REPORT ON THE INDUCED POLARIZATION AND RESISTIVITY SURVEY ON THE MT. SICKER PROPERTY VICTORIA MINING DIVISION, B.C. FOR SEREM LIMITED

827189

1980

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NOTES ON THE THEORY, METHOD OF FIELD OPERATION, AND PRESENTATION OF DATA FOR THE INDUCED POLARIZATION METHOD

Induced Polarization as a geophysical measurement refers to the blocking action or polarization of metallic or electronic conductors in a medium of ionic solution conduction.

This electro-chemical phenomenon occurs wherever electrical current is passed through an area which contains metallic minerals such as base metal sulphides. Normally, when current is passed through the ground, as in resistivity measurements, all of the conduction takes place through ions present in the water content of the rock, or soil, i.e. by ionic conduction. This is because almost all minerals have a much higher specific resistivity than ground water, The group of minerals commonly described as "metallic", however, have specific resistivities much lower than ground waters. The induced polarization effect takes place at those interfaces where the mode of conduction changes from ionic in the solutions filling the interstices of the rock to electronic in the metallic minerals present

in the rock.

The blocking action or induced polarization mentioned above, which depends upon the chemical energies necessary to allow the ions to give up or receive electrons from the metallic surface, increases with the time that a d.c. current is allowed to flow through the rock; i.e. as ions pile up against the metallic interface the resistance to current flow increases. Eventually, there is enough polarization in the form of excess ions at the interfaces, to appreciably reduce the amount of current flow through the metallic particle. This polarization takes place at each of the infinite number of solution-metal interfaces in a mineralized rock.

When the d.c. voltage used to create this d.c. current flow is cut off, the Coulomb forces between the charged ions forming the polarization cause them to return to their normal position. This movement of charge creates a small current flow which can be measured on the surface of the ground as a decaying potential difference.

From an alternate viewpoint it can be seen that if the direction of the current through the system is reversed repeatedly before the polarization occurs, the effective resistivity of the system as a whole will change as the frequency of the switching is changed. This is a consequence of the fact that the amount of current flowing through each metallic interface depends upon the length of time that current has been passing through it in one direction.

The values of the per cent frequency effect or F.E. are a measurement of the polarization in the rock mass. However, since the measurement of the degree of polarization is related to the apparent resistivity of the rock mass it is found that the metal factor values or M.F. are the most useful values in determining the amount of polarization present in the rock mass. The MF values are obtained by normalizing the F.E. values for varying resistivities.

The induced polarization measurement is perhaps the most powerful geophysical method for the direct detection of metallic sulphide mineralization, even when this mineralization is of very low concentration. The lower limit of volume per cent sulphide necessary to produce a recognizable IP anomaly will vary with the geometry and geologic environment of the source, and the method of executing the survey. However, sulphide mineralization of less than one per cent by volume has been detected by the IP method under proper geological conditions.

The greatest application of the IP method has been in the search for disseminated metallic sulphides of less than 20% by volume. However, it has also been used successfully in the search for massive sulphides in situations where, due to source geometry, depth of source, or low resistivity of surface layer, the EM method cannot be successfully applied. The ability to differentiate ionic conductors, such as water filled shear zones, makes the IP method a useful tool in checking EM

anomalies which are suspected of being due to these causes.

In normal field applications the IP method does not differentiate between the economically important metallic minerals such as chalcopyrite, chalcocite, molybdenite, galena, etc., and the other metallic minerals such as pyrite. The induced polarization effect is due to the total of all electronic conducting minerals in the rock mass. Other electronic conducting materials which can produce an IP response are magnetite, pyrolusite, graphite, and some forms of hematite.

In the field procedure, measurements on the surface are made in a way that allows the effects of lateral changes in the properties of the ground to be separated from the effects of vertical changes in the properties. Current is applied to the ground at two points in distance (X) apart. The potentials are measured at two points (X) feet apart, in line with the current electrodes is an integer number (n) times the basic distance (X).

The measurements are made along a surveyed line, with a constant distance (nX) betwen the nearest current and potential electrodes. In most surveys, several traverses are made with various values of (n); i.e. (n) = 1,2,3,4, etc. The kind of survey required (detailed or reconnaissance) decides the number of values of (n) used.

In plotting the results, the values of apparent resistivity, apparent per cent frequency effect, and the apparent metal factor

measured for each set of electrode positions are plotted at the intersection of grid lines, one from the center point of the current electrodes and the other from the center point of the potential electrodes. (See Figure A.) The resistivity values are plotted at the top of the data profile, above the metal factor values. On a third line, below the metal factor values, are plotted the values of the percent frequency effect. The lateral displacement of a given value is determined by the location along the survey line of the center point between the current and potential electrodes. The distance of the value from the line is determined by the distance (nX) between the current and potential electrodes when the measurement was made.

The separation between sender and receiver electrodes is only one factor which determines the depth to which the ground is being sampled in any particular measurement. The plots then, when contoured, are not section maps of the electrical properties of the ground under the survey line. The interpretation of the results from any given survey must be carried out using the combined experience gained from field results, model study results and the theoretical investigations. The position of the electrodes when anomalous values are measured is important in the interpretation.

In the field procedure, the interval over which the potential differences are measured is the same as the interval over which the electrodes are moved after a series of potential readings has been made.

One of the advantages of the induced polarization method is that the same equipment can be used for both detailed and reconnaissance surveys merely by changing the distance (X) over which the electrodes are moved each time. In the past, intervals have been used ranging from 25 feet to 2000 feet for (X). In each case, the decision as to the distance (X) and the values of (n) to be used is largely determined by the expected size of the mineral deposit being sought, the size of the expected anomaly and the speed with which it is desired to progress.

The diagram in Figure A demonstrates the method used in plotting the results. Each value of the apparent resistivity, apparent metal factor, and apparent per cent frequency effect is plotted and identified by the position of the four electrodes when the measurement was made. It can be seen that the values measured for the larger values of (n) are plotted farther from the line indicating that the thickness of the layer of the earth that is being tested is greater than for the smaller values of (n); i.e. the depth of the measurement is increased.

The IP measurement is basically obtained by measuring the difference in potential or voltage (ΔV)obtained at two operating frequencies. The voltage is the product of the current through the ground and the apparent resistivity of the ground. Therefore in field situations where the current is very low due to poor electrode contact, or the apparent resistivity is very low, or a combination of the two effects; the value of (ΔV) the change in potential will be too small to be measurable. The symbol "TL" on the data plots indicates this situation.

In some situations spurious noise, either man made or natural, will render it impossible to obtain a reading. The symbol "N" on the data plots indicates a station at which it is too noisy to record a reading. If a reading can be obtained, but for reasons of noise there is some doubt as to its accuracy, the reading is bracketed in the data plot ( ).

In certain situations negative values of Apparent Frequency Effect are recorded. This may be due to the geologic environment or spurious electrical effects. The actual negative frequency effect value recorded is indicated on the data plot, however, the symbol "NEG" is indicated for the corresponding value of Apparent Metal Factor. In contouring negative values the contour lines are indicated to the nearest positive value in the immediate vicinity of the negative value.

The symbol "NR" indicates that for some reason the operator did not attempt to record a reading although normal survey procedures would suggest that one was required. This may be due to inaccessible topography or other similar reasons. Any symbol other than those discussed above is unique to a particular situation and is described within the body of the report.

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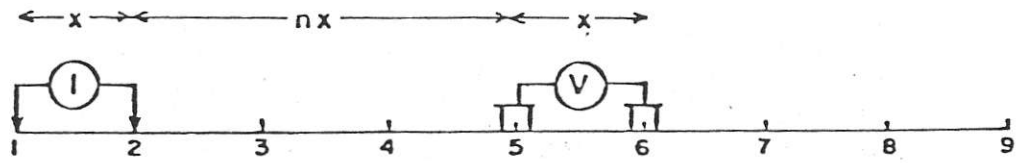
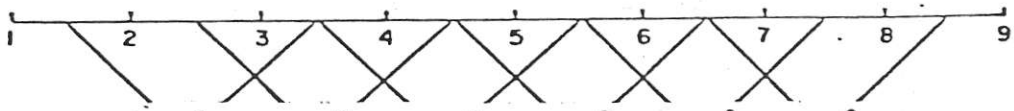
METHOD USED IN PLOTTING DIPOLE-DIPOLE INDUCED POLARIZATION AND RESISTIVITY RESULTS



Stations on line

x = Electrode spread length
n = Electrode separation

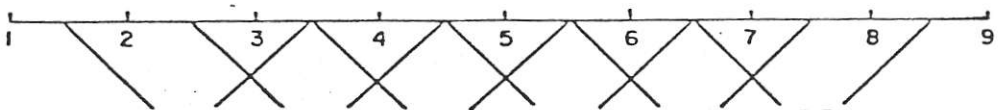


n - 1	ρ 1,2-3,4	ρ 2,3-4,5	ρ 3,4-5,6	ρ 4,5-6,7	ρ 5,6-7,8	ρ 6,7-8,9
n - 2	ρ 1,2-4,5	ρ 2,3-5,6	ρ 3,4-6,7	ρ 4,5-7,8	ρ 5,6-8,9	
n - 3	ρ 1,2-5,6	ρ 2,3-6,7	ρ 3,4-7,8	ρ 4,5-8,9		
n - 4	ρ 1,2-6,7	ρ 2,3-7,8	ρ 3,4-8,9			

Apparent Resistivity

n - 1	M.F. 1,2-3,4	M.F. 2,3-4,5	M.F. 3,4-5,6	M.F. 4,5-6,7	M.F. 5,6-7,8	M.F 6,7-8,9
n - 2	M.F. 1,2-4,5	M.F. 2,3-5,6	M.F. 3,4-6,7	M.F. 4,5-7,8	M.F. 5,6-8,9	
n - 3	M.F. 1,2-5,6	M.F. 2,3-6,7	M.F. 3,4-7,8	M.F 4,5-8,9		
n - 4	M.F. 1,2-6,7	M.F. 2,3-7,8	M.F. 3,4-8,9			

Apparent Metal Factor



n - 1	F.E. 1,2-3,4	F.E. 2,3-4,5	F.E. 3,4-5,6	F.E. 4,5-6,7	F.E. 5,6-7,8	F.E. 6,7-8,9
n - 2	F.E. 1,2-4,5	F.E. 2,3-5,6	F.E. 3,4-6,7	F.E. 4,5-7,8	F.E. 5,6-8,9	
n - 3	F.E. 1,2-5,6	F.E. 2,3-6,7	F.E. 3,4-7,8	F.E. 4,5-8,9		
n - 4	F.E. 1,2-6,7	F.E. 2,3-7,8	F.E. 3,4-8,9			

Apparent Percent Frequency Effect

Fig. A

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REPORT ON THE INDUCED POLARIZATION AND RESISTIVITY SURVEY ON THE MT. SICKER PROPERTY VICTORIA MINING DIVISION, B.C. FOR SEREM LIMITED

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1. INTRODUCTION

An Induced Polarization and Resistivity survey has been carried out over part of the Mt. Sicker Property for SEREM Limited. The property is located within the Victoria Mining Divsion, about 10 kilometers northwest of Duncan on Vancouver Island, B.C. The approximate centre of the property is situated at $48^{o}52'$ north latitude and $123^{o}46'$ west longitude.

Access to the property is north on the Somenos Road from Highway #18, then northwest on to the Mt. Prevost Road. A network of old mining and logging roads leads to various parts of the claim group.

The purpose of the IP survey was to explore for indications of ore extensions around the old mine workings and to investigate areas of similar geological conditions for new mineral occurrences.

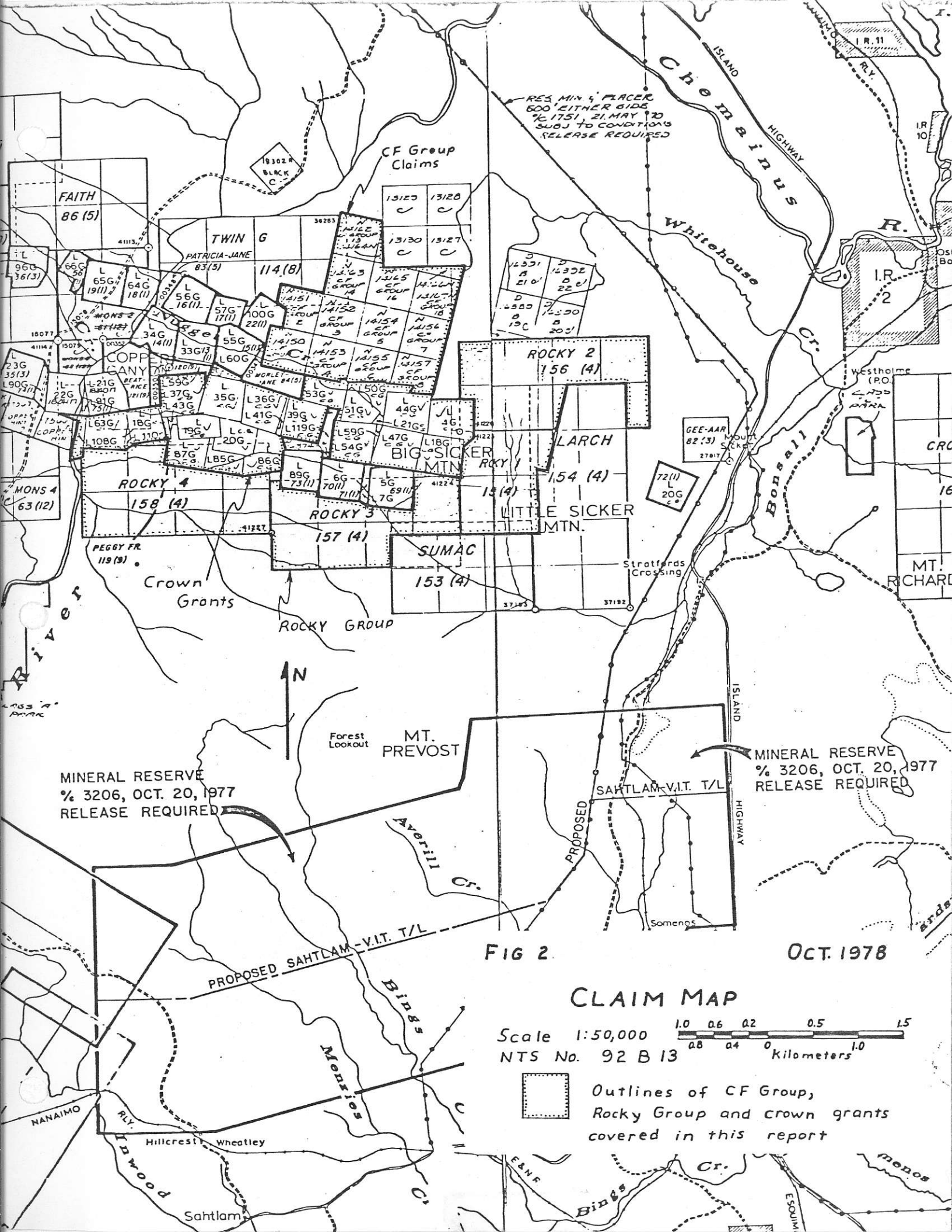

FIG 2

OCT. 1978

CLAIM MAP

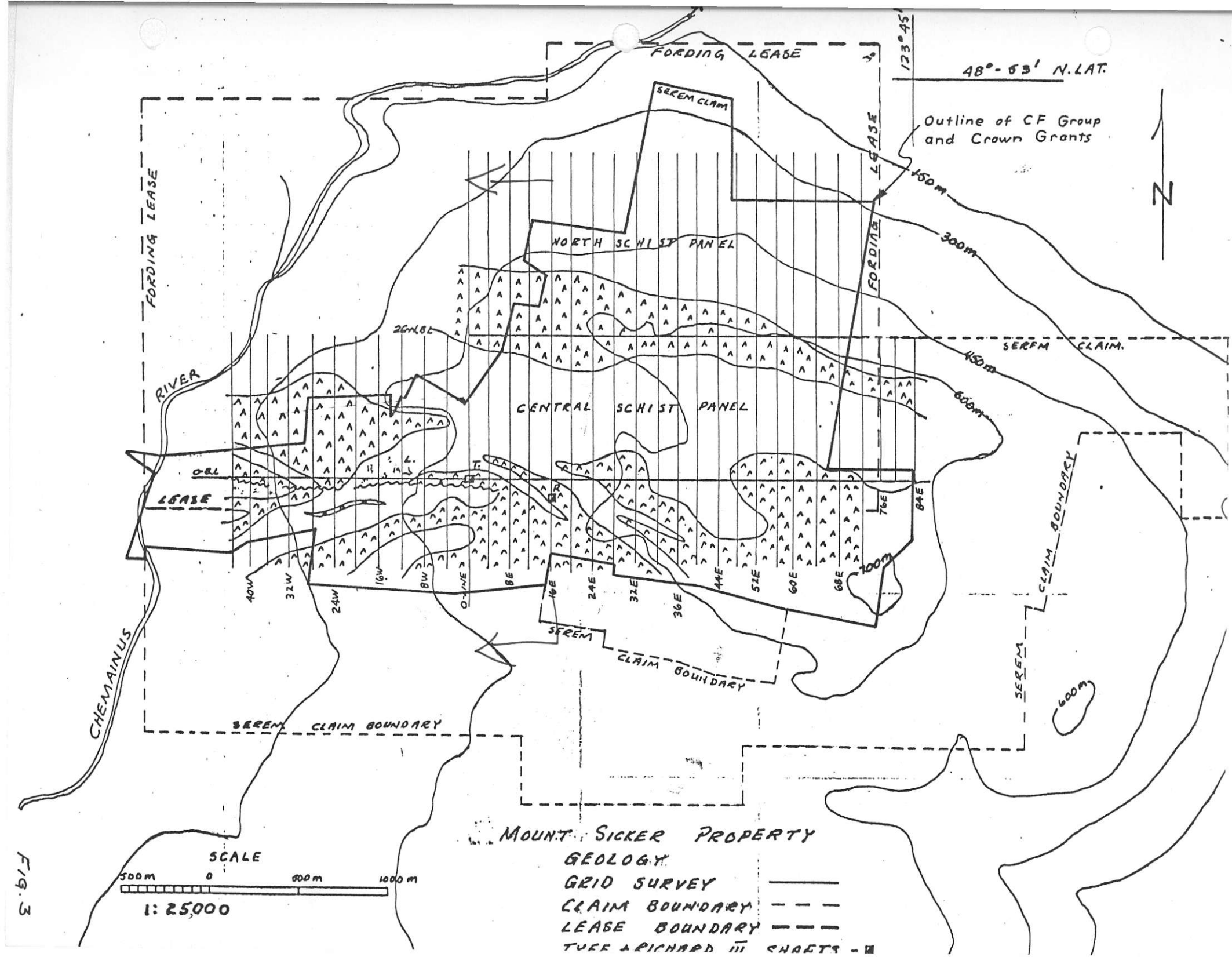
FORDING LEASE
123°45'
48°-53' N.LAT.
SEREM CLAIM
Outline of CF Group and Crown Grants
FORDING LEASE
450m
300m
NORTH SCHIST PANEL
FORDING
SEREM CLAIM.
RIVER
CENTRAL SCHIST PANEL
LEASE
600m
CLAIM BOUNDARY
SEREM
CHEMAINUS
SEREM CLAIM BOUNDARY
600m
MOUNT SICKER PROPERTY
GEOLOGY
GRID SURVEY
CLAIM BOUNDARY
LEASE BOUNDARY
SCALE
500m 0 500m 1000m
1:25,000
N

Fig. 3

Field work was carried out by Mr. Alex B. Walcer, Senior Field Supervisor for Phoenix Geophysics Limited. The survey was carried out in April, 1979. A Phoenix IPT-1, IPV-1 frequency domain IP system was used for the survey. Operating frequencies were 0.3 and 5.0 Hz.

2. DESCRIPTION OF CLAIMS

SEREM Limited is the recorded owner of the following listed claims under the terms of an option agreement with Mount Sicker Mines Ltd.

LIST OF CLAIMS

Crown Granted Mineral Claims

Name	Lot No.	Owner
Estelle	53-G	SEREM LTD.
Westholme	54-G	"
Blue Bell	51-G	"
Moline Fraction	50-G	"
Acme	4-G	"
Tony	18-G	"
Hellena	47-G	"
Westholme Fraction	59-G	"
Dixie Fraction	21-G	"
Golden Rod	44-G	"
Donagan	18-G	"
XL	19-G	"
Donald	63-G	"
Muriel Fraction	108-G	"
Doubtful Fraction	87-G	"
Thelma Fraction	85-G	"
Imperial Fraction	86-G	"
Herbert Fraction	20-G	"
Phil Fraction	110-G	"
NT Fraction	43-G	"

Name	Lot No.	Owner
Magic Fraction	41-G	SEREM LTD.
Richard III	39-G	"
Key City	37-G	"
Lenora	35-G	"
Tyee	36-G	"
International Fraction	60-G	"

Recorded Mineral Claims	Record No.	
C.F. Group #1-8 inclusive	N14150-N14157	"
C.F. Group #13-18 inclusive	N14162-N14167	"

3. PRESENTATION OF RESULTS

The Induced Polarization and Resistivity results are shown on the following enclosed data plots. The results are plotted in the manner described in the notes preceding this report.

Line	Electrode Interval	Dwg. No.
12W	30 M	IP 5153-1
0+00	60 M	IP 5153-2
0+00	30 M	IP 5153-3
0+00	30 M	IP 5153-4
4E	30 M	IP 5153-5
8E	60 M	IP 5153-6
8E	60 M	IP 5153-7
8E	30 M	IP 5153-8
16E	30 M	IP 5153-9
20E	60 M	IP 5153-10
28E	60 M	IP 5153-11
32E	60 M	IP 5153-12
32E	30 M	IP 5153-13

Line	Electrode Interval	Dwg. No.
32(a)E	60 M	IP 5153-14
36E	60 M	IP 5153-15
40E	60 M	IP 5153-16
44E	60 M	IP 5153-17
48E	60 M	IP 5153-18
52E	60 M	IP 5153-19
56E	60 M	IP 5153-20
60E	60 M	IP 5153-21
64E	60 M	IP 5153-22
68E	60 M	IP 5153-23

Also enclosed with this report is Dwg. I.P.P. 4051, a plan map of the Mt. Sicker Grid at a scale of 1:2500 metric. The definite, probable and possible Induced Polarization anomalies are indicated by bars, in the manner shown on the legend, on this plan map as well as on the data plots. These bars represent the surface projection of the anomalous zones as interpreted from the location of the transmitter and receiver electrodes when the anomalous values were measured.

Since the Induced Polarization measurement is essentially an averaging process, as are all potential methods, it is frequently difficult to exactly pinpoint the source of an anomaly. Certainly, no anomaly can be located with more accuracy than the electrode interval length; i.e. when using 60 M electrode intervals the position of a narrow sulphide body can only be determined to lie between two stations 60 M apart. In order to definitely locate, and fully evaluate, a narrow, shallow source it is

necessary to use shorter electrode intervals. In order to locate sources at some depth, larger electrode intervals must be used, with a corresponding increase in the uncertainties of location. Therefore, while the centre of the indicated anomaly probably corresponds fairly well with source, the length of the indicated anomaly along the line should not be taken to represent the exact edges of the anomalous material.

The grid and claim information shown on Dwg. I.P.P. 4051 has been taken from maps made available by the staff of SEREM LTD.

4. DESCRIPTION OF GEOLOGY

The Mt. Sicker property straddles Big Sicker Mountain and part of Little Sicker Mountain, Victoria Mining Division, Vancouver Island, B.C.

Big Sicker Mountain is a little over 700 M high. The flanks slope between 10^{o} and 30^{o} and are heavily treed.

The property centers on an old underground mine which has been worked sporadically by various companies since the turn of the century. The initial discovery was made in 1897, with development and mining beginning on the Tyee Claim in that year. Work on the Lenora claim began in 1898, and the two claims were amalgamated by the Lenora Mount Sicker Mining Company in 1900. Mining continued until 1907. Another company shipped a few tons from the Richard III claim in the same period.

Development and exploration work were done by Ladysmith-Tidewater Smelters Ltd., in 1926-29 and by Sheep Creek Mines Ltd., in 1939-40.

From 1943-47 Twin J Mines produced copper and zinc concentrates from the consolidated group. In 1949-52 Vancouver Island Base Metals rehabilitated the mine, with some production.

Some surface mining was done by the original principals of Mt. Sicker Mines Ltd. in 1964, and the company was formed shortly thereafter. From that time until 1974 various operators explored the property, doing surface mapping and diamond drilling. In 1967 an attempt was made to extract copper from dump material by heap leaching, but it did not prove feasible.

Ore in the old mine occurred as two orebodies, more or less parallel and trending east-west. It was of massive sulphide type, containing principally copper and zinc, with minor lead and significant gold and silver. Barite is a major constituent of some ore and may be of economic interest. To data, production has been 305,787 tons of ore running about 3.3% Cu. 7.5% Zn, 0.13 ou. Au and 2.75 ou. Ag.

Orebodies occur within the mid to upper paleozoic Sicker Group, associated with schists believed to be derived from acid volcanics. They were similar to those now being mined by Western Mines at Buttle Lake, and are hypothesized to be of Kuroko type.

Hopes of finding more ore on Mount Sicker are based on two possibilities. One is that there may be ore remaining in or near the old mine. Old mine plans and reports show a few occurrences of massive sulphides which were not exploited or followed up, and several references are made to "low grade" disseminated type mineralization that was not of much interest in the early days. However, no specific information is available about what remains in the old mine area.

The other possibility is that there may be similar deposits elsewhere on the property. Many mineral occurrences have been found, and rocks similar to the host rocks in the mine are widespread on the flanks of Big Sicker Mountain.

5. DISCUSSION OF RESULTS

The Induced Polarization and Resistivity survey consisted of a limited amount of orientation surveying in the vicinity of the old workings followed by a number of reconnaissance lines to the east.

The orientation work was carried out in the vicinity of the Lenora openings and the Tyee shaft, where considerable massive sulfide ore has been previously mined. Graphitic schist has been mapped in both these locations in close proximity to the known sulfides. Metal pipes and tracks probably exist in some of the old workings. Both the pipes and graphite would be expected to contribute to the recorded IP effect.

A specimen of the graphitic schist tested in the Phoenix laboratory, had a Frequency effect of 9.5% and a resistivity of 51. While these results are anomalous, the FE is significantly lower and the resistivity higher than normally obtained from graphitic schist. Possibly some of the carbonaceous material is not graphite.

The resistivities associated with the IP anomalies are moderate to moderately high in magnitude. The frequency effects are of low to moderate magnitude. The anomalies are not typical of the response that would be expected from large conductive massive sulfide bodies. However, smaller bodies with their response averaged in with the country rock, could result in anomalous conditions similar to those recorded. Detail surveying with shorter dipoles would better define the shallow source anomalies.

A line by line discussion of the survey results follows:

Line 12W, Dwg. IP 5153-1

A moderate magnitude IP anomaly centred at 0+00 has an estimated depth to the source of 15 M. The Lenora No.1 and No.2 Adits are located 50-60 M

east of the grid line.

Line 0+00, Dwgs. IP 5153-2,-3,-4

The 60 M dipole survey outlines a generally shallow IP anomaly between 60S and 120N. The anomalous pattern could reflect a single source or two separate IP sources. There is a suggestion of a stronger source at depth beneath 90N.

In order to further investigate the nature of the source, the line was resurveyed with shorter 30 M dipoles (see Appendix). This detail suggests two separate anomalies, both with some indicated depth to the top of the source. The northerly anomalous zone occurs between 30N and 90N. The depth to the source is estimated to be 30-45 M. The second anomaly is located between 0+00 and 30S. It has an indicated depth of about 15 M.

A northern portion of Line 0+00 was also surveyed with 30 M dipoles. A wide zone of weak IP effects was located, extending south from 570N, and extending beyond the IP coverage at 450N. The strongest IP effects occur between 510N and 540N. The source is shallow and the results are similar to those usually recorded from sparsely disseminated metallic material.

Line 4E, Dwg. IP 5153-5

Line 4E was surveyed from 420N to 690N with 30 M dipoles. A very weak shallow anomaly extends south from 540N to 450N. Somewhat stronger IP effects, associated with much lower resistivities, occur from 450N south to the end of the survey coverage at 420N.

Line 8E, Dwg. IP 5153-6,-7,-8

The 60 M dipole survey outlined a well defined shallow anomaly with moderate magnitude frequency effects between 0+00 and 120N. Subsequent

detailing with 30 M dipoles better defined the anomaly with the source now located between 30N and 90N. Outcroppings of black graphitic schist have been mapped in the vicinity of this anomaly.

Further to the north, a very weak IP anomaly was outlined between 360N and 480N. The associated resistivities are relatively high suggesting sparsely disseminated metallics.

Line 16E, Dwg. IP 5153-9

A weak IP anomaly with an estimated depth of 30-60 M occurs between 45S and 15N. Very weak effects extend south to 90S. Resistivity lows on either side of the anomaly do not correlate with the stronger frequency effects and may reflect shear zones.

Line 20E, Dwg. IP 5153-10

A weak shallow IP anomaly centred at 30S correlates with a moderate magnitude resistivity low. Surrounding resistivities are high and probably reflect the gabbro rocks mapped in this vicinity.

Very weak IP effects occur at the north end of the IP grid. The anomaly is incomplete.

Line 28E, Dwg. IP 5153-11

A weak but well defined IP anomaly occurs between 0 and 60S. Depth to the source is estimated to be about 30 M.

Very weak IP effects occur north of 180N. The anomaly is incomplete to the north.

Line 32E, Dwgs. IP 5153-12 & -13

Two IP anomalies were located on Line 32E.

The southerly anomaly is located between 0+00 and 60N. It may extend south at depth to 60S. The pattern is complex and may consist of two sources; one shallow, centred at 30N and a deeper source to the south. This anomaly was detailed with 30 M dipoles. The shallow portion was better defined with the centre at about 45N. The possible deeper source would be beneath the detection limit of the 30 M dipoles.

The second anomaly is located between 180N and 300N. Frequency effects are of moderate magnitude and a resistivity low centred at 210N correlates with the southern part of the higher frequency effects. There is a possibility of a limited size source of higher metal content located at a depth of about 30 M.

Line 32(a)E, Dwg. IP 5153-14

A low magnitude IP anomaly associated with moderately high resistivities was located between 0+00 and 120N. It may extend further north to 180N; however, the metallic mineral content would be lower. The anomaly is shallow relative to the dipole interval and may have limited depth extent.

Line 36E, Dwg. IP 5153-15

A shallow, low magnitude anomaly similar to the anomaly on Line 32(a)E was located between 60S and 60N on Line 36E. There is a suggestion, primarily from the resistivity data, that a deeper anomaly could exist beneath 0+00. The indicated depth would be about 120 M. The source could be better located and evaluated using shorter electrode intervals (see Appendix).

Line 40E, Dwg. IP 5153-16

A weak IP anomaly with a shallow source occurs between 0+00 and 120S. Associated resistivities are relatively high. Again, the source could be

better located and evaluated using shorter electrode intervals.

Very weak IP effects were recorded north of 120N and extend beyond the survey grid. Resistivities are high.

Line 44E, Dwg. IP 5153-17

The IP coverage from Line 44E to Line 69E shifts to the north and does not extend south to the base line.

A very weak IP anomaly centred at 120N has an estimated depth to the source of 30 M. Resistivity levels are moderately high.

A complex IP anomaly, which may have more than one source, extends north from 300N to beyond the survey grid at 540N. Associated resistivities are variable, suggesting either variations in metallic sulfide content within the anomaly or more than one source.

Line 48E, Dwg. IP 5153-18

A very weak deep anomaly occurs at the south end of Line 48E and is incomplete. The location of the anomaly as presently defined, is centred at 90N at an estimated depth of 100 M.

A second anomaly extends north from 420N to beyond the survey grid at 540N. The pattern is complex and difficult to interpret because the data is incomplete. It could consist of more than one source. The anomaly could be better evaluated if measurements with shorter electrode intervals were made.

Line 52E, Dwg. IP 5153-19

A well defined weak anomaly with a shallow source occurs between 300N and 420N. An increase of resistivities with depth suggests a limited depth extent for the anomaly. Weakly anomalous IP effects extend north

from 420N to beyond the grid coverage.

Line 56E, Dwg. IP 5153-20

Very weak IP effects were recorded from 300N to the end of the IP coverage. The frequency effect data suggests a depth to the source of about 30 M.

Line 60E, Dwg. IP 5153-21

A well defined, complex IP anomaly was located between 300N and 420N. It either dips to the south or consists of a second deeper source to the south.

Line 64E, Dwg. IP 5153-22

A very weak shallow anomaly with limited depth extent occurs between 300N and 420N. An increase of frequency effect with depth is believed to be primarily a function of increased resistivity.

Line 68E, Dwg. IP 5153-23

A very weak complex anomaly associated with moderate resistivities occurs between 240N and 420N. There is a suggestion of a second deeper source centred at about 210N.

6. SUMMARY AND CONCLUSIONS

Over 300,000 tons of massive sulfide ore have been mined from the Mt. Sicker property since the turn of the century. The orebodies are centred on the Tyee shaft and extend westwards toward the Lenora workings and eastwards towards the Richard III shaft area. Two complex parallel orebodies strike east-west in the Sicker Group schists, which are believed to be derived from acid volcanics.

Pipe and track probably exist in some of the old workings. A weakly anomalous graphitic schist occurs close to the sulfides. Both these factors would contribute to the recorded IP effect. The graphitic schist, if sufficiently continuous, could act as a useful horizon marker.

Very weak-to-moderate magnitude IP anomalies, associated with moderate to moderately high resistivities, occur on all IP grid lines. None of the anomalies display the typical response expected from large, shallow, very massive sulfide deposits. However, within the anomalous zones, there could exist small massive sulfide deposits or larger deep deposits. Confirmatory detail IP surveying could help determine the nature of the IP source (see Appendix).

Multiple source IP anomalies are not always obvious because of the averaging inherent in the IP method. Some of the anomalous patterns are complex and could have more than one source.

The anomalies listed below are considered primary targets, however, any of the anomalies could be important if they correlate with other favourable conditions i.e. anomalous to other geophysical methods, geology, anomalous geochemical values, etc.

8E, 60N - Good definition - moderate magnitude - apparently shallow source - nearby graphitic schist.

28E, 30S - Good definition - weak magnitude - about 30 M depth to the source.

32E, 45N & 210N - Northern anomaly at 210N may have more concentrated source at depth. Southern anomaly at 45N complex and may consist of more than one source.

36E, 0+00 - Possible deep source beneath shallow anomaly.

44E, North End of Line - Complex anomaly - probably multiple source - about 30 M depth at 390N, apparently shallow at 510N.

48E, North End of Line - Complex possible multiple source anomaly.

60E, 360N - Well defined complex pattern - moderate magnitude - probable multiple source.

68E, 240N-420N - Complex anomaly with possible shallow and deep source.

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Ashton W. Mullan,
Geologist

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
A. W. MULLAN

Philip G. Hallof,
Geophysicist

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
P. G. HALLOF

Expiry Date: February 25, 1980

DATED: June 21, 1979

CERTIFICATE

I, Ashton W. Mullan, of the City of Vancouver, in the Province of British Columbia, hereby certify:

1. That I am a geologist/geophysicist and a fellow of the Geological Association of Canada, Geophysics Division, with a business address at 1424 - 355 Burrard Street, Vancouver, B.C.

2. That I am registered as a member of the Association of Professional Engineers of the Provinces of Ontario and British Columbia.

3. That I hold a B.Sc. degree from McGill University.

4. That I have been practising my profession as a geologist/geophysicist for over twenty-five years.

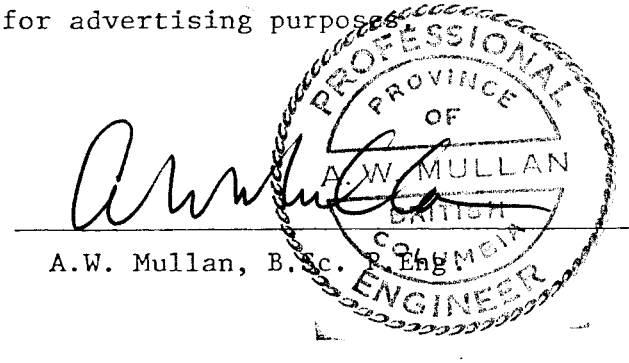
5. I have no direct or indirect interest, nor do I expect to receive any interest directly or indirectly, in the property or securities of Serem Limited, or any affiliate.

6. The statements made in this report are based on a study of published geological literature and unpublished private reports.

7. Permission is granted to use in whole or in part for assessment and qualification requirements but not for advertising purposes.

Dated at Vancouver

This 21st day of June, 1979



A.W. Mullan, B.Sc. P.Eng.

CERTIFICATE

I, Philip George Hallof, of the City of Toronto, Province of Ontario, do hereby certify that:

1. I am a geophysicist residing at 15 Barnwood Court, Don Mills, Ontario.

2. I am a graduate of the Massachusetts Institute of Technology with a B.Sc. Degree (1952) in Geology and Geophysics, and a Ph.D. Degree (1957) in Geophysics.

3. I am a member of the Society of Exploration Geophysicists and the European Association of the Exploration Geophysicists.

4. I am a Professional Geophysicist, registered in the Province of Ontario, the Province of British Columbia and the State of Arizona.

5. I have no direct or indirect interest, nor do I expect to receive any interest directly or indirectly, in the property or securities of Serem Limited or any affiliate.

6. The statements made in this report are based on a study of published geological literature and unpublished private reports.

7. Permission is granted to use in whole or in part for assessment and qualification requirements but not for advertising purposes.

Dated at Toronto

This 21st day of June, 1979

Philip G. Hallof, Ph.D. P.Eng.

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
G. HALLOF

Expiry Date: February 25, 1980

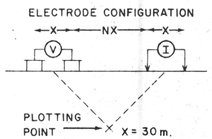
DWG. NO.- I.P. - 5153-1

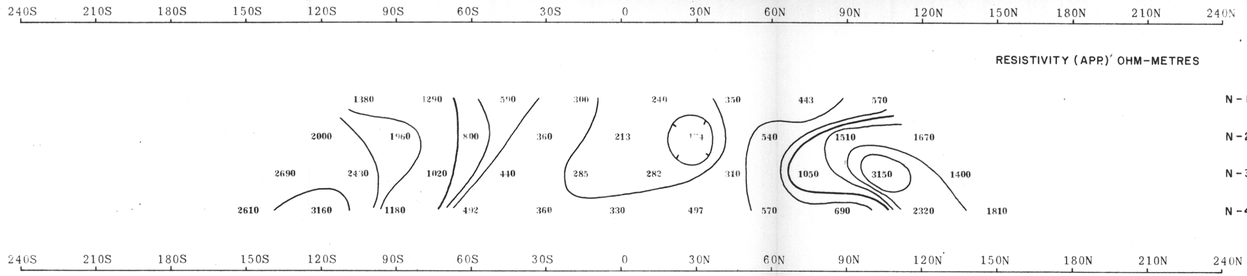
SEREM LIMITED

MT. SICKER PROPERTY , VICTORIA M.D.

DUNCAN AREA , BRITISH COLUMBIA

LINE NO.- 12 W





FREQUENCIES 0.3-5.0HZ

DATE SURVEYED APRIL 1979

NOTE - CONTOURS AT LOGARITHMIC INTERVALS 1,-1.5,-2,-3,-5,-7.5,-10

APPROVED

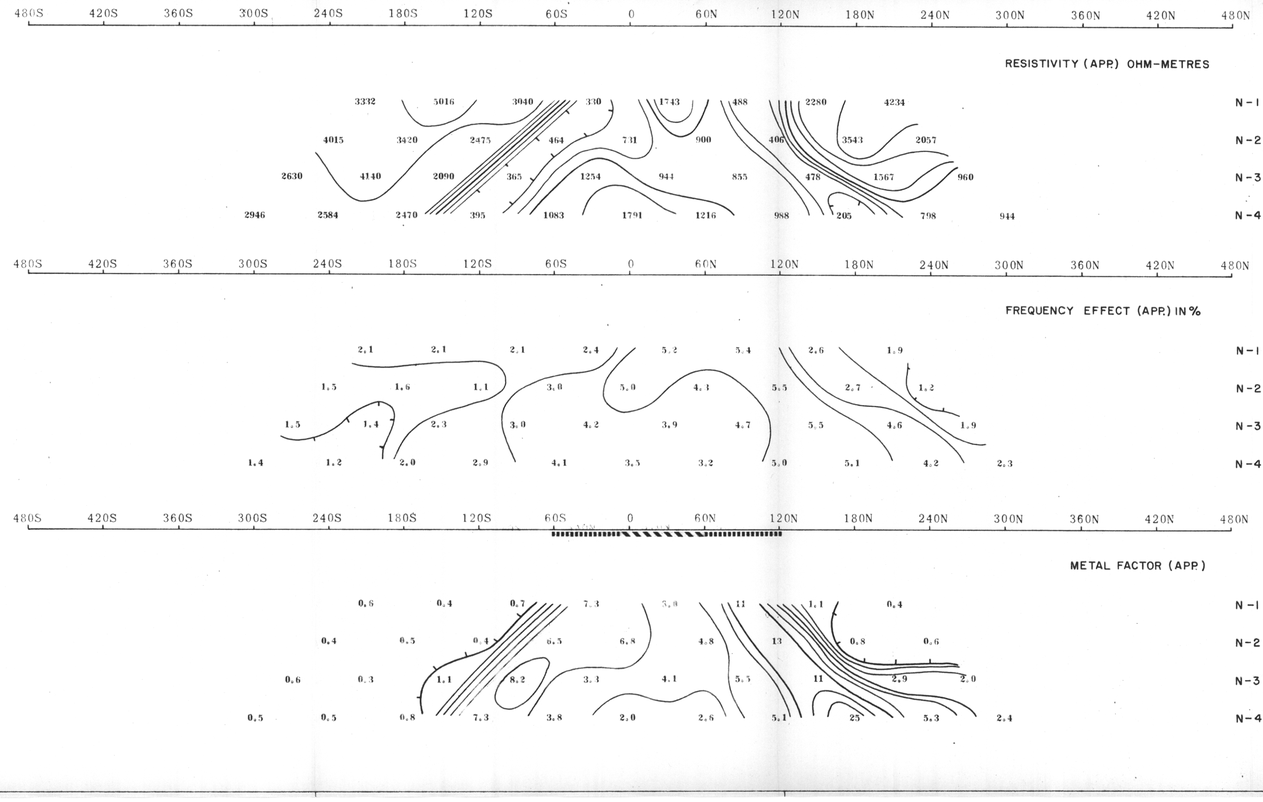
DATE 6/24/79

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA

Expiry Date: February 25, 1980

PHOENIX GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY



DWG. NO.- I.P. - 5153 -2

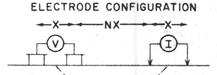
SEREM LIMITED

MT. SICKER PROPERTY , VICTORIA M.D.

DUNCAN AREA , BRITISH COLUMBIA

LINE NO.- 0 + 00

ELECTRODE CONFIGURATION



PLOTTING POINT → X = 60 m.

SURFACE PROJECTION OF ANOMALOUS ZONE

DEFINITE

PROBABLE

POSSIBLE

FREQUENCIES 0.3-5.0HZ

DATE SURVEYED APRIL 1979

NOTE - CONTOURS AT LOGARITHMIC INTERVALS 1,-1.5,-2,-3,-5,-7.5,-10

APPROVED P. G. HALLOF

DATE 5/21/79

PROFESSIONAL ENGINEER

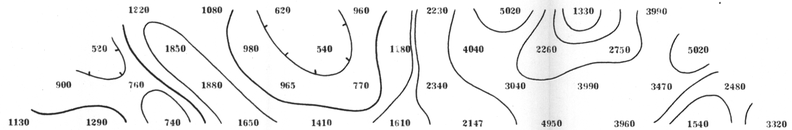
Expiry Date: February 25, 1980

PHOENIX GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

330N 360N 390N 420N 450N 480N 510N 540N 570N 600N 630N 660N 690N 720N 750N 780N 810N

RESISTIVITY (APP.) OHM-METRES



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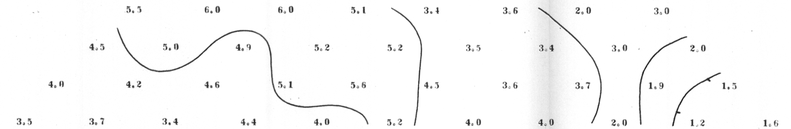
FREQUENCY EFFECT (APP.) IN %



330N 360N 390N 420N 450N 480N 510N 540N 570N 600N 630N 660N 690N 720N 750N 780N 810N

?

METAL FACTOR (APP.)

DWG. NO.- I.P. - 5153-3

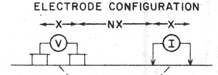
SEREM LIMITED

MT. SICKER PROPERTY, VICTORIA M.D.

DUNCAN AREA, BRITISH COLUMBIA

LINE NO.- 0+00

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONE

DEFINITE

PROBABLE

POSSIBLE

FREQUENCIES 0·3-5·0HZ

DATE SURVEYED APRIL 1979

NOTE - CONTOURS AT LOGARITHMIC INTERVALS 1,-1·5,-2,-3,-5,-7·5,-10

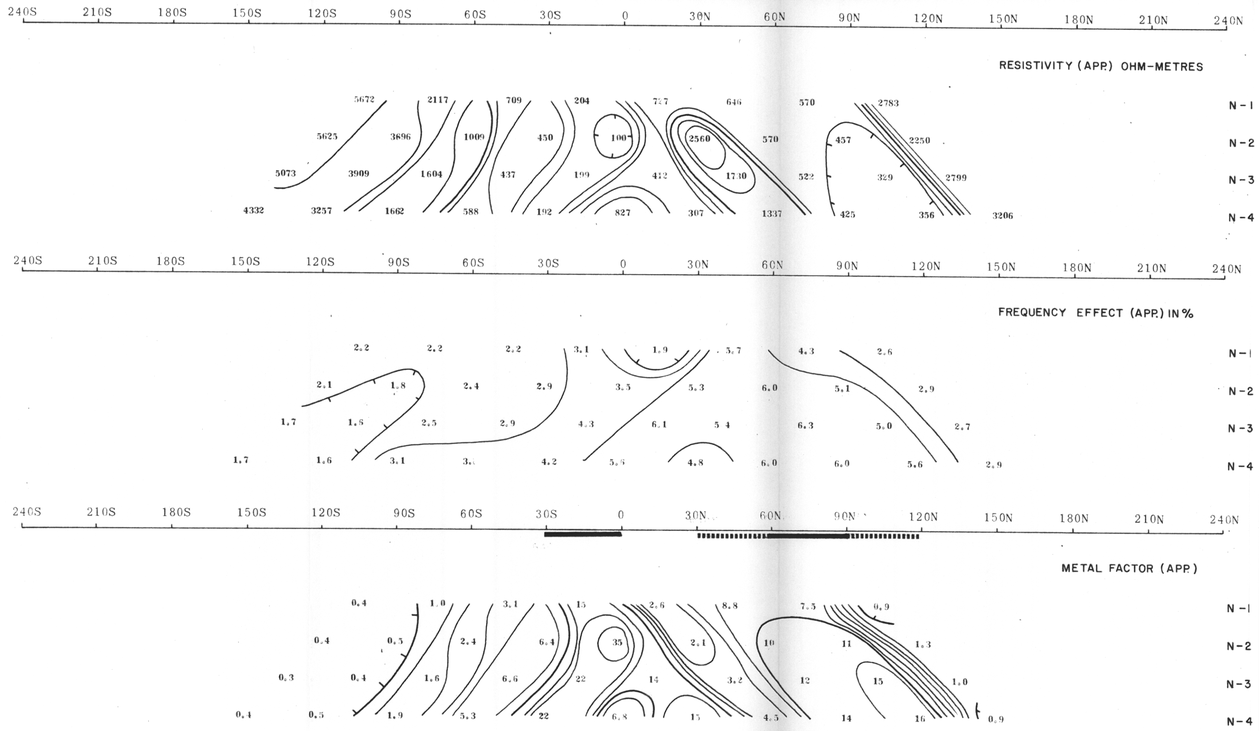
APPROVED

DATE 6/2/79

Expiry Date: February 25, 1980

PHOENIX GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY



DWG. NO.- I.P. - 5153-4

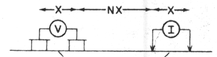
SEREM LIMITED

MT. SICKER PROPERTY, VICTORIA M.D.

DUNCAN AREA, BRITISH COLUMBIA

LINE NO.- 0+00

ELECTRODE CONFIGURATION



PLOTTING POINT X= 30m.

SURFACE PROJECTION OF ANOMALOUS ZONE

DEFINITE

PROBABLE

POSSIBLE

FREQUENCIES 0.3-5.0HZ.

DATE SURVEYED APRIL 1979

APPROVED

P. G. HALLOF

DATE

PROFESSIONAL ENGINEER

Expiry Date: February 25, 1980

NOTE - CONTOURS AT LOGARITHMIC INTERVALS 1, -1.5, -2, -3, -5, -7.5, -10

PHOENIX GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

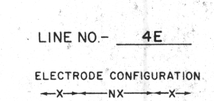
DWG. NO.- I.P.- 5153-5

SEREM LIMITED

MT. SICKER PROPERTY, VICTORIA M.D.

DUNCAN AREA, BRITISH COLUMBIA

LINE NO.- 4E

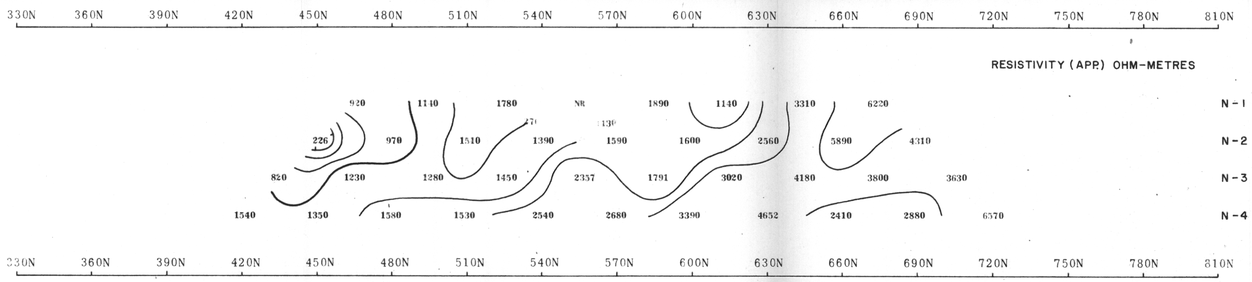


SURFACE PROJECTION OF ANOMALOUS ZONE

DEFINITE

PROBABLE

POSSIBLE



FREQUENCIES 0.3-5.0HZ

DATE SURVEYED APRIL 1979

NOTE - CONTOURS AT LOGARITHMIC INTERVALS 1,-1.5,-2,-3,-5,-7.5,-10

APPROVED

P. G. HALLOF

DATE

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA

Expiry Date: February 25, 1980

PHOENIX GEOPHYSICS LIMITED

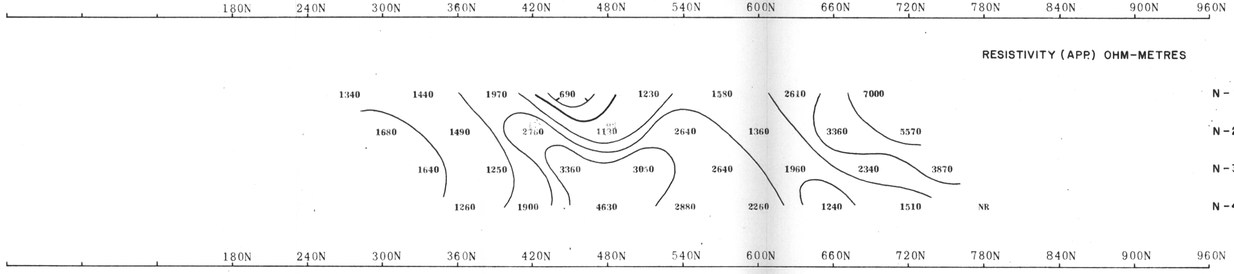
INDUCED POLARIZATION AND RESISTIVITY SURVEY

DWG. NO.- I.P. - 5153-6

SEREM LIMITED

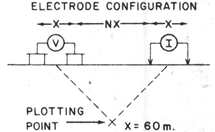
MT. SICKER PROPERTY, VICTORIA M.D.

DUNCAN AREA, BRITISH COLUMBIA



LINE NO.- 8E

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONE

DEFINITE

PROBABLE

POSSIBLE

FREQUENCIES 0.3-5.0 HZ.

NOTE - CONTOURS AT LOGARITHMIC INTERVALS 1,-1.5,-2,-3,-5,-7.5,-10

DATE SURVEYED APRIL 1979

APPROVED

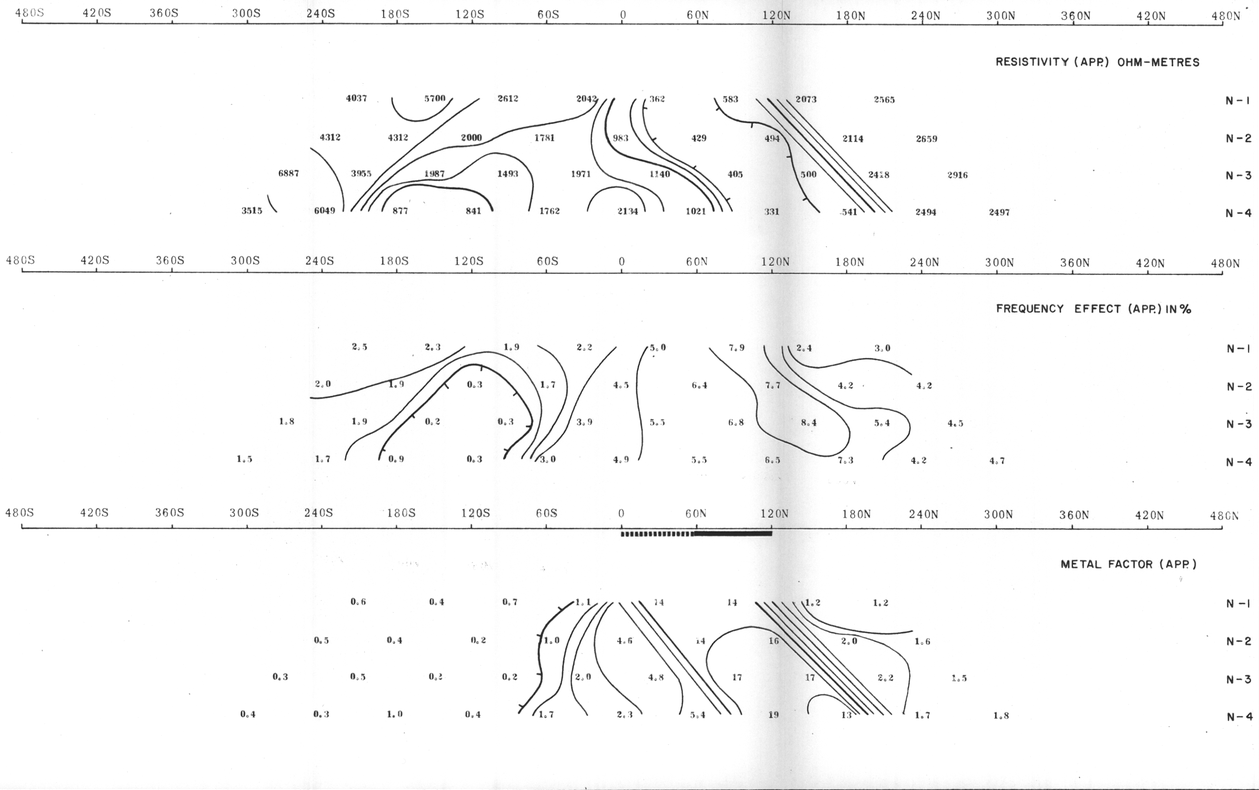
DATE

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA P. G. HALLOF

Expiry Date: February 25, 1980

PHOENIX GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY



NOTE – CONTOURS AT LOGARITHMIC INTERVALS 1, -1·5, -2, -3, -5, -7·5, -10

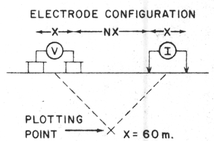
DWG. NO.- I.P. - 5153-7

SEREM LIMITED

MT. SICKER PROPERTY , VICTORIA M.D.

DUNCAN AREA , BRITISH COLUMBIA

LINE NO.- 8E



SURFACE PROJECTION OF ANOMALOUS ZONE

DEFINITE

PROBABLE

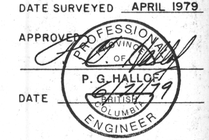
POSSIBLE

FREQUENCIES 0·3-5·0HZ.

DATE SURVEYED APRIL 1979

APPROVED

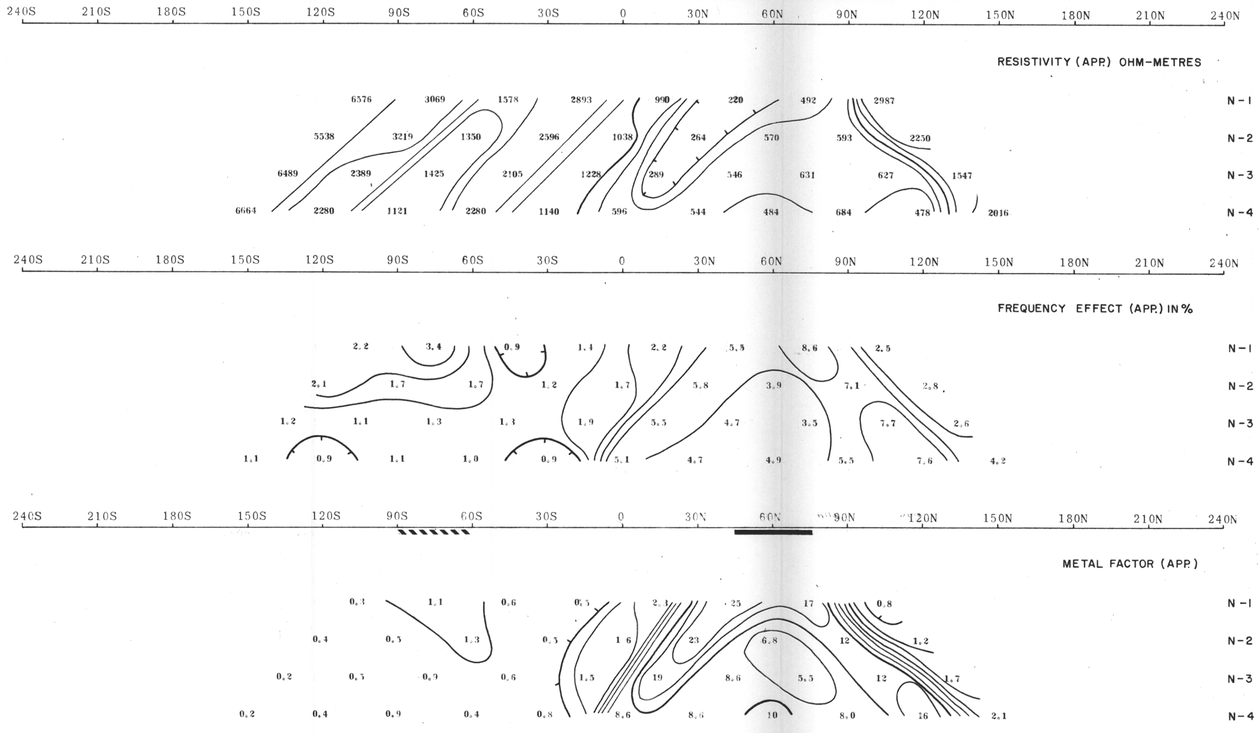
DATE



Expiry Date: February 25, 1980

PHOENIX GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY



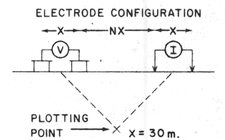
DWG. NO.- I.P.- 5153-8

SEREM LIMITED

MT. SICKER PROPERTY, VICTORIA M.D.

DUNCAN AREA, BRITISH COLUMBIA

LINE NO.- 8E



SURFACE PROJECTION OF ANOMALOUS ZONE

DEFINITE

PROBABLE

POSSIBLE

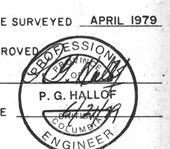
FREQUENCIES 0.3-5.0HZ

DATE SURVEYED APRIL 1979

APPROVED

NOTE - CONTOURS AT LOGARITHMIC INTERVALS 1,-1.5,-2,-3,-5,-7.5,-10

DATE



Expiry Date: February 25, 1980

PHOENIX GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

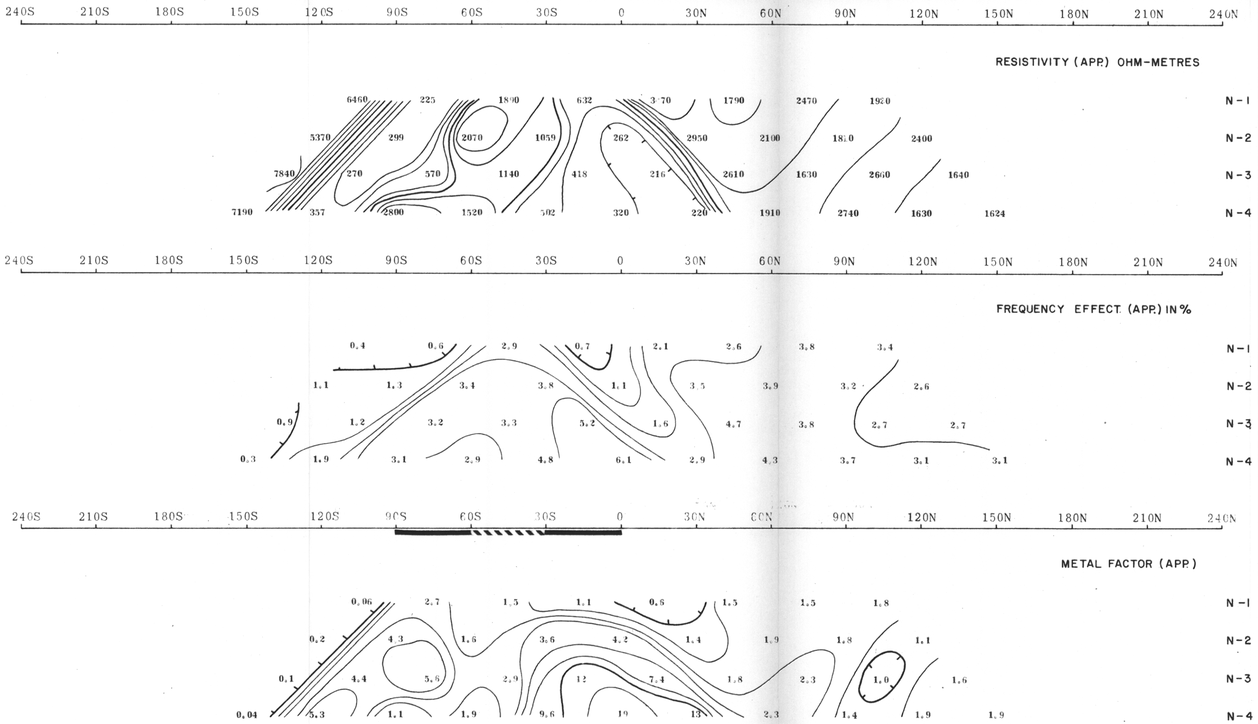
DWG. NO.- I.P. - 5153-9

SEREM LIMITED

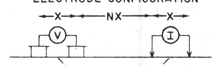
MT. SICKER PROPERTY, VICTORIA M.D.

DUNCAN AREA, BRITISH COLUMBIA

LINE NO.- 16E



ELECTRODE CONFIGURATION



PLOTTING POINT → X = 30 m.

SURFACE PROJECTION OF ANOMALOUS ZONE

DEFINITE

PROBABLE

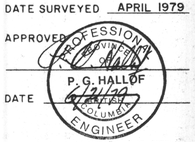
POSSIBLE

FREQUENCIES 0.3-5.0HZ.

DATE SURVEYED APRIL 1979

NOTE - CONTOURS AT LOGARITHMIC INTERVALS 1, -1.5, -2, -3, -5, -7.5, -10

APPROVED



DATE 6/24/80

Expiry Date: February 25, 1980

PHOENIX GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

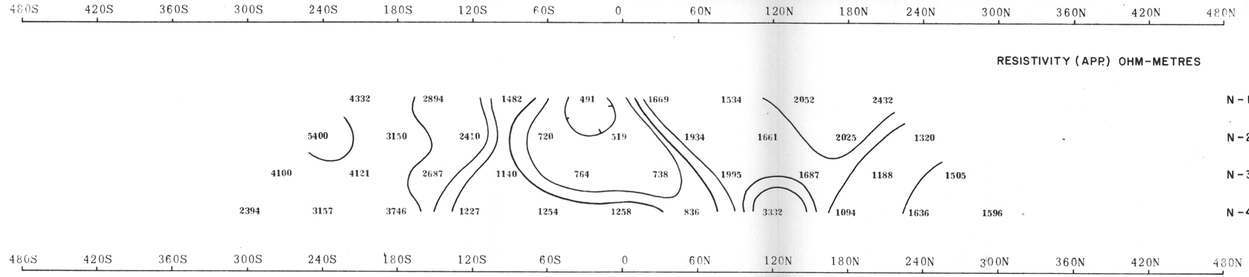
DWG. NO.- I.P. - 5153-10

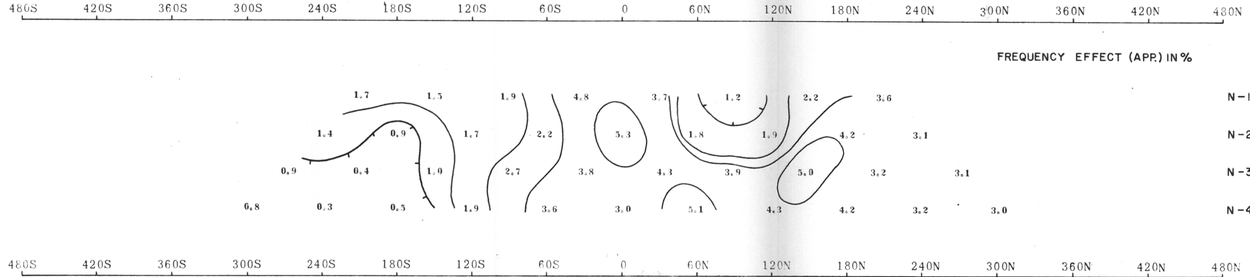
SEREM LIMITED

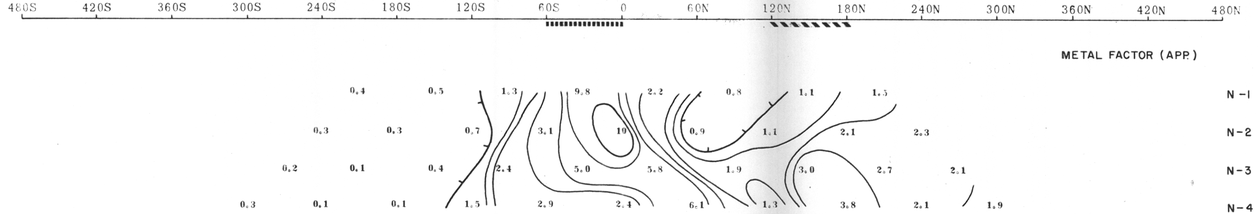
MT. SICKER PROPERTY, VICTORIA M.D.

DUNCAN AREA, BRITISH COLUMBIA

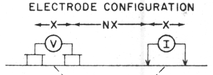
LINE NO.- 20E







ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONE

DEFINITE

PROBABLE

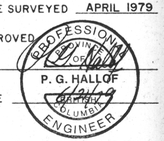
POSSIBLE

FREQUENCIES 0.3-5.0HZ.

DATE SURVEYED APRIL 1979

NOTE - CONTOURS AT LOGARITHMIC INTERVALS 1,-1.5,-2,-3,-5,-7.5,-10

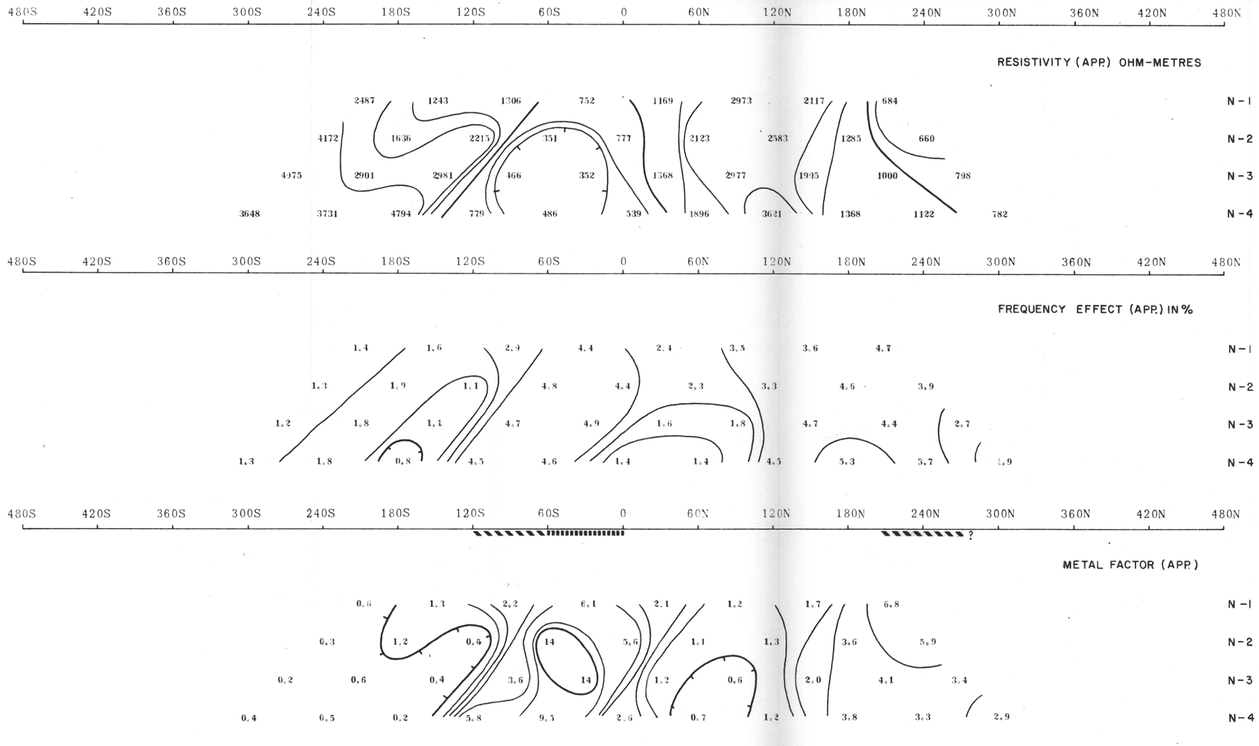
APPROVED



Expiry Date: February 25, 1980

PHOENIX GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY



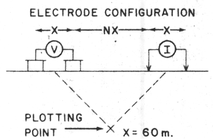
DWG. NO.- I.P. - 5153-11

SEREM LIMITED

MT. SICKER PROPERTY, VICTORIA M.D.

DUNCAN AREA, BRITISH COLUMBIA

LINE NO.- 28E



SURFACE PROJECTION OF ANOMALOUS ZONE

DEFINITE

PROBABLE

POSSIBLE

FREQUENCIES 0·3-5·0HZ.

DATE SURVEYED APRIL 1979

APPROVED

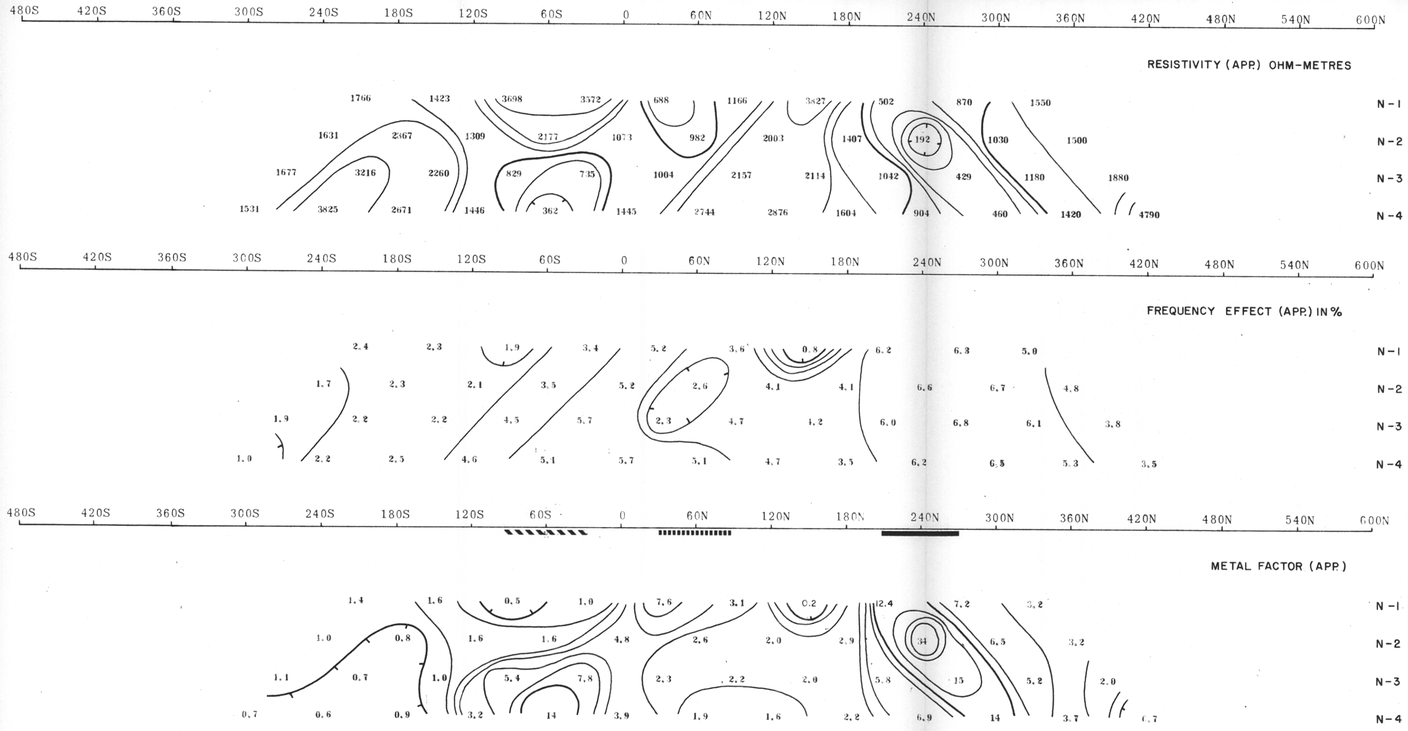
DATE

NOTE - CONTOURS AT LOGARITHMIC INTERVALS 1,-1·5,-2,-3,-5,-7·5,-10

Expiry Date: February 25, 1980

PHOENIX GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY



DWG. NO.- I.P. - 5153-12

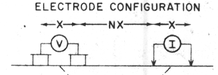
SEREM LIMITED

MT. SICKER PROPERTY, VICTORIA M.D.

DUNCAN AREA, BRITISH COLUMBIA

LINE NO.- 32E

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONE

DEFINITE

PROBABLE

POSSIBLE

FREQUENCIES 0.3-5.0HZ.

DATE SURVEYED APRIL 1979

NOTE - CONTOURS AT LOGARITHMIC INTERVALS 1,-1.5,-2,-3,-5,-7.5,-10

APPROVED

P. G. HALLOF

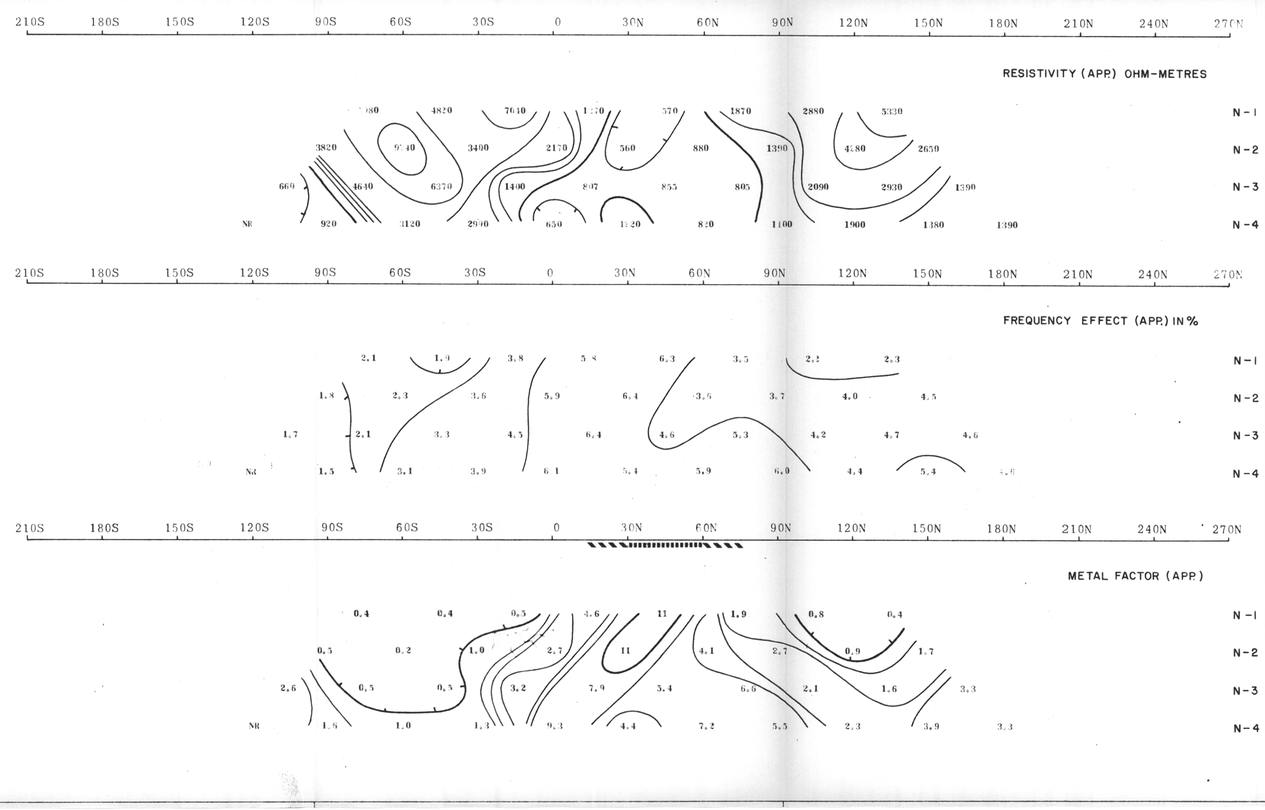
DATE

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA

Expiry Date: February 25, 1980

PHOENIX GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY



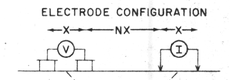
DWG. NO.- I.P. - 5153-13

SEREM LIMITED

MT. SICKER PROPERTY , VICTORIA M.D.

DUNCAN AREA , BRITISH COLUMBIA

LINE NO.- 32E



SURFACE PROJECTION OF ANOMALOUS ZONE

DEFINITE

PROBABLE

POSSIBLE

FREQUENCIES 0.3-5.0HZ.

DATE SURVEYED APRIL 1979

APPROVED

NOTE - CONTOURS AT LOGARITHMIC INTERVALS 1,-1.5,-2,-3,-5,-7.5,-10

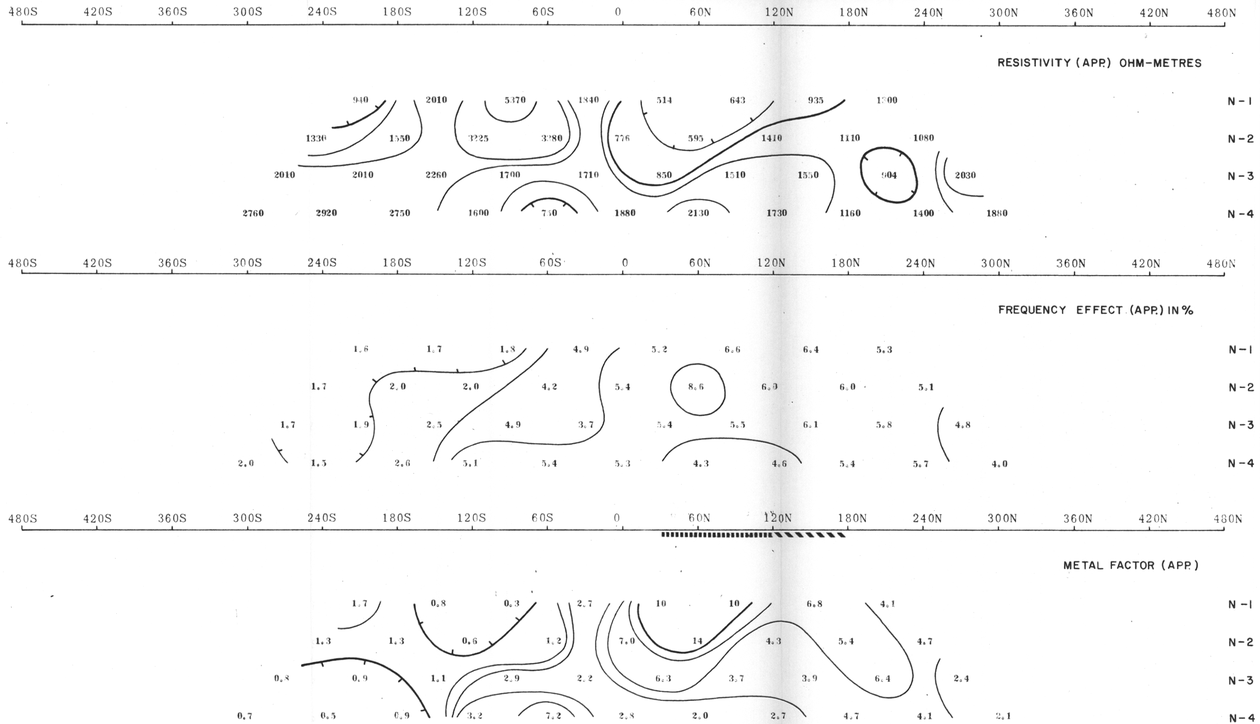
DATE

PROFESSIONAL ENGINEER P. G. HALLOF BRITISH COLUMBIA

Expiry Date: February 25, 1980

PHOENIX GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY



DWG. NO.- I.P. - 5153-14

SEREM LIMITED

MT. SICKER PROPERTY, VICTORIA M.D.

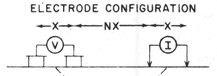
DUNCAN AREA, BRITISH COLUMBIA

LINE NO.- 32(g)E

inches 0 1
centimetres 0 2

This reference scale bar has been added to the original plot to enable the scale of the same into be determined if it can be used as a reference for the original size.

ELECTRODE CONFIGURATION



PLOTTING POINT → X = 60 m.

SURFACE PROJECTION OF ANOMALOUS ZONE

DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES 0.3-5.0HZ

DATE SURVEYED APRIL 1979

APPROVED

NOTE - CONTOURS AT LOGARITHMIC INTERVALS 1,-1.5,-2,-3,-5,-7.5,-10

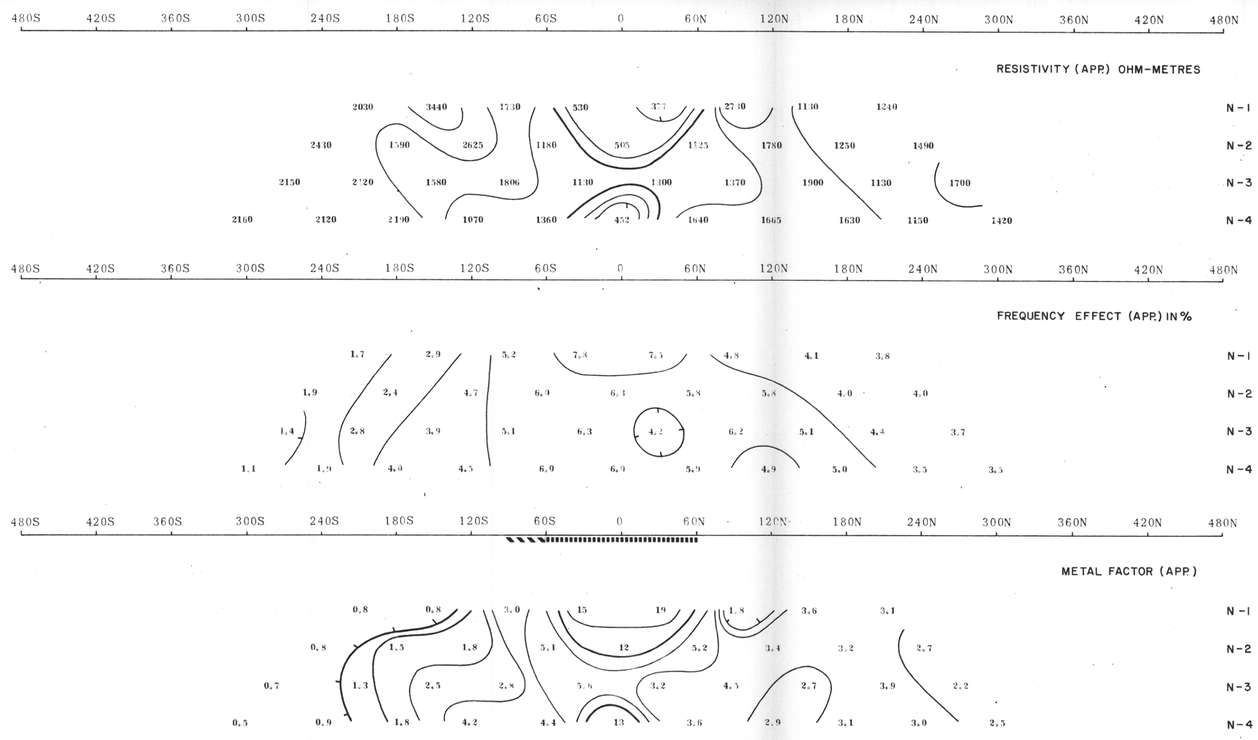
DATE

PROFESSIONAL ENGINEER P. G. HALLOF BRITISH COLUMBIA

Expiry Date: February 25, 1980

PHOENIX GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY



DWG. NO.- I. P. - 5153-15

SEREM LIMITED

MT. SICKER PROPERTY , VICTORIA M.D.

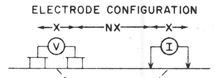
DUNCAN AREA , BRITISH COLUMBIA

LINE NO.- 36 E

inches 0 1 0 2 centimetres

This reference scale bar has been added to the original image. It will change if the image is resized as the image therefore should be used as a reference for the original size.

ELECTRODE CONFIGURATION



PLOTTING POINT → X = 60 m.

SURFACE PROJECTION OF ANOMALOUS ZONE

DEFINITE

PROBABLE

POSSIBLE

FREQUENCIES 0·3-5·0HZ

DATE SURVEYED APRIL 1979

APPROVED

NOTE - CONTOURS AT LOGARITHMIC INTERVALS 1,-1·5,-2,-3,-5,-7·5,-10

DATE

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA P. G. HALLOF

Expiry Date: February 25, 1980

PHOENIX GEOPHYSICS LIMITED

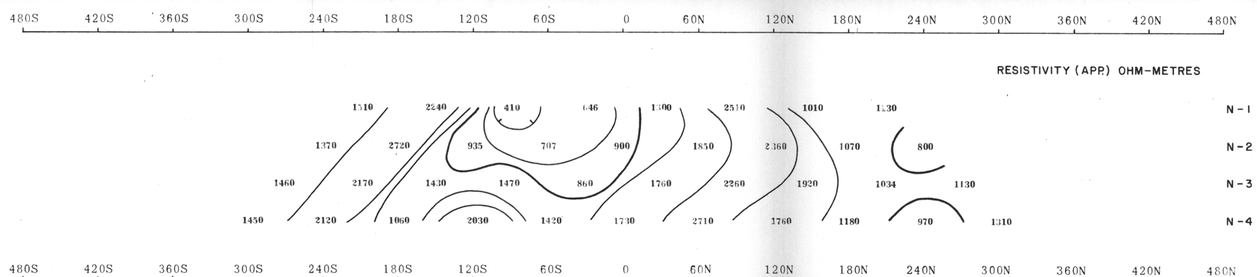
INDUCED POLARIZATION AND RESISTIVITY SURVEY

DWG. NO.- I.P. - 5153-16

SEREM LIMITED

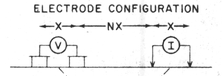
MT. SICKER PROPERTY , VICTORIA M.D.

DUNCAN AREA , BRITISH COLUMBIA



LINE NO.- 40E

ELECTRODE CONFIGURATION



PLOTTING POINT → X = 60 m.

SURFACE PROJECTION OF ANOMALOUS ZONE

DEFINITE

PROBABLE

POSSIBLE

FREQUENCIES 0·3-5·0HZ.

DATE SURVEYED APRIL 1979

NOTE - CONTOURS AT LOGARITHMIC INTERVALS 1,-1·5,-2,-3,-5,-7·5,-10

APPROVED

P. G. HALLOF

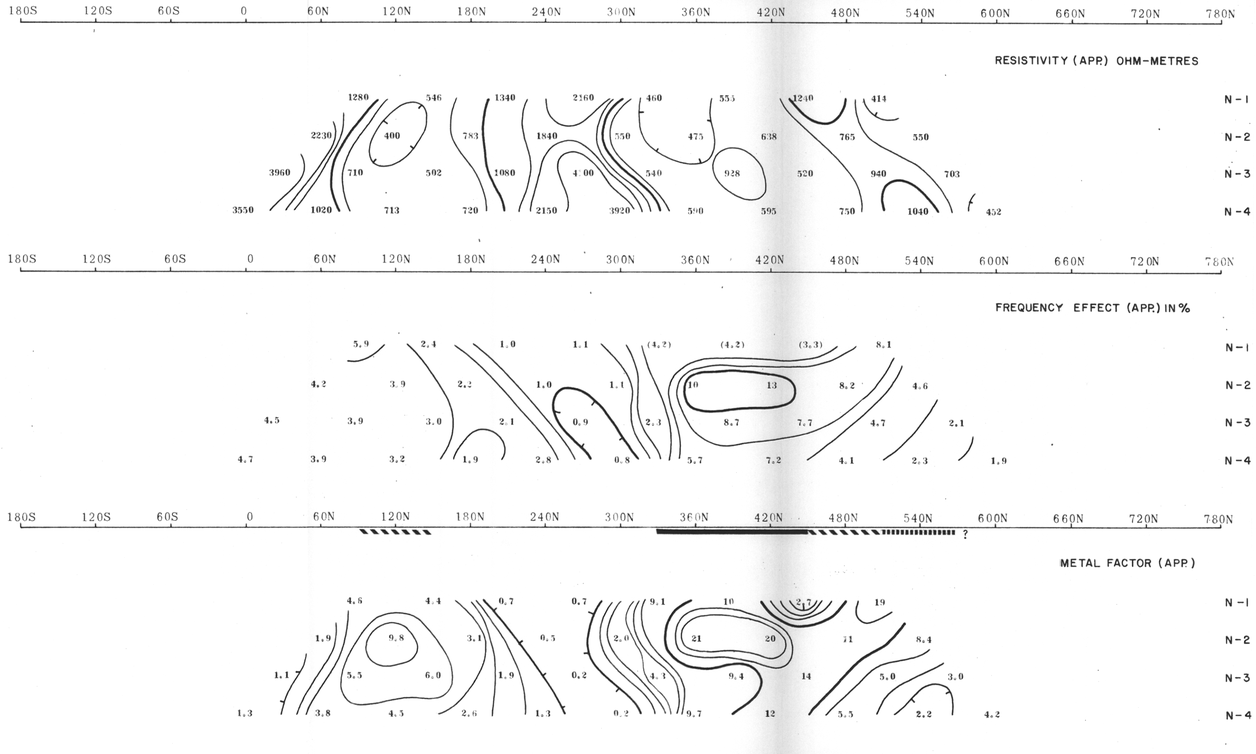
DATE

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA

Expiry Date: February 25, 1980

PHOENIX GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY



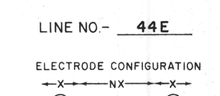
DWG. NO.- I.P. - 5153-17

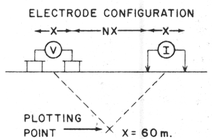
SEREM LIMITED

MT. SICKER PROPERTY, VICTORIA M.D.

DUNCAN AREA, BRITISH COLUMBIA

LINE NO.- 44E



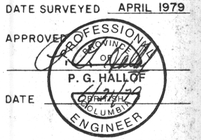


FREQUENCIES 0.3-5.0HZ.

DATE SURVEYED APRIL 1979

NOTE - CONTOURS AT LOGARITHMIC INTERVALS 1,-1.5,-2,-3,-5,-7.5,-10

APPROVED

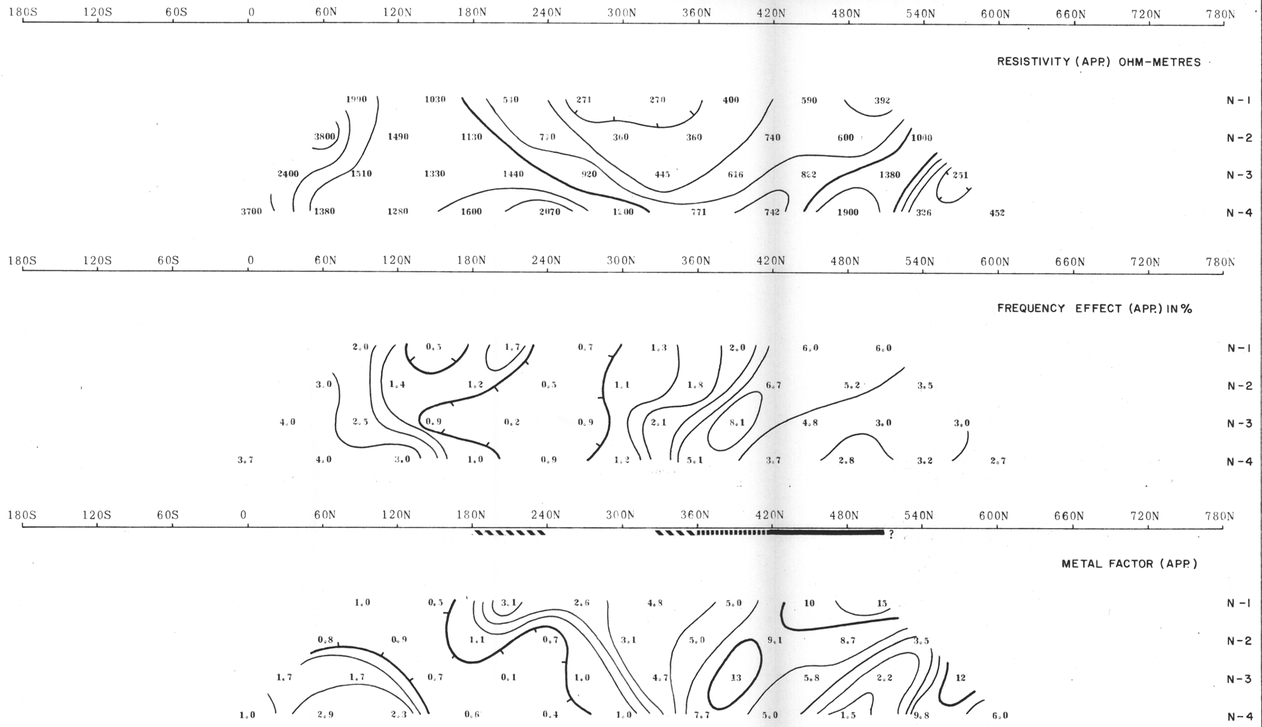


DATE

Expiry Date: February 25, 1980

PHOENIX GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY



NOTE – CONTOURS AT LOGARITHMIC INTERVALS 1,-1.5,-2,-3,-5,-7.5,-10

DWG. NO.- I.P. - 5153-18

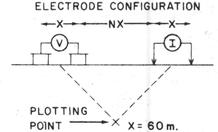
SEREM LIMITED

MT. SICKER PROPERTY , VICTORIA M.D.

DUNCAN AREA , BRITISH COLUMBIA

LINE NO.- 48 E

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONE

DEFINITE

PROBABLE

POSSIBLE

FREQUENCIES 0.3-5.0HZ

DATE SURVEYED APRIL 1979

APPROVED

DATE

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA P. G. HALLOF

Expiry Date: February 25, 1980

PHOENIX GEOPHYSICS LIMITED

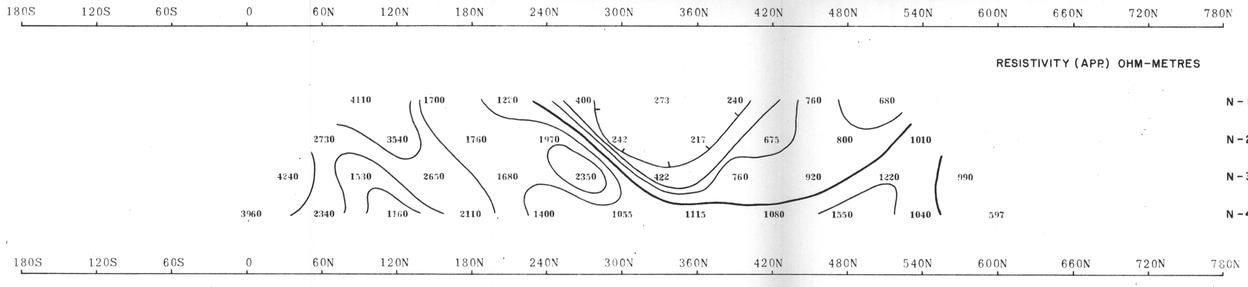
INDUCED POLARIZATION AND RESISTIVITY SURVEY

DWG. NO.- I.P. - 5153-19

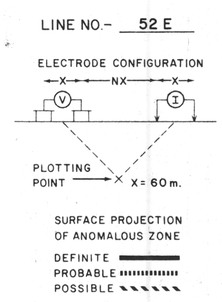
SEREM LIMITED

MT. SICKER PROPERTY , VICTORIA M.D.

DUNCAN AREA , BRITISH COLUMBIA



LINE NO.- 52 E



FREQUENCIES 0.3-5.0HZ.

DATE SURVEYED APRIL 1979

NOTE - CONTOURS AT LOGARITHMIC INTERVALS 1,-1.5,-2,-3,-5,-7.5,-10

APPROVED

P. G. HALLOF

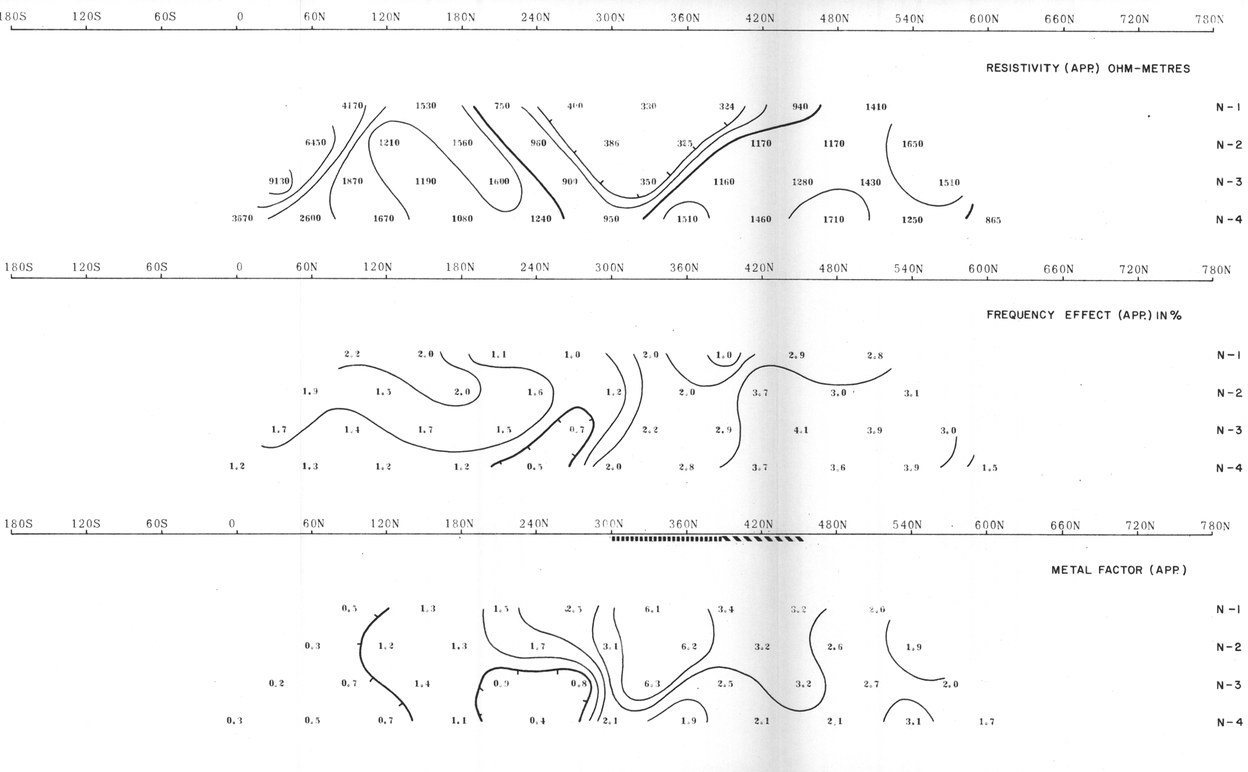
DATE

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA

Expiry Date: February 25, 1980

PHOENIX GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY



DWG. NO.- I.P. - 5153-20

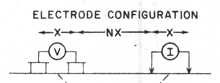
SEREM LIMITED

MT. SICKER PROPERTY, VICTORIA M.D.

DUNCAN AREA, BRITISH COLUMBIA

LINE NO.- 56E

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONE

DEFINITE

PROBABLE

POSSIBLE

FREQUENCIES 0.3-5.0HZ.

DATE SURVEYED APRIL 1979

APPROVED

P. G. HALLOF

DATE

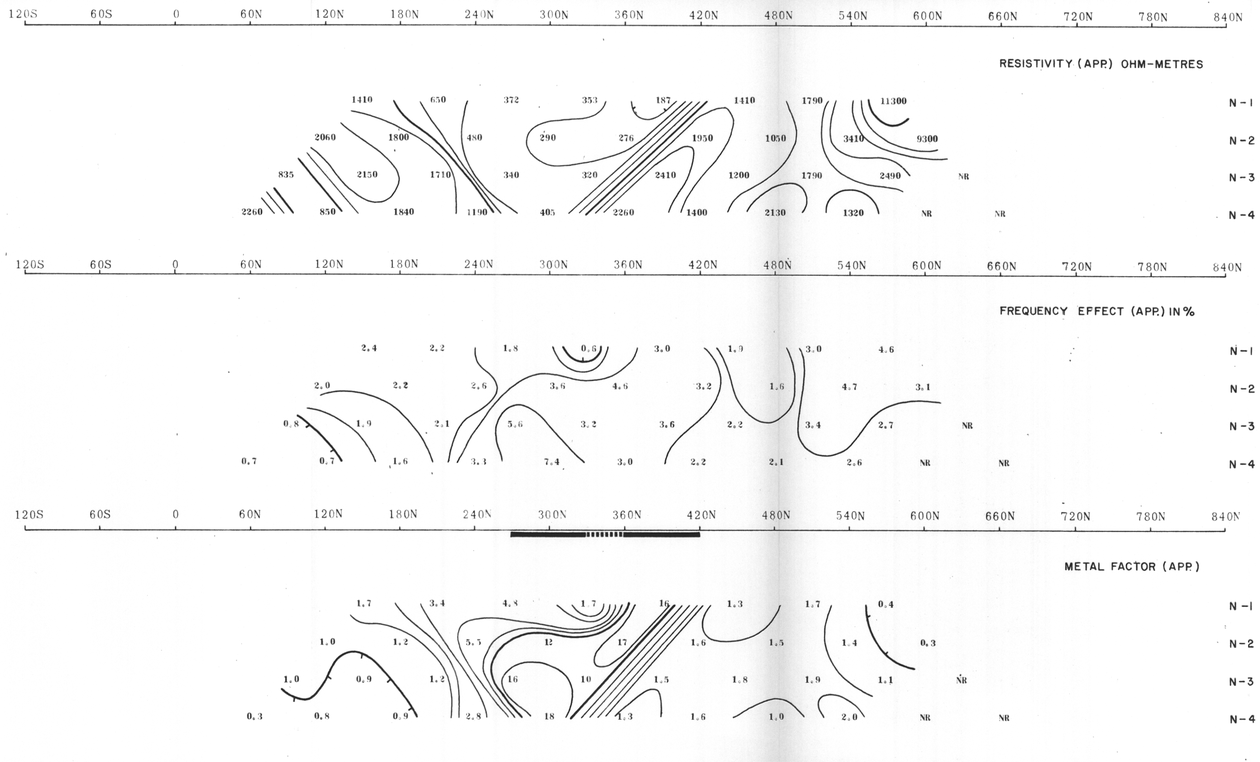
PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA

Expiry Date: February 25, 1980

NOTE - CONTOURS AT LOGARITHMIC INTERVALS 1,-1.5,-2,-3,-5,-7.5,-10

PHOENIX GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY



DWG. NO.- I.P. - 5153-21

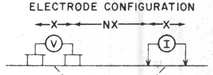
SEREM LIMITED

MT. SICKER PROPERTY, VICTORIA M.D.

DUNCAN AREA, BRITISH COLUMBIA

LINE NO.- 60E

ELECTRODE CONFIGURATION



PLOTTING POINT → X = 60m.

SURFACE PROJECTION OF ANOMALOUS ZONE

DEFINITE

PROBABLE

POSSIBLE

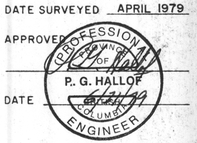
FREQUENCIES 0.3-5.0HZ

DATE SURVEYED APRIL 1979

APPROVED

DATE

NOTE - CONTOURS AT LOGARITHMIC INTERVALS 1, -1.5, -2, -3, -5, -7.5, -10



Expiry Date: February 25, 1980

PHOENIX GEOPHYSICS LIMITED

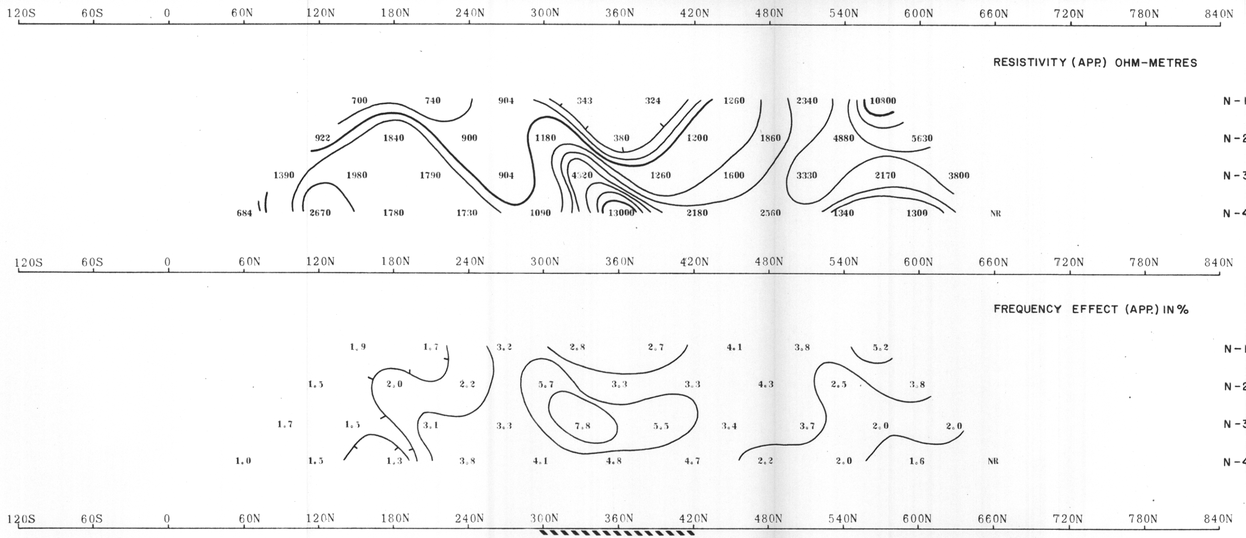
INDUCED POLARIZATION AND RESISTIVITY SURVEY

DWG. NO.- I.P. - 5153-22

SEREM LIMITED

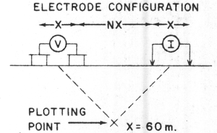
MT. SICKER PROPERTY, VICTORIA M.D.

DUNCAN AREA, BRITISH COLUMBIA



LINE NO.- 64E

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONE

DEFINITE

PROBABLE

POSSIBLE

FREQUENCIES 0.3-5.0HZ

DATE SURVEYED APRIL 1979

APPROVED

DATE

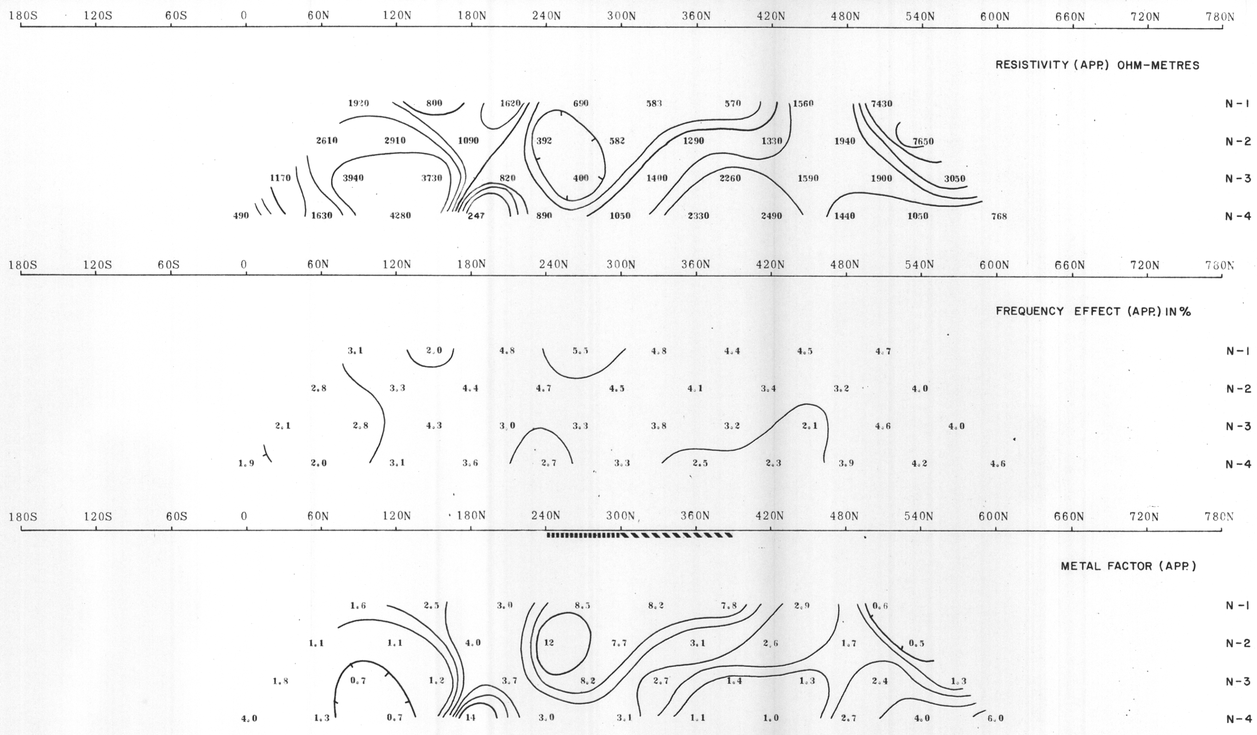
NOTE - CONTOURS AT LOGARITHMIC INTERVALS 1, 1.5, 2, 3, 5, 7.5, 10

PROFESSIONAL ENGINEER
P. G. HALLOF
COLUMBIA

Expiry Date: February 25, 1980

PHOENIX GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY



DWG. NO.- I.P. - 5153-23

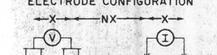
SEREM LIMITED

MT. SICKER PROPERTY, VICTORIA M.D.

DUNCAN AREA, BRITISH COLUMBIA

LINE NO.- 68E

ELECTRODE CONFIGURATION



PLOTTING POINT → X = 60 m.

SURFACE PROJECTION OF ANOMALOUS ZONE

DEFINITE

PROBABLE

POSSIBLE

FREQUENCIES 0.3-5.0HZ.

DATE SURVEYED APRIL 1979

NOTE - CONTOURS AT LOGARITHMIC INTERVALS 1, -1.5, -2, -3, -5, -7.5, -10

APPROVED

P. G. HALLOF

DATE

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA

Expiry Date: February 25, 1980

PHOENIX GEOPHYSICS LIMITED

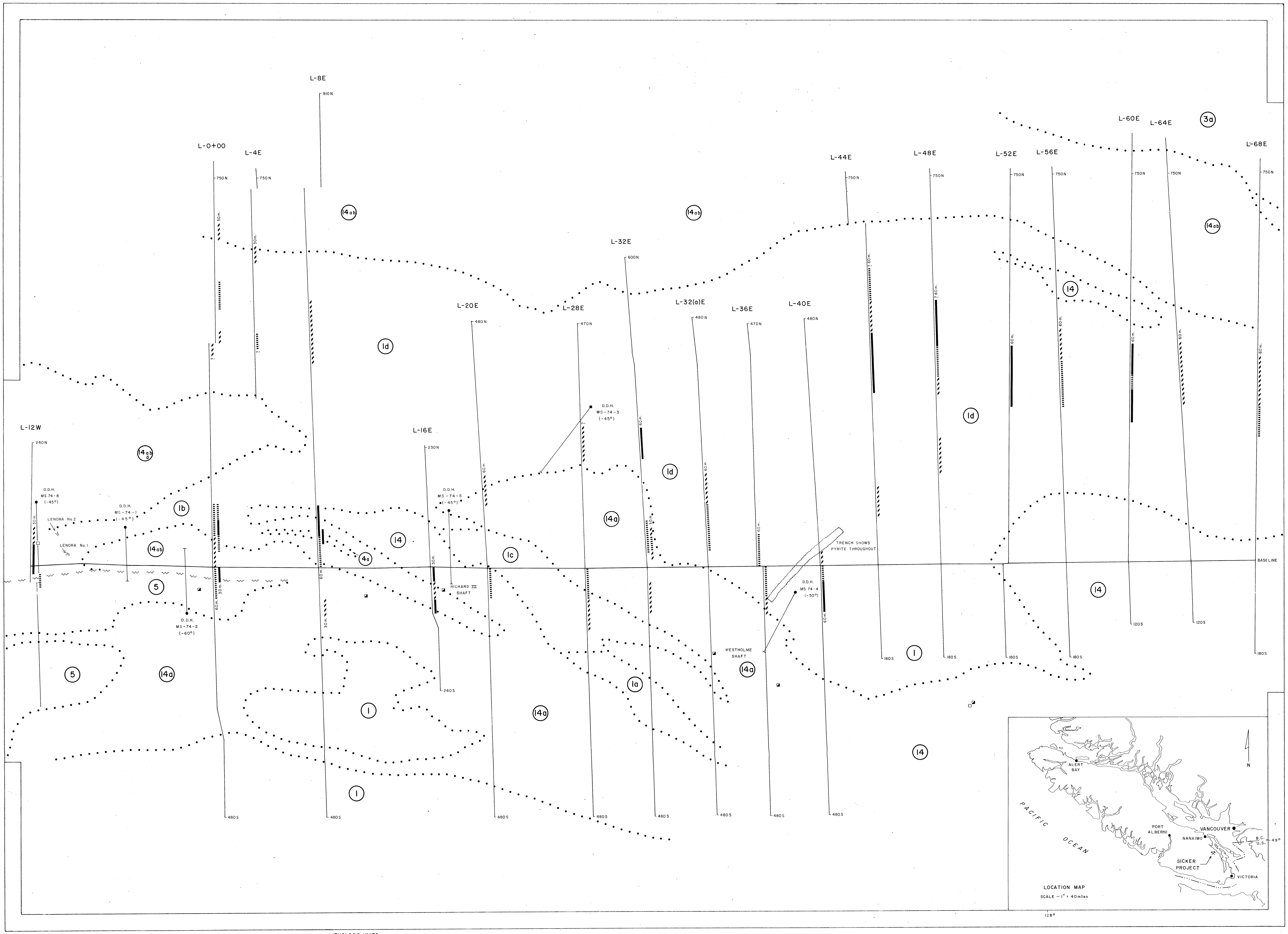
INDUCED POLARIZATION AND RESISTIVITY SURVEY

DWG. NO.-I.P.P.-4051

PHOENIX GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

PLAN MAP



SURFACE PROJECTION OF ANOMALOUS ZONE

DEFINITE
PROBABLE
POSSIBLE

NUMBER AT END OF ANOMALIES INDICATE SPREAD USED.

LITHOLOGIC UNITS

1 QUARTZ SCHIST
- 1a SERICITE
- 1b SERICITE AUGEN
- 1c CHLORITE SERICITE
- 1d CHLORITE SERICITE AUGEN
- 3a CHLORITE
- 4a BLACK GRAPHITIC SCHIST

5 TUFF

14 GABBROIC STOCKS
- 14a GABBRO
- 14b DIABASE
- 14c DIORITE
- 14d SCHISTOSE DERIVATIVES of 14a, b or c.

SEREM LIMITED

MT. SICKER PROPERTY, VICTORIA M.D.

DUNCAN AREA, BRITISH COLUMBIA

SCALE

50 0 100 200 METRES

200 0 200 400 600 FEET

1:2500

SYMBOLS

GEOLOGICAL BOUNDARY; approximate
FAULT
SHAFT
ADIT
PIT
DIAMOND DRILL HOLE D.D.H.

inches 0 1 2
0 1 2 3 4 5 centimetres

BRITISH COLUMBIA GEOLOGICAL SURVEY

This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

NOTE: TO ACCOMPANY GEOPHYSICAL REPORT FOR SEREM LIMITED ON THE MT. SICKER PROPERTY, VICTORIA M.D., DUNCAN AREA, BRITISH COLUMBIA BY PHILIP G. HALLOF P. ENG. GEOPHYSICIST, AND A.W. MULLAN P. ENG. GEOLOGIST.

DATED - JUNE 21, 1979.

DRAWN: R.J.P.

DATE: JUNE 1979

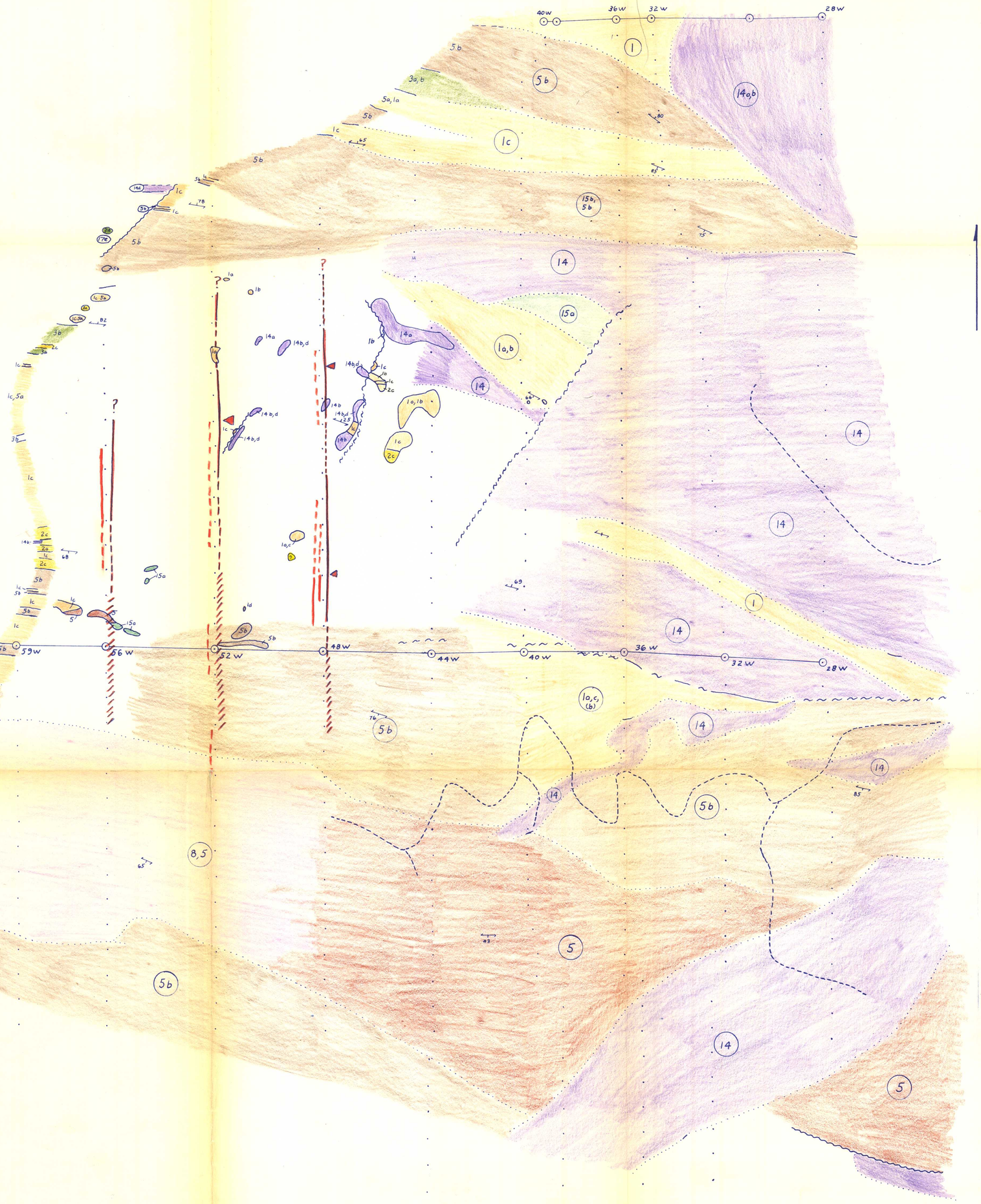
APPROVED:

DATE: 6/21/79

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA P.G. HALLOF

Expiry Date: February 25, 1980

DWG. NO.-I.P.P.-4051



LEGEND:

- Generalized Geological Boundary
- Outcrop: NOTE – outcrops shown where poor exposure and geological complexity preclude showing generalized geology
- Geological Boundary in Chemainus River
- (2c) Generalized Rock Type (Units as on geological map of Mt. Sicker)

IP ANOMALY

METAL FACTOR

- Strong
- Medium
- Weak

CENTER of RESISTIVITY LOW

inches 0 1 2

0 1 2 3 4 5 centimetres

This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

SEREM LTD.

PROJECT: MT. SICKER

TITLE: INDUCED POLARIZATION SURVEY WITH SIMPLIFIED GEOLOGY CHEMAINUS RIVER AREA

NTS:	SCALE:	DATA: FDS., P.R., C.V.H	FIGURE
92 B 13 W	1:2,500	DRAWN: P.R.	
		DATE: SEPT. 1980	