

LOG NO: 1117	RD.
ACTION: 13 pp.	
FILE NO: 87-752-16561	

GROUND GEOPHYSICAL SURVEYS

Spruce Creek Option

FILMED

Shuksan 5, 6 and 13
Atlin Mining Division

N.T.S. 104N/11W ~~104N/11W~~
Lat. $59^{\circ} 30' 33''$ N Long. $133^{\circ} 30' 23''$ W

**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

16,561

Owned by: Surprise Lake Exploration Limited Partnership (D.G. Purvis)
Work by: Placer Dome Inc. (Placer Development Limited)

M.V. Smith

August 1987

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1.0 Summary

The 1987 ground geophysical survey on the Spruce Creek option was conducted during the middle of August. A total of 19.5 kms of line were marked at 20 m intervals along lines 200 m apart. VLF-EM readings were taken at 20 m stations and magnetometer readings were taken at 10 m intervals. No anomalous magnetic readings were obtained on the grid but several VLF conductors were detected on the NW end of the grid and have been interpreted as being indicative of carbonaceous sediments overlain by varying thicknesses of overburden towards the SE.

2.0 Introduction

During August 1987, Placer Dome Inc. of Vancouver, B.C., carried out a ground geophysical survey on the Spruce Creek property of Surprise Lake Exploration Limited Partnership.

A NW-SE grid was established with lines at 330 degrees Az on the Shuksan 5, 6 and 13 claims. The line-cutting and marking of the grid was contracted to Eaglehead Exploration Services of Atlin, B.C., and consisted of 19.5 kms of line.

No previous work had taken place on these claims. The objective of the geophysical survey is to determine whether there are any structural settings adjacent to or in ultramafic bodies which may contain gold mineralization.

2.1 Location and Access

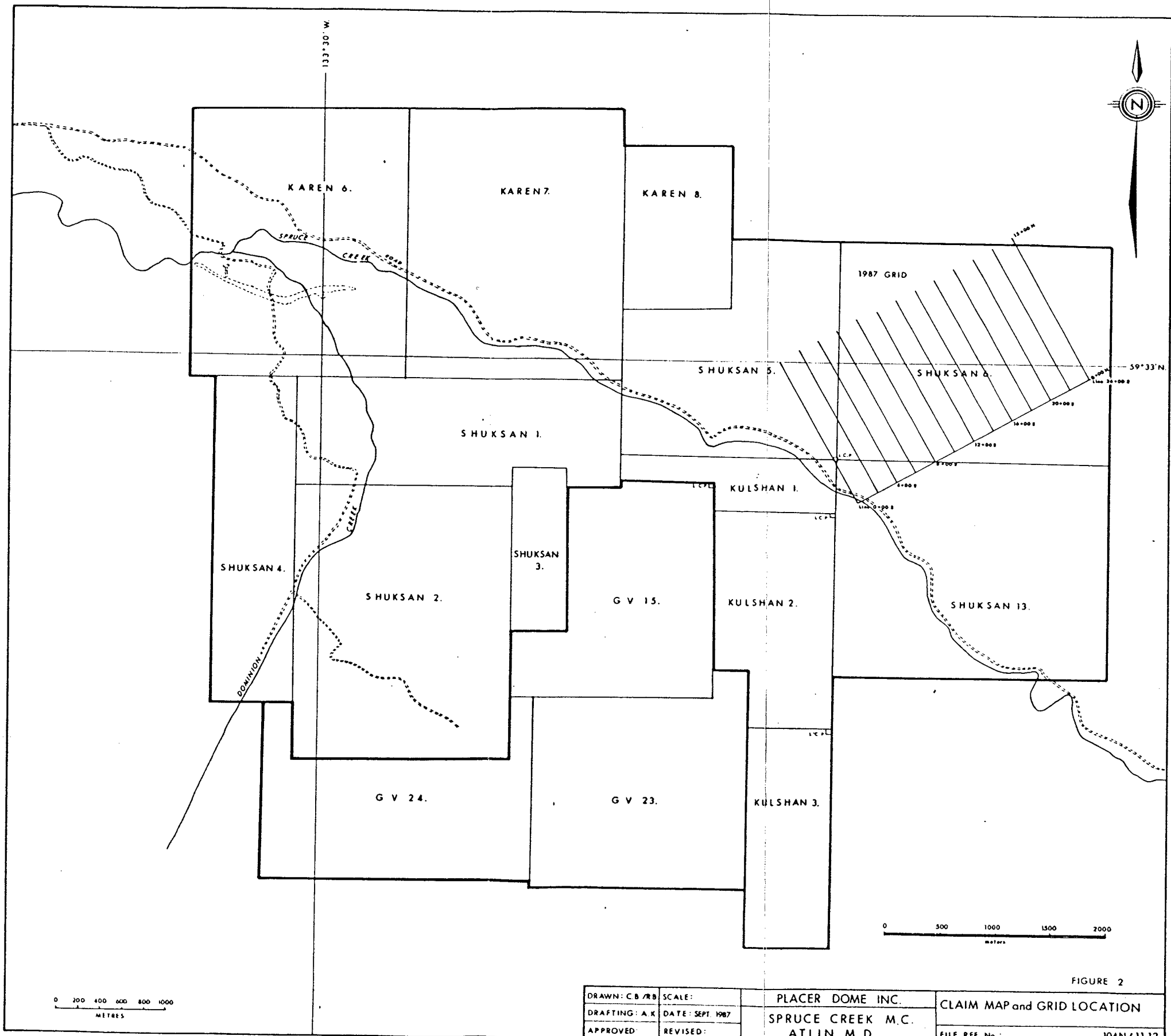
The Spruce Creek property is located in the Atlin district of northwestern B.C., about 50 km south of Yukon border. It encompasses an area including the confluence of Dominion and Spruce Creeks which are tributaries of Pine Creek.

Access to the property, located approximately 15 kms east of Atlin, is by means of a 2 or 4-wheel drive vehicle along good gravel roads which branch off the Surprise Lake road located 6 kms from the Atlin townsite.

2.2 Claim Status

The Spruce Creek property consists of 13 claims totaling 179 units which are owned by Surprise Lake Exploration Limited Partnership, West Vancouver, B.C. Placer Dome Inc., Vancouver, B.C., is the current operator on the property.

The Spruce Creek property consists of the following claims in good standing:



0 200 400 600 800 1000
METRES

0 500 1000 1500 2000
METRES

DRAWN: C B / R B	SCALE:	PLACER DOME INC.	CLAIM MAP and GRID LOCATION
DRAFTING: A K	DATE: SEPT. 1987	SPRUCE CREEK M.C.	
APPROVED:	REVISED:	ATLIN M.D.	
			FILE REF. No.: 104N/11,12

FIGURE 2

<u>NAME</u>	<u>UNITS</u>	<u>ANNIV. DATE</u>	<u>RECORD NO.</u>
Shuksan 1	12	July 28	1359
Shuksan 2	20	July 28	1360
Shuksan 3	3	July 28	1361
Shuksan 4	12	September 2	2027
Shuksan 5	16	September 2	2028
Shuksan 6	20	September 2	2016
Shuksan 13	20	September 2	2023
Karen 6	20	July 28	1369
Karen 7	20	July 28	1370
Karen 8	6	July 28	1371
Kulshan 1	8	January 27	2587
Kulshan 2	12	July 15	2574
Kulshan 3	8	July 15	2575

3.0 Geophysical Surveys

VLF-EM and magnetometer surveys were conducted along 19.5 kms of line.

The VLF-EM survey was carried out using the transmitting station of Lualualei, Hawaii. The direction to the station was 210 degrees Az, therefore, the readings were taken facing 300 degrees Az at 20 m intervals along the line.

Magnetometer readings were taken at 10 m stations and correction for drift and diurnal changes were made by use of a base station recording magnetometer.

3.1 Equipment Used

The magnetometer survey was performed using two Geometrics G-856A portable proton magnetometers (memory-mag). One was used in the field mode (Ser. No. 27502) while the other was used in a base station mode (Ser. No. 27383). The internal clocks within the two instruments were synchronized before commencement of the survey. At the end of a survey day the readings were dumped out to floppy disc in a Kaypro II portable computer. The data from the two magnetometers were merged and corrected for diurnal drift from an established base station value (57650). The corrected results were plotted as field profiles and also stored on disc for eventual transfer to a Univac 1108 for final plotting.

The VLF-EM 16 data was gathered by employing a Geonics EM-16 (Ser. No. 25) which used the following transmitting station:

Lualualei NPM 23,4 Khz

VLF readings were also entered onto a floppy disc in a Kaypro II computer and field profiles of In-Phase, Quadrature and Fraser Filter data were plotted. The stored data was also transferred to a Univac 1108 for final processing and plotting.

3.2 Data Presentation

The magnetometer survey results were plotted as plan maps of stacked profiles at a scale of 1:5000 (see plates in folder at back of report).

The VLF-EM survey results were plotted as stacked In-phase, Quadrature and Fraser Filter profiles on plan maps at a scale of 1:5000. The Fraser Filter data was calculated as per the method put forth by D.C. Fraser (1969, Contouring of VLF-EM data: Geophysics. v. 34. p. 958-967). See plates in the folder at the back of report.

3.3 Interpretation and Discussion of Results

3.3.1 Geology

There are four main rock types found on the Spruce Creek property;

- 1) sediments consisting of argillite, siltstone and chert;
- 2) greenstones (metamorphosed andesitic volcanics);
- 3) unaltered and altered ultramafic rocks and serpentinite and;
- 4) various intermediate to mafic dykes.

Exposures of bedrock on the Shuksan 5, 6 and 13 claims are restricted to the mountain ridges and their slopes, located at the northwest end of the grid. Overburden consisting of glacial drift and alluvium masks bedrock on the remainder of the grid. G.S.C. Mapsheet 1082A by J.D. Aitken, 1960 indicates these mountain ridges consist of sediments of the Cache Creek Group and field mapping confirms the presence of interbedded chert and black argillite sediments. At the base of the slopes there is no visible outcrop but float material consisting of chert and black argillite was observed. The southwest corner of the grid consists of observed overburden thicknesses of greater than 30 meters. Overburden thickness decreases as you move to the north towards the mountain sides. Gold mineralization in the Atlin camp has been found in quartz veins and quartz stockworks associated with intensely carbonatized intermediate volcanics and ultramafic rocks (pers. comm. M. Gareau, 1987). Unaltered occurrences of the ultramafics have strong magnetic signatures; carbonatization destroys their magnetic susceptibility.

3.3.2 Magnetometer Survey

Geophysical features indicative of favourable geology would be the flanks of magnetic highs and local magnetic lows. No magnetic effects of any significance were found on this grid. The magnetic signature is relatively quiet apart from a slight increase in magnetic value and a more spikey pattern towards the south end of the grid.

It is assumed that there are no ultramafics underlying the glacial drift.

3.3.3 VLF-EM Survey

Several strong VLF conductors were detected on the grid and have been numbered 1 through 7. There appears to be no correlation between these conductors and the magnetometer results. The sub-parallel pattern of these conductors has been observed before on previous ground geophysical surveys on the Spruce Creek property (Cannon 1986). Drilling of these conductors yielded sheared, interbedded chert and black argillite sediments (Gareau 1987).

Utilizing the geology of the surrounding area and the observed pattern of the conductors it is assumed that this grid consists of carbonaceous sediments which could possibly be sheared.

Three domains labelled A, B and C have been interpreted as areas of varying thickness of overburden which effect the magnitude of the sub-parallel conductors.

A - area of thick overburden, greater than 30 m in the SW portion of the grid.

B - area of overburden layer, assumed to be about 15-30 m thick.

C - flanks of mountainside, overburden layer less than 15-20 m thick.

4.0 Conclusions and Recommendations

- 1) No magnetic effects of any significance were found on this grid. Ground magnetics does not indicate the presence of unaltered ultramafic rocks.
- 2) Seven strong VLF-EM conductors were observed towards the NW portion of the grid.

- 3) Relatively quiet magnetic signatures and the sub-parallel pattern of the VLF-EM conductors and the limited geological mapping suggest that the grid is underlain by carbonaceous sediments.

Successful gold exploration in the Atlin camp has all been focused on mineralization associated with structural settings adjacent to or in ultramafic bodies. The ground geophysics of this survey has not indicated such a setting on this grid. Consequently no further work can be recommended on the basis of the mag. and VLF data.

M. V. Smith

M.V. Smith

5.0 Statement of Expenditures

The following expenditures were incurred for a geophysical exploration program on Shuksan 5, 6 and 13 claims located in the Atlin District of northwestern B.C. during August 1987.

1. Camp Costs

a) Accommodation 4 days @ \$55/day	\$ 220.00
b) Meals 4 days @ \$30/day	120.00

2. Line Cutting (Eaglehead Exploration Services, Invoice dated 17 Aug. 1987) \$ 8,470.00

3. Transportation

a) Airfare - Vancouver to Whitehorse	\$ 300.00
b) 4x4 Crew Cab - 3 days @ \$60/day	180.00
c) Gas	60.00

4. Data Collection, Interpretation and Report Writing
(Salaries & Benefits)

M.V. Smith 7 days @ \$175/day	\$ 1,225.00
D. Hayward 3 days @ \$125/day	375.00

5. Equipment Charges

2 G-865 magnetometers @ \$400/week x 1/2	\$ 200.00
1 Kaypro computer @ \$100/week x 1	100.00
1 Geonics EM-16 @ \$200/week x 1/2	100.00
Computer Plotting Costs	<u>50.00</u>

Total Expenditures: \$11,400.00

6.0 Statement of Qualifications

I, M.V. Smith, of Placer Dome Inc., Vancouver, British Columbia do hereby certify that:

- 1) I am a graduate of the University of British Columbia where I received a B.A. Sc. in Geological Engineering - (Geophysics Option) in May 1987.
- 2) I am presently working as an E.I.T. under the direction of a registered professional geophysical engineer.
- 3) I personally carried out the geophysical survey on the Shuksan 5, 6 and 13 claims, and the interpretation of the data and the writing of this report.

M. V. Smith

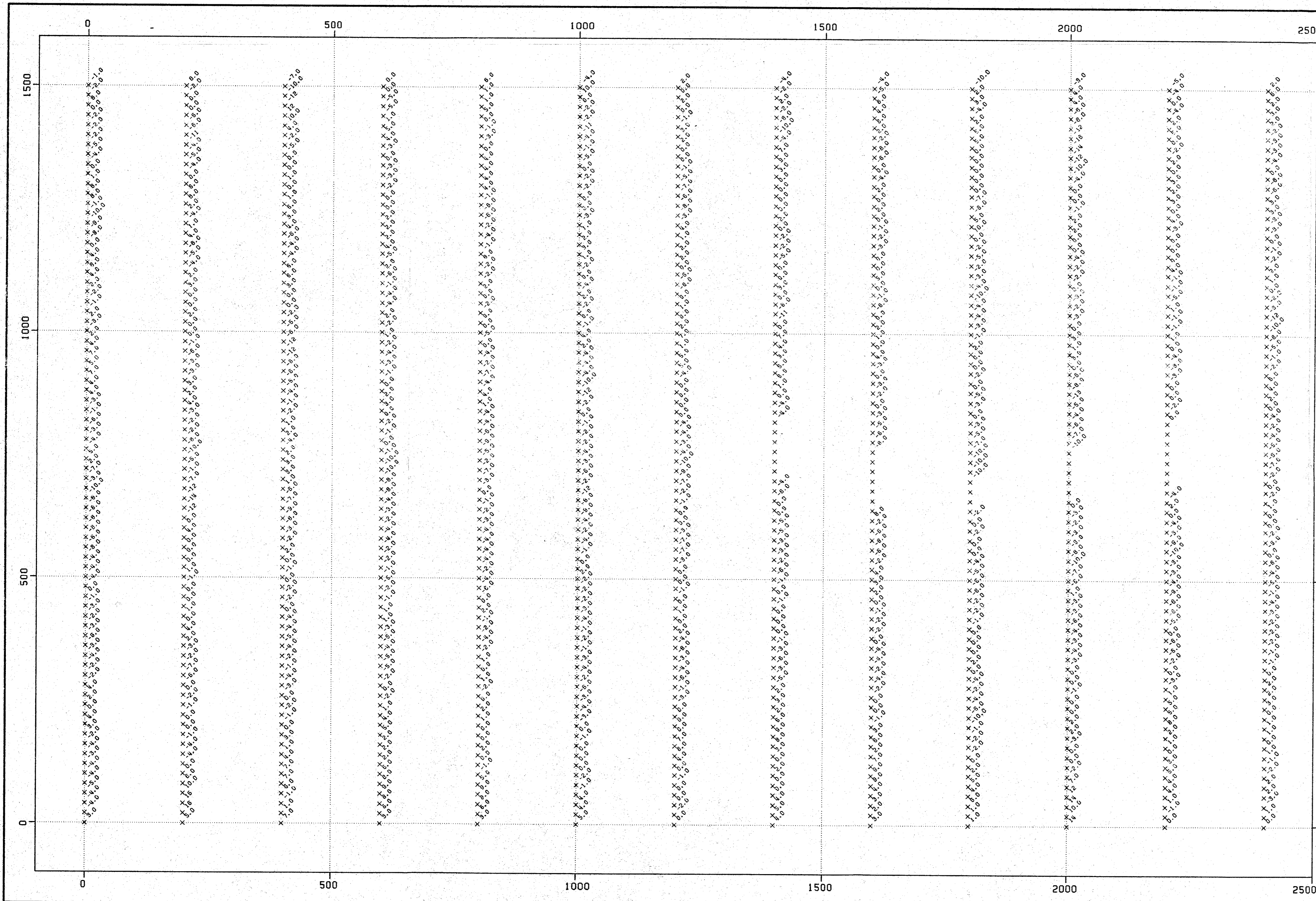
M.V. Smith

October 14, 1987

Date

7.0 References

1. Cannon R.W. 1986. Ground Geophysical Surveys, Spruce Creek Option, Atlin Mining District; B.C. Assessment Report.
2. Gareau, M.B. 1987. Diamond Drilling Report on the Spruce Creek Property, Atlin Mining Division.

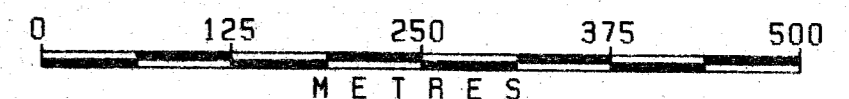
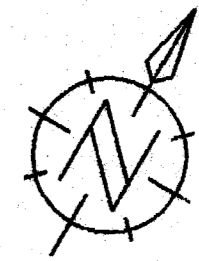


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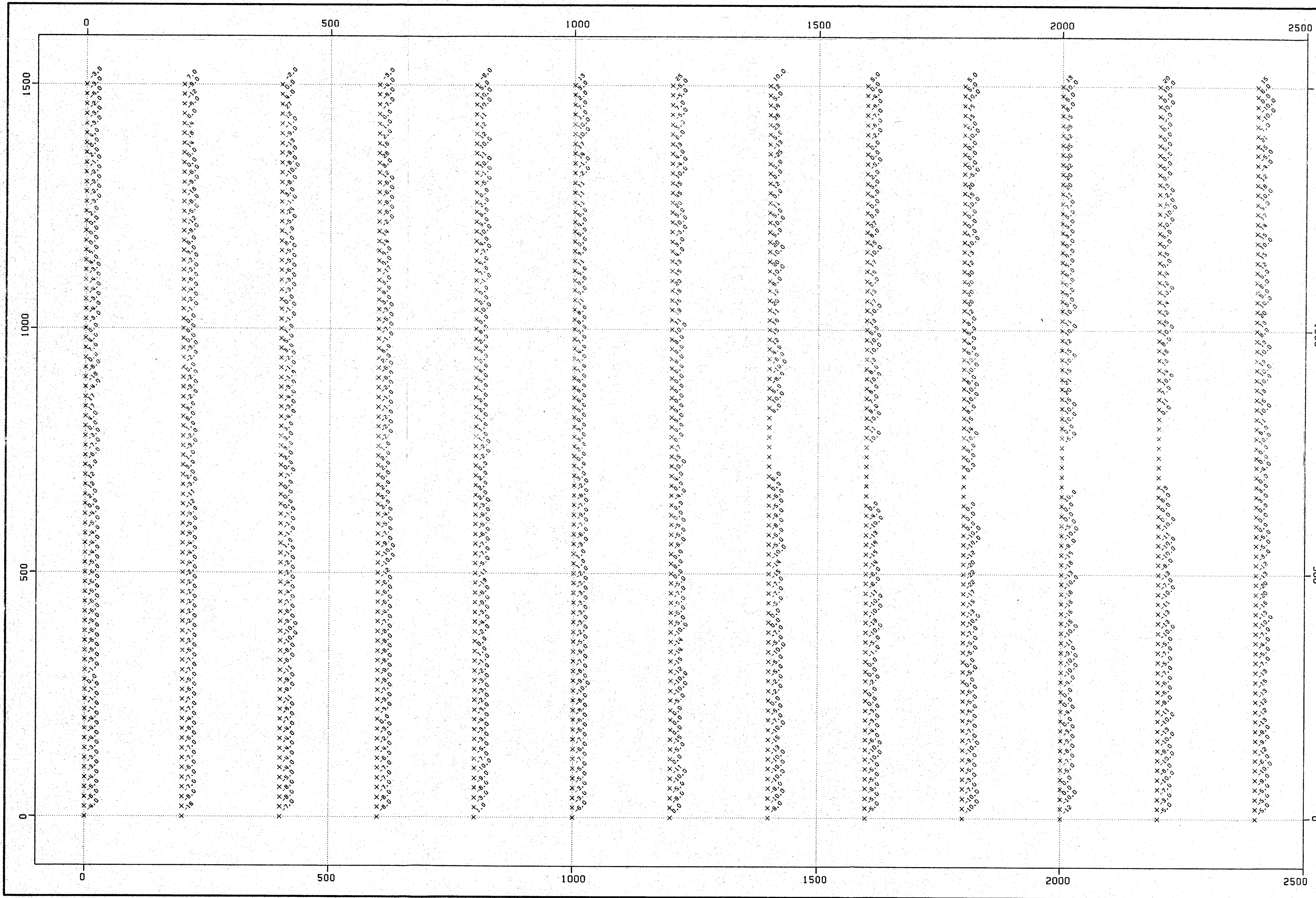
16,561

DIRECTION OF NORTH AT CENTRE OF MAP



Map V. Smith, Oct 14, 1987

DRAWN AC		PLACER DOME INC.	
DATE 87/09/22		SPRUCE CREEK	
SCALE 1:5000		1987 VLF EM-16 DATA	
		POSTED QUADRATURE	
		NO.	PLATE 0005

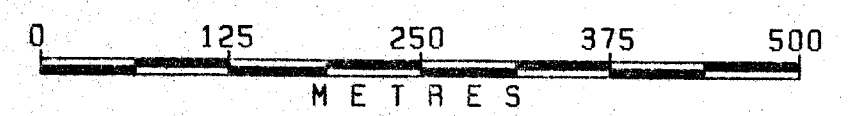


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 × POINTS: IP EXPL*SPRUCE-IPS.

DIRECTION OF NORTH AT CENTRE OF MAP

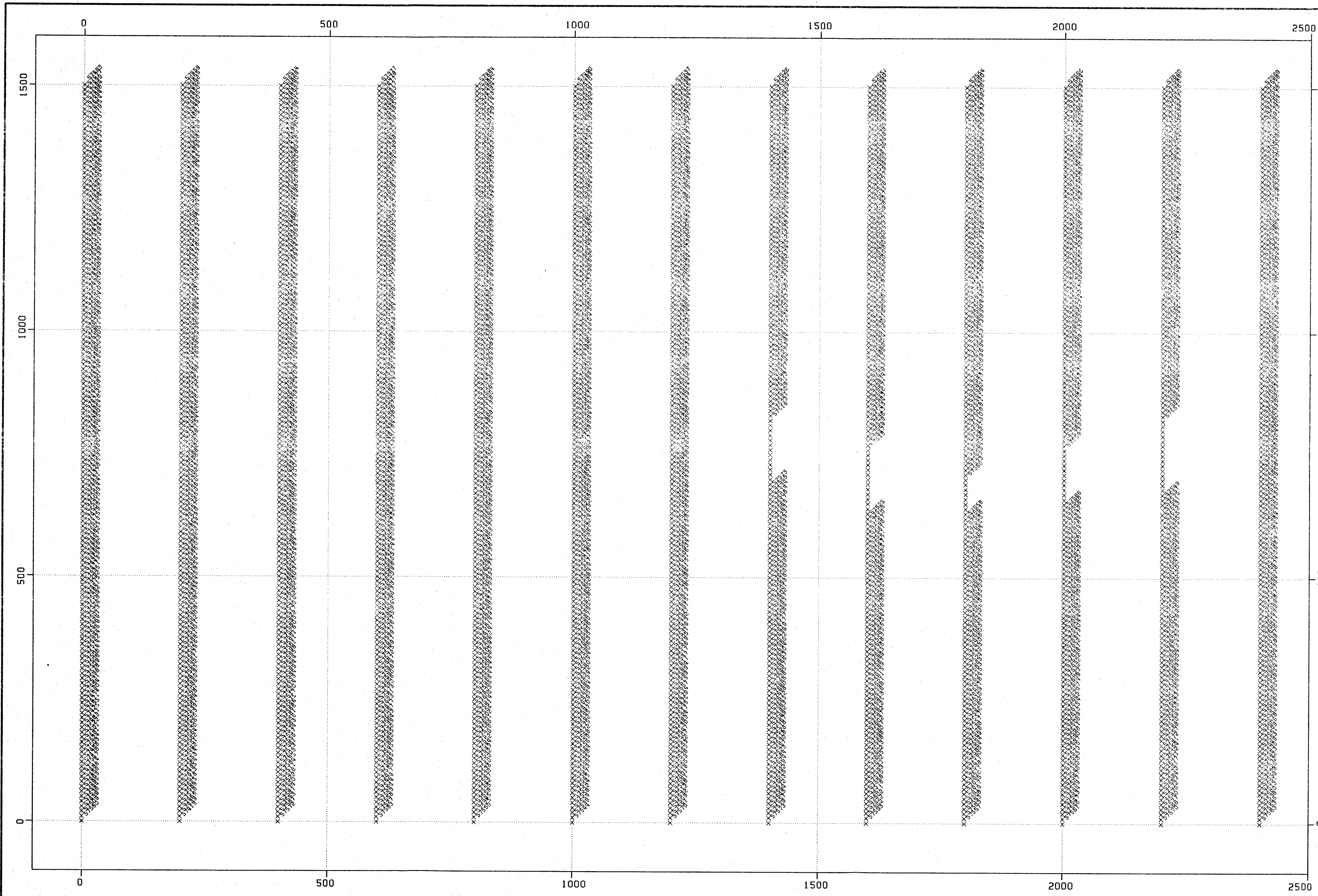
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Mark V. Smith Oct 14, 1987

DRAWN RC		PLACER DOME INC.	
DATE 87/09/22		SPRUCE CREEK	
SCALE 1:5000		1987 VLF EM-16 DATA	
NO.		POSTED IN PHASE	
		PLATE 0004	



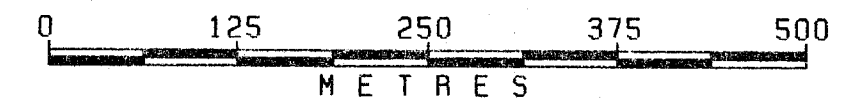
SPRUCE CREEK
1987 MAGNETIC DATA
UNITS= NANOTESLAS

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DIRECTION OF NORTH AT CENTRE OF MAP

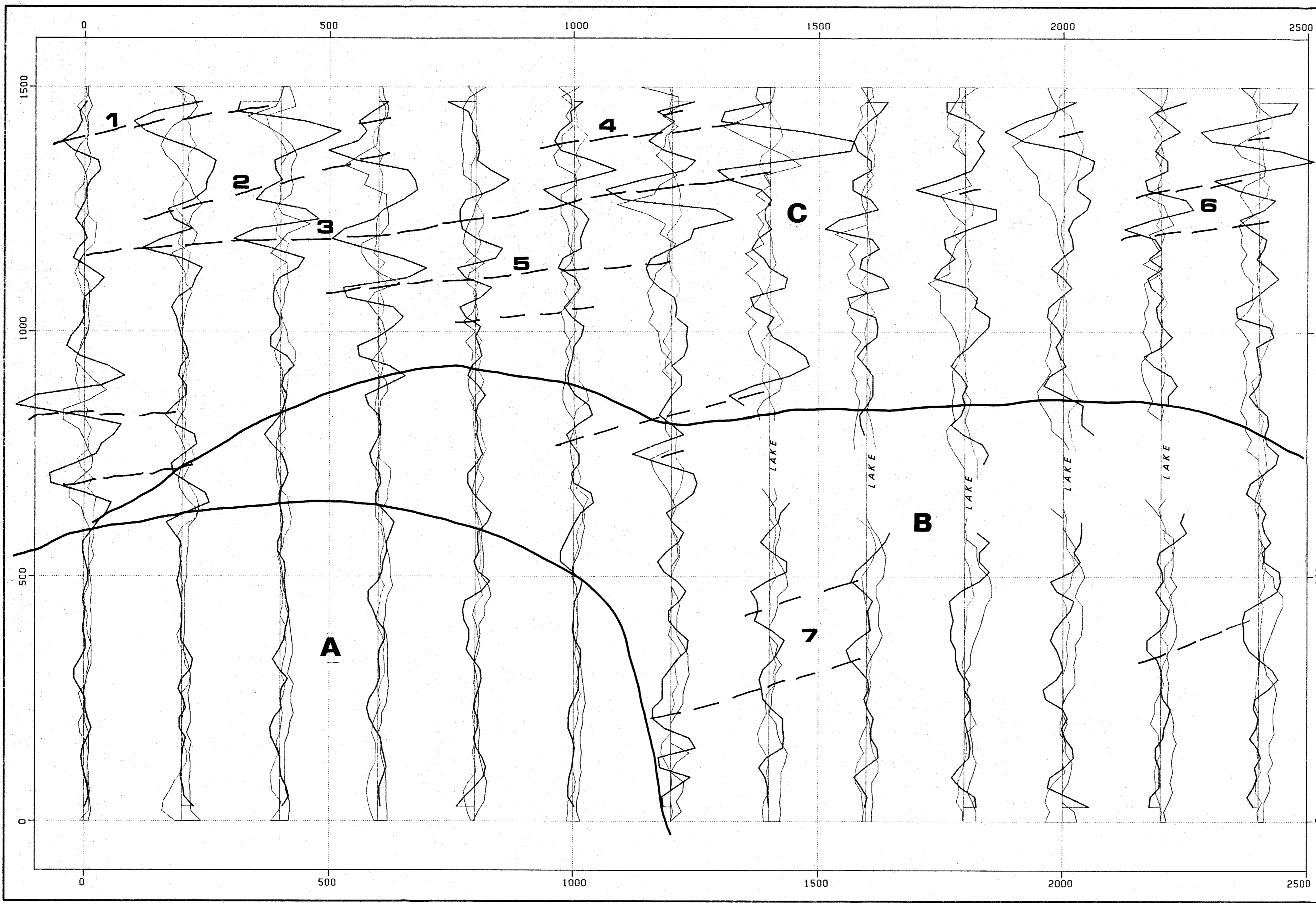
GEOLOGICAL BRANCH
ASSESSMENT REPORT

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Map V. Smith Oct 14, 1987

DRAWN RC		PLACER DOME INC. SPRUCE CREEK 1987 MAGNETIC DATA
DATE 87/09/22		
SCALE 1:5000		
NO.		PLATE 0003



SPRUCE CREEK
1987 VLF EM-16 DATA

LIGHT LINE - QUADRATURE
MEDIUM LINE - IN-PHASE
DARK LINE - FRASER FILTER

--- VLF CONDUCTORS

A, B, C. - AREAS OF DIFFERENT OVERBURDEN THICKNESS

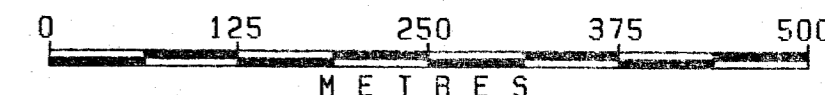
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SCALE:	20.0 UNITS / CM
BASE LEVEL:	0.0
PROFILES: IP	EXPL*SPRUCE-IPS.
SCALE:	20.0 UNITS / CM
BASE LEVEL:	0.0
FRASER FILTER APPLIED	

DIRECTION OF NORTH AT CENTRE OF MAP

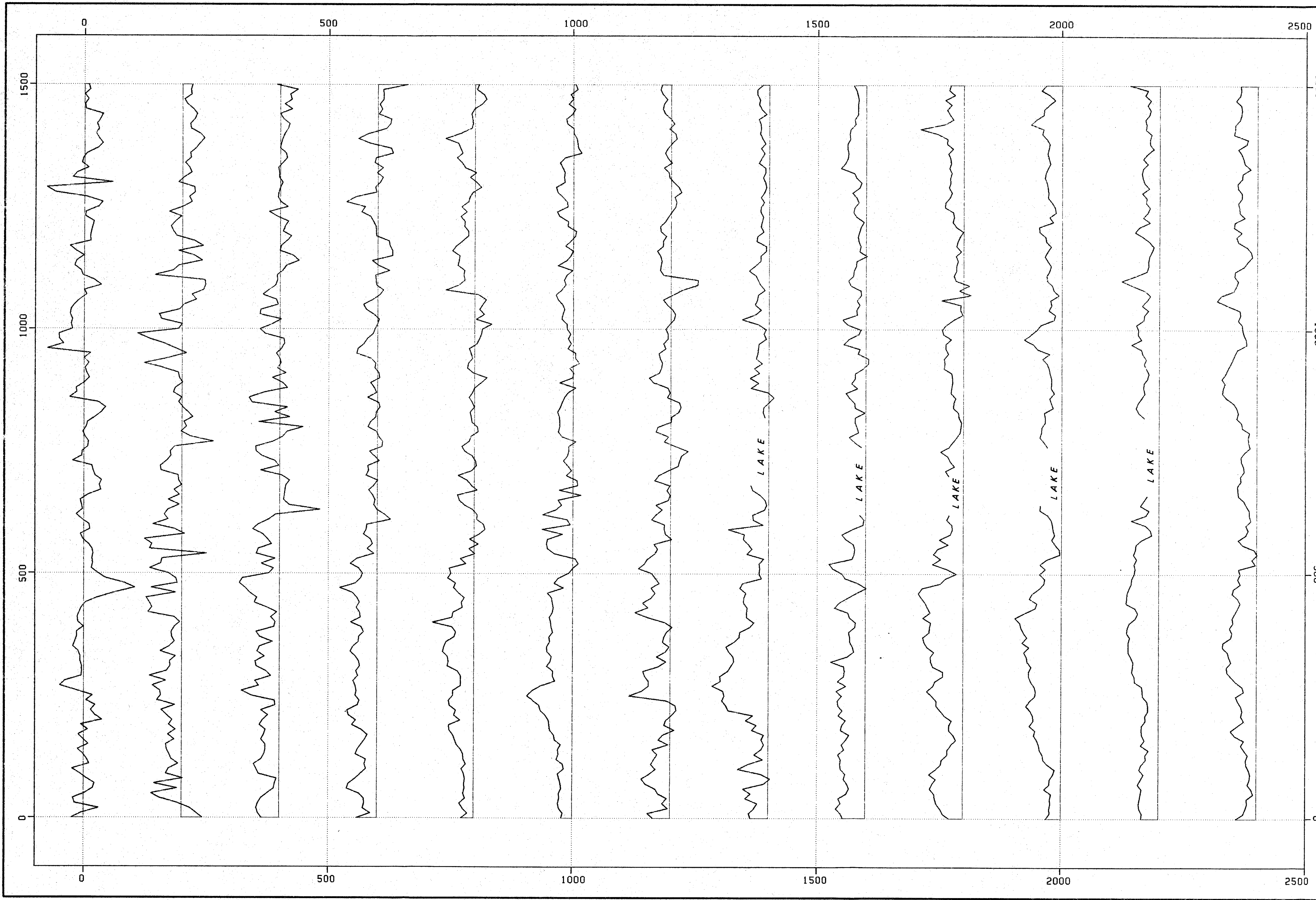
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Mark V. Smith Oct 14, 1987

DRAWN RC		PLACER DOME INC.	
DATE 87/09/22		SPRUCE CREEK	
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NO.		PLATE 0002	

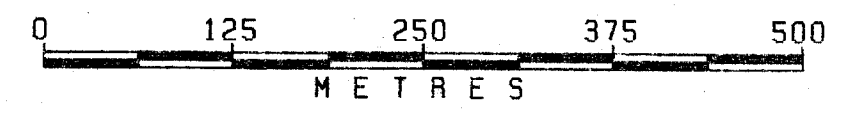


SPRUCE CREEK
1987 MAGNETIC DATA
UNITS= NANOTESLAS

DATA PLOTTED ON THIS MAP:
FIELD FILE
PROFILES: MAG EXPL*SPRUCE-MAGS.
SCALE: 100 UNITS / CM
BASE LEVEL: 57500

DIRECTION OF NORTH AT CENTRE OF MAP
GEOLOGICAL BRANCH
ASSESSMENT REPORT

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Map of Spruce Creek Oct 14, 1987

DRAWN RC		PLACER DOME INC. SPRUCE CREEK 1987 MAGNETIC DATA
DATE 87/09/22		
SCALE 1:5000		
NO.		PLATE 001