

## SUMMARY REPORT

IRON LAKE PROPERTY

Keating and Keating Additional Townships, Ontario, Canada



ESSAR STEEL ALGOMA INC.  
105 West Street,  
Sault Ste. Marie, Ontario, Canada  
P6A 7B4

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Prepared By:

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## 1.0 HIGHLIGHTS

- Essar's Iron Lake Property covers a ~252 ha area underlain by an approximately 3 km long and up to 350 m wide section of the Iron Lake Iron Range.
- Located ~78 km northwest of Wawa by road, following the Trans Canada Hwy. and a network of secondary roads.
- The iron formation is composed of ~90% oxide facies iron formation, which is generally more preferred due to the low content of minor elements (Gross, 1996)
- Two 7 m sections containing 39% and 46% iron were intersected by drill holes completed by Lake Superior Company (Algoma Commercial Company) between 1909 and 1911
- The amount of iron in grab samples is up to ~62% (Reilly, 1991).
- The focus of exploration has been pockets of hematite; the magnetite content has not been investigated.
- Essar's Property is cut by the Iron Lake Deformation Zone that is associated with gold mineralization.
- There are thirteen (13) gold and/or copper occurrences within 5 km of the property boundaries.
- No modern exploration for iron or gold on the Property.

## 2.0 LOCATION AND TENURE

The Iron Lake Property is located approximately 47 km northwest of Wawa, northeastern Ontario, in Keating and Keating Additional Townships. The approximate center of the Property in UTM coordinates is: 624980m E, 5341010m N, Zone 16, NAD 83 and in geographic coordinates: 85° 19' 3.70" W, 48° 12' 36.04" N.

The Iron Lake Property consists of seventeen (17) freehold patents totaling 252.122 ha (Table 2-1, Figure 2-1). Essar holds 100% of the mining rights only on the patents. The patents have no expiry date and the only obligation is to pay land tax on it. All patents are subject to reservations in Crown Grant.

*Table 2-1 Essar's tenure for the Iron Lake Property*

<b>MNDMF patent number</b>	<b>Land Registry Pin No.</b>	<b>MPAC Roll Number</b>	<b>Township</b>	<b>Ownership</b>	<b>Area (ha)</b>	<b>Name</b>
Y310	31134-0003 LT	579900013201000	Keating	MRO	16.592	Iron Lake
Y311	31134-0003 LT	579900013201000	Keating	MRO	17.402	Iron Lake
Y312	31134-0003 LT	579900013201000	Keating	MRO	18.211	Iron Lake
Y313	31134-0003 LT	579900013201000	Keating	MRO	15.378	Iron Lake
Y314	31134-0003 LT	579900013201000	Keating	MRO	16.188	Iron Lake
Y315	31134-0003 LT	579900013201000	Keating	MRO	16.997	Iron Lake
Y316	31134-0003 LT	NA	Keating	MRO	14.164	Iron Lake
Y317	31134-0003 LT	579900013201000	Keating	MRO	12.141	Iron Lake
Y318	31134-0003 LT	579900013201000	Keating	MRO	14.164	Iron Lake
Y319	31134-0003 LT	579900013201000	Keating/Keating Additional	MRO	13.355	Iron Lake
Y320	31134-0003 LT	579900013201000	Keating	MRO	14.569	Iron Lake
Y321	31134-0003 LT	579900013201000	Keating/Keating Additional	MRO	14.569	Iron Lake
Y322	31134-0003 LT	579900013201000	Keating/Keating Additional	MRO	14.569	Iron Lake
Y323 PT	31134-0003 LT	579900013201000	Keating/Keating Additional	MRO	12.545	Iron Lake
Y324	31134-0003 LT	581122000300400	Keating/Keating Additional	MRO	12.545	Iron Lake
Y325 PT	31134-0003 LT	581122000300400	Keating/Keating Additional	MRO	16.188	Iron Lake
Y326 PT	31134-0003 LT	579900013201000	Keating/Keating Additional	MRO	12.545	Iron Lake
				<b>Total</b>	<b>252.122</b>	

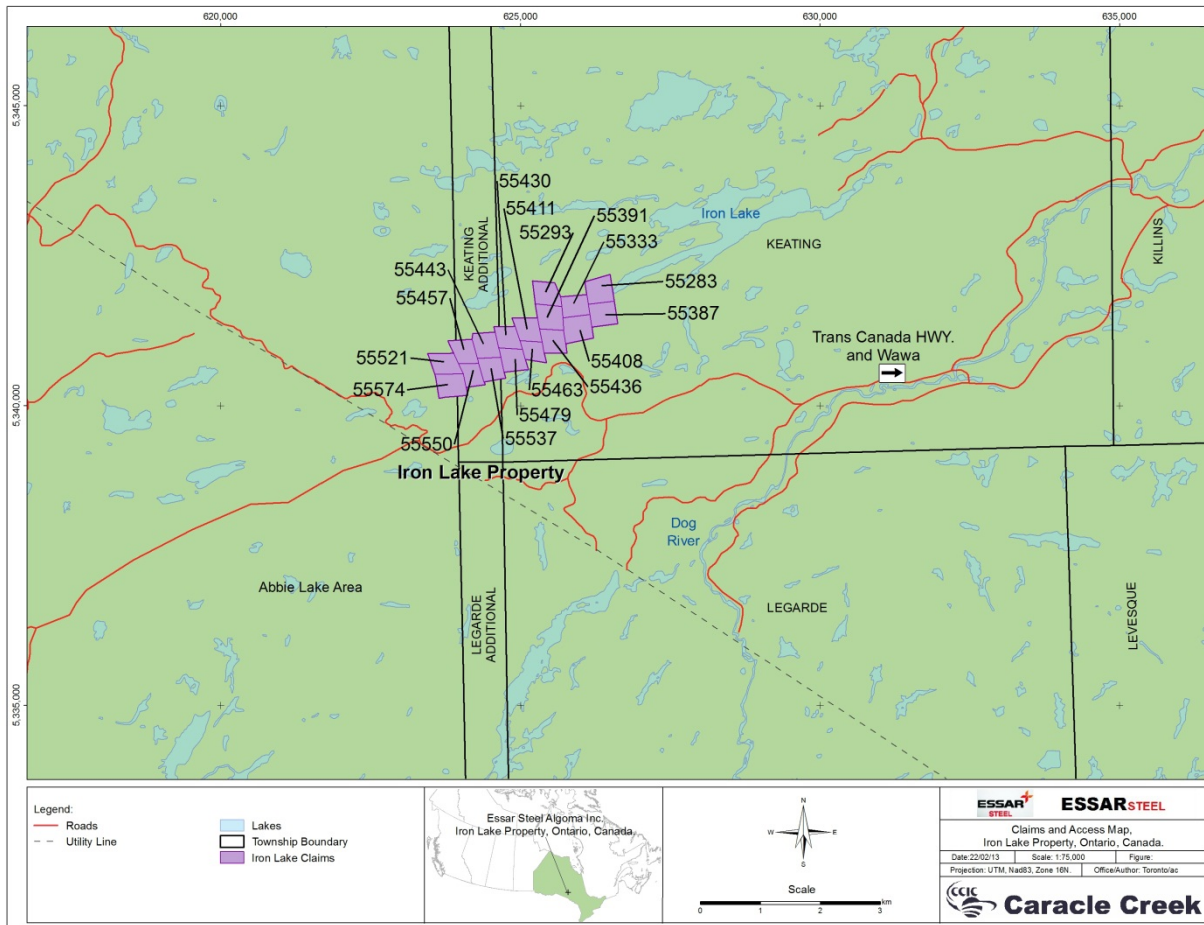


Figure 2-1 Tenure map for the Iron Lake Property

### 3.0 ACCESS AND INFRASTRUCTURE

The Iron Lake Property can be accessed by road following the Trans Canada Hwy. north from Wawa for ~48 km, then following a network of smaller roads west-southwest for an additional ~30 km. The nearest airport and railway track to the Property are in Wawa. A utility line runs ~1 km southwest of the Property.

The town of Wawa has restaurants, hotels, hospital, and Ontario Provincial Police Station. The town of Wawa could supply most of the needs of an exploration program at Iron Lake. Wawa has an urban population of 2,634 people in 2011 (Statistics Canada: <http://www.citypopulation.de/php/canada-ua-ontario.php?cityid=394>).

## 4.0 EXPLORATION HISTORY

Exploration on the property started in 1898 and included stripping trenching, shaft sinking, sampling, drilling and geophysical surveys. Most of the companies explored for iron, but Algoma analyzed some of the drill core for gold between 1943 and 1948. No records were found to document the gold grade in this drill program. Table 4-1 summarizes the exploration history on the Iron Lake Property.

*Table 4-1 Summary of exploration on the Iron Lake Property*

Year	Company	Source of data	Type of work	Results
1898-1902	Pickands Mather Mining Company/Ontario Mining Company	MNDM MDI	stripping, trenching, test pitting, 30 foot shaft into the iron range (211 feet)	44.1 to 56.45% Fe
1899	Minnesota Mining Company	Reilly, 1991	sampling	62.04% Fe and 4.71% Si
1902	Lake Superior Company	MNDM MDI	bought property	
1904	Clergue Company	MNDM MDI	1 drill hole	
1909-1911	Lake Superior Company (Algoma Commercial Company)	MNDM MDI	5 drill holes (1904 m), trenching	two 7 m sections containing 39% and 46% Fe
1943-1948	Algoma	Algoma internal reports and MNDM MDI and Ass. File: 42C03NW0050	magnetometer survey, drilling, geological report	identified 4 magnetic anomalies, Fe content up to 51.37% over 1.8 m
1957	Canadian Pacific Railway	Ass. File: 42C03NW8811	mapping, prospecting	Fe content in grab samples ranges between 28 and 56.24%
1990	Corona Corporation	Ass. File: 42C06SE0002	report of activities	sampling, but mostly not within Essar's Property

## 5.0 GEOLOGY

The Iron Lake Property occurs within the Wawa Subprovince of the Superior Province. The Wawa Subprovince is an aggregation of Archean greenstone belts and granitoid plutons (Williams et al., 1991). The greenstone belts are composed of metamorphosed komatiite, basalt, dacite and rhyolite and associated metasedimentary rocks dispersed in a sea of granitoid rocks. The Wawa Subprovince is composed of two linear greenstone belts: one along its northern border with the Quetico Subprovince and another in the Mishibishu-Michipicoten-Gamitagama area.

The Iron Lake Property is located in the western part of the Michipicoten greenstone belt (Reilly, 1991). The metavolcanic rocks, the oldest rocks in the area, are divided into a south-younging northern terrane and a north-younging southern terrane (Figure 5-1). The Iron Lake Range is underlain by the metavolcanic rocks and is overlain by a clastic metasedimentary sequence, which separates the northern and southern terranes. All rocks are intruded by mafic and felsic intrusions and diabase dikes.

Bedding and foliation strike approximately east-west and dip steeply (Reilly, 1991). Minor folding, several shear zones and a broad zone of strike-slip movement named the Iron Lake Deformation Zone (ILDZ) affected the area. The ILDZ crosses the Property, has a northeast-southwest trend and is associated with gold mineralization (Figure 5-1).

The Iron Lake Range strikes east-west and measures up to 350 m in thickness (Reilly, 1991). It is composed of mainly oxide facies iron formation, 90% of the Iron Lake Range, with minor carbonate facies iron formation at the base and massive to brecciated chert on top. Sulphide facies iron formation is also locally present. The strike length of the iron formation on the Essar Property is approximately 3 km. The oxide facies iron formation is composed of magnetite and/or hematite layers thinly interbedded with chert. Bedding ranges between 1 and 10 cm with an average of 2 cm.

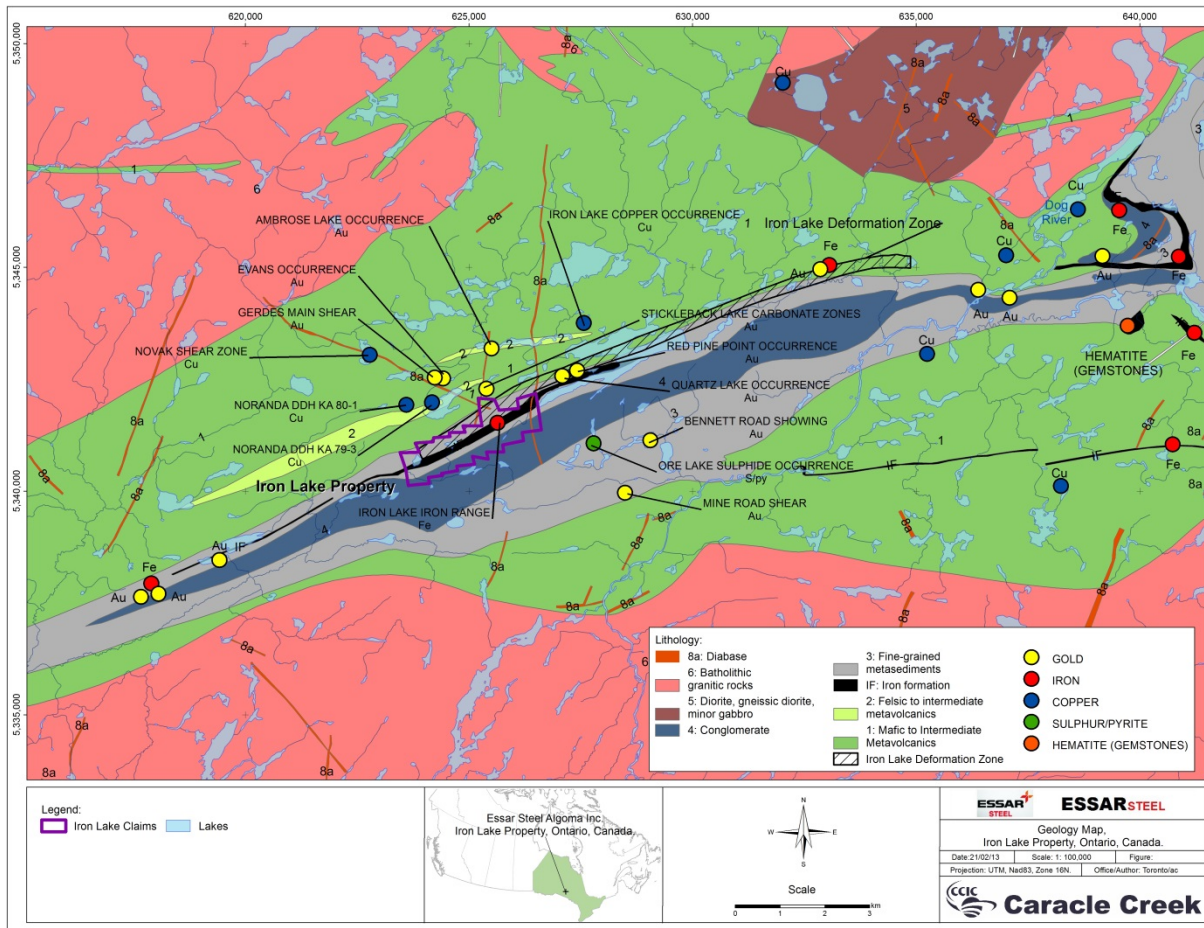


Figure 5-1 Local geology map for the Iron Lake Property (modified from ODM Map 2333)

## 6.0 MINERALIZATION

The Iron Lake Property covers the thickest part of the Iron Lake Range extending west of Iron Lake (Reilly, 1991). The iron formation is composed of mostly oxide facies iron formation composed of layers of chert and hematite with minor magnetite. The focus of exploration by most of the companies was pockets of hematite (Assessment file: 42C03NW0050). According to Gross (1996) oxide facies iron formation is generally more preferred due to the low content of minor elements.

Grab samples of weathered cap rock collected by the Minnesota Mining Company in 1899 yielded 62.04% iron and 4.71% silicon (MNDM Mineral Deposit Inventory). Samples collected by Pickland-

Mather Mining Company (Ontario Mining Company) returned iron values between 44.1% and 56.45%. Drilling by the Lake Superior Company between 1909 and 1911 intersected two 7 m sections containing 39% and 46% iron (Reilly, 1991). Four samples of hematite contained 41.2 to 55.1% iron (Shklanka, 1968).

Gold in quartz veins is also associated with the iron formation and with the Iron Lake Deformation Zone that crosses the Property (Reilly, 1991). One drill hole completed by Algoma between 1947 and 1948 intersected 0.13 ounce/ton (~4.46 g/t) gold over 1 m in drill hole 3A, but it is located 2 km east-northeast of Essar's current property (Assessment file: 42C03NW0050). Gold mineralization is hosted in a quartz vein at the north edge of the iron formation.

## **7.0 ADJACENT PROPERTIES**

The Iron Lake Range extends beyond the Essar's Property boundaries in both directions, but it becomes thinner (Reilly, 1991). The total length of the iron formation is not known. There are several thin, discontinuous iron formations north of the Iron Lake Range up to 10 m in thickness. The Katossin Prospect is located in the eastern boundary of Keating Twp. and it is a continuation of the Iron Lake Iron Range.

There are several gold and copper occurrences within 5 km of Essar's Property (Figure 5-1). Most of them are associated with the Iron Lake Deformation Zone. They include the Quartz Lake (Au, 0.7 km), Red Pine Point (Au, ~1 km), Stickleback Lake Carbonate (Au, 0.2 km), Bennett Road (Au, ~2.5 km), Mine Road Shear (Au, ~2.5 km), Iron Lake Copper (Cu and Au, ~2 km), Ambrose Lake (Au, ~1 km), Evans (Au, 0.8 km), Gerdes Main Shear (Au, ~1 km), Novak Shear Zone (Cu, Ag and Au, 2.3 km), Noranda DDH KA 80-1 (Cu and Ag, ~0.9 km), Noranda DDH KA 79-3 (Cu, Au and Zn, ~0.7 km) and Ore Lake Sulphide (sulphur/pyrite and Au, ~1.2 km).

## **8.0 REFERENCES**

Gross, G.A. (1996): Algoma-type Iron-formation, in Selected British Columbia Mineral Deposit Profiles, Volume 2 - Metallic Deposits, Lefebvre, D.V. and Höy, T, Editors, British Columbia Ministry of Employment and Investment, Open File 1996-13, pages 25-28.



- Reilly, B.A. (1991): Geology of the Iron Lake Area; Ontario Geological Survey, Open File Report 5783, 28p.
- Shklanka, R. (1968): Iron Deposits of Ontario; Ontario Department of Mines, Mineral Resources Circular No. 11, 489p.
- Williams, H.R., Stott, G.M., Heather, T.L., Muir, T.L. and Sage, R.P. (1991): Wawa Subprovince, Chapter 12, *in* Geology of Ontario, Ontario Geological Survey, Special Volume 4, Part 1, p. 485-542.