Open File Envelope No. 576

SML 78

MOUNT WOODS

PROGRESS AND RELINQUISHMENT REPORTS FOR THE PERIOD 1/5/65 TO 31/10/66

Submitted by

Delhi Australian Petroleum Ltd
1966

Enquiries: Customer Services
Ground Floor
101 Grenfell Street, Adelaide 5000

Telephone: (08) 8463 3000
Facsimile: (08) 8204 1880

PRIMARY INDUSTRIES AND RESOURCES SA

DELHI AUSTRALIAN PETROLEUM LTD.

and

SANTOS LIMITED

SPECIAL MINING LEASE NO. 78

QUARTERLY REPORT

for the period

May 1, 1965 to July 31, 1965

EXPLORATION

During the report period no field operations were carried out within the bounds of Special Mining Lease No. 78.

A Mining Department has been set up within the organisation of Delhi Australian Petroleum Ltd. Mr. Kevin J. Callow, a mining geologist with approximately ten years of varied mining exploration experience, has been employed in the capacity of Senior Geologist - Mining. Mr. Callow commenced his employment on July 26 and his initial duties have consisted of a thorough review of reports of investigations previously carried out in the area of the Special Mining Lease. In addition he has examined at the Mines Department Thebarton Depot the cores taken from the seven holes put down on the Mining Lease during late 1964.

At the end of the report period, work was underway to select a contractor to conduct an Induced Polarization Survey of selected areas of the magnetic anomolies.

EXPENDITURES

During the quarterly period, May 1, 1965 to July 31, 1965, the following expenditures were allocated to laboratory and office work relative to investigations of Special Mining Lease No. 78: £1643. 1. 9.

DELHI AUSTRALIAN PETROLEUM LTD.

and

SANTOS LIMITED

SPECIAL MINING LEASE NO. 78

QUARTERLY REPORT

For the period August 1, 1965 to October 31, 1965

EXPLORATION

During the period bids were called for on the induced polarization survey to be carried out covering the two magnetic anomalies in the Mount Woods Area, South Australia. McPhar Geophysics Pty. Ltd. were awarded the contract for the survey and their party, consisting of two operators and three helpers, arrived at the southern anomaly area on October 22, 1965.

The induced polarization survey will be run along the lines established by the previous gravity and magnetic surveys, the only difference being the stations will be 400 feet apart instead of 500 feet. At the end of the period the first eastern line had been completed.

EXPENDITURES

During the period August 1, 1965 to October 31, 1965, the following expenditure has been allocated to office and laboratory investigations relative to Special Mining Lease No. 78:

£322.14.1d.

<u>DELHI AUSTRALIAN PETROLEUM LTD.</u>

and

<u>SANTOS LIMITED</u>

<u>SPECIAL MINING LEASE NO. 78</u>

<u>QUARTERLY REPORT</u>

For the period November 1, 1965 to January 31, 1966

EXPLORATION

During the period an Induced Polarization survey over the Southern Anomaly Area was completed by McPhar Geophysics Pty. Ltd. The survey commenced October 22, 1965 and was completed on December 10, 1965. Thirteen lines, each approximately 1½ miles in length and spaced 2,000 feet apart were run with stations spaced 400 feet apart. As yet the final report on the survey has not been received from McPhar Geophysics Pty. Ltd. Future developments will be decided when this report comes to hand.

EXPENDITURES

Since the previous quarterly report for the period ending October 31, 1965, the following expenditures have been incurred with respect to Special Mining Lease No. 78:

£1,855. 3. 5d.

DELHI AUSTRALIAN PETROLEUM LTD.

and

SANTOS LIMITED

SPECIAL MINING LEASE NO. 78

QUARTERLY REPORT

For the period February 1, 1966 to April 30, 1966.

EXPLORATION

The final report on the Induced Polarization survey over the Southern Anomaly Area conducted by McPhar Geophysics Pty. Ltd. for Delhi Australian Petroleum Ltd. and Santos Limited has been received and a copy is submitted herewith as a part of this Quarterly Report. Due to technical difficulties the results of the survey were considered inconclusive, although several "possible" and "probable" anomalies were indicated.

It is now proposed to interest other companies in the project. For this purpose all exploration data will be submitted to several companies.

EXPENDITURES

Since the previous Quarterly Report for the period ending January 31, 1966, the following expenditures have been incurred with respect to Special Mining Lease No. 78:

$A 715.75

ENVELOPE No 576

REPORT ON THE
INDUCED POLARIZATION
AND RESISTIVITY SURVEY
ON THE
SOUTH GRID, MT. WOODS AREA, S. A.
FOR
DELHI AUSTRALIAN PETROLEUM 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

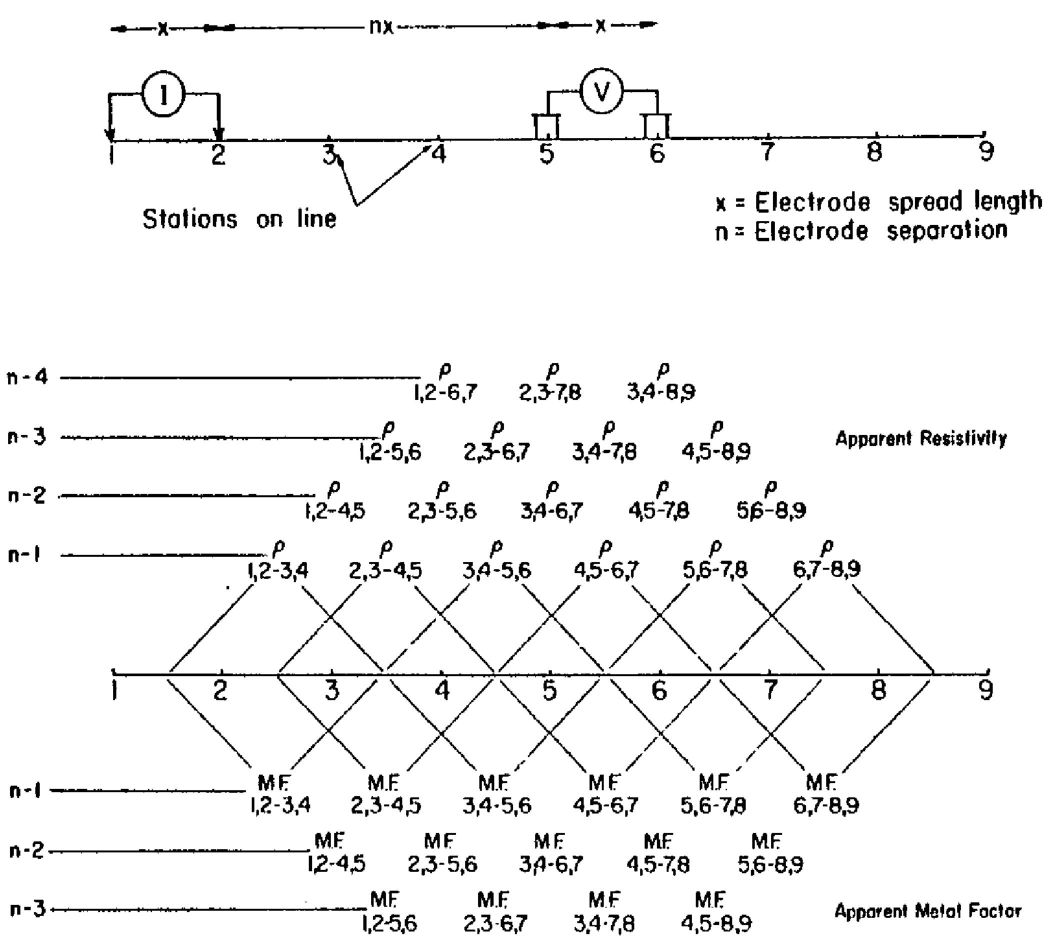


FIG 1

McPHAR GEOPHYSICS LIMITED

REPORT ON THE

INDUCED POLARIZATION

AND RESISTIVITY SURVEY

ON THE

SOUTH GRID, MT. WOODS AREA, S.A.

FOR

DELHI AUSTRALIAN PETROLEUM LTD.

1. INTRODUCTION

At the request of Delhi Australian Petroleum Ltd. a reconnaissance induced polarization and resistivity survey has been carried out in Mt. Woods Area of South Australia. A magnetic survey, carried out previously, shows large variations in the earth's magnetic field in the area of the grid. The induced polarization survey was planned in an attempt to locate any metallic mineralization (pyrite, magnetite, etc.) that might be associated with the magnetic variations.

A plan map showing the results of the ground magnetic survey on the South Grid was supplied by Delhi Australian Petroleum Ltd. The plan map shows several local features with values of -15,000 gammas; the background level in the area is about -23,000 gammas. In the Southern Hemisphere, this type of expression would represent a decrease in the magnetic susceptibility of the underlying rocks. However, it is possible that the arithmetic sign of the measured values has been changed and therefore these variations should represent an increase in susceptibility.

Several drill holes on the property have been completed; some of the holes are in the center of anomalies, others are on the flanks. All of the holes intersected some magnetite and/or pyrite. The mineralization intersected was at a depth at which it could normally be located and outlined by the IP method.

2. PRESENTATION OF RESULTS

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

Line 45E	0.3 & 2.5 cps	400' electrode intervals	Dwg. IP 2379-1
Line 20E	0.3 & 2.5 cps	400' electrode intervals	Dwg. IP 2379-2
Line 0+00	0.3 & 2.5 cps	400' electrode intervals	Dwg. IP 2379-3
Line 0+00 (South Extension)	0.3 & 2.5 cps	400' electrode intervals	Dwg. IP 2379-4
Line 0+00	d.c. & 1.25 cps	400' electrode intervals	Dwg. IP 2379-5
	d.c. & 1.25 cps	400' electrode intervals	Dwg. IP 2379-6
Line 20W	0.3 & 2.5 cps	400' electrode intervals	Dwg. IP 2379-7
Line 20W (North Extension)	0.3 & 2.5 cps	400' electrode intervals	Dwg. IP 2379-8
Line 20W	d.c. & 1.25 cps	400' electrode intervals	Dwg. IP 2379-9
	d.c. & 1.25 cps	400' electrode intervals	Dwg. IP 2379-10
Line 40W	0.3 & 2.5 cps	400' electrode intervals	Dwg. IP 2379-11
Line 60W	0.3 & 2.5 cps	400' electrode intervals	Dwg. IP 2379-12
Line 80W	0.3 & 2.5 cps	400' electrode intervals	Dwg. IP 2379-13

Line 100W	0.3 & 2.5 cps	400' electrode intervals	Dwg. IP 2379-14
Line 120W	0.3 & 2.5 cps	400' electrode intervals	Dwg. IP 2379-15
Line 140W	0.3 & 2.5 cps	400' electrode intervals	Dwg. IP 2379-16
Line 170W	0.3 & 2.5 cps	400' electrode intervals	Dwg. IP 2379-17
	d.c. & 1.25 cps	400' electrode intervals	Dwg. IP 2379-18
	d.c. & 1.25 cps	400' electrode intervals	Dwg. IP 2379-19
Line 135W	0.3 & 2.5 cps	400' electrode intervals	Dwg. IP 2379-20
Line 210W	0.3 & 2.5 cps	400' electrode intervals	Dwg. IP 2379-21

Also enclosed with this report is Dwg. Misc. 3149, a plan map of the South Grid at a scale of 1" = 1000'. The definite and possible induced polarization anomalies are indicated by solid and broken bars respectively on this plan map as well as the data plots. These bars represent the surface projection of the anomalous zones as interpreted from the location of the transmitter and receiver electrodes when the anomalous values were measured.

Since the induced polarization measurement is essentially an averaging process, as are all potential methods, it is frequently difficult to exactly pinpoint the source of an anomaly. Certainly, no anomaly can be located with more accuracy than the spread length; i.e. when using 400' spreads the position of a narrow sulphide body can only be determined to lie between two stations 400' apart. In order to locate sources at some depth, larger spreads must be used, with a corresponding increase in the uncertainties of location. Therefore, while the 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.

A general representation of the magnetic contours has also been shown on Dwg. Misc. 3149.

3. DISCUSSION OF RESULTS

The general resistivity level in the Mt. Woods Area was discovered to be very low. This is relatively common in the arid area of Australia. The deep weathering creates a very porous surface layer that is frequently saturated with saline solutions. On the northwestern portion of the South Grid (Line 210W, 20S 4N) the resistivity level is appreciably higher; the weathered depth may be different in this area.

On most of the South Grid, the resistivity level is less than 5.0. In many areas the level is 2.5 or less. In areas of low resistivity, the inductive coupling effects between the wires used in the survey may become large enough in magnitude to affect the IP measurements. The inductive coupling effects give lower voltages at the higher frequency; therefore, the frequency effects created may be confused with IP effects from metallic mineralization.

The exact magnitude of the inductive coupling effects can only be calculated for a uniform earth. However, an approximate estimate of the inductive coupling effects for other geometries can be made by assuming a uniform earth. I have listed below a small table giving the inductive coupling effects to be expected in several situations.

Electrode Interval	frequency	resistivity	Separation (n)	frequency effects	Metal facto
400'	2.5 cps	2.5	2	2.3%	920

Electrode Interval	frequency	resistivity	Separation (n)	frequency effects	Metal factor
400'	2.5 cps	2.5	3	5.1%	2020
400'	2.5 cps	5.0	3	1.0%	200
400'	2.5 cps	5.0	3	2.1%	420
400'	1.25 cps	2.5	3	2.1%	840
400'	1.25 cps	5.0	3	0.8%	160

It can be seen from these typical values that large inductive coupling effects (greater than 2%) would be expected on most of the South Grid, when 2.5 cps is used. This magnitude of inductive coupling effects makes interpretation of the IP results very difficult. A careful study of the results from the South Grid at Mt. Woods has shown several areas in which the effects measured appear to be greater than would be expected from inductive coupling. These have been shown as possible anomalies on the data plots and the plan maps.

These very weak anomalies are not definite enough to permit interpretation as to the exact position, depth, shape, etc. of the source. These slightly anomalous effects do not necessarily correlate with the magnetic features, and there are no recognizable IP effects from some of the metallic mineralization located in the drill holes. The relatively thin zones of mineralization located in the drill holes occur at depths of several hundred feet. The apparent IP effects from these zones, measured at the surface, are not large enough in magnitude to be recognized in the presence of the inductive coupling effects.

In many low resistivity areas it is possible to obtain more useful IP results by altering the frequencies used to d.c. - 1.25 cps. The coupling effects are much less at 1.25 cps, and the IP effects expected using these frequencies are as large or larger, than with 0.31 and 2.5 cps. The effect of this frequency change is demonstrated by the enclosed examples (Fig. I & Fig. 2).

These results are from a low resistivity area near Louth, N.S.W. The original results with 2.5 cps and 400' electrode intervals were not interpretable. When the survey was repeated with d.c. - 1.25 cps, the results were more useful; an anomalous zone could be identified. Detailed interpretation was not possible, but a drill hole spotted to test the anomaly intersected disseminated mineralization.

Measurements with d.c. - 1.25 cps were tried at Mt. Woods when the low resistivity level was discovered. The high level of natural electrical noise in the area made the d.c. measurements impossible. On some lines the measurements were attempted several times; these results have been included in this report.

In the absence of reliable d.c. - 1.25 cps results, it is not possible to use the IP data to locate the zones of metallic mineralization on the South Grid.

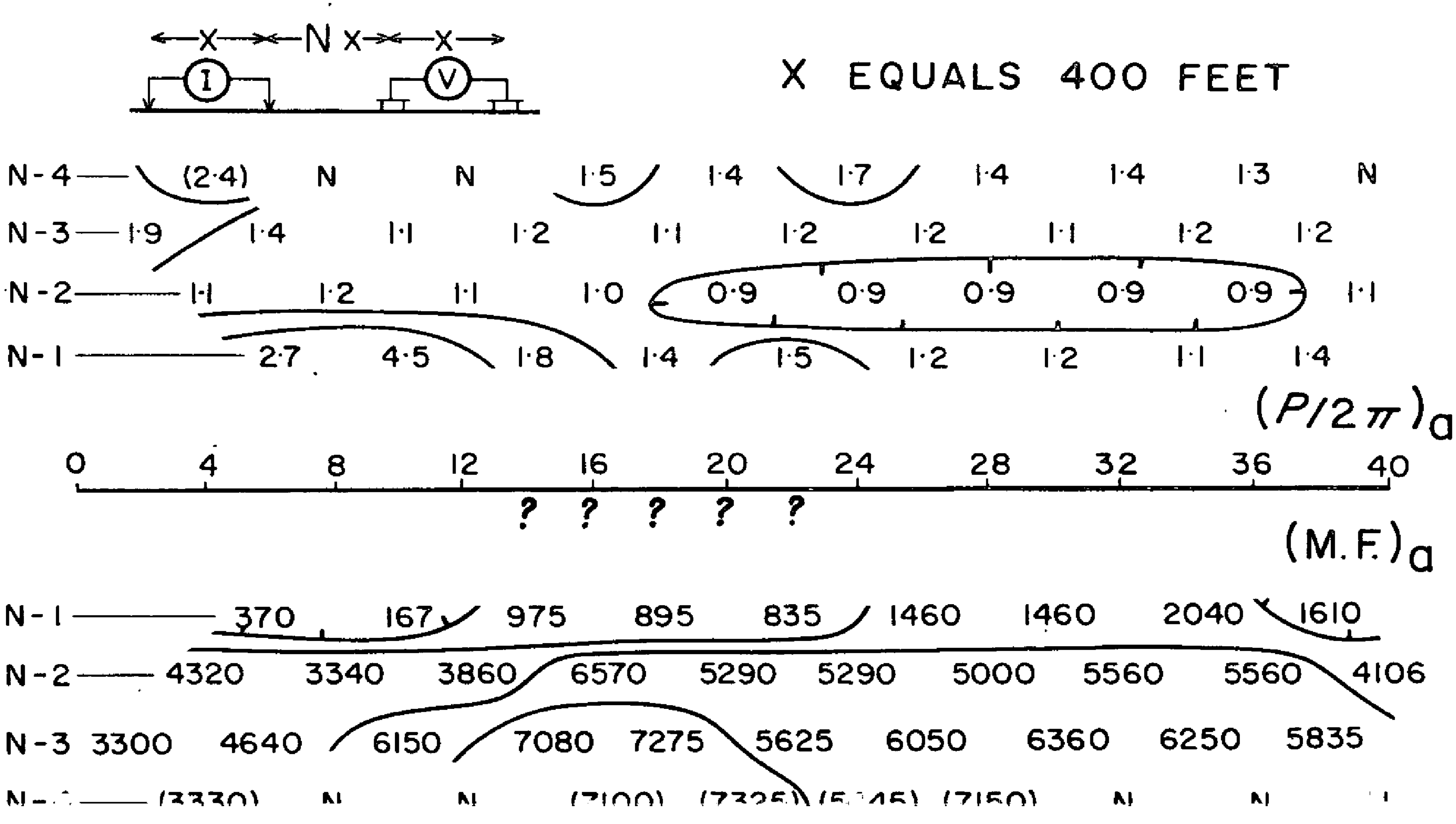
4. CONCLUSIONS AND RECOMMENDATIONS

The data from the South Grid at Mt. Woods show that when 2.5 cps is used the inductive coupling effects measured are large enough

INDUCED POLARIZATION AND RESISTIVITY FIELD RESULTS

DISSEMINATED MINERALIZATION-LOUTH, N.S.W.

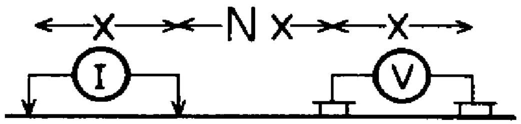
(FREQUENCIES EQUAL 0·31 & 2·5 C.P.S.)



INDUCED POLARIZATION AND RESISTIVITY FIELD RESULTS

DISSEMINATED MINERALIZATION – LOUTH, N.S.W.

(FREQUENCIES EQUAL ·07 & 1·25 C.P.S.)



X EQUALS 400 FEET

$(P/2\pi)_a$

N-4	2·5	1·5	—	N	N	N	N	1·5	—	1·6
N-3	2·1	1·5	1·2	1·2	1·2	1·3	N	1·2	1·4	1·5
N-2	1·3	1·3	1·2	1·2	1·0	1·0	1·1	1·0	1·0	1·4
N-1	2·8	5·0	2·3	1·4	1·6	1·2	1·3	1·1	1·5	

0 4 8 12 16 20 24 28 32 36 40

$(M.F.)_a$

N-1	178	1410	545	1030	1060	1960	1850	1665	1030	
N-2	2000	1370	1460	6420	3160	2640	3100	2500	1500	1640
N-3	(955)	(1660)	(1040)	(3330)	(2380)	(2200)	N	(3750)	(3315)	(2405)
N-4	(1000)	N	—	N	N	N	N	(2240)	—	(1400)

FIG

in magnitude to limit the usefulness of the IP results. The resistivity level is such that measurements with d. c. - 1.25 cps should be interpretable; however, at the time of the survey the electrical noise in the area made it impossible to take reliable d. c. readings.

Our experience in other areas indicates that the magnitude of the natural electrical noise voltage varies. At some later time it might be possible to make d. c. - 1.25 cps measurements at Mt. Woods.

McPHAR GEOPHYSICS LIMITED

Philip G. Hallof

Philip G. Hallof,
Geophysicist.

Robert A. Bell.

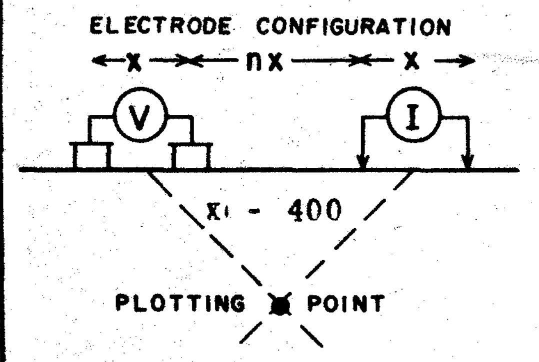
Robert A. Bell,
Geologist.

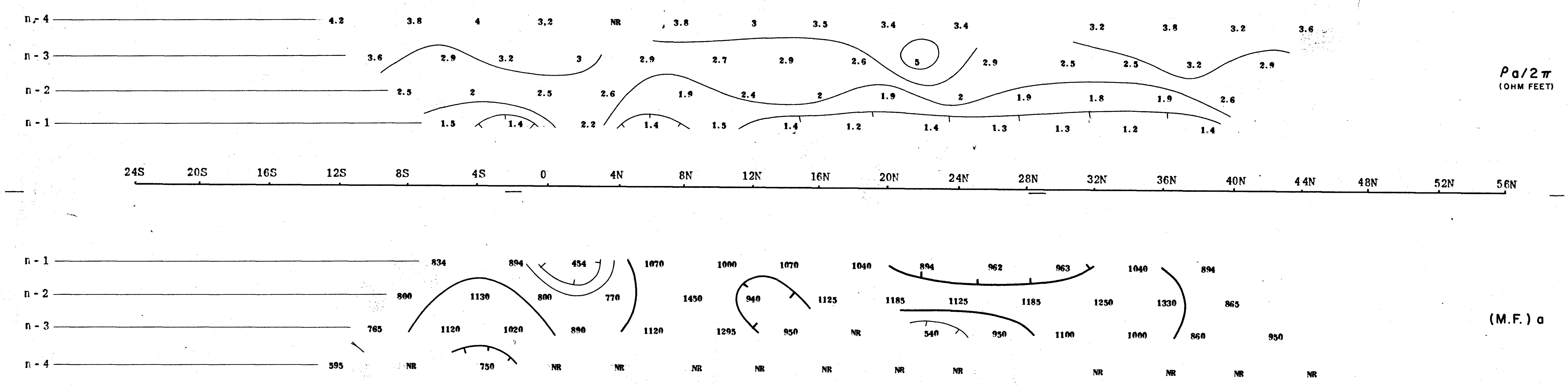
Dated: February 18, 1966

McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

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





LINE NO.– 45 E

DELHI AUSTRALIAN PETROLEUM LTD.

SOUTH GRID, MT. WOOD AREA - S.A

Scale–One inch= 400 Feet

NOTE LOGARITHMIC CONTOUR INTERVAL

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCY 0.3 & 2.5 C.P.S.
DATE SURVEYED NOV./'65
APPROVED
DATE 8/2/66

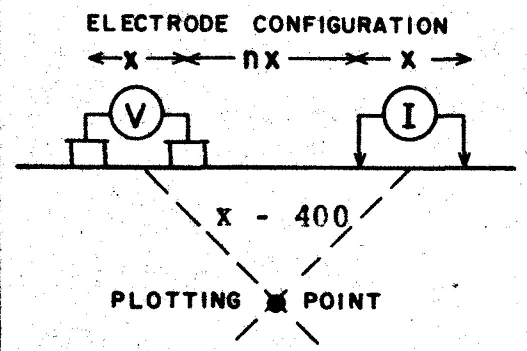
McPHAR GEOPHYSICS

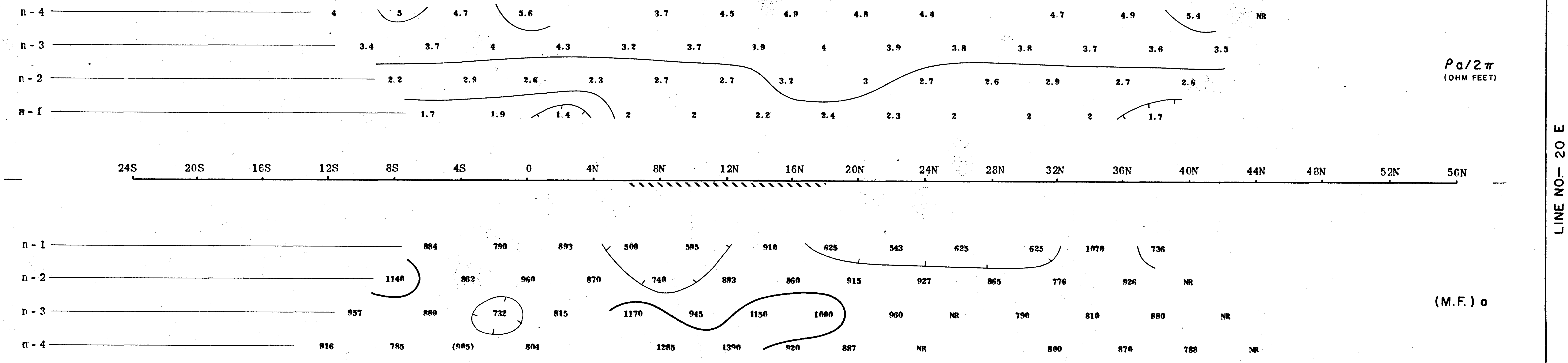
576-1

McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

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





DELHI AUSTRALIAN PETROLEUM LTD.

SOUTH GRID, MT. WOOD AREA - S.A

Scale—One inch= 400 Feet

NOTE LOGARITHMIC CONTOUR INTERVAL

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCY 0.3-2.5 C.P.S.
DATE SURVEYED NOV./65
APPROVED
DATE 28/2/66

McPHAR GEOPHYSICS LIMITED

576-2

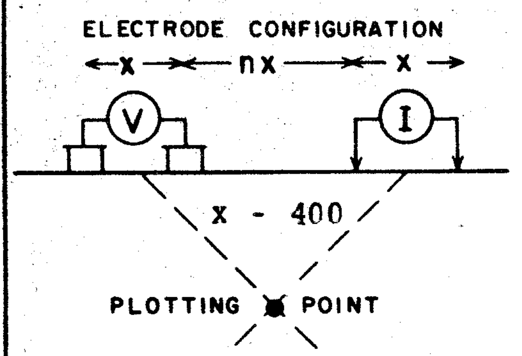
DWG. NO.–I.P.– 2379-3

McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

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

ELECTRODE CONFIGURATION



LINE NO.– 00

DELHI AUSTRALIAN PETROLEUM LTD.

SOUTH GRID, MT. WOOD AREA - S. A.

Scale—One inch= 400 Feet

NOTE: LOGARITHMIC CONTOUR INTERVAL

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

FREQUENCY ... C.P.S.

DATE SURVEYED NOV/65

APPROVED

DATE 8/2/66

McPHAR GEOPHYSICS LIMITED

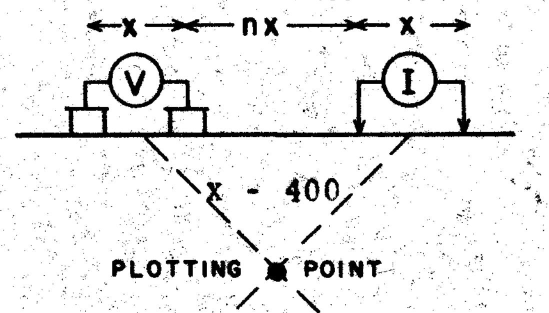
576-3

DWG. NO.-I.P.- 2379-5

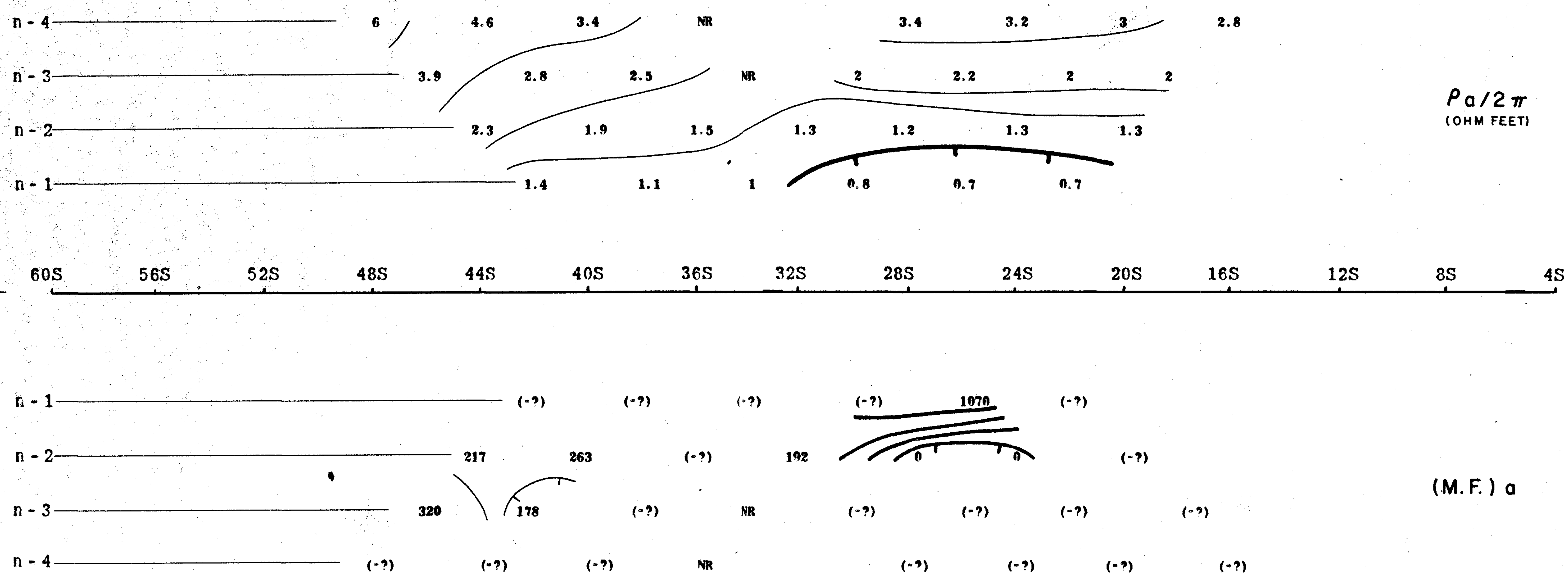
McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

ELECTRODE CONFIGURATION



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



LINE NO.- 00

DELHI AUSTRALIAN PETROLEUM LTD.

SOUTH GRID, MT. WOOD AREA - S. A.

Scale-One inch = 400 Feet

NOTE LOGARITHMIC CONTOUR INTERVAL

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCY 1·25 & D.C. C.P.S.

DATE SURVEYED NOV./65

APPROVED

DATE 18/2/66

McPHAR GEOPHYSICS LIMITED

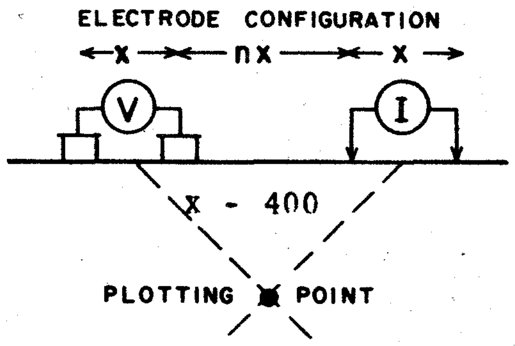
576-4

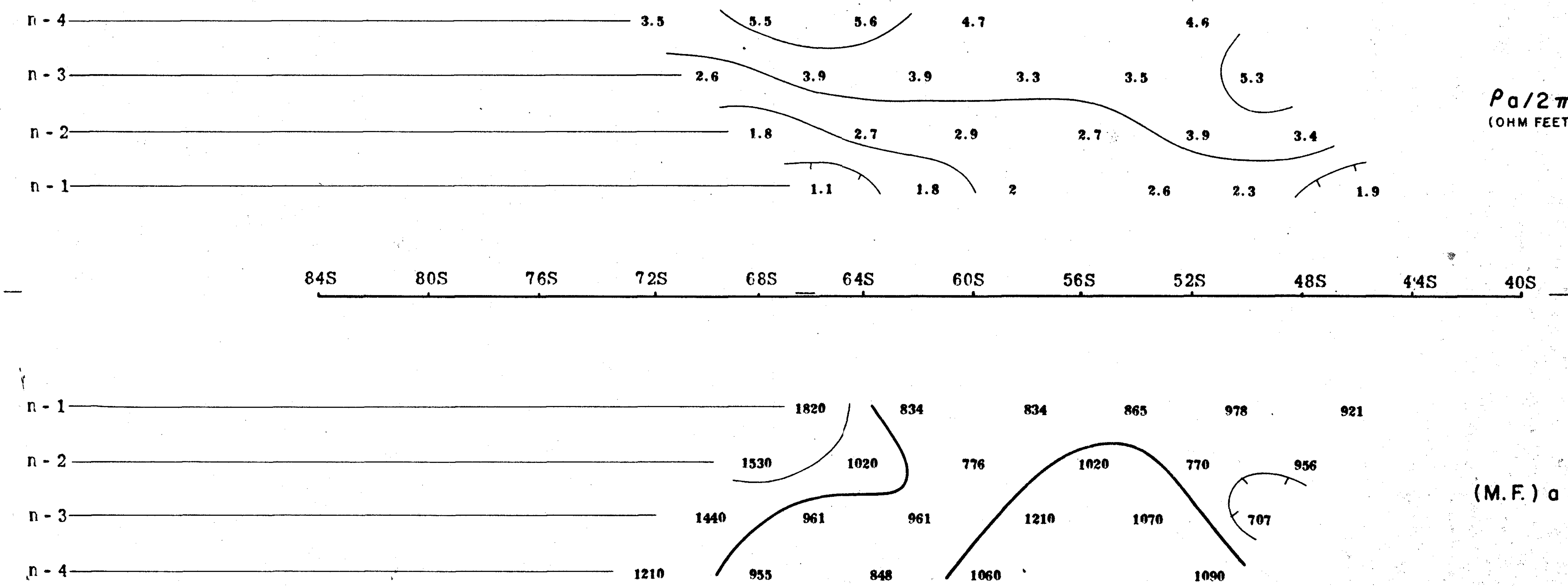
DWG. NO.-I.P.- 2379-4

McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

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





LINE NO.- 00 (SOUTH EXTENSION)

DELHI AUSTRALIAN PETROLEUM LTD.

SOUTH GRID, MT. WOOD AREA - S. A.

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

Scale—One inch= 400 Feet

NOTE LOGARITHMIC CONTOUR INTERVAL

FREQUENCY 0.3-2.5 C.P.S.

DATE SURVEYED NOV./65

APPROVED

DATE 28/2/66

McPHAR GEOPHYSICS LIMITED

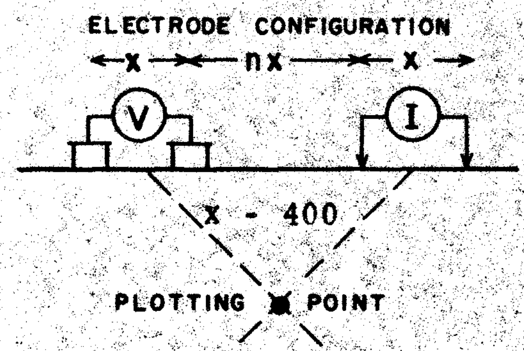
576-5

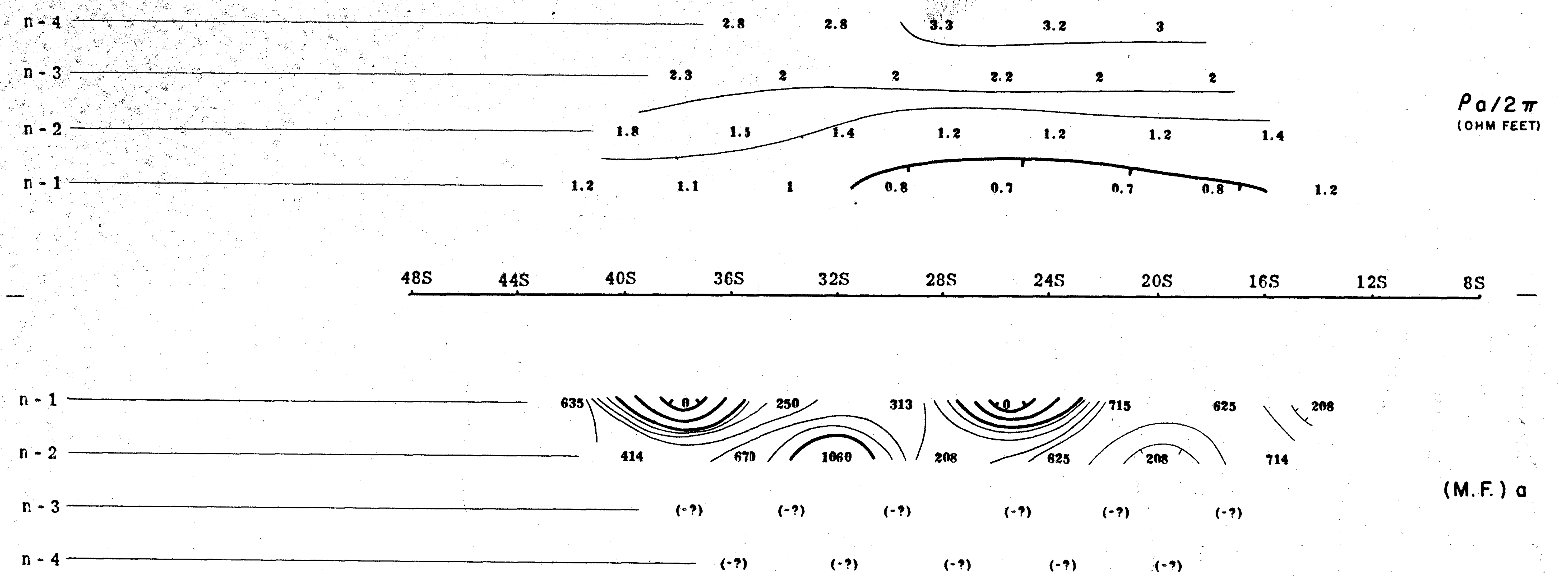
DWG. NO.-I.P.- 2379-6

McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

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





LINE NO.- 00

DELHI AUSTRALIAN PETROLEUM LTD.

SOUTH GRID, MT. WOOD AREA - S. A.

Scale-One inch = 400 Feet

NOTE: LOGARITHMIC CONTOUR INTERVAL

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCY D.C. & 1.25 C.P.S.

DATE SURVEYED NOV./65

APPROVED

DATE 18/2/66

McPHAR GEOPHYSICS LIMITED

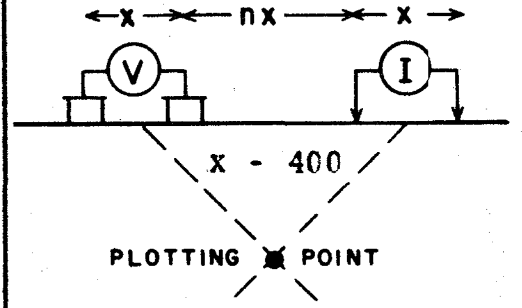
576-6

DWG. NO.–I.P.– 2379-7

McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

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



DELHI AUSTRALIAN PETROLEUM LTD.

SOUTH GRID, MT. WOOD AREA - S.A.

Scale—One inch= 400 Feet

NOTE LOGARITHMIC CONTOUR INTERVAL

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

FREQUENCY 3 & 2.5 CPS.

DATE SURVEYED NOV/65

APPROVED

DATE 8/2/66

McPHAR GEOPHYSICS LIMITED

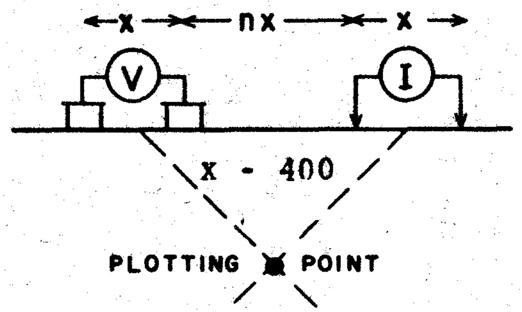
576-7

DWG. NO.- I.P.- 2379-8

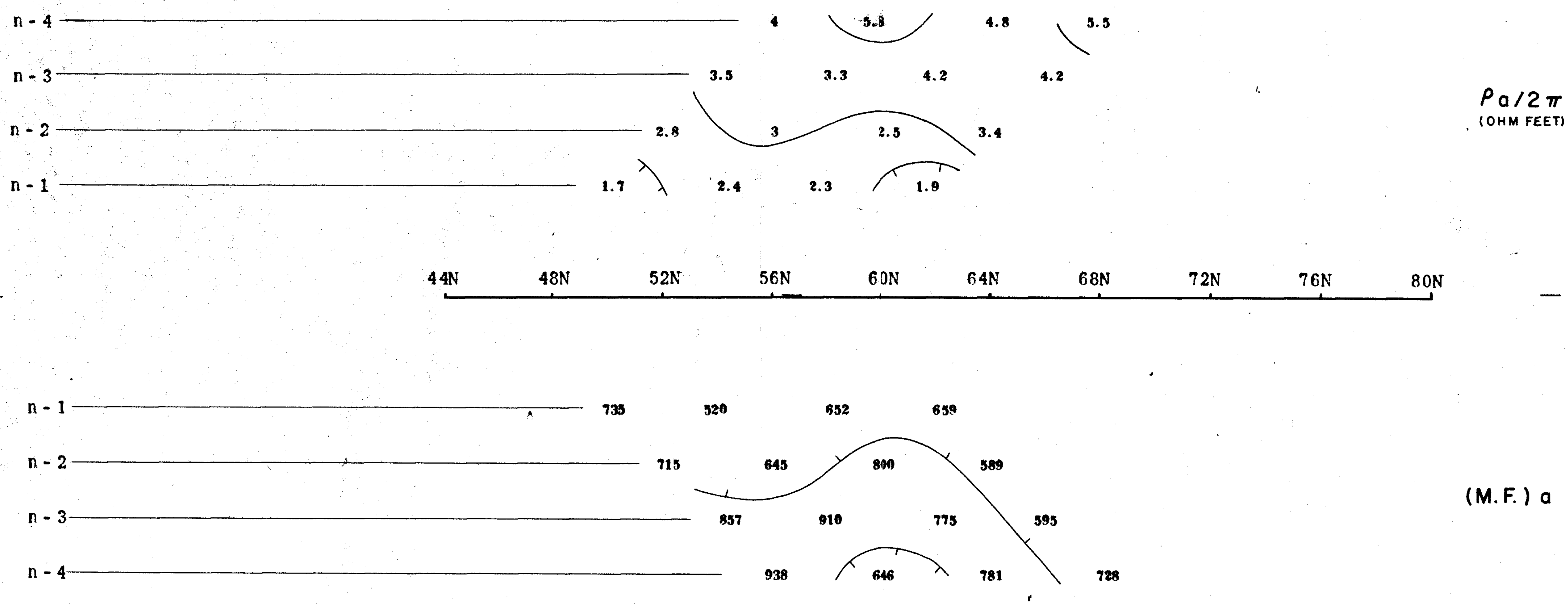
McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

ELECTRODE CONFIGURATION



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



LINE NO.- 20 W

DELHI AUSTRALIAN PETROLEUM LTD.

SOUTH GRID, MT. WOOD AREA - S. A.

Scale - One inch = 400 Feet

NOTE LOGARITHMIC CONTOUR INTERVAL

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCY 0.3 & 2.5 C.P.S.

DATE SURVEYED NOV./65

APPROVED

DATE 18/2/66

McPHAR GEOPHYSICS LIMITED

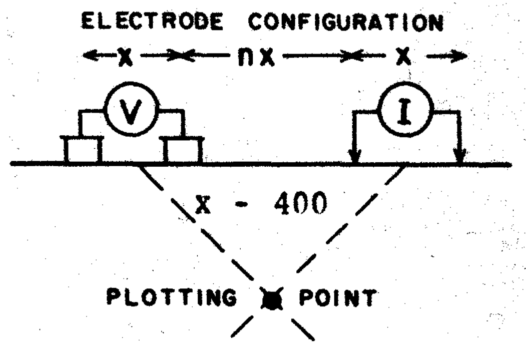
576-8

DWG. NO.-I.P.- 2379-9

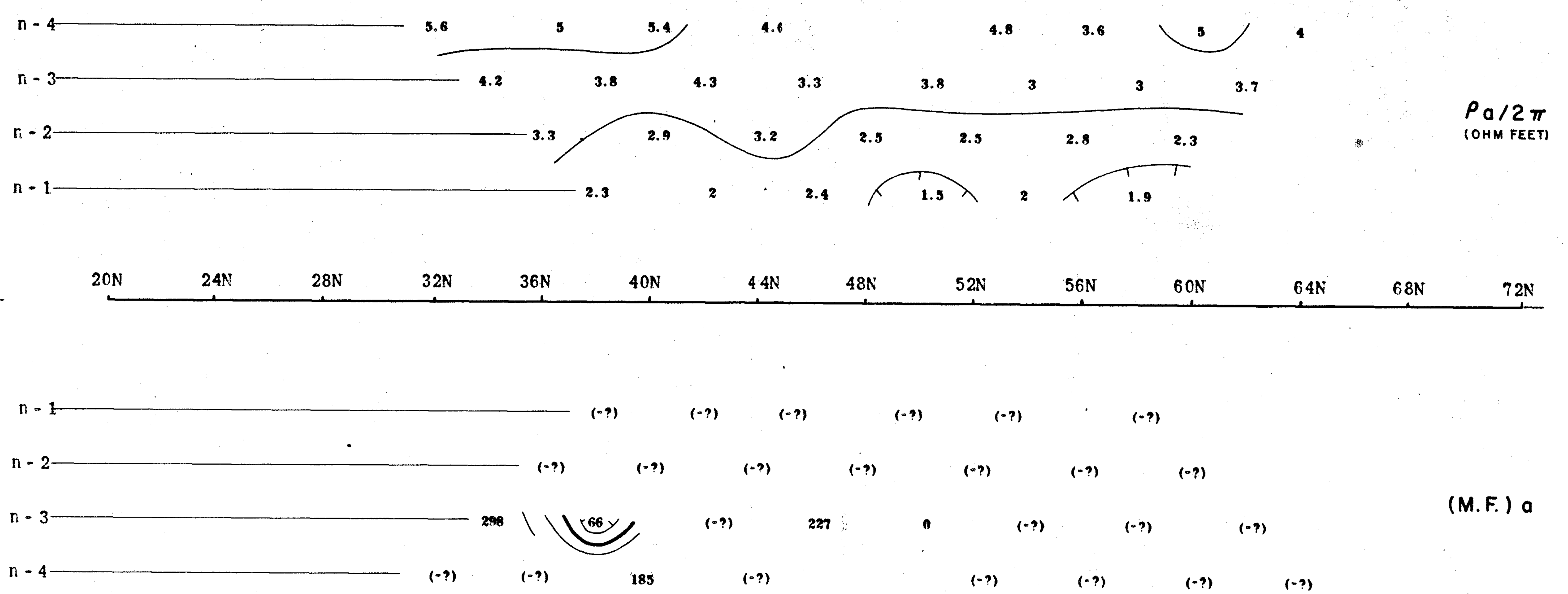
McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

ELECTRODE CONFIGURATION



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



LINE NO.- 20W

DELHI AUSTRALIAN PETROLEUM LTD.

SOUTH GRID, MT. WOOD AREA - S.A.

Scale-One inch= 400 Feet

NOTE: LOGARITHMIC CONTOUR INTERVAL

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCY D.C. & 1.25 C.P.S.

DATE SURVEYED NOV./65

APPROVED

DATE 8/2/66

McPHAR GEOPHYSICS LIMITED

576-9

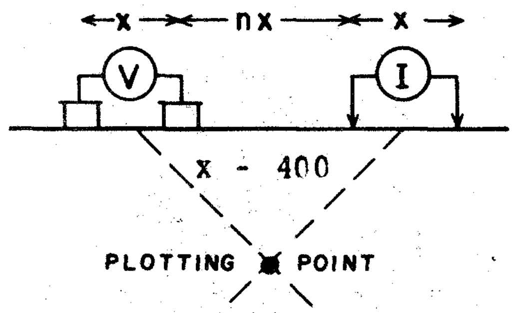
DWG. NO.–I.P.– 2379-10

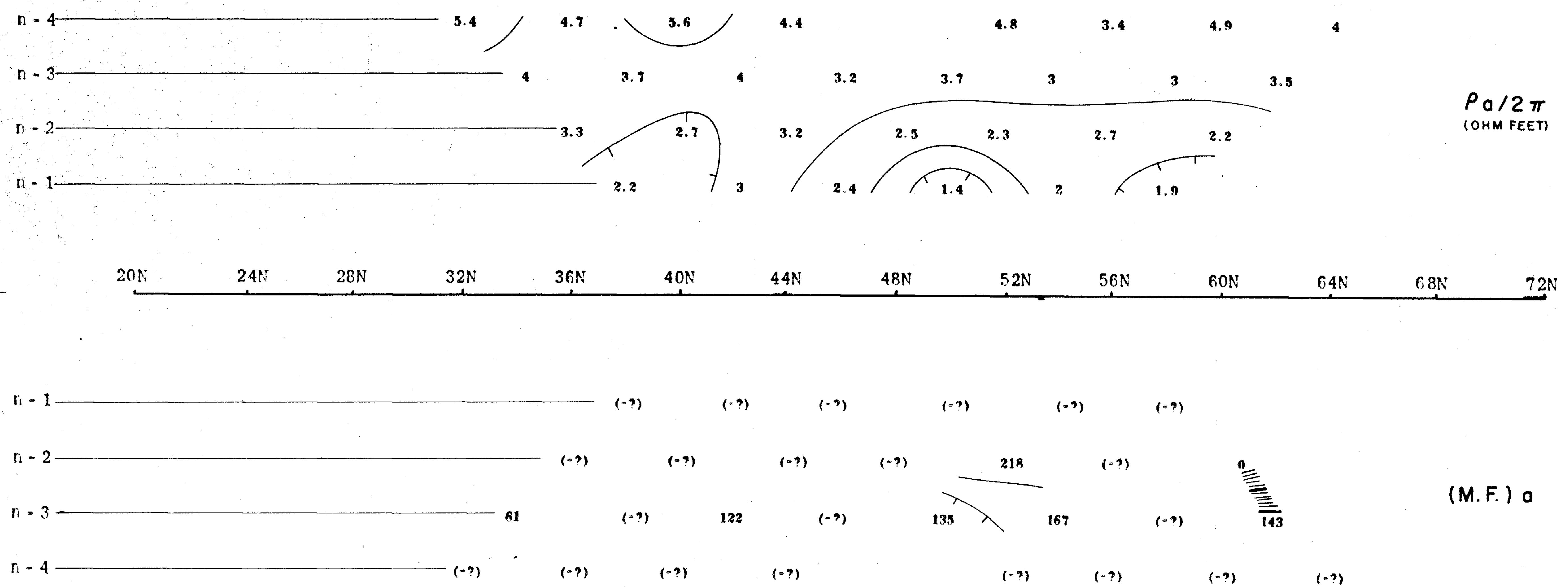
McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

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

ELECTRODE CONFIGURATION





LINE NO.– 20 W

DELHI AUSTRALIAN PETROLEUM LTD.

SOUTH GRID, MT. WOOD AREA - S. A.

Scale– One inch = 400 Feet

NOTE LOGARITHMIC CONTOUR INTERVAL

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

FREQUENCY D.C. & 1.25 C.P.S.

DATE SURVEYED NOV./65

APPROVED

DATE 18/5/66

McPHAR GEOPHYSICS LIMITED

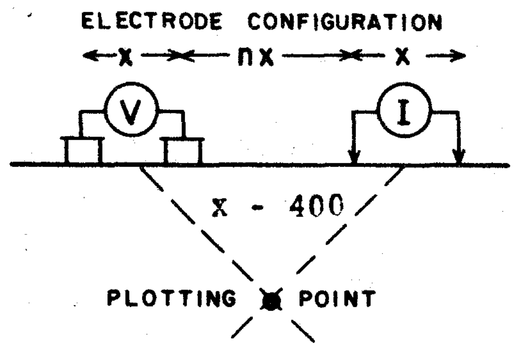
576-10

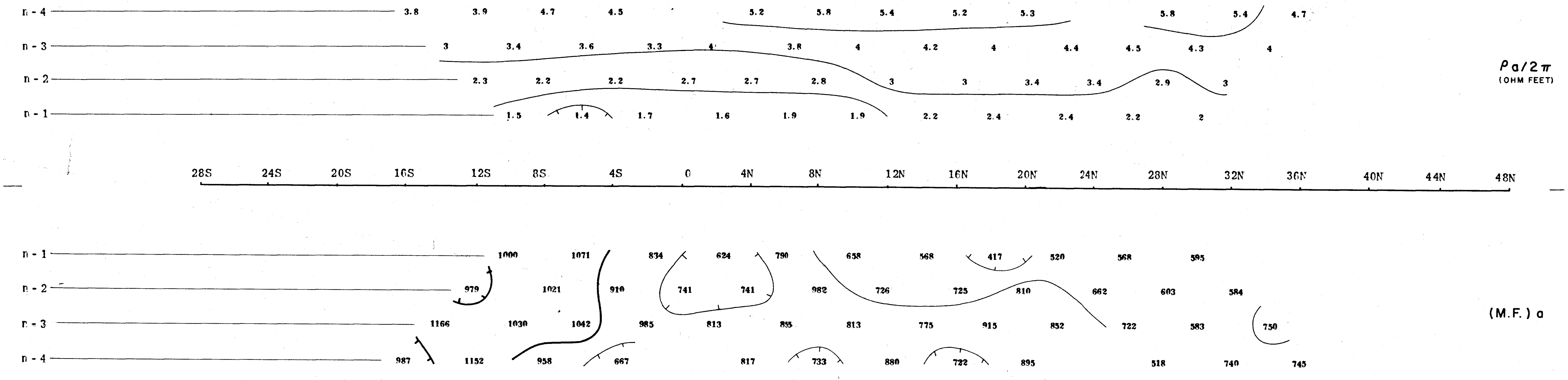
DWG. NO.-I.P.- 2379-II

McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

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





LINE NO.- 40 W

DELHI AUSTRALIAN PETROLEUM LTD.

SOUTH GRID, MT. WOOD AREA - S.A

Scale—One inch= 400 Feet

NOTE LOGARITHMIC CONTOUR INTERVAL

SURFACE PROJECTION OF ANOMALOUS ZONES

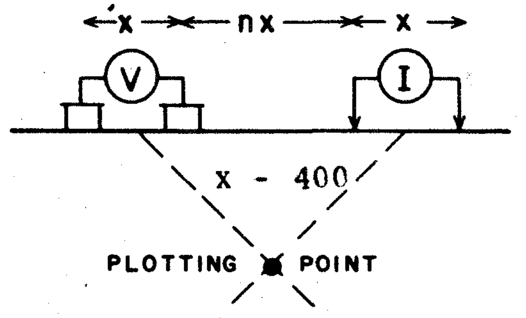
DEFINITE
PROBABLE
POSSIBLE

FREQUENCY 0.3 & 2.5 C.P.S.
DATE SURVEYED NOV./65
APPROVED
DATE 18/2/66

McPHAR GEOPHYSICS LIMITED

576-II

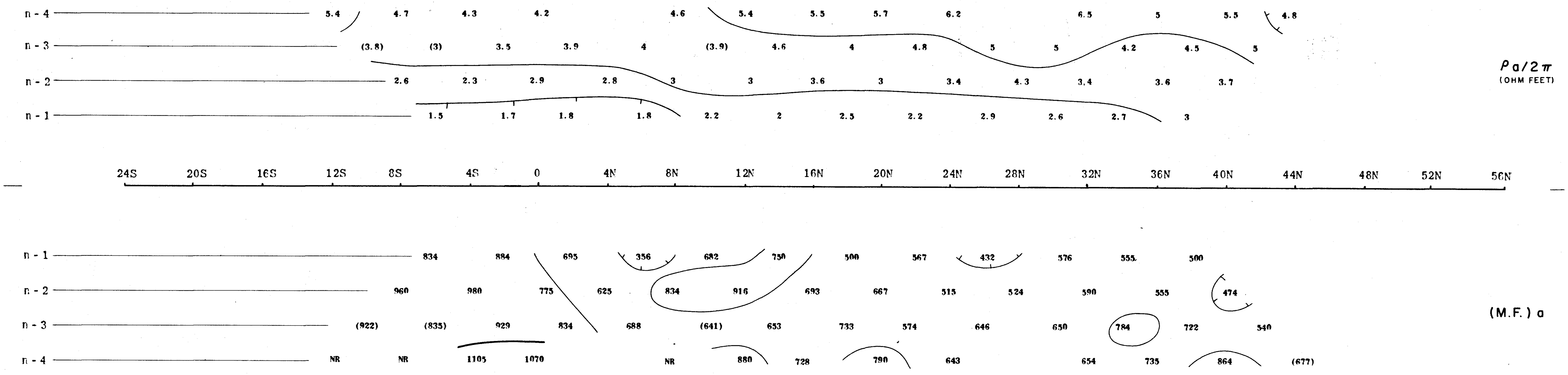
ELECTRODE CONFIGURATION



McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

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



LINE NO.- 60 W

DELHI AUSTRALIAN PETROLEUM LTD.

SOUTH GRID, MT. WOOD AREA - S.A

Scale—One inch= 400 Feet

NOTE LOGARITHMIC CONTOUR INTERVAL

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

FREQUENCY 0.3 & 2.5 C.P.S.

DATE SURVEYED NOV./65

APPROVED

DATE 19/4/66

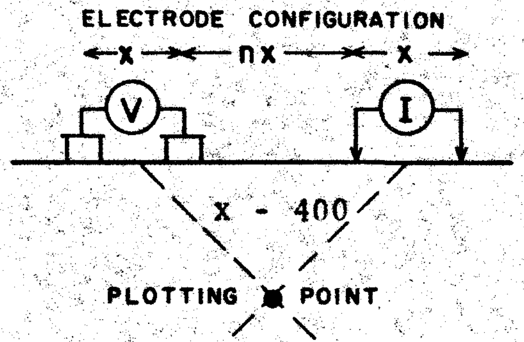
McPHAR GEOPHYSICS LIMITED

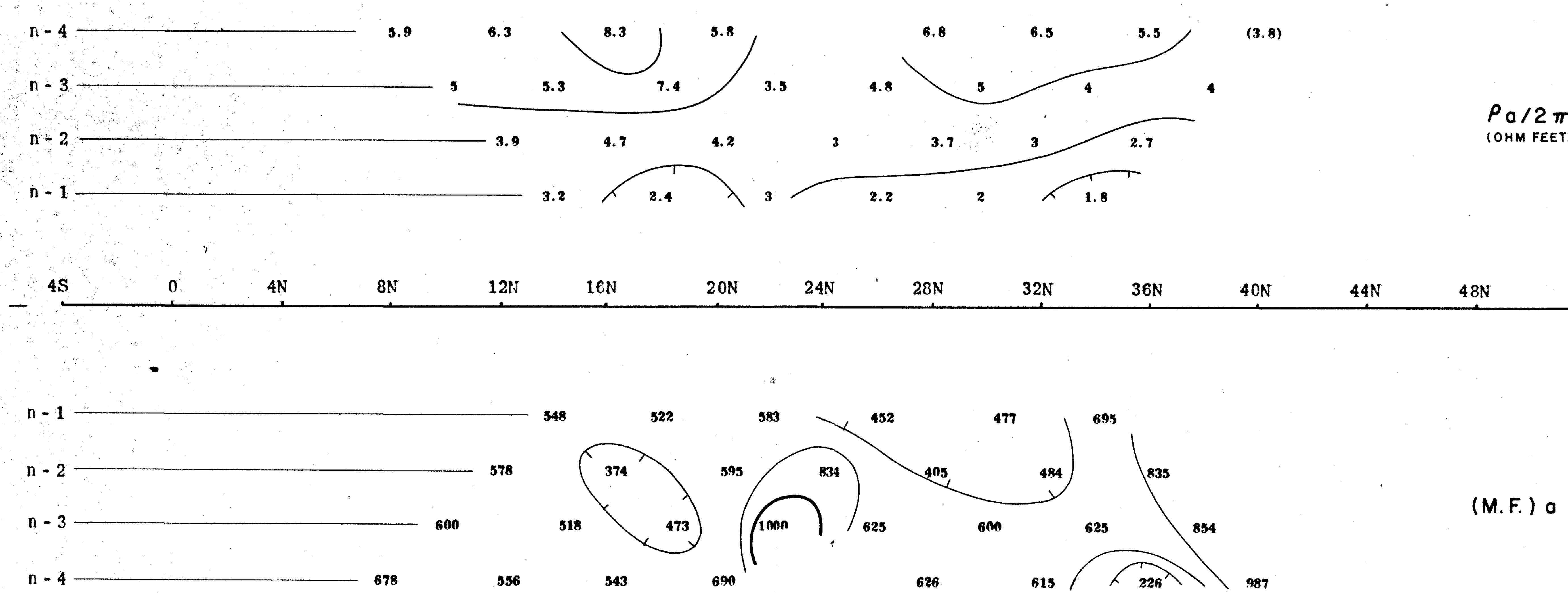
576-12

McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

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





LINE NO.- 80 W

DELHI AUSTRALIAN PETROLEUM LTD.

SOUTH GRID, MT. WOOD AREA - S. A.

Scale—One inch= 400 Feet

NOTE: LOGARITHMIC CONTOUR INTERVAL

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

FREQUENCY 0.3 & 2.5 CPS

DATE SURVEYED NOV./65

APPROVED

DATE 18/2/66

McPHAR GEOPHYSICS LIMITED

576-13

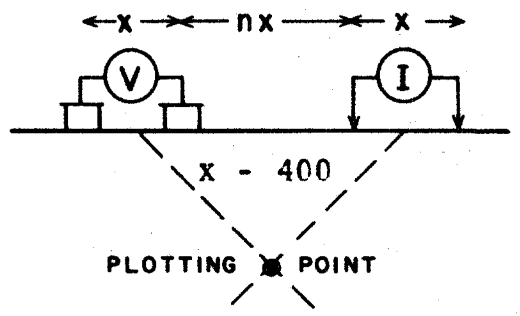
DWG. NO.-I.P.- 2379-14

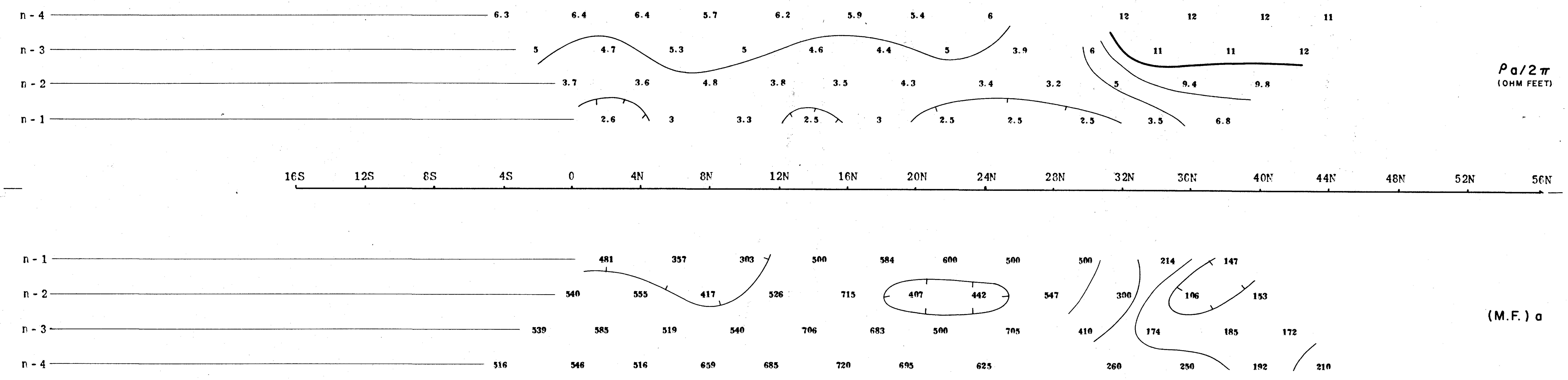
McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

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

ELECTRODE CONFIGURATION





LINE NO.- 100 W

DELHI AUSTRALIAN PETROLEUM LTD.

SOUTH GRID, MT. WOOD AREA - S.A

Scale-One inch= 400 Feet

NOTE LOGARITHMIC CONTOUR INTERVAL

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

FREQUENCY 0.3 - 2.5 C.P.S

DATE SURVEYED NOV./65

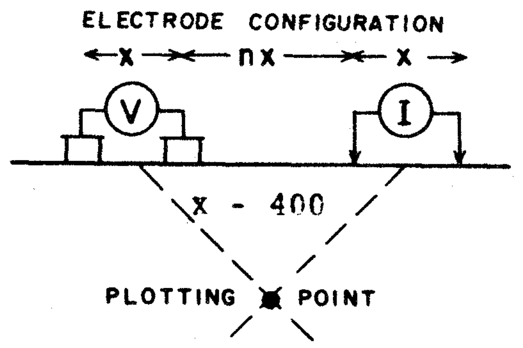
APPROVED

DATE 8/2/66

McPHAR GEOPHYSICS LIMITED

576-14

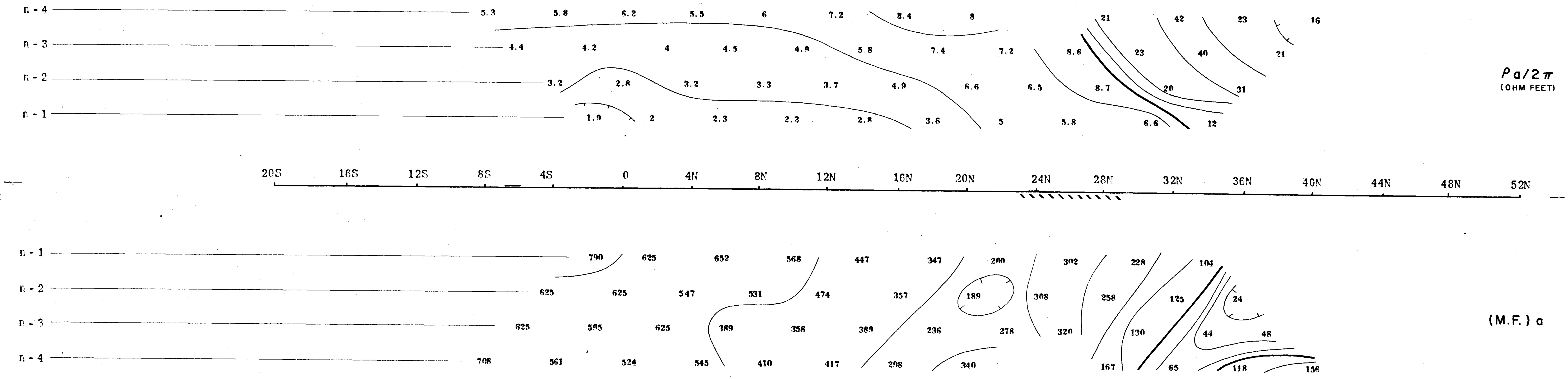
DWG. NO.-I.P.- 2379-15



McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

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



LINE NO.- 120 W

DELHI AUSTRALIAN PETROLEUM LTD.

SOUTH GRID, MT. WOOD AREA - S.A

Scale—One inch= 400 Feet

NOTE LOGARITHMIC CONTOUR INTERVAL

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

FREQUENCY 0.3-2.5 C.P.S.

DATE SURVEYED NOV/65

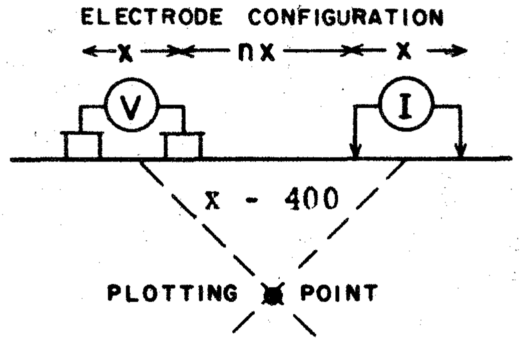
APPROVED

DATE 1/2/66

McPHAR GEOPHYSICS LIMITED

576-15

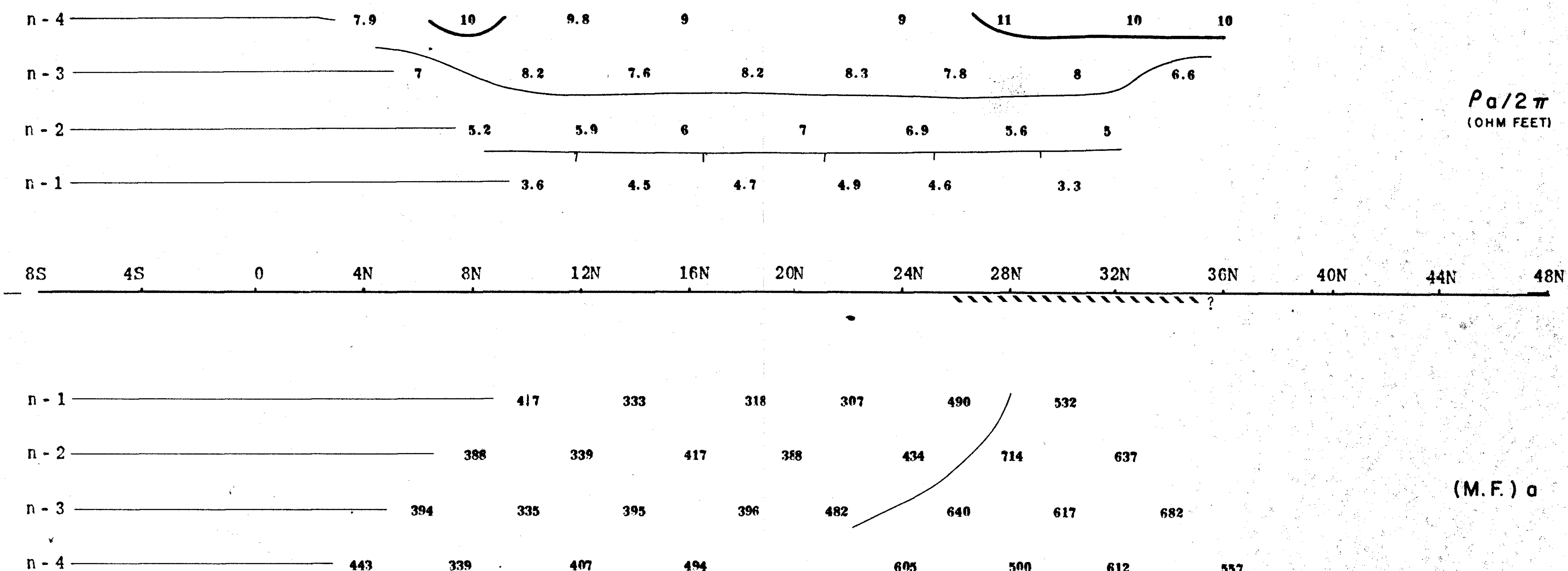
DWG. NO.– I.P.– 2379-16



McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

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



LINE NO.– 140 W

DELHI AUSTRALIAN PETROLEUM LTD.

SOUTH GRID, MT. WOOD AREA - S. A.

Scale– One inch = 400 Feet

NOTE: LOGARITHMIC CONTOUR INTERVAL

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

FREQUENCY 0.3 & 2.5 CPS.

DATE SURVEYED NOV./65

APPROVED

DATE 18/2/66

McPHAR GEOPHYSICS LIMITED

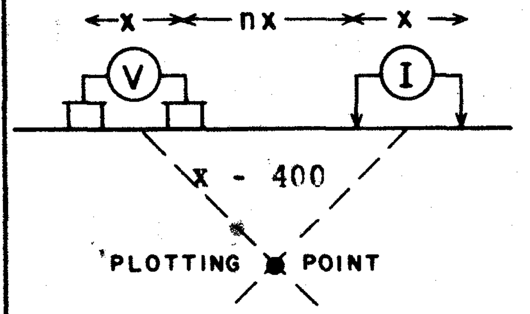
576-16

DWG. NO.–I.P.– 2379-17

McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

ELECTRODE CONFIGURATION



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

LINE NO.– 170 W

DELHI AUSTRALIAN PETROLEUM LTD.

SOUTH GRID, MT. WOOD AREA - S.A.

Scale—One inch= 400 Feet

NOTE LOGARITHMIC CONTOUR INTERVAL

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

FREQUENCY 0.3-2.5 C.P.S.

DATE SURVEYED NOV/65

APPROVED

DATE

McPHAR GEOPHYSICS LIMITED

576-17

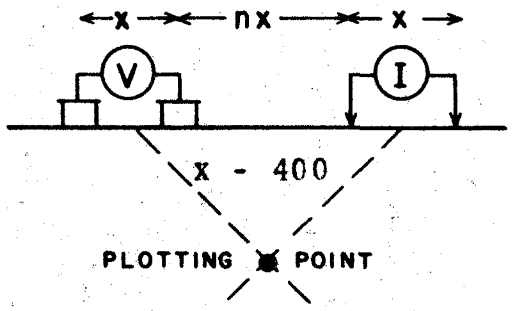
DWG. NO.–I.P.– 2379-18

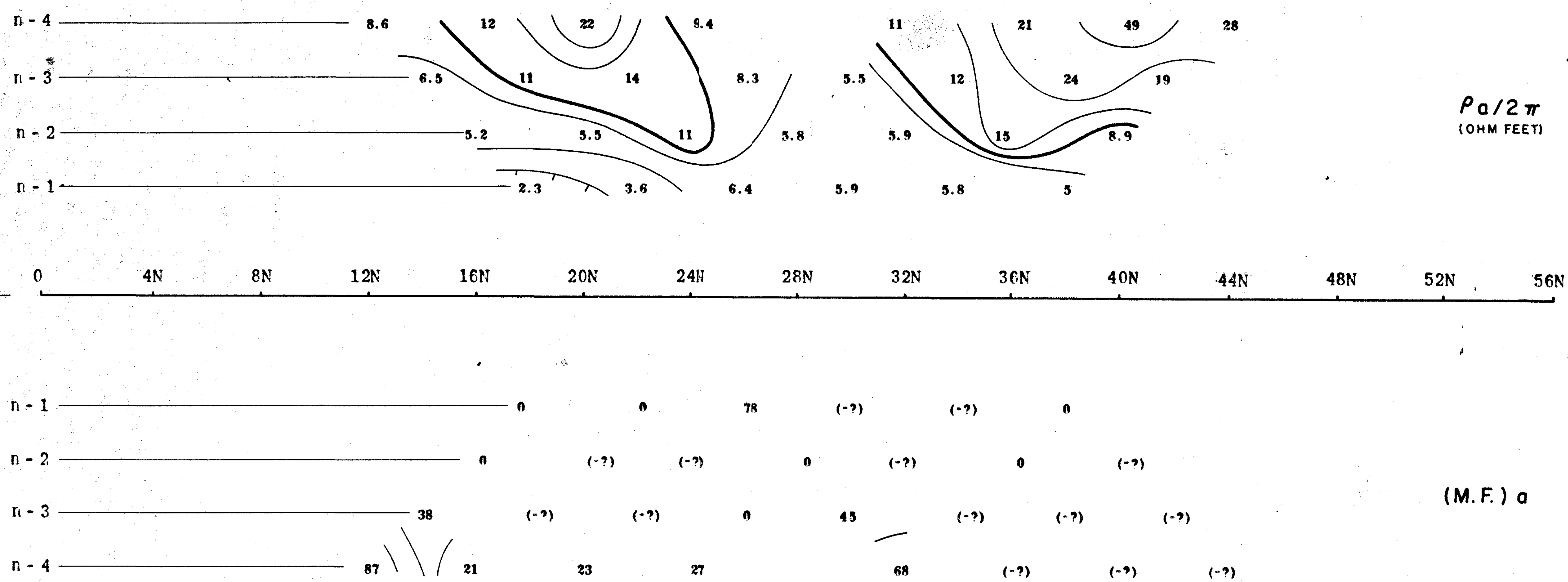
McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

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

ELECTRODE CONFIGURATION





LINE NO.– 170 W

DELHI AUSTRALIAN PETROLEUM LTD.

SOUTH GRID, MT. WOOD AREA - S. A.

Scale–One inch= 400 Feet

NOTE LOGARITHMIC CONTOUR INTERVAL

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCY D.C. & 1.25 C.P.S.

DATE SURVEYED NOV./65

APPROVED

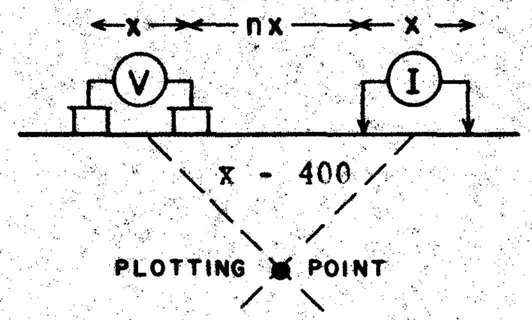
DATE 8/2/66

McPHAR GEOPHYSICS LIMITED

576-18

DWG. NO.–I.P.– 2379-19

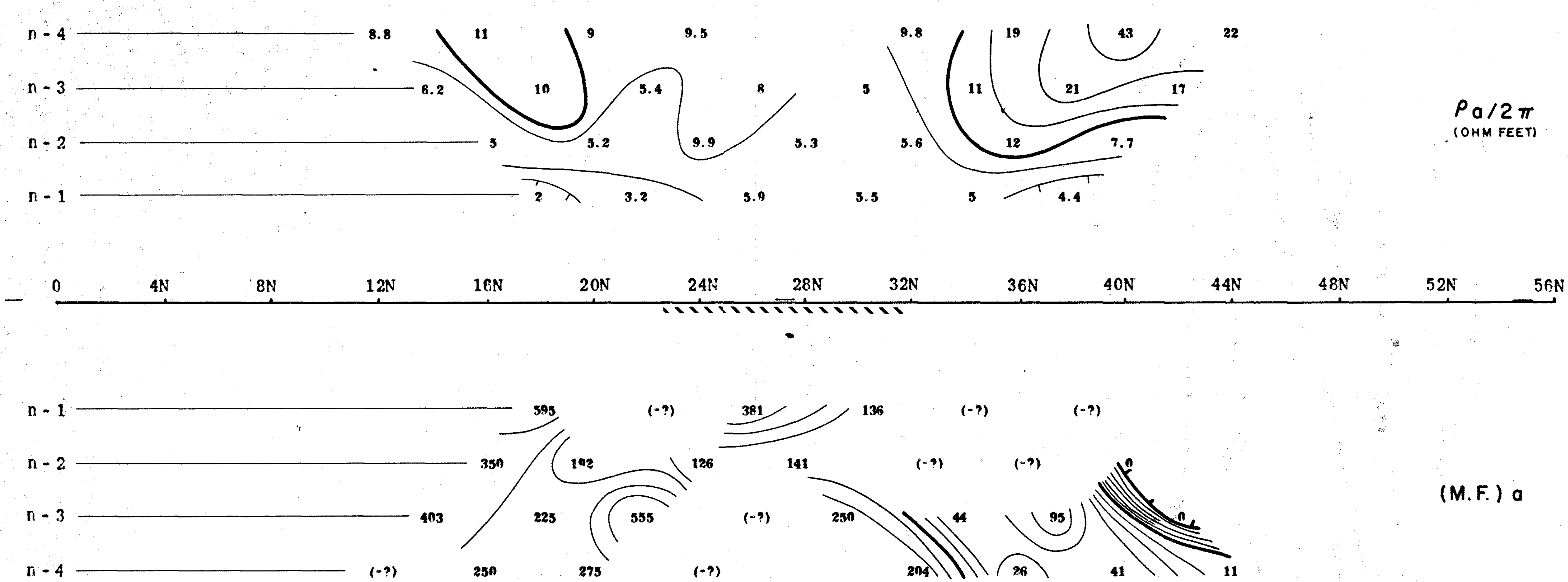
ELECTRODE CONFIGURATION



McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

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



LINE NO.– 170 W

DELHI AUSTRALIAN PETROLEUM LTD.

SOUTH GRID, MT. WOOD AREA – S. A.

Scale–One inch = 400 Feet

NOTE: LOGARITHMIC CONTOUR INTERVAL

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

FREQUENCY D.C. & 1.25 C.P.S.

DATE SURVEYED NOV./65

APPROVED

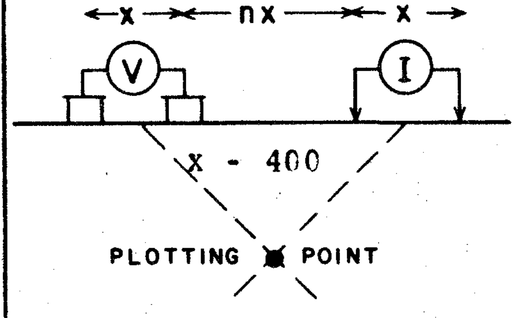
DATE 18/2/66

McPHAR GEOPHYSICS LIMITED

576-19

DWG. NO.–I.P.– 2379-20

ELECTRODE CONFIGURATION



McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

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

LINE NO– 185 W

DELHI AUSTRALIAN PETROLEUM LTD.

SOUTH GRID, MT. WOOD AREA – S.A.

Scale—One inch= 400 Feet

NOTE LOGARITHMIC CONTOUR INTERVAL

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

FREQUENCY .3 & 2.5 CPS.

DATE SURVEYED NOV./65

APPROVED

DATE 5/2/66

MCPHAR GEOPHYSICS LIMITED

576-20