4578

REPORT ON THE
INDUCED POLARIZATION
AND RESISTIVITY SURVEY
ON THE
T A PROPERTY, NANIKA LAKE AREA
OMINECA MINING DIVISION, B.C.
FOR
GRÄNGES EXPLORATION AKTIEBOLAG
93E/13E, 14W

BY

ASHTON W. MULLAN, P. Eng.

AND

MARION A. GOUDIE, B.Sc.

NAME AND LOCATION OF PROPERTY:

T A PROPERTY, NANIKA LAKE AREA

OMINECA MINING DIVISION, B.C. 53°50'N - 127°30'W

DATE STARTED: JULY 1, 1973

DATE FINISHED: JULY 16, 1973

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McPHAR GEOPHYSICS LIMITED

REPORT ON THE INDUCED POLARIZATION AND RESISTIVITY SURVEY ON THE T.A. PROPERTY, NANIKA LAKE AREA OMINECA MINING DIVISION, B.C. FOR GRÄNGES EXPLORATION AKTIEBOLAG

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1. INTRODUCTION

We have recently completed an Induced Polarization and Resistivity Survey on the T.A. Property, Nanika Lake Area, Omineca Mining Division, B.C., for Gränges Exploration Aktiebolag. The property is situated with the northwest corner at 53°50'N latitude and 127°30' W longitude, two miles east of Nanika Lake on Bergland Creek. Access is by helicopter.

The survey grid lies on the northwest flank of the Tahtsa Range. The country rocks are volcanics and sediments of the Hazelton group. The area is structurally deformed by a gently folded antiform-synform system. No detailed geology is known for this specific area, but the claims were staked on the basis of a geochemical survey which located anomalous areas for copper and molybdenum.

The IP survey was carried out to locate and outline possible drill targets. The work was completed in July, 1973, using a McPhar P660 high power variable frequency IP unit operating at 0.3 Hz and 5 Hz over the following claims:

1 to 24 Inclusive

These claims are assumed to be owned or held under option by Gränges Exploration Aktiebolag.

2. PRESENTATION OF RESULTS

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

Line	Electrode Intervals	Dwg. No.
400S	300 feet	IP 6079-1
1200S	300 feet	IP 6079-2
2000S	300 feet	IP 6079-3
2800S	300 feet	IP 6079-4
3600S	300 feet	IP 6079-5
4400S	300 feet	IP 6079-6
5200S	300 feet	IP 6079-7
6000S	300 feet	IP 6079-8
6800S	300 feet	IP 6079-9
7600S	300 feet	IP 6079-10
8400S	300 feet	IP 6079-11

Also enclosed with this report is Dwg. I.P.P. 3591, a plan map of the T.A. Property Grid at a scale of 1" = 400'. The definite, probable and possible Induced Polarization anomalies are indicated by bars, in the manner shown on the legend, on this plan map as well as on the data plots. These bars represent the surface projection of the anomalous zones as interpreted from the location of the transmitter and receiver electrodes when the anomalous values were measured.

Since the Induced Polarization measurement is essentially an averaging process, as are all potential methods, it is frequently difficult to exactly pinpoint the source of an anomaly. Certainly, no anomaly can be located with more accuracy than the electrode interval length; i.e. when using 300' electrode intervals the position of a narrow sulphide body can only be determined to lie between two stations 300' apart. In order to definitely locate, and fully evaluate, a narrow, shallow source it is necessary to use shorter electrode intervals. In order to locate sources at some depth, larger electrode intervals must be used, with a corresponding increase in the uncertainties of location. Therefore, while the centre of the indicated anomaly probably corresponds fairly well with source, the length of the indicated anomaly along the line should not be taken to represent the exact edges of the anomalous material.

3. DISCUSSION OF RESULTS

The resistivities of the rocks in the survey are generally high, a factor which results in weak IP effects which normally would not be considered anomalous. In this case, the frequency effects must be considered with the metal factors to locate the anomalies. The geochemical results showed the presence of copper and molybdenum. If molybdenum should form a large part of the mineralization, this again would increase the importance of weak IP anomalies.

The IP anomalies appear to be located in a magnetic low, ringed by 1000 to 2000 gamma anomalies.

Three anomalous IP zones have been located by the survey. These will be discussed below as each line is analyzed.

Line 400S

A weak anomaly extends from 15E to 21E, with the top of the source appearing on n = 2, or about 150' in depth. A second weak anomaly was located from 33E to 36E. It is possible that these two anomalies may be continuous at depth, and on the basis of this possibility, the two anomalies have tentatively been correlated into Zone 1.

Increased frequency effects from 3E to 6E on n = 2 and n = 3 are countered by high resistivities to result in very low metal factors. This portion of the line could be re-assessed later on the basis of drilling results.

Line 1200S

A weak anomaly with the top of the source at a depth of near 300' extends from 2W to 2E.

The unsurveyed portion of the line from 21E to 30E represents a turbulent creek, which was difficult to cross with equipment at survey time. At 15E, low metal factors are nevertheless six times background and have been interpreted as anomalous from there to the east. A weak anomaly from 30E to 42E may be enhanced by conductive surface sediments, as the area is swampy, but anomalous readings extend to n = 3, a depth which is unlikely to be affected by surface water. The possibility exists that the source of these two anomalies continues beneath the creek and Zone 1 has been mapped from

15E to 42E. This is, of course, subject to confirmation by further work. This same assumption has been made on Line 2000S and Line 2800S.

Line 2000S

A weak anomaly with the top of the source appearing on n = 2 extends from 4W to 2E. The western boundary of Zone 1 was not surveyed - the eastern edge lies at 35E.

Line 2800S

The surveyed portion of Zone 1 extends from 20E to 35E. There appears to be a barren or less mineralized capping from 26E to 32E and the source appears to be more variable. The anomaly is definite from 23E to 26E, representing a one-station increase in magnitude on n = 3.

Line 3600S

The Zone 1 anomaly extends from 16E to 22E, definite from 16E to 19E and possible from 19E to 22E. A second anomaly from 34E to 37E is weak. There is no apparent connection between the two anomalies.

Line 4400S

A weak anomaly extends from 8E, incomplete, to 11E.

A weak to possible anomaly extends from 20E to 35E. The possible portion of the anomaly reflects a one-station reading on n = 3.

Line 5200S

A weak anomaly with the top of the source on n = 2 extends from 6W, incomplete, to 3E, where it becomes possible to 6E, reflecting a one-station reading on n = 3. A weak, shallow anomaly from 9E to 18E shows some depth extent. A third weak anomaly with the top of the source at n = 2 may be continuous at depth with the two anomalies to the east, however, as this is uncertain, only the eastern anomaly has been included in Zone 1.

Line 6000S

A shallow, weak anomaly was located from 0 to 3E. From 12E to 21E the pattern of the IP readings is similar to that caused by a vertical source which would underlie 15E to 18E. However, the pattern is rather poorly defined. It is flanked on the east by weak frequency effects from 24E to 30E, the Zone 1 anomaly.

Line 6800S

A broad, weak to possible anomaly with the top of the source varying from n = 1 to n = 2 extends from 3E to 18E. The possible portion of the anomaly reflects a one-station reading on n = 3. A second weak anomaly which is relatively shallow was located from 27E to 36E, incomplete. This is the Zone 1 anomaly.

Line 7600S

A weak, shallow anomaly extends from 9E to 15E. A narrow, weak, shallow anomaly was located from 24E to 27E.

Line 8400S

This line is not anomalous.

Zone 2 and Zone 3 have been tentatively correlated (see Dwg.I.P.P. 3591) but the lines are fairly widely separated and the correlation is very uncertain.

4. CONCLUSIONS AND RECOMMENDATIONS

The IP survey located anomalies on all lines except Line 8400S. The anomalies have been tentatively correlated into three zones. The anomalies are very weak and would normally not be considered anomalous except that in this case the country rocks are highly resistive. This, combined with the presence of molybdenum as a constituent mineral with copper, as shown by a geochemical survey, makes it necessary to consider the results closely. However, the sources of the anomalies must be weakly disseminated mineralization for the most part, probably less than 1% sulphides, and a very large tonnage would be necessary to make the deposit economic. Zone 1 is open to both north and south and IP coverage could be extended if drilling results indicate that further work is warranted. Several drill hole locations have been provided by McPhar's consulting geophysicist in the Vancouver office and when the drilling results are known, the geophysical and geochemical results should be re-interpreted.

McPHAR GEOPHYSICS LIMITED

PROFESSIONAL ENGINEER, PROVINCE OF BRITISH COLUMBIA, A. W. MULLAN

A. W. Mullan, P. Eng.
Geologist

Marion A. Goudie,
Geologist

Dated: August 16, 1973

ASSESSMENT DETAILS

PROPERTY: T.A. Property

MINING DIVISION: Omineca

SPONSOR: Gränges Exploration Aktiebolag

PROVINCE: British Columbia

LOCATION: Nanika Lake

TYPE OF SURVEY: Induced Polarization

OPERATING MAN DAYS:	38	DATE STARTED: July 1, 1973
EQUIVALENT 8 HR. MAN DAYS	57	DATE FINISHED: July 16, 1973
CONSULTING MAN DAYS:	3	NUMBER OF STATIONS: 216
DRAUGHTING MAN DAYS:	5	NUMBER OF READINGS: 1442
TOTAL MAN DAYS:	65	MILES OF LINE SURVEYED: 11.64

CONSULTANTS:

Ashton W. Mullan, 1440 Sandhurst Place, West Vancouver, B.C.
Marion A. Goudie, 739 Military Trail, West Hill, Ontario.

FIELD TECHNICIANS:

J. Parker, Box 340, Choiceland, Saskatchewan
K. McAughtrie, 1015 Aubeneau Crescent, West Vancouver, B.C.
+ 2 Helpers:
M. Faust, 841 Selkirk Ave. Kamloops, B.C.
J. Skippit, 1411 Schubert Drive, Kamloops, B.C.

DRAUGHTSMEN:

B. Boden, 103 Petworth Crescent, Agincourt, Ontario.
V. Young, 64 Highcourt Crescent, Scarborough, Ontario.

McPHAR GEOPHYSICS LIMITED

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — A. W. MULLAN

Ashton W. Mullan

Ashton W. Mullan, P. Eng.

Dated: August 16, 1973

STATEMENT OF COST

Gränges Exploration Aktiebolag
T.A. Property, Nanika Lake Area, B.C.

Crew:- J. Parker - K. McAughtrie

11.64 line miles	@ $460.00/mile		$5,354.40

Breakdown of above

9½ days Operating		@ $298.00/day	$2,831.00
3 days Travel) ½ day Bad Weather) 6 days 2½ days Standby)		@ $100.00/day	600.00
Charge re - less than 10 operating days			200.00
Crew Expenses			
Truck Rental	176.22		
Vehicle Expense	29.51		
Meals & Accommodation	497.04		
Supplies	45.60		
	748.37		
+ 10%	74.84		823.21
Extra Labour:	750.00		
+ 20%	150.00		
	900.00		900.00
			$4,454.21

McPHAR GEOPHYSICS LIMITED

Ashton W. Mullan, Eng.

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
A. W. MULLAN

Dated: August 16, 1973

CERTIFICATE

I, Ashton W. Mullan, of the City of Vancouver, in the Province of British Columbia, hereby certify:

1. That I am a geologist and a fellow of the Geological Association of Canada with a business address at Suite 811, 837 West Hastings Street, Vancouver, B.C.

2. That I am registered as a member of the Association of Professional Engineers of the Provinces of Ontario and British Columbia.

3. That I hold a B.Sc. degree from McGill University.

4. That I have been practising my profession as a geologist for about twenty years.

5. I have no direct or indirect interest, nor do I expect to receive any interest directly or indirectly, in the property or securities of Gränges Exploration Aktiebolag or any affiliate.

6. The statements made in this report are based on a study of published geological literature and unpublished private reports.

7. Permission is granted to use in whole or in part for assessment and qualification requirements but not for advertising purposes.

Dated at Toronto

This 16th day of August, 1973

A. W. Mullan, B.Sc., P.Eng.

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
A. W. MULLAN

CERTIFICATE

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

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

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

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

4. I have been practising my profession for 23 years.

5. I have no direct or indirect interest, nor do I expect to receive any interest directly or indirectly, in the property or securities of Gränges Exploration Aktiebolag or any affiliate.

6. The statements made in this report are based on a study of published geological literature and unpublished private reports.

7. Permission is granted to use in whole or in part for assessment and qualification requirements but not for advertising purposes.

Dated at Toronto

This 16th day of August, 1973

Marion A. Goudie

Marion A. Goudie, B.Sc.

McPHAR GEOPHYSICS

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

Induced Polarization as a geophysical measurement refers to the blocking action or polarization of metallic or electronic conductors in a medium of ionic solution conduction.

This electro-chemical phenomenon occurs wherever electrical current is passed through an area which contains metallic minerals such as base metal sulphides. Normally, when current is passed through the ground, as in resistivity measurements, all of the conduction takes place through ions present in the water content of the rock, or soil, i.e. by ionic conduction. This is because almost all minerals have a much higher specific resistivity than ground water. The group of minerals commonly described as "metallic", however, have specific resistivities much lower than ground waters. The induced polarization effect takes place at those interfaces where the mode of conduction changes from ionic in the solutions filling the interstices of the rock to electronic in the metallic minerals present in the rock.

The blocking action or induced polarization mentioned above, which depends upon the chemical energies necessary to allow the ions to give up or receive electrons from the metallic surface, increases with the time that a d.c. current is allowed to flow through the rock; i.e. as ions pile up against the metallic interface the resistance to current flow increases. Eventually, there is enough polarization in the form of excess ions at the interfaces, to appreciably reduce the amount of current flow through the metallic particle. This polarization takes place at each of the infinite number of solution-metal interfaces in a mineralized rock.

When the d.c. voltage used to create this d.c. current flow is cut off, the Coulomb forces between the charged ions forming the polarization cause them to return to their normal position. This movement of charge creates a small current flow which can be measured on the surface of the ground as a decaying potential difference.

From an alternate viewpoint it can be seen that if the direction of the current through the system is reversed repeatedly before the polarization occurs, the effective resistivity of the system as a whole will change as the frequency of the switching is changed. This is a consequence of the fact that the amount of current flowing through each metallic interface depends upon the length of time that current has been passing through it in one direction.

The values of the per cent frequency effect or F. E. are a measurement of the polarization in the rock mass. However, since the measurement of the degree of polarization is related to the apparent resistivity of the rock mass it is found that the metal factor values or M. F. are the most useful values in determining the amount of polarization present in the rock mass. The MF values are obtained by normalizing the F. E. values for varying resistivities.

The induced polarization measurement is perhaps the most powerful geophysical method for the direct detection of metallic sulphide mineralization, even when this mineralization is of very low concentration. The lower limit of volume per cent sulphide necessary to produce a recognizable IP anomaly will vary with the geometry and geologic environment of the source, and the method of executing the survey. However, sulphide mineralization of less than one per cent by volume has been detected by the IP method under proper geological conditions.

The greatest application of the IP method has been in the search for disseminated metallic sulphides of less than 20% by volume. However, it has also been used successfully in the search for massive sulphides in situations where, due to source geometry, depth of source, or low resistivity of surface layer, the EM method can not be successfully applied. The ability to differentiate ionic conductors, such as water filled shear zones, makes the IP method a useful tool in checking EM anomalies which are suspected of being due to these causes.

In normal field applications the IP method does not differentiate between the economically important metallic minerals such as chalcopyrite, chalcocite, molybdenite, galena, etc., and the other metallic minerals such as pyrite. The induced polarization effect is due to the total of all electronic conducting minerals in the rock mass. Other electronic conducting materials which can produce an IP response are magnetite, pyrolusite, graphite, and some forms of hematite.

In the field procedure, measurements on the surface are made in a way that allows the effects of lateral changes in the properties of the ground to be separated from the effects of vertical changes in the properties. Current is applied to the ground at two points in distance (X) apart. The potentials are measured at two other points (X) feet apart, in line with the current electrodes is an integer number (n) times the basic distance (X).

The measurements are made along a surveyed line, with a constant distance (nX) between the nearest current and potential electrodes. In most surveys, several traverses are made with various values of (n); i.e. (n) = 1, 2, 3, 4, etc. The kind of survey required (detailed or reconnaissance) decides the number of values of (n) used.

In plotting the results, the values of the apparent resistivity, apparent per cent frequency effect, and the apparent metal factor measured for each set of electrode positions are plotted at the intersection of grid lines, one from the center point of the current electrodes and the other from the center point of the potential electrodes. (See Figure A.) The resistivity values are plotted above the line as a mirror image of the metal factor values below. On a second line, below the metal factor values, are plotted the values of the per cent frequency effect. In some cases the values of per cent frequency effect are plotted as superscripts of the metal factor value. In this second case the frequency effect values are not contoured. The lateral displacement of a given value is determined by the location along the survey line of the center point between the current and potential electrodes. The distance of the value from the line is determined by the distance (nX) between the current and potential electrodes when the measurement was made.

The separation between sender and receiver electrodes is only one factor which determines the depth to which the ground is being sampled in any particular measurement. The plots then, when contoured, are not section maps of the electrical properties of the ground under the survey line. The interpretation of the results from any given survey must be carried out using the combined experience gained from field results, model study results and theoretical investigations. The position of the electrodes when anomalous values are measured is important in the interpretation.

In the field procedure, the interval over which the potential differences are measured is the same as the interval over which the electrodes are moved after a series of potential readings has been made. One of the advantages of the induced polarization method is that the same equipment can be used for both detailed and reconnaissance surveys merely by changing the distance (X) over which the electrodes are moved each time. In the past, intervals have been used ranging from 25 feet to 2000 feet for (X). In each case, the decision as to the distance (X) and the values of (n) to be used is largely determined by the expected size of the mineral deposit being sought, the size of the expected anomaly and the speed with which it is desired to progress.

The diagram in Figure A demonstrates the method used in plotting the results. Each value of the apparent resistivity, apparent metal factor, and apparent per cent frequency effect is plotted and identified by the position of the four electrodes when the measurement was made. It can be seen that the values measured for the larger values of (n) are plotted farther from the line indicating that the thickness of the layer of the earth that is being tested is greater than for the smaller values of (n); i. e. the depth of the measurement is increased. When the F. E. values are plotted as superscripts to the MF values the third section of data values is not presented and the F. E. values are not contoured.

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

The IP measurement is basically obtained by measuring the difference in potential or voltage (ΔV) obtained at two operating frequencies. The voltage is the product of the current through the ground and the apparent resistivity of the ground. Therefore in field situations where the current is very low due to poor electrode contact, or the apparent resistivity is very low, or a combination of the two effects; the value of (ΔV) the change in potential will be too small to be measurable. The symbol "TL" on the data plots indicates this situation.

In some situations spurious noise, either man made or natural, will render it impossible to obtain a reading. The symbol "N" on the data plots indicates a station at which it is too noisey to record a reading. If a reading can be obtained, but for reasons of noise there is some doubt as to its accuracy, the reading is bracketed in the data plot ( ).

In certain situations negative values of Apparent Frequency Effect are recorded. This may be due to the geologic environment or spurious electrical effects. The actual negative frequency effect value recorded is indicated on the data plot, however the symbol "NEG" is indicated for the corresponding value of Apparent Metal Factor. In contouring negative values the contour lines are indicated to the nearest positive value in the immediate vicinity of the negative value.

The symbol "NR" indicates that for some reason the operator did not attempt to record a reading although normal survey procedures would suggest that one was required. This may be due to inaccessible topography or other similar reasons. Any symbol other than those discussed above is unique to a particular situation and is described within the body of the report.

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

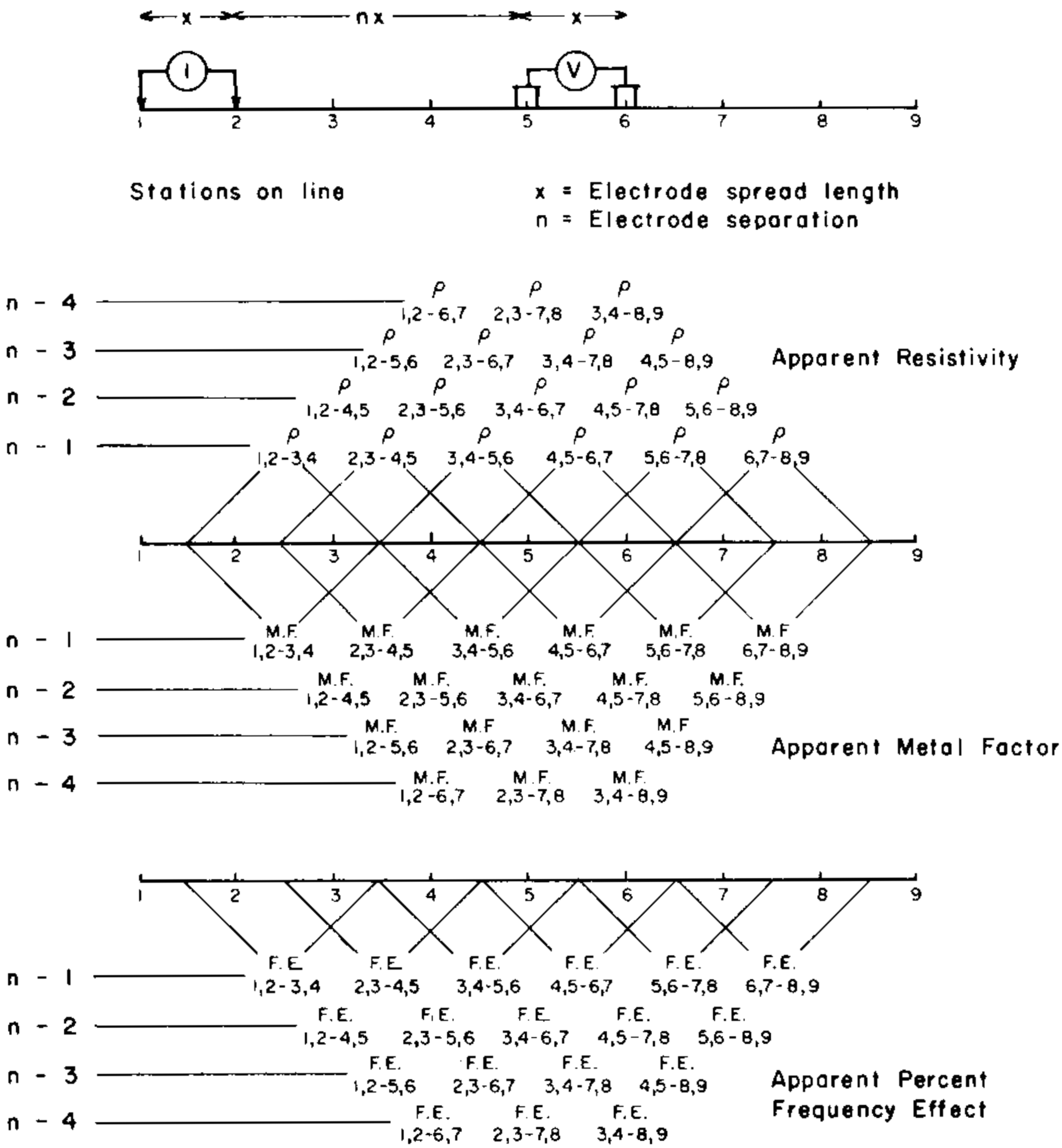
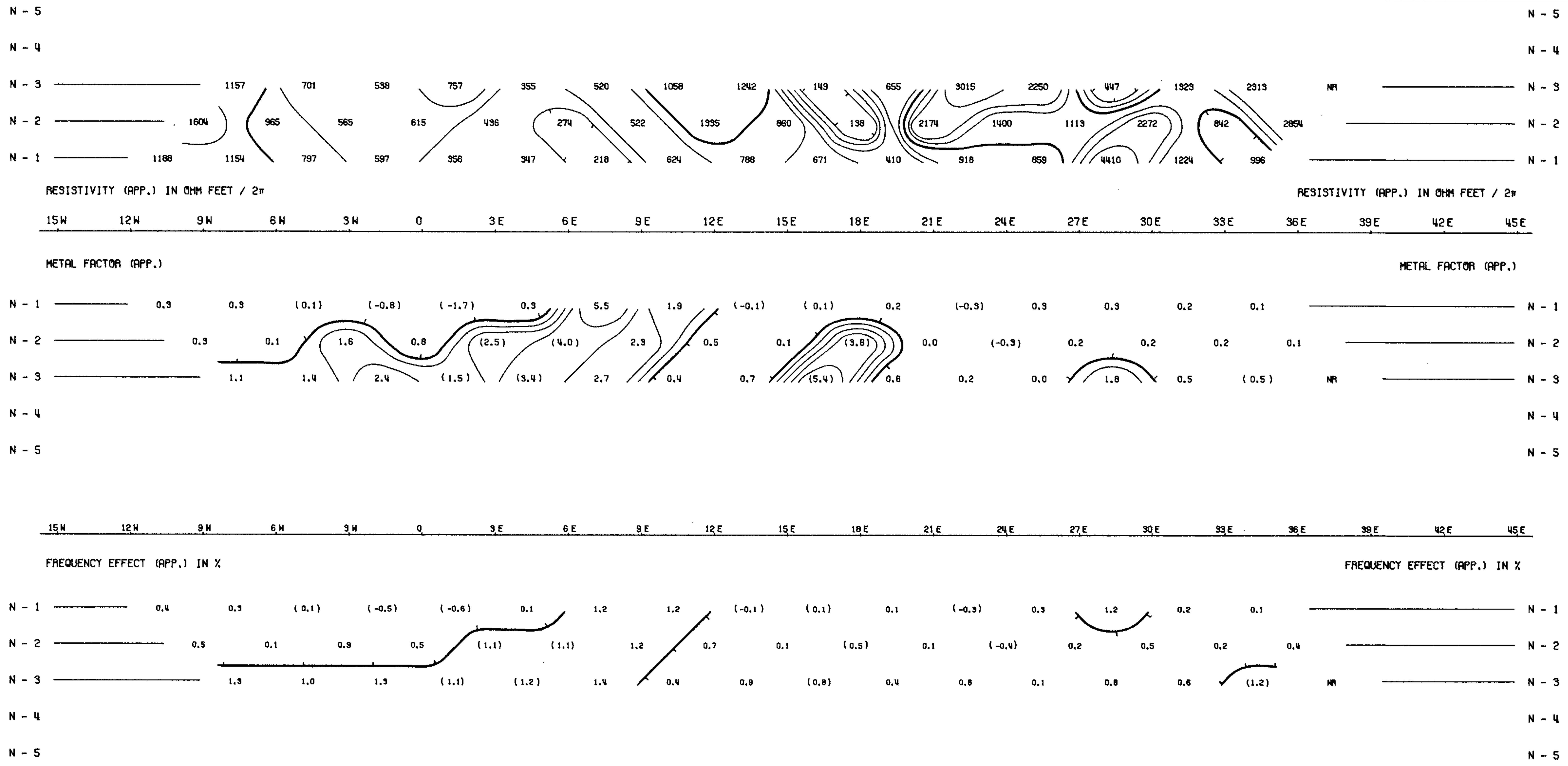


Fig. A



DWG. NO.- I.P.- 6079-11

GRÄNGES EXPLORATION AKTIEBOLAG

T.A. PROPERTY, NANIKA LAKE, OMINECA M.D.
BRITISH COLUMBIA

LINE NO.- 8400S

ELECTRODE CONFIGURATION
X — NX — X
PLOTTING POINT X = 300FT

SURFACE PROJECTION OF ANOMALOUS ZONES
DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-5.0 HZ
DATE SURVEYED: JUL 1973

APPROVED:
DATE: Aug 16, 1973

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

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — A. W. MULLAN

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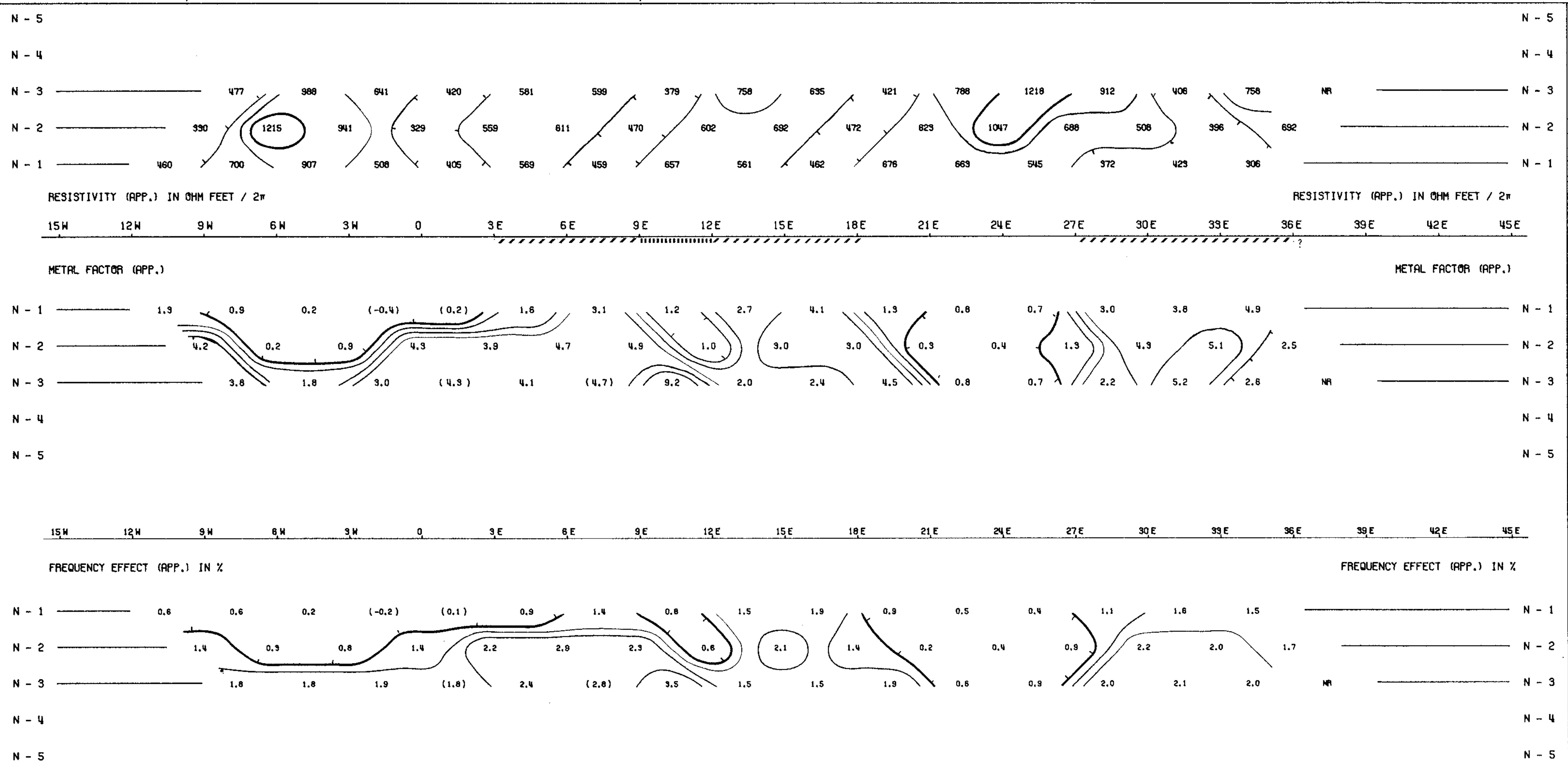
McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY MCPHAR COMPUTER DIVISION



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GRÄNGES EXPLORATION AKTIEBOLAG

T.A. PROPERTY, NANIKA LAKE, OMINECA M.D.
BRITISH COLUMBIA

LINE NO.- 6800S

ELECTRODE CONFIGURATION

PLOTTING POINT X = 300FT

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: JUL 1973

APPROVED:

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

DATE: Aug 16, 1973

PROFESSIONAL ENGINEER, PROVINCE OF BRITISH COLUMBIA, A. W. MULLAN

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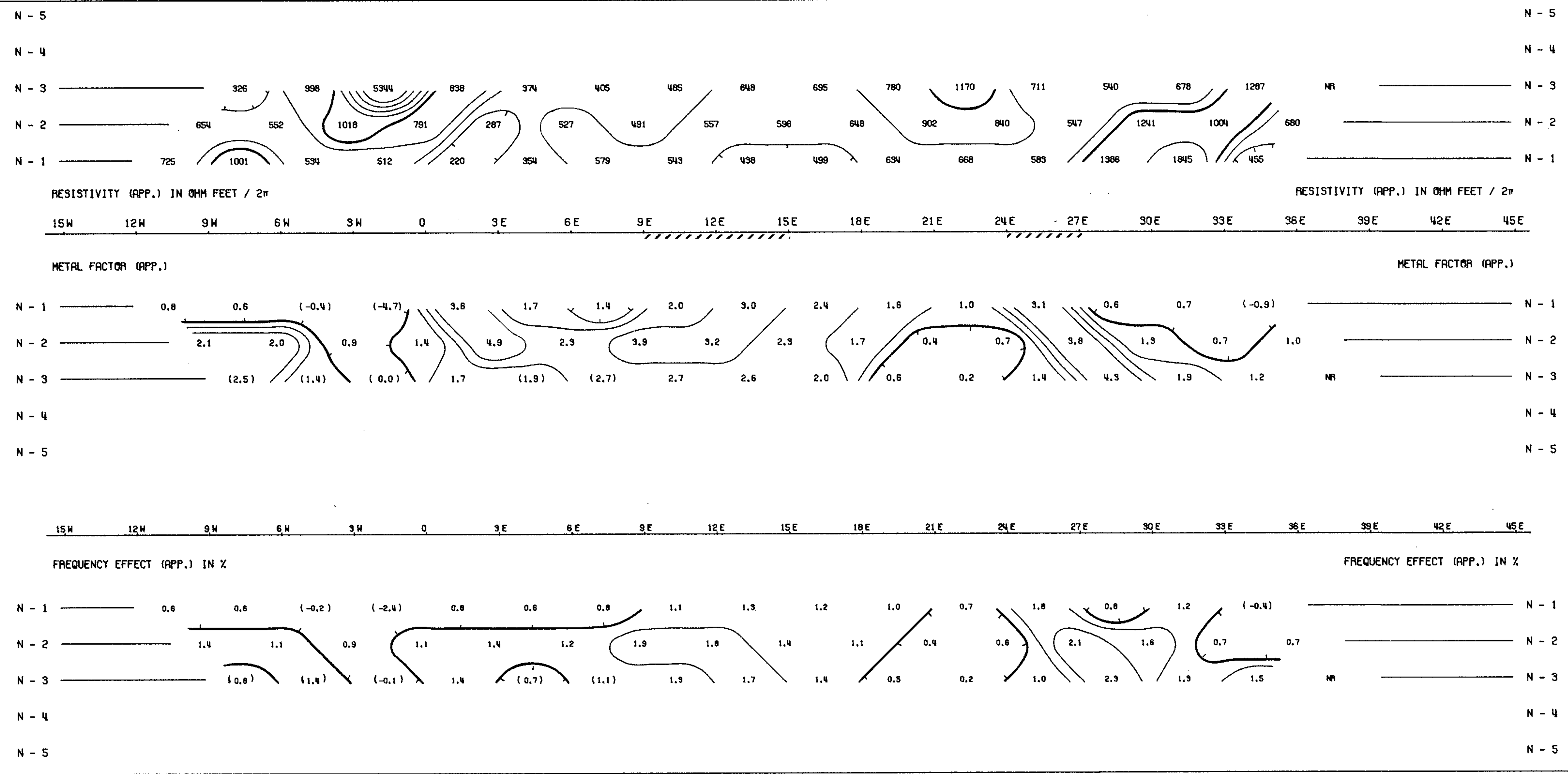
McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY MCPHAR COMPUTER DIVISION



DWG. NO.- I.P.- 6079-10

GRÄNGES EXPLORATION AKTIEBOLAG

T.A. PROPERTY, NANIKA LAKE, OMINECA M.D.
BRITISH COLUMBIA

LINE NO.- 7600S

ELECTRODE CONFIGURATION

PLOTTING POINT X = 300FT

SURFACE PROJECTION OF ANOMALOUS ZONES
DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: JUL 1973

APPROVED:

DATE: Aug 16, 1973

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

PROFESSIONAL ENGINEER, PROVINCE OF BRITISH COLUMBIA, A. W. MUDGE

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McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

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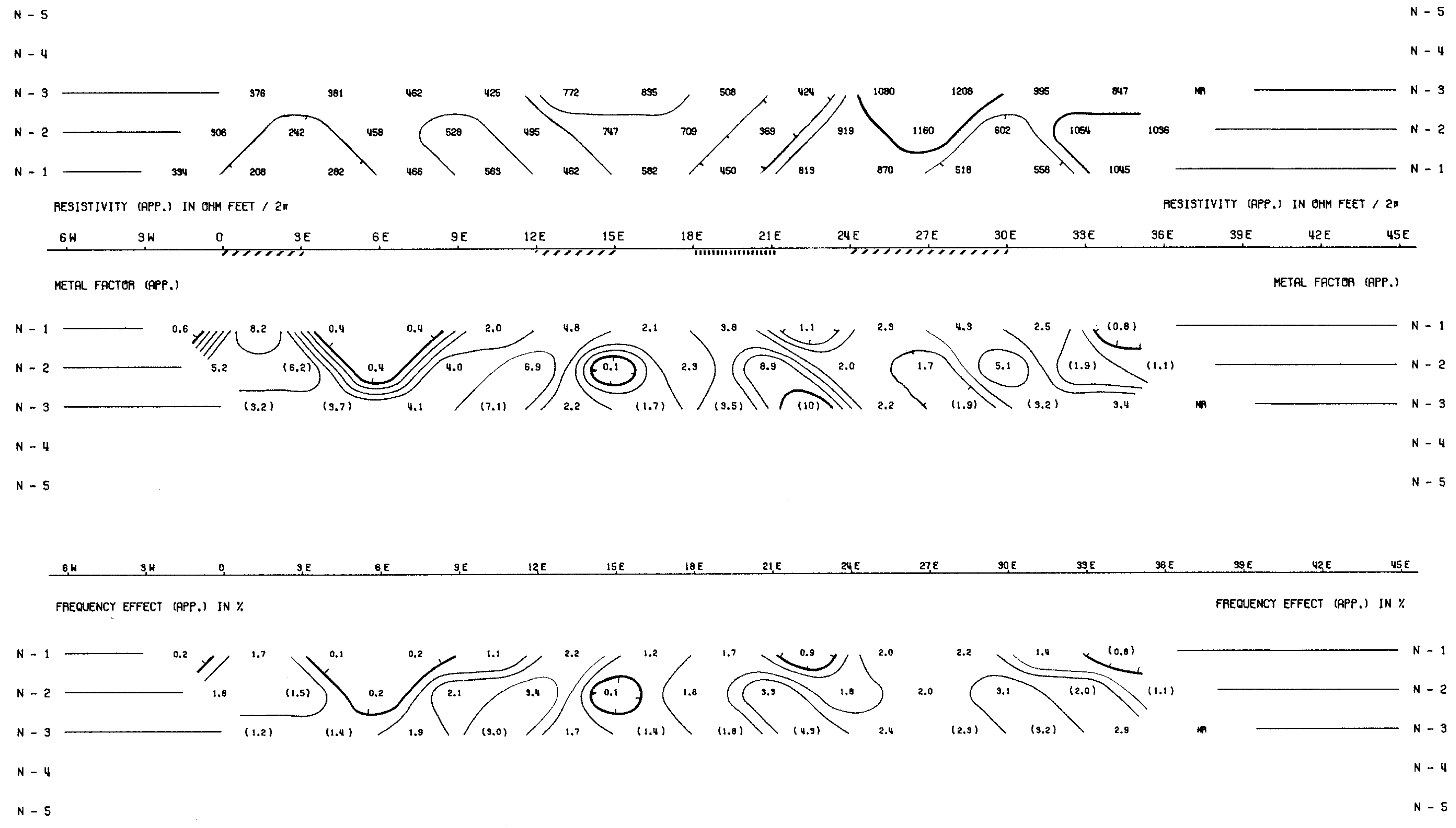

DWG. NO.- I.P.- 6079-8

GRÄNGES EXPLORATION AKTIEBOLAG

T.A. PROPERTY, NANIKA LAKE, OMINECA M.D.
BRITISH COLUMBIA

LINE NO.- 6000S

ELECTRODE CONFIGURATION

PLOTTING POINT X = 300FT

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: JUL 1973

APPROVED:

DATE: Aug 16, 1973

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

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
A. W. MULLAN

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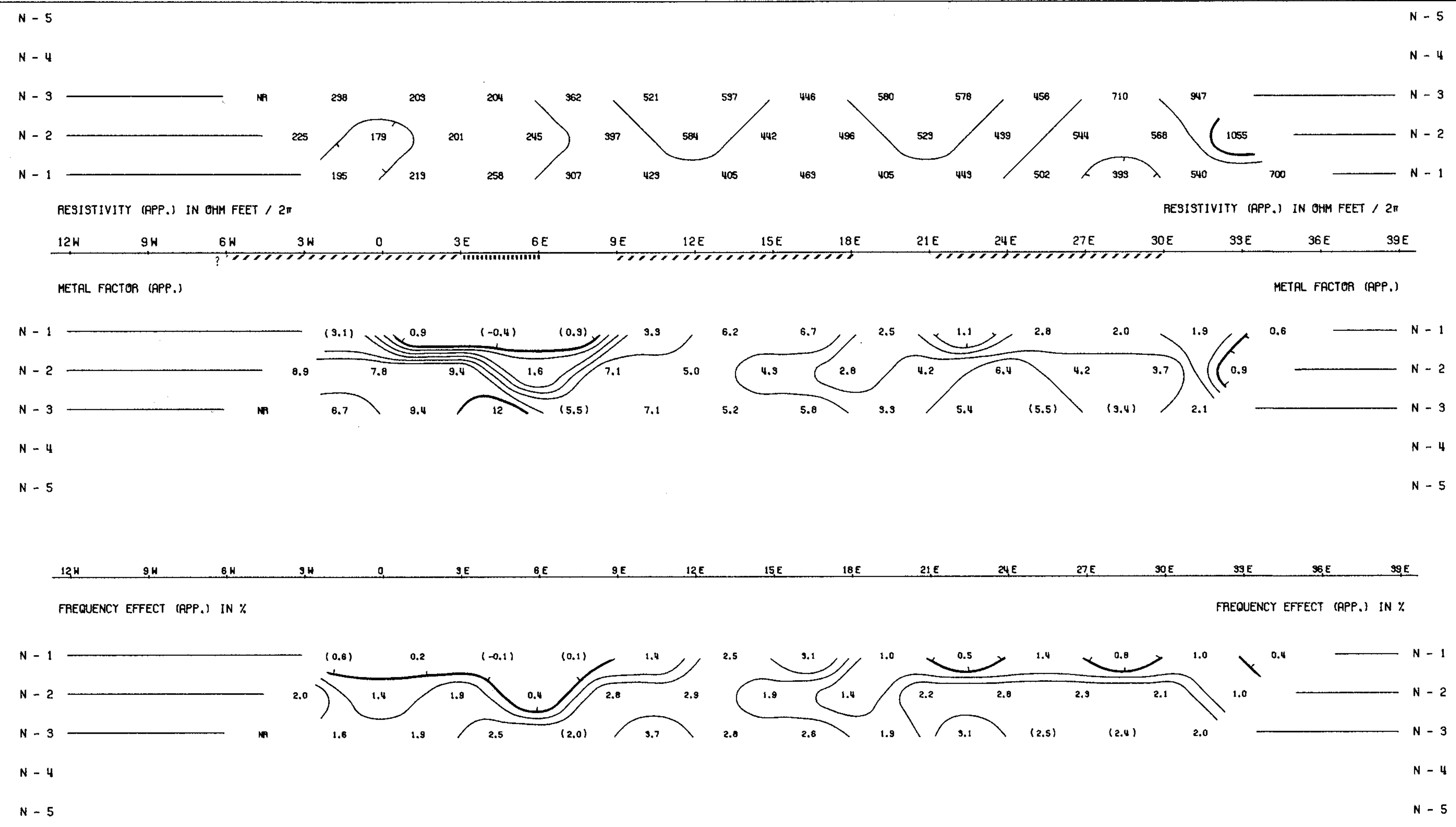
McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY McPHAR COMPUTER DIVISION



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GRÄNGES EXPLORATION AKTIEBOLAG

T.A. PROPERTY, NANIKA LAKE, OMINECA M.D.
BRITISH COLUMBIA

LINE NO.- 5200S

ELECTRODE CONFIGURATION

PLOTTING POINT X = 300FT

SURFACE PROJECTION OF ANOMALOUS ZONES
DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: JUL 1973

APPROVED:

DATE: Aug 16, 1973

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

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA A. W. McLEAN

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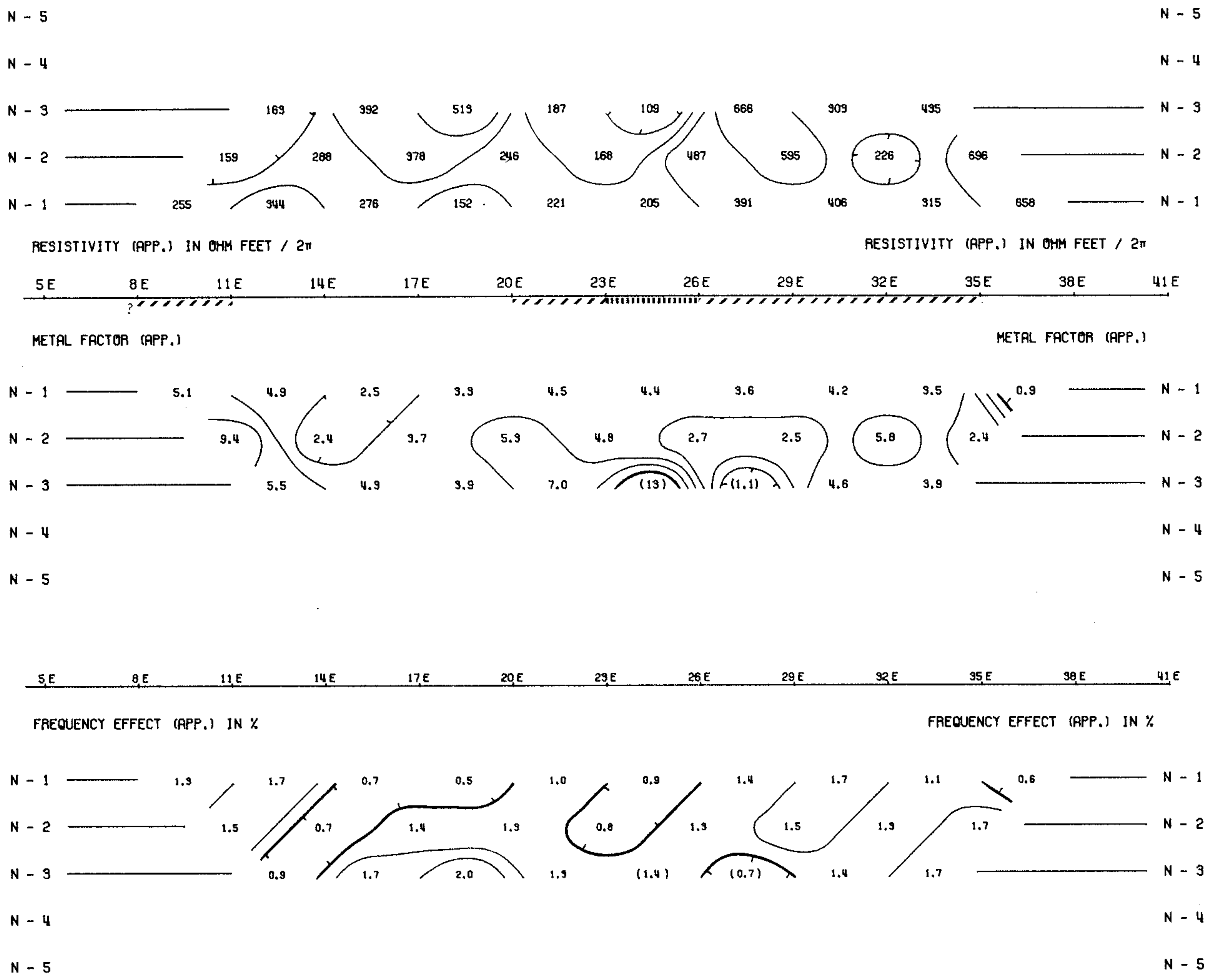
McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY McPHAR COMPUTER DIVISION



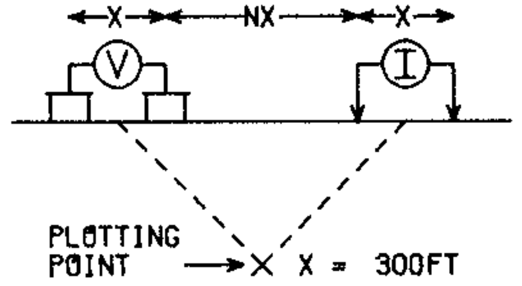
DWG. NO.- I.P.- 6079-6

GRANGES EXPLORATION AKTIEBOLAC

T.A. PROPERTY, NANIKA LAKE, OMINECA M.D.
BRITISH COLUMBIA

LINE NO.- 4400S

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: JUL 1973

APPROVED:

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

DATE: Aug 16, 1973

PROFESSIONAL ENGINEER, PROVINCE OF BRITISH COLUMBIA, A. W. MULLAN

4578

McPHAR GEOPHYSICS

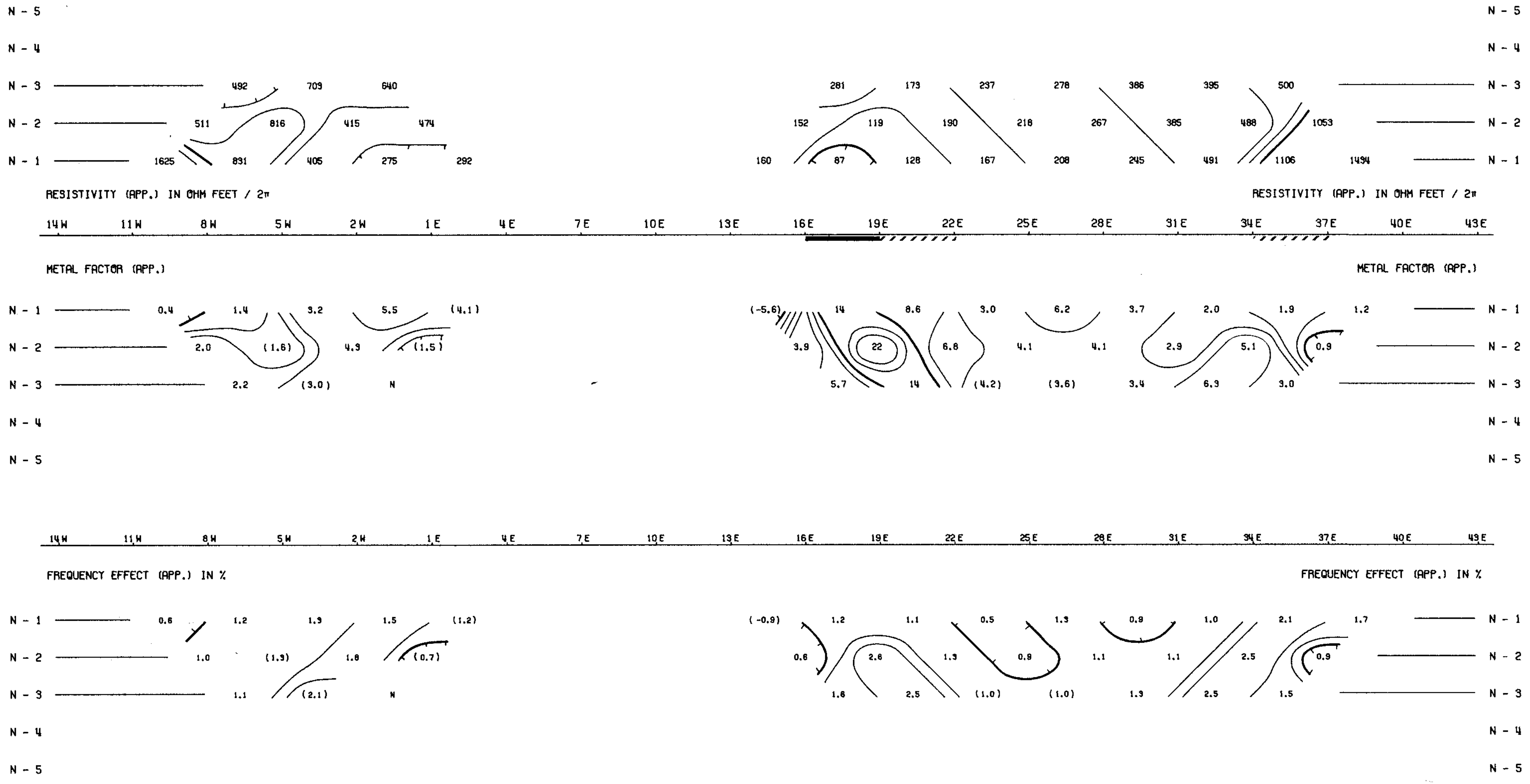
INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY MCPHAR COMPUTER DIVISION

DWG. NO.- I.P.- 6079-5

GRÄNGES EXPLORATION AKTIEBOLAG

T.A. PROPERTY, NANIKA LAKE, OMINECA M.D.
BRITISH COLUMBIA



LINE NO.- 3600S

ELECTRODE CONFIGURATION

PLOTTING POINT X X = 300FT

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: JUL 1973

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

APPROVED:

DATE: Aug 16, 1973

PROFESSIONAL ENGINEER, PROVINCE OF BRITISH COLUMBIA, A. W. MULLAN

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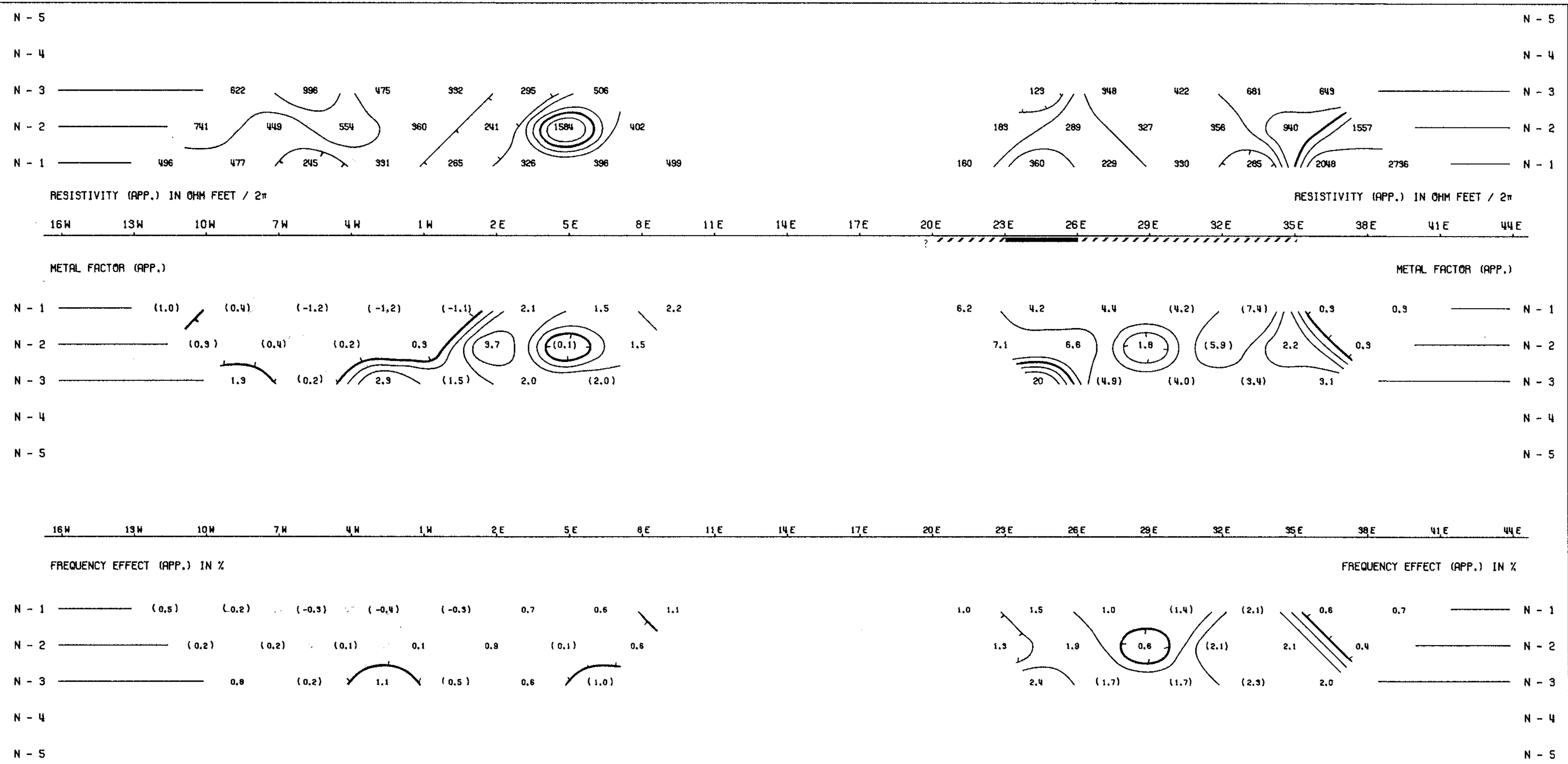
McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY McPHAR COMPUTER DIVISION



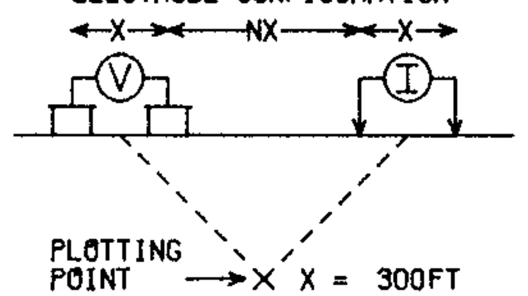
DWG. NO.- I.P.- 6079-4

GRÄNGES EXPLORATION AKTIEBOLAG

T.A. PROPERTY, NANIKA LAKE, OMINECA M.D.
BRITISH COLUMBIA

LINE NO.- 2800S

ELECTRODE CONFIGURATION



SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: JUL 1973

APPROVED:

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

DATE:

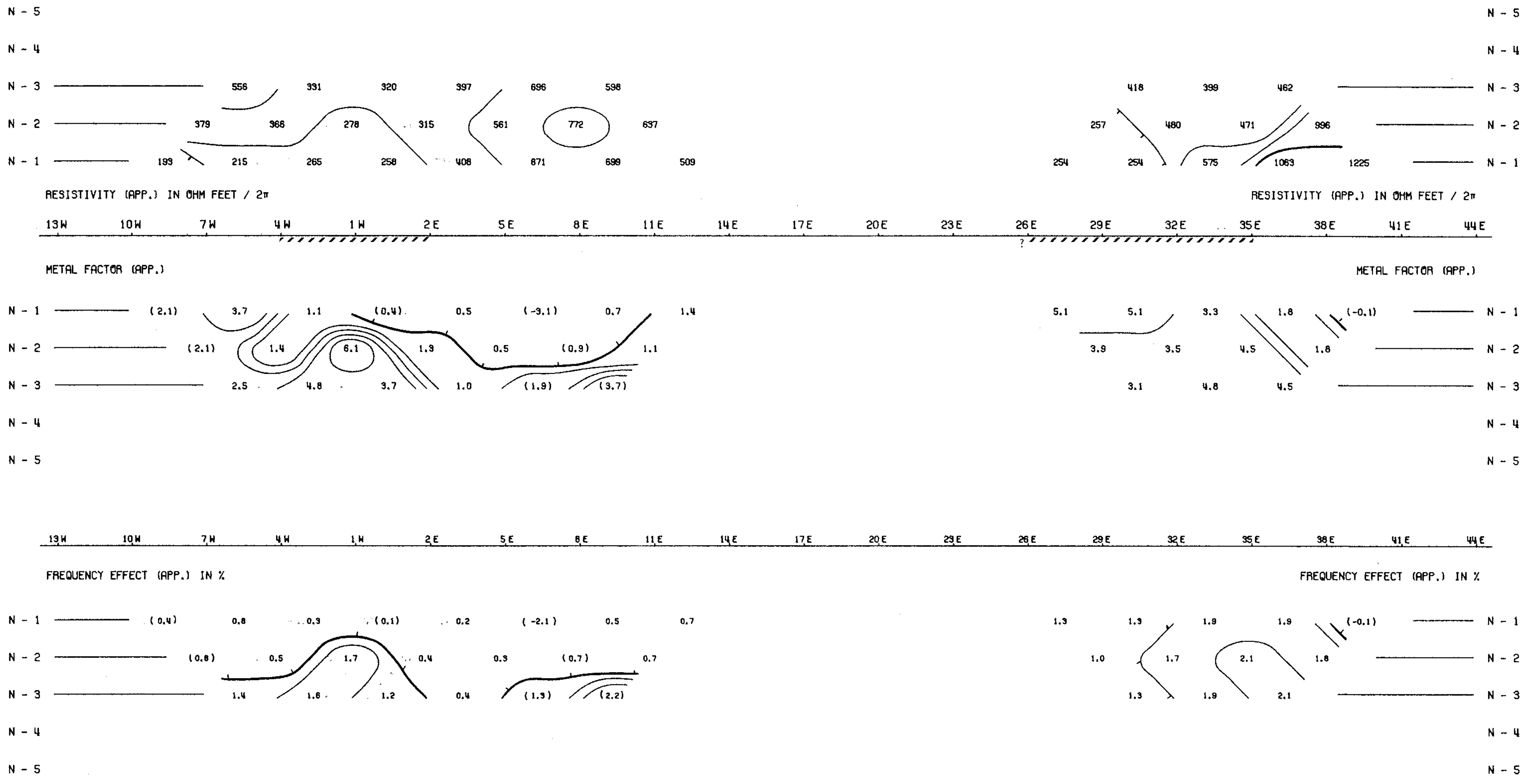
PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — A. W. MULLAN

4578

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY McPHAR COMPUTER DIVISION



DWG. NO.- I.P.- 6079-3

GRÄNGES EXPLORATION AKTIEBOLAG

T.A. PROPERTY, NANIKA LAKE, OMINECA M.D.
BRITISH COLUMBIA

LINE NO.- 2000S

ELECTRODE CONFIGURATION

PLOTTING POINT X = 300FT

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: JUL 1973

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

APPROVED:
DATE: Aug 16, 1973

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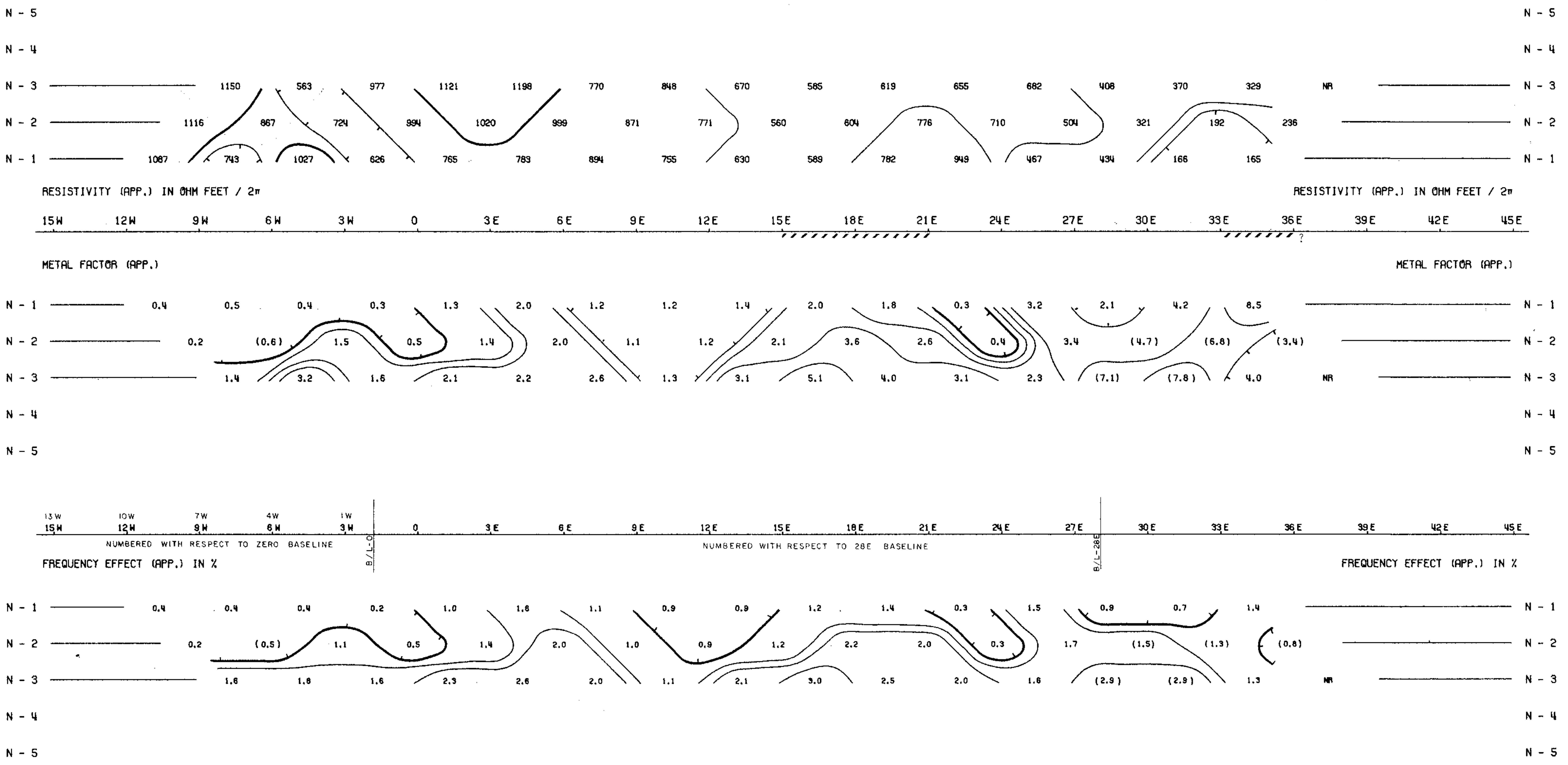
McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY MCPHAR COMPUTER DIVISION



DWG. NO.- I.P.-6079-1

GRÄNGES EXPLORATION AKTIEBOLAG

T.A. PROPERTY, NANIKA LAKE, OMINECA M.D.
BRITISH COLUMBIA

LINE NO.- 400S

ELECTRODE CONFIGURATION

PLOTTING POINT → X   X = 300FT

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-5.0 HZ

DATE SURVEYED: JUL 1973

APPROVED:

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

DATE: Aug 16, 1973

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — A. W. MULLAN

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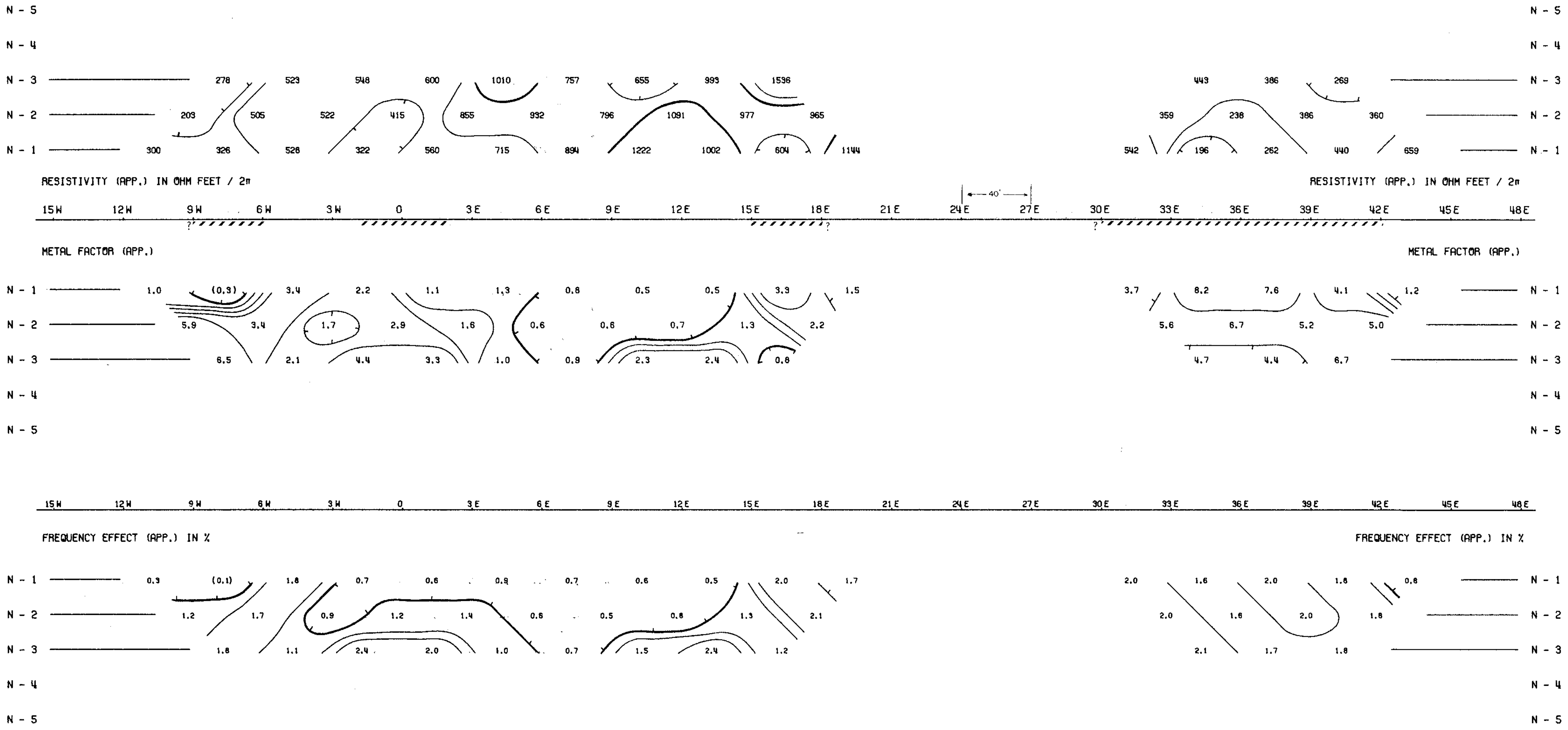
McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: THIS PLOT WAS PRODUCED BY McPHAR COMPUTER DIVISION



DWG. NO.- I.P.- 6079-2

GRÄNGES EXPLORATION AKTIEBOLAG

T.A. PROPERTY, NANIKA LAKE, OMINECA M.D.
BRITISH COLUMBIA

LINE NO.- 1200S

ELECTRODE CONFIGURATION
X — NX — X
PLOTTING POINT → X   X = 300FT

SURFACE PROJECTION OF ANOMALOUS ZONES
DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES: 0.31-5.0 HZ   DATE SURVEYED: JUL 1973

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

APPROVED:
DATE: Aug 16, 1973
PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — A. W. MUDGE

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McPHAR GEOPHYSICS

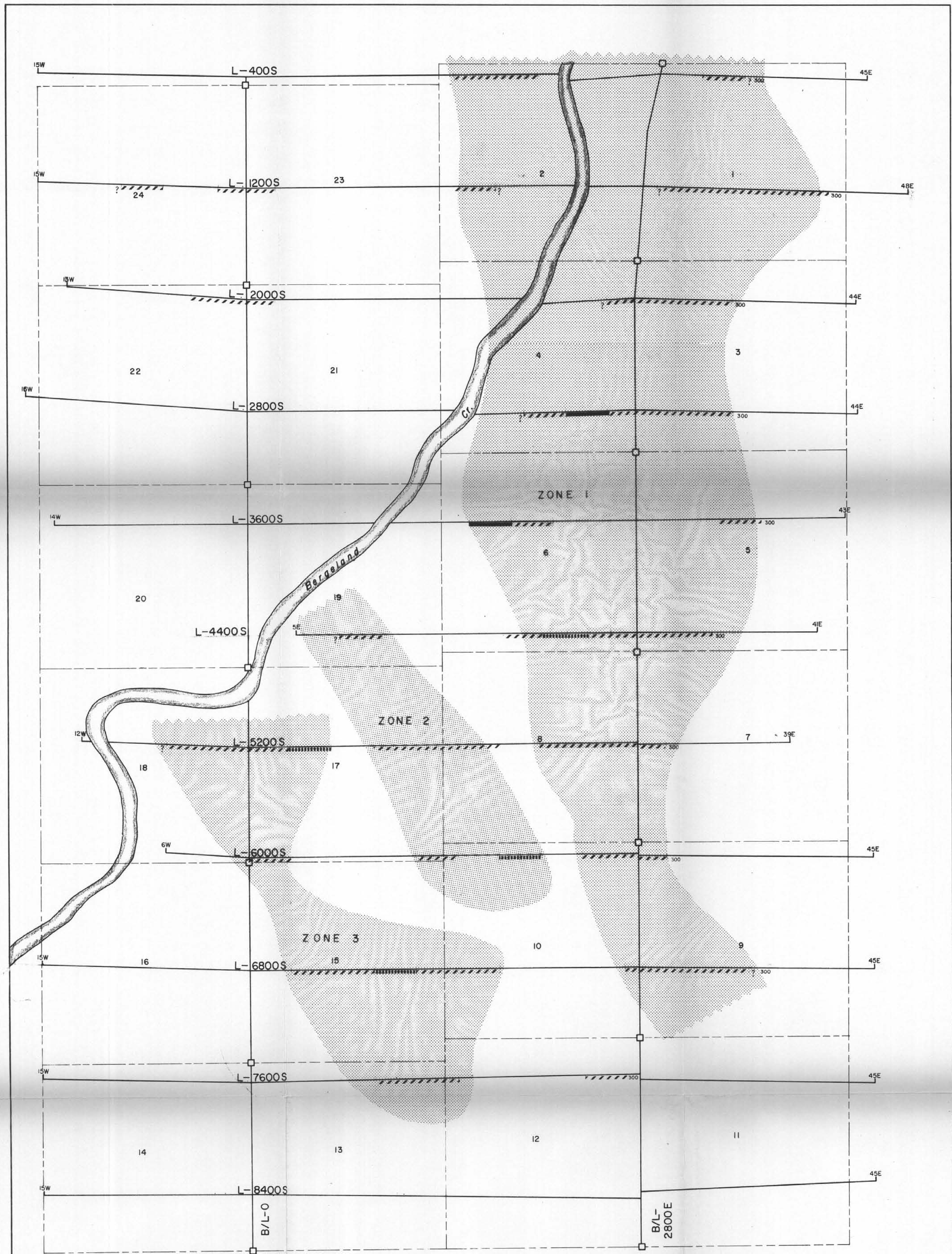
INDUCED POLARIZATION AND RESISTIVITY SURVEY

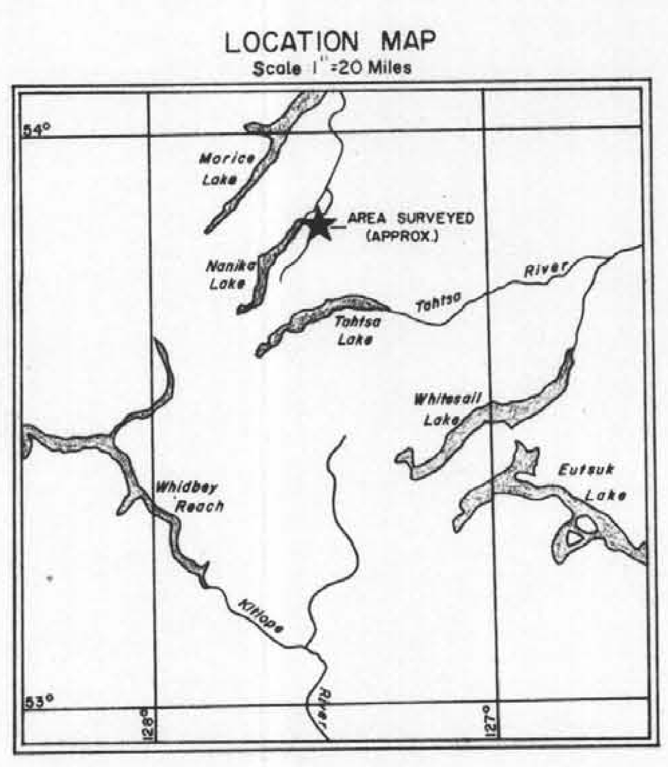
NOTE: THIS PLOT WAS PRODUCED BY McPHAR COMPUTER DIVISION

McPHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

PLAN MAP





NOTE TO ACCOMPANY GEOPHYSICAL REPORT FOR GRÄNGES EXPLORATION AKTIEBOLAG, T A PROPERTY, NANIKA LAKE, OMINECA M.D. BRITISH COLUMBIA, BY A.W. MULLAN (P. Eng.) AND M.A. GOUDIE (Geologist).

DATE; AUG. 16, 1973

Department of Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4578 MAP #1

SURFACE PROJECTION OF ANOMALOUS ZONES

- DEFINITE
- PROBABLE
- POSSIBLE

Numbers at the end of the anomalies indicate electrode interval

GRÄNGES EXPLORATION AKTIEBOLAG

T A PROPERTY, NANIKA LAKE, OMINECA M.D., BRITISH COLUMBIA

SCALE

ONE INCH EQUALS FOUR HUNDRED FEET

4578
M1

DRAWN: M.J.S.
DATE: AUG. 16/73
APPROVED:
DATE: Aug 16, 1973

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA A. W. MULLAN

DWG. IPP-3591