, are higher than total iron analyses obtained from LKJE's drill core samples. The cause may be due to surface samples included in averaging partial chemical analyses. The surface sample under overburden cover may be enriched with secondary iron.

## 23.3 Flint Rock Mines Ltd.

Flint Rock Mines Ltd. (FR) conducted exploration adjacent to the east and southeast of Jean Property from 1959 to 1962. Majority of this work was carried out on claims currently held by 1401385 Ontario Inc. The program started with prospecting and surface sampling by Mr. L. D. Chisholm in 1959. Two samples from UGF formation were collected continuously from the cliff face under diabase sill. These two samples may probably belong to Upper Taconite, and the first sample assayed 29.54% over 3.05 m and the second 25.40% Fe over 4.57 m averaging 27.00% Fe over 7.63 m.

With these encouraging values and after dip needle survey, FRML drilled 7 holes in 1960 under the supervision of Mr. H. H. Sutherland. The drill logs were broadly grouped into two main Upper Gunflint and Lower Gunflint Formation, and no attempt was made on differentiating iron-bearing members in the formations. The oriented summarized drill logs of 1960 program are shown in Table 19 and on Figure 7. All holes were drilled at - 75° due north.

In summary, weighted total Fe% of formational level Upper Gunflint Formation and Lower Gunflint Formation are as follows:

<u>Formation</u>	<u>Upper Gunflint</u>	<u>Lower Gunflint</u>
	<u>(Fe%)</u>	<u>(Fe%)</u>
Hole 1	30.29	23.59
Hole 2	25.80	21.35
Hole 3	26.10	n.a

Hole 4	26.70	n.a
Hole 5	24.95	n.a
Hole 6	30.19	n.a
Hole 7	25.99	27.61

This 1960 drilling program was followed in 1962 by another six infill diamond drilling program, Hole No. 8 to Hole No. 13, under the supervision of Dr. R. V. Oja (Table 20).

The weighted total Fe% obtained from infill drill holes for iron-bearing members are as follows:

<b><u>Member</u></b>	<b><u>Upper Taconite</u></b> <b>(Fe%)</b>	<b><u>Upper Jasper</u></b> <b>(Fe%)</b>	<b><u>Lower Taconite</u></b> <b>(Fe%)</b>
Hole 08	19.34	23.79	24.16
Hole 09	19.52	24.55	23.79
Hole 10	21.92	24.92	21.72
Hole 11	20.08	24.35	24.52
Hole 12	23.38	25.39	25.44
Hole 13	20.09	24.54	25.90

Oriented Summarized Drill Logs																					
Flint Rock Mines Ltd: Drill Program 1960																					
(after H.H. Sutherland 1960)																					
Member	Hole No. 7 (West)			Hole No. 6			Hole No. 5			Hole No. 4			Hole No. 3			Hole No. 2			Hole No. 1		
	From (m)	To (m)	Int. (m)	From (m)	To (m)	Int. (m)	From (m)	To (m)	Int. (m)	From (m)	To (m)	Int. (m)	From (m)	To (m)	Int. (m)	From (m)	To (m)	Int. (m)	From (m)	To (m)	Int. (m)
Overburden																					
Diabase Capping	0.00	22.81	22.81	0.00	22.88	22.88	0.00	9.85	9.85	0.00	20.72	20.72	0.00	22.75	22.75	0.00	16.33	16.33	0.00	15.65	15.65
Upper Limestone	22.81	49.99	27.18	22.88	49.56	26.68	9.85	38.13	28.28	20.72	48.98	28.26	22.75	51.55	28.80	16.33	49.99	33.66	15.65	45.08	29.43
Upper Taconite																					
Upper Shale																					
Upper Jasper																					
Upper Algae																					
Lower Taconite	49.99	115.29	65.30	EOH			EOH			EOH			EOH			49.99	76.25	26.26	45.08	76.25	31.17
Lower Shale																					
Lower Algae Chert																					
Basal Conglomerate																					
Archean Granite																			76.25	89.21	12.96

Table 19: Drill logs – FR Drill Program 1960



Oriented Summarized Drill Logs																		
Flint Rock Mines Ltd: Infill Drill Program 1962																		
after Dr. R. V. Oja (1962)																		
Member	Hole No. 13 (West)			Hole No. 12			Hole No. 11			Hole No. 10			Hole No. 8			Hole No. 9		
	From (m)	To (m)	Int. (m)	From (m)	To (m)	Int. (m)	From (m)	To (m)	Int. (m)	From (m)	To (m)	Int. (m)	From (m)	To (m)	Int. (m)	From (m)	To (m)	Int. (m)
Overburden	0.00	3.05	3.05	0.00	3.36	3.36	0.00	0.61	0.61	0.00	3.05	3.05	0.00	2.75	2.75	0.00	5.80	5.80
Diabase Capping	3.05	23.79	20.74	3.36	18.61	15.25	0.61	27.76	27.15	3.05	26.54	23.49	2.75	26.54	23.79	5.80	13.73	7.93
Upper Limestone	23.79	33.55	9.76	18.61	30.50	11.89	27.76	36.60	8.84	26.54	47.28	20.74						
Upper Taconite																		
Upper Shale	33.55	46.97	13.42	30.50	39.96	9.46	36.60	38.13	1.53	47.28	56.73	9.45	26.54	28.98	2.44	13.73	15.56	1.83
Upper Jasper							38.13	51.24	13.11									
Upper Algae	46.97	74.12	27.15	39.96	57.04	17.08	51.24	68.63	17.39	56.73	63.44	6.71						
Lower Taconite	74.12	105.23	31.11	57.04	95.47	38.43	68.63	99.43	30.80	63.44	86.62	23.18	28.98	97.60	68.62	39.04	103.40	64.36
Lower Shale	EOH			EOH			EOH			EOH			97.60	98.82	1.22	103.40	106.14	2.74
Lower Algae Chert																		
Basal Conglomerate																EOH		
Archean Granite													98.82	117.12	18.30			

Table 20: Drill logs summary – FR Drill Program 1962

### **23.4 Raytech Metals Corp. (2007-08)**

Raytec Metal Corp., (RMC) staked almost the same area located immediate east of Jean Property in 2007 cover historic Gunflint or Mt. Edna Property drilled by Flint Rock Mines Ltd (1959-1962) and estimated by Shklanka in 1968.

A reconnaissance-style mineral exploration consisting prospecting, geologic mapping, surface rock sampling and radiometric survey was conducted in 2008 under the supervision of Mr. Gordon. J. Allen.

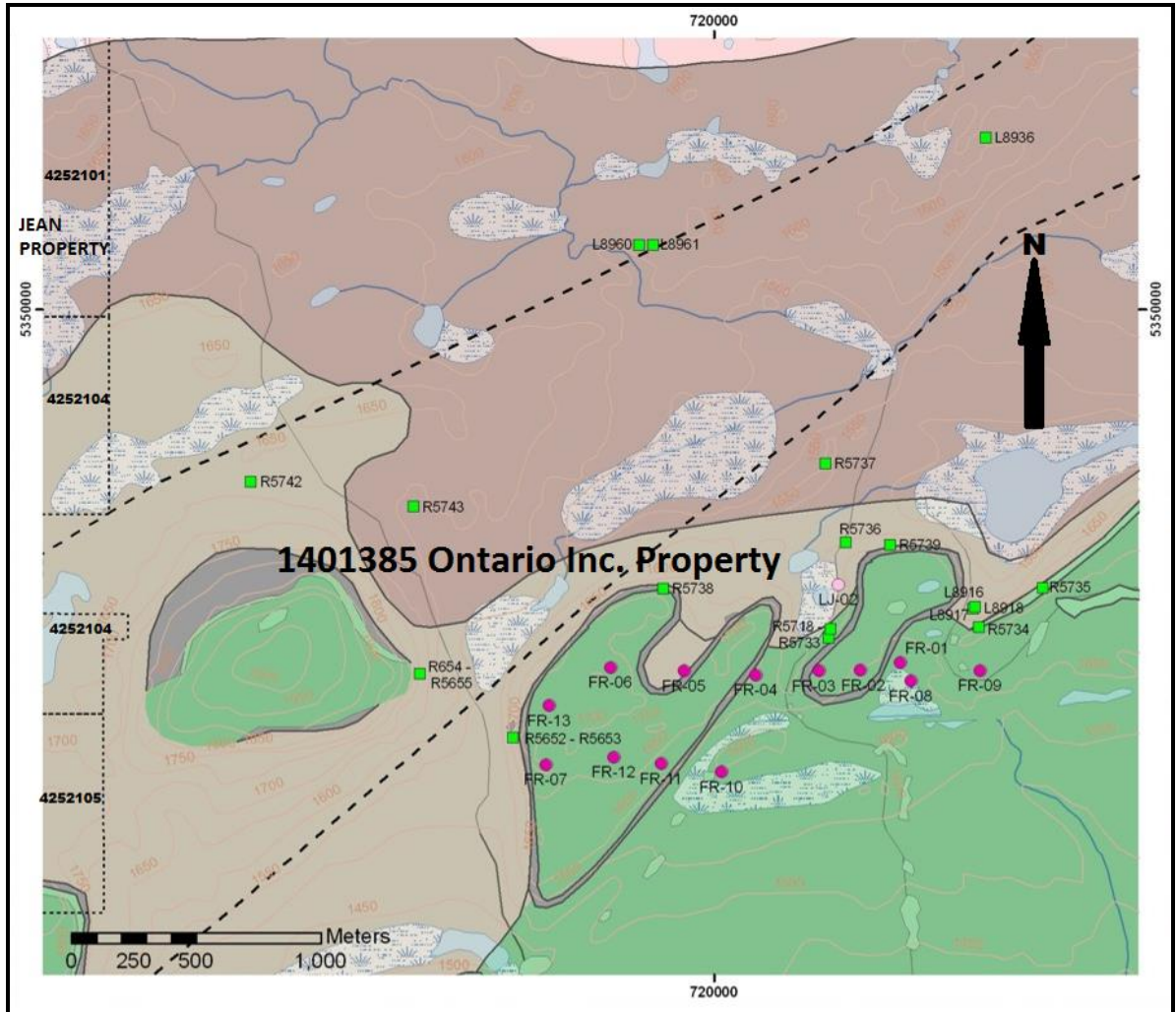
RMC during 2008 program collected 30 surface rock chip samples mainly from Upper Taconite horizon exposing approximately 3.4 km strike length beneath the diabase capping of Divide Ridge. In addition 16 vertical samples, each representing different lithologic units were also collected along cliff face exposed by trenching north of Divide Ridge. The lengths of trench samples range from 0.1 to 1.90 m based on thickness of individual lithologic units.

All the samples were shipped to SGS Lakefield Research Ltd, Lakefield, Ontario for analyzing whole rock by borate fusion XRF, magnetic iron by Satmagan and ferrous iron by titration. No DT magnetic concentration test was involved during the program.

Assay returns from chip samples collected from the Upper taconite member average 22% total iron and 6.4% magnetite iron (by Satmagan). The grab sample assays from trench are variable as they represented different lithology. The highest assay, 47.2% Fe over 0.1 m was obtained from magnetite bearing lithology.

### **23.5 Canada Iron Inc. (2010)**

Canada Iron Inc. carried out and airborne VTEM survey in 2010 contracted to Geotech Ltd. The survey identified six electromagnetic anomalies interpreted to be associated with diabase sills of Mount Marny and its contact with Gunflint Iron Formation. The magnetic lows adjacent to the strong highs may represent the Gunflint horizons where hematite-carbonate-jasper-greenalite predominate. Results of twenty samples are also available in the technical report filed by Canada Iron Inc. in 2011, with iron oxide ( $\text{Fe}_2\text{O}_3$ ) results in the range of 28.189% to 32.560%.



## **24.0 OTHER RELEVANT DATA AND INFORMATION**

### **24.1 Environmental Concerns**

There is no historical production from the Jean Property, and the author is not aware of any environmental liabilities which have accrued from historical exploration activity.

### **24.2 Aboriginal Issues**

The area is under claim by the following three First Nations Groups:

1. Fort Williams First Nations, 90 Anemkie Drive, Suite 200, Thunder Bay, Ontario, P7J 1L3.
2. Metis Nation of Ontario, 500 Old Street, Ottawa, Ontario, K1N 9G4.
3. Whitewater Lake First Nations, 307 Euclid Avenue – Suite 414, Thunder Bay, Ontario, P7E 6G6.

Ministry of Northern Development, Mines and Forestry (MNDMF) Ontario encourages claim holders to engage with Aboriginal communities and begin developing a working relationship as early in the mining sequence as possible.

## **25.0 INTERPRETATION AND CONCLUSIONS**

The Jean Property consists of 17 mineral claims in 114 units covering 2,596 hectares land located in Thunder Bay Mining District of Northwestern Ontario, Canada. It is underlain by an Archean granitic basement, which is unconformably overlain by gently southerly-dipping sedimentary rocks of the Aphebian (lower Proterozoic) Animikie group. These sediments are capped by a Helikian (1.0 Ga) Keweenawan diabase sill. Unconsolidated rocks are Pleistocene age glacial till debris which forms an extensive mantle over low-lying parts of the area.

Gunflint Iron formation of Animikie Group is part of extensive Lake Superior-type iron formation (LSTIF) ranges developed along the margins of cratons or epicontinental platforms between 2.4 Ga and 1.9 Ga. It is banded iron formation (BIF) mainly comprised of taconite rocks, and is characterized by unusually high iron content, as well as by a variety of textures, of which the granular texture of the taconite rock being most distinctive. The Gunflint formation, approximately 145 m thick, is divided into lower and upper cycles. Each cycle contains a sequence of members, most of which are common to both. The uppermost member, a limestone bed, is unique to the formation and marks the top of the iron-bearing rocks. The key economic parameters for magnetite iron being economic in BIF are the crystallinity of the magnetite, the grade of the iron in the host rock, and the contaminant elements which exist within the magnetite concentrate. The

typical grade of iron at which a magnetite-bearing banded iron formation becomes economic is roughly 25% Fe, which can generally yield a 33% to 40% recovery of magnetite by weight, to produce a concentrate grading in excess of 64% iron by weight.

ABZ has not carried out any exploration work on the Property. The historical exploration data available for the Property area includes geophysical surveys, geological mapping, diamond drilling, bulk surface sampling, and magnetic tube testing of core and surface samples. This work was carried out during the period from 1943 to 1962. The total Fe% obtained through magnetic tube separation and acid roasting with magnetic concentration range from 23.95% to 39.85% for feed, from 38.66% to 54.21% for minus 100-mesh and from 43.42% to 56.77% for minus 200-mesh.

In 2011, Great Lakes Resources Ltd. (GLR) re-activated exploration work on the current Property with two-phase geologic exploration and surface sampling program. The first phase program conducted in May 2011, consisted of field geological prospecting, collection of selective grab samples to verifying historical information, assaying for iron content and Davis Tube Test (DTT) for magnetic concentrates. The second phase program was followed in August 2011 and consisted of systematic channel and bulk sampling, DTT test, Mineral Liberation Analysis (MLA) test and geological report writing.

In May-June 2012, GLR followed-up previous year surface sampling program with diamond drilling program. A grid totaling 3.5km was planned and cut according to iron formation stratigraphy. The base line, 2km in length, trends 055° azimuth with perpendicular 0.5km tie-lines. The diamond drilling program was planned to adequately understand the third depth dimension of iron formation stratigraphy and to correlate with surface geology and sampling. The program includes eight vertical NQ-size holes totaling 492.88m bounding 3km by 0.5km area. The drilling program started on May 15, 2012 and completed on June 6, 2012.

Geology obtained from the diamond drill program verified known surface geology with additional detailed stratigraphic information. The drill area is underlain by northeast trending (approximately 055° azimuth) gently 4-5° southeast dipping Lower Gunflint Formation. Lower Taconite Member of Lower Gunflint Formation was the main economically-interesting stratigraphic horizon investigated in this program. All eight holes intersected iron bearing Lower Taconite Member, whereas two complete Lower Taconite Member vertical intersections were delineated in holes JN12-03 (56.81m) and JN12-05 (57.75m). The average true thickness is estimated to be 57.06m.

Only Upper Shale, Upper Jasper and Upper Algae Chert Member composing lower portion of Upper Gunflint Formation was encountered in two holes, JN12-03 and JN12-05, located on the higher ground and on baseline or southern portion of the drilled area. No Upper Taconite Member was intersected during the program. Both Upper Gunflint and Lower Gunflint Formation within the Property contain no diluting diorite sills. Narrow diorite sills less than a meter in thickness, are only recorded in JN12-02 and JN12-04 at the contact of the base of Lower Gunflint Formation and underlying Archean

Basement. A total of 84 drill core samples with varying length from 0.33m to 12.00m based on geology were collected and assayed for iron content. In addition, Davis Tube Test (DTT) was performed on two composite samples combined from drill core samples of Lower Taconite Member of Lower Gunflint Formation, one from JN12-03 and the other from JN12-05. The results indicated 23.44 percent weighted average iron (Fe). For DTT, the weighted average feed grade was 24.08% Fe. For minus 200-mesh size, the magnetic concentrates recovery averaged 7.48% with the magnetic concentrates grade of 57.79% Fe. The non-magnetic concentrates values for this size fraction were 91.45% for recovery and 22.55% Fe for grade.

Mineral Liberation Test results on two samples indicated that the Lower Taconite Members samples are mineralogically fairly similar with average magnetic content of 8.34% and average magnetic grain size of 23 microns. The non-magnetic goethite/siderite averaged 4.1%. The sample from Lower Shale contains <0.1% magnetite with main iron minerals as pyrite (14.3%) and goethite/siderite (combined 17.3%).

Finding more areas with natural concentration of iron in GIF is a key exploration criterion for further development of the Property. Previous exploration and geological work indicate that there is no direct evidence for natural concentrations of iron within the Jean Property area. Rocks of the Lower Taconite member appear to have been weathered more than other parts of the formation, particularly in the ridges and mounds north of the Whitefish River. The Upper Taconite rocks show the least signs of oxidation and leaching. The member typically occupies a high topographic position beneath diabase sills of considerable thickness, and oxidizing activity may have been restricted for this reason.

The Property is exposed to certain risks which may potentially impact its future economic viability or continued viability. The economics of the iron-bearing rocks of Jean Property appears to depend upon a process that will produce a commercial concentrate. More detailed metallurgical testing might reveal such a process.

The Jean Property has good year round road access from the towns of Thunder Bay via the Trans-Canada Highway 11/17, about 20 km west from the Highway 61 junction to Highway 588 (Stanley access), and then a further 45 km southwest along Highway 588. Travel time by road from Thunder Bay to the Property is approximately one hour. A network of logging roads and trails traverse the mineral claims.

A part of the field data presented in this report was collected by the author during May 21, 2011 and September 21-22, 2013 Property visits. The geological work performed in order to verify the existing data consisted of surface rock and drill core sampling, and visiting accessible rock outcrops. The sampling approach for this reconnaissance work was to collect representative surface rock and drill core samples from each of the dominant rock type present on the Property. A total of five representative grab rock and eight drill core samples were collected and placed in marked poly bags, and shipped to

the laboratory for analysis. The magnetic tube separation of grab rock samples indicated that the percent values of magnetics are 41.1% and 58.3% in samples GE-JP11-01 and GE-JP11-05 respectively. These samples are from upper taconite member of Gunflint Iron formation. The drill core samples were collected from Lower Gunflint formation and their results indicated iron oxide ( $\text{Fe}_2\text{O}_3$ ) in the range of 28.53% to 73.17%. Two values of relatively higher iron content are shown in samples JN12-03-32.5m (61.46%  $\text{Fe}_2\text{O}_3$ ) and JN12-05-29.5m.

The data presented in this report is based on published assessment reports available from Great Lake Resources, Ontario MNDMF, the Geological Survey of Canada, and the Ontario Geological Survey. All the consulted data sources are deemed reliable. The data collected during the course of present study is considered sufficient to provide an opinion about the merit of the Property as a viable exploration target.

Based on its favourable geological setting indicating surface and subsurface presence of Gunflint Iron formation, and the results of present study, it is concluded that the Property is a property of merit and possess a good potential for discovery of economic concentration of iron bearing rocks through further exploration and improvement of beneficiation processes. Good road access, availability of exploration and mining services in the vicinity makes it a worthy mineral exploration target. The historical exploration data collected by previous operators on the Property provides the basis for a follow-up work program. The author is of the opinion that the present study has met its original objectives.

## **26.0 RECOMMENDATIONS**

In the qualified person's opinion the character of the Jean Property is sufficient to merit the following phased work program, where the second phase is contingent upon the results of the first phase.

### ***Phase 1 – Ground Geophysical Survey, Drilling, Trenching and Sampling***

This work includes carrying out ground magnetic survey in the area adjacent to the southeast and southwest of 2012 drill program carried out by Great Lake Resources. Extension of line cutting grid of 2012 will be a good option to tie up historical data with new survey lines. Geological mapping, prospecting, trenching and sampling work should also be carried out alongside the geophysical survey. A 1,000 metres diamond core drilling program should follow-up ground geophysics and trenching work.

Phase 1 work program will be of six weeks duration with a budget of \$202,950 (Table 21), and includes the following tasks:

- Ground Total Field Magnetometer survey at 100 m line spacing and 25 metres survey spacing;
- Detailed geological mapping, sampling and trenching of all accessible rock units of Gunflint Iron Formation with special emphasis on the area in the vicinity of 2012 drill program;
- Drilling eight to ten holes in the extension of 2012 drilling grid, with a total drilling of 1,000 metres; and
- Sample assaying for XRF and Davis tube separation.

**Table 21: PHASE 1 BUDGET – Ground Geophysical Survey, Drilling, Trenching and Sampling**

Item	Unit	Unit Rate (\$)	Number of Units	Total (\$)
Permitting	day	\$650	3	\$1,950
Ground geophysical survey (2 person crew)	day	\$800	10	\$8,000
Geological work and sampling	day	\$650	10	\$6,500
Prospecting and sampling	day	\$450	15	\$6,750
Diamond drilling	meters	\$1,000	80	\$80,000
Core logging geologist	day	\$550	15	\$8,250
Core cutting and sampling	meters	\$1,000	3	\$3,000
Excavator for trenching and drilling	hrs	\$135	80	\$10,800
Equipment rentals	lump sum	\$5,000	1	\$5,000
Transportation air	airfare	\$1,000	2	\$2,000
Transportation ground	day	\$150	50	\$7,500
Field supplies	lump sum	\$2,000	1	\$2,000
Meal and board	day	\$200	50	\$10,000
Sample assays and DTT testing	sample	\$120	200	\$24,000
GIS work	hrs	\$60	20	\$1,200
Data compilation	day	\$650	15	\$9,750
Report and filing	day	\$650	15	\$9,750
Project management	day	\$650	10	\$6,500
<b>TOTAL BUDGET ESTIMATE</b>				<b>\$202,950</b>

### ***Phase 2 – Step-out and Infill Exploratory Drilling and Beneficiating Tests***

If results from the first phase are positive, then a step-out and infill drilling program would be warranted. This work will help to define the trends and continuity of the



favourable taconite units of Gunflint Iron formation within and adjacent to the past exploratory drilling area. This drilling program, if successful will provide basis of iron resource estimation. The metallurgical testing will help in defining the potential for economic concentration of iron in taconite. The scope of work and location of drill holes would be determined based on the findings of Phase 1 investigations. Initially a 3,000 metres diamond core drilling is proposed in 20-25 drill holes.

Estimated cost of this program is \$450,000.

## 27.0 REFERENCES

- 1.0 Aung Myint Thein, 2011; Assessment Report on the Jean Iron Property, Jean Township, Thunder Bay South Mining Division, Ontario, Claims 4252101, 4252102, 4252103, 4252104, 4252105, 4252106, 4252107, 4252108, 4252109, 4252110, 4252111, 4252112, 4252113, 4252114, 4252115, 4252116 and 4252117, October 26, 2011.
- 2.0 Aung Myint Thein, 2012; Assessment Report on the Jean Iron Property, Jean Township, Thunder Bay South Mining Division, Ontario, Claims 4252101, 4252102, 4252103, 4252104, 4252105, 4252106, 4252107, 4252108, 4252109, 4252110, 4252111, 4252112, 4252113, 4252114, 4252115, 4252116 and 4252117, August 30, 2012.
- 3.0 Flint Rock Mines Limited, 1962; Drill Hole Logs Whitefish Lake Property; Port Arthur Mining Division, May 07, 1962.
- 4.0 G.A. Gross, 2009; Iron Formation in Canada, Genesis and Geochemistry; Geological Survey of Canada Open File 5987.
- 5.0 Goodwin, A.M. (1961), Gunflint Iron Formation of the Whitefish Lake Area, District of Thunder Bay, Ontario, Ontario Department of Mines report ORV 69.
- 6.0 Gordon J. Allen, 2008; Assessment Report on Geological Mapping, Rock Sampling, and Radiometric Survey on Gunflint (Mt.Edna) Property, Thunder Bay Mining Division, Ontario; for Raytec Metals Corp., Dec 31, 2008.
- 7.0 Gunter Faure and Jack Kovach, 1969; Age of Gunflint Iron Formation of Animikie Series in Ontario, Canada; PP Geological Society of America.
- 8.0 J.F. Wright, 1952; Concentration Tests on Cores from Gunflint Range Exploration Drilling, November 27, 1952.
- 9.0 Kelly, T.J., 1961; Statistical review of mineral industry 1959, Annual report of the Department of Mines, Ontario, published 1961 (ORV 69).
- 10.0 Pier Kenneth Pufahl, 1996; Stratigraphic Architecture of a Paleoproterozoic Iron Formation Depositional System: the Gunflint, Mesabi and Cuyuna Iron Ranges; Master of Science Thesis, Lakehead University, Thunder Bay, Ontario.
- 11.0 Roman Shklanka, 1968; Iron Deposits of Ontario; Department of Mines, Mineral Circular No. 11, 1968.
- 12.0 Sharpe George C., 2011; Technical report on Gunflint Property, Thunder Bay Mining District, Ontario; prepared for Canada Iron Inc., dated August 10, 2011.

13.0 Zago Neal, and Gutta Blair, 2012; Whitefish River assessment report, prepared for Lakehead Region Conservation Authority; August 2012.

14.0 Websites:

<http://www.canadaironinc.com/66901/67301.html>

<http://gsabulletin.gsapubs.org/content/80/9/1725.short#>

[http://www.thunderbaydirect.info/about\\_thunder\\_bay](http://www.thunderbaydirect.info/about_thunder_bay)

[http://www.thunderbay.ca/Doing\\_Business/About\\_Thunder\\_Bay.htm](http://www.thunderbay.ca/Doing_Business/About_Thunder_Bay.htm)

<http://www.mnsu.edu/urc/journal/URC2007journal/Drommerhausen.pdf>

<http://www.thunder-bay.climateemps.com/graph.php>

<http://www.mndm.gov.on.ca/en/mines-and-minerals/applications/exploration-permits>

[http://minerals.usgs.gov/minerals/pubs/commodity/iron\\_ore/mcs-2010-feore.pdf](http://minerals.usgs.gov/minerals/pubs/commodity/iron_ore/mcs-2010-feore.pdf)

## 28.0 SIGNATURE PAGE

Dated: October 1<sup>st</sup>, 2014



Signed and Sealed

Afzaal Pirzada, P.Geol.

## 29.0 CERTIFICATE OF AUTHOR

I, Afzaal Pirzada, P.Geo., as an author of this report entitled, “Technical Report on the Jean Property, Thunder Bay Mining District, Northwestern Ontario, Canada; Dated October 1<sup>st</sup>, 2014”, do hereby certify that:

1. I am a consulting geologist of: GEOMAP EXPLORATION INC. 12430 – 76<sup>th</sup>Avenue, Surrey, British Columbia, Canada, V3W 2T5.
2. I have M.Sc. degree in Geology from Punjab University, Lahore, Pakistan in 1979.
3. This certificate applies to the report entitled “Technical Report on the Jean Property, Thunder Bay Mining District, Northwestern Ontario, Canada; Dated October 1<sup>st</sup>, 2014”.
4. I am registered as a Professional Geologist in British Columbia (License #: 28657) Canada.
5. I have been practicing my profession continuously since 1979, and have over twenty years of experience in mineral exploration for uranium, iron, titanium, lithium, rare metals, base metals, coal, PGE, and gold.
6. I have read the definition of “qualified person” set out in National Instrument 43-101 (“NI43-101”) and certify that by reason of my education, affiliation with professional associations and past relevant work experience, I fulfill the requirements to be a “qualified person” for the purpose of NI43-101.
7. I visited the property for one day on May 21, 2011 and September 21-22, 2013, and I am the Author of the report. To my knowledge, no exploration work has been carried out by ABZ or Great Lakes Resources Ltd. on the property since my last visit to the Property.
8. I am responsible for all items of this report.
9. I have no interest, direct or indirect in the Jean Property, nor do I have any interest in any other properties of ABZ, nor do I own directly or indirectly any of the securities of neither ABZ, nor do I expect to receive any such interest or securities in the future.
10. I am independent of ABZ and Great Lakes Resources Ltd., as that term is defined in Section 1.5 of NI 43-101.

11. I have no prior involvement with the Jean Property other than as disclosed in item 7 of this certificate.
12. I have read National Instrument 43-101 ("NI43-101"), and the Technical Report has been prepared in compliance with NI43-101, and Form 43-101F1.
13. I am not aware of any material fact or material change with respect to the Jean Property the omission of which would make this report misleading.
14. As at the date of this certificate, to the best of my knowledge, information and belief the technical report contains all scientific and technical information that is required to be disclosed to make this technical report not misleading.

Dated: October 1<sup>st</sup>, 2014



Signed and Sealed

Afzaal Pirzada, P.Geo.