CORPORATION FALCONBRIDGE COPPER

MEMORANDUM

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DATE: July 30, 1985

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TO: A. J. Davidson

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FROM: D. V. Lefebure

SUJET
SUBJECT: 1985 MPH Ground Magnetic Survey, Mt. Sicker, NTS 92B/13

Introduction

Randy Nickson of MPH completed a magnetometer survey of part of CFC's Mt. Sicker grid. The survey was carried out from July 21st to 23rd using an EDA PPM 400 magnetometer and PPM 400 base station. The magnetometer records data to plus or minus 1/10th of a gamma. The base station recorded the magnetic susceptibility every 120 seconds and was used to correct the field data for diurnal variations to the nearest gamma.

The objective of the magnetometer survey was to define the extent and attitude of the mafic intrusion intersected at the ends of drill holes MTS1, MTS7 and MTS9. The mafic intrusion will be called the GD Diorite ("God Damned") for clarity in this memo.

Work Done

Magnetometer readings were taken every 25m with intermediate readings in area of high values. A total of 23 km of line were surveyed on the following lines:

i) 10W to 1W north of baseline;
ii) 0 to 8E from baseline to 8N;
iii) 14E from baseline to 6N;
iv) 16E to 18E from baseline to 6N; and
v) 19E to 24E from baseline to 8N.

The corrected data was printed out on paper tapes (appended) and printed out as profiles at 1:1,000 scale.

An additional line at 1+50E was read from 1+30N to 2+80N to test the magnetometer's response to magnetite-rich bands (Figure 1).

Results

The magnetic susceptibility of the mafic intrusions is almost always higher (>5600 gammas) than the volcanic rocks (approximately 55,900 to 56,100 gammas). The quartz diorite-gabbro intrusion (GD Diorite) exhibits relatively high magnetic susceptibility values which range between 56,500 and 57,809 gammas. The Leona diorite is less magnetic than the GD Diorite with gamma values varying from 56,000 to 56,300 gammas. Magnetite-rich bands interbedded with andesitic tuffs have the highest magnetic susceptibilities (>56,800 gammas) with a maximum reading 59,791 gammas.

The following discussion deals with three areas:

i) west of Postuk-Fulton Fault;

ii) east of Postuk-Fulton Fault; and

iii) Northeast Copper area.

West of Postuk-Fulton Fault

Anomalously high magnetic susceptibility values were found on outcrops of the GD Diorite on lines 9W to 4W. The anomaly has a steep northern edge which is coincident with the intrusion's northern contact. On the other hand the southern edge of the anomaly declines gradually and extends well beyond the southern contact of the GD Diorite. Therefore, both the magnetic and geological data are consistent with an intrusion with a steep northern contact and moderate, southerly-dipping southern margin.

Low gamma values within the anomaly either variation in the magnetite content of the GD Diorite. Clearly the intrusion is not magnetically homogeneous. As well, it is possible the low gamma values are indicating the lense of volcanic rocks (seen in the Chemainus River immediately to the west) continues at depth beneath lines 9W to 5W.

East of Postuk-Fulton Fault

The interpretation of the magnetic data in the area immediately east of the Postuk-Fulton Fault is more complicated because one, the GD Diorite is more than 100 to 200m below the surface; two, magnetite-rich bands occur within some of the overlying volcanic rocks; and three, the moderately

magnetic Leona diorite outcrops immediately to the south. However, there is a broad, moderately magnetic anomaly underlain by volcanic rocks on lines 0E to 5E which is due to the GD Diorite. There is no magnetic evidence of the quartz diorite-gabbro intrusion on lines 6E to 8E and 14E, possibly because it is masked by overlying Leona diorite.

A test line following a Serem cut line at approximately 1+50E showed the magnetite-rich bands are strongly magnetic (Figure 1). The higher gamma values on lines 0E to 4E near the andesite - QFP contact are believed to reflect the presence of abundant magnetite-rich layers in outcrop or subcrop.

Northeast Copper Area

Further to the east a diorite intrusion (Northeast Copper Diorite) north of the Northeast Copper Chert Horizon exhibits similar magnetic susceptibilities to the G D Diorite. Indeed the Northeast Copper diorite could be a faulted (Fortuna Fault) extension of the latter intrusion. The anomalous gamma values from lines crossing outcrops of Northeast Copper Diorite extend south of the southern contact but terminate abruptly at the northern contact. Therefore, the southern contact dips moderately to the south and the northern contact either dips steeply or moderately to the south. The strong negative values on line 24E immediately north of the contact provide some support for the a south-dipping northern contact.

The anomalously high gamma values associated with the Northeast Copper Diorite can be followed as far as the Fortuna Fault, although their magnitude decreases due to the increasing thickness of cover rocks.

Conclusions

1) Ground magnetic data can be used to define the approximate extent of the G D Diorite between 10W and 5E.

2) The Northeast Copper Diorite is a possible eastern faulted extension of the G D Diorite and can be traced with magnetic data from 18E to 24E.

3) Proposed drill holes (P5 to P8, P10, P11) require only minor changes in dip or location to test the Northeast Copper Horizon downdip of the intrusion.

4) The shortest possible hole to test the Postuk-Fulton Horizon downdip of MTS 8 is 425m.

Recommendations

1) Survey lines 15 to 17E and 24E to 28E from baseline to 8N with ground magnetometer.

2) Model the results to determine more accurately the attitude of both G D and Northeast Copper diorites.

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