

19028

**GEOPHYSICAL REPORT**

**ON THE**

**STRIKER PROPERTY**

**COTT 6, FOOTLOOSE 6, JOSS 6 AND ZIP 1 CLAIMS**

**VICTORIA MINING DIVISION**

**SOUTHERN VANCOUVER ISLAND, BRITISH COLUMBIA**

**NTS 92C/16**

**48° 54'N 124° 12'W**

**OWNER:**

**BHP-UTAH MINES LTD.**

**1600 - 1050 WEST PENDER STREET**

**VANCOUVER, BRITISH COLUMBIA**

**V6E 3S7**

**FILMED**

**J.F. WETHERILL, B.A.Sc.**

**AUGUST 12, 1989**

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## 1. INTRODUCTION

This report discusses geophysical surveys carried out on the Cott 6, Footloose 6, Joss 6 and Zip 1 claims on the Striker property held by BHP-Utah Mines Ltd. The data presented were collected during a reconnaissance geophysical exploration program carried out by Stetson Resource Management Corp. under the direction of the writer.

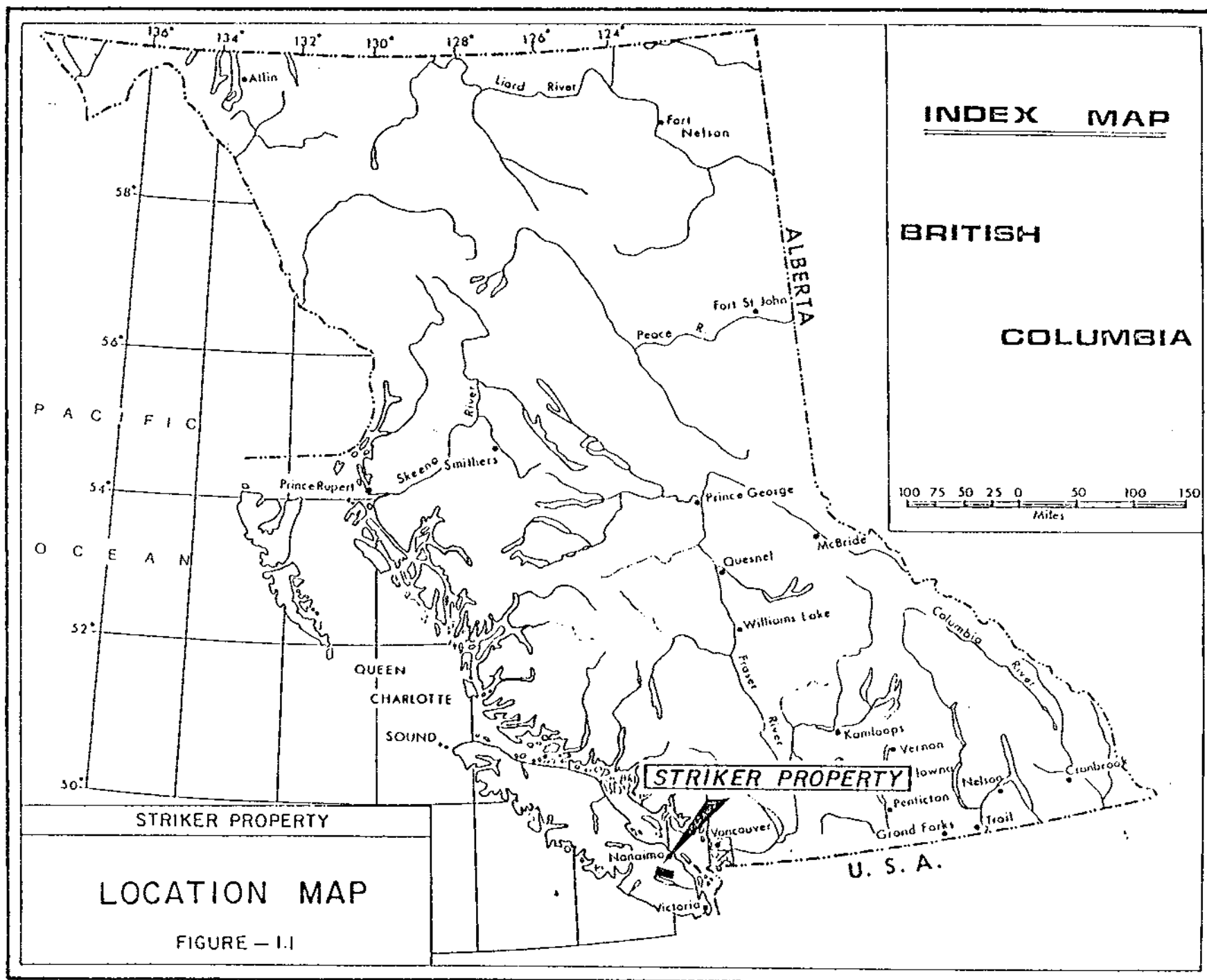
### 1.1 Location and Access

The Striker property is situated north of Cowichan Lake on southern Vancouver Island, British Columbia, approximately 27 kilometres west of Duncan. The Striker Property covers a total area of 132 square kilometres centred at 48° 54'N and 124° 12'W and can be located on Map Sheet 92C/16 (Figure 1.1).

Access from Duncan to the Cowichan Lake area is via Highway 18. Several logging roads connecting with the highway provide access to various parts of the property. The claims are accessible via several logging roads branching off of a major logging road which parallels the north shore of Cowichan Lake and connects with the main highway at Youbou.

Exploration can be carried out from the village of Lake Cowichan, 3 kilometres south of the eastern end of the property.

Groceries, fuel, lumber and general supplies are available to a limited extent, in Lake Cowichan. The remainder may be trucked from Duncan.

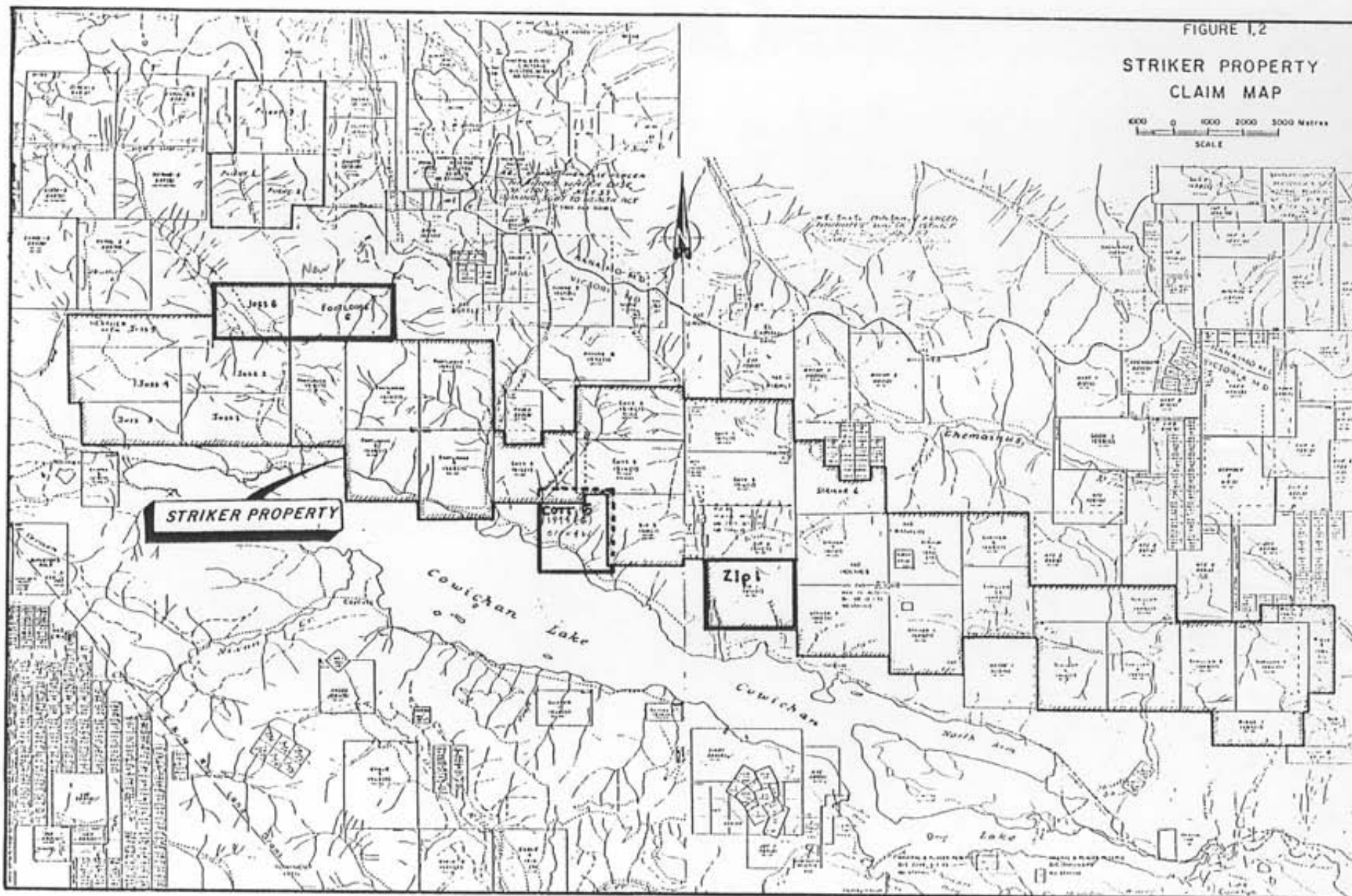


## 1.2 Property

The Striker property covers 31 contiguous claims comprised of 528 units located in the Victoria mining division (see Table 1.2). During the recent exploration program, the Cott 6, Footloose 6, Joss 6 and Zip 1 claims were investigated.

**Table 1.2**  
**Claim Status**

<u>Claim Name</u>	<u>Record No.</u>	<u>Record Date</u>	<u>Expiry Date</u>	<u>No. Units</u>
Ridge 1	1385	Nov. 1, 1984	1991	10
Ridge 2	1386	Nov. 1, 1984	1991	8
Ridge 3	1387	Nov. 1, 1984	1991	4
Thriller 2	1308	July 6, 1984	1994	15
Thriller 3	1307	July 6, 1984	1994	20
Thriller 4	1306	July 6, 1984	1991	20
Thriller 6	1304	July 6, 1984	1993	20
Thriller 1	1309	July 6, 1984	1996	16
Thriller 5	1305	July 6, 1984	1995	16
Striker 1	1303	July 6, 1984	1992	20
Striker 2	1302	July 6, 1984	1990	15
Striker 4	1300	July 6, 1984	1995	16
Striker 5	1299	July 6, 1984	1996	12
Cott 1	1317	July 6, 1984	1997	18
Cott 2	1316	July 6, 1984	1997	18
Striker 3	1301	July 6, 1984	1996	20
Striker 6	1484	April 19, 1985	1997	20
Zip 2	1311	April 19, 1985	1991	15
Zip 1	1312	July 6, 1984	1990	20
Zip 3	1310	July 6, 1984	1991	20
Cott 3	1315	July 6, 1984	1990	18
Cott 4	1314	July 6, 1984	1990	18
Cott 5	1313	July 6, 1984	1991	20
Footloose 1	1321	July 6, 1984	1991	20
Footloose 2	1322	July 6, 1984	1991	20
Footloose 3	1320	July 6, 1984	1990	16
Footloose 4	1319	July 6, 1984	1990	20
Footloose 5	1318	July 6, 1984	1990	18
Footloose 6	1693	June 5, 1986	1990	18
Joss 6	1692	June 5, 1986	1990	12
Cott 6	1944	June 5, 1987	1990	20





### 1.3 Physiography, Vegetation and Climate

The Striker property is situated within the eastern mountains of Vancouver Island. The region has a moderate climate, with annual precipitation of 112 to 665 cm.

The western portion of the property covers steep topography which becomes gradually gentler to the east. Elevations range from 170 metres (558 feet) to 1,541 metres (5,055 feet). Most slopes are fairly steep, but can be traversed with care.

Natural vegetation cover is moderate to dense and typical of west coast rain forest. Douglas Fir, Hemlock, Red Cedar and alder trees with thick to moderate underbrush characterize the vegetation. Approximately one third of the property has been logged and is in various stages of regrowth.

Water and timber resources for exploration and development purposes are plentiful. Several tributaries to the main creeks carry sufficient drilling water during most of the year.

### 1.4 History

The southern end of Vancouver Island has been explored since the 1860's for its mineral potential. Several polymetallic massive sulphide deposits and prospects including the Buttle Lake mines, the Twin "J" mine and the Lara property have been discovered occurring within the Sicker Group. In addition several copper, gold and molybdenum prospects have also been discovered.

Geological mapping of southern Vancouver Island was started in 1912 and 1913, by Clapp and Bancroft of the Geological Survey of Canada. In 1949 and 1955, J.T. Fyles identified a laterally extensive 200 metre thick cherty tuff marker bed with isolated pods of rhodonite ( $\text{MnSiO}_3$ ) within Sicker sediments in the Cowichan Lake area.

The Striker property was staked by Utah Mines Ltd. in 1984 to cover the belt of Sicker Group rocks hosting the rhodonite bearing cherty tuff marker bed. Exploration programmes carried out by BHP-Utah Mines Ltd. have included airborne and ground geophysical surveys, geochemical (silt and soil) sampling, geological mapping, rock chip sampling and limited diamond drilling.

## 1.5 1989 Exploration Program

In 1989 an exploration program was undertaken on the Cott 6, Footloose 6, Joss 6 and Zip 1 claims by J.F. Wetherill, geologist and M. Djordevich, field technician, of Stetson Resource Management Corp. Geophysical surveys utilizing electromagnetics and magnetics were carried out between May 1 and June 7, 1989. A total of 16.25 line kilometres was covered by these surveys. The geophysical data was interpreted by J. Wetherill, B.A.Sc. of Stetson Resource Management Corp.

## 2. GEOLOGY

### 2.1 Regional Geology

The Cowichan Lake area lies within the Insular Belt, the westernmost tectonic subdivision of the Canadian Cordillera. The Insular Belt, also called the Island Mountains, comprises Paleozoic and Mesozoic volcanic - plutonic complexes which are both underlain by gneiss migmatite terranes and overlain respectively by Permo - Pennsylvanian and Cretaceous clastic sediments. The two complexes are separated by Upper Triassic basalts overlain by carbonate - clastic sediments. The lower complex is part of an allochthonous terrane called Wrangellia. Although it formed in southern latitudes plate tectonics moved this terrane up to the North American plate during the Early Jurassic.

Southern Vancouver Island was mapped most extensively by J.E. Muller in 1968 and 1980. Muller's work is presented in the Geological Survey of Canada Open File 463 and Paper 70-30. Most recently, in 1987, the Cowichan Lake area has been mapped by N.W.D. Massey and S.J. Friday of the B.C.M.E.M.P.R.

The Striker property is situated on the southern flank of the Horne Lake-Cowichan uplift, one of three northwest trending structural uplifts exposing a mid-Paleozoic through Mesozoic sequence of volcanic, sedimentary and granitic rocks.

The oldest rocks within the Horne Lake-Cowichan uplift belong to the Paleozoic Sicker Group which represents an island arc terrane of massive submarine basic, intermediate and rhyodacitic flows and pyroclastics overlain by shallow water sediments. The lower Nitinat Formation ( $P_{Sp}$ ) comprises massive uralitic (actinolite pseudomorphs after augite) basalt flows and agglomerates. Overlying the Nitinat is the

Myra Formation ( $P_{Smr}$ ), a thin bedded sequence of andesitic, and locally rhyodacitic, lapillis and tuffs grading upwards into cherty ash tuffs. The Myra Formation grades further upwards into the "sediment-sill" unit ( $P_{Scr}$ ) characterized by a sedimentary environment which is crosscut by diorite sills or flows. The diorite bodies are believed to be the roots to the Vancouver Group volcanics. The top of the Sicker Group is marked by the Buttle Lake Formation which comprises crinoidal limestone and associated shallow water sediments. Regional greenstone metamorphism masks textures in these rocks.

Unconformably overlying the Sicker Group is the Upper Triassic Vancouver Group, a second island arc succession. This group is made up of the lower Karmutsen Formation comprising massive submarine fine grained to aphanitic basaltic flows overlain by massive, argillaceous limestones and minor sediments belonging to the Quatsino Formation. The Karmutsen Formation is distinguished from other volcanics by the abundance of pillows, the dark grey colour and the less intense greenstone metamorphism.

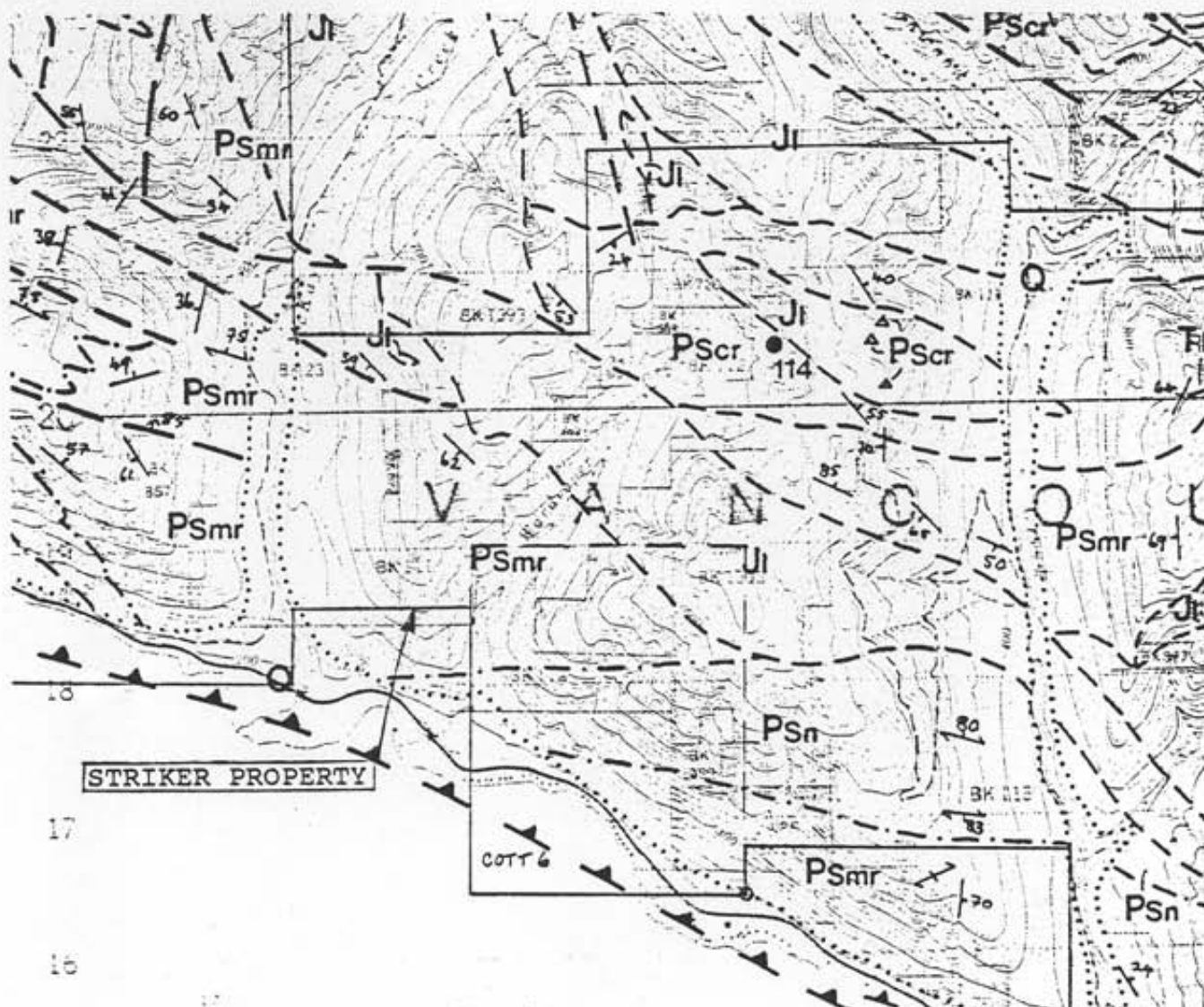
Overlying the Vancouver Group is a third island arc succession, the Lower Jurassic Bonanza Group, which comprises massive basaltic to rhyolitic tuff, breccia and flows with minor argillite.

Lower to Middle Jurassic Island intrusions ( $J1$ ) of granodiorite to quartz diorite composition invade the older rocks over most of the region.

The youngest rocks in the area are Late Cretaceous Nanaimo Group sediments which were deposited unconformably in a series of five transgressive - regressive terrigenous cycles.

Two episodes of deformation have been identified. The first was a pre-Triassic event which severely folded the Sicker Group. The second episode was a post-Cretaceous event which folded both the Nanaimo sediments and older units.

Within the Horne Lake-Cowichan uplift the predominant structural trend is northwesterly as evidenced by the rock fabric. The most predominant fault in the area covered by the Striker property is the Cowichan Lake fault. Results from lithoprobe studies by the B.C.D.E.M.P.R. in 1984, interpret this fault to be an active north dipping ( $65^{\circ}$ ) structure.



Drawn by: Traced by: J.C.F.

Revised by	Date	Revised by	Date

# REGIONAL GEOLOGY OF THE COWICHAN LAKE AREA NTS 92C/16

by N.W.D. Massey, S.T. Friday, D. Tercier and  
V.J. Rublee, 1986, E.M.P.R. Open File 1987/2

Scale: 1:50,000

Date: Sept. 1, 1988

Plate: 2.1

TABLE 2.1

## TABLE OF FORMATIONS

ERA	PERIOD	LITHOLOGY	NAME	DESCRIPTION
MESOZOIC	UPPER CRETACEOUS		GABRIOLA to EXTENSION FMS UNDIFFERENTIATED	Repeating sequence of conglomeratic sandstone and siltstone
			HASLAM FM.	Black marine shale & sandstone
			COMOX FM.	Conglomerate, sandstone
	LOWER - MIDDLE JURASSIC		ISLAND INTRUSIONS	Granodiorite and quartz diorite
			BONANZA GROUP	Basaltic to rhyolitic tuff, breccia, flows, minor argillite, graywacke
	UPPER TRIASSIC		QUATSINO FM.	Limestone; minor siltstone, chert & cherty lat.
			KARMUTSEN FM.	Pillow basalt, breccia tuff, minor flows
PALEOZOIC	PENN - MISS		BUTTLE LAKE FM.	Limestone, graywacke, argillite, chert
			MYRA FM.	Argillite, graywacke, chert, Diorite sills (Muller's sediment-sill unit)
	LOWER DEVONIAN and older		SICKER GROUP	Well bedded silicic tuff and breccia, argillite, rhyodacite flows, minor basic tuff, rare diorite sills, massive sulphides
			NITINAT FM.	Pillow lava and breccia of augite porphyry; basic tuff

## 2.2 Regional Mineralization

The regional structural trend is northwest-southeast. Faults occur both parallel to the main trend and in a north-south direction.

The Insular (tectonic) Belt hosts several precious and base metal ore deposits.

Chalcopyrite, magnetite, molybdenite and weak gold mineralization occur in the Island Copper porphyry copper deposit associated with a Jurassic batholith intruding Bonanza group volcanic rocks at the north end of Vancouver Island.

Polymetallic volcanogenic massive sulphides formed syngenetically in the Sicker volcanics produce copper, lead, zinc, gold, silver, cadmium and barium in mines held by Westin Resources Ltd. at Buttle Lake.

Gold mineralization occurs in quartz - carbonate veins within faults and shears crosscutting the Sicker Group and late Triassic intrusives in the Horne Lake - Cowichan uplift. The most significant prospect found to date is the Debbie property, held by Westmin Resources and the Nexus Group, 40 kilometres northwest of the Striker property. On the Debbie property gold mineralization has been delineated in grades of up to 1.37 oz/ton occurring over a 44 foot width.

### 3. GEOPHYSICS

#### 3.0 Introduction

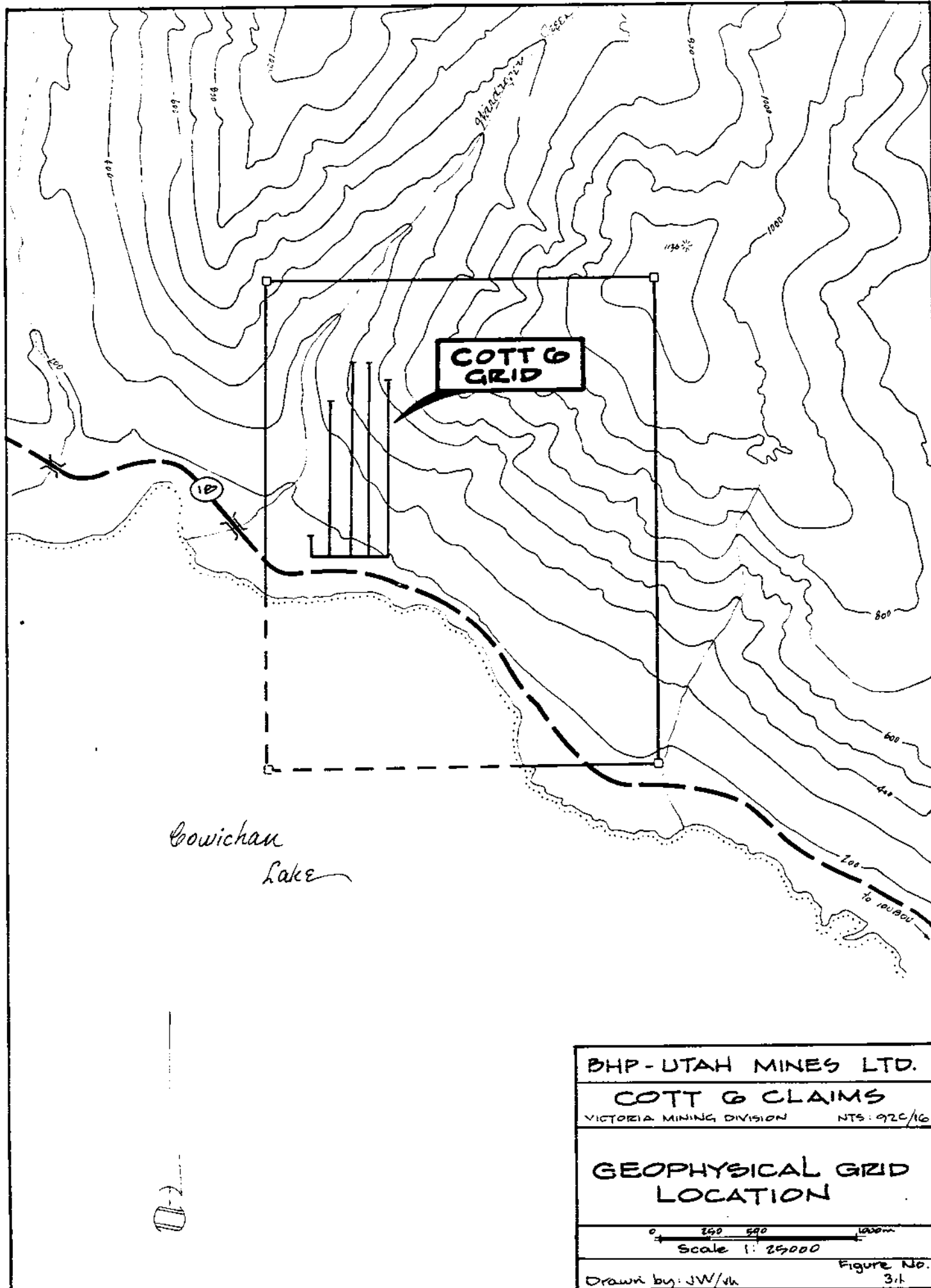
A detailed geophysical program, consisting of electromagnetic (VLF - EM) and magnetic surveys was carried out on four grids located on the Striker property in the Victoria Mining Division near Youbou, B.C. The Cott 6 grid had survey lines oriented at azimuth north. The Joss grid and Footloose grid had survey lines oriented at azimuth 45 degrees, and the Zip grid had survey lines oriented at azimuth 170 degrees.

The surveys were conducted to test the effectiveness of VLF-EM in following possible mineralized trends, to establish new unrecognized conductive trends, and to establish correlations between magnetic responses and conductive trends, in order to define geophysical areas of interest for further exploration.

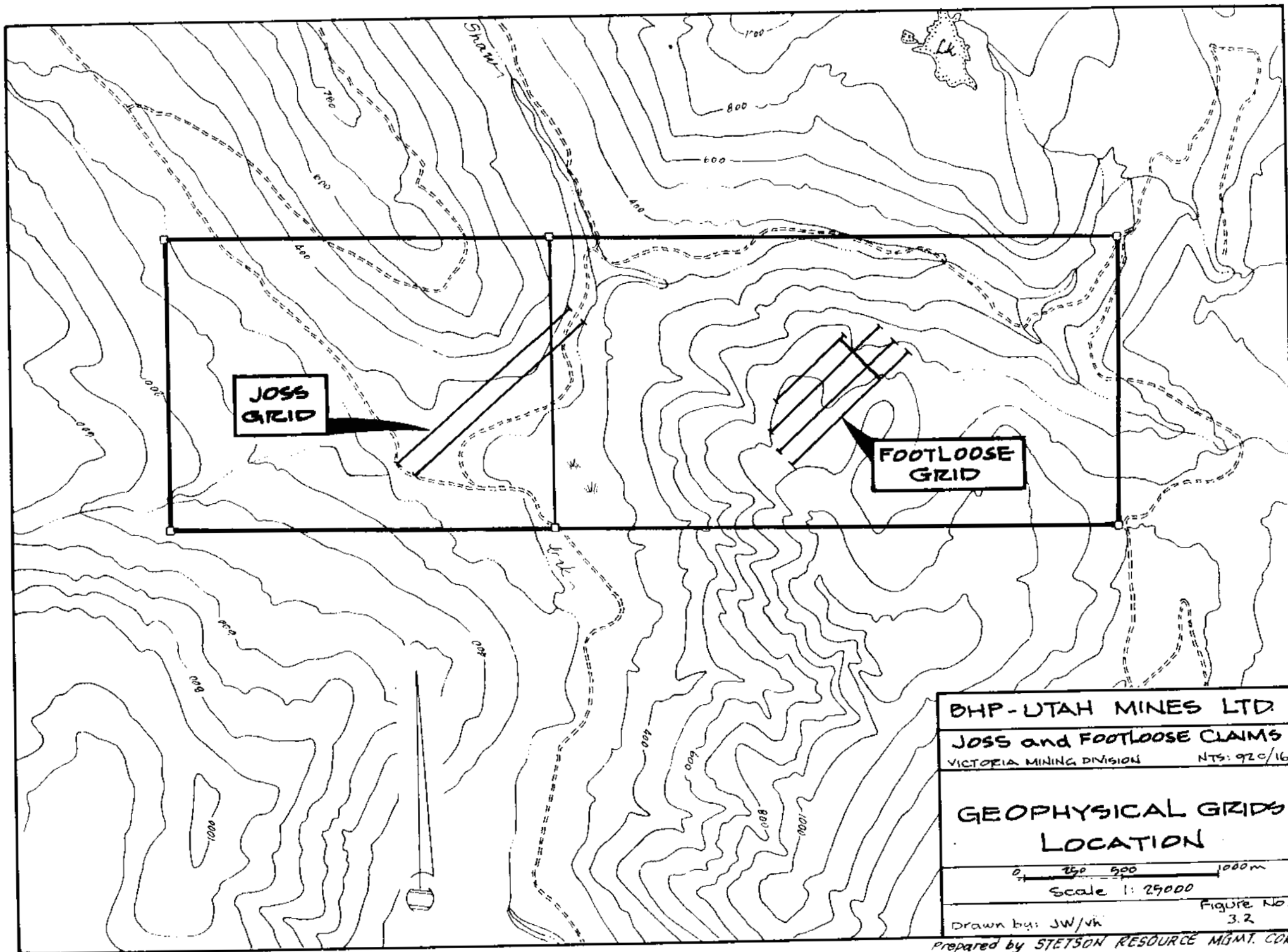
#### 3.1 Survey Specifications

##### 3.1.1 Survey Parameters

- Cott 6 Grid - 100 meter survey line separation
  - 12.5 meter survey station spacing
  - 3.8 kilometers of VLF-EM and magnetic survey.
- Joss Grid - 100 meter survey line separation
  - 12.5 meter survey station spacing
  - 2.4 kilometers of VLF-EM and magnetic survey.
- Footloose Grid - 100 meter survey line separation
  - 12.5 meter survey station spacing
  - 3.1 kilometers of VLF-EM and magnetic survey
- Zip Grid - 50 meter survey line separation
  - 12.5 meter survey station spacing
  - 6.95 kilometers of VLF-EM and magnetic survey







BHP-UTAH MINES LTD

JOSS and FOOTLOOSE CLAIMS

VICTORIA MINING DIVISION

NTS: 92C/16

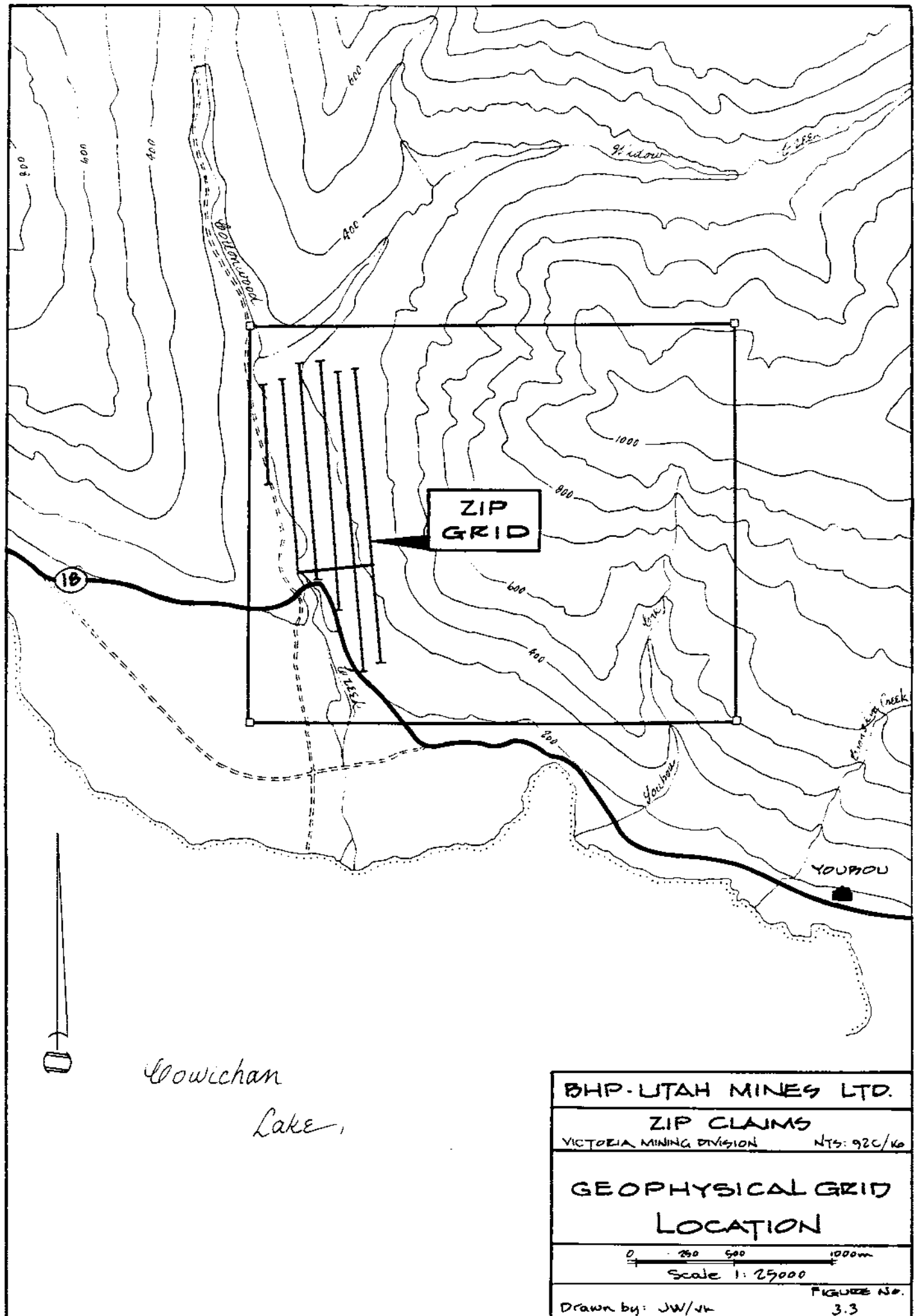
## GEOPHYSICAL GRIDS LOCATION

0 250 500 1000m  
Scale 1: 25000

Drawn by: JW/vh

Figure No.  
3.2

Prepared by STETSON RESOURCE MGMT. CORP.



### 3.1.2 Equipment Parameters

VLF - EM and magnetic surveys were conducted using a Scintrex - EDA Omni Plus VLF - EM and magnetometer system. In phase and Quadrature readings were measured in percent and VLF - EM Total Field Strength measured in equipment - fixed units. The transmitting stations used were Cutler, MA (NAA - 24.0 kHz); Jim Creek, Wa (NLK - 24.8 kHz) and Annapolis, Md (NSS - 21.4 kHz).

Earth's total magnetic field was measured in gammas (nT) with diurnal variations corrected by automatic base station recordings made at 30 second intervals. For equipment specifications from the manufacturer, see Appendix I.

### 3.2 Data

Total field magnetic readings were individually corrected for variations in the earth's magnetic field using magnetic base station readings by the formula: Total Field Reading + Datum Level - Base Station Reading.

The VLF - EM data are presented in profile form on figures 3.4, 3.5, 3.7, 3.8, 3.10, 3.11, 3.13, and 3.14. Magnetic data are presented in profile form on figures 3.6, 3.9, 3.12, and 3.15.

### 3.3 Interpretation

#### 3.3.1 Cott 6 Grid

Total field magnetic data over the Cott 6 grid were relatively noise free. Magnetic readings range from 56255nT to 55693 nT with datum of approximately 56000 nT. This datum was picked to profile the magnetic data.

An area of magnetic activity was observed in the profiled data, covering roughly 800 square meters and centered over L3 + 00 E, 3 + 00 N. Within this area of activity three magnetic lineaments are observed. ML1 is a magnetic high lineament oriented east - west, and is flanked to the south by MLC2, a magnetic low lineament paralleling MLC1. MLC2 is a shorter magnetic high lineament oriented east - southeast, converging with MLC1 to the east.

VLF - EM data were collected using the Jim Creek and Annapolis transmitters. Jim Creek transmitter data were erratic over this grid and were not interpreted. Data quality for Annapolis was good indicated by the similarity of duplicate readings taken to test inphase, and quadrature responses on different days.

Two conductor systems with significant strike lengths were delineated on the Cott 6 grid. Conductor CC1 is detected across the grid from L1 + 00 E, 5 + 25 N to L4 + 00 E, 6 + 00 N and is characterized by a small increase in total field response, positive and increasing quadrature response and increasing or crossover inphase response.

Conductor CC2 is detected across the grid from L2 + 00 E, 1 + 75 N to L4 + 00 E, 1 + 62 N, and is characterized by a weak total field response, flat positive quadrature response, and increasing or crossover inphase response.

### 3.3.2 Joss Grid

Total field magnetic data over the Joss grid were relatively noise - free. Magnetic readings range from 55785 nT to 56160 nT with a datum of approximately 55800 nT. This datum was selected to profile the magnetic data.

Magnetic response over the grid was flat, with one single station high response at L1 + 00 W, 10 + 00 N. No obvious trends are observed in the stacked profiles. VLF - EM data were collected from the grid using the Jim Creek and Cutler transmitters. Readings from both transmitters exhibited continuity and were repeatable over a period of 8 hours.

A conductor was delineated on the Joss grid by both Jim Creek and Cutler data. Conductor CJ1 from the Jim Creek transmitter data is characterized by a total field high response, crossover quadrature response, and crossover or increasing inphase response. Conductor CJ2 from the Cutler transmitter data is characterized by very weakly increased total field response, increasing or crossover quadrature response, and increasing or crossover inphase response. The response of conductor CJ2 on L1 + 00 W was located by profile matching rather than crossover location. The orientation of CJ2 matches CJ1 but the conductive responses are separated by approximately 75 meters, along the grid lines.

### 3.3.3 Footloose Grid

Total field magnetic data over the Joss grid were reasonably noise - free. Magnetic readings range from 55808 nT to 56701 nT with a datum of approximately 56000 nT. This datum was selected to profile the magnetic data.

Magnetic response is active but somewhat noisy on the northern portion of the grid. The southern portion of the grid exhibits reasonably uniform magnetic response close to the datum with narrow but strong highs which correlate well from line to line.

A magnetic lineament MLF1 crosses the grid from L3 + 00 W, 3 + 50 S to L6 + 00 W, 3 + 87 S. To the south 100 meters, magnetic lineament MLF2 crosses the grid from L3 + 00 W, 4 + 67 S to L5 + 00 W, 4 + 12 S and converges on MLF1 to the west. VLF - EM data were collected using the Jim Creek and Annapolis transmitters. Data quality for both transmitters was good, and inphase and quadrature values were repeatable from day to day.

Topographic conditions necessitated a rough correction to the raw data. A formula adapted from Wright (1988) where correction =  $1.2 * \text{slope}^{\circ}$  was applied to the data and found to approximate a physical rotation about a fixed point. Rough corrections to the data involved revolving the inphase and quadrature values about a point positioned at an approximate topographic maximum.

Conductors CF1 (Annapolis) and CF2 (Jim Creek) were delineated on the southern portion of the grid coincident with magnetic lineament MLF2. Both conductors are characterized by a moderate total field response, crossover or increasing inphase response, and increasing or flat quadrature response. Inphase crossovers were observed in data from both transmitters but were not coincident, did not coincide with the magnetics, and were not correlatable from line to line.

### 3.3.4 Zip Grid

Total field magnetic data over the Zip grid were moderately noisy, which is observed in several areas as a "sawtooth" profile. Magnetic readings range from 55790 nT to 56236 nT with a datum of approximately 56000 nT. This datum was chosen as a baseline to profile the magnetic data.

Three areas of magnetic activity were observed in the profiled data. All areas trend south - southeast but no definite lineaments were observed in the profiles. The MZ1 area of magnetic activity is centred over  $L0 + 50 E, 9 + 50 N$ ; the MZ2 area is centred over  $L0 + 00, 5 + 75 N$ ; and the MZ3 area is centred over  $L0 + 50 E, 0 + 00$ .

VLF - EM data were collected using the Jim Creek and Annapolis transmitters. Data from the Jim Creek source was reasonably good, with minor erratic readings. Data from the Annapolis transmitter was good with no erratic readings and excellent duplication of readings from day to day.

Readings from both transmitters delineated two subparallel conductors crossing south - southeast on the northern portion of the grid covered by magnetic activity area MZ1. Conductors CZ1 (Jim Creek) and CZ4 (Annapolis) are characterized by strong total field response, increasing inphase response, and decreasing quadrature response for both transmitters. Conductors CZ2 (Jim Creek) and CZ5 (Annapolis) are characterized by weak total field response, crossover inphase response and decreasing quadrature response for both transmitters.

A possible conductor was delineated by data from the Jim Creek transmitter (CZ3), and crosses the portion of the grid covered by magnetic activity area MZ2. The conductor is characterized by a distinctive total field response, increasing inphase response and flat quadrature response.

## CONCLUSIONS

### Cott 6 Grid

Results from the Cott 6 geophysical grid indicate three magnetic lineaments and two VLF - EM conductors. One set of magnetic and VLF - EM responses appear to be coincident.

Conductor C1 is not coincident with a magnetic lineament, but does flank to the north the area of magnetic activity centered at L3 + 00 E, 2 + 00 N. This conduction is interpreted as a contact between units of the Nitinat basalts and agglomerates and the overlying Myra lapilli and ash tuffs.

Conductor C2 is coincident with magnetic lineament ML2, a magnetic low. These responses are interpreted to represent weathered structure which is gradually masked to the west by fluvial overburden.

### Joss Grid

Magnetic response on the Joss grid was uniform and flat. No trends were observed in the stacked profiles.

Conductors CJ1 and CJ2 are likely responses from one feature, shifted out of phase by the orientation difference of the fields produced by the two transmitters. The conductors are interpreted as a small fault structure ( extend grid to south), possibly weakly mineralized.

### Footloose Grid

Results from the Footloose grid indicate 2 magnetic lineaments and a strong coincident VLF - EM conductor.

The conductors CF1 (Annapolis) and CF2 (Jim Creek) represent one conductive feature and are coincident with a magnetic high lineament MLF2. The conductor system is interpreted as fault controlled sulphides, or a fault controlled dyke.

### Zip Grid

Geophysical results from the Zip grid indicate three areas of magnetic activity, two strong conductors and one weak conductor. The two strong conductors are coincident with an area of magnetic activity (MZ1). The weak conductor is also associated with an area of magnetic activity (MZ2).

Conductors CZ1 and CZ4 are somewhat coincident with local highs in the magnetic activity area MZ1 suggesting the presence of a fault controlled dyke or mineralized vein structure. Conductors CZ2 and CZ5 cross an area of relative magnetic inactivity and are interpreted to represent a strong fault structure.

Conductor CZ3 is very weak, but is somewhat coincident with magnetic lows. The conductor possibly represents a weakly mineralized vein structure.



**COST STATEMENT**

**Personnel:**

J.F. Wetherill, B.A.Sc.	7 days @ \$300/day	\$ 2,100.00
M. Djordjevich, Field Tech	6 days @ \$200/day	\$ 1,200.00
		=====
		\$ 3,300.00

**Support Costs:**

Accommodation in town of Lake Cowichan/Nanaimo		
Motel	5 days @ 36.50/day	\$ 182.50
Meals	13 days @ 25/day/man	\$ 325.00
Radio, B.C. Tel Toll Charges		\$ 35.86
Supplies		\$ 68.70
		=====
		\$ 612.06

**Transportation:**

Ford 4x4 Truck	6 days @ \$60/day	\$ 360.00
	450 km @ \$.25/km	\$ 112.50
Fuel		\$ 143.20
Ferries		\$ 53.00
		=====
		\$ 668.70

Geophysical Instrument Rental: Omni EDA 6 days	\$ 1,500.00
Report Writing, Drafting etc.	\$ 1,650.00
	=====
	\$ 3,150.00

Subtotal	\$ 7,730.76
Administration and Overhead @ 15%	\$ 1,159.61
	=====
<b>TOTAL COSTS</b>	<b>\$ 8,890.37</b>

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Canada, Paper 70-30
- Wright, J.L., 1988 1988 VLF Interpretation Manual;  
unpublished manuscript

## STATEMENT OF QUALIFICATIONS

NAME: Wetherill, J.F.

PROFESSION: Geologist - Engineer in Training

EDUCATION: 1987 B.A.Sc. Geology -  
University of British Columbia

EXPERIENCE: 1987 - Present: Geologist with  
Stetson Resource Management Corp.  
Field Supervisor for exploration  
programs involving geology, geo-  
chemistry, and geophysics in B.C.  
and Yukon.

1986, June - August: Field Assistant  
-Geologist involved with geological,  
geochemical and geophysical aspects  
of exploration programs in B.C.

**APPENDIX I**  
**SCINTREX-EDA SPECIFICATIONS**

# OMNI PLUS VLF/Magnetometer System



## Specifications\*

Frequency Tuning Range	15 to 30 kHz, with bandwidth of 150 Hz; tuning range accommodates new Puerto Rico station at 28.5 kHz
Transmitting Stations Measured	Up to 3 stations can be automatically measured at any given grid location within frequency tuning range
Recorded VLF Magnetic Parameters	Total field strength, total dip, vertical quadrature (or alternately, horizontal amplitude)
Standard Memory Capacity	800 combined VLF magnetic and VLF electric measurements as well as gradiometer and magnetometer readings
Display	Custom designed, ruggedized liquid crystal display with built-in heater and an operating temperature range from $-40^{\circ}\text{C}$ to $+55^{\circ}\text{C}$ . The display contains six numeric digits, decimal point, battery status monitor, signal strength status monitor and function descriptors.
RS232C Serial I/O Interface	2400 baud rate, 8 data bits, 2 stop bits, no parity
Test Mode	A. Diagnostic Testing (data and programmable memory) B. Self Test (hardware)
Sensor Head	Contains 3 orthogonally mounted coils with automatic tilt compensation
Operating Environmental Range	$-40^{\circ}\text{C}$ to $+55^{\circ}\text{C}$ ; 0 - 100% relative humidity; Weatherproof
Power Supply	Non-magnetic rechargeable sealed lead-acid 18V DC battery cartridge or belt; 18V DC disposable battery belt; 12V DC external power source for base station operation only.
Weights and Dimensions	
Instrument Console	2.8 kg, 128 x 150 x 250 mm
Sensor Head	2.1 kg, 130 dia. x 130 mm
VLF Electronics Module	1.1 kg, 40 x 150 x 250 mm
Lead Acid Battery Cartridge	1.8 kg, 235 x 105 x 90 mm
Lead Acid Battery Belt	1.8 kg, 540 x 100 x 40 mm
Disposable Battery Belt	1.2 kg, 540 x 100 x 40 mm

\*Preliminary

EDA Instruments Inc.,  
4 Thorncliffe Park Drive,  
Toronto, Ontario  
Canada M4H 1H1  
Telex: 06 23222 EDA TOR,  
Cables: Instruments Toronto  
(416) 425-7800

In USA,  
EDA Instruments Inc.,  
5151 Ward Road,  
Wheat Ridge, Colorado  
U.S.A. 80033  
(303) 422-9112

Printed in Canada

# OMNI IV "Tie-Line" Magnetometer



## Specifications

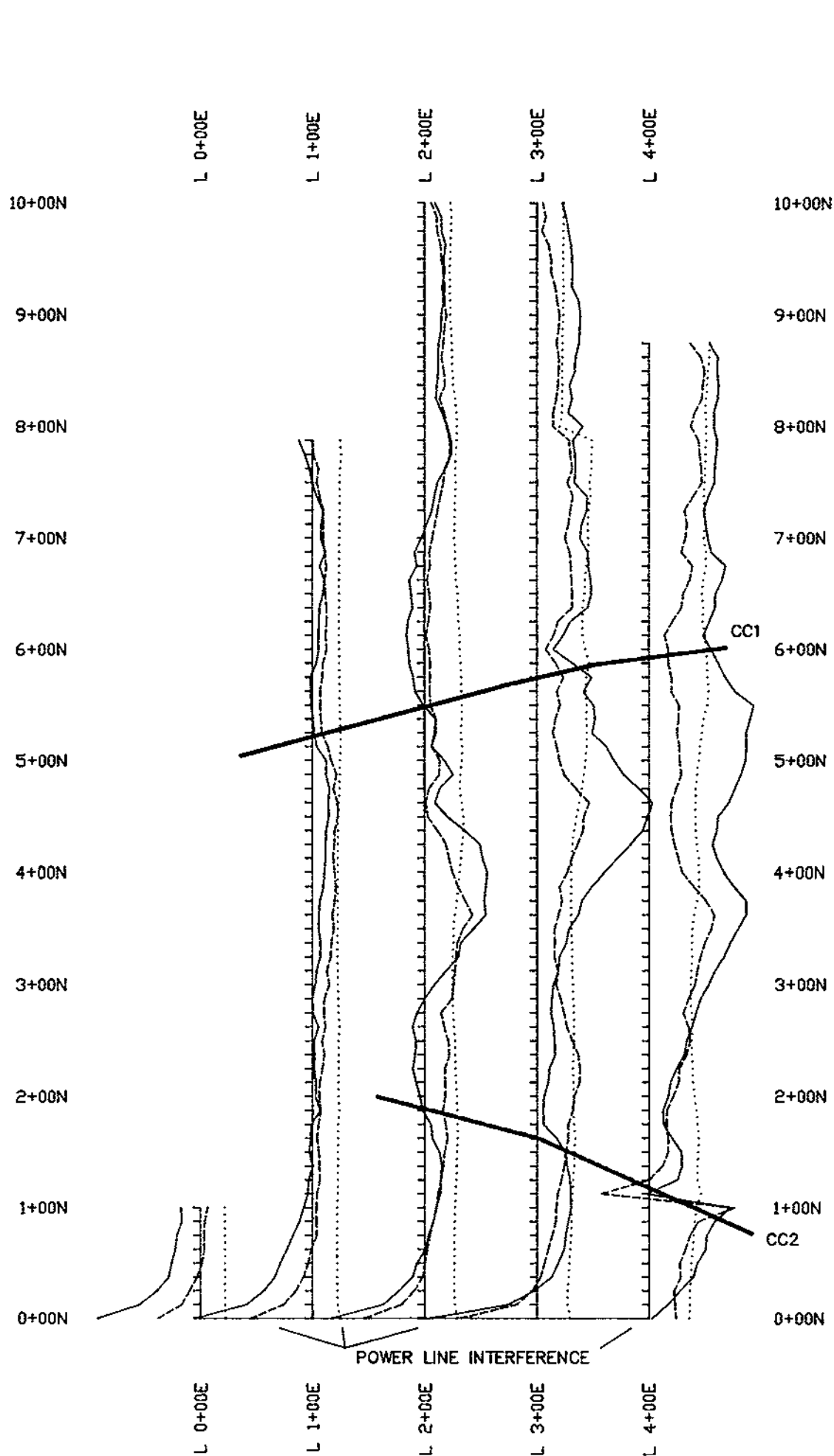
Dynamic Range	18,000 to 110,000 gammas. Roll-over display feature suppresses first significant digit upon exceeding 100,000 gammas.
Tuning Method	Tuning value is calculated accurately utilizing a specially developed tuning algorithm
Automatic Fine Tuning	$\pm 15\%$ relative to ambient field strength of last stored value
Display Resolution	0.1 gamma
Processing Sensitivity	$\pm 0.02$ gamma
Statistical Error Resolution	0.01 gamma
Absolute Accuracy	$\pm 1$ gamma at 50,000 gammas at 23°C $\pm 2$ gamma over total temperature range
Standard Memory Capacity	
Total Field or Gradient	1,200 data blocks or sets of readings
Tie-Line Points	100 data blocks or sets of readings
Base Station	5,000 data blocks or sets of readings
Display	Custom-designed, ruggedized liquid crystal display with an operating temperature range from -40°C to +55°C. The display contains six numeric digits, decimal point, battery status monitor, signal decay rate and signal amplitude monitor and function descriptors.
RS 232 Serial I/O Interface	2400 baud, 8 data bits, 2 stop bits, no parity
Gradient Tolerance	6,000 gammas per meter (field proven)
Test Mode	A. Diagnostic testing (data and programmable memory) B. Self Test (hardware)
Sensor	Optimized miniature design. Magnetic cleanliness is consistent with the specified absolute accuracy.
Gradient Sensors	0.5 meter sensor separation (standard), normalized to gammas/meter. Optional 1.0 meter sensor separation available. Horizontal sensors optional.
Sensor Cable	Remains flexible in temperature range specified, includes strain-relief connector
Cycling Time (Base Station Mode)	Programmable from 5 seconds up to 60 minutes in 1 second increments
Operating Environmental Range	-40°C to +55°C; 0-100% relative humidity; weatherproof
Power Supply	Non-magnetic rechargeable sealed lead-acid battery cartridge or belt; rechargeable NiCad or Disposable battery cartridge or belt; or 12V DC power source option for base station operation.
Battery Cartridge/Belt Life	2,000 to 5,000 readings, for sealed lead acid power supply, depending upon ambient temperature and rate of readings
Weights and Dimensions	
Instrument Console Only	2.8 kg, 238 x 150 x 250mm
NiCad or Alkaline Battery Cartridge	1.2 kg, 235 x 105 x 90mm
NiCad or Alkaline Battery Belt	1.2 kg, 540 x 100 x 40mm
Lead-Acid Battery Cartridge	1.8 kg, 235 x 105 x 90mm
Lead-Acid Battery Belt	1.8 kg, 540 x 100 x 40mm
Sensor	1.2 kg, 56mm diameter x 200mm
Gradient Sensor (0.5m separation-standard)	2.1 kg, 56mm diameter x 790mm
Gradient Sensor (1.0m separation-optional)	2.2 kg, 56mm diameter x 1300mm
Standard System Complement	Instrument console; sensor; 3-meter cable, aluminum sectional sensor staff, power supply, harness assembly, operations manual.
Base Station Option	Standard system plus 30 meter cable
Gradiometer Option	Standard system plus 0.5 meter sensor

EDA Instruments Inc.  
4 Thorncliffe Park Drive  
Toronto, Ontario  
Canada M4H 1M1  
Telex: 06 23222 EDA TOR  
Cable: Instruments Toronto  
(416) 425 7800

In U.S.A.  
EDA Instruments Inc.  
5151 Ward Road  
Wheat Ridge, Colorado  
U.S.A. 80033  
(303) 422 9112

Printed in Canada

**APPENDIX II**  
**GEOPHYSICAL DATA**



INSTRUMENT: EDA OMNI PLUS  
 STATION FREQUENCY: 24.0  
 SOLID LINE: IN PHASE (%)  
 VERTICAL SCALE: 20/cm  
 BASELINE VALUE: 0  
 DASHED LINE: QUADRATURE (%)  
 VERTICAL SCALE: 20/cm  
 BASELINE VALUE: 0  
 DOTTED LINE: TOTAL FIELD STRENGTH (united)  
 VERTICAL SCALE: 10  
 BASELINE VALUE: 0  
 CONDUCTOR: CC1

BHP-UTAH MINES LTD

COTT 6 CLAIM  
 VICTORIA MINING DIVISION NTS 92 C/18

VLF-EM GEOPHYSICS  
 Annapolis, MD

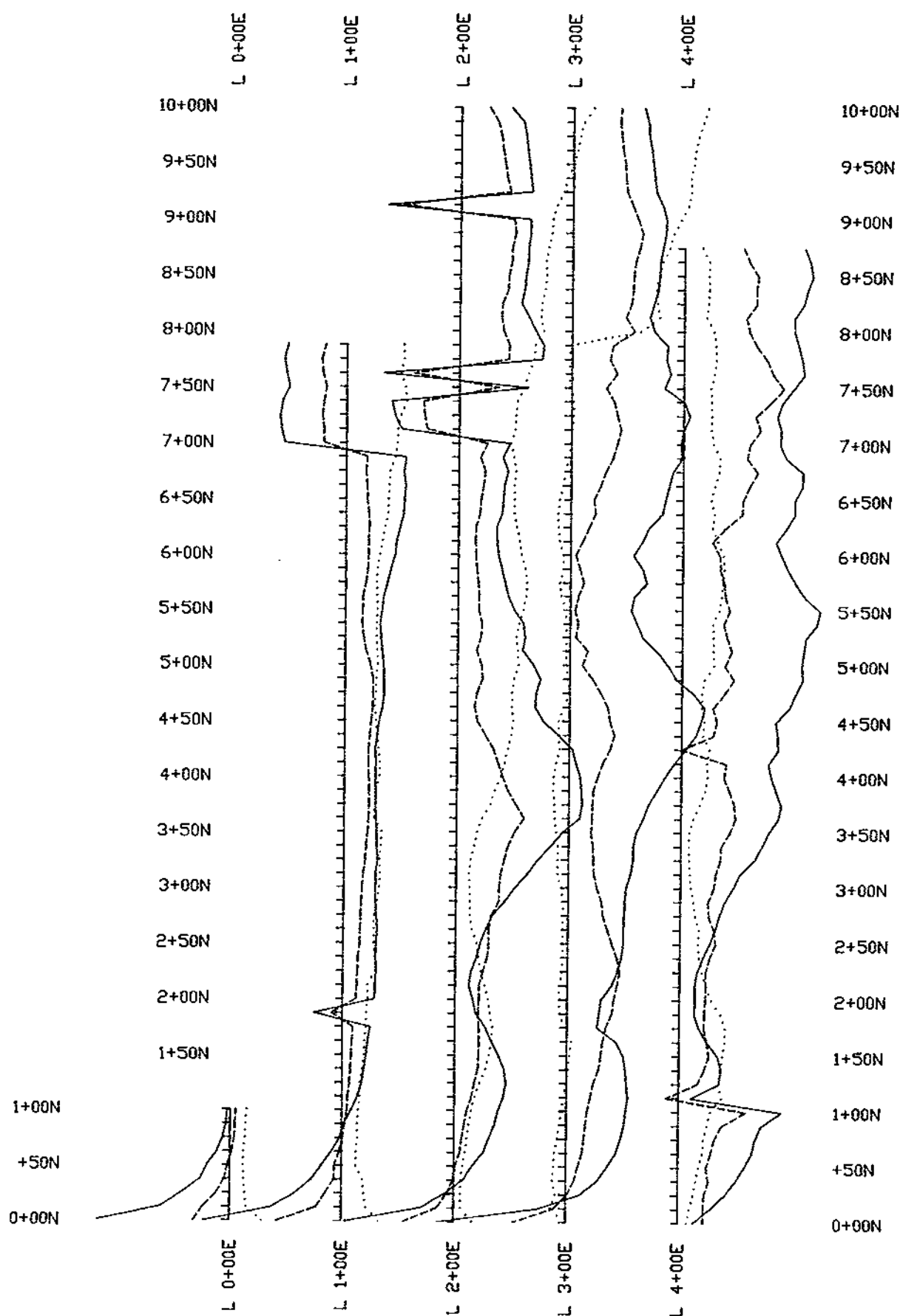
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 SCALE: 1:5000 (metres)

DRAWN BY: J. WETHERILL  
 DATED: AUGUST 12, 1989

FIGURE: 3.4

Prepared by: STETSON RESOURCE MGMT. CORP.





INSTRUMENT: EDA OMNI PLUS  
 STATION FREQUENCY: 24.8  
 SOLID LINE: IN PHASE (%)  
 VERTICAL SCALE: 20 /cm  
 BASELINE VALUE: 0  
 DASHED LINE: QUADRATURE (%)  
 VERTICAL SCALE: 20 /cm  
 BASELINE VALUE: 0  
 DOTTED LINE: TOTAL FIELD STRENGTH (units)  
 VERTICAL SCALE: 100/cm  
 BASELINE VALUE: 200

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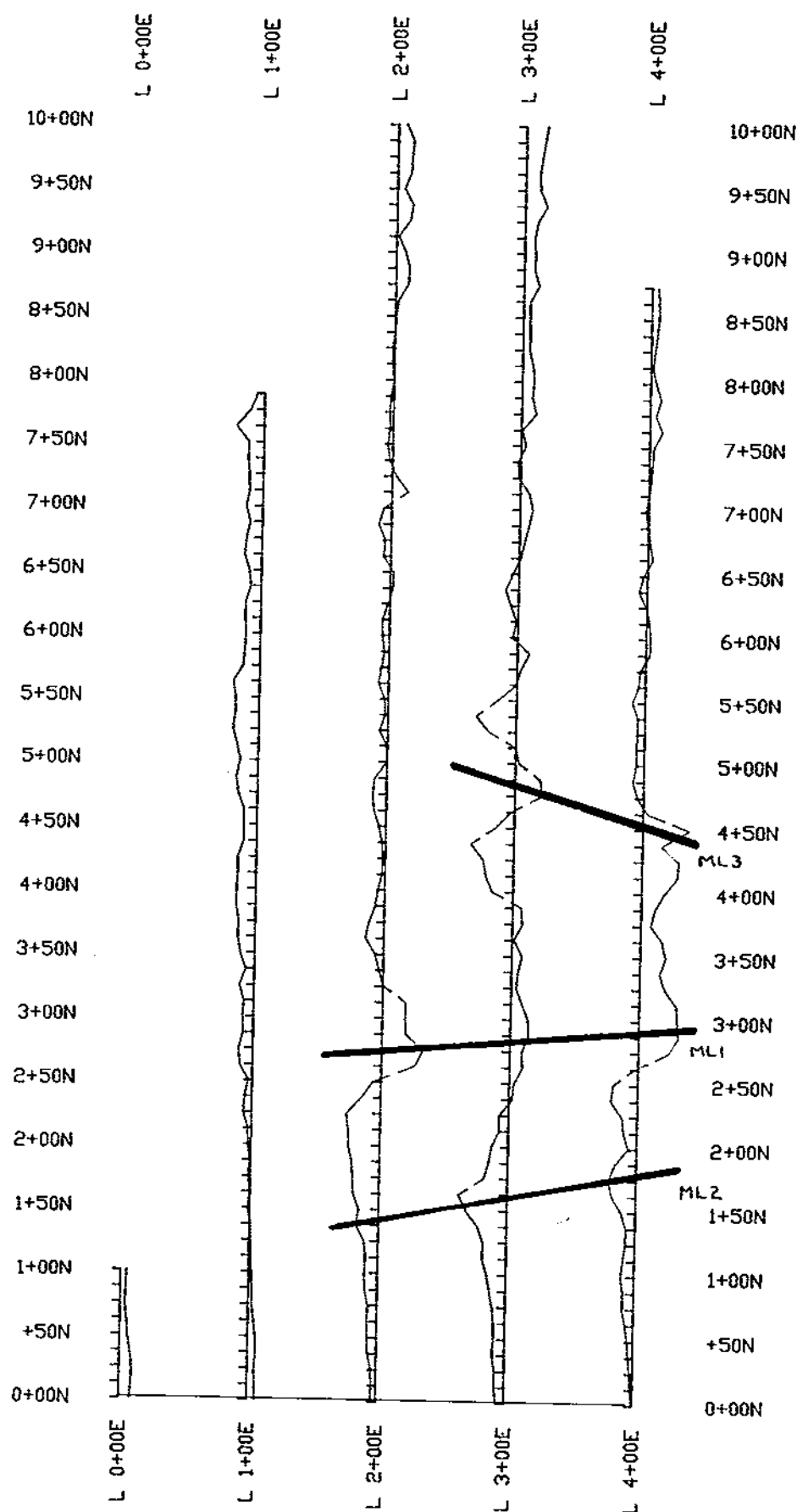
COTT 6 CLAIM  
 VICTORIA MINING DIVISION NTS 92 C/16

VLF-EM GEOPHYSICS  
 Jim Creek, WA

0 50 100 150 200 250  
 SCALE 1:2,500 (metres)

DRAWN BY: J. WETHERILL  
 DATED: NOVEMBER 5, 1989 FIGURE: 3.5

Prepared by: STETSON RESOURCE MGMT. CORP.



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COTT 6 CLAIM  
VICTORIA MINING DIVISION NTS 92 C/16

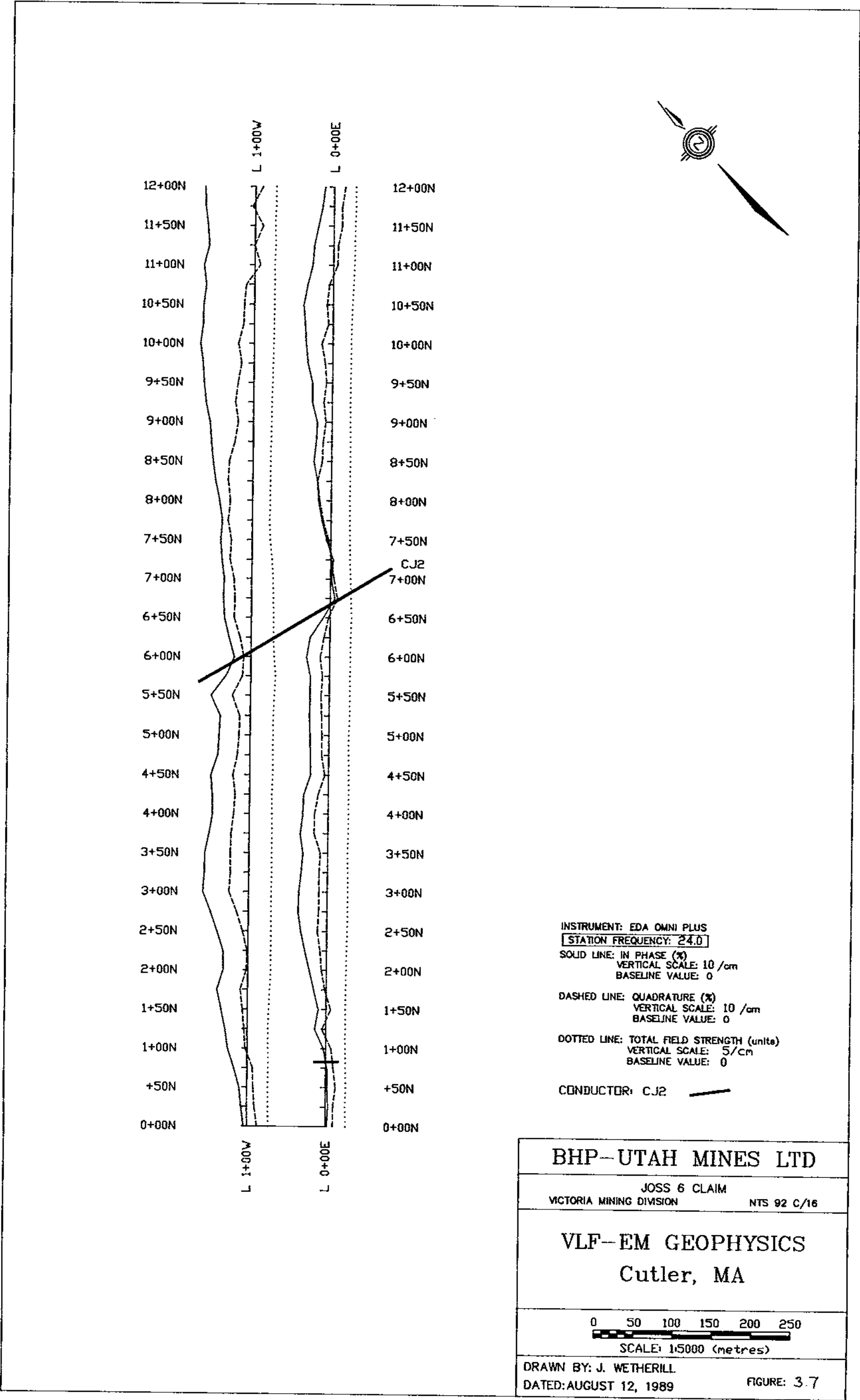
MAGNETIC SURVEY  
PROTON MAGNETOMETER

0 50 100 150 200 250  
SCALE: 1:5000 (metres)

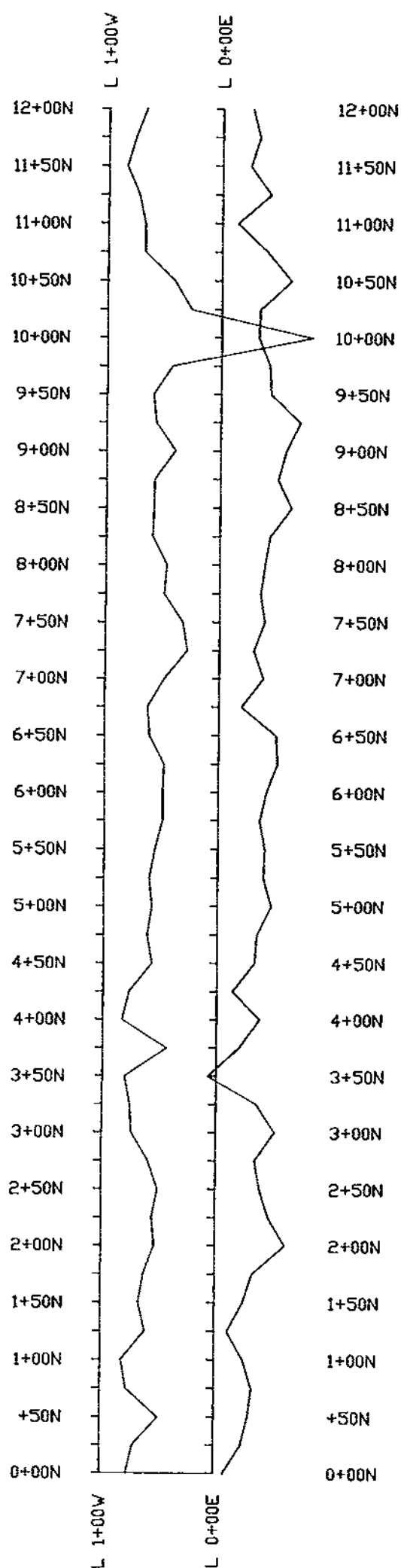
DRAWN BY: J. WETHERILL  
DATED: NOVEMBER 5, 1989

FIGURE: 3.6

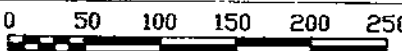
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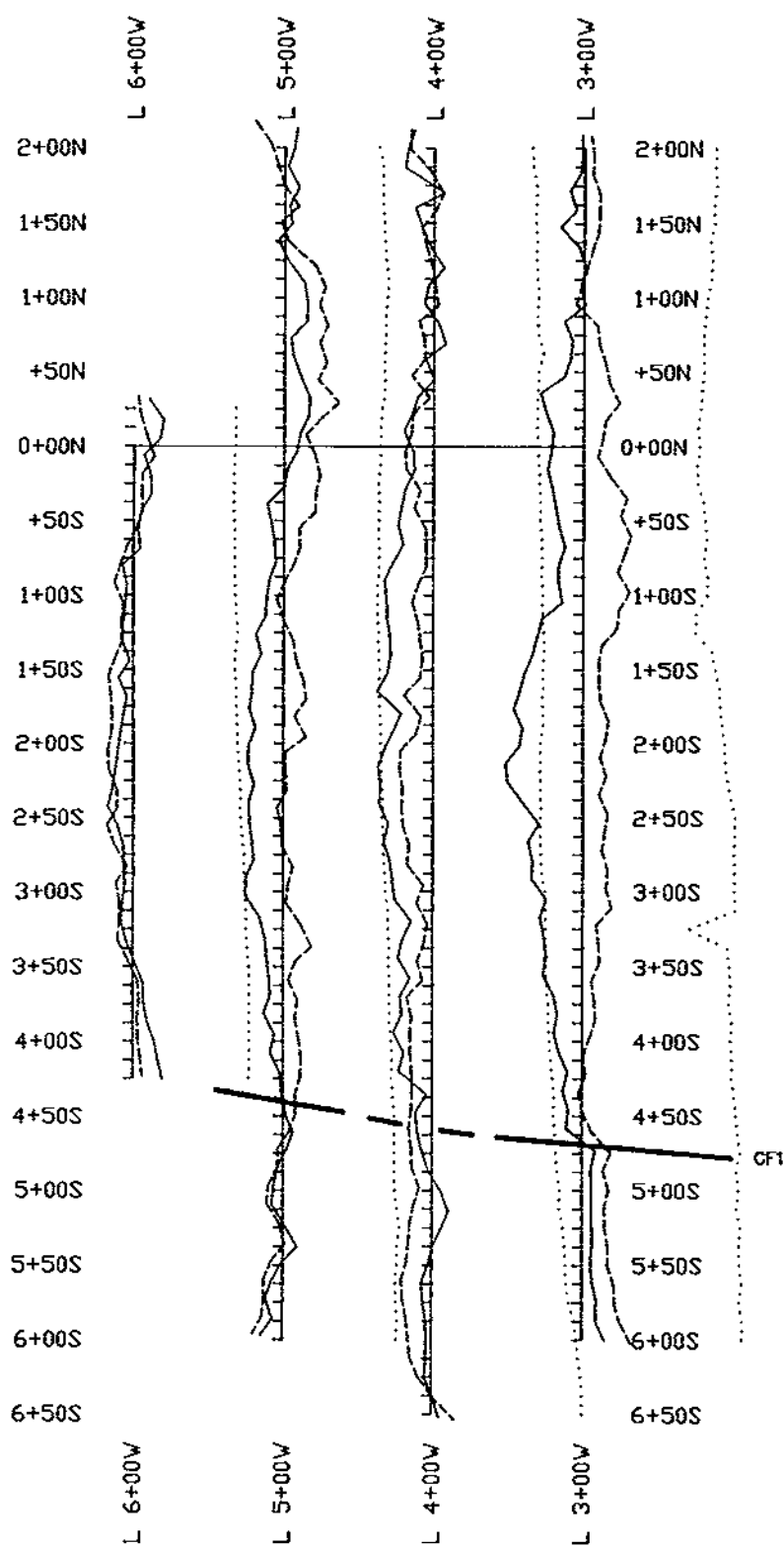
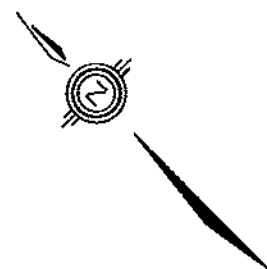




INSTRUMENT: EDA OMNI PLUS 100  
 SOLID LINE: MAGNETICS (gammas)  
 VERTICAL SCALE: 100/cm  
 BASELINE VALUE: 55800

BHP-UTAH MINES LTD	
JOSS 6 CLAIM VICTORIA MINING DIVISION	NTS 92 C/16
MAGNETIC SURVEY PROTON MAGNETOMETER	
 SCALE: 1:5000 (metres)	
DRAWN BY: J. WETHERILL DATED: AUGUST 12, 1989	FIGURE: 3.9

Prepared by: STETSON RESOURCE MGMT. CORP.



INSTRUMENT: EDA OMNI PLUS  
STATION FREQUENCY: 21.4  
SOLID LINE: IN PHASE (%)  
VERTICAL SCALE: 10/cm  
BASELINE VALUE: 0  
DASHED LINE: QUADRATURE (%)  
VERTICAL SCALE: 10/cm  
BASELINE VALUE: 0  
DOTTED LINE: TOTAL FIELD STRENGTH (units)  
VERTICAL SCALE: 5/cm  
BASELINE VALUE: 0

CONDUCTOR: CF1

BHP-UTAH MINES LTD

FOOTLOOSE 6 CLAIM  
VICTORIA MINING DIVISION NTS 92 C/16

VLF-EM GEOPHYSICS  
Annapolis, MD

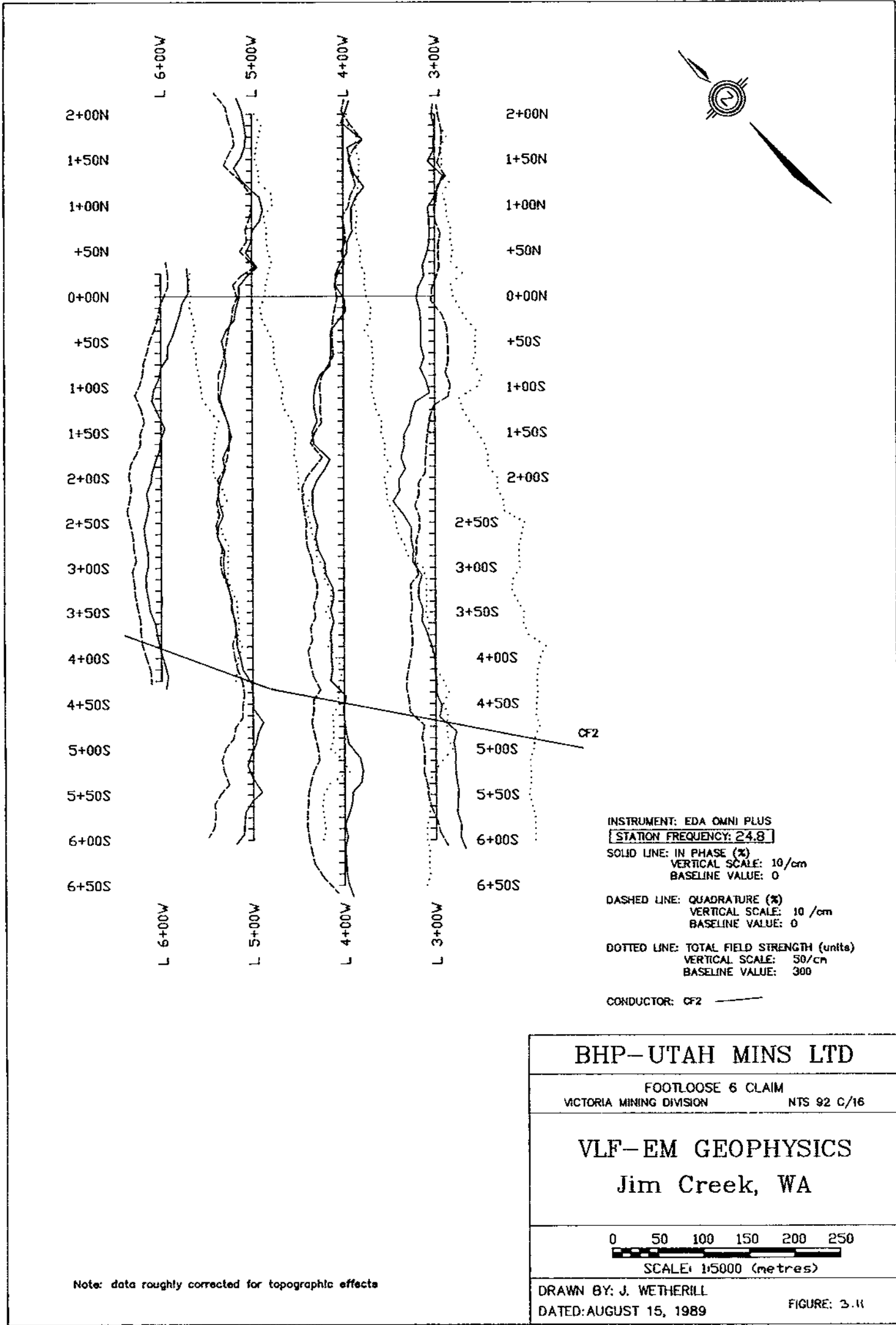
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SCALE: 1:5000 (metres)

DRAWN BY: J. WETHERILL  
DATED: AUGUST 14, 1989

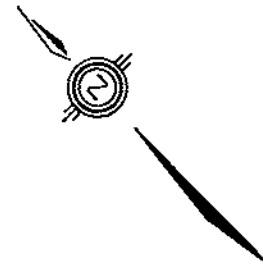
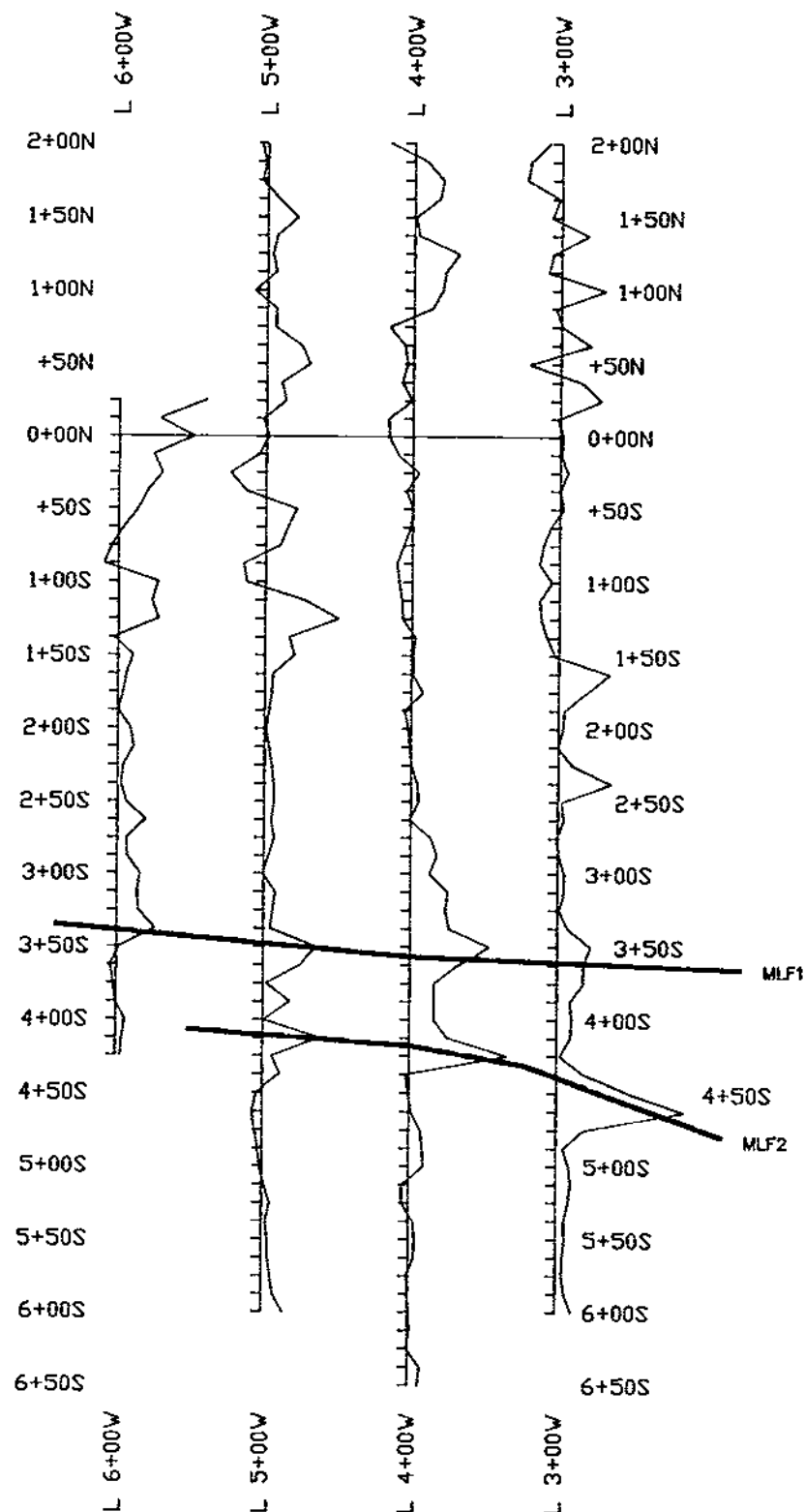
FIGURE: 3.10

Note: Data roughly corrected for topographic effects (see figure 3.2)

Prepared by: STETSON RESOURCE MGMT. CORP.

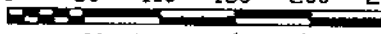


Prepared by: STETSON RESOURCE MGMT. CORP.



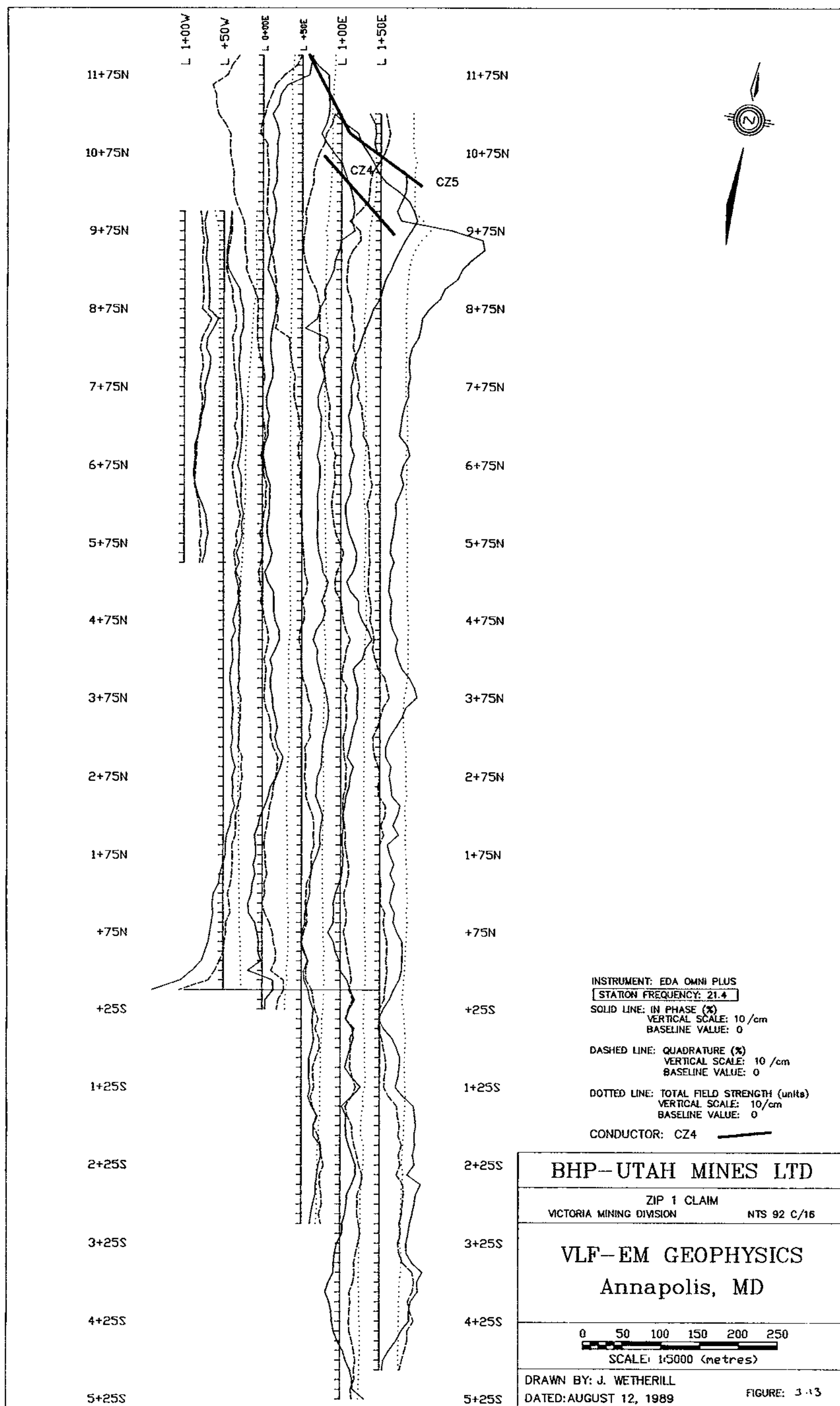
INSTRUMENT: EDA OMNI PLUS  
 SOLID LINE: MAGNETICS (gamma)  
 VERTICAL SCALE: 100/cm  
 BASELINE VALUE: 56000

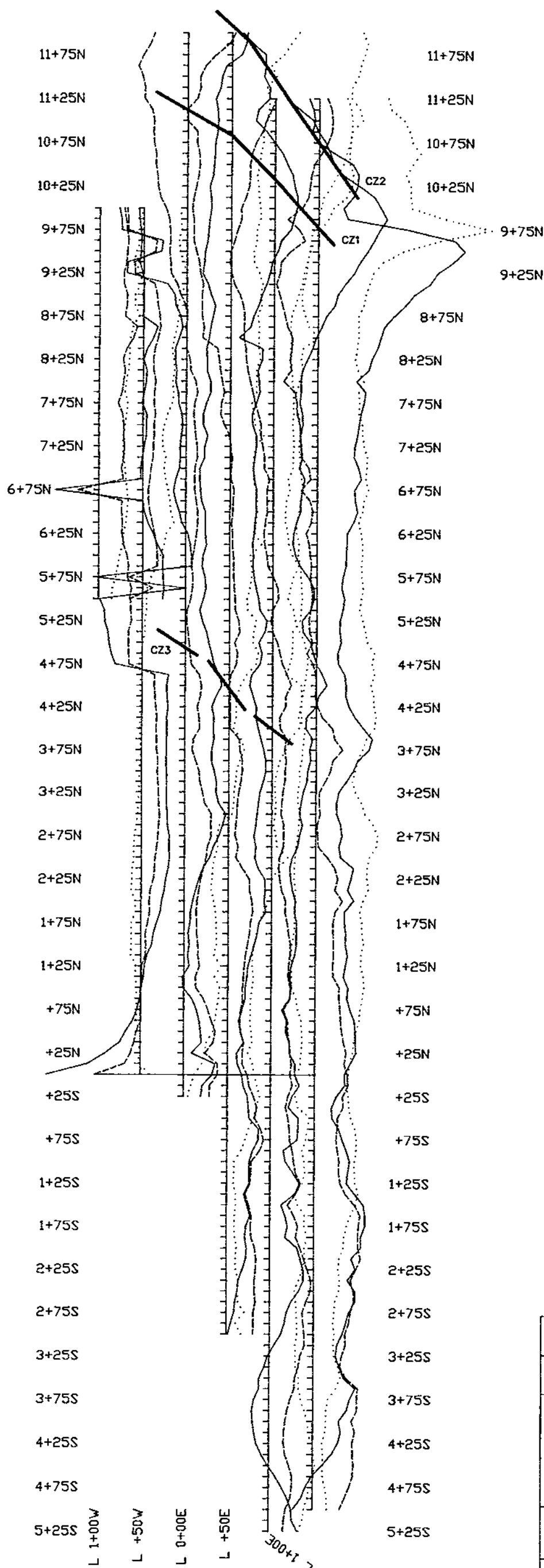
MAGNETIC LINEAMENT: MLF1

BHP-UTAH MINES LTD	
FOOTLOOSE 6 CLAIM	NTS 92 C/16
MAGNETIC SURVEY PROTON MAGNETOMETER	
0 50 100 150 200 250  SCALE 1:2,500 (metres)	
DRAWN BY: J. WETHERILL	FIGURE: 3.12
DATED: AUGUST 10, 1989	

Prepared by: STETSON RESOURCE MGMT. CORP.







INSTRUMENT: EDA OMNI PLUS  
 STATION FREQUENCY: 24.8  
 SOLID LINE: IN PHASE (%)  
 VERTICAL SCALE: 20/cm  
 BASELINE VALUE: 0  
 DASHED LINE: QUADRATURE (%)  
 VERTICAL SCALE: 20/cm  
 BASELINE VALUE: 0  
 DOTTED LINE: TOTAL FIELD STRENGTH (units)  
 VERTICAL SCALE: 100/cm  
 BASELINE VALUE: 200  
 CONDUCTOR: CZ1

BHP-UTAH MINES LTD

ZIP 1 CLAIM  
 VICTORIA MINING DIVISION NTS 92 C/16

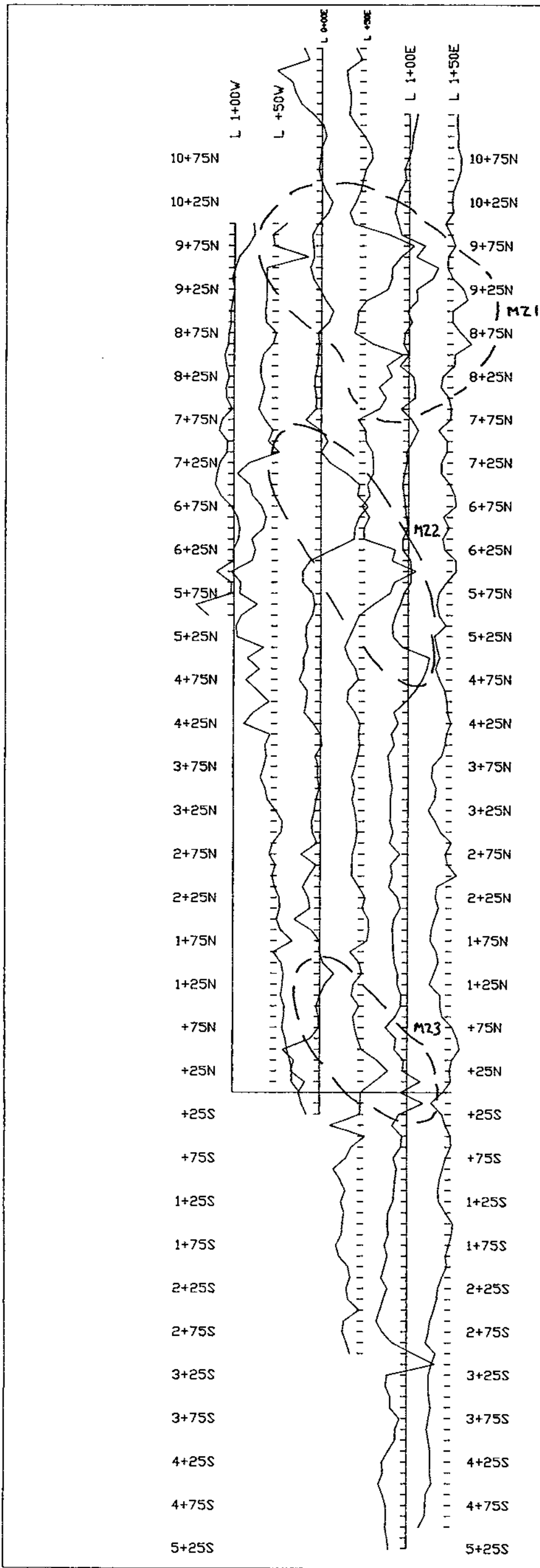
VLF-EM GEOPHYSICS  
 Jim Creek, WA

0 50 100 150 200 250  
 SCALE: 1:5000 (metres)


DRAWN BY: J. WETHERILL  
 DATED: AUGUST 12, 1989

FIGURE: 3.19

Prepared by: STETSON RESOURCE MGMT. CORP.



INSTRUMENT: EDA OMNI PLUS  
 SOLID LINE: MAGNETICS (gamma)  
 VERTICAL SCALE: /cm  
 BASELINE VALUE:  
 ( ) M21 MAGNETIC ACTIVITY

BHP-UTAH MINES LTD	
ZIP 1 CLAIM	NTS 92 C/16
MAGNETIC SURVEY PROTON MAGNETOMETER	
0 50 100 150 200 250  SCALE: 1:5000 (metres)	
DRAWN BY: J. WETHERILL	FIGURE: 3-15
DATED: AUGUST 12, 1989	