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# KOULOMZINE, GEOFFROY & Co.

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SUCCESSORS TO TECHNII-COUNSEL LIMITED

GEOPHYSICAL AND GEOLOGICAL PROSPECTING

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VAL D'OR, QUE.

Report on the  
Magnetometer & Electromagnetic Surveys  
on Part of the Property of  
DOLMAC MINES LIMITED,  
Rathbun Twp., Distr. of Sudbury, Ontario,

by

T. Koulomzine, L.Sc., Ing. ENSP., Prof. Eng. Que.,  
and J.V. Fox, B.Sc., Prof. Eng. Que.

March, 1954.

## INTRODUCTION

The Dolmac property consists of 24 mining claims  
numbered

S-72006 to S-72014 incl.  
S-72839 to S-72846     "  
S-73071 to S-73076     "  
S-73115 & S-73116

These claims are located on the northeastern shore of Manapitot Lake and occupy the entire lots 9 and 10 of Concession IV as well as parts of the same lots in the adjoining Concessions III and V of Rathbun Township.

The value of the ground is due to the presence of a small deposit containing high copper and platinum metal together with lower nickel and gold values. Furthermore, it

appears that the geological conditions at the property are somewhat similar to those present at the Milnet Mines which is a successful new producer located in the neighbouring Parkin Township, some 9 miles to the northwest of Dolmac.

The surveys described in this report constitute only the first step in the program of exploration and development of the Dolmac holdings. The aim of the magnetometer survey is essentially to outline the geological structure of the rock formations. The electromagnetic survey was limited to the water-covered areas. It is considered that the spontaneous polarization electrical method of geophysical prospecting is the best suited for the exploration of the property, but a spontaneous polarization survey cannot be undertaken over the ground portion of the claims until the frost gets out of the ground and it cannot be used over water-covered areas. The electromagnetic method is the only electrical method which can be advantageously used over ice, it was used, therefore, over the water covered section of the claims pending the possibility of conducting spontaneous polarization measurements over the ground.

#### GENERAL GEOLOGY

A discussion of the geological conditions prevailing in the eastern part of the Sudbury District has been presented by one of the writers in the "Report on the Property of Dolmac Mines Limited" prepared by T. Koulomzine and dated November-December, 1953, to which the reader is referred. It seems that the best chances of locating ore deposits at Dolmac would be along the boundaries of a diabase intrusive mass which has a rather irregular shape and occupies the central part of the property. The age of this intrusive is questionable but it appears that age has very little bearing on the chances of encountering sulphide deposits in its vicinity.

The only detailed geological map covering the property is the "Wanapitei Lake-Area" map, prepared by T.T. Quirke, and issued in 1922 by the Geological Survey of Canada. This map gives very little details and, therefore, very much is to be gained by remapping the surface geology of the property. Additional geological information, useful for the age correlation of the district, is derived from the study of the adjoining geological map 872A, "Falconbridge", issued by the Geological Survey of Canada in 1946.

For the last decades prospecting and diamond drilling exploration in the Sudbury district have been confined almost exclusively to the Sudbury Basin itself and to its dyke-like quartz-diorite offsets. The Milnet Mine is the first producer that broke the tradition and is related to an intrusive

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of doubtful age and which is detached from the basin. The Dolmac claims could well be in the same class and are, therefore, definitely worthy of investigation.

The Dolmac property lies in an area of low hills. Rock outcrops seem to be fairly abundant, but it can be estimated that at least 75% of the area is drift-covered. Furthermore, our survey having been done while snow was blanketing the ground, we did not have the opportunity of examining the outcrops, except in very few isolated spots.

The only mineral showing known on the property is located on lot 9, Concession IV, at the southern end of an elongated lake known under three different names on various maps and designated as McClarens Lake on our map. A small shaft estimated to be 50 ft. in depth has been sunk on the showing some 40 years ago. It is impossible at the present time to determine the exact size of the ore lens on which the shaft has been put down as it is full of water and collapsed timbers, while the vicinity is covered with muck and overburden. It has been estimated, however, that the mineralization is in the form of a lens, elongated in a NE-SW direction along the contact of the diabase and sandstone sediments. It seems that high grade massive sulphides in the shaft have a width of 1 to 2 feet, while the sparsely mineralized walls would increase the overall width of the ore to about 10 feet. Grab samples taken by the author gave assays ranging between 1.31 and 19.92% copper; 0.11 to 0.50% nickel; 0.021 oz. to 1.08 oz. platinum; 0.16 to 0.95 oz. palladium and up to 0.38 oz. gold.

The known showing on the Dolmac property is, no doubt, small, but the chances of discovering other larger deposits in the sections of the property covered by overburden are excellent and, therefore, the aim of the geophysical surveys already performed and those still to be done, is to obtain information which will help to guide the proposed diamond drilling program.

#### RESULTS OF THE SURVEYS

The results of the two surveys are presented on a 200-foot-to-the-inch map attached to this report. Technical details describing the methods used are to be found in the Appendix, while the geological and geophysical interpretation is given hereafter.

##### Electromagnetic Survey

This survey covered 216.6 acres and was done only over the ice of Lakes Wanapitei and McClarens. It failed to

discover any indications of the presence of massive sulphides under the beds of the lakes.

There are two possible interpretations of the results of this survey. First of all, they can be accepted at their face value, to mean that there are no large sulphide deposits under the beds of these lakes. On the other hand, it is a well-known fact that water and overburden are fairly good conductors of electricity and have a masking effect in geophysical surveying which varies from place to place, depending on the conditions of the overburden. It can be surmised, therefore, that valuable ore could exist under the lakes which would have remained undetected. Some exploratory drilling under the McClarens Lake would be indicated, although we prefer to reserve the decision on this drilling until the spontaneous polarization survey of the ground portions of the property is completed.

#### Magnetometer Survey:

The survey covered 445.7 acres and was done not only over the ice but also over the areas of the property, which according to the available geological information, were considered to be the most promising.

The results of the magnetometer survey show a rather complicated geological structure, which suggests the possibility of sulphide mineralization occurring in a number of locations.

#### Zone S<sub>1</sub>

The part of the property lying north of line (a), (b), (c), (d), and (e) and which is marked. Zone S<sub>1</sub> on our map is interpreted as being underlain by late Precambrian sediments of Cobalt age consisting of a mixture of conglomerates, greywacke, sandstone and quartzite. According to the magnetometer results these formations strike slightly west of north and probably dip toward the east. Three magnetic belts marked M<sub>1</sub>, M<sub>2</sub> and M<sub>3</sub> have been outlined in this zone. We presume that they are underlain by bands of sediments containing some magnetic material. A certain amount of surface exploration of belts M<sub>1</sub> and M<sub>3</sub> could be done by trenching. There is little likelihood that the magnetic properties of the belts are caused by valuable mineralization, nevertheless, there is always the possibility that these belts which, undoubtedly, have physical properties different from the surrounding rocks, could act as "competent rocks" attracting mineralization.

Anomaly I:

A strong magnetic anomaly is located on the west shore of McClarens Lake. We interpret this anomaly as caused mainly by a small pipe-like diabase intrusive mass. On the other hand it should be emphasized that numerous orebodies have been found in close vicinity of small intrusive masses of this nature. We recommend, therefore, that the vicinity of Anomaly I be carefully explored first with detailed spontaneous polarization measurements, then by surface trenching and finally, if necessary, by means of a few diamond drill holes.

Zone D<sub>1</sub>

This zone is limited on the north by line (a), (b), (c), (d) and (e) and on the southwest by (f), (g), (h) and (i). The magnetic readings within this zone are very irregular, showing numerous axes of maxima criss-crossing the zone. We interpret zone D<sub>1</sub> as being underlain by diabase of complex composition. The high magnetic readings found within Zone D<sub>1</sub> are due in most cases to fractures enriched in magnetite, but at least part of these magnetic maxima could be due to valuable sulphide mineralization, therefore, it would be very important to cover the area of Zone D<sub>1</sub> with electrical measurements which should help to distinguish between the magnetic highs due to valueless magnetite and the highs due to magnetic sulphide mineralization, which could contain copper and nickel ore deposits.

Dykes d<sub>1</sub> and d<sub>2</sub> seem to be off-shoots of the diabase underlying Zone D<sub>1</sub>.

Zone D<sub>2</sub> is quite different from D<sub>1</sub>. The magnetometer readings here are very uniform and rather low. There are no positive clues to decide whether this zone is underlain by a non-magnetic intrusive or an equally non-magnetic sediment. The extreme uniformity of the readings and the NW-SE strike of a very weakly magnetic core leads us to decide on the intrusive character of the rocks underlying this zone. If such is the case it might be expected that the rocks underlying Zone D<sub>2</sub> are of granodiorite or quartz-diorite composition closely related to the diabase of Zone D<sub>1</sub>. There are no chances of encountering any valuable mineralization within this zone.

Dyke d<sub>3</sub>, located in the southern part of Zone D<sub>2</sub> is undoubtedly underlain by diabase similar to that found in dykes d<sub>1</sub> and d<sub>2</sub>.

The magnetometer results around the Portage Bay, in the southeastern corner of the property are difficult to interpret without filling in with magnetometer measurements

the unexplored ground between this bay and the areas surrounding the Wanapitei and McClarens Lakes. We have tentatively divided the ground into Zones D<sub>3</sub> and S<sub>2</sub> which are interpreted as underlain respectively by diabase and sediments. A strong magnetic anomaly marked An II has been discovered here and should be investigated by electrical measurements and if necessary by trenching and diamond drilling.

En resumé, the magnetic survey was instrumental in outlining the geological structure which in general confirmed the position of the northern contact of the Diabase as shown on the "Wanapitei Area" government geological map. The discovery of a non-magnetic section of diabase referred to as Zone D<sub>2</sub> is something new, it suggests a complexity of the diabase intrusive which was heretofore unsuspected. The complexity of the magnetic pattern in Zone D<sub>1</sub> and the presence of at least two strong magnetic anomalies suggests the strong possibility of the presence of lenses of magnetic sulphides in and around Zones D<sub>1</sub> and D<sub>3</sub>.

#### RECOMMENDATIONS

In view of the fact that the survey outlined quite a number of magnetic maxima that could be interpreted as possibly underlain by magnetic sulphides, it would seem more economical to perform an electrical survey of the interesting area before embarking on a program of costly diamond drilling.

We recommend, therefore, that:

1. The magnetometer survey be extended to the whole area of the property south of McClarens and east of Wanapitei Lakes. This would involve an area of about 320 acres and would cost about \$1,360.00.
2. A spontaneous polarization, electrical survey be carried out over all the ground previously surveyed magnetically lying south of station 10 N, which would total some 150 acres, and over half of the area mentioned in the paragraph above. This survey would cost approximately \$1,080.00.
3. Some surface prospecting, geological mapping of the outcrops and some geiger counter investigations be undertaken in conjunction with the above surveys. The outlay for this work should be in the order of \$1,500.00.

The necessity for surface prospecting and geological mapping is evident in any program of exploration and the time to do it is before starting costly diamond drilling.

The necessity of geiger counter investigation is less obvious. In this connection we wish to point out that the now famous Blind River uranium fields are located in sediments which are similar in age and composition to the Cobalt sediments found at Dolmac and, therefore, a check for possible radioactivity should be in order.

The Dolmac property is geologically well located and contains an already known small, but rather high grade copper-nickel and platinum metals deposit. The magnetometer survey just performed indicated the existence of a complicated structure favorable to the presence of other ore lenses. We consider, therefore, that the expenditures recommended above to further investigate the economic value of the property are well warranted and would lead to the formulation of a program of diamond drilling which should have excellent chances of discovering a commercial ore deposit.

*Thompson*



APPENDIXTECHNICAL DETAILS OF THIS SURVEYNETWORK OF PICKET LINES

The main network of picket lines consists of a series of picket lines started at 300 ft. intervals at right angles to an east-west base line started from the ice of Wanapitei Lake. Numbered pickets have been placed along these lines at 100 foot intervals. The ends of the lines have been carefully chained along especially cut cross-lines. We failed to locate any government survey posts which would tie the network to the survey of the township concessions. This will have to be done when the snow is gone from the ground. Numerous claim posts have been located and tied to the network.

The work of line cutting started on the property on March 3rd and lasted till March 17th.

ELECTROMAGNETIC SURVEY

The standard vertical sending loop technique was employed, the sending loop being pointed at the receiver. Normally, in an undisturbed field the receiving loop, when held horizontally, i.e. at right angles to the sending loop, does not pick up any electromagnetic signals. If a conductor is present in the ground a complex electromagnetic field results which is at an angle to the horizontal. It is the angle of the total field which is usually measured and serves as a means of detecting the presence of electrical conductors underground.

A total of 810 electromagnetic measurements were performed at Dolmac between March 12th and 18th, 1954.

MAGNETOMETER SURVEY

The magnetometer measurements were made between March 9 and March 16, 1954.

The stations established and the measurements performed can be classified as follows:

Base stations	2
Ordinary measurement stations	805
Detail measurement stations	<u>30</u>
Total measurement stations	837

Total measurement stations	837
Check measurements on bases	31
Check measurements on ordinary stations	<u>4</u>
Total number of measurements	872

The survey was performed with a RUSKA magnetometer measuring the variation of the vertical component of the earth's magnetic field. The scale constant of the instrument was of 21.7 gammas per division. The instrument was fully temperature compensated.

In order to minimize the errors due to diurnal magnetic variations, check readings were taken at regular time intervals of about 3 hours at especially established magnetic base stations and the daily variations observed were distributed proportionally to time between the stations occupied during the day.

Check measurements made on ordinary stations suggest that the survey can be considered accurate within 15 gammas.

All magnetic values plotted on our map are expressed in gammas (1 gamma = 1/100,000 gauss, C.G.S.) and tied in to a base located at station O L 31 E. This base was considered to have a value of 200 gammas.

The profiles used for the interpretation of the results have been drawn to a scale of 500 gammas to the inch.

*Whouler*

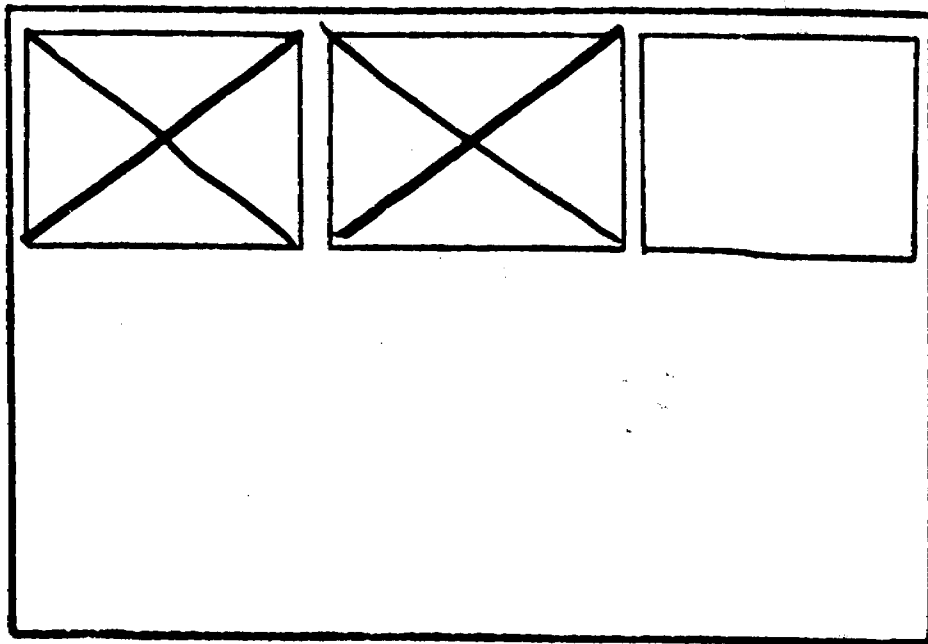


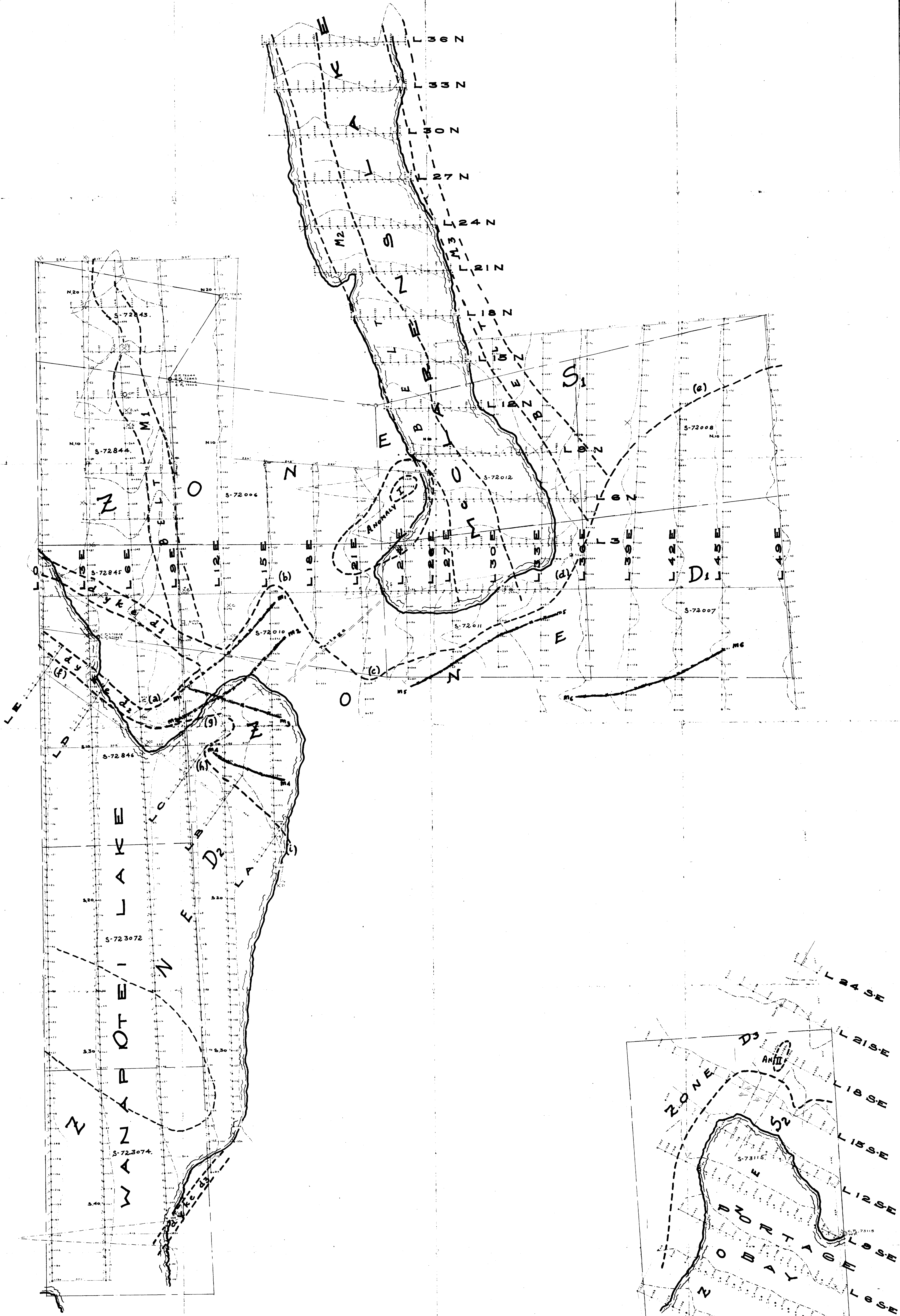
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SEE ACCOMPANYING  
MAP(S) IDENTIFIED AS  
RATHBUN-0021-A1 #1

LOCATED IN THE MAP  
CHANNEL IN THE FOLLOWING  
SEQUENCE (X)





Magnetometer & Electromagnetic surveys  
of part of the property of  
**DOLMAC MINES LIMITED.**  
Rathbun twp. Distn of Sudbury, Ontario.  
by  
**KOULOMZINE, GEOFFROY & Co.**  
Scale: 200 ft. to the inch  
March 1954.

- LEGEND**
- Magnetic base station
  - Measurement stations along profile line
  - Relative values of the vertical component of the natural magnetic field in gamma (see gamma's base line chart unit)
  - Magnetic profile; scale: 50γ to the inch
  - Dip angle of the Electromagnetic receiver coil
  - Located claim post
  - ×<sub>o</sub> outcrop (contourments indicated by the arrows)
  - Magnetically indicated contact
  - Axis of magnetic maxima

M & E.M. 335.

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