# TECHNICAL REPORT ON THE EL SOL IRON PROJECT, ONTARIO FOR NORTHERN IRON CORP.

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### 1. SUMMARY

#### **General and Terms of Reference**

Northern Iron Corp. ("**NIC**") holds an option to earn a 100% interest, subject to a 2% net smelter return ("NSR") royalty, in certain mineral claims that comprise the El Sol Iron Property located in the Avis Lake area, northwestern Ontario, Canada, approximately 100 km east of Red Lake, and 68 km northeast of Ear Falls, Ontario. The El Sol Property hosts the El Sol (also known as the Tex-Sol) magnetite taconite, Algoma-type iron ore deposit that has been identified from historical exploration programs. The past producing Griffiths iron ore mine, which closed in 1986, was located 20 km north of Ear Falls and 70 km west of the Property. This property is also now controlled by NIC.

In 2008, Raytec Metals Corp. ("**Raytec**"), predecessor company to Lion Energy Corp. ("**LEC**"), completed an exploration program on the Property consisting of ground geophysics and diamond drilling. Its drilling program consisted of 11 drillholes aggregating 2,301 m. The purpose of this program was to validate historic results from the late 1950s.

Watts, Griffis and McOuat Limited ("**WGM**") was retained by NIC to prepare an updated independent Technical Report conforming to the guidelines of the Canadian Securities Administrators' National Instrument 43-101 ("NI 43-101") and the Council of the Canadian Institute of Mining, Metallurgy and Petroleum ("**CIM**") standards and definitions.

#### **Sources of Information**

Much of the material used to prepare this report has been provided originally by Raytec and this current NI 43-101 is an updated version of a report dated December 22, 2009 prepared on behalf of LEC. This data included assessment reports completed for El Sol and its contractors and associate companies, and filed with the Ministry of Northern Development and Mines, Ontario, to document its historic exploration programs in the 1950s. Raytec also filed one assessment report covering the work it completed during the initial stages of its 2008 program. WGM was also provided with a draft report that was to be filed for assessment credit covering the latter parts of Raytec's 2008 exploration program concerned mostly with the diamond drilling campaign.

WGM Senior Associate Geologist Mr. Richard Risto, P.Geo., QP visited the Property in October 2008, discussed Raytec's 2008 program and reviewed 2008 program results with Ms. Janice Fingler, P.Geo., Project Geologist.



### Property

The Property comprises four staked mining claims covering a total of approximately 1,000 hectares. In November 2007, Raytec entered into an option agreement to acquire a 100% interest (subject to a 2% Net Smelter Royalty) in the Property by making a series of staged cash payments to the vendors, issuing shares, and incurring certain exploration expenditures. In February 2010, LEC assigned its rights in the Property to NIC in exchange for 8.5 million common shares of NIC. By agreement with the original vendors, the original vendors accepted an aggregate of 500,000 common shares of NIC as compensation for the assignment of the Property to NIC and also for agreeing to waive the requirement for LEC/Raytec/NIC to incur remaining exploration expenditures on the Property in an amount of up to \$1,500,000.

#### **Previous Work**

In 1955, a large scale airborne geophysical survey was completed. This survey defined several magnetic anomalies and claims were staked, but then sold to various interested parties. The claims covering the Property, amongst others, were sold to Tex-Sol Explorations Limited ("**Tex-Sol**") and/or El Sol Gold Mines Limited, understood to be associated companies. In 1956, El Sol carried out ground geophysical surveys, geological mapping and trenching programs. This work delineated two main zones of iron formation, A and B Zones, on the Property within an east-west trending corridor straddling Kesaka and Crossley (Jean) Lakes.

During the winter of 1956-1957, the extent of the A and B Zones were tested by a total of 33,998 ft (10,423 m) of drilling in 67 holes. Metallurgical testwork was conducted at the University of Toronto and at Lakefield Research. Subsequent testwork was conducted at Lurgi in Germany. The testwork at Lurgi completed on drill core samples showed that concentrates averaging nearly 70% iron could be produced using fine grinding. Iron recovery in Davis Tubes was approximately 80%. Pellets made from concentrates contained 68.4% iron and 2.2% silica. In 1958, the mineral "reserve" estimate was completed and various economic and mine planning studies were initiated.

As far as WGM knows, no significant work was completed after this date until a small trenching program was initiated in 2007.

#### **Geology and Mineralization**

The Property is situated within the folded metasedimentary terrane on the southern fringes of the Archean, Lake Birch-Uchi greenstone belt of the Uchi Subprovince of the Canadian Shield. The Property is underlain by a central east-west trending sequence of clastic metasediments with local horizons of iron formation, flanked to the north and south by volcanic flows, volcaniclastics and amphibolites.



The distribution of the iron formation within the succession outlines an east-west trending steeply plunging syncline with its fold closure southwest of Kesaka Lake. El Sol named the iron formation forming the north limb of the fold the A Zone, and the south limb the B Zone, and also named a number of subsidiary zones. The iron formation dips steeply.

The El Sol deposit is an iron formation of the Algoma-type and consists predominantly of magnetite taconite-type iron formation, with minor hematite and iron-bearing silicates and iron-lean sections. Narrow transitional facies of silicate iron formation containing minimal magnetite occasionally also occur.

The A Zone has a strike extent of approximately 4.5 km and dips vertical to steeply south. True thickness of mineralization varies from approximately 50 m to 70 m and towards the fold closure it pinches out. In some places there are subsidiary A Zones. The B Zone is segmented into sections by a NE-SE trending fault and folding. It has a total strike length of approximately 2.1 km. El Sol's historic drilling shows that its thickness diminished eastwards away from the fold closure. Near the fold closure, the historic drilling indicates the mineralized zone has a true thickness of approximately 85 m and it dips steeply south. Additional drilling is required to more completely outline zones of mineralization.

The average grade for all (314) of Raytec's regular drill core oxide iron formation samples was 31.8% TFe, (Total Iron), 39.1% magnetite. Phosphorus and sulphur levels are low.

### **Exploration and Drilling**

NIC has completed no exploration on the Property.

Raytec completed one exploration program on the Property. This exploration program was conducted in 2008 and consisted of four main components: Linecutting; Very Low Frequency Electromagnetic ("VLF-EM") and Ground proton precession magnetic surveying; Ground Overhauser magnetic survey; and diamond drilling. The ground geophysics successfully outlined the magnetite-rich iron formation and was used for sighting the drillholes.

Raytec's drilling program started October 1st and was completed October 28<sup>th</sup>, 2008. The program consisted of a total of 2,301 m of drilling in 11 drillholes. All of the drilling was completed on the A Zone.

Since the end of October 2008, no additional work has been conducted on the El Sol Property, apart from the SGS metallurgical testwork and report issued in 2010. WGM understands that



total exploration expenditures on the El Sol property by Raytec between 2008 and 2010 aggregated \$1,180,616.

### Logging, Sampling and Assaying

Core logging consisted of descriptive and geotechnical logging. It included RQD, magnetic susceptibility measurements and photography of all core in the trays.

Samples were laid out nominally at 3 m intervals, but were also delimited at lithic unit boundaries at both shorter and longer intervals. A selection of samples 1 m in length were also made for in-field bulk density measurements. Samples submitted from the field included field Blanks and a field Duplicates consisting of second half sawn core. One field Blank and one field Duplicate were included with every 20 regular samples submitted for analysis. Bracket samples were also used to bracket all mineralized sections.

All in-lab sample preparation mandated by Raytec was performed by SGS-Lakefield and was performed on a total of 429 drill core samples including field-inserted Blanks and second half core Duplicates. Preparation Duplicates were also prepared at SGS-Lakefield.

The drill core samples were analyzed for major whole rock element oxides ("WR"), including  $Fe_2O_3$ , by lithium metaborate fusion XRF. FeO was determined by  $H_2SO_4/HF$  acid digest-potassium dichromate titration. Magnetic iron, expressed on SGS-Lakefield certificates in terms of magnetite, was completed by Satmagan. Specific gravity was done by helium comparison pycnometer. Additionally, fifty samples had bulk density determined on whole core prior to crushing.

### **Data Corroboration**

WGM Senior Associate Geologist, Richard Risto, P.Geo., completed a site visit to the project between October 23 and 27, 2008. At the time of the visit, the drill was on the second last hole of the drill program. Ms. Janice Fingler, Project Geologist, guided Mr. Risto through the project.

Mr. Risto reviewed, with Ms. Fingler, a selection of documents detailing historic exploration results and newly collected data from the current program. The drills were visited, as well as all of the program's drill sites. Mr. Risto reviewed 2008 program drill core and independently collected seven samples of second half drill core for independent assay and validation of Raytec's results. The samples were sent to SGS-Lakefield for WR XRF analysis, Satmagan, pycnometer SG and -10 mesh fractions were also sent to Midland Research Center, Minnesota, for determination of Head iron, and preparation of Davis Tube concentrates, with analysis of concentrates for iron and silica.



#### **Adjacent Properties**

In addition to El Sol, NIC has acquired the rights and is exploring for iron ore on several other claims in the Red Lake District. Included in these properties is the past producing Griffith Mine (approx. 70 km west of El Sol). In the summer of 2010, NIC conducted reconnaissance work on the Griffith claims.

Other claims held by NIC in the Red Lake District include the Karas property (approx. 56 km west of El Sol), the Whitemud-Bluffy-Slate property (approx. 28 km west of El Sol), the Slate Lake property (approx. 7 km west of El Sol) and the Avis-Currie property (approx. 15 km east of El Sol). During the summer of 2010, NIC conducted ground-based magnetometer surveys and geological mapping on three of the projects to further define magnetic anomalies identified from airborne geophysics and three drillholes were completed. WGM is aware of three iron exploration programs in Ontario at Lake St. Joseph, Bending Lake and Cummings Lake respectively 100 km east, 200 km south and 900 km south east of the Property.

#### Mineral Processing and Metallurgical Testing

The initial LIMS testwork was conducted on five samples of drill core selected by Raytec. Three charges were used for grind curve determination, three for Davis Tube testing by size, and one for Head assays. The objective of the grind curve determination was to estimate the required grinding time to achieve the grinding targets for Davis Tube testing. The grinding targets were 100% passing 200 mesh (75 um), 325 mesh (45 um), and 400 mesh (38 um). In order to generate the grinding curve, three 100 g test charges were pulverized for 90 seconds, 150 seconds and 210 seconds in a ring pulverizer. The ground products were then submitted for wet particle size analysis ("PSA").

Although this work showed no consistent trends with the various rock types in the metallurgical responses, it consistently reflected that fine grinding was required to achieve marketable grades of iron and silica in the concentrates. This was consistent with the conclusions reached in the 1956 and 1957 testwork campaigns.

Subsequently, SGS was contracted to conduct a test program on a Master composite prepared from the 2008 drill core samples. This program was aimed at developing a flowsheet to produce saleable Fe concentrates (<4% SiO<sub>2</sub>), which would include magnetic separation followed by the removal of silicates using reverse flotation. The Master composite was made up of 298 of the original 424 variability samples that graded 31.6% Fe, 43.6% SiO<sub>2</sub> and contained 38.5% magnetite.



Three batch LIMS ("Low Intensity Magnetic Separation")+ flotation kinetics tests conducted on whole ore showed that a primary grind of K80 of 50  $\mu$ m (100% passing 150mesh) was sufficient to produce an Fe concentrate grading less than 4% SiO<sub>2</sub>. Batch rougher tests on a bulk LIMS concentrate did not show any effect of caustic starch or sodium silicate dosage. Batch cleaner (Fe scavenger) tests indicated that the addition of a LIMS stage after regrinding to a K80 of 25 $\mu$ m was beneficial in scavenging the majority of the Fe lost to the silicate rougher concentrate. The addition of a scavenger cleaner flotation stage would help ensure that the Fe scavenger concentrate was on-spec and therefore could be blended with the primary Fe concentrate (SiO2 rougher tailings). A single locked cycle test conducted on the LIMS concentrate produced a final combined Fe concentrate grading 68.0% Fe, 3.86% SiO<sub>2</sub>, 0.18% Al<sub>2</sub>O<sub>3</sub>, 0.27% MgO, and 0.43% CaO at 84.6% Fe recovery and 39.4% mass recovery.

### Conclusions

- The El Sol iron deposit probably ranks as one of the top ten deposits in iron formation known in Ontario. Although there are potential limitations with the project size, there is reasonable potential that a combination of product type and quality available on the Great Lakes with the transportation advantage to central North American markets can be viable in the current iron ore and iron markets;
- In the late 1950s the El Sol or Tex-Sol deposit was explored by 67 drillholes aggregating 10,363 m. The deposit in the form of a fold with two steeply dipping limbs was delineated. This work led to the definition of a deposit of 312 million tons of "reserves" averaging 31.1 %Fe to a vertical depth of approximately 300 m. These "reserves" are non-compliant with guidelines of NI 43-101 and should not be relied upon, but they are of historic significance;
- Preliminary mine planning in the late 1950s suggested the steeply dipping deposit could be open pitted to a depth of 250 ft depending on assumptions to allow for mining of 60 million tons or 20% of deposit "reserve" tonnage;
- At the same time as the mine planning, metallurgical testwork was completed at Lakefield Research and at Lurgi in Germany. The testwork showed that high quality concentrates could be produced by fine grinding the mineralization and subjecting it to low intensity magnetic concentration;
- Raytec's 2008 exploration program focussed on the A Zone (the north limb) of the deposit and, in general, has successfully validated the historic data available for the tested area in terms of extent, widths, and composition of mineralization;

- Much of the specific historic information concerning drillhole assays, drillhole locations, assay methods and certificates are missing and no drill core has been located. Therefore, additional drilling will be required to allow for a NI 43-101 compliant Mineral Resource estimate encompassing the known historic deposit on the Property to be completed;
- The iron oxide formation deposit is mainly fine grained magnetite, with minor hematite. Gangue components are mainly iron-bearing silicates: hornblende, actinolite and chlorite. The average grade for all (314) of Raytec's regular drill core oxide iron formation samples was 31.8 % TFe, 39.1% magnetite, 1.3% hematite (calculated) and with an average of 13.0% of the TFe in other mineral phases (most likely iron-bearing silicates);
- The metallurgical characteristics of the mineralization determined on the work completed to date by Raytec has been consistent with the more extensive historical metallurgical testwork in the 1956 and 1957 period where LIMS magnetic concentration is able to achieve high iron recovery on the iron mineralization that is predominantly magnetite;
- The 2010 testwork inclusion of silica flotation with LIMS concentration has shown that grinding to 100% passing 150 Mesh will produce iron concentrates of saleable specification. Regrind of the initial LIMS stage tailings will allow further production of saleable concentrates. The flowsheet used in 2010 indicates that the grinding energy requirements can be reduced with a combination of stage grinding and employing silica flotation to clean the magnetic concentrates. These results are regarded as an improvement on the high energy requirements indicated by historical testwork;
- Further mineralogical work is required to verify mineralogical content and the natural grain size to help optimize production of marketable concentrates. This work would be supported with a program to assess the liberation of the iron mineralization in the concentrates being produced across a range of fine grinding levels to better define the optimum;
- In conjunction with future testwork, additional mineralogical work is required to assess the liberation of the iron mineralization in the concentrates being produced across a range of ore types and primary grinding levels. This work should be campaigned across the deposit to confirm the application of the optimum grinding level for each stage;
- Final concentrates require further testwork to confirm their suitability for the production of pellets. Additionally, testwork may be conducted on the technical viability of producing direct reduction iron ("DRI") from pellets and from concentrate;



The most significant challenge facing development of the El Sol deposit may be the • smaller size of the deposit and the scale of project that could be sustained with the historic mine size suggested. With the North American market limitations and the possible inability to realize the economies of a large scale project, the resulting costs may make it difficult to compete with the larger scale of other North American production. Supplemental challenges are the steep dip and relative narrow width of mineralization which will result in higher stripping ratios in the mine operation, and the high energy and operating costs that are associated with fine grinding to produce the concentrates. The remote location of the deposit will require relatively high capital and operating costs for the supporting infrastructure to develop and operate the mine. Transportation, concentrating and pelletizing costs are expected to be proportionally higher. An economic and market study of the El Sol Project and possibly in conjunction with neighbouring iron projects should be undertaken to review various development approaches to assess project viability.

#### Recommendations

WGM makes the following recommendations:

- Simplify the drillhole database particularly with respect to samples and assays. WGM suggests that the original and duplicate assays not be averaged, but that duplicates simply be used for QA/QC assessment.
- Conduct mineralogical work as required to verify mineralogical content and the natural grain size to help optimize production of marketable concentrates.
- Complete the ground magnetic survey to provide survey coverage of the areas of the Property covered by lakes.
- Attempt to locate and to acquire the missing Lurgi metallurgical testwork report. Enter all available assays for the historic drillholes into the project database (all known iron assays have been entered, but, assays for P, SiO<sub>2</sub> and others have not been entered).
- Continue efforts to open a dialogue with local first nations and aboriginal groups.

- Contact the owners of trap lines located on and adjacent to the Property and notify them of the Company's plans concerning the Property.
- Complete a preliminary economic study on the deposit based on the new technical information available. Variables and scenarios to be addressed in the study could include:
  - Sensitivities of the variations in the life of mine plan to variations in annual production levels.
  - Variations in the type of iron concentrates produced for the market. This would include iron ore concentrate, iron ore pellets, and/or DRI.
  - Potential operational synergies with other iron ore projects in the vicinity of El Sol.
  - Various potential markets, which include international and North American steel mills. The supply and demand picture for iron will be considered for each market.
  - Projected cost regime for developing and operating a project in this location.
  - The study would also consider alternate product transport technologies and include slurry pipeline, a technology that has been proven in recent years.

The preliminary economic study would be used as a basis to decide whether further drilling and predevelopment studies are warranted on the project at this time. This study will use the historic resource base as is, estimating and interpolating for missing data as geologically reasonable and will be an internal study for NIC's usage.

Following the completion of a positive preliminary economic study, it is recommended that NIC conduct an exploration drill program to bring the El Sol property into the Inferred category of Mineral Resource under NI 43-101, followed by a Preliminary Assessment which includes a NI 43-101 compliant Mineral Resource Estimate.

NIC, in conjunction with WGM, has developed a work program and budget to advance the El Sol Property:

Proposed Program, El Sol Property			
Component	Cost (C\$)	Total (C\$)	
Drillhole database simplification	10,000	C\$10,000	
Mineralogical study and Variability Testwork	50,000	C\$50,000	
Magnetic survey	40,000	C\$40,000	
Technical and Preliminary Economic Study			
Estimate of scope schedule and cost for predevelopment studies	5,000		
Resource Model (includes review of historic data)	25,000		
Mine Design and Costs	20,000		
Mill Design and Costs	20,000		
Pelletising and DRI Evaluation	20,000		
Infrastructure	10,000		
Transportation Study and Costs	20,000		
Environmental and Economic study	20,000		
Market Study	20,000		
First Nations Consultation	10,000		
Financial and Sensitivity Analysis	10,000		
Report Preparation	<u>10,000</u>	<u>C\$190,000</u>	
Exploration Program (2,500 metres @ \$400 per metre)	<u>\$1,000,000</u>	<u>C\$1,000,000</u>	
<b>Preliminary Assessment</b> (includes NI 43-101 Mineral Resource Estimate)	C\$500,000	C\$500,000	
Geological-Technical-Management Costs	<u>100,000</u>	<u>C\$100,000</u>	
GRAND TOTAL		C\$1,890,000	

## 2. INTRODUCTION AND TERMS OF REFERENCE

## 2.1 GENERAL

Northern Iron Corp. ("**NIC**"), In February 2010 entered into an agreement with Lion Energy Corp. ("**LEC**"), previously Raytec Metals Corp. ("**Raytec**"), to acquire its rights to the El Sol Iron Property (the "Property" or "Project") from a consortium of vendors. The Property, as shown in Figure 1 is located in the Avis Lake area, 100 km east of Red Lake, Ontario, and covers an iron formation originally explored by El Sol Gold Mines Ltd. ("**El Sol**") and Tex-Sol Explorations Limited ("**Tex-Sol**") in the 1950s.

El Sol completed airborne and ground geophysics, mapping and some trenching. In 1956 and 1957, it completed diamond drilling programs aggregating 10,363 m (33,998 ft) in 67 drillholes. This work resulted in the definition of a tightly folded, steeply dipping magnetite-rich iron formation consisting of two main zones (A and B) and a series of smaller subsidiary zones of iron formation. Subsequent metallurgical testwork was conducted both in Ontario and in Germany on trench and drill core samples. In 1958, a mineral resource estimate was completed for mineralization to a vertical depth of 1,000 ft. A total mineral resource of 312,550,000 tons at an average grade of 31.1% Fe was estimated. The forgoing historic reserve estimate was completed prior to the implementation of Canadian Securities Administrators' National Instrument 43-101 ("NI 43-101") and should not be relied upon. WGM has not audited or confirmed this estimate but both NIC and WGM believe it is of historic significance.

Raytec initiated exploration of the Property in 2008 and has completed ground geophysical surveys and a drilling program aggregating 2,301 m in 11 drillholes. This work was aimed mainly at validating historic exploration results for the Property completed by El Sol.

The opinions and conclusions presented in this report are based on information received from NIC and Raytec. WGM received full cooperation and assistance from NIC personnel during the site visit and subsequent exchanges, and during the preparation of this report.

## 2.2 TERMS OF REFERENCE

Watts, Griffis and McOuat Limited ("**WGM**") was retained by NIC to prepare an independent Technical Report for the El Sol Iron Project and Property conforming to the guidelines of the Canadian Securities Administrators' National Instrument 43-101 ("NI 43-101") and the





Council of the Canadian Institute of Mining, Metallurgy and Petroleum ("CIM") standards and definitions.

WGM did not review legal, environmental, political, surface rights, water rights or other nontechnical issues which might indirectly relate to this report as NIC has retained legal counsel for these purposes.

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The preparation of this report was authorized by Mr. Peter Arendt, P.Eng., President and CEO of Northern Iron Corp. on September 24, 2010.

### 2.3 SOURCES OF INFORMATION

Much of the material used to prepare this report has been provided by LEC's predecessor company Raytec and this current report is an update of a report prepared for LEC dated December 22, 2009. This data included assessment reports completed for El Sol and its contractors and associate companies, and filed with the Ministry of Northern Development and Mines ("**MNDM**"), Ontario to document its historic exploration programs in the 1950s. Additional historic exploration data, not part of the Ministry's digital assessment files collection, is held in the files of the Regional Resident's Geologist Office in Red Lake. Both Raytec and WGM acquired some data from this office. A summary of this historic work is contained in Ontario Geological Survey Report 256, "Geology of the Slate Lake Area", District of Kenora by R.P. Bowen. Recent exploration results by Raytec are documented in assessment reports for its 2008 exploration programs. In particular, "Assessment Report on Line Cutting and Magnetics and VLF-EM surveys on the Avis Lake (El Sol) Property, Red Lake Mining Division for Raytec Metals Corp." by Gordon J. Allen, dated October 22, 2008 and also "2008 Exploration Report on The El Sol Iron Project, Northwestern Ontario for Raytec Mining Corporation" by Ms. Janice Fingler, Fingler Geological. Additional information was sourced from WGM files. WGM reviewed the documents available and corroborated a number of details concerning the Property and deposit geology.

WGM Senior Associate Geologist Mr. Richard Risto, B.Sc., M.Sc., P.Geo., QP visited the Property from October 23 to 27, 2008 and reviewed Raytec's program results with Ms. Janice Fingler, P.Geo., M.Sc., Project Geologist for Raytec.



A complete list of the material reviewed is found in the "References" section of this report.

NIC has reviewed a previous draft of this report. Nevertheless, this report is the responsibility of WGM which alone has been in charge of its overall presentation and production.

### 2.4 UNITS AND CURRENCY

Metric units are used throughout this report unless specified otherwise and all dollar amounts are quoted in Canadian currency ("C\$"). Historical data and some government map data in original reports are generally in Imperial units. WGM has converted the necessary data for inclusion in this report, although Imperial units are often provided for clearer reference to historic data.

Raytec's 2008 drill core samples were analysed by X-Ray Florescence ("XRF") whole rock ("WR") methods on metaborate discs by SGS Minerals Services ("**SGS-Lakefield**") at its Lakefield, Ontario facility. Iron results on SGS-Lakefield certificates of analysis are reported in the form of  $Fe_2O_3$  and are total iron. Total Iron ("TFe") refers to the total iron in a sample. TFe is calculated from  $Fe_2O_3$  by dividing the  $Fe_2O_3$  wt% value by 1.4295. TFe assays are often completed on both Head and Crude samples of rock and also on the concentrates produced from the rock. %TFe Head or %TFe\_H refers to the percent total iron in a Head or Crude sample.

El Sol's historic drill core and trench samples were assayed for iron but details are scant. Its original assays may be in terms of partial iron or hydrochloric/nitric acid Soluble Iron ("SFe"). SFe assays will generally report less iron than TFe assays because not all iron-containing minerals are digested.

Raytec's 2008 drilling program on the Property, in addition to using chemical assays, also included determining magnetic iron or the magnetite content of samples using the Satmagan method (Satmagan is an acronym for Saturation Magnetization Analyzer). Satmagan refers to an electromagnetic method to estimate the magnetite content of a sample. These assays are expressed as %Fe<sub>3</sub>O<sub>4</sub> or as %magnetite ("%mt").

Raytec and historic El Sol also completed bench-scale metallurgical testwork programs on samples from the Property. This testwork included the preparation of Davis Tube concentrates ("DTC") for trench and drillhole samples. Davis Tube provides an alternative method to Satmagan for estimating the magnetic iron content of a sample. Davis Tube refers to instrumentation and a procedure that produces a mineral concentrate high in magnetic iron



by separating that portion of the sample that is magnetic from the portion that is nonmagnetic, following sample comminution. Percent Davis Tube Weight Recovery ("%DTWR") refers to the weight percent of the sample concentrated in the magnetic fraction using the Davis Tube procedure. This is approximately the same as percent magnetite in the Crude sample but subject to liberation of the magnetite in the sample preparation. Davis Tube concentrates are also assayed for iron and other oxides expressed in weight percent. %Fe\_DTC and %SiO<sub>2</sub>\_DTC refer respectively to the iron and silica content in the Davis Tube concentrates and a number of other elements are often expressed in this same way. The %magnetic iron in the Crude sample can be estimated by multiplying the %DTWR figure by the %Fe in the Davis Tube concentrate. Total Iron Recovery ("TFe Recovery") is the %TFe units recovered in the concentrates compared to the TFe in the Crude samples.

Other whole rock analysis results for samples are expressed in weight percent ("Wt%"). Table 1 documents several of the commonly used abbreviations and acronyms in the text of this report.

Abbreviation	Term		
% or Wt%	Weight Percent		
Head or Crude or H	Non-concentrated material		
TFe	Total Iron		
SFe	Soluble Iron		
Fe	Iron; SFe and TFe		
DT, DTC or C	Davis Tube, Davis Tube Concentrate, Concentrate		
%DTWR	% Davis Tube Weight Recovery		
%Wt Recovery	General term for weight recovery		
TFe Recovery, %Rec'y	Fe units recovered in concentrates: Fe units in Crude		

TABLE 1. SUMMARY OF TERMS AND ABBREVIATIONS FOR UNITS

## **3. RELIANCE ON OTHER EXPERTS**

WGM prepared this report using the resource materials, reports and documents as noted in the text and "References" at the end of this report.

WGM has not independently verified the legal title to the Property. We are relying on public documents and information provided by Raytec, previous owners of the option on the Property for our descriptions of title and status of the Property agreements.

We have also not carried out any independent geological surveys of the Property, but did complete a site visit in October 2008 to view first-hand the Project site, view 2008 drill core, collect samples from the drill core and to review historical exploration and development work. These samples were collected and assayed independently of Raytec, to validate Raytec's results. We have relied for our geological descriptions and program results solely on the basis of historical reports, notes and communications with Raytec.

### 4. PROPERTY DESCRIPTION AND LOCATION

### 4.1 PROPERTY LOCATION

The Property as shown in Figure 1 is located approximately 100 km east of Red Lake and 68 km northeast of Ear Falls in the Red lake Mining Division, District of Kenora, Northwest, Ontario.

The Property spans an area that extends about 6.27 km east-west and 1.55 km north-south in NTS map areas 52K/15 and 16 and centred at approximately  $50^{\circ}57$ 'N latitude and  $92^{\circ}23$ 'W longitude.

### 4.2 PROPERTY DESCRIPTION AND OWNERSHIP

The Property comprises four staked mining claims covering a total of approximately 1,000 hectares. A claim is a mineral right that gives its holder the exclusive right to explore a designated territory for any mineral substance that is part of the public domain, except for loose surficial deposits of gravel, sand and clay.

A claim does not bestow any surface rights and NIC owns no surface rights.

The Property has not been legally surveyed. Table 2 provides details of the current land holdings. Figure 2 shows the four mining claims.

TABLE 2.   EL SOL PROPERTY –LICENCE DETAILS				
Mining Claim Number	Units	Area (Ha)	Due Date	
KRL 3019665	16	258	May 2, 2017	
KRL 3019666	16	258	May 2, 2017	
KRL 3019667	16	258	May 2, 2017	
KRL 4241201	<u>16</u>	<u>258</u>	October 17,2016	
Total	64	1,032 Ha (nominal)		

The registered owner of the claims listed in the MNDM claims database is Mr. Perry English of Souris, Manitoba.



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NIC REV / NIC\_02\_Claim\_Map.cdr Last revision date: Monday 04 October 2010

To maintain a claim in good standing, approved exploration work of required dollar value must be completed and filed with the MNDM. As prescribed by the Ontario Mining Act and regulations, work to a value of \$400 per year is required per claim unit except for the first year, when no assessment work is required. Assessment work must be performed and applied to each of the mining claims until the holder applies for a Mining Lease.

Three of the claims were staked in May 2005. The fourth claim, 4241201, was staked in September 2008. Assessment work was filed for the initial three claims in 2007 and 2008. The 2007 work consisted of stripping and sampling of an old trench area. The 2008 filing was for the initial components of Raytec's exploration program and covered linecutting and geophysics. The MNDM claims information database reports that assessment work was filed for all four claims on June 2010 maintaining the Property in good standing. Earliest claim Due Date is now May 2016 (see Table 2).

## 4.3 PROPERTY AGREEMENTS

WGM understands that on February 10, 2005, Spectre Investments Inc. ("**Spectre**") of Vancouver, British Columbia, entered into an Option Agreement (the "Agreement") with 1544230 Ontario Inc., a company owned by P.V. English. This Agreement initially only concerned the three westernmost claims (3019665, 301966 and 301967). WGM further understands that this Agreement was subsequently annulled, but Spectre did complete a small trenching and sampling program in 2007 that was filed with the MNDM for assessment credit.

In November 2007, Raytec entered into another Option Agreement (the "Vendor's Agreement") to acquire a 100% interest (subject to a 2% Net Smelter Royalty) in the three westernmost claims with Skyridge Consulting Inc., Jason Gigliotti, Negar Towfigh, Minegate Resources Capital Group Inc. and 1544230 Ontario Inc., collectively the "the vendors".

According to the Vendor's Agreement Raytec may earn its interest within three (3) years from the time of Exchange Acceptance, (14 December 2007) by making:

- 1. a series of staged cash payments to the vendors totaling \$160,000;
- 2. issuing a total 1.25 million shares; and,
- 3. incurring exploration expenditures totaling \$3,000,000 on or before three years from the date of Exchange Acceptance.

The Vendor's Agreement also grants Raytec the right to purchase half of the 2% NSR for a cash payment of \$1,000,000. The Vendor's Agreement defined an "Area of Mutual Interest defined as extending five miles from the outermost boundary of the three claims. The



Vendor's Agreement stipulates that if any of the parties stake claims, partially or wholly within this Area of Mutual Interest, it must notify the other parties of the acquisition and the other parties have the option to elect to include the new claim(s) within the Property for the purposes of the agreement. The easternmost claim of the Property, claim number 4241201 was staked subsequent to the Vendor's Agreement, but became part of the Property, as it was within the original Area of Mutual Interest.

WGM understands that, Raytec completed the cash payment and share issuance obligations and two years of the required exploration expenditures stipulated by the Vendor's Agreement.

On February 17, 2010, NIC completed two agreements: one with the successor to Raytec, LEC and a second with the original Vendors: Skyridge Consulting, Jason Gigliottie, Negar Towfish, Minegate Resources Capital Group Inc., 1544230 Ontario Inc. plus LEC. Pursuant to the Assignment agreement, LEC agreed to transfer and assign its option and obligations in the El Sol Property to NIC in exchange for 8.5 million common shares of NIC. In the second agreement, the initial optioners or Vendors agreed to waive the original requirement for NIC or LEC to incur the remaining exploration expenditures on the Property in an amount of up to \$1.5 million. As compensation for agreeing to the assignment of the Property to NIC and as consideration for agreeing to waive the exploration expenditure requirement NIC transferred to them an aggregate of 500,000 common shares of NIC.

The shares are intended to be converted, on a ratio of not less than 1 to 1, into shares of a company listed on the TSX Venture Exchange as a result of a "Qualifying Transaction".

In an agreement dated August 31, 2010, NIC and LEC amended the Assignment agreement to extend the date of the Right of Reversion to Option whereby NIC has until May 31, 2011 to have the shares converted to shares of a company listed on the TSX Venture Exchange ("TSX-V").

## 4.4 PERMITTING

No permits were required for NIC's exploration programs, but it had to adhere to guidelines established by the Ministry of the Environment ("**MOE**") for working near water and on water. The Camp Site used for Raytec's exploration programs was permitted under a permit issued to Ackewance Exploration Services Ltd. ("**Ackewance**").



#### 4.5 ENVIRONMENTAL ISSUES

WGM understands that neither Mr. Perry English, Raytec, nor LEC have conducted any environmental studies on the Property. No environmental studies are required at this time.

#### 4.6 FIRST NATION ISSUES

The Property is located in the traditional lands of the Lac Seul First Nation, part of the Grand Council of the Treaty 3 Anishinabe First Nation. Its Chief is Clifford Bull. The Lac Seul First Nation consists of three principle communities, Kejick Bay, Whitefish Bay, and Frenchman's Head, all located southwest of Lac Seul, and southwest of the Property.

The Anishinabe First Nation's traditional lands include the Avis Lake/Slate Lake area. These lands were ceded to the Crown by Treaty No. 3, 1873 in exchange for an annuity, a reserve for each band, and the promise of continued hunting and fishing rights over unoccupied Crown lands subject to such regulations as may from time to time be made by the government of the country...excepting such tracts as may be required or taken up from time to time for settlement, mining, lumbering, trading or other purposes.

Early in 2008, Raytec made contact with the Lac Seul Band Council to advise them of its upcoming activities prior to the onset of its exploration program.

In October 2009, an act to amend the Mining Act was passed in the Ontario legislature. This legislation includes:

- Incorporating aboriginal consultation in mining legislation and regulations; and
- Introducing a dispute-resolution process for Aboriginal-related issues in mining.

The process to develop the new regulations to govern this new legislation has just started.

WGM strongly recommends that notifications of exploration activity by NIC to the Band Council continue and regular meetings should be held to foster a good relationship. WGM believes good relations would be further promoted if members of the Aboriginal communities were offered employment on the project and owners of trap lines on the Property were contacted directly and apprised of NIC's plans concerning the Property.

# 5. ACCESS, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

### 5.1 ACCESS

The Property is accessed via the Wenasaga logging road off Highway 105 immediately north of Ear Falls. At kilometre 70, on the Wenasaga road, just west of a prominent radio antenna, a spur logging road heads off to the east. At the end of this road, approximately 2.8 km from the Wenasaga road junction, an all-terrain vehicle ("ATV") trail extends an additional 2.7 km to the north boundary of the claims (see Figure 2). Travel time by road from Ear Falls to the start of the ATV trail is approximately 1 hour.

The Property can also be accessed by float plane out of Ear Falls. Kesaka Lake on the west side of the Property is very shallow, but a small plane such as a Cessna 180 can land there. Jean or Crossman Lake, on the east side of the Property is deeper and is suitable for larger float planes. During the 2008 exploration program, supplies were transported by truck to a staging area 4 km to the north of the Property and then were slung in by helicopter to camp as required.

## 5.2 CLIMATE

The Kenora area has a moist temperate climate with cold winters. Mean daily summer temperatures at Ear Falls range from 18 to 24°C in July. The days are warm and the nights are cool. In January and February, mean daily temperatures are approximately -23 to -18°C.

Mean annual precipitation is 650 mm to 700 mm, including about 200 cm of snowfall.

Vegetation is boreal forest.

## 5.3 PHYSIOGRAPHY

The Property is situated between two major drainage systems with the Wenesaga River, to the north, and the Papaonga River to the south. Throughout the area, the maximum topographic relief is 100 m with normal variations less than 30 m.

The Property is centered on an east-west trending creek with flanking bog areas between Kesaka and Jean Lakes. The central and southern part of the Property area is dominated by marsh and spruce bog with very limited outcrop. Terrain to the west and north, are higher and

characterized by a series of isolated outcrops, subcrops and broad deposits of coarse glacial debris. Outside of the central marsh, the Property is treed. Trees are mostly spruce, poplar and aspen, with low lying shrubs and moss cover. A dense stand of immature spruce is dominant in the western area of the Property.

Drillhole records indicate that overburden varies from 1 to 3 m deep in the northern part of the area, and from 3 to 10 m deep in the southern part. Overburden type is variable from organically derived muskeg and peat deposits to glacial and lacustrine clay, sand and gravel deposits and local metre-scale erratics. To the northeast of Kesaka Lake, a series of transverse glacial moraines trend north-westerly into a logged area off the Mascooch Road.

## 5.4 LOCAL RESOURCES AND INFRASTRUCTURE

The Property is located 68 km northeast and 100 km respectively east of the towns of Ear Falls and Red Lake, Ontario. Red Lake is the home of Goldcorp Inc.'s Red Lake Gold Mine. The Red Lake Gold Mine is Canada's largest gold mine, and in 2008 produced 629,000 ounces of gold. It is also one of the world's richest gold mines and lowest cost producers. Red Lake has a population of approximately 5,000.

Ear Falls was founded as the site for a water dam, part of a hydroelectric development which would regulate the discharge of waters from Lac Seul into the English River. A powerhouse was added in 1929 and soon power was being generated for the mining operations to the north at Red Lake. Additional generating units were installed in 1937, 1940 and 1948 providing a steady flow of electricity to the northwestern power grid.

Ear Falls was also the staging point for the Griffith iron ore mine located at Bruce Lake 20 km north of Ear Falls. This property is now also under the control of NIC. The Griffith mine was in production from 1968 until 1986. Approximately 22,850,000 tonnes of pellets grading 66.7% Fe were produced. The pellets were transported by train to Thunder Bay and then shipped on the Great Lakes to Stelco's steel making facilities in Hamilton and Nanticoke, Ontario on the shore of Lake Erie. According to an Ear Falls website, the mine closed in March 1986 due to the high transportation costs and inability to be competitive with larger North American producers in Quebec and Labrador. The MNDM states that the mine site contains a "reserve" of 120,000,000 tonnes of mineralization at an average grade of 29% Fe. WGM understands that all equipment has been removed and the site rehabilitated to provide an area for recreational activities. WGM does not know the status of the rail bed for the spur leading to the mine site.



The Camp location for Raytec's operations in 2008 was the site of the former zinc, copper and silver South Bay Mine. The mine started production in 1971 and closed in 1981. Currently, the population of Ear Falls is approximately 1,200. Major industries include hydro-electric power generation, forestry, lumber production and tourism. Ontario Power Generation operates the dams at Ear Falls and Manitou Falls and maintains a regional maintenance yard. The Ear Falls sawmill, owned and operated by Weyerhaeuser Canada, produces dimensional lumber for markets in Canada, the U.S. and abroad. Over forty tourist resorts offer visitors a wide range of services and facilities, fishing, hunting and wilderness experiences.



#### 6. HISTORY

#### 6.1 GENERAL

The first documented exploration in the Property area was in 1955. Hicks, in 1958, reported that Capital Lithium Mines Ltd. ("**Capital Lithium**") initiated an exploration program to assess the area's potential for other mineral resources to support a lithium deposit under its control. Continental Mining Exploration, and/or Newkirk Mining Corporation Limited, apparently both associated companies with Capital Lithium, contracted Aeromagnetic Surveys Limited to conduct an airborne magnetic, electromagnetic and radiometric survey covering 2,000 km<sup>2</sup> which included the Property. This survey detected several magnetic anomalies which were staked. Some claims were retained by Capital Lithium, others were sold. The claims covering the Property, along with others, were sold to Tex-Sol and/or El Sol Gold Mines Limited. These companies also apparently were associated companies.

In 1956, El Sol initiated exploration on its properties by contracting Geo-Technical Development Company Limited ("Geo-Technical") to complete geological mapping and a ground magnetometer (dip needle survey) of the property to follow-up the airborne survey results. This survey delineated the main zones of iron formation on the Property within an east-west trending corridor straddling Kesaka and Crossley (Jean) Lakes. The most extensive anomalies were named the A and B Zones and the zones of lesser extent were named Zones C to I. Small surface exposures of the A Zone iron formation were mapped near the northwestern shore of Kesaka Lake. A channel sample was cut across one of the exposures and assay results for a composited sample returned 31.74 %Fe over 26.5 ft (8.08 m). A broad area to the west of Jean Lake across the A Zone horizon was trenched and blasted. A 50-ton bulk sample was extracted and stored at the western shore of Jean Lake, but there is no record of results for this sample.

During the winter of 1956-1957, the extent of the A and B Zones were tested by a total of 33,998 ft (10,423 m) of drilling in 67 holes. Details for these drillholes are tabulated in Section 11. Most holes were drilled on 400 ft (122 m) spaced sections, at inclinations of  $-45^{\circ}$ , and all but one hole was drilled to the north. Multiple holes were drilled along selected 200 ft spaced sections. The holes were mostly 400 to 600 ft (122-183 m) long, with two steeper inclined holes greater than 1,600 ft (488 m) long. The vertical depth drilled was typically 250 to 300 ft (75-90 m).

Drill core samples were assayed by Thomas Heys and Sons, of Toronto, but no description of the method is available. Metallurgical testwork was initially designed and supervised by

Professor Harry U. Ross of the University of Toronto and a second program of testwork was conducted at Lakefield Research. Subsequent testwork was conducted at Lurgi in Germany. More description of the historic metallurgical testwork is contained in Section 16.

In 1958, H. Brodie Hicks, P.Eng., prepared a preliminary engineering study for the property and completed a mineral resource estimate of 312 million tons (284 million tonnes) to a vertical depth of 1,000 ft (305 m) averaging 31.1% Fe. The forgoing historic "reserve" estimate was completed prior to the implementation of "NI 43-101 and should not be relied upon. The specific data used to make the estimate is incomplete and/or not available, and has not been confirmed. WGM has not audited or confirmed this estimate, but it is reported here because both NIC and WGM believe it to be of historical importance.

Hicks suggested a mining scenario combining open pit and underground mining methods to depths of 400 ft (122 m) and 1,000 feet (305 m), respectively because he estimated the waste:ore stripping ratios would be excessive for pitting to depths greater than 400 ft vertical.

R.L Segsworth completed an initial mining cost assessment in 1957 (Segsworth, 1957). Segsworth concluded that the cut-off between open pit and underground mining would be at a vertical depth of 250 ft. In addition, a transportation study was undertaken. H. Ross also investigated alternative processing options for the "ore" including direct reduction.

In 1969, MAW Bartley and Associates Limited of Thunder Bay prepared a preliminary economic appraisal of the property. Three approaches to mining the deposit were outlined. This review, however, has not been located.

No significant additional work on the Property was carried out until 2007. Consolidated Canadian Faraday Limited ("**Consolidated Faraday**") was apparently the successor to El Sol/Tex-Sol. Bowen, 1989 reports that Consolidated Faraday and its predecessors continued to report on its iron properties in the Canadian Mines Handbook each year, until 1972. Presumably, in 1972 the claims lapsed.

The three mineral claims of the Property were staked in 2005 by Mr. P. English, to cover much of the iron formation explored by previous workers. During the early winter of 2007, a brief program of outcrop stripping and trenching was conducted in two areas to the west of Kesaka Lake by Spectre, but this program failed to expose iron formation.

Raytec optioned the Property in November 2007, and in the spring of 2008 initiated a program of linecutting and ground geophysics.

## 7. GEOLOGICAL SETTING

### 7.1 REGIONAL GEOLOGY

The Property is situated in the Archean, Lake Birch-Uchi greenstone belt of the Uchi Subprovince of the Canadian Shield (Figure 3). The Birch-Uchi belt is one of six principal interconnecting greenstone belts in the Uchi Subprovince (Stott, 1996). From west to east these greenstone belts are: the Bee Lake, Red Lake, Birch-Uchi, Meen-Dempster, Lake St. Joseph and Pickle Lake. The greenstone belts are underlain and surrounded by, or internally intruded by, both younger and older felsic and mafic plutons and are complexly deformed. The Property is located adjacent to the southern boundary of the Uchi Subprovince, adjacent to its boundary with the English River Subprovince. The east-west trending Sydney Lake - Lake St. Joseph Fault is the boundary between the two subprovinces. This fault zone is located 5 km south of the Property.

The Birch-Uchi greenstone belt is comprised of three volcanic assemblages: Balmer, Woman and Confederation, each the product of separate episodes of volcanism and each showing an evolution from mafic to felsic rocks. The volcanic assemblages, particularly in the eastern and south easternmost part of the Birch-Uchi belt are overlain unconformably by an extensive metasedimentary sequence dominated by turbiditic greywacke—mudstone rocks containing panels of volcanic rock. The Property is situated within this folded metasedimentary terrane on the fringes of the greenstone belt.

Metamorphic grade within the Birch-Uchi greenstone belt ranges from very low grade to medium, to high grade. High grade metamorphic rocks form an outer rim for each of the greenstone belts against external granitic terrane while the interior of each of the greenstone belts are low grade to very low metamorphic grade. An east-west trending ribbon of medium metamorphic grade follows the Sydney Lake - Lake St. Joseph Fault south of the Property, but this ribbon is in the English River Subprovince. The Property is in an area of generally low metamorphic grade between the high grade rim of the greenstone belt (to the northeast) and the Sydney Lake - Lake St. Joseph Fault.

Similar metasedimentary terranes occur associated with the other greenstone belts of the Uchi Subprovince. The metasedimentary sequences are characteristically tightly folded and trend east-west.

The past producing Griffith Mine was located on Bruce Lake, 20 km west of the Property, on a magnetite iron formation within a metasedimentary panel at the westernmost extreme of the





Birch-Uchi greenstone belt. The Bruce Lake iron occurrence is situated at the closure of a large scale east-west trending fold adjacent to, and intruded by, a granitic intrusive complex. There are a number of other occurrences of iron formation known within the metasedimentary sequence of the Birch-Uchi greenstone belt, notably at Emarton or Karas lakes and at Whitemud Lake, respectively 55 km and 25 km west of the Property. The Emarton-Karas Lake occurrence is also at a fold closure. The Griffith, Emarton/Karas and Whitemud Lake properties are now also controlled by NIC and initial exploration work on all three was conducted during the summer 2010.

The Eagle Island - Fish Island iron ore deposit, on the periphery of the Lake St. Joseph greenstone belt located on claims owned by Rockex Ltd. 100 km east of the Property is another example of an east-west trending tightly to isoclinally folded iron formation sequence located in a similar, and likely correlative, metasedimentary sequence. Figure 4 shows several of the most significant iron formation deposits known in northwestern Ontario.

### 7.2 PROPERTY GEOLOGY

### 7.2.1 GENERAL

The Property is underlain by a central east-west trending sequence of clastic metasediments with local horizons of iron formation, flanked to the north and south by horizons of mafic to intermediate volcanic flows, volcaniclastics and amphibolite. The clastic sediments vary from wacke to arkose and are locally intercalated with horizons of argillite and magnetite-dominant oxide iron formation. Local units of polymictic conglomerate have also been documented. The volcano-sedimentary successions generally trend north-eastward to eastward in the western part of the claim group and trend eastward to south-eastward in the eastern part. The rocks dip vertically to steeply south. The distribution of the iron formation within the succession outlines an east-west trending tight fold structure with its fold closure southwest of Kesaka Lake. The gross repetition of stratigraphy from pelitic to argillaceous sediments with the iron formation in the core of the structure, flanked by intermediate and mafic volcanics to both the north and south, is consistent with a property-scale synclinal fold. El Sol named the iron formation forming the north limb of the fold the A Zone and the south limb the B Zone.

Indicators of stratigraphic tops within mafic pillowed flows in the southern part of the Property show tops are to the south. However, the succession drilled on the A and B zones of the iron formation, together with observed cross bedding in sediments near the iron formation, indicates tops are to the south, along the northern limb, and to the north, along the southern limb. These observations suggest that either an additional fold axis or a thrust fault lies near the southern edge of the Property. This could account for the apparent discrepancy between





the stratigraphic tops indicators. The outer part of the fold is thus considered to be the base of the sedimentary succession. Stratigraphically below the iron formation, the sequence is dominated by a coarser section of greywacke with local conglomeratic horizons. Thin, discontinuous horizons of argillite (grey to black) are concentrated near the iron formation, but are more common near the base of the iron formation. Above the iron formation, the sequence becomes finer and consists mostly of greywacke and arkose. The conglomerate consists of lens shaped clasts of mostly mafic to felsic volcanics and sediments, within a wacke matrix. Conglomeratic horizons are repeated within the succession and could be part of a series of isoclinal folds. With increasing metamorphic grade, migmatitic textures have been generated in the clastic metasediments. Such rocks have been logged as paragneiss and quartz-biotite schist, and are more common near Jean Lake and west of Kesaka Lake.

Along the southern edge of the Property, there is an east-west trending sequence of pillowed mafic volcanics which is 200 m to 300 m wide. To the immediate north of the Property, there is also a broad, 300 m wide section of mafic to ultramafic volcanics. This corridor hosts horizons of coarse grained, garnetiferous amphibolite. These rocks appear to be tuffaceous, with common alternating layers of amphibolite and feldspar-rich sandstone. Garnets up to 1 mm in size are common, and locally form bands which are highly contorted. Bowen (1989) suggested that these units may have had volcanic flow and volcaniclastic members as protoliths.

Immediately south of the amphibolite, and in the northern part of the Property, is a 500 m thick section of intermediate volcaniclastics of tuff to tuff-breccia. Bowen described outcrop exposures of these rocks as typically light to medium grey, with 15 to 20% biotite. Primary bedding planes are discernable. Veins and fracture-fillings of albite and epidote are common.

Table 3 presents a listing of lithologies identified on the Property, as well as their relative position in the stratigraphic sequence.

## 7.2.2 STRUCTURE

The area has been subjected to high levels of ductile strain, resulting in regional-scale folding with strong cleavage development. Indications of strain are best preserved within bedded units such as conglomerate, argillite and iron formation. The observance of decimetre-scale refolded folds in the iron formation suggests that polyphase folding of several orders has occurred. Tight, isoclinal to asymmetrical folds and straight to attenuated bands of magnetite-chert indicate that the iron formation has been highly transposed. The plunge of these folds is generally steeply to the west.


Order	Summary	Unit	Core Logging					
	Code		Codes					
8	BD	Biotite Dyke	BD					
7	GD	Granite or Aplite Dyke	GD, AD					
6b	QPM	Quartz Porphyry with Iron Formation	IMCQP, QPM					
6a	QP	Quartz Porphyry	QP, QFP, QBP, QDP, QPBX					
5g	IFMR	Magnetite±Chlorite Iron Formation + grunerite overprint	IMCR, IMCLR					
5f	IFMS	Magnetite Iron Formation	IMCLS, IMCS, ISMC, ICMS,					
		+ Sediment Interbeds	ILSCM, ISMLC, ILSMC					
5e	IFMJ	Magnetite-Jasper Iron Formation	IMCJ, IMJC, IMJ, IMCJh,					
			IMJCh, IMJ					
5d	IFM	Magnetite Iron Formation	IMC					
5c	IFML	Magnetite-Chlorite Iron Formation	ILMC, IMCL, IMCLJ, ICMLgt,					
			ILMCgt, ICMLgt					
5b	IFLM	Lean Iron Formation±garnet	ILC, ILCM, ICMLgt, ILCMgt,					
			ILSCM, ILCMS					
5a	IFL	Silicate Iron Formation	ICL, ILC, ILCgt, ILS, ILCS,					
		±sediment interbeds	ISLC, GHS, HS					
4e	CONG	Conglomerate	CONG					
4d	ARG	Argillite	ARG, ARGc					
4c	GWK	Greywacke	BWK, GWK, GWKa					
4b	PG	Paragneiss	PG					
4a	QBS	Quartz Biotite Schist	QBS					
3	FV	Felsic Volcanics	FV					
2	IV	Intermediate Volcanics	IV					
1 a	AMPH	Amphibolite	AMPH					
1	MV	Mafic Volcanics	MV					

TABLE 3.LITHOLOGIC UNITS ON THE EL SOL PROPERTY

Notes: Stratigraphic order of units for sub-units 6, 5, 4, and 1 not implied.



#### 8. DEPOSIT TYPES

#### 8.1 GENERAL

The El Sol deposit is an iron formation of the Algoma-type. Algoma-type iron formation consists of banded sedimentary rocks composed principally of bands of iron oxides, magnetite and hematite within quartz (chert)-rich rock with variable amounts of silicate, carbonate and sulphide lithofacies. Such iron formations are the second most important source of iron after Lake Superior-type iron formations (Gross, 1996). Table 4, after Eckstrand, editor (1984), presents the salient characteristics of the Algoma-type iron deposit model. No Algoma-type iron formation is currently mined in Ontario for iron. The past producing Sherman, Adams and Griffith mines west of the Property mined Algoma-type iron deposits.

Gross (1996) states:

"In 1986 production from oxide facies at the Adams, Griffith and Sherman mines in Ontario amounted to more than 8.1 Mt of crude ore grading 19 to 27% iron for the recovery of 2.1 Mt of ore-concentrate and pellets. In 1986, Algoma Ore Division at Wawa, Ontario, produced more than 1.7 Mt of siderite crude ore grading 34.15% iron that provided 1.2 Mt of sinter and agglomerate.

"The ore-concentrate, pellets, sinter and agglomerate produced from these mines provided about 10% of the total iron ore produced in Canada in 1986..."

Lithofacies that are fine grained, and not highly metamorphosed or altered by weathering, regardless of whether they are dominantly magnetite or hematite, are referred to as taconite. The El Sol deposit is an example of taconite-type iron formation. All of the iron deposits in Ontario are taconite. Strongly metamorphosed taconites are known as meta-taconite or as itabirite (itabirite particularly when hematite (specularite) - rich). The iron deposits in the Grenville part of the Labrador Trough in the vicinity of Fermont and Wabush are metataconite. These deposits mined by Iron Ore Company of Canada ("IOCC"), Québec Cartier Mining Company ("QCM"), now owned by ArcelorMittal Mines of Canada and Wabush Mines, now owned by Cliffs Natural Resources Inc. plus the Bloom Lake Deposit, owned by Consolidated Thompson Iron Mines Limited are the only iron deposits currently mined in Canada. The iron deposits of the Mesabi Range in Minnesota and Michigan, although to some minor degree affected by iron remobilization and concentration due to metamorphism, are also taconites. The Lac Otelnuk deposit owned by Adriana Resources Ltd., located 165 km north of Schefferville, Québec and the KeMag and LabMag deposits respectively in Québec and Labrador, at Schefferville, owned by New Millennium Capital Corp. ("New Millennium") are also taconites, but are the least metamorphosed examples of taconite.



Commodities	Fe (Mn)
Examples:	Helen Mine at Wawa, Sherman Mine at Temagami, Griffith Mine at Ear Falls, and Lake
Canadian - Foreign	St. Joseph, Ont.; Woodstock, N.B Krivoy Rog, U.S.S.R
Importance	Canada: second most important (after Lake Superior type) as a source of iron. Potential source of manganese (Woodstock).
Typical Grade, Tonnage	Up to billions of tonnes, with grades ranging from 15 to $45\%$ Fe, averaging $25\%$ Fe. Manganese content is generally low in Precambrian deposits (generally less than $2\%$ ) but is more significant in some Paleozoic deposits (Mn=10 to $40\%$ ). Fe:Mn may range from $40:1$ to $1:50$ .
Geological Setting	Iron formation members occur with volcanic rocks, greywacke and shale near or distal from extrusive centres, along volcanic belts, deep fault systems, and rift zones; may be present at any stage in a volcanic succession. Most abundant in Archean greenstone belts. Some oxide, carbonate and sulphide facies have polymetallic sulphide facies associated with them.
Host Rocks or Mineralized Rocks	Oxide, silicate, carbonate, and sulphide facies of banded iron-formation are commonly composed of thin, alternating layers or beds of silica (chert and quartz) and iron-rich minerals; and are interbedded with clastic sedimentary and volcanic strata.
Associated Rocks	Felsic, mafic and ultramafic volcanic rocks, greywacke, black shale, argillite, chert, interlayered pyroclastics and other volcaniclastic beds; metamorphic equivalents.
Form of Deposit, Distribution of Ore Minerals	Ores are sedimentary sequences commonly up to 100 m thick, and several kilometres in strike length. In most cases, isoclinal folding or thrust faulting have produced thickened sequences of iron formation, thus greatly enhancing economic mining feasibility. Ore mineral distribution closely reflects primary sedimentary facies.
Minerals: Principal Ore	Magnetite hematite: siderite manganoan siderite pyrite and pyrrhotite are mined in a few
Minerals	deposits.
- Associated Minerals	Chert, quartz, Fe-silicates and –carbonates, chlorite, amphiboles, biotite, feldspar, garnet, chalcopyrite.
Age, Host Rocks	Precambrian to Recent, but predominantly Archean.
	Syngenetic, same age as host rocks.
Age, Ore Genetic Model	Chemical and colloidal precipitation of iron silica in euxinic and oxidizing environments; iron and silica derived from volcanic effusive and hydrothermal sources along volcanic belts and deep faults or rift systems. Formation and distribution evidently controlled by tectonic rather than by biogenic or atmosphere factors.
Ore Controls, Guides to Exploration	<ol> <li>Distribution of iron formation is reasonably well known from aeromagnetic surveys.</li> <li>Oxide facies is the most favourable, economically, of the iron formation facies.</li> <li>Thick primary beds (30 to 100 m) of iron formation are desirable.</li> <li>Repetition of favourable beds by folding or faulting is economically favourable.</li> <li>Metamorphism increases grain size, improves metallurgical recovery.</li> <li>Metamorphic mineral assemblages reflect the mineralogy of primary sedimentary facies.</li> <li>Basin analysis and tectonic and sedimentation modelling indicate controls for facies development, and help define location and distribution of different iron formation</li> </ol>
Author	factes. G.A. Gross Eckstrand editor
1 100101	0.21. 01055, LAKStrand Curiot.

#### TABLE 4. DEPOSIT MODEL FOR ALGOMA TYPE IRON FORMATION (after Eckstrand, 1984)



Taconites that have not been enriched in iron by metamorphism or weathering have iron grades in the range of 25% to 35% and silica of 38% to 50%. Metamorphism and remobilization with folding and circulation of hydrothermal fluids results in concentration of iron and leaching of silica. These iron up-grading processes have been operative in most taconites to some extent, including those in the Archean terranes of Ontario and Quebec, and the Proterozoic iron ranges of Minnesota and Michigan, but iron upgrading for these deposits has not been overly significant. Metamorphic remobilization of iron and the hydrothermal fluid leaching of silica have upgraded the iron deposits of Brazil that originally were taconites grading 25% to 35% Fe to over 60% Fe. At over 60% Fe they are "direct shipping ores". Direct shipping ores is mineralization that requires practically no treatment, except perhaps for screening and washing, before shipment to a steel mill. Metamorphic/hydrothermal upgrading of the deposits in the Grenville part of the Labrador Trough has been weak to moderate resulting in deposits that are higher grade than non-upgraded taconite, but not as iron-rich and silica-deficient as the deposits of Brazil and Australia.

The Precambrian deposits in Brazil are meta-taconites or itabirites, as are many of the deposits in Australia, and these have been further modified by supergene weathering. Supergene weathering is also responsible for turning taconite deposits at Schefferville, previously mined by IOCC, and currently under development by New Millennium and Labrador Iron Mines Holdings Limited, into "direct shipping ores". Most of the iron mined from the Mesasbi Range deposits pre-WWII, "the direct shipping ore" was from the upper parts of the taconites that had been subject to, and upgraded by, supergene processes.

For taconite or weakly meta-taconite iron formation (Algoma or Superior type) to be mined economically, iron content must be in the range of 25-35%, and the iron oxides must be amenable to concentration (beneficiation). Amenability to beneficiation can, and is often at least as important as, or more important than Head grade of a deposit. Taconites are mainly magnetite and/or hematite and chert. Some are mainly magnetite, others are mainly hematite and some are mixtures. When they are mixtures, the two mineral types can be closely spatially associated or can be segregated into different parts of the deposit. Whether the iron formation is mainly magnetite or hematite or a combination is both a primary feature of the oxidation/reduction environment of deposition, but metamorphism can also be a determining factor. Whether mineralization is magnetite or hematite makes a difference in terms of how the ore is to be beneficiated. Grain size and mineral fabric also controls how the iron oxides are to be concentrated.

Furthermore, the concentrates produced must be low in deleterious elements such as silica, titanium, aluminium, phosphorus, sulphur, manganese and alkalis. Often the blending of ore characteristics is required to maintain a standard feed product and keep deleterious elements

within acceptable levels. To be marketable taconites at 25% to 35% Fe and 38% to 50%  $SiO_2$  must be upgradable to approximately 66 to 67% Fe and less than 5%  $SiO_2$  (preferably <4%  $SiO_2$ ).

To meet the specifications for Direct Reduction plants concentrate containing less than 2% SiO<sub>2</sub> is desirable. Not all iron formation can be beneficiated to this grade. The beneficiation of certain types of mineralization will be less expensive than for iron formation of different characteristics. Different processes are required for iron formations of different characteristics.

For bulk mining, the silicate and carbonate lithofacies and other rock types interbedded within the iron formation must be largely segregated from the iron oxide facies iron formation, if wide enough for selective mining. Configuration of ore zones is important for minimizing waste:ore ratios and internal dilution.

# 8.2 IRON IN ONTARIO

For evaluating iron deposits, a considerable number of interrelated factors are important. Characteristics of mineralization, as aforementioned, are very important for cost and efficacy of beneficiation.

Table 5 lists the most significant iron deposits in Ontario adapted after Iron in Ontario, 2006. WGM understands that there are no iron deposits in Ontario with NI 43-101 compliant Mineral Resources. The tonnage figures listed in the table should therefore not be relied upon.

TABLE 5.							
LARGEST IRON DEPOSITS OF ONTARIO							
Name Tonnage Alternate Names							
(M tonnes)							
Kesaka Lake	283.5	El Sol, Tex-Sol					
Griffith Mine	108.8	Bruce Lake, Iron, Calmor Iron Bay					
Doran Lake	186						
Eagle & Fish Islands	218	Western Lake St. Joseph					
Kashaweogama Lake	453.6						
Lake St. Joseph	559	Soules					
Barton Bay	453.6	Errington, Long Lac					
Cummings Lake Prospect	327	Tinto					
North Spirit Lake	508						



Furthermore, the tonnage figures listed are not directly comparable for a variety of reasons. For some deposits the tonnage figures listed are derived from advanced feasibility studies while in other cases the figures ignore some historic resource estimates and drilling program results. For some deposits, tonnages listed are defined only by the amount of drilling that has been completed and don't treat potential tonnage equivalently. Magnetite/hematite ratios vary between deposits as do grain size, geometry of mineralization and amenability to beneficiation. Also, at least for one of these deposits, underground mining would be required while the others are open pit operations. The Griffith Mine mineral resources in 1960 were quoted as 250,000 long tons. One advantage this deposit may have had compared with others was the mineralization may have been coarser due to a higher grade of metamorphism. Shklanka, 1970, reported that andalusite and staurolite occur within the metasediments.

WGM believes these issues are largely still valid and that to be marketed in Ontario a premium product must be produced. A premium product meaning: a direct reduction quality product at least 70% Fe, with less than 2% SiO<sub>2</sub>.

Historic testwork (see Metallurgical section in this report) has indicated that concentrates can be produced that demonstrate Market grade concentrates and pellets but commercial-scale technical feasibility has not been ascertained. Pellets made from such concentrates may be suitable feed for DR plants which could produce a premium product. The production of DR pellets may be a key factor for developing an Ontario iron producer for access to markets in the Great Lakes region.



#### 9. MINERALIZATION

The iron formation on the Property consists predominantly of magnetite taconite-type iron formation. The mainly magnetite iron formation in some places carries a minor amount of hematite and iron-bearing silicates. Narrow transitional facies of silicate iron formation containing minimal magnetite occasionally occur on the contacts of the oxide iron formation ("OIF") with the metasedimentary host. Mineralogical work by Lurgi in1957 indicated that the silicates were mainly hornblende and actinolite with some chlorite and grunerite. Polythin section examination and liberation testwork by Lurgi and Lakefield Research, described in Section 16, showed that fine grinding to 99% -325 mesh was required to achieve maximum liberation. The iron formation is generally characterized by alternating bands of magnetite and recrystallized chert  $\pm$ jasper, and chloritic mudstone which range in thickness from sub-millimetre to metre-scale. Internal variants are common with varying proportions of the above four components: from silicate and lean iron formation, to magnetite-chlorite and magnetite-jasper dominant types.

As described, under Property Geology, and shown on Figures 4 and 5, the iron formation on the Property is in the form of a tight, east-west and likely steeply plunging fold. The iron formation that is the north limb of this fold was designated the A Zone and the south limb the B Zone by El Sol in 1956. A number of smaller zones located between the A and B zones were also defined. These zones are named C to I. The H and I Zones according to Bowen, were located on the western property boundary and just north of the A Zone. Bowen describes them as being extremely small. WGM is unsure where these are located and is not sure they are located on the Property or covered by Raytec's magnetic surveys.

Magnetic patterns suggest the C to g Zones individually have strike lengths of 200 m to 300 m. They presumably are segments of the south limb, the B Zone that has been partitioned and offset from the general trend by folding and faulting. In any eventual mining scenario these segments could potentially be of importance so their extent and structure will need to be better understood.

The closure of the main fold in the iron formation is immediately west of Kesaka Lake but either it is not very prominent or has been partly sheared away. The A and B Zones at the west end of the Property are about 200 m apart. About mid-Property, the A and B Zones are approximately 850 m apart.

The A Zone was drilled by El Sol over it entire extent (Figure 6). All of Raytec's 2008 drillholes targeted the A Zone. The zone has a strike extent of approximately 4.5 km and dips





vertical to steeply south. True thickness of mineralization varies from approximately 50 m to 70 m and towards the fold closure it pinches out. In some places there are subsidiary A Zones.

Figure 7 is a drill cross section through the A Zone, approximately 800 m east of Kesaka Lake. It shows the main part of the A Zone to the north and a second narrower zone 80 m to the south. This second parallel zone as aforementioned is probably part of the south limb (extension of B Zone). Raytec's drillhole ES08-007 tested the main A Zone and returned an average grade of 21.21% TFe (26.8% Mt) over an intersection length of 80.8 m. Considerable rock coded as QP ("Quartz Porphyry") containing minimal magnetite ("Mt") was logged within the iron formation in this drillhole. WGM believed much of this material is probably metasediments, either clastics or volcanic rather than intrusive. Drillhole ES08-008 was drilled on the same section below drillhole ES08-007. It intersected a section of OIF containing much less QP than the upper hole. The zone of mineralization averaged 32.06% TFe (42.3% Mt) over an intersection length of 125.30 m.

Historic drillhole ES57-026 also tested this same zone of mineralization. The zone of mineralization is slightly displaced in this drillhole from what is indicated by the two 2008 drillholes but the geology intersected is very similar in rock types logged and zone width. The displacement of the zone in the 1956 drillhole, relative to the 2008 drillholes is most likely due to the present uncertainty of the collar location for the 1956 drillhole. Historic El Sol drill cross sections and logs report the zone of mineralization that averages 25.9 %Fe over an intersection length of 79.10 m. A narrow interval of silicate iron formation was logged along the north contact of the mineralized zone in both ES57-026 and ES08-007.

The southern zone of mineralization was only tested by historic drillhole ES56-024. It shows this zone is approximately 20 m thick, true thickness. Historic assay results returned an average grade of 32.17% Fe over an intersection length of 26.76 m. WGM has reported these historic assays as %Fe because we are not completely certain whether they were total iron or partial iron, but we think it most likely that they are partial iron, or aqua regia acid soluble iron. Work by Lakefield Research on historic samples commonly reports both SFe and TFe. This work shows that SFe assays for OIF material are only approximately 2% less than TFe assays. This is reasonable and as expected because El Sol mineralization contains low amounts of iron-bearing silicates. Generally, therefore there should not be a lot of difference between historic El Sol drill core assay results and Raytec's assays. This zone and the main A Zone are both reflected in Raytec's magnetic survey results plotted in profile along the top of the section. Magnetic survey results show that this subsidiary zone has a strike length of approximately 1 km.





5,644,2	700m.N
	600
	400
	200
	0
	-200
5,644,2	700m.N

			400 RL			
			350 RL			
			300 RL			
le 1 : 1,500	75					
Metres						
NAD 83 Zone 15			250 RL			
		Figure 7.				
	NOR	THERN IRON CORP.				
	I	El Sol Iron Project Ontario, Canada				
	Zone A Cross Section ES08-007/008 (looking west)					



Figure 8 shows a cross section through the A Zone 1.1 km east of the cross section described above. This cross section shows two Raytec drillholes, ES08-001 and 002 both of which cut the mineralized zone below its intersection in historic drillhole ES57-053. The mineralized zone in all three holes is fairly similar in width. The zone dips about 85° south and is 50 m to 70 m true thickness. Raytec drillhole ES08-001 returned a grade of 25.96% TFe (31.4% Mt) over an intersection width of 65.5 m. Raytec drillhole ES08-002 returned 30.53% TFe (37.2% Mt) over an intersection length of 98.43 m. No individual sample assay results have been located for historic drillhole ES57-053, but a historic cross section is available that indicates the presence of a zone of mineralized zone in the historic drillhole may be slightly displaced from where it is indicated by the two 2008 drillholes.

The B Zone was drilled extensively by El Sol, but not by Raytec. It is segmented into sections by a NE-SE trending fault and folding. It has a total strike length of approximately 2.1 km. El Sol's historic drilling shows that its thickness diminished eastwards away from the fold closure. Figure 9 is a drill cross section through the B Zone immediately west of Kesaka Lake, adjacent to the main fold closure. The historic drillholes, ES57-027 and ES57-033 on this cross section indicate the mineralized zone has a true thickness at this location of approximately 85 m and it dips steeply south. Assays for both these two historic drillholes are available. In drillhole ES57-033 the zone of iron formation averaged 32.48% Fe over an intersection length of 86.14 m. Drillhole ES57-027 cut the same zone 50 m below ES57-033 and assays averaged 32.05% Fe over an intersection length of 91.87 m. Figure 10 is a drill cross section through the B Zone 800 m east of section ES57-027/033. This cross section is close to the furthest east extent of the B Zone. Drillhole ES57-066 intersected a zone of iron formation with true thickness of approximately 36 m. Dip of the zone is not certain but it is vertical or steep. Individual assays results have not been located but historic drill cross sections report a zone of mineralization that averaged 31.08% Fe over an intersection length of 49.41 m. The lithology description from the drill log agrees with the assay average reported and the location of the intersection agrees with Raytec's magnetic survey results.

Table 6 lists summary statistics for Raytec's 2008 drill core assays by summary lithology codes. It includes density/SG data. Column "OIF Summary" lists averages for the units considered to be OIF. It is evident that TFe is mainly magnetic iron, "magFe", for OIF units. Estimates of hematite content are listed under %Hm. As expected, iron formation containing more jasper shows slightly higher levels of hematite. The non-OIF units contain much higher levels of Al<sub>2</sub>O<sub>3</sub>, TiO<sub>2</sub>, Na<sub>2</sub>O and K<sub>2</sub>O than OIF. Silicate iron formation contains levels of these elements transitional between the non-OIF and the OIF units.



# 🔗 Watts, Griffis and McOuat

5, 5,	644,800m.N
	400
	200
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<sup>!</sup> ,700m.N 5,	644,800m.N
	400 RL
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Metres UTM NAD 83 Zone 15	
	250 RL
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El Sol Iron H	Project
Ontario, Can Zone A	aaa <b>1</b>
Cross Section ES	08-001/002
00m.N	esij



# 🔗 Watts, Griffis and McOuat

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		0
		-500
5,643,	900m.N 5,644,0	000m.N
		400 DI
		400 KL
		350 RL
r	40	
F3	0 0	
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7~0 ЕОН ?7.40m	Scale 1 : 1,500	
	Metres UTM NAD 83 Zone 15	
		250 RL
ſ	Figure 9.	
	NORTHERN IRON COR	<b>RP.</b>
	El Sol Iron Project Ontario. Canada	
	Zone B Chass Section 57 027/022	
	(looking west)	



🔗 Watts, Griffis and McOuat

700m.N	5,643,800m.N
	500
	500
	0
	500
	-500
700m.N	5,643,800m.N
	400 RL
	350 RL
	300 RL
Scalo 1 • 1 500	
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Metres	
UTMINAD 63 ZUIE 15	250 RL
Figur	re 10.
NORTHERN	IRON CORP.
El Sol Iro	on Project
Ontario, Zaz	Canada A <b>B</b>
Cross Sectio	on ES57-066
(lookin	g west)
00m.N	

	AN	ALYTICAL	L RESULTS	ANALYTICAL RESULTS FOR RAYTEC DRILL CORE SAMPLES GROUPED BY LITHOLOGY								
Lithology Code	ARG	GWK	SIF	QP	QPM	IFMS	IFLM	IFML	IFM	IFMJ	IFMR	OIF
												Summary
Number of Samples	17	33	11	33	8	13	15	64	83	118	13	314
Avg of TFe%	8.96	4.53	14.07	3.23	13.94	22.69	16.46	29.74	34.24	35.66	28.73	31.79
Avg of %Fe <sub>3</sub> O <sub>4</sub> Sat	1.5	0.3	1.5	1.0	14.6	24.0	7.3	34.1	45.7	46.5	22.5	39.1
Avg of %magFe	1.1	0.2	1.1	0.7	10.6	17.3	5.3	24.7	33.1	33.6	16.3	28.3
Avg Of %FeO	10.00	5.08	14.92	3.16	8.43	14.86	14.50	17.49	16.39	15.20	23.09	16.09
Avg Of %Hm	0.8	0.5	2.5	0.4	0.5	0.6	1.9	0.3	0.4	2.5	0.4	1.3
Avg of %Fe other	82.08	85.78	79.83	75.44	21.31	30.50	63.51	19.57	5.48	2.03	47.40	13.04
Avg of SiO <sub>2</sub> %	57.06	64.16	54.90	63.54	55.04	49.94	53.28	45.39	42.73	41.85	45.46	44.17
Avg of Al <sub>2</sub> O <sub>3</sub> %	15.14	14.58	12.86	15.27	10.71	6.66	9.52	3.18	1.57	1.27	3.87	2.70
Avg of TiO <sub>2</sub> %	0.56	0.54	0.51	0.29	0.25	0.23	0.37	0.13	0.05	0.04	0.14	0.10
Avg of MgO%	2.80	1.83	2.29	1.82	2.38	2.01	2.70	1.92	1.67	1.64	2.00	1.80
Avg of CaO%	2.76	3.59	2.47	3.59	3.81	2.47	3.08	3.22	2.81	2.37	3.68	2.79
Avg of Na <sub>2</sub> O%	0.86	2.45	0.64	3.97	2.43	0.48	0.18	0.11	0.14	0.13	0.18	0.21
Avg of $K_2O\%$	3.53	2.91	3.27	3.12	2.07	3.94	3.00	1.12	0.70	0.65	0.91	1.06
Avg of Mn	0.077	0.051	0.126	0.034	0.049	0.071	0.099	0.070	0.049	0.042	0.105	0.057
Avg of P	0.072	0.063	0.077	0.054	0.071	0.075	0.076	0.079	0.071	0.070	0.076	0.073
Avg of $Cr_2O_3\%$	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Avg of $V_2O_5\%$	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Avg of LOI%	3.75	2.84	2.17	2.97	2.27	1.32	3.43	1.66	0.91	0.66	1.76	1.18
Avg of Sum%	99.59	99.63	99.63	99.37	99.08	99.78	99.43	99.52	99.77	99.82	99.42	99.69
Count of Field BD	1	1	0	1	0	2	0	4	8	18	2	34
Avg of Field BD	2.84	2.74		2.71		3.25		3.37	3.46	3.53	3.39	3.47
Count of SGS BD	0	3	0	1	0	2	2	13	14	19	0	50
Avg of SGS BD		2.75		2.70		3.06	2.98	3.33	3.46	3.50		3.40
Count of SGS SG	2	2	1	3	0	4	6	22	24	34	4	94
Avg of SGS SG	2.92	2.77	2.93	2.77		3.21	3.07	3.38	3.54	3.56	3.44	3.46

TABLE 6. NALYTICAL RESULTS FOR RAYTEC DRILL CORE SAMPLES GROUPED BY LITHOLOGY.

Notes: ARG: Argillite;

GWK: Greywacke;

SIF: Silicate iron formation;

QP: Quartz porphyry;

QPM: Quartz porphyry with magnetite;

IFMS: Iron formation interlayered with metasediment;

Values less than detection limit (dl)reduced to 0.5 x dl before averaging

IFLM: Iron formation - Lean;

IFML: Iron formation – magnetite and chlorite;

IFM: Iron formation – magnetite;

IFMJ: Iron formation – magnetite with jasper;

IFMR: Iron formation – magnetite with grunerite;

OIF: OIF includes IFMS, IFLM, IFML, IFM, IFMJ and IFMR.



Figures 11, 12 and 13 present, respectively, histograms of iron distribution for El Sol 1956/57 drill core samples, the Heads for Lurgi's -325 mesh composites and for all Raytec drill core samples designated as OIF. Medians and average values are similar between data sets.



Figure 11. %Fe 1956/1957 drill core samples



Figure 12. %Fe in Lurgi composites





Figure 13. % TFe in OIF of Raytec 2008 drill core samples

In Table 6, the estimate of % hematite ("%Hm") has been made by subtracting iron in magnetite (determined from Satmagan) and the iron from the FeO analysis in excess of what can be attributed to the iron in the magnetite from %TFe, and then restating this excess iron as hematite, or as restated differently:

The %Fe\_other is the percentage of iron in the sample, indicated by the FeO results, that is in excess of what can be accommodated by the magnetite as determined from Satmagan results. Overall for OIF, the %Fe in other is 13.04% meaning 13.04% of the TFe in OIF is attributable to iron-bearing silicates, carbonates or sulphides and 86.96% of TFe is attributable to magnetite or hematite. It is considered to be the percentage of TFe that is in silicates or carbonates or sulphides.

Figure 14 illustrates the results for the in-field bulk density work, the in-lab bulk density and the pycnometer results plotted against %TFe. Clearly all three methods of determination give similar results.





Figure 14. In-field bulk density



# **10. EXPLORATION**

# 10.1 GENERAL

The issuer, NIC has conducted no exploration on the Property. All recent exploration was conducted by Raytec, the predecessor of LEC.

### 10.2 RAYTEC'S 2008 EXPLORATION PROGRAM

Raytec, LEC's predecessor company, has completed one exploration program on the Property. This exploration program was conducted in 2008 and consisted of four main components:

- Linecutting;
- Ground Very Low Frequency Electromagnetic ("VLF-EM") and proton precession magnetic surveying;
- Ground Overhauser magnetic survey; and
- Diamond drilling.

The early parts of the 2008 program were designed and supervised by Gordon J. Allen, P.Geo. The latter phases of the program consisted of the diamond drilling. Analysis and testwork aspects relating to drillhole samples were designed, directly supervised, compiled and reported on by Ms. Janice Fingler, P.Geo.

WGM understands that total exploration expenditures on the Property by Raytec between 2008 and 2010, inclusive of the drill program and exclusive of all property acquisition costs, were \$1,180,616.

### 10.2.1 LINECUTTING

A total of 68.5 km of linecutting was completed by personnel of Ackewance of Red Lake, Ontario. A 4.5 km long, east-west oriented baseline was centered on the Property between the two main zones of iron formation. Crosslines spaced at 100 m intervals, with stations at 25 m intervals, were cut north-south to the Property boundaries. Portions of the central grid were not completed due to time and access limitations and the lakes within the Property also were not covered.



### 10.2.2 GROUND VLF-EM AND PROTON PRECESSION MAGNETIC SURVEY

Dan Patrie Exploration Ltd. was contracted to conduct GPS surveying of grid stations, and ground magnetic and VLF-EM surveying along 58 km of the cut lines. The UTM coordinates of the picketed stations of the lines were collected for spatial plotting of the geophysical data. The surveys were carried out using a Scintrex Envi combined magnetometer and VLF-EM receiver. The VLF-EM survey collecting readings using both the transmitter at Cutler, Maine, USA (24.0 hz) and the transmitter at Seattle, Washington., USA (24.8 hz). At all stations and for both transmitters, the in-phase and out-of-phase (quadrature) of the resultant electromagnetic field were measured. Processing and imaging of the data was conducted by Roman Tykajlo. This work has been filed for assessment and a copy of a report that covers this work was completed by Gordon J. Allen, P.Geo.

A series of short length VLF-EM conductors were mapped by the survey. Some appear to be closely coincident with sections of the iron formation, while others do not. The responses could reflect areas of conductive magnetite within the iron formation and/or argillaceous interbeds.

The proton procession magnetometer used during this survey was not accurate in areas of high magnetic gradient over the magnetite-rich iron formations. A series of magnetic lows, which represent reversed polarity were delineated over the zones of iron formation. The analytical signal of the total magnetic field gives a closer approximation to axes of magnetic highs, however, data issues both with the widely spaced grid and station coordinates were encountered. It was therefore recommended by R. Tykajlo that better and more accurate positioning and collection of magnetic data could be obtained from a continuous reading "walking magnetometer" such as a cesium vapour or an Overhauser instrument and so subsequently a second magnetic survey was completed.

#### 10.2.3 GROUND OVERHAUSER MAGNETIC SURVEY

The ground Overhauser magnetic surveying was conducted by Clearview Geophysics Ltd. ("Clearview"), of Toronto, and was carried out concurrent with diamond drilling. The survey was conducted using two Scintrex SM5 NavMag magnetometers. The internal GPS from the NavMag was used for navigation and positioning. The magnetometer sensor was located on a vertical staff and the GPS sensor antenna was located on a backpack carried by the operator. Readings were acquired at one second intervals. GEM Systems Overhauser magnetometers were used for the base station corrections with readings taken at one second intervals. Results from the survey were used to help select the drill sites.



Post-processing of the data was completed by Kit Campbell, of Intrepid Geophysics of North Vancouver, BC. Filtering transformations (in Fourier domain) generated secondary products with enhanced information content. The enhancements made to the data included vertical and horizontal derivatives, to produce anomaly contrasts over the peaks and edges of the formation. A coloured image of the first derivative of the magnetic field is show together with the drillholes previously on Figure 5.

# 10.2.4 DIAMOND DRILLING

The diamond drilling program consisted of a total of 2,301 m of drilling in 11 drillholes. This program is discussed in the subsequent section, *Section 11.0*, of this report.

### 10.2.5 WGM COMMENTS ON RAYTEC'S 2008 PROGRAM

WGM believes the exploration program was well managed. The decision to redo the magnetic survey using the Overhauser instrument was the correct approach.

The magnetic survey of the lakes should be completed before more diamond drilling is started.



# 11. DRILLING

# 11.1 HISTORIC DRILLING

During the winter of 1956-1957, the extent of the A and B Zones were tested by a total of 33,998 ft (10,423 m) of drilling in 67 holes (Table 7 and previous Figure 6). Core size is unknown and no core is known to have survived. The drilling was done by Continental Diamond Drilling of Rouyn, Quebec. Most holes were drilled on 400 ft (122 m) spaced sections, at inclinations of -45°, and all but one hole was drilled to the north. Multiple holes were drilled along selected 200-ft spaced cross sections. The holes were mostly 400 to 600 ft (122 to 183 m) long, with two steeper inclined holes greater than 1600 ft (488 m) long. Typically the drilling tested the deposit to depths of 250 to 300 ft (75 to 90 m). Drill core assays were completed by Thomas Heys and Sons, of Toronto which we believe was a commercial lab.

Raytec estimated the position of the historic drillholes on a best-fit basis from available maps and local grid coordinates on historic drill logs and sections. These historic documents are preserved as MNDM assessment files and/or as documents in the office of the Regional Geologist at Red Lake. Information about drillhole specifics was preserved by these original sources, but sample and assay data was incomplete.

Raytec located the casing for drillhole ES57-032 off the north shore of Jean Lake. The bulk sample trench above drillhole ES57-055 was also found, as was the original iron formation outcrop for which the 1956 El Sol channel sample results have been reported. These locations were used to adjust positions for the other historic drillholes.

Out of a total of 67 historic drillholes, all but four holes interested iron formation. Sample assay results are available for 22 of 42 drillholes on the A Zone, and 10 of 15 drillholes on the B Zone. Drill logs or cross sections for which data is available all reported %Fe values, while for some samples, %SiO<sub>2</sub>, %P<sub>2</sub>O<sub>5</sub> or %P and %S were also reported. There are no indications of analytical methods and there is no drill core available for review. Nevertheless, the available results provide a coherent picture of the deposit to which the 2008 results may be compared.



TABLE 7. HISTORIC DRILLING SUMMARY – FL SOL PROPERTY									
DDH	Zone Main	UTM83z15E	UTM83215N	Elev_m	AZ_UTM	Dip	Depth_m	Start Date	End Date
ES56-001	A Zone	540971.16	5644190.21	409.85	360	-45.00	92.35	9/21/1956	9/25/1956
ES56-002	A Zone	540971.16	5644242.03	411.98	360	-45.00	92.66	9/28/1956	10/2/1956
ES56-003	A Zone	540971.16	5644298.42	415.34	360	-45.00	101.19	10/3/1956	10/6/1956
ES56-004	A Zone	540971.16	5644357.85	416.56	360	-45.00	91.44	10/8/1956	10/12/1956
ES56-005	none	540971.16	5644520.92	427.83	360	-45.00	121.92	10/13/1956	10/13/1956
ES56-006	A Zone	540849.24	5644164.00	410.15	360	-45.00	92.96	10/19/1956	10/23/1956
ES56-007	A Zone	540849.24	5644189.91	412.59	360	-45.00	92.05	10/24/1956	10/2//1956
ES56-008	A Zone	540849.24	5644234.10	420.82	360	-45.00	121.92	10/28/1956	11/1/1956
ES36-009	A Zone	540727.52	5642508.00	409.85	360	-45.00	91.74	11/3/1930	11/6/1930
ES56-011	B Zone	540239.04	5643653 76	410.15	360	-45.00	121.92	11/3/1930	11/0/1950
ES56-012	A Zone	540727 32	5644158 21	415.03	360	-45.00	100.58	11/5/1956	11/10/1956
ES56-012	A Zone South	542678.04	5644315.18	404 97	360	-45.00	145.08	11/11/1956	11/18/1956
ES56-014	A Zone	541093.08	5644231.36	411.98	360	-45.00	106.68	11/11/1956	11/14/1956
ES56-015	A Zone	541093.08	5644284.70	412.75	360	-45.00	92.66	11/15/1956	11/18/1956
ES56-016	B Zone	540239.64	5643736.06	410.15	360	-45.00	136.73	11/21/1956	11/27/1956
ES56-017	A Zone	541093.08	5644330.42	412.29	360	-45.00	92.66	11/20/1956	11/23/1956
ES56-018	A Zone	542678.04	5644482.82	407.78	360	-45.00	121.92	11/21/1956	11/28/1956
ES56-019	A Zone	540971.16	5644196.31	410.00	180	-45.00	100.28	11/25/1956	11/29/1956
ES56-020	A Zone	542678.04	5644403.57	405.28	360	-45.00	85.04	11/29/1956	12/8/1956
ES56-021	B Zone	540239.64	5643812.26	410.46	360	-45.00	91.74	11/29/1956	12/4/1956
ES56-022	A Zone	541820.03	5644223.74	415.03	360	-45.00	121.92	12/3/1956	12/7/1956
ES56-023	A Zone	541820.03	5644302.99	413.69	360	-45.00	130.45	12/9/1956	12/14/1956
ES56-024	A Zone South	542799.96	5644345.66	404.85	360	-45.00	137.16	12/12/1956	12/16/1956
ES57-025	A Zone	541820.03	5644385.28	409.85	360	-45.00	62.18	1/8/1957	1/12/1957
ES57-026	A Zone	542799.96	5644432.53	405.28	360	-45.00	185.93	1/13/195/	1/21/1957
ES57-027	B Zone	540501.50	5643600.34	409.24	360	-45.00	240.18	1/0/1937	2/3/1957
ES57-028	A Zone	541580.76	5644319.75	409.24	360	-45.00	151.49	1/25/1757	2/3/1/3/
ES57-030	A Zone	543043.80	5644498.06	414 12	360	-45.00	181.36	1/28/1957	2/7/1957
ES57-031	A Zone	541820.03	5644071.34	418.08	360	-55.00	199.34	1/28/1957	2/7/1957
ES57-032	A Zone	544263.00	5644399.00	402.52	360	-45.00	156.06	2/5/1957	2/14/1957
ES57-033	B Zone	540361.56	5643690.34	409.24	360	-45.00	227.38	2/6/1957	2/15/1957
ES57-034	A Zone	541336.92	5644235.93	409.24	360	-45.00	167.34		
ES57-035	A Zone	543043.80	5644397.48	407.11	360	-45.00	247.80	2/10/1957	2/18/1957
ES57-036	A Zone	541820.03	5644071.34	418.23	360	-70.00	506.27	2/7/1957	3/18/1957
ES57-037	A Zone	541336.92	5644080.50	409.24	360	-45.00	176.48		
ES57-038	A Zone	544384.92	5644363.95	402.53	360	-45.00	37.49	2/16/1957	2/22/1957
ES57-039	B Zone	540727.32	5643705.58	409.24	360	-45.00	232.11	2/17/1957	2/25/1957
ES57-040	A Zone	543531.48	5644525.49	411.68	360	-45.00	145.39	2/13/1957	3/1/1957
ES57-041	A Zone	541215.00	5644132.30	409.24	360	-45.00	282.85	2/2/1057	2/10/1057
ES57-042	A Zone	545775.52	5644304.10	403.28	360	-45.00	145.59	3/3/193/	3/10/1937
ES57-043	A Zone	544500.84	5644358.04	402.33	360	-45.00	142.65	2/22/1957	3/0/1957
ES57-044	B Zone	540971 16	5643736.06	403.14	360	-45.00	142.03	2/26/1957	3/4/1957
ES57-046	A Zone	541215.00	5644257.88	410.46	360	-45.00	77 42	2/20/1/5/	5/4/1/5/
ES57-047	B Zone	540849.24	5643705.58	409.24	360	-45.00	87.78	3/6/1957	3/12/1957
ES57-048	A Zone	544384.92	5644269.46	402.53	360	-45.00	275.54	3/4/1957	3/17/1957
ES57-049	A Zone	544019.16	5644452.34	403.75	360	-45.00	173.74	3/13/1957	3/19/1957
ES57-050	A Zone	544141.08	5644399.00	403.14	360	-45.00	199.64	3/11/1957	3/18/1957
ES57-051	B Zone	541093.08	5643743.68	410.46	360	-45.00	187.15	3/14/1957	3/21/1957
ES57-052	A Zone	544263.00	5644296.89	402.53	360	-45.00	274.93	3/20/1957	3/28/1957
ES57-053	A Zone	543897.24	5644479.77	404.36	360	-45.00	188.98	3/20/1957	3/25/1957
ES57-054	A Zone	543653.40	5644528.54	412.29	360	-45.00	149.05	3/20/1957	3/26/1957
ES57-055	A Zone South	543043.80	5644266.41	405.28	360	-70.00	512.37		
ES57-056	B Zone	541215.00	5643743.68	410.46	360	-45.00	152.40	3/23/1957	3/28/1957
ES57-057	A Zone	543409.56	5644543.78	411.68	360	-45.00	141.43		
ES57-058	A Zone South	543409.56	5644299.94	404.67	360	-45.00	177.70		
ES57-059	B Zone	540483.48	5643690.34	409.24	360	-45.00	204.22		
ES5/-060	B Zone	541556.92	5644408.06	410.76	360	-45.00	122.22		
ES57.001	A Zone	545105.72	2044498.00 5644269.52	409.54	300	-45.00	182.38		
ES37-062	A Zone	541580 74	2044208.22 5612682 72	408.03	260 260	-43.00	132.40		
ES37-003 ES57-064		541560.70	5644320 42	411.37	360	-45.00	05.54 124.66		
ES57-065	R Zone	541824 60	5643530.42	410.40	360	-45.00	94 /0		
ES57-066	B Zone	542068 44	5643537 94	410.61	360	-45.00	91 44		
ES57-067	B Zone	542190 36	5643533 37	404 36	360	-45.00	89.31		
Total					200				

Notes: drillhole coordinates are NAD83, Zone 15. Collar Coordinates are estimated made on a best-fit basis from historical documents. The casing for drillhole ES57-032 was located during Raytec's 2008 drill program and was used to help determine locations for the other collars. Regardless collar locations for most are probably no better than 25 m accurate.



#### 11.2 RAYTEC'S 2008 DRILLING PROGRAM

#### 11.2.1 GENERAL

Drilling started October 1st and was completed October 28<sup>th,</sup> 2008. Hy-tec Drilling Ltd., of Smithers, B.C., carried out the program. Drilling was conducted using two heli-portable Tech 500 rigs which were moved and supported with an ASTAR 350 B2 helicopter provided by Forest Helicopters of Kenora, Ontario. For reasons of both safety and time effectiveness, the helicopter was used to move the drills and drilling crews and provide drill geologists access to the drills. Mobilization was from logging roads in a clear cut area located 4 km to the north of the Property. The program was based out of a permitted camp at the South Bay Mine site, which was owned and operated by Ackewance. The drilling was done on the basis of two 12 hour shifts per day. Core size was NQ, 47.6 mm diameter. A BC Level 3 First Aid attendant contracted from 1984 Enterprises Inc., of Vancouver, BC was stationed in the camp.

Drill pads were cleared and built by personnel of CJ Enterprises Ltd., of Smithers, BC. Raytec personnel cut grid lines and access trails, and helped to build drill pads. DGPS surveying of drillhole collar locations at the end of the program was completed by E. Rody, O.L.S, of Kenora, Ontario. The "zero" elevation mark for all downhole measurements was from the surface of the drill pad. The height of the pad was measured in the field for every drillhole and the elevation of these points was used as the elevation of the drillhole.

Drilling sites were selected to test widely spaced intervals along the A Zone. Due to the widespread, boggy ground to the south of the A Zone, drill sites were limited to areas with suitable conditions to support a drill rig. Drill locations were spotted along approximate north-south trending cut lines. Sites were cleared and drill pads were built in advance of drill moves.

Eight holes (ES08-001 to 008) were drilled along five sections of the A Zone in the Kesaka Far East area, towards Jean Lake. Two holes (ES08-009, 010) were drilled along two sections at the Kesaka East area, located northeast of Kesaka Lake. One hole (ES08-011) was drilled in the Kesaka West area, approximately 100 m off the western shore of Kesaka Lake.

After completion of the drill program, the core was mobilized to Red Lake, Ontario, by Barrens Transport. The Raytec drillholes are summarized in Table 8.



TABLE 8. SUMMARY 2008 DRILL PROGRAM – EL SOL PROPERTY

Seminini 2000 DRIEE I ROOMINI						NOI ENI	-		
DDH	Zone Main	UTM83z15E	UTM83215N	Elev_m	AZ_U	Dip	Depth_m	Start Date	End Date
					TM				
ES08-001	A Zone	543883.28	5644407.72	407.56	355	-43.00	234.00	10/3/2008	10/6/2008
ES08-002	A Zone	543883.28	5644407.72	407.56	355	-58.00	291.00	10/6/2008	10/9/2008
ES08-003	A Zone	543624.34	5644484.14	410.38	358	-46.50	177.00	10/9/2008	10/11/2008
ES08-004	A Zone	543317.76	5644501.70	417.24	360	-45.50	171.00	10/11/2008	10/13/2008
ES08-005	A Zone	543317.76	5644501.70	417.24	360	-65.50	222.00	10/13/2008	10/15/2008
ES08-006	A Zone	543008.72	5644430.66	412.06	358	-45.00	234.00	10/15/2008	10/17/2008
ES08-007	A Zone	542803.30	5644581.14	418.04	179	-46.00	168.00	10/18/2008	10/19/2008
ES08-008	A Zone	542803.30	5644581.14	418.04	179	-59.50	228.00	10/19/2008	10/21/2008
ES08-009	A Zone	541791.32	5644248.96	418.76	360	-45.00	201.00	10/21/2008	10/23/2008
ES08-010	A Zone	541982.95	5644263.98	417.80	360	-46.50	189.00	10/23/2008	10/24/2008
ES08-011	A Zone	540810.00	5644265.62	429.20	180	-46.00	186.00	10/25/2008	10/26/2008
Total	11 drillholes								

Note: Coordinates are UTM NAD 83, Zone 15N.

#### 11.2.2 DRILLHOLE COLLAR AND DOWN~HOLE SURVEYING

The drill rig was positioned on elevated drill pads and aligned with two foresites on the cut lines. The drillhole collar inclination was set using a carpenter's inclinometer and was later checked by the geologist, with a Brunton compass. Downhole surveys were conducted approximately every 50 m downhole with a Ranger single shot downhole survey tool (from Ranger Survey Systems Canada, Inc.) operated by the drill crew. However, since the instrument was affected by the magnetic field associated with the iron formation, only measurements of inclination were accepted as valid. Downhole drillhole azimuths are assumed to be the same as the collar azimuth.

After each drillhole was completed, the casing entry point was marked with a cut log. A metal tag indicating drillhole details was attached to this collar marker and photographs were taken of the site. A metal anchor rod also remains at each pad location. DGPS surveying of 10 of 11 of the drillholes, as well as a located metal casing of historic drillhole ES57-032, was completed by surveyor Eric Rody, O.L.S. A metal survey reference pin was installed between the drill pad sites for holes ES08-001/002 and ES08-003. The coordinates of this pin are:

IB (iron bar) 543767.403 m East, 5644429.645 m North, 410.138 m above sea level, UTM NAD 83 Zone 15.

To complete the DGPS survey, the surveyor located the DGPS base station on this monument. A roving unit was successively moved from drillhole to drillhole. GPS signals in the area were difficult to obtain, due to the tall tree cover surrounding the drill sites, as well as the low trajectory of satellites over the area. Long data collection times at each survey point were required to ensure data was within acceptable error limits. E. Rody provided the final list of coordinates as UTM NAD83, Zone 15.

### 11.2.3 WGM COMMENT ON 2008 DRILLING

Raytec's drilling program appears to have been run well. Certainly it is good practice to complete a DGPS survey of all collars at the end of the program.

Down-hole surveying was done using a Ranger instrument. This instrument determines azimuths based on a magnetic compass. Raytec ignored azimuth readings from the instrument and utilized only the inclination information from the survey. WGM agrees that this was appropriate.

As described in the Corroboration section of this report, WGM examined many of the drill sites during its site visit and can corroborate that the drill collar locations reasonably agree with locations as posted in Raytec's database. WGM also checked some drillhole inclinations and is satisfied Raytec's data is accurate. Collars were well marked.

WGM recommended that Raytec conduct a more thorough search for the historic drillhole collars.

# 12. SAMPLING METHOD AND APPROACH

# 12.1 GENERAL

NIC has completed no sampling of the Property. LEC, through processor company Raytec, has conducted one exploration program on the Property.

# 12.2 HISTORIC DRILL CORE SAMPLING

Incomplete information is available concerning El Sol's 1956 and 1957 drillhole core sampling. Some of the preserved and available drill logs and cross sections report drill core sample locations but much of the data is missing.

# 12.3 2008 DRILL CORE HANDLING AND LOGGING

Drill core was transported daily, from each drill pad location by helicopter. Wooden core boxes were stacked, covered, and strapped into a steel caged basket which was slung back to camp each day. Geotechnical logging including RQD (Rock Quality Designation) of the core was conducted at the field camp. Overall core recovery and RQD were both very good, averaging 98.6% and 76.2%, respectively. Only brief drill core logs were completed in the field. Comprehensive descriptive logging was not done until the core was transported to Red Lake, at the end of the drill program where sampling was also completed.

The drill core was logged and sampled at a fully equipped, core shack facility rented from Premier Gold Mines Ltd. Drill core logging and geotechnical data collection were completed by Janice Fingler, P.Geo, and James Thurston. Drill core sampling and packaging was completed by Willy Desmeules of Ackewance.

Before being logged, drill core was re-oriented. Core was logged for general lithology and structure. Selected sample intervals were also logged for detailed lithology within these intervals. Estimates of the relative components of the iron formation were made and coded in order of relative proportions: as magnetite, chert, chloritic mudstone, jasper and sediment interbeds. The presence of garnets and grunerite were also included in the coding. A measurement of magnetic susceptibility was taken within each drill run interval using a KT-9 handheld unit. Due to the high proportion of magnetite within the iron formation, readings taken within the iron formation mostly exceeded the detection limits of the instrument.

#### 12.4 2008 SAMPLING APPROACH

Samples were laid out nominally at 3 m intervals, but were also delimited at lithic unit boundaries at both shorter and longer intervals. The sample selected for in-field bulk density measurements were laid out at approximate 1 m intervals. Un-mineralized greywacke from the first few drillholes of the program was sampled and this material was put aside for insertion into the sample stream as Blanks as required. Samples submitted from the field included Field Blanks ("FB") and Field Duplicates ("FDC"), consisting of second half sawn core. One Field Blank and one Field Duplicate were included with every 20 regular samples submitted for analysis.

#### 12.5 2008 SAMPLING METHOD

Sample intervals and numbers were marked on the core using china markers. Sequentially numbered, two part sample tickets, together with an aluminum tag containing sample interval information, were stapled into the core trays near the end of each regular sample. Tags for designated Field Blanks and Field Duplicate samples were included. The Blank tags were positioned at the start of the sample they precede; the duplicate tags were placed after the sample they follow.

Details about all samples submitted were recorded on the original drill logs. After samples were marked and tagged, the core boxes were photographed with core both wet and dry. A total of 429 samples were submitted for analysis, including 20 Blanks and 22 second half core Duplicates. This represented 407 sample intervals over a length of 1064.45 m. The average sample length was 2.62 m.

In-field bulk density measurements were made on 47 samples which represented a variety of lithological units with variable iron content. A total of 38 of these measurements were made on intervals sampled and sent for assay at SGS-Lakefield (one of these was on a Duplicate). The whole core samples were weighed in air and in water.

All of the core samples were sawn in half using a diamond saw. One half of the core was returned to the core tray and the other half was inserted, together with the sample tag, into a poly sample bag labelled with the sample number. When the sampler encountered a tag for a Blank sample, the designed Blank sample and the new tag was transferred into a new bag with the new sample number. When the sampler encountered a tag for a Duplicate sample, the sampler placed the remaining half core for the preceding interval, and the sample tag into a bag with the indicated number. The resultant gap in the core box was replaced with a wooden block bearing a metal tag with information about the two samples: regular and duplicate, for

the interval. The bags were sealed and also put into individual, labelled rice bags for additional strength for transportation to the laboratory.

Five samples (5751 to 5755) were selected for preliminary metallurgical tests. These were packed into three sealed sample pails, together with a shipping list.

All samples were loaded sequentially into three large wooden crates with shipping lists and sent to SGS-Lakefield.

# 12.6 CORE STORAGE

At the end of the program the core trays were cross piled. The core is currently stored at Barrens Transport in Red Lake.

# 12.7 WGM COMMENT ON LOGGING AND SAMPLING

WGM examined sections of Raytec's 2008 drill core during its September 2008 site visit and found the core in good order. The drill logs have also been reviewed and WGM agrees they are comprehensive and are of excellent quality.

At the time of WGM's visit no detailed logging or sampling of the drill core had been completed. WGM can therefore not validate Raytec's logging and sampling procedures.

# 13. SAMPLE PREPARATION, ASSAYING AND SECURITY

# 13.1 2008 SAMPLE PREPARATION

All in-lab sample preparation mandated by Raytec was performed by SGS-Lakefield. Each of the 429 drill core samples including field-inserted Blanks and second half core Duplicates was cone-crushed to nominal 1/4" and a 1 kg sub-sample was then riffled out. The 1 kg sub-sample was stage-crushed to -10 mesh and one 100 g test charge was prepared, while the remainder was stored. In addition 18 of the routine samples were selected by Raytec to be prepared as –A and –B suffixed Preparation Duplicates. For these samples, an additional 100 g test charge was prepared of -10 mesh material.

The 100 g portions were pulverized in a ring pulverizer to 200 mesh (75  $\mu$ m) and then sent for analysis.

All sample rejects were re-packaged using the original sample bags and are currently stored by SGS-Lakefield.

### 13.2 2008 SAMPLE ASSAYING

Raytec's drill core samples were analyzed for major whole rock element oxides ("WR"), including  $Fe_2O_3$ , by lithium metaborate fusion XRF. FeO was determined by  $H_2SO_4/HF$  acid digest-potassium dichromate titration. Magnetic iron, expressed on SGS-Lakefield certificates in terms of magnetite, was completed by Satmagan. Specific gravity was done by helium comparison pycnometer. The five samples on which the optimization grind testwork was performed were also analysed for S. Sulphur was determined by combustion followed by infrared detection on LECO instrumentation. Additionally, fifty samples had bulk density determined on whole core prior to crushing. Each sample was weighed in air and weighed when submerged in water.

Excluding the B-Preparation Duplicate portions, but including the field-inserted Blanks and second half core Duplicates, a total of 429 samples were sent for assay. Sample and statistics are summarized in Table 9.



Sample Classification	Analysis	Number
Routine, including 5 testwork samples	XRF WR, FeO and Satmagan	387
In-Field Blank	XRF WR, FeO and Satmagan	20
In-Field Duplicate	XRF WR, FeO and Satmagan	21 or 22
Additional on selected samples	SG- pycnometer in lab	105 (3 of these on duplicates)
Additional on selected samples	Bulk Density in lab	56 (2 of these on duplicates)
In-lab Preparation Duplicates	XRF WR, FeO and Satmagan	19 (for one sample,
		there were two duplicates)
In-lab analytical Duplicates	XRF WR, FeO	18
In-lab analytical Duplicates	Satmagan	22
In-lab Reference Standards	XRF WR	23
In-lab Reference Standards	FeO	37
In-lab Reference Standards	S	2

 TABLE 9.

 SAMPLING AND ANALYSIS SUMMARY RAYTEC'S 2008 DRILL PROGRAM

Notes: Five of the 429 routine samples also were used for optimization grind testwork that is described in Section 6. In addition to WR, Satmagan, FeO and SG by pycnometer, these samples in had S determinations completed.

### 13.3 QUALITY ASSURANCE AND QUALITY CONTROL

Raytec as aforementioned conducted an in-field QA/QC program by inserting Blanks and second half drill core Duplicates into the sample stream. One field Blank and one second half core field Duplicate were included with every regular 20 samples submitted for analysis. The Field Blanks were unmineralized greywacke inserted into the sample stream as required and given a routine sequential sample number. SGS-Lakefield also conducted its own internal QA/QC program using Blanks, and reference Standards. The Preparation Duplicate component was as aforementioned, performed in-lab, but the samples for this were selected by Raytec. Preparation Duplicates consisted of a second charge of material riffled out of the -10 mesh reject and then treated as a new sample. Samples and analysis for both these programs are summarized in Table 9.

#### 13.3.1 FIELD BLANKS

Twenty-two Field Blanks were assayed during the drill program. On Figure 15, % TFe for these Blanks is plotted against certificate date. All of the samples correctly returned assays commensurate with the samples being unmineralized greywacke.

#### 13.3.2 SECOND HALF CORE DUPLICATES

Twenty-one second half core Duplicates were inserted into the sample stream by Raytec and sent blind to the lab. Figures 16 to 18, respectively show assay results for % TFe, %FeO, and %Fe<sub>3</sub>O<sub>4</sub> from Satmagan. Correlation between assays for equivalent pairs is excellent.





Figure 15. Assay results for Field Blanks for % TFe over the course of the program



Figure 16. Assay results for second half core Duplicates - % TFe





Figure 17. Assay results for second half core Duplicates - %FeO





#### 13.3.3 PREPARATION DUPLICATES

Results for 18 Preparation Duplicate pairs are shown in Figures 19 and 20. Figure 19 shows results for %TFe on Heads; Figure 20 shows results for %SiO<sub>2</sub> on Heads.





Figure 19. Assay results for Preparation Duplicates - % TFe



Figure 20. Assay results for Preparation Duplicates - %SiO<sub>2</sub>

### 13.3.4 CERTIFIED REFERENCE STANDARDS AND LABORATORY BLANKS

As part of its in-house QA/QC, SGS-Lakefield analysed certified reference Standards and Blanks with every batch of Raytec's samples. Seventy-six instances of certified reference

Standards including Blanks, were assayed by SGS-Lakefield through the assay program. In total eight (8) different Standards were used. Table 10 summarizes the results for the Standards in terms of TFe used by SGS-Lakefield during the program for WR major element analysis including %Fe and presents the results for TFe.

HEAD SAMPLES ASSAYED FOR IRON							
Standard	Provider	Material	Certified	Number of	Average	Maximum	Minimum
ID			Value %Fe	Assays	Assay %Fe	Assay %Fe	Assay %Fe
SARM-12	SA Bureau of Standards	Palabora magnetite	66.6	2	66.83	67.01	66.66
SARM-4	SA Bureau of Standards	MainZone Bushveld	6.274	6	6.33	6.37	6.24
		Complex					
SARM42	SA Bureau of Standards	Stream Sediment	3.273	1	3.29	3.29	3.29
680-1	ECSC	-	59.98	8	59.91	59.91	60.15
681-1	ECSC	Iron Ore	33.21	3	33.29	33.43	33.15
SY4	Canmet	Diorite Gneiss	4.34	1	4.39	4.39	4.39
NIST-690	NIST	Iron ore concentrate	66.85	1	67.01	67.01	67.01
SO3	Canmet	Till	1.51	1	1.50	1.50	1.50
Count				24			

TABLE 10. RESULTS FOR SGS LAKEFIELD INTERNAL STANDARDS HEAD SAMPLES ASSAYED FOR IRON

Note: ECSC is European Coal & Steel Community

SGS-Lakefield results for the reference materials are close to the accepted values and this indicates that SGS-Lakefield assays are accurate.

# 13.3.5 WGM COMMENT ON RAYTEC'S 2008 DRILL PROGRAM SAMPLING AND ASSAYING

Raytec employed a sampling strategy in the field that included Blanks and second half drill core Duplicates. In addition mineralized intervals of drill core were bracketed by sampling at least one sample interval of waste. Bracket sampling is good practice and helps to ensure that there are no sample-sequencing errors. In the lab, Raytec requested SGS-Lakefield to complete Preparation Duplicates every 26 regular samples. Analytical Duplicates were also assayed. Results indicated by the QA/QC program were very good, showing excellent precision between sample and assay pairs indicating sampling and assaying were well done and there were no sample mix-ups in the field or in the lab.

Review of analytical results by WGM showed that for a number of the routine samples % magnetic Fe completed by the Satmagan significantly exceed %TFe results. In some cases results for FeO are also out of balance with  $Fe_2O_3$  results. A few values (most likely Satmagan determinations) are therefore inaccurate. WGM recommends that SGS-Lakefield be queried about these results.
# **14. DATA CORROBORATION**

WGM Senior Associate Geologist, Richard Risto, P.Geo., on behalf of Raytec completed a site visit to the project between October 23 and 27, 2008. At the time of the visit, the drill was on the second last hole of the drill program. Ms. Janice Fingler, Project Geologist guided Mr. Risto through the project.

Mr. Risto reviewed, with Ms. Fingler, a selection of documents detailing historic exploration results and newly collected data from the current program. The drills were visited as well as all of the program's drill sites. Mr. Risto observed 2008 collars marked by casings and posts labelled with aluminum tags. GPS (handheld instrument) measurements of coordinates were made at a number of drillhole sites and WGM's collar coordinates readings validated Raytec's coordinates. Mr. Risto also checked the inclination of several of the casings. Iron formation in outcrop was observed at a historic bulk sample trench site and at a camp site dating from the 1950s where a channel sample had been collected.

WGM noted that Raytec's drill core was securely stacked and in excellent condition. Core trays were well labelled. Mr. Risto reviewed 2008 program drill core and independently collected seven samples of second half drill core for independent assay and validation of Raytec's results. At the time of the visit, neither detailed logging, nor sampling of the new core had been started. Raytec had completed only quick summary logs and RQD-recovery logging in the field. The detailed logging and sampling was completed later in Red Lake. Table 11 lists the WGM independent sample locations along with Raytec's sample identifiers that were determined from Raytec's sample database after its logging and sampling were completed.

WGM	Original	Hole	From	То	Description						
Sample ID	Sample ID	ID	( m)	( m)							
RYWGM-01	16235	08-04	123.0	126.0	Chloritic mudstone, occasional Mt rare garnets						
RYWGM-02	16215	08-04	72.0	75.0	Banded Mt-jasper						
RYWGM-03	16295	08-06	132.0	135.0	Banded Mt-chert Iron Formation						
RYWGM-04	16448	08-09	108.0	111.0	Banded Mt-Jasper-chert, minor specularite						
RYWGM-05	16458	08-09	135.3	138.3	Banded Mt with intervals of biotite schist						
RYWGM-06	16507	08-01	135.0	138.0	Banded Mt-chert Iron Formation						
RYWGM-07	16571	08-02	231.0	234.0	Banded Mt-chert with minor chloritic matrix						

TABLE 11. WGM INDEPENDENT SAMPLES – EL SOL PROPERTY

The samples were sent to SGS-Lakefield and analysed for major WR elements using XRF on fused discs similar to the original analytical work completed at SGS-Lakefield for Raytec. Fe<sub>3</sub>O<sub>4</sub> was determined by Satmagan. Results are listed in Table 12. The SG and/or density of



the samples were determined by immersion in water and also on pulps using the helium comparison pycnometer method. After SGS-Lakefield completed their work, WGM requested the samples of -10 mesh coarse reject from the lab. WGM then forwarded these samples to the Midland Research Centre ("**MRC**"), Minnesota. MRC was requested to pulverize the samples to 100% passing 325 mesh, assay the Heads for Fe using its wet chemistry method, determine Head magnetite by Satmagan, prepare Davis Tube concentrates, and analyse each of the concentrates for Fe and SiO<sub>2</sub>. MRC uses a multi-stage, mechanical mortar and pestle grinding method with dry screening between stages to reach the point where 100% of the sample passes the prescribed screen. MRC uses wet chemical methods of analysis, as opposed to instrumental methods used at SGS-Lakefield. For determining Fe, MRC uses a non-mercury titration method using titanium chloride and titrating with potassium dichromate, following sample digestion using stannous chloride, HCL and HF. MRC determines silica by weighing sample residues before and after selective digestion and two stages of fusion in platinum crucibles.

Sample ID	TFe	FeO	Fe <sub>3</sub> O <sub>4</sub>	SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	TiO <sub>2</sub>	MgO	MnO	CaO	Na <sub>2</sub> O	K <sub>2</sub> O	$P_2O_5$
	%	%	%	%	%	%	%	%	%	%	%	%
16235	33.50	21.66	33.70	45.50	2.32	0.08	1.87	0.08	1.97	0.05	0.71	0.15
RYWGM-01	32.30	21.80	31.30	45.40	2.65	0.10	1.95	0.10	2.02	0.05	0.81	0.17
MRC	30.35		29.8									
16215	37.14	14.99	46.00	39.90	1.05	0.04	1.60	0.06	2.49	0.05	0.59	0.14
RYWGM-02	37.10	14.90	45.40	40.40	0.88	0.03	1.45	0.06	2.50	0.02	0.57	0.14
MRC	37.52		42.1									
16295	35.60	16.80	48.20	41.90	1.22	0.04	1.83	0.07	2.90	0.05	0.49	0.17
RYWGM-03	35.50	17.10	48.00	41.90	1.22	0.05	1.86	0.07	2.66	0.01	0.60	0.15
MRC	35.36		44.0									
16448	36.58	13.00	41.50	41.60	0.88	0.03	1.42	0.04	1.80	0.07	0.77	0.16
RYWGM-04	37.30	13.50	42.30	41.00	0.86	0.03	1.45	0.05	1.75	0.06	0.71	0.17
MRC			40.0									
16458	29.87	13.88	42.10	43.80	3.33	0.13	1.98	0.04	2.41	0.37	3.03	0.14
RYWGM-05	30.10	14.10	40.00	43.40	3.66	0.15	2.12	0.04	2.50	0.35	3.23	0.17
MRC	29.9		37.9									
16507	35.60	16.32	49.70	41.10	0.69	0.02	0.63	0.04	3.83	0.00	0.06	0.16
RYWGM-06	35.90	16.50	49.30	41.80	0.69	0.03	0.64	0.03	3.39	0.03	0.11	0.16
MRC	36.48		46.1									
16571	31.34	15.93	40.30	45.20	2.99	0.11	1.94	0.07	2.47	0.08	1.07	0.16
RYWGM-07	31.90	16.00	41.50	45.20	2.60	0.10	1.79	0.08	2.48	0.06	0.88	0.18
MRC	31.99		39.7									

TABLE 12.WGM SAMPLE CHECK ASSAYS VS. ORIGINAL ASSAYS

The Certificate of Analysis for WGM's independently collected samples analysed by SGS-Lakefield and MRC are contained in Appendix 1.

Figures 21 to 24 present graphical representation of results for WGM check assays vs. original assays reported by Raytec for TFe\_H,  $Fe_3O_4$ \_H (Satmagan), FeO\_H and SiO\_H. All of these assays were completed by SGS-Lakefield and the sample identifications were blind both to the SGS-Lakefield and Raytec.



Figure 21. %TFe\_H for WGM Check vs. Raytec Original





Figure 22. %FeO\_H for WGM Check vs. Raytec Original



Figure 23. %Fe<sub>3</sub>O<sub>4</sub>\_H Satmagan for WGM Check vs. Raytec Original





Figure 24. %SiO<sub>2</sub>H for WGM Check vs. Raytec Original

Figures 25 to 27 compare assay results for the same samples at SGS-Lakefield and MRC. For the MRC assays, the -10 mesh reject was prepared at SGS-Lakefield but pulverized and assayed at MRC.









Figure 26. %Magnetic Fe by Satmagan method for MRC vs. SGS-Lakefield



Figure 27. %Magnetic Fe from Davis Tube at MRC vs. Satmagan Method at MRC

The SGS-Lakefield assays for WGM's independent samples correlate tightly with original assays obtained by Raytec. Head Fe assays for SGS-Lakefield and MRC also strongly correlate despite the fact that they were completed using different methods.

Although SGS-Lakefield and MRC Satmagan results for Heads strongly correlate, MRC consistently reports lower Satmagan values than SGS-Lakefield. In WGM's opinion MRC's Satmagan values are probably a little low, with SGS-Lakefield's results more accurate. This conclusion is based on the comparison of MRC's Magnetic Fe values, calculated from Satmagan versus its Magnetic Fe values calculated from their Davis Tube results (see Figure 27). MRC's results for Satmagan are also lower than its Davis Tube results suggesting its Satmagan results are biased a little low.

Figure 28 shows SG by pycnometer versus %TFe for Heads for WGM's independent samples. The formula for the line shown is for a best fit line to these samples. Also shown are two best fit lines to data obtained by Raytec; one best fit to its gas comparison pycnometer data and one fit to its field bulk density data (see Figure 13).



Figure 28. SG data by gas comparison pycnometer for WGM's independent samples

The relationship between SG and TFe is well correlated and similar to that obtained directly by Raytec.

In WGM's opinion, Raytec's sample assay data are reasonably accurate and precise.

# **15. ADJACENT PROPERTIES**

Considerable exploration for gold and base metals in Northwestern Ontario continues but exploration for iron deposits in Ontario represents only a very small proportion of total exploration expenditures.

In addition to El Sol, NIC has acquired the rights and is exploring for iron ore on several other claims in the Red Lake District. Included in these properties is the past producing Griffith Mine (approx. 70 km west of El Sol). In the summer of 2010, NIC conducted minimal reconnaissance work on the Griffith claims.

Other claims held by NIC in the Red Lake District include the Karas property (approx. 56 km west of El Sol), the Whitemud-Bluffy-Slate property (approx. 28 km west of El Sol), the Avis-Currie property (approx. 15 km east of El Sol) and the Slate Lake property (approx. 7 km west of El Sol). During the summer of 2010, NIC conducted ground-based magnetometer surveys and geological mapping on all three of the projects to further define magnetic anomalies identified from airborne geophysics. WGM understands that NIC completed three drillholes, with one per property, on the Karas, Whitemud-Bluffy-Slate and Avis-Currie properties and assays are pending.

The only other recent iron formation related exploration in Ontario that WGM is aware of is Rockex Limited ("**Rockex**") at western Lake St. Joseph, Bending Lake Iron Group Ltd. at Bending Lake and The Temagami Iron Corporation on the Cummings Lake or Tinto deposit.

The closest other exploration activity was 20 km west and north of the El Sol Project. The work to the north, in the vicinity of Confederation Lake was carried out by Skyharbour Resources Ltd. Its program consisted of drilling to evaluate volcanogenic massive sulphide (VMS) targets located adjacent to the site of the former South Bay Mine. King's Bay Gold Corp. also conducted exploration on an adjacent property. It carried out a program of drilling on the Bobjo gold property in Dent Township. The closest exploration programs situated west of the Property were by Tribute Minerals Inc. Tribute carried out diamond drilling and geophysics programs focussed on VMS mineralization in Belanger Township, 30 km west of the Property.

In 2008, at Bending Lake, 200 km south of the Property and 38 km southwest of Ignace, the Bending Lake Iron Group Ltd. initiated an exploration program to evaluate the Bending Lake iron deposit. Diamond drill core from historical programs targeting the Bending Lake iron deposit was recovered, re-logged and sampled. Eight diamond-drillholes, totalling



approximately 2,200 m were completed. The company plans to issue a NI 43-101 Mineral Resource estimate in 2009.

In the western part of Lake St. Joseph, 100 km east of the Property, Rockex conducted a diamond drill program consisting of five holes aggregating 1,311 m. The program was focussed on confirmation work on the historic Eagle and Fish Islands iron deposit and resource. Mr. Pierre Gagne is the principle contact.

The only additional iron related program WGM is aware of in Northwestern Ontario was the acquisition by Premier Gold Mines Limited of an option on the Barton Bay iron property. The Barton Bay deposit, otherwise known as the Errington or Geraldton deposit, is located at Geraldton 400 km from the Property. It is unknown whether any exploration was conducted. Further east and north of Sudbury, in 2007, The Temagami Iron Corporation conducted a magnetic survey over the Cummings Lake or Tinto deposit.

# 16. MINERAL PROCESSING AND METALLURGICAL TESTING

### 16.1 GENERAL

Historical metallurgical testwork was carried out in three separate programs in late 1956 and 1957 on the El Sol Property consisting of preliminary concentration tests as well as preliminary pelletizing tests. The samples used in the testwork were a combination of material from surface trenches and core from the diamond drilling program. Initial testwork was completed at the University of Toronto along with another campaign at Lakefield Research and another campaign at Lurgi in Germany, all in the 1956 and 1957 period. There is not a good record of the sample selection method or sample origin and there are several missing reports, and others are not completely legible. However in 2009, WGM had concluded that the consistency of the results available was indicative of the general metallurgical characteristics of the deposit. The available results on the limited work completed in 1957 along with the more recent work were considered suitable for preliminary considerations of the viability of commercial development of the deposit.

In 2008 there was an attempt to establish a standard grinding test and Davis Tube test on each of the core samples generated from the 2008 drill program to provide metallurgical results to supplement the data base. Due to the extensive grinding required for the sample preparation and the associated costs, the Davis Tube testing was discontinued in favour of routine Satmagan testing for magnetite content.

In 2010 WGM advised Lion Ore on the scope of work necessary to advance the additional metallurgical investigation necessary to develop a flowsheet suitable for concentrating the deposit to a saleable Fe product with less than 4 % silica. The scope of this work took into consideration historical indications of the metallurgy and the fine grinding requirement to liberate the iron minerals. The initial phase of this work was completed in September 2010.

### 16.2 TESTWORK AT THE UNIVERSITY OF TORONTO, 1957

The initial testwork completed in January 1957 was performed on a sample of surface or trench mineralization weighing about 10 lbs and reported in "*Iron Ore Concentration Tests for Newkirk Mining Corp. LTD*". by H.U. Ross, a professor at the university. Following crushing, the sample was split for grinding and magnetic concentration tests. One sample was ground to 99% passing 100 mesh and the second sample was ground to 99% passing 200 mesh with each sample subjected to a Davis Tube test producing the results in Tables 13 and 14.

DAVIS TUBE TEST ON SURFACE SAMPLE GROUND TO 99% PASSING 100 mesh									
Product	Wt (%)	Assa	y (%)	Distribu	ution (%)				
		Fe	SiO <sub>2</sub>	Fe	SiO <sub>2</sub>				
Rough Concentrate	74.9	55.87	20.32	96.8	46.3				
Tailings	25.1	5.56	-	3.2	-				
Calc Head	100.0	43.2	-	100.0	-				
Assay Head	-	42.33	32.84	-	100.0				

TABLE 13.

TABLE 14.	
DAVIS TUBE TEST ON SURFACE SAMPLE GROUND TO 99% PASSING 200 mes	sh

Product	Wt (%)	Assay (%)		Distribution (%)		
		Fe	SiO <sub>2</sub>	Fe	SiO <sub>2</sub>	
Rough Concentrate	69.8	60.00	10.05	97.7	21.3	
Tailings	30.2	3.27	-	2.3	-	
Calc Head	100.0	42.86	-	100.0	-	
Assay Head	-	42.50	34.98	-	100.0	

The results showed an improvement in concentrate grade with the finer grinding (55.9% Fe to 60.0% Fe). Even though the silica grade of the concentrate was reduced by half with the magnetic concentration on 100% passing 200 mesh material it remained high at 10.05%.

A second program of tests were completed at the University of Toronto using composites selected from drill core and reported in a "Letter Report on Iron Ore Concentration Tests to El Sol Gold Mines Limited" dated February 28, 1957. The results are shown in Tables 15, 16, and 17.

TABLE 15. DAVIS TUBE TEST DRILL CORE SAMPLE GROUND TO 83.6% PASSING 200 mesh								
Product	Wt%	Assay	Distribut	tion (%)				
		Fe	SiO <sub>2</sub>	Fe	SiO <sub>2</sub>			
Concentrate	62.9	57.13	16.80	97.4	-			
Tailings	37.1	2.61	-	2.6	-			
Calc Head	100.0	36.90	-	100.0	-			
Assay Head	-	36.97	-	-	-			

Note: Composite from drill core samples 150, 151 and 152.

TABLE 16. DAVIS TUBE TEST – DRILL CORE SAMPLE GROUND TO 94.6% PASSING 200 mesh									
Product	Wt%	Assay	(%)	Distribution (%)					
		Fe	SiO <sub>2</sub>	Fe	SiO <sub>2</sub>				
Concentrate	56.8	58.92	15.90	95.1	-				
Tailings	43.2	4.00	-	4.9	-				
Calc Head	100.0	35.19	-	100.0	-				
Assay Head	-	35.18	-	-	-				

Note: Composite from drill core samples 189, 190 and 191.



DAVIS TUBE TEST – DRILL CORE SAMPLE GROUND TO 88.5% PASSING 200 mesh								
Product	Wt%	Assay (%)		Distribution (%)				
		Fe	SiO <sub>2</sub>	Fe	SiO <sub>2</sub>			
Concentrate	44.5	55.58	19.34	85.8	-			
Tailings	55.5	7.35	-	14.2	-			
Calc Head	100.0	28.81	-	100.0	-			
Assay Head	-	28.81	-	-	-			

TABLE 17.DAVIS TUBE TEST – DRILL CORE SAMPLE GROUND TO 88.5% PASSING 200 mesh

Note: Composite from drill core samples 215 and 216.

The testwork campaign on the drill core composites demonstrated similar conclusions to the initial tests where the concentrate grade and rejection of the silica from the concentrate is very dependent on the fineness of the grinding of the sample. The Davis Tube tests showed weight recoveries ranging from 44.5% to 74.9% and iron recoveries ranging from 85.8% to 97.7% with the sample head grades ranging from 28.8% Fe to 42.5% Fe. Although the tests did not make saleable concentrate grades, the high iron recoveries would indicate that the finer grinding would probably yield good iron recoveries at the required concentrate grade.

Another magnetic concentration test and a coarse cobbing test was completed in 1957 on the El Sol mineralization on drill core assay sample rejects to make a preliminary assessment of upgrading the ore to a grade suitable for production of luppen (a direct reduction iron product) produced using the Krupp-Renn process, developed in Germany in the 1930s. This work was carried out to make a comparison to the production of concentrates and pellets and documented in a report titled "*Report on A comparative study of Pelletizing Progress and the Krupp-Renn Process for Iron Ores*".

Two samples of drill core were prepared with one crushed and ground to 100% passing 200 mesh and subjected to magnetic concentration, and the second was crushed to 100% passing 8 mesh. A higher than average grade sample was used in the testwork with the results shown in Tables 18 and 19.

Product	Wt%		Assay (%)					Distribution (%)					
		Fe	SiO <sub>2</sub>	$Al_2O_3$	CaO	MgO	Fe	SiO <sub>2</sub>	$Al_2O_3$	CaO	MgO		
Concentrate	62.9	63.84	9.90	0.36	0.25	0.14	94.0	20.2	25.4	7.3	10.6		
Tailings	37.1	6.95	-	-	-	-	6.0	79.8	74.6	92.7	89.4		
Calc Head	100.0	42.73	-				100.0	-					
Assay Head	-	42.77	30.86	0.94	2.16	0.83	-	100.0	100.0	100.0	100.0		

TABLE 18.DAVIS TUBE TEST – DRILL CORE SAMPLE GROUND TO 100% PASSING 200 mesh

Notes: Composite from drillhole ES56-22; Original core samples 434.1 to 644.3 ft averaged 32.5% Fe over 210.2 ft.



COAKSE C	COARSE CODDING TEST ON DRILL CORE SAMPLES CRUSHED TO 100% PASSING 8 mesi										
Product	Wt (%)	Assays (%)				Distribution (%)					
		Fe	SiO <sub>2</sub>	$Al_2O_3$	CaO	MgO	Fe	SiO <sub>2</sub>	$Al_2O_3$	CaO	MgO
Concentrate	92.0	45.76	27.51	0.90	1.89	0.87	98.4	82.0	88.1	78.0	96.4
Tailings	8.0	8.31	-	-	-	-	1.6	18.0	11.9	22.0	3.6
Calc Head	100.0	42.76	-	-	-	-	100.0	-	-	-	-
Assay Head	-	42.77	30.86	0.94	2.16	0.83	-	100.0	100.0	100.0	100.0

TABLE 19.COARSE COBBING TEST ON DRILL CORE SAMPLES CRUSHED TO 100% PASSING 8 mesh

The testwork showed similar results for the magnetic concentration on the material ground to 100% passing 200 mesh, with the silica grade of the concentrate at 9.9% and higher than testwork on the finer ground samples, despite the higher head grade of the sample. The coarse cobbing test showed that when the material was crushed to 100% passing 8 mesh and subjected to magnetic concentration, the ore grade only increased from 42.77% Fe to 45.76% Fe with the rejection of 1.6 % of the Fe and 8% of the weight.

The comparative analysis of the two processes showed that the Krupp-Renn process to produce luppen may be advantageous, but considerable marketing effort would be required as it was not a product the steel industry in the North American market at that time had used. The Krupp-Renn process was developed for mineralization that could not be concentrated by conventional technology, which is not the case for the El Sol deposit.

The coarse cobbing test would indicate that the project could not be enhanced by a coarse cobbing stage in the operation without considerable loss in iron recovery with little gain in concentration costs.

### 16.3 TESTWORK AT LAKEFIELD RESEARCH, 1956 AND 1957

A campaign of testwork on the El Sol deposit was carried out at Lakefield Research in late 1956 and early 1957 and reported in four separate progress reports titled "*An investigation of Iron Ore Samples submitted by El Sol Gold Mines Limited*". Although the initial report was carried out on surface samples and was not available, the latter three reports on testing using assay rejects from drill core samples were available for this review.

Lakefield's Progress Report #2 covers testwork on a composite sample made from 69 assay reject samples. It is reported that the sample rejects were from seven drillholes (ES-56-01, 02, 11, 13, 14, 16, and 18). The test program was designed to test the potential for stage grinding preliminary magnetic concentrates followed by a second concentration by magnetic and table separation. The initial concentration was completed on sample material ground to 100% passing 65 mesh and the second concentration was completed on regrinding to



100% passing 100 mesh with a second test on reground concentrate to 100% passing 200 mesh. The Head analysis of composite sample is shown in Table 20.

TABLE 20. HEAD ANALYSIS AT OF SAMPLE FOR TABLING, REGRIND AND MAGNETIC SEPARATION TEST						
Analyte	%					
TFe	33.86					
SFe	31.20					
Cu	0.016					
S	0.260					
Р	0.084					
TiO <sub>2</sub>	0.210					

Analysis of the concentrate produced in the first test is shown in Table 21 and the metallurgical results of the subsequent tabling and magnetic separation is shown in Tables 22 and 23.

TABLE 21. CHEMICAL ANALYSIS OF CONCENTRATE FROM **MAGNETIC CONCENTRATION OF 100% PASSING 65 mesh** % Analyze TFe 56.80 SFe 55.21 Cu 0.016 S 0.049 Р 0.185 TiO<sub>2</sub> 0.18

#### TABLE 22. METALLURGICAL RESULTS FOR TABLING AND MAGNETIC CONCENTRATION OF CONCENTRATES, REGROUND TO 100% PASSING 100 mesh

Products	Wt%	SFe (%)	% Distribution							
Table cleaner concentrate	46.22	56.21	80.61							
Table middling	2.70	22.55	1.84							
Table cleaner tailing	1.15	24.12	0.87							
Table tailing: Sand	1.23	22.53	0.88							
Table tailing: Slime	0.46	23.50	0.33							
3 <sup>rd</sup> magnetic cleaner tailing	2.49	19.03	1.50							
2 <sup>nd</sup> magnetic cleaner tailing	5.39	12.39	2.11							
1st magnetic cleaner tailing	6.53	16.05	3.31							
Classifier tailing	15.37	7.52	3.65							
Primary tailing	18.46	8.41	4.90							
Head (calculated)	100.00	31.66	100.00							

CONCENTRATION OF CONCENTRATES, REGROUND TO 100% PASSING 200 mesh								
Products	Wt (%)	SFe (%)	% Distribution					
Final concentrate	38.27	58.60	70.57					
4 <sup>th</sup> cleaner tailing	1.29	20.93	0.83					
3 <sup>nd</sup> cleaner tailing	3.70	22.13	2.58					
2 <sup>nd</sup> cleaner tailing	8.13	28.09	7.19					
1st cleaner tailing	9.39	7.93	2.34					
Classifier tailing	7.00	11.02	2.43					
Primary tailing	32.22	13.88	14.06					
Head (calculated)	100.00	31.78	100.00					

TABLE 23.						
METALLURGICAL RESULTS FOR TABLING AND MAGNETIC						
CONCENTRATION OF CONCENTRATES,						
DECIDALIND TO 1000/ DASSING 200 mach						

The final concentrate produced in the two tests carried out used primary magnetic separation performed on samples ground to 100% passing 65 mesh and 100% passing 100 mesh. These concentrates were then subjected to regrinding to 100% passing 100 mesh and 100 % passing 200 mesh with the product subjected to cleaning by further magnetic separation and tabling. The magnetic concentration was completed on a wet belt Dinge high-intensity separator and a Wilfrey Table was used for the gravity separation.

The two tests produced final concentrates with grades of 56.21% Fe and 58.6% Fe with corresponding iron recoveries of 80.61 and 70.57%. Both tests show considerable iron content of middling products with un-liberated iron. Microscopic review of the products indicated the presence of several middling particles of mixed gangue-magnetite which could account for the lower recoveries of soluble iron. Lakefield suggested that grinding much finer than 325 mesh may be required to obtain complete liberation. Further investigations were recommended, to assess: (1) finer primary grinding (minus 200 mesh); (2) finer grinding of primary concentrate (minus 325 mesh); and (3) flotation to remove siliceous gangue from the final concentrate.

The next stage of testwork documented in Progress Report #3 (April, 1957) focused on variables associated with the magnetic separator. It was found that the speed of the belt and the rate of feed were important factors for improved success. For these tests, the same assay rejects as in the test for Report #2 were used. The results of the tests indicated that an improved concentrate grade of 63.18% SFe with a recovery of 83% was possible with a regrinding to minus 325 mesh.

In Progress Report #4, three increasing grind time tests were conducted on the same sample material, to compare the resultant grade of concentrates. Grinding times varied between 40 and 80 minutes and the products were then treated as in the previous tests. The tests indicated that while the concentrate grade %SFe increased with finer grinding of the ore, the concentrate

still did not exceed 64% Fe, with feed finer than 10 microns. Such grinding times were 4 times longer than that needed to yield 95% passing 200 mesh and would result in high grinding costs.

The intimate association of magnetite and gangue was again confirmed from this test. Investigations were recommended to test the following treatment of the ore: grind the ore to 90-95% passing 200 mesh, carry out magnetic separation and treat the concentrate by flotation to remove the silica. Another test was recommended with the concentrate passed through a demagnetizing coil before each stage of retreatment on the magnetic separator.

## 16.4 TESTWORK AT LURGI IN GERMANY, 1957

An undated report by Lurgi on file at the regional Geologists office in Red Lake is titled: "*Report on Magnetic Separation and Pelletising Tests carried out on Drill Core samples from El Sol Gold Mines Ltd. executed in the Pilot Plant of Lurgi gesellschaft für Chemie and Hüttenwesen Frankfurt Main, Germany*". It states that Lurgi received 40 samples of drill core in 1957 from El Sol. The samples were in four batches: 100/57, 102/57, 147/57 and 189/57 and contained respectively samples numbered: 22 to 24; 26 to 33; 35; 39 to 64; 66 and 67. The relationships between these sample numbers and El Sol drillholes are unknown. They cannot be drillhole numbers because some of the drillholes represented by the sample numbers had no intersections of mineralization.

Bowen, 1989, says that the samples provided to Lurgi consisted of 725 assay rejects representing 6,900 feet of diamond drill core with a total weight of 4,750 lbs (2,155 kg). He also provides some additional information not contained in the Lurgi report available concerning silica content of concentrates and pellets. It is clear that in 1957, Lurgi conducted extensive reviews which included microscopic examination of polished thin sections, Davis Tube separation tests, and pelletizing tests on concentrates.

### 16.4.1 DAVIS TUBE TESTS

The individual samples were crushed in a laboratory roll crusher to approximately minus 0.8 mm (20 mesh). From the crushed material, samples averaging approximately 3 kg was coned and quartered and then subdivided into three portions each approximately 1 kg. The three 1 kg portions of each sample were ground in a laboratory rod mill with intermediate screenings to three degrees of fineness:

- 100% passing 65 mesh;
- 100% passing 200 mesh; and

• 100% passing 325 mesh.

Two portions, each 30 g from each of the samples were prepared for double Davis Tube tests with the similar results obtained from the parallel tests. The Heads, Davis Tube concentrates and Davis Tube tails were assayed for Fe and Fe<sup>++</sup>. Results for the 40 samples tested for the 100% passing 325 mesh portions are listed in Table 24. Some values are missing from the tables because they were not legible in the copies that were available and some others may be subject to error for the same reason. WGM believes the impact of this is insignificant to the conclusions reached. Improvements to the quality of the tables could be made by reference to the most original version of the tables available, housed in the Resident's Geologist office.

TABLE 24.								
SUMMARY OF LURGI TESTWORK RESULTS FOR -325 mesh FRACTION								
		Ass	ay %	Distril	oution %			
	%DTWR	Fe	Fe <sup>++</sup>	FeRec'y	Fe <sup>++</sup> Rec'y			
DTC								
Count	38	38	38	38	38			
Average	38.71	69.82	26.52	80.54	79.61			
Concentration ratio	2.58							
DTT								
Count	32	36	33	34	34			
Average	60.34	8.97	4.05	17.02	20.61			
Concentration ratio								
Heads								
Count		40.00	19.00					
Average		32.84	12.49					
Median		33.53						

From the sample portions tested a magnetic concentrate was produced that assayed 70.8% TFe with a 23.2%  $Fe^{++}$ . This concentrate had a size distribution as shown in Table 25.

TABLE 25. SIZE ANALYSIS OF MAGNETIC CONCENTRATE USED IN PELLET PRODUCTION							
Size Fraction (µ m) Wt % Cumulative Wt %							
Plus 60	-	-					
60 to 42	0.2	0.2					
42 to 35	0.8	1.0					
Minus 35	99.0	100.0					

### 16.4.2 PELLET TESTS

Green pellets were formed on a balling disk, dried in a drying oven and then fired in a muffle furnace at different temperatures. The physical properties of interest were determined both on the green and fired pellets. Pellet characteristics are summarized in Table 26.

IABLE 26.	
PHYSICAL CHARACTERISTICS OF PELLETS PRODUCED AT LURGI	
Test Description	Va

Test Description	Value
Crushing strength of green pellets	3.6 kg
Moisture content	7.5%
Maximum dropping strength after a one-time dropping from a height of 60 cm	2.3 kg
Maximum dropping strength after a three-time dropping from a height of 25 cm	2.4 kg
Crushing strength of dried pellets	11.6 kg
Crushing strength of pellets burned at 1200° C	438 kg
Crushing strength of pellets burned at 1250° C	470 kg
Crushing strength of pellets burned at 1300° C	548 kg

One of two reports completed by Lurgi was not available for review by WGM. No mention of silica determinations are made in the report that was available and reviewed above, but Bowen (1989) reports that final concentrates were 70.8% Fe and 2.0% SiO<sub>2</sub>. Furthermore, he states pellets made from concentrate analysed 68.39% Fe and 2.2% SiO<sub>2</sub>. Although as aforementioned, there is no mention of silica content of concentrates in the report available, it can be appreciated that silica levels in the best concentrates are very low. Pure magnetite is 72% Fe. The iron content of many of the concentrates Lurgi produced is above 69% Fe. There is not much room for more than 2% to 3% silica in many of these concentrates. The missing Lurgi report was probably based on further work subsequent to the first report.

### 16.5 RAYTEC TESTWORK BY SGS AND MRC IN 2008

SGS-Lakefield performed the routine assays on Raytec's 2008 drill core samples which are described in Section 13, and also performed a program of testwork to generate metallurgical data. This testwork was mainly designed to provide the information required to complete Davis Tube tests on the routine samples, but when early results indicated grinding to 100% - 400 mesh required unexpected amounts of grinding energy, silica values in concentrates were likely to be a little higher than optimum and iron content of concentrates were lower than optimum, this work was discontinued. These initial results prompted revisions in the "assaying" method for routine samples to exclude routine Davis Tube tests and include Satmagan and FeO determinations accompanying XRF and WR major element determinations. The decision to proceed with Davis Tube tests was put aside until later.

In addition to the grind optimization testwork SGS-Lakefield was requested to complete Blaine tests on -325 mesh and -400 mesh LIMS ("Low Intensity Magnetic Separation") concentrates. The Blaine measurements ranged from 886 to  $1,166 \text{ cm}^2/\text{g}$  on the -325 concentrates and from 1,122 to  $1,246 \text{ cm}^2/\text{g}$  on the -400 mesh concentrates.

The work by MRC was completed under the auspices of WGM to meet its data corroboration responsibilities, but a component of it is reported here because it is relevant to the metallurgical characterization of the El Sol mineralization.

### 16.5.1 GRIND OPTIMIZATION TESTWORK AT SGS-LAKEFIELD IN 2008

The initial LIMS testwork was conducted on five samples of drill core selected by Raytec. Figure 29 is the sample preparation flowsheet followed at SGS-Lakefield. Each sample was crushed to nominal  $\frac{1}{4}$ " and a 1 kg sub-sample was split out. The remainder was stored. Each nominal  $\frac{1}{4}$ " sub-sample was stage crushed to -10 mesh (91.7 mm), and seven 100 g charges were prepared. Three charges were used for grind curve determination and three for Davis Tube testing by size, and one for Head assays. The objective of the grind curve determination was to estimate the required grinding time to achieve the grinding targets for Davis Tube testing. The grinding targets were 100% passing 200 mesh (75 um), 325 mesh (45 um), and 400 mesh (38 um). In order to generate the grinding curve, three 100 g test charges were pulverized for 90 seconds, 150 seconds and 210 seconds in a ring pulverizer. The ground products were then submitted for wet particle size analysis ("PSA"). The PSA results are summarized in Table 27. The P<sub>99</sub> were then plotted against grind time to estimate the target grind times which are listed in Table 28. The results of this work are summarized in Table 29 and Figures 30, 31, and 32 where weight recovery, concentrate iron grade and concentrate silica grade are plotted against grinding size.

Although this work showed no consistent trends with the various rock types in the metallurgical responses, it consistently reflected that fine grinding was required to achieve marketable grades of iron and silica in the concentrates. This was consistent with the conclusions reached in the 1956 and 1957 testwork campaigns.

TABLE 27. SUMMARY OF PARTICLE SIZE ANALYSIS								
Grind Time (seconds)			P99 (	(µm)				
Sample ID	5751	5752	5753	5754	5755	Avg.		
Summary Rock Code	IFMJ	IFML	IFM	IFMJ	IFMJ			
90	123	136	128	133	129	130		
150	85	106	96	103	101	98		
210	73	96	83	95	93	88		

Note: For Summary Rock Code description see Table 3.



GRIND TIME ESTIMATION								
Top Size				Grind Tim	ne (seconds)			
Mesh	μm	5751	5752	5753	5754	5755	Avg	
Summary Rock Code		IFMJ	IFML	IFM	IFMJ	IFMJ		
200	75	194	358	249	353	333	297	
325	45	437	1185	664	1222	1155	932	
300	38	571	1761	919	1843	1743	1367	





Figure 29. Sample Preparation Flowsheet

Sample ID/100% passing	F80	DTWR	TFe	FeO	MtSat	SiO <sub>2</sub>	Al2O <sub>3</sub>	TiO <sub>2</sub>	CaO	Mn	Na <sub>2</sub> O	K <sub>2</sub> O	Р	S	SG	Blaine
Simplified Rock Code	(um)	%	%	%	%	%	%	%	%	%	%	%	%	%	g/cm3	(cm2/g)
5751-200m	-	57.2	66.6	28.1	96.9	8.52	0.18	0.02	0.22	0.02	< 0.01	0.12	0.009	0.05	4.80	-
5751-325m	35.6	57.1	66.9	28.5	98.6	7.05	0.21	0.01	0.21	0.02	< 0.01	0.12	0.004	0.03	4.90	886
5751-400m	27.5	54.5	69.7	29.5	100.0	4.08	0.13	< 0.01	0.12	0.02	< 0.01	0.06	0.004	0.03	4.91	1246
Head - IMCJ	-	-	35.6	16.2	49.5	42.20	0.87	0.03	2.39	0.05	0.01	0.74	0.061	0.07	3.54	-
5752-200m	_	46.3	63.9	27.6	92.7	11.00	0.30	0.04	0.24	0.02	< 0.01	0.03	0.026	0.08	4.88	-
5752-325m	28.1	44.2	67.6	29.1	97.8	6.44	0.29	0.04	0.16	0.02	< 0.01	0.04	0.017	0.07	4.85	1166
5752-400m	26.5	44.2	68.1	29.4	98.2	5.63	0.22	0.03	0.14	0.02	< 0.01	0.03	0.017	0.08	4.84	1152
Head - IMCL	-	-	32.0	17.4	39.1	45.30	2.47	0.10	1.98	0.06	0.17	0.65	0.079	0.23	3.45	-
5753-200m	-	45.2	65.0	28.2	93.0	9.37	0.29	0.04	0.47	0.01	< 0.01	0.04	0.035	0.06	4.69	-
5753-325m	30.1	44.3	67.8	29.2	98.3	6.14	0.20	0.04	0.34	0.01	< 0.01	0.04	0.026	0.06	4.81	1150
5753-400m	21.1	43.5	69.0	29.9	99.7	4.93	0.18	0.04	0.23	0.01	< 0.01	0.03	0.022	0.07	4.98	1122
Head - IMC	-	-	31.5	16.5	38.9	43.80	1.24	0.05	4.10	0.05	0.02	0.21	0.061	0.32	3.41	-
5754-200m	-	55.4	63.7	26.7	92.2	11.30	0.28	< 0.01	0.37	0.02	0.03	0.10	0.017	0.02	4.68	-
5754-325m	31.8	54.7	65.2	27.6	93.5	9.66	0.23	0.02	0.33	0.02	< 0.01	0.09	0.017	0.02	4.82	890
5754-400m	22.9	53.1	68.5	29.2	99.9	5.58	0.13	0.01	0.16	0.02	< 0.01	0.06	0.004	0.02	4.94	1142
Head - IMJ	-	-	35.8	14.6	46.1	41.20	0.83	0.03	2.67	0.05	0.17	0.43	0.074	0.05	3.57	-
5755-200m	-	45.7	66.7	27.7	94.2	8.45	0.14	< 0.01	0.10	0.02	< 0.01	0.08	0.009	0.01	4.71	-
5755-325m	31.5	43.9	69.7	29.5	97.7	4.00	0.15	< 0.01	0.07	0.03	< 0.01	0.04	0.004	0.01	4.85	907
5755-400m	24.4	43.5	70.6	29.9	99.9	3.14	0.10	< 0.01	0.07	0.03	< 0.01	0.05	< 0.01	0.01	4.86	1172
Head - IMJ	-	-	37.6	12.7	44.8	40.20	0.94	0.04	1.66	0.04	0.01	0.69	0.074	0.03	3.63	-

TABLE 29.DAVIS TUBE GRINDING OPTIMIZATION SUMMARY SGS 2008





Figure 30. Concentrate Weight Recovery versus Grinding Size



Figure 31. Magnetic Concentrate Iron Grade versus Grinding Size





Figure 32. Magnetic Concentrate Silica Grade versus Grinding Size

### 16.5.2 TESTWORK AT MRC

The -10 mesh fraction of WGM's seven independent samples (after being returned by SGS-Lakefield) was sent to MRC for head analysis and magnetic concentration and assay of Davis Tube concentrates. Results for head assays are presented in the Corroboration section of this report. WGM requested that MRC pulverize each sample to 100% passing 325 mesh as per their standard method. MRC uses a multi-stage, mechanical mortar and pestle grinding method with dry screening between stages to reach the point where 100% of the sample passed the prescribed screen. Results are listed in Table 30. Further details on MRC analytical methods are in the Corroboration section of this report.

RESULTS FOR TESTWORK AT MRC										
WGM	Raytec	Summary Rock	%TFe_H	%DTWR	TFe_DTC	SiO <sub>2</sub> DTC				
Sample ID	Sample ID	Code	(MRC)			_				
RYWGM 1	16235	IMCL	30.35	31.5	70.86	2.54				
RYWGM 2	16215	IMJ	37.52	46.0	70.56	3.12				
RYWGM 3	16295	IMCL	35.36	47.5	69.97	2.40				
RYWGM 4	16448	IMJC	37.38	44.0	68.99	4.68				
RYWGM 5	16458	IMC	29.90	40.0	70.41	2.32				
RYWGM 6	16507	IMCL	36.48	52.5	66.08	8.00				
RYWGM 7	16571	IMCL	31.99	43.0	66.83	6.40				

TABLE 30. RESULTS FOR TESTWORK AT MR(



Of note is that the two samples highest in silica in concentrates are coded as IMCL but this may or may not be significant.

### 16.6 SGS LAKEFIELD METALLURGICAL TESTWORK IN 2010

In 2010 a master composite was made from 424 samples selected for ore variability testing. The results from the testwork were documented in a report entitled "An Investigation into the Recovery of Iron from the El Sol Deposit prepared for Northern Iron Corporation in September 2010. The sample was subjected to initial concentration by magnetic separation and despite grinding to 100% passing 400 mesh was unable to produce a saleable concentrate. Concentrate silica levels showed 9 % after grinding 100% passing 325 mesh and 8% after grinding to 100% passing 400 mesh confirming previous metallurgical indications.

Subsequent to the LIMS concentration, flotation was employed on the concentrate for further reduction in the silica content. These tests on samples with a primary grind of 100% passing 150 mesh demonstrated that an iron concentrate with less than 4% silica could be produced. Further testing demonstrated that regrind of the rougher tails to 80% passing 25 microns could produce a second LIMS concentrate that could meet silica specifications with a cleaning flotation stage. A confirmation locked cycle test of the indicated flowsheet showed that a combined concentrate grading 68.0% Fe, 3.86% SiO<sub>2</sub>, 0.18% Al<sub>2</sub>O<sub>3</sub>, 0.27% MgO, and 0.43% CaO. The indicated iron recovery was 84.6% at a weight yield of 39.4%.

Further testwork is required to test the proposed flowsheet on samples representing the various ore types. The flowsheet indicated by this testwork is shown in Figure 33.

### 16.7 WGM COMMENT ON METALLURGICAL TESTWORK

The earlier metallurgical work both at Lakefield and at the University of Toronto looked at mineralization ground to 100% passing 200 mesh and 325 mesh. Concentrates generated by the better tests graded in the range of 63.18% Fe, with an iron recovery of 83%. Early testwork at Lakefield also was focused on grinds nominally to 100% passing 200 mesh. The later programs at Lakefield showed that finer grinds did promote greater liberation, but that the grinding energy requirements would be high. The best Lakefield results in 2008 showed concentrate grades above 68% Fe with silica grades in the 3 to 5% range and weight recoveries ranging from 43 to 55%.





Figure 33.

Proposed El Sol Flowsheet



The testwork completed at Lurgi showed that high Fe, low SiO<sub>2</sub> grade concentrates could be achieved by grinding to nominally 100% passing 325 mesh where a significant portion of the concentrate would be even finer than 400 mesh. Lurgi demonstrated this material was suitable for pellet production. It is not clear where in the deposit the samples used in the Lurgi tests came from. If the samples sent to Lurgi represent El-Sol drillhole numbers they probably are composites made from entire mineralized sections of selected drillholes. They could have been made by combining all of second half core left in the trays after initial sampling and assaying by Heys and Sons, or they could have been made up by combining assay reject samples. The first method would have resulted in a more representative sample.

It is not clear whether the samples processed by Lurgi are representative of the mineralization of the deposit. They could be representative of the deposit in total or they might represent higher grade sections. The sample also may have been selected to represent different "ore" types and be representative of the deposit in total. Insufficient information is available. Different types of mineralization are expected to have somewhat different metallurgical responses.

Although the better Lurgi concentrates are reported as being 100% -325 mesh and the best SGS-Lakefield concentrates are 100% -400 mesh, the particle size profile of the Lurgi concentrates may be finer than for the SGS-Lakefield concentrates. The most likely explanation for the higher grade of the Lurgi magnetic concentrates is the probable finer grinding that was achieved allowing rejection of more silica from the concentrates. The increased fineness of the concentrate may increase filtering and drying requirements in preparation for the production of pellets.

Raytec's testwork both at SGS-Lakefield and MRC in 2008 achieved results comparable with the earlier work. The samples tested were however not necessarily representative of the deposit. Testwork was discontinued at SGS-Lakefield because of the long grinding times required to achieve -325 mesh concentrates and because these concentrates even at 100% -325 mesh contained silica contents that were marginally high. These results were therefore not dissimilar to historic results from Lakefield.

The SGS Lakefield testwork in 2010 introduced flotation of the silica on the LIMS concentrate for the first time and demonstrated that saleable iron concentrates could be produced at grinds somewhat coarser than previous indications. It also demonstrated that regrind of the rougher stage tailings would also yield a LIMS concentrate that can meet saleable concentrate specifications with flotation. The result of this testwork indicates that stage grinding and flotation has the potential to reduce the grinding costs from the indications of the historic testwork and produce low silica concentrates.



From the collective results to date it is clear that the mineralization at El Sol must be ground to at least 100% passing 150 mesh and the combination of stage grinding and flotation of LIMS concentrates will be effective in production of saleable concentrates. Although not subject to recent testing, pellets made from such concentrates may be suitable feed for DR plants. DR pellets are a premium product and the production of DR pellets may be a key factor for developing an Ontario iron producer for access to markets in the Great Lakes region.

Further testwork is required to optimize the reagent scheme for the flotation stage and test all possible variations in ore types with the proposed flowsheet. The metallurgical information that is now available will allow a preliminary economic evaluation of the deposit.



#### 17. MINERAL RESOURCE AND MINERAL RESERVE ESTIMATES

No NI 43-101 compliant Mineral Resource or Mineral Reserve estimates have been completed for the Property.

#### **18. OTHER RELEVANT DATA AND INFORMATION**

WGM is unaware of any other available technical information pertaining to the Property, except for the pieces of information that are currently known to be missing (such as metallurgical reports and some historic drillhole assay results). Some preliminary economic assessments were also completed in the late 1950s but these are not pertinent. WGM has suggested that NIC attempt to locate missing information.

# **19. INTERPRETATION AND CONCLUSIONS**

With the information and technical data available on the El Sol deposit coupled with WGM's knowledge of the iron ore industry the following interpretations and conclusions have been drawn to guide future considerations:

- The El Sol iron deposit probably ranks as one of the top 10 deposits in iron formation known in Ontario. Although there are limitations with the project size, there is reasonable potential that a combination of product type and quality available on the Great Lakes with the transportation advantage to central North American markets can be viable in the current iron ore market;
- In the late 1950s the El Sol or Tex-Sol deposit was explored by 67 drillholes aggregating 10,363 m. The deposit in the form of a fold with two steeply dipping limbs was delineated. This work led to the definition of a deposit of 312 million tons of "reserves" averaging 31.1 %Fe to a vertical depth of approximately 300 m. These "reserves" are non-compliant with guidelines of NI 43-101 and should not be relied upon, but they are of historic significance;
- Preliminary mine planning in the late 1950s suggested the steeply dipping deposit could be open pitted to a depth of 250 ft depending on assumptions to allow for mining of 60 million tons or 20% of deposit "reserve" tonnage;
- At the same time as the mine planning, metallurgical testwork was completed at Lakefield Research and at Lurgi in Germany. The testwork showed that high quality concentrates could be produced by fine grinding the mineralization and subjecting it to low intensity magnetic concentration;
- Raytec's 2008 exploration program focussed on the A Zone (the north limb) of the deposit and has successfully validated in general the historic data available, where tested in terms of extent, widths, and composition of mineralization;
- The iron oxide formation deposit is mainly fine grained magnetite, with minor hematite. Gangue components are mainly iron-bearing silicates: hornblende, actinolite and chlorite. The average grade for all (314) of Raytec's regular drill core oxide iron formation samples was 31.8 % TFe, 39.1% magnetite, 1.3% hematite (calculated) and with an average of 13.0% of the TFe in other mineral phases (most likely iron-bearing silicates);

- Much of the specific historic information concerning drillhole assays, drillhole locations, assay methods and certificates is missing, and no drill core has been located. Additional drilling will be required to allow for a NI 43-101 Mineral Resource estimate encompassing the known historic deposit on the Property to be completed;
- The metallurgical characteristics of the mineralization determined on the limited work completed to date by Raytec has been consistent with the more extensive historical metallurgical testwork in the 1956 and 1957 period;
- The mineralization is mostly magnetite which allows high iron recoveries with the finer grinding and provides for a high concentration ratio. Magnetite allows for production of a high quality concentrate with 70% Fe and SiO<sub>2</sub> in the 2% to 4% range;
- The 2010 testwork including flotation of silica with LIMS concentration has shown that grinding to 100% passing 150 Mesh will produce iron concentrates of saleable specifications. Regrind of the initial LIMS stage tailings will allow further production of concentrates of saleable specification. The flowsheet used in 2010 indicates that the grinding energy requirements can be reduced with a combination of stage grinding and employing silica flotation to clean the magnetic concentrates. These results are regarded as an improvement on the high energy requirements indicated by historical testwork;
- Further testwork will be required to confirm these conclusions on variations in ore type. This work should be campaigned across the deposit to confirm the application of the optimum grinding level for each stage. Mineralogical work is also required to verify mineralogical content and the natural grain size to help optimize production of marketable concentrates. This work would be supported with a program to assess the liberation of the iron mineralization in the concentrates being produced across a range of fine grinding levels to better define the optimum;
- Final concentrates require further testwork to confirm their suitability for the production of pellets. Additionally, testwork may be conducted on the technical viability of producing direct reduction iron ("DRI") from pellets and from concentrate;
- The most significant challenge facing development of the El Sol deposit may be the smaller size of the deposit and the scale of project that could be sustained with the historic mine size suggested. With the North American market limitations and the possible inability to realize the economies of a large scale project, the resulting costs may make it difficult to compete with the larger scale of other North American production. Supplemental challenges are the steep dip and relative narrow width of mineralization which will result in higher stripping ratios in the mine operation, and the high energy and



operating costs that are associated with fine grinding to produce the concentrates. The remote location of the deposit will require relatively high capital and operating costs for the supporting infrastructure to develop and operate the mine. Transportation, concentrating and pelletizing costs are expected to be proportionally higher. An economic and market study of the El Sol Project and possibly in conjunction with neighbouring iron projects should be undertaken to review various development approaches to assess project viability.



### **20. RECOMMENDATIONS**

WGM makes the following recommendations:

- Simplify the drillhole database particularly with respect to samples and assays. WGM suggests that the original and duplicate assays not be averaged, but that duplicates simply be used for QA/QC assessment;
- Conduct mineralogical work as required to verify mineralogical content and the natural grain size to help optimize production of marketable concentrates;
- Complete the ground magnetic survey to provide survey coverage of the areas of the Property covered by lakes;
- Attempt to locate and to acquire the missing Lurgi metallurgical testwork report. Enter all available assays for the historic drillholes into the project database (all iron assays known have been entered but, assays for P, SiO<sub>2</sub> and others have not been entered);
- WGM strongly recommends that Northern Iron continue with its efforts to open a dialogue with the LSFN. If a dialogue cannot be established via telephone or e-mail WGM recommends that a representative of Northern Iron pay an informal visit to the community as a way to kick-start the process. Once the lines of communication have been established it is further recommended that Northern Iron provide regular notifications of exploration activity to the Band Council (or their delegated representative) as a vehicle to promote a positive working relationship between the parties;
- Given the economic and cultural significance of fur trapping in the region, WGM recommends that Northern Iron directly contact the owners of trap lines located on and adjacent to the Property and notify them of the Company's plans concerning the Property;
- As the Project matures Northern Iron should consider the efficacy of contracting a consultant with experience in First Nations issues who could provide expert advice on engagement strategies;
- Complete a preliminary economic study on the deposit based on the new technical information available. The study would assess all the components for the development and operation of an iron ore mine on the El Sol deposit. This would include the capital and operating costs of an integrated mine and concentrating operation and the mode of transport for the product to markets. The mine design would be based on existing



geological information and metallurgical results to date interpolating for missing data as reasonable. A preliminary market study would be included as well as an assessment of product types that may be suitable and the location of any downstream processing and supporting transportation infrastructure. The project would be evaluated in a discounted cash flow model complete with a sensitivity analysis of all the main project factors including metal prices, capital and operating costs, and mining factors including stripping ratio, grade and recovery. This study will be an internal study for a company decision making process;

- Variables and scenarios to be addressed in the study could include:
  - Sensitivities of the variations in the life of mine plan to variations in annual production levels.
  - Variations in the type of iron concentrates produced for the market. This would include iron ore concentrate, iron ore pellets, and/or DRI.
  - Potential operational synergies with other iron ore projects in the vicinity of El Sol.
  - Various potential markets, which include international and North American steel mills. The supply and demand picture for iron will be considered for each market.
  - Projected cost regime for developing and operating a project in this location.
  - The study would also consider alternate product transport technologies and include slurry pipeline, a technology that has been proven in recent years.
- The preliminary economic study would be used as a basis to decide whether further drilling and predevelopment studies are warranted on the project at this time;
- Following the completion of a positive preliminary economic study, it is recommended that NIC conduct an exploration drill program to bring the El Sol property into the Inferred category of Mineral Resource under NI 43-101, followed by a Preliminary Assessment which includes a NI 43-101 Mineral Resource Estimate.

NIC, in conjunction with WGM, has developed a work program and budget to advance the El Sol Property:



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Component	Cost (C\$)	Total (C\$)
Drillhole database simplification	10,000	C\$10,000
Mineralogical study and Variability Testwork	50,000	C\$50,000
Magnetic survey	40,000	C\$40,000
Technical and Preliminary Economic Study		
Estimate of scope schedule and cost for predevelopment studies	5,000	
Resource Model (includes review of historical data)	25,000	
Mine Design and Costs	20,000	
Mill Design and Costs	20,000	
Pelletising and DRI Evaluation	20,000	
Infrastructure	10,000	
Transportation Study and Costs	20,000	
Environmental and Economic study	20,000	
Market Study	20,000	
First Nations Consultation	10,000	
Financial and Sonsitivity Analysis	10,000	
Ponort Droporation	10,000	C\$100.000
Report Preparation	10,000	<u>C\$190,000</u>
Exploration Program (2 500 matras @ \$400 par matra)	\$1,000,000	C\$1 000 000
Exploration rogram (2,500 metres @ \$400 per metre)	<u>\$1,000,000</u>	<u>C\$1,000,000</u>
Sconing Study (includes NI 43-101 Mineral Resource Estimate)	C\$500.000	C\$500 000
Scoping Study (mendes 141 43-101 Winicial Resource Estimate)	C#300,000	C\$300,000
Geological-Technical-Management Costs	100 000	C\$100.000
Georgical Technical-Management Costs	100,000	<u>υψινο,υυυ</u>
GRAND TOTAL		C\$1.890.000
		C#1,070,000

TABLE 31.PROPOSED PROGRAM BUDGET, EL SOL PROPERTY



### **21. SIGNATURE PAGE**

This report entitled "*Technical Report on the El Sol Iron Project, Ontario for Northern Iron Corp.*" and dated January 7, 2011, was prepared and signed by the following authors:

Dated effective as of January 7, 2011.

Richard W. Risto, P.Geo., Senior Associate Geologist

G. Ross MacFarlane, P.Eng. Senior Associate Metallurgical Engineer

Dr. Stephen A. Roberts, P.Ag., Senior Social and Economic Scientist



### CERTIFICATE

### To Accompany the Report Entitled "Technical Report on the El Sol Iron Project, Ontario for Northern Iron Corp." dated January 7, 2011

I, Richard W. Risto, do hereby certify that:

- 1. I reside at 22 Northridge Ave, Toronto, Ontario, Canada, M4J 4P2.
- 2. I am a graduate from the Brock University, St. Catherines, Ontario with an Honours B.Sc. Degree in Geology (1977), Queens University, Kingston, Ontario with a M.Sc. Degree in Mineral Exploration (1983), and I have practised my profession for over 20 years.
- 3. I am a member of the Association of Professional Geoscientists of Ontario (Membership Number 276).
- 4. I am a Senior Associate Geologist with Watts, Griffis and McOuat Limited, a firm of consulting engineers and geologists, which has been authorized to practice professional engineering by Professional Engineers Ontario since 1969, and professional geoscience by the Association of Professional Geoscientists of Ontario.
- 5. I am an independent Qualified Person for the purposes of NI 43-101 and have extensive experience with iron deposits, a variety of other deposit types and the preparation of technical reports.
- 6. I visited the El Sol Iron Property from October 23 and 27, 2008.
- 7. I have no personal knowledge as of the date of this certificate of any material fact or change, which is not reflected in this report.
- 8. I am responsible for Sections 2 to 15 and 17. I am responsible with co-authors for Sections 1, 18, 19 and 20.
- 9. This report was prepared for Northern Iron Corp. in part by Richard Risto, Ross MacFarlane, Stephen Roberts and WGM. It is based almost exclusively on data that were provided to the authors by Lion Energy Corp. The authors and WGM disclaim all liability for the underlying data and do not accept responsibility for the interpretations and representation made in this report where they were a result of erroneous, false, or misrepresented data. The authors and WGM disclaim any and all liability for representations or warranties, expressed or implied, contained in, or for omissions from, this report or any other written or oral communications transmitted or made available to any interested party when done without written permission or when they are inconsistent with the conclusions and statements of this report.
- 10. This report or portions of this report are not to be reproduced or used for any purpose other than to fulfil Northern Iron Corp.'s obligations pursuant to Canadian provincial securities legislation, including disclosure on SEDAR, and to support a public financing, without the authors and WGM's prior written permission in each specific instance. The authors do not assume any responsibility or liability for losses occasioned by any party as a result of the circulation, publication or reproduction or use of this report contrary to the provisions of this paragraph.
- 11. Neither I, nor any affiliated entity of mine, is at present, under an agreement, arrangement or understanding or expects to become, an insider, associate, affiliated entity or employee of Northern Iron Corp., or any associated or affiliated entities.
- 12. Neither I, nor any affiliated entity of mine own, directly or indirectly, nor expect to receive, any interest in the properties or securities of Northern Iron Corp. or any associated or affiliated companies.
- 13. Neither I, nor any affiliated entity of mine, have earned the majority of our income during the preceding three years from Northern Iron Corp. or any associated or affiliated companies.
- 14. I have read NI 43-101 and Form 43-101F1 and have prepared the technical report in compliance with NI 43-101 and Form 43-101F1; and have prepared the report in conformity with generally accepted Canadian mining industry practice, and as of the date of the 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 the technical report not misleading.

Richard W. Risto, P.Geo. January 7, 2011



#### CERTIFICATE

#### To Accompany the Report Entitled "Technical Report on the El Sol Iron Project, Ontario for Northern Iron Corp." dated January 7, 2011

I, G. Ross MacFarlane, do hereby certify that:

- 1. I reside at 1302 Woodgrove Place, Oakville, Ontario, Canada, L6M 1V5.
- 2. I am a graduate of the Technical University of Nova Scotia, Halifax, Nova Scotia, with a Bachelor of Engineering, Mining with Metallurgy Option in 1973 and have practiced my profession since that time.
- 3. I am a member of the Association of Professional Engineers Ontario (Registration Number 28062503).
- 4. I am a Senior Associate Metallurgical Engineer with Watts, Griffis and McOuat Limited, a firm of consulting engineers and geologists, which has been authorized to practice professional engineering by Professional Engineers Ontario since 1969, and professional geoscience by the Association of Professional Geoscientists of Ontario.
- 5. I have more than 35 years of experience in the operation, evaluation, and design of mining and milling operations.
- 6. I am a Qualified Person for the purposes of NI 43-101 because of my knowledge of and experience with iron ore operations including mining, concentrating, and pelletizing. I am responsible for Section 16 and share responsibility for Sections 1 and 17 to 20 with Richard Risto.
- 7. I have reviewed all of the technical data regarding the El Sol Property as provided by Lion Energy Corp. I did not visit the property.
- 8. I have no personal knowledge as of the date of this certificate of any material fact or change, which is not reflected in this report.
- 9. This report was prepared for Northern Iron Corp. in part by Richard Risto, Ross MacFarlane, Stephen Roberts and WGM. It is based almost exclusively on data that were provided to the authors by Lion Energy Corp. The authors and WGM disclaim all liability for the underlying data and do not accept responsibility for the interpretations and representation made in this report where they were a result of erroneous, false, or misrepresented data. The authors and WGM disclaim any and all liability for representations or warranties, expressed or implied, contained in, or for omissions from, this report or any other written or oral communications transmitted or made available to any interested party when done without written permission or when they are inconsistent with the conclusions and statements of this report.

- 10. This report or portions of this report are not to be reproduced or used for any purpose other than to fulfil Northern Iron Corp.'s obligations pursuant to Canadian provincial securities legislation, including disclosure on SEDAR, and to support a public financing, without the authors and WGM's prior written permission in each specific instance. The authors do not assume any responsibility or liability for losses occasioned by any party as a result of the circulation, publication or reproduction or use of this report contrary to the provisions of this paragraph.
- 11. Neither I, nor any affiliated entity of mine, is at present, under an agreement, arrangement or understanding or expects to become, an insider, associate, affiliated entity or employee of Northern Iron Corp., or any associated or affiliated entities.
- 12. Neither I, nor any affiliated entity of mine own, directly or indirectly, nor expect to receive, any interest in the properties or securities of Northern Iron Corp. or any associated or affiliated companies.
- 13. Neither I, nor any affiliated entity of mine, have earned the majority of our income during the preceding three years from Northern Iron Corp. or any associated or affiliated companies.
- 14. I have read NI 43-101 and Form 43-101F1 and have prepared the technical report in compliance with NI 43-101 and Form 43-101F1; and have prepared the report in conformity with generally accepted Canadian mining industry practice, and as of the date of the 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 the technical report not misleading.

D. Hartal

Ross MacFarlane, P.Eng. January 7, 2011



#### CERTIFICATE

#### To Accompany the Report Entitled "Technical Report on the El Sol Iron Project, Ontario for Northern Iron Corp." dated January 7, 2011

I, Stephen A. Roberts, do hereby certify that:

- 1. I reside at 4702 Crofton Place, Victoria, British Columbia, V8Y 3C5.
- 2. I graduated from Queen's University with a BA in Political Science (1983), from the University of British Columbia with Master of Landscape Architecture (1999) and a Ph.D. in Mining Engineering (2005). Since 1999 I have been involved in the reporting of environmental and socio-economic impacts resulting from mine development project. In 2006 I became a professional agrologist practicing in the field of natural resource development, both in Canada and internationally. I have been involved in the writing of Environmental Impact Assessments for mine projects in British Columbia.
- 3. I am a registered Professional Agrologist with the British Columbia Institute of Agrologists (license no. 1861).
- 4. I am an Senior Social and Economic Scientist of Watts, Griffis and McOuat Limited, a firm of consulting geologists and engineers, which has been authorized to practice professional engineering by Professional Engineers Ontario since 1969 and professional geoscience by the Association of Professional Geoscientists of Ontario.
- 5. I have read the definition of "Qualified Person" set out in National Instrument 43-101 and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "Qualified Person" for the purposes of NI 43-101.
- 6. I am independent of the issuer applying all of the tests in section 1.5 of National Instrument 43-101.
- 7. I have reviewed all of the relevant data regarding the El Sol Property as provided by Lion Energy Corp. I did not visit the property.
- 8. I have no personal knowledge as of the date of this certificate of any material fact or change, which is not reflected in this report.
- 9. I am responsible for authorship of Sections 4.5 and 4.6 and part of Section 20 dealing with First Nations issues.
- 10. This report was prepared for Northern Iron Corp. in part by Richard Risto, Ross MacFarlane, Stephen Roberts and WGM. It is based almost exclusively on data that were provided to the authors by Lion Energy Corp. The authors and WGM disclaim

all liability for the underlying data and do not accept responsibility for the interpretations and representation made in this report where they were a result of erroneous, false, or misrepresented data. The authors and WGM disclaim any and all liability for representations or warranties, expressed or implied, contained in, or for omissions from, this report or any other written or oral communications transmitted or made available to any interested party when done without written permission or when they are inconsistent with the conclusions and statements of this report.

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- 12. Neither I, nor any affiliated entity of mine, is at present, under an agreement, arrangement or understanding or expects to become, an insider, associate, affiliated entity or employee of Northern Iron Corp., or any associated or affiliated entities.
- 13. Neither I, nor any affiliated entity of mine own, directly or indirectly, nor expect to receive, any interest in the properties or securities of Northern Iron Corp. or any associated or affiliated companies.
- 14. Neither I, nor any affiliated entity of mine, have earned the majority of our income during the preceding three years from Northern Iron Corp. or any associated or affiliated companies.
- 15. I have read NI 43-101 and Form 43-101F1 and have prepared the technical report in compliance with NI 43-101 and Form 43-101F1; and have prepared the report in conformity with generally accepted Canadian mining industry practice, and as of the date of the 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 the technical report not misleading.

Dr. Stephen A. Roberts, P.Ag. January 7, 2011



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## APPENDIX 1: WGM INDEPENDENT SAMPLING ANALYTICAL CERTIFICATES

SGS Minerals Services Midland Research Center



SGS Lakefield Research Limited P.O. Box 4300 - 185 Concession St. Lakefield - Ontario - KOL 2HO Phone: 705-652-2000 FAX: 705-652-6365

#### LR Internal Dept 14

Attn : N lee

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Phone: ---Fax:--- Wednesday, May 13, 2009

Date Rec. :22 April 2009LR Report :CA02793-APR09Project :CALR-12089-001Client Ref :Raytec Metals Corp

# CERTIFICATE OF ANALYSIS

## **Final Report**

Sample ID	SiO2	AI2O3	Fe2O3	MgO	CaO	Na2O	K20	TiO2	P2O5	MnO	Cr2O3	V2O5	LOI	Sum F	e2+ as FeO
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
1: Rywgm 01	45.4	2.65	46.2	1.95	2.02	0.05	0.81	0.10	0.17	0.10	< 0.01	< 0.01	0.07	99.5	21.76
2: Rywgm 02	40.4	0.88	53.0	1.45	2.50	0.02	0.57	0.03	0.14	0.06	0.03	< 0.01	0.72	99.9	14.93
3: Rywgm 03	41.9	1.22	50.8	1.86	2.66	< 0.01	0.60	0.05	0.15	0.07	< 0.01	< 0.01	0.38	99.7	17.12
4: Rywgm 04	41.0	0.86	53.4	1.45	1.75	0.06	0.71	0.03	0.17	0.05	< 0.01	< 0.01	0.09	99.5	13.49
5: Rywgm 05	43.4	3.66	43.0	2.12	2.50	0.35	3.23	0.15	0.17	0.04	< 0.01	< 0.01	0.85	99.5	14.06
6: Rywgm 06	41.8	0.69	51.4	0.64	3.39	0.03	0.11	0.03	0.16	0.03	< 0.01	< 0.01	1.01	99.4	16.53
7: Rywgm 07	45.2	2.60	45.6	1.79	2.48	0.06	0.88	0.10	0.18	0.08	< 0.01	< 0.01	0.82	99.8	16.04
8-DUP: Rywgm 0	43.4	3.66	43.2	2.14	2.50	0.35	3.25	0.15	0.17	0.04	< 0.01	< 0.01	0.86	99.7	14.03

Nicole Mozola, B,Sc. (Eng) Project Coordinator Mineral Services, Analytical

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