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SML 98

RADIUM HILL COPPER PROSPECT

PROGRESS AND TECHNICAL REPORTS FOR THE PERIOD 1/12/65 TO 30/11/67

Submitted by

Electro-winning Pty Ltd
1966

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PRIMARY INDUSTRIES AND RESOURCES SA

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TENEMENT: S.M.L. 98

TENEMENT HOLDER: Electrowinning Pty. Ltd.

REPORTS:

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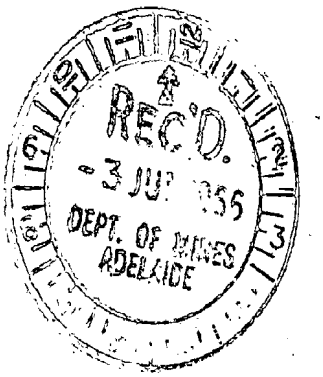

REPORT

on the

RADIUM HILL COPPER PROSPECT

SOUTH AUSTRALIA

for

ELECTRO-WINNING (PTY) LIMITED

by

D.L. SEYMOUR

(Consultant Geologist)

REPORT ON THE RADIUM HILL COPPER PROSPECT

INTRODUCTION

Electro-Winning (Pty) Limited presently hold Special Mining Lease No. 98 over an area of 6.25 square miles in the Olary District of South Australia. At the request of Mr Peter Taylor, the area was visited by the author. This report deals with the observations made and impressions gained during the brief inspection of the copper prospect which lies within the S.M.L. Recent geophysical and geochemical surveys are described and the results discussed.

LOCATION AND ACCESS

Special Mining Lease No. 98 is located in the north-eastern portion of South Australia, about three miles west of the abandoned mining town of Radium Hill. Radium Hill is 286 miles by road or 220 miles by air northeast of Adelaide. Broken Hill lies about 60 miles to the east-northeast.

Access to the area is excellent, all but the last two miles being over graded roads. There is an airstrip suitable for light aircraft at Radium Hill. A railway spur line (standard guage) joins Radium Hill to the Broken Hill/ Adelaide line at Cutana.

GEOLOGY

General

The copper prospect consists basically of four shafts and numerous trenches and shallow pits spread out over a distance of at least 2,500 feet. The old workings go under the names of Mildatie Copper and Silver Mine and the Dalkey Mine, and have not been worked since well before the turn of the century. The old miners were obviously attracted to this location by two paralled 12-15 inch wide lodes of quartz, malachite, cuprite and limonite with the occasional bleb of chalcopyrite. The lodes cut across the strike of the country rocks in a north-northeast direction (025°M). One is well exposed in a small inclined shaft near the southern end of the line of workings.

Local geology

The country rocks are mainly hard, dark grey, fine-grained, finely laminated, micaceous sandstones to siltstones of the Upper Proterozoic. There are also fairly numerous beds of dark-grey, smoother weathering, impure limestones to calcareous siltstones among the generally non-carbonate sedimentary sequence.

A thick succession of tillites occurs less than 1000 feet

to the north and northwest of the main shaft at the northern end of the line of workings. These dark greenish-grey tillites contain countless boulders, cobbles and pebbles composed of a variety of predominately acidic igeous rock types, many of which are now strewn over the surface giving the false impression that the country is underlain by an igeous complex.

Diorite is reported in the Record of Mines review of the Mildaltie Mine, but none was observed. However, there is some doubt in the author's mind as to whether or not these workings are, in fact, the Mildaltie. There is a possibility that they are the Dalkey Mine and that the small lead working recently located farther to the northeast is the Mildaltie.

Structure

The strike of the local sediments is fairly consistently 115° to 125°M, but the rapidly changing dips point to the existence of a series of folds which plunge to the east-southeast. At the southern shafts the dip is 53° to 64° to the northeast whereas, 2000 feet across strike at the northern shafts, the dip is 68° to the southwest. It appears that the northern shafts lie near the crest of the anticline with an adjacent syncline between the northern and southern groups of shafts. However, the

highly contorted state of these sediments combined with several prominent fracture directions and a strong cleavage development often renders accurate attitude measurements difficult.

The most prominent fracture direction is north-northeast (same as the narrow lodes), and it is notable that the mapped occurrences of "porphyry" on the Olary Province geological map also trend in this direction. The airphoto enlargement of the area shows a strong lineament trending in the above direction and passing under or very close to the old workings.

Mineralization

At the southern group of shafts the dumps are composed almost entirely of weathered micaceous siltstones in which fine-grained limonitic specks and very thin, bedded lenses of limonitic material strongly suggest the removal by leaching of both disseminated and bedded sulphides. At the northeastern shafts, one of which reportedly reached a depth of 140 feet, absolutely fresh siltstones and fine-grained quartzites can be found on the dump. This unoxidised material contains fine-grained sulphides (pyrite, pyrrhotite and chalcopyrite) distributed along bedding planes in addition to what appear to be fracture

fillings of coarser chalcopyrite. The copper content of the better specimens averages about 2%. This material appears to have been some of the last rock mined from the shafts.

Outcrops of siltstone in a dry river bed beside the northern shafts and some 1200 feet to the northwest show signs of having carried disseminated mineralization but lack evidence of the fracture filling type of copper mineralization observed on the dumps.

GEOPHYSICS

McPhar Geophysics was contracted to carry out a preliminary I.P. survey over the prospect. A baseline, bearing 025°M, was laid out to pass immediately to the east of the northern shafts. Three lines, 00, 10S and 20S, of 4,200 feet each were run at right angles off the baseline. Subsequently, two additional lines, 3W and 12W, were run in a direction parallel to the baseline. Electrode spread was 300 feet throughout.

Line 00 detected a strong anomaly 300 feet wide over the old shafts. The anomaly tends to shift westwards at depth. At the extreme western end of this line, the metal factor values increase markedly again and leave an open anomaly.

Line 10S and 20S both showed rather weak anomalies. These two anomalies, together with that which was detected at the northern shafts, tend to line up in a direction roughly parallel with the strike of the narrow lodes and with the strong lineament on the airphotos.

The anomaly on line 3W is at least 600 feet wide and it is interesting to note how the strength of the anomaly increases to a maximum at the deepest level of I.P. penetration. Line 12W detected an anomalous zone as much as 1,100 feet wide, although the strongest section occurs beneath 3S and drops off very sharply to the south, suggesting a change in rock type, or certainly a change from metalliferous horizon to a non-metalliferous one.

At the moment the geophysical picture is far from complete, but, nonetheless, very encouraging and interesting. The strong anomalies on lines 12W, 3W and 00 definitely are of sufficient merit to warrant additional I.P. work so as to clarify the incomplete picture outlined by the five lines to date.

GEOCHEMISTRY

Dr. P.R. Donovan, Chief Geochemist of McPhar Geophysics,

supervised the collection of a suite of 63 soil samples to form the basis of a geochemical orientation survey. Line 00 was sampled at 150 foot intervals from 21E to 21W (29 samples). Line 12W was sampled at 100 foot intervals from 11N to 9S (21 samples). The remaining samples (13) were collected from a line run across the possible southwestern extension of the narrow copper lode observed in the inclined shaft.

Much of this area is covered by a thin blanket of outwash sand and gravel which would necessitate the use of an auger for the collection of soil samples at or near bedrock. Suboutcrops are usually incompletely coated with a thin layer of caliche. However, other portions of the area, particularly immediately to the west of the northern shafts, are free of transported overburden and the thin cover of juvenile residual soil developed over the bedrock should lend itself very well to geochemical soil surveys.

The total copper, lead and zinc analyses are expected shortly and should be of some help in evaluating the geophysical anomalies, providing, of course, that the copper mineralization was originally exposed at surface before being largely removed by leaching.

Conclusions

1. The northern shafts, sunk on a narrow, high grade lode, intersected promising copper mineralization in the siltstone/quartzite country rocks at depth.

2. The mineralization in these sediments seems to be of a bedded type and probably is syngenetic, rather than epigenetic, in origin.

3. The recent I.P. survey detected strong anomalies at and to the west of the main shaft and weaker anomalies to the south.

4. No estimate of the extent or grade of the copper mineralization can be made without considerable additional fieldwork.

Recommendations

1. With the help of aerial photos, the geology of the S.M.L. should be examined and mapped in sufficient detail to give help in the interpretation of geophysical and/or geochemical anomalies.

2. Additional I.P. lines should run at 12E, 7E, 2E, 7W, 17W and 22W in an attempt to outline better the anomalous area.

3. Providing the orientation survey results are favourable, soil sampling should be carried out over the above I.P. lines, in addition to line 3W.

4. The combination of additional geophysics and geochemistry should result in the delineation of drill targets and diamond drilling to vertical depths of at least 600 feet is recommended.

D.L. SEYMOUR B.Sc., M.Sc.
(Consultant Geologist)

ADELAIDE S.A.
14th MARCH 1966

ENVELOPE No 568

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REPORT ON THE INDUCED POLARIZATION AND RESISTIVITY TEST SURVEY ON THE RADIUM HILL COPPER PROSPECT OLARY AREA, SOUTH AUSTRALIA FOR ELECTROWINNING PTY. LTD.

McPHAR GEOPHYSICS LIMITED

NOTES ON THE THEORY OF INDUCED POLARIZATION AND THE METHOD OF FIELD OPERATION

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 effectively stop all 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 "metal factor" or "M. F." are a measure of the amount of polarization present in the rock mass being surveyed. This parameter has been found to be very successful in mapping areas of sulphide mineralization, even those in which all other geophysical methods have been unsuccessful. The induced polarization measurement is more sensitive to sulphide content than other electrical measurements

because it is much more dependent upon the sulphide content. As the sulphide content of a rock is increased, the "metal factor" of the rock increases much more rapidly than the resistivity decreases.

Because of this increased sensitivity, it is possible to locate and outline zones of less than 10% sulphides that can't be located by E. M. Methods. The method has been successful in locating the disseminated "porphyry copper" type mineralization in the Southwestern United States.

Measurements and experiments also indicate that it should be possible to locate most massive sulphide bodies at a greater depth with induced polarization than with E. M.

Since there is no I. P. effect from any conductor unless it is metallic, the method is useful in checking E. M. anomalies that are suspected of being due to water filled shear zones or other ionic conductors. There is also no effect from conductive overburden, which frequently confuses E. M. results. It would appear from scale model experiments and calculations that the apparent metal factors measured over a mineralized zone are larger if the material overlying the zone is of low resistivity.

Apropos of this, it should be stated that the induced polarization measurements indicate the total amount of metallic constituents in the rock. Thus all of the metallic minerals in the rock, such as pyrite, as well as the ore minerals chalcopyrite, chalcocite, galena, etc. are responsible for the induced polarization effect. Some

oxides such as magnetite, pyrolusite, chromite, and some forms of hematite also conduct by electrons and are metallic. All of the metallic minerals in the rock will contribute to the induced polarization effect measured on the surface.

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 a distance (X) apart. The potentials are measured at two other points (X) feet apart, in line with the current electrodes. The distance between the nearest current and potential 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 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. The resistivity values are plotted above the line and the metal factor values below. 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. These 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, model and theoretical investigations. The position of the electrodes when anomalous values are measured must be used 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 100 feet to 1000 feet for (X). In each case, the decision as to the distance (X) and the values of (N) 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 1 below demonstrates the method used in plotting the results. Each value of the apparent resistivity and the apparent "Metal factor" 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.

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

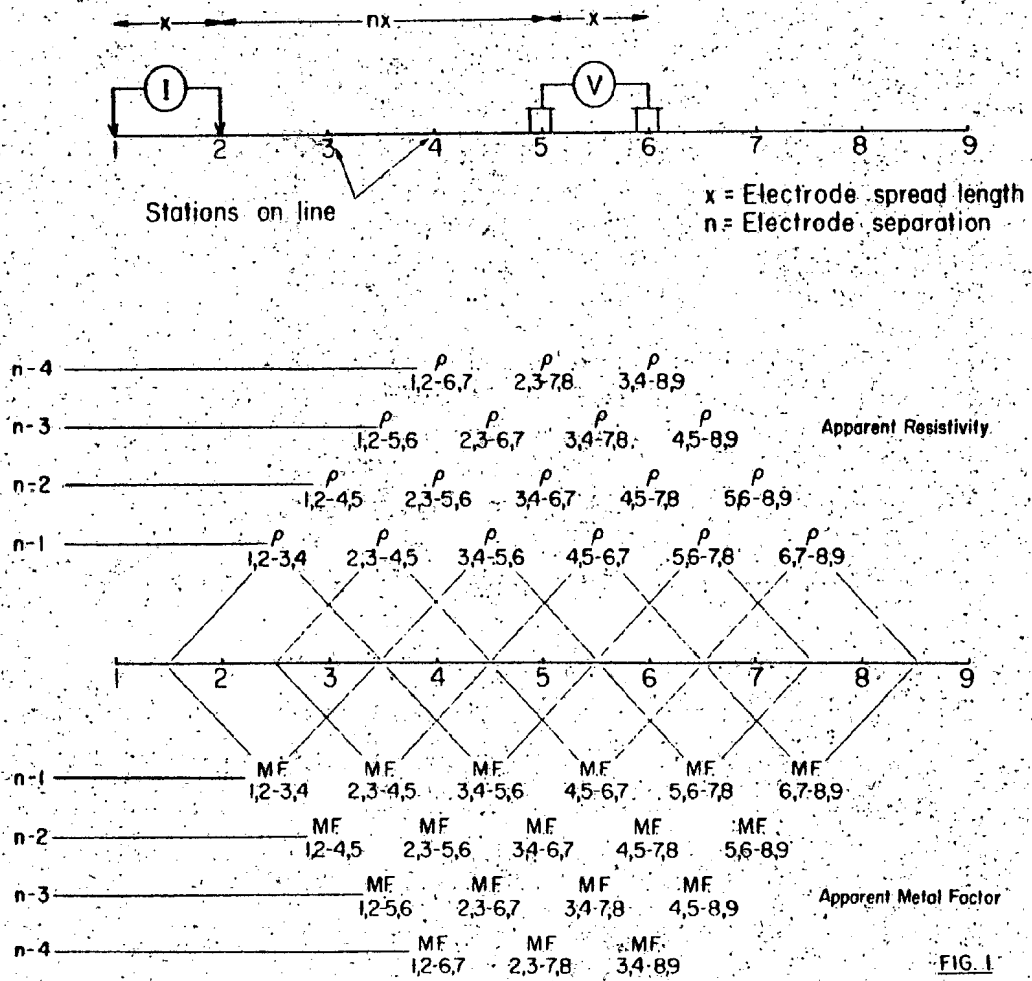

FIG. 1

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REPORT ON THE INDUCED POLARIZATION AND RESISTIVITY TEST SURVEY ON THE RADIUM HILL COPPER PROSPECT OLARY AREA, SOUTH AUSTRALIA FOR ELECTROWINNING PTY. LTD.

1. INTRODUCTION

At the request of Electrowinning Pty. Ltd., a test induced polarization survey has been carried out in the Olary Province of South Australia. The tests were made at, and around, the old Midaltie Copper-Silver Mine. The purpose of the test survey was to locate any unknown zones of metallic mineralization that might be present.

2. GEOLOGY

There is little geologic information available about the Midaltie Mine Area. Recently, a geologic examination by Mr. D. L. Seymour, geologic consultant for the Company, was carried out. He has made some observations in his report.

The exposed rocks in the vicinity of the workings are hard, dark grey to black, fine-grained, finely laminated, micaceous, somewhat calcareous sandstones and siltstones. The personel involved in the field

survey report definite igneous rock types to the north and northwest, but these rocks have not been mapped by a geologist.

The mineralization at the old workings has been traced over a strike length of at least 3,000 feet. The inclined shaft was worked to test a 15 inch wide lode of quartz, malachite, cuprite and limonite with some chalcopyrite. In some of the dumps over the 3,000 foot strike length of workings, the fresh rocks contain fine-grained sulphides (pyrite, pyrrhotite and chalcopyrite) distributed along bedding planes, as well as what appear to be fracture fillings of chalcopyrite. Other outcrops show signs of having carried disseminated mineralization.

The widespread evidence of mineralization, the quartz-lode material, the near-by intrusive rocks, all suggest the possible presence of metallic mineralization of economic interest. The IP test survey was carried out to determine the practicality of using the method to locate any unknown zones of mineralization that might be present.

3. PRESENTATION OF RESULTS

The induced polarization and resistivity results are shown on the following enclosed data plots. The results are plotted in the manner described in the notes preceding this report.

Line 0+00	300' electrode intervals	Dwg. IP 2401-1
Line 10S	300' electrode intervals	Dwg. IP 2401-2
Line 20S	300' electrode intervals	Dwg. IP 2401-3
Line 3W	300' electrode intervals	Dwg. IP 2401-4
Line 12W	300' electrode intervals	Dwg. IP 2401-5

Also enclosed with this report is Dwg. Misc. 4212, a plan map of the area surrounding the Midaltie Shaft. 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 300' spreads the position of a narrow sulphide body can only be determined to lie between two stations 300' 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.

4. DISCUSSION OF RESULTS

In the brief time available for the test IP survey, measurements could be made on only five lines. Anomalous effects were measured on all of the lines, but the anomalies are very different.

Line 0+00

This line crosses at the shaft area. The IP results show a very strong, narrow anomaly centered at 0+00 to 3+00E. The anomaly was detected

for n = 1, so that it should be detailed using shorter electrode intervals. The anomalous pattern suggests that the line passed nearly perpendicular to a dipping, tabular source; however, the width of the source, and the sulphide concentration can not be determined.

The IP measurements at the western end of the line show a definite anomaly west of about 9+00W. The IP effects are strong, and the measurements should be extended to completely outline the source.

Line 10S

This line also passes across the apparent strike of the zone of mineralization. Slightly anomalous IP effects were measured all along the line, but no definite anomaly was located. The weak IP effects do not vary much with depth, or laterally; the apparent IP effects measured at the surface must be nearly equal to the true IP effects in the rocks. Only weakly disseminated mineralization, perhaps little as 1%, would be necessary to cause these effects.

Line 20S

The results on this line are very similar to those on Line 10S. The IP effects decrease east of 3+00E; there are somewhat stronger IP effects at depth at 3W to 0+00. These effects could be due to a narrow zone of concentrated mineralization at depth, or a slight increase in the concentration of disseminated mineralization over a more extensive width.

Line 3W

This line was surveyed at right angles to Line 0+00, just west of the shaft. The IP results show a very strong anomaly that extends from

25

3+00S to 6+00N. The pattern suggests that the line passes parallel to a tabular source. The anomalous effects were measured only for n = 3 and n = 4, the effects could be due to the tabular source located on Line 0+00.

Line 12W

The strong IP effects measured on this line confirm the anomaly located at the western end of Line 0+00. The pattern suggests a source at least 600' wide. The southern edge is sharp, but the anomaly fades out gradually to the north.

5. CONCLUSIONS AND RECOMMENDATIONS

The results of the IP test survey at the Midaltie Mine have shown the definite presence of substantial volumes of metallic mineralization. In view of the lode-type copper, and disseminated copper, known in the area, these anomalies must be considered to be of definite interest.

A detailed IP survey, using electrode intervals of less than 300', is warranted to locate, and outline, the mineralized zones. Measurements should be made using 200' spreads, on lines not more than 400' apart.

A detailed geologic map of the area should be prepared, and consideration should be given to a detailed geochemical survey to evaluate the anomalies. When these results are available, a decision can be made concerning prospective drilling targets.

McPHAR GEOPHYSICS LIMITED

Philip G. Hallof,
Geophysicist.

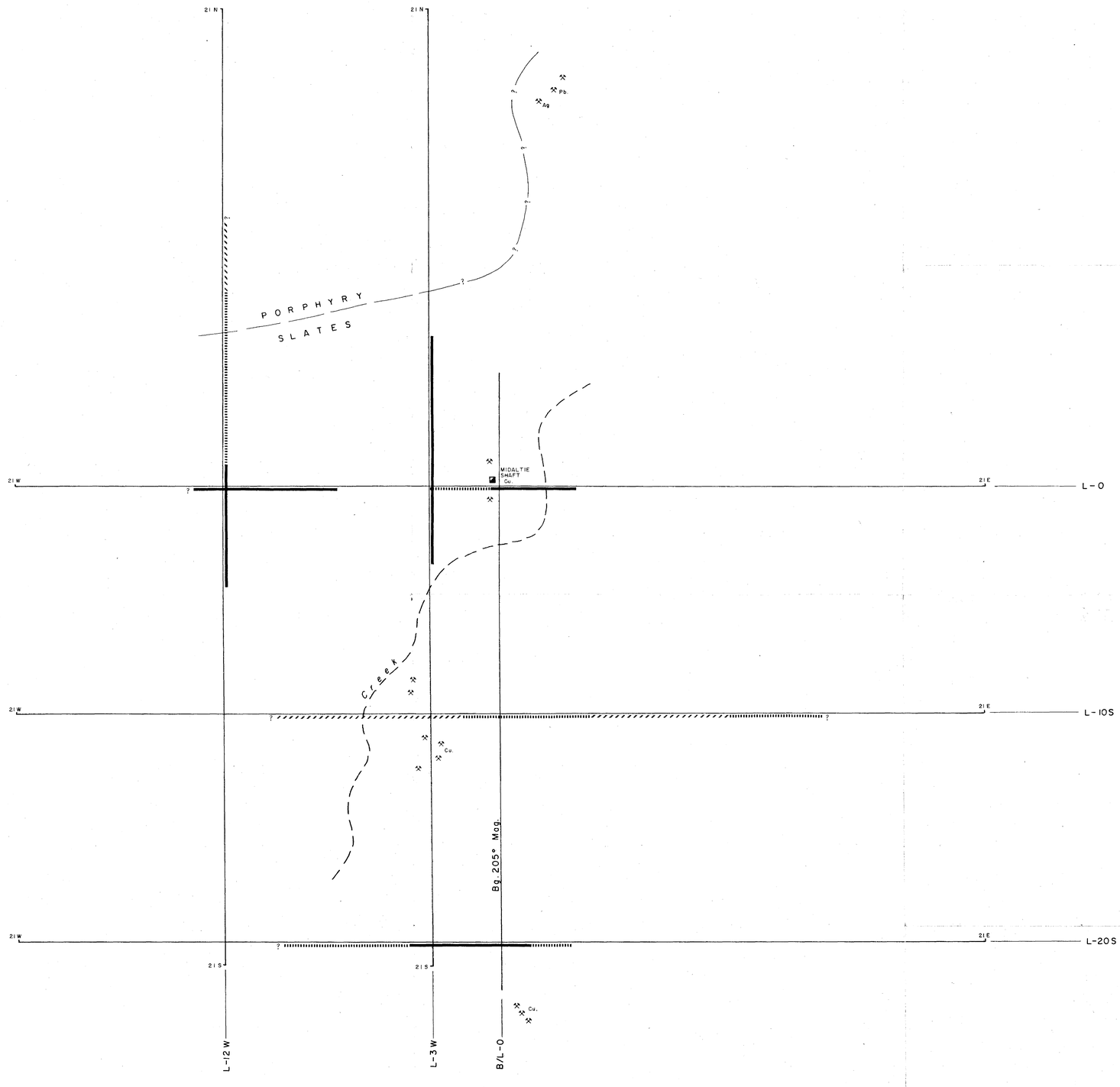
Dated: March 17, 1966

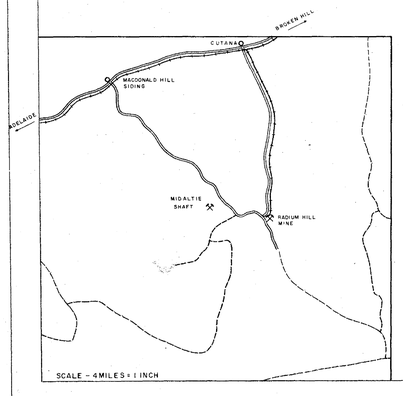
DWG.MISC.4212

McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

LOCATION MAP





MAGNETIC

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

ELECTROWINNING PTY. LTD.

RADIUM HILL PROSPECT, OLARY PROVINCE — S.A.

SCALE

200 150 100 60 0 200 400 600 800 1000 FEET

One Inch = Two Hundred Feet

McPHAR GEOPHYSICS LIMITED APPROVED

ENV. 568-1

DWG.MISC.4212

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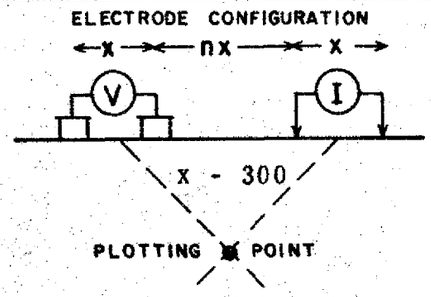

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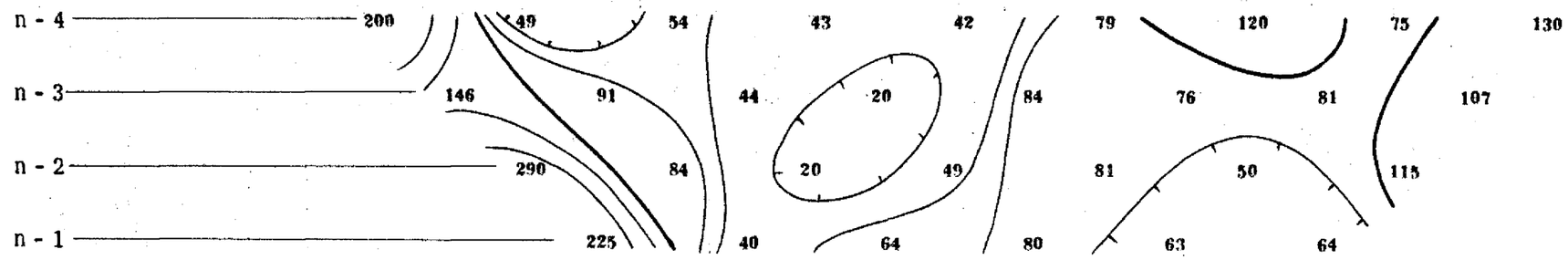
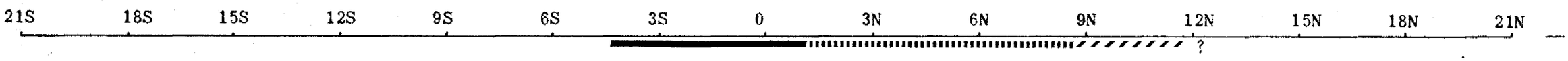
INDUCED POLARIZATION AND RESISTIVITY SURVEY

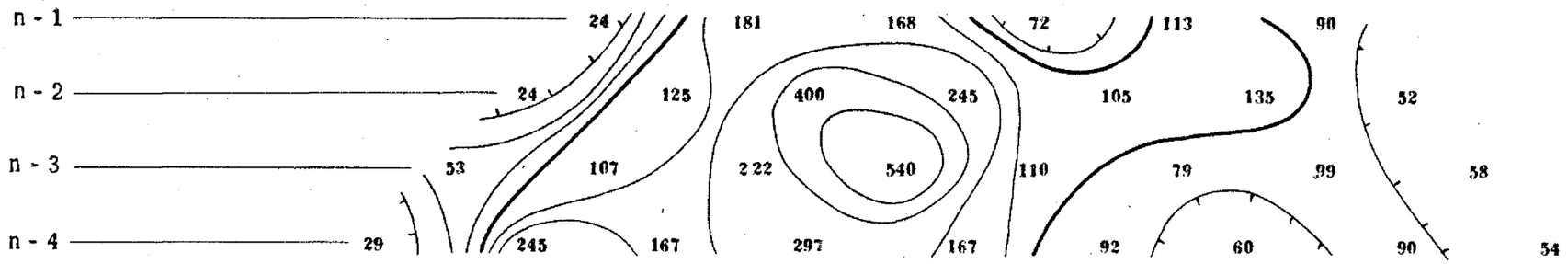
LINE 12W

NOTE: CONTOURS AT LOGARITHMIC MULTIPLES OF 10-15-20-30-50-75-100



Pa/2π
(OHM FEET)





(M.F.) a

LINE NO.- 12W

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE ——————

PROBABLE ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪

POSSIBLE / / / / / / / / /

ELECTROWINNING PTY. LTD.

RADIUM HILL PROSPECT, OLARY PROVINCE—S.A.

Scale—One inch = 300 Feet

NOTE LOGARITHMIC CONTOUR INTERVAL

FREQUENCY 0.3 - 2.5 CPS

DATE SURVEYED FEB 1966

APPROVED A

DATE 3/16/66

McPHAR GEOPHYSICS LIMITED

568-2

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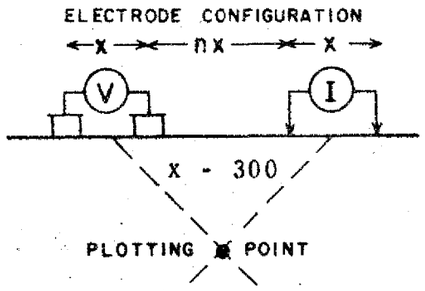
DWG. NO.-I.P.-2401-4

ELECTRODE CONFIGURATION

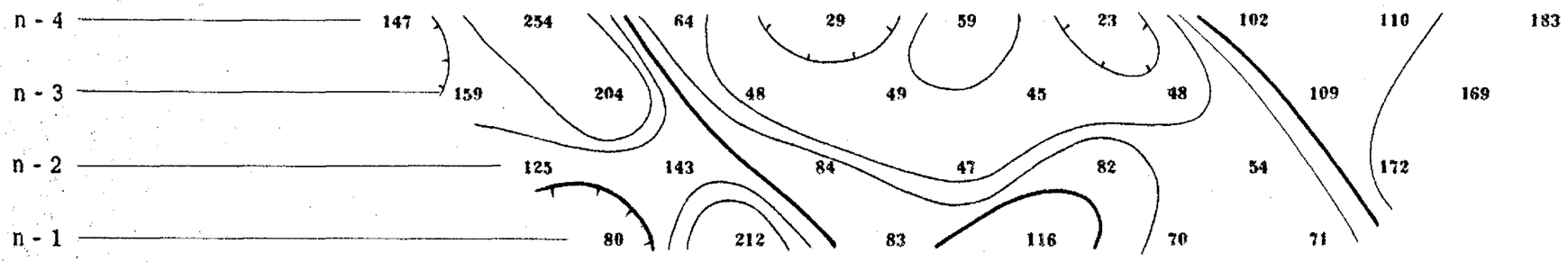


McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

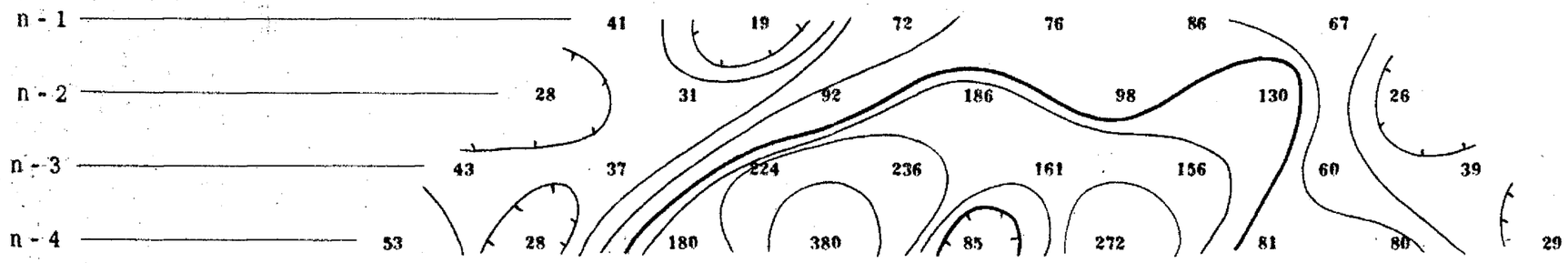
LINE 3W

NOTE: CONTOURS AT LOGARITHMIC MULTIPLES OF 10-15-20-30-50-75-100



Pa/2π
(OHM FEET)

21S 18S 15S 12S 9S 6S 3S 0 3N 6N 9N 12N 15N 18N 21N



(M.F.) a

LINE NO. 3W

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE ▬▬▬▬

PROBABLE ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪

POSSIBLE / / / / / / / / /

ELECTROWINNING PTY. LTD.

RADIUM HILL PROSPECT, OLARY PROVINCE — S.A.

Scale - One inch = 300 Feet

NOTE LOGARITHMIC CONTOUR INTERVAL

FREQUENCY 0.31-2.5 CPS

DATE SURVEYED FEB 1966

APPROVED A

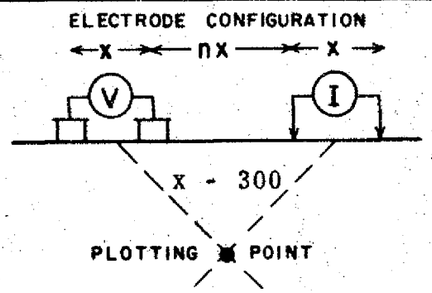
DATE 3/16/66

McPHAR GEOPHYSICS LIMITED

568-3

Env 568 *

DWG. NO.-I.P.-2401-3

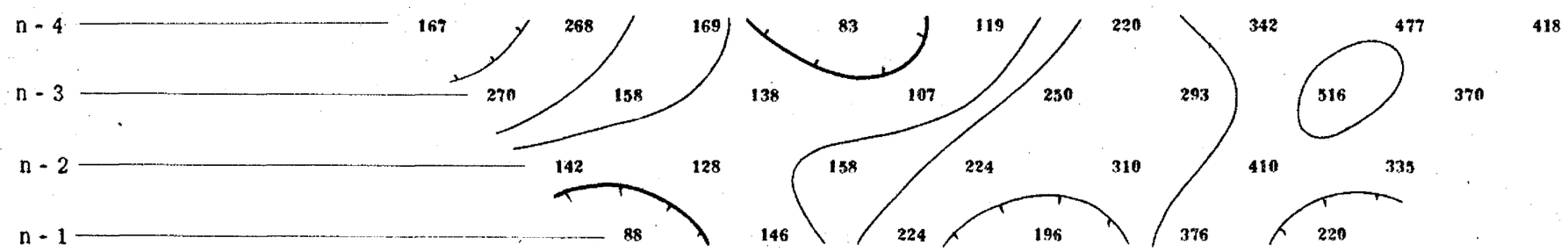


McPHAR GEOPHYSICS LIMITED

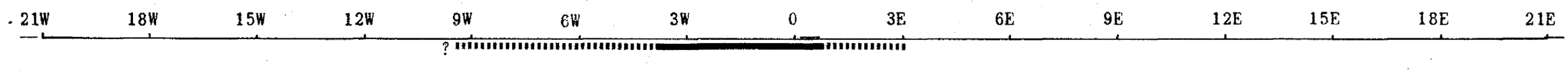
INDUCED POLARIZATION AND RESISTIVITY SURVEY

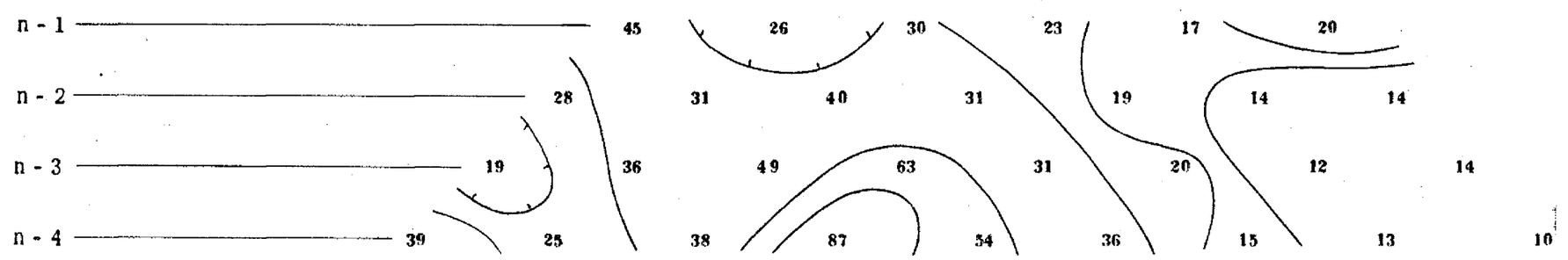
LINE 20 S

NOTE: CONTOURS AT LOGARITHMIC MULTIPLES OF 10-15-20-30-50-75-100



Pa/2π
(OHM FEET)





(M.F.) a

LINE NO-20S

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE ——————

PROBABLE ■■■■■■■■■■■■■■■■■■

POSSIBLE / / / / / / / / /

ELECTROWINNING PTY. LTD.

RADIUM HILL PROSPECT, OLARY PROVINCE—S.A.

Scale—One inch = 300 Feet

NOTE LOGARITHMIC CONTOUR INTERVAL

FREQUENCY 0·31-2·5 CPS

DATE SURVEYED FEB 1966

APPROVED A

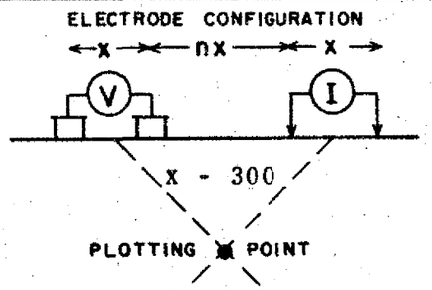
DATE 3/16/66

McPHAR GEOPHYSICS LIMITED

568-4

Env 568

DWG. NO.-I.P.-2401-2

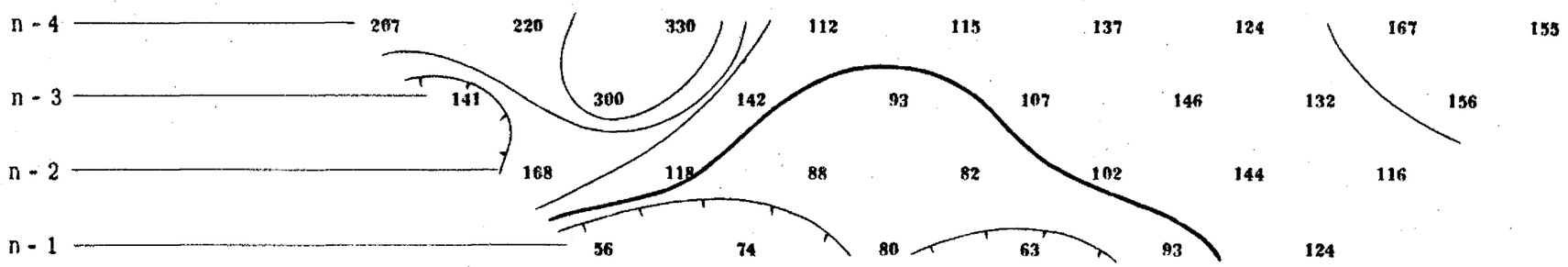


McPHAR GEOPHYSICS LIMITED

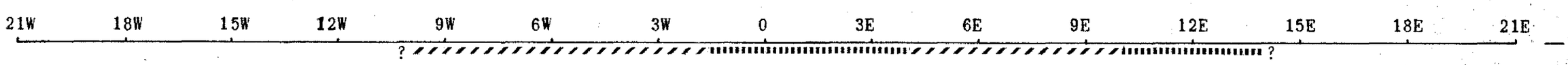
INDUCED POLARIZATION AND RESISTIVITY SURVEY

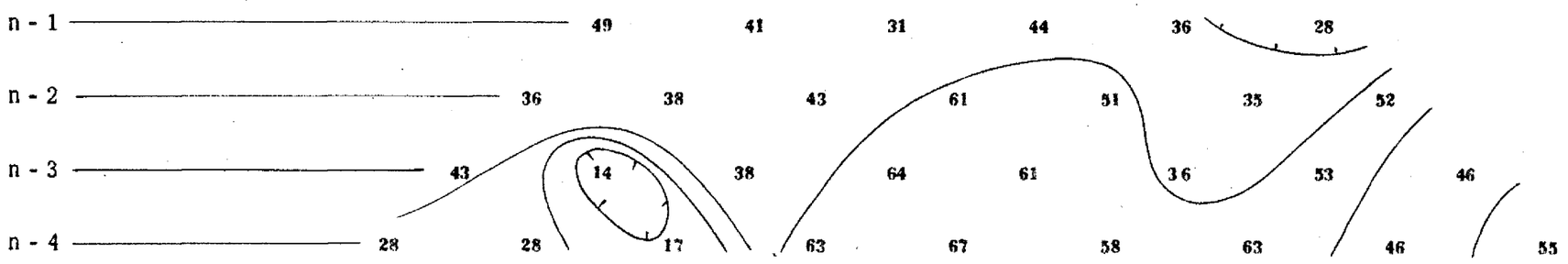
LINE 10S

NOTE: CONTOURS AT LOGARITHMIC MULTIPLES OF 10-15-20-30-50-75-100



Pa/2π
(OHM FEET)





(M.F.) a

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE ——————

PROBABLE ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪

POSSIBLE / / / / / / / / /

ELECTROWINNING PTY. LTD.

RADIUM HILL PROSPECT, OLARY PROVINCE—S.A.

Scale—One inch = 300 Feet

NOTE: LOGARITHMIC CONTOUR INTERVAL

FREQUENCY 0·3|-2·5 CPS

DATE SURVEYED FEB 1966

APPROVED PA

DATE 3/16/66

McPHAR GEOPHYSICS LIMITED

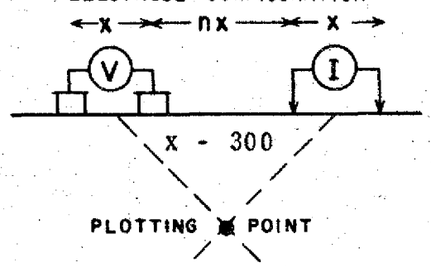
568-5

Env 568 *

LINE NO.—10S

DWG. NO.-I.P.-2401-1

ELECTRODE CONFIGURATION

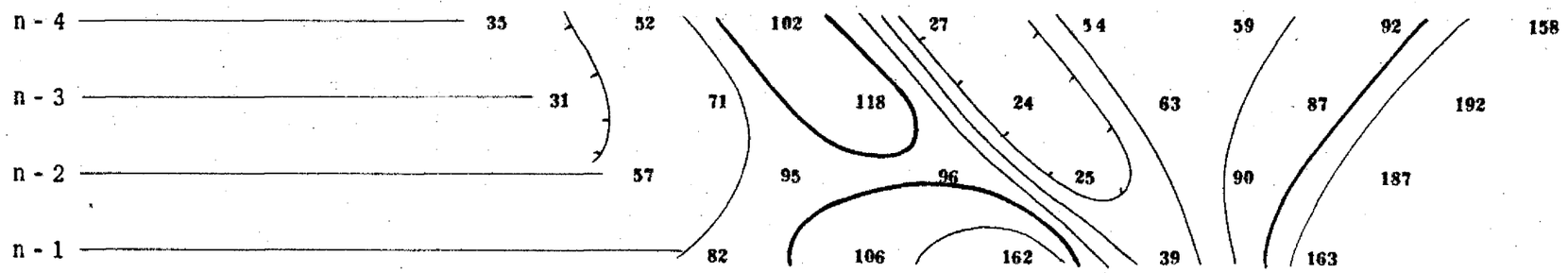


McPHAR GEOPHYSICS LIMITED

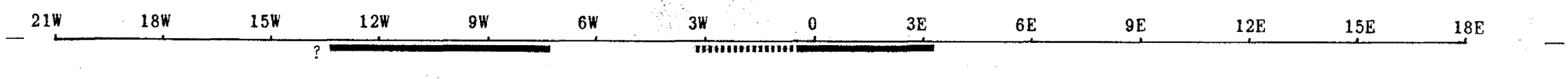
INDUCED POLARIZATION AND RESISTIVITY SURVEY

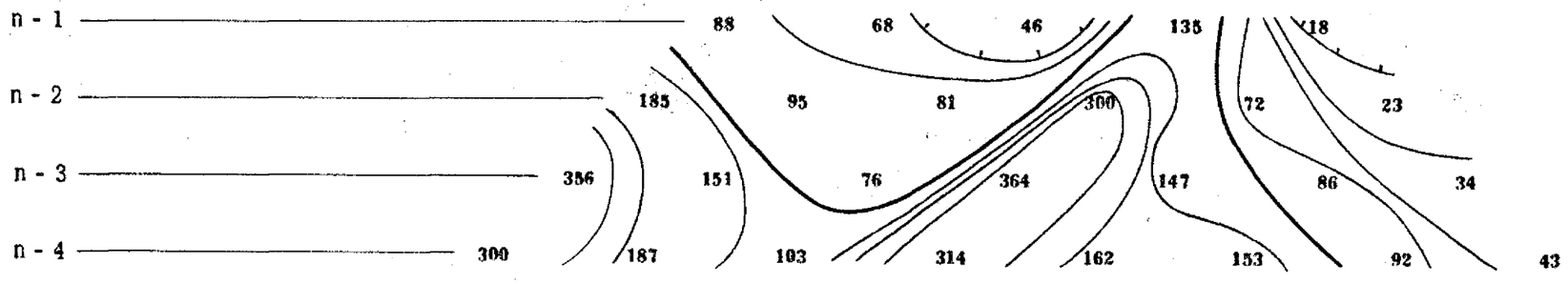
LINE 0-00

NOTE: CONTOURS AT LOGARITHMIC MULTIPLES OF 10-15-20-30-50-75-100



$\rho a/2\pi$
(OHM FEET)





(M.F.) a

LINE NO.- 0

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE ——————

PROBABLE ■■■■■■■■■■■■■■■■■■

POSSIBLE / / / / / / / / /

ELECTROWINNING PTY. LTD.

RADIUM HILL PROSPECT, OLARY PROVINCE—S.A.

Scale—One inch = 300 Feet

NOTE: LOGARITHMIC CONTOUR INTERVAL

FREQUENCY 0·31-2·5 CPS

DATE SURVEYED FEB 1966

APPROVED A

DATE 3/16/66

McPHAR GEOPHYSICS LIMITED

568-6

Enw 565 *

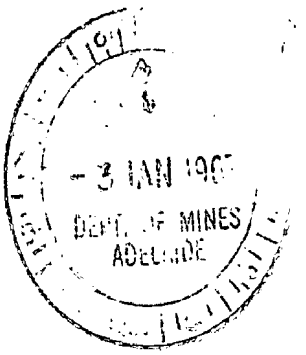
Env 568

AUSTMINEX VENTURE NO. 9

RADIUM HILL, S.A.

REPORT OF INVESTIGATIONS ON

S.M.L. 98



AUSTMINEX VENTURE NO. 9

RADIUM HILL, S.A.

S.I. 54. 2

REPORT OF INVESTIGATIONS ON S.M.L. 98

SEPTEMBER, 1966

Dated in Melbourne
14 December, 1966

Submitted by

L. F. Irving

Chapman, Wood, Griswold & Evans Pty. Ltd.

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LIST OF DRAWINGS AND ATTACHMENTS

Geochemical Assay data - Line 15W

Diamond drill hole logs 0.7S - 0.5W and 4S - 15W

Percussion drill hole field logs 0.5S - 0.5W, 1N - 7W,
1S - 7W, 2S - 15W and 4S - 15W

Vertical sections 0.5W, 7W and 15W — This plan missing.

McPhar Geophysics I.P. Profiles
Drawing Nos. I.P. - 2425 - 1 to 13

McPhar Geophysics I.P. Profiles
Drawing Nos. I.P. - 2401 - 2 to 5

McPhar Geophysics Drawing Misc. 3160

Composite Plan - C.W.G & E Drawing No. 16

SUMMARY and CONCLUSION

The Radium Hill copper prospect, S.M.L. 98, is located 3 miles west of the abandoned Radium Hill uranium mine. Austminex Pty.Ltd. held an option on the prospect from March 20, 1966, to August 31, 1966. During this time a programme of geophysical, geological and geochemical surveys was performed prior to and concurrently with an exploratory drilling programme involving both percussion and diamond drilling. Geophysical work was predominantly Induced Polarization with some magnetics. Eleven hundred and seventy-three feet of 3 inch percussion hole and 989 feet of NX and BX Wireline hole were completed.

Drilling and assaying results indicated large volumes of rock containing 1% to 10% of sulphide mineralization, principally pyrrhotite with minor chalcopyrite. Sufficient quantities of 5% to 8% sulphide mineralization were intersected to explain the highly anomalous I.P. effects. Copper assays showed values of about 0.01%. Minor amounts of lead and zinc and traces of gold and silver were detected.

The programme indicated that:

1. the I.P. anomalies were caused by disseminated pyrrhotite mineralization,

2. copper mineralization does not occur in economic quantities,

3. the property does not warrant further expenditure.

AUSTMINEX RADIUM HILL PROSPECT

SOUTH AUSTRALIA

S.I. 54. 2

REPORT OF INVESTIGATIONS ON S.M.L. 98

SEPTEMBER, 1966

INTRODUCTION

Special Mining Lease (S.M.L.) No. 98 covering an area of 6¼ square miles contains numerous old copper prospects including the Dalkey and Mildaltie Mines, both of which consist of a number of trenches and shafts excavated prior to 1900. Actual production could not have been more than a few wagon loads of copper ore.

Strong Induced Polarization anomalies and the presence of copper mineralization in planes of bedding and schistocity prompted Austminex to option the prospect.

S.M.L. 98 was taken out by Electrowinning Pty. Ltd., of Adelaide, on December 1, 1965. Subsequently, McPhar Geophysics Ltd. performed an Induced Polarization and Resistivity survey over the area of known mineralization. The property was then optioned to Austminex Pty. Ltd. on March 20, 1966. McPhar Geophysics Ltd. performed further I.P. surveys during April.

A program of percussion drilling with a Gardner-Denver PR 133 track-mounted drill commenced on June 8. Drilling finished on June 13 after completing 1173 ft. of 3 inch diameter hole. A magnetometer survey was performed at the same time.

A further one month programme of geological and geochemical surveying accompanied by diamond drilling commenced in early July. Sondra Drilling Pty. Ltd. completed 989 ft. of NX and BX wireline hole.

The option was dropped on August 31, 1966.

LOCATION, ACCESS and TOPOGRAPHY

The Radium Hill copper prospect is located 3 miles west of the abandoned Radium Hill Mine which lies approximately 290 miles by road, north-east of Adelaide, S.A. and 70 miles south-south-west of Broken Hill, N.S.W. The area is served by both road and railroad.

The Radium Hill district consists of undulating plains with occassional low ranges of hills. Tree cover is sparse.

GEOLOGY and MINERALOGY

The area comprising S.M.L. 98 consists of a highly folded and regionally metamorphosed sequence of dark grey, thin bedded, locally calcareous micaceous schists and quartzites of Upper Proterozoic age. These are underlain by a thick succession of boulder tillites which rest unconformably on the crystalline basement. Beds of tillite occur within the basal section of the schists.

The local sediments strike fairly consistently 295° - 305° with generally steep dips (C.W.G & E Drwg. No. 16). In the vicinity of the old copper prospects, beds dip to the south-west; to the south they dip north-east. Dragfolds are common and plunge at 15° - 20° south-east. Structure and folding suggest the presence of a south-east plunging synclinal axis at about LINE 37S on the geophysical grid.

A predominant set of vertical tension fractures striking N35°E exists throughout the area. Schistosity strikes parallel to the bedding and dips vertical to steeply south-west, usually cutting the beds at small angles. Slaty cleavage is common.

In the vicinity of the known copper occurrences quartz veinlets with minor calcite are very abundant. Narrow quartz veins (1" - 2" wide) filling the N35°E tension fractures carry chalcopyrite with pyrite and some pyrrhotite. Malachite and associated secondary copper minerals, viz. chalcocite, cuprite, and native copper, occur above the water table. In some localities copper minerals are associated with irregular veins, up to 12 inches wide, of dark brown siderite.

Pyrrhotite is the predominant metallic mineral in the area. It occurs principally along planes of schistocity with minor associated chalcopyrite. In small quartz veinlets it is coarser grained with exsolved chalcopyrite. Typical sections of diamond drill core often contain 5% - 8% of pyrrhotite. A selected sample of pyrrhotite-chalcopyrite in schist from the main shaft dump located at the grid origin assayed 0.86% Cu (Sample No. 79).

Pyrite is common in quartz veinlets and along chloritic shears.

GEOPHYSICS

Induced Polarization and Resistivity surveys indicated the presence of a broad conductor suggestive of disseminated mineralization over a strike length exceeding 2,000 ft. (See McPhar I.P. Plan and Profiles).

A magnetometer survey over the area did not give significantly anomalous results. One small anomaly of about 1,000 gammas was obtained at 43S - 17W.

GEOCHEMISTRY

Soil and drainage samples were collected at 200 ft. intervals along line 15W from 32N to 40S. Analyses indicated an average value of 2 ppm cx Cu.(See attached assay data).

EXPLORATORY DRILLING

Percussion Drilling

Initial drilling was done with a Gardner-Denver Model PR 133 track-mounted drill and 900 cfm compressor in hope of reaching the top of the I.P. anomalies located at depths of 250-300 ft. Holes were nominally 3 in. diameter. Five holes were drilled.

Hole No.	Angle and Bearing	Length (feet)
2S - 15 W	Vertical	248
4S - 15 W	-60° @ N 35° E	193
1N - 7 W	Vertical	254
1S - 7 W	Vertical	258
0.5S - 0.5W	-60° @ N 35° E	220
	TOTAL	1,173 ft.

The equipment on site and presence of water limited the depth of drilling to about 250 feet.

Percussion drilling samples were collected at 5 ft. intervals in a specially designed dust collector connected to a drill hole collar assembly. Dry samples were split with a Jones splitter to two representative 3 lb. samples which were then tagged and bagged. Wet samples were split directly on a special slotted table with the required sample being dried and bagged in duplicate.

Diamond Drilling

Two holes were drilled using wireline equipment. Holes were started with NX core and completed with BX. Recovery was virtually 100%.

The two holes were:

4S - 15W	-60° @ N 35° E	666 ft.
0.7S - 0.5W	-60° @ N 35° E	323 ft.
	TOTAL	989 ft.

Assaying

Of the percussion holes, only hole 0.5S - 0.5W had visible copper mineralization. The section 200 - 220 ft. averaged 0.77% Cu.

A number of the percussion hole 5 ft. sections were assayed. Copper content averages about 0.01% Cu. Lead and zinc values are about 0.01% and 0.02% respectively. Gold and silver occur only in trace amounts.

Four sections of diamond drill core carrying minor amounts of chalcopyrite were assayed. D.D.H. 0.7S - 0.5W contained a section from 77' - 84.5' with visible chalcopyrite which assayed 0.17% Cu. The other three sections assayed 0.01% Cu.

DISCUSSION

Percussion and diamond drilling of the I.P. anomalies revealed the presence of 1% - 10% of iron sulphides, principally pyrrhotite. Many large sections of the rock were found to contain 5% - 8% sulphide mineralization, a sufficient quantity to explain the strong I.P. anomalies.

Percussion hole 0.5S - 0.5W, which intersected 20 ft. of 0.77% Cu, strikes parallel (N35°E) to numerous copper bearing quartz-filled fractures in the immediate vicinity. Thus, it is conceivable that the drill hole followed one or more of these fractures.

Diamond drill hole 0.7S - 0.5W intersected chalcopyrite bearing quartz-calcite veinlets which strike nearly parallel to the core axis. The best section was 7½ ft. assaying 0.17% Cu.

Significant amounts of chalcopyrite in planes of bedding and schistosity were not intersected.

CHAPMAN, WOOD, GRISWOLD & EVANS PTY. LTD.

REPORT OF GEOCHEMICAL ANALYSIS

Samples submitted by D. Irving, J. Erdmanis Project RADIUM HILL - AUSTMINEX V9

Method data cx Bquinoline Analyst R. WEISNER Date: 25/7/66

Sample No.	Remarks	Soil	Silt	Water	exMe	Me	DR. SAMPLE	HM ppm	Cu ppm	Pb ppm	Zn ppm	Be	Mo	Sn	Ni	Hg	
15W-00N		✓							2								
15W-2N		✓							2								
15W-4N		✓							15								
15W-5.75N							✓		1								
15W-6N		✓							1								
15W-8N		✓							4								
15W-8+25N							✓		4								
15W-10N		✓							2								
15W-12N		✓							300	--	an erratic						
15W-14N		✓							2								
15W-16N		✓							1								
15W-18N		✓							1								
15W-20N		✓							2								
15W-22N		✓							2								
15W-24N		✓							2								
15W-26N		✓							4								
15W-28N		✓							2								
15W-30N							✓		2								
15W-32N		✓							4								
15W-2S		✓							2								
15W-4S		✓							2								
15W-6S		✓							2								

CHAPMAN, WOOD, GRISWOLD & EVANS PTY. LTD.

REPORT OF GEOCHEMICAL ANALYSIS

Samples submitted by D. Irving, J. Erdmanis *Project* RADIUM HILL – AUSTMINEX VS

Method data cx Biguinoline. *Analyst* R. WEISNER *Date:* 25/7/66

Sample No.	Remarks	Soil	Silt	Water	exMe	Me	DR. Sample	HM ppm	Cu ppm	Pb ppm	Zn ppm	Be	Mo	Sn	Ni	Hg	
15W-8S		✓							2								
15W-9135S							✓		1								
15W-10S		✓							2								
15W-12S		✓							2								
15W-14S		✓							4								
15W-16S		✓							2								
15W-18S		✓							2								
15W-20S							✓		<1								
15W-22S		✓							4								
15W-24S		✓							2								
15W-26S		✓							4								
15W-28S		✓							8								
15W-30S		✓							8								
15W-32S		✓							4								
15W-34S		✓							4								
15W-36S		✓							2								
15W-38S		✓							1								
15W-40S		✓							1								

* Double the sulphide content as estimated

DRILL HOLE EVALUATION SUMMARY

Company AUSTMINEX PTY LTD. Property RADIUM HILL Section No. Hole No: 705-50

Started 1st August 1966.	Bearing	Lat.	Collar El.	Logged by	J. FROMANIS.
Completed 8th August 1966.	Angle −60°	Dep.	Bottom El.	Remarks	0'-171' Nx. Wireline
Driller C. PAVEY (SONDA DRILL. PTY	Length 323'	Location	Level		171'-323' Bx. Wireline.

INTERVAL From	INTERVAL To	CORE RECOVERED Wt.	CORE RECOVERED Ft.	CORE RECOVERED %	DESCRIPTION	Sample No.	Interval	ASSAY
					August 1st			
0'	10'		–		No core recovered.			
10'	12'		1'5"		10'-10'4". Broken core; schistose micaceous shales;			
12'	16'		4'8"		limy in part.			
16'	26'		10'		10'-26'. Thin bedded micaceous shales; sections schistose			
					and limy; bedding 10° to 60° to axis of core; evidence of			
					cross bedding; contorted in vicinity of quartz veins;			
					shearing parallel to bedding with iron staining; leached			
					cavities; no sulphides noted.			
					August 3rd			
26'	30'6"		4'6"		26'36'. As above; mica schist 32'6"-33'6"; iron			
30'6"	36'		5'6"		staining in bedding plains, possible leached out iron sulphides;			
36'	46'		10'		limy bands and calcite veinlets.			
46'	56'		10'		36'-66'. Schistose shales, thin bedded, bedding w.r.t			
56'	66'		10'		axis of core 70°@41', 40°@46', 40°@52' 90°@60'			
					30°@66'; minature drag folding at 61' (anticline to N?)			
					Silicious bands at 44', 54', 61'6"; Shearing at 20°-30° to axis			
					of core, carry pyrite flakes, chloritic alteration; Qtz vein			
					at 49' with specular hematite; a at 49' with iron sulphides;			
					pyrite, pyrrhotite as flakes along bedding partly leached.			
					Very weak magnetism; lost water recovery at 43'			
					overall < ½% sulphides			

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DRILL HOLE EVALUATION SUMMARY

Company ..... Property ..... Section No. ..... Hole No. .....

Started	Bearing	Lat.	Collar El.	Logged by	
Completed	Angle	Dep.	Bottom El.	Remarks	
Driller	Length	Location	Level		

INTERVAL From	INTERVAL To	CORE RECOVERED Wt.	CORE RECOVERED Ft.	CORE RECOVERED %	DESCRIPTION	Sample No.	Interval	ASSAY % Cu
					August 4th			
66'	75'		9'		66'-71' schistose shales; evidence of bedding contorted	3024	77'-84½'	0.17
75'	85'		10'		sections schist; chloritic alteration; quartz veins; iron	3025	84½'-88'	0.01
85'	95'		10'		sulphide mineralisation along fractures and schistosity			
95'	102'		7'		plains, pyrite & pyrrhotite up to 2% very minor blebs			
102'	112'		10'		of chalcopyrite with pyrrhotite.			
					71'-75' Quartzitic mica schist with iron sulphides pyrite			
					pyrrho about 1% combined; calcite veins in shearing at 40°			
					to axis of core; bedding? 70°; conductivity poor; limy			
					in part			
					75'-76' Core brecciated cemented with calcite, chloritic			
					alteration; sulphides along hairline fractures, conductivity -			
					fair; chalcopyrite fleck.			
					76'-78'. Quartzitic mica schist; patchy sulphide mineralisation			
					pyrite pyrrhotite with areas of chalco up to 1½% ?			
					78'-112' Micaceous schist; sections with high chloritic			
					alteration, brecciated & cemented with calcite; breccia			
					ie shear striking parallel to section of drill core, dip 80°			
					W; iron sulphides 2 - 6% with up to 1½% chalco in			
					part; calcite & quartz veins erratic; limy in parts;			

DRILL HOLE EVALUATION SUMMARY

Company ..... Property ..... Section No. ..... Hole No. .....

Started	Bearing	Lat.	Collar El.	Logged by
Completed	Angle	Dep.	Bottom El.	Remarks
Driller	Length	Location	Level	

INTERVAL From	INTERVAL To	CORE RECOVERED Wt.	CORE RECOVERED Ft.	CORE RECOVERED %	DESCRIPTION	Sample No.	Interval	ASSAY
					(78'-112' cont.) Chloritic fractures at 102' 30° to axis of core.			
					7° @ 103', 35° @ 109'; Conductivity in fractured parts good,			
					poor in non fractured; iron sulphides deminishing 109' to 112'			
					about 1 to 3% max areas.			
112'	122'		10'		112'-142' Quartzitic micaceous schist; schistosity 10° to 60°			
122'	132'		10'		to axis of core; shearing 10° to 60° Qtz veins with pyrite			
132'	142'		10'		and pyrrhotite at 120', 130', 138', 141'; pyrrhotite along			
					schistosity up to 2% in bands; some evidence of bedding			
					highly contorted.			
142'	152'		10'		142'-171' Schistose fluvioglacial sediments; bedding			
152'	157'		5'		contorted; chloritic alteration mostly along shears,			
157'	163' 6"		6' 6"		shearing 30° @ 150' + 0° @ 157' to axis of core; bedding			
163' 6"	171'		4' 3"		displaced ½" at 164'; limy sections; pyrrhotite flakes in			
					schistosity about ½%; quartz and calcite veins with pyrite			
					partly leached; Sheared chloritic core at 171'; very			
					minor chalcopyrite blebs; conductivity poor in unfractured			
					core.			
					END OF NX CORE., HOLE CASED TO 171'. WATER RECOVERY			
					RETAINED FROM 171' BX CORE.			

82 700

DRILL HOLE EVALUATION SUMMARY

Company ..... Property ..... Section No. ..... Hole No. .....

Started		Bearing	Lat.	Collar El.	Logged by
Completed		Angle	Dep.	Bottom El.	Remarks
Driller		Length	Location	Level	

INTERVAL From	INTERVAL To	CORE RECOVERED Wt.	Ft.	%	DESCRIPTION July 6th	Sample No.	Interval	ASSAY
171'	181'		10'		171 - 180' Micaceous schist; Quartz veins with leached			
181'	191'		10'		pyrite at 173'6", 177'3"; shearing at 60° shistosity at 30° to 60°;			
191'	201'		10'		pyrrhotite along schistosity plains up to 2%.			
					180' - 202' - Fluvioglacial sediments, schistose a gneissic in			
					part; streached pebbles constituents; Sulphide mineralisation			
					along schistosity plains up to 5% in certain constituent pebbles.			
					at 197' gneissic pebbles 20% pyrrhotite. Quartz			
					veins with partly leached sulphides 186'9-190'; chalco			
					blebs minor; limy in part; green and bronze			
					mica in schists; sulphides average 4%			
201'	211'		10'		202' - 271' Schistose thin bedded micaceous sediments			
211'	220'		9'		(calcareous mica schist?); bedding contorted and wrinkled;			
220'	226'		6'		schistosity at various angles to axis of core and w.r.t.			
226'	236'		10'		bedding; limy sections; fracturing and shears chloritic;			
236'	246'		10'		10° to 40° to axis of core.; Quartz veins carry partly			
246'	256'		10'		leached pyrite, pyrrhotite, and minor blebs of chalcopyrite;			
256'	266'		10'		Sulphide mineralisation along schistosity in selected			
266'	276'		10'		thin beds; ratio of pyrite : pyrrhotite changes;			
					at 208'6" ½" band 10% pyrrho; average sulph 2%			

DRILL HOLE EVALUATION SUMMARY

Company ..... Property ..... Section No. ..... Hole No. .....

Started	Bearing	Lat.	Collar El.	Logged by
Completed	Angle	Dep.	Bottom El.	Remarks
Driller	Length	Location	Level	

INTERVAL From	INTERVAL To	CORE RECOVERED Wt.	CORE RECOVERED Ft.	CORE RECOVERED %	DESCRIPTION	Sample No.	Interval	ASSAY
					(202'-271' cont.) Qtz veins, 222' 25'3", 253'6", 254'3"; Shearing broken core 212', 214', 231'6", 255', at 231'6" leached fractures iron staining parallel to axis of core; conductivity good in veins poor in unfractured core.			
276'	284'		8'		very slightly magnetic. Lost all water recovery from 276'.			
284'	293'		9'		271'- 293' Micaceous schist chloritic alteration + shearing; main shear at 30°-275' iron oxide staining; brecciated + leached core; Quartz veins with partly leached sulphides mostly pyrite at 282'; overall 2% sulphides chalco up to ¾% 271' to 276'; Crystalline calcite veins + Vugs.;			
293'	303'		10'					
303'	313'		10'					
313'	323'		10'					
					293'- 323'. Calcareous mica schist; veins of quartz-pyrite + calcite-pyrite with erratic slips at 297', 299', 299'6", shears 20°-40° to axis of core; Sulphides ½% to 1% in schistosity; Pyrite flake in shears; weakly limy. conductivity in veins good; 306'6" gneissic rock (possible coarse altered fluvioglacial sods; bedding 30°. Magnet poor. END OF HOLE 323' 8th August 1966.			

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DRILL HOLE EVALUATION SUMMARY

Company AUSTMINEX PTY. LTD. Property RADIUM HILL Section No. 15W Hole No. 4S-15W

Started JULY 6, 1966	Bearing N 35° E	Lat.	Collar El.	Logged by D.F. IRVING & J. ERDMANIS	
Completed JULY 28, 1966	Angle -60°	Dep.	Bottom El.	Remarks 0-192½' - NX WIRELINE	
Driller C. PAVEY (SONDA DRILL. PTY)	Length 666	Location 4+00 S - 15+00W	Level	192½-666 - BX WIRELINE.	

INTERVAL From	INTERVAL To	CORE RECOVERED Wt.	CORE RECOVERED Ft.	CORE RECOVERED %	DESCRIPTION	Sample No.	Interval	ASSAY %Cu		ASSAY %Fe	
0	1				Casing above ground level.						
1	10		0	0	Surface soil, rubble and unconsolidated material with caliche						
10	258		248½	97.8	Dark grey micaceous schists with a multiplicity of narrow quartz-calcite veinlets; moderately soft rock with some calcareous material throughout; some sections show development of sillimanite; rock contains 2% to 4% of sulphide, predominantly pyrrhotite with some pyrite; pyrite is on fractures; pyrrh. in the rock, probably in the schistosity. Rocks are metased-inentary, partly of fluvio-glacial origin. Sulphides are highly conductive - the rock is non-conductive; no noticeable radioactivity. Bedding averages about 70° to core-axis.	3024	246-249	0.01			
						3028	192-202			5.0	

* Double the sulphide content

DRILL HOLE EVALUATION SUMMARY

Company AUSTMINEX PTY LTD. Property RADIUM HILL Section No. 15W Hole No. 4S-15W

Started	Bearing N 35° E	Lat.	Collar El.	Logged by	
Completed	Angle -60	Dep.	Bottom El.	Remarks	
Driller	Length 666	Location	Level		

INTERVAL From	INTERVAL To	CORE RECOVERED Wt.	Ft.	%	DESCRIPTION	Sample No.	Interval	ASSAY %Cu
258	387		129	100	Gneissic quartz-biotite schist with about 2% sulphide, predominantly pyrrh. with some pyrite on fractures and the occassional fleck of chalcopyrite (assoc. with pyrrh.); lightly calcareous, locally sheared and chloritized; numerous quartz veinlets. Beds locally twisted; avg. about 70° to core axis.			
387	442		55	100	Grey quartz-mica schist with ½% pyrrh. and a few grains of chalcopyrite; quartz veining common (½-1" veinlets) with minor pyrrh. and very minor assoc. chalco. Beds at 60°-90° to core axis.; 437'-439' contains about 10% pyrrh.	3027	437'-439'	0.01
442	523		78.5	98	Fluvio-glacial metasediments containing rock fragments and boulders of granite, quartzite, argillite and quartz; interstial material is biotitite (originally silt and sand) (cont.)			

0.00 Cu

DRILL HOLE EVALUATION SUMMARY

Company AUSTMINEX PTY. LTD. Property Section No. 15W. Hole No. 4S-15W

Started	Bearing N 35° E	Lat.	Collar El.	Logged by	
Completed	Angle -60°	Dep.	Bottom El.	Remarks	
Driller	Length 666	Location	Level		

INTERVAL From	INTERVAL To	CORE RECOVERED Wt.	CORE RECOVERED Ft.	CORE RECOVERED %	DESCRIPTION	Sample No.	Interval	ASSAY
					cont. from P.2. - The whole is altered, contains less than 1% sulphide which is predominantly pyrrh with very minor chalco.; very minor amounts of graphite noted on one or two fractures; chlorite common on fractures with pyrite.			
523	567		44	100	Bedded quartzitic sediments exhibiting cross bedding; highly altered with mica, chlorite, locally calcareous; less than 1% iron sulphide with very minor chalco. Beds 60°-90° to core.			
567	666		99	100	Fluvio-glacial material, altered and schistose, locally gneissic; iron sulphides throughout averaging 1% with short sections to 3%; pyrrh carries minor chalcopyrite; locally calcareous; some shearing at slight angles to the core. (cont.)			

DRILL HOLE EVALUATION SUMMARY

Company AUST. MINEX PTY. LTD. Property RADIUM HILL Section No. 15W Hole No. 43-15W

Started	Bearing N 35° E	Lat.	Collar El.	Logged by	
Completed	Angle -60	Dep.	Bottom El.	Remarks	
	Length 666	Location	Level		

INTERVAL From	INTERVAL To	CORE RECOVERED Wt.	CORE RECOVERED Ft.	CORE RECOVERED %	DESCRIPTION (cont. from P. 3.)	Sample No.	Interval	ASSAY
					Sheared areas are highly chloritic and occassionally contain minor amounts of graphite ; conductivity poor.			
10	666		649	99	Copper less than 0.01%			

CS LIMITED

ESISTIVITY SURVEY

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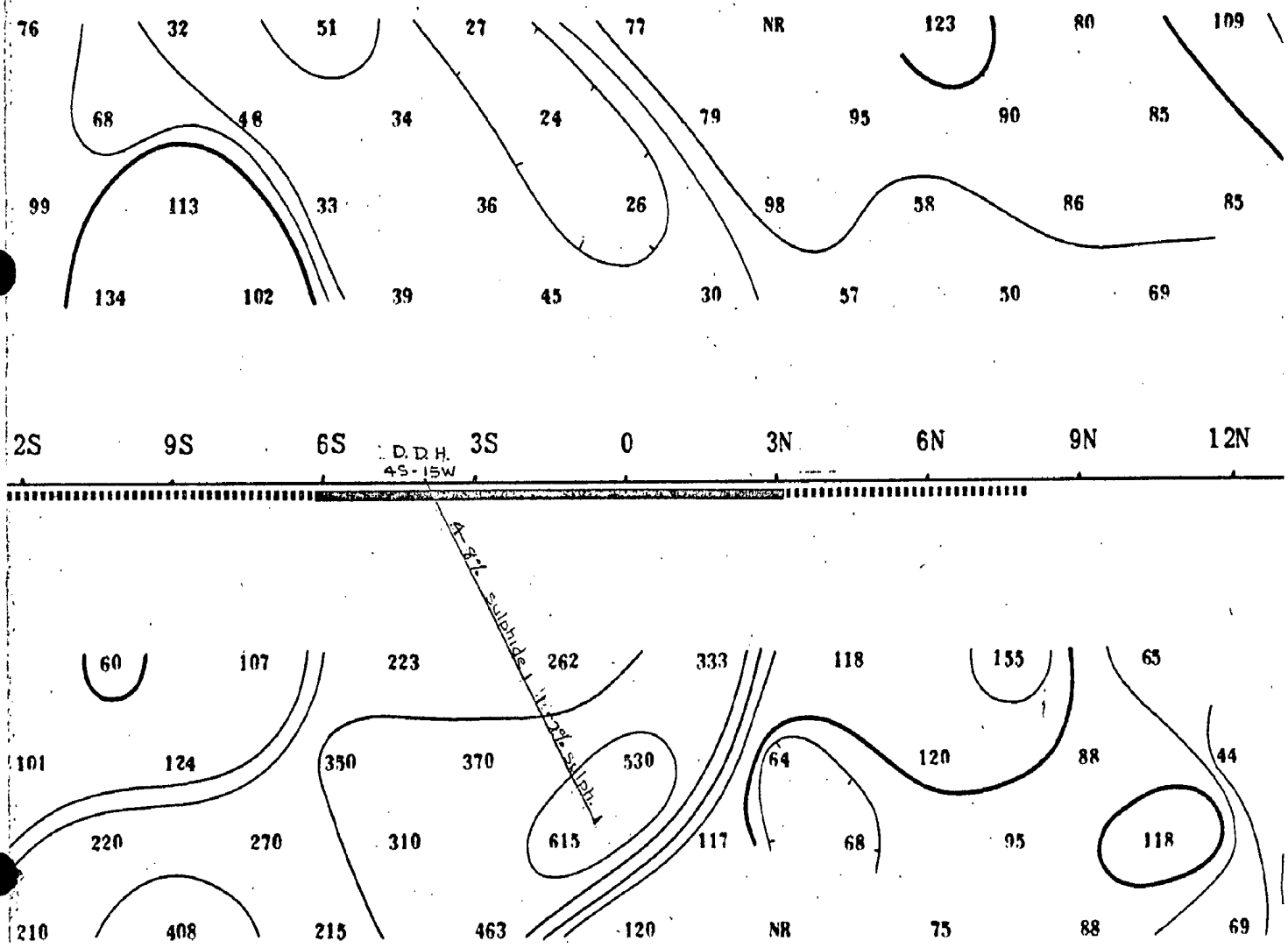

LIMITED

0 300 600

SCALE

Y PROVINCE—S. A.

I.P. SURVEY

RADIUM HILL, S.A.

0 Feet

INTERVAL

* Double estimated % sulphide content (see page 3)
Amount of Fe in other minerals is small

DRILL HOLE EVALUATION SUMMARY

Company AUSTMINEX PTY. LTD. Property RADIUM HILL - VENTURE 9 Section No. 15W Hole No. 4S-15W

Started July 6, 1966	Bearing N 35° E	Lat.	Collar El.	Logged by D.F. IRVINE.
Completed July 28, 1966	Angle -60°	Dep.	Bottom El.	Remarks
Driller C. PAVEY	Length 666	Location 4100S - 15100W	Level	

INTERVAL From	INTERVAL To	CORE RECOVERED Wt.	CORE RECOVERED Ft.	CORE RECOVERED %	DESCRIPTION	Sample No.	Interval	ASSAY
					0 - 1' - Casing above ground.			
1	10'		0		Surface soil, rubble and unconsolidated material with caliche.			
10	258				Dark grey micaceous schists with a multiplicity of narrow quartz - calcite veinlets; mod soft rock with some calcareous material throughout; very good coring rock; contains 2-4% of pyrite with some pyrrhotite; no radioactivity; rock is non-conductive - only sulphide veinlets or patches are conductive; rocks are metased probably of fluvio-glacial origin in part. Some sections have development of sillimanite.			
10	16		2		Soft, weathered rocks shot with gypsum veinlets			
16	26		9.75		and minor quartz, minor calcite; veinlets at 65°-90° off line of core; possibly bedding at 40° and evidence of tight folding.			
				0	Rusty zones suggest leaching of sulphides.			
26	36		10		Dark grey fresh micaceous schists, slightly			
36	46		10'		calcareous and shot with quartz veinlets up to 1" wide. These contain pyrite which shows leaching.			
46	49		3'		The rock is weakly magnetic due to pyrrhotite			
49	51		2'		which is a constituent in the rock up to 4 or 5%.			
51	57		6'					

(cont.)

DRILL HOLE EVALUATION SUMMARY

Company ..... Property ..... Section No. ..... Hole No. 43-15W

Started		Bearing	Lat.	Collar El.	Logged by
Completed		Angle	Dep.	Bottom El.	Remarks
Driller		Length	Location	Level	

INTERVAL From	INTERVAL To	CORE RECOVERED Wt.	CORE RECOVERED Ft.	CORE RECOVERED %	DESCRIPTION	Sample No.	Interval	ASSAY
57	64		7'		Pyrite predominantly occurs as fracture filling. Bedding at 60°-90° TC core, showing crumpling and twisting; minor light brown mica common. At 49-51' rusty calcite filled fracture, breccia @ 5° TC core; No radioactivity; good conductivity of minerals in fractures - none in rock			
64	74		10'		As above; some narrow sections are quite			
74	84		10'		calcareous; not as many quartz veins; some			
84	94		10'		narrow sections have up to 15% iron sulphide,			
94	104		10'		predominantly pyrrhotite - overall avg is +2%. At 80' a 3" muddy slip - chloritic; rocks becom-			
					ing more calcareous past 80'; beyond 99'			
					more twisting and warping of beds - more quartz			
					- iron sulphide veinlets			
104	114		10'		As above; at 116 bedding shown by thin			
114	124		10'		calcareous bands at 75°-90°; 117-119 is highly			
124	129		5'		calcareous; at 127 bedding at 60°; many pyrite			
129	136		10'		stringers at 134-135			

DRILL HOLE EVALUATION SUMMARY

Company ..... Property ..... Section No. ..... Hole No. 43-13W

Started	Bearing	Lat.	Collar El.	Logged by
Completed	Angle	Dep.	Bottom El.	Remarks
Driller	Length	Location	Level	

INTERVAL From	INTERVAL To	CORE RECOVERED Wt.	CORE RECOVERED Ft.	CORE RECOVERED %	DESCRIPTION	Sample No.	Interval	ASSAY % Fe.
136	146		10'		At 151-153' - high pyrite in veins; conductivity			
146	156		10'		over distances of 12"; 154-156 brecciated			
156	166		10'		and healed with calcite; pyrite sections still show			
166	172		5.25'		some leaching and deposition of secondary FeS_2 - pyrite			
172	177		5'		or marcasite; with HCl gives greenish colouring; fractures			
177	180		2.5'		show dark green secondary mineral			
180	185		5'		At 164 - more pyrite; 165-180 is breccia			
185	189		4'		zone healed with calcite-quarte; rusty fractures			
189	192½		3.5		and fault zone at 169-172; chloritic alt.			
					at 177; very little pyrrhotite through this			
					breccia zone.			
					At 185 - bedding at 55° to core			
					180-192½ - as before End of NX Core			
					Hole cased with NX and cont. with BX			
					on July 12, late afternoon			
192½	196		3.5		As before; quite calcareous; pyrrhotite	3028	192-202	5.0%
196	206		10'		with pyrite in quarte-calcite veins; crumpled and			
206	216		10'		contorted; up to 4.1% iron sulphide			

Fe mainly as pyrrhotite
thus % Iron sulphide ≅ 8%

DRILL HOLE EVALUATION SUMMARY

Company ..... Property ..... Section No. ..... Hole No. 45-15W

Started	Bearing	Lat.	Collar El.	Logged by	
Completed	Angle	Dep.	Bottom El.	Remarks	
Drifter	Length	Location	Level		

INTERVAL From	INTERVAL To	CORE RECOVERED Wt.	CORE RECOVERED Ft.	CORE RECOVERED %	DESCRIPTION	Sample No.	Interval	ASSAY %Cu
216	226		10'		Pyrrhotite more predominant and rocks very			
226	236		10'		calcareous, highly contorted; some sections			
236	246		10'		very micaceous with brassy pyrite; at 246			
					a clastic texture with small angular particles.			
					At 247 - banding of pyrrhotite at 70° to core			
					From 216 - 246 some sections are highly			
					calcareous, forming up to 5' lengths			
					of core.			
246	256		10'		From 246 rock is not as calcareous; locally	3026	246-249	0.01
256	266		10'		spotted and fewer quartz veins; still 2 or 3%			
266	276		10'		pyrrhotite - pyrite.			
					258 - 261½ - mottled core - gneissic; very			
					minor chalcopyrite with pyrrhotite.; At 264			
					banding at 60°; weakly calcareous, mainly			
					quartz and not heavily sulphided.			
					From 263 - 276 - quite siliceous with minor limy			
					areas; rather gneissic schist with bedding			
					at 80°-90° - 4:30 PM July 13.			

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DRILL HOLE EVALUATION SUMMARY

Company ..... Property ..... Section No. ..... Hole No. .....

Started	Bearing	Lat.	Collar El.	Logged by
Completed	Angle	Dep.	Bottom El.	Remarks
Driller	Length	Location	Level	

INTERVAL From	INTERVAL To	CORE RECOVERED Wt.	CORE RECOVERED Ft.	CORE RECOVERED %	DESCRIPTION	Sample No.	Interval	ASSAY
					July 14			
276	286		10'		One piece of core 276-286; cont. gneissic schist			
286	296		10'		rock, lightly calcareous; banding at 70° to core			
296	306		10'		279½ - 281½ - quartz vein; gneissic rock contains			
306	316		10'		about 2% of pyrrhotite, occasional specs of chalco			
316	321		5'		with pyrrhotite at 285			
					292 - 293 - augen texture - up to 3 or 4% pyrrhotite			
					295 - 298½ - shrd, clortically alt.; pyrrhotite veinlets			
					with minor chalco; some pyrite			
					302 - 308 - gneissic but broken; chl. & pyrite			
					318 - 321 - broken chloritically alt. ground; py.			
					& pyrrh. & very minor chalco			
					276 - 321 - Generally gneissic schist, lightly			
					calcareous; some chloritic sections - shrd & broken			
					Quartz - biotite schist to gneissic schist with			
					2% iron sulphide			

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DRILL HOLE EVALUATION SUMMARY

Company ..... Property ..... Section No. ..... Hole No. .....

Started	Bearing	Lat.	Collar El.	Logged by
Completed	Angle	Dep.	Bottom El.	Remarks
Driller	Length	Location	Level	

INTERVAL From	INTERVAL To	CORE RECOVERED Wt.	CORE RECOVERED Ft.	CORE RECOVERED %	DESCRIPTION	Sample No.	Interval	ASSAY
					July 15			
321	326		5		321 - 326 - Cont. gneissic schist with some darker bands,			
326	336		10'		these being less siliceous (more micaceous schistose)			
336	346		10'		Occassional blebs and veinlets of quartz; pyrrhotite			
346	356		10'		common throughout (2%) and occassional			
356	366		10'		pyrite stringers. Very minor chalco. with			
366	376		10'		pyrrhotite at quartz veinlets; locally weakly calcareous			
376	386		10'		At 324 bedding at 60°; at 337 @ 50°			
					at 352 @ 40°; at 355 @ 35°; 373 @ 70°			
					Local warping & twisting.			
					346-349 - Beds @ 20°; 5% pyrrh. with minor			
					chalco.			
					Pyrrh. occurs with quartz and along bedding (?) or schistosity			
					planes - occassionally a grain of chalco			
					is seen with it.			
					378-387 - Gneissic quartz-mica schist.			
					July 16			
386	396		10'		387-403 - Micaceous schist with minor pyrrhotite			
396	403		7'		(½%), and minor grains of chalcopyrite			
					398 Beds @ 60°; 398 @ 70°			
					401-403 - Rock more fract.; some chlorite.			

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DRILL HOLE EVALUATION SUMMARY

Company ..... Property ..... Section No. ..... Hole No. .....

Started	Bearing	Lat.	Collar El.	Logged by	
Completed	Angle	Dep.	Bottom El.	Remarks	
Drifter	Length	Location	Level		

INTERVAL From	INTERVAL To	CORE RECOVERED Wt.	Ft.	%	DESCRIPTION	Sample No.	Interval	ASSAY % Cu
					July 20, 1966			
403	413		10'		403-442 : Cont. as before - grey micaceous schist, mod. somewhat quartzitic			
413	423		10'		hard with very little calcareous matter ; less than			
423	433		10'		½% sulphide ; quartz veining common with minor pyrh			
433	436		3'		and usually a fleck of chalcopyrite with it.			
436	446		10'		At 405 - 6" quartz vein			
					Bedding 403 - 433 - 70°-90°			
					430'- Fractures @ 10°-20° ; bedding @ 65°			
					432-434 ; 436-437 - Broken core with 1%-2% iron sulphide			
					437-439 - 10% pyrh ; minor chalco ; rock brecciated	3027	437-439'	0.01
					440' beds @ 65°			
					440-444 - Rock twisted and contorted 1-2% sulphide			
					At 446 - Piece of pyrh with chalco.			
					- Sulphides conductive - not rock ; no radioactivity			
446	455		8'		442 - 481 - Fluvio-glacial metased conglomerate			
455	465		10'		rock fragments and boulders of granite, quartz,			
465	475		10'		quartzite & argillite - interstitial material is silt			
475	481		6'		and sand ; highly micaceous (biotitious) ; less than			
					1% sulphides - mainly pyrh with a few flecks of			

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DRILL HOLE EVALUATION SUMMARY

Company ..... Property ..... Section No. ..... Hole No. .....

Started	Bearing	Lat.	Collar El.	Logged by
Completed	Angle	Dep.	Bottom El.	Remarks
Driller	Length	Location	Level	

INTERVAL From	INTERVAL To	CORE RECOVERED Wt.	CORE RECOVERED Ft.	CORE RECOVERED %	DESCRIPTION	Sample No.	Interval	ASSAY
					chalcopyrite ; chloritic fractures often contain			
					pyrite ; sulphides visible in all rock types but			
					mainly found in fg. interstial matter.			
					446½ - 6" granite boulder with some graphite.			
					473-474 - granite boulder - pyrrh-py on fract ; spec			
					of chalco. at 474.			
					Occassionally the rock is weakly limy.			
					1:45 PM - 481 - changing bit.			
					July 21, 1966			
481	490		9'		481 - 523 As before - fluvio-glacial mateal with			
490	494		4'		minor iron sulphides, chlorite with pyrite on fractures			
494	497		3'		Minor graphite on sheared fractures			
497	499		1.5'		491 - 499 - Sheared parallel to core ; rock			
499	502		3'		broken - chlorite abund ; minor graphite ; sulphide			
502	506		4'		about 1% (mainly py.)			
506	516		10'		508½ - 510½ - chlorite schist much as 491-499 but			
516	526		10'		with 2% to 5% pyrite - shrg. parallel to core			
526	536		10'					

DRILL HOLE EVALUATION SUMMARY

Company ..... Property ..... Section No. ..... Hole No. .....

Started	Bearing	Lat.	Collar El.	Logged by D Irving & J Erdmanis
Completed	Angle	Dep.	Bottom El.	Remarks
Driller	Length	Location	Level	

INTERVAL From	INTERVAL To	CORE RECOVERED Wt.	CORE RECOVERED Ft.	CORE RECOVERED %	DESCRIPTION	Sample No.	Interval	ASSAY
536	546		10'		523 - 556 Mainly bedded quartzitic seds,			
546	556		10'		highly alt with mica, chl, locally very calcareous; minor			
					iron sulphide (less than 1%); the odd fleck of			
					shale with pyrrh.			
					Bedding is 60°-90° to core; cross bedding			
					common; material probably of fluvio-glacial			
					origin as some sections are pebbly (appear			
					gneissic as did rock at about 300 ft.)			
					530' - beds at 60°; 552 beds at 80°			
					5:30 PM - July 21.			
					July 23rd			
556	566		10'		556 - 567 Bedded quartzitic sediments			
566	576		10'		locally calcareous, sections high in mica; minor iron			
576	578		2'		sulphides (less than 1%); Chalcopyrite blebs with pyrrh;			
					conductivity poor;			
					Bedding is 90° to core at 565', schistosity at 55°			
					567 - 578 Fluvioglacial material with bands			
					of schists and quartzites; sulphide content up to			

55

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DRILL HOLE EVALUATION SUMMARY

Company..... Property..... Section No..... Hole No.....

Started	Bearing	Lat.	Collar El.	Logged by	J. Erdmanis.
Completed	Angle	Dep.	Bottom El.	Remarks	
Driller	Length	Location	Level		

INTERVAL		CORE RECOVERED			DESCRIPTION	Sample No.	Interval	ASSAY				
From	To	Wt.	Ft.	%								
					2% with pyrrhotite as main constituent, flecks of chalcopyrite in sections of quartzite at 575'							
					577' - Quartzite with flakes of mica. 578' Quartz vein 3" wide; sections slightly limy.							
					July 26th Changed bit.							
578	586		8'		578' - 596' Fluvioglacial seds; constituent boulders							
586	596		10'		and pebbles, schistose and gneissic; chloritic shears at							
					45° to axis of core; schists micaceous carrying							
					pyrrhotite with blebs of chalcopyrite; Sulphides patchy							
					up to 3%. core weakly magnetic in sections with							
					sulphides; conductivity poor; Schistosity and shearing							
					60 to ~~45~~ parallel to axis of core; Core in most part highly							
					siliceous:							
					586½' bedding & shearing 30° to axis							
					July 27th							
596	606		10'		596' - 636' Fluvioglacial sediments as above; some							
606	616		10'		angular fragments; Iron sulphides ½-1% throughout							
616	626		10'		with specs of chalcopyrite; larger blebs of pyrrhotite							
626	636		10'		associated with quartz & carry minor chalcopyrite							

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DRILL HOLE EVALUATION SUMMARY

Company ..... Property ..... Section No. ..... Hole No. .....

Started		Bearing	Lat.	Collar El.	Logged by J. Erelmanis.
Completed		Angle	Dep.	Bottom El.	Remarks
Driller		Length	Location	Level	

INTERVAL From	INTERVAL To	CORE RECOVERED Wt.	CORE RECOVERED Ft.	CORE RECOVERED %	DESCRIPTION	Sample No.	Interval	ASSAY
					Texture gneissic; bedding not defined; shearing at 604' 50° to axis of core; chloritic alteration			
					526 to 633' chloritic shears parallel to axis of core carry pyrite flakes and arsenopyrite crystals; core lying in part; shear zones carry minor graphite; conductivity poor			
					July 28th			
636	637½		1'6"		636 - 637½' core broken; shearing with chloritic			
637½	646		8'6"		alteration, 20° to 80° to axis of core; 643½ qtz vein			
646	650		4'0"		3" wide; 646 to 650 shearing parallel to axis			
650	656		6'		of core, chloritic alteration, minor graphite; iron			
656	666		10'		sulphides about ½%; very minor chalcopyrite			
					overall conductivity poor			
					END OF HOLE AT 666 ft 4.50 pm.			
					636 - 666 - Fluvioglacial material			

12 JUNE 66.

DRILL HOLE STRIP LOG

VERY WINDY SOME SAMPLE LOST AS IT'S SPLIT

COMPANY ALISTMINEX P/L PROPERTY RADIUM HILL SECTION _____ HOLE NO. 0-55-05W

STARTED 09-50, 12/6/66 BEARING _____ LAT. _____ COLLAR EL. _____ LOGGED BY D. I & W.L

COMPLETED _____ ANGLE -60° & N35E. DEP. _____ BOTTOM EL. _____

DRILLER R. O'NEILL LENGTH _____ LOCATION 0-5 SOUTH - 0-5 WEST

LENGTH FT.	LITHOLOGY	MINERAL GRADE	REMARKS	RECOVERY FT.	RECOVERY WT.	RECOVERY %	SAMPLE NO.	FT.	GRADE ESTIMATE ASSAY c/o Cu	FT. x ASSAY	ASSAY	FT. x ASSAY	ASSAY	FT. x ASSAY
0			GREY MICA SCHIST & QUARTZ SLIGHTLY BROWNISH. ALSO SOME QUARTZ		15	38	2745							
			AS ABOVE		27	68	2746							
10			AS ABOVE MINOR SULPHIDES. (IRON; PYRITE & PYRRHOTITE.)		27	68	2747							
			AS ABOVE		27	68	2748							
20			AS ABOVE.		25	63	2749							
			AS ABOVE. STILL MINOR IRON SULPHIDES		22	55	2750							
30			AS ABOVE.		25	63	2751							
			AS ABOVE.		25	63	2752							
40			AS ABOVE.		27	68	2753							

58

24

TIME 10:50	AS ABOVE.		27	68	2754							
50	AS. ABOVE.		26	65	2755							
	AS ABOVE.		29	73	2756							
60	AS ABOVE.		26	75	2757							
	STILL SOME KALIEHL. GREY MICA SCHIST & QUARTZ MINOR IRON SULPHIDES (PYRITE, PYRRH)		29	73	2758							
70	AS. ABOVE.		28	70	2759							
	AS. ABOVE.		29	73	2760							
80	AS ABOVE 2-3% IRON SULPHIDES MAINLY PYRRHOTITE).		28	70	2761							
	AS ABOVE. FILTER ON DUST COLLECTOR CLEANED & MIN.		29	73	2762							
90	AS ABOVE BUT MORE QUARTZ 5% IRON SULPHIDE (PYRITE, PYRRH)		30	75	2763		0.005					
TIME 11:30	AS ABOVE.		31	78	2764							
100	AS ABOVE.		27	68	2765							
	AS ABOVE BUT SLIGHTY LESS SULPHIDE. (IRON PYRITE PYRRH)		30	80	2766							
10	MICA SCHIST (GREY) 4-5% IRON SULPHIDE (PY, PYRRH) TRACE CHALCOPYRITE IN SCHIST.		27	68	2767		0.005					
			28	70	2768							
20	AS ABOVE BUT NO CHALCO SEEN											

56

125

12 JUNE 66

DRILL HOLE STRIP LOG

VERY WINDY SOME SAMPLE LOST AS IT P SPLIT

COMPANY AUSTMINEX P/L PROPERTY RADIUM HILL SECTION SM L 98 HOLE NO. 055-05W

STARTED 09:50 BEARING LAT. COLLAR EL. LOGGED BY D I & W L

COMPLETED ANGLE -60° & N35E DEP. BOTTOM EL

DRILLER R. O'NEILL LENGTH LOCATION 0·5 SOUTH & 0·5 WEST

LENGTH FT.	LITHOLOGY	MINERAL GRADE	REMARKS	RECOVERY FT.	RECOVERY WT.	RECOVERY %	SAMPLE NO.	FT.	GRADE ESTIMATE ASSAY % Cu	FT. x ASSAY	ASSAY % Zn	FT. x ASSAY	ASSAY % Pb	FT. x ASSAY
12.0			GREY MICA SCHIST 4-5% IRON SULPHIDE (PYRITE & PYRRHOTITE) ALSO QUARTZ & KALICHI.		50	75	2769							
(TIME 11.43 130			AS ABOVE		32	80	2770							
(11.46) 135			AS ABOVE		30	75	2771		0.008					
52) 140			AS ABOVE.		28	70	2772							
			AS ABOVE.		21	53	2773.		0.14					
TIME APP 12:09 150			AS ABOVE MINOR CHALCOPYRITE & TRACE OXIDE COPPER.		35	88	2774							
			GREY MICA SCHIST 4-5% IRON SULPHIDE (PYRITE & PYRRHOTITE) QUARTZ & KALICHI TRACE Cu. OXIDE.		25	63	2775		0.02					
					27	68	2776							
160			TRACE Cu OXIDE. (AS ABOVE)											
			AS ABOVE BUT TRACE CHALCOPYRITE. NO Cu OXIDE.		27	68	2777.							

09

26

	AS ABOVE BUT NO CHALCO - & NO Cu OXIDE.		~~29~~ 33	83	2778		0.02					
170	AS ABOVE NO Cu SEEN.		36	90	2779		0.006					
	AS ABOVE. TRACE CHALCOPYRITE & @ Cu OXIDE.		37	93	2780							
180	AS ABOVE BUT MORE QUARTZ & Cu OXIDE.		25	63	2781		0.02					
	GREY MICA SCHIST IRON SULPHIDES (PYRITE & PYARH.) ALSO FLAKES MICA.		27	68	2782							
190	AS ABOVE NO Cu SEEN.		22	55	2783		0.03					
	AS ABOVE NO Cu SEEN		23	58	2784							
200	AS ABOVE BUT TRACE Cu.		14	35	2785		0.90					
	AS ABOVE BUT SOME CHALCO- - PYRITE.		32	80	2786		1.06		<0.01		<0.01	<0.001
210	AS ABOVE SOME CHALCOPYRITE		25	63	2787		0.70					
	AS ABOVE SOME CHALCOPYRITE. NO CHIPS IN SAMPLE UNABLE TO LIFT CUTTINGS. - SOME WATER COMING IN.		3	8	2788		0.43					
220	Hole abandoned at 220' no longer able to bring reasonable % of cuttings to the surface (damp)											

00 61 127

9,10 JUNE 66

DRILL HOLE STRIP LOG

COMPANY AUSTMINEX P/L PROPERTY RADIUM HILL SECTION 1 HOLE NO. 1N-7W

STARTED 14.45 ; 9/6/66 BEARING LAT. COLLAR EL. LOGGED BY E.S.H & W.L

COMPLETED 12 ANGLE VERTICAL DEP. BOTTOM EL.

DRILLER R. O'NEILL LENGTH LOCATION 1 NORTH - 7 WEST

LENGTH FT.	LITHOLOGY	MINERAL GRADE	REMARKS	RECOVERY FT.	RECOVERY WT.	RECOVERY %	SAMPLE NO.	FT.	GRADE ESTIMATE ASSAY % Cu	FT. x ASSAY	ASSAY	FT. x ASSAY	ASSAY	FT. x ASSAY
0			Brownish yellow mica schist some quartz + PHLOGITE		19	48	2644							
			"		20	50	2645							
10			"		29	73	2646							
			"		29	73	2647							
20			"		28	70	2648							
			MORE QUARTZ											
			"		27	68	2649							
30			Becoming grey, no sulphides noted as yet		28	70	2650							
			As above with a trace of iron sulphides, less than 1%		30	75	2651							
40			AS ABOVE GREY MICA SCHIST MORE SULPHIDES		30	75	2652		0.005					

29.00

28

	Continuing in grey micaceous schist 5% qtz, 2% iron sulphides		36	90	2653									
50	As above, with more iron sulphides, 2% pyrrhotite 1% py		25	88	2654									
	"		39	98	2655									
60	As above, approximately 3% py and pyr(fine vals) in mica schist, 3% qtz		24	60	2656									
	As above		30	75	2657									
70	As above		26	65	2658									
	As above, with less quartz		30	75	2659									
80	AS ABOVE		34	85	2660									
	AS ABOVE		36	90	2661									
90	AS ABOVE				2662									
94	WATER AT 94'													
	94 - 98 HOLE LEFT OVERNIGHT WATER DOWN HOLE UNTILL FULL WET DRILLING NO SAMPLE OBTAINED.													
98	98 - 110 UNRESTRICTED WATER FLOW DRYED OUT MAX 2 FOOT SAMPLE (DAMP) OBTAINED OTHERWISE AS ABOVE.		5	13	2663									
110	DAMP SAMPLE POSSIBLY DETERGENT SAMPLE FROM SIDE OF HOLE OTHERWISE AS ABOVE.		80	200	2664									
120														

STARTED 12.45 ON 10th JUNE. AFTER OVERNIGHT STOP.

9, 10 JUNE 66.

DRILL HOLE STRIP LOG

COMPANY AUSTMINEX P/L PROPERTY RADILIM HILL SECTION _____ HOLE NO. 1N-7W.

STARTED 1445 9/6/66. BEARING _____ LAT. _____ COLLAR EL. _____ LOGGED BY E.S.H & W.L.

COMPLETED _____ ANGLE VERTICAL DEP. _____ BOTTOM EL. _____

DRILLER R. ONEILL LENGTH _____ LOCATION 1NORTH - 7WEST

LENGTH FT.	LITHOLOGY	MINERAL GRADE	REMARKS	RECOVERY FT.	RECOVERY WT.	RECOVERY %	SAMPLE NO.	FT.	GRADE ESTIMATE ASSAY o/o Cu	FT. x ASSAY	ASSAY o/o Zn	FT. x ASSAY	ASSAY o/o Pb	FT. x o/o ASSAY
120			120 · 123 DRY SAMPLE.		WET		2665							
			123 · 126 WET SAMPLE											
126			AS ABOVE.											
			DARK GREY MICA SCHIST & IRON		WET		2666							
129			SULPHIDES (PYRITE PYRRHOLITE.)											
			AS ABOVE		WET		2667							
			(HOLE MAKING WATER TO FAST FOR											
134			DETERGENT DRILLING. NO WATER).											
			AS ABOVE. ADDED		WET		2668							
139														
			AS ABOVIE.		WET		2669							
144														
			AS ABOVE.		WET		2670		L0.005					
149														
			DARK GREY MICA SCHIST & IRON		WET		2671							54
			SULPHIDES (PYRITE PYRRHOLITE) SOME											
154			QUARTZ & SOME RUSTY COLOURED SPOTS											
			AS ABOVE BUT ABOUT 5-10% SULPHIDES		WET.		2672.							
			& MORE QUARTZ											
159			AS ABOVE 10-15% SULPHIDES		WET.		2673							

30

	10% SULPHIDE IRON AS OTHERWISE		WET		2674						
169	AS ABOVE, LESS QUARTZ										
	AS ABOVE		WET		2675						
174											
	AS ABOVE. (NEG NH4)		WET		2676						
179											
	AS ABOVE		WET		2677		20.005				
184											
	AS ABOVE. NEGATIVE AMMONIA		WET		2678						
	CHECK 10-15% SULPHIDES (IRON)										
189	AS ABOVE		WET		2679						
	AS ABOVE, TRACE SILVER COLOURED		WET		2680						
199	SPECKS										
	AS ABOVE NO SILVER SPECKS		WET		2681						
	SEEN										
	AS ABOVE.		WET		2682						
209											
	AS ABOVE		WET		2683		0.009				
	AS ABOVE 10-15% SULPHIDES (IRON)		WET		2684		0.010				
219	AS ABOVE 15-20% SULPHIDES		WET		2685		0.010				
	BROWN PPT E NH4 (IRON.)										
	~~TRACE~~										
	AS ABOVE. TRACE SILVER		WET		2686		0.013		0.04		0.01	<0.01
229	COLOURED SPECKS CHANGE BITS										
	Rods plugged had to pull		wet		2687						
	no sample										
	Continuing in grey mica schist		wet		2688		0.012				
239	approx 10% iron sulphides										

10 June 66

DRILL HOLE STRIP LOG

COMPANY Austminex PROPERTY Radium Hill SECTION _____ HOLE NO. RN-76

STARTED _____ BEARING _____ LAT. _____ COLLAR EL. _____ LOGGED BY E. S. N. & W. G.

COMPLETED _____ ANGLE Vertical DEP. _____ BOTTOM EL. _____

DRILLER R O'Neill LENGTH _____ LOCATION 1 north 7 West

LENGTH FT.	LITHOLOGY	MINERAL GRADE	REMARKS	RECOVERY FT.	RECOVERY WT.	RECOVERY %	SAMPLE NO.	FT.	GRADE ESTIMATE ASSAY %	FT. x ASSAY	ASSAY	FT. x ASSAY	ASSAY	FT. x ASSAY
230			Grey mica schist with up to 15% iron sulphides and minor quartz		Wet		2689		0.010					
			As above, with grey flaky mineral, small sample		Wet		2690		0.010					
249			Grey mica schist with 15 to 20% iron sulphides		Wet		2691		0.003					
254														
							2692							
259			Hole abandoned at 254'											
			The amount of cuttings recovered dropped off sharply in the last 20 feet and we were no longer getting a representative sample											
			It appeared that the											

66

32

are available could no longer force the cuttings up through the large colum of water in the hole

11 JUNE 66.

DRILL HOLE STRIP LOG

COMPANY AUSTMINEX N/L PROPERTY RADIUM HILL SECTION SML 98 HOLE NO. 15-7W

STARTED 11.30 11/6/66 BEARING LAT. COLLAR EL. LOGGED BY E. S. H & W. L.

COMPLETED ANGLE VERTICAL DEP. BOTTOM EL.

DRILLER R. ONEILL LENGTH LOCATION 1 SOUTH - 7 WEST

LENGTH FT.	LITHOLOGY	MINERAL GRADE	REMARKS	RECOVERY FT.	RECOVERY WT.	RECOVERY %	SAMPLE NO.	FT.	GRADE ESTIMATE ASSAY % Cu	FT. x ASSAY	ASSAY % Zn	FT. x ASSAY	ASSAY % Pb	FT. x ASSAY
0			Mica schist with approx. 10% quartz stringers, yellowish grey with rusty patches		17	43	2692							
			As above		29	73	2693							
10			As above		18	45	2694							
			As above		23	58	2695							
20			As above, still no sulphides		24	60	2696							
			As above		24	60	2697							
30			AS ABOVE 2% SULPHIDES (PYRITE PYRRHOTITE)		28	70	2698							
			AS ABOVE BUT 1% SULPHIDE (PYRITE, PYRRHOTITE)		25	63	2699							
40			AS ABOVE.		30	75	2700							

34

AS ABOVE		25	63	2701							
AS ABOVE 1% SULPHIDES PYRITE, PYRRHOTITE		40	100	2702		<0.005					
AS ABOVE		38	95	2703							
Monotonously similar to above		32	80	2704							
DITTO		39	98	2705							
As above, with about 15% of a buff secondary mineral which is likely filling small fractures soft, clayey		37	93	2706		<0.005		0.01		<0.01	<0.001
AS ABOVE		34	85	2707							
AS ABOVE		31	78	2708							
AS ABOVE		39	98	2709							
AS ABOVE		33	83	2710							
As above		37	88	2711							
AS ABOVE		32	80	2712							
Continuing through micaceous schist 2% rock sulphides, 3% quartz		32	80	2713							
As above, 1% rock sulphides		32	80	2714							
As above		30	75	2715							

11 June 1966

DRILL HOLE STRIP LOG

COMPANY Austmaec PROPERTY Radium Hill SECTION _____ HOLE NO. 15 - 7W

STARTED 11:30 11/6/66 BEARING _____ LAT. _____ COLLAR EL. _____ LOGGED BY E. S. H & W. L.

COMPLETED _____ ANGLE Vertical DEP. _____ BOTTOM EL. _____

DRILLER R. O'Neill LENGTH _____ LOCATION 15 - 7W

LENGTH FT.	LITHOLOGY	MINERAL GRADE	REMARKS	RECOVERY FT.	RECOVERY WT.	RECOVERY %	SAMPLE NO.	FT.	GRADE ESTIMATE ASSAY Cu %	FT. x ASSAY	ASSAY Pb %	FT. x ASSAY	ASSAY Zn %	FT. x ASSAY
120			Grey micaceous schist, est 1-2% iron sulphides, 2% quartz, some calcite		32	80	2716							
			As above		26	65	2717							
130			As above, with less iron sulphides (approximately 1%)		35	88	2719							
			As above		33	83	2720							
140			As above		32	80	2721							
			As above		38	95	2722							
150			As above		35	88	2723		<0.005					
			Rock appears to be less micaceous, less schistose (1-2% iron sulphides)		29	73	2724							
160			As above		33	83	2725							

170	As above		32	80	2726								
	As above		35	88	2727								
180	Becoming gradually more compact, weakly schistose, 1-2% Fe sulphides		37	93	2728								
	As above		10	25	2729								
183	Hit water at 183', 2ft fractured soft drilling then H_2O clear now using the I.B Table				2730	Wet							
188	Weakly micaceous schist with 1 to 2% iron sulphides				2731	Wet							
193	As above				2732	Wet							
198	Grey weakly micaceous schist with 5 to 10% iron sulphides				2733	Wet							
					2734	Wet	0.008						
208	Assay the next few samples, dark grey 20% sulphides with graphite? Possibly some lead, strange traces on I.B. table, 20% sulphides				2735	Wet	0.004						
218	As above, lots of sulphides				2736	Wet	0.038		0.010		0.021		
	As above, 20% sulphides, some magnetite, also other grey minerals				2737	Wet	0.010						
228	As above				2738	Wet	0.018						
	Percent sulphides has dropped off (5% to 10%)				2739	Wet							
238	As above with less sulphides (approx 5%) continued				2740	Wet							

11 June 1966

DRILL HOLE STRIP LOG

COMPANY Austmarex PROPERTY Radium Hill SECTION _____ HOLE NO. 15 RH

D 11:30 11/6/66 BEARING _____ LAT. _____ COLLAR EL. _____ LOGGED BY E.S.H & W.L.

OMPLETED _____ ANGLE Vertical DEP. _____ BOTTOM EL. _____

DRILLER R. O'Neill LENGTH _____ LOCATION 100 South 700 West

LENGTH FT.	LITHOLOGY	MINERAL GRADE	REMARKS	RECOVERY FT.	RECOVERY WT.	RECOVERY %	SAMPLE NO.	FT.	GRADE ESTIMATE ASSAY	FT. x ASSAY	ASSAY	FT. x ASSAY	ASSAY	FT. x ASSAY
238			Dark grey weakly micaceous schist, 1-3% iron sulphides, minor quartz			Wet	2741							
48			As above. (3-5% iron sulphides)			Wet	2742							
			As above			Wet	2743							
258			As above with less sulphides 1-2% pyrite & pyrrhotite			Wet	2744							
			258' end of Hole											
			Recovery dropped off badly towards the end of the hole. It is believed that the anomaly has been tested.											

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8, JUNE 66.

DRILL HOLE STRIP LOG

COMPANY AUSTMINEX P/L PROPERTY RADIUM HILL SECTION _____ HOLE NO. 25-15W

STARTED 1300 - 8/6/66 BEARING _____ LAT. _____ COLLAR EL. _____ LOGGED BY E.S.H & W.L.L & D.I.

COMPLETED _____ ANGLE VERTICAL DEP. _____ BOTTOM EL. _____

DRILLER R. O'NEILL LENGTH _____ LOCATION 2. SOUTH - 15 WEST

LENGTH FT.	LITHOLOGY	MINERAL GRADE	REMARKS	RECOVERY FT.	RECOVERY WT.	RECOVERY %	SAMPLE NO.	FT.	GRADE ESTIMATE ASSAY c/a Cu	FT. x ASSAY	ASSAY	FT. x ASSAY	ASSAY	FT. x ASSAY
0			BIOTITE SCHIST		20	50	2601							
			BOITITE SCHIST		32	80	2602							
10			BOITITE SCHIST - PYRITE & PYRRHOTITE		31	78	2603							
			BOITITE SCHIST - PYRITE, PYRRHOTITE & CALCITE.		35	88	2604							
20			BOITITE SCHIST - PYRITE, PYRRHOTITE & CALCITE		26	90	2605							
			" " " "		37	93	2606							
30			" " " "		37	93	2607							
			" " " "		34	85	2608							
40			NEW BIT											
			" " " "		29	73	2609							

32.00

80

	" " " "		28	70	2610								
50	DARK GREY BOITITE (OR MICACEOUS) SCHISTS . PYRITE, PYRR. CALCITE & QUARTZ		34	85	2611								
	" " " "		38	95	2612								
60	" " " "		35	88	2613		<0.005						
	" " " "		36	90	2614								
70	NEW BIT												
	" " " "		36	90	2615								
	MICA SCHIST & PY, PYRR & QUARTZ 5% SULPHIDE		40	100	2616								
80	MICA SCHIST DARK GREY, PYRITE PYRRHOTITE & QUARTZ.		31	78	2617		<0.005						
	SOME RUSTY SPOTS IN THE MICACEOUS SCHIST		34	85	2618								
90	" " " "		32	80	2619								
	" " " " & CALCITE		37	93	2620								
100	GREY MICACEOUS SCHIST & PY, PYRR. QTZ. & CALCITE.		28	70	2621								
	AS ABOVE & COARSE CHIPS.		34	85	2622								
110	AS ABOVE		30	75	2623								
	AS ABOVE.		39	98	2624								
120	CONTINUED.												

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140

8, JUNE 66

DRILL HOLE STRIP LOG

BY AUSTMINEX P/L PROPERTY RADIUM HILL SECTION _____ HOLE NO. 25-15W

STARTED 13.00. - 8/6/66 BEARING _____ LAT. _____ COLLAR EL. _____ LOGGED BY E.S.H & W.L.G & D.T.

COMPLETED _____ ANGLE VERTICAL DEP. _____ BOTTOM EL. _____

DRILLER R. O'NEILL LENGTH _____ LOCATION 2 SOUTH - 15 WEST

LENGTH FT.	LITHOLOGY	MINERAL GRADE	REMARKS	RECOVERY FT.	RECOVERY WT.	RECOVERY %	SAMPLE NO.	FT.	GRADE ESTIMATE ASSAY oz/ton Cu	FT. x ASSAY	ASSAY	FT. x ASSAY	ASSAY	FT. x ASSAY
120			GREY MICACEOUS SCHIST & PYRITE, PYRRHOTITE, QUARTZ & CALCITE COARSE CHIPS		36	90	2625							
			AS ABOVE		35	88	2626							
130			AS ABOVE NEW BIT & COLLECTOR CLEANED.		37	93	2627		<0.005					
			AS ABOVE		40	100	2628							
140			" " " "		38	95	2629							
			" " " "		40	100	2630							
150			" " " "		40	100	2631							
			" " " "		38	95	2632							
160			" " " "		36	90	2633							

	" " " "		38	95	2634								
170	" " " "		26	65	2635								
	HARDER & LIGHTER IN COLOUR THAN ABOVE		33	83	2636								
180	ONLY MINOR IRON SULPHIDES - MUCH MORE QUARTZ & SOME MUSCOVITE FLAKES		24	60	2637		<0.005						
	AS ABOVE												
	AS ABOVE.		22	55	2638								
190	Left FOR OVERNIGHT HOLE WET IN MORNING		26		2639								
	35 FOOT OF DRILLING												
	BEFORE SAMPLE DRY				ZERO								
	ENOUGH TO REACH				2639								
200	SURFACE FIRST PART				—"								
	OF SAMPLE MOST PROBABLY												
	STUCK TO WALLS OF HOLE				"								
	SO THAT SAMPLE OBTAINED												
20	IS PROBABLY FROM LAST				2639								
	10 — 15 FOOT SAMPLE OBTAINED												
	WAS DAMP, DARK GREY				"								
	MICACEOUS SCHIST.												
210													
					2639								
215													01
	DAMP DARK GREY MICACEOUS		55		2640								
220	SCHIST MINOR SULPHIDES.												36
	SAMPLE # CONTAINS CONTAMIN-												
	ATION FROM ABOVE 35 FOOT												
	AS ROD PULLED FOR BIT												
	CHANGE.												
230													

42

8, JUNE 66.

DRILL HOLE STRIP LOG

COMPANY AUSTMINEX P/L PROPERTY RADIUM HILL SECTION _____ HOLE NO. 25-15 W

COMMENCED 13:00 8/6/66. BEARING _____ LAT. _____ COLLAR EL. _____ LOGGED BY E.S.H ; W.L. & D.I.

COMPLETED 11:45 9/6/66. ANGLE VERTICAL DEP. _____ BOTTOM EL. _____

DRILLER R. O'NEILL LENGTH 245' LOCATION 2. SOUTH - 15 WEST

LENGTH FT.	LITHOLOGY	MINERAL GRADE	REMARKS	RECOVERY FT.	RECOVERY WT.	RECOVERY %	SAMPLE NO.	FT.	GRADE ESTIMATE ASSAY % Cu	FT. x ASSAY	ASSAY % Zn	FT. x ASSAY	ASSAY % Pb	FT. x ASSAY Ag oz
30			Damp sample, mica schist with minor iron sulphides		5	13	2641		0.006		0.04		0.02	<0.001
			As above, sample sticking to walls of hole		5	13	2642							
10			Only very fine dust reaching top of hole, as above		4	10	2643							
245'														
			HOLE COMPLETED ABANDONED at 248'				2644							
50							~~2645~~							
							~~2646~~							
~~200~~							~~2647~~							
							~~2648~~							
~~250~~							~~2649~~							

A3

12 JUNE 66

DRILL HOLE STRIP LOG

COMPANY ALISTMINEX P/L PROPERTY RADIUM HILL SECTION SML 98 HOLE NO. 4-M-15S

STARTED 14.50 12/6/66 BEARING LAT. COLLAR EL. LOGGED BY D J & W. L

COMPLETED ANGLE -60° N35E DEP. BOTTOM EL.

DRILLER R. ONEILL LENGTH LOCATION 4 ~~NORTH~~ SOUTH - 15 WEST

LENGTH FT	LITHOLOGY	MINERAL GRADE	REMARKS	RECOVERY FT.	RECOVERY WT.	RECOVERY %	SAMPLE NO.	FT.	GRADE ESTIMATE ASSAY	FT. x ASSAY	ASSAY	FT. x ASSAY	ASSAY	FT. x ASSAY
0			GRAVEL				NO SAMPLE							
			GRAVEL & WEATHERED SCHIST		30	95	2789							
10			WEATHERED SCHIST (BROWN)		32	80	2790							
			WEATHERED SCHIST (BROWN)		35	63	2791							
20			WEATHERED SCHIST (BROWN)		36	90	2792							
			WEATHERED SCHIST (BROWN-GREY)		34	85	2793						C.D	
30			WEATHERED GREY MICACEOUS SCHIST		35	95	2794							
			AS ABOVE & MINOR IRON SULPHIDES		36	90	2795							
40			AS ABOVE & MINOR IRON SULPHIDES (PYRITE & PYRRHOTITE)		34	85	2796							

A4

AS ABOVE	30	75	2797	
AS ABOVE. ↓ QUARTZ. ↓ KALICHI	30	75	2798	
AS ABOVE.	32	80	2799	
AS ABOVE ABOUT 1% SULPHIDES IRON VERY LITTLE QUARTZ.	33	83	2800	
AS ABOVE.	33	83	2801	
AS ABOVE.	34	85	2802	
AS. ABOVE	32	80	2803	
AS ABOVE	38	95	2804	
AS ABOVE MINOR SULPHIDES (IRON)	34	85	2805	
AS ABOVE 1% - 2% SULPHIDES IRON (PYRRHOTITE & PYRITE)	31	78	2806	
AS. ABOVE	30	75	2807	
AS. ABOVE. MINOR SULPHIDES (IRON)	35	88	2808	
AS ABOVE	35	88	2809	
AS ABOVE	31	78	2810	
AS ABOVE	36	90	2811	

FINE 11:00

64

45

12 JUNE 66

DRILL HOLE STRIP LOG

COMPANY DUSTMINEX · P/L · PROPERTY RADIUM HILL · SECTION SML 98 · HOLE NO. 4N-15W-5

STARTED · BEARING · LAT. · COLLAR EL. · LOGGED BY E.S.I-10 & W.L.

COMPLETED 11-10 · ANGLE -60° N35°E · DEP. · BOTTOM EL.

DRILLER R. ONEILL · LENGTH · LOCATION 4 SOUTH & 15 WEST

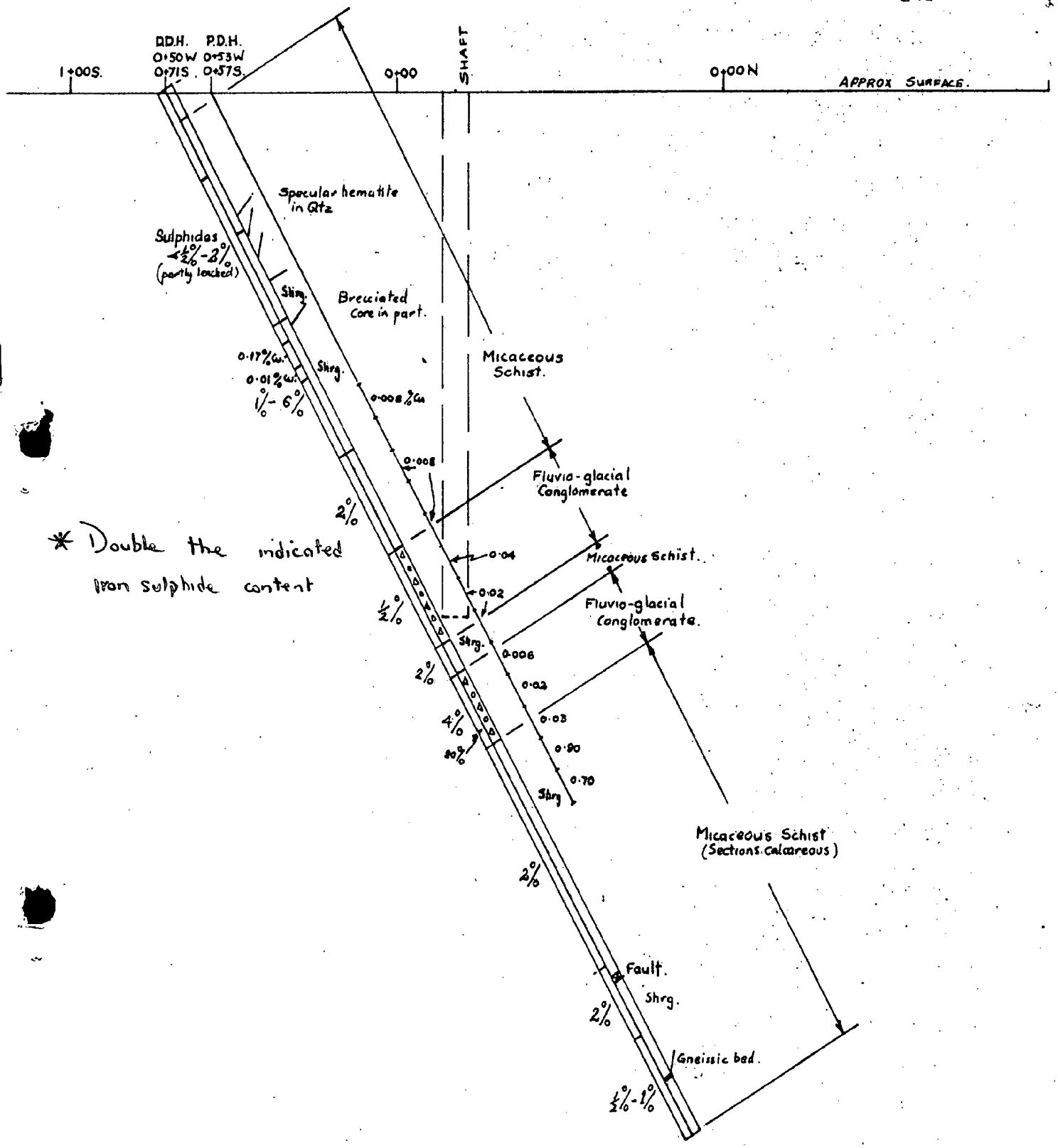
LENGTH FT.	LITHOLOGY	MINERAL GRADE	REMARKS	RECOVERY FT.	RECOVERY WT.	RECOVERY %	SAMPLE NO.	FT.	GRADE ESTIMATE ASSAY	FT. x ASSAY	ASSAY	FT. x ASSAY	ASSAY	FT. x ASSA
120			GREY MICACEOUS SCHIST & QUARTZ & KALICHI 1% IRON SULPHIDES (PYRITE ; PYRRHOTITE)		88	95	2812							
			AS ABOVE		86	90	2813							
130			AS ABOVE		86	90	2814							
			AS ABOVE		86	90	2815							
TIME 16[illegible]														
140			STOP OVERNIGHT . MOVE DOWN .		NO SAMPLE									
TIME 09:30 13/6			NO SAMPLE 140-145											
			NO SAMPLE 145-150		NO SAMPLE									
150			NO SAMPLE 150-155		NO SAMPLE									
			GREY MICACEOUS SCHIST & QUARTZ (RUSTY) KALICHI 1% IRON SULPHIDES (PYRITE ; PYRRHOTITE)		71	178	2816							
160			WATER AT 164' BEFORE WATER 2-3 FOOT OF VERY SOFT DRILLING		6	74	2817							

46

164	POSSIBLY FRACTURED QTZ. RICH?				
	AS ABOVE RUSTY QUARTZ & KALIUM	WET	2818		
168	ABUNDANT				
	AS ABOVE ABUNDANT RUSTY SPOTS	WET	2819		
	QUARTZ + KALIUM NO SULPHIDE.				
173					
	AS ABOVE	WET	2820		
178					
	AS ABOVE	WET	2821		
	AS ABOVE	WET	2822		
183					
	AS ABOVE	WET	2823		
193	HOLE ABANDONED (FAILED DONE 2 WATER CAVING IN SO THAT SAMPLE				
	BROKEN) NOT TO BE GETTING . MIST AS SAME TYPE SAMPLE FOR EACH METRE				
	FEET EVEN THROUGH DRILLING THROUGH HARD ROCK AGAIN . ROD ALSO GETTING STUCK				

T8

47



* Double the indicated iron sulphide content

SECTION 50W.

D.D.H. 50W--71S

August. 1966.

1 INCH = 40 FEET.

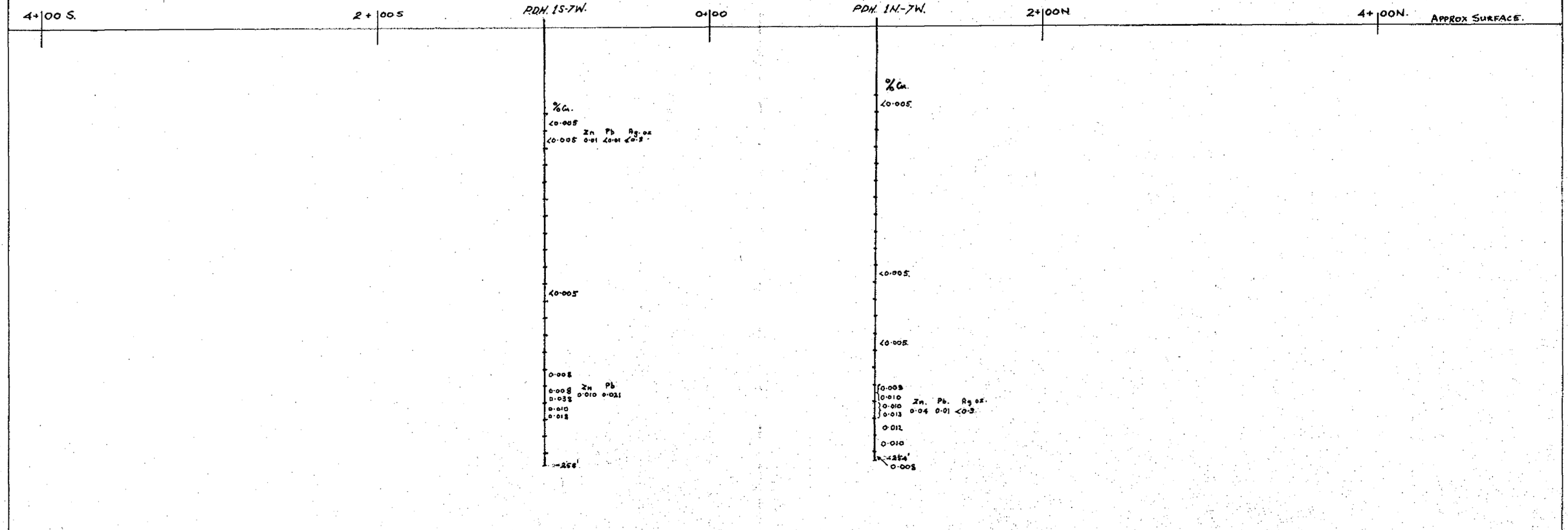
Plane of section is N35°E.

NB. Geophysical grid is N35°E.

AUSTMINEX VENTURE 9.

RADIUM HILL S.A.

J.E.



Plane of section is N.35°E.
N.B. Geophysical grid is N.35°E.

SECTION 7W

P.D.H. 1N-7W
P.D.H. 1S-7W
August 1966
1" = 60'

AUSTMINEX Venture 9
RADIUM HILL S.A.

JE.

568-7

4+00S 2+00S 0+00 2+00N 4+00N

Overburden

Rusty weathering

Sulphide 6% - 8%

+4%

Micaceous schist

Fault

4% - 8%

Gneissic quartz - mica schist

Vein

Sulphide content

4% shrg.

10%

Quartz - mica schist

4%

shrg, broken core

Fluvio - glacial conglomerate

20% 2% - 4%

4% - 2% shrg

shrg

6%

Quartzitic mica schist

4% - 2%

Fluvio - glacial conglomerate

2% - 6% shrg

4% - 2% shrg

Tillite

Plane of section is N 35°E

N.B. Geophysical grid is N 35°E

SECTION 15W.

D.D.H. 43 - 15W.

July 1966

1" = 60'

Austmines Venture 9

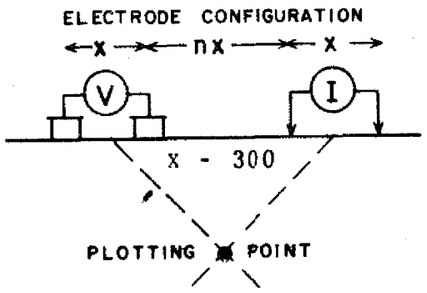
Radium Hill, S.A.

D.F.I.

568-8

DWG. NO.-I.P.- 2425-I

ELECTRODE CONFIGURATION

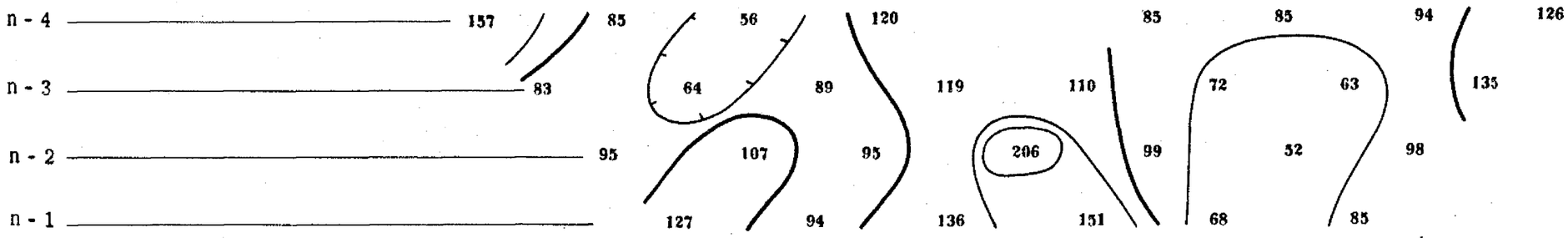


McPHAR GEOPHYSICS LIMITED

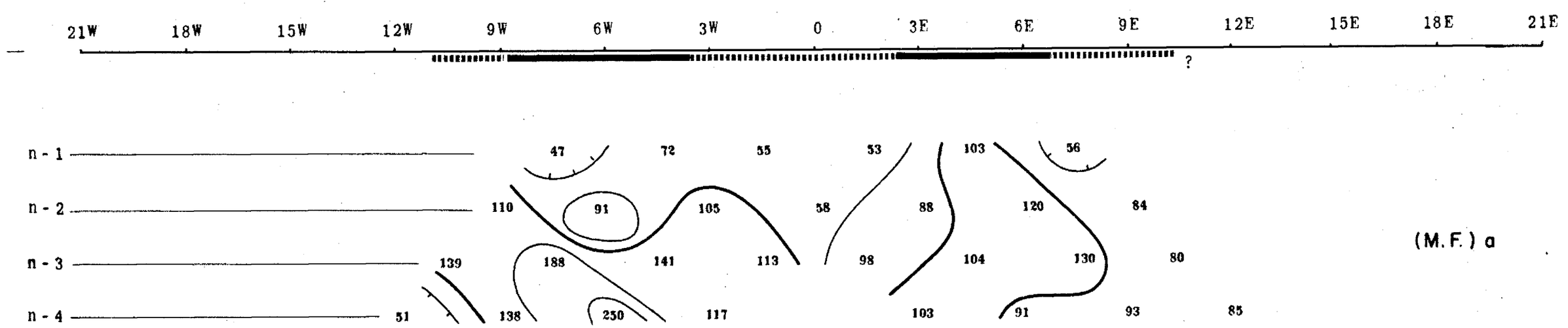
INDUCED POLARIZATION AND RESISTIVITY SURVEY

LINE 3N

NOTE:— CONTOURS AT LOGARITHMIC MULTIPLES OF 10-15-20-30-50-75-100



Pa/2π
(OHM FEET)



(M.F.) a

LINE NO- 3 N

AUSMINEX PTY. LIMITED

RADIUM HILL PROSPECT, OLARY PROVINCE—S. A.

Scale—One inch = 300 Feet

NOTE LOGARITHMIC CONTOUR INTERVAL

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE ——————

PROBABLE ■■■■■■■■■■■■■■■■■■

POSSIBLE / / / / / / / / /

FREQUENCY 0.3 & 2.5 CPS

DATE SURVEYED APRIL 1966

APPROVED

DATE 6/2/66

McPHAR GEOPHYSICS LIMITED

568-9

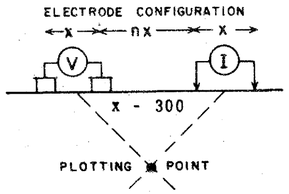
DWG. NO.-I.P.- 2425-2

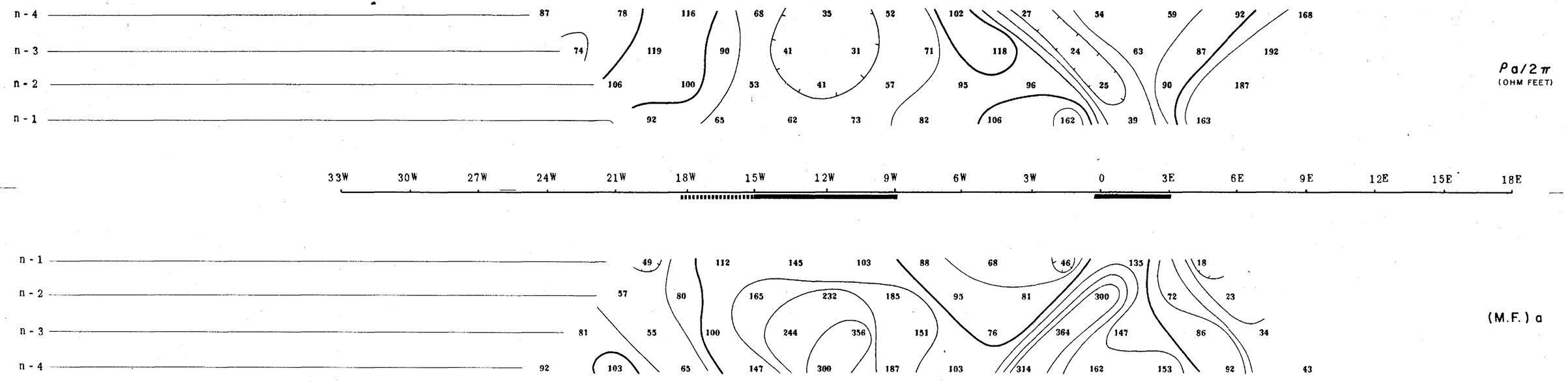
McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

LINE -0

NOTE:— CONTOURS AT LOGARITHMIC MULTIPLES OF 10-15-20-30-50-75-100





Pa/2π
(OHM FEET)

(M.F.) a

LINE NO—0

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

AUSMINEX PTY. LIMITED

RADIUM HILL PROSPECT, OLARY PROVINCE—S.A.

Scale—One inch = 300 Feet

NOTE LOGARITHMIC CONTOUR INTERVAL

FREQUENCY 0.5 & 2.5 CPS

DATE SURVEYED APRIL '68

APPROVED

DATE 6/2/68

McPHAR GEOPHYSICS LIMITED

568-10

DWG. NO.-I.P.- 2425 - 3

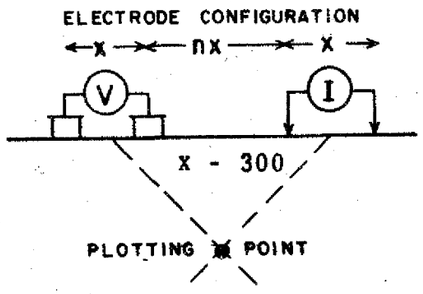
53

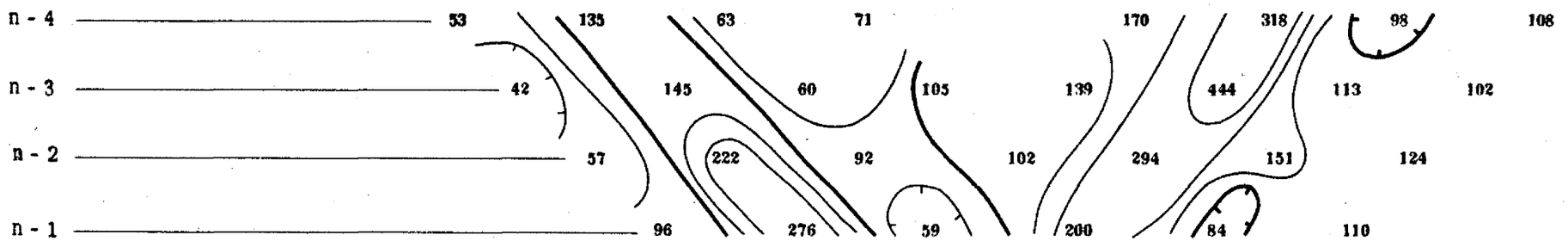
McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

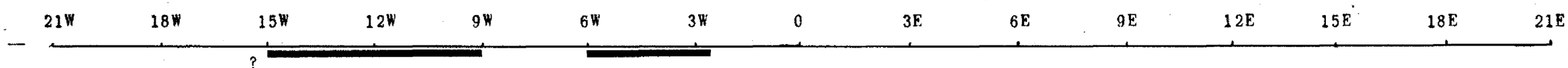
LINE 3S

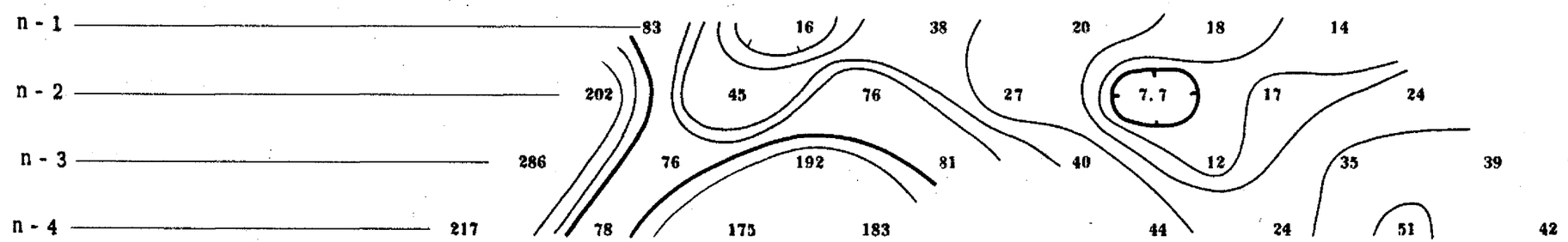
NOTE:— CONTOURS AT LOGARITHMIC MULTIPLES OF 10-15-20-30-50-75-100





Pa/2π
(OHM FEET)





(M.F.) a

LINE NO.- 3 S

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

AUSMINEX PTY. LIMITED

RADIUM HILL PROSPECT, OLARY PROVINCE—S. A.

Scale—One inch = 300 Feet

NOTE LOGARITHMIC CONTOUR INTERVAL

568-11

FREQUENCY 2.5 CPS

DATE SURVEYED APRIL '66

APPROVED

DATE 6/2/66

McPHAR GEOPHYSICS LIMITED

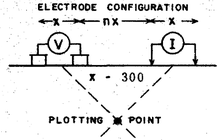
DWG. NO.-I.P.- 2425 - 4

McPHAR GEOPHYSICS LIMITED

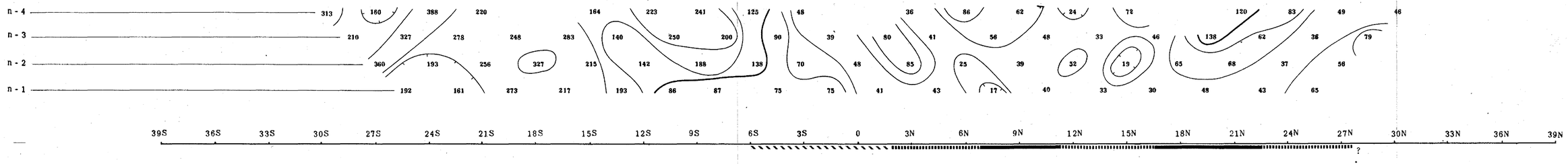
INDUCED POLARIZATION AND RESISTIVITY SURVEY

LINE 12E

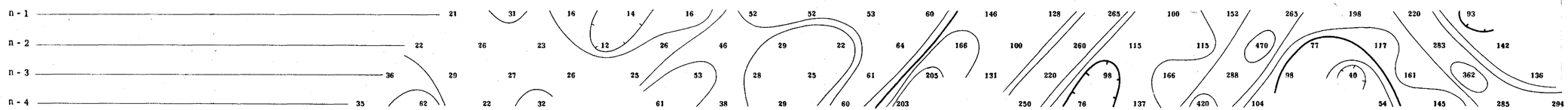
ELECTRODE CONFIGURATION



NOTE:— CONTOURS AT LOGARITHMIC MULTIPLES OF 10-15-20-30-50-75-100



Pa/2π
(OHM FEET)



(M.F.) a

LINE NO- 12 E

AUSMINEX PTY. LIMITED

RADIUM HILL PROSPECT, OLARY PROVINCE—S. A.

Scale—One inch= 300 Feet

NOTE LOGARITHMIC CONTOUR INTERVAL

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE ——————

PROBABLE ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪

POSSIBLE / / / / / / / / /

FREQUENCY 0.31-2.5 C.P.S.

DATE SURVEYED APRIL 1966

APPROVED

DATE 6/12/66

McPHAR GEOPHYSICS LIMITED

568-12

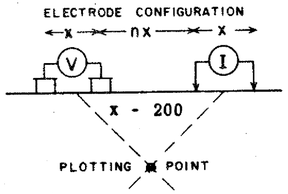
DWG. NO.-I.P.-2425-5

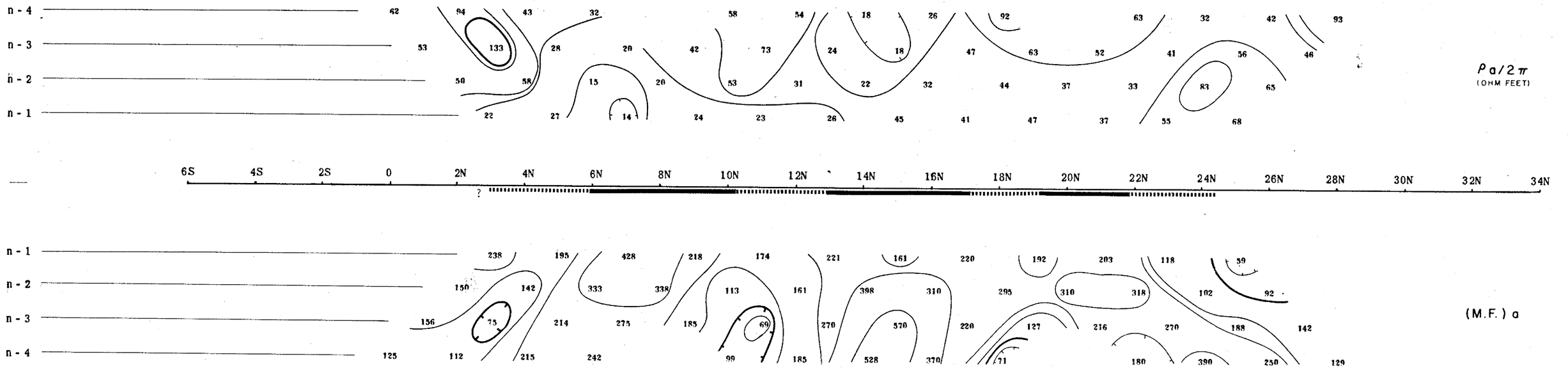
McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

LINE 12E

NOTE:— CONTOURS AT LOGARITHMIC MULTIPLES OF 10-15-20-30-50-75-100





Pa/2π
(OHM FEET)

(M.F.) a

LINE NO.-12E

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

AUSMINEX PTY. LIMITED

RADIUM HILL PROSPECT, OLARY PROVINCE—S.A.

Scale—One inch= 200 Feet

NOTE LOGARITHMIC CONTOUR INTERVAL

FREQUENCY 0.3 - 2.5 CPS

DATE SURVEYED APRIL 66

APPROVED

DATE 8/2/66

McPHAR GEOPHYSICS LIMITED

568-13

DWG. NO.-I.P.- 2425-6

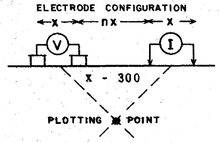
McPHAR GEOPHYSICS LIMITED

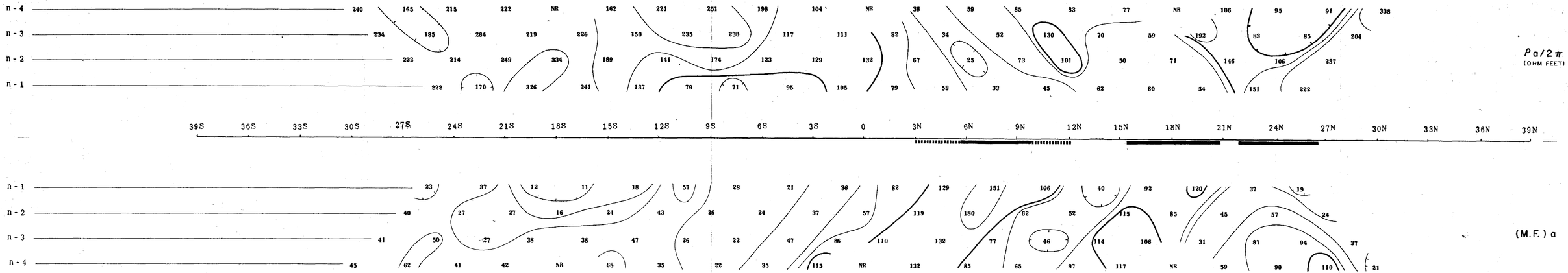
INDUCED POLARIZATION AND RESISTIVITY SURVEY

LINE 7E

NOTE:— CONTOURS AT LOGARITHMIC MULTIPLES OF 10-15-20-30-50-75-100

ELECTRODE CONFIGURATION





Pa/2π (OHM FEET)

(M.F.) a

LINE NO.-7 E

AUSMINEX PTY. LIMITED

RADIUM HILL PROSPECT, OLARY PROVINCE—S.A.

Scale—One inch = 300 Feet

NOTE: LOGARITHMIC CONTOUR INTERVAL

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

FREQUENCY 0.31-2.5 C.P.S.

DATE SURVEYED APRIL 1966

APPROVED PJ

DATE 5/12/66

McPHAR GEOPHYSICS LIMITED

568-14

DWG. NO.-I.P.- 2425-7

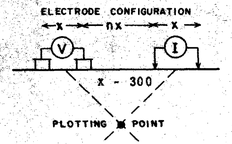
McPHAR GEOPHYSICS LIMITED

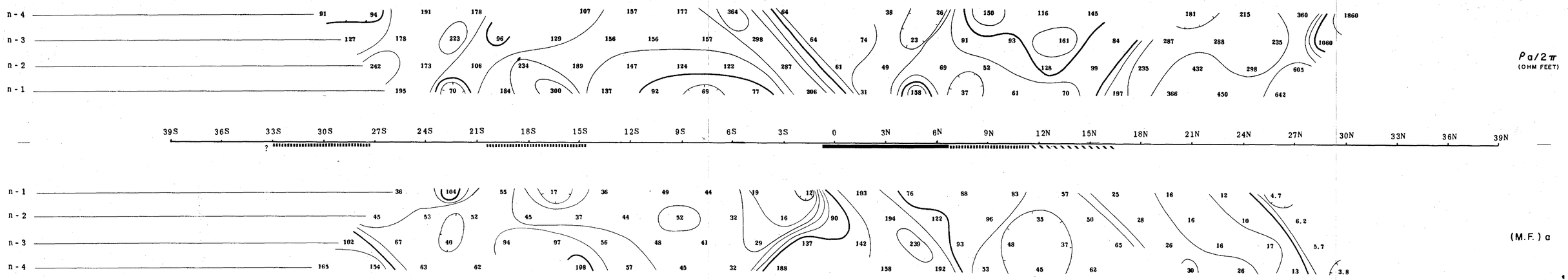
INDUCED POLARIZATION AND RESISTIVITY SURVEY

LINE 2E

NOTE:— CONTOURS AT LOGARITHMIC MULTIPLES OF 10-15-20-30-50-75-100

ELECTRODE CONFIGURATION





Pa/2π (OHM FEET)

(M.F.) a

LINE NO.- 2 E

AUSMINEX PTY. LIMITED

RADIUM HILL PROSPECT, OLARY PROVINCE—S. A.

Scale—One inch= 300 Feet

NOTE: LOGARITHMIC CONTOUR INTERVAL

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

FREQUENCY 0.25 C.P.S.

DATE SURVEYED APRIL/66

APPROVED

DATE 5/6/66

McPHAR GEOPHYSICS LIMITED

568-15

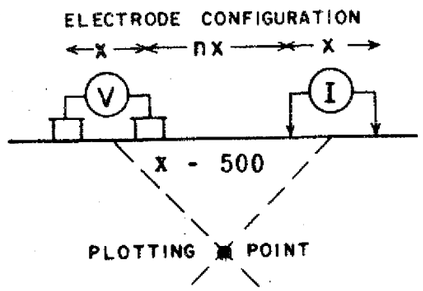
DWG. NO.-I.P.-2425-8

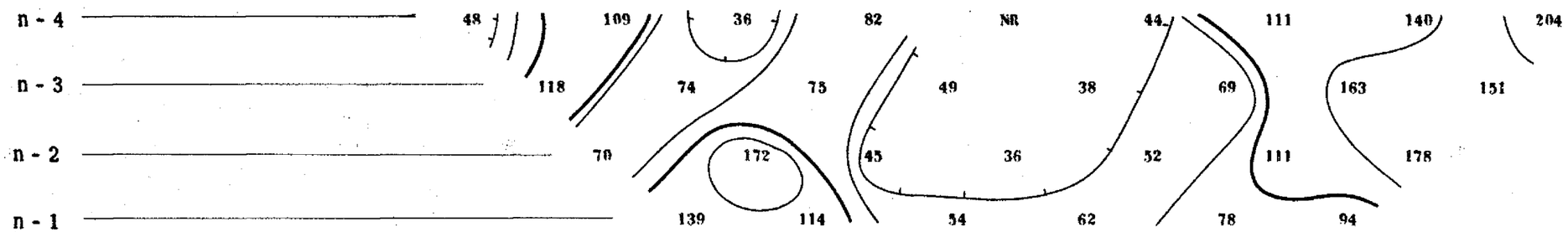
McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

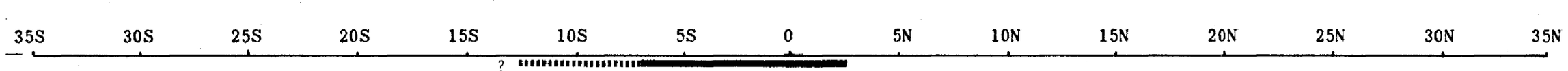
LINE 3W

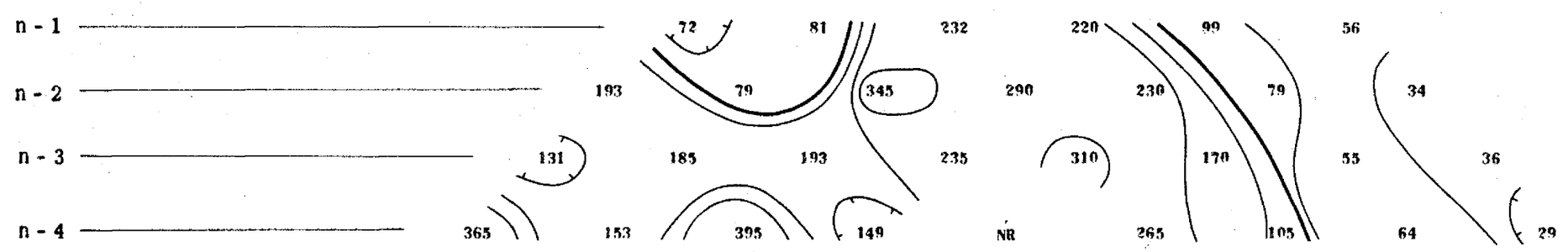
NOTE:— CONTOURS AT LOGARITHMIC MULTIPLES OF 10-15-20-30-50-75-100





Pa/2π
(OHM FEET)





(M.F.) a

LINE NO.-3W

AUSMINEX PTY. LIMITED

RADIUM HILL PROSPECT, OLARY PROVINCE—S. A.

Scale—One inch = 500 Feet

NOTE LOGARITHMIC CONTOUR INTERVAL

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

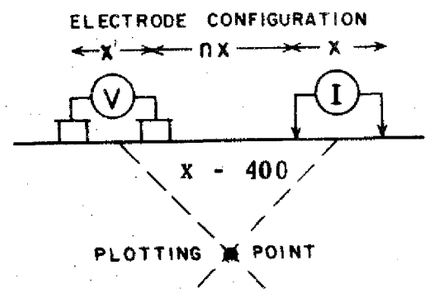
FREQUENCY 0.3 ~~/0.5~~ C.P.S.
DATE SURVEYED APRIL '66
APPROVED PH
DATE 6/2/66

McPHAR GEOPHYSICS LIMITED

568-16

DWG. NO.-I.P.-2425-9

59

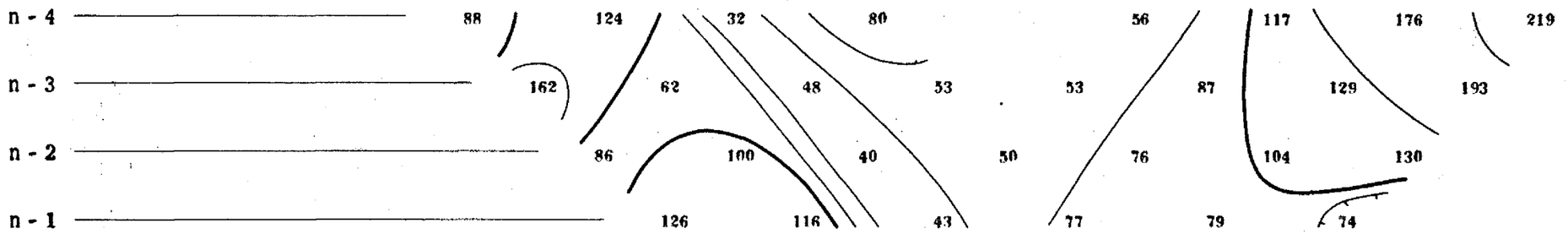


McPHAR GEOPHYSICS LIMITED

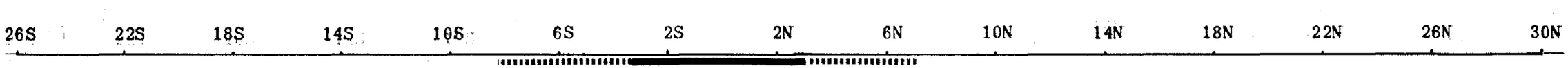
INDUCED POLARIZATION AND RESISTIVITY SURVEY

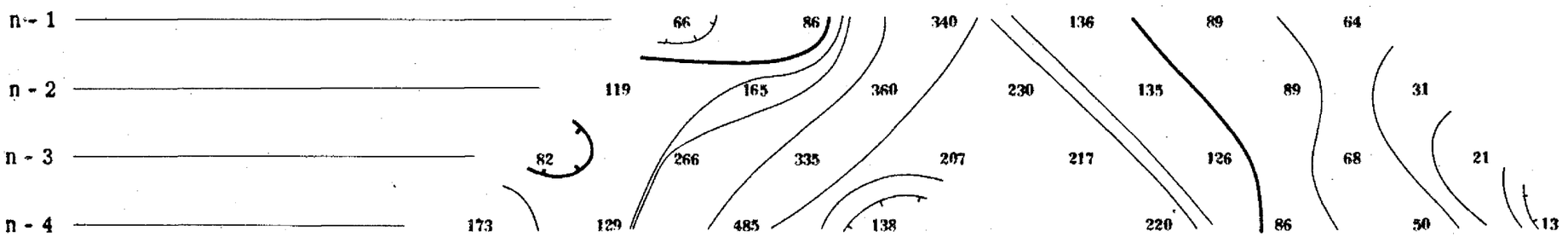
LINE 7W

NOTE:— CONTOURS AT LOGARITHMIC MULTIPLES OF 10-15-20-30-50-75-100



Pa/2π
(OHM FEET)





(M.F.) a

LINE NO.-7W

AUSMINEX PTY. LIMITED

RADIUM HILL PROSPECT, OLARY PROVINCE—S. A.

Scale—One inch = 400 Feet

NOTE LOGARITHMIC CONTOUR INTERVAL

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

568-17

FREQUENCY 0.31 - 2.5 CPS

DATE SURVEYED APRIL/66

APPROVED

DATE 6/2/66

McPHAR GEOPHYSICS LIMITED

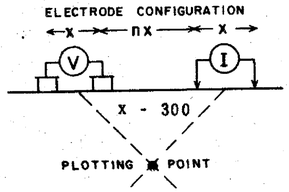
DWG. NO.-I.P.- 2425-10

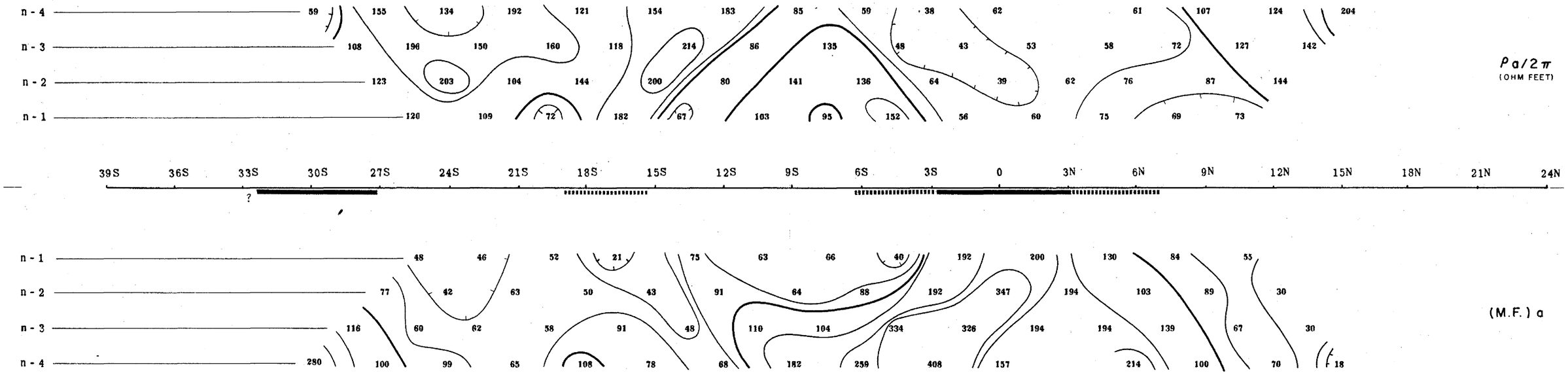
McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

LINE 7W

NOTE:— CONTOURS AT LOGARITHMIC MULTIPLES OF 10-15-20-30-50-75-100





Pa/2π
(OHM FEET)

(M.F.) a

LINE NO.- 7 W

AUSMINEX PTY. LIMITED

RADIUM HILL PROSPECT, OLARY PROVINCE—S. A.

Scale—One inch = 300 Feet

NOTE LOGARITHMIC CONTOUR INTERVAL

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE ——————

PROBABLE ··········

POSSIBLE / / / / / / / /

FREQUENCY 0.1 - 2.5 C.P.S.

DATE SURVEYED APRIL/66

APPROVED PJ

DATE 12/2/66

McPHAR GEOPHYSICS LIMITED

568-18

DWG. NO.-I.P.-2425-11

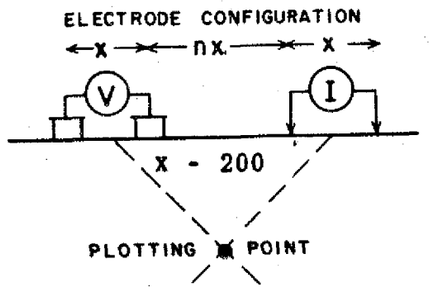
61

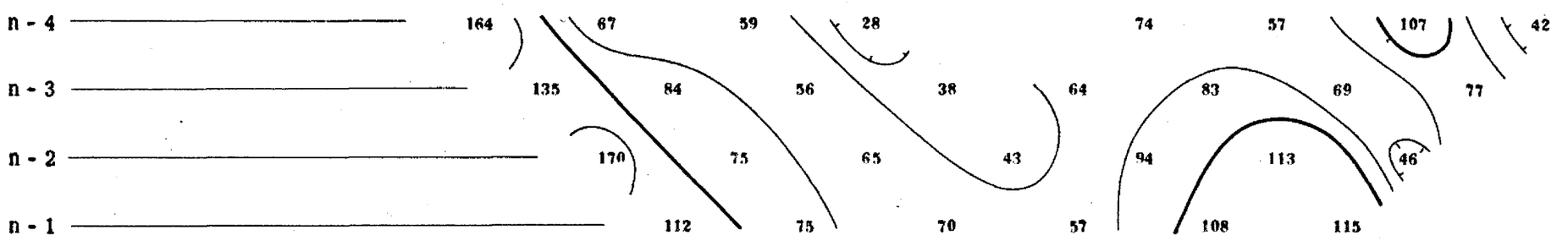
McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

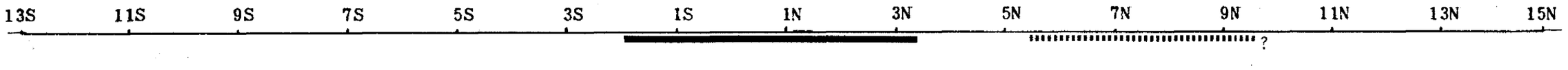
LINE 7W

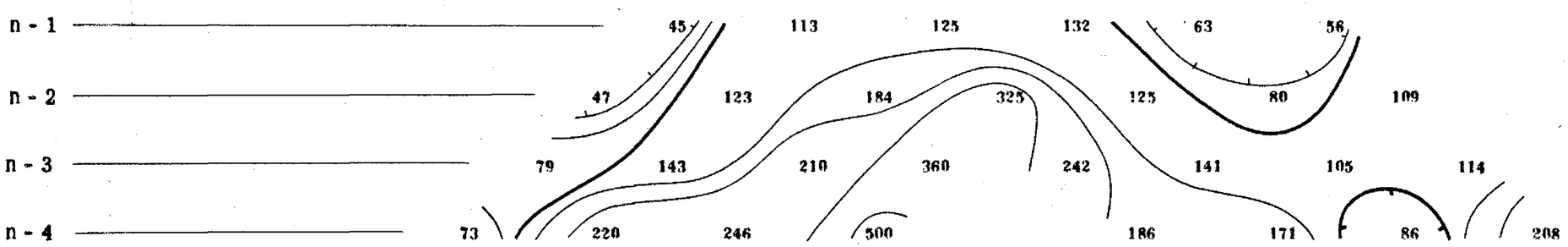
NOTE:— CONTOURS AT LOGARITHMIC MULTIPLES OF 10-15-20-30-50-75-100





$\rho a/2\pi$
(OHM FEET)





(M.F.) a

LINE NO.- 7W

AUSMINEX PTY. LIMITED

RADIUM HILL PROSPECT, OLARY PROVINCE—S. A.

Scale—One inch = 200 Feet

NOTE LOGARITHMIC CONTOUR INTERVAL

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

FREQUENCY 0.3 & 2.5 CPS

DATE SURVEYED APRIL 1966

APPROVED

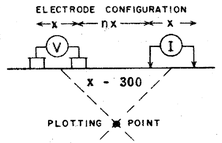
DATE 6/2/66

McPHAR GEOPHYSICS LIMITED

568-19

DWG. NO.-I.P.-2425-12

ELECTRODE CONFIGURATION

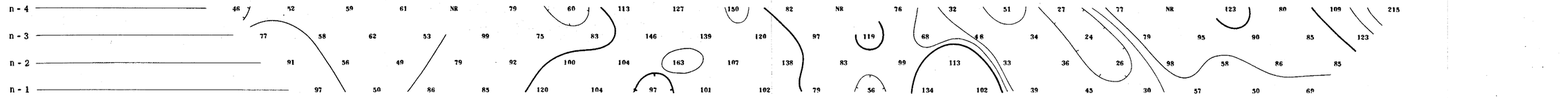


McPHAR GEOPHYSICS LIMITED

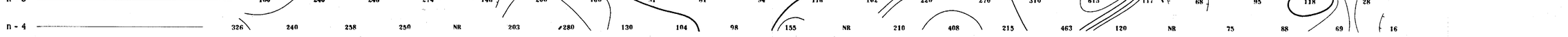
INDUCED POLARIZATION AND RESISTIVITY SURVEY

LINE 15W

NOTE:— CONTOURS AT LOGARITHMIC MULTIPLES OF 10-15-20-30-50-75-100



Pa/2π
(OHM FEET)



(M.F.) a

AUSMINEX PTY. LIMITED

RADIUM HILL PROSPECT, OLARY PROVINCE—S.A.

Scale—One inch= 300 Feet

NOTE LOGARITHMIC CONTOUR INTERVAL

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

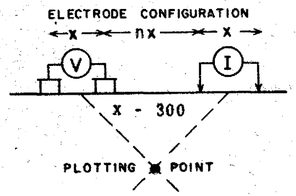
FREQUENCY 0.31-2.5 C.P.S.
DATE SURVEYED APRIL 1961
APPROVED
DATE 6/2/61

McPHAR GEOPHYSICS LIMITED

568-20

LINE NO-15W

ELECTRODE CONFIGURATION

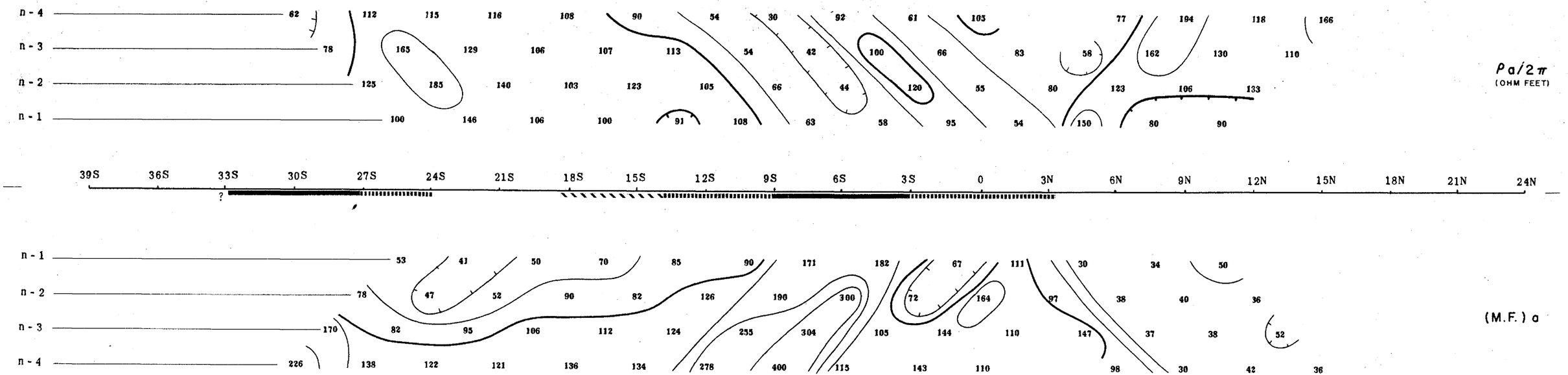


McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

LINE 12W

NOTE:— CONTOURS AT LOGARITHMIC MULTIPLES OF 10-15-20-30-50-75-100



Pa/2π
(OHM FEET)

(M.F.) a

LINE NO.- 21 W

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

AUSMINEX PTY. LIMITED

RADIUM HILL PROSPECT, OLARY PROVINCE—S.A.

Scale—One inch = 300 Feet

NOTE LOGARITHMIC CONTOUR INTERVAL

FREQUENCY 0.31-2.5 C.P.S.
DATE SURVEYED APRIL 1966
APPROVED PH
DATE 6/2/66

McPHAR GEOPHYSICS LIMITED

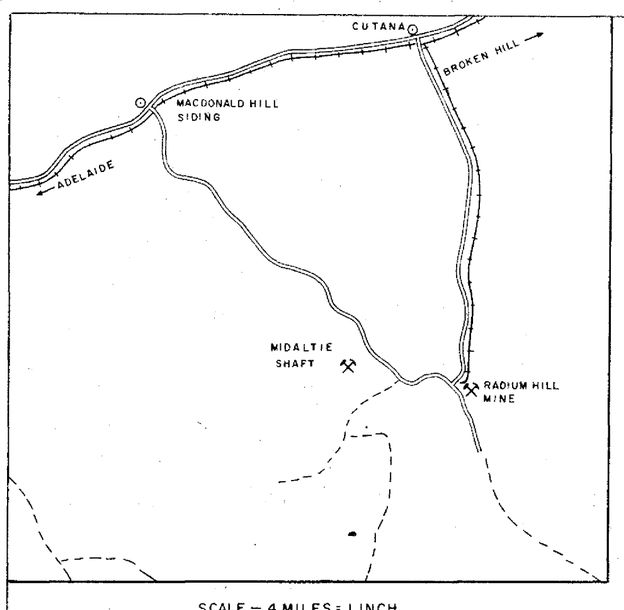
568-21

DWG. MISC. 3160

McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

LOCATION MAP



SCALE — 4 MILES = 1 INCH

SLATE
TILLITE
39N
35N
30N
L-15 W
32N
24N
21N
TILLITE
SLATE
?300
300
33W
21E
L-3N
MIDALTIE SHAFT Cu.
BL-0
L-3S
L-10S
Cu.
21S
L-10W
L-3W
INDEFINITE ZONE OF FAULTING
39S
40 S
L-7 W
L-2E
L-7E
L-12E
L-21 W
QUARTZITE
57S
MAGNETIC

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

NUMBERS AT THE ENDS OF ANOMALIES INDICATE SPREAD

AUSMINEX PTY. LIMITED

RADIUM HILL PROSPECT, OLARY PROVINCE — S.A.

SCALE

ONE INCH EQUALS FOUR HUNDRED FEET

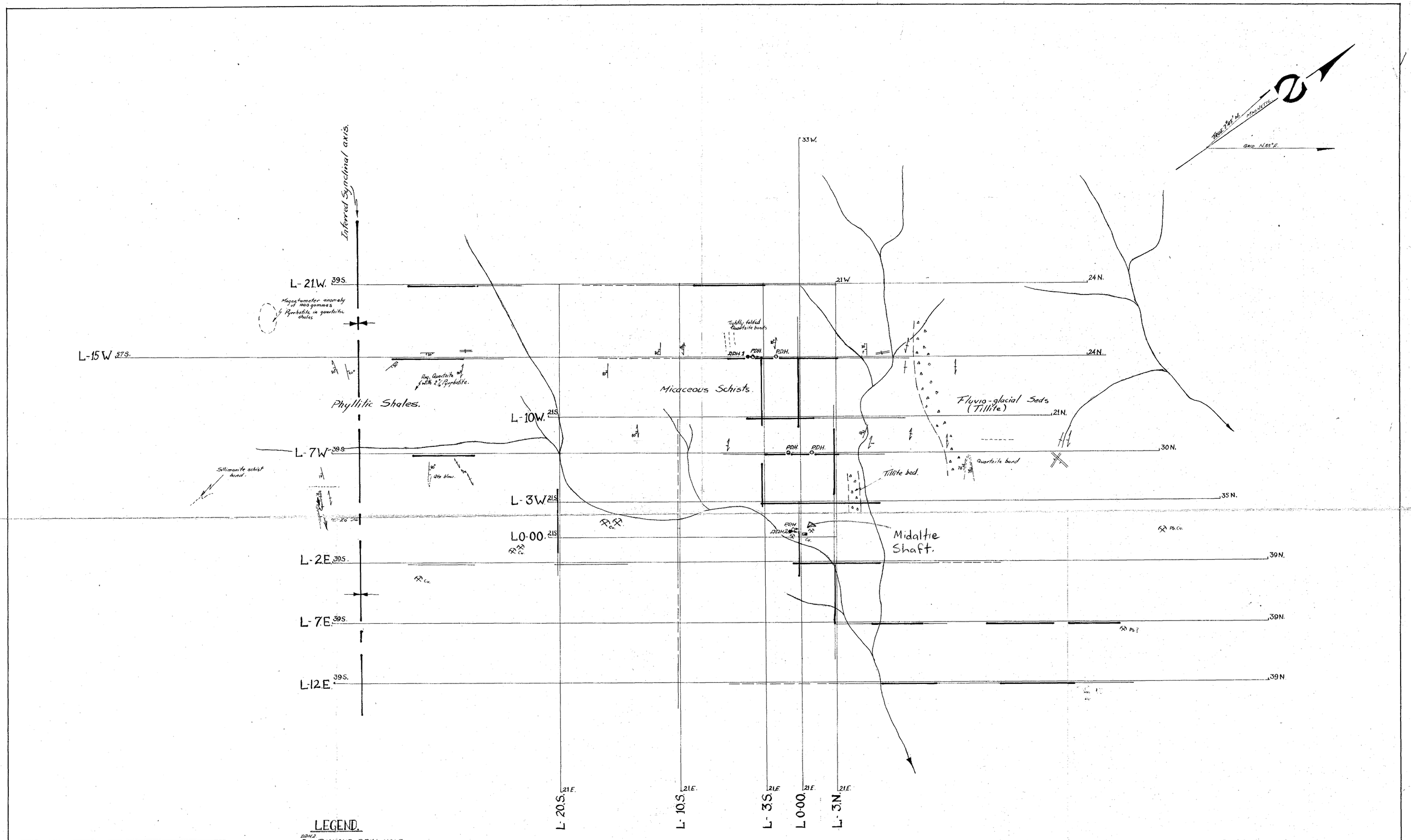
DRAWN: P.C.
DATE: APRIL/66
APPROVED:
DATE: 6/12/66

McPHAR GEOPHYSICS LIMITED

568-22
~~ENV. 568~~
~~Env. 568~~

Neg. held

DWG. MISC 3160

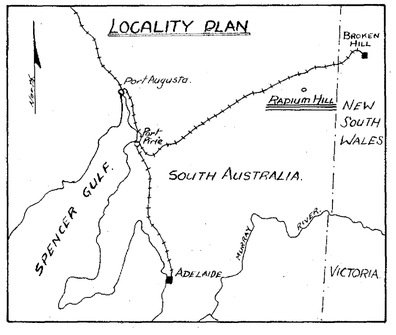


LEGEND.

- DDH2 — DIAMOND DRILL HOLE.
- PDH — PERCUSSION DRILL HOLE.
- SHAFT.
- PROSPECT.
- SCHISTOSITY.
- FRACTURES.
- ATTITUDE.

SURFACE PROJECTIONS OF I.P. ANOMALOUS ZONES.

- DEFINITE.
- PROBABLE.
- POSSIBLE.



AUSTMINEX PTY. LIMITED.

VENTURE 9.

RADIUM HILL S.A.

COMPOSITE PLAN

SCALE. 1 INCH = 400 FEET.

Drawn-JE. August 1966.

C. W. G. & E. DWG. No. 16.

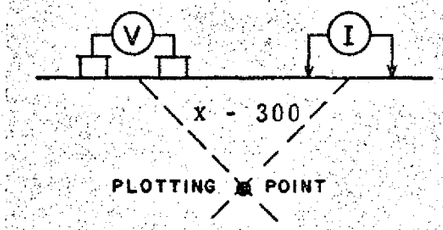
568-23

ENV. 568

Env. 568

DWG. NO.-I.P.-2401-5

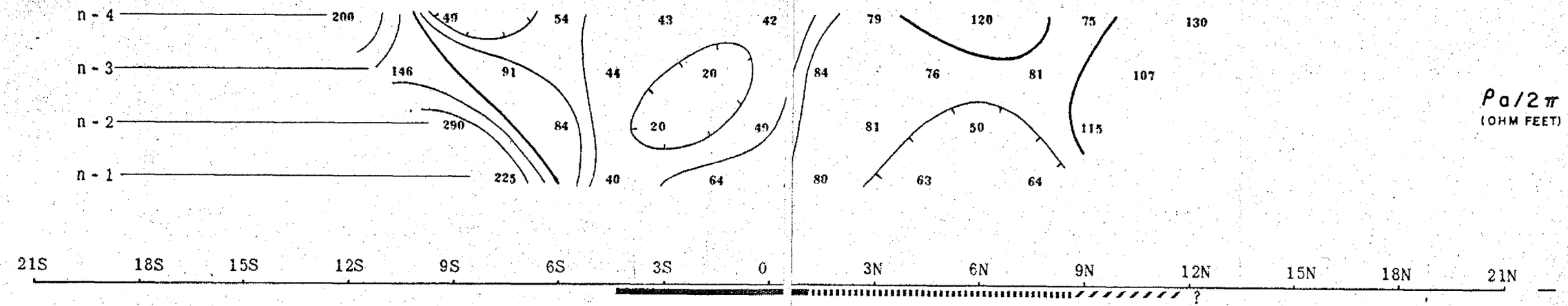
ELECTRODE CONFIGURATION



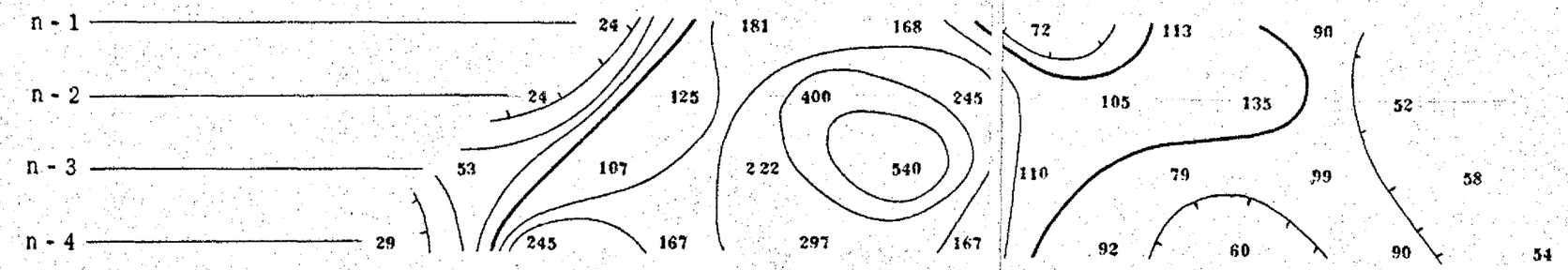
McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: CONTOURS AT LOGARITHMIC MULTIPLES OF 10-15-20-30-50-75-100



Pa/2π
(OHM FEET)



(M.F.) a

LINE NO - 10W

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

ELECTROWINNING PTY. LTD.

RADIUM HILL PROSPECT, OLARY PROVINCE—S.A.

Scale—One inch = 300 Feet

NOTE LOGARITHIC CONTOUR INTERVAL

568-24

FREQUENCY 0·3 1·2 4·5 CPS

DATE SURVEYED FEB 1966

APPROVED A1

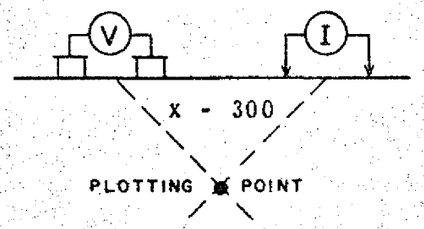
DATE 3/16/66

McPHAR GEOPHYSICS LIMITED

568-2

DWG. NO.-I.P.-2401-4

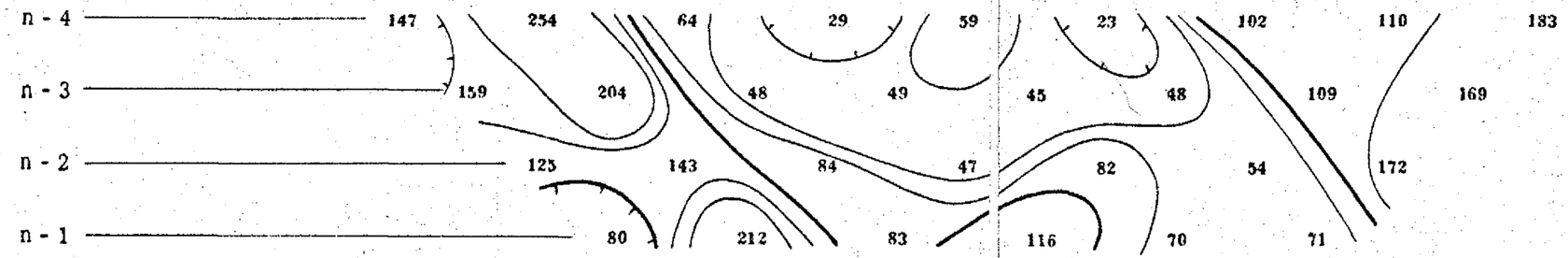
ELECTRODE CONFIGURATION



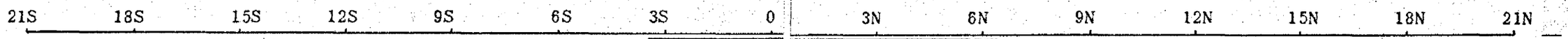
McPHAR GEOPHYSICS LIMITED

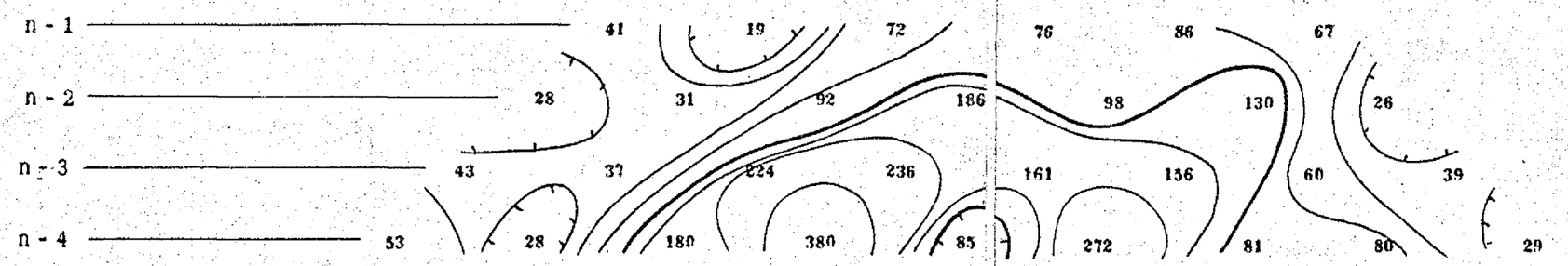
INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: CONTOURS AT LOGARITHMIC MULTIPLES OF 10-15-20-30-50-75-100



$Pa/2\pi$
(OHM FEET)





(M.F.) a

LINE NO. - 3 W

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE ▬▬▬▬

PROBABLE ▪▪▪▪▪▪▪▪▪▪▪▪

POSSIBLE / / / / / / / /

ELECTROWINNING PTY. LTD.

RADIUM HILL PROSPECT, OLARY PROVINCE—S.A.

Scale—One inch = 300 Feet

NOTE LOGARITHMIC CONTOUR INTERVAL

568-25

FREQUENCY 0.31-2.5 CPS

DATE SURVEYED FEB 1966

APPROVED

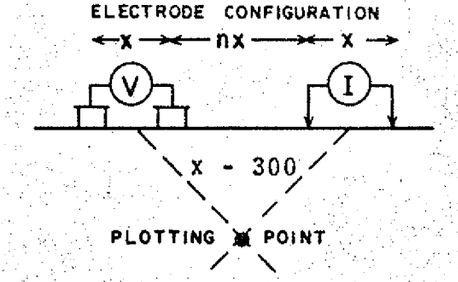
DATE 3/16/66

McPHAR GEOPHYSICS LIMITED

568-3

DWG. NO.-I.P.-2401-3

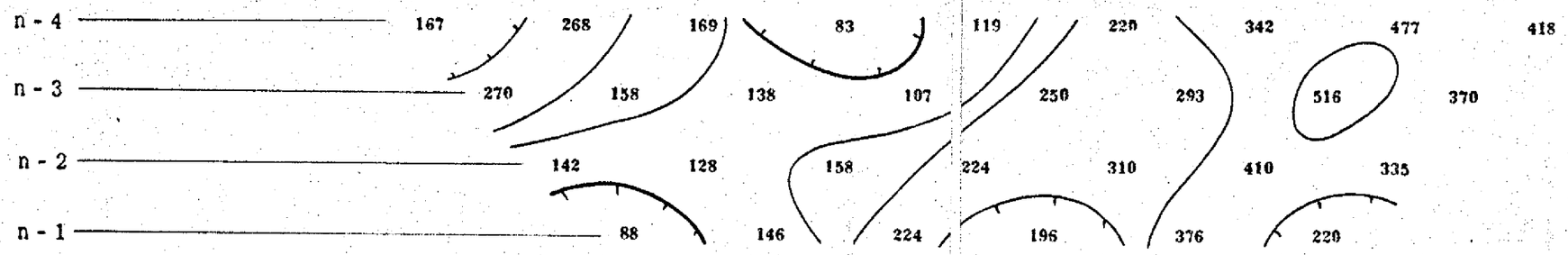
ELECTRODE CONFIGURATION



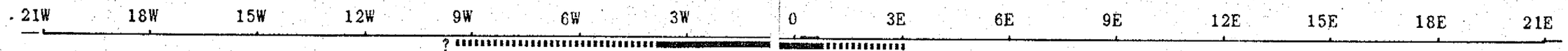
McPHAR GEOPHYSICS LIMITED

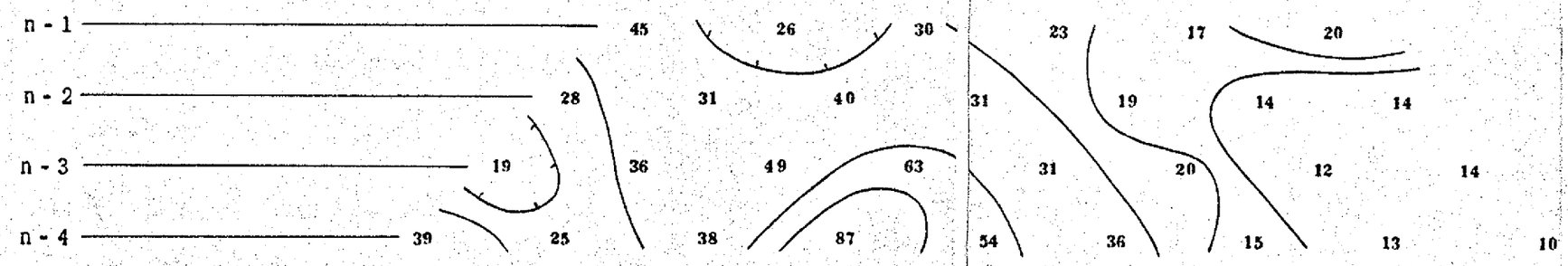
INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: CONTOURS AT LOGARITHMIC MULTIPLES OF 10-15-20-30-50-75-100



Pa/2π
(OHM FEET)





(M.F.) a

LINE NO.-20S

ELECTROWINNING PTY. LTD.

RADIUM HILL PROSPECT, OLARY PROVINCE—S.A.

Scale—One inch = 300 Feet

NOTE LOGARITHMIC CONTOUR INTERVAL

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

568-26

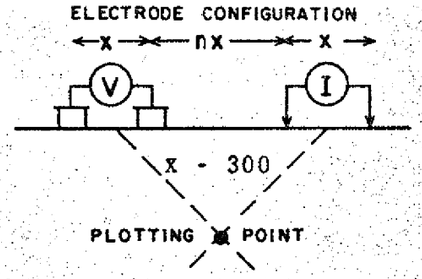
FREQUENCY 0·31-2·5 CPS
DATE SURVEYED FEB 1966
APPROVED A
DATE 3/16/66

McPHAR GEOPHYSICS LIMITED

568-4

DW[illegible] R-2401-[illegible]

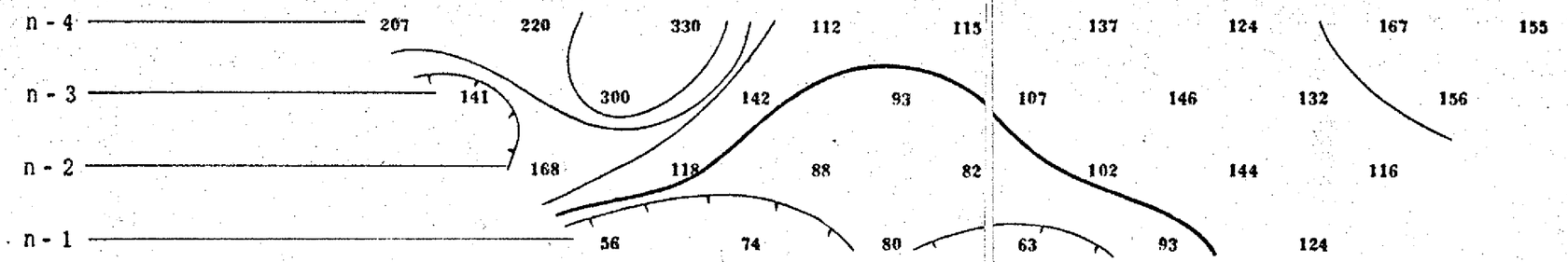
ELECTRODE CONFIGURATION



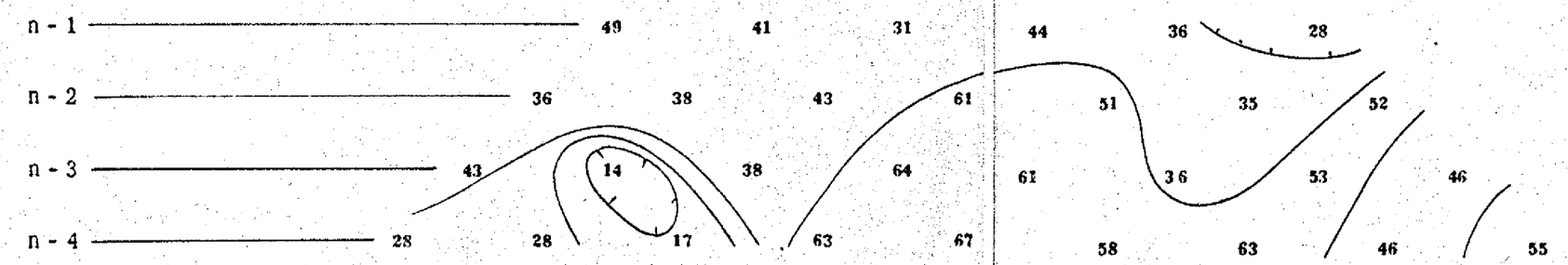
McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: CONTOURS AT LOGARITHMIC MULTIPLES OF 10-15-20-30-50-75-100



$\rho a/2\pi$
(OHM FEET)



(M.F.) a

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

ELECTROWIN[illegible]NING PTY. LTD.

RADIUM HILL PROSPE[illegible]T, OLARY PROVINCE—S.A.

Scale—On[illegible]nch = 300 Feet

NOTE LOGARI[illegible]IC CONTOUR INTERVAL

FREQUENCY 0·31-2·5 CPS

DATE SURVEYED FEB 1966

APPROVED A

DATE 3/16/66

568-27

568-5

McPHAR GEOPHYSICS LIMITED

LINE NO. 101