REPORT ON THE INDUCED POLARIZATION AND RESISTIVITY SURVEY OF THE SOUTH (#1) GROUP STURGEON LAKE AREA PATRICIA MINING DIVISION, ONTARIO FOR SCANDIA MINING AND EXPLORATION LTD.

McPHAR GEOPHYSICS LIMITED

REPORT ON THE INDUCED POLARIZATION AND RESISTIVITY SURVEY OF THE SOUTH (#1) GROUP STURGEON LAKE AREA PATRICIA MINING DIVISION, ONTARIO FOR SCANDIA MINING AND EXPLORATION LTD.

1. INTRODUCTION

At the request of Mr. B. Kvendbo, President of Scandia Mining and Exploration Limited, we have carried out a combined induced polarization and resistivity survey on the company's South, or Number 1, Claim Group in the Sturgeon Lake area of northwestern Ontario. The property is of interest because it adjoins on the west side of Abitibi Block #7, on which Mattagami Lake Mines has discovered a large copper-zinc-silver ore body. The present survey was carried out in late October and early November of 1970 on the following claims, to search for concentrations of metallic mineralization.

Claims

250,004	250,832
250,005	250,833
250,830	250,834
250,831	

2. PRESENTATION OF RESULTS

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

East Boundary	200 foot spreads	Dwg. IP 5604-1
Line 3W	200 foot spreads	Dwg. IP 5604-2
Line 3W	100 foot spreads	Dwg. IP 5604-3
Line 6W	200 foot spreads	Dwg. IP 5604-4
Line 6W	100 foot spreads	Dwg. IP 5604-5
Line 9W	200 foot spreads	Dwg. IP 5604-6
Line 12W	200 foot spreads	Dwg. IP 5604-7
Line 15W	200 foot spreads	Dwg. IP 5604-8
Line 18W	200 foot spreads	Dwg. IP 5604-9
Line 21W	200 foot spreads	Dwg. IP 5604-10
Line 24W	200 foot spreads	Dwg. IP 5604-11

Enclosed with this report is Dwg. I.P.P. 4704, a plan map of the grid at a scale of 1" = 200'. 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 200' spreads the position of a narrow sulphide body can only be determined to lie between two stations 200' 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 center 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

According to Ontario Department of Mines Preliminary map #590, the central and northern parts of the property are underlain by mafic to intermediate volcanic flows and pyroclastics and the south part by migmatites. Previously, the Company had carried out magnetometer and electromagnetic surveys. This work indicated a short conductor, coincident with a magnetic anomaly, on the east part of the claim group.

The IP survey was carried out on the same grid as the previous surveys (i.e. north-south lines at 300-foot intervals) using 200-foot electrode intervals. In a few instances, anomalies were detailed using 100-foot intervals. The results from each traverse are described below.

East Boundary Line

This short line was intended to check a small magnetic anomaly between 26N and 28N. The IP results show a low magnitude, but fairly definite, anomaly centered at 27N. Since the source of this anomaly appears to be shallow and narrow relative to the 200-foot electrode interval, it could be better evaluated by detailing with shorter electrode intervals as described in the Appendix following this report.

Line 3W

The results from Line 3W are typical of the entire grid, in that they show very high resistivities and low background IP effects. A definite anomaly of low to moderate magnitude was found between 11N and 14N, coincident with the EM conductor and a weak magnetic high. This feature is identified as Zone A on the accompanying plan. The source of the IP anomaly appears to be broad and at some depth. In addition, there are minor increases in the IP effects at 6N and at 16N to 18N.

Part of the line was subsequently detailed using 100-foot separations. This work indicated a shallow portion of Zone A centered at station 12N and confirmed the weak anomaly near 6N.

Line 6W

On this line, Zone A is shallow and centered between 10N and 12N, coincident with a weak EM anomaly and a magnetic high with about 1200 gammas relief.

The detail results indicate a shallow, narrow source centered at 11N to 12N, and a weak anomaly at 15N to 16N that has been identified as Zone B.

Line 9W

Similar results were obtained here, with Zone A centered at 10N to 12N. The EM conductor apparently does not extend this far west but there is a magnetic anomaly centered at 10+50N.

Line 12W

Here Zone A occurs between 8N and 12N, with the strongest section at depth under 10N. The magnetometer results show only a one-station low at 9N but it might be of interest to fill in the traverse with readings every 50 feet to check for a narrow zone.

Line 15W

Zone A appears to consist of two closely-spaced sources on this line, a shallow feature near 7N and a deep feature at 9N. No significant magnetic relief was measured in the vicinity of the IP anomaly.

Line 18W

Here Zone A is appreciably stronger, with the main section at depth under station 9N; there is a magnetic high at 7N, corresponding with the shallow weak section of the IP anomaly.

Line 21W

Similar results were obtained here although the anomaly is not as strong as on Line 18N.

Line 24W

Zone A is broader on Line 24W and appears to include a shallow section at 3N and a deep section at 5N to 6N. This correlates exactly with a magnetic high with 800 - 1000 gammas relief.

4. SUMMARY AND RECOMMENDATIONS

The geophysical results indicate an anomalous zone trending east-northeast across the property for a distance of 2200 feet, still open in both directions. This feature has been labelled Zone 'A' on the accompanying plan. The eastern part of the zone correlates with an EM conductor but no EM response was obtained over the center or western sections. Similarly, the eastern section is coincident with a magnetic high, but there is also magnetic expression on Line 18W and Line 24W. If the source of the IP zone can not be established from examination of outcrops, then a drill test would be warranted. A short hole could be drilled on Line 6W, to pass under 11+50N at a vertical depth of 100 to 150 feet to investigate the shallow part of the zone. A longer hole should probably be drilled on Line 18W, under 9+00N at a vertical depth of 200 to 250 feet, to investigate the strongest part of the zone.

No clear indication of the direction of dip could be obtained from the IP results, except that the source appears to be nearly vertical. Consequently, the direction of drilling should be governed by the regional dip of the volcanics.

Weak anomalies were located north of Zone A on Line 3W and Line 6W and these have been correlated to form Zone B. There is also a definite anomaly on the east boundary at 27N. In view of the limited length of these features on the Company's ground, drilling does not seem to be warranted at this time.

McPHAR GEOPHYSICS LIMITED

Robert A. Bell,
Geologist.

Philip G. Hallof,
Geophysicist.

Dated: November 27, 1970.

Permission is granted to use in whole or in part for assessment and qualification requirements but not for advertising purposes without prior written consent from McPhar Geophysics Limited.

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

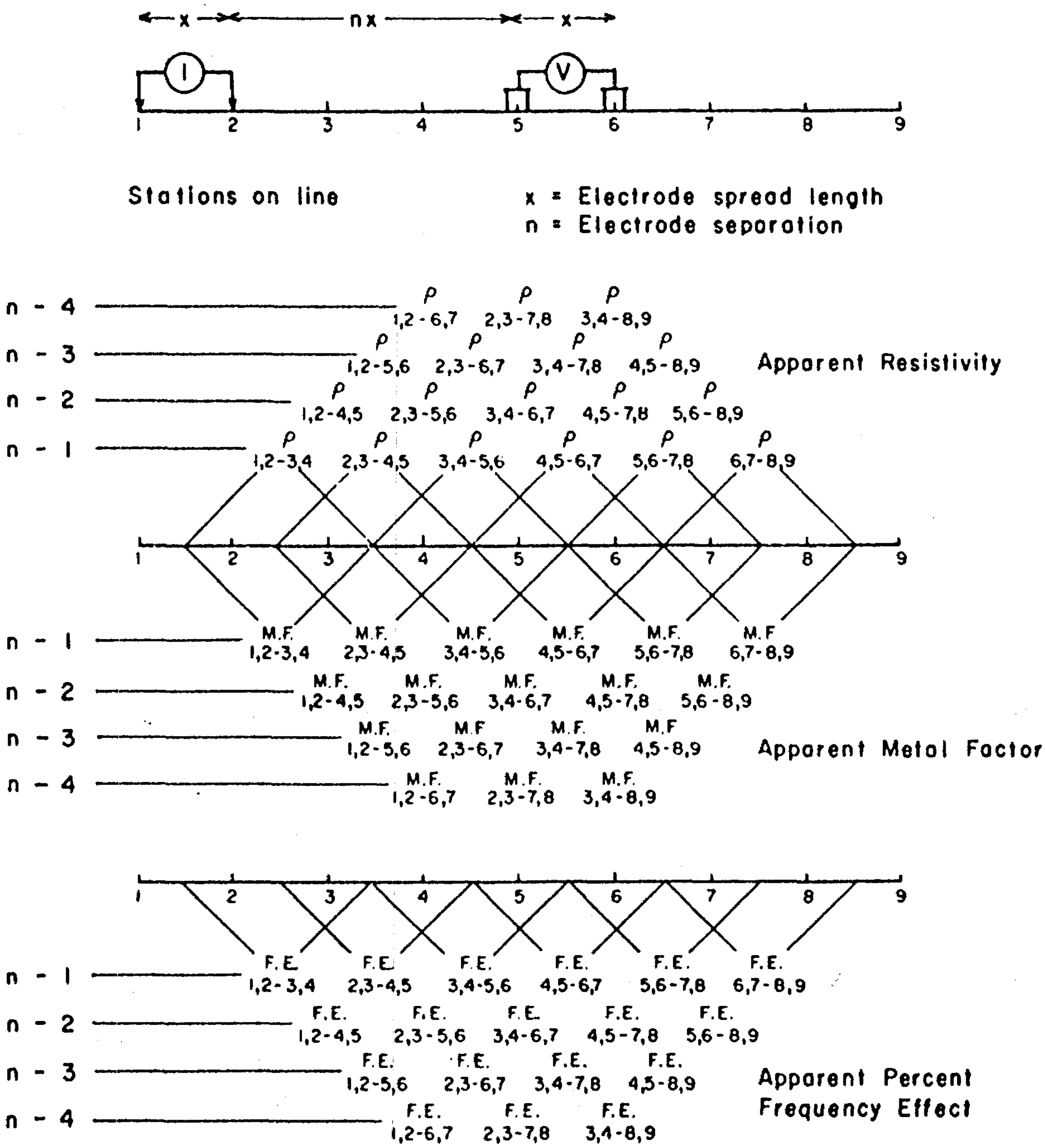


Fig. A

APPENDIX

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

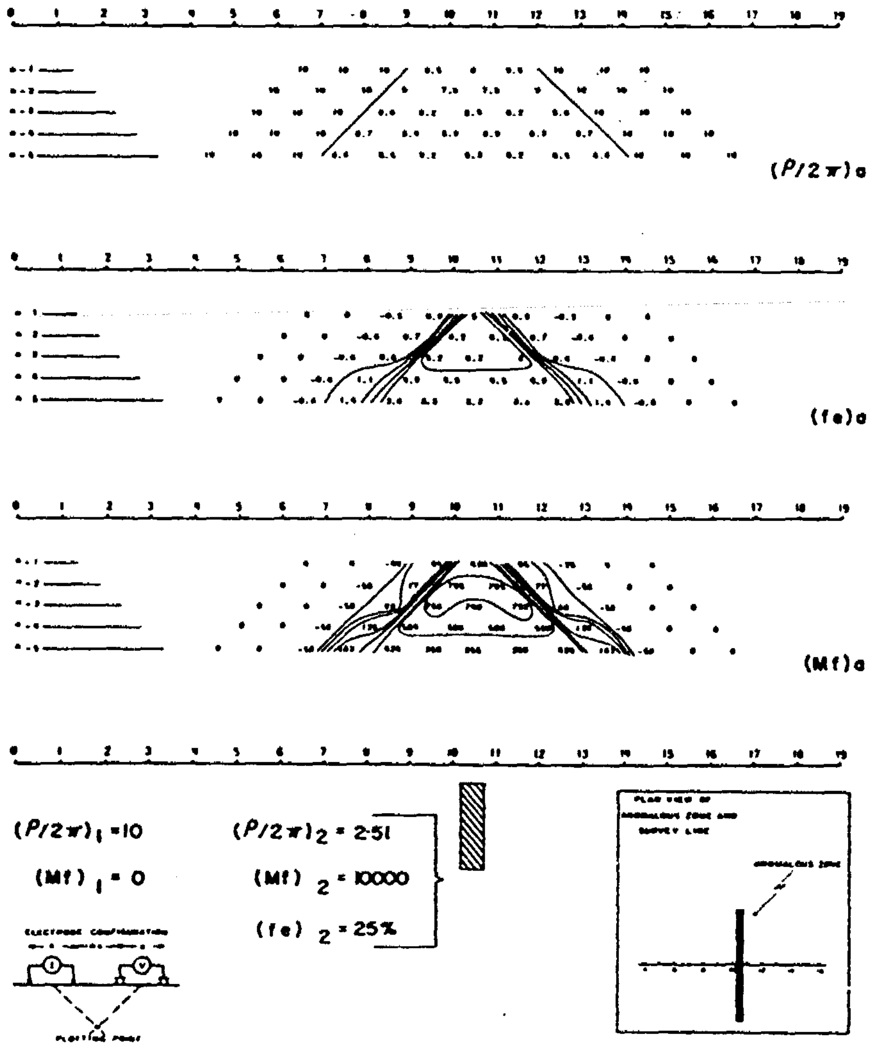


FIG 1

CASE II-0.5-8U-10-a

McPHAR GEOPHYSICS LIMITED

Theoretical Induced Polarization and Resistivity Studies

Scale Model Cases

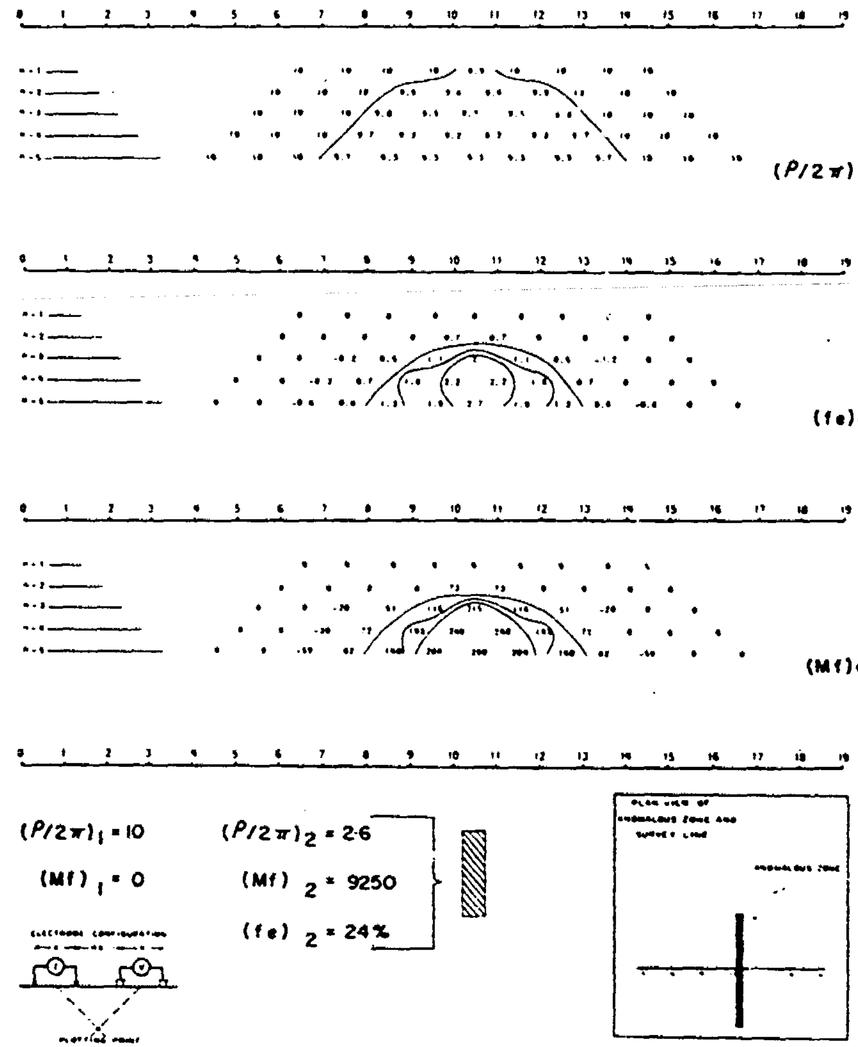
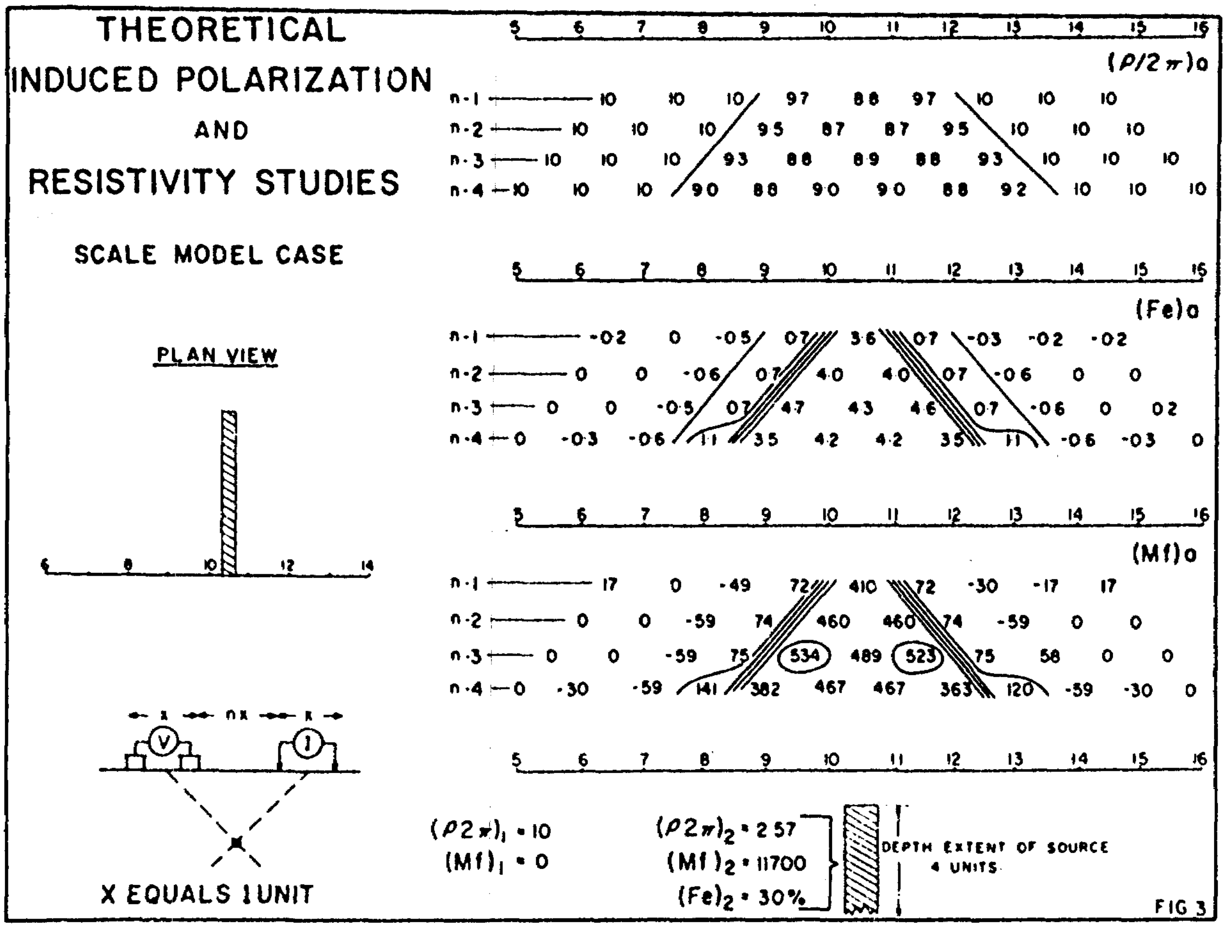
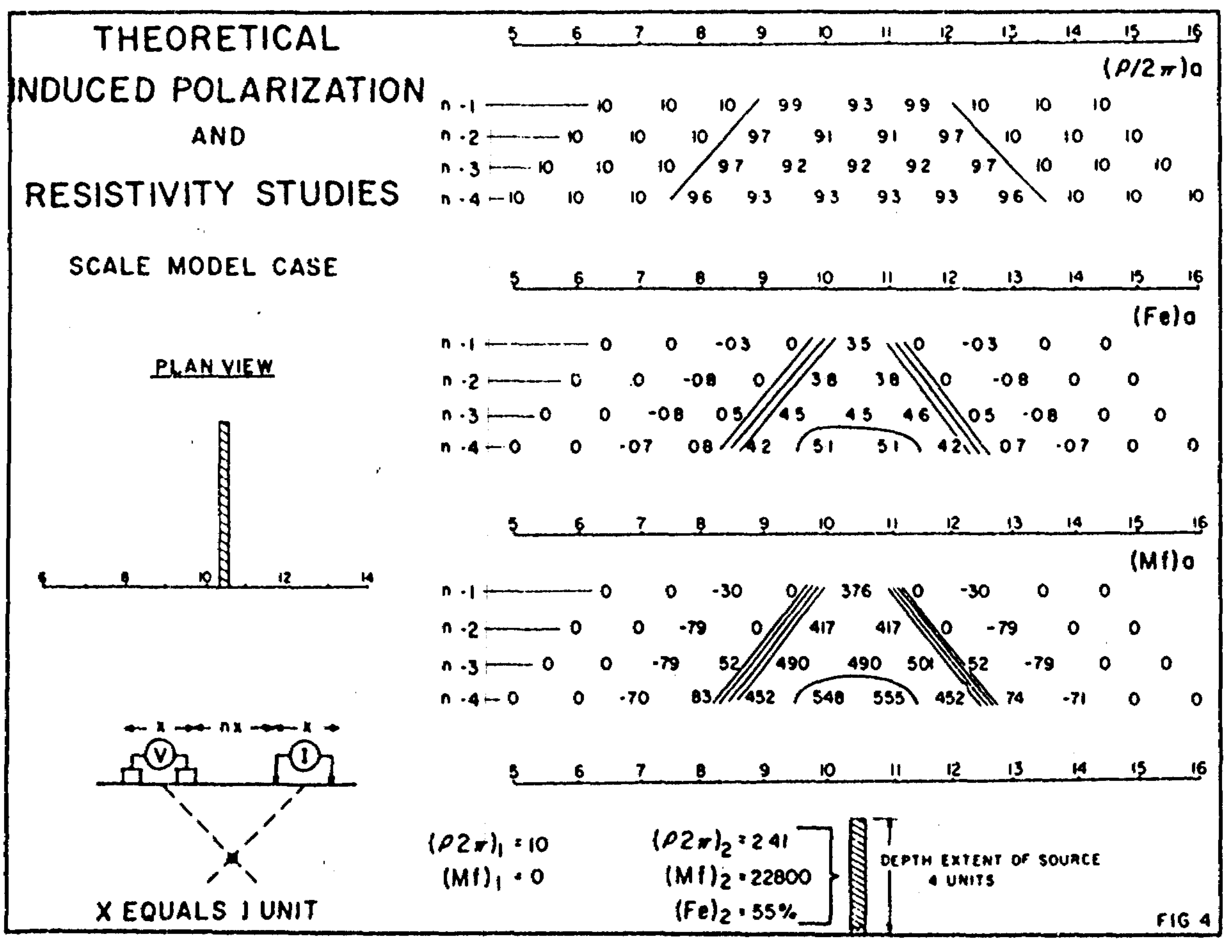


FIG 2

CASE II-1.5-8U-10-a

- 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 97 88 97 10 10 10
n-2 10 10 10 95 87 87 95 10 10 10
n-3 10 10 10 93 88 89 88 93 10 10 10
n-4 10 10 10 90 88 90 90 88 92 10 10 10
(Fe)a
n-1 -02 0 -05 07 3.6 07 -03 -02 -02
n-2 0 0 -06 07 4.0 4.0 07 -06 0 0
n-3 0 0 -05 07 4.7 4.3 4.6 07 -06 0 02
n-4 0 -03 -06 11 3.5 4.2 4.2 3.5 11 -06 -03 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 99 93 99 10 10 10
n-2 10 10 10 97 91 91 97 10 10 10
n-3 10 10 10 97 92 92 92 97 10 10 10
n-4 10 10 10 96 93 93 93 93 96 10 10 10
(Fe)a
n-1 0 0 -03 0 35 0 -03 0 0
n-2 0 0 -08 0 38 38 0 -08 0 0
n-3 0 0 -08 05 45 45 46 05 -08 0 0
n-4 0 0 -07 08 42 51 51 42 07 -07 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.

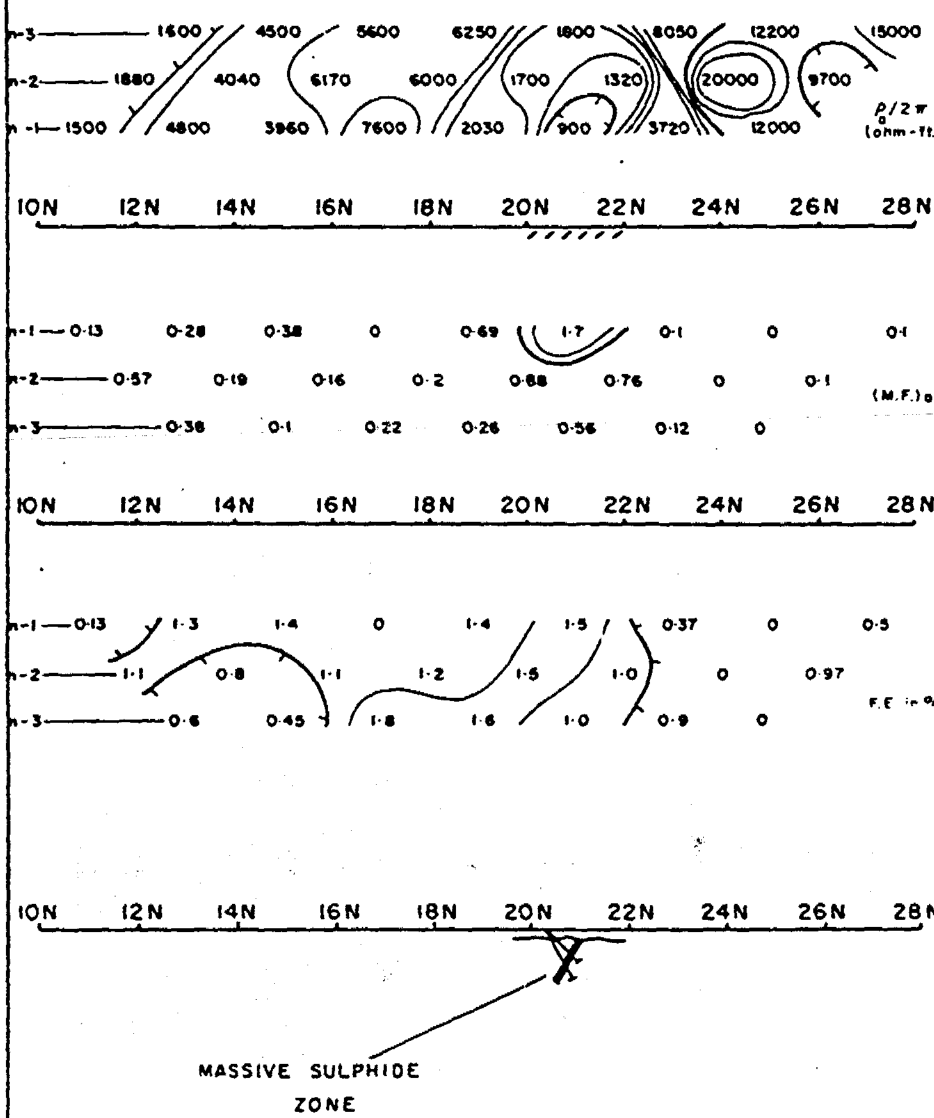


FIG 5

INDUCED POLARIZATION AND RESISTIVITY RESULTS

BATCHELOR LAKE AREA, QUEBEC.

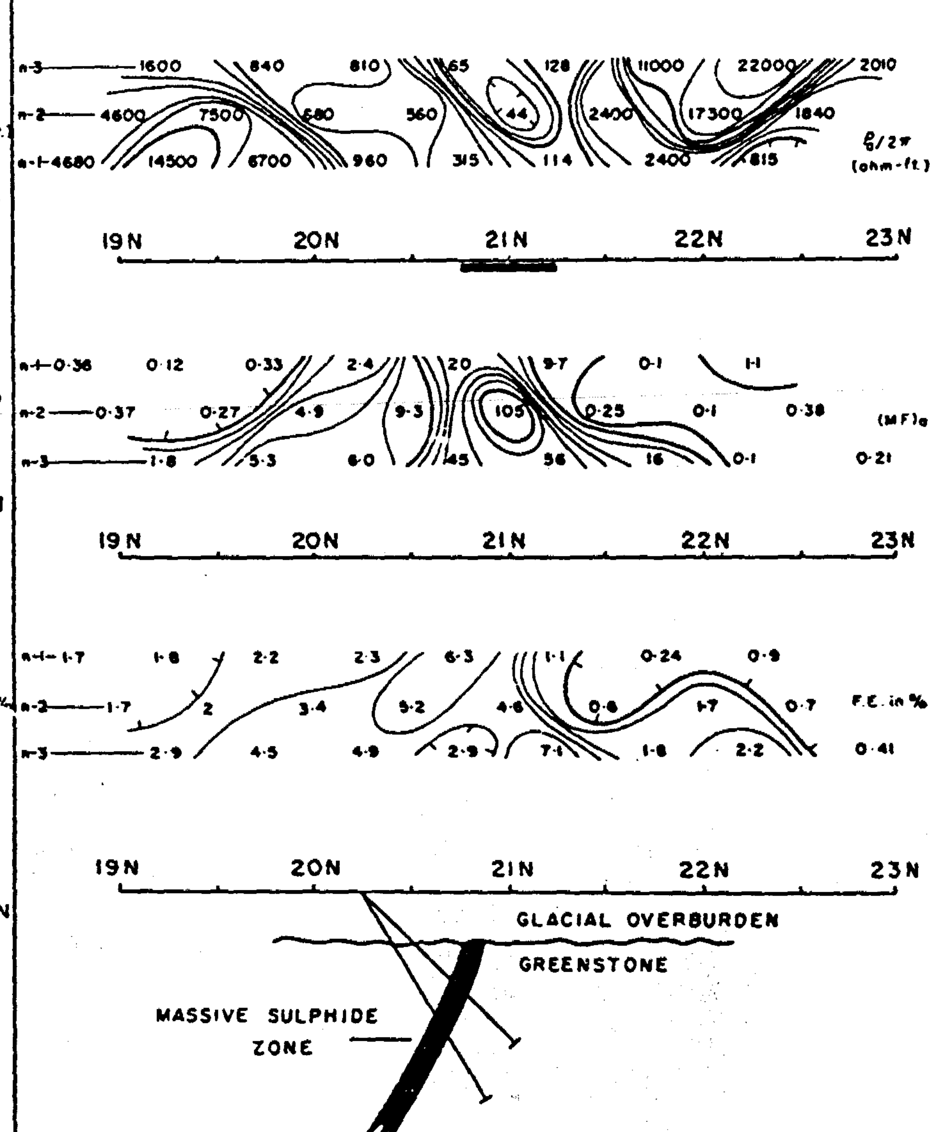


FIG. 6

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.

*

INTERIM STATEMENT OF COST

Scandia Mining & Exploration Ltd.

Sturgeon Lake Area, Ontario.

Crew - (2 men) - J.L. Mark - J. Garland

7 days Operating		@ $265.00/day	$1,855.00
1½ days Preparation)			
4 days Travel) 6 days		@ $100.00/day	600.00
½ day Bad Weather)			
Less than 10 Operating days			200.00
			2,655.00
Extra Labour	$417.00		
+ 20%	83.40		
	500.40		500.40
			$3,155.40

McPHAR GEOPHYSICS LIMITED

Robert A. Bell

Robert A. Bell,
Geologist

* Note: This statement reflects at least 90% of the total cost; there may be a few minor charges not yet received by us and hence not included in the foregoing.

Dated: November 27, 1970

ASSESSMENT DETAILS

PROPERTY: South Group		MINING DIVISION: Patricia	
SPONSOR: Scandia Mining & Exploration Ltd.		PROVINCE: Ontario	
LOCATION: Sturgeon Lake Area			
TYPE OF SURVEY: Induced Polarization			
OPERATING MAN DAYS:	28	DATE STARTED: October 30, 1970	
EQUIVALENT 8 HR. MAN DAYS:	42	DATE FINISHED: November 11, 1970	
CONSULTING MAN DAYS:	2	NUMBER OF STATIONS:	144
DRAUGHTING MAN DAYS:	6	NUMBER OF READINGS:	1392
TOTAL MAN DAYS:	50	MILES OF LINE SURVEYED:	4.38

CONSULTANTS:
Robert A. Bell, 50 Hemford Crescent, Don Mills, Ontario.
Philip G. Hallof, 5 Minorca Place, Don Mills, Ontario.

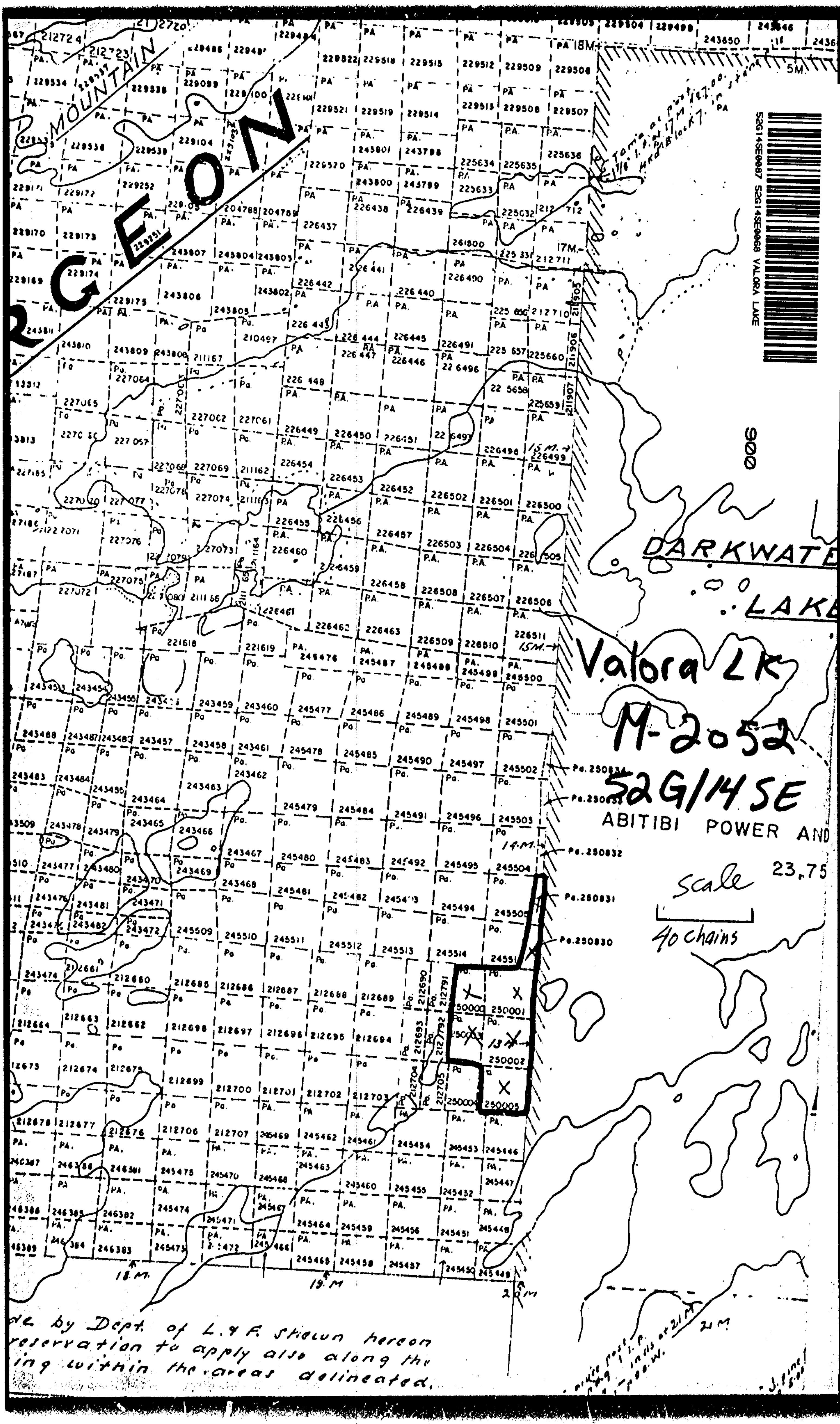
FIELD TECHNICIANS:
J.L. Mark, 61 Borden Street, Toronto 4, Ontario.
J. Garland, 86 Augusta Street, Port Hope, Ontario.
Extra Labourers:
J. Leffering, R.R. #2, Markham, Ontario.
F. Lajoie, General Delivery, Ignace, Ontario.

DRAUGHTSMEN:
N. Lado, 1355 Lakefield Street, Oshawa, Ontario.
Yuri Dojc, 20 Roselawn Ave., Apt. 3, Toronto, Ontario.
B. Marr, 19 Kenewen Court, Toronto 16, Ontario.

McPHAR GEOPHYSICS LIMITED

Robert A. Bell,
Geologist.

Dated: November 27, 1970



STURGEON
MOUNTAIN
DARKWATER
LAKE
Valora LK
M-2052
52G/14SE
ABITIBI POWER AND
scale
40 chains
23,75
18M.
17M.
15M.
14M.
13M.
19 M
20M
21M
900
52G14SE0087 52G14SE0068 VALORA LAKE

Single group (group No. 1)

PERFORMANCE & COVERAGE CREDITS

ASSESSMENT WORK DETAILS

Township or Area: Sturgeon Lake Area

Type of Survey: Induced Polarization Survey
A separate form is required for each type of survey

Chief Line Cutter or Contractor: ____ (Name) ____ (Address)

Party Chief: ____ (Name) ____ (Address)

Consultant: Dr. R. Boll, McPhar Geophysics Ltd., (Name)
139 Bond Avenue, Don Mills, Ontario. (Address)

COVERING DATES

Line Cutting: ____

Field: Induced Polarization Survey Oct. 30/70 to Nov. 11/70
Instrument work, geological mapping, sampling etc.

Office: Nov. 15/70 to Nov. 27/70

INSTRUMENT DATA

Make, Model and Type: See Catalogue

Scale Constant or Sensitivity: See Catalogue

Or provide copy of instrument data from Manufacturer's brochure.

Radiometric Background Count: ____

Number of Stations Within Claim Group: 144

Number of Readings Within Claim Group: 1392

Number of Miles of Line cut Within Claim Group: 4.38

Number of Samples Collected Within Claim Group: ____

CREDITS REQUESTED

	20 DAYS per claim	40 DAYS per claim	Includes (Line cutting)
Geological Survey	☐	☐	
Geophysical Survey	☒	☐	Show Check ✓
Geochemical Survey	☐	☐	

DATE: Toronto Dec. 1, 1970

SIGNED: X Robert W. Boll

MINING CLAIMS TRAVERSED

List numerically

PA250000
PA250001
PA250002
PA250003
PA250004
PA250005
PA250830
PA250831
PA250832
PA250833
PA250834

If space insufficient, attach list

PROJECTS SECTION TORONTO RECEIVED DEC 2 1970 AM 7 8 9 10 11 12 1 2 3 4 5 6 PM

TOTAL: 11 Claims

Send in duplicate to:
FRED W. MATTHEWS
SUPERVISOR-PROJECTS SECTION
DEPARTMENT OF MINES & NORTHERN AFFAIRS
WHITNEY BLOCK
QUEEN'S PARK
TORONTO, ONTARIO

Performance and coverage credits do not apply to airborne surveys

AREA CODE — 416
TELEPHONE — 365-6918

ONTARIO

WHITNEY BLOCK
QUEEN'S PARK
TORONTO 182, ONT.

DEPARTMENT OF MINES AND NORTHERN AFFAIRS
MINING LANDS BRANCH

May 7th, 1971.

Mr. J. A. Stocking,
Acting Mining Recorder,
Court House,
Sioux Lookout, Ontario.

Re: Mining Claims PA. 250000 et al,
S. W. Part of Sturgeon Lake Area,
File No. 2.204

Dear Sir:

The Geophysical (Induced Polarization) assessment work credits as listed with my Notice of Intent dated April 22nd, 1971, have been approved as of the date above. Please inform the recorded holder and so indicate on your records.

Yours very truly,

Fred W. Matthews,
Supervisor,
Projects Section.

c.c.Scandia Mining & Exploration Ltd.,
Suite 1005, 50 Place Cremazie,
Montreal 351, P.O.

c.c.McPhar Geophysics Limited,
139 Bond Avenue,
Don Mills, Ontario.

c.c.Mr. Robert A. Bell,
139 Bond Avenue,
Don Mills, Ontario.

c.c.Mr. H.L. King,
Resident Geologist,
808 Robertson St.,
Kenora, Ontario. ✓

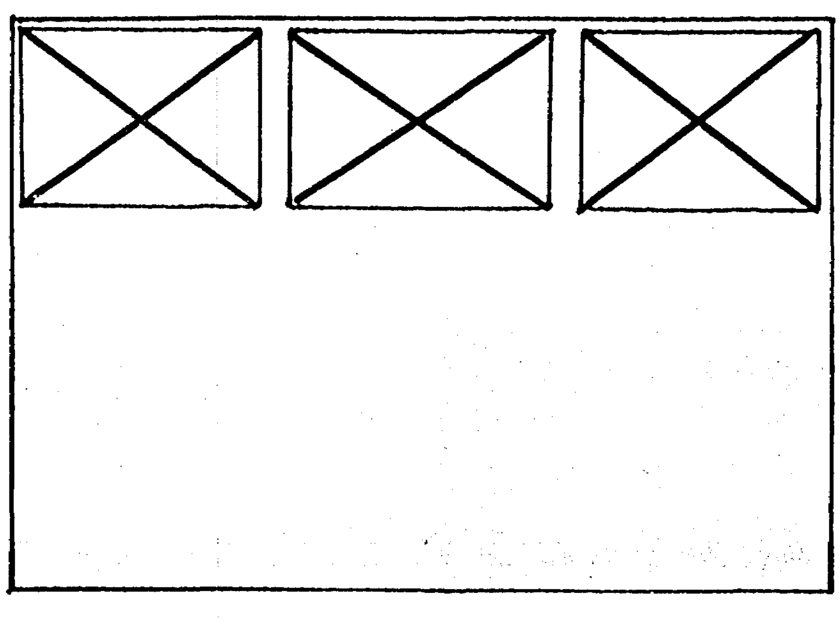
FWM/mr

SEE ACCOMPANYING MAP(S) IDENTIFIED AS

52G/14SE-0068 #1-3

LOCATED IN THE MAP CHANNEL IN THE FOLLOWING SEQUENCE

(X)



FOR ADDITIONAL INFORMATION SEE MAPS:

52G/14SE-0068 # 4-5