

REPORT ON
INDUCED POLARIZATION
AND RESISTIVITY SURVEY
OF THE
EFFIE FAY GROUP
ELKO COUNTY, NEVADA
FOR
PAN-NEVADA INCORPORATED

McPHAR GEOPHYSICS

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1. INTRODUCTION

At the request of Mr. Norman H. Ursel, geological consultant for the Company, we have carried out a combined induced polarization and resistivity survey of the Effie Fay claim group in Elko County, Nevada.

The property is located in Sections 24 and 25 of T45N, R63E.

The property is underlain by granodiorite that has been extensively altered, fractured and mineralized. Copper carbonates have
been found at several locations and the IP survey was carried out to search
for any sulphide concentrations that might be present.

2. PRESENTATION OF RESULTS

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

Line 0

100 foot spreads

Dwg. IP 5202-1

Line 4W

100 foot spreads

Dwg. IP 5202-2

Line 8W	100 foot spreads	Dwg. IP 5202-3
Line 12W	100 foot spreads	Dwg. IP 5202-4
Line 16W	100 foot spreads	Dwg. IP 5202+5
Line 20W	100 foot spreads	Dwg. IP 5202-6
Line 24W	100 foot spreads	Dwg. IP 5202-7
Line 28W	100 foot spreads	Dwg. IP 5202-8
Line 32W	100 foot spreads	Dwg. IP 5202-9
Line 36W	100 foot spreads	Dwg. IP 5202-10
Line 40W	100 foot spreads	Dwg. IP 5202-11
Line 44W	100 foot spreads	Dwg. IP 5202-12
Line 48W	100 foot spreads	Dwg. IP 5202-13

Enclosed with this report is Dwg. I.P.P. 3331, a plan map of the grid at a scale of 1" = 300°. 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 100' spreads the position of a narrow sulphide body can only be determined to lie between two stations 100' 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 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

Line 0

The geophysical results on this line indicate a possible IP anomaly at 1S to 2S; the contour pattern suggests a broad weak source at depth.

Line 4W

Here there is a probable anomaly at 0 to 1S, indicating a relatively shallow narrow source with a weaker extension to the south. There is also a possible source at 1N to 2N.

Line 8W

This line is characterized by somewhat lower resistivities and high Metal Factor values, suggesting a broad altered zone with minor metallic mineralization. Within this broad zone there are several more concentrated sections. The strongest anomaly is at 1N to 2N but the pattern is incomplete; this is north of the property. There is a probable shallow, narrow source at 3S to 4S and a broad weak source from about 5S to 8S.

Line 12W

The northern zone is centred at 4N to 5N on this line but it is not as strong as on Line 8W. There is also a possible deep weak anomaly at 7S that may correlate with the probable anomalies on Line 8W and Line 16W, forming a northeast-trending zone in the central part of the grid.

Line 16W

Both the north zone and central zone are much broader here.

Line 20W

The north zone is still present on this traverse but the pattern is incomplete. There is a probable shallow anomaly at 11S to 12S, reperesenting the central zone. Anomalous effects were measured from 17S to at least 20S indicating a new zone on the south part of the grid.

Line 24W

Here there is no indication of the north zone but it is not known whether it terminates between Line 20W and Line 24W, or if it is offset to the north.

The probable anomaly centred at 6S is apparently an isolated feature as it does not correlate with anomalies on the adjacent lines.

A broad zone of weakly anomalous effects was found from about 10S to 18S. Within this there is a narrow, more definite, section at 14S that may represent the southwestward continuation of the central zone.

Line 28W

On this line there is a probable wide anomaly at 15S to 18S.

Again the correlation is uncertain, but this feature could represent the central zone.

Line 32W

A probable shallow anomaly occurs at 5S; this apparently corerelates with weak effects on the lines to the west. There is also a possible

weak anomaly at 135, correlating with a zone of alteration.

Line 36W

Possible shallow weak anomalies occur at 2S to 3S and at 13S on this line.

Line 40W and Line 44W

Possible weak anomalies occur just south of the Base Line on these two traverses.

Line 48W

Only minor variations in the M.F. values were measured on this line.

4. SUMMARY AND RECOMMENDATIONS

No strong IP anomalies were found on the Effie Fay Group but there are numerous low to moderate magnitude anomalies. Most of these features can be correlated into continuous zones, as shown on Dwg.

L.P.P. 3331.

The north zone has been traced from Line 4W to Line 20W but may still be open in both directions. It appears to represent a shallow, narrow source such as a vein or mineralized fault zone. The anomaly at 1N to 2N, Line 8W is one of the strongest and most definite on the grid and therefore merits a drill test. Unfortunately the entire zone is off the property, therefore consideration should be given to acquiring this ground.

Anomalies indicative of narrow sources were found on all traverses from Line 4W to Line 28W and these have been tentatively

correlated into the Central Zone. It should be pointed out that this is only one of several possible groupings, such as a series of short en echelon zones. This group contains some of the most interesting anomalies on the property and a drill test is warranted. Inclined holes should be drilled under the mid-point of each anomaly at the indicated vertical depth.

	A	ALFAC	100	1006
1	Line 8W,	3+50S;	11111	- 150 feet.
	TITTO O 11	21300	100	TOO TOOM

2)	Line 16W,	8+00S;	150 feet.
41	Line low.	OTUUD,	TOO TEEF

3) Line 24W, 14+00S; 200 feet.

or

Line 28W, 16+00S; 200 feet.

Several broad anomalies occur on the south-central part of the grid but these do not form a well defined zone. However, the anomaly centred at 17+50S, Line 20W may warrant a short drill hole.

The weak anomalies south of the Base Line from Line 32W to Line 44W have been grouped to form the West Zone. This might be tested on Line 32W, with a short angle hole to pass under station 5S at a vertical, depth of 100 feet.

McPHAR GEOPHYSICS INCORPORATED

Robert A. Bell,

Geologist.

Philip G. Hallof, Geophysicist.

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APPENDIX

THE INTERPRETATION OF
INDUCED POLARIZATION ANOMALIES
FROM RELATIVELY SMALL SOURCES

The induced polarization method was originally developed to detect disseminated sulphides and has proven to be very successful in the search for "porphyry copper" deposits. In recent years we have found that the IP method can also be very useful in exploring for more concentrated deposits of limited size. This type of source gives sharp IP anomalies that are often difficult to interpret.

The anomalous patterns that develop on the contoured data plots will depend on the size, depth and position of the source and the relative size of the electrode interval. The data plots are not sections showing the electrical parameters of the ground. When the electrode interval (X) is appreciably greater than the width of the source, a large volume of unmineralized rock is averaged into each measurement. This is particularly true for the large values of the electrode separation (n).

The theoretical scale model results shown in Figure 1 and Figure 2 indicate the effect of depth. If the depth to the top of the source is small compared to the electrode interval (i. e. d X) the measurement for n=1 will be anomalous. In Figure 1 the depth is 0.5 units (X=1.0 units) and the n=1 value is definitely anomalous; the pattern on the contoured data plot is typical for a relatively shallow, narrow, near-vertical tabular source. The results in Figure 2 are for the same source with the depth increased to 1.5 units. Here the n=1 value is not anomalous; the larger values of (n) are anomalous but the magnitudes are much lower than for the source at less depth.

When the electrode interval is greater than the width of the source, it is not possible to determine its width or exact position between the electrodes. The true IP effect within the source is also indeterminate; the anomaly from a very narrow source with a very large true IP effect will be much the same as that from a zone with twice the width and 1/2 the true IP effect. The theoretical scale model data shown in Figure 3 and Figure 4 demonstrate this problem. The depth and position of the source are unchanged but the width and true IP effect are varied. The anomalous patterns and magnitudes are essentially the same, hence the data are insufficient to evaluate the source completely.

The normal practise is to indicate the IP anomalies by solid, broken, or dashed bars, depending upon their degree of distinctiveness. 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. As illustrated in Figure 1, Figure 2, Figure 3 and Figure 4, no anomaly can be located with more accuracy than the spread length. While the centre of the solid bar indicating the anomaly corresponds fairly well with the source, the length of the bar should not be taken to represent the exact edges of the anomalous material.

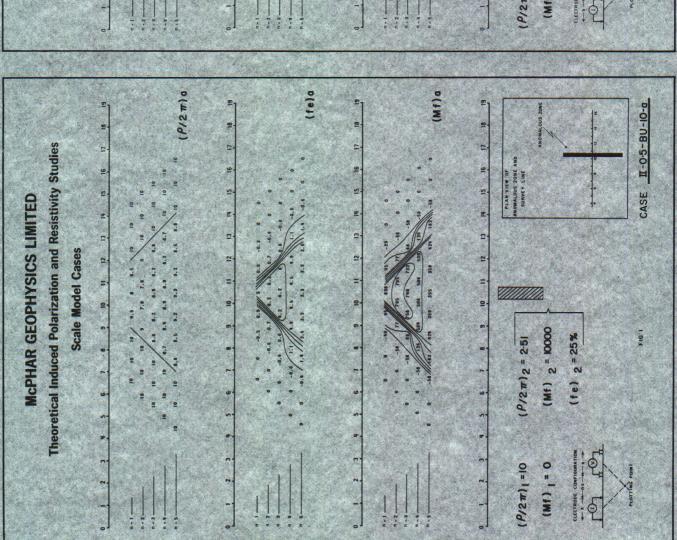
If the source is shallow, the anomaly can be better evaluated using a shorter electrode interval. When the electrode interval used approaches the width of the source, the apparent effects measured will be nearly equal to the true effects within the source. When there is some depth to the top of the source, it is not possible to use electrode intervals that are much less than the depth to the source. In this situation, one must realize that a definite ambiguity exists regarding the width of the source and the IP effect within the source.

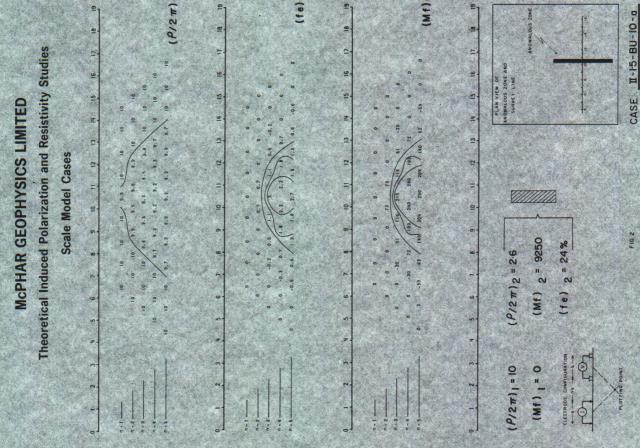
Our experience has confirmed the desirability of doing detail. When a reconnaissance IP survey using a relatively large electrode interval indicates the presence of a narrow, shallow source, detail with shorter electrode intervals is necessary in order to better locate, and evaluate, the source. The data of most usefulness is obtained when the maximum apparent IP effect is measured for n=2 or n=3. For instance, an anomaly originally located using X=300' may be checked with X=200' and then X=100'. The data with X=100' will be quite different from the original reconnaissance results with X=300'.

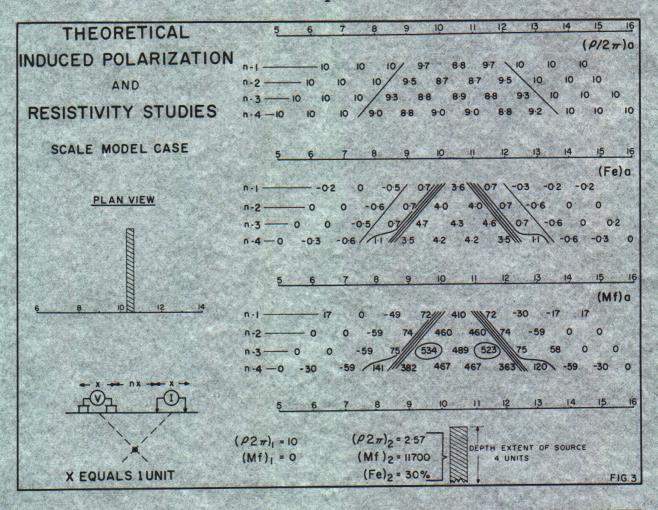
The data shown in Figure 5 and Figure 6 are field results from a greenstone area in Quebec. The expected sources were narrow (less than 30' in width) zones of massive, high-grade, zinc-silver ore. An electrode interval of 200' was used for the reconnaissance survey in order to keep the rate of progress at an acceptable level. The anomalies located were low in magnitude.

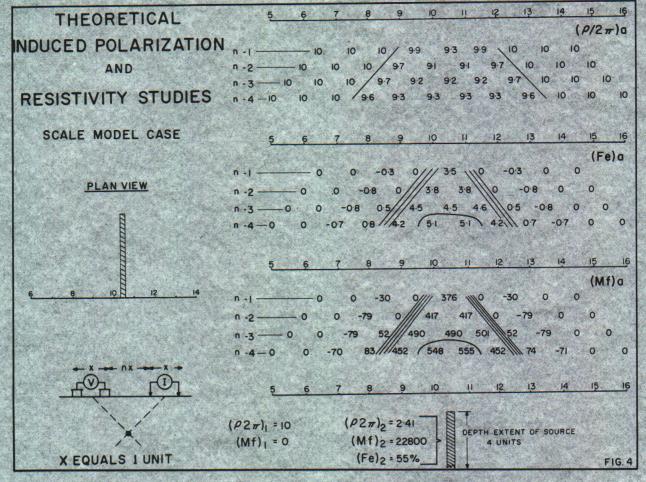
The very weak, shallow anomaly shown in Figure 5 is typical of those located by the $X=200^{\circ}$ reconnaissance survey. Several anomalies of this type were detailed using shorter electrode intervals. In most cases the detail measurements suggested broad zones of very weak mineralization. However, in the case of the source at 20N to 22N, the measurements with shorter electrode intervals confirmed the presence of a strong, narrow source. The $X=50^{\circ}$ results are shown in Figure 6. Subsequent drilling has shown the source to be 12.5° of massive sulphide mineralization containing significant zinc and silver values.

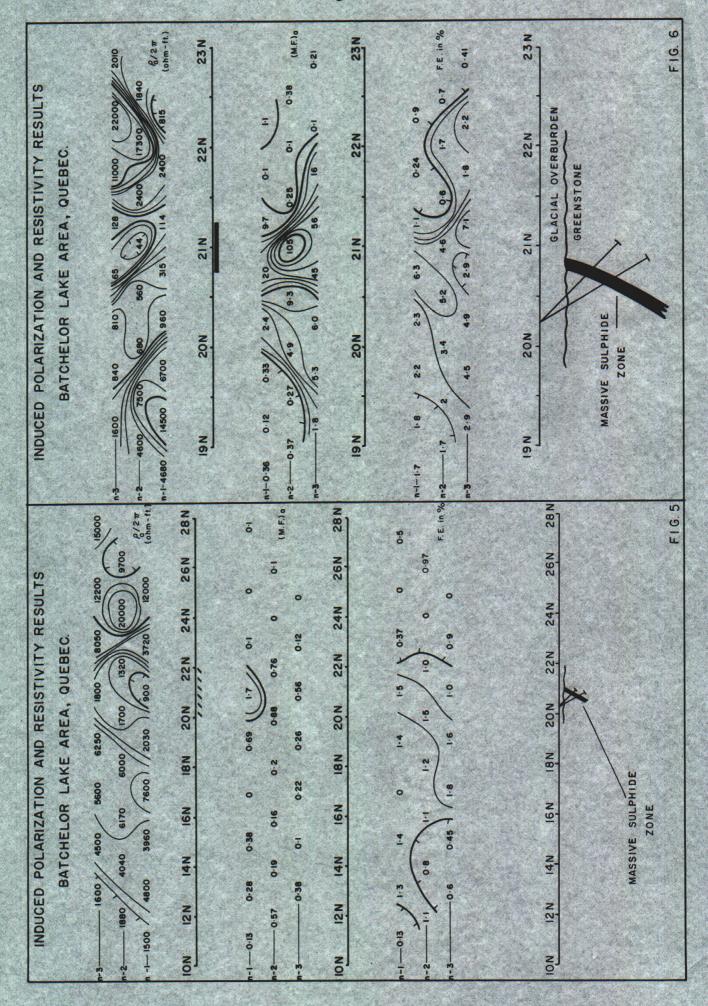
The change in the anomaly that results when the electrode interval is reduced is not unusual. The X = 50' data more accurately locates the narrow source, and permits the geophysicist to make a better evaluation of its importance. The completion of this type of detail is very important, in order to get the maximum usefulness from a reconnaissance IP survey.



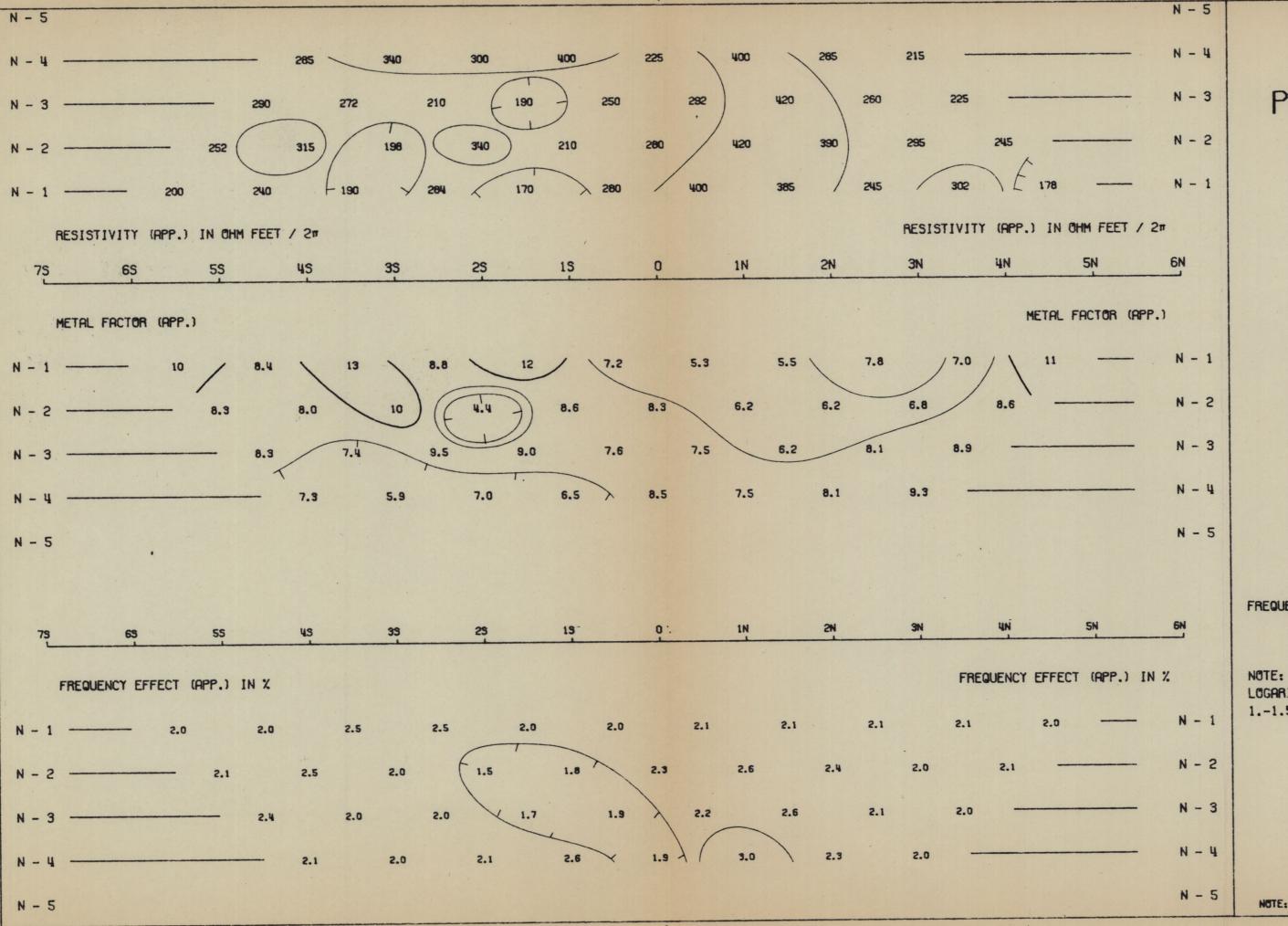








Dwg. I.P.P. 3331



DWG. NO. - I.P. - 5202-13

PAN-NEVADA INCORPORATED

EFFIE FAY GROUP, TP. 45N, R63E, SEC. 24 4 25
ELKO COUNTY, NEVADA

LINE NO. - 48W

PLOTTING X X = 100'

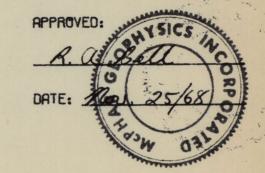
SURFACE PROJECTION OF ANOMALOUS ZONES

PROBABLE POSSIBLE //////

FREQUENCIES: 0.31-5.0 CPS

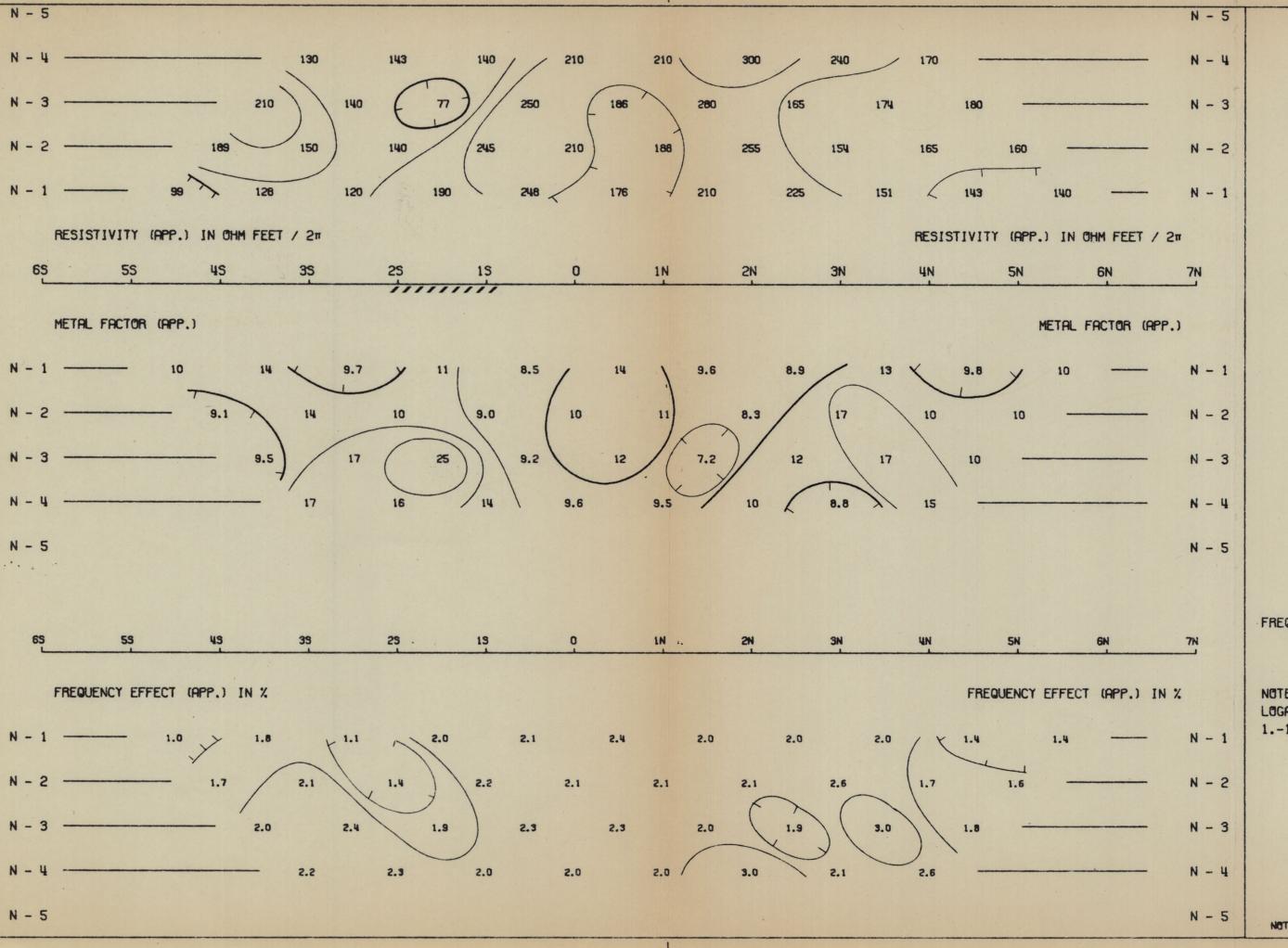
DATE SURVEYED: OCT 1968

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



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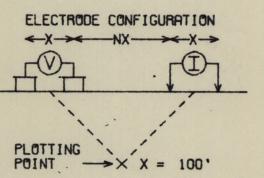


DWG. NO. - I.P. - 5202-12

PAN-NEVADA INCORPORATED

EFFIE FAY GROUP, TP. 45N, R63E, SEC. 24 4 25
ELKO COUNTY, NEVADA

LINE NO. - 44W



SURFACE PROJECTION OF ANOMALOUS ZONES

PROBABLE POSSIBLE

FREQUENCIES: 0.31-5.0 CPS

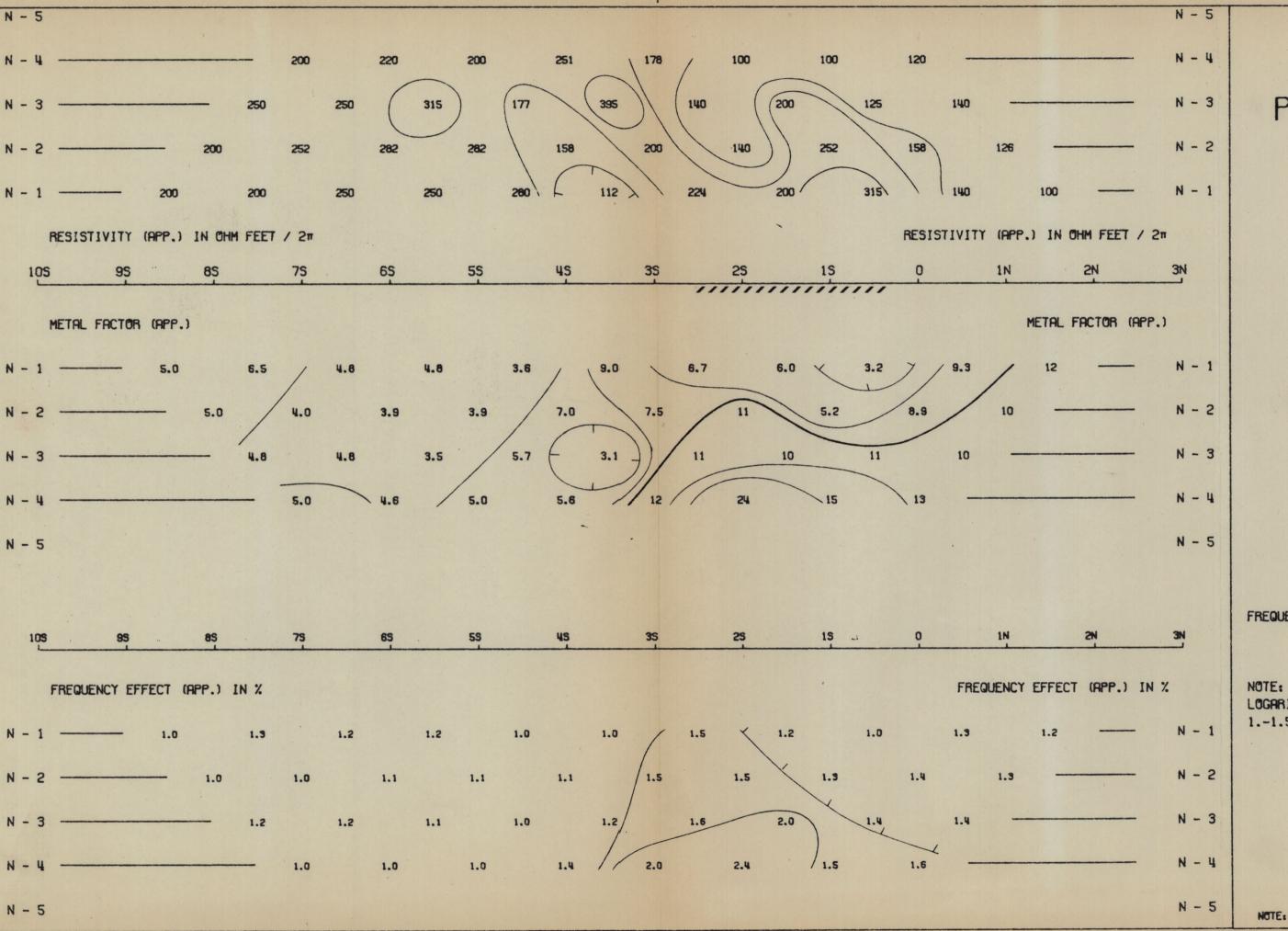
DATE SURVEYED: OCT 1968

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

DATE: 25/68

Mc PHAR GEOPHYSICS

INDUCED POLARIZATION AND RESISTIVITY SURVEY

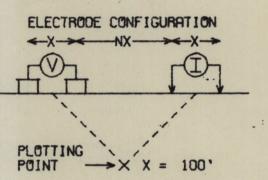


DWG. NO. - I.P. - 5202-1

PAN-NEVADA INCORPORATED

EFFIE FAY GROUP, TP. 45N, R63E, SEC. 24 & 25
ELKO COUNTY, NEVADA

LINE NO. - 0



SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE PROBABLE POSSIBLE //////

FREQUENCIES: 0.31-5.0 CPS

DATE SURVEYED: OCT 1968

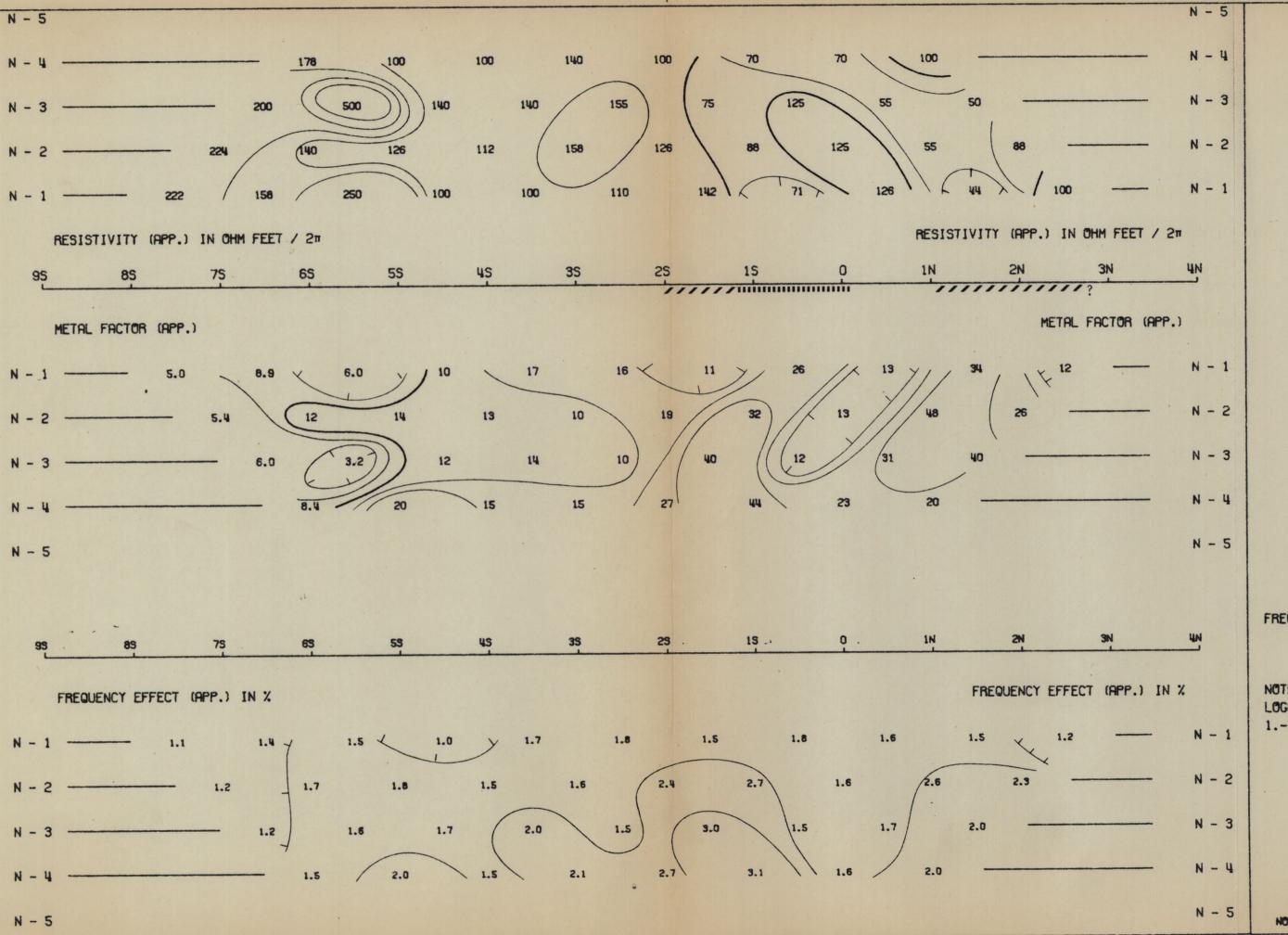
APPROVED:

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DATE: 1

Mc PHAR GEOPHYSICS

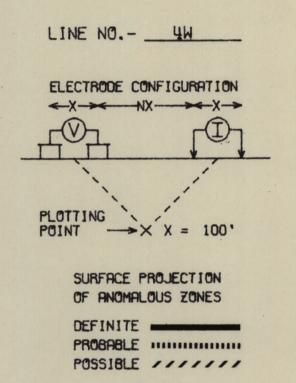
INDUCED POLARIZATION AND RESISTIVITY SURVEY



DWG. NO. - I.P. - 5202-2

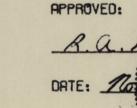
PAN-NEVADA INCORPORATED

EFFIE FAY GROUP, TP. 45N, R63E, SEC. 24 4 25 ELKO COUNTY, NEVADA



FREQUENCIES: 0.31-5.0 CPS

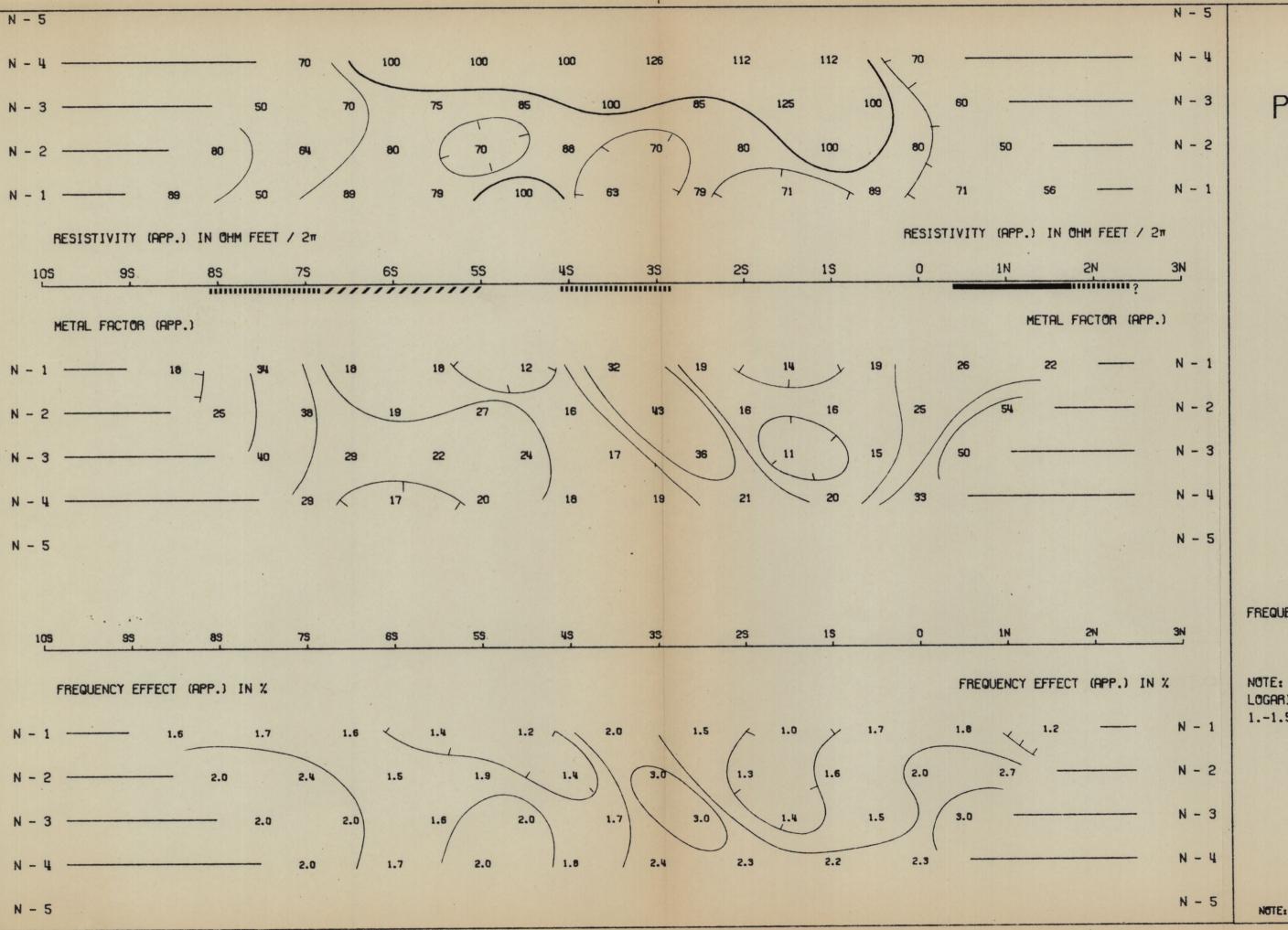
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CONTOURS AT NOTE: LOGARITHMIC INTERVALS 1.-1.5-2.-3.-5.-7.5-10

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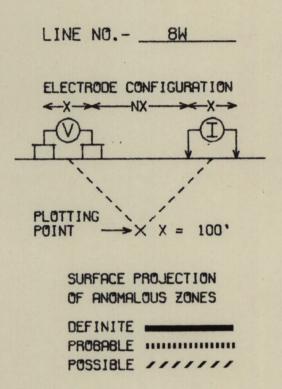
INDUCED POLARIZATION AND RESISTIVITY SURVEY



DWG. NO.- I.P.-5202-3

PAN-NEVADA INCORPORATED

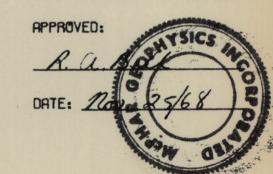
EFFIE FAY GROUP, TP. 45N, R63E, SEC. 24 & 25
ELKO COUNTY, NEVADA



FREQUENCIES: 0.31-5.0 CPS

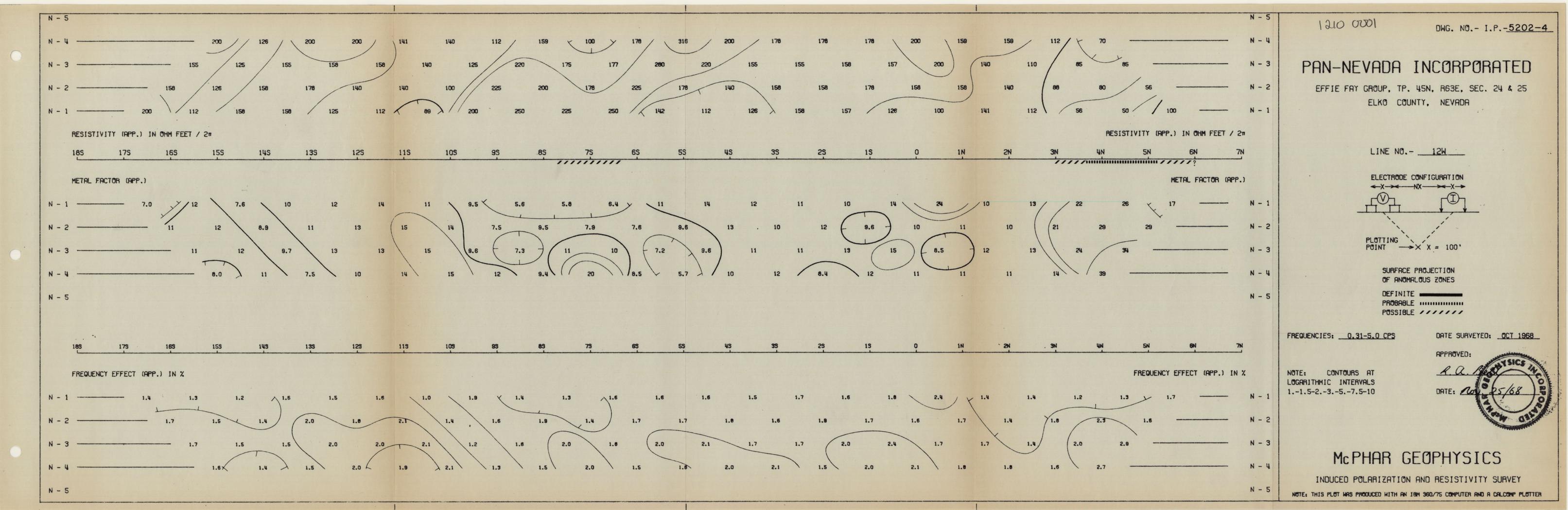
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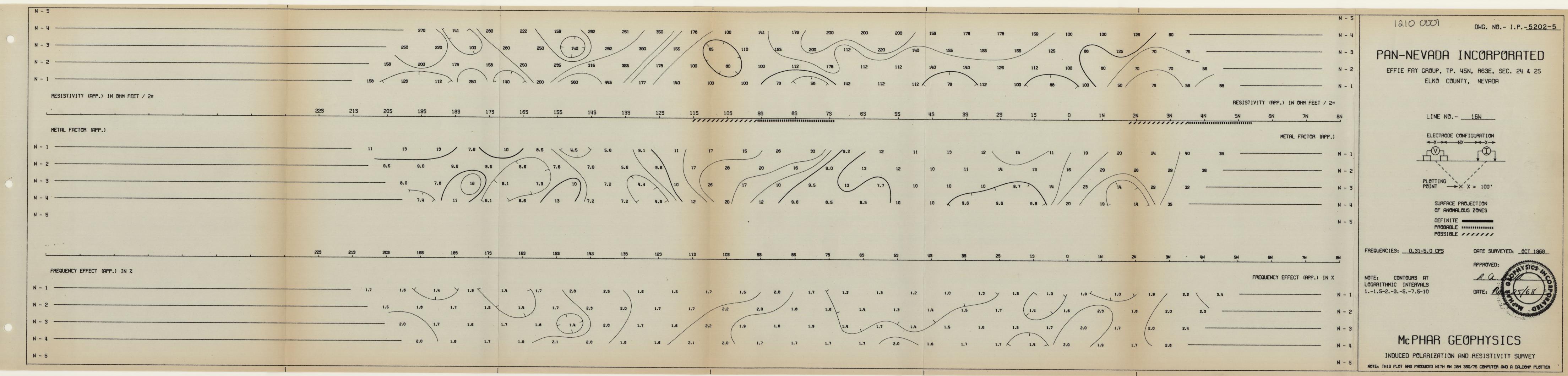
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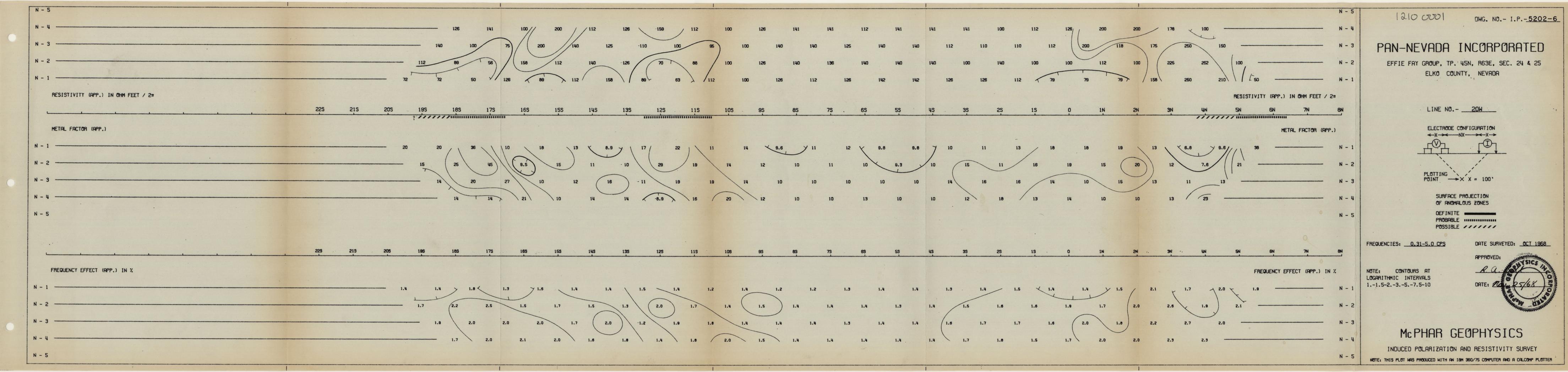
Mc PHAR GEOPHYSICS

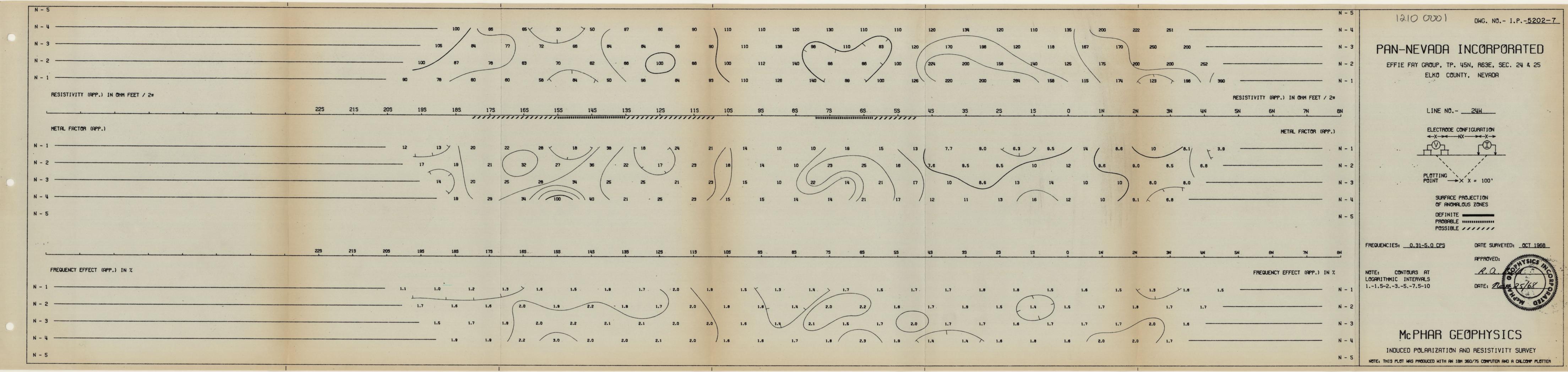
INDUCED POLARIZATION AND RESISTIVITY SURVEY

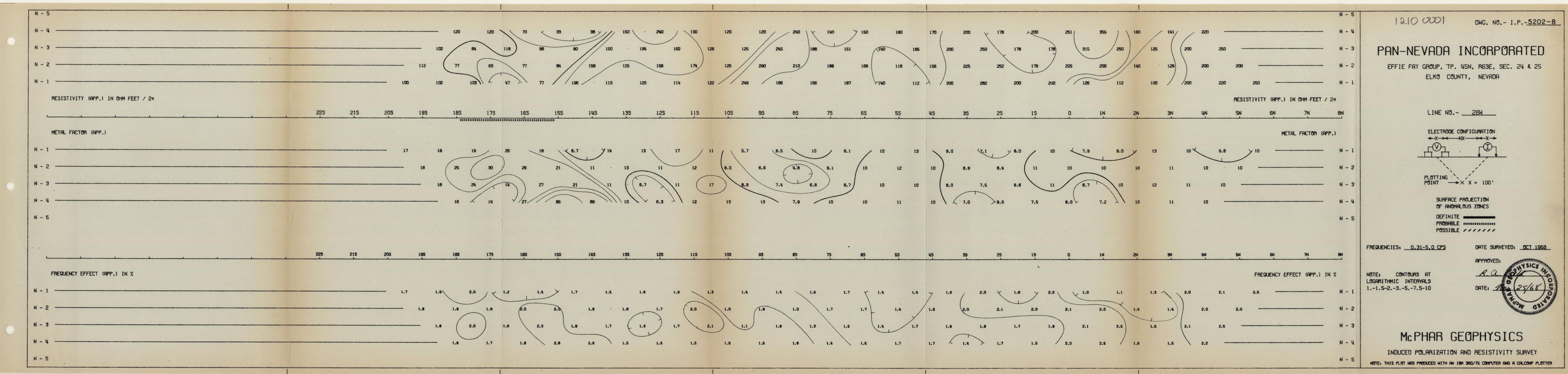


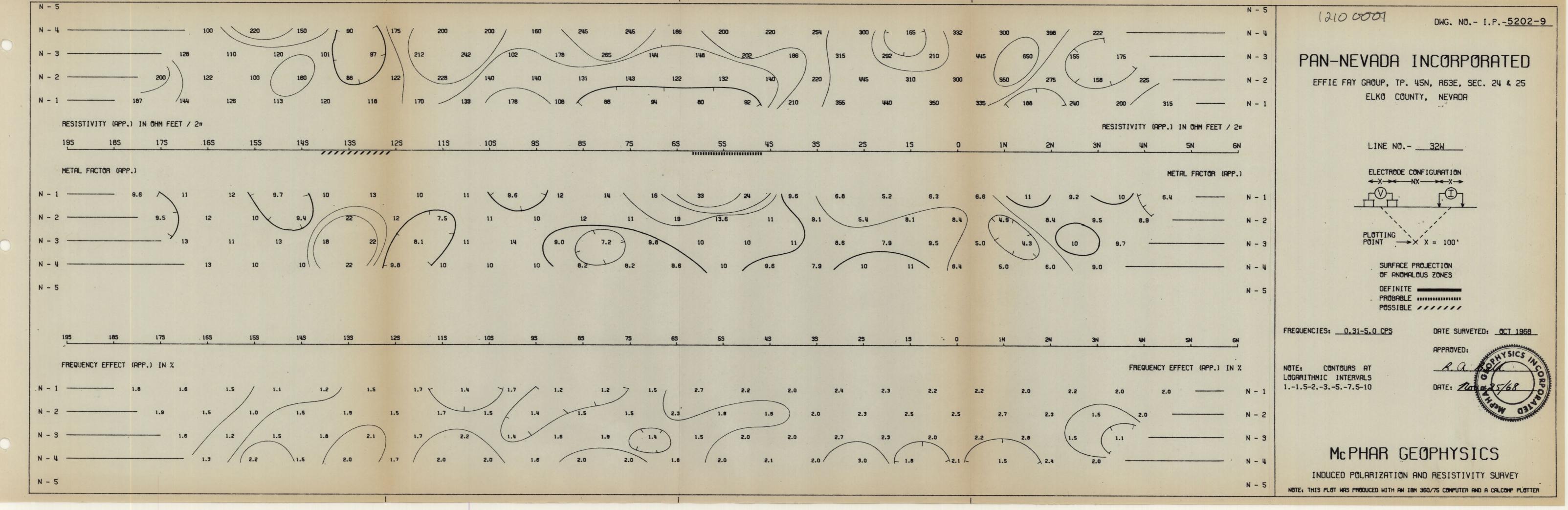


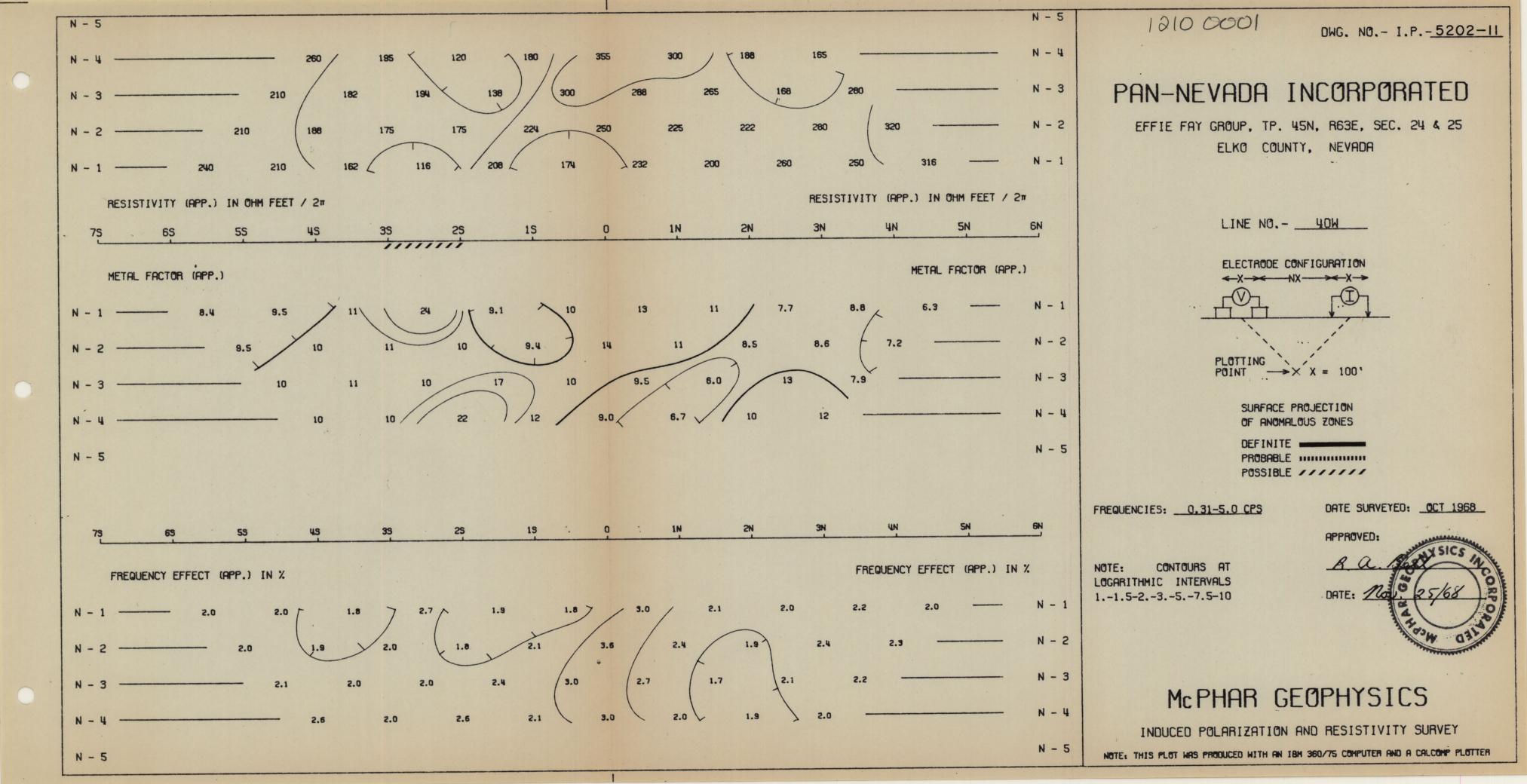








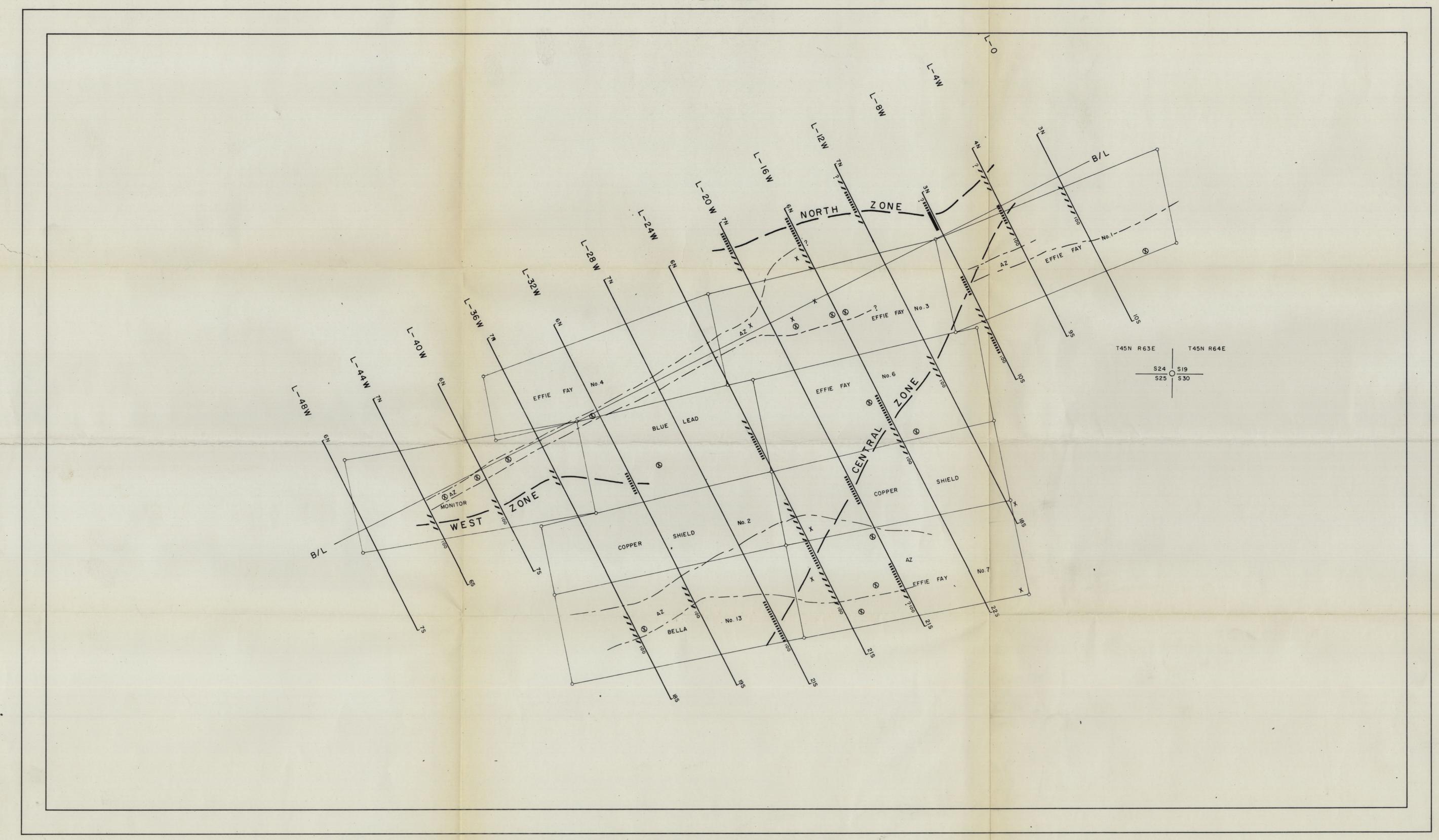




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INDUCED POLARIZATION AND RESISTIVITY SURVEY

PLAN MAP



SURFACE PROJECTION OF ANOMALOUS ZONES

indicates spread used.

DEFINITE
PROBABLE
POSSIBLE
Number at the end of anomaly

PAN-NEVADA INCORPORATED

T.45N, R.63E, S.24 & 25 MDBM ELKO COUNTY NEVADA EFFIE FAY GROUP

SCALE

ONE INCH EQUALS THREE HUNDRED FEET

NOTE:
AZ-ALTERED ZONE (or ALASKITE DIKE)
X -SULPHIDE

- INFERRED TREND OF I.P. ZONE

