REPORT ON

GEOLOGY AND GEOCHEMISTRY

WABICO MINES LIMITED PROPERTY

ISLAND IN EMERALD LAKE,

AFTON TOWNSHIP

BY

GEOPHYSICAL ENGINEERING & SURVEYS LTD.

REPORT ON

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WABICO MINES LIMITED PROPERTY

ISLAND IN EMERALD LAKE, AFTON TOWNSHIP

BY

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LOCATION AND ACCESS

Property consists of two claims, S89451 and S89452 at Emerald Lake, southeastern part of Afton Township, District of Sudbury. Access is by car by way of the Afton-Scholes road to the lake shore and then by boat, a short distance, to the island. The property may be reached by air also. The island lies south of the peninsula on which the New Golden Rose Mine, now closed, is located.

PREVIOUS WORK

The most recent, published work in this general area was done by E.S. Moore[1], who mapped the Afton-Scholes Townships in the summer of 1936. Geologists of the gold mine north of the island probably mapped the area surrounding the mine, including this island, but their maps are not available to the public. In his 1901 report, Miller[2] discussed occurrence of gold at Emerald Lake and some of the geology of the area.

1. Geology of the Afton-Scholes Area, by E.S. Moore, O.D.M. Annual Report Vol. XLV, Part VI, 1936.

2. W.G. Miller, "Iron Ores of Nipissing District", Ont. Bur. Mines, Vol. X, 1901, P. 175.

TOPOGRAPHY

The terran is very rugged. An Iron formation band stands out high above the other rocks comprising an east-west ridge roughly parallel to the length of the island. North and south of this band the ground slopes to the lakeshore, in places very abruptly. Heavy glacial drift covers most of the terrain north and south of the iron formation. Once, the iron formation was probably covered with glacial material also, but its topographic prominence caused the speedy removal of the overburden.

PURPOSE OF THE MAPPING

An airborne magnetometer survey of this island showed a strong magnetic anomaly over the iron formation. Electrical self-potential survey, subsequently done, disclosed anomalous values of ground currents generally in the area of the iron formation. The readings were so high that they were sugge tive of graphitic material rather than sulphides. Finally, the results of the geo-chemical survey over the area indicated anomalous content of heavy metals in soil in several places.

To guide further exploration in the area, it was decided that the island should be mapped to obtain information about rock types over which various anomalies occur and to test the possibility of the presence of surface sulphides showing. Geology was plotted on the map using a scale 1 inch = 200 feet; the same map scale was used for plotting geophysical and geochemical results.

GEOLOGY

The area consists of rocks of Archean age. It is a part of the basement complex in the Afton-Scholes Townships that has been exposed by erosion of overlying Proterozoic rocks--Cobalt sediments

and Nipissing diabase sill which make up the surface rocks of the surrounding area.

These Archean rocks comprise the Keewatin type volcanics (now greenstones) and Iron Formation, and Timiskaming type sediments - quartzites, greywackes, impure quartzites and conglomerate. Division into Keewatin and Timiskaming types is after E.S. Moore.

KEEWATIN-TYPE ROCKS

The oldest rocks in the area are greenstones and iron formation.

A band of dark green, fine to medium grained chloritic rock, borders the iron formation to the north for about 700 feet. This has been called "greenstone". The rock is not uniform in character over the whole distance but varies from one outcrop to another. In one specimen (Line 2 ⁄ 00 E, 60' N) minerals recognized include chlorite, amphibole, feldspar (?) and calcite. However, other specimens are not calcareous but veinlets and seams of carbonates occur occasionally. Minute, perfectly developed magnetite octahedrons were noted only in one specimen (3⁄ 00E, 100'N). In one specimen (Line 6⁄00E, 50'N) patches of white sugary silica were observed. Amphibole was identified only in one place, as mentioned above, while the majority of specimens show only the presence of chlorite. Microscopic work should be done in order to justify the application of one name to apparently different rock specimens.

The rock is generally low in sulphides. Pyrite is the most common of these and occurs in cubes scattered sparsely throughout. Pyrrhotite is less common and occurs in fine grained dissemination.

Iron Formation is the best exposed rock on the island. It extends from the west end of the island eastward to the Line 28 / OOE, where it disappears under the heavy drift cover. It strikes roughly east-west along the Base Line, and swings slightly to the north of east, approaching the eastern end. The width of the band varies--at the western extreme it is about 200 feet wide, while around the line 11 / COE it is almost 500 feet wide. The rock is of a banded type and consists mostly of nearly black or sometimes red jaspilite. In places it is only laminated chert; in a few places, such as on the Line 16 / OOE, 100'N, it is grey-green siliceous rock, probably an argillaceous phase. This iron formation is generally highly magnetic, and in places, such as on Line 6 / OOE, 150'S, it is almost a massive magnetite. To the south, at the western end of the band, the iron formation is bordered with conglomerate; the contact is almost vertical. Further east, from approximately Line 10 / OOE up to the line 23 / 50E, there is a series of outcrops of a rock tentatively named by the writer, "iron formation." This rock is pale grey, yellowish-brown in colour, extremely fine grained and highly siliceous. Its structure is characteristic--it consists of very thin platy bands (in places the rock looks like a book) striking slightly north of east, as at Line 11 / OOE, 250'S, being either vertical or dipping at high angle to the south. These bands are not always thin; they may be thick, dark, almost black in colour; then the rock becomes massive (looses platy structure) and resembles iron formation. This is most likely the lean phase of iron formation--at least the writer was unable to identify it with any other rock.

Iron formation is low in sulphides. Scattered pyrite cubes occur occasionally, but only in minor quantities. At three places only is heavier sulphidization noticed: 1) Line 13 / 00E, 200'N, very abundant medium to coarse grained aggregates of pyrite in cubes occur in cherty host rock; 2) Line 10 / 00E, 150'S just beside the outcrop of argillaceous phase of iron formation, occurs a high concentration of very fine grained cubic pyrite in chert as a host rock. Some pyrite was dissolved and molds of cubic shape were left; some of it was oxidized and rusty material is present in abundance; 3) Line 17 / 00E, 150'N aggregates of very fine grained crystalline sulphide, probably pyrite, occur in white sugary silica.

TIMISKAMING-TYPE SEDIMENTS

These sediments border the iron formation on the south and north side. No outcrops of such sediments were found north of the greenstone band, but it seems probable that they do extend in that direction and are only obscured by overburden. Outcrops of sediments are not as abundant as those of iron formation as they are less resistant to weather and are quickly eroded and covered with heavy overburden.

Conglomerate is restricted to the southern side of the iron formation band. Near the contact with iron formation it contains abundant angular fragments of iron formation and it looks more like a breecia than a conglomerate. Further south, the content of granite pebbles increases at the expense of iron formation fragments; matrix is gritty or greywacke in nature and the rock is a typical conglomerate. Near Line 1 / 00E, 600'S it changes gradationally into greywacke and impure quartzite. A small outcrop of clean, buff coloured quartzite occurs in the vicinity of this conglomerate.

Chloritic, fine grained rocks, probably greywacke, occur to the east of conglomerate, on the southern side of the iron formation band. Near the east end of the band, Line 25 / 00E, Base line, there is an outcrop of chloritic grit; quartz pebbles stand up high above the softer chloritic matrix which weathers more easily. On the same line about 100 feet to the south, there is a large outcrop of highly calcareous and chloritic rock, possibly a greenstone (somewhat similar to specimen of greenstone on the Line 2 / 11E, 50'N). On the southern side of the same outcrop dull green fragments (?) stand out on the weathered surface; this does not occur on the northern side. Otherwise the rocks are similar.

On the northern side of the iron formation band a series of outcrops of grey-green fine grained, chloritic and rather siliceous rocks occur. These might be a very impure quartzite, but sedimentary quartz grains could not be identified due to the fineness of the grains. The rock is massive but the outcrops are not so well exposed as to reveal any structural features.

Scattered pyrite grains occur throughout all sediments in negligible amounts. In outcrop on the Line 13 / 00E 250'N occurs fine grained disseminated pyrrhotite.

GEOCHEMISTRY

Soil samples were collected along the geophysical picket lines at stations 50 feet apart. The total heavy metals in parts per million were plotted on the 1 inch to 200 feet scale map and the values contoured. The background has a value of about 100 ppm.

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GEOCHEMISTRY

Soil samples were collected along the geophysical picket lines at stations 50 feet apart. The total heavy metals in parts per million were plotted on the 1 inch to 200 feet scale map and the values contoured. The background has a value of about 100 ppm.

The anomalously high values are acattered in an irregular fashion over the iron formation and to the south of this band. Very high values (only a few of them occur) ranging from 800 ppm. to 2000 ppm. are essentially singular results, so that the strike of this anomaly, when contoured, is purely arbitrary. These anomalies could not be important since they are probably due to erratic, higher concentrations of sulphides at the particular station where the sample was collected. Anomalies of lower intensities, ranging from 200 ppm. to 500 ppm., generally have the greater lateral extent, and their trend is roughly parallel to the strike of rock formation, i.e. east-west.

During the mapping, attention was paid to the relief of the ground in respect to geochemical anomalies, because it influences locations of the latter. There is no fast rule controlling these positions, but more often than not anomalies appear at the stations situated in small depressions or valley-like ground. Thus the source of heavy metals may be on any side around the anomaly, or below, deeper in the ground.

A somewhat large group of high values occurs over the eastern end of the iron formation. This is (in pant) an area of well exposed iron formation but no sulphides were noticed in specimens from outcrops.

CONCLUSIONS

Mapping of the area did not reveal any impressive mineralization in the bedrock.

Geochemical anomalies have erratic distribution and show little continuity. If it is taken into account the fact that most soil samples contained large percentage of humus, and thus part of the heavy metal content might be due to the presence of plants (Which may serve as metal collectors), the face value of these anomalies should be interpreted with great caution.

Respectfully submitted,

J. C. Frantz
GEOPHYSICAL ENGINEERING & SURVEYS LIMITED

R. Subotincic
Geologist

North Bay, Ontario
December 19, 1956.

APPENDIX TO GEOPHYSICAL ENGINEERING & SURVEYS LTD. REPORT NO. 146ND FOR WABICO MINES LTD.

PROPERTY - S89451 & S89452 - Afton Twp.

TYPE OF SURVEY - Geological

MILES OF PICKET LINE - 7.75

TIME DISTRIBUTION

Line cutting	14 days done in connection with geophysical survey, but not credited.
Geological mapping	4 "
Geo-chemical Sampling	2 "
Plotting, drafting, report re:geology	5 "
	25 days X 4 = 100

To be applied 40 days per claim

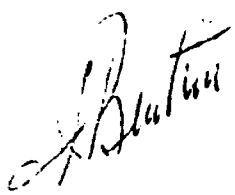
PERSONNEL

Line cutting - T.Montroy - Mattawa - August 28 to September 10, 1956
H. Bell " " "

Geo-chemical - D. Leaper - Cobalt - September 15 to 17, 1956
J. Nixon - North Bay " " " "

Geology & Report - R. Subotincic - North Bay - October 31 to September 4, 1957
J. Frantz " " - Oct, 1956
J. H. Beatson " " - Oct. 1956

Drafting etc. - Y. Martin - North Bay - October 1956
L. Vosu - North Bay - " "



ELECTRICAL GEOPHYSICAL SURVEY

REPORT ON ELECTRICAL GEOPHYSICAL SURVEYS

PART OF EMERALD LAKE PROPERTY

AFTON TWP., ONTARIO.

FOR

WABICO MINES LIMITED

MAPS No 1031 AND 1032

NOT ENCLOSED

REPORT ON ELECTRICAL GEOPHYSICAL SURVEYS

63-7-13

PART OF EMERALD LAKE PROPERTY

AFTON TWP., ONTARIO

FOR

WABICO MINES LIMITED

INTRODUCTION

The Emerald Lake property of Wabico Mines Limited includes eleven unpatented mining claims located at Emerald Lake in Afton township, District of Sudbury, Province of Ontario.

Electrical geophysical surveys were carried out on claims S-91055, S-91058 and the land portions of S-91056 and S-91059.

The claims may be reached by motor road from Glen Afton, a distance of approximately twenty miles.

GENERAL GEOLOGY

The Nipissing diabase sheet and Cobalt sediments which cover the older rocks over most of the area have been removed by erosion at Emerald Lake where steeply-dipping sedimentary and volcanic rocks are exposed.

Argillite, quartzite, breccia and limestone outcrop on the claims covered by the present survey.

A limited amount of trenching and diamond drilling was carried out by previous owners on a pyrrhotite-chalcopyrite zone and a pyrrhotite-smaltite-chalcopyrite zone.

GEOPHYSICAL SURVEYS

Electrical resistivity and self-potential surveys were carried out on claims S-91055, S-91058 and the land portions of S-91056 and S-91059.

63-721

RESISTIVITY SURVEY

Sixty cycle alternating current was introduced into the earth through electrodes spaced 1½ miles apart. Voltage drops, between stations 100 feet apart, were measured along picket lines spaced 300 feet apart using a vacuum-tube voltmeter. Apparent average earth resistivities were calculated and plotted logarithmically.

SELF-POTENTIAL SURVEY

Readings of electrical self-potential were taken along picket lines spaced 300 feet apart using a D. C. potentiometer. The readings were plotted as negative self-potentials in millivolts relative to an arbitrary base level.

DISCUSSION OF RESULTS OF GEOPHYSICAL SURVEYS

Resistivity Survey

A large resistivity anomaly was outlined on claim S-91055. The anomaly is located on a gossan covered ridge where disseminated pyrrhotite and chalcopyrite can be seen in some old trenches. Smaltite, chalcopyrite, pyrrhotite mineralization can be seen at the east end of the anomaly area. Lowest resistivities are indicated on line 3+00E, an overburden-covered section of the ridge. The anomaly zone continues to the west across claim S-91056 where two separate zones were outlined.

A second anomaly zone has been outlined near the north boundary of claim S-91055. in an overburden covered section of the property.

Self Potential Survey

A broad self potential anomaly, with local high readings superimposed, follows in a general way the outline of the large area of low resistivity outlined on Claims S-91055 and S-91056. It is believed that the broad anomaly is the expression of disseminated sulphides, and the local highs are caused by graphite and/or massive sulphides.

A second anomaly zone near the north end of claim S-91055 corresponds roughly to the second resistivity anomaly.

RECOMMENDATIONS

It is recommended that geological mapping be done on the claims to correlate the geology and known showings with the geophysical results.

It is further recommended that the anomalies discussed above be tested by diamond drilling.

Respectfully submitted,

North Bay, Ontario.
June 20, 1956

J. J. FRANTZ
GEOPHYSICAL ENGINEERING & SURVEYS LTD.

APPENDIX TO GEOPHYSICAL ENGINEERING & SURVEYS LTD. REPORT #131 KB

PROPERTY: Nabico Mines Limited, Afton Twp., Ontario.
Claims S-91055, S-91056, S-91058, S-91059.

INSTRUMENT: Electrical resistivity: vacuum-tube voltmeter
Electrical self-potential survey : L. C. potentiometer

MILES OF PICKET LINE: 4.2

NO. OF STATIONS: 560

TIME DISTRIBUTION

Surveying, line cutting, chaining, picketing -	16 days
Geophysical readings -	26 days
Calculating, plotting, drafting, report	20 days
	62 days

Applicable for assessment work - 4 X 40 = 160 days

PERSONNEL

Field

C. Wilson - North Bay - May 3 to May 16, 1956
O. Leaper - Cobalt "
G. Bartels - Temagami "
J. May - Toronto "
T. J. Robinson - Kirkland Lake "
J. C. Frantz - North Bay "

Office

H. Stoeckert - North Bay - May 10 to June 20, 1956 intermittently
L. Vosu - " "
Y. Martin - " "
J. C. Frantz - " "
J. Beatson - " "

REPORT ON

ELECTRICAL SELF POTENTIAL SURVEY

CLAIMS S89451 & S89452

EMERALD LAKE, AFTON TOWNSHIP, ONTARIO

FOR

WARICO MINES LIMITED

BY

GEOPHYSICAL ENGINEERING & SURVEYS LTD.

63-7

REPORT ON

ELECTRICAL SELF-POTENTIAL SURVEY

CLAIMS S89451 & S89452

EMERALD LAKE, AFTON TOWNSHIP, ONTARIO

FOR

WABICO MINES LIMITED

BY

GEOPHYSICAL ENGINEERING & SURVEYS LTD.

INTRODUCTION

Claims S89451 and S89452 are situated on a large island in Emerald Lake, Afton township, district of Sudbury, province of Ontario. Emerald Lake may be reached by motor road from the village of River Valley. The large island is located about 200 feet from the east shore of Emerald Lake.

GENERAL GEOLOGY

The island is underlain by magnetite-jaspilite iron formation and steeply-dipping sedimentary rocks. The sediments are largely impure quartzites.

GEOPHYSICAL SURVEY

An electrical self-potential survey was made along north-south picket lines spaced 100 feet apart. Readings were taken at 50 foot intervals, reduced to an arbitrary base level and plotted on the map as negative self potentials in millivolts.

RESULTS OF GEOPHYSICAL SURVEY

A large complex anomaly zone traverses the centre of the island from east to west. This anomaly zone is undoubtedly caused, in part at least, by bands of graphite. There is, however, a definite possibility that sulphide mineralization is associated with the graphitic zones.

RECOMMENDATIONS

Geological mapping combined with geochemical prospecting is recommended to evaluate the large anomaly zone.

Respectfully submitted,

J. G. Frantz
GEOPHYSICAL ENGINEERING & SURVEYS LTD.

October 2, 1956
North Bay, Ontario

APPENDIX TO GEOPHYSICAL ENGINEERING & SURVEYS LTD. REPORT NO. 136MB FOR WABICO MINES LTD.

PROPERTY - S89451 & S89452, Afton Township

TYPE OF SURVEY - Electrical Self potential

INSTRUMENT - D. C. Potentiometer

MILES OF PICKET LINE - 7.75

NO. OF STATIONS - 829

TIME DISTRIBUTION

Line cutting, picketing, chaining	14
Geophysical readings	16
Calculating, plotting, drafting, report	8
	38 X 4 = 152 days

To be applied 40 days per claim

PERSONNEL

Field

- line cutting - Tom Montroy - Mattawa - August 28 to September 10, 1956
  Harold Bell - Mattawa - " " " " " "

- Geophysical Readings - H. Stoeckert - North Bay - August 28 to September 10/56
  G. L. Rowe, North Bay " " " " " "

Office

J. C. Frantz, North Bay, Ontario - September 1956
H. Stoeckert, " " " " "
Y. Martin " " " " "
L. Vosu " " " " "

For Additional Information See Maps:

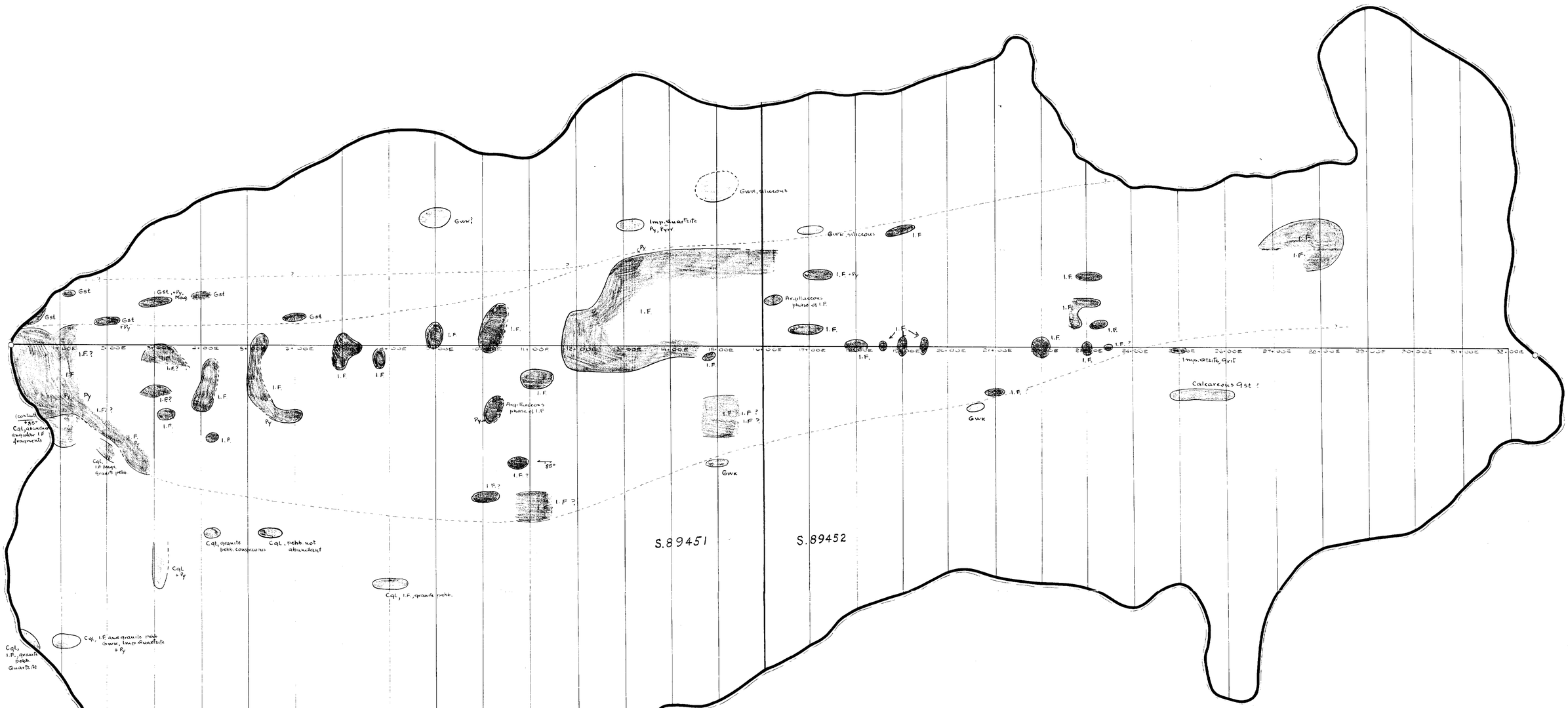
AFTON-0017-A1 #1

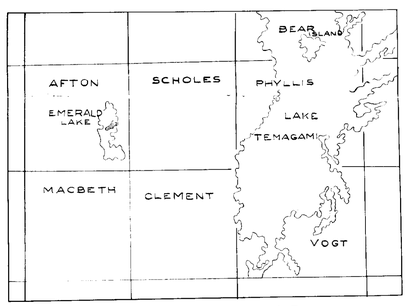
2

3

4

DATED: DEC. 1956 | DWG. No. 1084





LOCATION MAP
SCALE: 1 INCH = 4 MILES

63-721

GEOLOGICAL SURVEY OF ISLAND CLAIMS, EMERALD LAKE

AFTON TWP, ONT.

FOR

WABICO MINES LIMITED

BY

GEOPHYSICAL ENGINEERING & SURVEYS LTD.

1416 NE

SCALE: 1 INCH = 100 FEET

0 100 200 300 400

LEGEND:

ARCHEAN ROCKS:

Timiskaming types:

- Conglomerate, grey wacke, impure quartzite

Keewatin types:

- Iron Formation
- Volcanics (greenstone)

ABBREVIATIONS:

- Cgl. = Conglomerate
- Gst = Greenstone
- Gwk = Greywacke
- I.F. = Iron Formation
- Py = Pyrite
- Pyrr = Pyrrhotite

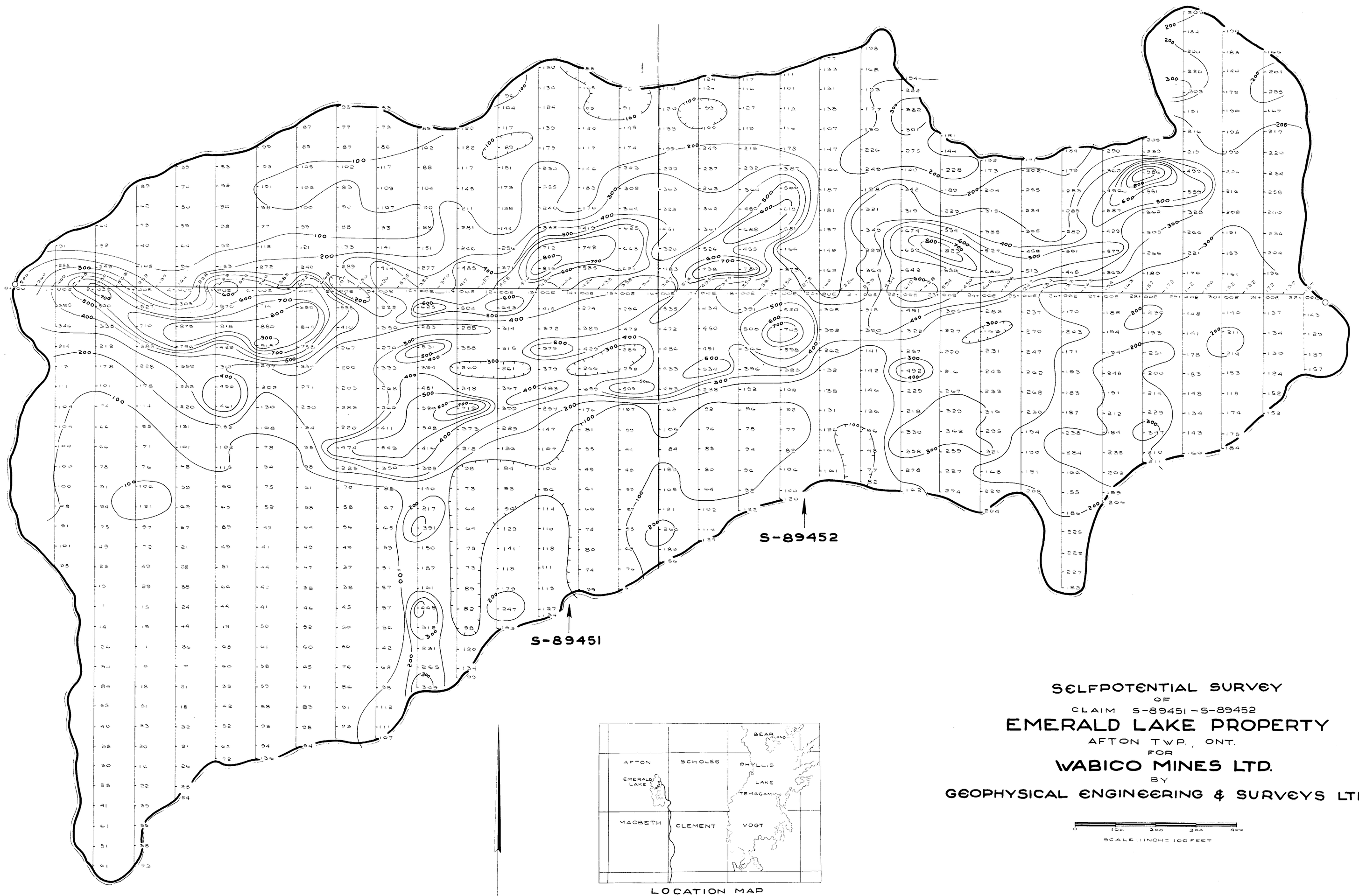
63-721

AFTON-0017-A1 #1

DATED: DEC. 1956 | DWG. No. 1084

200

DATED: SEPT. 1956 | DWG. No. 1055



LOCATION MAP
SCALE: 1 INCH = 4 MILES

SELFPOTENTIAL SURVEY
OF
CLAIM S-89451 - S-89452
EMERALD LAKE PROPERTY
AFTON TWP., ONT.
FOR
WABICO MINES LTD.
BY
GEOPHYSICAL ENGINEERING & SURVEYS LTD.

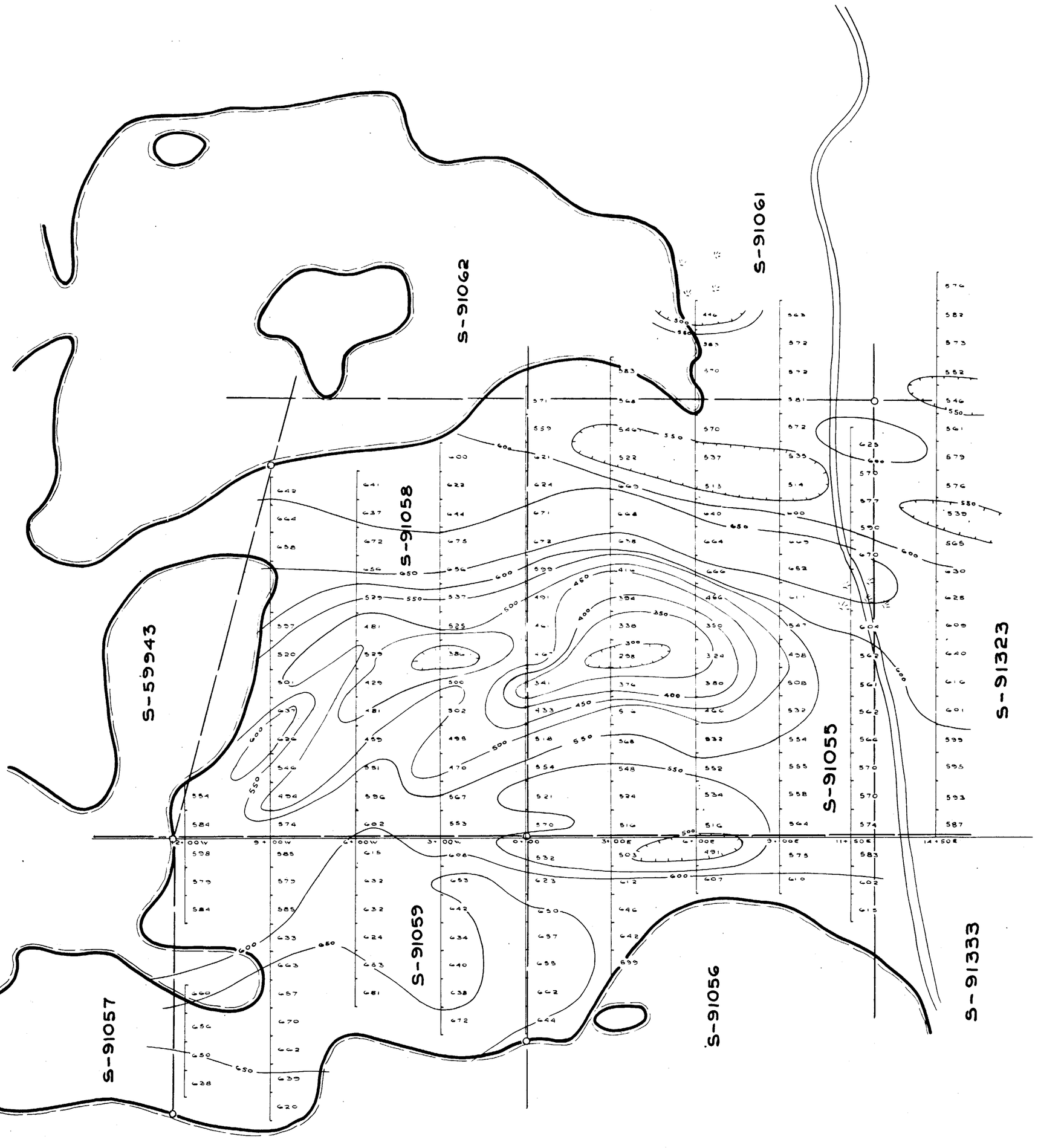
0 100 200 300 400
SCALE: 1 INCH = 100 FEET

NOTE: VALUES ARE NEGATIVE SELF-POTENTIALS IN MILLIVOLTS.

63-721

AFTON-0017-A1 #2

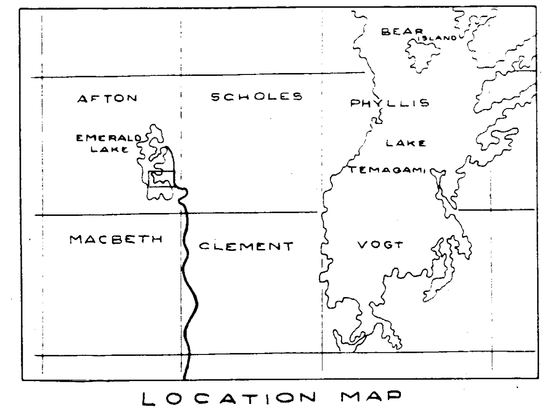
DATED: SEPT. 1956 | DWG. No. 1055



ELECTRICAL RESISTIVITY SURVEY
PART OF
EMERALD LAKE PROPERTY
AFTON TWP., ONT.
FOR
WABICO MINES LTD.
BY
GEOPHYSICAL ENGINEERING & SURVEYS LTD.

0 200 400 600 800
SCALE: 1 INCH = 200 FEET

NOTE: VALUES ARE APPARENT AVERAGE RESISTIVITIES IN 100 $\log_{10}$ Ohm·cm.



LOCATION MAP
SCALE: 1 INCH = 6 MILES

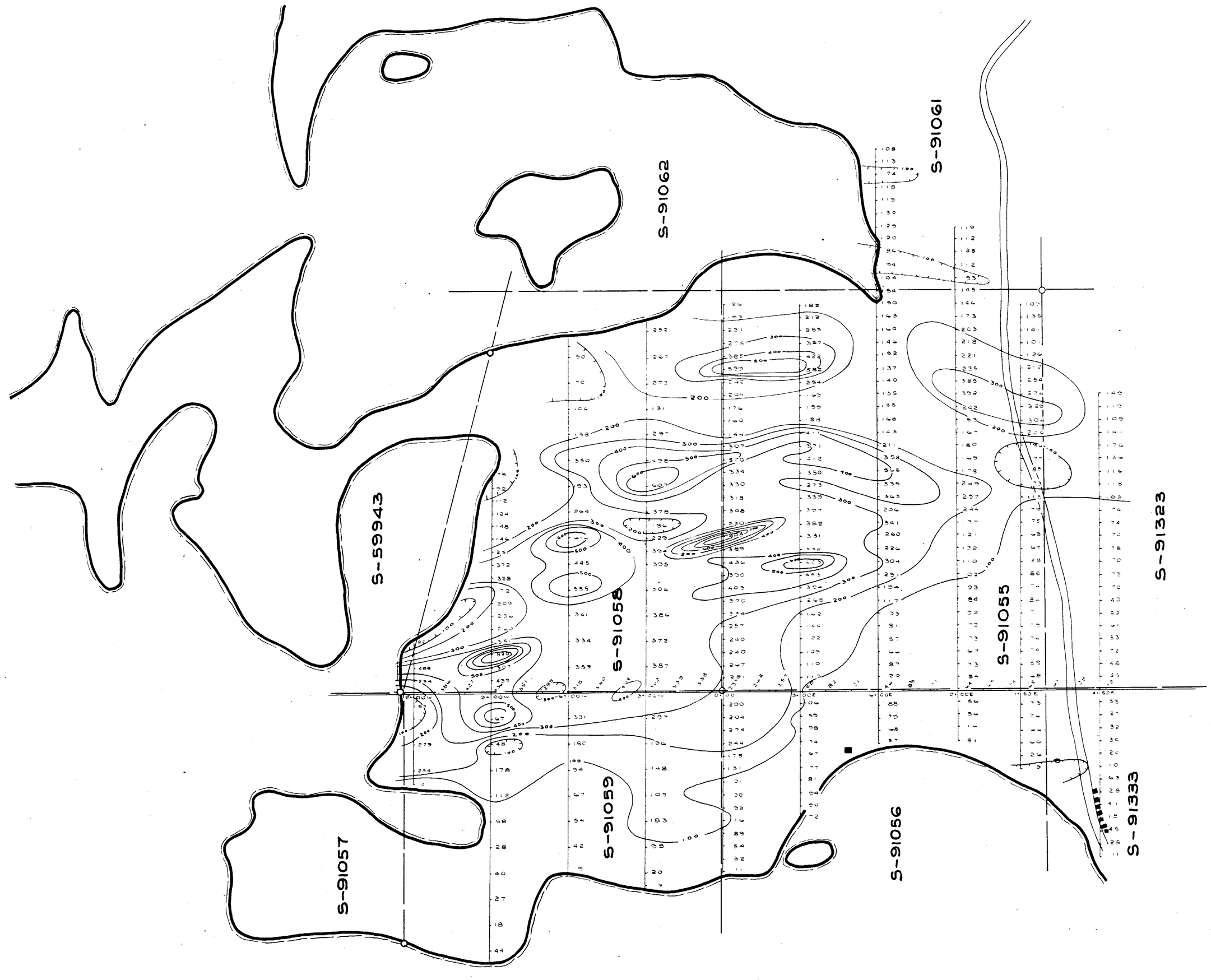
AFTON-007-A1 #3

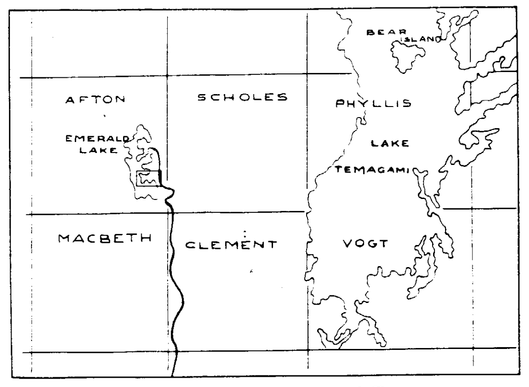
DATED: MAY 1956 Dwg.1031

ELECTRICAL SELFPOTENTIAL SURVEY
PART OF
EMERALD LAKE PROPERTY
AFTON TWP., ONT.
FOR
WABICO MINES LTD.
BY
GEOPHYSICAL ENGINEERING & SURVEYS LTD.

0 200 400 600 800
SCALE: 1 INCH = 200 FEET

NOTE: VALUES ARE NEGATIVE SELF POTENTIALS IN MILLIVOLTS.





LOCATION MAP
SCALE: 1 INCH = 4 MILES

63-721

AFTON-0017-A1 #4

DATED: MAY 1956 Dwg.1031

230