

2833

Department of  
 Mines and Petroleum Resources  
 ASSESSMENT REPORT  
 NO. 2833 MAP \_\_\_\_\_

*92M/SW*

REPORT ON  
 AN INDUCED POLARIZATION SURVEY  
 CHEHALIS RIVER AREA, BRITISH COLUMBIA  
 ON BEHALF OF  
 ZENITH MINING CORPORATION LIMITED

by

Jon G. Baird, B.Sc., P.Eng.

January 20, 1971

CLAIMS:

<u>Name</u>		<u>Record Numbers</u>
HARRISON	1 - 2	6592 - 93
HARRISON	3 - 4	10939 - 40
HARRISON	1 Fr.	10938
HARRISON	13	10949
HARRISON	15 - 22	10951 - 58
LUCKY JIM		3296

LOCATION:

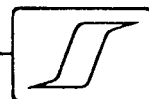
East side of the Chehalis River  
 About 5 miles north of Harrison Mills, B. C.  
 New Westminster Mining Division  
 121°                      49°                      SW

DATES OF FIELD SURVEY:

November 26 to December 7, 1970  
 December 11 to December 14, 1970

TABLE OF CONTENTS

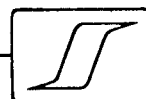
	<u>Page No.</u>
SUMMARY	
INTRODUCTION	1
GEOLOGY	3
DISCUSSION OF RESULTS	3
CONCLUSIONS AND RECOMMENDATIONS	5
PLATES:	
(in text)	
#1 Plate 1 - Property Location Map	1" = 4 miles
(in envelope)	
#2 Plate 2 - Grid and Claims Location Map	1" = 200'
#3 Plate 3 - Chargeability and Resistivity Profiles	1" = 200'



### SUMMARY

The present induced polarization survey has revealed a broad area of increased chargeability response which may arise from relatively narrow bodies containing appreciable percentages of metallicly conducting material, possibly sulphides. One such body occurs near a showing giving high copper, lead and zinc assays.

The locations for eleven short drill holes, one for each profile exhibiting anomalous responses are herein given. The order of priority for these holes and the decision as to whether they should all be drilled should depend upon geological opinion and the information gained from the initial holes.



REPORT ON  
AN INDUCED POLARIZATION SURVEY  
CHEHALIS RIVER AREA, BRITISH COLUMBIA  
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ZENITH MINING CORPORATION LIMITED

INTRODUCTION

During the period November 26 to December 7, and again from December 11 to December 14, 1970, a geophysical field party under the direction of Mr. Christian Zogg, executed an induced polarization survey in the Chehalis River area, British Columbia on behalf of Zenith Mining Corporation Limited. The writer visited the property on December 3, 1970. The property lies on the east side of the Chehalis River about 5 miles north of Harrison Mills, B. C. Access is by truck from Highway 7 at Harrison Mills along a good gravel road to within 1/2 miles of the property. The remainder of the route requires the use of a four wheel drive vehicle. Glacial drift and forest cover most of the surface of the property and topographic relief is moderate although steep slopes lie in the northeast part of the grid. As usual for this area in the fall of the year, heavy rain and snow was experienced throughout the period of the survey.

The claims covered, in whole or part, by this survey are listed on the title page of this report and are shown on Plate 2 on a scale of 1" = 200'.

Seigel Mk VII time-domain (pulse-type) induced polarization equipment has been employed on this property. The transmitting unit had a rating of 2.5 kilowatts and equal on and off times of 2.0 seconds. The receiving unit was a remote, ground-pulse type triggered by the rising and falling primary voltages set up in the ground by the transmitter. The integration of the transient polarization voltages takes place for

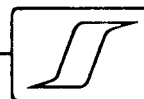


0.65 seconds after a 0.45 second delay time following the termination of the current on pulse.

The purpose of an induced polarization survey is to map the subsurface distribution of metallically conducting mineralization beneath the grids covered. In the present area such mineralization could include bornite, chalcopyrite, galena, pyrite and other metallic sulphide minerals. Other metallic conductors such as graphite and magnetite as well as non-metallic minerals such as chlorite and sericite can give responses not always distinguishable from sulphide mineralization.

The three electrode array was employed for the survey. For this electrode array, one current electrode and two potential electrodes traverse the profiles with an interelectrode spacing called "a". The second or "infinite" current electrode is placed a distance greater than 5a from the measuring point which is defined as the midpoint between the moving current electrode and the near potential electrode. For reconnaissance purposes observations were taken for  $a = 200'$  and  $a = 400'$ , the distance between observations being 200'. For additional detail in the north part of the grid readings were taken with  $a = 50'$  and 100' with 100' station intervals.

On the present property a baseline 7400' long was laid out oriented approximately N 40° W and grid lines were established perpendicular thereto at 200' intervals although in the south part of the grid not all grid lines were surveyed. One reconnaissance line, 2000' long was laid out along a road running northwest of the grid from Line 0. Part of the baseline was covered as well as a road running from L 12 S to L 20 S. The survey totalled approximately 7.5 miles of profile covered with several electrode spacings. The profiles covered are shown on Plate 2.



## GEOLOGY

The geology of the property has been studied by Michael Stadnyk of Zenith Mining Corporation and Earl Dodson of MacDonald Consultants Limited and is the subject of their reports. The geology of the area including and surrounding the present claims is shown on G.S.C. Map 737 A, "Hope", on a scale of 1" = 4 miles.

The survey grid is mainly underlain by acidic to intermediate volcanic rocks of the Middle Jurassic Harrison Lake Formation. A quartz diorite intrusive lies about one mile to the west.

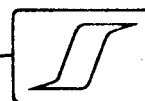
A showing in a pit just east of the baseline on L 18 S contains pyrite, chalcopyrite, galena and sphalerite. Assays reveal that the grade of this material is rather high.

Although a large tonnage-low grade deposit may possibly occur on the property, the main target of the present survey was a high grade body which might be economic even if tonnage were rather limited. Such bodies would have to occur quite near surface in order to be detectable by the induced polarization method.

## DISCUSSION OF RESULTS

Plate 2, on the scale of 1" = 200' shows the survey grid, claims and some topographic features. Also shown is an interpretation of the high chargeability bodies located by the survey.

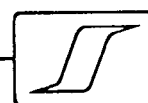
Plate 3, shows the geophysical results in profile form. Two parameters are plotted, chargeability (the induced polarization characteristic of the rock) and resistivity. The vertical scales are 1" = 10.0 milliseconds for chargeability and 2" = 1 logarithmic cycle with the line trace taken as 1000 ohm-meters for resistivity. The horizontal scale is 1" = 200'



although in order to accommodate the profiles, the interline spacing is not to scale.

The chargeability results, particularly for the south part of the grid, reveal that background values lie between about 1.0 and 8.0 milliseconds which is the normal non-metallic response range for the volcanic rocks believed to underlie the survey grid. With this background a uniform subsurface distribution of 1% by volume of metallicly conducting mineralization would be expected to add approximately 10.0 milliseconds to the background level. Because small bodies, which are the principal targets of the present survey, may not constitute a "uniform subsurface distribution" so that 1% by volume of sulphide mineralization may contribute much less than 10.0 milliseconds to the peak values, chargeability responses only modestly in excess of background may be of interest.

As shown by the chargeability profiles and on Plate 2, an extensive area up to 800' in width and trending approximately N 45° W from L 18 S possibly beyond the north boundary of the grid exhibits chargeability responses in excess of 10.0 milliseconds. On the basis of the 200' and 400' electrode spacing results this area could be interpreted as underlain by a large volume of rock containing a uniform distribution of up to 1% by volume of metallicly conducting material approaching to within at least 100' of the ground surface. However, the results of the 50' and 100' electrode spacing profiles in the same area reveal that within the upper 100' the anomalous material is confined to relatively narrow bodies which may contain several percent by volume of metallicly conducting material and which may approach to within a few tens of feet of the ground surface. The locations of these narrow bodies are shown on Plate 2.



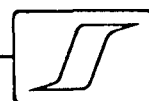
It is possible that a number of such confined bodies, some within the upper 100' and some at greater depth, may give rise to the broad curve forms observed for the 200' and 400' electrode spacings and that the interpretation that these responses may be due to a wide-spread uniform distribution of metallicly conducting material is incorrect. Since the wide electrode spacings necessary for greater depth of penetration do not give resolution for small bodies at depth, it is not likely that even further detailed induced polarization surveying may resolve the "one large body or several small bodies" ambiguity for the wide electrode spacings results.

The observed resistivities range from a few hundred to a few thousand ohm-meters and average about 1000 ohm-meters. The resistivities are quite uniform over the survey area and for the different electrode spacings although some particularly low values are seen for the short electrode spacings. These low values are likely due to the occurrence of low resistivity overburden. There is no distinct high or low resistivity correlation with the increased chargeability responses.

#### CONCLUSIONS AND RECOMMENDATIONS

The present induced polarization survey has revealed one broad area of increased chargeability response which may arise from relatively narrow bodies containing appreciable percentages of metallicly conducting material. The nature of such material is as yet unknown, however one of the anomalous bodies lies near a showing containing good grades of copper, lead and zinc sulphide mineralization.

Since geological opinion suggest that small, high grade bodies may have the highest economic potential, it is recommended that a series of drill holes, possibly only 100' each in length, be drilled in order to





investigate the confined, near surface anomalous bodies revealed by the induced polarization survey. The following drill holes are therefore proposed, one for each profile exhibiting anomalous responses. All holes should be drilled at -45° inclination westwards in the direction of the line trace:

<u>Line</u>	<u>Collar</u>
L 2 S	0 + 50 W
L 4 S	0 + 25 W
L 6 S	0 + 75 W
L 8 S	1 + 50 W
L 10 S	4 + 00 W
L 12 S	3 + 50 W
L 14 S	2 + 50 W
L 16 S	1 + 00 E
L 18 S	2 + 50 E
L 20 S	1 + 25 E
L 22 S	1 + 00 E

These holes have been proposed based upon the geophysical results alone. The decision as to whether or not to undertake individual holes and the order in which they should be drilled should depend upon the known geology with consideration of the ease of access to the drill sites. As more information becomes available it would be wise to review these recommended locations.

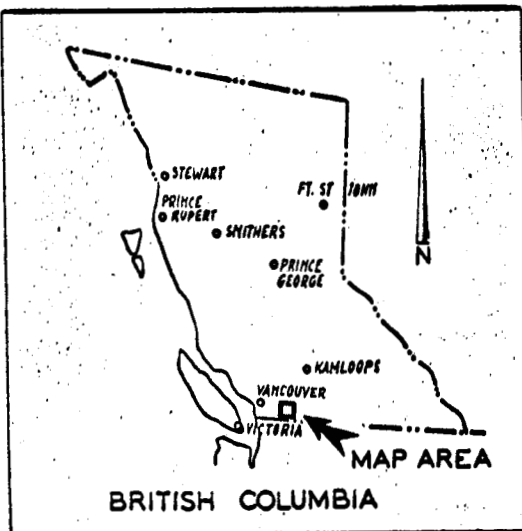
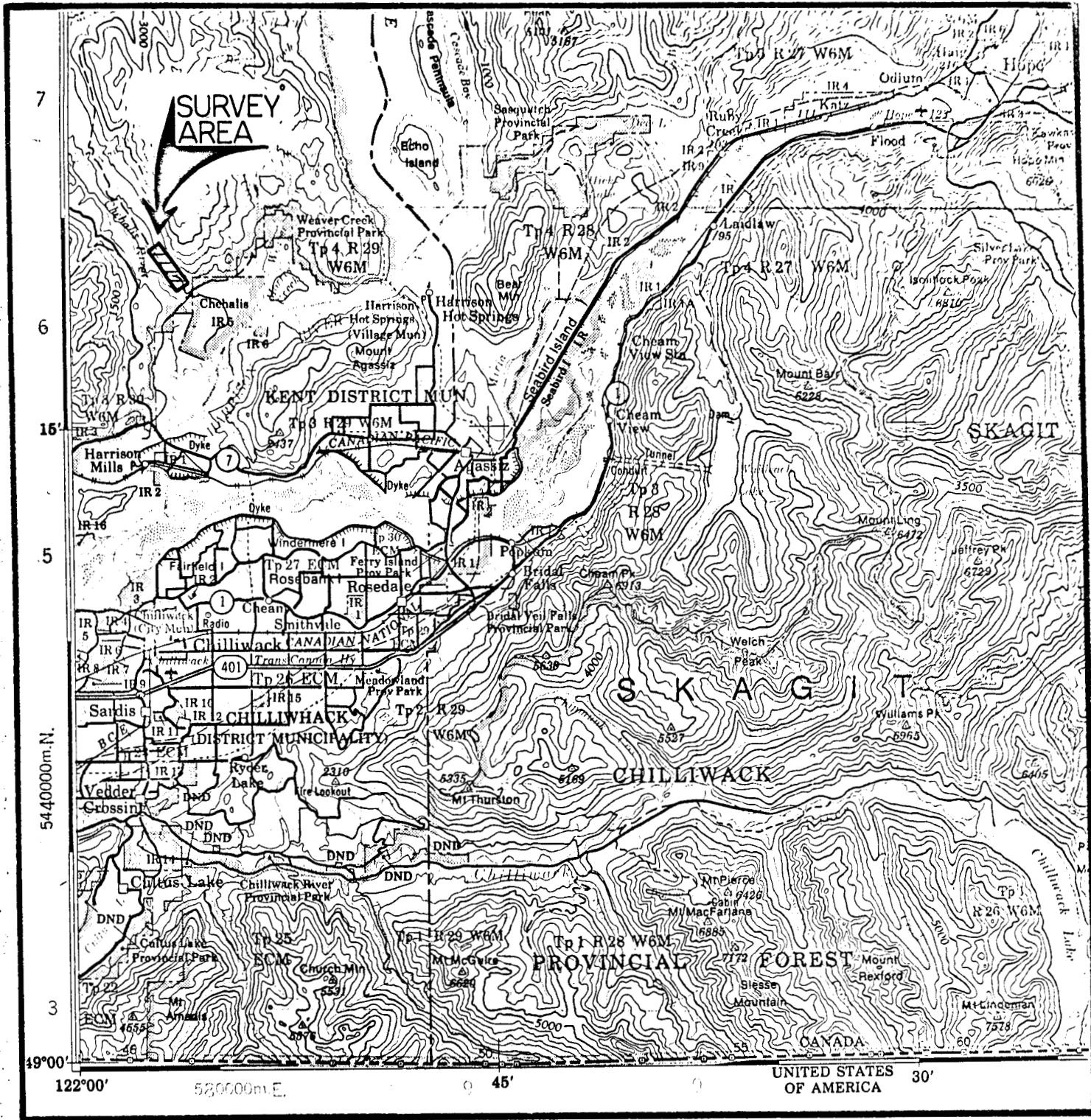
Respectfully submitted,  
SEIGEL ASSOCIATES LIMITED



Jon G. Baird, B.Sc., P.Eng.  
Geophysicist

Vancouver, B. C.  
January 20, 1971





ZENITH MINING CORPORATION LTD (NPL)	
<h2 style="margin: 0;">LOCATION MAP</h2> <p style="margin: 0; font-size: 1.2em;">INDUCED POLARIZATION SURVEY</p> <p style="margin: 0;">CHEHALIS RIVER AREA, BRITISH COLUMBIA</p>	
Survey by <b>SEIGEL ASSOCIATES LTD.</b> NOV. DEC. 1970	<b>PLATE 1</b>

DOMINION OF CANADA:  
 PROVINCE OF BRITISH COLUMBIA.  
 To Wit:

**In the Matter of**

a geophysical survey on behalf of  
 Zenith Mining Corporation Limited  
 (N.P.L.)

I, L. A. Merrifield for Seigel Associates Limited

of 750 - 890 West Pender Street, Vancouver

in the Province of British Columbia, do solemnly declare that an induced polarization survey has been executed on some HARRISON AND LUCKY JIM Claims, Chehalis River area, British Columbia between November 26 to December 7, 1970 and December 11 to December 14, 1970. The following expenses were incurred:

(1) Wages:			
	C. Zogg	16 days @ \$50.00/day	\$800.00
	T. Guernier	6 days @ \$27.50/day	165.00
	F. Bourqui	6 days @ \$27.50/day	165.00
	G. Budgell	6 days @ \$27.50/day	165.00
	B. Paradis	10 days @ \$27.50/day	275.00
	H. Zehnder	4 days @ \$27.50/day	110.00
			<u>\$1,680.00</u>
			\$1,680.00
(2) Transportation & shipping to the job			24.00
(3) Transportation on the job			94.50
(4) Food & living expenses			34.93
(5) Use of geophysical equipment			
		16 days @ \$60.00/day	960.00
(6) Paid to Seigel Associates Limited to cover geophysicist's supervision, calculating, plotting and fairdrawing data and preparation of final reports.			<u>2,369.17</u>
			\$5,162.60

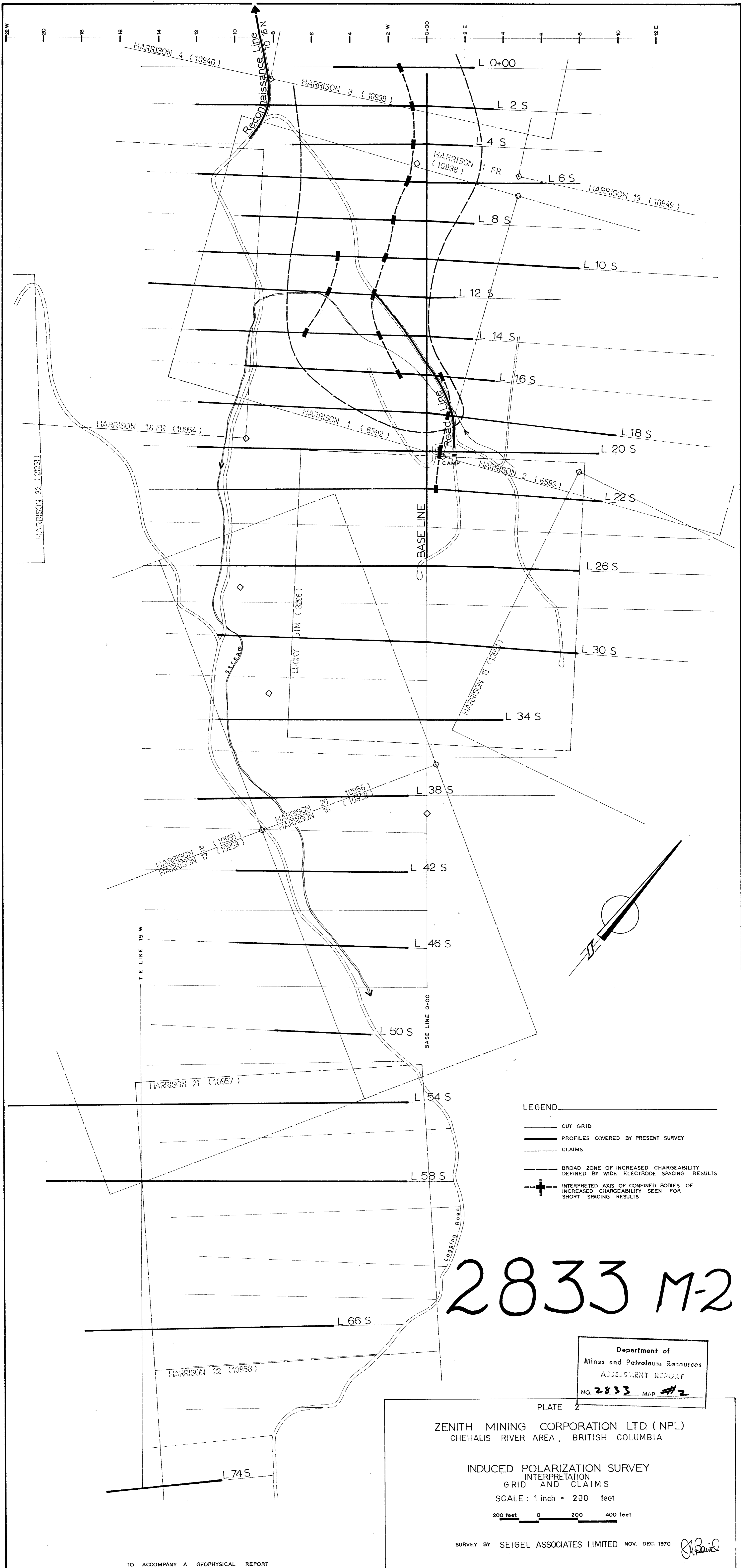
And I make this solemn declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath and by virtue of the "Canada Evidence Act."

Declared before me at the City  
 of Vancouver, in the  
 Province of British Columbia, this 1st  
 day of February, 1971, A.D.

*L.A. Merrifield*

*[Signature]*

**SUB-MINING RECORDER**  
 A Commissioner for taking Affidavits within British Columbia or  
 A Notary Public in and for the Province of British Columbia.



2833 M-2

- LEGEND
- CUT GRID
  - PROFILES COVERED BY PRESENT SURVEY
  - - - CLAIMS
  - BROAD ZONE OF INCREASED CHARGEABILITY DEFINED BY WIDE ELECTRODE SPACING RESULTS
  - + INTERPRETED AXIS OF CONFINED BODIES OF INCREASED CHARGEABILITY SEEN FOR SHORT SPACING RESULTS

Department of  
 Mines and Petroleum Resources  
 ASSESSMENT REPORT  
 NO. 2833 MAP #2

PLATE 2

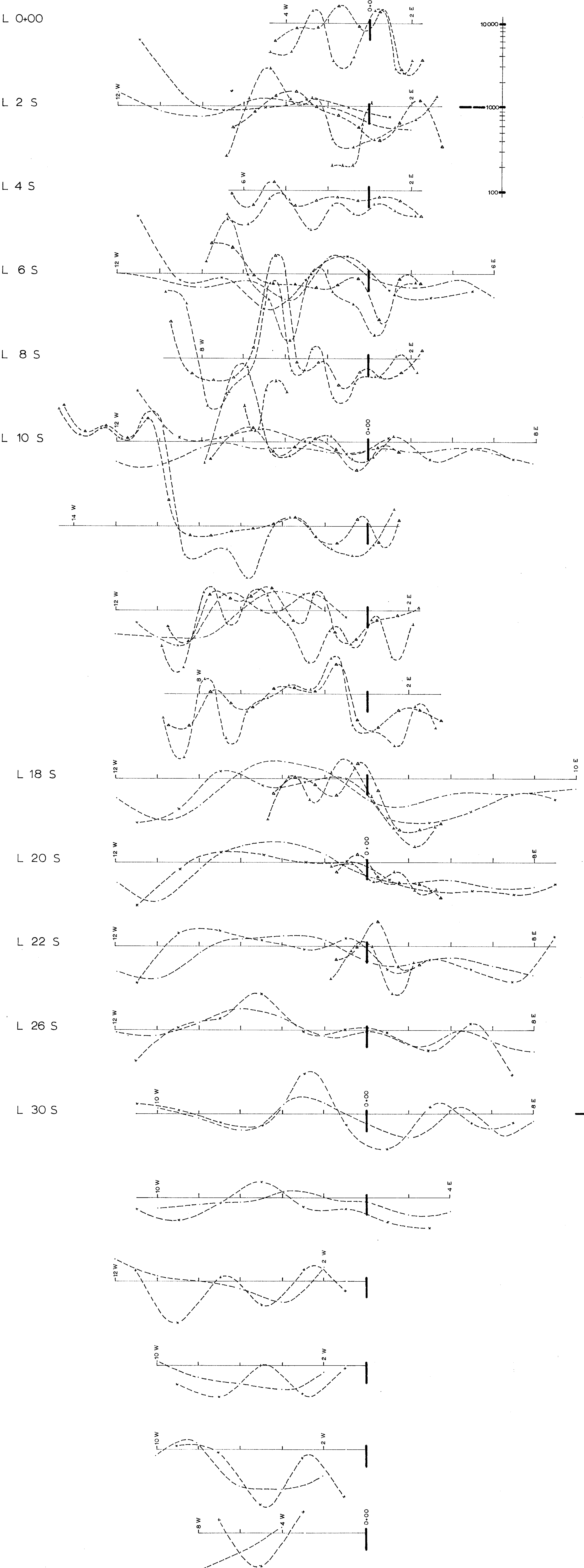
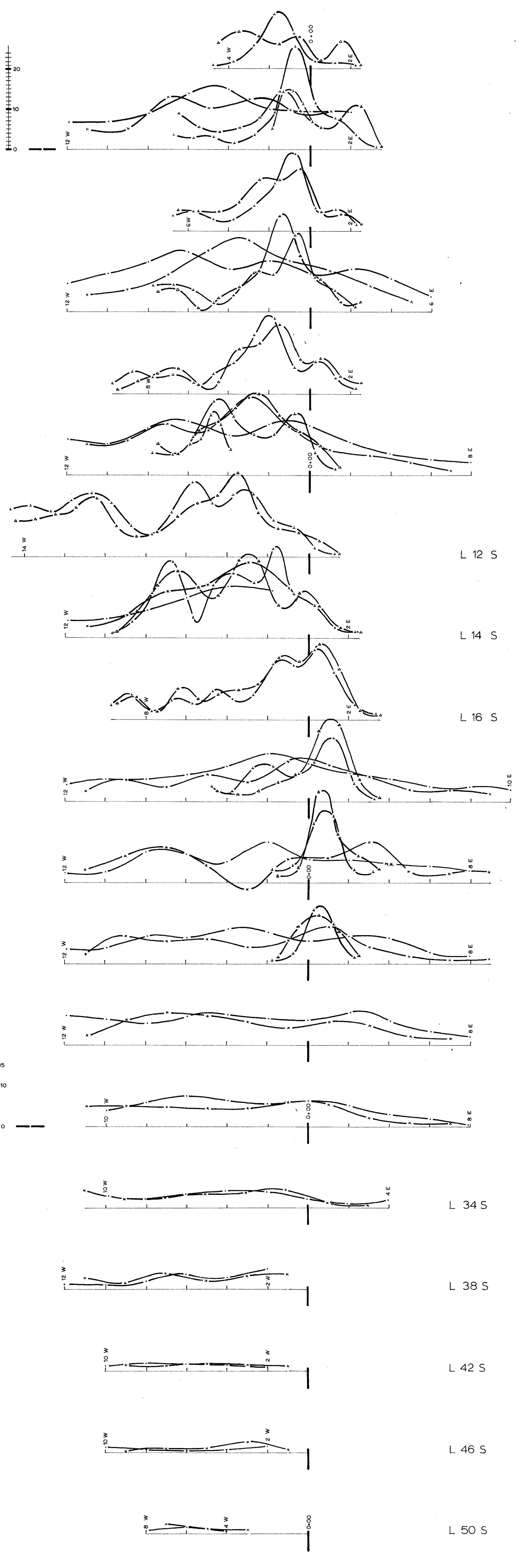
ZENITH MINING CORPORATION LTD. (NPL)  
 CHEHALIS RIVER AREA, BRITISH COLUMBIA

INDUCED POLARIZATION SURVEY  
 INTERPRETATION  
 GRID AND CLAIMS

SCALE: 1 inch = 200 feet

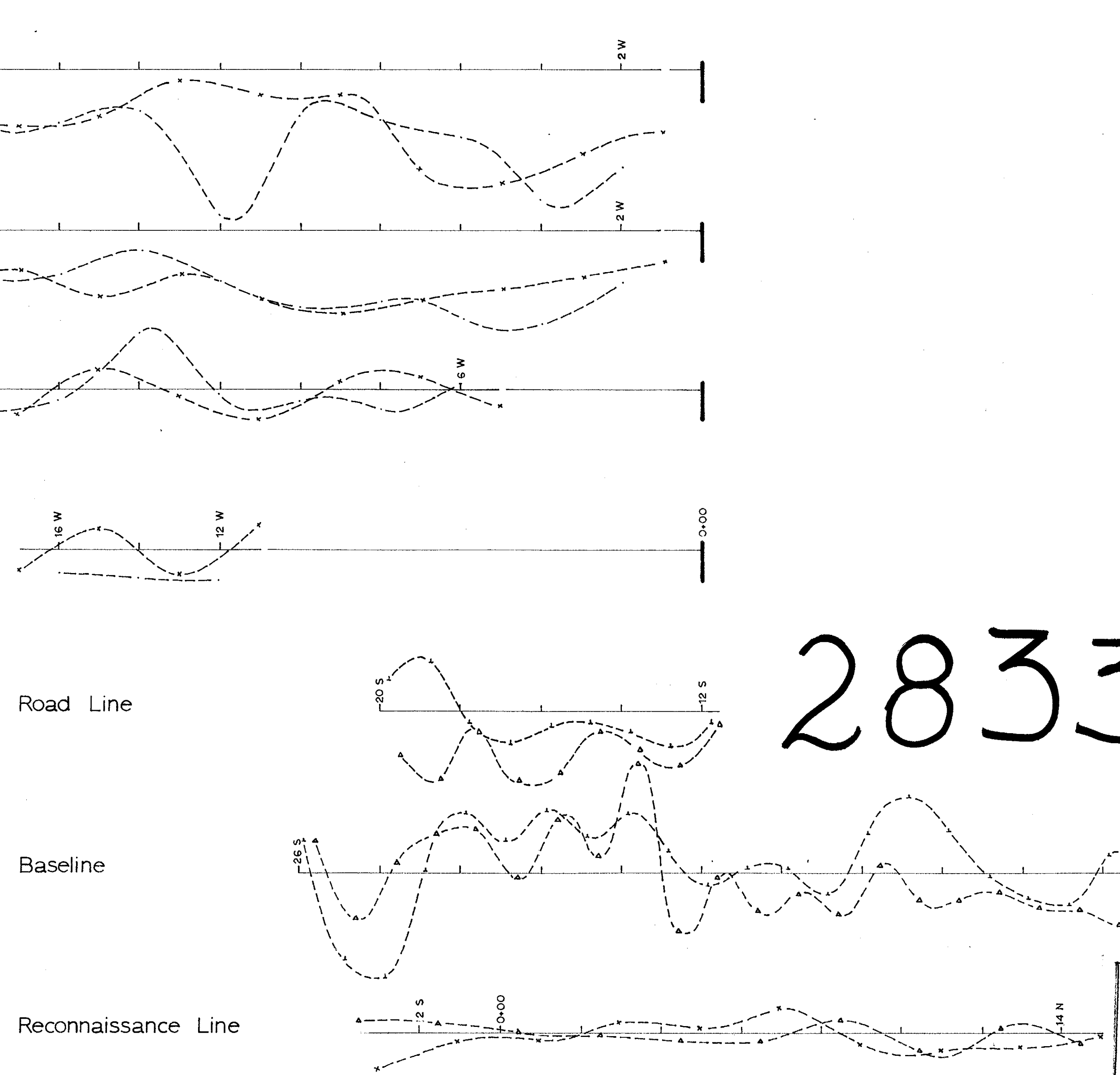
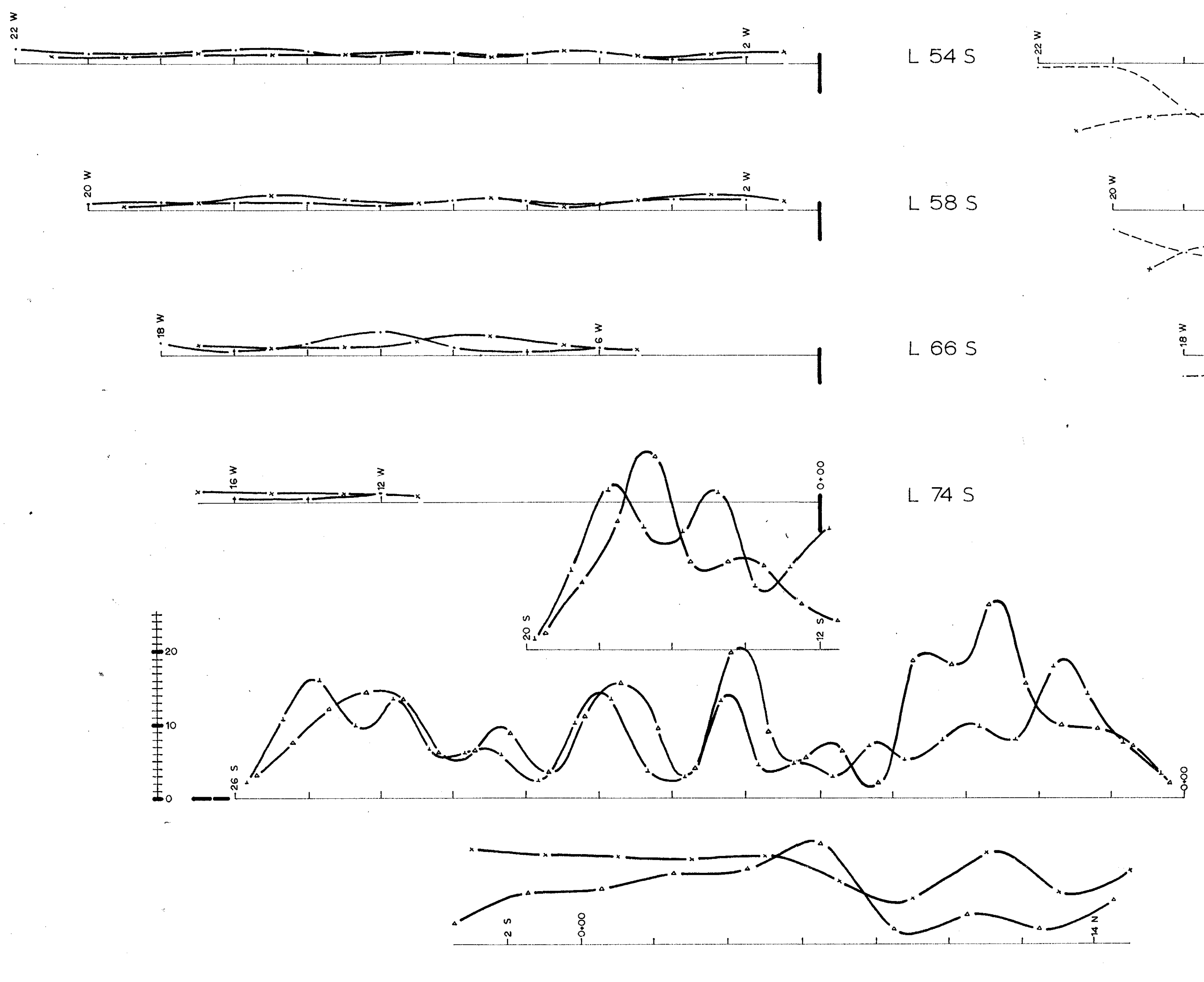
200 feet 0 200 400 feet

SURVEY BY SEIGEL ASSOCIATES LIMITED NOV. DEC. 1970

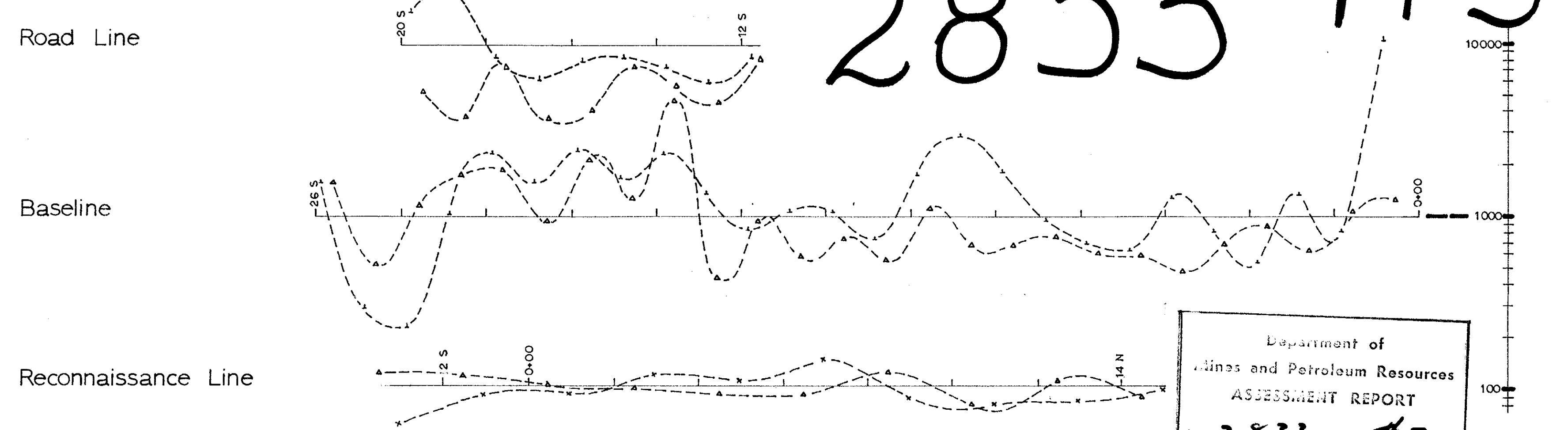


CHARGEABILITY SCALE IN MILLISECONDS

RESISTIVITY SCALE IN OHM-METRES



2833 M-3



LEGEND

CHARGEABILITY SCALE 1 inch = 10 MILLISECONDS  
ELECTRODE SPACING  
 400' ————  
 200' ————  
 100' ————  
 50' ————  
 25' ————

RESISTIVITY SCALE 2 inches = 1 LOGARITHMIC CYCLE WITH LINE TRACE TAKEN AS 1000 OHM-METRES  
ELECTRODE SPACING  
 400' ————  
 200' ————  
 100' ————  
 50' ————  
 25' ————

NOTES

SCINTREX MKVII INDUCED POLARIZATION INSTRUMENTATION  
THREE ELECTRODE ARRAY  
 infinite current electrode ————  
 moving current electrode ————  
 potential electrodes ————  
 5m ————  
 10m ————  
 20m ————  
 40m ————  
 INTERLINE SPACING NOT TO SCALE

PLATE 3  
 ZENITH MINING CORPORATION LTD. (NPL)  
 CHEHALIS RIVER AREA, BRITISH COLUMBIA  
 INDUCED POLARIZATION SURVEY  
 CHARGEABILITY AND RESISTIVITY PROFILES  
 SCALE: 1 inch = 200 feet  
 200 feet 0 200 400 feet  
 SURVEY BY SEIGEL ASSOCIATES LIMITED NOV. DEC. 1970