

GEOPHYSICAL REPORT

on

VLF-EM and MAGNETOMETER SURVEYS

DES CLAIM

DESMOND LAKE AREA, KAMLOOPS M.D., and NICOLA M.D., B.C.

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DES CLAIM : 14.5 kms S30<sup>o</sup>E of the town of Logan Lake  
50<sup>o</sup> 120<sup>o</sup> SW  
: N.T.S. 92I/7E

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Dated : April 29th, 1980



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GEOTRONICS SURVEYS LTD.  
Engineering & Mining Geophysicists  
VANCOUVER, CANADA

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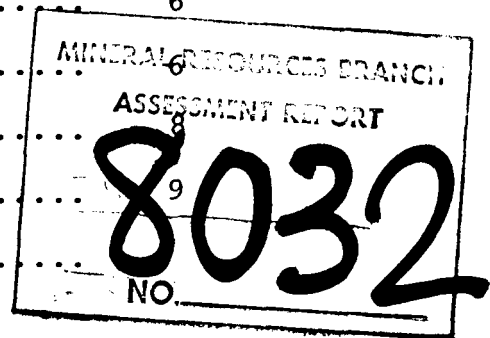


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### SUMMARY

During the last part of September, 1979, a combined magnetic and VLF-EM survey was carried out on the DES Claim. The legal post of the Des Claim is located 14.5 km S30E of the town of Logan Lake, and 0.45 km due west of Desmond Lake. Access to much of the property is easily gained by a two-wheel drive vehicle. The terrain consists of mainly moderate slopes forested with moderately dense coniferous trees and much windfall. The purpose of the surveys was to locate probable zones of copper mineralization through mapping the structure and rock types.

No work has been previously done on the Des Claim but much work has been done in the general area.

The property is mainly underlain by Upper Triassic Nicola Group volcanics. The rock types noted on the property are amygdaloidal basalts and fine-grained andesites. Structure on the property is predominantly north-south, and north-west. Mineralization occurs as bornite, chalcopryrite, and chalcocite within fracture or shear zones within meta-volcanics.

The VLF-EM and magnetic readings were taken every 50 meters on 100-meter separated east-west lines. The VLF-EM and magnetic readings were then profiled and the anomalies plotted on a plan.

CONCLUSIONS

Northerly and northwesterly trending VLF-EM anomalies were located on the Des Claim. These correlate directly with magnetic highs varying from low to high intensities. The VLF-EM anomalies are quite likely reflecting fault, shear or fracture zones which may contain copper sulphides.

RECOMMENDATIONS

1. The VLF-EM and magnetic surveys should be continued over the whole property, but reducing the reading interval to at least 25 m, though the preferable interval would be 12.5 m.
2. A soil geochemistry survey should be carried out over the whole property using the same grid. The samples should be tested for copper. The soil survey done previously cannot be used on this property since it covers only a portion of the property and since it cannot be correlated very accurately to the present grid.
3. The property should be geologically mapped in more detail.
4. Further work that may be recommended is an induced polarization survey and a diamond drilling program but these are contingent upon the results of the soil geochemistry survey and the geological mapping.

## GEOPHYSICAL REPORT

on

### VLF-EM and MAGNETOMETER SURVEYS DES CLAIM

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#### INTRODUCTION AND GENERAL REMARKS

This report discusses the survey procedure, compilation of data, and the interpretation of a very low frequency electromagnetic (VLF-EM) survey and a vertical component magnetic survey carried out on the Des Claim from September 22nd to 29th, 1979.

The survey was carried out by Charles Boitard. A total of 4.1 line km of survey were done with 86 readings taken.

The primary purpose of the VLF-EM survey was to locate geological structure with which may occur copper mineralization. The purpose of the magnetic survey was to map structure as well as lithology.

This work was primarily carried out for assessment work requirements. Therefore, this report should only be considered an interim one. Further work is planned of which a fuller, more detailed report will be written.

PROPERTY AND OWNERSHIP

The Des Claim consists of one claim of 8 units as shown on Figure 2 and as described below:

<u>Claim Name</u>	<u>No. Units</u>	<u>Record No.</u>	<u>Expiry Date</u>
DES	8	1544	November 15, 1979

It is expected this report will extend the expiry date to 1981.

The property is owned by Charles Boitard of Vancouver, British Columbia.

LOCATION AND ACCESS

The legal post of the Des Claim is found about 0.45 km due west of the Desmond Lake and about 14.5 km S30E of the town of Logan Lake.

The geographical coordinates are 50° 25.5'N latitude, and 120° 39'W longitude.

Access to the property is via a good jeep road to the center of the property. The distance by road from the center of the property to the Logan Lake-Kamloops road is approximately 7.2 km. The road junction to the property is 13 km east of Logan Lake on the way to Kamloops.

PHYSIOGRAPHY

The AK Claim lies within the central part of the physiographic division known as the Thompson Plateau which is part of the Interior Plateau System. The terrain is generally that of flat or rolling hills over most of the property. The general trend of the topography is northerly to northwesterly. Elevations vary from 1300 meters a.s.l. along the northern boundary to 1380 meters a.s.l. along the southern boundary to give a relief of only 80 meters.



The terrain varies from flat to swampy. The tree cover is generally of second growth and wind falls, which make it very difficult to walk. The wind falls are at some places 6 to 8 feet high.

The climate is semi-arid with an annual rainfall varying from 25 to 28 cm. The temperature varies from the high extreme in the summer of over 38°C to the low extreme in winter of around -34°C, although the average temperature during the summer would be 16° to 27° and that in winter -6° to 4°.

#### HISTORY OF PREVIOUS WORK

The writer is unaware of any previous work having been done on the Des Claim. However, a variety of work varying from geochemistry and geophysics to trenching and drilling has been done in the area on ground previously staked and now lapsed. Some of this work has covered portions of the Des Claim.

#### GEOLOGY

The property is underlain by a north-south trending zone of the Nicola Group of Upper Triassic sediments and volcanics. Stocks and plugs of acidic intrusives occur throughout the Nicola rocks.

Sookochoff identified amygduloidal basalts and fine-grained andesites on the Des Claim. Mainly propylitic alteration, but also sericite alteration, was noted within the rocks.

The main trends of structure such as faults, shears and fracture zones, over the claim and in the general area is northerly and northwesterly. Some northeasterly trends have been noted as well.

"The writer, (Sookochoff), located minor chalcopyrite-bornite-chalcocite mineralization within meta-volcanics outcropping along the road in the central eastern portion of the property. This mineralization would correlate with the indicated shear zone trending at  $310^{\circ}$  through Dupont Lake and the area of the Dupont showings. Bornite, chalcopyrite and chalcocite are associated with calcite on fracture planes and more rarely as disseminations. Moderate hematite-chlorite alteration with carbonate veinlets and stringers occurs in the area of mineralization."

#### VLF-EM SURVEY

##### 1. Instrumentation and Theory:

A VLF-EM Receiver, Model 27, manufactured by Sabre Electronic Instruments Ltd. of Burnaby, B.C. was used for the survey. This instrument is designed to measure the magnetic component of a very low frequency (VLF) electromagnetic field. The U.S. Navy submarine transmitter located at Seattle, Washington and transmitting at 18.6 KHz. was used.

In all electromagnetic prospecting, a transmitter produces an alternating magnetic field (primary) by a strong alternating current usually through a coil of wire. If a conductive mass such as a sulphide body is within this magnetic field, a secondary alternating current is induced within it which in turn induces a secondary magnetic field that distorts the primary magnetic field. It is this distortion that the EM receiver measures. The VLF-EM uses a frequency range from 16 to 24 KHz. whereas most EM instruments use frequencies ranging from a few hundred to a few thousand Hz. Because of its relatively high frequency, the VLF-EM can pick up bodies of a low conductivity and therefore is more susceptible to clay beds, electrolyte-filling fault or shear zones and porous

horizons, graphite, carbonaceous sediments, lithological contacts as well as sulphide bodies of too low a conductivity for other EM methods to pick up.

Consequently, the VLF-EM has additional uses in mapping structure and in picking up sulphide bodies of too low a conductivity for conventional EM methods and too small for induced polarization (in places it can be used instead of IP). However, its susceptibility to lower conductive bodies results in a number of anomalies, many of them difficult to explain and, thus, VLF-EM preferably should not be interpreted without a good geological knowledge of the property and/or other geophysical and geochemical surveys.

## 2. Survey Procedure:

The VLF-EM survey was run on a grid in which the lines run east-west at 100-meter intervals as shown on Figure 2. Dip angle and field strength readings were taken every 50 meters with the instrument facing towards the transmitter at Seattle. Flagging was placed at each 50-meter station with the grid coordinates marked thereon.

## 3. Compilation of Data:

The readings were plotted in profile form on Figure 3 to 6. The anomalous features of the results were plotted on Figure 2.

## MAGNETIC SURVEY

### 1. Instrumentation and Theory:

The magnetic survey was carried out using a portable vertical component, Model G-110 fluxgate magnetometer manufactured by Sabre Electronic Instruments Ltd. of Burnaby, B.C. This is a visual-null type instrument using a digital dial readout with a range of 100,000 gammas and a reading accuracy of 10 gammas.

Only two commonly occurring minerals are strongly magnetic; magnetite and pyrrhotite, hence, magnetic surveys are used to detect the presence of these minerals in varying concentrations. Magnetic data are also useful as a reconnaissance tool for mapping geologic lithology and structure since different rock types have different background amounts of magnetite and/or pyrrhotite.

2. Survey Procedure:

The readings were taken on the same grid as that for the VLF-EM survey, that is, every 50 meters on east-west lines 100 meters apart.

The magnetic diurnal change was monitored in the field by the closed loop method and double checked by a series of base stations.

3. Compilation of Data:

The magnetic data were profiled on the same figures as that for the VLF-EM data, namely Figure 3 to 6.

DISCUSSION OF RESULTS

The major cause of the VLF-EM anomalies, as a rule, are geologic structures such as fault, shear and breccia zones. It is, therefore, logical to interpret VLF-EM anomalies to likely be caused by these structural zones. Of course, sulphides may also be a causitive source. But in the writer's experience, when VLF-EM anomalies correlate with sulphide mineralization, the anomalies are usually reflecting the structure associated with the mineralization rather than the mineralization itself.

There are three main anomalies and four one-line anomalies all of which occur on line 50S.


The major trend of the VLF anomalies, as seen on Figure 2 is primarily north and northwest. This is in general agreement with that on the known structure in the area as noted by Sookochoff. It is quite possible that sulphides may occur with the structure as reflected by the VLF-EM anomalies.

The magnetic results vary from about 5440 gammas to 5570 gammas giving a general range of 130 gammas. One high reaches about 5590 gammas. The range is quite small though the data appears to be fairly noisy. This is fairly typical of the Nicola volcanics.

It is very interesting to note that magnetic highs varying from a low intensity to a high intensity correlate both directly with and adjacent to the VLF-EM anomalies. It appears that magnetite is associated with the structure and therefore there seems to be an increased possibility of economic sulphides occurring with the structure as well.

A small magnetic high occurs on the western part of the survey area. This may reflect a different rock type or simply a remobilized magnetite.

Respectfully submitted,  
GEOTRONICS SURVEYS LTD.,

  
David G. Mark  
Geophysicist

April 29th, 1980

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Aeromagnetic Map, Mamit Lake, B.C. Geol. Surv. of Can.,  
Map 5212G, Sheet 92I/7, 1968.

Cockfield, W.E., Geology and Mineral Deposits of the Nicola  
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Sookochoff, Laurence, Geological Report on the Desmond Lake  
Property, Nicola M.D., B.C. October 12, 1976.

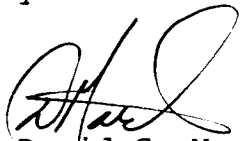
GEOPHYSICIST'S CERTIFICATE

I, DAVID G. MARK, of the City of Vancouver, in the Province of British Columbia, do hereby certify:

THAT I am a Consulting Geophysicist of Geotronics Surveys Ltd., with offices at 420-890 West Pender Street, Vancouver, British Columbia.

I further certify:

1. I am a graduate of the University of British Columbia (1968) and hold a B.Sc., degree in Geophysics.
2. I have been practising my profession for the past twelve years and have been active in the mining industry for the past fifteen years.
3. That I am an active member of the Society of Exploration Geophysicists and a member of the European Association of Exploration Geophysicists.
4. This report is compiled from data obtained from VLF-EM and magnetic surveys carried out by Charles Boitard during the last part of September, 1979.
5. I do not hold any interest in the Des Claim nor do I expect to receive any interest as a result of writing this report.

  
David G. Mark  
Geophysicist

April 29th, 1980.

AFFIDAVIT OF EXPENSES

The VLF-EM and magnetic surveys were carried out on the DES Claim, Desmond Lake Area, Kamloops Mining Division and Nicola Mining Division, British Columbia to the value of the following:

FIELD

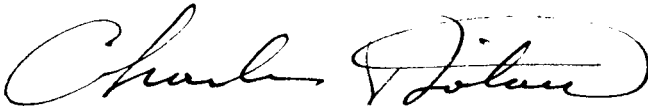
Geophysical Technician, 30 hours at \$20/hour	\$ 600.00
Vehicle rental	150.00
Room and Board	150.00
	<hr/>
	\$ 900.00

REPORT

Geophysicist, 6 hours at \$35/hour	\$ 210.00
Geophysical technician, 20 hours at \$20/hour	380.00
Typing, xeroxing and compilation	110.00
	<hr/>
	\$ 700.00

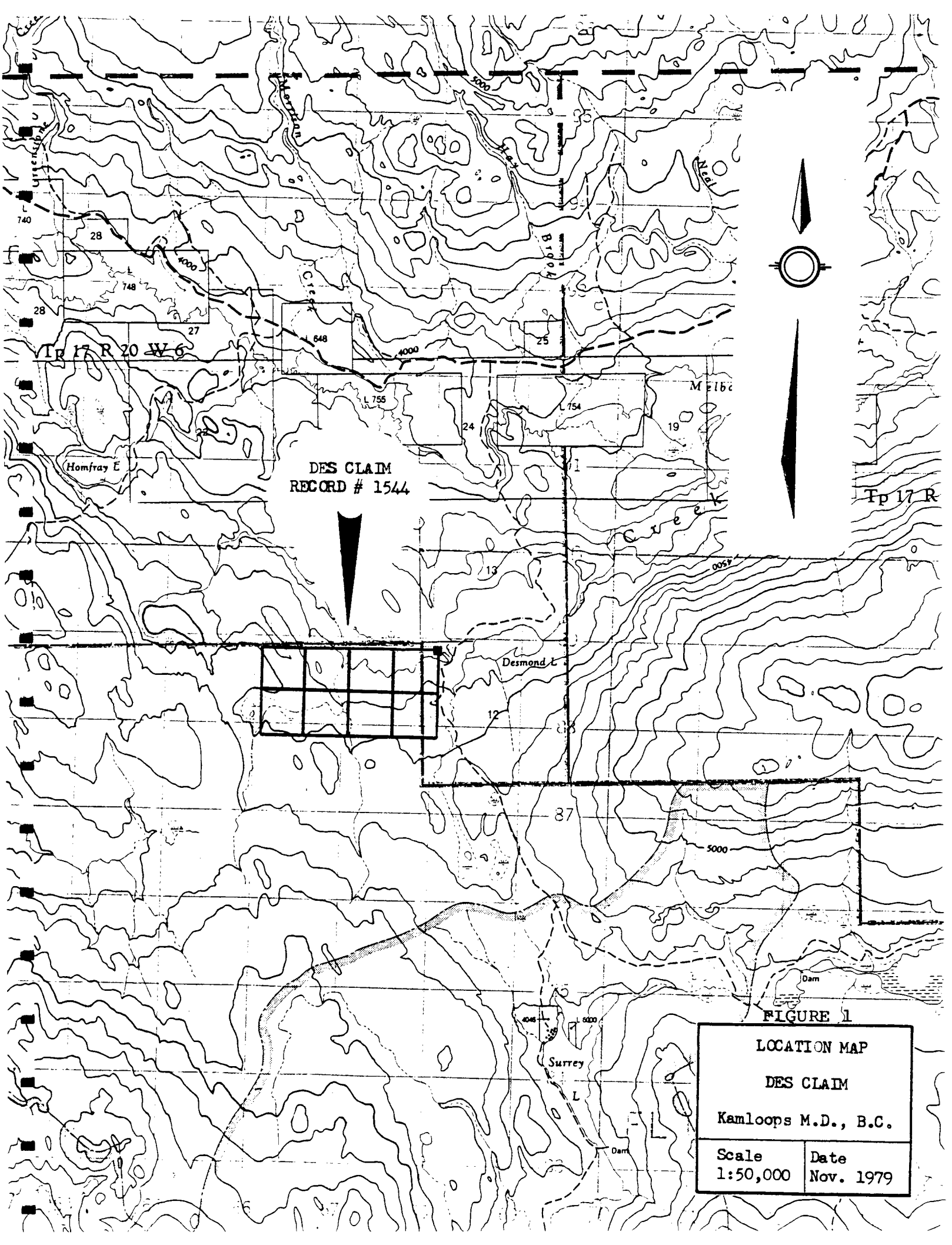
TOTAL.....	<hr/> <hr/> \$1,600.00
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Respectfully submitted,



Charles Boitard





DES CLAIM  
RECORD # 1544

Tp 17 R 20 W 6

Tp 17 R

FIGURE 1

LOCATION MAP	
DES CLAIM	
Kamloops M.D., B.C.	
Scale	Date
1:50,000	Nov. 1979

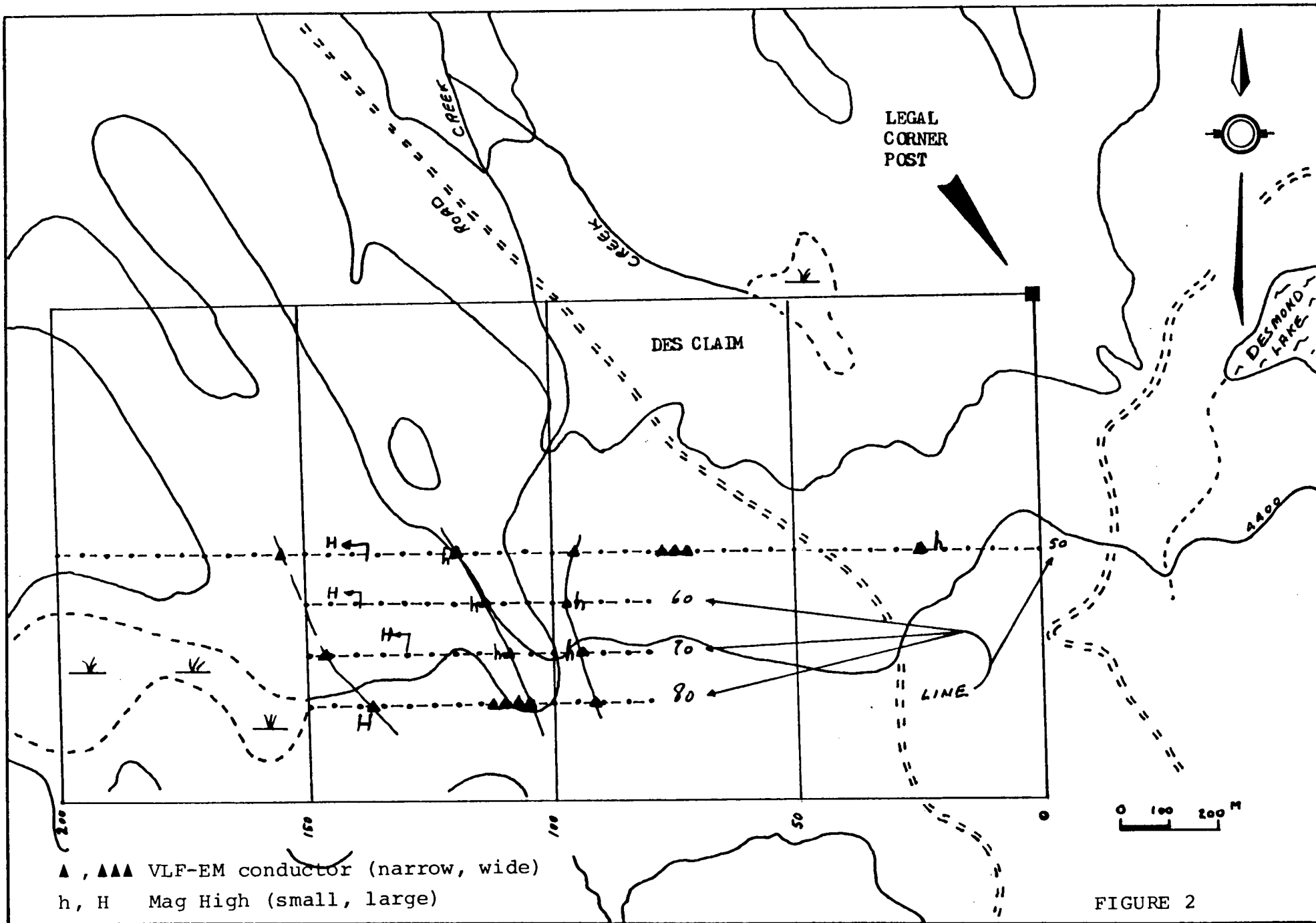


FIGURE 2

DES CLAIM

Line 50S reading stations at 50 meter intervals

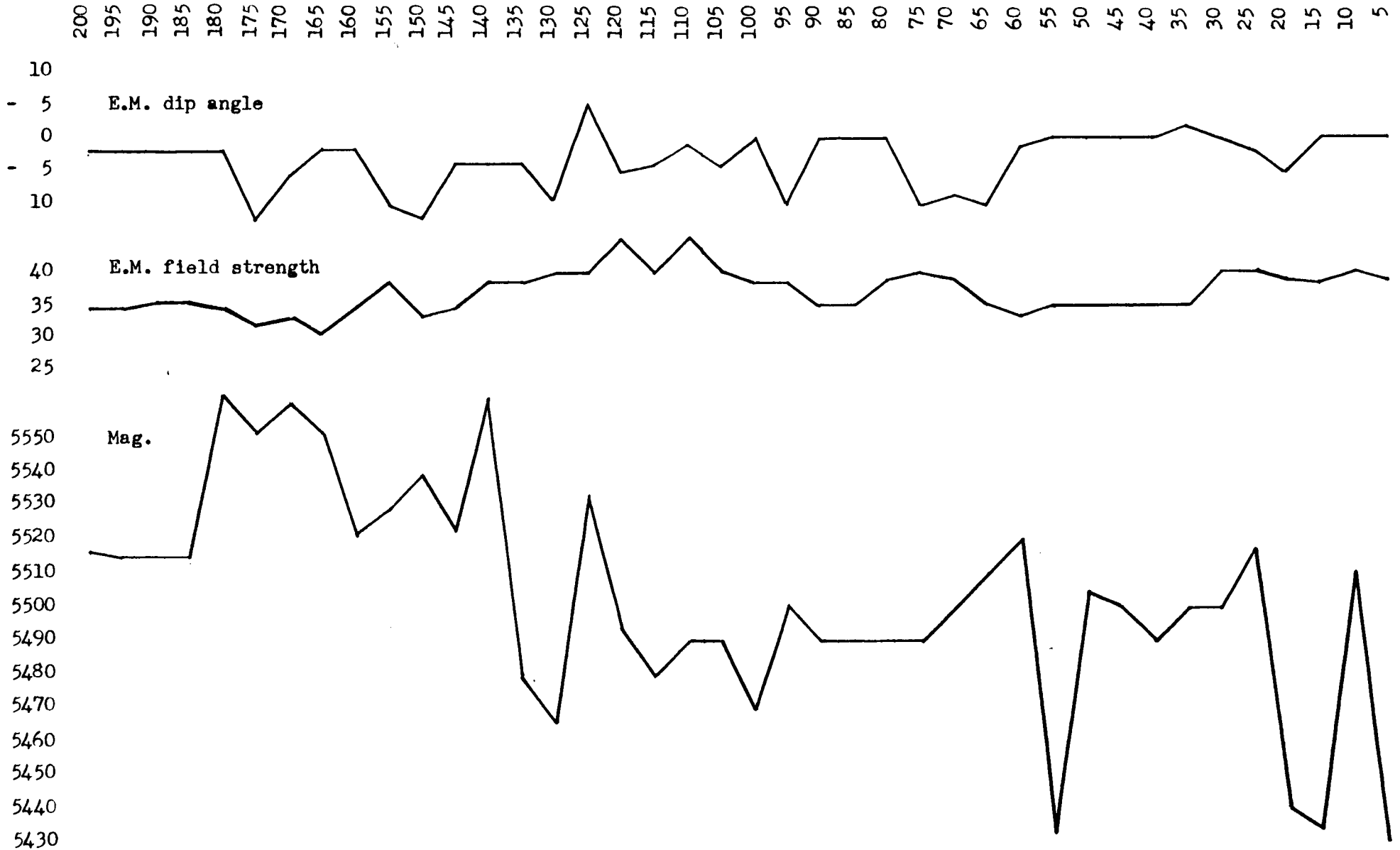


FIGURE 3

DES CLAIM

Line 60S reading stations at 50 meter intervals

150 145 140 135 130 125 120 115 110 105 100 95 90 85 80

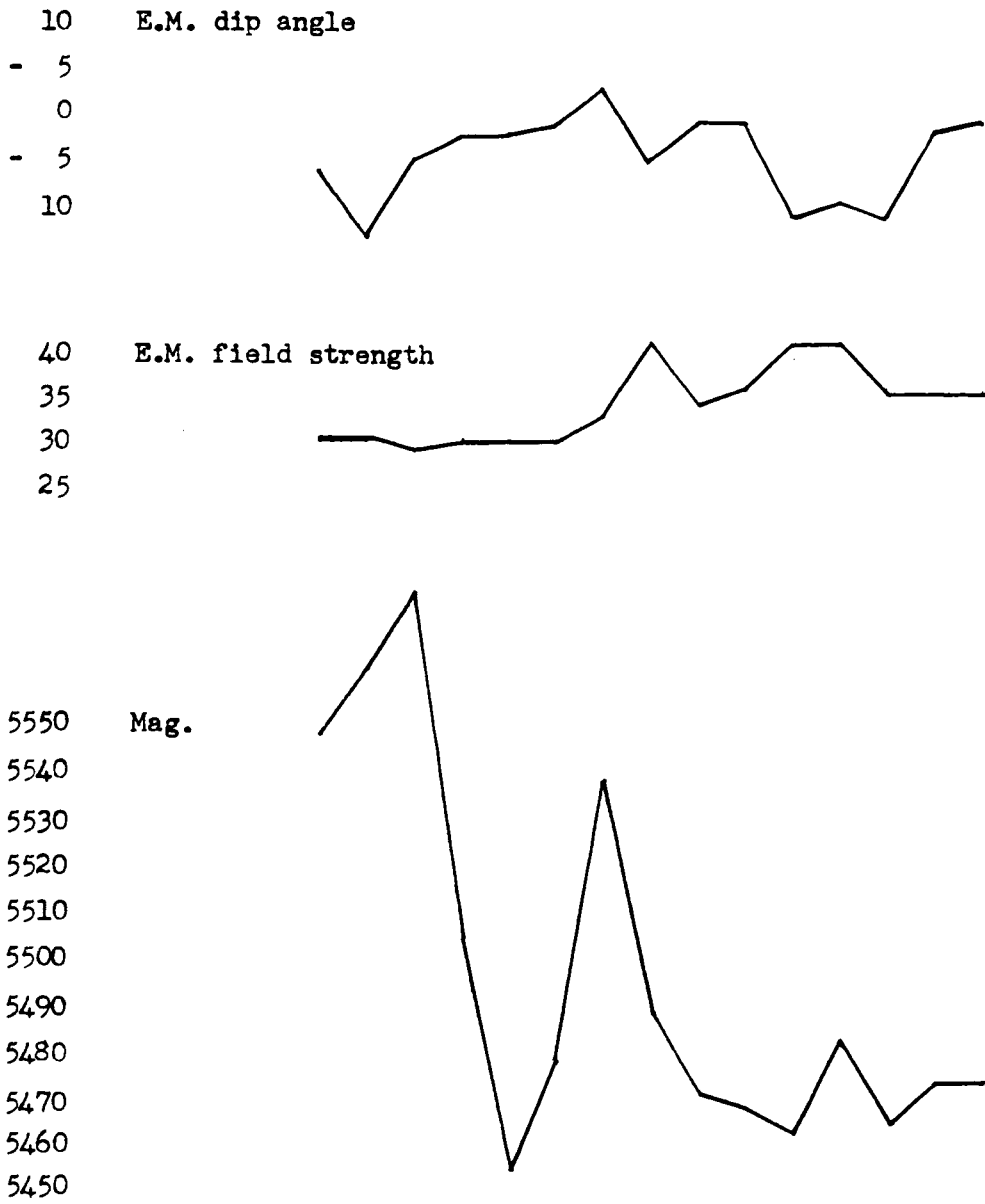


FIGURE 4

DES CLAIM

Line 70S reading stations at 50 meter intervals

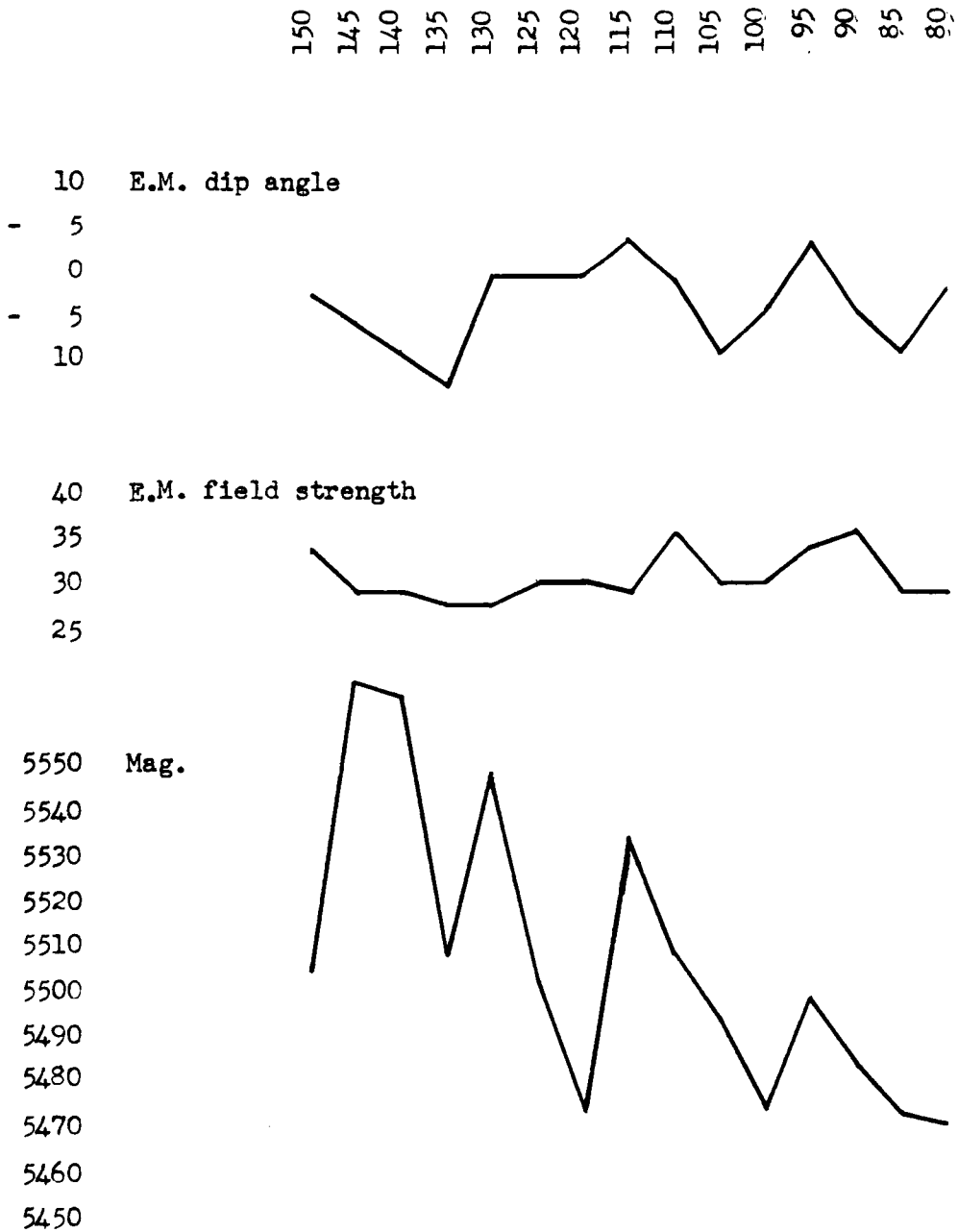


FIGURE 5

DES CLAIM

Line 80S reading stations at 50 meter intervals

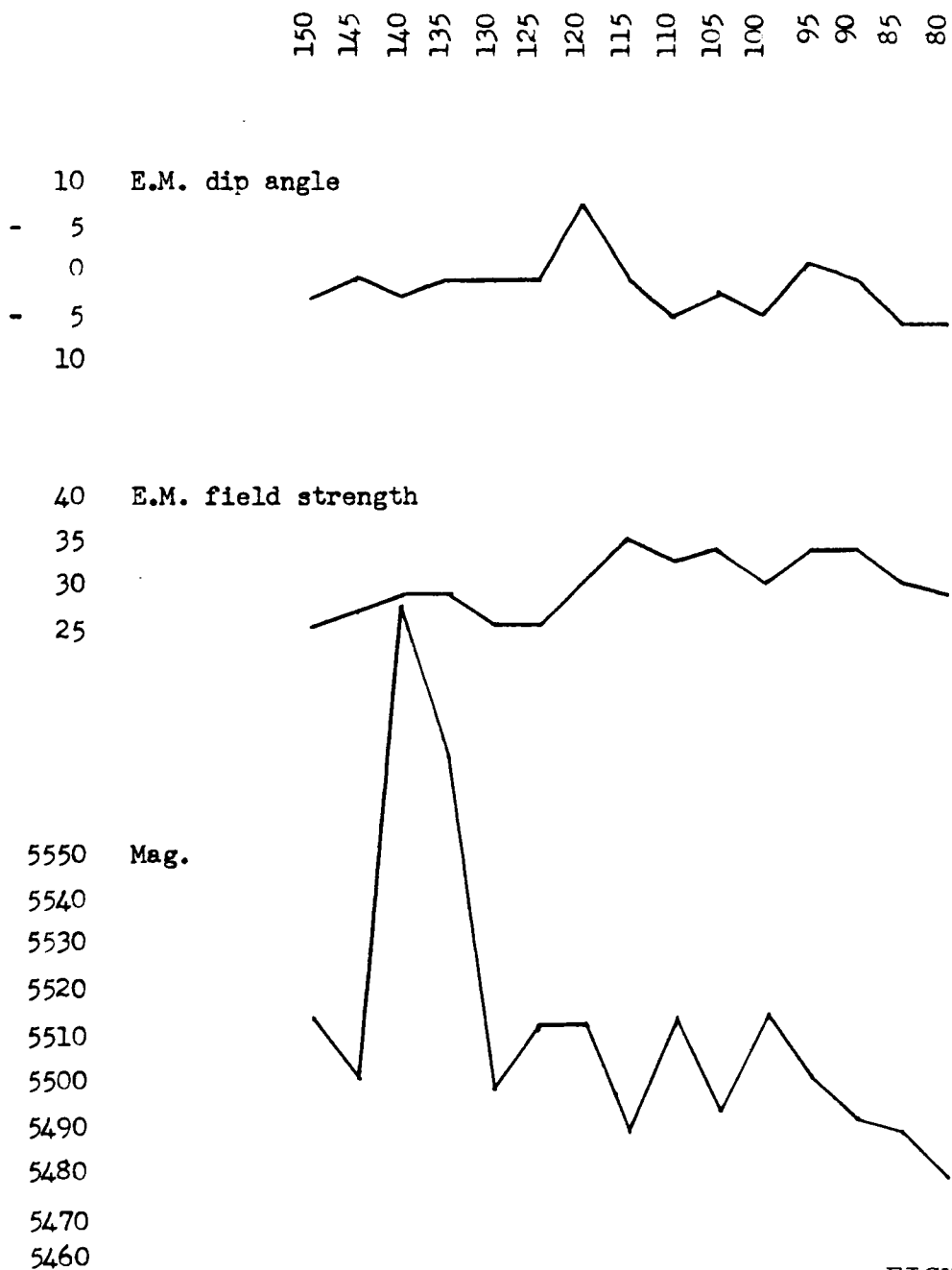


FIGURE 6