

2839

A GEOPHYSICAL AND GEOCHEMICAL REPORT

ON THE

KAREN CLAIMS

OMINECA MINING DIVISION

54° 126° NE

38 MILES EAST OF SMITHERS, B.C.

FOR

WHITESAIL MINES LTD.

BY

R.W. WOOLVERTON, P. ENG.

BETWEEN

NOVEMBER 10 AND DECEMBER 16, 1970

FEBRUARY, 1971

VANCOUVER, B.C.

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Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 2839 MAP.....

RECEIVED
MAY 1970
SANDWICH I. C.

LIST OF ILLUSTRATIONS

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| | |
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INTRODUCTION

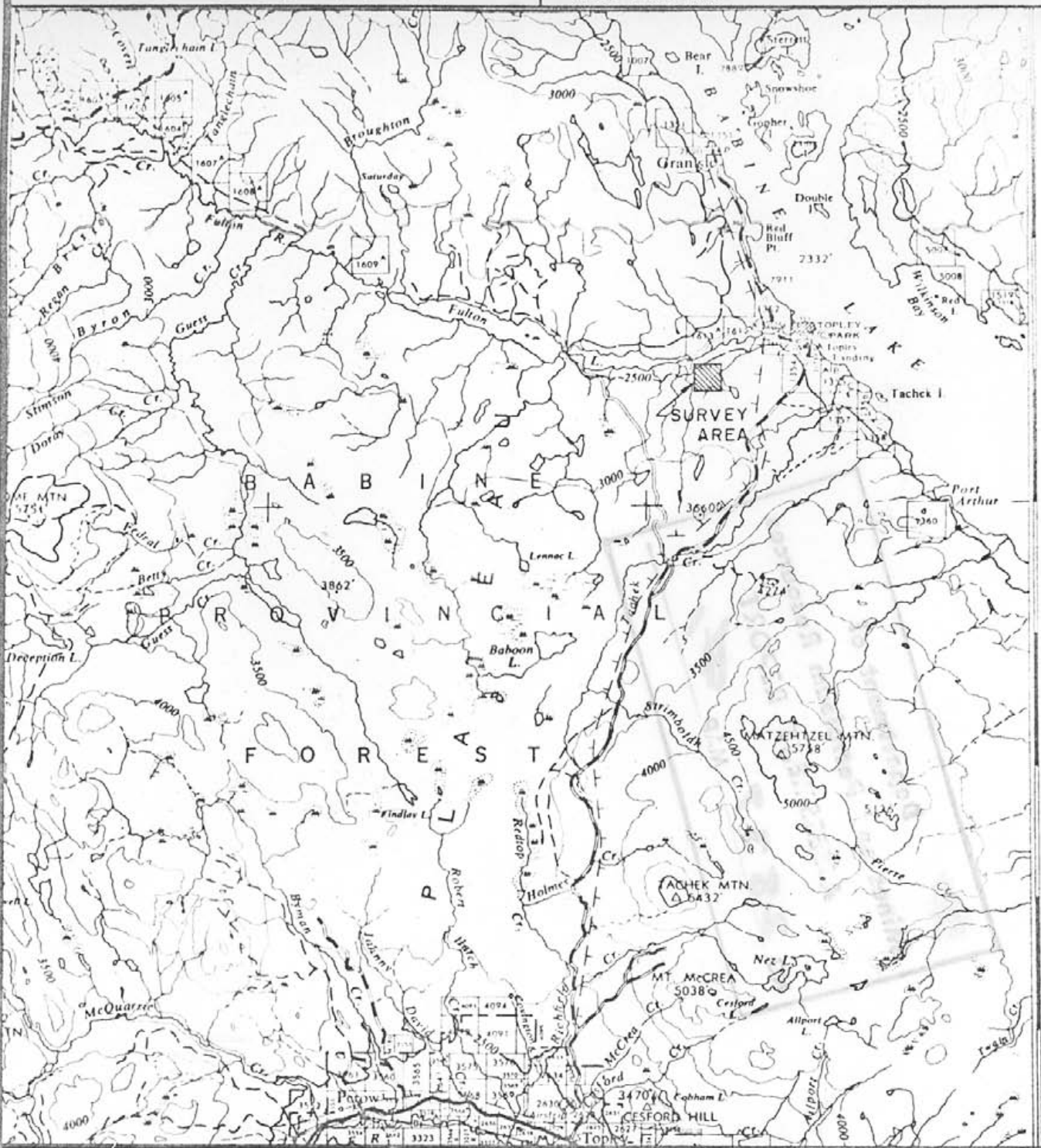
LOCATION

The Karen Claims are southeast of Fulton Lake about 3 miles west of Topley Landing, B.C., on Babine Lake and about 38 miles east of Smithers at Longitude $126^{\circ}13'$ and Latitude $54^{\circ}48'$. Access is from Topley Landing by the Bowater Logging Road to Houston which crosses the claims. Topley Landing is also connected by an all weather 28-mile long gravel road to Topley on Highway 16.

1970 PROGRAM

The regional geology is generalized on the Smithers - Fort St. James G.S.C. Map 971A and on the B.C. Department of Mines Map 69-1 by Carter and Kirkham. Topley Granites underly most of the area south at Topley Landing with the younger (?) overlying Hazelton forming many of the prominent hills. The Topley Landing region marks the northern limit of exposure of the Topley Granites which form a batholith stretching some 150 miles to the southeast.

Locally, Topley Granites intrude and pyritize limestone (Triassic or Permian) northwest of the claim group near the dam on the Fulton River above the fish hatchery. A helicopter magnetic-electromagnetic survey in 1969 outlined an interesting complex on the adjacent drift covered Karen claims. One line of induced polarization indicated chargeable material approximately coincident with the airborne anomaly. To further evaluate this area of interest, about a mile of grid was cut



WHITESAIL MINES LTD.

LOCATION MAP KAREN PROPERTY

OMINECA M.D.

BRITISH COLUMBIA



DATE:

1 / 28 / 71

in 1970 and surveyed with a magnetometer and a radem. Thirteen soil samples were collected. Further induced polarization was attempted but snow conditions prevented the collection of useful data.

All survey work was done by experienced Evergreen Exploration personnel under the writer's supervision.

GEOCHEMISTRY

SOIL SURVEY

SAMPLING PROCEDURE AND ANALYSIS

Soil samples were collected at 200 foot stations on the grid. They were taken from the "B" horizon by shovel and shipped to Barringer Research Laboratory in Vancouver where they were analyzed for total copper. They were stored in paper bags and partly dried prior to shipping. The results are plotted on Map #1 which accompanies this report. The analytical procedure used by Barringer is described in Appendix I.

RESULTS

It is difficult to establish a threshold for only a few samples; however, using the standard frequency distribution method, a background value of 20 ppm for copper was obtained. This compares favourably with a background on the adjacent Donna property of 15 ppm copper established in 1969. It can therefore be assumed that anything over 40 ppm copper is anomalous. Thus the 4 north line is anomalous from 34W to 40W and was unfortunately not closed off to the west. Significantly, these soil highs are approximately coincident with the induced polarization anomaly located in 1969.

- 4 -

GEOPHYSICS

MAGNETOMETER SURVEY

EQUIPMENT AND SURVEY

Readings were taken every 200 feet along the grid lines using a "Sabre" fluxgate magnetometer. This instrument is manufactured by Sabre Electronics Ltd. of Burnaby, B. C. Readings were adjusted for daily fluctuations by tying into the base station twice daily. The magnetic profiles obtained are included as Map #4 in the pocket of this report.

RESULTS

An 1800 gamma high was located immediately adjacent to the IP - soil complex. A second mag high of about the same magnitude is shown at 4N/10W. Because only a small area was surveyed, it is impossible to establish any trends; however, it is reasonably certain that the 1969 IP results were not caused by disseminated magnetite since the mag high and IP anomaly are not coincident. Also, the mag high does not appear intense enough to be caused by contact metamorphic mineralization unless the magnetite content is extremely low.

RADEM SURVEY

EQUIPMENT AND SURVEY

The Radem unit used in the survey is a 1-man EM radio receiver utilizing the 12 to 24 kilocycle United States Naval Communication Broadcast Stations. It was built by Crone Geophysics Limited, 3607 Wolfedale Road, Mississauga, Ontario. The instrument utilizes higher than normal EM frequencies and is capable of detecting disseminated sulfides. However, due to the high frequency, it is affected by clay and other conductive overburden. Some type curves and specifications are included as Appendix II of this report.

Readings were taken using the Cutler Maine Station (17.8 Kc) and Seattle Washington (18.6 Kc). Both in-phase (dip angle) and out-of-phase (HF field strength) readings were recorded. The results are plotted on Maps #2 and #3 which accompany this report.

RESULTS

The conductors outlined to date are comparatively weak so that the IP anomaly is probably not due to graphite. In fact, the many weak crossovers indicate fairly intense fracturing, a characteristic of porphyry mineralization.

The most significant area outlined by the Radem is on Line 4N from 15W to 25W. Numerous weak conductors are present which were detected on both frequencies indicating a lack of preferred orientation to the fracturing. The out-of-phase is anomalous in this area

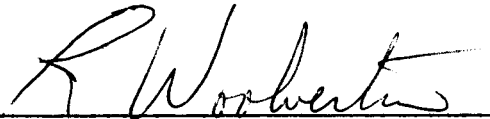
only on the Seattle frequency. The sudden change in out-of-phase response on the Cutler frequency at 4N/32W is probably due to a change in power output at the radio station.

- 7 -

CONCLUSIONS

An airborne mag-EM complex was found in 1969. Initial ground follow-up resulted in the discovery of an induced polarization anomaly. Further follow-up in 1970 outlined an adjacent mag high and a down slope copper soil anomaly. A nearby zone of intense fracturing may also be present. Data to date suggest that the source of the IP anomaly is probably sulfides which carry some copper. The magnetite concentrations do not appear to be chargeable. The pyritized intrusive - limestone contact exposed near the dam some 2,000 feet to the northwest indicates a favourable geological setting. The area requires a comprehensive geophysical and geological evaluation.

Respectfully submitted,

A handwritten signature in cursive script, appearing to read 'R. Woolverton', is written over a horizontal line.

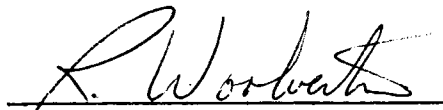
R.W. Woolverton, P. Eng.

SUMMARY OF EXPENSES

| | |
|---------------------------------|-------------------|
| November Invoice | \$1,265.30 |
| December Invoice | 115.26 |
| Drafting and Report Preparation | <u>400.00</u> |
| TOTAL | <u>\$1,780.56</u> |

DECLARATION OF PROJECT CHARGES

The undersigned considers the preceding invoices applicable
as assessment work.

A handwritten signature in cursive script, appearing to read 'R. Woolverton', written over a horizontal line.

R.W. WOOLVERTON, P. ENG.

APPENDICES

- I GEOCHEMICAL ANALYTICAL PROCEDURE
- II RADEM SPECIFICATIONS
- III DECLARATION OF EXPENDITURES

APPENDIX I

GEOCHEMICAL ANALYTICAL PROCEDURE



304 CARLINGVIEW DRIVE
REXDALE, ONTARIO, CANADA
PHONE: 416-677-2491
CABLE: BARESEARCH

December 8th, 1969

Evergreen Explorations Limited
635-789 W. Pender Street
Vancouver 1, B.C.

Attention: Mr. Woolverton

Dear Sir:

Our laboratory procedures for your samples are as follows:-

Total Copper - a portion of -80M material is digested in concentrated (soils) perchloric acid, diluted with water and analysed by atomic absorption.

HCl copper - same as above but using a dilute solution of hydrochloric (stream sed.) acid.

Total Molybdenum -
a -80M portion of sample is fused with a carbonate flux and the molybdenum is colorimetrically determined using zinc dithiol.

Total copper was done on the "Donna" and "Red Top" projects and both total copper and moly on the "Allie". Our reports 168-B (for total copper) and 161-B (for HCl copper) had no project no. specified on the work order form received from you.

Should you require any further information, please do not hesitate to contact me.

Yours sincerely

BARRINGER RESEARCH LIMITED

Y. M. Hazeldene

Yvonne Hazeldene
Chief Analyst
Department of Geochemistry

YH:lh

RECEIVED
DEC 10 1969

APPENDIX II

RADEM SPECIFICATIONS

FIGURE 2.

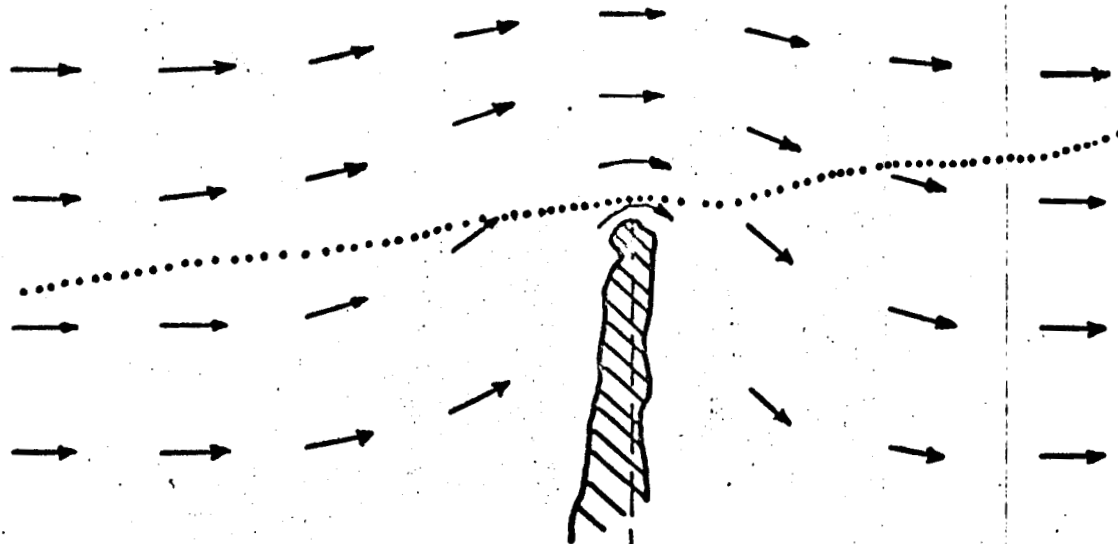
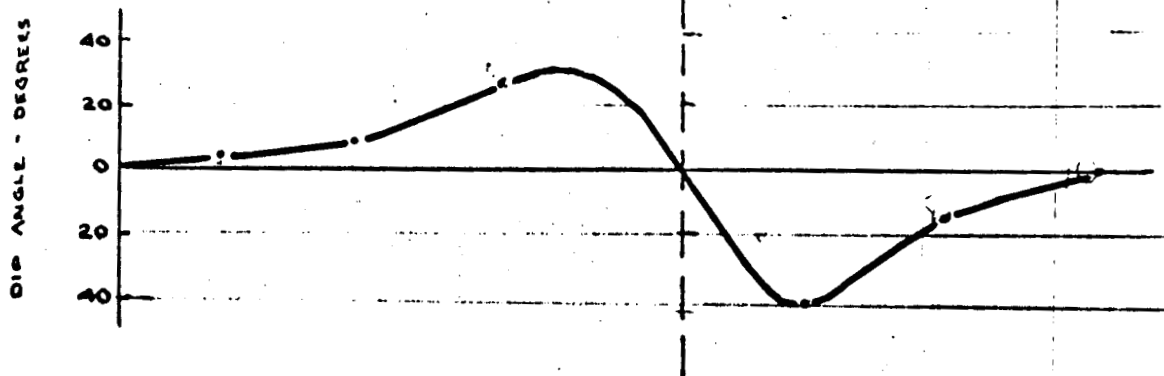


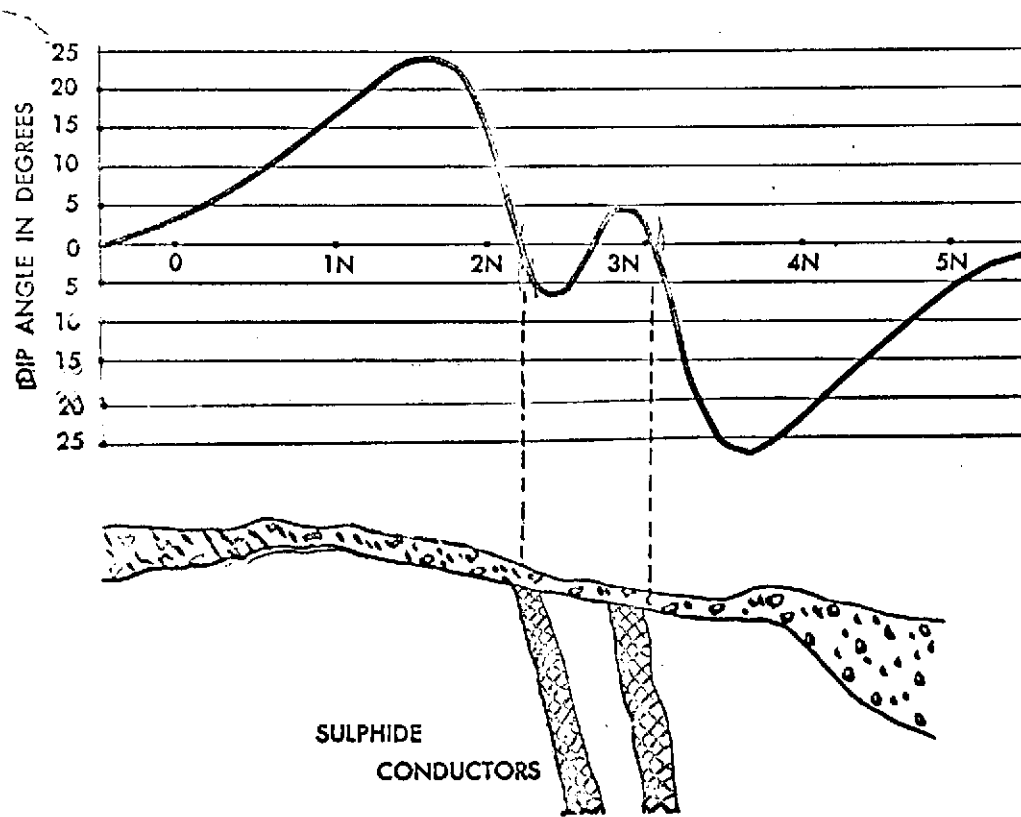
FIGURE 3.



THE VERY LOW FREQUENCY RADIO TRANSMITTING STATIONS

The purpose of these stations is to broadcast over large distances navigational and other information for use by ships and submarines. Numerous stations are situated around the globe and a considerable number are in the process of construction. Operational stations are located at Cutler Maine, Annapolis Maryland, Fort Collins Colorado, Seattle Washington, Balboa Panama, Rugby England, Lualualei Hawaii, Guam and N.W. Cape Australia. The frequency range used varies between 12 and 24 KC's and is thus 10 times higher than the normal frequencies used in mineral prospecting. This results in the RADEM method being more sensitive to lower conductivity and smaller sized bodies than normal EM equipment.

Example of a RADEM traverse over a Banded Conductor in the Timmins area of Ontario.



SPECIFICATIONS

READOUT — Dip angle of resultant VLF magnetic field component from an inclinometer of $\pm \frac{1}{2}$ degree sensitivity

NULL INDICATOR — Both audio (loudspeaker) and visual by means of an averaging field strength meter

TUNING — Preset switch tuning

BATTERIES — 2 of 9 volt Eveready # 216, independent test indicators

STATIONS — Standard 5 stations — Cutler, Maine 17.8; Seattle, Wash. 18.6; Ft. Collins, Colorado 20.0; Annapolis, Md. 21.4; Balboa, Panama 24.0 KCs.

— Optional — N.W. Cape, Australia 15.5; Lualualei, Hawaii 23.4; Rugby, England 16.0 KCs.

Other stations as they become operational

WEIGHT — Receiver — 4 lb. Leather Case — 2 lb. Shipping Weight — 15 lb.

Price — \$2,250.00 Canadian

RENTAL — \$150.00 per month

CRONE GEOPHYSICS LIMITED

979 LAKESHORE ROAD E.
PORT CREDIT, ONTARIO

TELEPHONE 274-3704

CASE HISTORY # 1

March 1, 1968

Two Radem (VLF Radio EM) Traverses in the Timmins Area, Ontario.

The use of the VLF radio transmitters as an EM primary field source is not new, but rather one of the oldest and earliest (1929) EM methods. The recent revival of this method is due to the greatly increased power and reliability of the transmitter stations. The method still has, however, its original advantages and limitations. If used properly it can be very effective; if pushed beyond its basic limitations disappointing results will be obtained. The following two profiles illustrate this point.

The first profile, over the Canadian Jamieson Mine near Timmins, illustrates the ability of the method to detect the three in echelon ore bodies. This is rather remarkable from three aspects: 1) no other EM method (horizontal loop, vertical loop - fixed and broadside, or JEM) was capable of detecting even one of these ore lenses; 2) the traverse crossed the yard of a producing mine, thus operating in an area of high hydro noise; 3) the dip angles obtained were very large, $+30^{\circ}$ to -30° .

The ore lenses are excellent conductors, but were not detected by previous EM surveys, due to their being discontinuous and of limited size.

The second profile, also from the Timmins area, is a traverse over a strong conductor buried below 75 ft. of clay and sand overburden. The RADEM profile fails to detect the conductor which is clearly outlined by the dual frequency vertical loop survey. (Note: The ratio of low frequency, 480 cps, to high frequency, 1800 cps, is unity.) This illustrates the inability of the VLF - EM method to penetrate the overburden. The VLF - EM method will produce large tilt angles from the clay bed itself. These large angles will occur towards the edge of the clay bed and thus complicate interpretation in these areas.

Conclusion: The VLF - EM method is a highly effective and rapid reconnaissance tool. It is limited by its high frequency and the inability to interpret from the results the conductivity and shape of the conductor. Until more experience is gained, this method should be used in shallow (less than 30 ft.) overburden areas.


J. Duncan Crone,
Geophysicist.

GEOPHYSICAL CONSULTING
EQUIPMENT SALES & RENTALS

CASE HISTORY # 1

RADEM PROFILES OVER CANADIAN JAMIESON MINE, TIMMINS, ONTARIO.

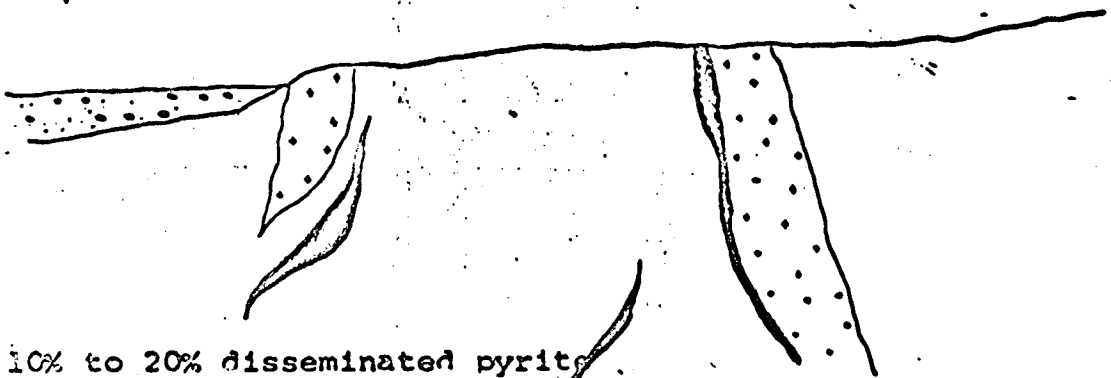
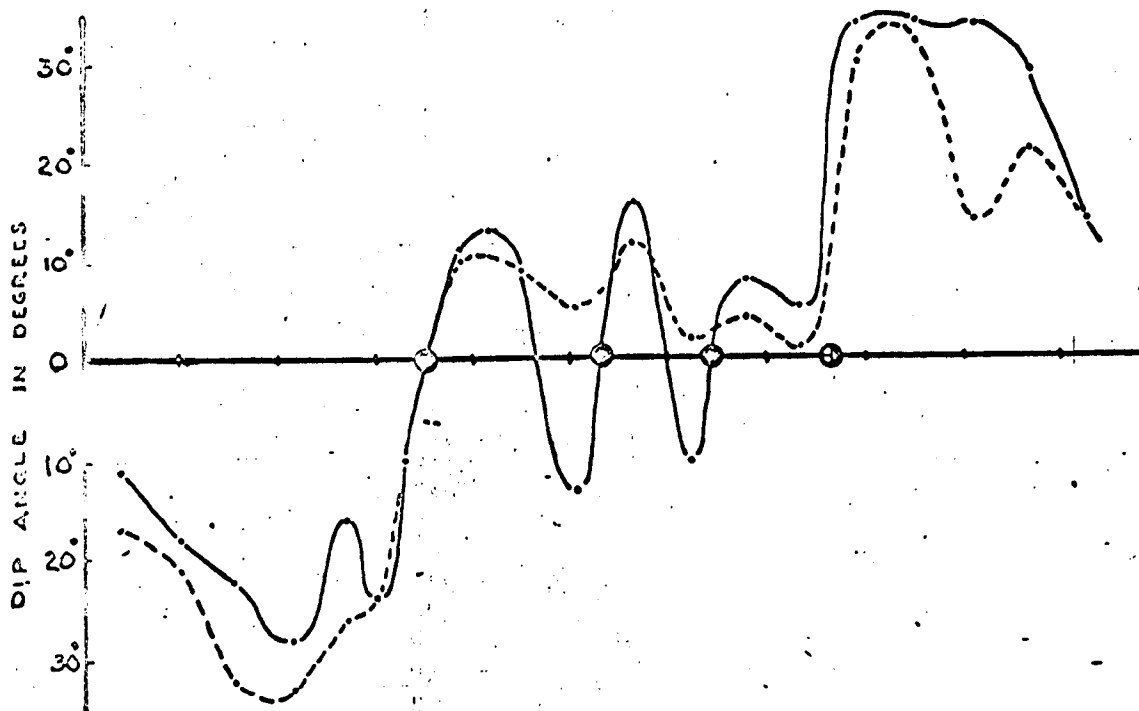
Scale 1" = 20°; 1" = 200'

— Annapolis 21.4 kcs

- - - Panama 24.0 kcs

○ True Cross-Over

○ Indicated Cross-Over



10% to 20% disseminated pyrite



Massive Sulphides

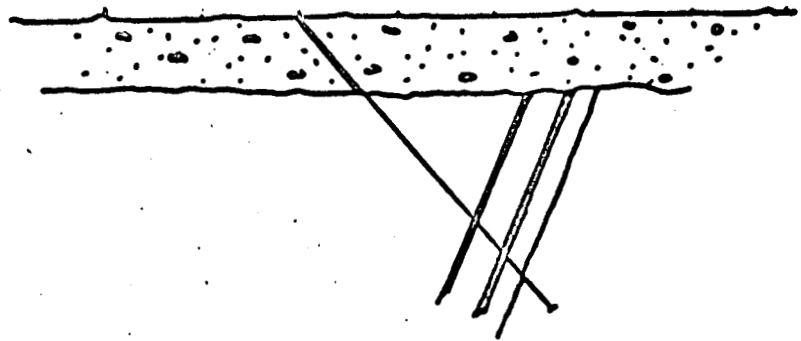
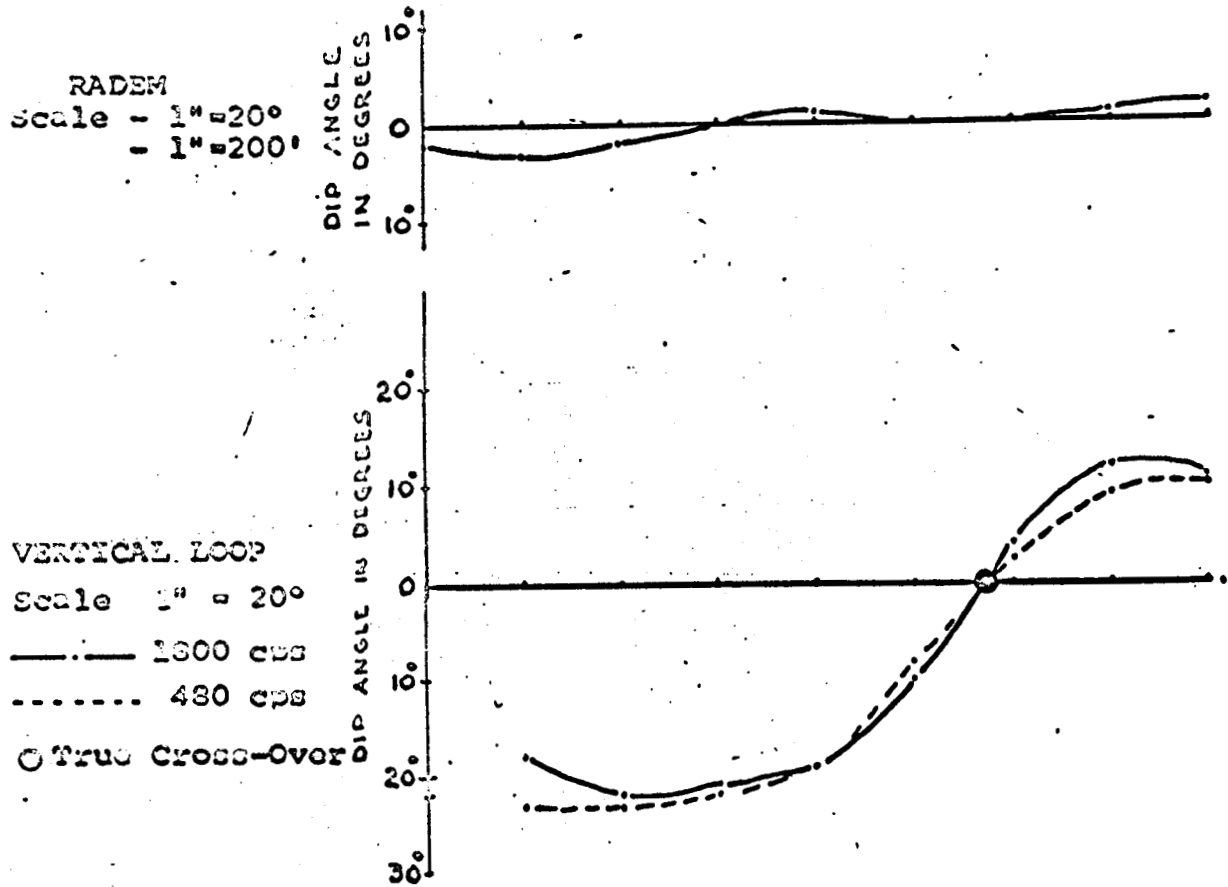
Sizes of ore lenses - 105,000, 135,000 and 280,000 tons

Only one of the ore lenses outcrops

Overburden is shallow over mineralized area.

CASE HISTORY # 1

RADEM AND DUAL FREQUENCY VERTICAL LOOP TRAVERSES OVER AN EXCELLENT CONDUCTOR BURIED AT MODERATE DEPTH (75'), TULLY TOWNSHIP, TIMMINS, ONTARIO.



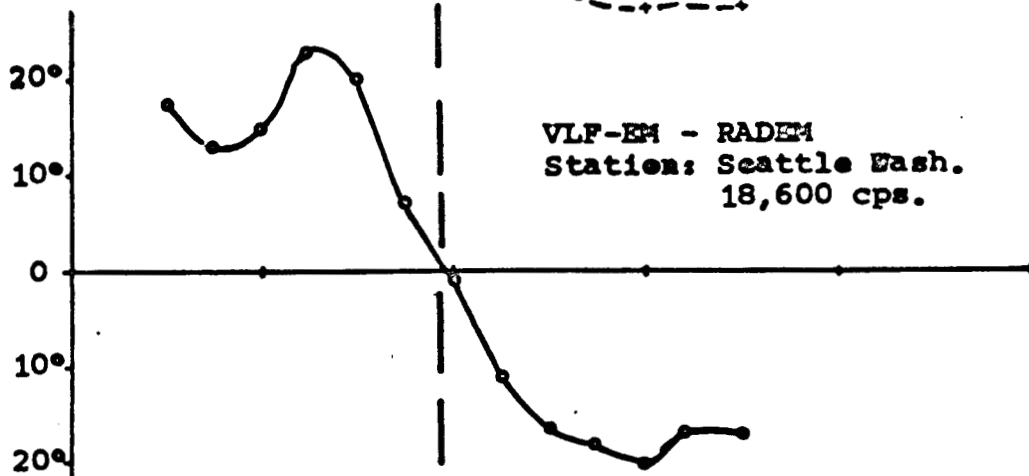
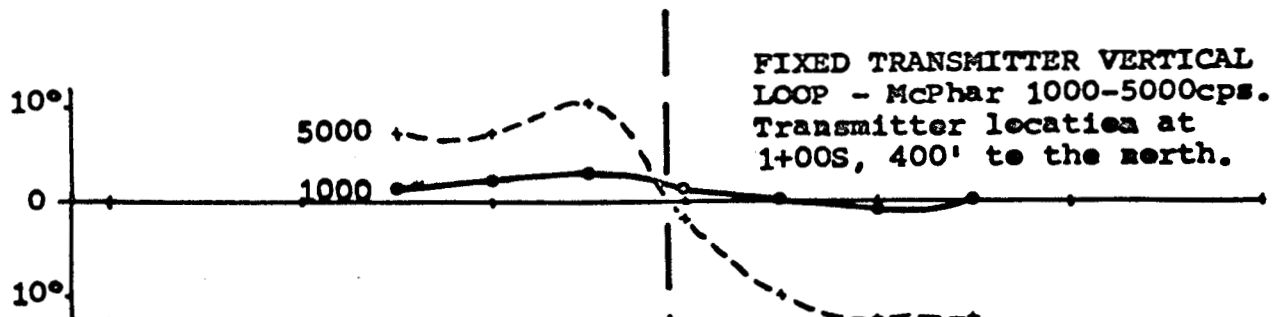
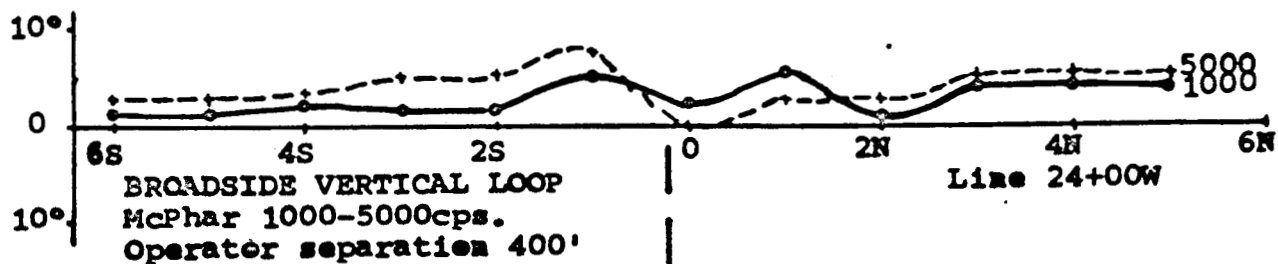
Graphitic conductor with 10% pyrite

Depth of overburden = 75'

Overburden extends for at least one mile in all directions

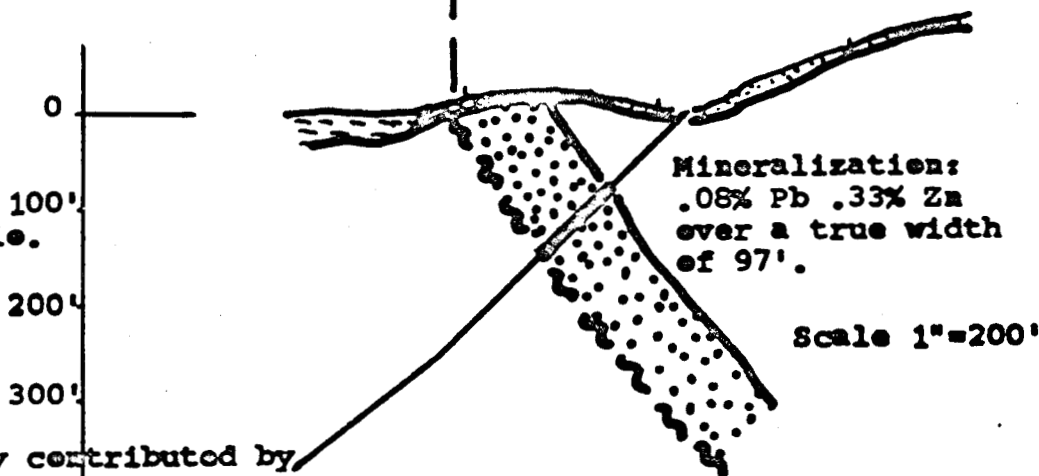
CASE HISTORY #7

VLF-EM (RADEM) and VERTICAL LOOP (McPHAR 1000-5000cps) profiles over a shear zone associated with disseminated lead - zinc mineralization.



Overburden:
0 to 20'

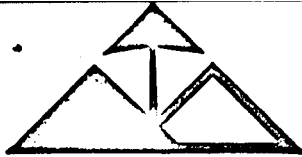
Location:
White River 100'
Area, Ontario.



Case History contributed by
Mattagami Lake Mines Ltd.

APPENDIX III

DECLARATION OF EXPENDITURES



Evergreen Explorations Ltd.

- R. WOOLVERTON
GEOLOGIST, P.ENG.
- R. C. O'BRIEN
FIELD SUPERVISOR
- JOHN C. OSWALD & CO., C.A.'s
ACCOUNTANTS:

CONTRACT EXPLORATION

- 5424 HALIFAX ST., BURNABY 2, B.C., CANADA, PHONE - 299-6998
- P.O. BOX 604, SMITHERS, B.C., CANADA PHONE - 847-3523

635 - 789 W. PENDER ST.
VANCOUVER 1, B.C., CANADA

December 10, 1970.

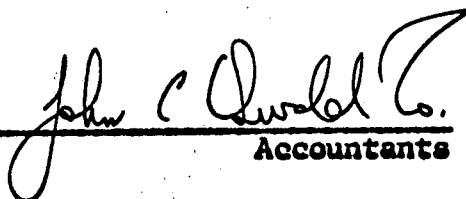
Whitesail Mines Ltd. (N.P.L.)
202 - 560 West Broadway,
Vancouver 9. B.C.

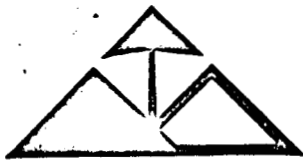
I N V O I C E

CHARGES FOR NOVEMBER -

| <u>Personnel</u> | <u>No. of man days</u> | <u>Rate</u> | |
|---------------------------|----------------------------|-------------|---------------------------------------|
| Operators | 6 | \$ 40 | \$ 240.00 |
| Helpers | 6 | 25 | 150.00 |
| Geologist | 5 3 | 75 | 375.00 225 |
| | | | <u>765.00</u> 615 |
| <u>Equipment</u> | | | |
| Truck | 4 days @ \$20 | | 80.00 |
| Mag rental | | | 75.00 |
| Radem rental | | | 50.00 |
| Field & field office | | | 200.00 |
| | | | <u>405.00</u> |
| <u>Room and board</u> | 15 days @ \$15 | | <u>225.00</u> |
| <u>Disbursements</u> | | | |
| Sundry | | | 20.30 |
| | | | \$ <u>1,415.30</u> 1265 ³⁰ |

E & O E


Accountants



Evergreen Explorations Ltd.

- R. WOOLVERTON
GEOLOGIST, P.ENG.
- R. C. O'BRIEN
FIELD SUPERVISOR
- JOHN C. OSWALD & CO., C.A.'s
ACCOUNTANTS:

CONTRACT EXPLORATION

- 5424 HALIFAX ST., BURNABY 2, B.C., CANADA, PHONE - 299-6998
- P.O. BOX 604, SMITHERS, B.C., CANADA PHONE - 847-3523

635 - 789 W. PENDER ST.
VANCOUVER 1, B.C., CANADA

January 12, 1971.

Whitesail Mines Ltd. (N.P.L.)
202 - 560 West Broadway,
Vancouver 9. B.C.

I N V O I C E

CHARGES FOR DECEMBER -

| <u>Personnel</u> | <u>No. of man days</u> | <u>Rate</u> | | |
|--|----------------------------|-------------|----|-----------------|
| Operators | 5 | \$ 40 | \$ | 200.00 |
| Helpers | 7 | 25 | | 175.00 |
| Geologist | 8 | 75 | | 600.00 |
| | | | | <u>975.00</u> |
| <u>Equipment</u> | | | | |
| Truck | 2 days | 20 | | 40.00 |
| Mag rental | 1 mo. | 75 | | 75.00 |
| Radem rental | 1 mo. | 50 | | 50.00 |
| Field & office equipment | 1 mo. | 70 | | 70.00 |
| | | | | <u>235.00</u> |
| Less credit for tractor and parcoll rental | | | | <u>(150.00)</u> |
| | | | | <u>85.00</u> |
| <u>Room and board</u> | 6 days | \$ 15 | | <u>90.00</u> |
| <u>Disbursements</u> | | | | |
| Expendable hardware and supplies | | | | 90.71 * |
| Freight and sundry | | | | 31.51 |
| Geochem analysis | | | ✓ | 15.60 |
| Accounting | | | ✓ | 33.66 |
| Telephone | | | ✓ | 66.00 |
| Mining Recorder (fee for recording work re Daisy 1 - 38 claims) | | | | 240.00 |
| | | | | <u>477.48</u> |
| | | | | 9.07 |
| | | | | <u>486.55</u> |
| Plus 10% on \$90.71 | | | | <u>90.71</u> |
| | | | | <u>486.55</u> |
| | | | \$ | <u>1,636.55</u> |

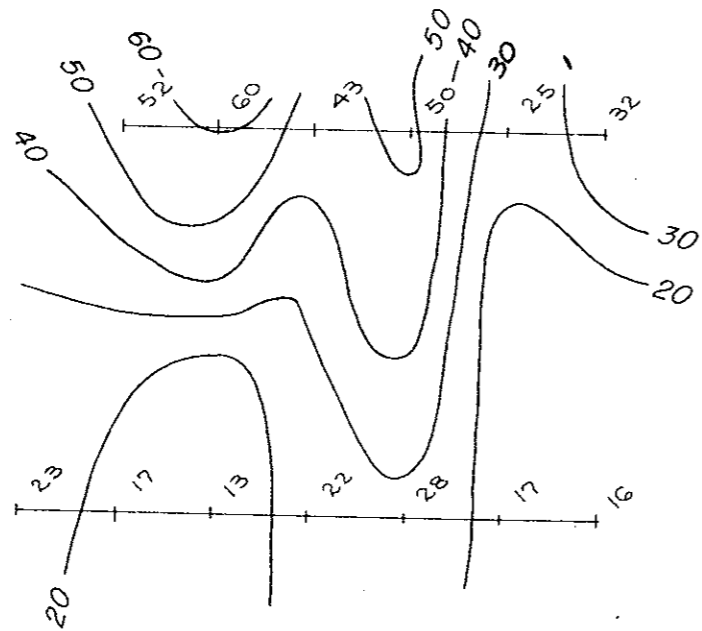
Total invoice

E & O E

John C. Oswald & Co.
Accountants

115.26

44W 40W 36W 32W 28W 24W 20W 16W 12W 8W 4W 0



BASELINE

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L 0
L 4 S



2839

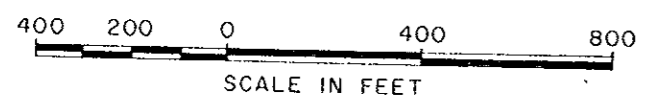
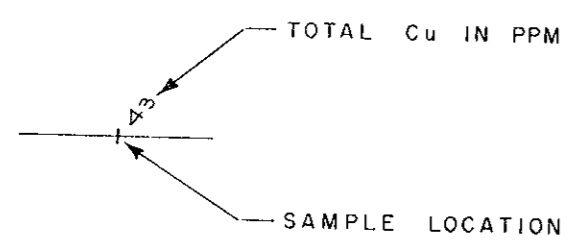
M-2

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 2839 MAP M-2

WHITESAIL MINES LTD.
KAREN PROPERTY
OMINECA M.D., BRITISH COLUMBIA
GEOCHEMICAL SURVEY
COPPER IN PPM

SURVEY BY
EVERGREEN EXPLORATIONS LTD.
NOVEMBER, 1970

LEGEND



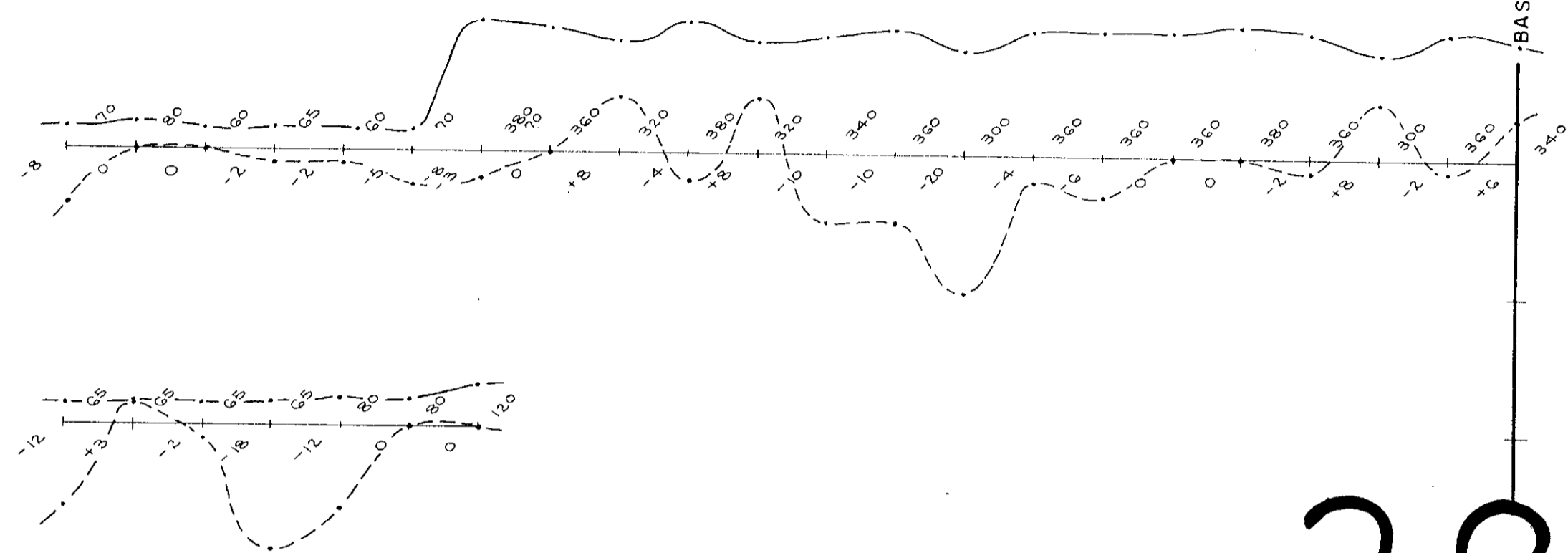
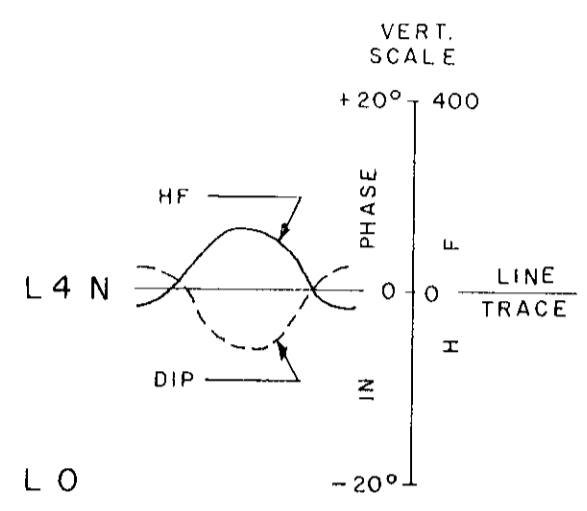
TO ACCOMPANY A REPORT BY R. WOOLVERTON, P. ENG.
ON THE KAREN CLAIMS DATED 4 Feb 1971

R. Woolbert

MAP #1

44W 40W 36W 32W 28W 24W 20W 16W 12W 8W 4W 0

LEGEND



2839

M-3

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 2839 MAP #13

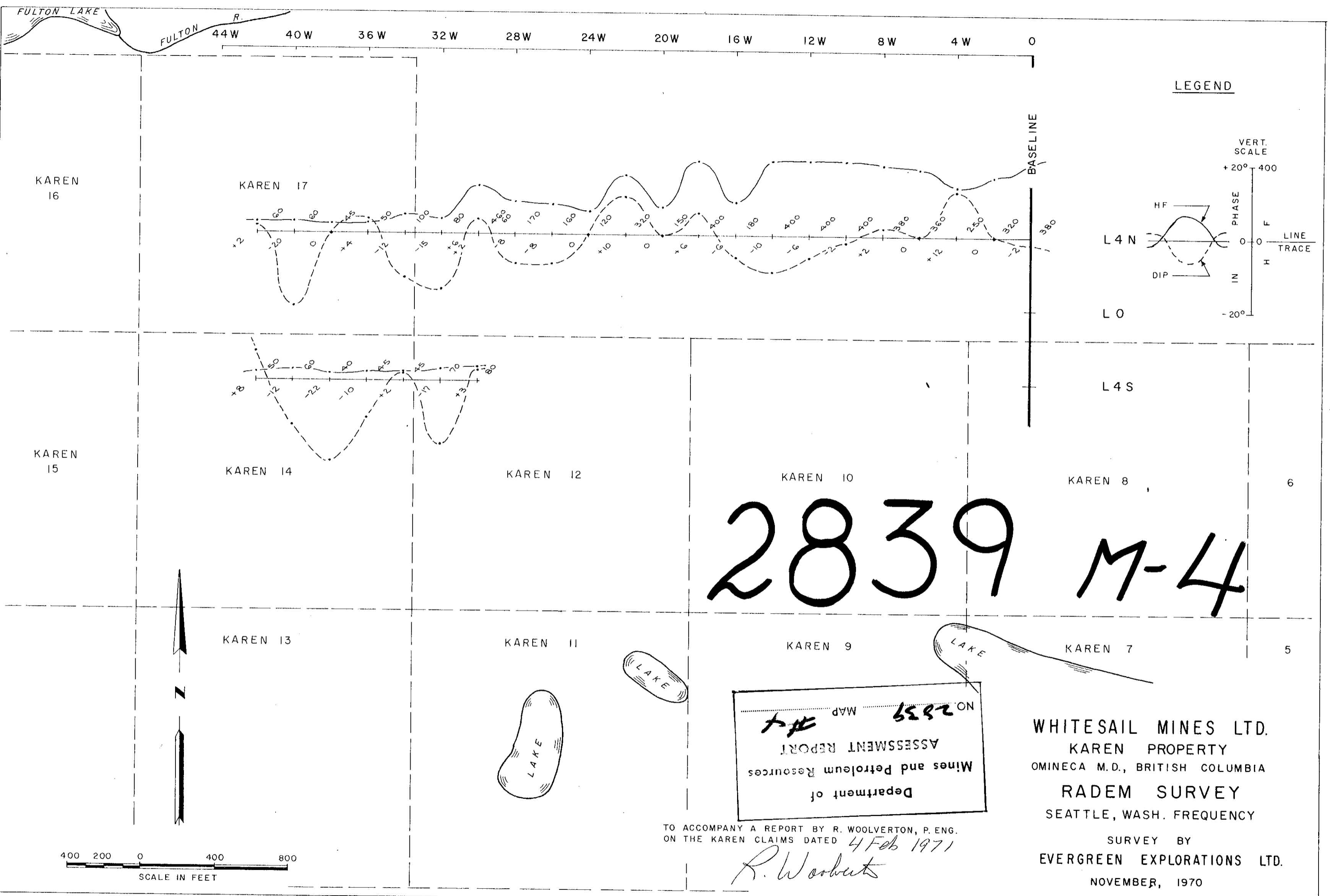
WHITESAIL MINES LTD.
KAREN PROPERTY
OMINECA M.D., BRITISH COLUMBIA
RADEM SURVEY
CUTLER, MAINE FREQUENCY

SURVEY BY
EVERGREEN EXPLORATIONS LTD.
NOVEMBER, 1970

TO ACCOMPANY A REPORT BY R. WOOLVERTON, P. ENG.
ON THE KAREN CLAIMS DATED 4 Feb 1971

R. Woolverton





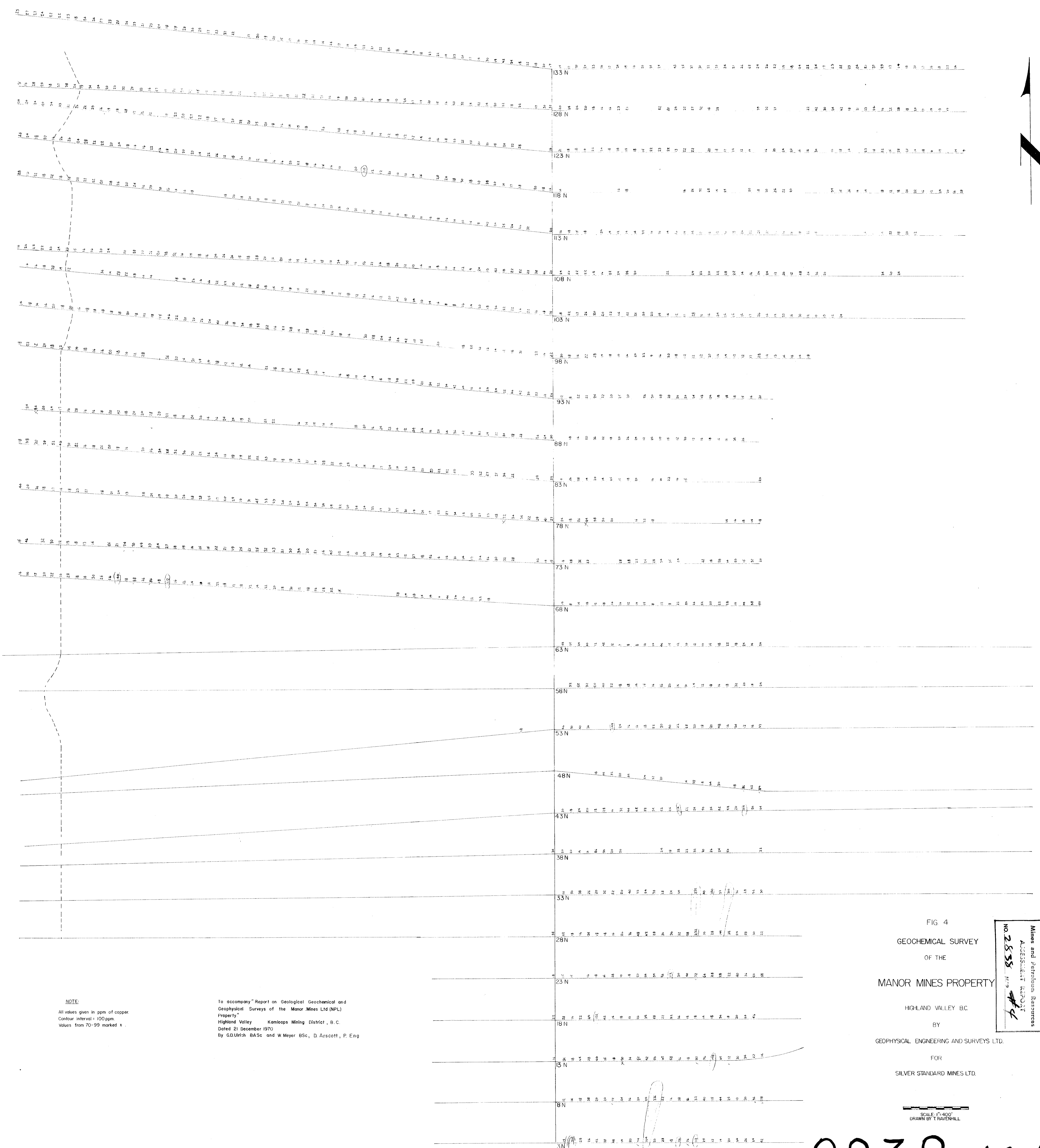
2839 M-4

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
Map NO. 2839 ON
#4

WHITESAIL MINES LTD.
KAREN PROPERTY
OMINECA M.D., BRITISH COLUMBIA
RADEM SURVEY
SEATTLE, WASH. FREQUENCY
SURVEY BY
EVERGREEN EXPLORATIONS LTD.
NOVEMBER, 1970

TO ACCOMPANY A REPORT BY R. WOOLVERTON, P. ENG.
ON THE KAREN CLAIMS DATED 4 Feb 1971

R. Woolbert



NOTE:
 All values given in ppm of copper.
 Contour interval = 100ppm.
 Values from 70-99 marked x.

To accompany Report on Geological Geochemical and
 Geophysical Surveys of the Manor Mines Ltd (NPL)
 Property,
 Highland Valley Kamloops Mining District, B.C.
 Dated 21 December 1970
 By G.D. Ulrich B.A.Sc. and W. Meyer B.Sc., D. Arscott, P. Eng.

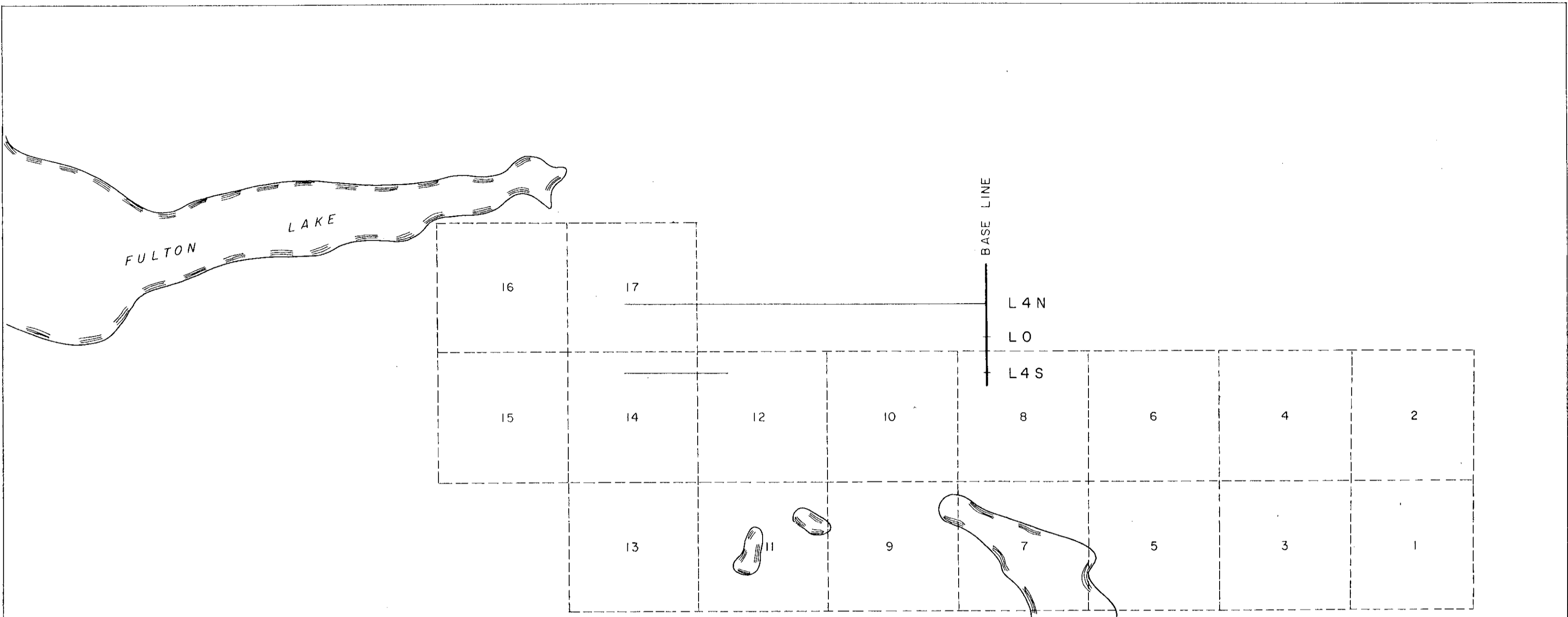
FIG 4
 GEOCHEMICAL SURVEY
 OF THE
 MANOR MINES PROPERTY
 HIGHLAND VALLEY B.C.
 BY
 GEOPHYSICAL ENGINEERING AND SURVEYS LTD.
 FOR
 SILVER STANDARD MINES LTD.

Department of
 Mines and Petroleum Resources
 ASSESSMENT REPORT
 NO. 2838
 M-4

SCALE: 1"=400'
 DRAWN BY T. RAVENHILL

2838 M-4

D. Arscott
 W. Meyer
 G.D. Ulrich



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 2839
#6

2839 M-6

WHITESAIL MINES LTD.
KAREN PROPERTY
OMINECA M.D., BRITISH COLUMBIA
GRID & CLAIM LOCATION
SEATTLE, WASH. FREQUENCY

SURVEY BY
EVERGREEN EXPLORATIONS LTD.
NOVEMBER, 1970

TO ACCOMPANY A REPORT BY R. WOOLVERTON, P. ENG.
ON THE KAREN CLAIMS DATED 4 Feb 1971

R. Woolvats