INTRODUCTION

The airborne magnetometer survey to be described was done by Dominion Exploration Syndicate of Winnipeg as Contractor for Daering Explorers Corporation Limited, the claim owner. The survey was done March 16, 1967, by the undersigned as operator and H.M. Lincoln, Kenora, Ontario, as pilot.

The survey was conducted, and the accompanying maps prepared, in accordance with the Mining Act of Ontario in order to qualify the work as assessment work.

Illustrations:

1. A claim location map, scale 1" to 40 chains, is attached (page 11).

The following maps are enclosed:

2. A coloured ozalid print, scale 1" to 1320', showing flight lines, magnetic contours, topographic features, key map and survey data.

3. An overlay showing values in gammas measured at intervals of 330 feet along the flight lines.

4. A second overlay, coloured, showing geological data.

The original tape recorded in the course of the survey is also enclosed.

References:


2. Thomson, J.E.: Map 42c, "Manitou - Stormy Lakes Area" (geological), 1933.

The instrument used was a Dominion Exploration Syndicate Vertical Flux-Gate Magnetometer, #582-4. This instrument was secured to the floor of the Cessna 180 airplane immediately behind the pilot's seat. The vertical, gyro-stabilized probe was mounted on a padded, athwartship wooden shelf near the rear of the cabin. It was operated by a hose connected to the airplane's vacuum system and was connected to the instrument by electrical cable. A continuous strip recorder was carried forward of the co-pilot's seat.

The instrument is so designed that it measures changes in gammas in the vertical component of the earth's field so long as the probe is maintained close to the vertical. The instrument can be balanced to eliminate the effect of the earth's field and all but a small residue of the vertical effect due to the airplane engine, the recorder and other magnetic elements. That residue is index error, or wind/heading error, and is constant for a given heading of the airplane during the short periods of time involved. Changes in wind direction and/or speed cause corresponding changes in index error.

In the case of the present survey, where flight lines were north and south, the index error was positive on northerly courses and negative on southerly ones. The wind was 340°/17 mph, with some gusts. Index error varied from 100 to 200 gammas.

Index error was corrected for each flight line on the tape by choosing a zero line such that the general level of the trace is the same as those of the two adjacent lines which were flown in the opposite direction.
The instrument was zeroed by balancing it to read 1000 gammas while on an easterly course over a granite area four miles north of Manitou Island, or \(1\frac{1}{2}\) miles northwest of the claims. Flight altitude was 500 feet above lake level except for two special low-level lines (see page 5).

Flight lines were previously laid out at 660-foot intervals on a map prepared for that purpose. They were flown with a good degree of accuracy by lining on topographic points.

Pre-determined points A and B were marked on each flight line on the map used for flying and are shown on the accompanying maps. An auxiliary, battery actuated pen was provided on the recorder, in circuit with a push-button conveniently located. When the airplane was over a given point, the tape was marked by pressing the button. The mark was identified as point A or B by felt-point pen. This method provided good ground control at the slow speed and low altitude used. The airplane was throttled back to give indicated airspeed slightly over 85 mph and true airspeed of 90 mph (132 feet per second). True heading/groundspeed for northerly courses was 356°/74 mph and for southerly courses 184°/106 mph.

A scale division on the tape reads 100 gammas. Readings were to 25 gammas by interpolation. The first scale reads to 4,000 gammas, the second scale to 10,000 gammas. Recorder feed was set at such a rate that longitudinal scale on the tape is 640 to 730 feet per inch for northerly courses and 870 to 970 feet for southerly courses.

The area mapped is an isolated one, surveyed for the sole purpose of exploring the claims in question. 57 line miles were covered by the survey with results reported herein.
The property consists of 54 entry mining claims with official numbers K.39239 to K.39274 and K.39347 to K.39364. Locations are shown on Ontario Department of Mines Plan No. M-2007 and on the attached location map. The claims are disposed northeasterly, following the approximate regional strike.

The property is near the northeast end of Lower Manitou Lake, 75 miles east-southeast of Kenora. Wabigoon on the CPR mainline is 30 airline miles north-northeast.

There was gold mining and prospecting activity in the period 1896 to 1912 and again in the 1930's. The Glass Reef mine was in or beside the present claim K.39248 in the southwest part of the property. The Bee-hive mine and the Gaffney claims on Manitou Island were 1\(\frac{1}{2}\) and 2\(\frac{1}{2}\) miles west of the property. The Royal Sovereign mine was on the mainland not far north of the Bee-hive mine. The "mines" had limited underground work on gold-quartz occurrences and small production from stamp mills.

**SURVEY RESULTS**

It is usual, with the instrument balanced at 1000 gammas, to consider areas of over 1500 gammas to be anomalies of interest. This is true in the present case in the northeast part of the property but is not necessarily true in the southwest part. Readings are appreciably higher in the southwesterly 25 claims as shown by Aeromagnetic Map 1153G and by the present survey. In the latter case, background is probably of the order of 1400 gammas, due presumably to deep-seated causes. Beyond a narrow transition zone, background in the northeasterly 22
Three anomalies were found by the survey on the claim-group proper. They are identified by the flight lines between which they extend.

**Anomaly 1-13**

A large anomaly of moderate to strong intensity occurs in the north part of the southwest part of the property. Readings of more than 2000 gammas occur in a zone trending about N65°E for 9000 feet from the west property boundary. There is a core of plus 4000 gammas some 3000 feet long between lines 2 and 6. In the latter case, readings were off the first scale at the flight altitude of 500 feet. On completion of the survey proper, part of line 4 was re-flown with the instrument on the second scale, at an altitude of 20 feet above the lake and ground-speed just over 40 mph (see extr. tape enclosed). Here, readings were over 10,000 gammas, off the second scale. The anomaly was much sharper, with mean width about 400 feet compared with about 1300 feet at the 500-foot altitude. A similar low-level line was flown 100 feet east of line 1. Highest reading was 8400 gammas compared with 3850 gammas at the 500-foot altitude; mean width 300 feet compared with 925 feet.

**Anomaly 7-9**

This anomaly lies mostly outside the property but its western portion is within the east boundary of claim K,39248. Its central part has readings over 1900 gammas, the highest observed reading 2000 gammas. The anomaly includes the location of the former Glass Reef mine.
This occurrence is in the northeast part of the property on claims K.39259 and K.39264. Readings are over 1500 gammas in a boom-erang-shaped area about 1100 feet long. In this vicinity, background is 1000 gammas (see pages 4 & 5) so that the anomaly is considered to be of similar strength to Anomaly 7-9.

Three or four anomalies of similar strength to Anomaly 22-23 were logged outside the property, south and north of its northeast part.

Anomalous Lows

Two areas were encountered where readings were appreciably below background. One is on line 18, the other on lines 24 to 27. These areas are considered to be anomalous and to require explanation or interpretation.

GEOLOGY

The local geology as covered by Thomson's report and map (references 1 and 2) is not recapitulated here but is depicted on the accompanying Overlay showing Geological Data.

A feature with a bearing on the present survey is a fault, presumably a major one, that strikes northeastward through the area. It crosses the northwesterly part of the property where it dips 70° southeast. This fault separates Timiskaming sediments on the southeast from Kewatin lavas and fragmentals on the northwest. Two branch faults are described by Thomson (his page 18) as joining the main fault 7½ and 9½ miles northeast of the property. They strike about south-southwest.
Several references to sulphide occurrences are made by Thomson. On page 23, in speaking of the area generally, he states:

"Small bodies of massive sulphides were observed in a few places. The sulphides are pyrite and pyrrhotite with a little chalcopyrite," and, "Irregularly shaped zones of more or less disseminated sulphides occur in schists."

In discussing the fault, Thomson further states on page 19:

"... massive sulphides are found along or near the fault zone, which suggests a structural control over their deposition." Thomson does not state, but his map seems to show, that the sulphide occurrences are in the vicinity of the cross faults.

The principal example given of disseminated sulphides is the occurrence on the Gaffney claims, 2 1/2 miles west of the subject property. Facing his page 29, Thomson depicts a body some 35 feet wide and says in the text: "The sulphides are pyrite and, to a much lesser extent, chalcopyrite." He reports interesting gold values. Aeromagnetic map 1153G shows a rather weak anomaly at this location. Thomson's report does not mention magnetic minerals in the zone so that the association is indefinite.

Thomson makes scant mention of the occurrence in the area of magnetite or iron formation. He does report (page 14) boulders of iron formation up to six inches in the Timiskaming conglomerate. This implies the existence of Keewatin iron formation which Thomson recognizes in speaking of the post-Keewatin terrain (page 15).
Anomaly 1-13

When the accompanying Overlay showing Geological Data is compared with the Contour Map, a correspondence is apparent between the northeast-striking fault and Anomaly 1-13. The axis of the anomaly in its northeast part almost coincides with the fault as mapped by Thomson. The coincidence of the southwest part under the lake is interpretative. Any interpretation of the airborne magnetic survey must try to account for this association. It can hardly be due to iron formation in the Timiskaming sediments because:

(s) Thomson does not report the existence of such iron formation.
(b) If iron formation did exist, it would lie parallel to the bedding at an angle of 25° to the fault (Thomson, page 18).

The alternate interpretations that are consistent with Thomson's report seem to be:

1. That the strong part of the anomaly (over 10,000 gammas at lake level) is caused by iron formation of Keewatin age, either in its original stratigraphic position or dragged along the fault. The weaker part of the anomaly would then seem to be caused by small pods of iron formation distributed quite uniformly along the fault or by, say, hematite iron formation with low magnetic effect.

2. That the strong part of the anomaly is caused by sulphides. It would seem that some magnetite would have to be also present to account for the strongest effects. The weaker part of the anomaly could be caused by massive sulphides with some pyrrhotite or by disseminated sulphides with much pyrrhotite.
The second interpretation seems the more likely despite the considerable length of 9000 feet. Such sulphides, although not with reported magnetite, do occur along the fault as Thomson reports. Iron formation of any age is not known to occur, there being only indirect evidence for its existence anywhere near.

At the northeast end of the anomaly, a branch of over 2000-gamma strength extends 2300 feet in a direction a little east of north. The interpretation is offered that this possibly represents a branch fault similar to those described by Thomson to the northeast (see page 6). If so, the "sulphide" interpretation given above for the main anomaly might again seem more reasonable than that postulating iron formation.

Anomaly 7-9

This anomaly as mentioned (page 5) has an association with the former Glass Reef mine. The veins at the mine are associated with quartz porphyry (Thomson, page 25) and a large quartz porphyry dyke is mapped to the northeast, also within the anomalous area. Thomson's description of the porphyry and mine showings does not account for the anomaly and it may be that the mine's location here is fortuitous. Interpretation must await further investigation.

Anomaly 22-23

The anomaly lies within Timiskaming sediments 1320 feet southeast of the main fault. Its strength is about 500 gammas over background. Its shape is reminiscent of the nose of a fold but this does not correspond with any known structure in the sediments. It could represent a basic plug intruding the sediments. Here, however, reference
should be made to flight line 2C which was an extra line flown to test a gabbro plug mapped by Thomson just northeast of the property. That line gave no distinctive magnetic profile and nothing similar to Anomaly 22-23. Again, the anomaly might represent a mineralized structure, possibly associated with the fault or even alongside the fault at depth (with a 70° dip, the fault would lie around 3700 feet vertically below the anomaly at surface). In the latter case, the presence at depth of Keewatin iron formation is an alternate possibility (see page 8).

**Anomalous Lows**

The area of low readings in the northern parts of lines 24 to 27 is suggested to be associated with the bodies of feldspar porphyry mapped by Thomson in this vicinity. The association is not an exact one but this might be explained by supposing the porphyry as mapped to be the surface expression of a body or bodies that is/are considerably larger below surface.

The anomalous low along line 18 might have a similar cause. It might even be due to a body of acid intrusive of low susceptibility in the footwall of the main fault.

**Recommendations**

A ground electromagnetic survey is recommended with particular attention to the magnetic anomalies described above. Correlation of anomalies might indicate diamond drill targets.

Respectfully submitted,

A.S. Dawson, P.Eng.

405 Vaverley St.,
Winnipeg 9, Man.,
April 10, 1967
CLAIM LOCATION MAP
SHOWING PROPERTY OF
DAERING EXPLORERS CORPORATION LIMITED
LOWER MANITOU LAKE, ONTARIO
Scale 1 inch to 40 chains

AREA OF LOWER MANITOU LAKE
DISTRICT OF KENORA
KENORA MINING DIVISION
SCALE 1 INCH = 40 CHAINS

NOTES
- 400' Reserve around all lakes & 100' around the Forests.
- Private Roads indicated on the map may be used by prospectors only after permission is obtained from the Department of Mines, Kenora.

DEPARTMENT OF MINES
ONTARIO

PLAN NO. M-2007
OVERLAY SHOWING GEOLOGICAL DATA:

Legend:
1. Quartz porphyry, feldspar porphyry
2. Gabbro
3. Conglomerate, some agglomerate & tuff
4. Clastic sediments
5. Agglomerate, tuff
6. Basic volcanics

Source of information:
Map 42c, Ont. Dept. of Mines, "Manitou - Storey Lake Areas" by J.R. Thomson, 1933.

Fault showed by Thomson
Fault inferred from magnetometer survey

LOWER MANITOU LAKE