4331

REPORT ON THE 92I/7W
INDUCED POLARIZATION
AND RESISTIVITY SURVEY
ON THE Fin, Luck
KRISTIAN ROSS PROPERTY,
MERRITT AREA,
NICOLA MINING DIVISION, B.C.
FOR
RIO PLATA SILVER MINES LTD.

BY

PHILIP G. HALLOF, Ph. D.

AND

MARION A. GOUDIE, B.Sc.

NAME AND LOCATION OF PROPERTY:
KRISTIAN ROSS PROPERTY, MERRITT AREA
NICOLA MINING DIVISION, B.C. 50°17'N - 120°51'W
DATE STARTED: MARCH 26, 1973
DATE FINISHED: MARCH 31, 1973

## TABLE OF CONTENTS

# McPHAR GEOPHYSICS

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

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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 ($\Delta V$) 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 ($\Delta V$) 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

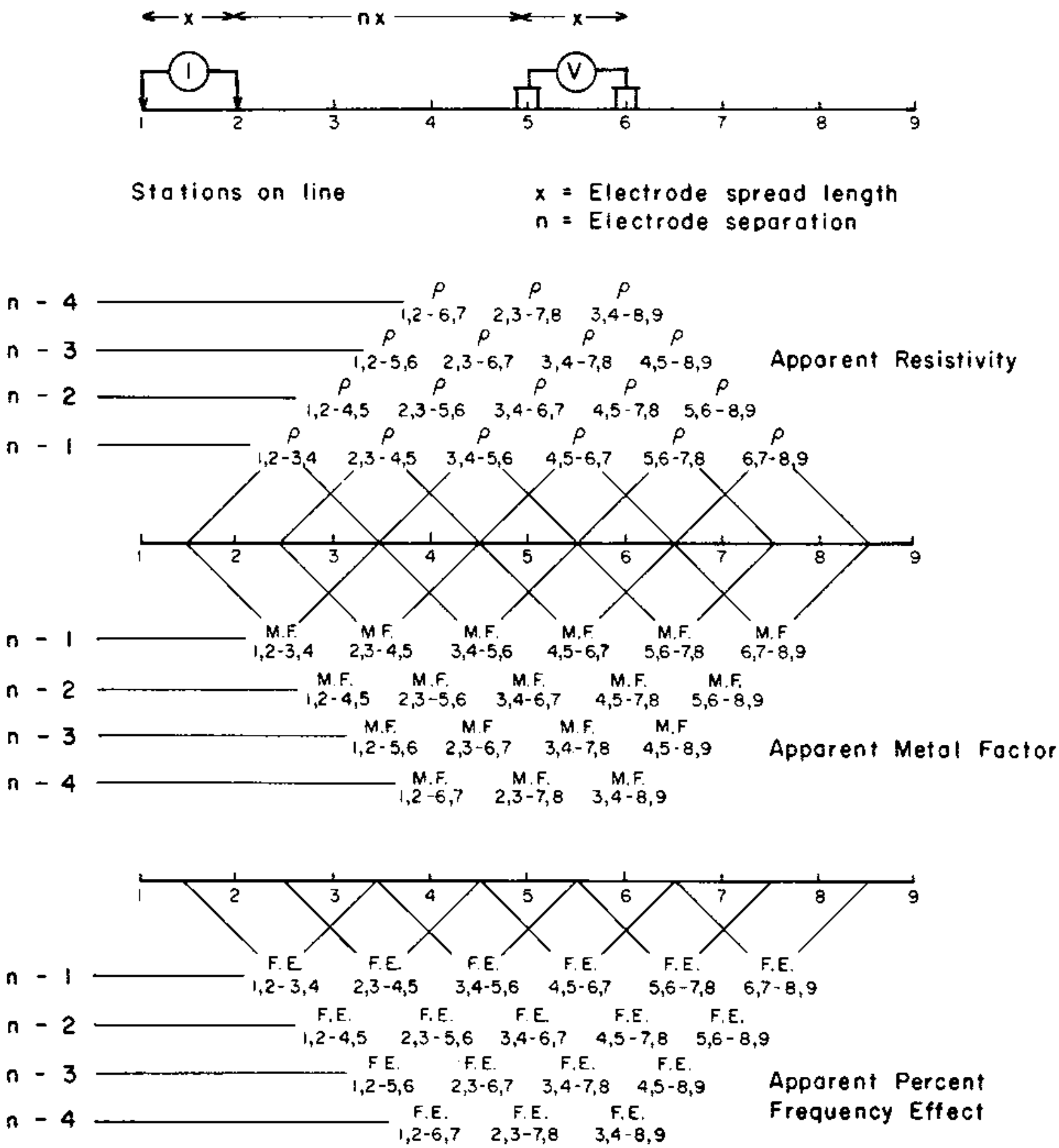


Fig. A

# McPHAR GEOPHYSICS LIMITED

REPORT ON THE

INDUCED POLARIZATION

AND RESISTIVITY SURVEY

ON THE

KRISTIAN ROSS PROPERTY,

MERRITT AREA,

NICOLA MINING DIVISION, B.C.

FOR

RIO PLATA SILVER MINES LTD.

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## 1. INTRODUCTION

At the request of the client, we have completed an Induced Polarization and Resistivity survey on the Kristian Ross Property in the Merritt area, Nicola Mining Division, B.C. for Rio Plata Silver Mines Ltd. The survey grid lies 16 miles northeast of Merritt, B.C., the centre of which is at 50°17'N latitude and 120°51'W longitude. The country rock underlying the claims belongs to the Guichon Creek batholith, with basic intrusives of the Chataway variety of the Highland Valley phase.

The probable mineralization is a porphyry copper deposit with associated molybdenite. The IP survey was carried out to locate any economic deposit of metallic mineralization which might be present in the survey area.

The work was completed in the last week of March, 1973, using a McPhar P660 high power variable frequency IP unit operating at 0.3 and 5.0 Hz over the following claims:

Fin: 17, 35, 36, 37, 38

Luck: 1, 2, 11, 12, 13, 14, 15, 16, 21, 23

These claims are assumed to be owned or held under option by Rio Plata Silver Mines Ltd.

## 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.

| Line | Electrode Intervals | Dwg. No. |
|---|---|---|
| 1200N | 400 feet | IP 6061-1 |
| 800N | 400 feet | IP 6061-2 |
| 400N | 400 feet | IP 6061-3 |
| 0 | 400 feet | IP 6061-4 |
| 400S | 400 feet | IP 6061-5 |
| 800S | 400 feet | IP 6061-6 |
| 1200S | 400 feet | IP 6061-7 |
| 1600S | 400 feet | IP 6061-8 |

Also enclosed with this report is Dwg. I.P.P. 3575, a plan map of the Kristian Ross Property Grid at a scale of 1" = 400'. 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 200' electrode intervals the position of a narrow sulphide body can only be determined to lie between two stations 200' apart. In order to definitely locate, and full 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 claim information shown on Dwg. I.P.P. 3575 has been taken from maps made available by the staff of Rio Plata Silver Mines Ltd.

## 3. DISCUSSION OF RESULTS

The IP survey located anomalies on all of the lines, but these anomalies reflected for the most part a source or sources of very weakly disseminated mineralization. In addition, the mineralization appears to be erratic and there is no continuous zone of any large extent. However, if one of the source minerals were to be molybdenum, the mineralization could be of some importance (see Appendix).

A discussion of the anomalies follows:-

Line 1200N

Two weak anomalies were located from 2E to 10E and from 18E to 26E. The tops of the sources in both anomalies lie near 200' in depth.

Line 800N

A weak anomaly extends from 2W to 6E. The anomaly may be incomplete at the western end of the line; the pattern is incomplete. The source is relatively shallow.

A probable anomaly is just barely indicated at the eastern end of the line; here again the pattern is incomplete. The top of the source beneath 24E appears on n = 4, or at a depth near 400' and beneath 28E the source is less than 200' deep. The pattern suggests a possible change in rock type at 26E.

Line 400N

A weak anomaly with a relatively shallow source extends from 2E to 6E. A probable anomaly extends from 22E to the end of line, incomplete. The top of the source appears to be about 200' in depth.

Line 0

The line is very weakly anomalous from 2E to 22E, with the anomaly becoming somewhat stronger from 22E to the end of the line, where the top of the source lies near 200' in depth. Again the anomaly is incomplete to the east.

Line 400S

A weak anomaly was located from 2E to 14E. The top of the source varies in depth from less than 200' to 200'.

Line 800S

A probable, incomplete anomaly from 6W to 2E is flanked by a weaker portion from 2E to 6E. Shallow, weak anomalies extend from 10E to 14E, 18E to 22E and 24E to 28E, the latter incomplete.

Line 1200S

A weak anomaly from 2E to 10E reflects a very weak source which is underlain by a source of slightly more concentrated mineralization. This is reflected by the probable anomaly from 10E to 14E. A weak, shallow anomaly was located from 18E to 22E.

Line 1600S

A shallow, probable anomaly extends from 2E to 10E. This is the best anomaly of the survey. It is flanked by a weak anomaly from 10E to 18E.

## 4. CONCLUSIONS AND RECOMMENDATIONS

The IP survey located anomalies on all lines, but they appear to represent weak, erratic mineralization. However, the electrode interval spacing is large enough that a good deal of barren rock can be averaged into the readings. It is recommended that some of the shallower anomalies be detailed with shorter electrode spacings, e.g. 200' intervals, then if the anomalies are still shallow, even shorter intervals. It would be much more effective to choose drilling targets from such detailed surveying, as the source can be located more definitely. Anomalies recommended for such detail are on Line 1600S, Line 1200S and Line 800S. Further work could then be recommended on the basis of the results.

If a drill target is required on the basis of this work, it could be located on Line 1600S to test the source at a vertical depth of 200' below 6E.

McPHAR GEOPHYSICS LIMITED

Philip G. Hallof,
Geophysicist

Marion A. Goudie,
Geologist

Dated: May 2, 1973

## ASSESSMENT DETAILS

| | | |
|---|---|---|
| PROPERTY: Kristian Ross Property | | MINING DIVISION: Nicola |
| SPONSOR: Rio Plato Silver Mines Ltd. | | PROVINCE: British Columbia |
| LOCATION: Merritt Area | | |
| TYPE OF SURVEY: Induced Polarization | | |
| OPERATING MAN DAYS: | 14 | DATE STARTED: March 26, 1973 |
| EQUIVALENT 8 HR MAN DAYS: | 21 | DATE FINISHED: March 31, 1973 |
| CONSULTING MAN DAYS: | 1 | NUMBER OF STATIONS: 106 |
| DRAUGHTING MAN DAYS: | 5 | NUMBER OF READINGS: 585 |
| TOTAL MAN DAYS: | 27 | MILES OF LINE SURVEYED: 7.42 |

CONSULTANTS:

Philip G. Hallof, 15 Barnwood Ct., Don Mills, Ontario.
Marion A. Goudie, 739 Military Trail, West Hills, Ontario.

FIELD TECHNICIANS:

J. Parker, Box 340, Choiceland, Saskatchewan.
Plus 3 Extra Labourers:
H.P. Winzeler, 647 Broadway, Burnaby, B.C.
K. Hoeberg, Apt. 1, 35 Princess Crescent, Sault Ste. Marie, Ontario.
D. Henry, National Trailer Park, Kamloops, B.C.

DRAUGHTSMEN:

B. Boden, 58 Glencrest Blvd. Toronto 16, Ontario.
R. Koenig, 508 Cosburn Ave. Toronto 6, Ontario.

McPHAR GEOPHYSICS LIMITED

Philip G. Hallof,
Geophysicist

Dated: March 2, 1973

## STATEMENT OF COST

**Rio Plato Silver Mines Ltd.**
**Kristian Ross Property**

**Crew:** J. Parker

| | | | |
|---|---|---|---|
| 3½ days Operating) 1 day Standby ) 1 day Travel ) | 5½ days | @ $407.65 | $2,242.10 |

**Expenses**

| | | |
|---|---|---|
| Extra Labour | 412.50 | |
| Meals and Accommodation | 330.93 | |
| Truck Rental | 124.32 | |
| Vehicle Expense | 30.15 | |
| | | 900.90 |
| | | **$3,143.00** |

McPHAR GEOPHYSICS LIMITED

Philip G. Hallof,
Geophysicist.

Dated: May 2, 1973

Declared before me at the City of Vancouver, in the Province of British Columbia, this 18 day of May 1973, A.D.

A Commissioner ... within British Columbia or

## 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 Rio Plato Silver Mines 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 2nd day of May, 1973

Philip G. Hallof, Ph.D.

## CERTIFICATE

I, Marion A. Goudie, of the City of Toronto, Province of Ontario, do hereby certify that:

1. I am a geologist residing at 739 Military Trail, West Hill, Ontario.

2. I am a graduate of the University of Western Ontario with a B.Sc. Degree (1950) in Honours Geology.

3. I am a member of the Geological Society of America.

4. I have been practising my profession for 23 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 Rio Plato Silver Mines 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

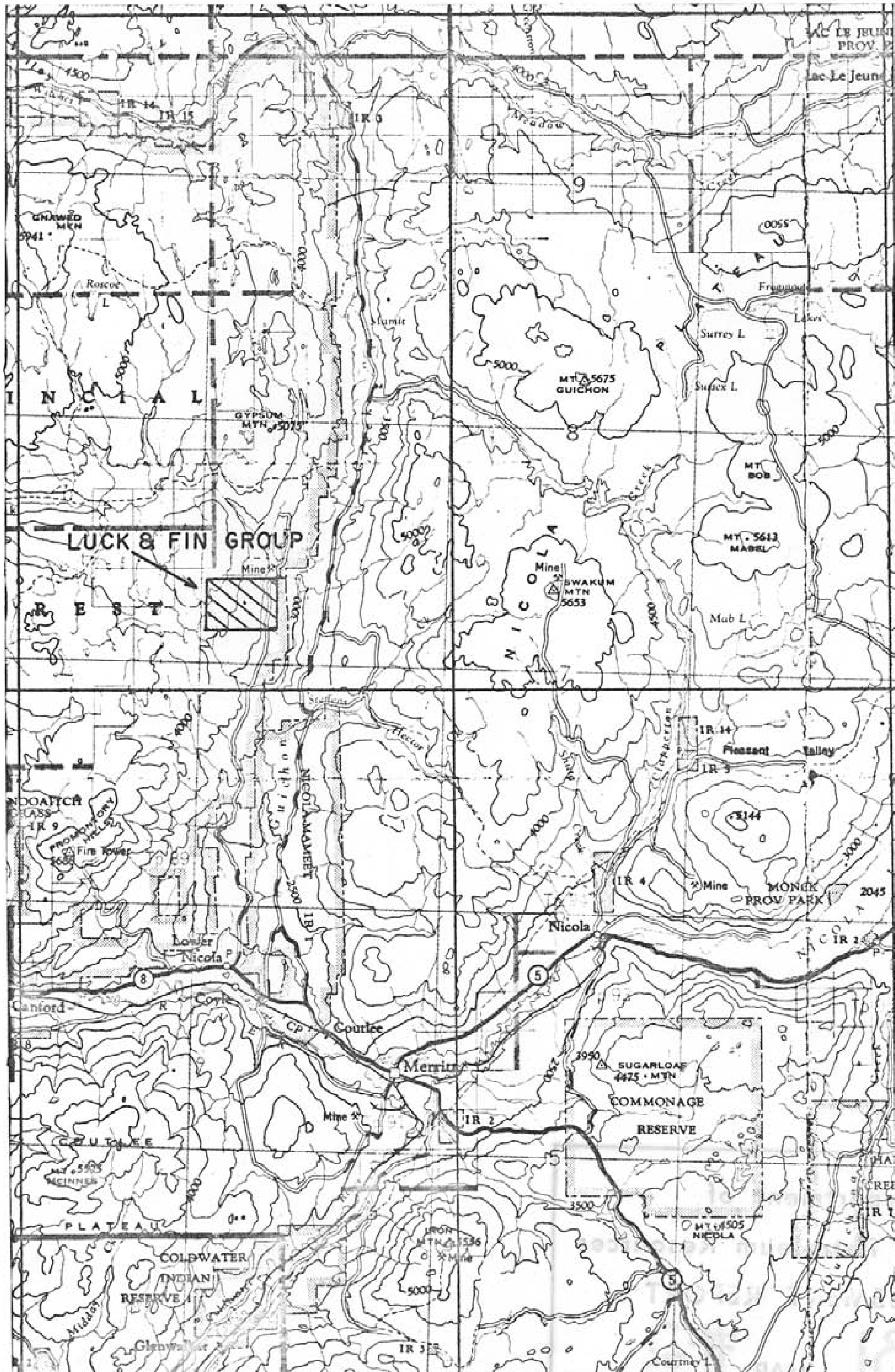
This 2nd day of May, 1973

Marion A. Goudie

Marion A. Goudie, B.Sc.

**McPHAR GEOPHYSICS LIMITED**
**LOCATION MAP**
**1:250000**






**NOTE** TO ACCOMPANY GEOPHYSICAL REPORT FOR RIO PLATA SILVER MINES LIMITED ON KRISTIAN ROSS PROPERTY, NICOLA M.D., MERRITT AREA, B.C. BY P.G. HALLOF (P.ENG.) AND M.A. GOUDIE (GEOLOGIST) DATED MAY 2, 1973.

## APPENDIX

## 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.

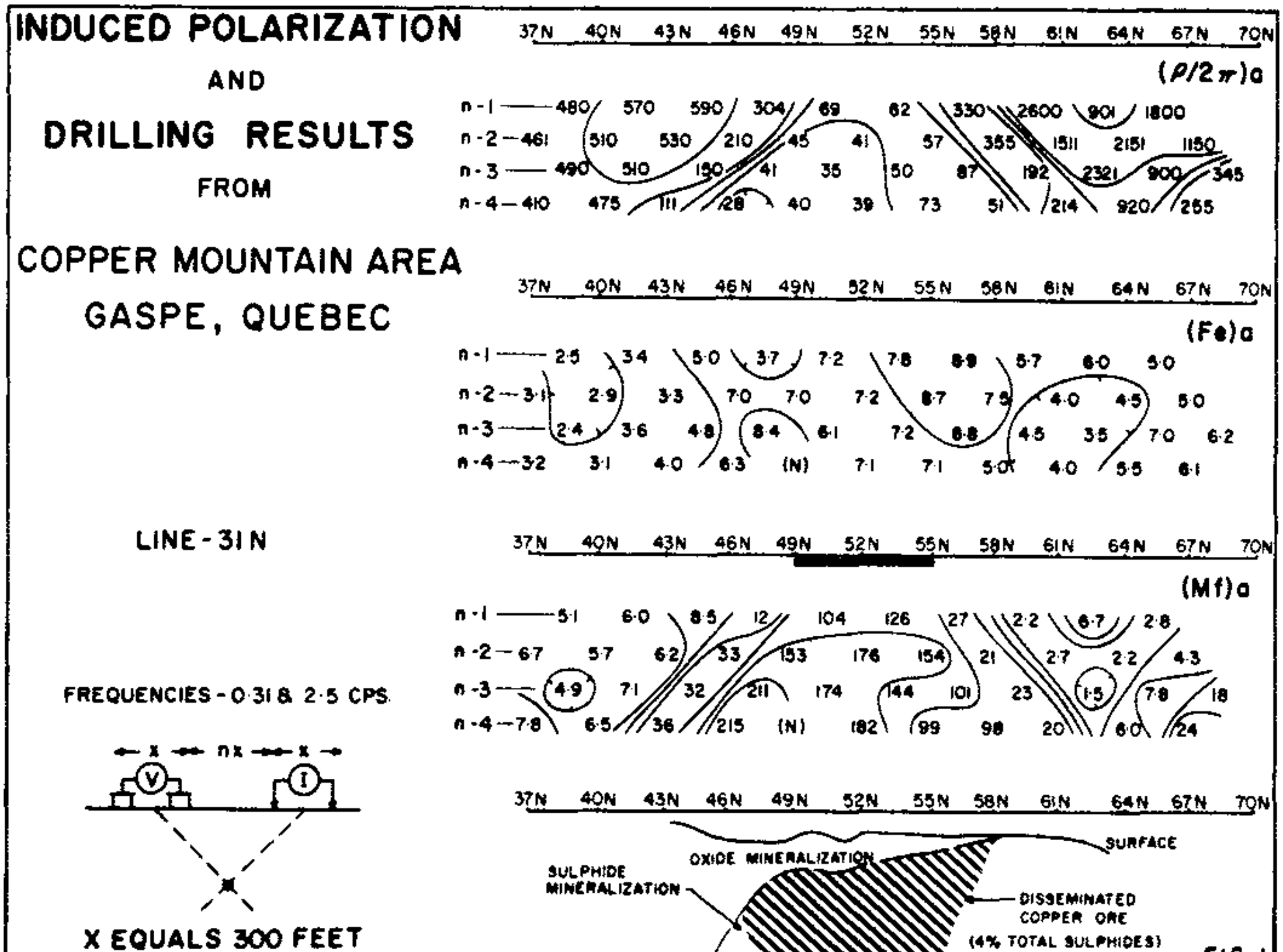



FIG. 1

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.

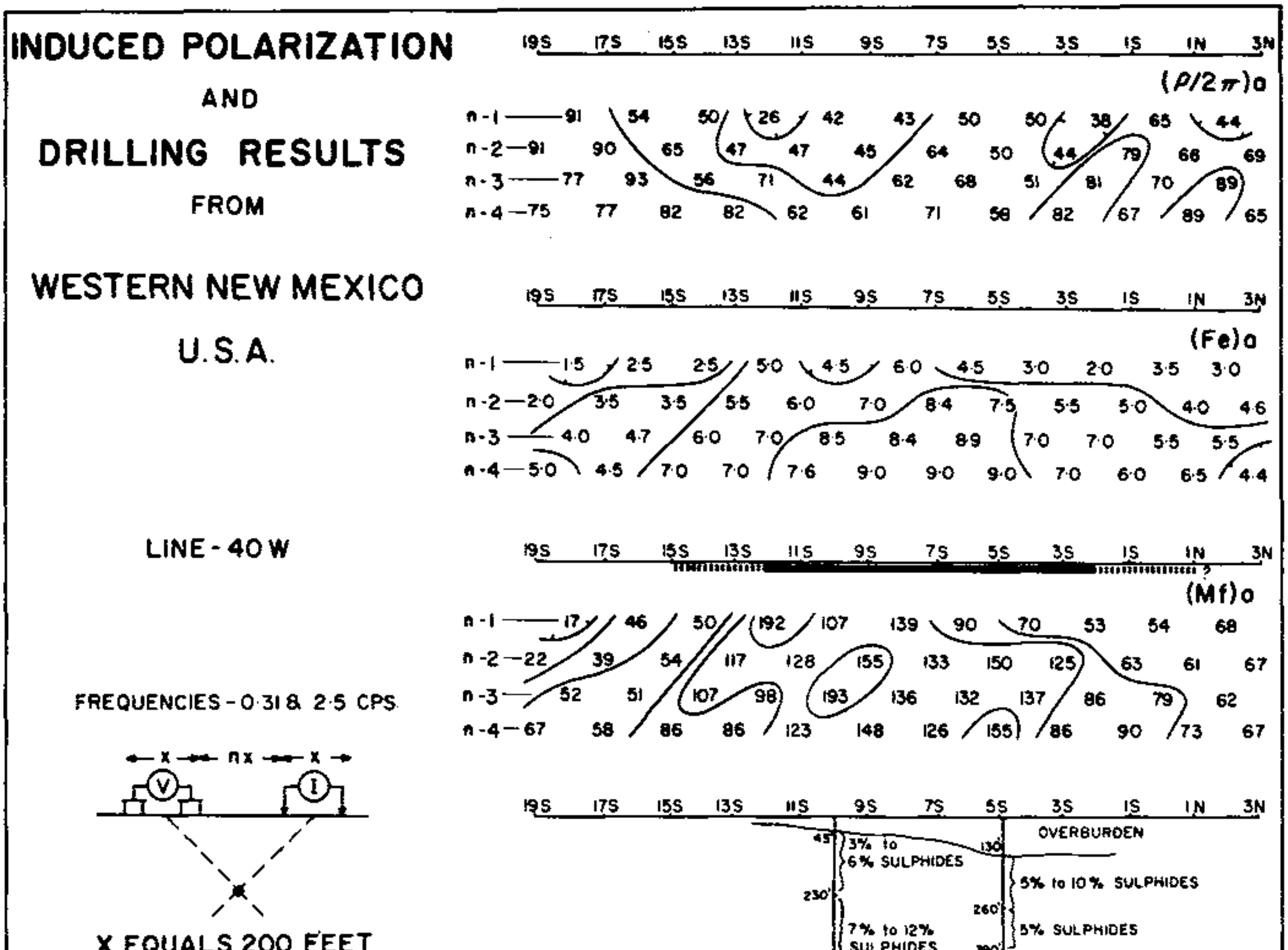


FIG. 2

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.

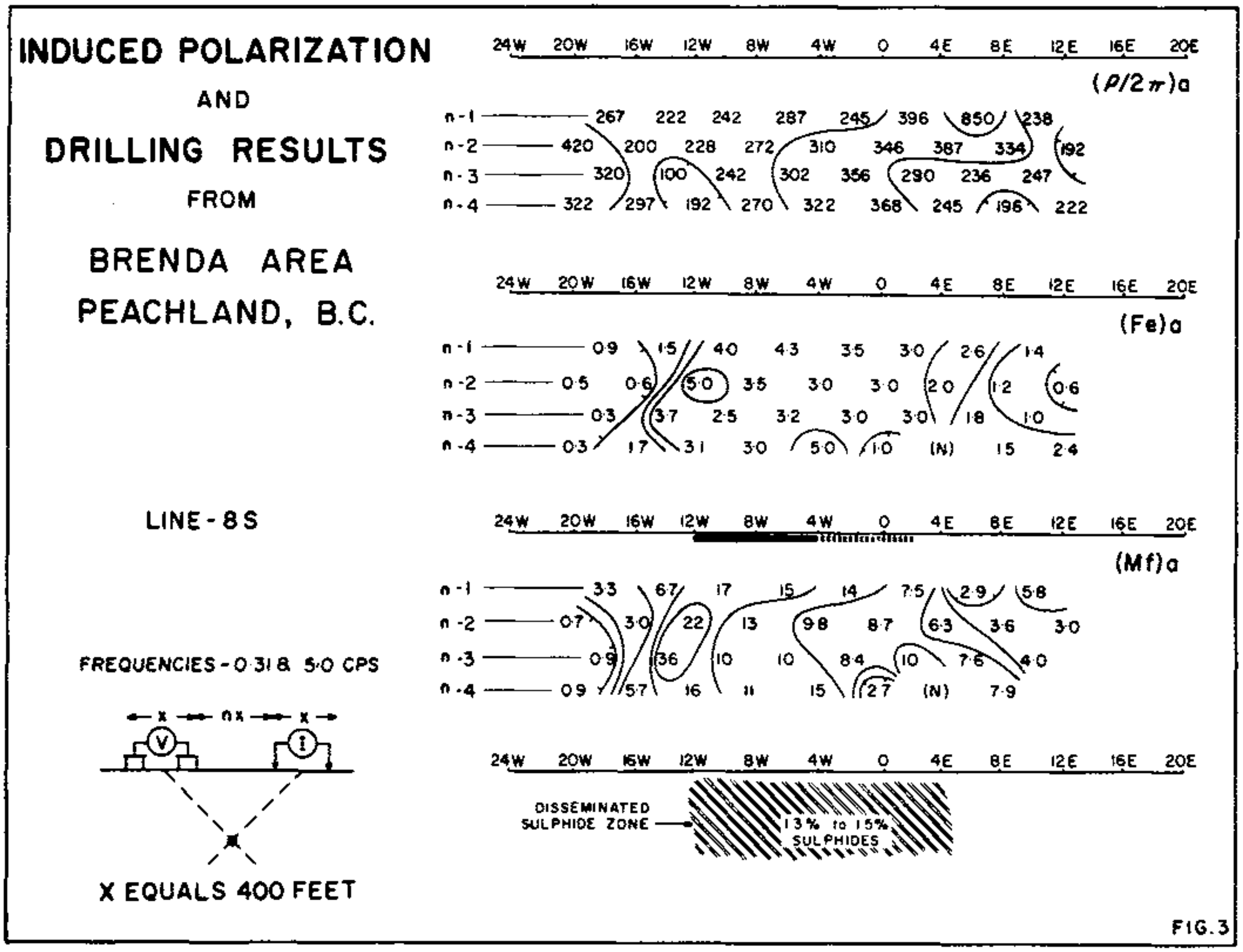
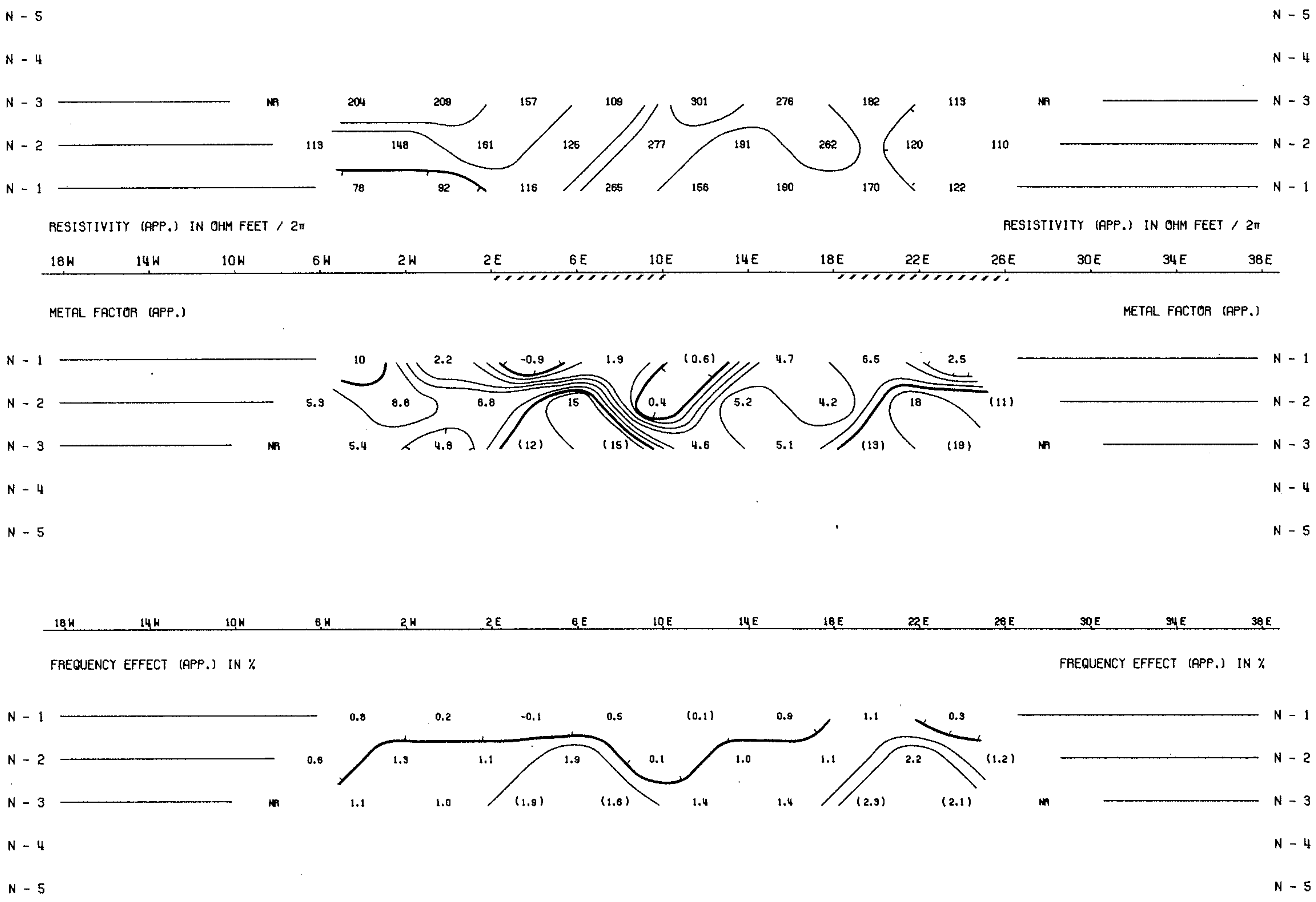



FIG. 3



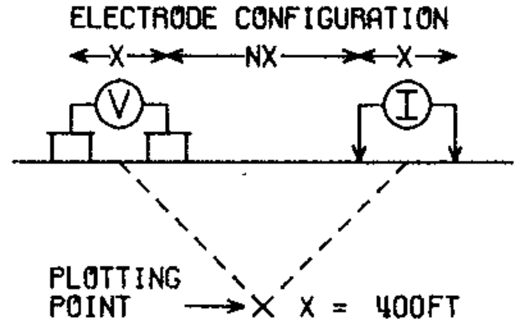

4331

DWG. NO.- I.P.-6061-1

# RIO PLATA SILVER MINES LTD.

KRISTIAN ROSS PROPERTY, MERRITT AREA,
NICOLA M.D., B.C.

LINE NO.- 1200N




SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE ▬▬▬
PROBABLE ▮▮▮▮▮▮
POSSIBLE / / / / /

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: MAR 1973

APPROVED: Philip G. Hallof

DATE: May 2/73

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

PROFESSIONAL ENGINEER, PROVINCE OF BRITISH COLUMBIA, PHILIP G. HALLOF

Expiry Date: February 25, 1974

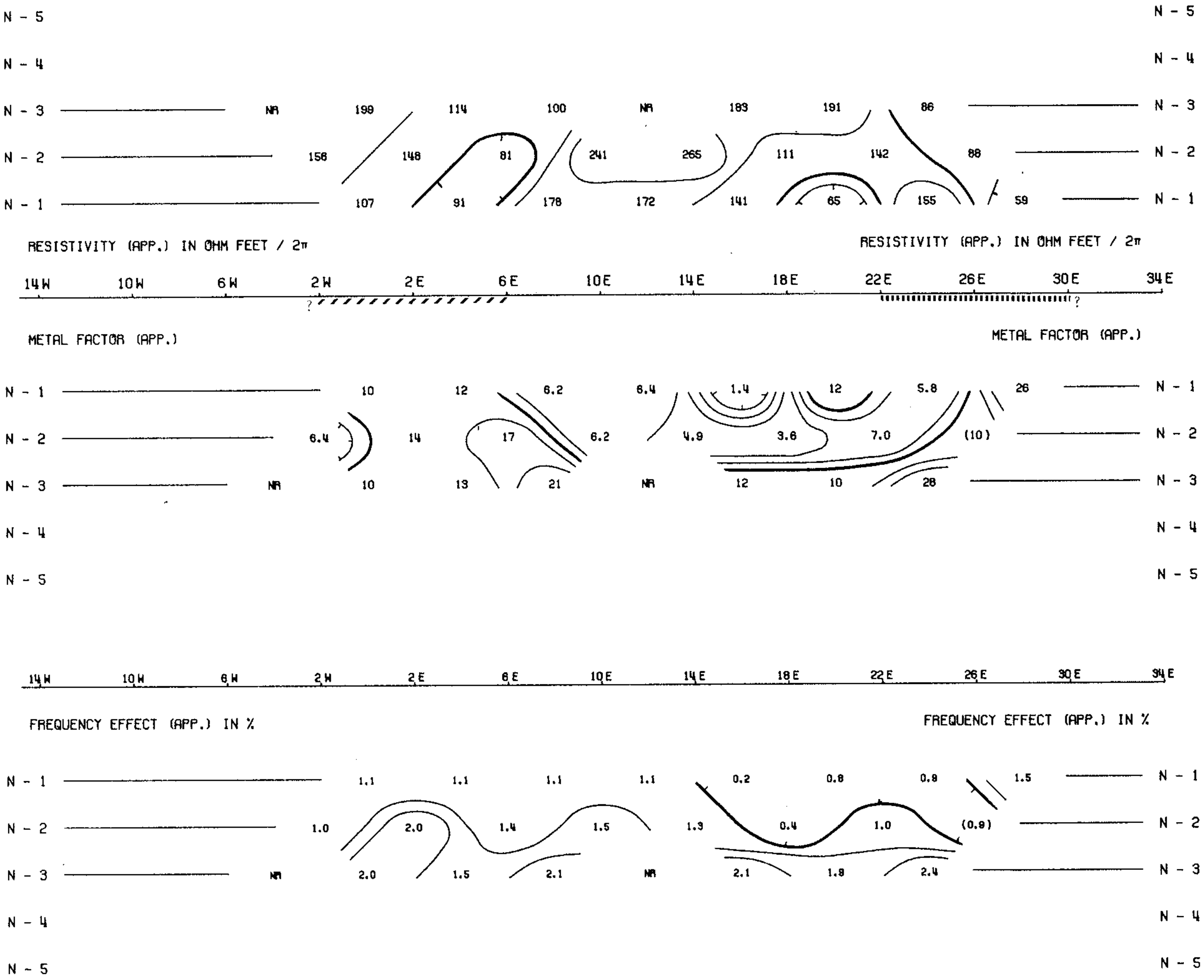
# McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY MCPHAR COMPUTER DIVISION

4331

DWG. NO.- I.P.-6061-2

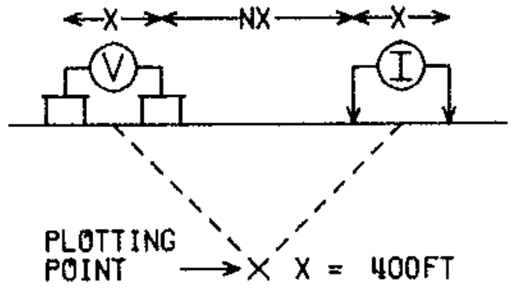



# RIO PLATA SILVER MINES LTD.

KRISTIAN ROSS PROPERTY, MERRITT AREA,
NICOLA M.D., B.C.

LINE NO.- 800N

ELECTRODE CONFIGURATION




SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: MAR 1973

APPROVED:

DATE: May 7 /73

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — PHILIP G. HALLOF

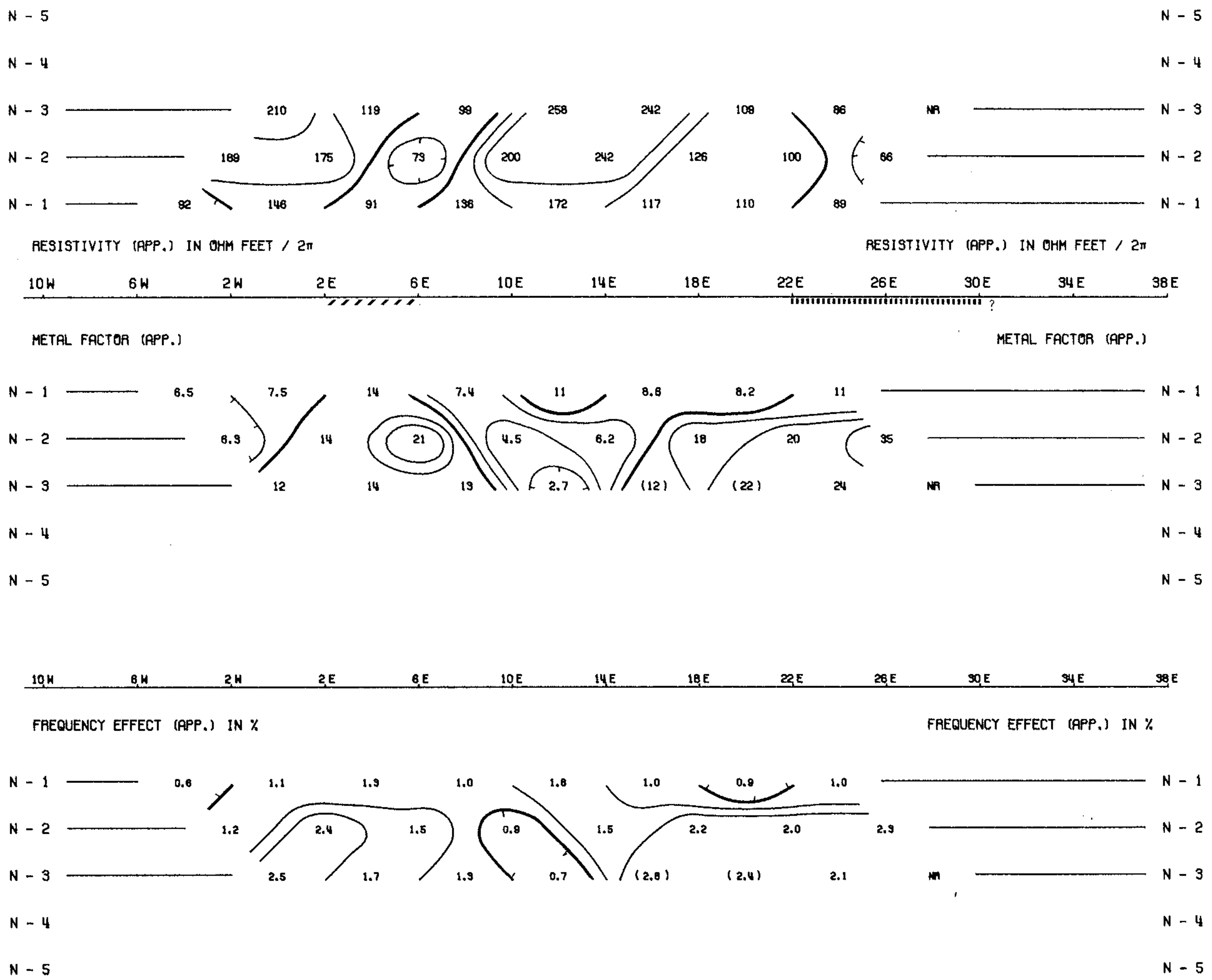
Expiry Date: February 25, 1974

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

# McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY MCPHAR COMPUTER DIVISION




4331

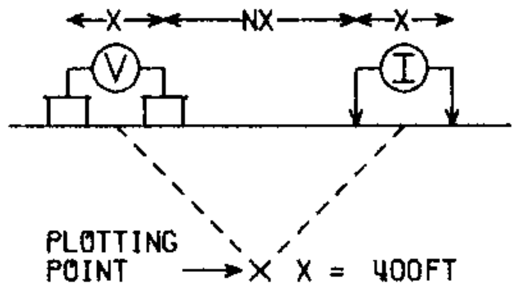
DWG. NO.- I.P.- 6061-3

# RIO PLATA SILVER MINES LTD.

KRISTIAN ROSS PROPERTY, MERRITT AREA,
NICOLA M.D., B.C.

LINE NO.- 400N

ELECTRODE CONFIGURATION




SURFACE PROJECTION
OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: MAR 1973

APPROVED: Philip G. Hallof

DATE: May 2/73

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

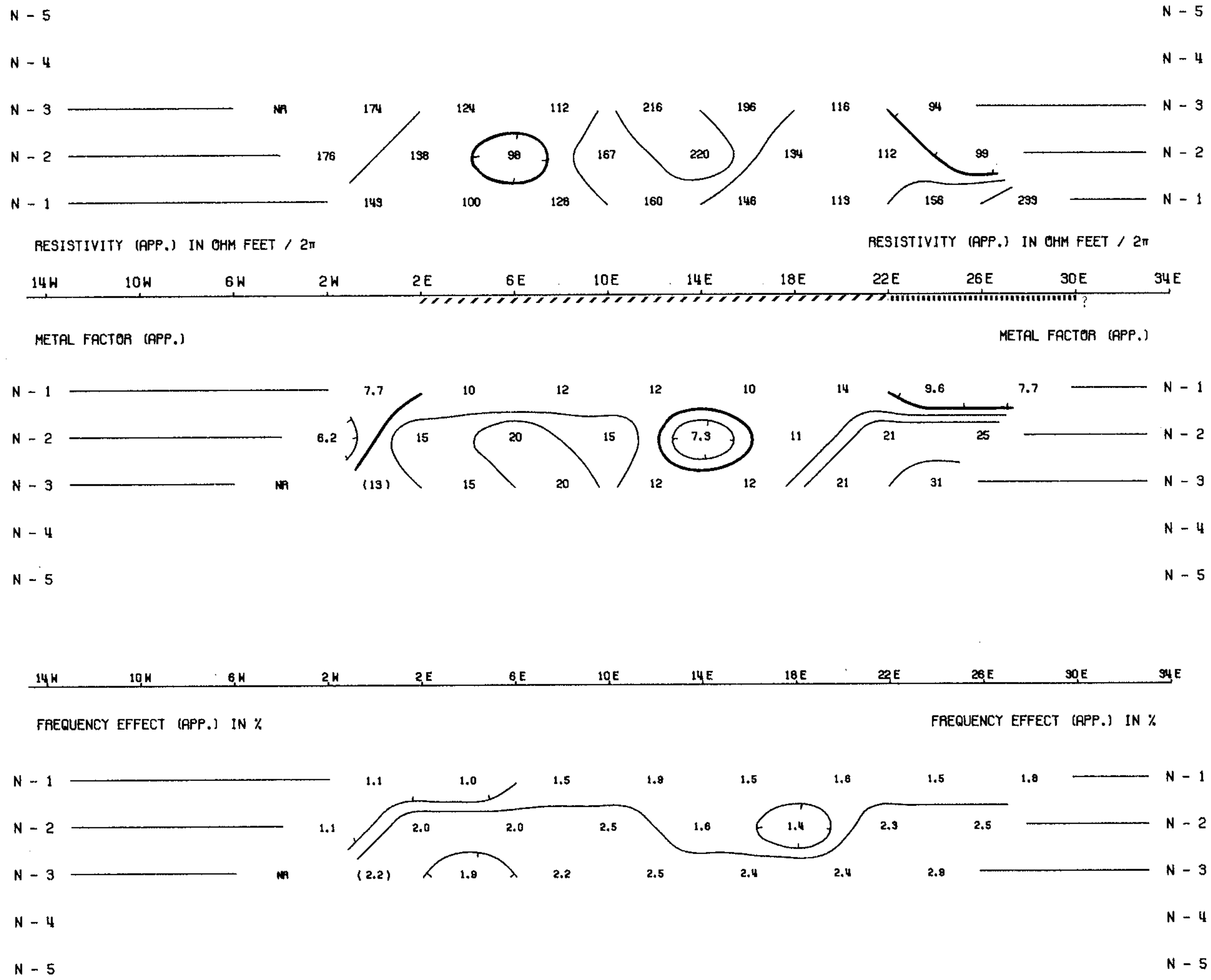
# McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY MCPHAR COMPUTER DIVISION

4331

DWG. NO.- I.P.- 6061-4

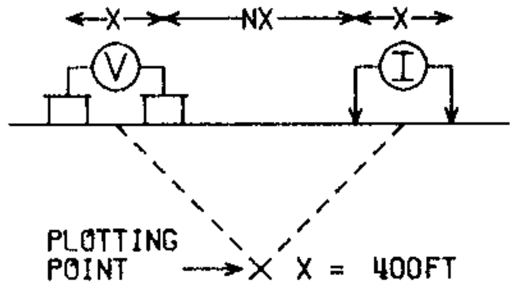



# RIO PLATA SILVER MINES LTD.

KRISTIAN ROSS PROPERTY, MERRITT AREA,
NICOLA M.D., B.C.

LINE NO.- 0

ELECTRODE CONFIGURATION




SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE ▬▬▬
PROBABLE ıııııııııı
POSSIBLE / / / / /

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: MAR 1973

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

APPROVED: Philip G. Hallof

PROFESSIONAL ENGINEER, PROVINCE OF BRITISH COLUMBIA, PHILIP G. HALLOF

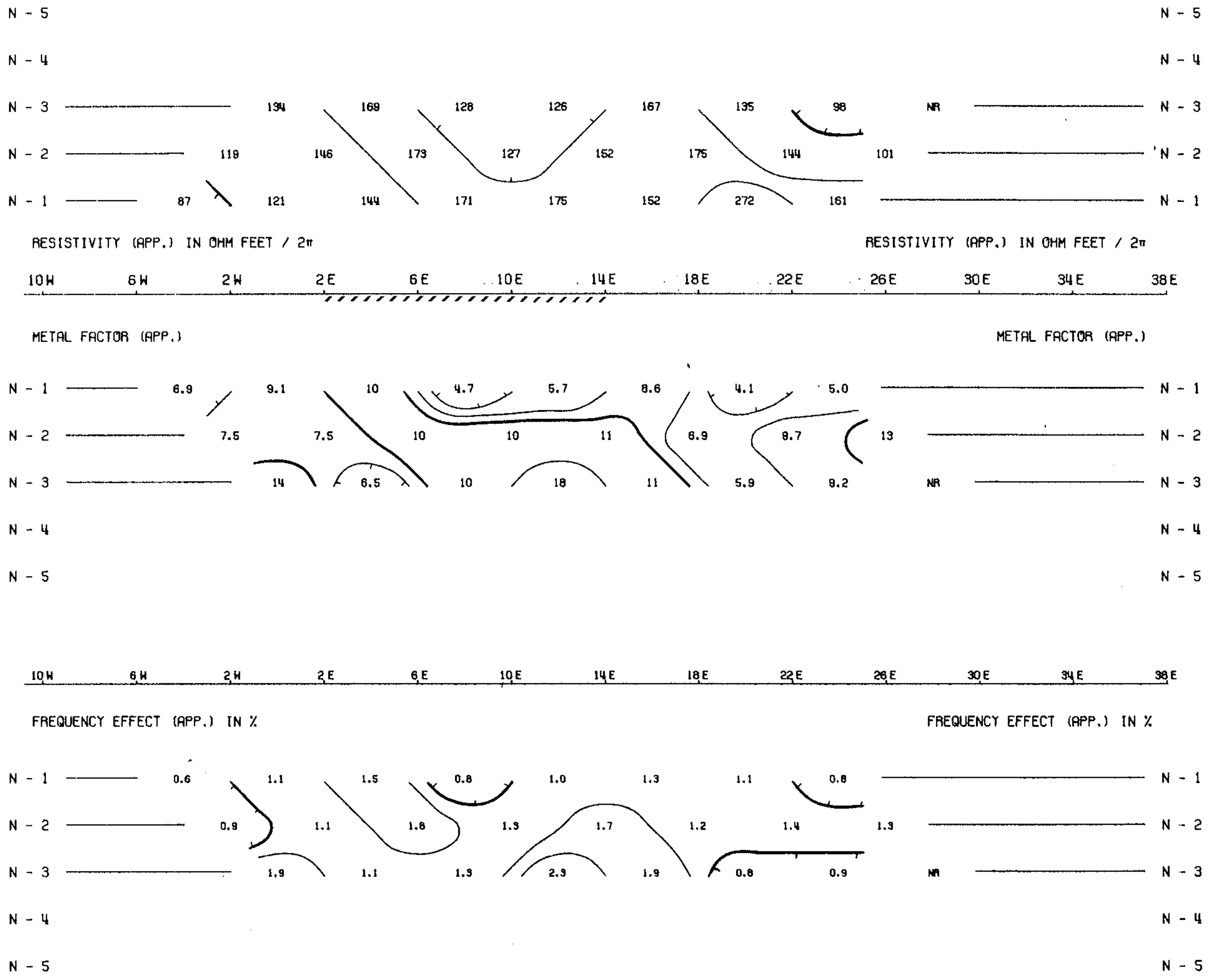
DATE: May 2/73

Expiry date February 25, 1974

# McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY MCPHAR COMPUTER DIVISION




4331

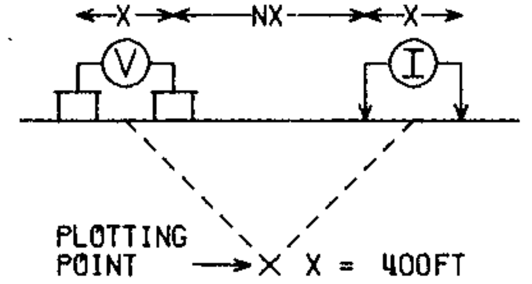
DWG. NO.- I.P.- 6061-5

# RIO PLATA SILVER MINES LTD.

KRISTIAN ROSS PROPERTY, MERRITT AREA, NICOLA M.D., B.C.

LINE NO.- 400S

ELECTRODE CONFIGURATION




SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: MAR 1973

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

APPROVED: Philip G. Hallof

DATE: May 2/73

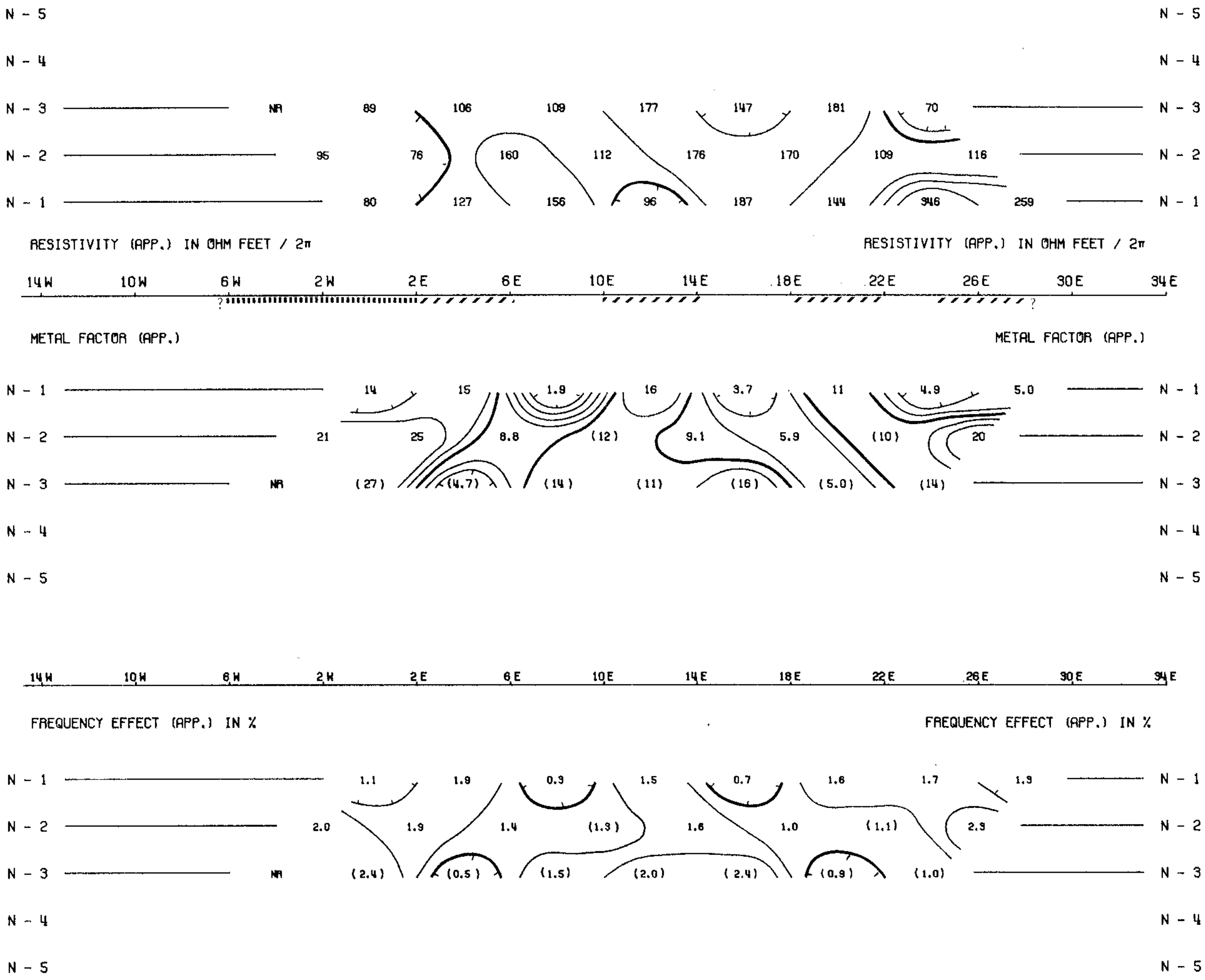
PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — PHILIP G. HALLOF

Expiry Date: February 25, 1974

# McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY MCPHAR COMPUTER DIVISION



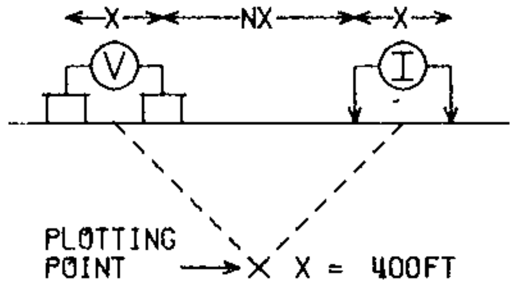

4331 DWG. NO.- I.P.- 6061-6

# RIO PLATA SILVER MINES LTD.

KRISTIAN ROSS PROPERTY, MERRITT AREA, NICOLA M.D., B.C.

LINE NO.- 800S

ELECTRODE CONFIGURATION




SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: MAR 1973

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

APPROVED: [signature]

DATE: May 2/73

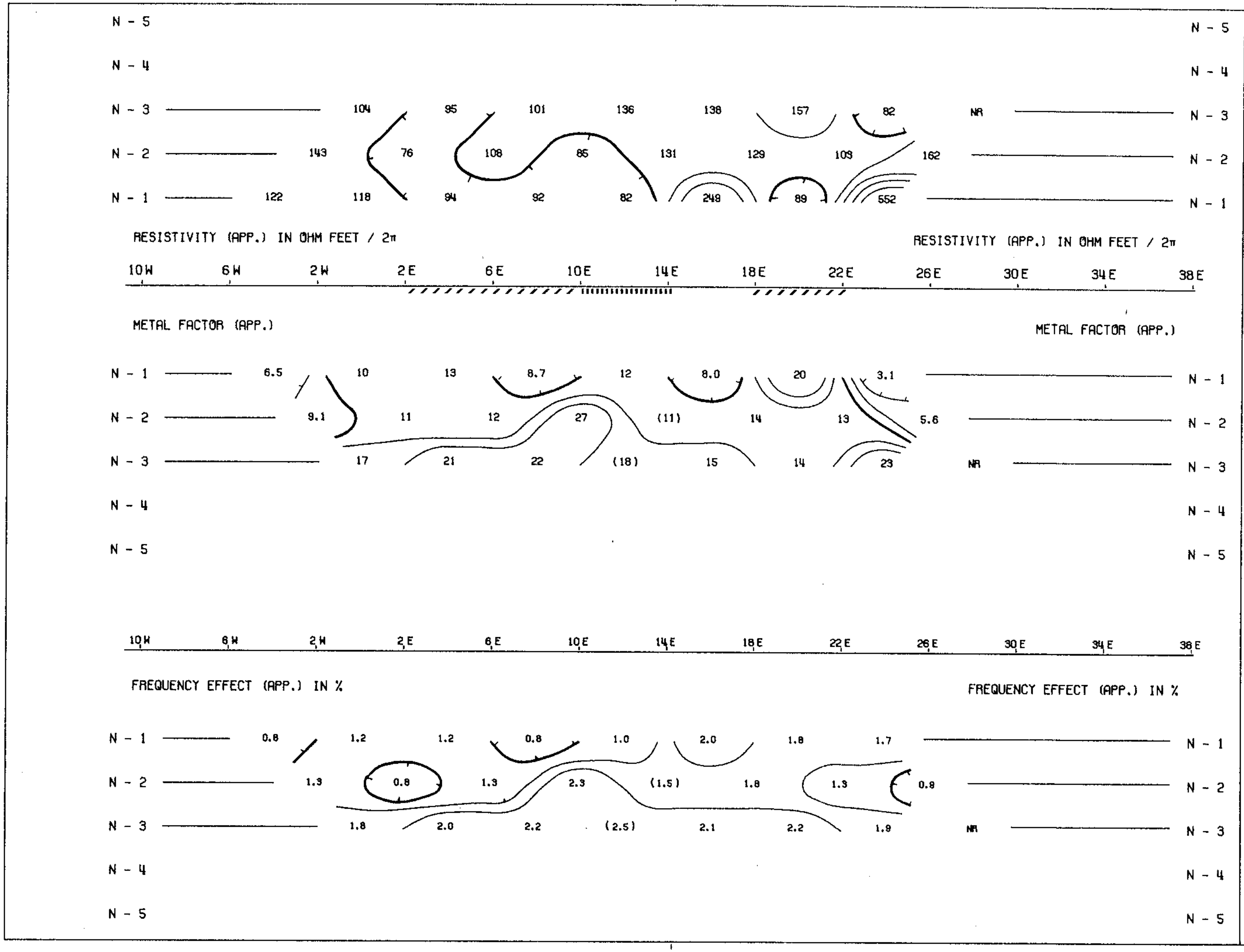
PHILIP G. HALLOF, BRITISH COLUMBIA, ENGINEER

Expiry date: February ... 1974

# McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY MCPHAR COMPUTER DIVISION




4331

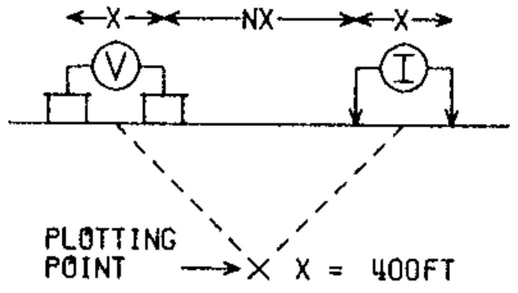
DWG. NO.- I.P.- 6061-7

# RIO PLATA SILVER MINES LTD.

KRISTIAN ROSS PROPERTY, MERRITT AREA, NICOLA M.D., B.C.

LINE NO.- 1200S

ELECTRODE CONFIGURATION




SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE ▬▬▬
PROBABLE ||||||||||
POSSIBLE / / / / /

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: MAR 1973

APPROVED: Philip G. Hallof

DATE: May 2/73

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

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA PHILIP G. HALLOF

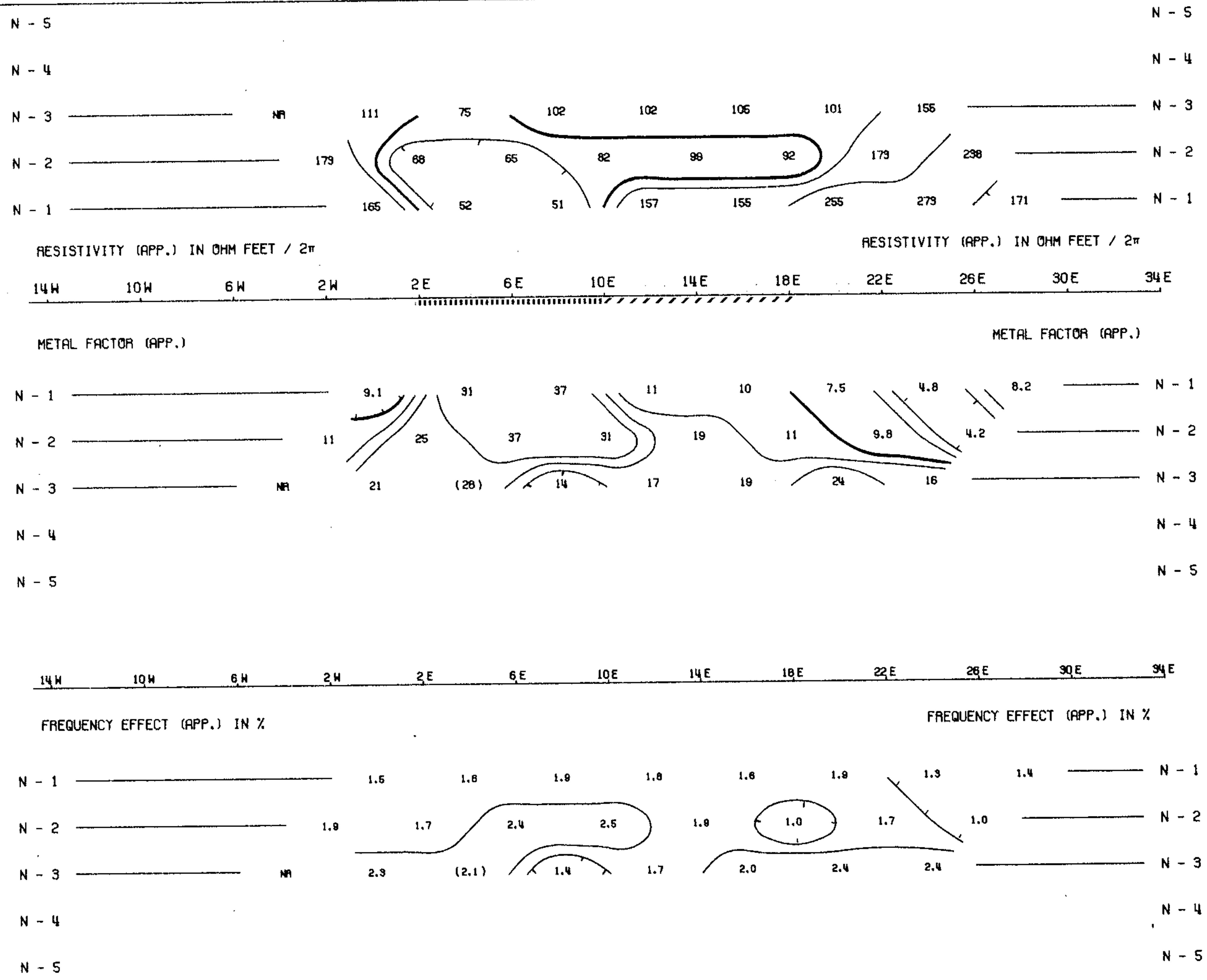
# McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY MCPHAR COMPUTER DIVISION

4331

DWG. NO.- I.P.- 6061-8

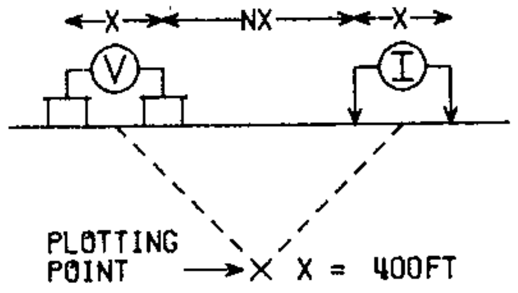



# RIO PLATA SILVER MINES LTD.

KRISTIAN ROSS PROPERTY, MERRITT AREA,
NICOLA M.D., B.C.

LINE NO.- 1600S

ELECTRODE CONFIGURATION




SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE ▬▬▬
PROBABLE ||||||||||
POSSIBLE / / / / /

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: MAR 1973

APPROVED: [signature]

DATE: May 8/73

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — PHILIP G. HALLOF

Expiry Date: February 25, 1974

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

# McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY MCPHAR COMPUTER DIVISION

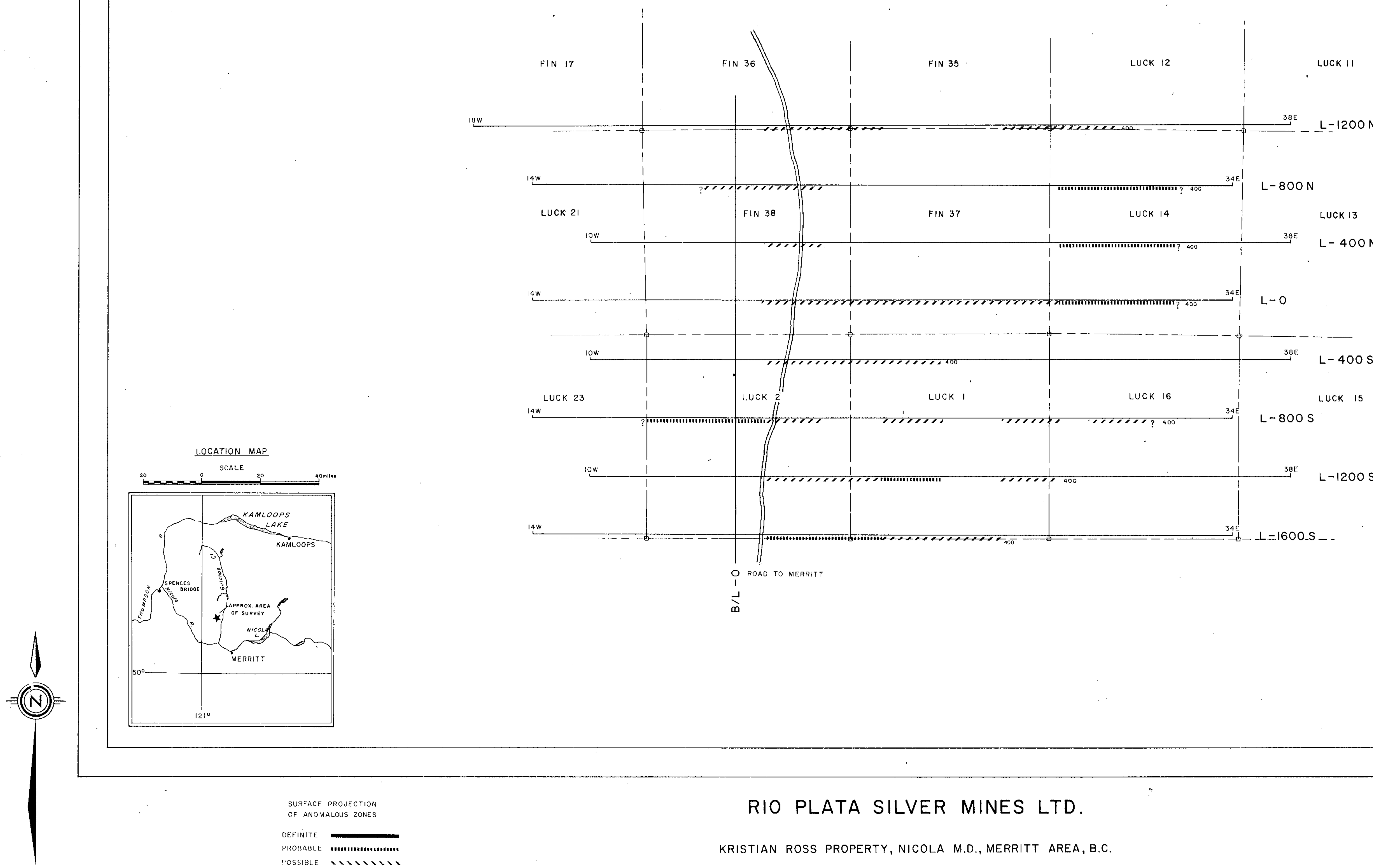
DWG. IPP - 3575

# McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

PLAN MAP

Department of Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4331 MAP #1




4331M-1

NOTE

TO ACCOMPANY GEOPHYSICAL REPORT FOR RIO PLATA SILVER MINES LIMITED ON KRISTIAN ROSS PROPERTY, NICOLA M.D., MERRITT AREA, B.C. BY P.G. HALLOF (P.ENG.) AND M.A. GOUDIE (GEOLOGIST)

DATED: MAY 2, 1973

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

Number at the end of anomaly indicates spread used.

## RIO PLATA SILVER MINES LTD.

KRISTIAN ROSS PROPERTY, NICOLA M.D., MERRITT AREA, B.C.

SCALE

ONE INCH EQUALS FOUR HUNDRED FEET

PROFESSIONAL ENGINEER, PROVINCE OF BRITISH COLUMBIA, PHILIP G. HALLOF
APPROVED: May 2/73
Expiry Date: February 25, 1974

DWG. IPP - 3575