



INTRODUCTION

During the latter part of January, 1947, a geophysical survey was carried out on a property owned by the X-Ray Prospecting Syndicate, north of Sturgeon Falls, Ontario, in the Afton-Scholes Area. The magnetic survey described in this report was undertaken to delineate a magnetic sulphide zone in Temiskaming sediments which, from trenches and test pits on the side of a hill, showed substantial widths of gossan material bearing in places massive pyrrhotite, pyrite and chalcopyrite with narrow fractures bearing arsenopyrite, cobalt bloom and other finely crystalline white metallics not readily identified. Sampling of the test pits on the hillside had given encouraging values in copper, gold, silver, zinc and cobalt.

Several anomalies were outlined and enclosed by the survey and considering all the data available from the survey, limited X-Ray diamond drilling and surface geology, it is suggested that the observed anomalies are due to varying concentrations of magnetic sulphides (chiefly pyrrhotite and pyrite with minor magnetite) and with conditions favourable in the host rock for replacement type bodies of sulphides.

LOCATION AND DESCRIPTION OF PROPERTY

The property of the X-Ray Prospecting Syndicate is located in the south-east quarter of Afton Township, Timagami Forest Reserve, Sudbury Mining Division, Ontario. The 29 unpatented claims which form a solid block are situated on the south-east side of Emerald Lake and extend westward to the west shore of the lake, including several lake claims. The area is approximately at the mid point on a line drawn between the Sudbury and Cobalt Mining Camps, while the property itself is about one and one-half miles south of the New Golden Rose Mine - formerly a gold producer developed by the Consolidated Mining and Smelting Company of Canada. The property was staked in 1945 and 1946 and includes mining claims Nos. S-39933-41, E-43238-41, S-45384-88, and S-45396-45406.

ACCESS

The property is readily accessible by motor car or truck as there is a highway and gravelled road in first-class condition going north from Sturgeon Falls, past Field and River Valley through the property to the former New Golden Rose Mine. From Sturgeon Falls it is approximately sixty-five miles to the property with the thirty-two mile section from River Valley to the camp well gravelled and used by the Cookburn Lumber Company trucks. The road passes within 500 feet of the trenches and test pits where a limited amount of X-Ray diamond drilling was completed along the strike of the sulphide zone during the summer of 1946.

GENERAL GEOLOGY

The Afton-Scholes area may be considered as a low dome, on the surface of which erosion has cut windows through a great sill of Nipissing diabase exposing rocks of Keewatin, Timiskaming, Algoman and Cobalt ages. The area favourable for prospecting is almost surrounded by diabase, and two large ridges of this rock traverse the area from north to south. Streams have cut through the sill in places exposing the older rocks. It is estimated that up to three hundred to four hundred feet of the sill still remains.

LOCAL GEOLOGY

A brief field examination of the property was made on October 1st and 2nd, 1946, at which time it was recommended that a magnetic survey be undertaken on a portion of the group through which it was thought that the sulphide zone would pass.

The area surveyed by magnetometer and through which several anomalies were traced is underlain by Temiskaming sediments, chiefly quartzite - which is highly impregnated by pyrite and characterized by a rusty weathering appearance. Some Keewatin greenstone outcrops have been mapped near the north boundary of the property at the base of the diabase sill. The strike varies from east-west to slightly north of west and the formations dip to the north. Drag folding in the weathered sediments with included narrow beds of limestone was noted at one place on the north shore of the south-east bay of Emerald Lake. The Nipissing diabase sill traverses the east side of the claims from north to south and the base of this great sill forms the east boundary of the area surveyed.

While no outcrops of porphyry are known on the property, it is interesting to note that east of the diabase sill in Scholes Township there is a very large porphyry mass which appears to pass westward beneath the sill and hence might enter the property at depth. Such porphyry body may have been responsible for the solutions which resulted in the formation of the sulphide zones at present exposed in the sediments on the hillside of Mining Claim S-43240.

The X-Ray diamond drilling, completed in 1946, was of a very shallow nature and only portions of the core was available in boxes for inspection. Samples of core showed chiefly pyritized quartzite. Porphyry and a Volcanic breccia were noted in one box with evidence in the brecciation of replacement by pyrrhotite and pyrite. One 29' core section of nearly solid massive pyrrhotite was sampled by the writer and yielded low values in copper and zinc. Character samples from the narrow fracture in the sulphide zone seen in the first test pit west of the road yielded up to .20 oz. in gold and 3 oz. in silver per ton and up to 10% in both zinc and cobalt. Assays for platinum and nickel were nil and trace respectively. At this pit chalcopyrite is associated with the pyrrhotite and assay returns from the massive sulphide section of the pit ran up to 10% in copper with only low values in gold and silver. It would appear that there are two ages of mineralization with the minerals in the fractures of the latest age and possibly related to the silver cobalt mineralization.

RESULTS OF THE SURVEY

All the results of the magnetic survey are plotted on Map No. 1 drawn on a scale of 200' to one inch. Contours of equal magnetic vertical intensity have been drawn at intervals of 4,000, 3,000, 2,500, 2,000, 1,500, 1,400, 1,300, 1,200, 1,100, 900, 800, 700, 600, 500, 0, -500, -1,000 and -2,000 gamma, with the observed anomalies marked A, B, C, etc. Beside each measurement station the magnetic value is shown as well as the approximate elevation above Emerald Lake. Sections recommended for cross-sectional diamond drilling have been heavily marked in black and numbered.

On map #2, all cross-section lines are shown in magnetic graphic profile with the corresponding topography, on a 7' roll of graph paper. The continuations of the anomalies (from line to line) are marked and designated to correspond to map No. 1.

Technical details regarding the procedure followed in performing the survey will be found in the appendix.

DISCUSSION OF MAGNETIC RESULTS

The survey confirmed the expectation that a wide zone of magnetic sulphides was present in the Temiskaming Sediments, and this zone was proven to extend eastward from line 15 W for a distance of 3,000 ft., at which point it narrows and appears to pass under the Nipissing Diabase sill. The maximum width of this area is approximately 1200 ft. in the vicinity of line "O". This favourable area has been further broken down into 7 anomalies of varying length and width and which merge into one another at various places within the area mentioned, making it rather difficult to clearly define their relationship. These anomalies have been designated on map No. 1 as A, B, C, D, E, F and G, and lie within or close to the 20' elevation contour above the level of Emerald Lake. Of the seven observed anomalies "A" appears to have the strongest intensity and persists for a distance of 3,000 ft., being open at the east end as it passes under the sill. Anomaly "B" on the north side of "A" may be considered as a spur of "A". The remaining anomalies C, D, E, F and G closely parallel "A" and "B" on either side, and while of diminishing intensity and shorter length, are no doubt indications of smaller magnetic sulphide lenses within the main zone.

It is suggested that along the strike length of anomaly "A" the more significant areas are those where the magnetic intensity suddenly drops, suggesting areas of alteration, faulting, or a different mineral assemblage. It is further suggested that fringing around the margins of these anomalies (presumably due to lenses of pyrrhotite) are sections where replacement type deposits of sulphides bearing copper ore may occur and which might not be indicated from a magnetic survey. In the vicinity of the copper test pit a sharp decrease in the magnetic intensity is evident, suggesting a decreasing proportion of disseminated pyrrhotite and possibly a change to chalcopyrite as observed in the pits on the hillside. Such areas are regarded as key points in the cause of the anomaly variations and have been taken into consideration in recommending the cross-sectional drilling program.

To the north of the property at the New Golden Rose Mine the gold deposits are associated with strongly magnetic banded iron formation where intruded by porphyry.

The magnetic intensity range of this survey varies from -2696 gamma to +11,900 gamma, which range is not regarded as of sufficient magnitude to indicate a strongly magnetic iron formation which would be of the order of 50,000 gamma. The observed anomalies, therefore, might be regarded as due to a low grade iron formation, but evidence from surface geology and drill cores would indicate that the anomalies are due to lenses of disseminated pyrrhotite and pyrite associated with minor magnetite.

RECOMMENDATIONS

On the accompanying map No. 1, 8 section lines are marked to be tested for cross-sectional drilling, and are regarded as key points in determining the indicated change in the mineralization for the observed anomalies. Sections 1 to 4 are recommended to test the more interesting portions of anomaly "A" and spur "B" so as to establish the structural and mineralogical changes that takes place from a region of low intensity to high intensity. If commercial values in copper are encountered in the first two holes, it is believed that drilling should proceed eastward towards the diabase sill, as eastward from the test pit there is a pronounced weakening of the magnetic intensity. The remaining four sections are to test the conditions on anomalies "C" and "O", "E" and "D" and "D" and "A" in the given order. To carry out this program 6000 ft. of cross-sectional diamond drilling would be required. A further recommendation is made that a geological map of the area covered by the geophysical survey showing all rock outcrops be made on a similar scale of 200 ft. to one inch.

Thus, to completely test all observed anomalies within or close to the 20' elevation contour the 6,000 ft. of cross-sectional drilling should be done to investigate existing geological conditions and fully appraise the economic possibilities of the sulphide zone as exposed on the east side of the hill where two trenches and three pits show gossan and heavy mineralization carrying encouraging values in copper, gold, silver, zinc and cobalt.

Appendix

TECHNICAL DETAILS OF THE MAGNETOMETER SURVEY

1. PERIOD OF SURVEY

The geophysical survey commenced on January 20th, 1947, and was completed on January 26, 1947. As approximately 20" of snow blanketed the property, it was not possible to examine outcrops, and the magnetic contour map shows only the location of trenches and test pits as well as the approximate position of the Nipissing Diabase Sill at the east side of the area surveyed.

2. PERSONNEL

All magnetic measurements were taken by H. L. Banting with E. Hurst and F. Gougeon acting alternately as assistants.

3. LINE CUTTING

At the beginning of the Magnetic Survey, 22,000 lineal feet of line had been cut and chained. During the course of the survey many extra lines were cut and the network of stations was extended out into the various bays of Emerald Lake. This additional work totalling 20,000 lineal feet was quickly completed by E. Hurst, F. Gougeon and W. Collings, whose valuable assistance greatly facilitated the survey.

4. AREA SURVEYED

The survey covered all of Mining claims Nos. S-45238-41, S-45388, and portions of claim Nos. S-45384-87, S-45396-97 and S-45406, representing a total area of approximately 260 acres. Many of the claim posts were not located and on the accompanying magnetic contour map the claim numbers are marked but the claims lines are omitted. In the Spring the exact position of these posts should be plotted on the map and the claim boundaries drawn in.

5. TOPOGRAPHY

In addition to recording the magnetic measurements at each field station, the approximate elevation above the level of Emerald Lake was noted, with the highest point estimated to be 90' above lake level. On Map No. 2 showing graphically the profile of magnetic intensity along each line, the corresponding Topography has been plotted on a vertical scale of 1 inch = 50'.

6. NETWORK OF MEASUREMENT STATIONS

The network of stations consists in a series of numbered pickets placed 100' apart along north-south lines established by the X-Ray Prospecting Syndicate, at intervals of 300 feet, and which lines are approximately at right angle to the east-west "A" base line.

7. CLASSIFICATION OF MAGNETIC MEASUREMENTS

Base stations	2
Stations of Main Network (300' x 100') . .	415
Stations of main network at 50' intervals .	10
Check measurements on bases	20
Check measurements on ordinary stations	23
Total measurements performed	<u>470</u>

6. 110
COUNTER SURVEY

Readings were taken with a Watt Variometer measuring the variations of the vertical component of the earth's magnetic field. All plotted gamma values for the individual stations were referred to an arbitrarily chosen magnetic base station located in front of the camps on the ice surface of the south-east bay of Emerald Lake, and designated as the "Home Base", on the map with the arbitrary value of 560 γ .

At this station the instrument was calibrated and found to have a scale constant of 32.9 γ per scale division. With the medium magnet in position, having the north pole up, at a distance of 200 cm. (at which position it had a strength of 2,836 γ) the reading was 22.0 scale divisions. Hence the "Home Base" was calculated to have a value of $2,836 + 22.0 \times 32.9 = 3,560 \gamma$. A normal correction of 3,000 γ was subtracted, giving the arbitrary chosen value of 560 γ for the base to which all field measurements were tied.

The instrument had been previously set to ensure precision with internal adjustments effected so as to practically annul its temperature coefficient - thus eliminating all errors due to temperature changes.

Diurnal Magnetic variations were reduced to a minimum by re-reading a magnetic base station approximately every hour and the average error calculated from 25 check measurements on ordinary stations showed the survey to be accurate within $\pm 8 \gamma$. During the survey the diurnal correction did not exceed $\pm 50 \gamma$, except on the afternoon of January 25th, when a minor magnetic storm occurred of the order of 150 γ and work was discontinued.

Respectfully submitted,

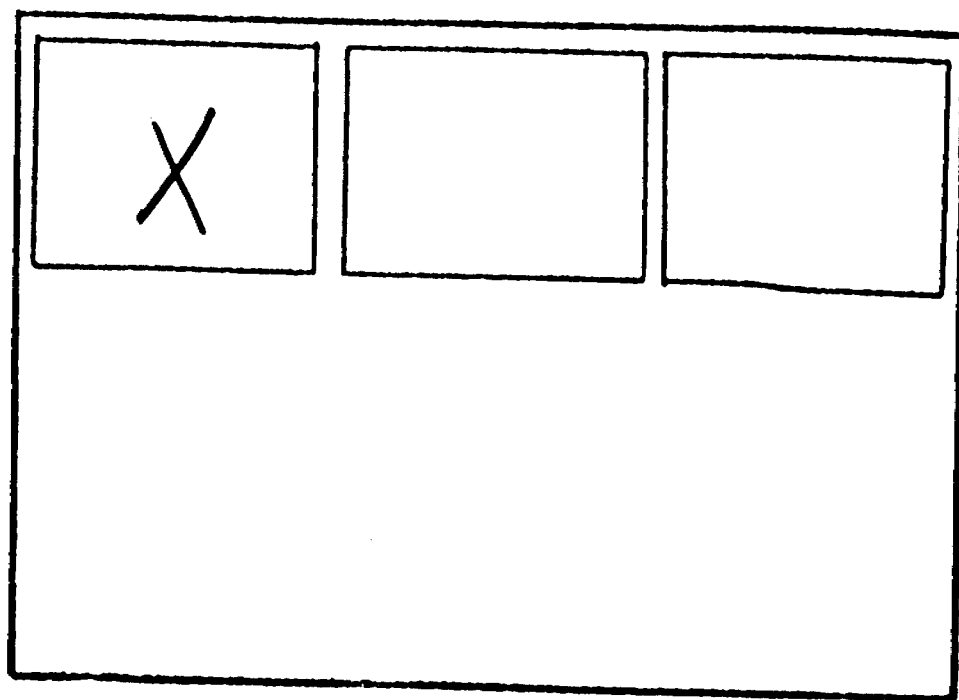
Howard L. Banting.

Toronto, Ont.
May 15th, 1947.

Howard L. Banting

SEE ACCOMPANYING
MAP(S) IDENTIFIED AS
AFTON-0024-A1 #1

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

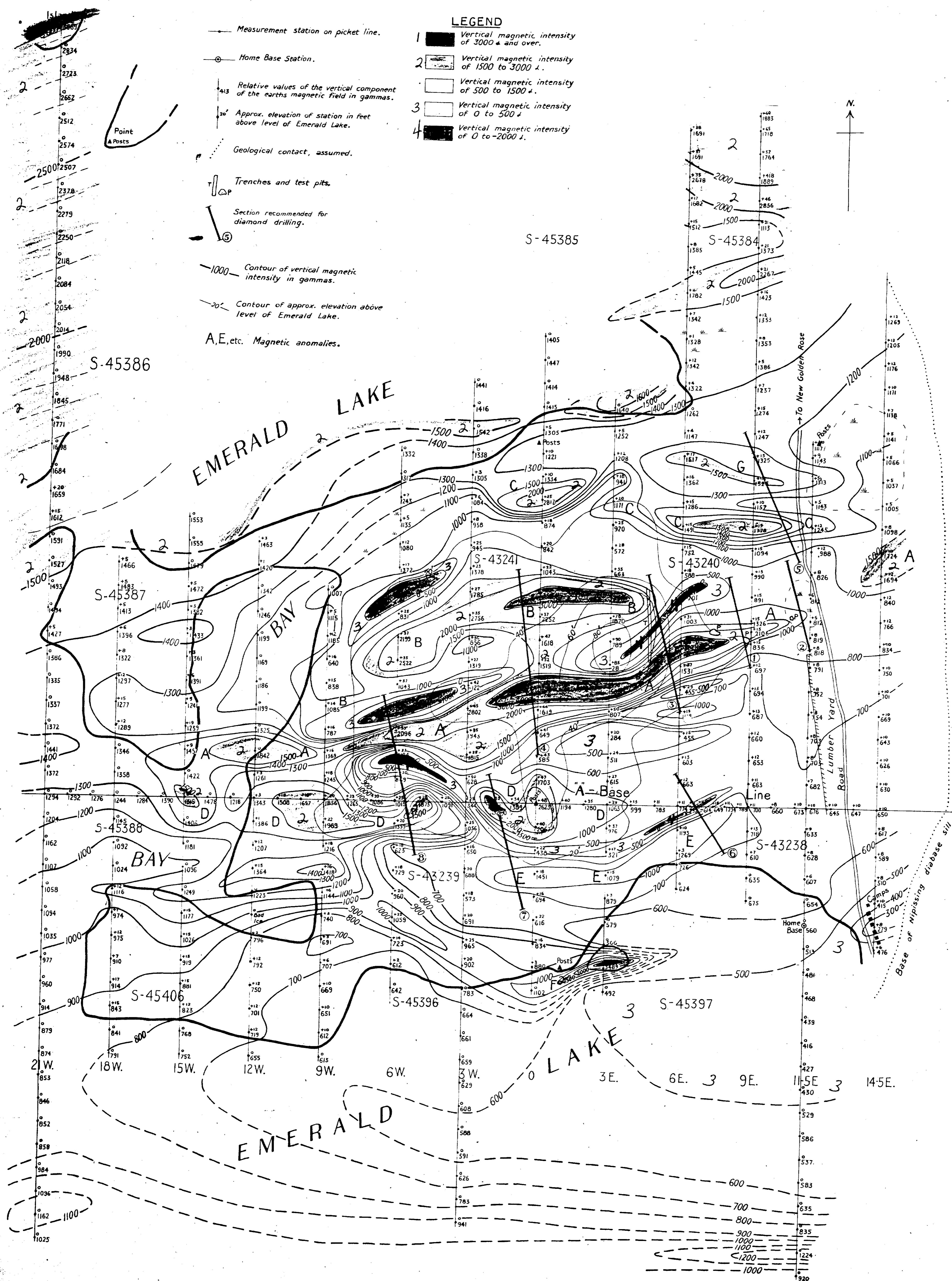


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LEGEND

- Measurement station on picket line.
- Home Base Station.
- Relative values of the vertical component of the earth's magnetic field in gammas.
- Approx. elevation of station in feet above level of Emerald Lake.
- Geological contact, assumed.
- Trenches and test pits.
- Section recommended for diamond drilling.
- 1000- Contour of vertical magnetic intensity in gammas.
- 200- Contour of approx. elevation above level of Emerald Lake.
- A, E, etc. Magnetic anomalies.

- 1 Vertical magnetic intensity of 3000 and over.
- 2 Vertical magnetic intensity of 1500 to 3000.
- Vertical magnetic intensity of 500 to 1500.
- 3 Vertical magnetic intensity of 0 to 500.
- 4 Vertical magnetic intensity of 0 to -2000.

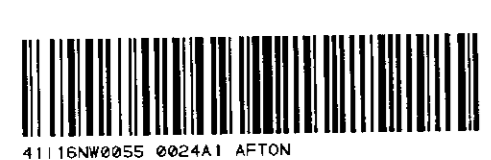


MAP No.1
 Magnetometer Survey
 of a portion of the
X-RAY PROSPECTING SYNDICATE PROPERTY
 in the AFTON-SCHOLES AREA
 Sudbury Mining Division
 Scale, 200 Feet = 1 inch
 May 15th - 1947
 by
 H.L. Banting

AFTON-0024-A1

#1
63-110

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200

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