



41P07NE0010 63.1867 BREWSTER

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GEOPHYSICAL AND GEOLOGICAL REPORT

ON PROPERTY OF

HARDIMAN BAY MINES LIMITED

BREWSTER TOWNSHIP  
MONTREAL RIVER MINING DIVISION  
PROVINCE OF ONTARIO

Summary and Recommendations

Magnetic and geological surveys were carried out on a group of 18 claims held by Hardiman Bay Mines Limited in Brewster Township, Ontario.

The magnetometer survey indicates considerable relief in the central and northwestern portion of the property with an apparent contact between two different rock types near the west shore of Gooseneck Lake. A number of possible faults are interpreted from the magnetic results.

It is recommended that an electromagnetic survey be carried out over the lake and be extended to cover the areas of magnetic highs and possible faults in an attempt to locate sulfide zones which may be associated with the magnetic and structural features. On the basis of electromagnetic results, a diamond drilling programme would be laid out, if warranted.

The geological survey did not locate any economically significant mineralization. The observations, however, do generally conform with the magnetic results and interpretation.

### Introduction

From October 20 to November 5, 1965, Sulmac Exploration Services Limited carried out a magnetometer survey and geological mapping on a group of claims held by Hardiman Bay Mines Limited, and located in Brewster Township, Montreal River Mining Division, Ontario.

The geophysical survey was supervised by Mr. P. E. Walcott, while the geological mapping was carried out by Mr. A. H. Frew under the supervision of Sulmac's Chief Geologist, Mr. E. Amendolagine.

The survey was run over an east-west grid, the lines being established at 400 foot intervals and located as shown on the accompanying map. Magnetometer readings were taken every 100 feet on each line using a Sharpe MF-1 Fluxgate magnetometer.

The results of the surveys are shown on the maps accompanying this report, the magnetometer results being presented in contoured form. The base map is drawn at a scale of 400 feet to the inch.

Property, Location and Access

The property is located in the northeast corner of Brewster Township, Montreal River Mining Division, Ontario. The property consists of 18 contiguous mining claims numbered:

MR41758 to MR41775 inclusive

The claim group is situated approximately 30 miles southwest of the town of Elk Lake. Gooseneck Lake, a narrow lake about 1 1/2 miles long, lies in the center of the group. The northern tip of Kaa Lake occupies the southeast corner of the claim group.

Access to the property is via a secondary road from Elk Lake which passes within two miles of the north boundary of the claim group. Float equipped aircraft can land on Gooseneck Lake, thereby making the property readily accessible from either Elk Lake or New Liskeard by aircraft.

Topography

Gooseneck Lake occupies the central portion of the claim group. The shore rises sharply in the northwest and northeast. There are several steep hills facing the lake by sheer escarpments. The height of these hills varies from 60' to 300'.

The remaining ground is generally swampy with minor sections of sand-covered terrain. All of the property, excepting, of course, the bare hill tops, lake and marshes, is densely forested with jack pine, spruce, fir and minor maple and birch patches. Surrounding the marshes and creeks there are thick growths of alders.

At the foot of the hills are strewn large boulders which are covered with moss and decaying leaves, and sparse growths of mixed forest. This, combined with numerous windfalls, makes walking extremely hazardous and severely encumbers conventional linecutting.

#### Survey Data

The magnetometer survey was carried out using a Sharpe MP-1 Fluxgate magnetometer. This instrument measures the variations in the vertical component of the earth's magnetic field to an accuracy of  $\pm 10$  gammas. Corrections for diurnal variation were made by tying-in to previously established base stations at intervals not exceeding two hours. Readings with this instrument were obtained every 100 feet along the lines. A total of 382 readings, constituting some 7 line miles, was taken.

The geological mapping and prospecting were carried out over the same grid. All observed outcrops were examined and mapped with particular attention given to alteration and/or structural features that could be indicative of mineral occurrence.

### Discussion of Results

#### a. Geophysical

The results of the magnetometer survey show that the central portion of the property has considerable relief. This appears to indicate the claim group is probably underlain by two different rock types. Their contact, assumed on the basis of the magnetic results, is indicated on the accompanying geophysical plan and appears to be in agreement with the geological findings.

The magnetometer survey has further indicated a number of possible faults running generally in northeast-southwest and northwest-southeast directions, centered and possibly intersecting under Gooseneck Lake.

b. Geological

The entire property was examined by a geologist utilizing the established grid system as control.

Outcrops within the boundaries of the claim group were found to be scarce and, therefore, could not be used as a criterion to determine the economic aspects of the property. The outcrops observed are shown on the accompanying map and consist primarily of coarse grained diorite and quartzite.

North of Gooseneck Lake, bedrock exposures are lacking entirely. The outcrops observed along the northwest side of the lake, north of the narrows, were all diorite. This rock was coarse grained, dark green to black in colour, with high hornblende content and lesser plagioclase feldspar. The diorite of this area was high in magnetite content. Minor flecks of pyrite, and in one location a fleck of chalcopyrite, were the only other minerals of significance. Outcrops of this area show no evidence of faulting, however the general trend of jointing strikes 150° and is dipping 45° to 60° to the west. In places the diorite approaches a pegmatitic texture.

South of the narrows, quartzite is encountered. It is fine grained with fairly uniform colour of pale pink, with

reddish zones locally. The quartzite appears to be dipping at a shallow dip to the southwest. No mineralization of economic interest or significance was seen in the quartzite.

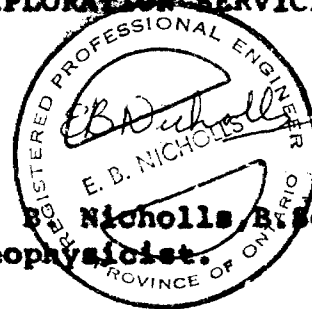
Conclusion and Recommendation

The magnetic survey, combined with geological mapping, has outlined a number of features which warrant further investigation by electromagnetic means. As the main portion of this work would be carried out on the lake, it is necessary that this phase of the programme of exploration be executed after freeze-up, i.e. after December 15th. If this recommendation is implemented, an expenditure of approximately \$2,000 will be required.

Respectfully submitted,

SULMAC EXPLORATION SERVICES LIMITED

E. B. Nicholls B.Sc., P.Eng.,  
Geophysicist.



November 22, 1965



## Introduction

The initial survey of the property was carried out during the period of October 20th to November 5th, 1965, at which time the land areas only were covered by a magnetometer survey and by geological mapping. The present survey, therefore, consisted of surveying, by electromagnetic and magnetic methods, those claims located on Gooseneck Lake, and the checking by E.M. of the magnetic anomalies located during the previous survey.

Sulmac Exploration Services Limited carried out the work during the period January 6th to 13th, 1966, and January 18th to 21st, 1966.

The results of the surveys are shown on the maps accompanying this report, the magnetometer results being presented in contour form. The base map is drawn at a scale of 400 feet to the inch.

## Summary & Conclusions

Additional geophysical work carried out over the claim group is discussed in this report. The initial work consisted of a ground magnetometer survey and geological mapping of the claims located on land; this work was reported in a report submitted on November 22, 1965. The present work was carried out



over the lake area and consisted of magnetometer and electromagnetic surveys.

The magnetometer survey did not add anything to the picture obtained during the previous work. A number of faults are indicated by the magnetic data as are the contacts between the various rock types.

Reconnaissance and detail E.M. surveys were carried out over the lake portion of the claims, and a conductor of some 1,200 feet in length, was located. Vertical loop and horizontal loop E.M. techniques were used, the vertical loop giving the stronger indications of the conductor. The conductor is, therefore, to be located at a depth of greater than 100 feet. This northwest trending conductor may be due to a fault or shear zone which may or may not be carrying sulphide mineralization. Graphitic zones and sedimentary horizons can also be the cause of electromagnetic anomalies, as can variations in lake bottoms.

However, as the economic significance of a conductor can only be determined by visual examination, further investigation by diamond drilling is recommended. The zone should, therefore, be tested by a minimum of drilling, two or three holes. It is suggested that the first hole be located on

line 8N at 2+00E and drilled at an angle of 45° to the south-west. The second hole should be located on line 4N at 2+00E and drilled at 45°. Further drilling would depend on the results obtained from these first two holes.

Property, Location and Access

The property is located in the northeast corner of Brewster Township, Montreal River Mining Division, Ontario. The claim group consists of 18 contiguous mining claims numbered:

MR 41758 to MR 41775 inclusive

Access to the property is via secondary road from Elk Lake which passes within two miles of the north boundary. Float equipped aircraft can land on Gooseneck Lake, thereby making the property accessible from New Liskeard by aircraft.

Method of Survey

The survey was run over grid lines, established on Gooseneck Lake, at 400 foot intervals and located as shown on the accompanying map. Pickets were located every 100 feet along the traverse lines. A total of 5.6 miles of line were chained and picketed. The magnetometer survey was carried out

using a Sharpe MF-1 Fluxgate magnetometer. This instrument measures the variation in the vertical component of the earth's magnetic field to an accuracy of  $\pm 10$  gammas. Readings were taken at 100 foot intervals along the picket lines. A total of 54 readings, constituting some 1.0 miles of line, were taken.

The electromagnetic survey was carried out using a Squires' vertical loop single phase unit. The primary field was set up by suspending a large triangular transmitting coil vertically from a mast and orienting it so as to point at the receiving coil position. The receiver coil is then tilted about a horizontal axis until a minimum signal is obtained. Any deviation from the horizontal is indicative of a secondary field. A total of 262 stations were read during the survey of 4.6 miles of line. Nine transmitter setups were required.

Detail electromagnetic survey was carried out using the Sheridan-Keik Magniphase E.M. equipment. This instrument consists of a transmitter and receiver unit which are coupled together by a 200 foot cable. The primary field is set up by a ferrite-covered coil and 1100 cycle per second transistorized oscillator. While the secondary field is picked up at the receiver by another ferrite-covered coil and fed into

a compensatory network which measures the amplitude and phase of the respective secondary field. The instrument is set up so that when no secondary field is present the corrected readings of the amplitude and phase will be 100% and 0°, so that any deviation from these will be indicative of a secondary field. A total of 0.5 miles were surveyed, requiring 30 station readings.

#### Discussion of Results

The results of the magnetometer survey carried out over the lake are shown on the accompanying map along with the data obtained from the initial survey. The additional information did not change the picture as given by the previous work. The contacts between the various rock types are shown on the accompanying map as are the inferred faults. The character of the magnetics is such as would be exhibited by diabase and quartzite rocks. It is possible that the high magnetics are indicative of a diabase dyke that is intersected by faults.

One conductor of interest was located by the reconnaissance E.M. survey and was further substantiated by detail work carried out by the vertical loop technique.

Additional detail work was carried out by using the magniphase.

however, this method only gave weak indications of a conductor. As this method has only shallow depth penetration as compared with the vertical loop system, it suggests that the cause of the conductor is probably 150 to 200 feet deep.

The conductor appears to have an overall length of some 1,200 feet and is probably intersected by a fault on line 17+50N. Continuation of the conductor on the other side of the fault is indicated by the E.M. profile on Line 20N.

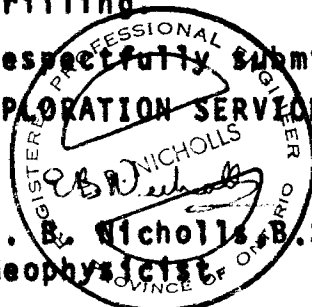
The axis of the conductor is marked on the accompanying map. From the shape of the crossovers it appears that the conductor is lying nearly vertical. The cause of the anomaly could be a fault or shear zone which may or may not be carrying sulphide mineralization. Should the lake bottom vary in any way it is possible this change could be the cause of an electromagnetic anomaly. It must also be pointed out that the vertical loop technique has a broad field and the anomaly may not reach a line on which it is indicated as crossing.

As the geophysical survey gives no direct information as to the cause of the conductor, it is recommended that it be further investigated by diamond drilling.

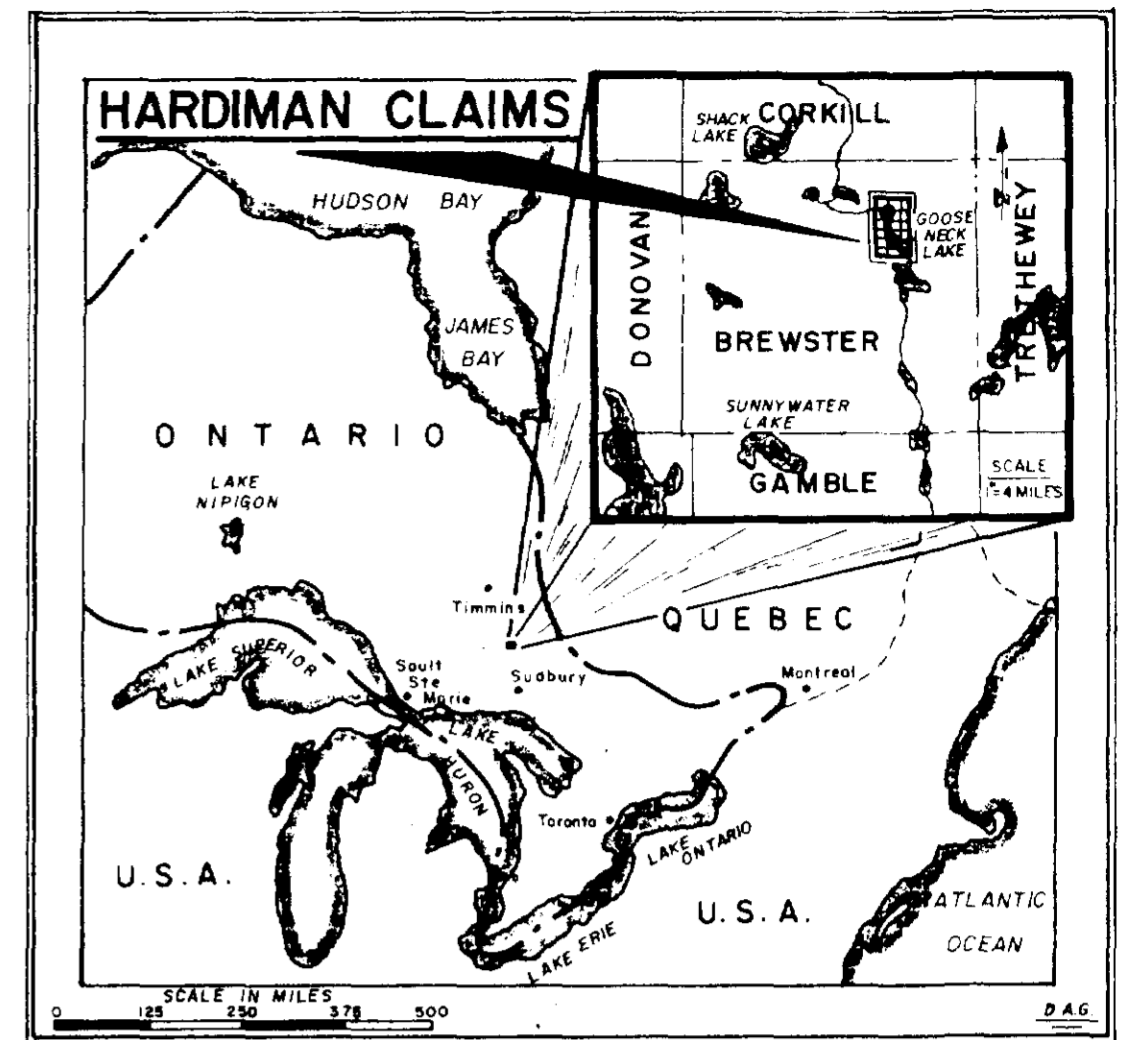
Respectfully submitted,  
SULMAC EXPLORATION SERVICES LIMITED

E. B. Nicholls, B.Sc., P.Eng.  
Geophysicist

February 4, 1966



LOCATION MAP



LEGEND

SYMBOLS

- OUTCROP
- SWAMPY
- BOULDERS
- RIVER
- LAKE BOUNDARY
- PROBABLE FAULT
- FRACTURE - DIP ANGLE
- GEOLOGICAL CONTACT (ASSUMED)
- CLAIM POST AND CLAIM BOUNDARY (APPROX.)
- RIDGE
- OUTLINE OF LOW POPLAR BIRCH CONTENT

ABBREVIATIONS

- DIQ — DIORITE
- C. — COARSE
- M. — MEDIUM
- G. — GRAINED
- QTZ — QUARTZITE
- PY — PYRITE

GEOLOGY

- DIORITE (MEDIUM TO COARSE GRAINED)
- QUARTZITE (MEDIUM GRAINED)

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BREWSTER TOWNSHIP, DISTRICT OF TIMSKAMING, ONTARIO

MONTREAL RIVER MINING DIVISION

GEOLOGICAL SURVEY

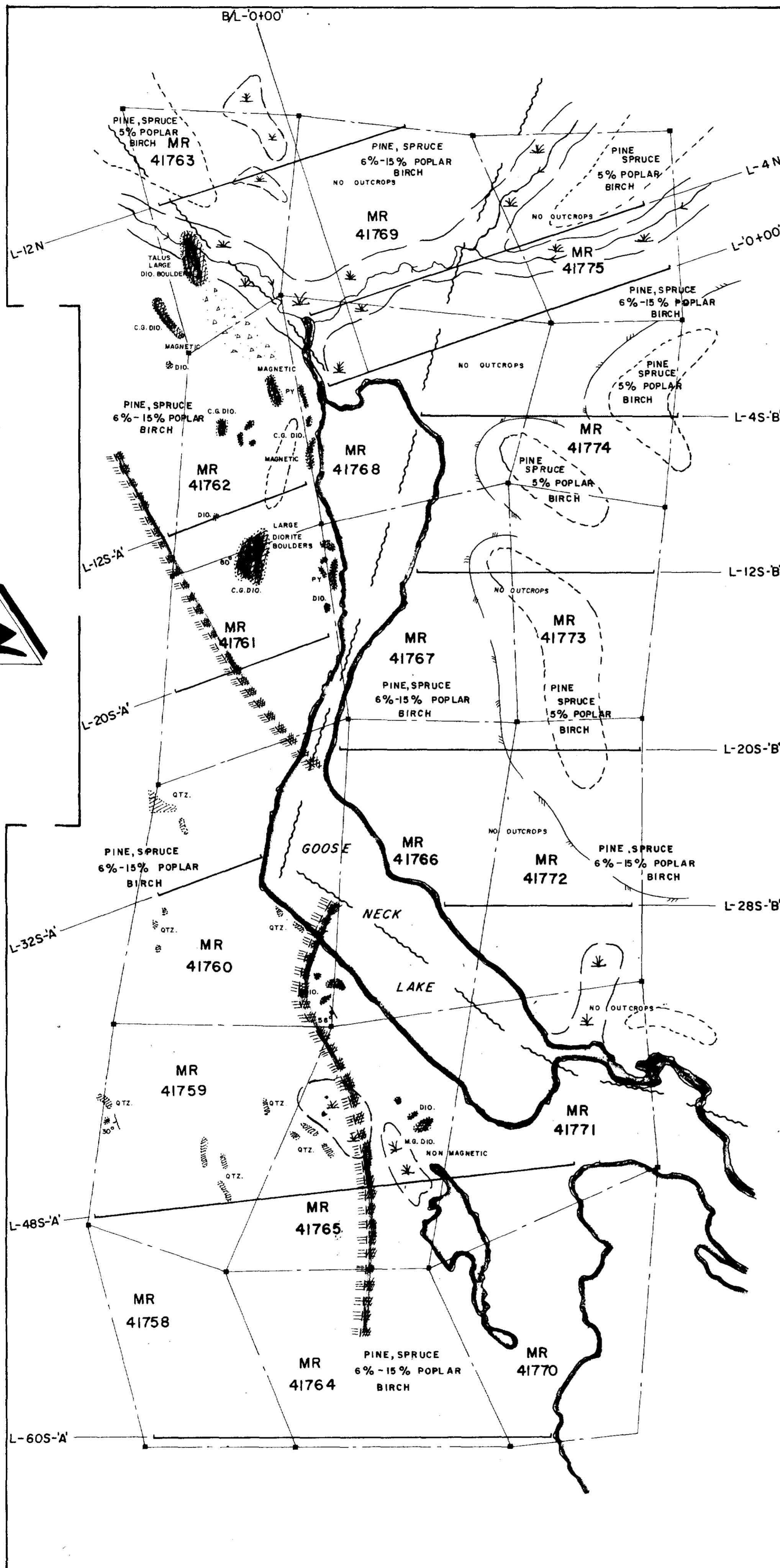
SULMAC EXPLORATION SERVICES LIMITED  
OCT.-NOV.-1965



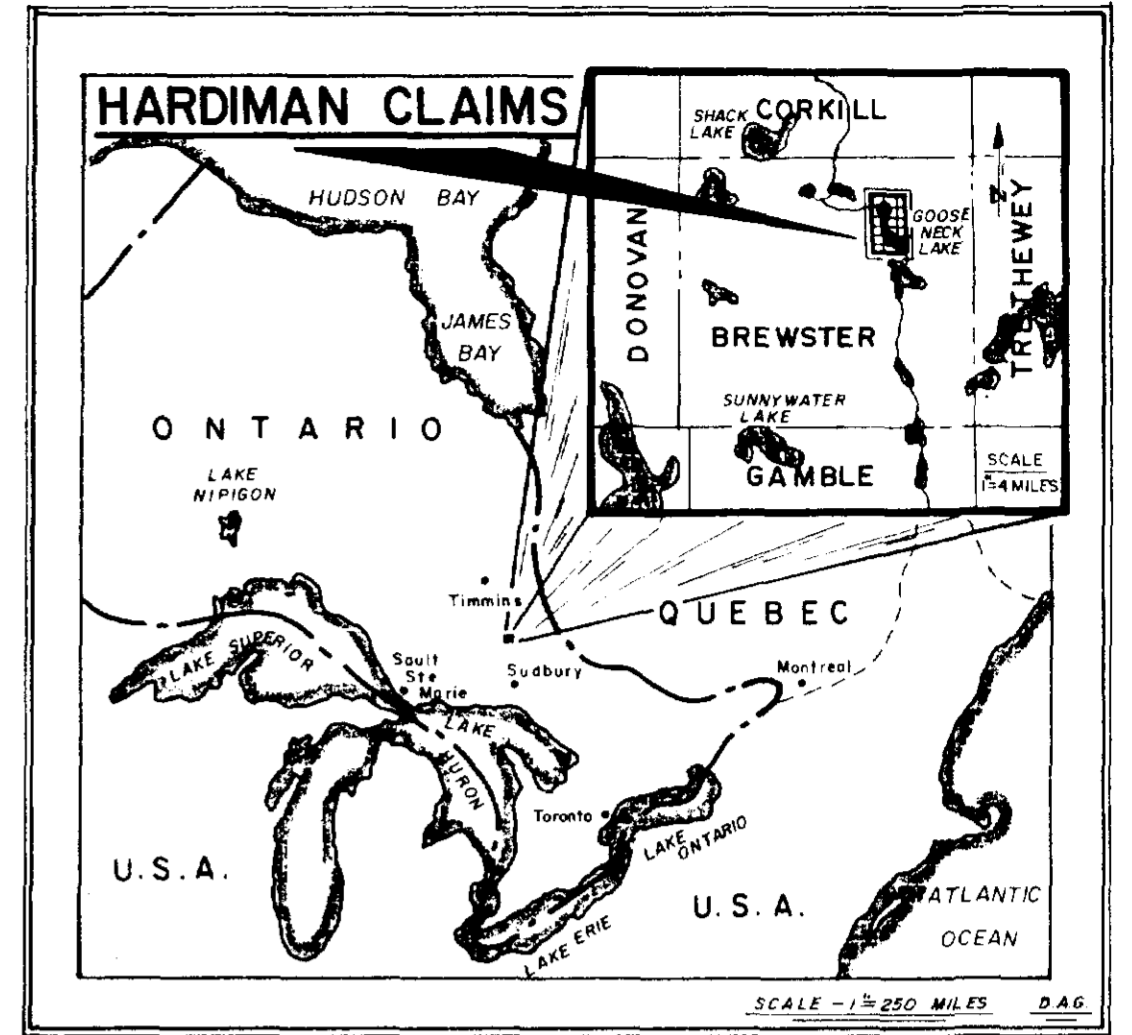
GEOLOGIST A.M.FREW

DRAWN BY D.AGRANT

TO ACCOMPANY REPORT BY E.B. NICHOLLS, DATED NOV. 22, 1965.



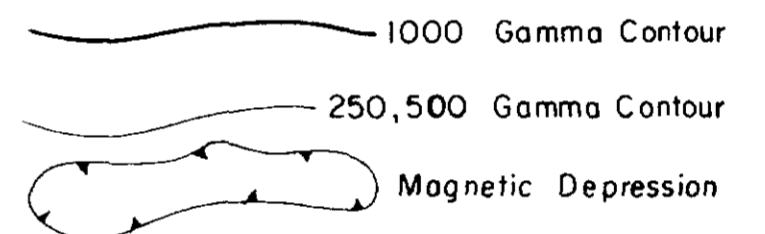
**LOCATION MAP**



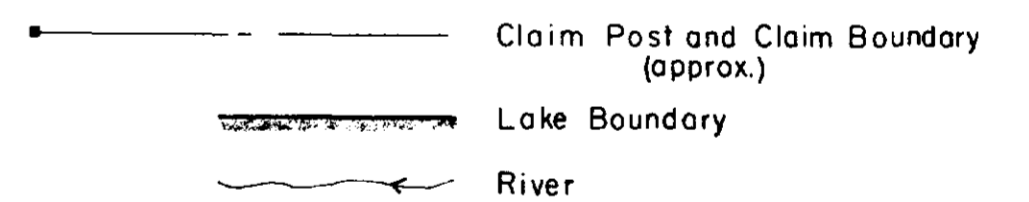
**LEGEND**

**MAGNETOMETER SURVEY**

Contour Interval 250 Gammas



**MAP SYMBOLS**

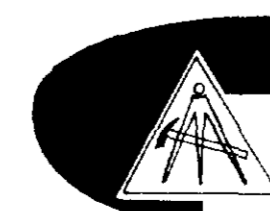


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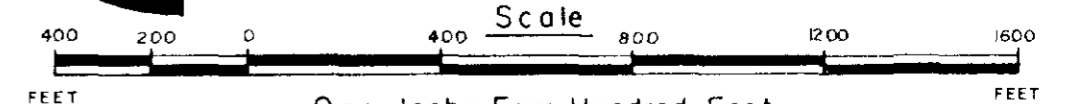
**MAGNETOMETER SURVEY**



SULMAC EXPLORATION SERVICES LIMITED

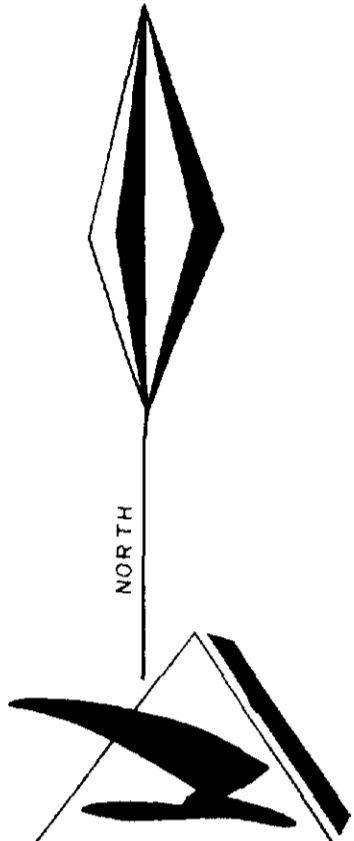
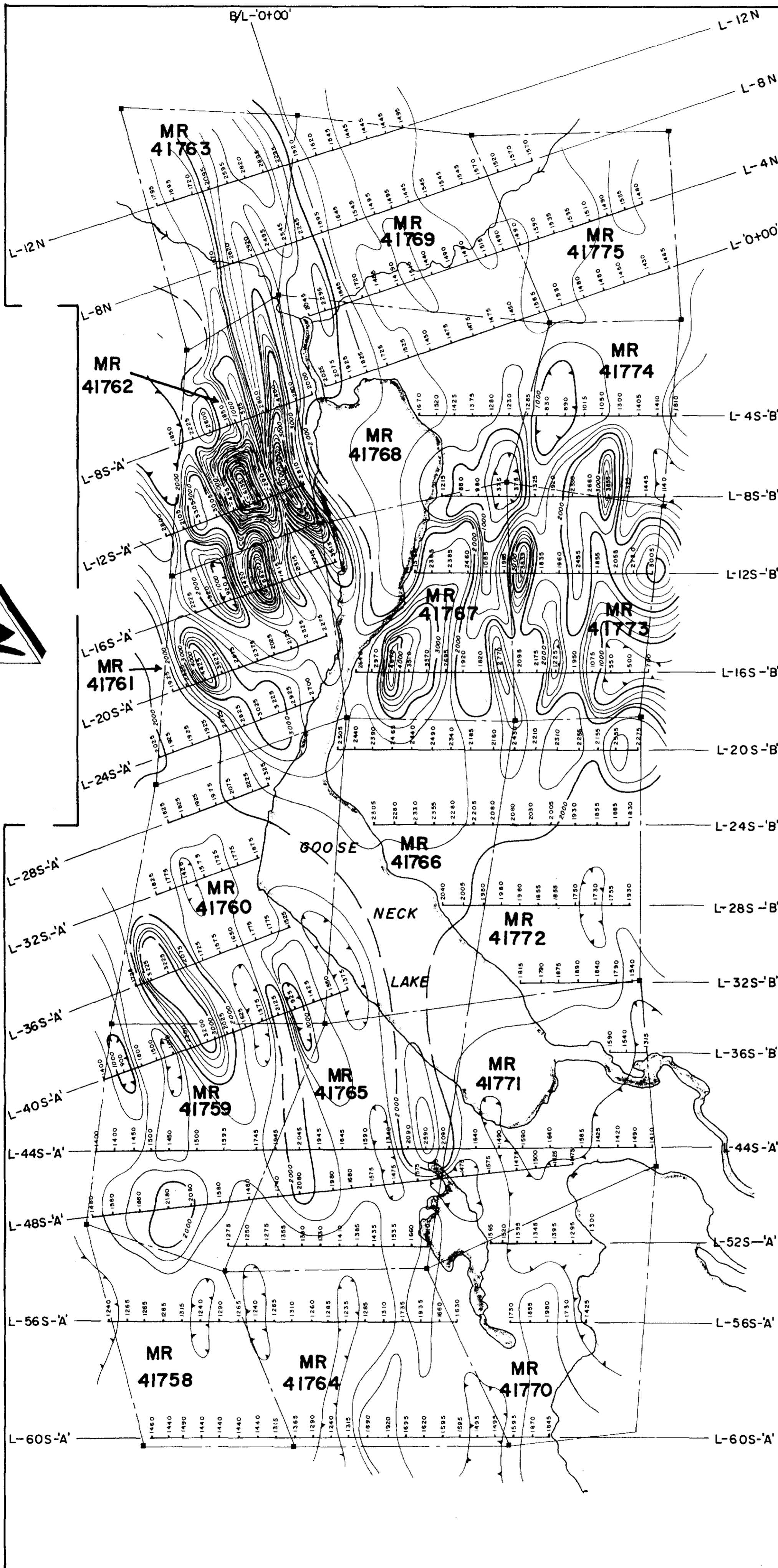
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Scale



GEOPHYSICIST E. B. NICHOLLS

DRAWN BY D.A.G.R.A.T.

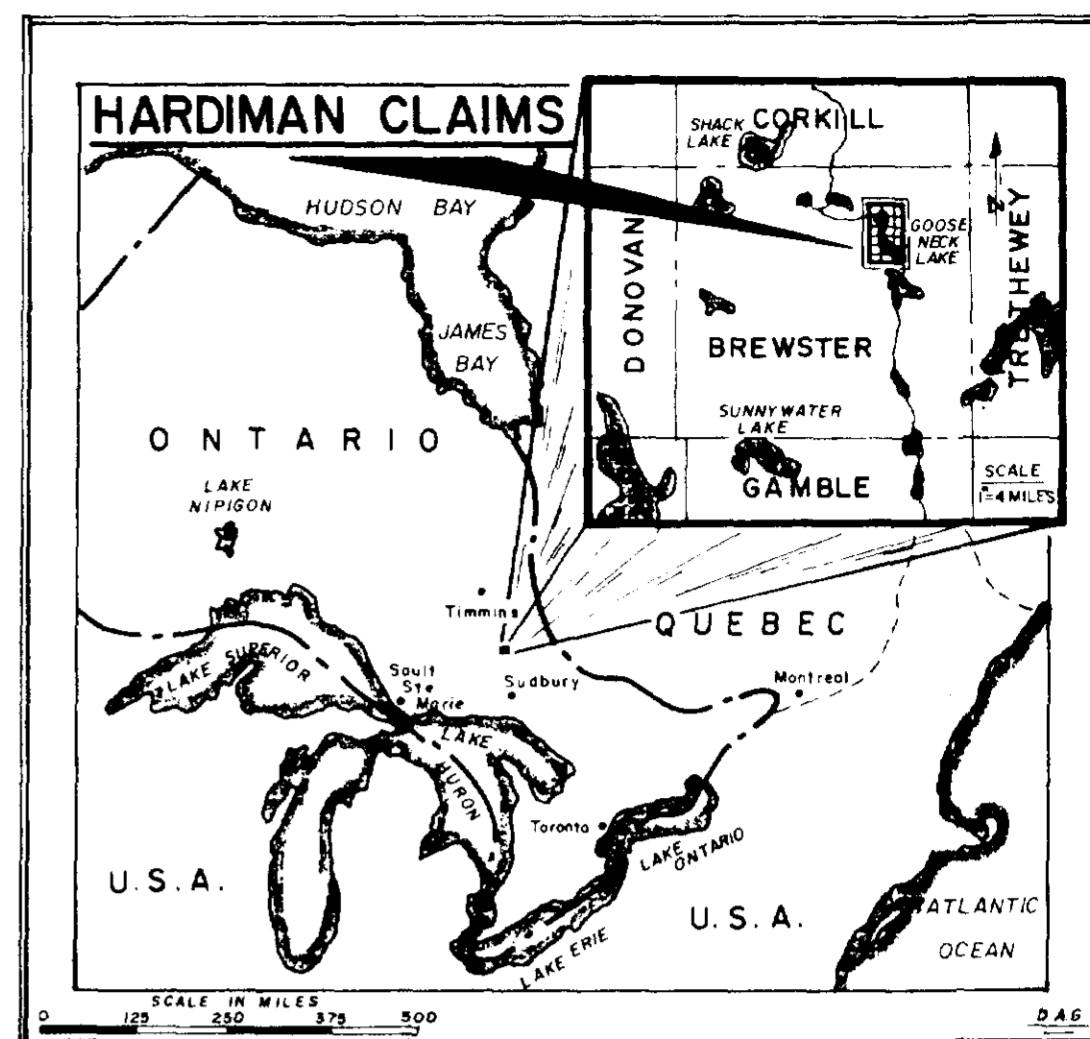


TRUE



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LOCATION MAP



LEGEND

MAGNETOMETER SURVEY

Contour Interval 250 Gammas

1000 Gamma Contour

250, 500 Gamma Contour

Magnetic Depression

Fault

Contact } Inferred from Magnetics

MAP SYMBOLS

Claim Post and Claim Boundary (approx.)

Lake Boundary

River

E. M. Conductor Axis

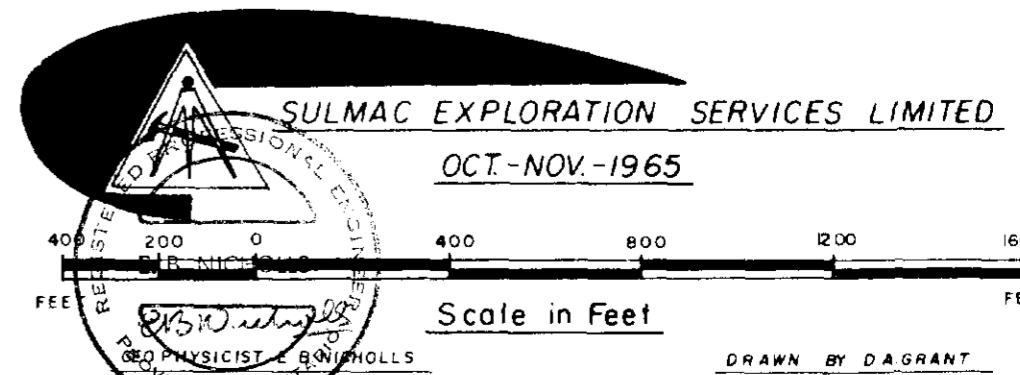
Diamond Drill Hole (proposed)

HARDIMAN BAY MINES LTD

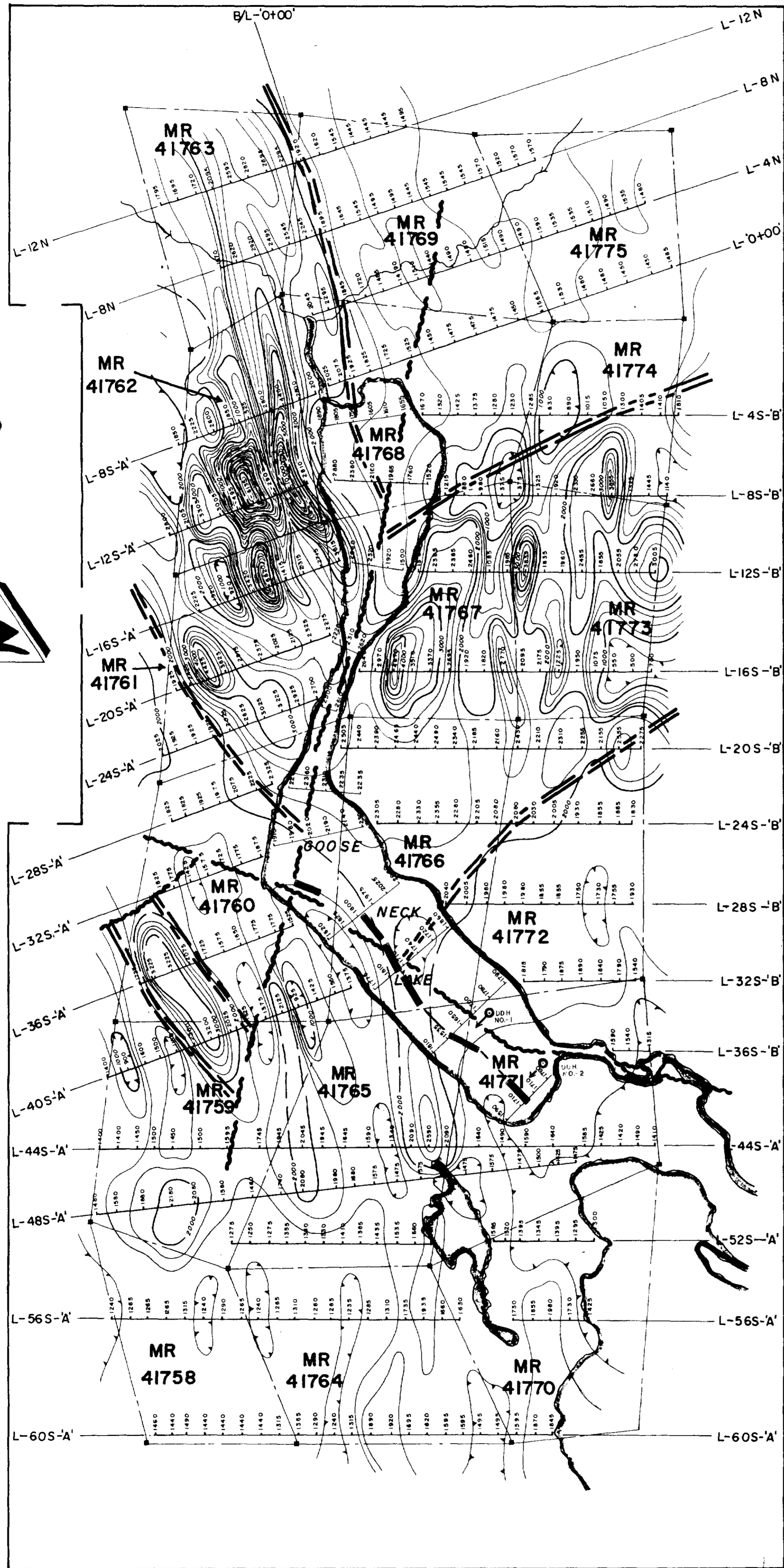
BREWSTER TOWNSHIP, DISTRICT OF TIMSKAMING, ONTARIO

MONTREAL RIVER MINING DIVISION

MAGNETOMETER SURVEY



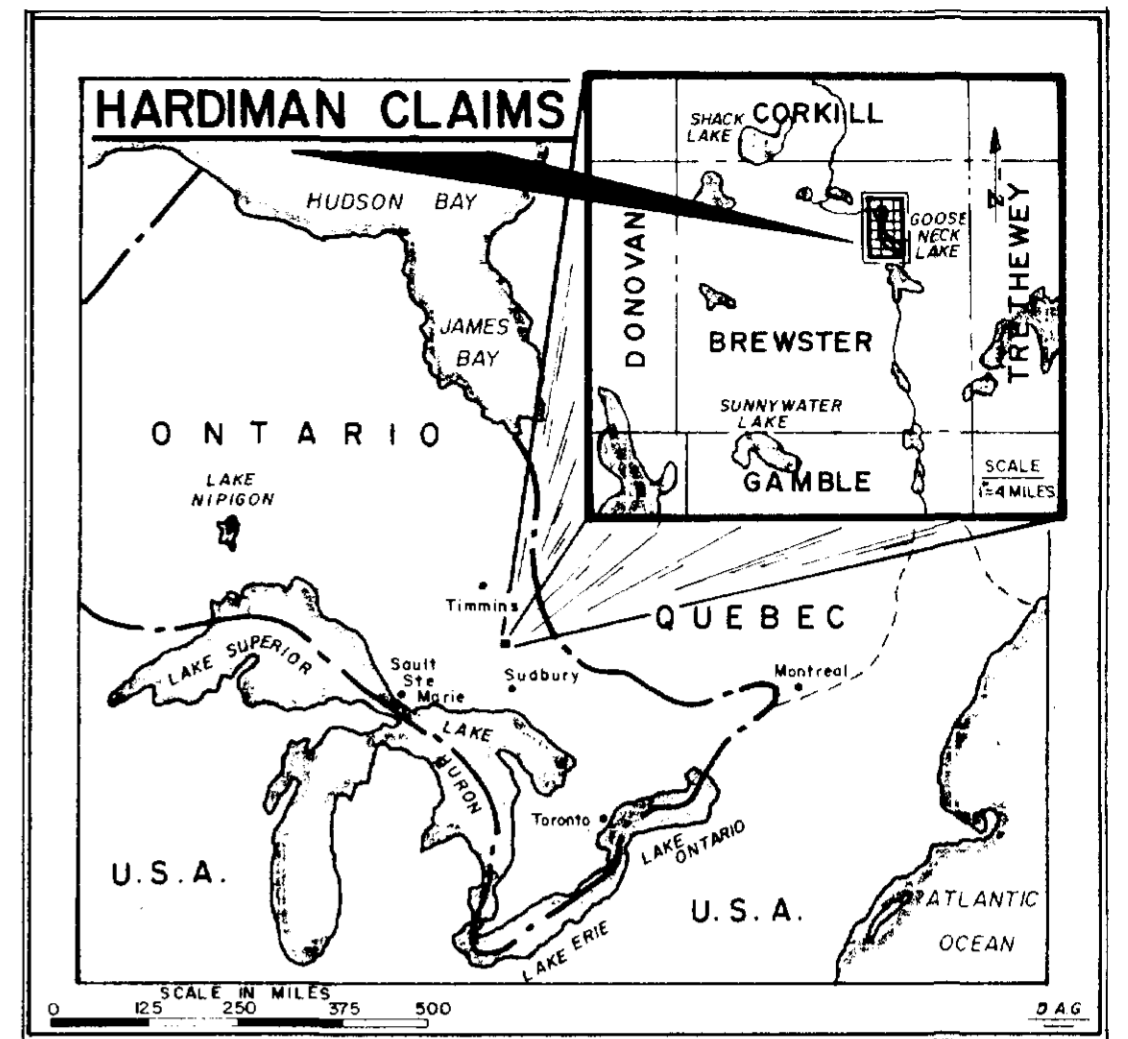
TO ACCOMPANY REPORT BY E.B. NICHOLLS, DATED NOV 22, 1965 -- FEB. 4, 1966



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LOCATION MAP

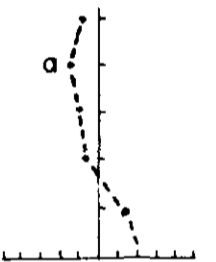
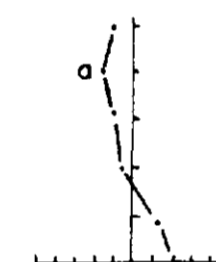


LEGEND

VERTICAL LOOP ELECTROMAGNETIC SURVEY

RECONNAISSANCE

DETAIL



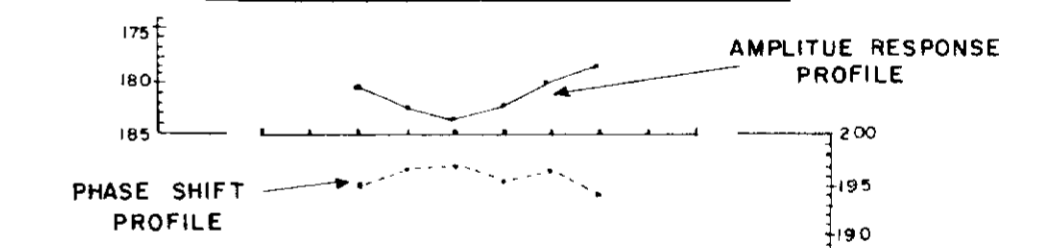
$\Delta T\#2$  Electromagnetic Transmitter Location

$\Delta D\#2$  Detail Transmitter Location

--- T-2 Transmitter Location Reference

--- D-2 Detail Transmitter Location Reference

HORIZONTAL LOOP ELECTROMAGNETIC SURVEY



MAP SYMBOLS

- Claim Post and Claim Boundary
- Lake Outline
- Diamond Drill Hole (proposed)

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MONTREAL RIVER MINING DIVISION

HORIZONTAL LOOP and VERTICAL LOOP

ELECTROMAGNETIC SURVEY

