REPORT ON
AIRBORNE MAGNETOMETER SURVEY
OF THE
MAX LAKE PROJECT AREA OF ONTARIO
FOR
DOME EXPLORATIONS (CANADA) LIMITED

I. INTRODUCTION

This report pertains to the magnetometer portion of an airborne geophysical survey flown on behalf of Dome Explorations (Canada) Limited by Spartan Aero Limited, of Ottawa, in the Max Lake Area of Ontario. The survey was performed by a geophysically equipped Otter aircraft, registration CF-IGM, based at Thunder Bay, during the period from the 4th. to the 10th. of April 1971.

Aeromagnetic data was gathered from a total of 392.7 line miles of survey, 9 miles of which were an extension. Flight lines were spaced 1/8 of a mile apart and oriented approximately N30°W. Mean terrain clearance throughout the survey was 150 feet.

Spartan Aero Limited personnel associated with this project were as follows:

S.T. Taylor  Chief Pilot
W. Craig    Navigator - Co-Pilot
D. Henderson  Electronic Technician
H. Hannan  Data Technician
W. Knappers  Chief Data Technician
D. Fitzsimmons  Chief Draftsman
Data from the survey is presented on one map sheet of scale 1 inch to 1320 feet prepared from an uncontrolled airphoto laydown.

II. INSTRUMENTATION

The instrument flown for this survey is the Gulf Fluxgate Air Magnetometer, Model No. 3, which measures total magnetic intensity. The sensor is mounted in the fuselage of the Otter aircraft and has been compensated for magnetic fields arising from the aircraft. The magnetometer is operated on the 1200 gamma full scale sensitivity setting and the output recorded on a Hewlett Packard rectilinear recorder, Model 7100B which uses 10 inch chart paper. The short term sensitivity is approximately 10 gammas in the above installation and mode of operation and the total dynamic range is 250,000 gammas. The altitude is monitored using a Bonzer Radar Altimeter (non linear output) and this is recorded together with electromagnetic data on a separate recorder (Brush 260).

The entire flight path is photographed by a vertically mounted Aeropath AS-5 35 mm. continuous strip camera.
Synchronization of the film strip and the recorders is accomplished by printing simultaneous numbered time markers on each record every 10 seconds. These fiducials are generated by a Canadian Aero Timing Unit.

The magnetic record is read in the following manner. With the chart oriented so that fiducial numbers increase from the right to the left, upward deflections on the chart indicate increases of the total magnetic field strength of the earth. When the record steps a change of 1000 gammas is indicated. The step number multiplied by 1000 gives a very approximate value of the total magnetic field strength in gammas.

Survey altitude is read from the 6-channel Brush 260 recording, oriented as described above for the magnetic record. The altimeter trace appears on the third channel from the top, altitude increases upwards, two major divisions from the lower edge is 100 feet, the centre line is 150 feet and the upper edge is 300 feet.
III. **SURVEY AND MAP COMPILATION PROCEDURES**

An uncontrolled airphoto mosaic serves as the base map for the survey and an overlay is used for the compilation of the magnetic data.

Flight path recovery is accomplished by relating the strip film to the airphoto mosaic and identified points are designated by their fiducial numbers.

For this survey an arbitrary base level of 5,600 gammas was selected in the centre of the chart for traverse 1. Levelling from profile to profile to remove heading effects etc. is done visually with guidance from the tie line to reduce all profiles to a common base level. The profiles are then transcribed onto the overlay and the data contoured at 25 gamma intervals and drafted. The final isomagnetic contours of the survey area are presented on one map at a scale of approximately 1 inch to 1320 feet.

IV. **GEOLOGY AND RESULTS**

The following material has been used for reference in this report:


2) Ontario Department of Mines - Preliminary Geological Map p.340, Eayrs - Starnes Lake Area, (East Part)

   Scale: 1 inch to ½ mile.
   Scale: 1 inch to 1 mile.

   Scale: 1 inch to 1 mile.

The survey is over an area of Archean and Proterozoic rocks of the Superior Province, overlain unconformably by thin deposits of Pleistocene and Recent glacial drift, gravel, sand and silt. Solid geology is comprised of a sequence of volcanic lavas, tuffs, and agglomerate, chiefly intermediate to basic composition with some interbedded sediments (conglomerate) in the south eastern portion of the survey area. Most of the intermediate and basic lava has been metamorphosed to amphibolite. Intruding the meta-volcanic and meta-sedimentary rocks is a stock of quartz gabbro south of Legris Lake. Granitic rocks are also intruded flanking the survey area on the northwest boundary.

The youngest rock in the area is diabase of Keweenawan age. It occurs as flat sheets up to 250 feet thick and as dykes. The sheets occur mainly at or near the level of the present land surface.
Most of the magnetic activity in the area is characterized by small and irregular lows and highs of about 100 to 300 gamma amplitude. This typical pattern is produced by the diabase sheets containing irregular areas of remanent magnetism. These cover or underlie at a shallow depth, more than half of the survey area. The string of magnetic lows along the east side and to the north of Rinker Lake represent the outcropping edge of a diabase sheet which extends away to the west under Salmi Lake. South of a line running approximately through Max, Kiddman, Jolly and the south end of Vandenberg Brooks Lakes, diabase outcrops or is present at shallow depth. The magnetically higher area (above 6000 gammas) south of Legris Lake represents a mapped quartz gabbro intrusion. South of Stern Lake in the extension area is a strongly anomalous magnetic ridge representing iron formation.

The narrow magnetically low structure running north from Max Lake represents a mapped diabase dyke about 300 feet wide. A similar structure running west from the north end of Max Lake represents a mapped fault, possibly with diabase intruded along its plane. The magnetic low over Tyrrell Lake may reflect a small pipe-like intrusion of diabase.

There is no obvious difference in the magnetic pattern over areas mapped as volcanic lavas and granites in the northwest margin of the area, outside areas influenced by diabase. This may
suggest the volcanic rocks form a fairly thin veneer over the younger granite along this margin.

This discussion has dealt with the more obvious and extensive magnetic phenomena and further study could provide more detailed interpretation.

Respectfully submitted,

E.J. Wilson, B.Sc.,
Geophysicist.

Robert W. Ste*ph, P.Eng.,
Chief Geophysicist.

OTTAWA, ONTARIO,
ADDITIONAL INFORMATION
AIRBORNE MAGNETOMETER SURVEY - MAX LAKE AREA

SURVEY PERSONNEL:
- S.T. Taylor: Pilot
- W. Craig: Navigator, Co-Pilot
- D. Henderson: Electronic Technician
- H. Hannan: Data Technician
- W. Knappers: Chief Data Technician
- D. Fitzsimmons: Chief Draftsman
- G.A. Curtis: Proj. Manager - Geophysicist
- E.J. Wilson: Geophysicist
- R.W. Stamp: Chief Geophysicist

ADDRESS FOR ALL ABOVE: Spartan Aero Limited, 380 Hunt Club Road, Ottawa

DATES OF SURVEY: April 4 - April 10, 1971

TOTAL NO. OF LINE-MILES FLOWN: 392.7

TOTAL AREA COVERED: 46 SQUARE MILES

LINE INTERVAL: 1/8 mile

NO. OF CLAIMS STAKED: 162

AREA OF CLAIMS STAKED: 10 SQUARE MILES

CLAIM NUMBER AND RECORDING DATES:

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RECEIVED
JUL 23 1971

LB:em
Toronto, Ontario
July 21, 1971

*Mining Claim TB 313824 was not covered.