2341

REPORT ON
INDUCED POLARIZATION SURVEY
FOR

AMERICAN SMELTING AND REFINING COMPANY LTD.

ON THE

CORANEX PROPERTY

"PEACH" AND "PIT" CLAIM GROUPS

CLINTON MINING DIVISION

(51°, 121°, NE)

BRITISH COLUMBIA

BY

GEOTERREX LIMITED

Project 85-71

P. Norgaard, P.Eng.,
Geophysicist.

W. Finney,
Geophysicist.

R. Wasylechko,
Geophysicist.

OTTAWA, ONTARIO,
January 23, 1970.

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I. INTRODUCTION

In the period from September 15 to October 1, 1969, an induced polarization survey was carried out by Geoterrex Limited on the Coranex property on behalf of American Smelting and Refining Company Limited. The Coranex property is located approximately 20 miles northeast of the town of Lac La Hache within the Clinton Mining Division in British Columbia.

The purpose of the induced polarization survey was to map the subsurface distribution of polarizable material in the region of a magnetic "low" which was considered a possible indication of the presence of a zone of alteration.

A total of 647 observations were made for a coverage of approximately 97,000 feet including some detailed work. The survey was conducted by R. Wasylechko.

II. CLAIMS COVERED

The induced polarization survey was conducted on the following claims located in the Clinton Mining Division of British Columbia:

CLAIM GROUP	CLAIM NUMBER
"Peach"	#44, 46, 48, 59-62, 73, 74, 77-~~86~~ 89, 161, 163, 165, 212 Fr., 215, 216, 230
"Pit"	60, 61, 62

III. PERSONNEL AND TIME DISTRIBUTION

The following is a list of the Geoterrex Limited personnel involved in the induced polarization survey as well as the number of 8-hour man-days spent by each person on the project:

NAME AND ADDRESS	NO. OF 8-HOUR MAN-DAYS	
R. Wasylechko, Geophysicist, 790 Springland Drive, OTTAWA, Ontario.	Field Office	17 2
P. Norgaard, Geophysicist, 749B Springland Drive, OTTAWA 8, Ontario.		1
W. Finney, Geophysicist, 1320 Bank Street, OTTAWA, Ontario.		1
D. Johnston, Helper, Keremeos, B.C.		17
R. Johnston, Helper, Keremeos, B.C.		17

NAME AND ADDRESS	NO. OF 8-HOUR MAN-DAYS
K. Miller, Helper, Keremeos, B.C.	17
P. Steele, Draughtsman, 107 Skead Rd., OTTAWA, Ontario.	2 3/4
B. McMillan, Draughtsman, 1725 Riverside Drive, OTTAWA, Ontario.	1/4
TOTAL	75

IV. SURVEY INSTRUMENTS:

High Sensitivity DC pulse-type induced polarization equipment was employed for the survey. The I.P. receiver, which was used in the "remote" sense, is designed by Newmont Exploration Limited, and manufactured by Scintrex Limited. The receiver has the integration time constant adjusted to give readings of apparent chargeability equivalent to those with a transmitter cycle of 3:3:3:3 (+:0:-:0) and an integration time of one second. The apparent chargeability results are read directly on the receiver in milliseconds or millivolt seconds per volt.

The apparent resistivities are calculated from observations of primary voltages and corresponding applied currents.

The transmitter and motor generator set are manufactured by Huntec Limited. The transmitter operates on a timing cycle

of 2:2:2:2. A power supply and a transmitter of 2.5 kilowatt rating were used for the survey.

V. SURVEY PROCEDURE

The equispaced three-array electrode configuration was used throughout the survey. For the reconnaissance coverage of the grid an electrode spacing of 400 ft. was employed and observations were taken at 200 ft. intervals. Detailed work employing auxiliary electrode spacings of 50,100 and 200 ft. was completed in the course of the survey to aid in the interpretation of the results. The data obtained using various electrode spacings yields information on the change in physical properties with depth.

VI. PRESENTATION OF DATA

The survey results are presented as profiles of apparent chargeability and apparent resistivity (Plates 1,2), at a vertical scale of 1" = 10.0 milliseconds and 2" = 1 logarithmic cycle (ohm-metres) respectively. The horizontal scale along the traverses is 1" = 200 ft. but the lines are not spaced laterally at any particular scale; being positioned mainly for clarity of presentation.

In addition, the reconnaissance apparent chargeability results (i.e. using 400 ft. electrode spacing) are shown in contour form (Plate 3) at a scale of 1" = 400 ft. and a contour interval of 2.0 milliseconds.

VII. DISCUSSION OF RESULTS

Background chargeability observed in the reconnaissance phase of the work is approximately 4.0 milliseconds (Plate 3). An irregular, discontinuous, belt of anomalously high readings (i.e. greater than twice background) was outlined on the west, south and east sides of the survey area, surrounding a region of weaker response. Detailing of this anomalous zone which was carried out on several lines, using multiple electrode separations, has defined a number of discreet causative bodies.

Line 24W

Higher than background chargeability response was observed between stations 17S and 20S using the narrower electrode separation. No 50 ft. separations were tried which would have resolved the positions of very shallow parts of the source. However, it is clear that the causative body comes to within 20 ft. of ground level but probably does not have a great depth extent. The amplitude of the response suggests approximately 1% - 2% average by volume of polarizable material, the core of which appears to be located near 19 + 50S. Trenching at this station is suggested to determine the anomaly source.

The anomaly at the northern end of the line was detailed thoroughly with multiple electrode separations and two, steeply dipping, narrow bodies are interpreted as the source. These are centered on Stations 9 + 50N and 11 + 25N; the depth to the top in each case is less than 10 ft. If metallic sulphides is the source material then 1% - 2% by volume could account for the anomaly. The sharp drop in resistivity using the 50 ft. electrode separation just to the south of the anomaly suggests

a change in rock type or a rapid increase in the depth of overburden. Trenching should identify the I.P. source in both cases.

Between station 2S and 4S three electrode separations were used. The general increase in chargeability with increasing separations, and the fact that the response is fairly flat, suggests a two layer model is applicable to the interpretation. That is to say, the interpretation implies a less polarizable material overlying a rock type of higher chargeability; the interface between the two is assumed horizontal. Using this model, the interface is calculated to be at a depth of 150 ft. near station 4S and the true chargeability of the lower layer is approximately 20 milliseconds.

The true chargeabilities of the causative bodies producing the anomalies at the north and south ends of the line are also about 20.0 milliseconds which suggests the anomalies could be due to the absence towards the ends of the lines, of the less chargeable surface layer.

Line 16W

Two anomalous sections (Stations 8S-16S and 2N-10N) were detected on this line. At least two causative bodies which come to within 15 ft. of surface are interpreted as the source of the southern anomaly. These appear to be centered on stations 15S and 9+50S but without narrower electrode spacings these positions are only accurate to about $\pm$30 ft. Both sources are probably narrow and certainly limited in depth extent. The average concentration of polarizable material is estimated to be about 1%-2% by volume.

Two causative bodies are interpreted at the northern end of the line centered on 4+50N and 7+50N, the accuracy of these figures is limited to ±30 ft. as no 50 ft. detail profile is available. Depths to the top of the bodies, which probably come to bedrock surface, are less than 20 ft.

It is understood that trenching on the southern anomaly has exposed pyrite in andesitic volcanics. This could easily explain the I.P. effect and similarly it is felt trenching of the northern anomaly would probably determine the source material there.

No detailing was carried out on lines 8W, 0, 8E and 16E. The reconnaissance anomaly on line 0 between 7S-17S is quite distinct but the exact location of the causative body or bodies, depth of overburden, etc., cannot be estimated from one profile only. The anomaly is similar in amplitude and overall dimensions to the one almost due west of it, on line 16W. It is possible that both anomalies are related to the same geological feature although it is noted there is only a weak expression of such a feature on the intermediate line, line 8W.

Line 20E

A single causative body is interpreted as the source of the anomalous chargeability between 24S and 34S. Detailing with the narrower electrode separations indicates a narrow, steeply dipping body located on 27+50S to be the source. The top of the body is less than 15 ft. below surface and the data suggests the body dips to the south. Trenching at 27+50S on a 45° diamond drill hole collared at 28S and oriented north along the line should identify the source material. It is understood some

trenching was done at 28S and exposed "pseudo-diorite-syenite" containing pyrite. This trench was probably a little south of the main zone where the percentage of metallic sulphides (assuming this is the only polarizable material) is estimated at 1.5%-3% by volume.

Line 32E

No anomalies were observed on lines 24E and 28E but a broad 25 millisecond anomaly was detected in the reconnaissance survey on line 32E south of station 30S. The response, using the 200 ft. and 100 ft. electrode separations is weaker than that observed in the reconnaissance work which suggests the main response is coming from depths greater than 100 ft.

The main causative body is centered on 34+50S and the depth to the top of it is probably less than 50 ft. The polarizable material is considered to continue to depth and to test the body a 45° diamond drill hole, collared at 35+75S, oriented north along the line, is suggested. Scattered pyrite was observed in trenching between 36S and 40S and it is possible pyrite is the source of the main anomaly also. However, as the copper mineralization is thought (personal comment by Asarco Geologist) to be associated with the pyrite in the "pseudo-diorite-syenite" which is the rock type exposed, the I.P. target is probably worth testing with a drill hole.

The second weaker anomaly centered in 39+50S is very much a second priority and would only warrant investigation if the main anomaly proved interesting. Again the maximum response is coming from considerable depth, probably 200 ft. or more below surface.

Line 48E

The detailing on this line did not reveal any favourable targets that warrant further investigation. Two weak anomalies on the '100 ft. spacing' profile at 3S and 1+50N probably indicate shallow bodies with minor concentrations of polarizable material. As the chargeability response falls off rapidly using the widest separation, these bodies must have limited depth extent. Very low priority is assigned to these anomalies but if testing to determine the I.P. source is considered warranted, because of additional geological or geochemical evidence, then trenching at 3+00S, 0+50N and 2+50N is suggested.

CONCLUSIONS

1. The reconnaissance survey using the 400 ft. electrode separation detected seven anomalies which are detailed using multiple electrode separations.

2. The causative bodies detected on line 24W and at the northern end of line 16W are sufficiently shallow to be identified by trenching. Similar followup work is proposed for the anomaly on line 48E if additional geological or geochemical information supports the I.P. interpretation.

3. To test the main causative body producing the anomaly at the southern end of line 32E, a 45° diamond drill hole, collared at 35+75S and oriented north along the line is suggested.

4. Trenching, etc., already carried out by Asarco appears to have identified the polarizable material causing the remainder of the anomalies.

Respectfully submitted,

P. Norgaard, P.Eng.,
Geophysicist.

W. Finney,
Geophysicist.

R. Wasylechko,
Geophysicist.

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
P. NORGAARD

Expiry Date: November 26, 1970

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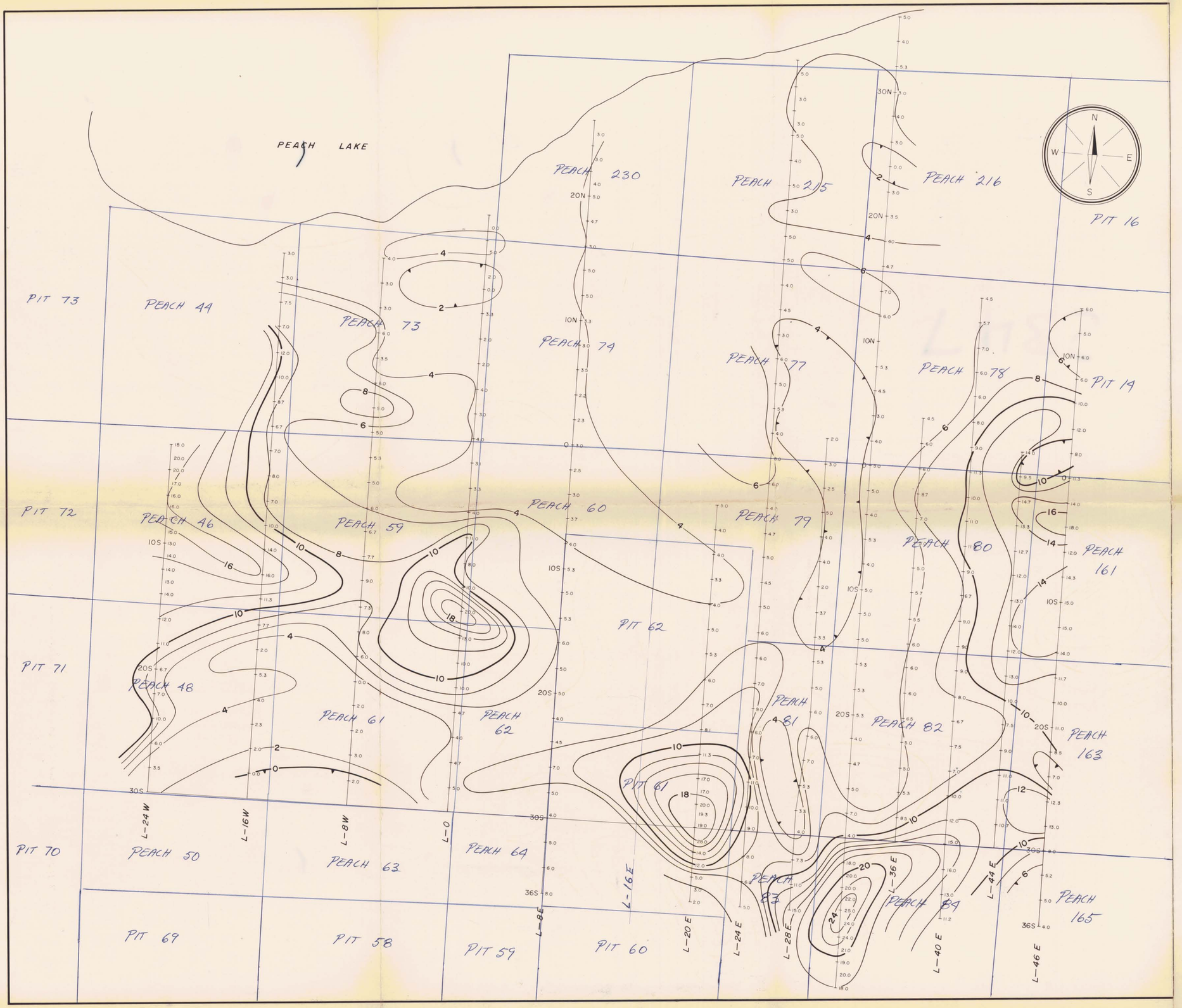

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CHARGEABILITY CONTOUR PLAN

PLATE 3

ELECTRODE SPACING ..... 400 FEET

ELECTRODE CONFIGURATION ..... THREE ARRAY

SCALE ..... 1 INCH = 400 FEET

2347

LEGEND

INDEX CONTOUR .....

INTERMEDIATE CONTOUR .....

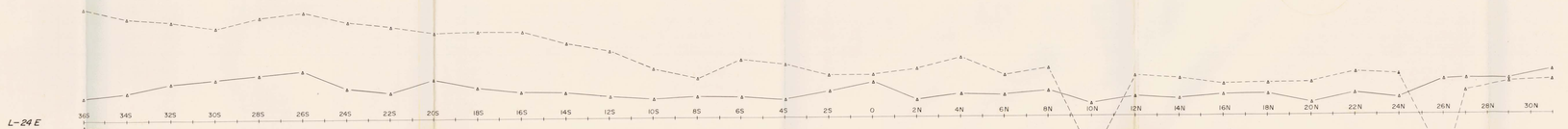
CONTOUR INTERVAL ..... 20 MILLISECONDS

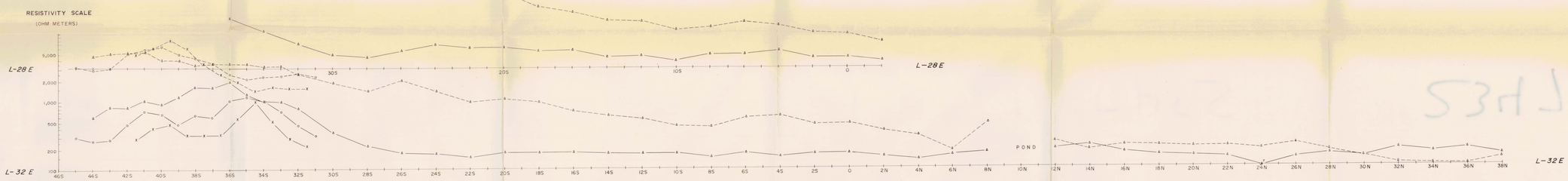
EFFECTIVE "D C PULSE I.P" TIMING SEQUENCE : 3 : 3 : 1
ON OFF INTGR.

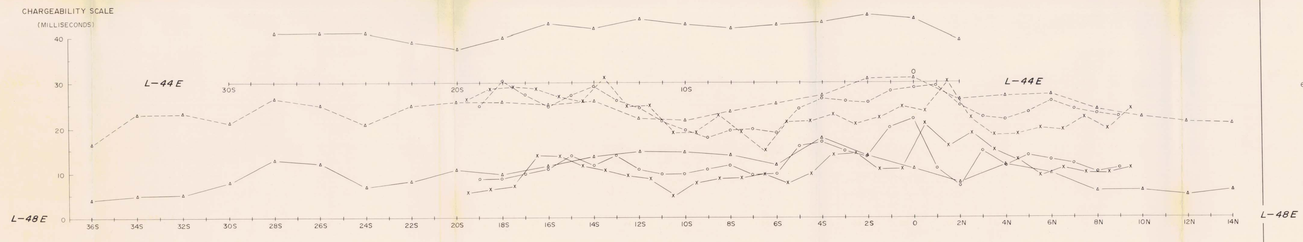
GEOTERREX PROJECT NO. 85-71

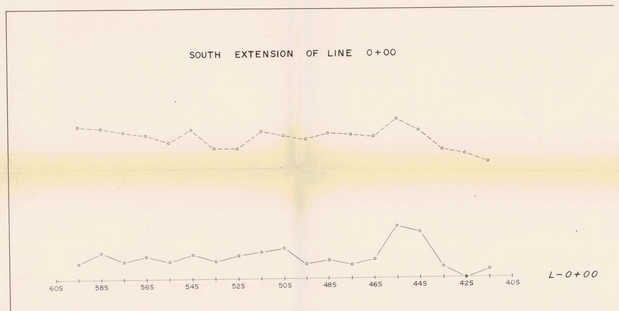
OCTOBER 1969

TO ACCOMPANY REPORT BY P. NORGAARD DATED JANUARY 23, 1970









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PROFILE PLAN

PLATE 2

ELECTRODE CONFIGURATION ..... THREE ARRAY

SCALES

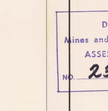
HORIZONTAL ..... 1 INCH = 200 FEET

N.B. LINES ARE NOT SPACED TO SCALE

APPARENT CHARGEABILITY 1 INCH = 100 MILLISECONDS

APPARENT RESISTIVITY ... LOGARITHMIC AS SHOWN

EFFECTIVE "D C PULSE I.P." TIMING SEQUENCE 3 : 3 : 1
ON OFF INTGR.



LEGEND

APPARENT CHARGEABILITY APPARENT RESISTIVITY

a = 50 FEET

a = 100 FEET

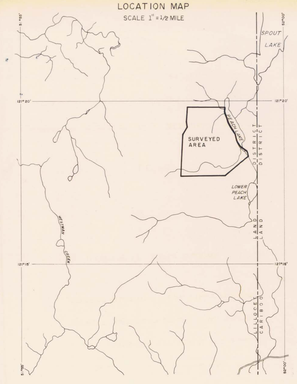
a = 200 FEET

a = 400 FEET

a = ELECTRODE SPACING

LOCATION MAP

SCALE 1" = 1/2 MILE



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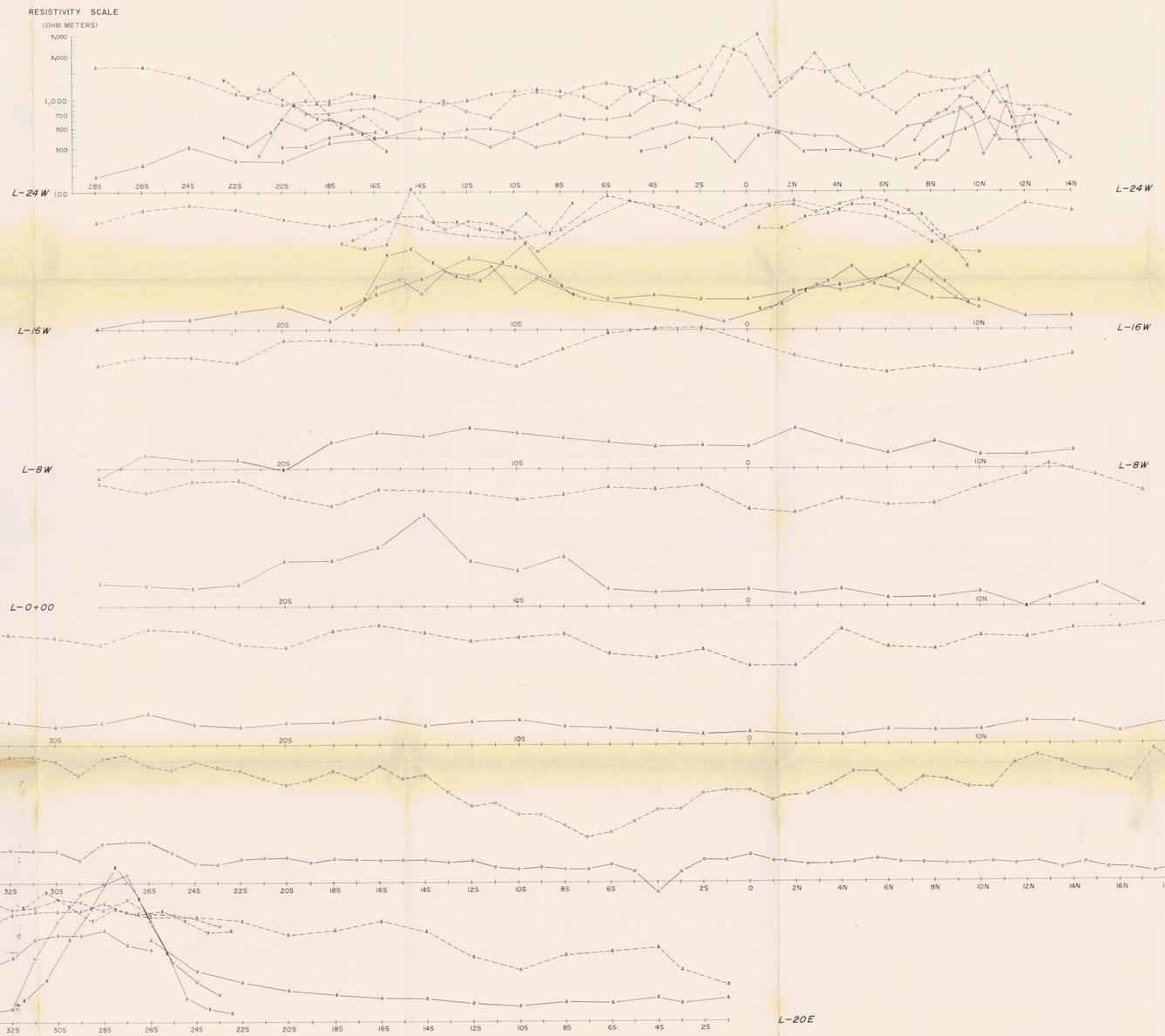

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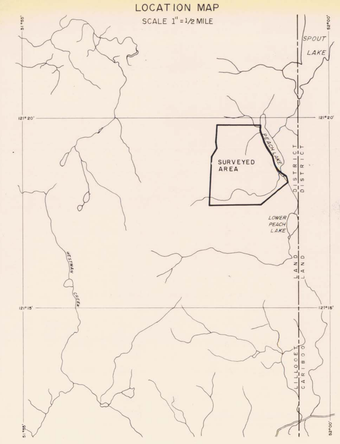

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