

NORANDA EXPLORATION COMPANY, LIMITED

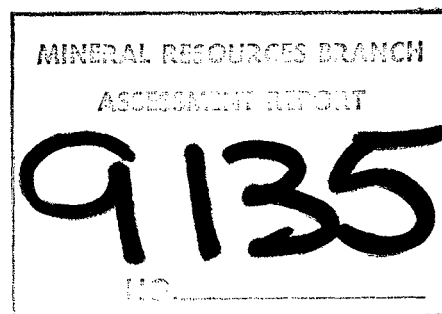
(No Personal Liability)

PROSPECTING AND GROUND VLF-EM REPORT

on the Mineral Hill C, D, E Claims

OMINECA MINING DISTRICT

93L/10E 54°30'54" 126°44'34"



M.W. Leahey

April 1981

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SUMMARY

This report describes a prospecting assessment and reconnaissance VLF-EM ground work on the Mineral Hill C, D and E claims.

1. INTRODUCTION

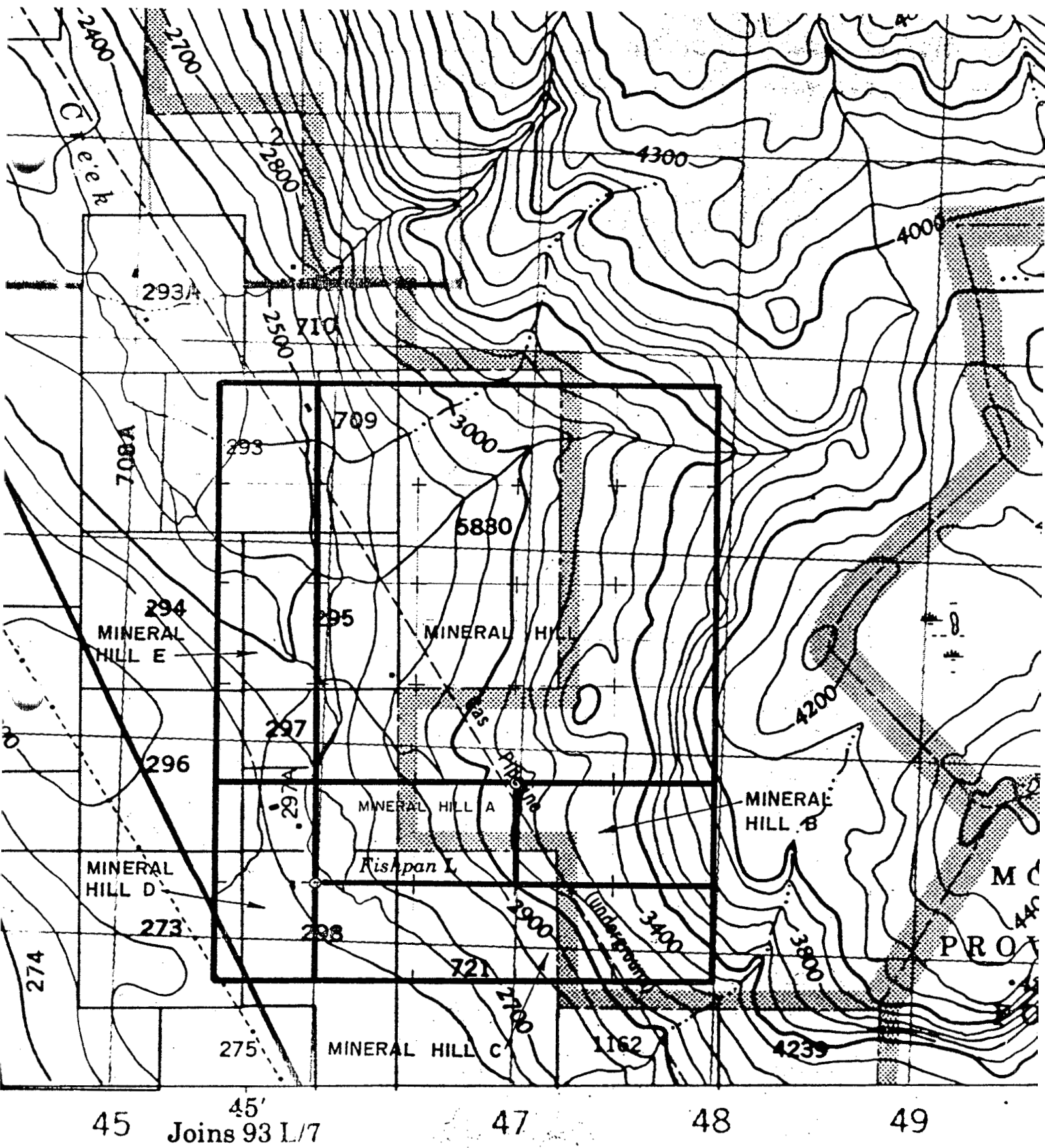
The Mineral Hill claim group is located 12.8 km north of Houston, 48 km southeast of Smithers, immediately east of the Yellowhead Highway, route 16. The secondary road to the hill currently passes through the farm yard of George Murphy. Mr. Murphy is having this road moved approximately 200 m north to avoid the buildings; the road reconstruction is planned for the summer of 1981.

2. CLAIM DATA

The property was acquired by Noranda following the purchase of Granby Mining Corporation on November 19, 1979. It consists of six mineral claims with a total of 30 units. Pertinent data on each of the mineral claims is as follows:

<u>Claims</u>	<u>Units</u>	<u>Record #</u>	<u>Expiry</u>
Mineral Hill	16	206	Jan. 16, 1989
Mineral Hill A	2	397	Jan. 16, 1989
Mineral Hill B	2	398	Jan. 16, 1989
Mineral Hill C	4	1641	March 12, 1981
Mineral Hill D	2	1642	March 12, 1981
Mineral Hill E	<u>4</u>	1643	March 12, 1981
Total	30		

This assessment report covers renewal of the Mineral Hill C, D, and E claims to March 12, 1982.



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Mineral Hill A, B, C, D, E
 Mineral Claims

CLAIM LOCATION MAP

Fig. 1

Scale 1:25 000

3. GEOLOGY

The Mineral Hill property is underlain by Hazelton group volcanics and sedimentary rocks. A four-phased Bulkley (70 m.y.) body composed of a large area of quartz porphyritic granite, Alaskite, fine grained monzonite, and diorite, invades the Hazelton Group. Molybdenum mineralization is predominated by association with quartz veinlets in the Alaskite and with fractured hornfels. The monzonite is post-mineralization. The Mineral Hill (Huber) property has been worked by a number of companies. During the early 1920's discovery of copper, lead and zinc was explored by trenching, short adits and a shaft. A brief summary of work undertaken on the property follows:

- 1962 - Southwest Potash undertook a soil and magnetometer survey.
- 1965 to 1969 - Moly Mine Exploration Limited did extensive work.
- 1965 - stripping, blasting, geochem, I.P.
- 1966 - optioned to Cominco who undertook 8 drill holes, trenching of the Alaskite zone and regional mapping.
- 1966 - optioned to Anco Exploration; geological, geochemical and geophysical surveys. 26 trenches totalling 5,500', 15 d.d. holes totalling 7300'.
- 1967 - Moly Mines drilled 13 holes totalling 4291'; 102 rotary drilling holes totalling 9456'; geochemical survey of 10 claims.

More recently, Granby optioned the property in 1975, compiled the previous work and undertook a 12 hole percussion drill program of 2240'. In 1978 Granby undertook exploration of a yet untested area with percussion drilling 515.3 m and deep drilling in the "Alaskite" and breccia zone. The breccia zone hole, 377 m, returned low grade molybdenite 0.062%. The Alaskite hole over its entire length averaged 0.057% molybdenite. Silver, copper, lead and zinc values were also recorded.

The ore potential of the property is for a large tonnage, however the grade is still uneconomic. In early March, 1981, prospecting in the areas of Mineral Hill claims C, D, and E south and west of the previous mineralization did not discover any amount of intrusive rock. On the southeast corner of the claim block local hornfelsic sediments and volcanics are noted. No mineralization other than magnetite was discovered.

4. GEOPHYSICS

(see following five pages)

OPERATING INSTRUCTIONS
SABRE VLF-EM RECEIVER

INTRODUCTION:

The VLF-EM method utilizes electromagnetic fields 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 field
(b) vertical component of field

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 relative 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 gain control so that the F.S. meter reads 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. Re-establish null bearing in horizontal plane.
3. Rotate receiver 90° in the horizontal plane.
4. Depress damp push button switch and observe field strength meter reading for sufficient time to obtain an average F.S. meter reading. (depressed damp switch slows needle action and reduces meter reading by half. The reading will normally range around 50).

5. Record F.S. reading.

Filtering Technique 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:-

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

Fig. 1 is an example of a field sheet showing null angle reading, filtered reading and relative field strength. Fig. 2 shows the field sheet with filter card overlaid. The small window in the side of the card shows the four readings 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 contoured 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 the correct sign of filtered data and to provide a consistent crossover pattern for plotting the profiled null angle data.

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

2. Record data on field sheets (top to bottom) as 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

4. GEOPHYSICS (con't.)

Both VLF-EM horizontal field strength and filtered data (Figures 2 and 3) show the best conductor to be the underground gas pipeline. The next area of interest worth investigation is Line 0. North of line 1000N deep overburden (70 - 90') masks any weak conductors.

5. COMMENTS

In light of Granby's drilling the chances of higher grade mineralization are slight. No large-scale program is warranted in light of all previous results.

6. REFERENCES

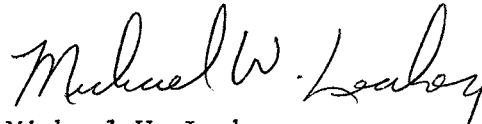
- Anderson, R.E., 1962: British Columbia Ministry of Energy, Mines and Petroleum Resources Assessment Report #510.
- Anderson, R.E., 1963: British Columbia Ministry of Energy, Mines and Petroleum Resources Assessment Report #509.
- British Columbia Ministry of Energy, Mines and Petroleum Resources:
1965 Annual Report.
- British Columbia Ministry of Energy, Mines and Petroleum Resources:
1966 Annual Report.
- British Columbia Ministry of Energy, Mines and Petroleum Resources:
1967 Annual Report.
- Carter, N.C., 1974: Geology and Geochronology of Porphyry Copper and Molybdenum Deposits in West-Central British Columbia.
- Dodds, A.R., 1965: British Columbia Ministry of Energy, Mines and Petroleum Resources Assessment Report #0757.

James, D.H., 1978: British Columbia Ministry of Energy, Mines and
Petroleum Resources Assessment Report #7117.

Wilkinson, W.J., 1976: British Columbia Ministry of Energy, Mines and
Petroleum Resources Assessment Report #6152.

Wilkinson, W.J., 1977: Report on Percussion Drilling on Mineral Claims:
Mineral Hill, Record No. 206 (1), Mineral Hill A, Record No. 397 (8),
Mineral Hill B, Record No. 398 (8).

Respectfully submitted,


Michael W. Leahey
District Geologist

APPENDIX I
STATEMENT OF COST

NORANDA EXPLORATION COMPANY, LIMITED

STATEMENT OF COST

PROJECT: MINERAL HILL DATE: 8 March 1981
 TYPE OF REPORT: Prospecting and Geophysics Report

a) Wages:	
No. of Days: 14	
Rate per Day: \$95.5071	
Month of: March 7-12, 1981	
Total Wages: 14 x \$95.5071	<u>1,337.10</u>
b) Food and Accommodation:	
No. of Days: 14	
Rate per Day: \$10.00	
Month of : March 7-12, 1981	
Total Cost: 14 x 10.00	<u>140.00</u>
c) Transportation:	
No. of Days: 14	
Rate per Day: 13.00	
Month of : March 7-12, 1981	
Total Cost: 14 x 13.00	<u>182.00</u>
d) Instrument Rental:	
Type of Instrument: VLF-EM	
No. of Days: 3	
Rate per Day: \$35.00	
Month of:	
Total Cost: 3 x \$35.00	<u>135.00</u>
f) Analysis:	
(See attached schedule)	
g) Cost of Preparation of Report:	
Author	
Drafting	
Typing	
Total Cost:	<u>100.00</u>
h) Other:	
Supervision: D.E. Cross, P. Eng., G.E. Dirom, P. Eng.	
½ day at \$300.00 per day	<u>150.00</u>
TOTAL COST	<u>\$2,014.10</u>

(continued)

STATEMENT OF COST (continued)

e) Unit Costs:

For Prospecting-

No. of Days: 3

No. of Units: 6 employee days

Unit costs: \$139.34146 per employee day

Total Cost: 6 x \$139.34146

836.05

For Geophysics-

No. of Units: 5.5 line kilometers

Unit costs: \$214.191 per line kilometer

Total cost: 5.5 x \$214.191

1,178.05

TOTAL COST

\$2,014.10

APPENDIX II
STATEMENTS OF QUALIFICATIONS

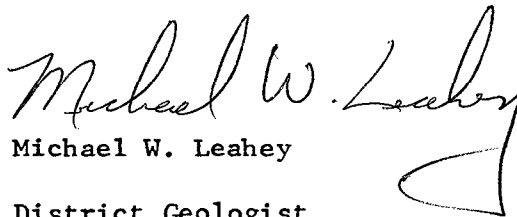
STATEMENT OF QUALIFICATIONS

I, Michael W. Leahey, of the town of Smithers, Province of British Columbia, do certify that:

1. I have been an employee of Noranda Exploration Company, Limited since May 1973.
2. I am a graduate of St. Francis Xavier University in Antigonish, N.S. with a Bachelor of Science Major in Geology (1973).

Dated at Smithers

this 7th day of November, 1980


Michael W. Leahey

District Geologist

Noranda Exploration Company, Limited

(No Personal Liability)

STATEMENT OF QUALIFICATIONS

I, Daryl R. Hill, of the town of Smithers, Province of British Columbia, do certify that:

1. I have been an employee of Noranda Exploration Company, Limited since May 1979.
2. I have completed the following courses at Cariboo College, Kamloops, B.C.: Basic Prospecting, Historical Geology, and Forensic Geology.
3. I have completed two Ministry of Mines, Energy and Petroleum Resources courses in Basic Prospecting and one in Advanced Prospecting.

Dated at Smithers

this 14th day of April, 1981

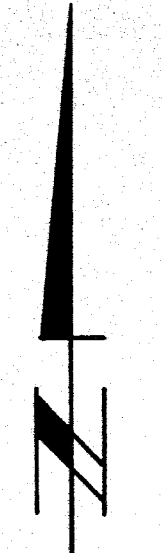
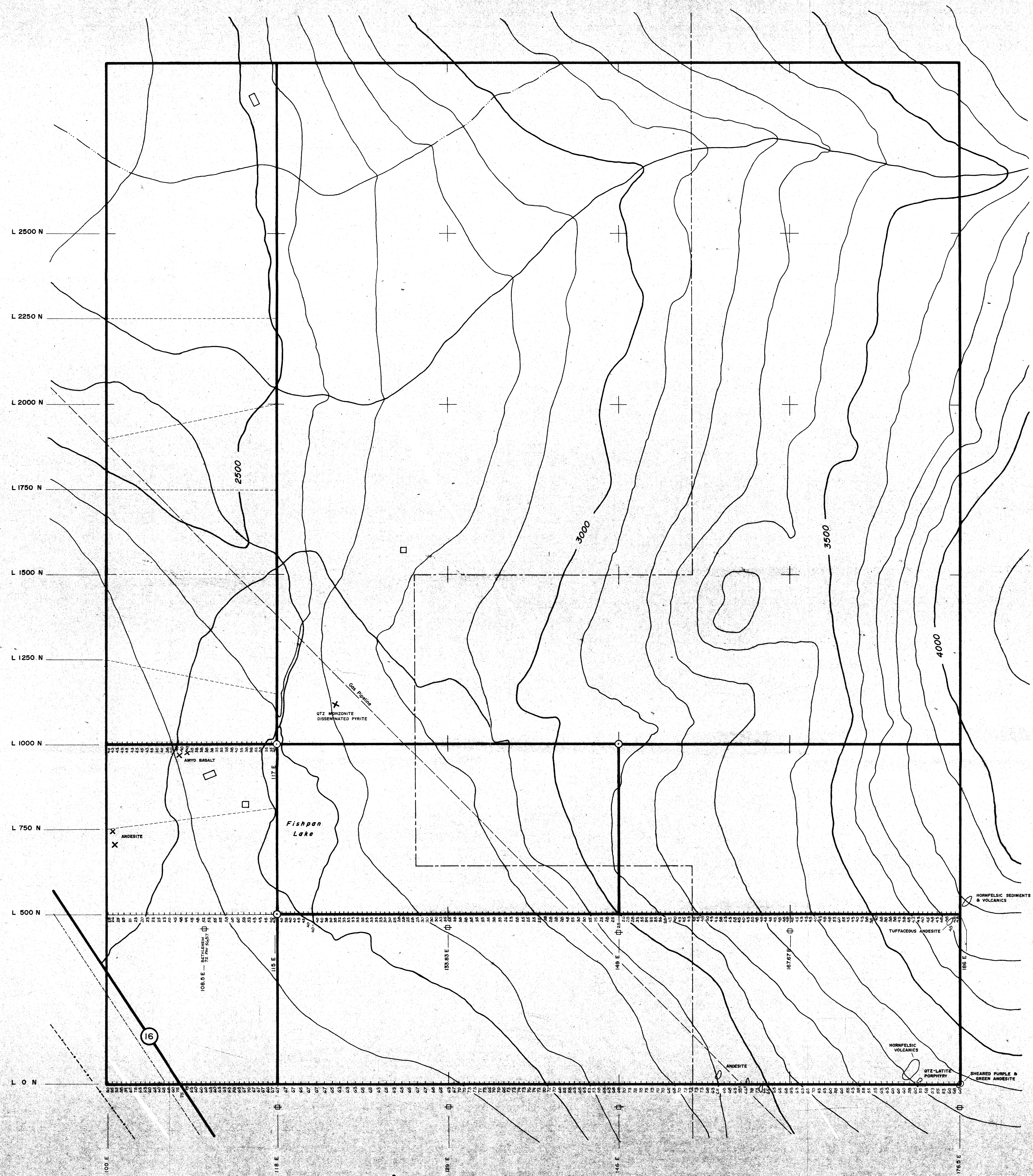


Daryl R. Hill

Field Supervisor

Noranda Exploration Company, Limited

(No Personal Liability)

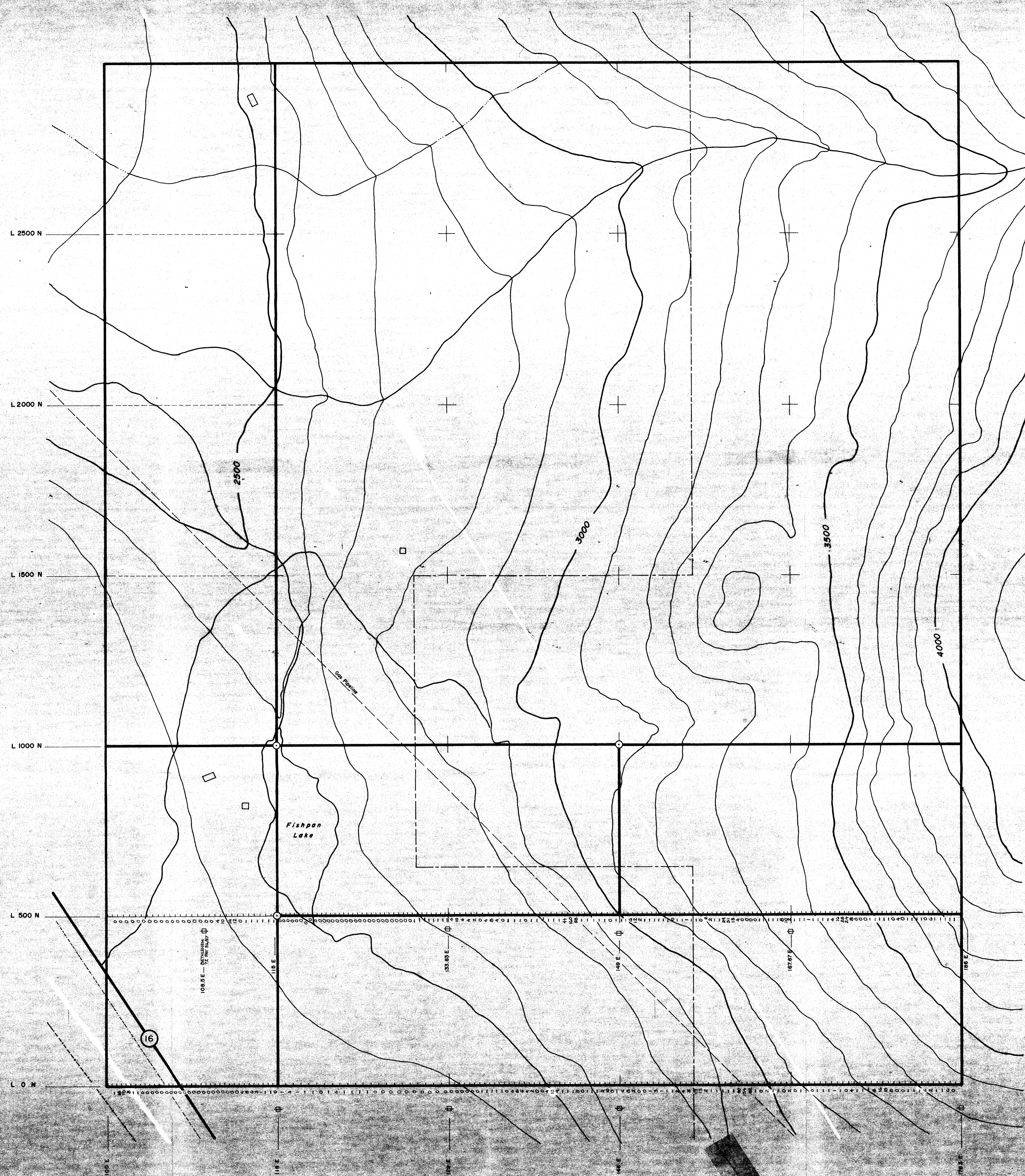


- LEGEND**
- CLAIM BOUNDARY CUT
 - - - FLAGGED LINE W/SURVEY
 - - - FLAGGED LINE
 - X FLOAT
 - OUTCROP
 - - - TRANSMISSION LINE
 - - - POWER LINE
 - L.C.P.



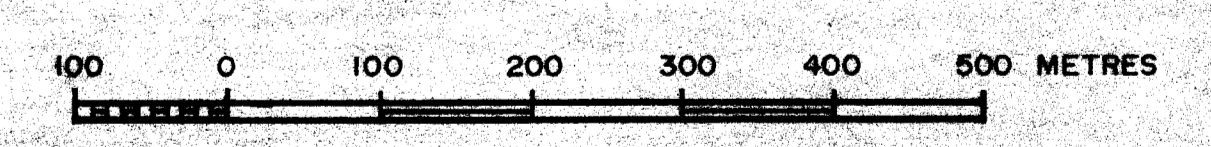
MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
9135
NO.

REVISED	Seattle station	
	VLF - EM HORIZONTAL FIELD STRENGTH PROSPECTING TRAVERSES	
	PROJECT: MINERAL HILL PROPERTY	
PROJ. NO. 2046	SURVEYED BY: D.M. W.S. M.S.	DATE: APRIL 10, 1991
N.T.S. 36.4/19.6	DRAWN BY: E.C.	SCALE: 1:8000
DWG. NO. FIG. 2	NORANDA EXPLORATION CO. LTD.	
	OFFICE: SMITHERS	



LEGEND

	CLAIM BOUNDARY CUT
	FLAGGED LINE W/SURVEY
	FLAGGED LINE
	FLOAT
	OUTCROP
	TRANSMISSION LINE
	POWER LINE
	L.C.P.



MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
9135
M.D.

REVISED	VLF - EM FRASER FILTERED DATA <i>Scatter Plot</i>
PROJECT: MINERAL HILL PROPERTY	
PROJ. NO. 1042	SURVEYED BY: DATE: APRIL 10, 1981
N.T.S. 89 L 10 E	DRAWN BY: E.G. SCALE 1:2000
DWG. NO. FIG. 3	NORANDA EXPLORATION CO. LTD. OFFICE: SMITHERS