| MAP NO.: | | DOCUMENT NO: | 092522 |
|---|---|---|---|
| 115 F 15,16 | ASSESSMENT REPORT X<br>PROSPECTUS<br>CONFIDENTIAL X<br>OPEN FILE | MINING DISTRICT:<br>TYPE OF WORK: | Whitehorse<br>GEOLOGICAL, GEOPHYSICAL |

| | | | |
|---|---|---|---|
| **REPORT FILED UNDER:** | Polestar Exploration Inc. | | |
| **DATE PERFORMED:** | May 18 - June 28, 1988 | **DATE FILED:** | August 15, 1988 |
| **LOCATION: LAT.:** | $61^{o}57'$N | **AREA:** | White River |
| **LONG.:** | $140^{o}30'$W | **VALUE $:** | 31,000.00 |
| **CLAIM NAME & NO.:** | V; IV (YA95769-88; YA95733-64) | | |
| **WORK DONE BY:** | R. Wolfe | | |
| **WORK DONE FOR:** | Polestar Exploration Inc. | | |

**DATE TO GOOD STANDING:**

**REMARKS:** Adjacent to # 33, 69 (CANALASK, ONION)
Magnetic and VLF-EM surveys and geological mapping were done on 2 overburden-covered areas either side of the CANALASK deposit in 1988. A strong magnetic anomaly trends northwest across both claim blocks following the outline of ultramafic dykes.

RECEIVED
AUG 16 1988
MINING
RECORDERS OFFICE
WHITEHORSE, Y.T.

# 1988 GEOLOGICAL,

# AND GEOPHYSICAL WORK

# ON THE

# IV AND V MINERAL CLAIMS

WHITEHORSE MINING DIVISION

115F 15/16

YUKON TERRITORY

61 57' N, 140 30' W

for

POLESTAR EXPLORATION INC.

by

R. Wolfe, P. Eng.

August 5, 1988

092588

## TABLE OF CONTENTS



## FIGURES



## APPENDIX

## 1.0 SUMMARY

1.1 Polestar Exploration Inc. holds title to the IV 1-20 and V 1-36 mineral claims near Koidern, mile 1167 on the Alaska Highway, 230 km northwest of Whitehorse, Y.T. Access is excellent.

1.2 The IV claims are to the northwest and the V claims are to the southeast of the Canalask property which contains 500,000 tons of nickeliferous sulphide ore grading 1.68% Ni, 0.03% Cu and minor platinum values. Several drill holes on the Canalask property show sulphide mineralization, the best of which ran 0.013 oz/t Pt, 0.04 oz/t Pd, 0.33% Cu, and 0.94% Ni over 3 meters.

1.3 The claims occur in a mafic to ultramafic belt, well known for Ni-Cu-Pt deposits. The largest (Wellgreen deposit) is presently being developed by Galactic Resources. Drill indicated reserves are 50 million tons grading 0.026 oz/t Pt, 0.014 oz/t Pd, 0.67% Cu and 0.36% Ni.

1.4 1988 work was focused on overburden covered areas on either side of the Canalask property. Magnetic and VLF EM surveys were completed and geological mapping.

1.5 The magnetic survey outlined the ultramafic belt very well. The VLF EM survey outlined several strong anomalies some of which could indicate potentially economic sulphide mineralization.

1.6 On the V claims 5000' of reverse circulation drilling is recommended. On the IV claims soil sampling is recommended to test a strong coincident magnetic and EM anomaly, to be followed by bulldozer trenching and drilling if warranted. The program is estimated to cost $180,000.00.

PROFESSIONAL
ENGINEER

## 2.0 INTRODUCTION

The following report describes additional work done on the IV and V mineral claims near Koidern Y.T.

Magnetometer, VLF EM surveys and geological mapping were carried out under the supervision of R. Wolfe, P.Eng. between May 18 and June 28, 1988. Computer services and MAG profiles were provided by G.H. Giroux P.Eng. and MAG and EM interpretation was provided by geophysical J. C. Graham M.Eng.

## 3.0 LOCATION AND ACCESS

The IV claims are located 0.5 miles southwest of the Alaska highway where the White River crosses the highway.

Access is by foot trail on the westside of the River.

The V claims lie to the southeast of the IV claims. Access is excellent by all weather road to the old Canalask Mine (about 2 miles from the White River bridge) and then by winter road to the claims for less than half a mile.

Accommodations can be had at the Bear Flats Lodge (Mile 1167) a few miles south of White River crossing or White River Lodge a short distance to the North.

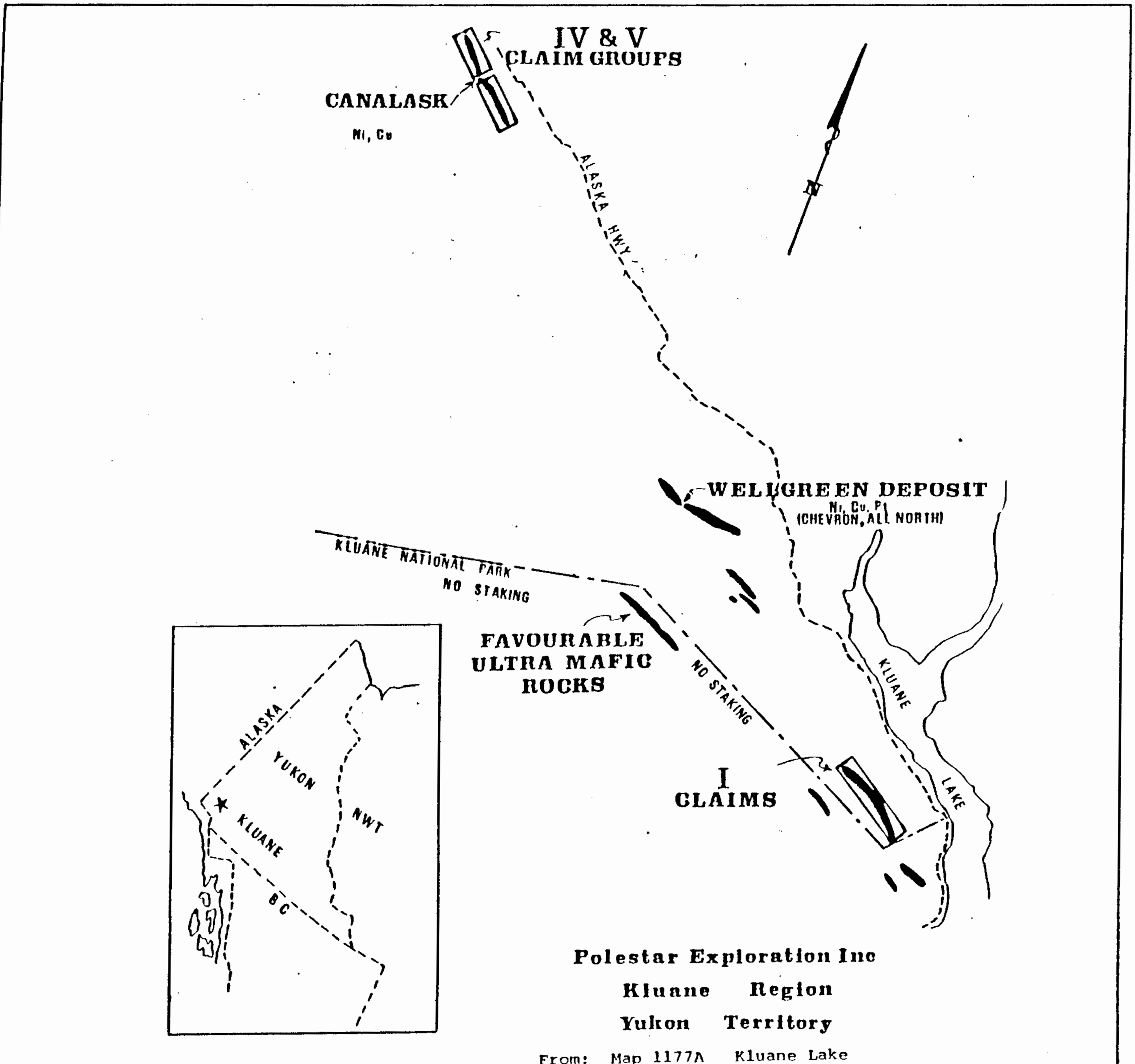



FIGURE 1

POLESTAR EXPLORATION INC.

IV & V CLAIMS — PROJECT # 87PS5

LOCATION MAP

SCALE 1: 950400.

0 — 15. — 30. — 45. Miles

MONTGOMERY CONSULTANTS LIMITED — JANUARY 5, 1988

## 4.0 CLAIM INFORMATION

Polestar Exploration Inc. holds title to the IV 1-20 and V 1-36 mineral claims in the Whitehorse Mining district.

| CLAIM | GRANT # | RECORD DATE | EXPIRY DATE |
|---|---|---|---|
| IV 1-20 | YA95769-788 | August 12/86 | August 12/89 |
| V 1-36 | YA95733-768 | August 12/86 | August 12/89 |

Assessment work and application to group were made as follows on August 5, 1988:

| GRANT # | CLAIM GROUP | | NEW EXPIRY DATE |
|---|---|---|---|
| YA95769-YA95787 | IV 1,3,5,7,9-19 | (10 claims) | August 12, 1995 |
| YA95770-YA95788 | IV 2,4,6,8,10-20 | (10 claims) | August 12, 1995 |
| YA95733-YA95763 | V 1,3,5-31 | (16 claims) | August 12, 1995 |
| YA95734-YA95764 | V 2,4,6-32 | (16 claims) | August 12, 1995 |

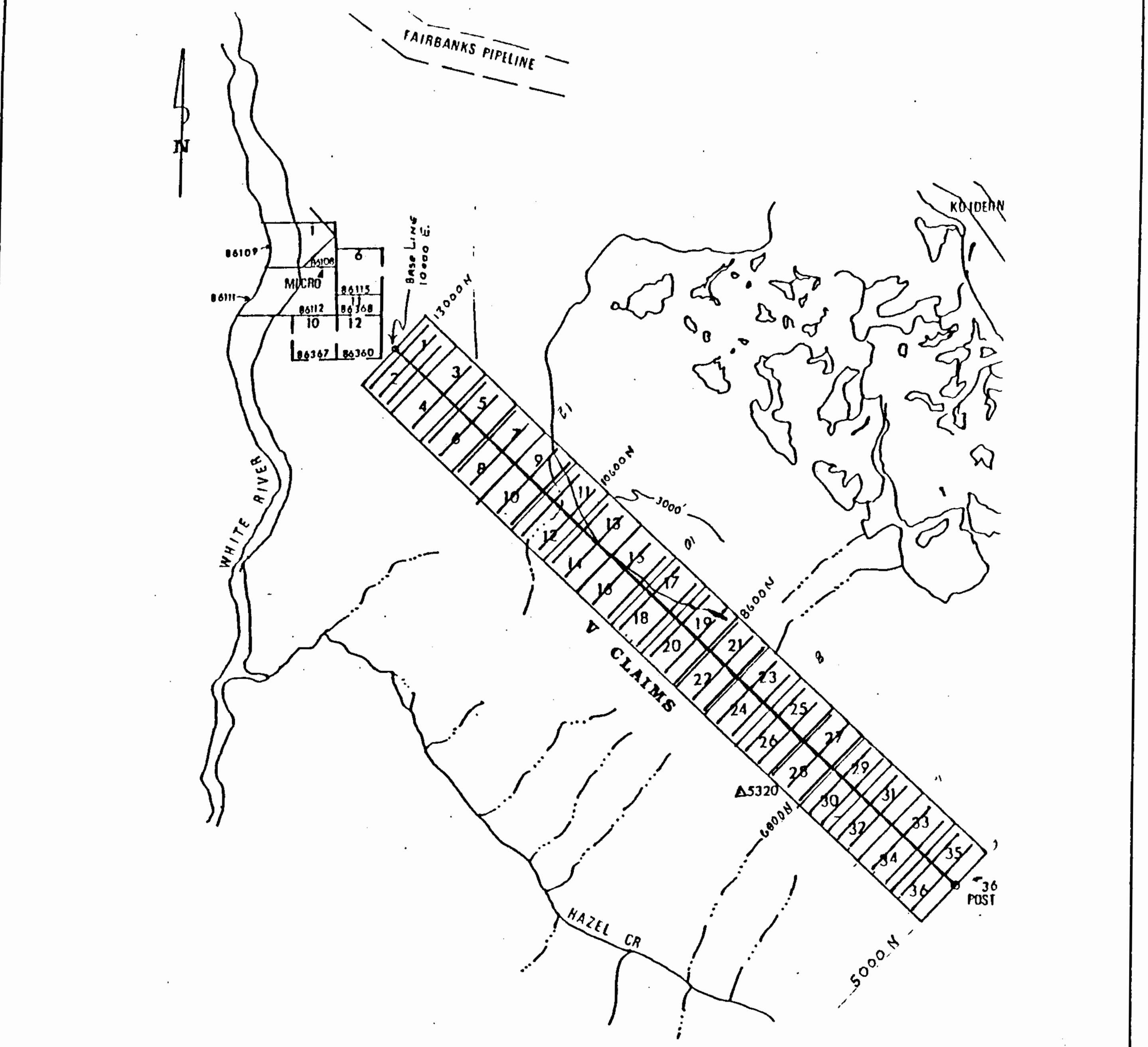



FIGURE 2

POLESTAR EXPLORATION INC.

IV & V CLAIMS

PROJECT # 87PS5

CLAIM MAP - V CLAIMS

SCALE 1: 64000.

0 1280. 2560. 3840. 5120. M.

MONTGOMERY CONSULTANTS LIMITED

JANUARY 5, 1988

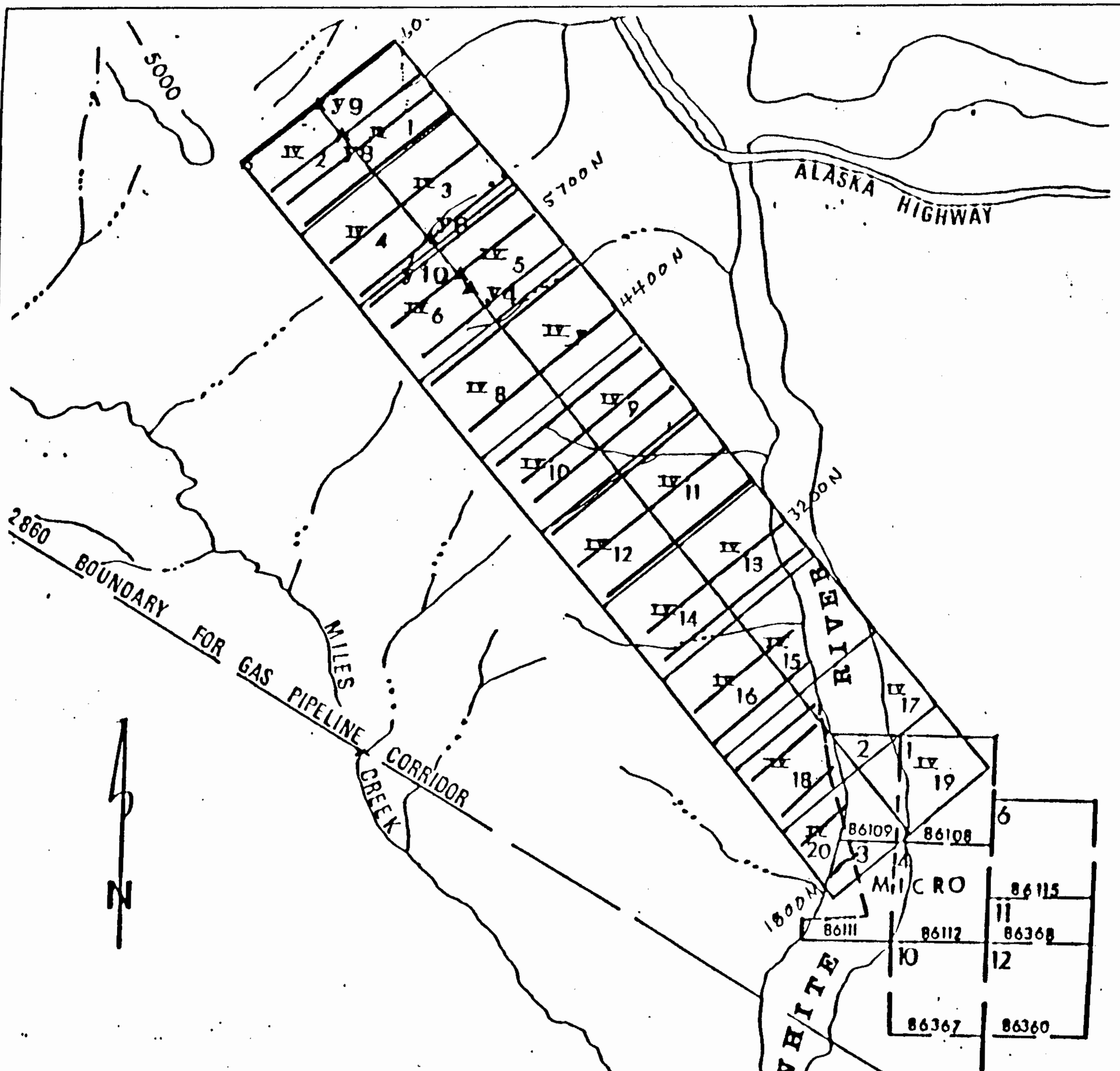



FIGURE 3

POLESTAR EXPLORATION INC.

IV & V CLAIMS

PROJECT # 87PS5

CLAIM MAP - IV CLAIMS

SCALE 1: 39600.

0 3300. 6600. 9900. Feet

MONTGOMERY CONSULTANTS LIMITED

JANUARY 5, 1988

## 5.0 PREVIOUS WORK

In 1987 Polestar conducted geochemical, magnetic and geological surveys over portions of the V and IV claims. This work is described by Montgomery and Giroux, (1988).

The V claims overlap on the Canalask property and some of the work conducted in the past is relevant (see Cathro 1987, Vincent 1987).

## 6.0 GEOLOGY

The geology has been described in a previous report by Montgomery and Giroux dated January 5, 1988 and also by Campbell (1976).

The 1988 field work was performed on areas of lower elevation with rather scarce outcrop.

Line grids were established for the geophysical surveys and every outcrop was mapped (see figures 4 and 5).

The claims cover a belt of Permo-Triassic serpentinized peridotites and dunites intruded as dykes and sills with subsequent intrusions of gabbro on the host rock contacts.

The ultramafics are some 200-250 m wide and dip almost vertically.

Significant Ni-Cu-Pt mineralization is associated at several locations with the ultramafic intrusions, its contact zones and a disseminations in the volcanoclastic and sedimentary host rocks.

# 7.0 MAGNETOMETER SURVEY

## 7.1 Instrumentation

Two Geometric Model G-856 AX portable proton precession magnetometers were used. One of the units was used to take readings on the line grid at 25 m intervals. The other unit was placed stationary on the baseline.

Data from both instruments was dumped into a Zenith Z100 portable computer. Diurnal corrections were made automatically using Geometrics MAG PAC software.

## 7.2 IV Claim Block (by J. C. Graham M.Eng., Geophysical Engineer)

The contoured total magnetic field strength results are presented as Figure 6. The survey area has strong magnetic relief (greater than 7,000 gammas), which is typical of areas underlain by ultramafic rock types.

The main anomaly is a high magnetic field strength zone trending northwesterly across the survey grid from 9600N/9400E to 10500N/9450E. The anomaly corresponds to an ultramafic dyke. The characteristics of the magnetic field indicate the dyke dips to the southwest. The anomaly has an apparent strike length of approximately 900 m, is open in both directions, and averages about 100-150 m in width.

There is a low field strength zone flanking the anomaly to the north, probably due to the dipole nature of the source's magnetic field but possibly indicating an alteration zone relatively depleted in magnetic minerals.

The anomaly is paralleled by a 300 m long high field strength zone trending from 10100N/9525E to 10300N/9575N. This subsidiary anomaly is more than 3,000 gammas above local background levels, and is probably due to a pod of ultramafic rock related to the main dyke. The magnetic contours there indicate the dyke is displaced by about 75 m, possibly faulted.

In the northeastern part of the survey grid (10300N/9850E) there is a 2 station, single line anomaly approximately 2,500 gammas above local background. The anomaly may indicate an ultramfic rock type similar to that responsible for the above-mentioned anomaly.

### 7.3 V Claim Block

A strong band of magnetic highs strikes across the claims in a northwesterly direction. Magnetic relief above background up to 6000 gammas. The outline of the ultramafics appears to correlate fairly well with 58,000 gamma contour. A major flexure(?) occurs on lines 10,995N and 11,115N (see figure 7). This may indicate a fault structure.

Line 10,325N 9500-9700E shows a magnetic high in the order of 2000 gammas. This may indicate disseminated pyrrhotite mineralization.

# 8.0 VLF EM SURVEY

## 8.1 Instrumentation

UNIT: Sabre Electronics 27 (see Appendix IV)
STATION: Seattle

## 8.2 Introduction

Slope angles were noted regularly. All plotted data was Fraser filtered. All dip angles were read facing south. Two testlines were run over the Canalask deposit. Strong anomalous dip angles in the order of $+50^{o}$ were obtained.

The Canalask deposit (500,000 tons) consists of massive sulphides, pyrite-pyrrhotite-chalcopyrite running 1.68% Nickel and 0.03% Copper.

A unusual feature is the lack of magnetic response over the orebody. This observation was corroborated by Cathro (1987).

## 8.3 IV Claims (by J.C. Graham M.Eng., Geophysical Engineer)

The Fraser Filtered dip angle measurements are presented as profiles on Figure 10. Positive values indicate conductive areas.

The strong magnetic anomaly described above (Sec. 7.2) correlates very well with a highly conductive zone. The filtered dip angles generally reach a maximum (general greater than 40 units) at the same stations as the magnetic field strength maxima. VLF-EM field strength values range up to 100% (relative to an arbitrarily selected datum level of about 35%), indicating a strong concentration of current flow in or near the dyke. The cause of the high conductivity is not known, but since the dyke is hydrothermally altered, the conductivity may be due to permeability associated with the structure hosting the dyke. An alternate explanation is that the conductivity is due to massive metallic mineralization.

There is no conductivity anomaly related to the 2 station single line magnetic anomaly noted in the northeastern part of the survey grid.

The strongly magnetic conductive zone is an intriguing target. Further work should include a soil geochemistry survey followed up by a trenching program.

### 8.4 V Claims

Several anomalies were outlined (see Figure 5) within the claim boundaries.

L9480N, 9650E: + $40^{o}$ in sediments

L9480N, 9850: + $25^{o}$ in ultrabasics

L10,000N, 10,100N/10,200N/10,325N: + $20^{o}$ on the contact zone between sediments and ultrabasics. This anomaly has a strong linear continuity and could be associated with sulphides

L10,750N/10,875N: + $35^{o}$-$40^{o}$ in ultrabasics.

L10,995N: + $40^{o}$ in ultrabasics, possibly off set to the right which corresponds to the flexure in the magnetic contours and may indicate a faulted linear structure with possible sulphides.

L11,485N/L11,615N/11,750N up to + $40^{o}$ fairly strong linear continuity in ultrabasics. Sulphides possible.

# 9.0 DISCUSSION AND RECOMMENDATIONS

## 9.1 Discussion

Two types of deposits have been encountered on the Canalask ground.

a) A massive sulphide deposit of 500,000 tons grading 1.68% Ni and 0.03% Cu with minor Platinum values. The Canalask deposit was emplaced in the volcanic hostrock, some 130 meters north of the ultrabasic intrusive.

b) Drill hole 73-7, 400 meters NW of the start of the present baseline at 12,000N/10,000E encountered 3 m of mineralization 0.13 oz/t Pt, 0.04 oz/t Pd, 0.33% Cu, 0.94% Ni.

Looking for similar deposits in overburden covered areas is complicated by the contradicting and erratic geophysical responses.

The Canalask deposit is picked up very well by VLF EM but shows no magnetic high even though it consists mostly of Nickeliferous pyrrhotite which is normally strongly magnetic.

The area of DH 73-7 shows neither magnetic relief over the background nor VLF EM anomalies. Disseminated sulphides are fairly common in the host rocks as well as the ultramafics. The usefulness of geophysical methods is therefore quite limited.

Recent exploration results at the Wellgreen deposit, which is being developed by Galactic Resources in exactly the same ultramafic belt, shows that the mineralization is found in high grade pods as well as disseminated in the volcanic and sedimentary footwall and hanging wall rocks. Present drill indicated reserves are 50 million tons grading 0.026 oz/t Pt, 0.014 oz/t Pd, 0.67% Cu, and 0.36% Ni with additional values in Cobalt and other platinum group metals (various news releases).

## 9.2 Recommendations

Reverse circulation drilling is recommended on the **V claims** across the ultramafic intrusives and on either side in "fence" like patterns. The area of interest is quite swampy,, so the drill should be mounted on a Nodwell track carrier. This type of drilling is considerably cheaper than diamond drilling and moves between holes can be made in a matter of hours. Structural information is of course not available but a large sample is collected every 5 feet and assay results are accurate. Previous diamond drilling in 1973 and 1986 show large core losses in sulphide zones. This type of loss will be eliminated. Initially a 5000' program is recommended.

The strong coincident MAG-EM anomaly on the **IV claims** should be investigated by soil sampling and subsequent bulldozer trenching with drilling to follow if warranted.

## 10. COST ESTIMATE

| | |
|---|---|
| **REVERSE CIRCULATION DRILLING** | |
| 5,000 ft @ $20/ft (all inclusive) | 100,000.00 |
| **ASSAYS** | |
| 1000 @ $25 | 25,000.00 |
| **GEOLOGICAL SUPERVISION** | |
| 1 geologist 50 days @ $300 | 15,000.00 |
| 1 helper 50 days @ $100 | 5,000.00 |
| **SOIL SURVEY IV CLAIM GRID** | 5,000.00 |
| **CAMP COSTS** | |
| 50 days @ $60.00 | 3,000.00 |
| **TRANSPORTATION** | 4,000.00 |
| **BULLDOZER TRENCHING/DRILL ACCESS** | 10,000.00 |
| **CONSULTANTS, REPORTS, ETC.** | 4,000.00 |
| subtotal | $171,000.00 |
| Contingencies (approx. 5%) | 9,000.00 |
| TOTAL: | $180,000.00 |

Respectfully submitted,

R. Wolfe, P.Eng.
August 5, 1988

ROBERT WOLFE

## APPENDIX I

## CERTIFICATE

I, ROBERT WOLFE, of Vancouver, B.C., do hereby certify that:

1. I am a Consulting Geological Engineer with an office at 3919 West 31st Avenue, Vancouver, B.C.

2.0 I am a graduate of the University of Alberta with a B.Sc. degree in Physics and Geology. I also took an extra year of geology at the University of B.C. in 1963-64.

3.0 I have practiced my profession since 1964, while being employed by such companies as KennCo (Western) Exploration, Meridian Exploration Syndicate, (Canex Aerial Exploration Ltd., Noranda Mines Ltd., Home Oil Canada Co.), Orequest Syndicate (Granby Mining Co., Home Oil Co., Homestake Silver Mines).

4. I have been in private independent practice since 1968.

5. I have been a member in good standing of the Association of Professional Engineers of the Province of British Columbia since 1967 and the Association of Professional Engineers of Yukon Territory since 1972.

6. I am a director and officer of Polestar Exploration Inc.

Dated this 5th day of August, 1988.

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA ROBERT WOLFE

---------------

Robert Wolfe, P.Eng.

# APPENDIX II

## 1988 COST BREAKDOWN

| | |
|---|---|
| WAGES | 15,976.00 |
| FOOD/ACCOMMODATIONS | 3,757.83 |
| GAS/OIL | 529.94 |
| EQUIPMENT/SUPPLIES | 1,325.32 |
| VEHICLE RENTAL | 1,664.32 |
| VEHICLE USE | 322.00 |
| TRANSPORTATION | 263.13 |
| MISCELLANEOUS | 157.40 |
| PHOTOCOPIES/REPRODUCTION COSTS | 1,214.50 |
| TELEPHONE | 121.26 |
| BOOKKEEPING | 1,088.75 |
| GEOCHEM ANALYSIS | 313.95 |
| EQUIPMENT RENTAL | 3,261.63 |
| AIRFARE | 1,040.12 |
| SHIPPING COSTS/COURIER | 594.83 |
| CUSTOM BROKER/COMPUTER COSTS | 697.20 |
| GEOLOGICAL & GEOPHYSICAL SUPERVISION MAPPING, CONSULTANTS, REPORTS, DRAFTING | 14,200.00 |
| | $46,528.18 |

## APPENDIX III

REFERENCES

**Campbell, S.W. (1976)** Nickel-Copper Sulphide Deposits in the Kluane Ranges Y.T. Open File Report EGS 1976-10.

**Campbell, S.W. (1976)** Geology of the Quill Creek Area, Y.T.

**Cathro, R.J (1987)** Report on 1987 Exploration Canalask Joint Venture. private report.

**Montgomery J.H., Giroux, G.H. (1988)** Geological, Geophysical and Geochemical report on the IV,V,I mineral claims. Assessment work report.

**Schwarz E.J. (1972)** Magnetic Properties of Pyrrhotite and their use in Geology and Geophysics Canadian Mining Journal, April 1972.

**Vincent, J.S. (1987)** A Summary Report on the Canalask Projects, Y.T. Private Report.

# APPENDIX IV
# SABRE MODEL 27 VLF-EM

SABRE MODEL 27
VLF-EM RECEIVER

**INSTRUMENTS LTD.**

4245 EAST HASTINGS STREET • BURNABY, B.C. V5C 2J5 • TELEPHONE: 291-16

## SABRE MODEL 27 VLF-EM RECEIVER

The model 27 EM unit was designed originally for a large Canadian mining company to overcome the deficiencies inherent in existing units.

The instrument is so stable and selective that completely reliable measurements can be made on distant stations without interference from nearby powerful transmitters. Stability and selectivity are especially important when making field-strength measurements, which are now being emphasized as a means of locating conductors.

This EM receiver is very compact, requires no earphones or loudspeakers and is housed in a heavy scotch saddle leather case. All of these features add up to make an ideal one-man EM unit of unexcelled electrical performance and mechanical ruggedness.

SPECIFICATIONS -

Source of Primary Field - VLF radio stations (12 to 24 KHz.)

Number of Stations - 4, selected by switch; Cutler, Main on 17.8 KHz. and Seattle, Washington on 18.6 KHz. are standard, leaving 2 other stations that can be selected by the user.

Types of Measurement

1. Dip angle in degrees, read on a meter-type inclinometer with a range of $\pm 60^\circ$ and an accuracy of $\pm \frac{1}{2}^\circ$.
2. Field strength, read on a meter and a precision digital dial with an accuracy exceeding 1%.
3. Out of phase component, read on the field strength meter as a residual reading when measuring the dip angle.

Dimensions and Weight

Approx. 9½" x 2½" x 8½"; Weighs 5 lbs.

Batteries

8 alkaline penlite cells. The instrument will run continuously on 1 set of batteries for over 200 hours; So that in normal on-off use, the batteries will last all season. The battery condition under load is shown by pushing a button and reading voltage on the field strength meter.

## VLF-EM OPERATING INSTRUCTIONS

The equipment is operated in the usual way as follows:

1. With the instrument held horizontal in front of you, turn around until a null appears on the field strength meter. You should now be facing the station.

2. With the receiver still facing the station, lift it to the vertical position and rotate it slightly in the vertical plane to your right or left until the best null appears on the field strength meter. Record the angle on the inclinometer at which the null appears. This is the DIP ANGLE (Positive or negative).

3. Return the instrument to the horizontal plane and turn around until the field strength meter is at its maximum reading. Set this maximum reading at 100 on the meter and record the reading on the gain control dial. This is the Field Strength Reading.

4. Repeat steps 1, 2 and 3 at each station.

5. To test the batteries turn the power switch on and push the test button. The field strength meter should read above the re[c] mark. Battery life is approximately 200 hours and if the instrument is turned off between readings, the batteries shoul[d] last for an entire season.

NOTE: An alternative way of measuring field strength is as follows:

ERRED
FED

Proceed as in step 3, setting the meter to 100. Now push the field strength button (marked FS) and the meter will read 50. (If it doesn't, adjust the gain control slightly). Leave the Gain Control setting where it is and take comparative Field Strength readings at each station by pressing the Field Strength button and recording the meter reading, which will vary from its Base Station Reading as you pass over conductive zones.

## SELECTION OF STATIONS:

The stations are selected by the switch on the control panel, with the following abbreviations being used;

| | |
|---|---|
| C = Cutler, Maine. | Frequency = 17.8 Khz. |
| S = Seattle, Wash. | Frequency = 18.6 Khz. |
| A = Annapolis, Md. | Frequency = 21.4 Khz. |
| H = Hawaii. | Frequency = 23.4 Khz. |

The two most useful stations are Cutler and Seattle and these will be used almost exclusively. Note that Seattle is off the air for several hours on Thursdays for maintenance (between 10 A.M. and 2 P.M. usually). Cutler is off the air for the same length of time every Friday.

If Equipment fails to operate:

(a) Check that station is transmitting (see above). If one station appears to be dead, check another one to see if it is operating normally.

(b) Check batteries. If they read low or the reading begins to drop after the test button is held down for a few seconds, replace them. Note also that there are 8 batteries in the instrument and they cannot be individually checked by the test button. If the batteries have been in the unit for a long time it is possible that one is dead or very weak but that the total voltage indicated by the test button is near normal. It is cheap insurance to instal new batteries before starting a big survey.

(c) If unit still fails to operate check that battery connectors are tight, then check wiring of battery connectors for breaks or damage.

DETAILED
OPERATING INSTRUCTIONS
SABRE VLF-EM RECEIVER

## INTRODUCTION:

The VLF-EM method utilizes electromagnet field transmitted from radio stations in the 15-25 K Hz range. The signals are propagated with the magnetic component of the field being horizontal in undisturbed areas.

Conductivity contrasts in the earth create secondary fields, producing a vertical component and changes in the field strength or amplitude. These conductive areas may be located, and to a degree, evaluated by measuring the various parameters of this electromagnetic field.

The Sabre VLF-EM receiver is tuned to receive any 4 transmitter stations: usually C-Cutler Maine, S-Seattle, H-Hawaii and P-Panama.

The station used in the survey should be selected so that the direction of the signal is roughly perpendicular to the direction of the grid lines which, in turn, should be laid out perpendicular to the regional strike.

## MEASUREMENTS:

The Sabre VLF-EM receiver can be used to measure the following characteristics of the VLF field.

(a) Tilt angle of resultant field;

(b) Field strength of (a) horizontal component of f
(b) vertical component of fie

## Field Procedure

The following procedure should be followed to measure the dip angle of null and the field strength of the horizontal component of the VLF field.

## Initial Field Strength Adjustment

Adjust the gain control to provide a suitable relati field strength measurement, as follows:-

(a) hold receiver in horizontal position (meter faces horizontal) and rotate in a horizontal plane until a null is indicated on the F.S. meter; rotate 90° in this horizontal plane (F.S. meter reads maximum)

(b) adjust fain control so that the F.S. meter roads 100

(c) record gain control setting (000 to 999). Close guard over gain control and do not readjust unless a major field strength occurs.

The above procedure should be carried out at the beginning of each day's survey and checked during the day.

## Dip Angle Measurement Procedure

1. Hold receiver in horizontal position and rotate in the horizontal plane until a null is observed. This aligns receiver in the field and the operator should be facing southerly or easterly depending on transmitter location.

2. Bring receiver up to the vertical position (meter faces vertical) and rotate the receiver in the vertical plane perpendicular to the transmitter direction until a null or minimum reading is observed on the field strength meter.

3. Hold the receiver in this field strength null position and read the inclinometer in degrees. Record this dip angle of null along with sign (+ or -).

## Horizontal Field Strength Measurement Procedure

1. Return receiver to the horizontal position.
2. Reestablish null bearing in horizontal plane.
3. Rotate receiver 90° in the horizontal plane.
4. Depress ~~damp~~ F.S. push button switch and observe field strength meter reading for sufficient time to obtain an average F.S. meter reading. (depressed ~~damp~~ F.S. switch slows needle action and reduces meter reading by half. The reading will normally range around 50).
5. Record F.S. reading.

Filtering Techneque For VLF-EM Dip Angle Data

The standard profile method of presenting dip angle data may be difficult to interpret. A filtering technique, described by D.C. Fraser 1969 (Geophysics, V.34 No. 6, P. 958-967) enables the data to be presented on a plan map with conductive areas defined by contours.

The following explains the calculation:-

| Line | Station | Null | | Filter |
|---|---|---|---|---|
| 8N | 0 E | + 3 | +3+4= +7 | |
| | 1 E | + 4 | +4+4= +8 | +7-(+10)= -3 |
| | 2 E | + 4 | +4+6= +10 | +8-(+13)= -5 |
| | 3 E | + 6 | +13 | +10-(+16)= -6 |
| | 4 E | + 7 | +16 | -8 |
| | 5 E | + 9 | +21 | -12 |
| | 6 E | + 12 | +28 | +3 |
| | 7 E | + 16 | +18 | +30 |
| | 8 E | + 2 | -2 | +32 |
| | 9 E | - 4 | -14 | +14 |
| | 11 E | - 6 | -16 | -14-(-7)= -7 |
| | | | -6-1= -7 | |
| | 12 E | - 1 | | |

Fig. 1 is an example of a field sheet showing null angle reading, filtered reading and relative field strengt Fig. 2 shows the field sheet with filter card overlaid. The small window in the side of the card shows the four reading used to calculate the filtered reading, and an arrow showing that the filter reading is to be plotted between station 8E and 9E as indicated in fig. 1. The card is moved down the field sheet, one reading at a time as a guide while carrying out the filtering procedure. Throughout the survey care must be taken to ensure that the filtered data has the correct sign. The positive values only are plotted and contour while for negative values, only the negative sign is plotted.

Crone suggests in instructions for the Radem VLF-EM, the use of N-S or E-W notation instead of (+ or -) signs, however for filtering a sign must be substituted.

The following convention may be used to ensure he correct sign of filtered data and provide a consistent rossover pattern when studying the profiled null angle data.

1. When taking a reading, always face southerly, n east-west lines, and always face easterly on north-south lines.

2. Record data on field sheets (top to bottom) s follows: on N-S lines record from south to north

: on E-W lines record from west to east

3. Plot and profile dip angle data on plan maps facing map north or map west.

The above convention will provide correct data regardless of the property location relative to the transmitter being used.

J.T. WALKER

MAY 17, 1974

522

(Grain - 024

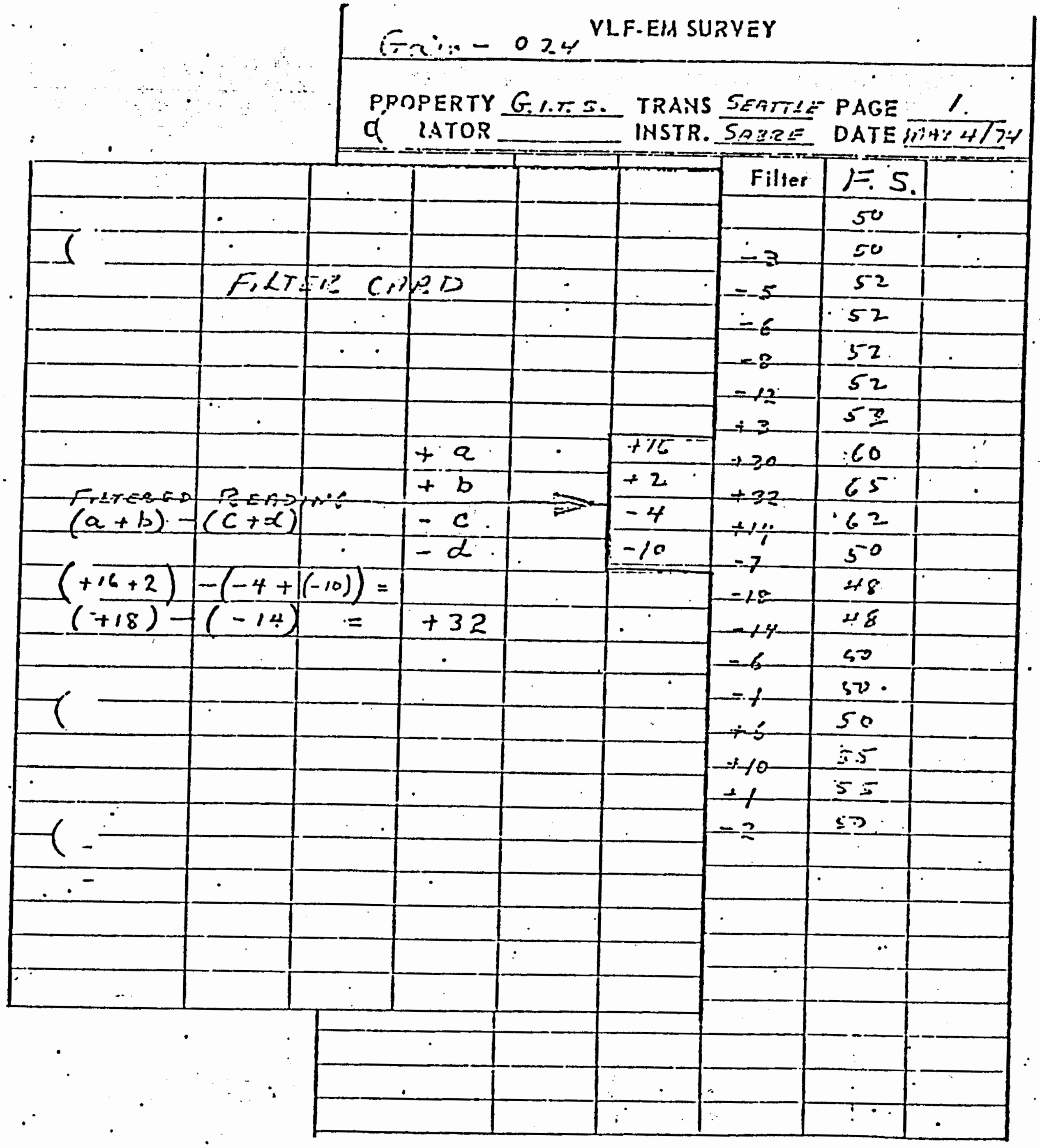
## VLF-EM SURVEY

PROPERTY G.I.T.S. TRANS SEATTLE PAGE 1

OPERATOR ________ INSTR. SABRE DATE MAY 4/74

| Line | Stn. | Null | Filter | F.S. | |
|---|---|---|---|---|---|
| 8N | 0E | +3 | | 50 | |
| | 1E | +4 | -2 | 50 | |
| | 2E | +4 | -5 | 52 | |
| | 3E | +6 | -6 | 52 | |
| | 4E | +7 | -8 | 52 | |
| | 5E | +9 | -12 | 52 | |
| | 6E | +12 | +3 | 53 | |
| | 7E | +16 | +20 | 60 | |
| | 8E | +2 | +32 | 65 | X OVER |
| | 9E | -4 | +14 | 62 | |
| | 10E | -10 | -7 | 50 | |
| | 11E | -6 | -13 | 48 | |
| | 12E | -1 | -14 | 46 | |
| | 13E | +3 | -6 | 50 | |
| | 14E | +4 | -1 | 52 | |
| | 15E | +4 | +6 | 50 | |
| | 16E | +4 | +10 | 55 | X OVER |
| | 17E | -2 | +1 | 55 | |
| | 18E | 0 | -2 | 50 | |
| | 19E | +1 | | | |
| | 20E | -1 | | | |

Fig. 1 Example of Field Sheet



Gain - 024 VLF-EM SURVEY

PROPERTY G.I.T.S. TRANS SEATTLE PAGE 1.
OPERATOR ______ INSTR. SABRE DATE MAY 4/74

FILTER CARD

| | Filter | F.S. |
|---|---|---|
| | | 50 |
| | -3 | 50 |
| | -5 | 52 |
| | -6 | 52 |
| | -8 | 52 |
| | -12 | 52 |
| | +3 | 53 |
| + a → +16 | +30 | 60 |
| + b → +2 | +32 | 65 |
| - c → -4 | +14 | 62 |
| - d → -10 | -7 | 50 |
| | -18 | 48 |
| | -14 | 48 |
| | -6 | 50 |
| | -1 | 50 |
| | +6 | 50 |
| | +10 | 55 |
| | +1 | 55 |
| | -2 | 50 |

FILTERED READING $(a+b)-(c+d)$

$(+16+2)-(-4+(-10)) =$

$(+18)-(-14) = +32$

Fig. 2 Field Sheet with Filter Card Overlayed

0.92522

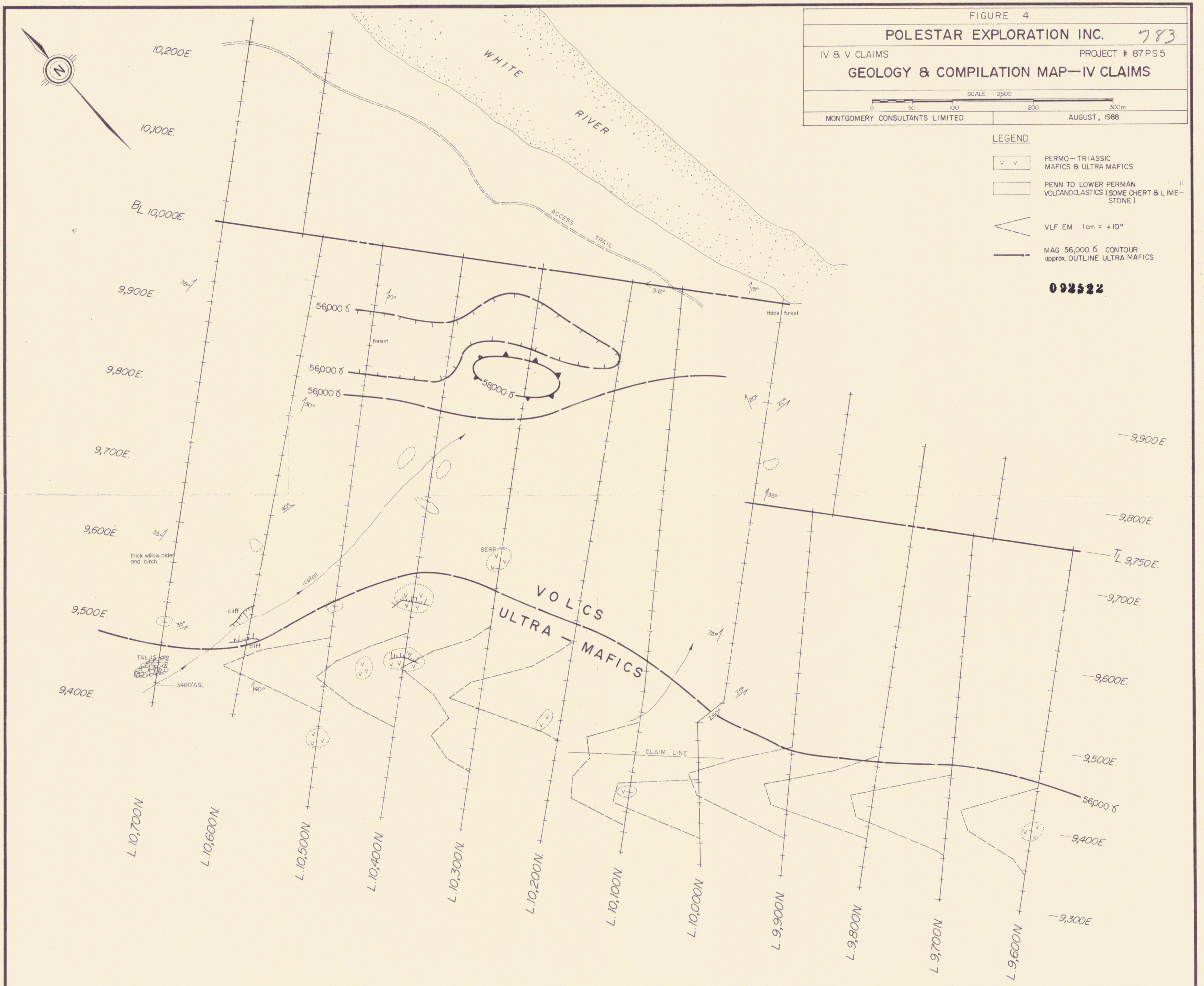


FIGURE 4
POLESTAR EXPLORATION INC.
783
IV & V CLAIMS
PROJECT # 87PS5
GEOLOGY & COMPILATION MAP—IV CLAIMS
SCALE 1:2500
0 50 100 200 300m
MONTGOMERY CONSULTANTS LIMITED
AUGUST, 1988
LEGEND
PERMO – TRIASSIC MAFICS & ULTRA MAFICS
PENN TO LOWER PERMAN VOLCANOCLASTICS (SOME CHERT & LIME-STONE)
VLF EM 1cm = +10°
MAG 56,000 γ CONTOUR approx. OUTLINE ULTRA MAFICS
092522
WHITE RIVER
ACCESS TRAIL
BL 10,000E.
TL 9,750E.
10,200E.
10,100E.
9,900E.
9,800E.
9,700E.
9,600E.
9,500E.
9,400E.
9,300E.
56,000 γ
58,000 γ
forest
thick forest
thick willow, alder and birch
cliff
TALUS
3480'ASL
icefall
SERP.
VOLCS
ULTRA MAFICS
CLAIM LINE
L.10,700N.
L.10,600N.
L.10,500N.
L.10,400N.
L.10,300N.
L.10,200N.
L.10,100N.
L.10,000N.
L.9,900N.
L.9,800N.
L.9,700N.
L.9,600N.


FIGURE 5
POLESTAR EXPLORATION INC.
778
IV & V CLAIMS
PROJECT # 87PS5
GEOLOGY & COMPILATION MAP—V CLAIMS
SCALE 1:2,500
0 50 100 200 300m
MONTGOMERY CONSULTANTS LIMITED
AUGUST, 1988
092522
LEGEND
PERMO-TRIASSIC MAFICS & ULTRA MAFICS
LOWER PERMIAN SEDIMENTS
PENN TO LOWER PERMAIN VOLCANOCLASTICS (SOME CHERT & LIMESTONE)
VLF EM 1 cm = +10°
MAG 58,000 CONTOUR approx. ULTRA-MAFICS
approx. CLAIM BOUNDARY
VQ
1973 D.D.H.
ULTRA — MAFICS
L.12,000N
L.11,900N
L.11,750N
L.11,615N
L.11,485N
L.11,370N
L.11,235N
L.11,115N
L.10,995N
L.10,875N
L.10,750N
L.10,635N
L.10,480N
L.10,325N
L.10,200N
L.10,100N
L.10,000N
L.9,900N
L.9,800N
L.9,700N
L.9,600N
L.9,500N
L.9,400N
10,300E.
10,200E.
10,100E.
BL 10,000E.
9,900E.
9,800E.
9,700E.
9,600E.
9,500E.
9,400E.
9,300E.
9,200E.
VQ1
VQ2
no sulph, 10m
core lost
VQ3
no sulph
10m + 20m
core lost
VQ4
lost in overburden
no log ?
C.P.
#1 WENG 5 & 6
#2 WENG 3 & 4
C.P. #1 V1, V2
C.P.
#1 V7, V8
#2 V5, V6
CAT TRACK
58,000 γ

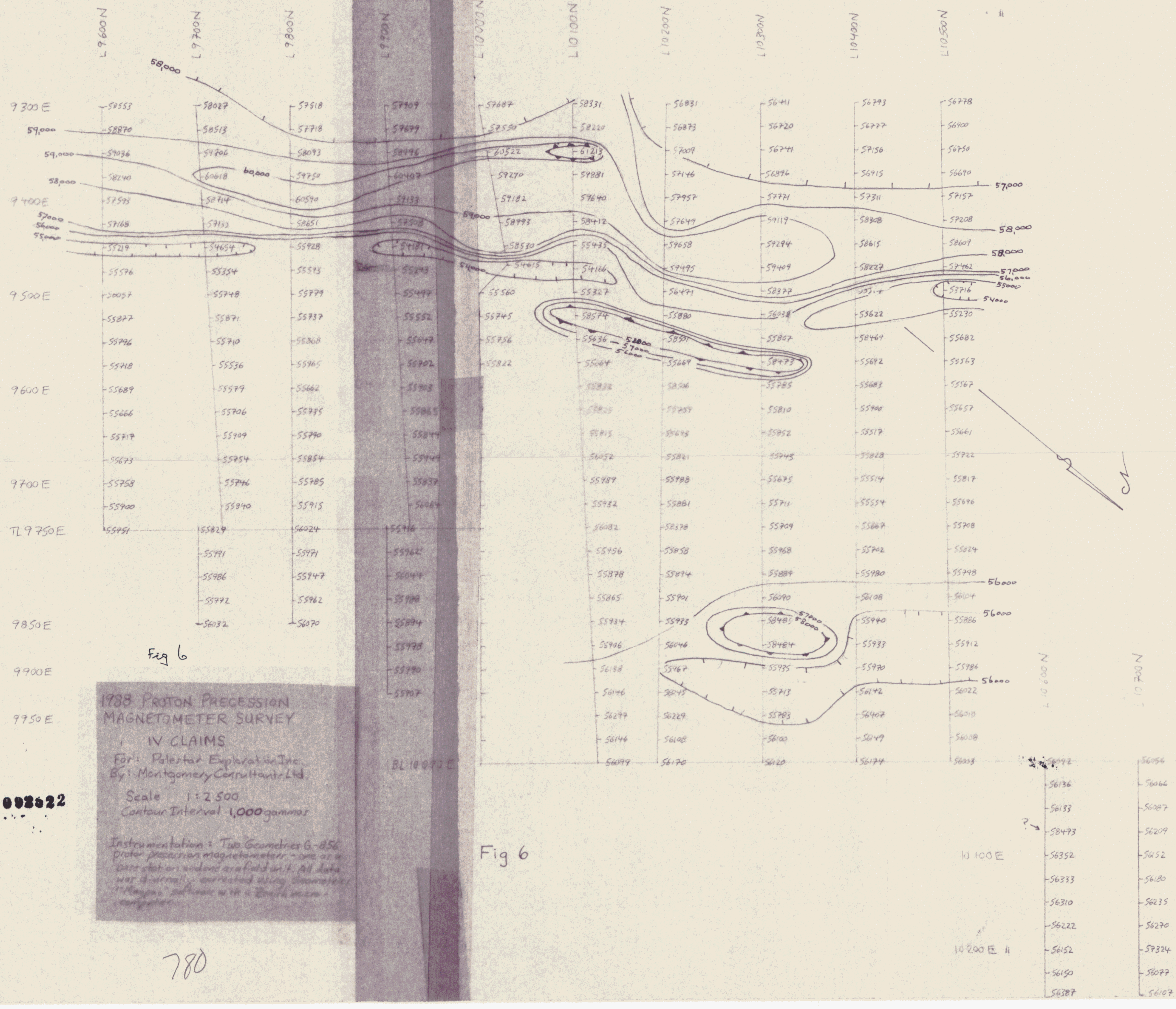



Fig 6

Fig 6

780

002522

Contour Interval = 500 gammas

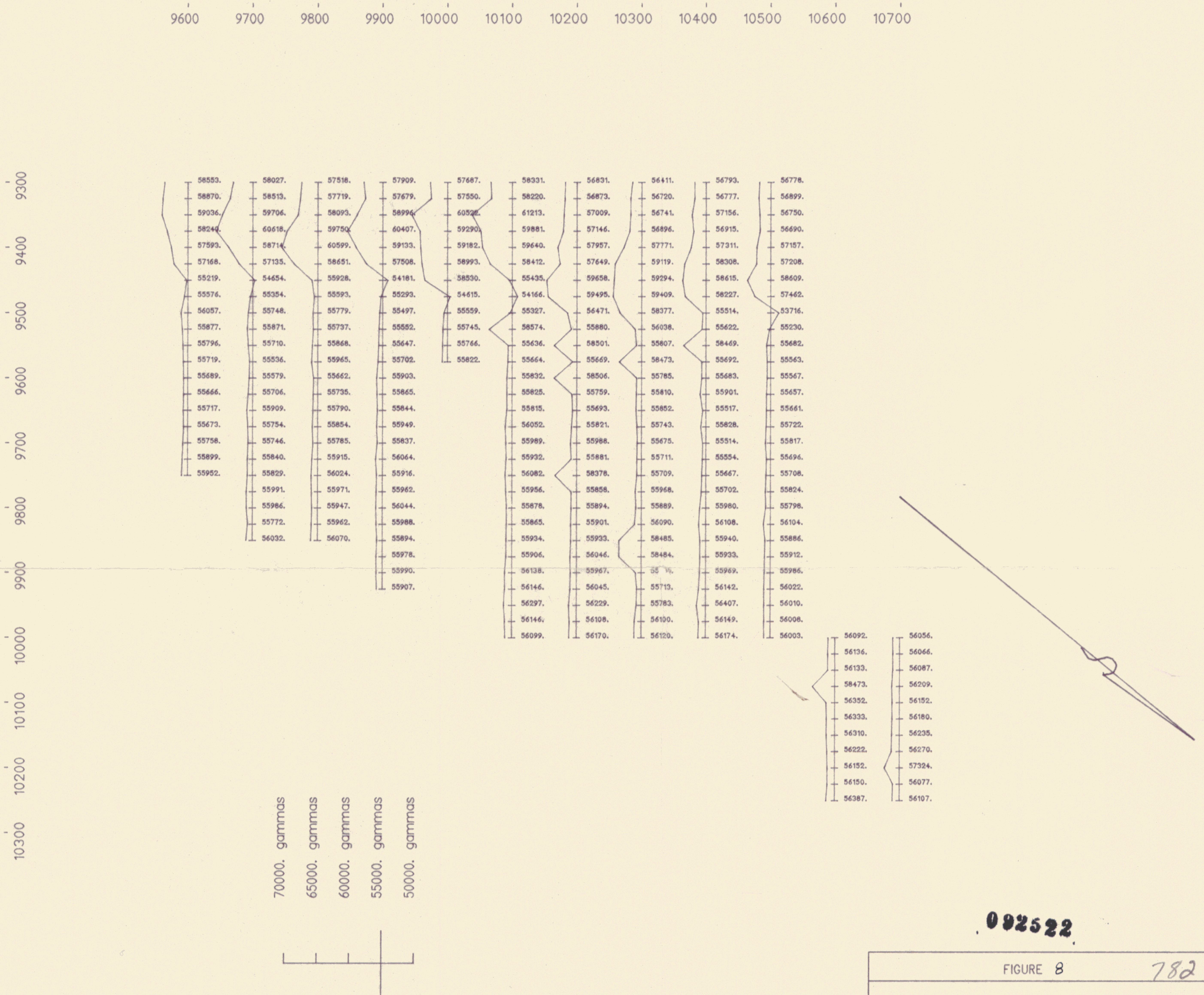
Scale
1:2 500

Fig. 7

092522

FIELD MAGNETICS MAP - CORRECTED DATA
V CLAIMS GRID
For: Polestar Exploration
By: Montgomery Consultants Ltd.

779




092522

FIGURE 8 782

**POLESTAR EXPLORATION INC.**

IV CLAIMS PROJECT # 88PS5

MAGNETOMETER PROFILES

0 100. 200. M.

MONTGOMERY CONSULTANTS LIMITED | AUGUST 5, 1988


002522

FIGURE 9 78/

**POLESTAR EXPLORATION INC.**

V CLAIMS PROJECT # 88PS5

MAGNETOMETER SURVEY

0 100. 200. M.

MONTGOMERY CONSULTANTS LIMITED JUNE 20, 1988


Fig 10

092522

June 1988

VLF-EM

Fraser Filter Dip ∠°

IV Claims Yukon

Scale 1:2500

profile scale 1cm = 10°

785


V Claims

VLF - Field Map

Filtered Profile Dip

1cm = 10°

Fig. 11

Scale 1:2500

784

092522

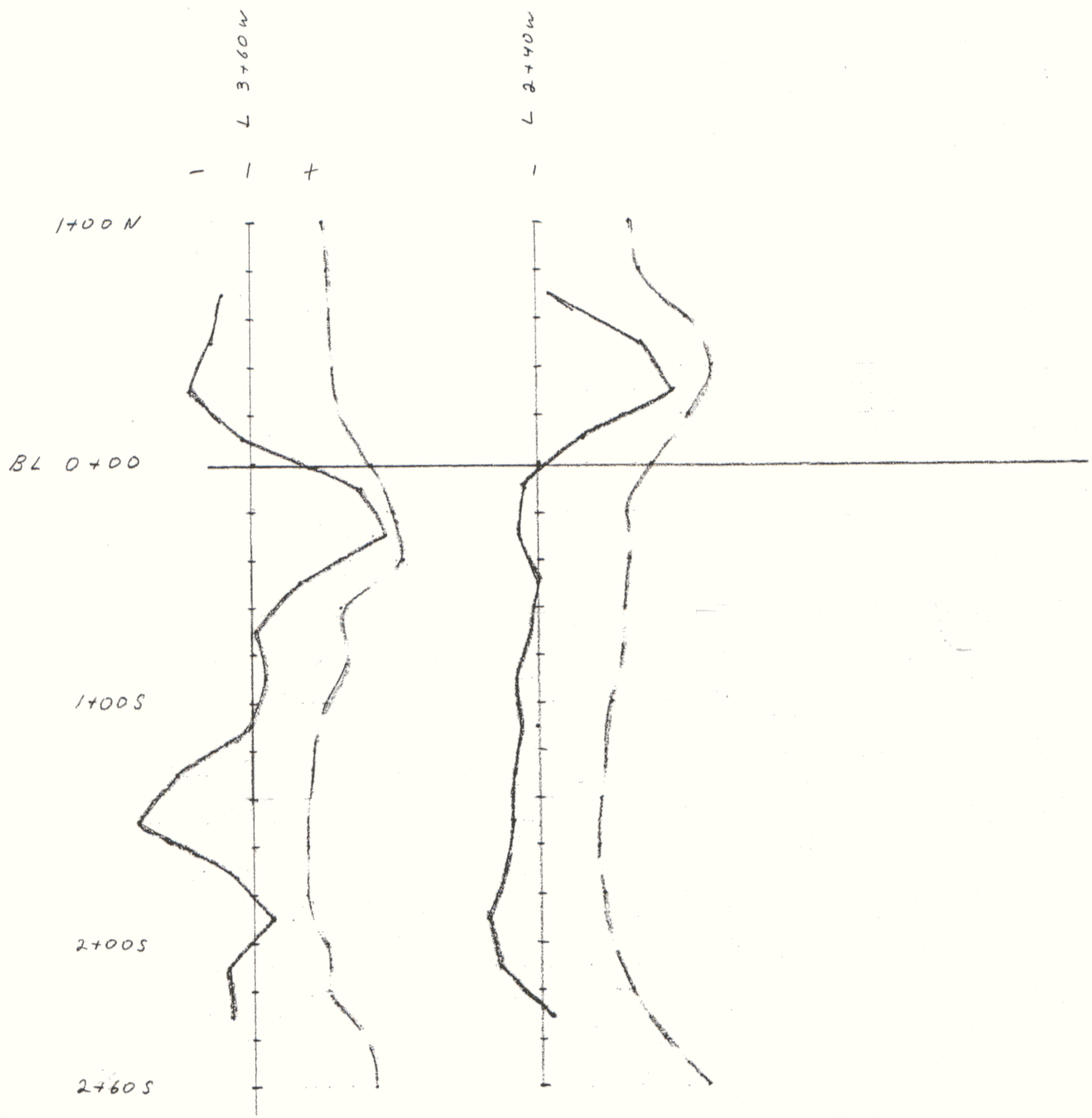
Lower Canyon
ALASKA HWY
parking
2328
ACCESS TRAIL
WHITE RIVER
IV Claim Blk. Grid
V Claim Blk. Grid
CAT TRACK
CANALASK
2300
3300
3400
3000
Creek
FIGURE 12
POLESTAR EXPLORATION INC.
786
IV & V CLAIMS
PROJECT # 87 PS 5
TOPOGRAPHY & GRIDS — IV & V CLAIMS
SCALE 1:10,000
092522
MONTGOMERY CONSULTANTS LIMITED
AUGUST, 1988

1cm = 20 m
1 : 2000

MAGNETICS TEST LINE
CANALASK DEPOSIT
May 30, 1988
Instruments : Field Geometrics G-856
Base " "

Fig. 13

092522




CANALASK DEPOSIT

VLF Test Lines
Sabre 27
Station - Seattle

G - 400
Face - South
1cm = 20°

Dip

FS

092522

Fig. 14

Grid 1cm = 20m