

3899

COMINCO LTD.

EXPLORATION

WESTERN DISTRICT

N.T.S. - 93-N-2

125° 55' N.E.

INDUCED POLARIZATION AND RESISTIVITY SURVEY

JEAN PROPERTY

N.B.C. SYNDICATE

OMINECA M.D., B.C.

Department of
Mines and Petroleum Resources
ANNUAL REPORT
NO. **3899** MAP.....

September 22, 1972

John M. Hamilton, P. Eng.

Work Performed During June and July, 1972

Mining Recorder's Office
RECORDED
SEP 29 1972
AT.....
SMITHERS, B.C.

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ATTACHMENTS

#1 Dipole - Dipole Electrode Array (Diagram showing plotting method)
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#17 Plate 1: Second Separation Frequency Effects, 1" = 800 Feet.

#18 Plate 2: Geochemistry, 1" = 800 Feet.

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Statutory Declaration Relating to Expenditures.

Statement of Expenditures.

#20 Location of 1972 I.P. Baseline

SUMMARY

About 12 line miles of I.P. have been completed by Eagle Geophysics on the Jean Property. This work has revealed an intermittent anomaly located along a volcanic-intrusive contact. A second anomaly has been mapped in part in a marshy area about 6,000 feet north of the contact. Surveying here is incomplete due to the widespread marsh.

INTRODUCTION

The Jean Property is located about 8 miles south of the eastern part of Tchentlo Lake, about 55 miles northwest of Fort St. James, B.C. Access is by aircraft, either by fixed wing to Tchentlo Lake and rotary wing from there, or by rotary wing from Fort St. James. The property consists of 268 mineral claims, and is held by the N.B.C. Syndicate consisting of The Granby Mining Co. Ltd., Conwest Exploration Co. Ltd., Duval Corp. Ltd., Bacon and Crowhurst Ltd. and Cominco Ltd.

The present geophysical survey was conducted in the western one eighth of the property at the suggestion of Dr. J.M. Allen of Cominco Ltd. The purpose of the survey was to search for disseminated copper sulphides in intrusive at or close to a contact with volcanics under a thin but extensive mantle of glacial till. Other work by Cominco to date consists of a till fabric study to determine probable direction of ice movement during glaciation. Previous work by the N.B.C. Syndicate consisted of soil geochemical work which revealed a copper-moly anomaly about 6,800 feet long by up to 2,000 feet wide, six lines of frequency domain I.P., and twelve diamond drill holes which encountered only very minor mineralization.

GEOLOGY

Geology in the survey area consists of a Jurassic (?) granodiorite which is intrusive into Takla Volcanics of Triassic age. The contact is a fairly straight east-west feature located along the southern side of a broad U-shaped valley. Volcanics are located south of the contact, and underly the southern flank of the valley.

INDUCED POLARIZATION AND RESISTIVITY SURVEY

(a) Method:

The survey was performed by John Lloyd, P. Eng., president of Eagle Geophysics of North Vancouver assisted by Mr. D. Brydle and three helpers A. Chenard, D. Jacobs and F. Smith between July 11 and July 27, 1972. The survey was performed with Eagle's McPhar Model P660 frequency domain I.P. unit, using frequencies of 0.31 and 5.0 c.p.s.

...continued...

(a) Method - con't.

In all, 11.5 miles of line were surveyed, on 15 parallel lines spaced 800 feet apart, using 200 foot dipoles and 4 separations. Three of the 15 lines are located about 4,000 feet east of the other 12 lines, as shown on Plate 1.

(b) Data Presentation:

The following data is included with this report:

Plate 1, plan of second separation frequency effects showing surface projection of anomalous I.P. zones, intrusive-volcanic contact, and drill holes, scale 1" = 800'.

Plate 2, plan of copper soil geochemistry and I.P. anomalies, scale 1" = 800'.

Plate 3, claim map, 1" = 3000'

The following data plots:

<u>Line No.</u>	<u>Dipole Length</u>	<u>Plate No.</u>
96 E	200 Feet	IP-77-1
88 E	200 Feet	IP-77-2
80 E	200 Feet	IP-77-3
40 E	200 Feet	IP-77-4
32 E	200 Feet	IP-77-5
24 E	200 Feet	IP-77-6
16 E	200 Feet	IP-77-7
8 E	200 Feet	IP-77-8
0	200 Feet	IP-77-9
8 W	200 Feet	IP-77-10
16 W	200 Feet	IP-77-11
24 W	200 Feet	IP-77-12
32 W	200 Feet	IP-77-13
40 W	200 Feet	IP-77-14
48 W	200 Feet	IP-77-15

...continued...

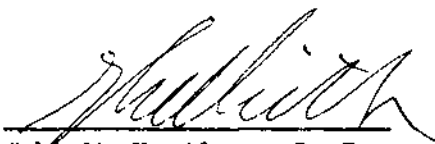
(c) Results:

An intermittent anomalous zone has been mapped along the southern portion of the survey grid, more or less coincident with the intrusive-volcanic contact. This zone is strongest on Line 48 W, where it appears to be largely hosted by volcanics. However, it is open to the south on this line, and to the west, beyond the western limit of this survey. This area is moderately anomalous geochemically.

Along strike to the east of this area, a second zone of anomalous frequency effects occurs. It is strongest on Line 32 E, but is present on the adjoining lines as well. This zone appears to be hosted by intrusives, and is located just uphill from a zone of anomalous geochemistry. Drill holes 8 and 10 drilled by the N.B.C. Syndicate, are located just off the northern edge of this I.P. anomaly. These holes averaged only about 0.05% Cu.

A weak I.P. anomaly was partly mapped during the present survey at the north ends of Lines 80 E and 88 E, about 6,000 feet north of the volcanic-intrusive contact. Presumably the host rocks are intrusives. However, this I.P. anomaly is located in an extensive marsh, which severely limited the summer I.P. work, and also prevented geochemical coverage during the original N.B.C. program. Effective I.P. coverage to fully map this anomaly would only be possible in the winter, and it is not regarded as attractive enough at present to justify the costs of mobilization to investigate it alone.

Submitted by


John M. Hamilton, P. Eng.
Geophysicist, Exploration
Cominco Ltd.


JMH/mjw

DISTRIBUTION

Exploration Administration
Mining Recorder (2) ✓
Western District
Geophysics File, Vancouver

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W. T. Irvine, P. Eng.
Manager, Western Exploration
Cominco Ltd.

APPENDIX I

NOTES ON THE INDUCED POLARIZATION METHOD

March 10, 1969. John M. Hamilton

THEORY:

Polarization is the separation of charge, or blocking action, of metallic or electronic conductors within a medium of ionic solution conduction. Induced polarization refers to this blocking action when caused by an applied electric current.

In its geological context, polarization, or I.P., refers to the electrochemical blocking phenomenon exhibited by metallic minerals such as most sulphides, magnetite and graphite, under the influence of an applied current. When a current is passed through the subsurface, conduction is ionic and is dependent upon ions in the water content of the subsurface because most minerals have a much higher specific resistivity than ground water. The "metallic" minerals have specific resistivities which are much lower than ground water. The I.P., effect occurs at the interfaces between ionic conductive conditions in ground water and electronic conductive conditions in metallic minerals. Electronic charges are built up on these interfaces which oppose the flow of current that produces them.

The blocking action, or I.P. effect, increases with the time during which the current is flowing in a given direction. Hence, if the current is periodically reversed, a high frequency current will be subject to less blocking, or I.P. effect, than will a low frequency, since less time is available for the blocking to occur at a high frequency. It is therefore possible to measure the I.P. effect by measuring resistivity at two frequencies. This is the basis of the frequency domain I.P. system. Field readings consist of current readings between the transmitter electrodes, and voltage readings between the receiver electrodes, at both the high and the low frequency. From these readings a resistivity can be calculated for each frequency, using the relationship $V = IR$ (Ohm's Law) and geometrical constants applicable to the electrode array.

The resistivity values so obtained are actually apparent resistivity values, being an average of all the material sampled for each reading. The resistivity plotted is the high frequency value, since it is least dependent on blocking action or I.P. effect, and hence is a truer value if polarizable material is present. The units used are ohm-feet/ 2π . To convert these units into ohm-meters used in some other I.P. systems, the ohm-feet/ 2π values should be multiplied by 1.9.

The percent frequency effect, actually an apparent frequency effect, is defined as $(R_L - R_H)/R_H \times 100\%$, where R_L and R_H are the resistivities at the low and high frequencies, respectively. The percent frequency effect is the parameter measured to show the I.P. effect, and is the frequency domain equivalent of the chargeability "m" used in time domain I.P. work,

The metal factor values are obtained by dividing the percent frequency effect by the resistivity and multiplying by 1000. The metal factor is proportional to the change in conductivity as the frequency of the applied current is varied, and can be shown to be equal to $(\sigma_H - \sigma_L) \times 2\pi \times 10^5$, where σ_H and σ_L are the conductivities at the high and low frequencies, respectively. The metal factor is generally more indicative of the conductive metallic content than is the frequency effect, although there are exceptions to this.

FIELD PROCEDURE:

Current is applied to the ground at two current electrodes (C_1 and C_2) spaced a distance x apart as shown in the accompanying diagram. The potential is measured at two potential electrodes (P_1 and P_2) also spaced a distance x apart and in line with the current electrodes. For any given locations of C_1 and C_2 , readings are taken when the distance between the nearest current and potential electrodes is equal to nx , and n has values of 1, 2, 3, etc. The electrode spacing x is determined by the requirements of the survey. Larger values of x would be used when the object is greater depth penetration and faster progress, whereas smaller values of x are employed in more detailed surveys, to provide more accurate anomaly location, but for the smaller values of x , the penetration is less and the survey slower. The value chosen for x should not greatly exceed the width of the target sought. The penetration is greater for the larger values of n .

INTERPRETATION:

The values of the resistivity, metal factor and percent frequency effect are plotted on "pseudo-sections", where the plotting point is determined by the intersection of lines drawn at 45° from the horizontal, and originating at the mid-points of the current electrode spread and the potential electrode spread, as shown in the accompanying diagram. The choice of 45° from the horizontal is made because it simplifies plotting on gridded paper. There is no other basis for it, and lines at any other angle would produce just as "correct" a distribution of plotted values. The percent frequency effect is shown either as a superscript to each metal factor value, or as a separate, contoured plot similar to the first two. Depths to causative bodies cannot be scaled from the "pseudo-section," because the relationship between "pseudo-section" depths and true depths depends on anomalous body configuration and size, and other other inhomogeneities in the true resistivity distribution in the earth, as well as on the method used to plot the section.

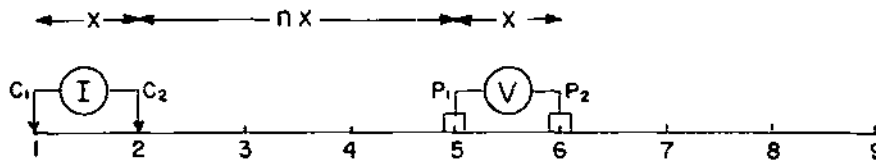
The most favourable type of anomaly would show a frequency effect high with a resistivity low, to provide a marked metal factor high. A frequency effect high, with little or no change in resistivity, to provide a metal factor high, mirroring the frequency effect high, is also favourable. Of lesser interest, but of possible importance, are those anomalies showing no frequency effect change, but a distinct resistivity low, to produce a metal factor anomaly. The type of anomaly, its strength, size and shape should be considered in relation to the geological setting and the target sought.

The surface projection of anomalous zones are shown under the base line of the "pseudo-sections", or data plots. The location of anomalous zones is made after studying the responses at all separations, and is aided by data from computer and tank model-studies, as well as case histories and local geology when known. The source of an anomaly can at best be located only to within one electrode interval or x distance.

Anomalies are classified into three groups: definite, probable and possible. Grouping is based on the strength of the metal

factor, the frequency effect, and the pattern of the anomaly. In general, the true metal factor is dependent on the concentration and distribution of chargeable material in the source, but the survey measures the apparent metal factor, which is an average. A large volume with a small percentage of sulphides could show the same metal factor as a smaller body with more concentrated sulphides. The apparent metal factor will approach the true metal factor when the anomalous body is large, and its depth to top small, relative to the electrode interval.

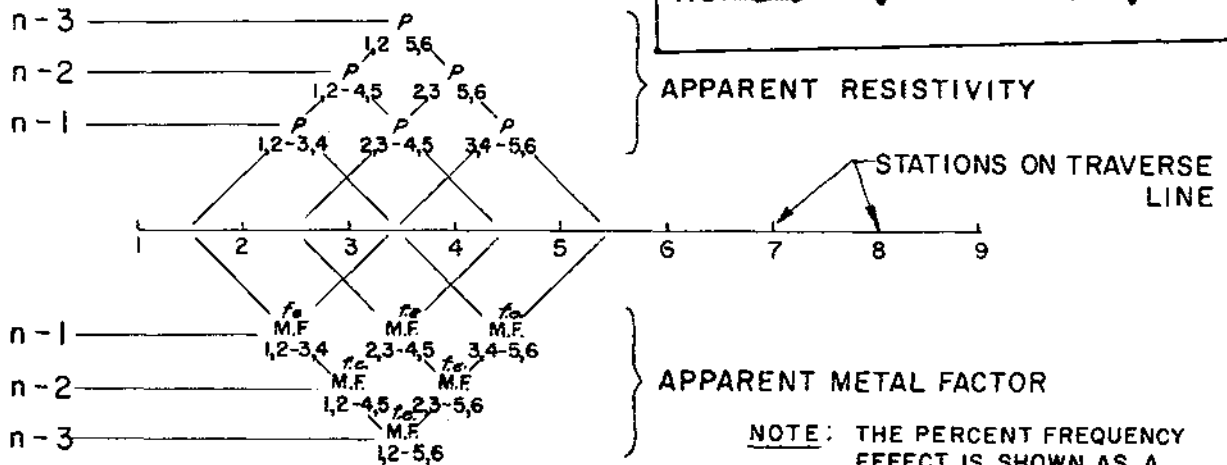
In some cases, a contoured data-plan is prepared, to show frequency effect, metal factor or resistivity values. Only data obtained at one separation is used on such a plan, and commonly the second separation data is plotted, to show results from an intermediate level of investigation. The surface projection of anomalous zones, as determined from the profiles, are also shown, and in many cases these will not coincide with contoured peaks, because data at other separations, if anomalous, will have been considered when locating anomalies. The most profitable use of contoured plans is as a trend indicator.



X = ELECTRODE SPREAD LENGTH OR ELECTRODE SPACING OR DIPOLE LENGTH
 n = ELECTRODE SEPARATION = 1, 2, 3, ...

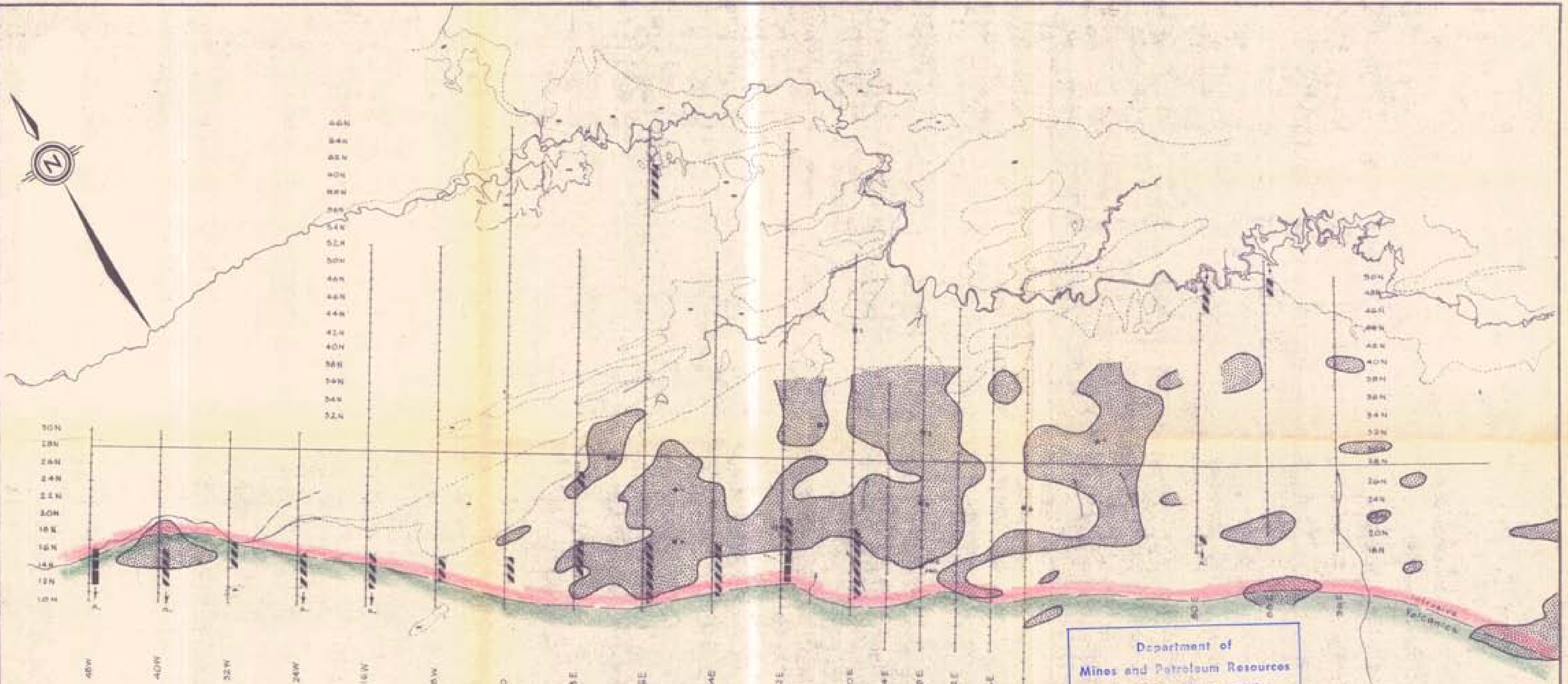
DIPOLE - DIPOLE ELECTRODE ARRAY

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NOTE: THE PERCENT FREQUENCY EFFECT IS SHOWN AS A SUPERSCRIPT TO EACH METAL FACTOR VALUE, OR AS SEPARATE CONTOURED PLOT.

DIAGRAM SHOWING PLOTTING METHOD



Notes 1. Soil geochemical anomalies based on N.B.C. Syndicate Work
 2. I.P. anomalies based on Eagle Geophysics 1972 Survey

- Drill Holes (N.B.C. Drilling)
- Geological Contact **Intrusive**
- 300 PPM Cu in Soils
- Surface Projection of I.P. Anomalous Zones
- DEFINITE
- ▨ PROBABLE
- ▩ POSSIBLE

Department of
 Mines and Petroleum Resources
 ASSESSMENT REPORT
 NO. **3899** MAP #18

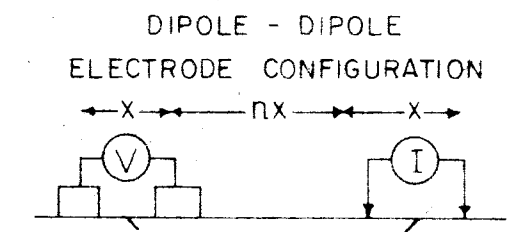
To accompany a Report by J.M. Hamilton, P. Eng.

J.M. Hamilton

Drawn by: J.P.S.	Traced by:	SOIL GEOCHEMISTRY B.I.P. ANOMALIES JEAN PROPERTY TCHENTLO LAKE AREA, OMINICA M.D., B.C.
Checked by: J.M.H.	Checked by: J.M.H.	
Scale: 1" = 500'	Date: Sept., 1972	Plate: 2

N. B. C. SYNDICATE JEAN PROPERTY OMINECA MINING DIV., B.C.

LINE NO. 88+00 E



PLOTTING X POINT
n = 1, 2, 3, & 4

SURFACE PROJECTION
OF ANOMALOUS ZONES
DEFINITE **————**
PROBABLE **————**
POSSIBLE **//////**

FREQUENCIES 0.31 & 5.0 cps DATE SURVEYED JULY, 1972

APPROVED *[Signature]*

NOTE: CONTOURS AT LOGARITHMIC INTERVALS
1-1.5-2-3-5-7.5-10 DATE *Sept 26/72*

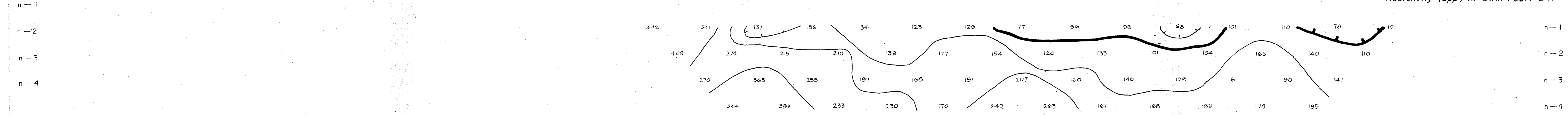
3899 M-3

FREQUENCY DOMAIN I.P. AND RESISTIVITY PROFILE
SURVEYED BY EAGLE GEOPHYSICS LTD., (JOHN LLOYD, M.Sc. P.Eng.)

20N 22N 24N 26N 28N 30N 32N 34N 36N 38N 40N 42N 44N 46N 48N 50N 52N 54N

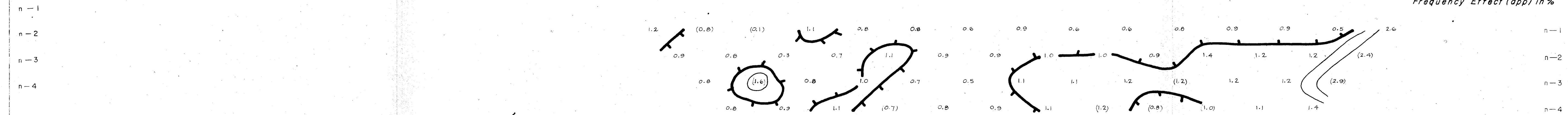
NO LINE CUT

WEAK, NOISY ?
Resistivity (app) in Ohm Feet / 2π



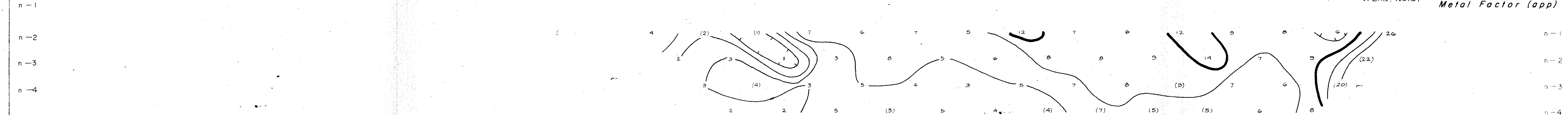
20N 22N 24N 26N 28N 30N 32N 34N 36N 38N 40N 42N 44N 46N 48N 50N 52N 54N

WEAK, NOISY ?
Frequency Effect (app) in %



20N 22N 24N 26N 28N 30N 32N 34N 36N 38N 40N 42N 44N 46N 48N 50N 52N 54N

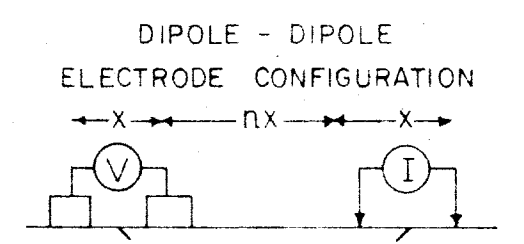
WEAK, NOISY ?
Metal Factor (app)



LINE NO. 88E

N. B. C. SYNDICATE
 JEAN PROPERTY
 OMINECA MINING DIV., B. C.

LINE NO. 80+00E



SURFACE PROJECTION
 OF ANOMALOUS ZONES
 DEFINITE
 PROBABLE
 POSSIBLE

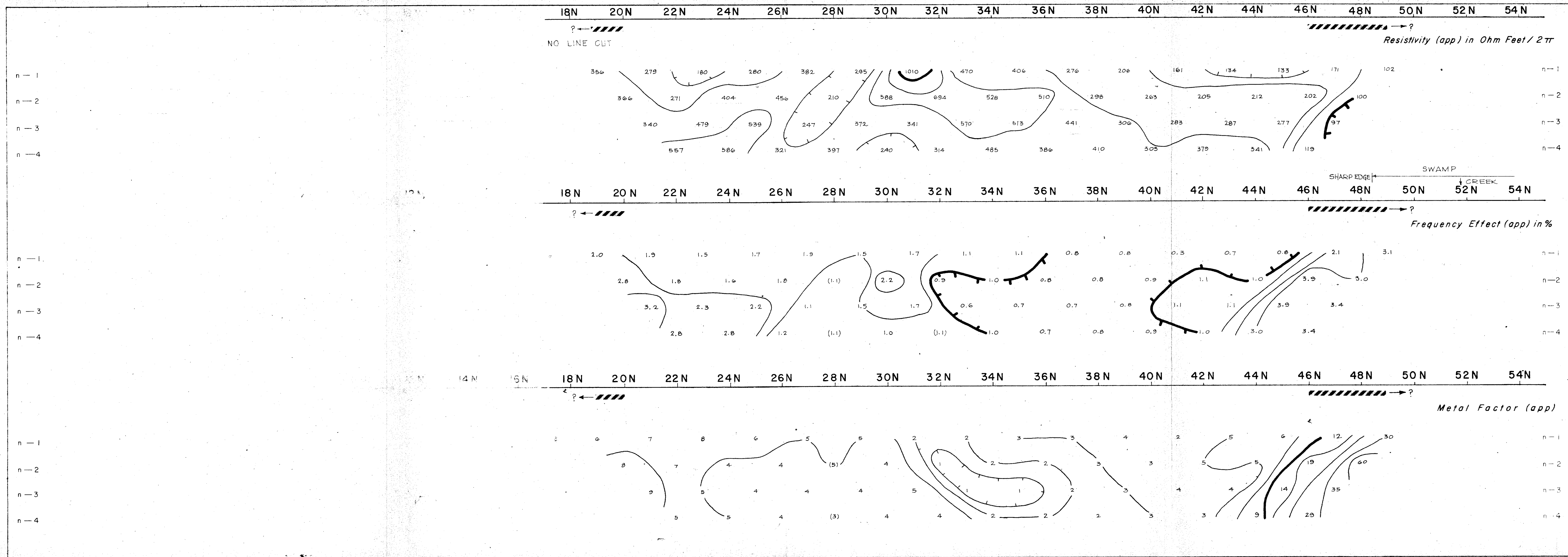
FREQUENCIES 0.31 & 5.0 cps DATE SURVEYED JULY, 1972

APPROVED

NOTE: CONTOURS AT LOGARITHMIC INTERVALS
 1-1.5-2-3-5-7.5-10 DATE Sept 20/72

3899 M-4

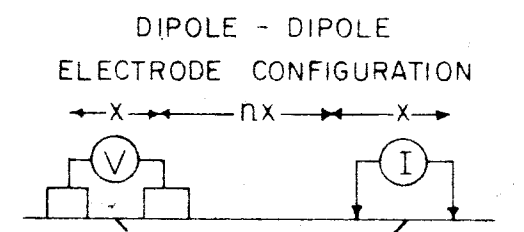
FREQUENCY DOMAIN I.P. AND RESISTIVITY PROFILE
 SURVEYED BY EAGLE GEOPHYSICS LTD., (JOHN LLOYD, M.Sc. P.Eng.)



LINE NO. 80 E

N. B. C. SYNDICATE JEAN PROPERTY OMINECA MINING DIV., B.C.

LINE NO. 40+00E



PLOTTING X POINT
n = 1, 2, 3, & 4

SURFACE PROJECTION
OF ANOMALOUS ZONES
DEFINITE [thick solid line]
PROBABLE [dashed line]
POSSIBLE [hatched line]

FREQUENCIES 0.31 & 5.0 cps DATE SURVEYED JULY, 1972

APPROVED *[Signature]*

NOTE: CONTOURS AT LOGARITHMIC INTERVALS 1-1.5-2-3-5-7.5-10 DATE *Sept 28/72*

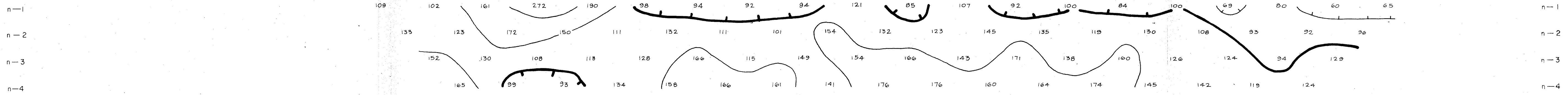
M-5

FREQUENCY DOMAIN I.P. AND RESISTIVITY PROFILE
SURVEYED BY EAGLE GEOPHYSICS LTD., (JOHN LLOYD, M.Sc. P.Eng.)

10N 12N 14N 16N 18N 20N 22N 24N 26N 28N 30N 32N 34N 36N 38N 40N 42N 44N 46N 48N 50N 52N 54N

BROAD SHALLOW SOURCE INDICATED

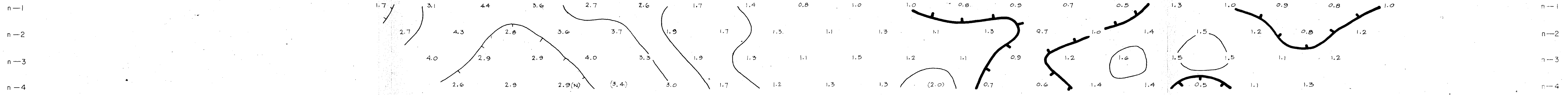
Resistivity (app) in Ohm Feet / 2π



10N 12N 14N 16N 18N 20N 22N 24N 26N 28N 30N 32N 34N 36N 38N 40N 42N 44N 46N 48N 50N 52N 54N

BROAD SHALLOW SOURCE INDICATED

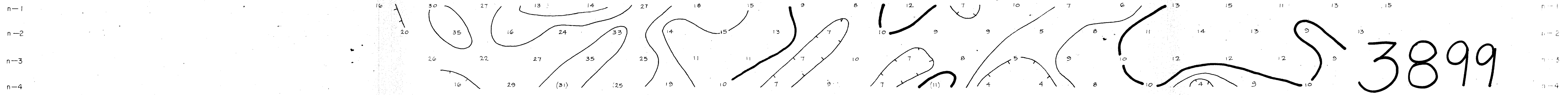
Frequency Effect (app) in %



10N 12N 14N 16N 18N 20N 22N 24N 26N 28N 30N 32N 34N 36N 38N 40N 42N 44N 46N 48N 50N 52N 54N

BROAD SHALLOW SOURCE INDICATED

Metal Factor (app)

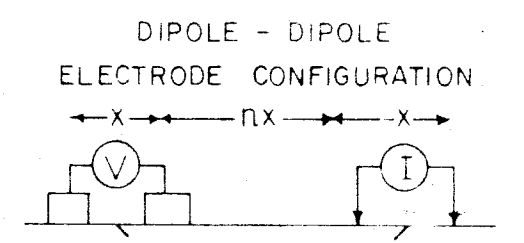


3899

LINE NO. 40 E

N. B. C. SYNDICATE JEAN PROPERTY OMINECA MINING DIV., B. C.

LINE NO. 32+00E



PLOTTING X POINT
n = 1, 2, 3, & 4

SURFACE PROJECTION
OF ANOMALOUS ZONES
DEFINITE [Solid Line]
PROBABLE [Dashed Line]
POSSIBLE [Hatched Line]

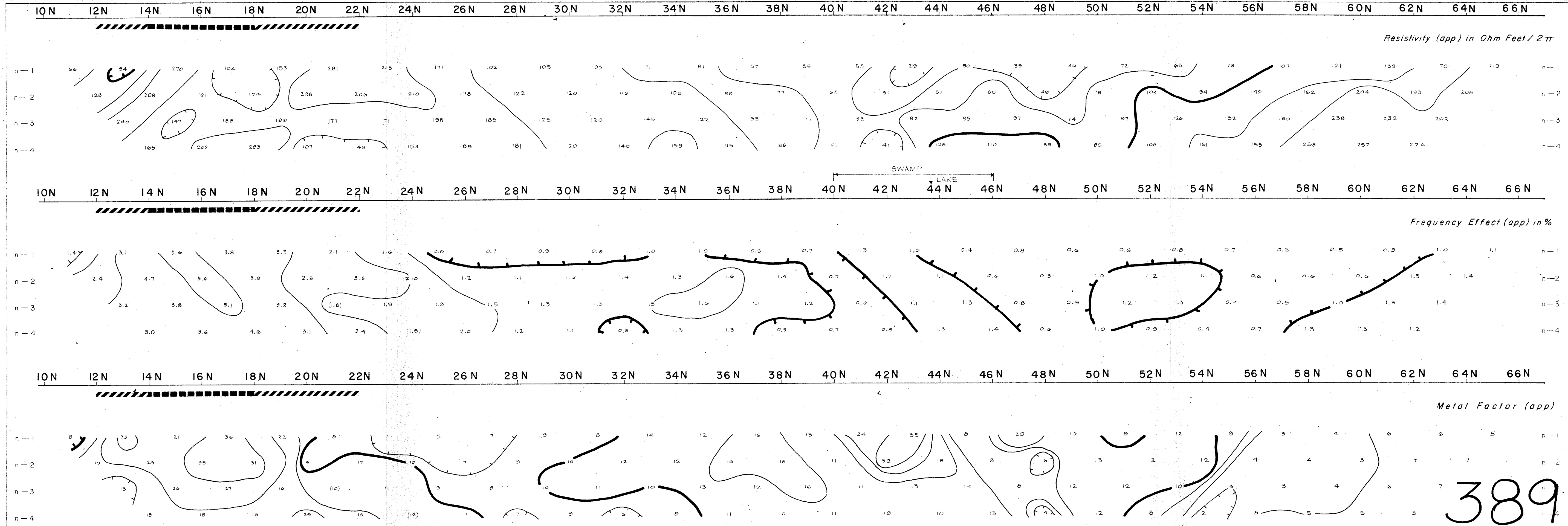
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APPROVED *[Signature]*

NOTE: CONTOURS AT LOGARITHMIC INTERVALS 1-1.5-2-3-5-7.5-10 DATE *[Signature]*

3899 M-6

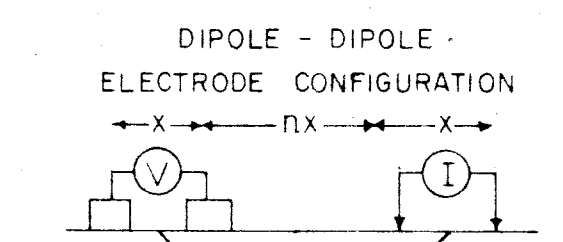
FREQUENCY DOMAIN I.P. AND RESISTIVITY PROFILE
SURVEYED BY EAGLE GEOPHYSICS LTD., (JOHN LLOYD, M.Sc. P.Eng.)



LINE NO. 32 E

N. B. C. SYNDICATE JEAN PROPERTY OMINECA MINING DIV., B.C.

LINE NO. 24+00 E



PLOTTING X POINT
n = 1, 2, 3, & 4

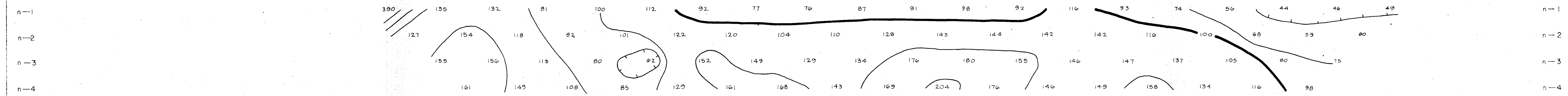
SURFACE PROJECTION
OF ANOMALOUS ZONES
DEFINITE
PROBABLE
POSSIBLE

FREQUENCIES 0.31 & 5.0 cps. DATE SURVEYED JULY, 1972
APPROVED
NOTE: CONTOURS AT LOGARITHMIC INTERVALS 1-1.5-2-3-5-7.5-10
DATE

FREQUENCY DOMAIN I.P. AND RESISTIVITY PROFILE
SURVEYED BY EAGLE GEOPHYSICS LTD., (JOHN LLOYD, M.Sc.P.Eng.)

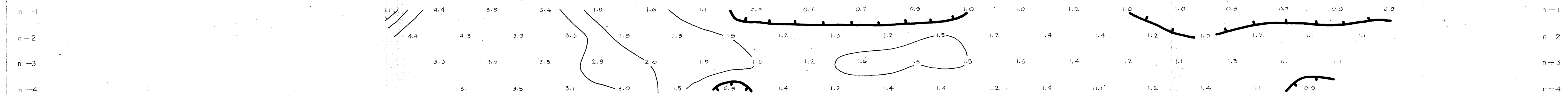
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Resistivity (app) in Ohm Feet / 2π



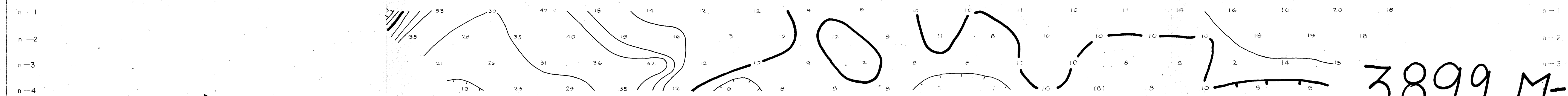
10N 12N 14N 16N 18N 20N 22N 24N 26N 28N 30N 32N 34N 36N 38N 40N 42N 44N 46N 48N 50N 52N 54N

Frequency Effect (app) in %



10N 12N 14N 16N 18N 20N 22N 24N 26N 28N 30N 32N 34N 36N 38N 40N 42N 44N 46N 48N 50N 52N 54N

Metal Factor (app)

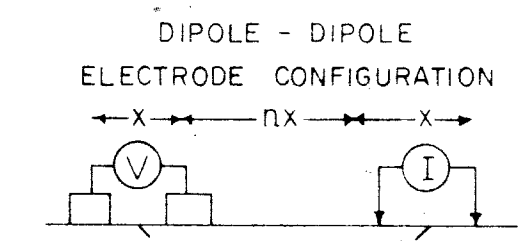


3899 M-7

LINE NO. 24 E

N. B. C. SYNDICATE
 JEAN PROPERTY
 OMINECA MINING DIV., B. C.

LINE NO. 16+00E



PLOTTING X POINT
 n = 1, 2, 3, & 4

SURFACE PROJECTION
 OF ANOMALOUS ZONES
 DEFINITE **————**
 PROBABLE **-----**
 POSSIBLE **~~~~~**

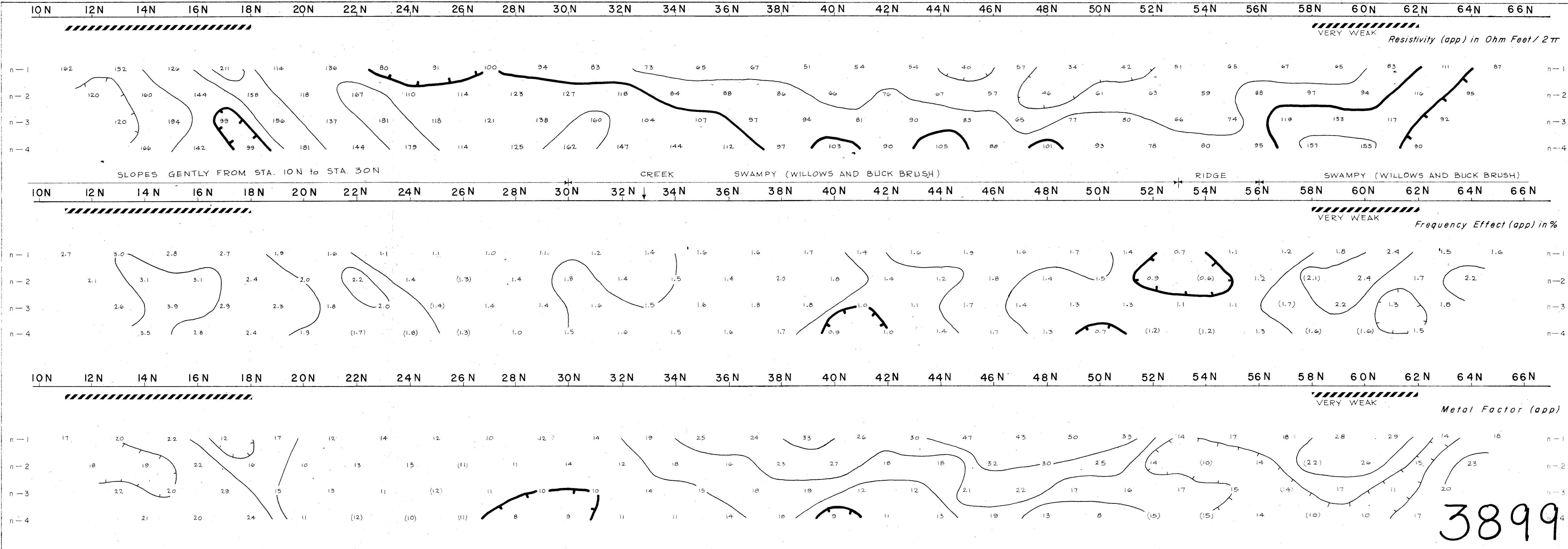
FREQUENCIES 0.31 & 5.0 cps DATE SURVEYED JULY, 1972

APPROVED *[Signature]*

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

DATE *Sept 26/72*

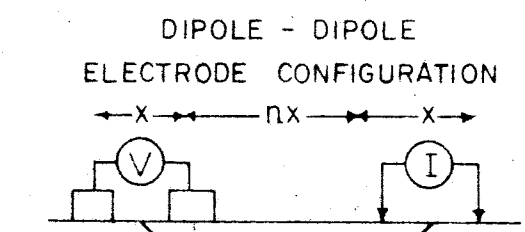
3899 M-8
 FREQUENCY DOMAIN I.P. AND RESISTIVITY PROFILE
 SURVEYED BY EAGLE GEOPHYSICS LTD., (JOHN LLOYD, M.Sc. P.Eng.)



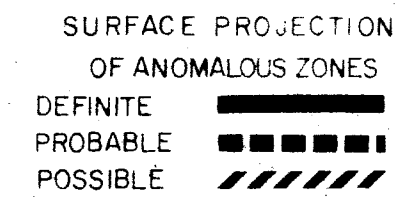
LINE NO. 16E

N. B. C. SYNDICATE
 JEAN PROPERTY
 OMINECA MINING DIV., B. C.

LINE NO. 8+00E



PLOTTING POINT
 n = 1, 2, 3, & 4



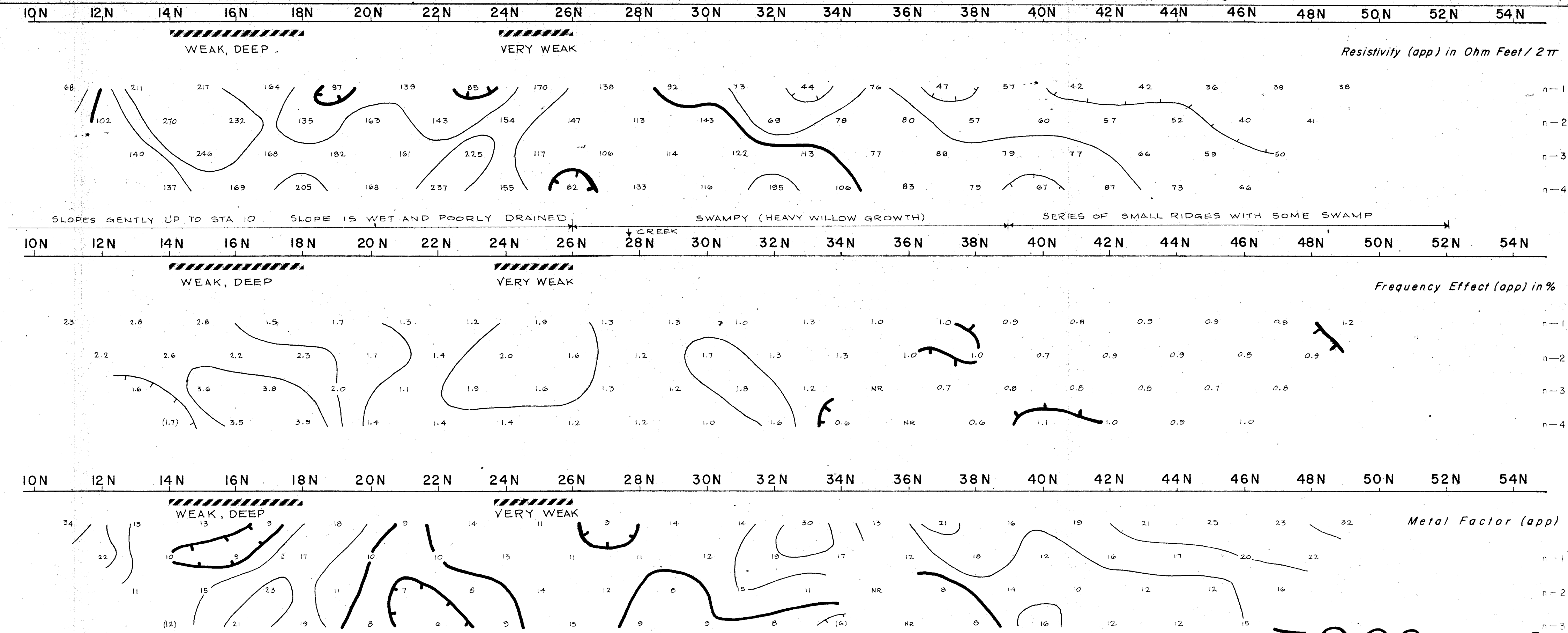
FREQUENCIES 0.31 & 5.0 cps DATE SURVEYED JULY, 1972

APPROVED *[Signature]*

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

DATE *Sept. 26/72*

FREQUENCY DOMAIN I.P. AND RESISTIVITY PROFILE
 SURVEYED BY EAGLE GEOPHYSICS LTD., (JOHN LLOYD, M.Sc. P.Eng.)

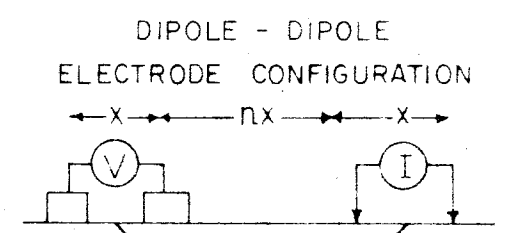


3899 M-9

LINE NO. 8 E

N. B. C. SYNDICATE
 JEAN PROPERTY
 OMINECA MINING DIV., B.C.

LINE NO. 0+00



PLOTTING X POINT
 n = 1, 2, 3, & 4

SURFACE PROJECTION OF ANOMALOUS ZONES
 DEFINITE
 PROBABLE
 POSSIBLE

FREQUENCIES 0.31 & 5.0 cps DATE SURVEYED JULY, 1972

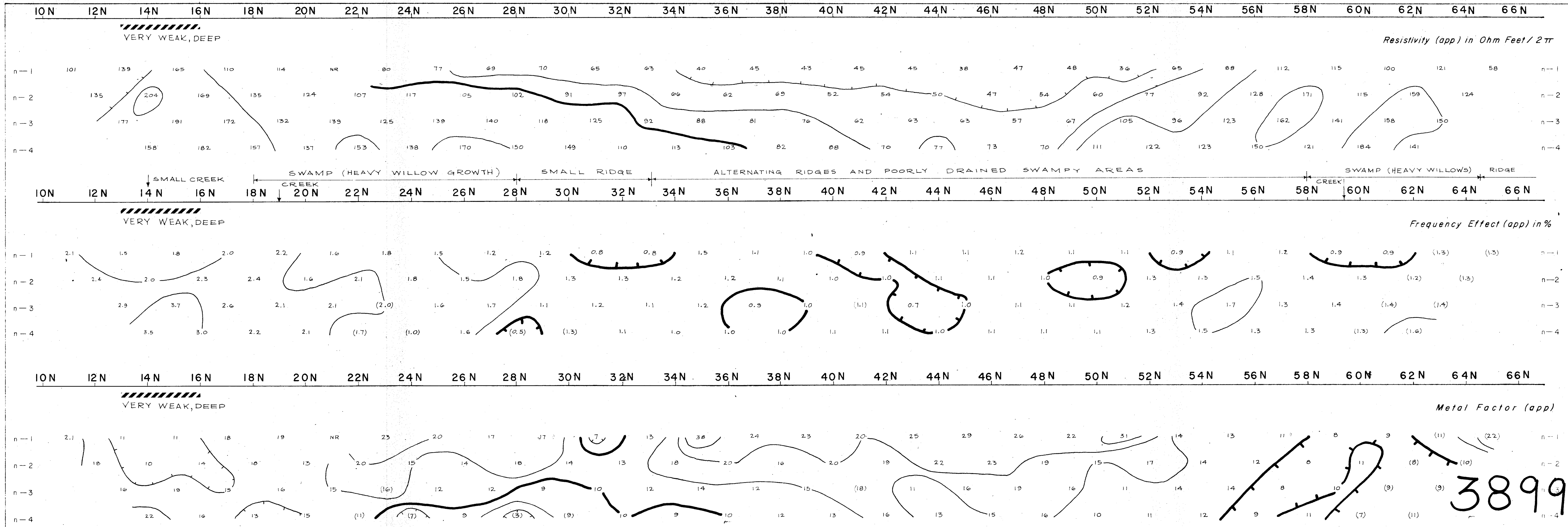
APPROVED

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

DATE

M-10

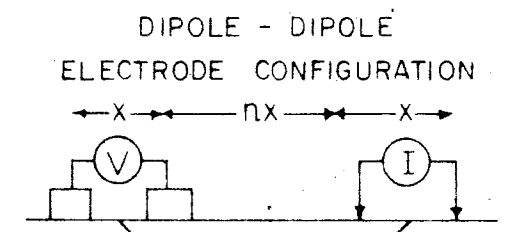
FREQUENCY DOMAIN I.P. AND RESISTIVITY PROFILE
 SURVEYED BY EAGLE GEOPHYSICS LTD., (JOHN LLOYD, M.Sc. P.Eng.)



LINE NO. 0

**N. B. C. SYNDICATE
JEAN PROPERTY
OMINECA MINING DIV., B. C.**

LINE NO. 8+00 W

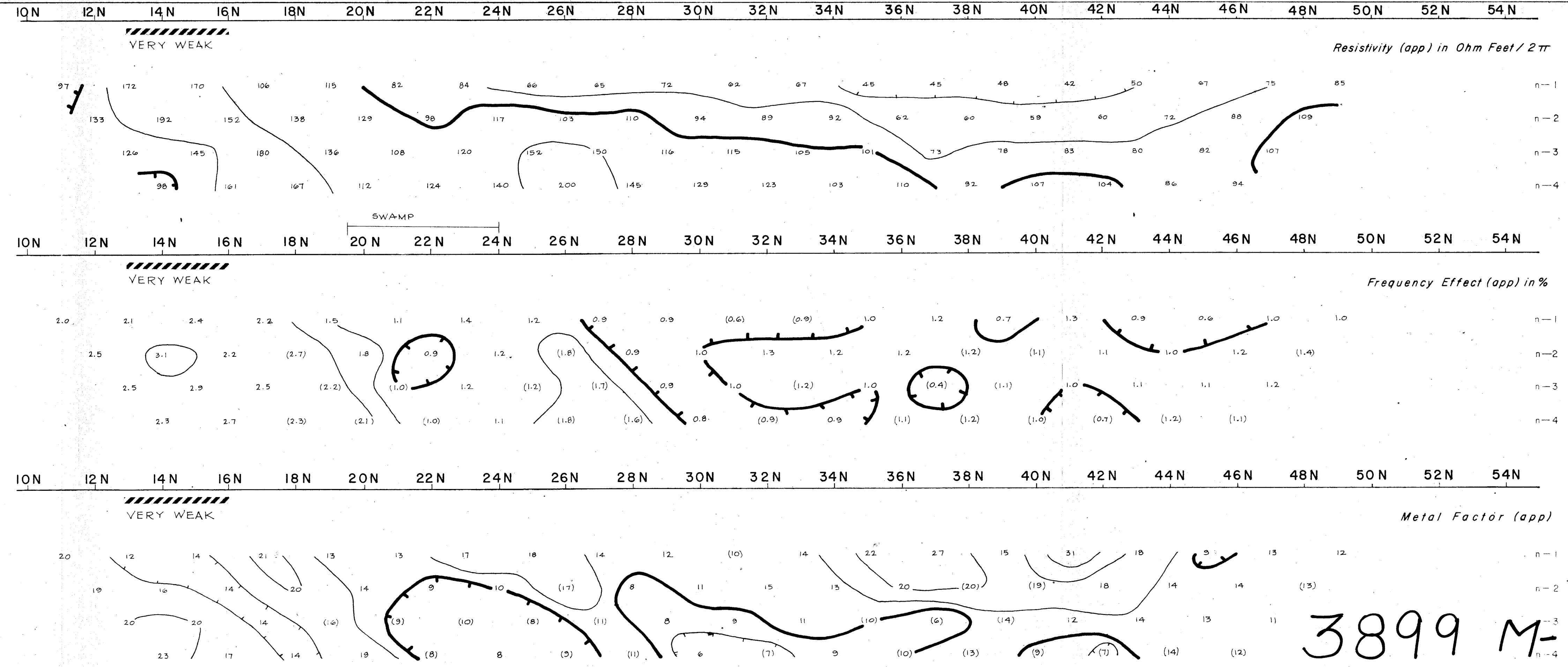


PLOTTING X POINT
n = 1, 2, 3, & 4

SURFACE PROJECTION
OF ANOMALOUS ZONES
DEFINITE [thick solid line]
PROBABLE [dashed line]
POSSIBLE [dotted line]

FREQUENCIES 0.31 & 5.0 cps DATE SURVEYED JULY, 1972
APPROVED *[Signature]*
NOTE: CONTOURS AT LOGARITHMIC INTERVALS
1-1.5-2-3-5-7.5-10 DATE *[Signature]*

FREQUENCY DOMAIN I.P. AND RESISTIVITY PROFILE
SURVEYED BY EAGLE GEOPHYSICS LTD., (JOHN LLOYD, M.Sc.P.Eng.)

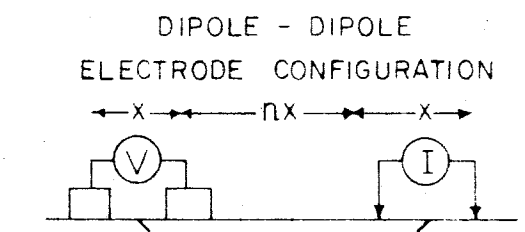


3899 M-11

LINE NO. 8 W

N. B. C. SYNDICATE
 JEAN PROPERTY
 OMINECA MINING DIV., B. C.

LINE NO. 16+00 W



PLOTTING X POINT
 n = 1, 2, 3, 4

SURFACE PROJECTION
 OF ANOMALOUS ZONES
 DEFINITE
 PROBABLE
 POSSIBLE

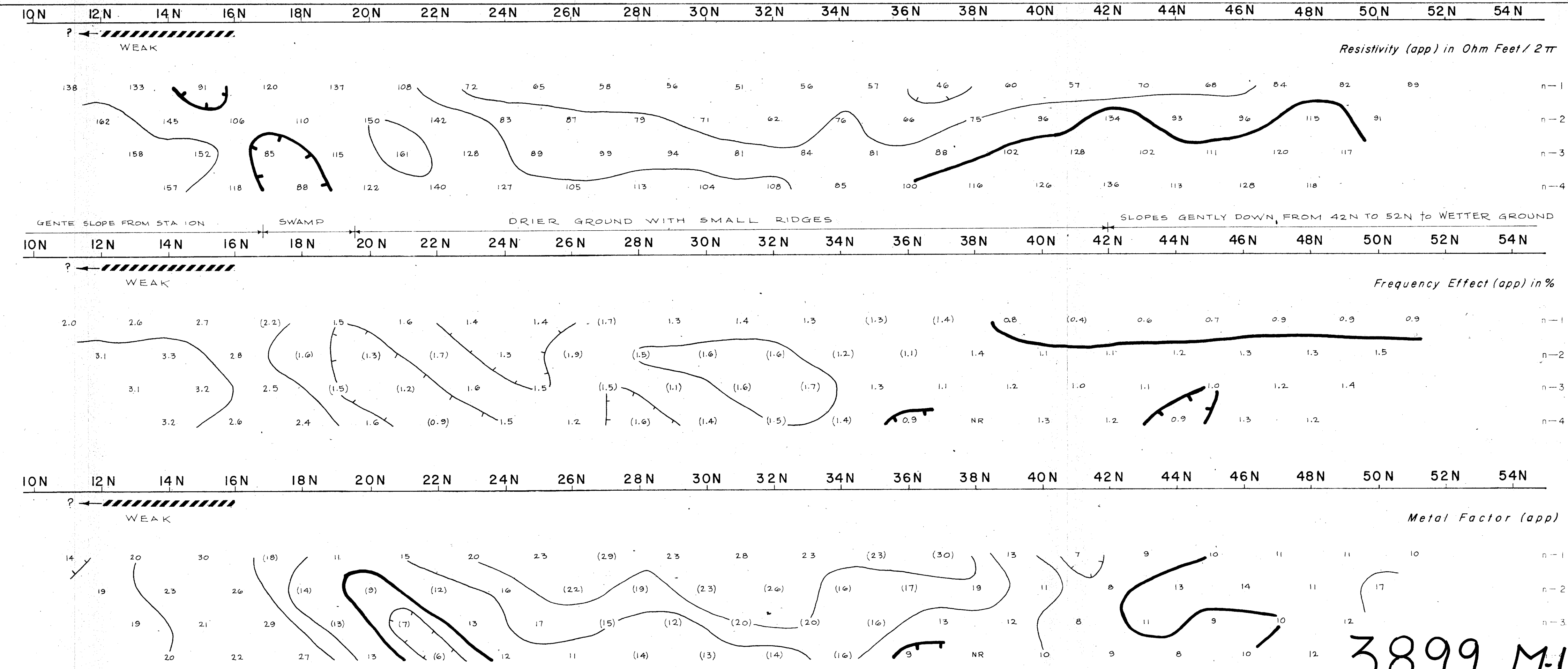
FREQUENCIES 0.31 & 5.0 cps DATE SURVEYED JULY, 1972

APPROVED

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

DATE

FREQUENCY DOMAIN I.P. AND RESISTIVITY PROFILE
 SURVEYED BY EAGLE GEOPHYSICS LTD., (JOHN LLOYD, M.Sc. P.Eng.)

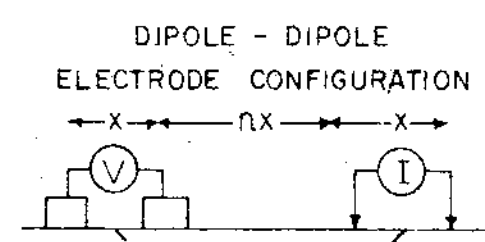


3899 M-12

LINE NO. 16 W

N. B. C. SYNDICATE
 JEAN PROPERTY
 OMINECA MINING DIV., B. C.

LINE NO. 24+00W



PLOTTING X POINT
 n = 1, 2, 3, & 4

SURFACE PROJECTION
 OF ANOMALOUS ZONES
 DEFINITE
 PROBABLE
 POSSIBLE

FREQUENCIES 0.31 & 5.0 cps DATE SURVEYED JULY, 1972

APPROVED

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

DATE Sept 26/72

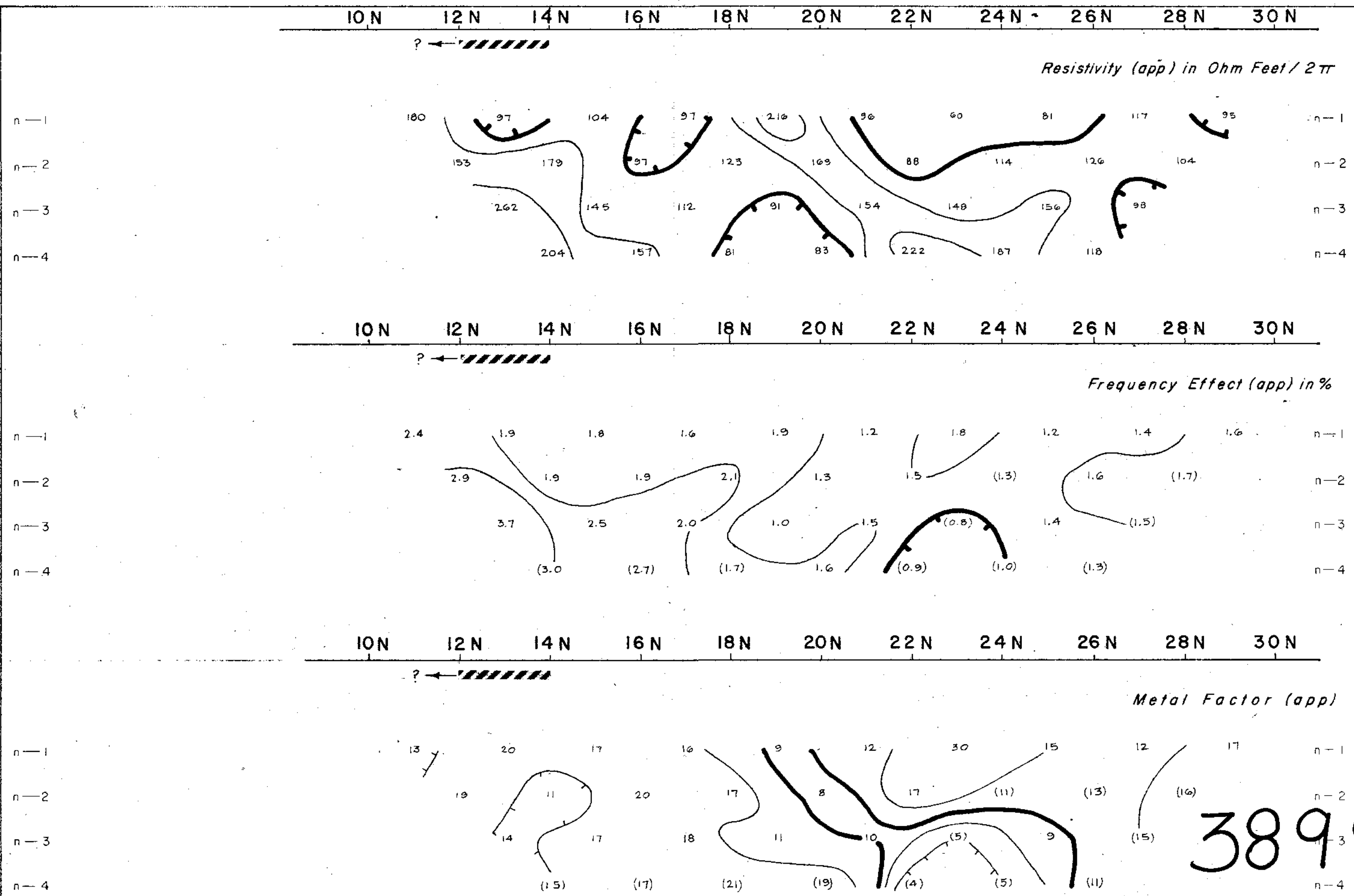
3899 M-13

FREQUENCY DOMAIN I.P. AND RESISTIVITY PROFILE
 SURVEYED BY EAGLE GEOPHYSICS LTD., (JOHN LLOYD, M.Sc. P.Eng.)

Resistivity (app) in Ohm Feet / 2π

Frequency Effect (app) in %

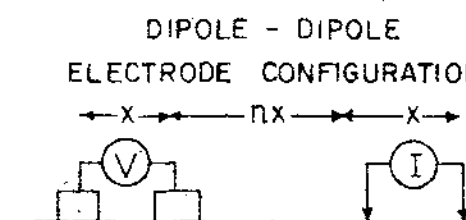
Metal Factor (app)



LINE NO. 24 W

N. B. C. SYNDICATE
 JEAN PROPERTY
 OMINECA MINING DIV., B. C.

LINE NO. 32+00W



PLOTTING X POINT
 n = 1, 2, 3, & 4

SURFACE PROJECTION
 OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

FREQUENCIES 0.31 & 5.0 cps

DATE SURVEYED JULY, 1972

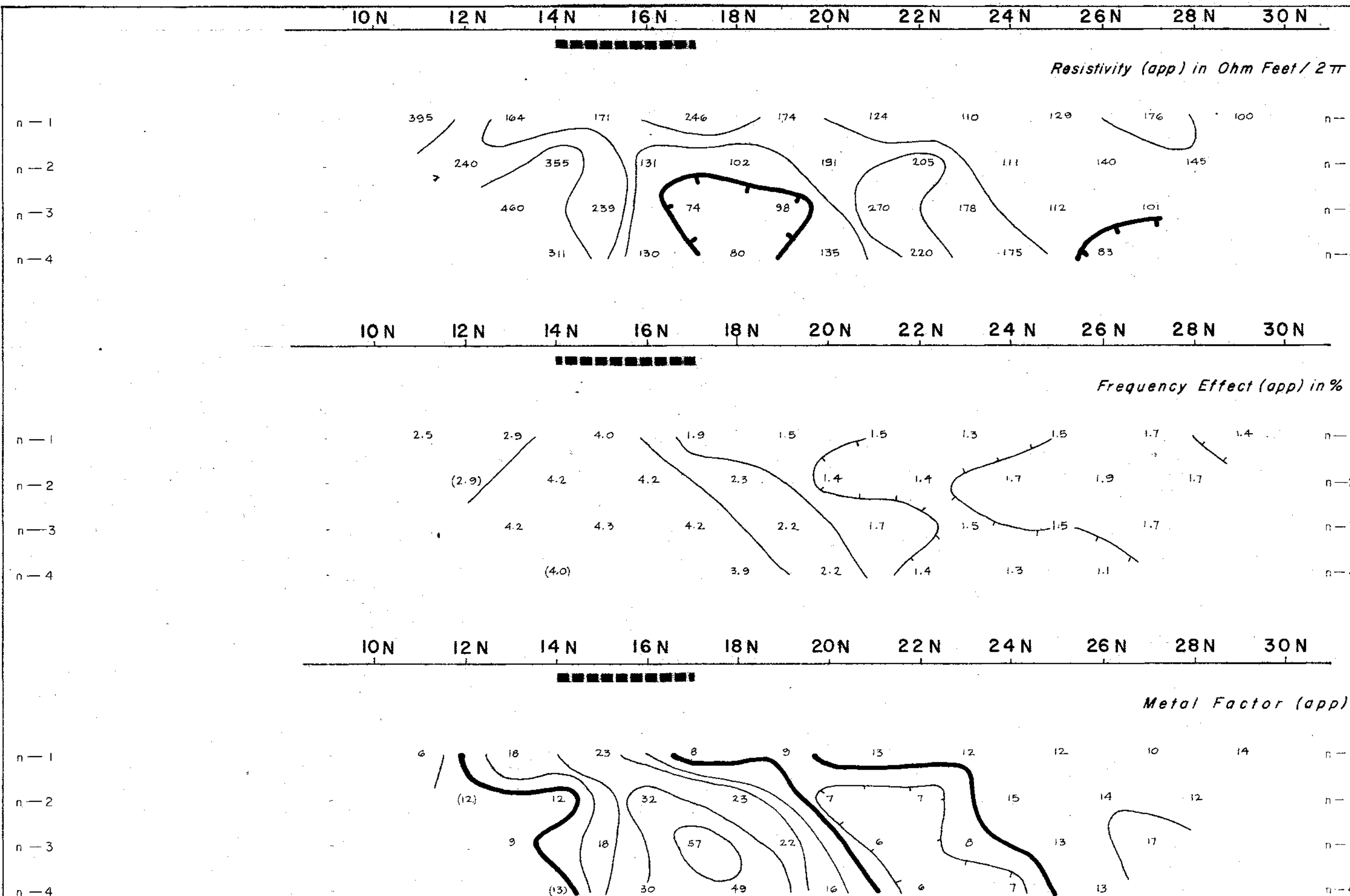
APPROVED

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

DATE

3899 M-14

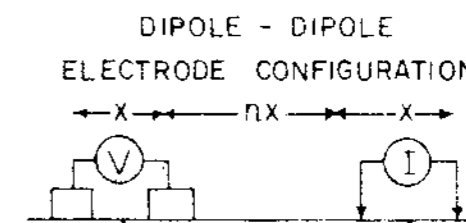
FREQUENCY DOMAIN I.P. AND RESISTIVITY PROFILE
 SURVEYED BY EAGLE GEOPHYSICS LTD., (JOHN LLOYD, M.Sc. P.Eng.)



LINE NO. 32W

N. B. C. SYNDICATE
 JEAN PROPERTY
 OMINECA MINING DIV., B. C.

LINE NO. 40+00 W



PLOTTING X POINT
 n = 1, 2, 3, & 4

SURFACE PROJECTION
 OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

FREQUENCIES 0.31 & 5.0 cps

DATE SURVEYED JULY, 1972

APPROVED

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

DATE

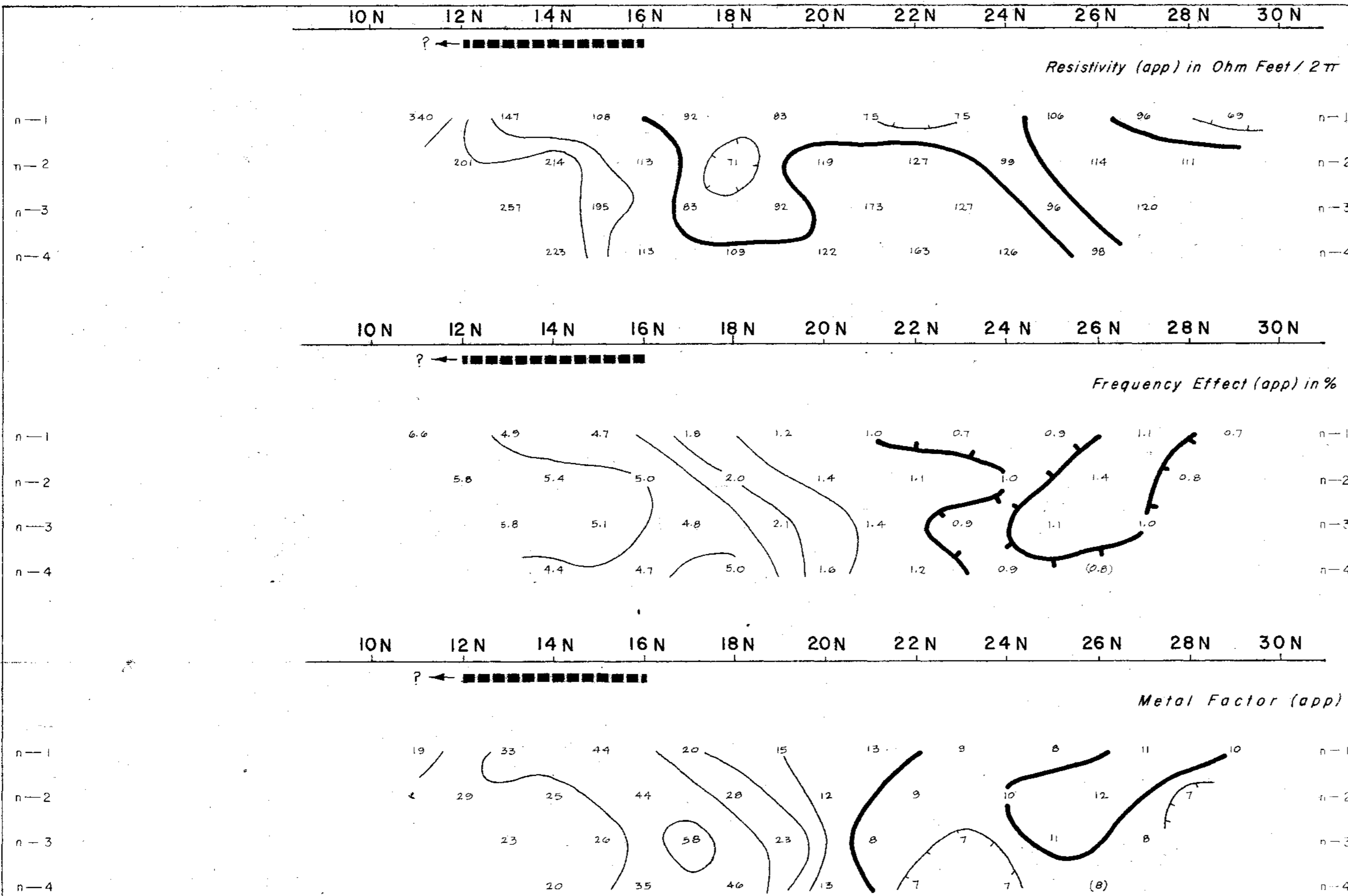
3899 M-15

FREQUENCY DOMAIN I.P. AND RESISTIVITY PROFILE
 SURVEYED BY EAGLE GEOPHYSICS LTD., (JOHN LLOYD, M.Sc. P.Eng.)

Resistivity (app) in Ohm Feet / 2π

Frequency Effect (app) in %

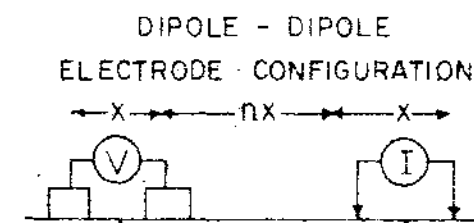
Metal Factor (app)



LINE NO. 40 W

N. B. C. SYNDICATE
 JEAN PROPERTY
 OMINECA MINING DIV., B. C.

LINE NO. 48+00 W



PLOTTING X POINT
 n = 1, 2, 3, & 4

SURFACE PROJECTION
 OF ANOMALOUS ZONES
 DEFINITE [Solid line]
 PROBABLE [Dashed line]
 POSSIBLE [Dotted line]

FREQUENCIES 0.31 & 5.0 cps

DATE SURVEYED JULY, 1972

APPROVED

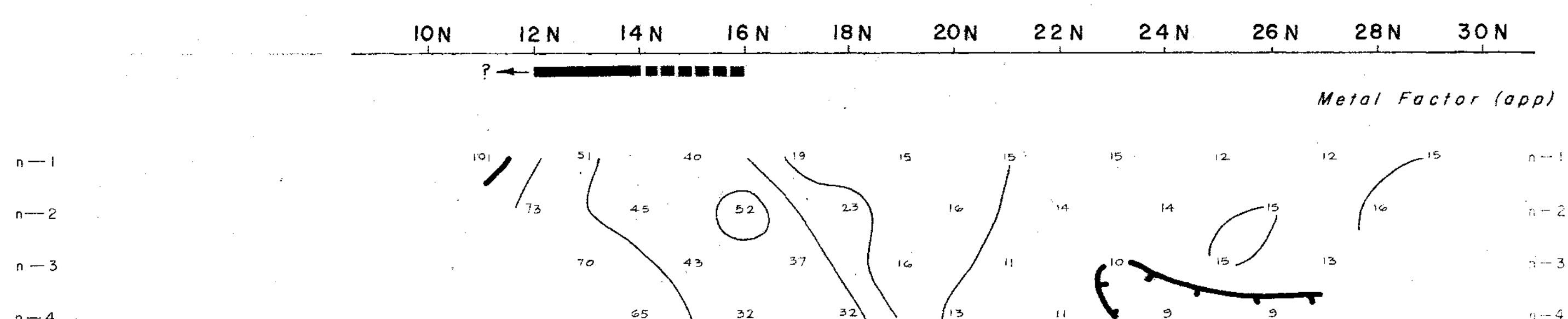
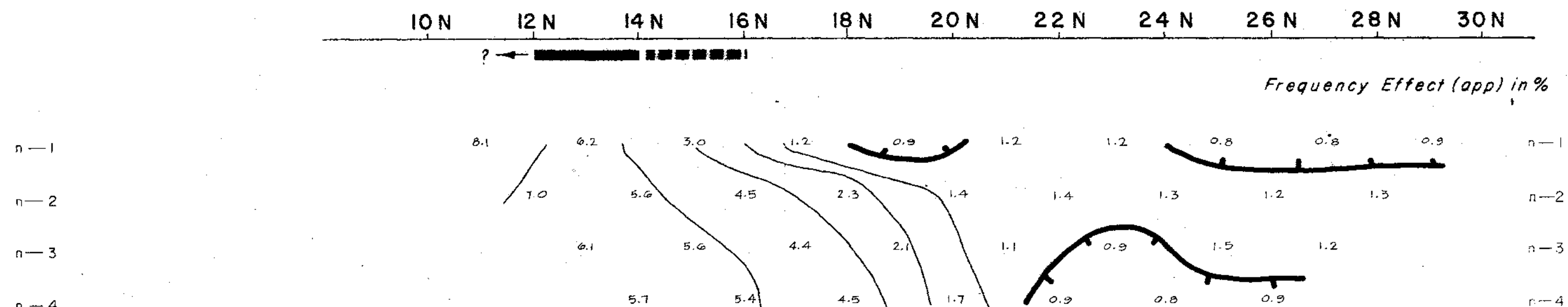
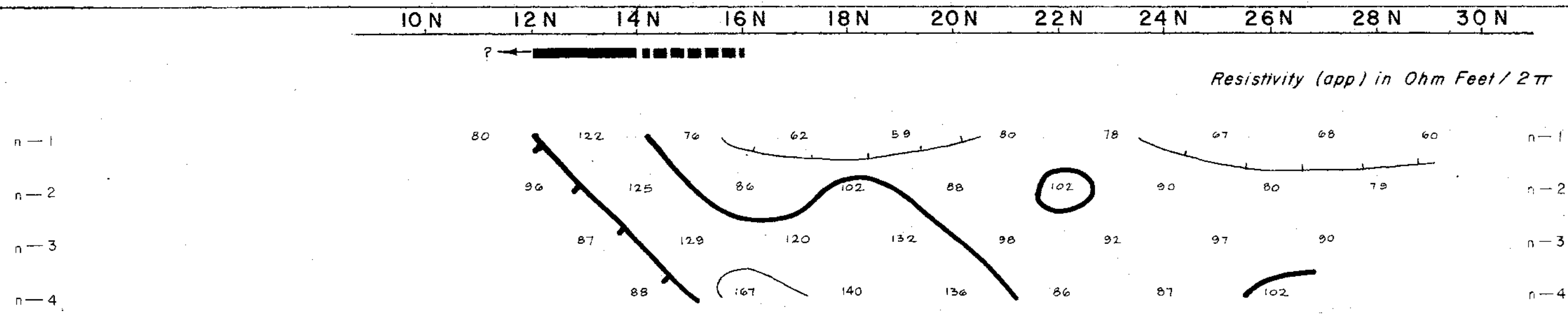
NOTE: CONTOURS AT
 LOGARITHMIC INTERVALS
 1-1.5-2-3-5-7.5-10

DATE

Jul 26/72

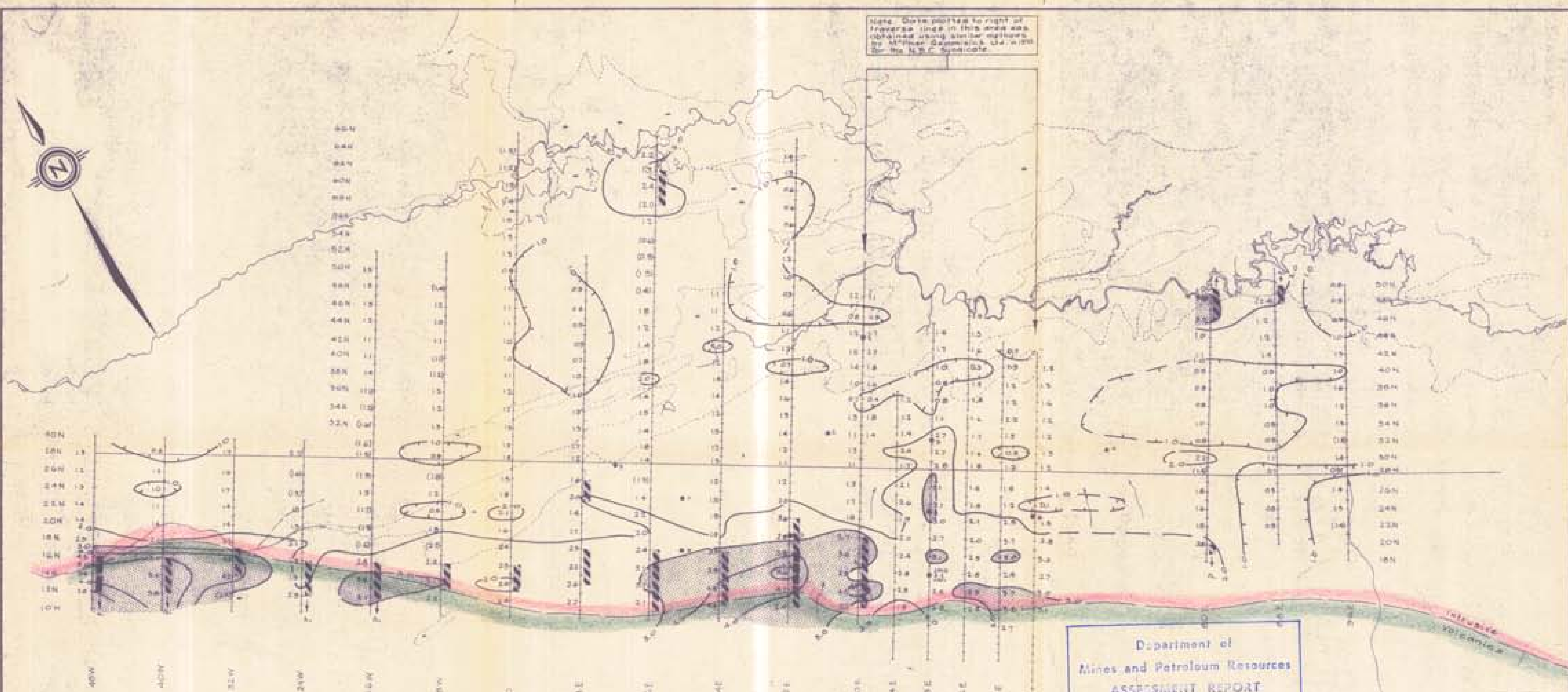
3899 M-16

FREQUENCY DOMAIN I.P. AND RESISTIVITY PROFILE
 SURVEYED BY EAGLE GEOPHYSICS LTD., (JOHN LLOYD, M.Sc. P.Eng.)



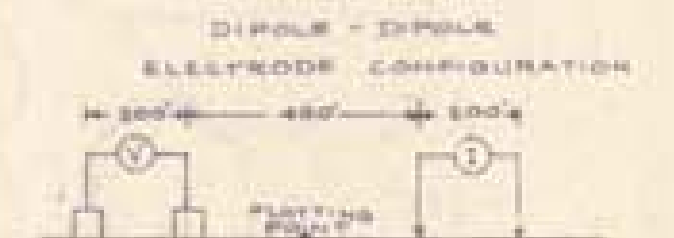
LINE NO. 48 W

Note: Data plotted to right of traverse line in this area was obtained using similar method as M.P.R. Geophysical Ltd. used for the N.B.C. Syncline.



3899 M-17

- Drill Holes (N.B.C. Drilling)
- Surface Rejection of Anomalous Zones
- DEFINITE
- - - - - PROBABLE
- ▨ POSSIBLE
- Geological Contact
- Contour Interval 1% F.E.



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 3899 MAP #17

To accompany a Report by J.M. Hamilton P.Eng.

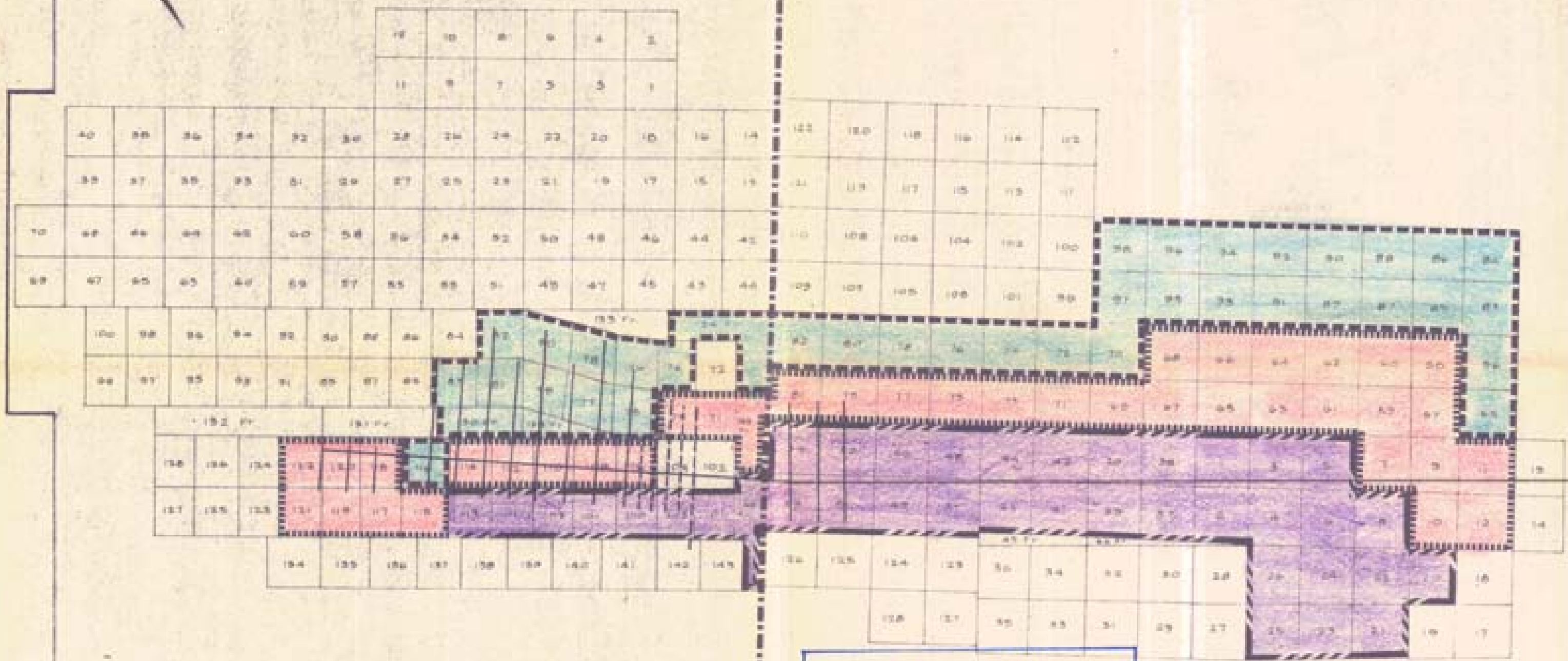
J. P. G.

Drawn by: J.P.G.	Traced by:	SECOND SEPARATION FREQUENCY EFFECTS
Checked by: J.P.G.	Checked by: J.P.G.	
		JEAN PROPERTY
		TCHENTLO LAKE AREA, OMINICA M.D., B.C.
Scale: 1" = 500'	Date: Sept. 1972	Page: 1



JEAN WEST CLAIMS

JEAN CLAIMS



- Paula Group
- Derak Group
- Guido Group
- Boundary between Jean Claims & Jean West Claims
- 1972 GRID
- 1970 GRID (N.B.C. SYNDICATE)

Department of
 Mines and Petroleum Resources
 ASSESSMENT REPORT
3899 MAP #19
 to Accompany a Report by J. M. Hamilton, P. Eng.

J. M. Hamilton

Drawn by: J. H. S.	Traced by:
Revised by: Date	Revised by: Date

CLAIM MAP
JEAN PROPERTY
TCHENTLO LAKE AREA, OMINICA M. D., B. C.
 Scale: 1" = 3000' Date: Sept 1972 Plate: 3



DOMINION OF CANADA:
PROVINCE OF BRITISH COLUMBIA.
To Wit:

In the Matter of

STATUTORY DECLARATION RELATING
TO EXPENDITURES ON LINE CUTTING
AND GEOPHYSICAL SURVEYS OF THE
JEAN PROPERTY, OMINECA MINING
DIVISION

I, JOHN MURRAY HAMILTON, PROFESSIONAL ENGINEER

of City of North Vancouver

in the Province of British Columbia, do solemnly declare that

1. Copies of a report regarding geophysical surveys on certain mineral claims situated in the Omineca Mining Division are being filed with the Mining Recorder in Vancouver.
2. Attached hereto, and marked with the letter "A" upon which I have signed my name at the time of declaring hereof, is a statement of expenditures incurred in connection with the line cutting on the said claims showing in addition the dates during which those doing the said line cutting performed their work.
3. Attached hereto, and marked with the letter "B" upon which I have signed my name at the time of declaring hereof, is a statement of expenditures incurred in connection with the Induced Polarization survey of the said claims showing in addition the dates during which those making the said survey performed their work.

And I make this solemn declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath and by virtue of the "Canada Evidence Act."

Declared before me at the City
of Vancouver, in the
Province of British Columbia, this 7th
day of September, A.D. 1976

A Commissioner for taking Affidavits within British Columbia or
A Notary Public in and for the Province of British Columbia.
as authorized by the Statute of British Columbia,

EXHIBIT "A"

COMINCO LTD.

EXPLORATION

WESTERN DISTRICT

LINE CUTTING COSTS

JEAN PROPERTY, OMINACA MINING DIVISION, TCHENTLO LAKE AREA

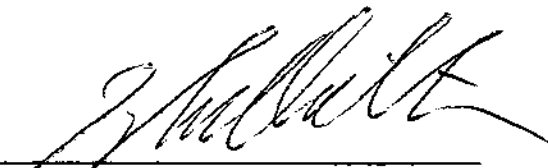
N.T.S. - 93-N-2, 125° 55' N.E.

1. Line cut under contract by Don Martinson L & S Limited during June, 1972.
15.8 mile at \$110.00 per mile, \$1,738.00

2. Fixed Wing and Helicopter Costs

Fixed Wing transport	\$390.00	
Helicopter ferry	\$455.00	\$ 845.00
		\$2,583.00

Signed


John M. Hamilton, P. Eng.

This Is Exhibit "A" To The Statutory Declaration Of
John M. Hamilton Declared Before Me This 7th Day of September, 1972



A Commissioner For Taking Affidavits
Within British Columbia

EXHIBIT "B"

C O M I N C O L T D.

EXPLORATION

WESTERN DISTRICT

INDUCED POLARIZATION SURVEY COSTS

JEAN PROPERTY, OMINECA M.D., TCHENTLO LAKE AREA, B.C.

N.T.S. - 93-N-2, 125° 55' N.E.

I.P. done under contract to Eagle Geophysics, during the period July 4 to July 30, 1972.

1. Survey Costs

14 Survey Days at \$305.00	\$4,270.00	
6 Standby Days at \$195.00	\$1,170.00	
Mobilization and Demobilization, Vancouver - Ft. St. James	\$1,799.57	
Camp costs, 5 men for 19 days at \$12.50	\$1,187.50	
Labourers, 3 men for 19 days at \$40	\$2,280.00	
Expendables	\$ 155.53	\$10,862.60

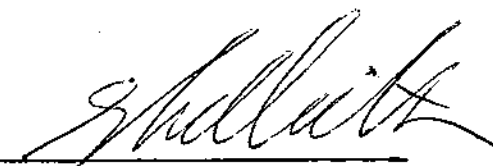
2. Report Writing Costs

J.M. Hamilton, Geophysicist, 3 days at \$65	\$ 195.00	
J.P. Synder, Draftsman, 17 days at \$30	\$ 510.00	\$ 705.00


3. Fixed Wing and Helicopter Costs

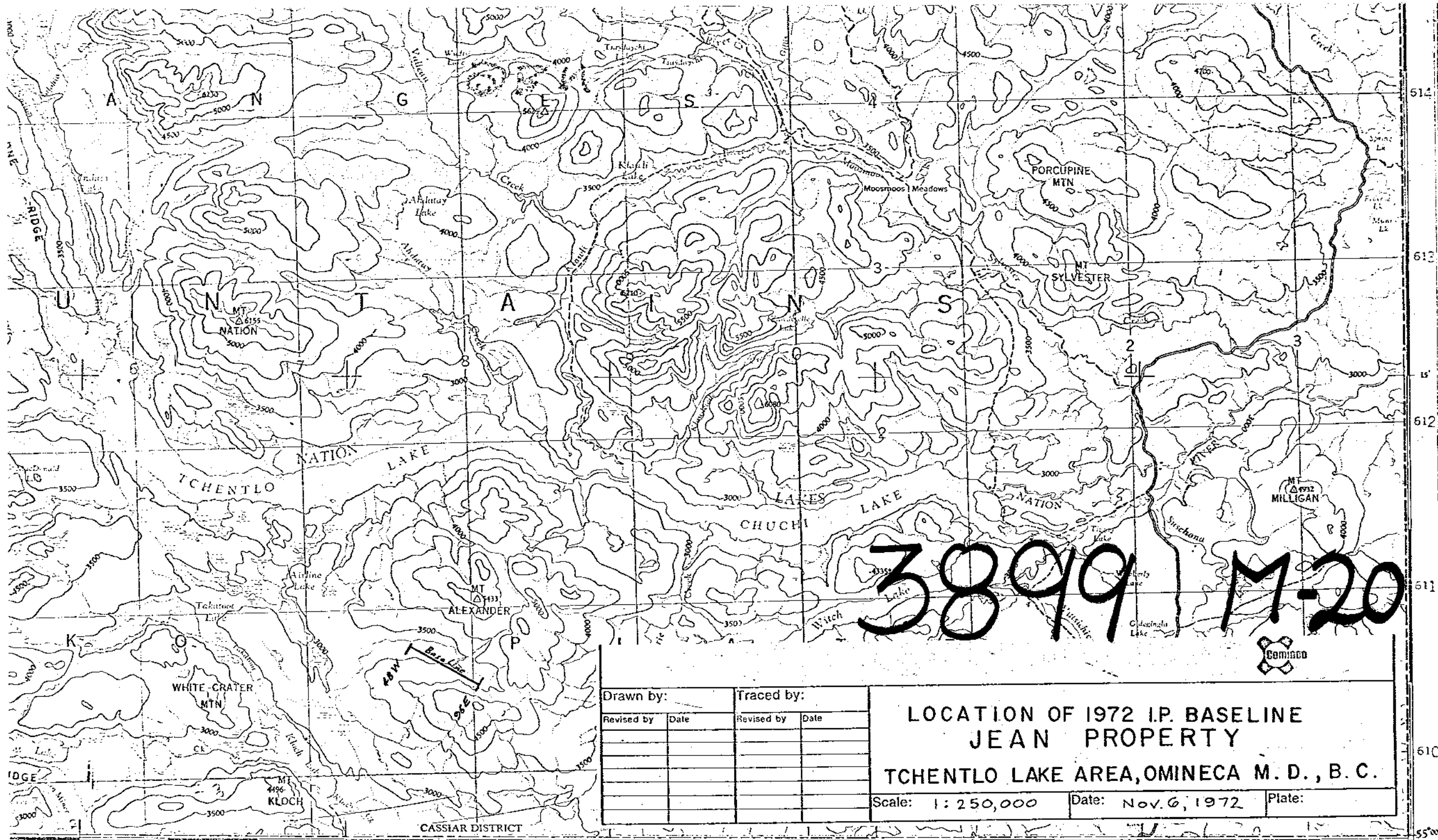
Fixed wing transport	\$ 404.00	
Helicopter costs	\$ 671.00	\$ 1,075.00
		<u>\$12,642.60</u>

Signed


John M. Hamilton, P. Eng.

This is Exhibit "B" To The Statutory Declaration Of
John M. Hamilton Declared Before Me This 26th Day of September, 1972


A Commissioner For Taking Affidavits
Within British Columbia



3899 M-20

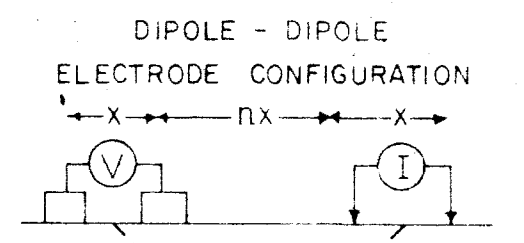
Drawn by:		Traced by:	
Revised by	Date	Revised by	Date

LOCATION OF 1972 I.P. BASELINE
 JEAN PROPERTY
 TCHENTLO LAKE AREA, Omineca M. D., B. C.

Scale: 1:250,000 Date: Nov. 6, 1972 Plate:

N. B. C. SYNDICATE JEAN PROPERTY OMINECA MINING DIV., B.C.

LINE NO. 96+00 E



PLOTTING X POINT
n = 1, 2, 3, & 4

SURFACE PROJECTION
OF ANOMALOUS ZONES
DEFINITE **████████**
PROBABLE **▨▨▨▨▨▨**
POSSIBLE **▤▤▤▤▤▤**

FREQUENCIES 0.31 & 5.0 cps DATE SURVEYED JULY, 1972

APPROVED *[Signature]*

NOTE: CONTOURS AT LOGARITHMIC INTERVALS
1-1.5-2-3-5-7.5-10 DATE *Apr 25/72*

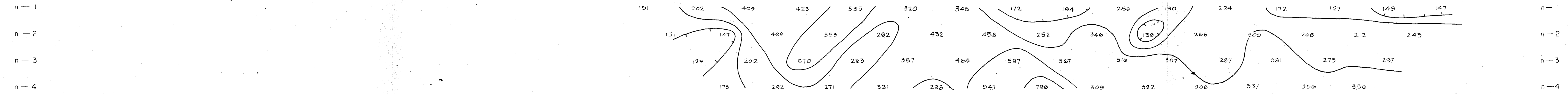
3899 M-2

FREQUENCY DOMAIN I.P. AND RESISTIVITY PROFILE
SURVEYED BY EAGLE GEOPHYSICS LTD., (JOHN LLOYD, M.Sc. P.Eng.)

18N 20N 22N 24N 26N 28N 30N 32N 34N 36N 38N 40N 42N 44N 46N 48N 50N 52N 54N

NO LINE CUT

Resistivity (app) in Ohm Feet / 2π



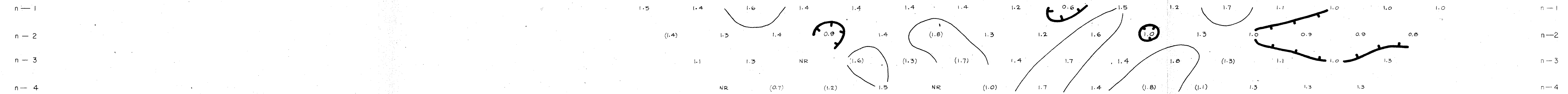
CREEK MEANDERS
ACROSS LINE

CREST OF SHARP RIDGE

SWAMP (OPEN)

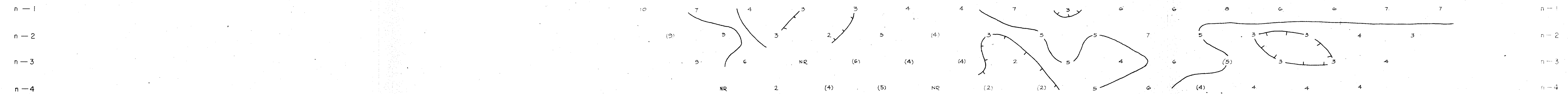
18N 20N 22N 24N 26N 28N 30N 32N 34N 36N 38N 40N 42N 44N 46N 48N 50N 52N 54N

Frequency Effect (app) in %



18N 20N 22N 24N 26N 28N 30N 32N 34N 36N 38N 40N 42N 44N 46N 48N 50N 52N 54N

Metal Factor (app)



LINE NO. 96 E