

11735

COMINCO LTD.

EXPLORATION

WESTERN DISTRICT

NTS: 82F/16

HORIZONTAL LOOP EM AND
MAGNETIC SURVEYS ON VULCAN
CLAIMS 4, 5, 6 and 7

- ASSESSMENT REPORT -

FORT STEELE MINING DIVISION, B.C.

Latitude : 49°45'N

Longitude : 116°20'W

Claim Owner and Operator : COMINCO LTD.

Work Performed by : Mike Rogers, Syd Visser & Ingo Jackisch
between June 20th and August 2nd, 1983

GEOLOGICAL BRANCH
ASSESSMENT REPORT

11,735

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CLAIMS 4, 5, 6 and 7

LIST OF CLAIMS

Cominco Ltd. Interest - 100%

The claims listed below are covered or partially covered by the prepared grid used for the geophysical survey described in this report.

<u>Name</u>	<u>Number of Units</u>	<u>Record Number</u>	<u>Expiry Date</u>
Vulcan 4	18	1739	December 15, 1983
Vulcan 5	12	1740	December 15, 1983
Vulcan 6	18	1741	December 15, 1983
Vulcan 7	6	1742	December 15, 1983

INTRODUCTION

Over the past 25 years the property entitled "Vulcan" has seen a wide variety of geological, geochemical, geophysical and diamond drilling activity. The general boundaries of the Vulcan locale are Dewar Creek on the west, White Creek to the east and the White Creek Batholith bounding the north. Various areas within these boundaries have been claimed by Cominco Ltd., as well as Texas Gulf, during the 25-year period.

In the spring of 1983, linecutting commenced to cover an area underlain by Aldridge stratigraphy which is known to host the Sullivan orebody in Kimberley, B.C. Plate 254-83-1a is a general location map of the Vulcan claim group. Plate 254-83-1b outlines the grid cut over the Vulcan 4 to 7 claims. The resulting grid dimensions are 1.7 km long lines, 200 metres apart crossing geologic strike along a 2,4 km length. A total of 22.4 km of HLEM and 25.6 km of magnetics surveying was completed with the nominal station spacing being 25 m.

FIELD WORK

The field programme began in late June and occupied the better part of the following month. Owing to the rugged terrain and lengthy hikes to reach the most northerly lines, progress was slow. Originally it was suggested that a third person could act as both data recorder of HLEM and operator of the magnetometer. The logistics and terrain limited that idea to being carried out only during the one day on the west side of the Dewar Creek. In the steeper terrain the third person was needed to pull the cable and unpin the cable when it became caught in talus.

Access to the grid is along the St. Mary's Lake road, approximately 20 km west of St. Mary's Lake. The major portion of the grid is to the north of Dewar Creek and contains the Dewar Creek road along its southern boundary. The northern lines were accessed by walking up either of the two tie lines on the ends of the grid. The smaller section of the grid south of Dewar Creek was reached via the West Fork road, several impassable cat trails, and finally bushwhacking.

The linecutters were still working on the grid at the geophysical crews' arrival. This permitted the reinforcement of the stringent chaining methods needed to maintain the high degree of chaining accuracy required for HLEM surveying. The lines were slope-chained by the linecutters and the standard chaining forms used to note the distance and slope information. Distance corrections were computed to account for the rugged terrain. By using these corrections, the operator is able to maintain the coil separation at the nominal value (in this survey either 100 m or 150 m) and no correction of the resultant data is necessary.

The horizontal loop survey used the Apex Parametrics MaxMin II system with a coil separation of 100 metres on all but three northern lines where depth to bedrock was suspected to be increasing. On these three lines a 150 metre cable between transmitter and receiver was employed. Readings were taken at 25 metre intervals along all the lines surveyed using the 100 metre cable while two of the three lines with the 150 metre coil separation had 50 metre reading intervals. Three frequencies (3555 Hz, 1777 Hz, and 444 Hz) were monitored throughout the survey with selected lines hand-plotted in stacked profile form to check for chaining inaccuracies.

The magnetics survey used a pair of Scintrex MP-2 proton precession magnetometers base shifted and drift corrected using a base station on the grid and closing loops at intervals no greater than 2 hours. While the normal station spacing was 25 metres, on sections of medium and high magnetic gradients the spacing was decreased to 12.5 metres and 6.25 metres respectively.

DATA PRESENTATION

The maps and results are presented as follows:-

Plate 254-83-1a (in text)	Vulcan Claim Location Map Scale 1:50,000
Plate 254-83-1b (in text)	Outline of Vulcan Grid Scale 1:10,000
Plate 254-83-2 (in envelope)	Horizontal Loop EM c.s. = 100 m & 150 m; f = 444 Hz Scale 1:5,000; 1 cm = 10%
Plate 254-83-3 (in envelope)	Horizontal Loop EM c.s. = 100 m & 150 m; f = 1777 Hz Scale 1:5,000; 1 cm = 10%
Plate 254-83-4 (in envelope)	Horizontal Loop EM c.s. = 100 m & 150 m; f = 3555 Hz Scale 1:5,000; 1 cm = 10%
Plate 254-83-5 (in envelope)	Magnetometer Data Scale 1:5,000; 1 cm = 200 gammas Lines 2000N - 4400N
Plate 254-83-6 (in envelope)	Magnetometer Data Scale 1:5,000; 1 cm = 200 gammas Lines 2000E & 3700E

INTERPRETATION

The horizontal loop data, collected at three frequencies, is presented in plan profile form on Plates 254-83-2 through 4 for frequencies 444 Hz, 1777 Hz and 3555 Hz. The major conductors are outlined on Plate 254-83-3, showing their axes position and strike length.

The topmost conductor is of poor conductance with an approximate strike length of 500 metres and depth-to-top varying between 30 and 60 metres. The magnetic response of this conductor varies between 100 and 300 gammas.

Of the two parallel conductors that strike approximately $N20^{\circ}E$, the eastern conductor is more shallow than the topmost conductor, being 15-40 metres below the surface, while the western conductor has similar depth-to-top estimates to the topmost conductor. While these two conductors exhibit better conductances than the topmost conductor has, they are still in the poor to moderate class in that regard. With the two conductors in such close proximity to one another, dip evaluations are difficult. The response curves appear to indicate steeply dipping conductors. There is poor magnetic correlation with both these conductors. It is likely that any coincident magnetic anomalies are caused by unrelated sources.

Other anomalous response curves, especially those observed on the high frequency, are caused by conductors of such low conductivities and small depth-to-top values that their likely cause is thickening in the overburden. Some response curves of the in-phase component have identical amplitudes at all frequencies. This is due to chaining errors and is a major reason why three frequencies are monitored.

The magnetic data indicates an alteration in the geological environment between Lines 4000N and 3800N. A thinning of the overburden in the northern portion of the grid, due to marked elevation changes, is at least partially responsible for this magnetic feature.

CONCLUSIONS

Of the four bedrock conductors outlined by the HLEM survey and indicated on Plate 254-83-3, the southerly pair have conductances marginally above the poor class. The general lack of magnetic correlation with these two conductors is disappointing, being an important factor in their disfavour.

Submitted by: *Mike Rogers*
Michael Hugh Rogers, B.Sc.
Exploration Geophysicist
Marston Geophysics Ltd.

Endorsed by: *[Signature]*
G. Harden,
Manager, Exploration
Western District
Cominco Ltd.

Approved for
Release: *John Hamilton*
J. M. Hamilton, P.Eng.
Chief Geologist, Kimberley
Cominco Ltd.

MHR/jel

DISTRIBUTION:

Mining Recorder	(2)
Kootenay Exploration	(2)
Western District Expl.	(1)
Geophysics Group	(1)

APPENDIX I

APPENDIX I

IN THE MATTER OF THE B.C. MINERAL ACT
AND IN THE MATTER OF A GEOPHYSICAL PROGRAMME
CARRIED OUT ON THE VULCAN CLAIMS 4, 5, 6 AND 7
LOCATED 20 KM WEST OF KIMBERLEY, B.C.
IN THE FORT STEELE MINING DIVISION OF THE
PROVINCE OF BRITISH COLUMBIA, MORE PARTICULARLY
N.T.S. 82F/16

S T A T E M E N T

I, MICHAEL HUGH ROGERS, of the City of Vancouver in the Province of British Columbia, make oath and say:-

1. THAT I am employed as a geophysicist by Marston Geophysics Ltd., on contract with Cominco Ltd. and, as such have a personal knowledge of the facts to which I hereinafter depose;
2. THAT annexed hereto and marked as "Exhibit A", to this statement is a true copy of expenditures incurred on geophysical survey on the Vulcan mineral claims;
3. THAT the said expenditures were incurred between June 20th and August 2nd, 1983, for the purpose of mineral exploration of the above-noted claims.



Michael Hugh Rogers, B.Sc.
Exploration Geophysicist
Marston Geophysics Ltd.

EXHIBIT "A"

STATEMENT OF GEOPHYSICAL EXPENDITURES (1983)

VULCAN 4, 5, 6 and 7 CLAIMS

1. SALARIES

Preparation, Field Work, Mob/Demob,
Interpretation, etc \$ 10,855.00

Geophysicists - S.J. Visser
M.H. Rogers
I. Jackisch
Assistant - R. Fregin

2. EQUIPMENT AND TRUCK RENTAL 830.00

3. EXPENSE ACCOUNTS 1,873.00

Total Cost \$ 13,558.00

I certify this to be a true statement of expenditures for the geophysical survey on the VULCAN 4, 5, 6 and 7 claims in 1983.



Michael Hugh Rogers, B.Sc.
Exploration Geophysicist
Marston Geophysics Ltd.

APPENDIX II

A P P E N D I X I I

C E R T I F I C A T I O N

I, MICHAEL HUGH ROGERS, of 3456 West 10th Avenue, in the City of Vancouver, in the Province of British Columbia, do hereby certify that:-

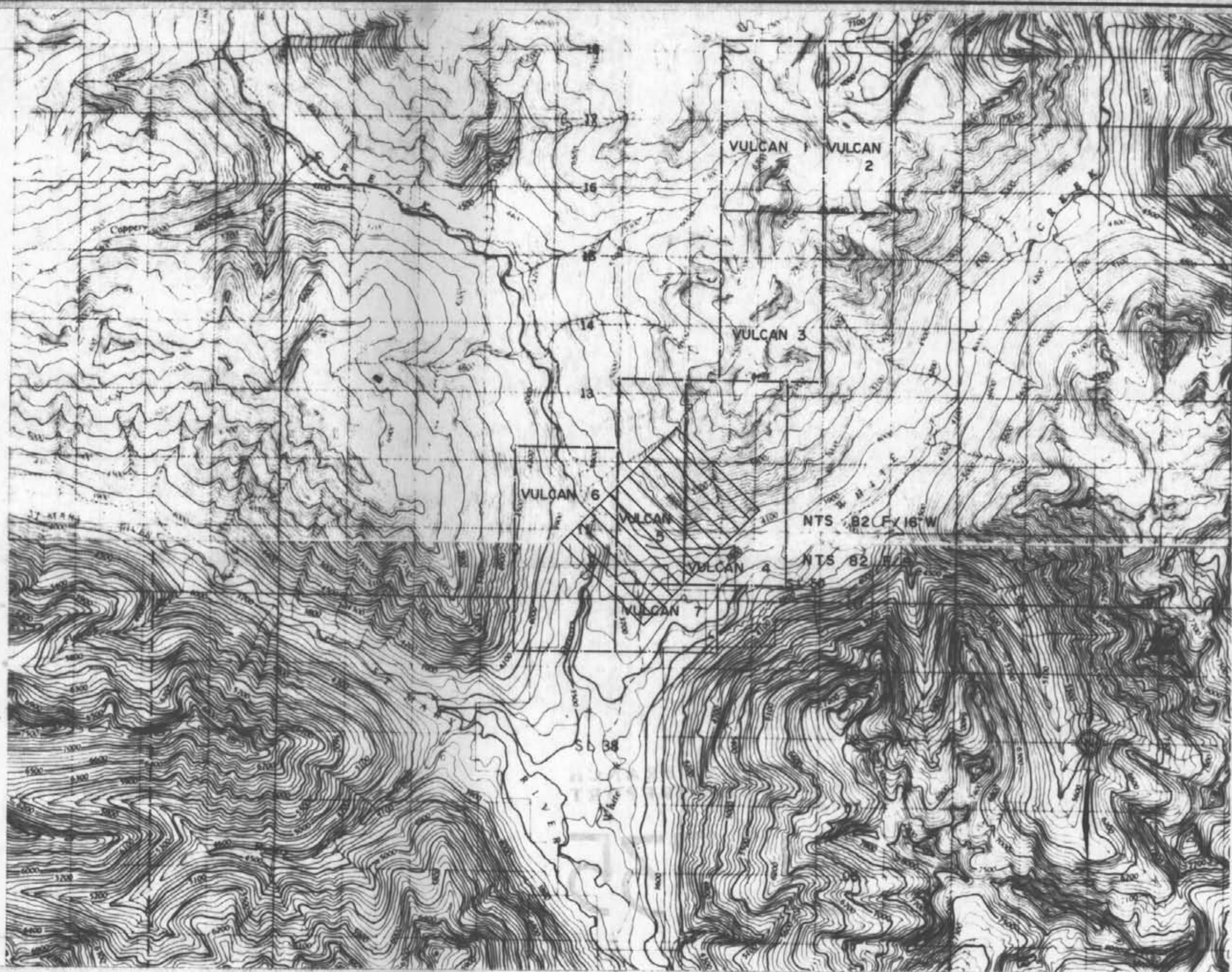
1. I graduated from the University of Western Ontario in 1972 with an Honours B.Sc. in Geophysics, and from the University of Toronto in 1975 with a B.Ed. in Science and Geography.

2. I am a registered member of the Society of Exploration Geophysicists, European Association of Exploration Geophysicists, and the British Columbia Geophysical Society.

3. I have been practicing my profession for seven years.



Michael Hugh Rogers, B.Sc.
Exploration Geophysicist
Marston Geophysics Ltd.



TO ACCOMPANY A REPORT BY M.H. ROGERS *M.H. Rogers*

VULCAN GROUP 11,735

N.T.S.
82-F-9/16W

Drawn by:	Traced by:
Revised by	Date

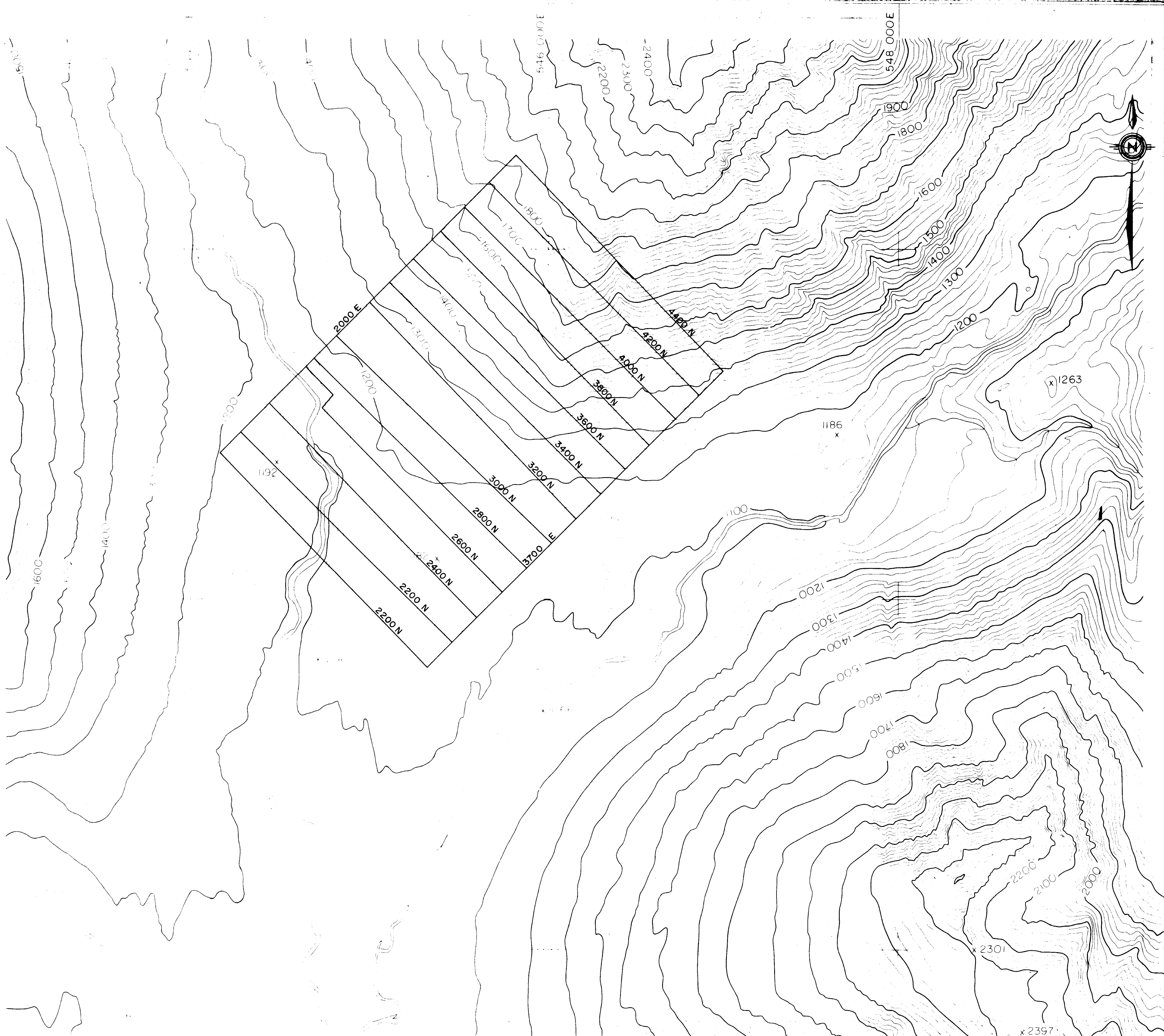
CLAIM AND GRID
LOCATION MAP

FORT STEELE
M.D., B.C.

Scale: 1:50,000

Date: OCTOBER 1983

Plate: 254-83-1a



GEOLOGICAL BRANCH
 REPORT

11,735



TO ACCOMPANY A REPORT BY M.H. ROGERS *M.H. Rogers*

VULCAN CLAIMS

GRID LOCATION MAP

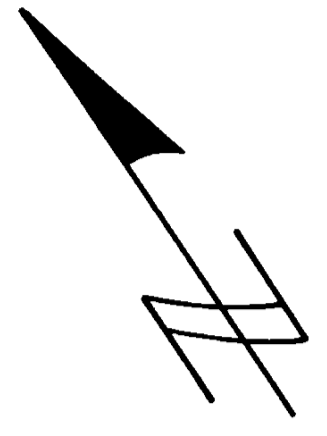
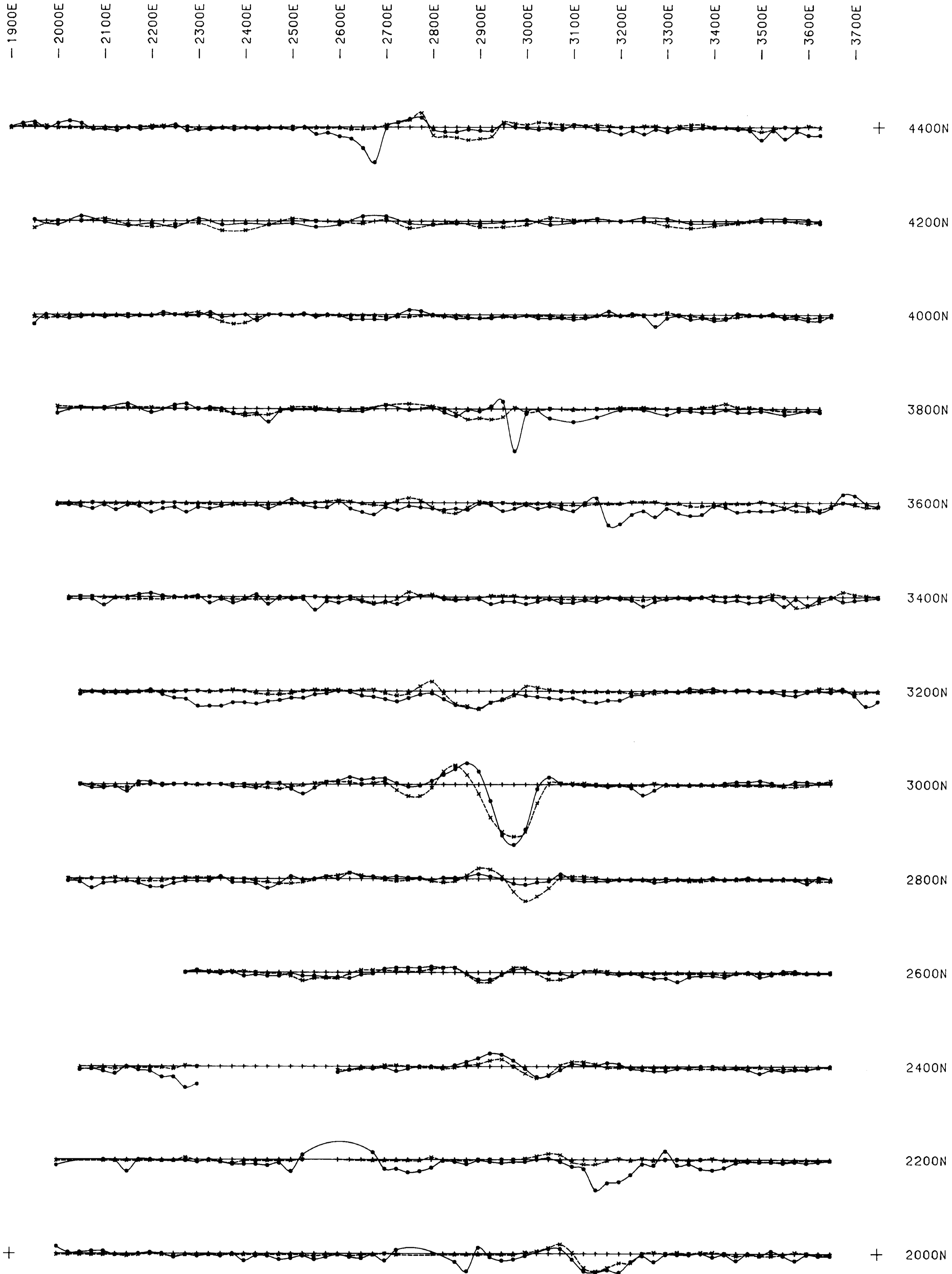
FORT STEELE M.D., B.C.

Scale: 1:10,000 Date: OCTOBER 1983 Plate: 254-83-1b

Drawn by:	Traced by:
Revised by:	Revised by:
Date:	Date:

NTS.
82-F-9/16W

FORM 510-0000



INSTRUMENT : APEX PARAMETRICS
MAX-MIN II

10.00%
444 IP IN-PHASE COMPONENT
10.00%
444 OP QUADRATURE COMPONENT
(OUT-OF-PHASE)



GEOLOGICAL RESEARCH
ASSESSMENT REPORT

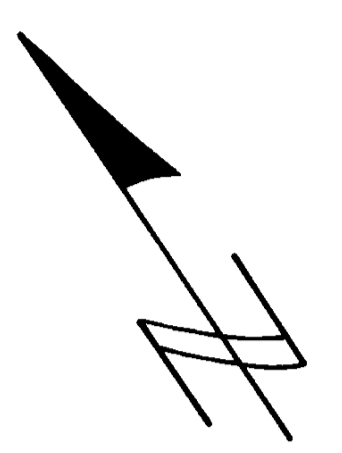
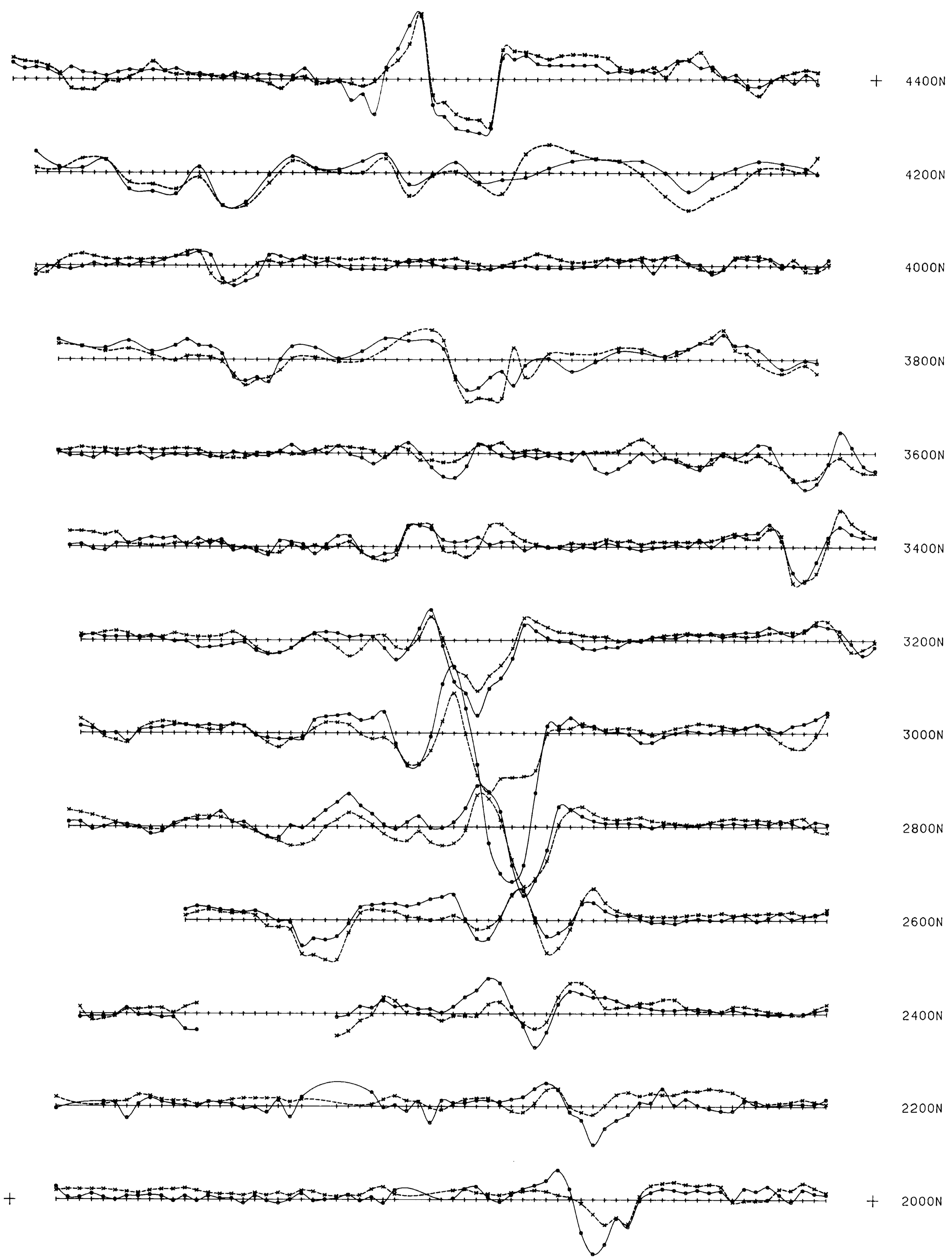
11,735

VULCAN 1983 444 IP
444 OP

TO ACCOMPANY A REPORT BY M.H. ROGERS *M.H. Rogers*

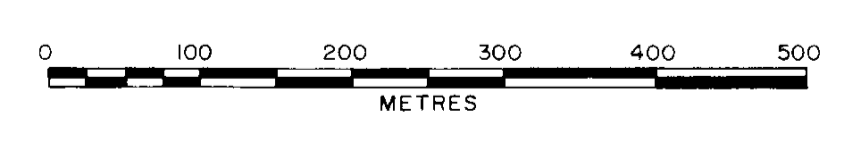
VULCAN CLAIMS				N.T.S. 82-F-9/16W
Drawn by:		Traced by:		HORIZONTAL LOOP EM f = 444 Hz FORT STEELE M.D., B.C.
Revised by:	Date:	Revised by:	Date:	
Scale: 1:5000		Date: OCTOBER 1983		Plate: 254-83-2

- 1900E
 - 2000E
 - 2100E
 - 2200E
 - 2300E
 - 2400E
 - 2500E
 - 2600E
 - 2700E
 - 2800E
 - 2900E
 - 3000E
 - 3100E
 - 3200E
 - 3300E
 - 3400E
 - 3500E
 - 3600E
 - 3700E



INSTRUMENT: APEX PARAMETRICS
MAX-MIN II

1 cm 10.00% 3555 IP IN-PHASE COMPONENT
 1 cm 10.00% 3555 OP QUADRATURE COMPONENT (OUT-OF-PHASE)



GEOLOGICAL BRANCH
ASSESSMENT REPORT

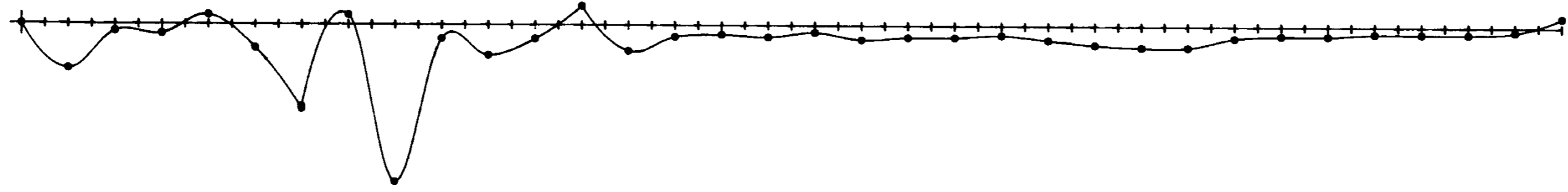
11,735

VULCAN 1983 3555 IP 3555 OP

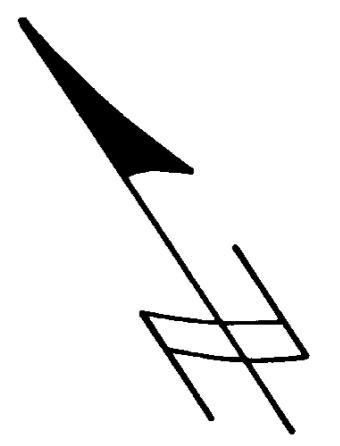
TO ACCOMPANY A REPORT BY M.H. ROGERS *M.H. Rogers*

VULCAN CLAIMS				N.T.S. 82-F/9/16W
Drawn by:	Traced by:	HORIZONTAL LOOP EM f = 3555 Hz FORT STEELE M.D., B.C.		
Checked by:	Verified by:			
		Scale: 1:5000	Date: OCTOBER 1983	File: 254-83-4

— 4400N
 — 4300N
 — 4200N
 — 4100N
 — 4000N
 — 3900N
 — 3800N
 — 3700N
 — 3600N
 — 3500N
 — 3400N
 — 3300N
 — 3200N
 — 3100N
 — 3000N
 — 2900N
 — 2800N
 — 2700N



3700E

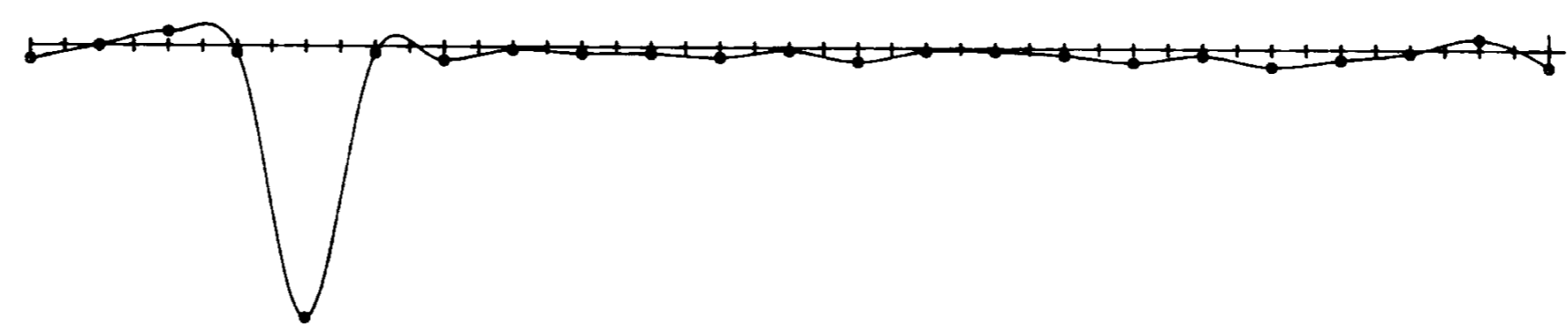


INSTRUMENT: SCINTREX M-P 2 PROTON PRECESSION MAGNETOMETER

—●— TOTAL MAGNETIC FIELD INTENSITY

1 cm
 200.00 Gammas
 CORR'D VALUE - 58000 Gammas

+



2000E

GEOLOGICAL BRANCH
 ASSESSMENT REPORT

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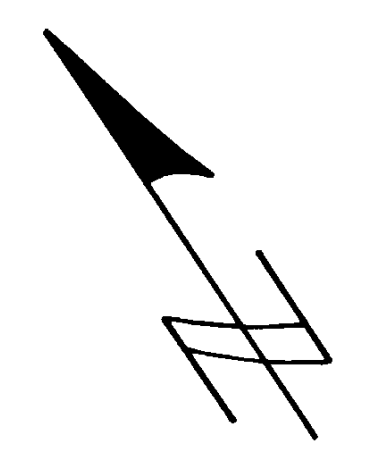
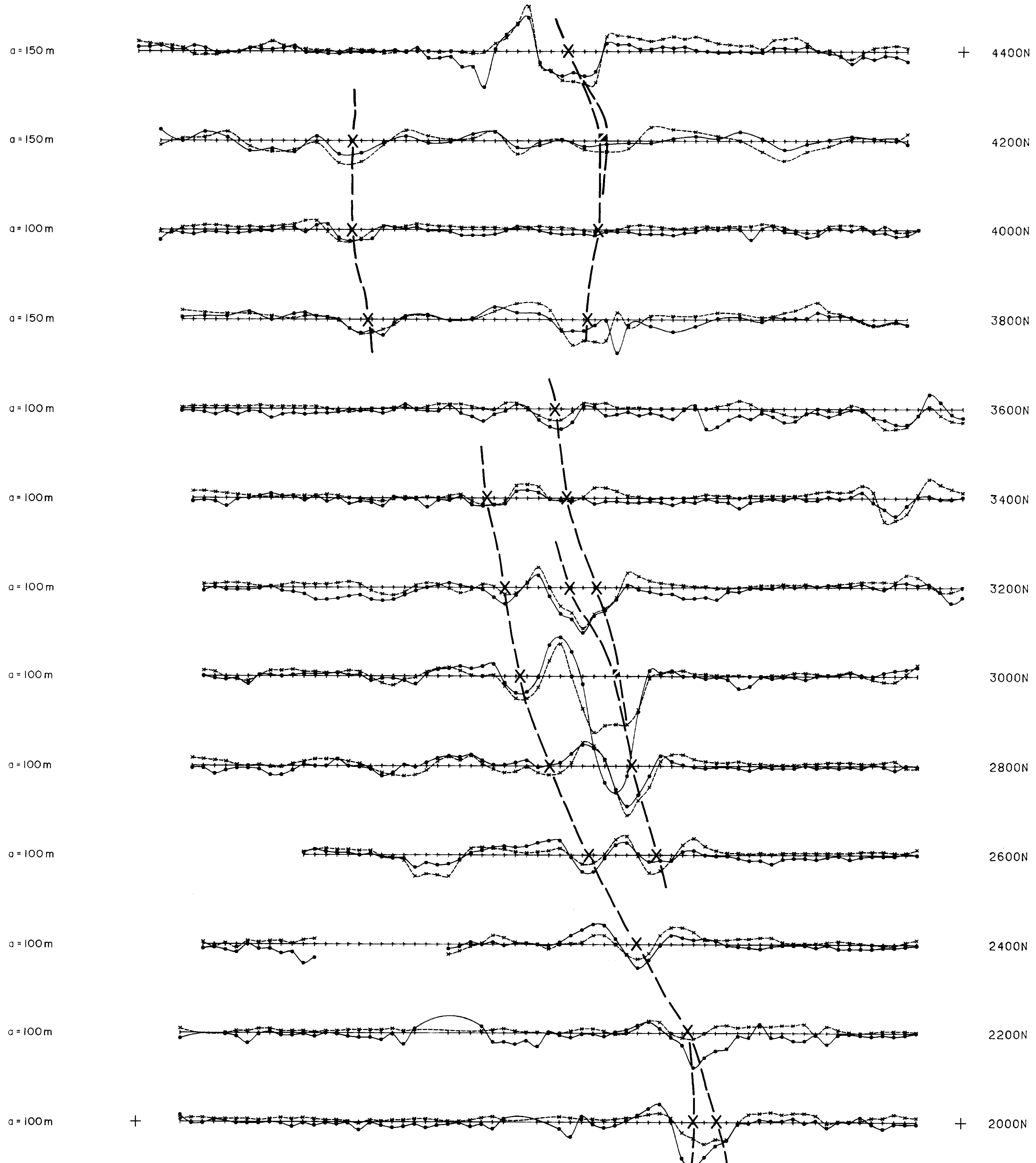


VULCAN MAGNETICS SURVEY
 CORRECTED VALUE — 58000 Gammas

TO ACCOMPANY A REPORT BY M.H. ROGERS *M.H. Rogers*

VULCAN CLAIMS				N.T.S. 82-F-9/16W
Drawn by:	Traced by:	MAGNETIC DATA, PROFILES		
Checked by:	Reviewed by:	Lines 2000E & 3700E		
		FORT STEELE M.D., B.C.		
		Scale: 1: 5000	Date: OCTOBER 1983	Plate: 254-83-6

- 1900E - 2000E - 2100E - 2200E - 2300E - 2400E - 2500E - 2600E - 2700E - 2800E - 2900E - 3000E - 3100E - 3200E - 3300E - 3400E - 3500E - 3600E - 3700E



X CONDUCTOR AXIS (THIN)
 CONDUCTOR AXIS (THICK)
 CONDUCTOR STRIKE
 a = 100m COIL SEPARATION PARAMETER

INSTRUMENT: APEX PARAMETRICS
 MAX-MIN II

10.00%
 1777 IP IN-PHASE COMPONENT
 10.00%
 1777 OP QUADRATURE COMPONENT
 (OUT-OF-PHASE)

GEOLOGICAL BRANCH
 ASSESSMENT REPORT

11,735

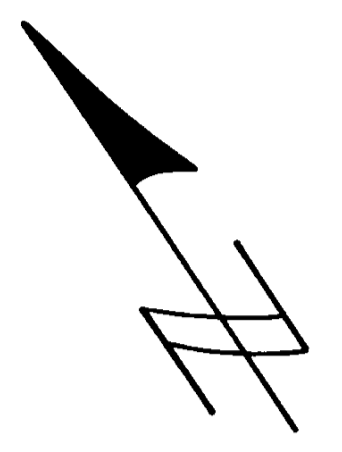
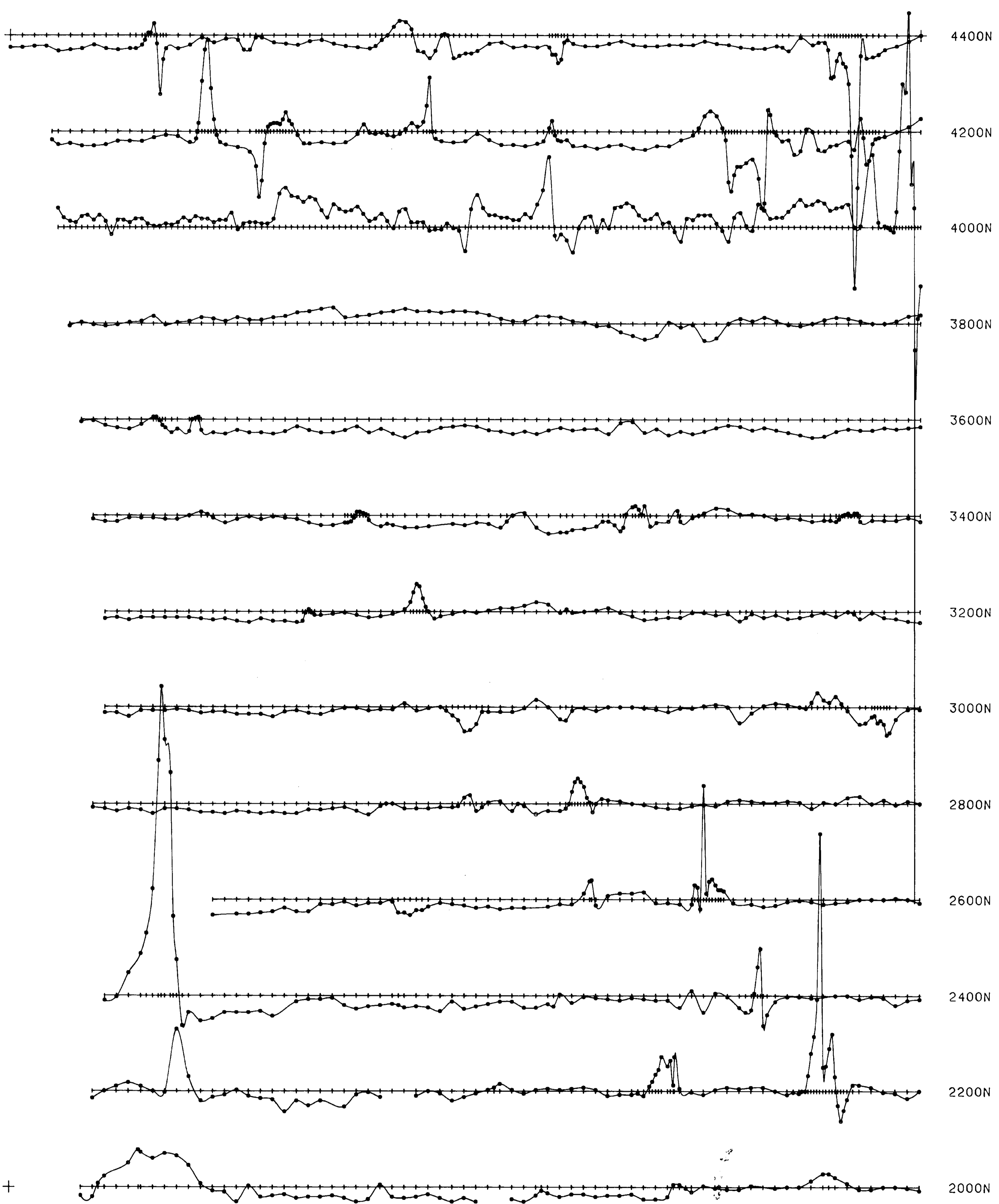


VULCAN 1983 1777 IP
 1777 OP

TO ACCOMPANY A REPORT BY M.H. ROGERS *M.H. Rogers*

DRAWN BY:		TRACED BY:		N.T.S. 82-F-9/16W
DATE:	SCALE:	DATE:	SCALE:	
VULCAN CLAIMS HORIZONTAL LOOP PLAN PROFILES, WITH INTERPRETED CONDUCTORS f = 1777 Hz FORT STEELE M.D., B.C.				Scale: 1 5000 Date: OCTOBER 1983 Plate: 254-83-3

- 1800E - 1900E - 2000E - 2100E - 2200E - 2300E - 2400E - 2500E - 2600E - 2700E - 2800E - 2900E - 3000E - 3100E - 3200E - 3300E - 3400E - 3500E - 3600E - 3700E



INSTRUMENT SCINTREX M-P 2 PROTON PRECESSION MAGNETOMETER
 TOTAL MAGNETIC FIELD INTENSITY

1 cm = 200.00 Gammas
 CORR'D VALUE - 58000 Gammas



**GEOLOGICAL BRANCH
 ASSESSMENT REPORT**

11,735

VULCAN MAGNETICS SURVEY
 CORRECTED VALUE - 58000 Gammas

TO ACCOMPANY A REPORT BY M.H. ROGERS *M.H. Rogers*

VULCAN CLAIMS				N.T.S. 82-F-9/16W
Drawn by:	Traced by:			MAGNETIC DATA, PROFILES Lines 2000N - 4400N FORT STEELE M.D., B.C.
Revised by:	Date:	Revised by:	Date:	
Scale 1: 5000		Date OCTOBER 1983		Plate 254-83-5