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REPORT ON THE INDUCED POLARIZATION AND RESISTIVITY SURVEY ROYAL GROUP ROYAL CANADIAN VENTURES PROPERTY HIGHLAND VALLEY AREA KAMLOOPS M.D., B.C.

92I/6E

FOR

GREAT PLAINS DEVELOPMENT
COMPANY OF CANADA LTD.

BY

WILLIAM H. PELTON, B.A. Sc.

AND

PHILIP G. HALLOF, Ph.D.

NAME AND LOCATION OF PROPERTY:

ROYAL GROUP, ROYAL CANADIAN VENTURES PROPERTY

HIGHLAND VALLEY AREA

KAMLOOPS MINING DIVISION, B.C. 50°N, 121°W - SE

DATE STARTED JUNE 6, 1970

DATE FINISHED JULY 13, 1970

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McPHAR GEOPHYSICS LIMITED

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INDUCED POLARIZATION

AND RESISTIVITY SURVEY

ROYAL GROUP

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1. INTRODUCTION

As requested by Great Plains Development Company of Canada Ltd., we have carried out an induced polarization and resistivity survey over the Royal Group, Royal Canadian Ventures Property in the Highland Valley Area of Kamloops M.D., B.C.

The Royal Claim Group is situated in the southeast quadrant of the one degree quadrilateral whose southeast corner is at 50° N latitude and 121° W longitude. Access is via the Highland Valley Road south from Ashcroft and by secondary road to the property.

The claim group occupies a favourable position in the Highland Valley adjacent to the property of Lornex Mining. The purpose of the survey was to outline any large areas of disseminated mineralization on the property which could possibly be similar to the "porphyry copper" type deposits now being mined in the area.

Surveying was carried out in June 1970 over the following claims, all of which are located in the Kamloops Mining Division.

Royal: 21 to 40 (inclusive)

2. PRESENTATION OF RESULTS

The reconnaissance dipole-dipole induced polarization and resistivity survey was carried out with 400' electrode intervals, taking measurements for only the first separation (n = 1). The results are shown in profile form on the following enclosed data plots.

Line	Dwg. No.
82E, 86E, 90E	IP 5548-1
94E, 98E	IP 5548-2
102E, 106E	IP 5548-3
110E, 114E, 118E, 122E	IP 5548-4

Also enclosed with this report is Dwg. I.P.P. 4666, a plan map of the Royal Group at a scale of 1" = 400'. The definite and possible induced polarization anomalies are indicated by solid and broken bars respectively on this plan map as well as 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 spread length; i.e. when using 400' spreads the position of a narrow sulphide body can only be determined to lie between two stations 400' apart. In order to locate sources at some depth, larger spreads 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.

3. DISCUSSION OF RESULTS

A number of very weak anomalies have been revealed by the survey. There are two areas where the anomalies appear to continue from line to line and form zones.

Zone A

This zone correlates with an area of sericite alteration where malachite staining and specks of bornite and chalcopyrite have been observed in outcrop. The Metal Factor values are very weak, however, and indicate that the mineralization is present in only small widths or low concentrations. As shown in Appendix B, detailing the zone with shorter electrode intervals would help determine which is the case.

Zone B

This zone is narrow in the west but broadens to the east and apparently extends beyond the survey area to the south on Line 110E and Line 106E.

There is no outcrop in most of the anomalous areas. The Metal Factor values are still very weak, but they are slightly stronger than those of Zone A.

If the mineralization in Zone A is considered significant, further work may be warranted to test Zone B.

4. SUMMARY AND RECOMMENDATIONS

The anomalies revealed by this survey are very weak compared to the anomalies measured over the typical "porphyry copper" deposits illustrated in Appendix A. The measured Metal Factor values are all less than 10, and thus do not indicate the presence of large volumes of disseminated mineralization with a total metallic content in excess of 2%.

Of the two weakly anomalous zones revealed by the survey, Zone A apparently correlates with a known mineralized area and Zone B lies in an area of no outcrop. Since the Metal Factor values for Zone B are the highest encountered on the grid, and the source is not known, further work may be suggested if very weak mineralization could still be of possible economic importance.

Both Zone A and Zone B could be better evaluated by detailing with 200' electrode intervals (n = 1 to 4).

McPHAR GEOPHYSICS LIMITED

William H Pelton

William H. Pelton,
Geophysicist

Philip G. Hallof

Philip G. Hallof,
Geophysicist

Dated: October 9, 1970

ASSESSMENT DETAILS

PROPERTY: Royal Canadian Ventures Property		MINING DIVISION: Kamloops
SPONSOR: Great Plains Development Company of Canada Ltd.		PROVINCE: British Columbia
LOCATION: Highland Valley Area		
TYPE OF SURVEY: Induced Polarization		
OPERATING MAN DAYS:	38	DATE STARTED: June 6, 1970
EQUIVALENT 8 HR. MAN DAYS:	57	DATE FINISHED: July 13, 1970
CONSULTING MAN DAYS:	2	NUMBER OF STATIONS: 230
DRAUGHTING MAN DAYS:	8	NUMBER OF READINGS: 567
TOTAL MAN DAYS:	67	MILES OF LINE SURVEYED: 16.3

CONSULTANTS:
William H. Pelton, Apt.2212, 650 Parliament Street, Toronto, Ontario.
Philip G. Hallof, 5 Minorca Place, Don Mills, Ontario.

FIELD TECHNICIANS:
D.R. Broswick, c/o McPhar, Suite 811, 837 West Hastings Street, Vancouver, B.C.
R. Hart, 23 Truman Road, Willowdale, Ontario.
Plus 2 Helpers:
G. McKinnon - c/o McPhar, Suite 811, 837 West Hastings Street, Vancouver, B.C.
M. McDonald - c/o McPhar, Suite 811, 837 West Hastings Street, Vancouver, B.C.

DRAUGHTSMEN:
F. Hurst, 230 Woburn Avenue, Toronto 12, Ontario.
B. Marr, 19 Kenewen Court, Toronto 16, Ontario.

McPHAR GEOPHYSICS LIMITED

William H Pelton

William H. Pelton,
Geophysicist.

Dated: October 9, 1970

STATEMENT OF COST

Great Plains Developement
Company of Canada Ltd.

Royal Group

Crew (2 men) - D. Broswick - R. Hart

9½ days Operating	- 16.3 miles	@ $275.00 per mile	$4,482.50
2 days Travel	)		
3½ days Standby	) 6½ days	@ $150.00	
1 day Bad Weather)		Royal Portion	251.87
			$4,734.37

McPHAR GEOPHYSICS LIMITED

William H Pelton

William H. Pelton,
Geophysicist.

Dated: October 9, 1970

CERTIFICATE

I, William H. Pelton, of the City of Toronto, in the Province of Ontario, hereby certify:

1. That I am a geophysicist with a business address at 139 Bond Avenue, Don Mills, Ontario.

2. That I hold a B.A.Sc. degree in Engineering Physics (Geophysics Option) from the University of British Columbia.

3. That I am a member of KEGS and an associate member of the Society of Exploration Geophysicists.

4. That I have been engaged in geophysical interpretation for more than three 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 Great Plains Development Company of Canada Ltd. 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 9th day of October 1970

William H Pelton

William H. Pelton, B.A. Sc.

CERTIFICATE

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

1. I am a geophysicist residing at 5 Minorca Place, Don Mills, (Toronto), 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 have been practising my profession for ten 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 Great Plains Development Company of Canada Ltd. 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 9th day of October 1970.

Philip G. Hallof, Ph.D.

McPHAR GEOPHYSICS

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 can not 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 other 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) between 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 the 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 above the line as a mirror image of the metal factor values below. On a second line, below the metal factor values, are plotted the values of the per cent frequency effect. In some cases the values of per cent frequency effect are plotted as superscripts of the metal factor value. In this second case the frequency effect values are not contoured. 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 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. When the F. E. values are plotted as superscripts to the MF values the third section of data values is not presented and the F. E. values are not contoured.

The actual data plots included with the report are prepared utilizing an IBM 360/75 Computer and a Calcomp 770/763 Incremental Plotting System. The data values are calculated, plotted, and contoured according to a programme developed by McPhar Geophysics. Certain symbols have been incorporated into the programme to explain various situations in recording the data in the field.

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 noisey 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.

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

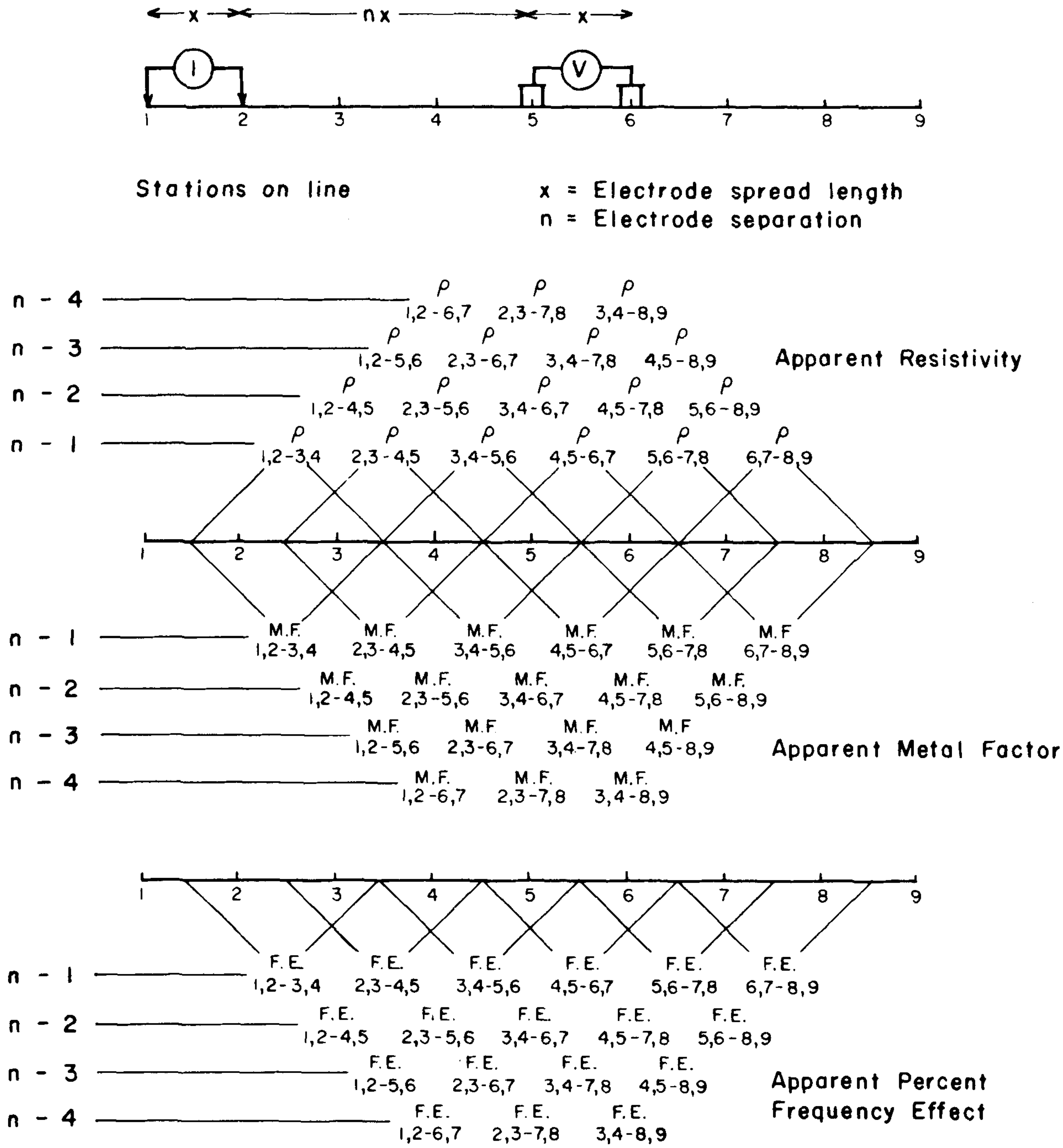


Fig. A

APPENDIX A

EXPECTED IP ANOMALIES FROM "PORPHYRY COPPER" TYPE ZONES OF DISSEMINATED SULPHIDE MINERALIZATION

Our experience in other areas has shown that the induced polarization method can be successfully used to locate, and outline, zones of disseminated sulphide mineralization of the "porphyry copper" type. In most cases the interpretation of the IP results is simple and straightforward. The results shown in Figure 1 and Figure 2 are typical.

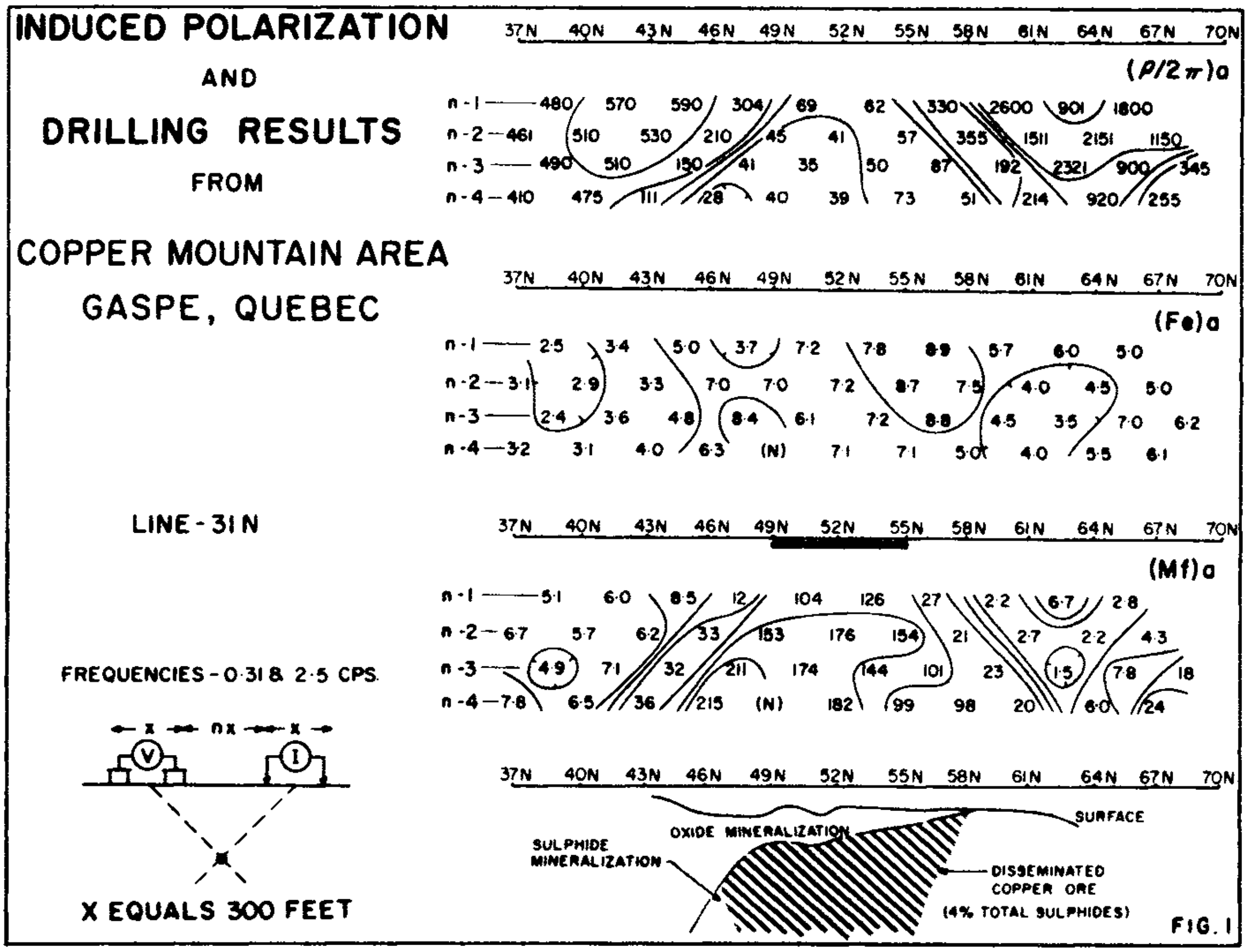


FIG. 1

The source of the moderate magnitude IP anomaly shown in Figure 1 contains approximately 4% metallic mineralization. The zone is of limited lateral extent and enough copper is present to make the mineralization "ore grade". The presence of the surface oxidation can be seen in the fact that the apparent IP effects increase for n = 2.

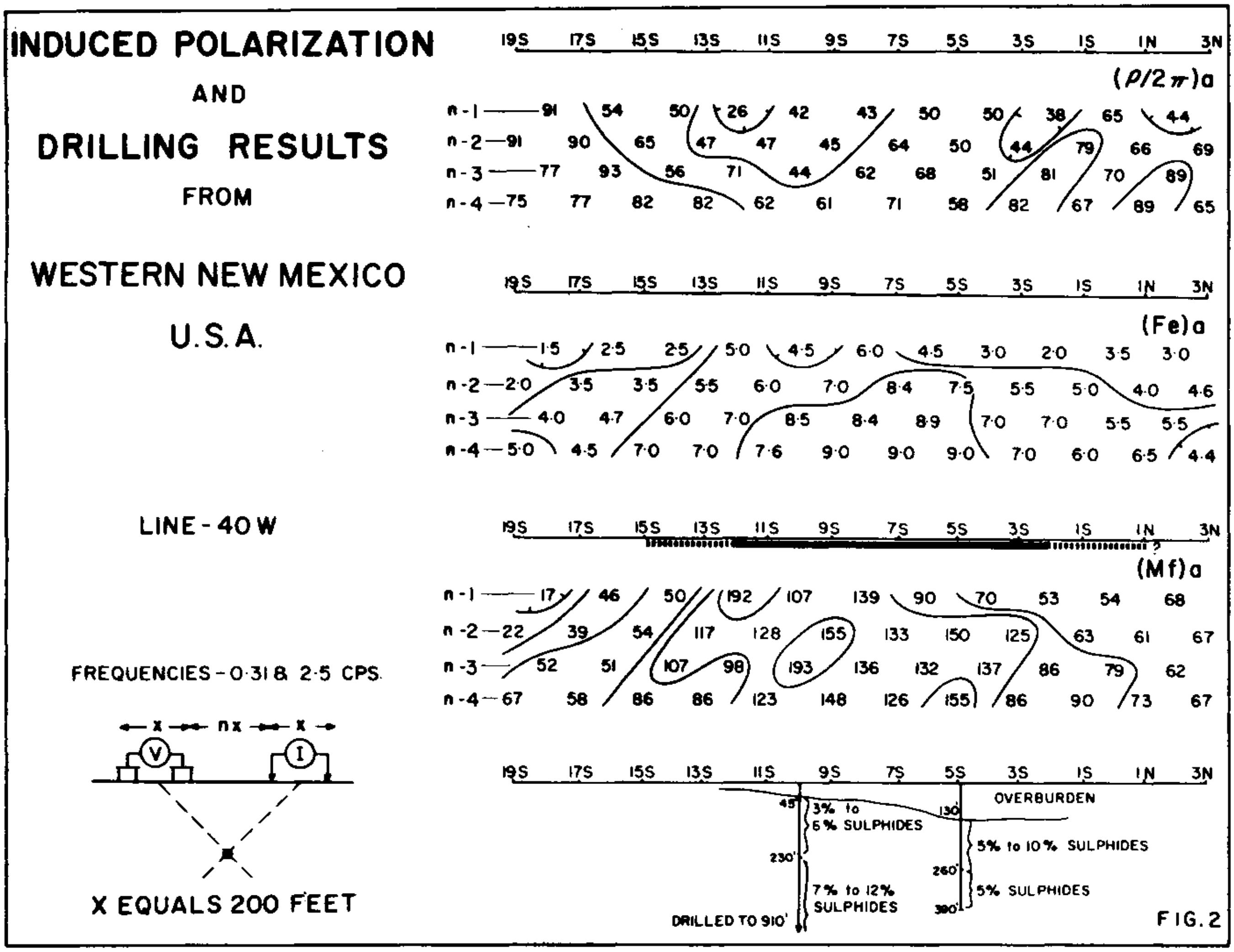


FIG. 2

The IP anomaly shown in Figure 2 has about the same magnitude as that described above. It should be noted that appreciably greater concentrations of metallic mineralization are present; further, there is little or no copper present. These results illustrate the fact that IP results can not be used to determine the exact amount of metallic mineralization present or to determine the economic importance of a mineralized zone. In some geologic situations zoning is present; the zones of mineralization of greatest economic value may contain less total metallic mineralization than other zones in the same general area.

In the proper geologic environment, the method will detect even very low concentrations of metallic mineralization. The IP results shown in Figure 3 located the ore zone at the Brenda Property near Peachland, B. C. The zone contains 1. 0 to 1. 5 per cent metallic mineralization; however, the mineralization is "ore grade" because only molybdenite and chalcopyrite are present.

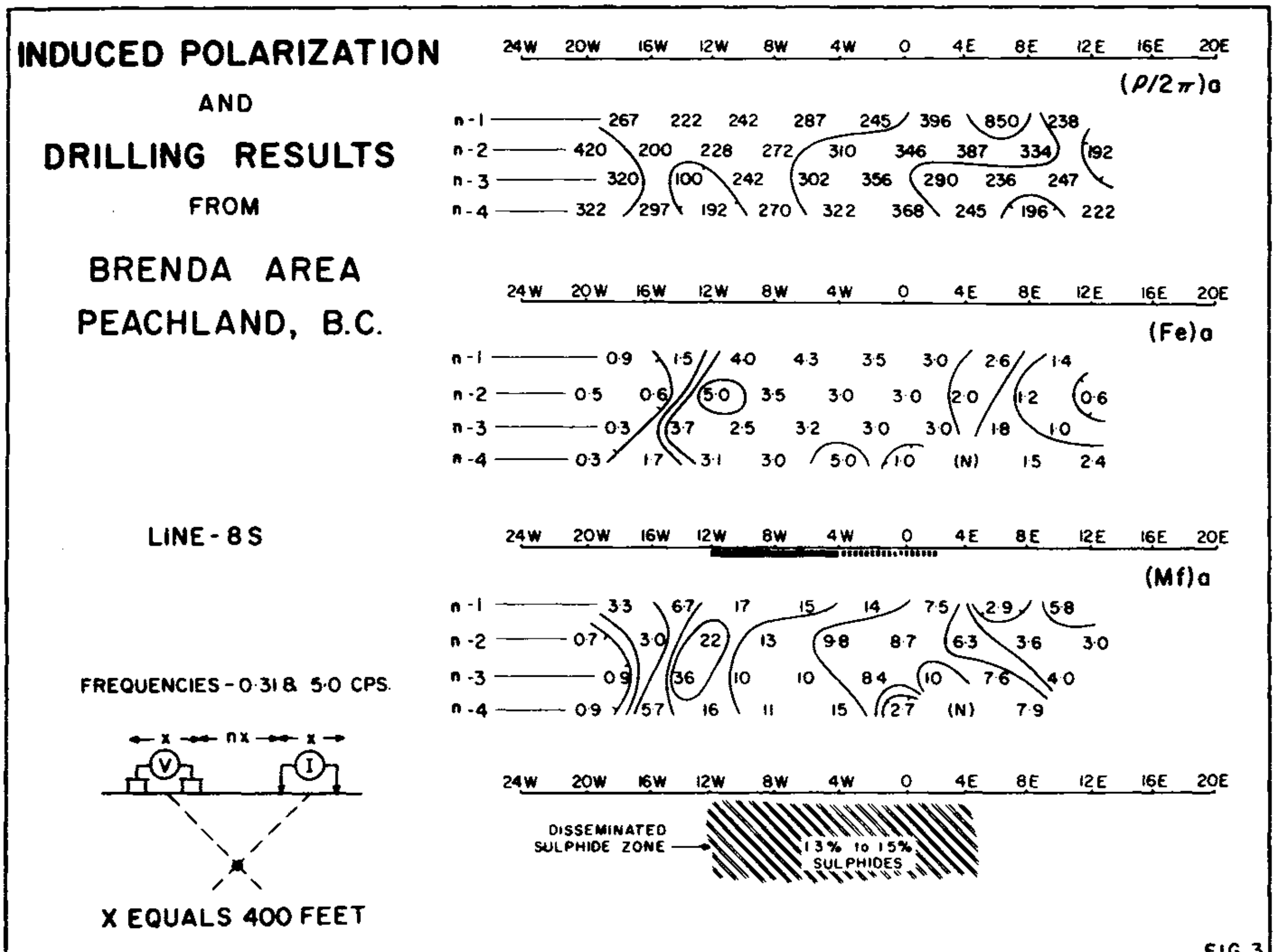


FIG. 3

APPENDIX B

THE INTERPRETATION OF INDUCED POLARIZATION ANOMALIES FROM RELATIVELY SMALL SOURCES

The induced polarization method was originally developed to detect disseminated sulphides and has proven to be very successful in the search for "porphyry copper" deposits. In recent years we have found that the IP method can also be very useful in exploring for more concentrated deposits of limited size. This type of source gives sharp IP anomalies that are often difficult to interpret.

The anomalous patterns that develop on the contoured data plots will depend on the size, depth and position of the source and the relative size of the electrode interval. The data plots are not sections showing the electrical parameters of the ground. When the electrode interval (X) is appreciably greater than the width of the source, a large volume of unmineralized rock is averaged into each measurement. This is particularly true for the large values of the electrode separation (n).

The theoretical scale model results shown in Figure 1 and Figure 2 indicate the effect of depth. If the depth to the top of the source is small compared to the electrode interval (i. e. d X) the measurement for n = 1 will be anomalous. In Figure 1 the depth is 0. 5 units (X = 1. 0 units) and the n = 1 value is definitely anomalous; the pattern on the contoured data plot is typical for a relatively shallow, narrow, near-vertical tabular source. The results in Figure 2 are for the same source with the depth increased to 1. 5 units. Here the n = 1 value is not anomalous; the larger values of (n) are anomalous but the magnitudes are much lower than for the source at less depth.

When the electrode interval is greater than the width of the source, it is not possible to determine its width or exact position between the electrodes. The true IP effect within the source is also indeterminate; the anomaly from a very narrow source with a very large true IP effect will be much the same as that from a zone with twice the width and 1/2 the true IP effect. The theoretical scale model data shown in Figure 3 and Figure 4 demonstrate this problem. The depth and position of the source are unchanged but the width and true IP effect are varied. The anomalous patterns and magnitudes are essentially the same, hence the data are insufficient to evaluate the source completely.

The normal practise is to indicate the IP anomalies by solid, broken, or dashed bars, depending upon their degree of distinctiveness. 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. As illustrated in Figure 1, Figure 2, Figure 3 and Figure 4, no anomaly can be located with more accuracy than the spread length. While the centre of the solid bar indicating the anomaly corresponds fairly well with the source, the length of the bar should not be taken to represent the exact edges of the anomalous material.

If the source is shallow, the anomaly can be better evaluated using a shorter electrode interval. When the electrode interval used approaches the width of the source, the apparent effects measured will be nearly equal to the true effects within the source. When there is some depth to the top of the source, it is not possible to use electrode intervals that are much less than the depth to the source. In this situation, one must realize that a definite ambiguity exists regarding the width of the source and the IP effect within the source.

Our experience has confirmed the desirability of doing detail. When a reconnaissance IP survey using a relatively large electrode interval indicates the presence of a narrow, shallow source, detail with shorter electrode intervals is necessary in order to better locate, and evaluate, the source. The data of most usefulness is obtained when the maximum apparent IP effect is measured for $n = 2$ or $n = 3$. For instance, an anomaly originally located using X = 300' may be checked with X = 200' and then X = 100'. The data with X = 100' will be quite different from the original reconnaissance results with X = 300'.

The data shown in Figure 5 and Figure 6 are field results from a greenstone area in Quebec. The expected sources were narrow (less than 30' in width) zones of massive, high-grade, zinc-silver ore. An electrode interval of 200' was used for the reconnaissance survey in order to keep the rate of progress at an acceptable level. The anomalies located were low in magnitude.

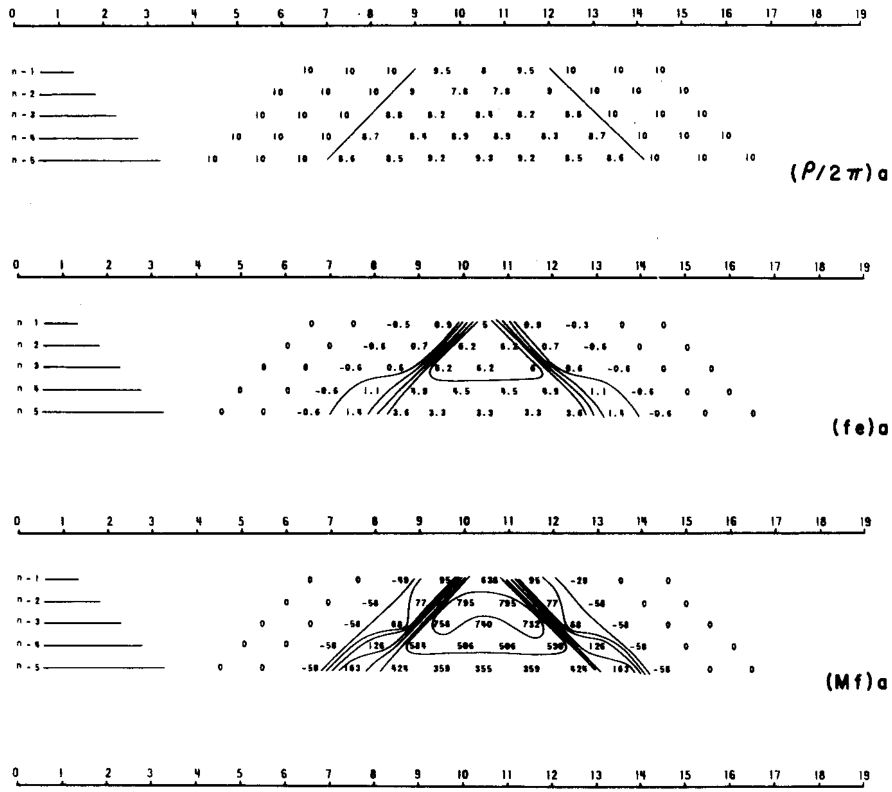
The very weak, shallow anomaly shown in Figure 5 is typical of those located by the X = 200' reconnaissance survey. Several anomalies of this type were detailed using shorter electrode intervals. In most cases the detail measurements suggested broad zones of very weak mineralization. However, in the case of the source at 20N to 22N, the measurements with shorter electrode intervals confirmed the presence of a strong, narrow source. The X = 50' results are shown in Figure 6. Subsequent drilling has shown the source to be 12.5' of massive sulphide mineralization containing significant zinc and silver values.

The change in the anomaly that results when the electrode interval is reduced is not unusual. The X = 50' data more accurately locates the narrow source, and permits the geophysicist to make a better evaluation of its importance. The completion of this type of detail is very important, in order to get the maximum usefulness from a reconnaissance IP survey.

McPHAR GEOPHYSICS LIMITED

Theoretical Induced Polarization and Resistivity Studies

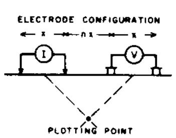
Scale Model Cases



$(\rho/2\pi)_1 = 10$ $(\rho/2\pi)_2 = 2{\cdot}51$

$(Mf)_1 = 0$ $(Mf)_2 = 10000$

$(fe)_2 = 25\%$



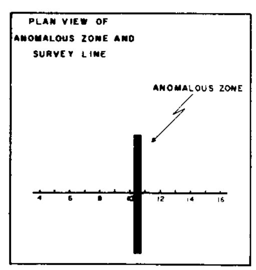


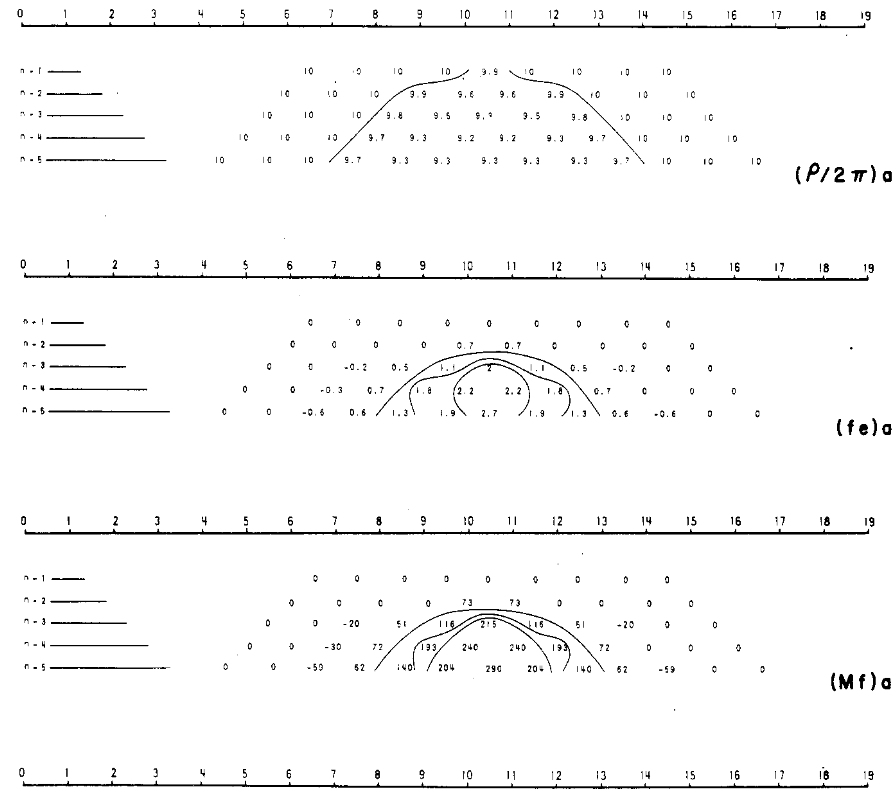
FIG 1

CASE II-0·5-BU-10-a

McPHAR GEOPHYSICS LIMITED

Theoretical Induced Polarization and Resistivity Studies

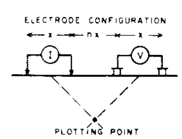
Scale Model Cases



$(\rho/2\pi)_1 = 10$ $(\rho/2\pi)_2 = 2{\cdot}6$

$(Mf)_1 = 0$ $(Mf)_2 = 9250$

$(fe)_2 = 24\%$



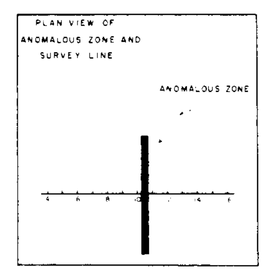
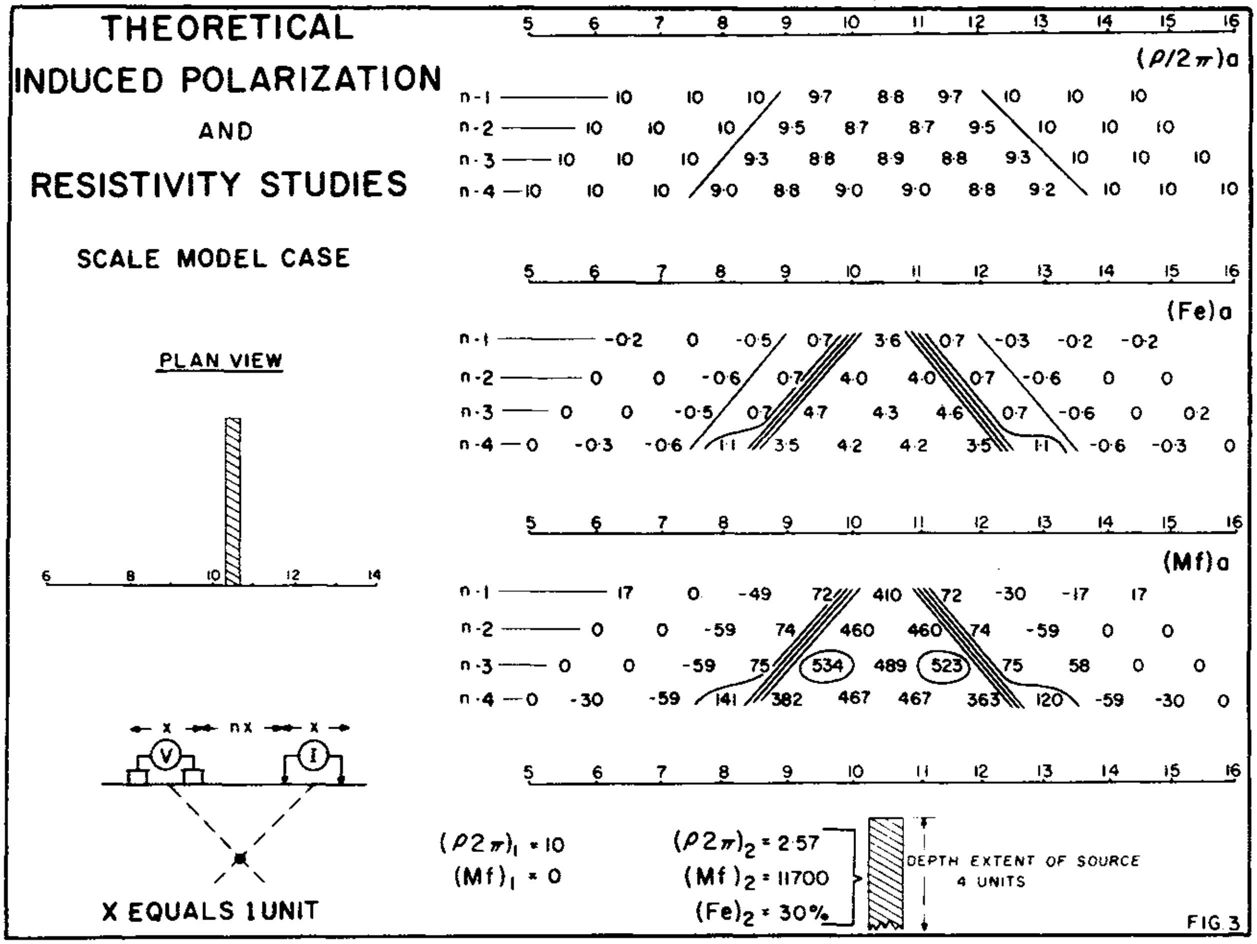
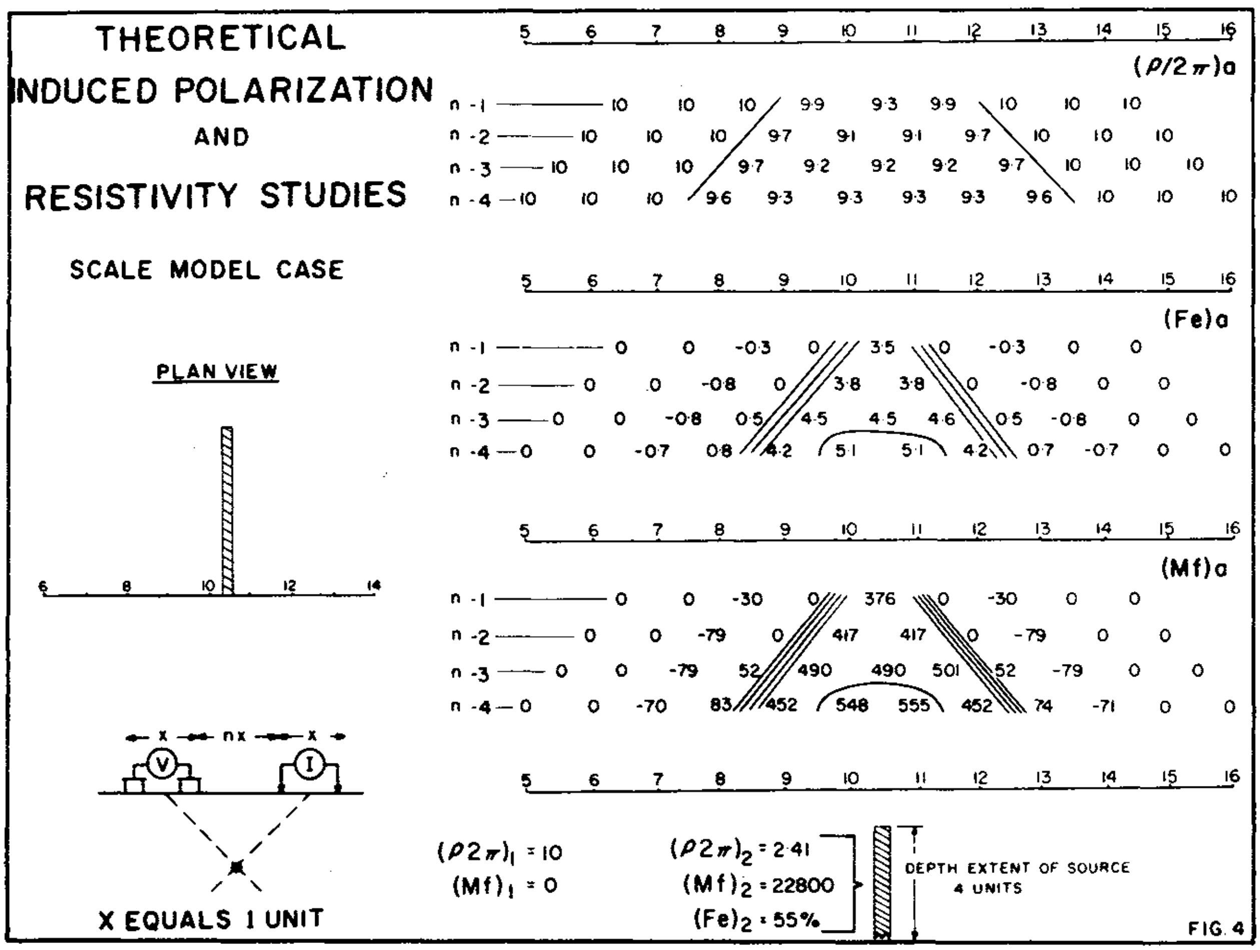


FIG 2

CASE II-1·5-BU-10-a


THEORETICAL
INDUCED POLARIZATION
AND
RESISTIVITY STUDIES
SCALE MODEL CASE
PLAN VIEW
6 8 10 12 14
X nX X
V I
X EQUALS 1 UNIT
5 6 7 8 9 10 11 12 13 14 15 16
(ρ/2π)a
n-1 10 10 10 9.7 8.8 9.7 10 10 10
n-2 10 10 10 9.5 8.7 8.7 9.5 10 10 10
n-3 10 10 10 9.3 8.8 8.9 8.8 9.3 10 10 10
n-4 10 10 10 9.0 8.8 9.0 9.0 8.8 9.2 10 10 10
(Fe)a
n-1 -0.2 0 -0.5 0.7 3.6 0.7 -0.3 -0.2 -0.2
n-2 0 0 -0.6 0.7 4.0 4.0 0.7 -0.6 0 0
n-3 0 0 -0.5 0.7 4.7 4.3 4.6 0.7 -0.6 0 0.2
n-4 0 -0.3 -0.6 1.1 3.5 4.2 4.2 3.5 1.1 -0.6 -0.3 0
(Mf)a
n-1 17 0 -49 72 410 72 -30 -17 17
n-2 0 0 -59 74 460 460 74 -59 0 0
n-3 0 0 -59 75 534 489 523 75 58 0 0
n-4 0 -30 -59 141 382 467 467 363 120 -59 -30 0
(ρ2π)1 = 10
(Mf)1 = 0
(ρ2π)2 = 2.57
(Mf)2 = 11700
(Fe)2 = 30%
DEPTH EXTENT OF SOURCE
4 UNITS
FIG. 3


THEORETICAL
INDUCED POLARIZATION
AND
RESISTIVITY STUDIES
SCALE MODEL CASE
PLAN VIEW
6 8 10 12 14
X nX X
V I
X EQUALS 1 UNIT
5 6 7 8 9 10 11 12 13 14 15 16
(ρ/2π)a
n-1 10 10 10 9.9 9.3 9.9 10 10 10
n-2 10 10 10 9.7 9.1 9.1 9.7 10 10 10
n-3 10 10 10 9.7 9.2 9.2 9.2 9.7 10 10 10
n-4 10 10 10 9.6 9.3 9.3 9.3 9.3 9.6 10 10 10
(Fe)a
n-1 0 0 -0.3 0 3.5 0 -0.3 0 0
n-2 0 0 -0.8 0 3.8 3.8 0 -0.8 0 0
n-3 0 0 -0.8 0.5 4.5 4.5 4.6 0.5 -0.8 0 0
n-4 0 0 -0.7 0.8 4.2 5.1 5.1 4.2 0.7 -0.7 0 0
(Mf)a
n-1 0 0 -30 0 376 0 -30 0 0
n-2 0 0 -79 0 417 417 0 -79 0 0
n-3 0 0 -79 52 490 490 501 52 -79 0 0
n-4 0 0 -70 83 452 548 555 452 74 -71 0 0
(ρ2π)1 = 10
(Mf)1 = 0
(ρ2π)2 = 2.41
(Mf)2 = 22800
(Fe)2 = 55%
DEPTH EXTENT OF SOURCE
4 UNITS
FIG. 4

INDUCED POLARIZATION AND RESISTIVITY RESULTS

BATCHELOR LAKE AREA, QUEBEC.

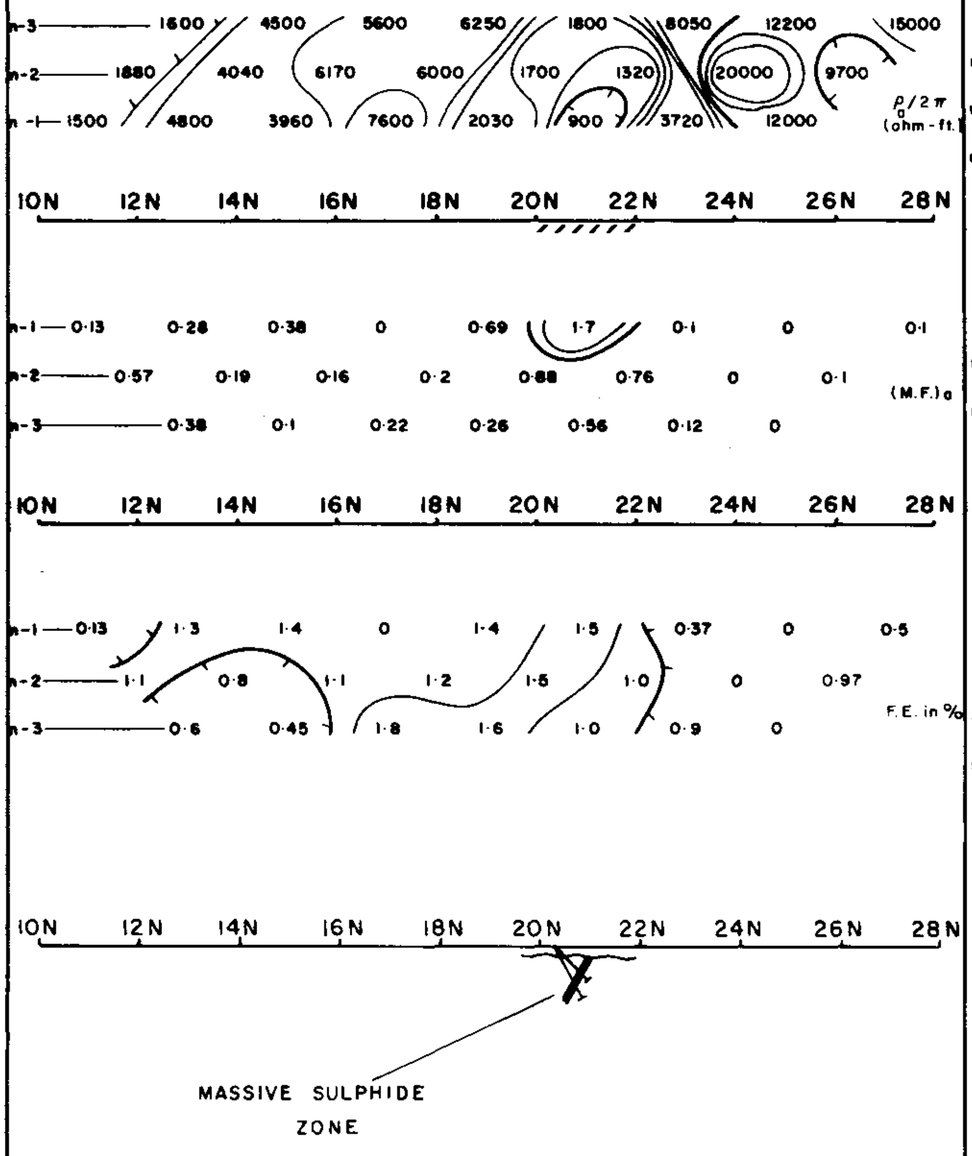


FIG. 5

INDUCED POLARIZATION AND RESISTIVITY RESULTS

BATCHELOR LAKE AREA, QUEBEC.

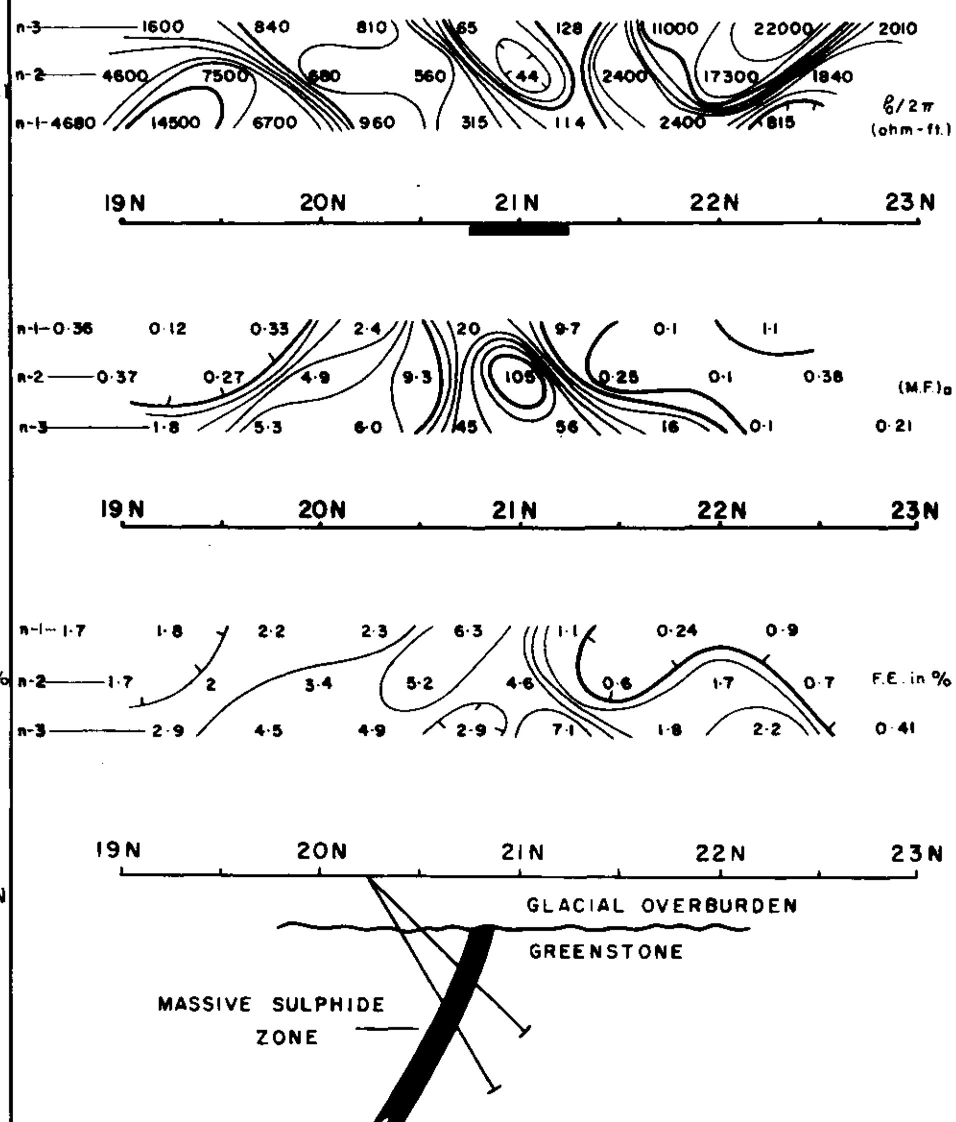


FIG. 6

2813

DWG. NO. - I.P. - 5548 - I

GREAT PLAINS DEVELOPMENT COMPANY OF CANADA LTD.

ROYAL GROUP, ROYAL CANADIAN VENTURES PROPERTY

HIGHLAND VALLEY AREA, KAMLOOPS M.D., B.C.

LINE NO. - 82E, 86E, 90E

ELECTRODE CONFIGURATION

X — NX — X

PLOTTING POINT

X = 400 Ft.

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

FREQUENCIES: 0.31 - 5.0 Hz.

DATE SURVEYED: JUNE 1970

NOTE: I.P. RESULTS SHOWN:

M.F.

% F.E.

$\rho_a/2\pi$

APPROVED

DATE Oct. 9, 1970

PROFILE SCALE

M.F. ONE INCH = 10

F.E. ONE INCH = 2%

$\rho_a/2\pi$, ONE INCH = 500 OHM-FT.

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

PROFILE SCALE

M.F. ONE INCH = 10

F.E. ONE INCH = 2%

$\rho_a/2\pi$, ONE INCH = 500 OHM-FT.

DWG. NO. - I.P. - 5548-2

GREAT PLAINS DEVELOPMENT COMPANY OF CANADA LTD.

ROYAL GROUP, ROYAL CANADIAN VENTURES PROPERTY

HIGHLAND VALLEY AREA, KAMLOOPS M.D., B. C.

LINE NO. - 94E, 98E

ELECTRODE CONFIGURATION

X — NX — X

PLOTTING POINT

X = 400 Ft.

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

FREQUENCIES: 0.31 - 5.0 Hz.

DATE SURVEYED: JULY 1970

APPROVED:

DATE: Oct. 9, 1970

NOTE: I.P. RESULTS SHOWN:

M.F.

% F.E.

$\rho_a/2\pi$

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

PROFILE SCALE

M.F. ONE INCH = 10

F.E. ONE INCH = 2%

$\rho_a/2\pi$, ONE INCH = 500 OHM-FT.

DWG. NO. - I.P. - 5548 - 3

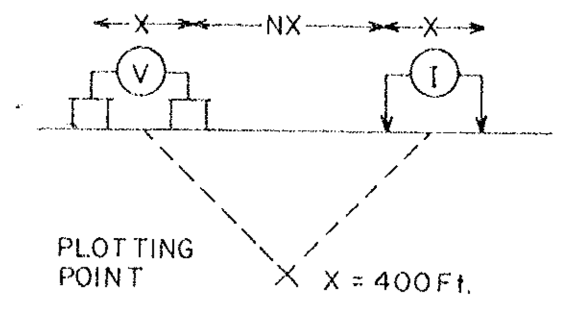
GREAT PLAINS DEVELOPMENT COMPANY OF CANADA LTD.

ROYAL GROUP, ROYAL CANADIAN VENTURES PROPERTY

HIGHLAND VALLEY AREA, KAMLOOPS M. D., B. C.

LINE NO. - 102E, 106E

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

FREQUENCIES: 0.31 - 5.0 Hz.

DATE SURVEYED: JULY 1970

NOTE: I.P. RESULTS SHOWN:

M.F.

% F.E.

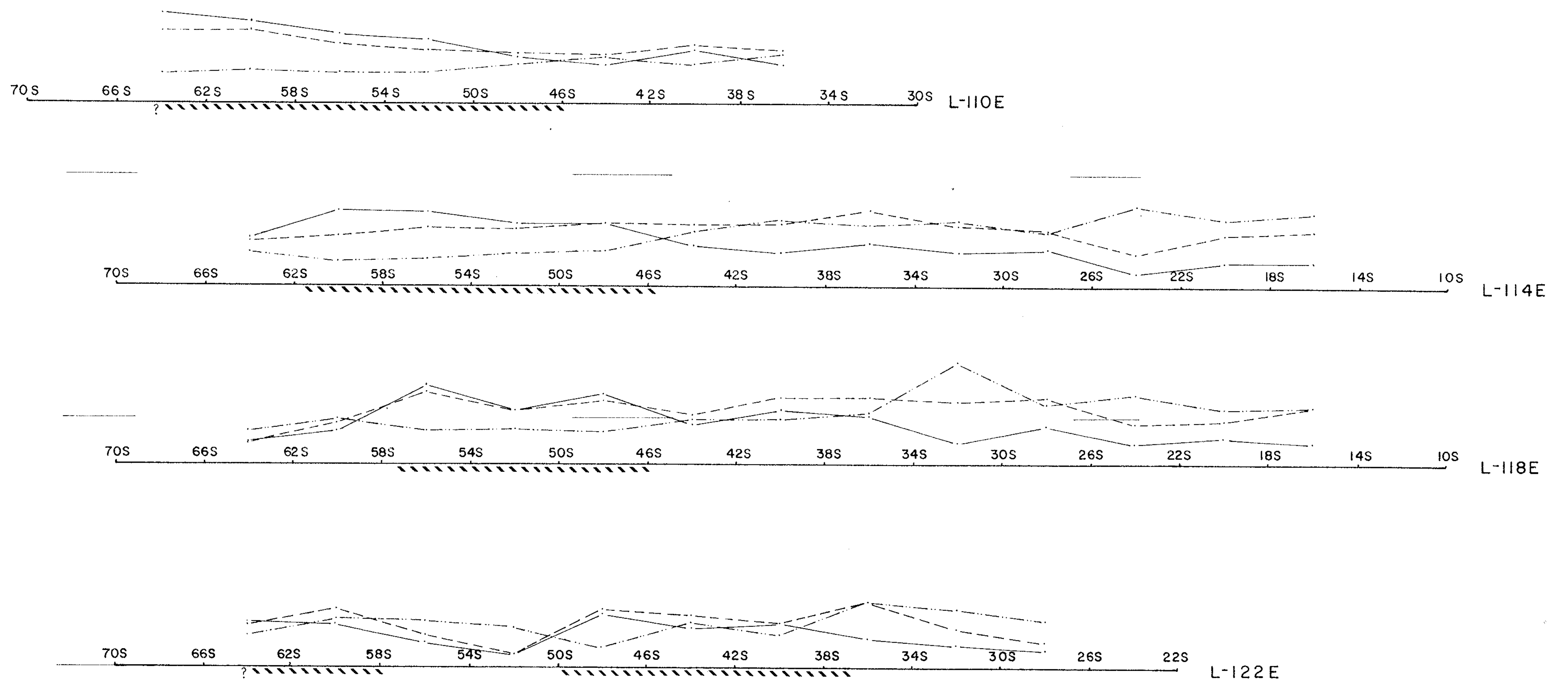
$\rho_a/2\pi$

APPROVED

DATE: Oct. 9, 1970

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY



PROFILE SCALE

M.F. ONE INCH = 10
F.E. ONE INCH = 2%
$\rho_a/2\pi$, ONE INCH = 500 OHM-FT.

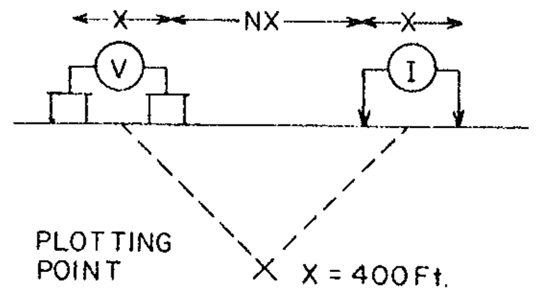
DWG. NO. - I.P. - 5548 - 4

GREAT PLAINS DEVELOPMENT COMPANY OF CANADA LTD.

ROYAL GROUP, ROYAL CANADIAN VENTURES PROPERTY

HIGHLAND VALLEY AREA, KAMLOOPS M.D., B.C.

LINE NO. - 110E, 114E, 118E, 122E



SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31 - 5.0 Hz.

DATE SURVEYED: JULY 1970

APPROVED:

NOTE: I.P. RESULTS SHOWN:

M.F.
%F.E.
$\rho_a/2\pi$

DATE: Oct. 9, 1970

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

DWG. I.P.P.-4666

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

PLAN MAP

-NOTE-

TO ACCOMPANY GEOPHYSICAL REPORT BY W. H. PELTON, GEOPHYSICIST, AND P. G. HALLOF, P. ENG., FOR GREAT PLAINS DEVELOPMENT COMPANY OF CANADA LIMITED, ON THE ROYAL GROUP, ROYAL CANADIAN VENTURES PROPERTY, HIGHLAND VALLEY AREA, KAMLOOPS M.D., B.C.

DATED: OCTOBER 9, 1970

2813 M-1

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

Number of the end of anomaly indicates spread used

GREAT PLAINS DEVELOPMENT COMPANY OF CANADA LTD.

ROYAL GROUP, ROYAL CANADIAN VENTURES PROPERTY

HIGHLAND VALLEY AREA, KAMLOOPS M.D., B.C.

SCALE

ONE INCH EQUALS FOUR HUNDRED FEET

ANOMALOUS I.P. ZONES

DRAWN: P.J.H.

DATE: SEPT. 1970

APPROVED:

DATE: Oct. 9, 1970

DWG. I.P.P.-4666