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INDUCED POLARIZATION SURVEY

ACE, DEA, FARO AND VANGORDA AREAS, Y.T.

CONTENTS

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INTRODUCTION

An induced polarization survey has been carried out on portions of the Ace, Dea, and Faro properties of Anvil Mining Corporation. The survey also included three lines across the Vangorda ore body on behalf of Anvil Mining Corporation.

The lines at the Ace, Dea and Vangorda properties were assigned in order to determine whether sulphide ore bodies can be distinguished from graphitic formations by the induced polarization method. At the Faro property the lines were assigned as an extension of the induced polarization exploration program carried out during July, 1966.

Field work was carried out between October 6 and 20, 1966, inclusive. The equipment was operated by the author with the assistance of R.E. Chaplin and two men provided by Anvil.

SUMMARY AND CONCLUSIONS

The results of the survey indicate that the induced polarization method can be effectively used to detect sulphide ore bodies in areas where graphite is encountered. Although graphitic formations give rise to a fairly high percent frequency effect of between 12% and 20%, the response to ore bodies such as Faro or

Vangorda is even higher, being of the order of 25% to 35%. The resistivity measurements are also diagnostic insofar as the values for graphitic formations are lower than the values associated with sulphides. However, where graphite is associated with an ore body, such as at Vangorda, the resistivities are deceptively low and the identification of an ore body depends on the P.E.E. values.

The lines in the Faro area have disclosed four lower order P.F.E. anomalies. These anomalies, which are supported by corresponding decreases in resistivity, could be the expression of zones containing disseminated mineralization. The position of these features suggests the possibility of two mineralized trends, as outlined below under the heading RESULTS. Another mineralized trend could be inferred from the anomalous values at the south end of two of the lines at Faro. However, it is possible to speculate that these values are on the flank of a larger anomaly located to the south of the present program.

The Faro No. 2 zone produced a strong P.F.E. response at the north end of two of the lines on the Faro property.

INSTRUMENTATION

The induced polarization equipment was manufactured by Geoscience Incorporated of Lexington, Massachusetts. The Sender supplies a preset constant current that is applied to the ground through two electrodes. The voltage between two potential electrodes is passed into the Receiver. A meter is nulled at one frequency and gives a direct reading of the percent frequency effect at a second frequency. From the applied current and received potential, the apparent resistivity of the medium may be calculated.

FIELD PROCEDURE

The electrodes are in a collinear array, with the current electrodes separated by a distance "a". The potential electrodes are also separated by a distance "a". The nearest current and potential electrodes are separated by a distance "Na", where N = 1, 2 or 3. By varying N, the sender-receiver spacing, one obtains a depth-probing effect, since the effective depth of exploration varies with this spacing. The results are plotted at the intersection between 45 degree diagonal lines drawn from the mid-points of the sender and receiver dipoles. Percent frequency effect values are plotted below the reference line, resistivity values in ohm-feet above. The row of data nearest the reference line corresponds with N = 1 values, the second row N = 2 and the third N = 3. Although the values for a = 600 are plotted at the N = 3 level, these points are N = 1 for the 600 foot electrode spacing.

On the line segments overlying graphitic formations it was very difficult to read the instrument and many of the N = 2 and N = 3 values were not obtained. This difficulty, which results from a lack of sufficient voltage between the receiver electrodes, is to be expected in areas of very low resistivity. It was found to be easier to read a N = 1; a = 600 value than the equivalent N = 3; a = 300 value on the line segments where the resistivity is low. The progress of the work was slower than anticipated because of this problem.

RESULTS

Line 216W traverses over a DDH at 16N which was drilled 500 feet with a south dip of 45 degrees. This hole penetrated graphitic phyllite from the base of overburden to the bottom of the hole. Near this hole the P.F.E. response, at the N = 1 level, is from 12% to 17% with somewhat higher but more doubtful values indicated at the deeper levels. The corresponding resistivity values are very low; that is less than 3 ohm-feet.

The resistivity values increase sharply to the south, between 9N and 6N, but the P.F.E. values remain fairly high. This indicates a loss of graphite and, to account for the higher than usual P.F.E. values, the presence of disseminated mineralization. Such an interpretation is supported by the geologic data insofar as pyrrhotite has been observed along the foliations of the phyllite to the south of the DDH at 16N.

Errors in chainage were encountered on this line. To the south of 16N the distance between stations is less than 100 feet. In fact 16N is probably no more than 1350 feet north of the base line. To the north of 16N the distance between stations is, in places, from 110 to 120 feet. The errors in chainage were not corrected and the stations plotted on the enclosed section agree with the stations existing on the ground.

DEA

The resistivity values which are less than 10 ohm-feet and P.F.E. values between 12% and 20% across line 44E are diagnostic of the graphite formation known to underlie this line. Along the N = 1 row of values some of the resistivities are somewhat higher and the corresponding P.F.E. values somewhat lower than would be expected over graphitic formations. This is probably due to the effects of overburden except at the north end of the line where possibly the boundary of the graphite zone is reached.

There are doubtful indications of a mineralized zone within the graphite formation between 10S and 14S. The quality of the data here is poor because the very low resistivities make the observation of the P.F.E. values difficult. A speculative interpretation would indicate the mineralized zone to be at a depth of from 500 to 700 feet below 12S.

VANGORDA

The boundaries of the sulphide mass, as indicated by drill holes, are shown in red on the enclosed sections.

The delineation of this ore body is complicated by the presence of graphitic formations to the south of and associated with the sulphide mass. Notwithstanding the influence of the graphite, the sulphide mass is more or less outlined by the P.F.E. values. Evidently an ore body such as Vangorda gives rise to P.F.E. values of over 25% whereas for graphitic formations the response is generally less than 20%.

The data from line 0 suggest that the ore body dips to the south. The high P.F.E. values from 6N to 9N N.B. could be the expression of another mineralized zone but are more likely caused by near surface mineralization between 0 and 6N. At line 12E the ore body appears to dip north and possibly extend, at depth, beyond the limits delineated by the drilling program. * From 5N on to and possibly beyond 11N it is possible that a mineralized zone exists at a depth of from 500 to 800 feet. N.B. Line 24E is similar to line 0 insofar as high P.F.E. values are recorded to the north of the outlined sulphide mass. As in the case for line 0, these values could indicate another mineralized zone but are more likely the expression of near surface mineralizations between 3S and 3N.

FARO

The No. 2 zone is indicated by high P.F.E. values and a decrease in resistivity on the north end of line 48W and the north part of line 40W. From the arrangement of the values on the section for 40W it can be postulated that the causative body lies between 6S and 3S and in depth between 0 and 300 feet.

There are four lower order P.F.E. anomalies, 18% to 22% values, with associated decreases in resistivity that can be interpreted as 2 disseminated mineralization trends. One of these trends intersects line 48W between 8S and 15S and line 40W between 10S and 15S. The other trend intersects line 48W between 40S and 43S and line 40W between 28S and 33S. At the south ends of line 40W and line 32W there are P.F.E. values of similar magnitude. These could also be interpreted as an expression of a disseminated mineralization trend or alternately as the flank of a more pronounced anomaly located south of the present survey. The same magnitude P.F.E. values recorded between 4S and 1S on line 48W are probably due to the influence of the No. 2 zone which lies to the north.

RECOMMENDATIONS

Induced polarization surveying is recommended as an exploration method for this area. In the interests of economy a wider spacing such as a = 400 should be employed and only N = 1 and N = 2 values recorded for reconnaissance programs. For delineating known mineralized zones, a shorter spacing should be used. This was not done at Vangorda because it was desired to observe the response of such an ore body on a reconnaissance program.

The suggested zones of disseminated mineralization at Faro warrant investigation by stripping or drilling. The first choice for this work is between 41S and 42S on line 48W.

Respectfully submitted

D.A. McDonald

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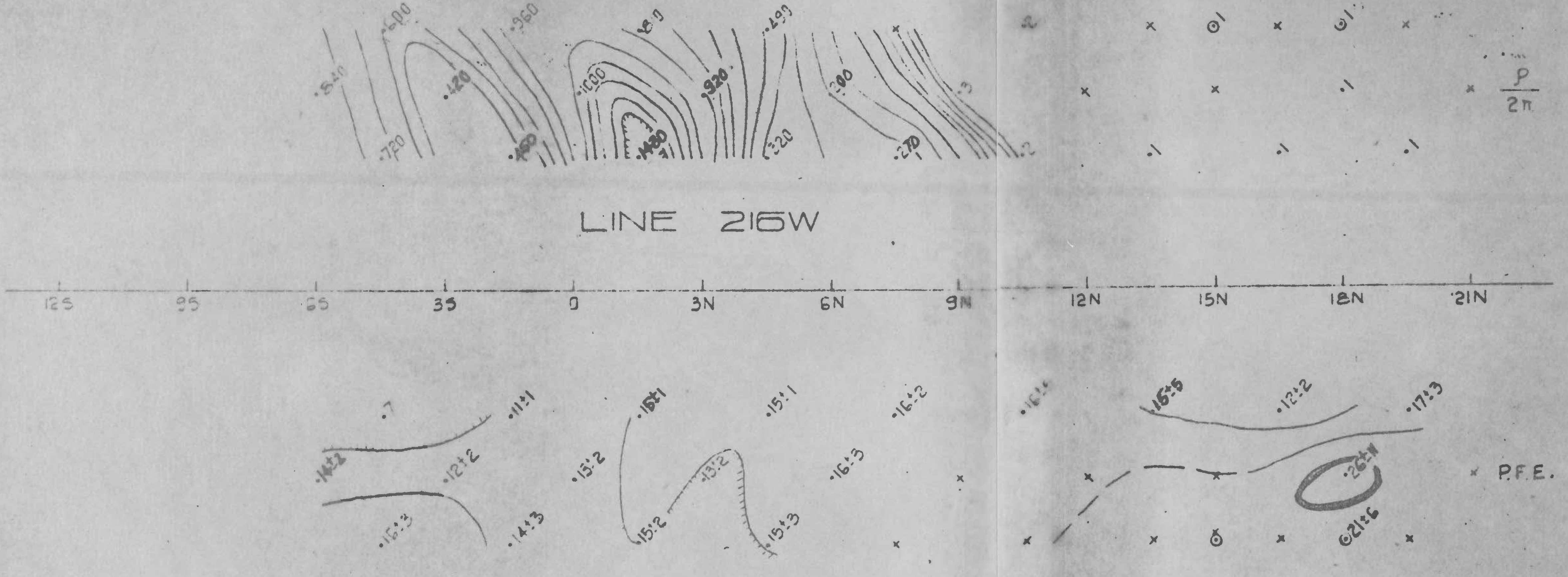
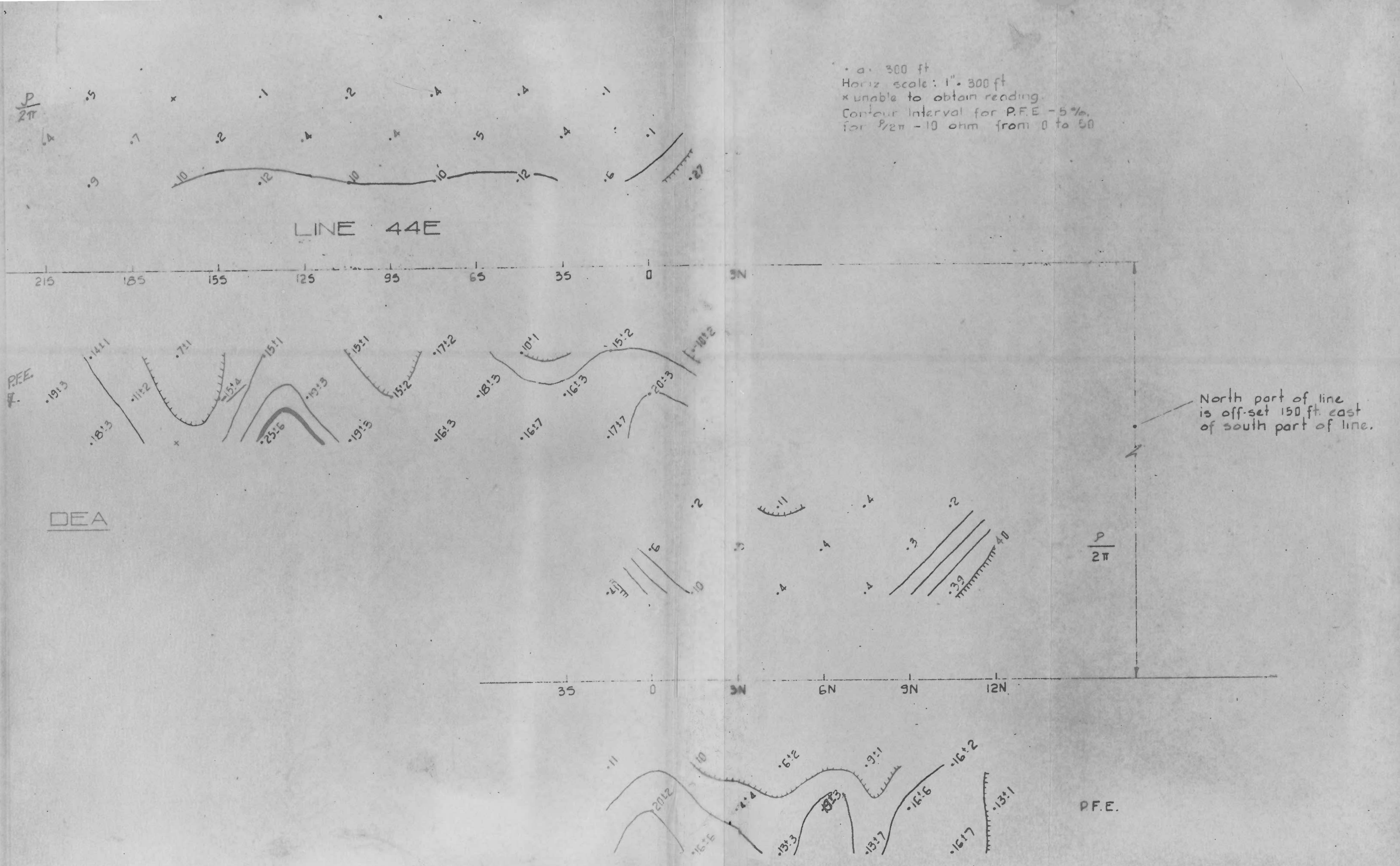
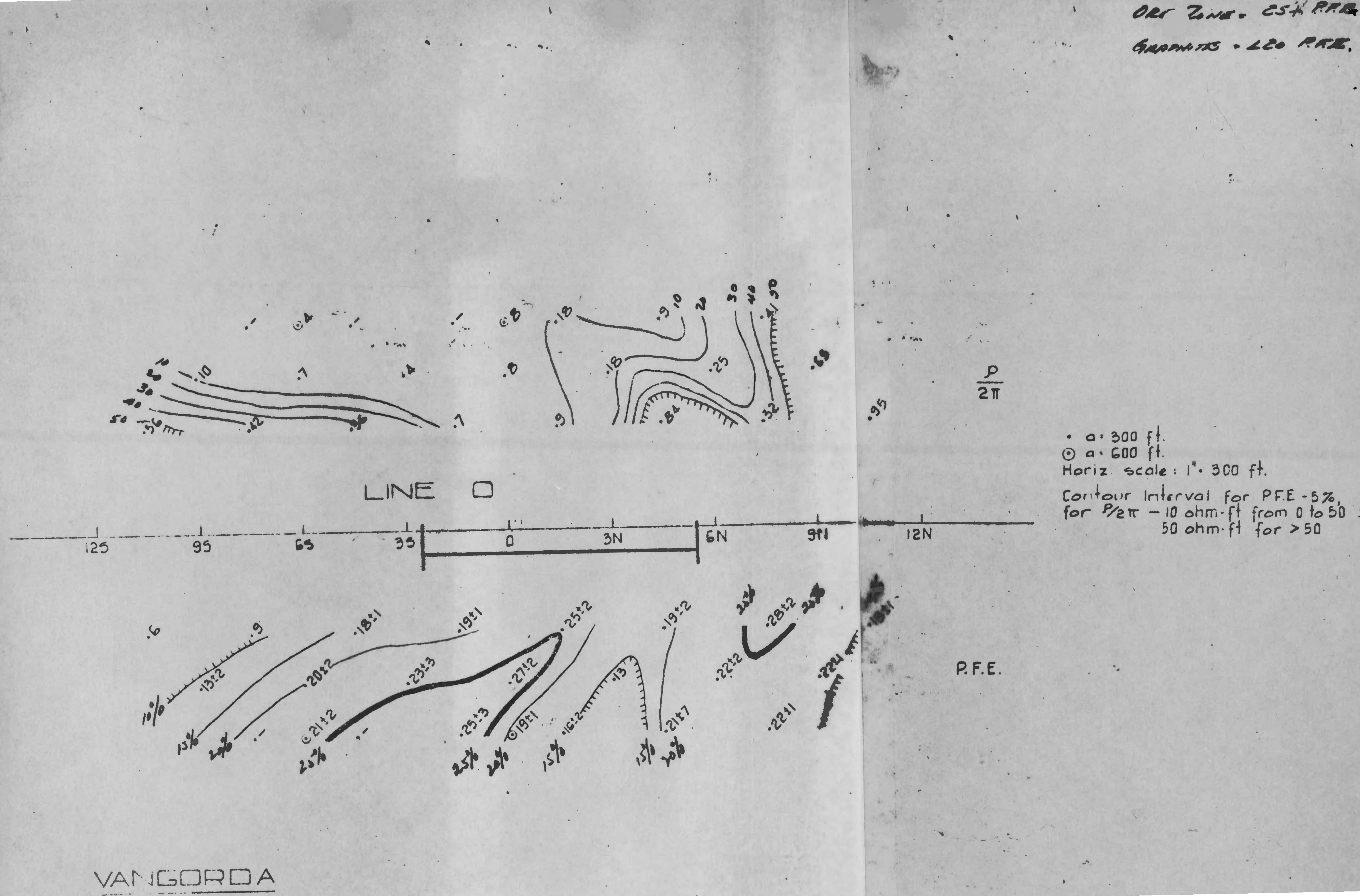


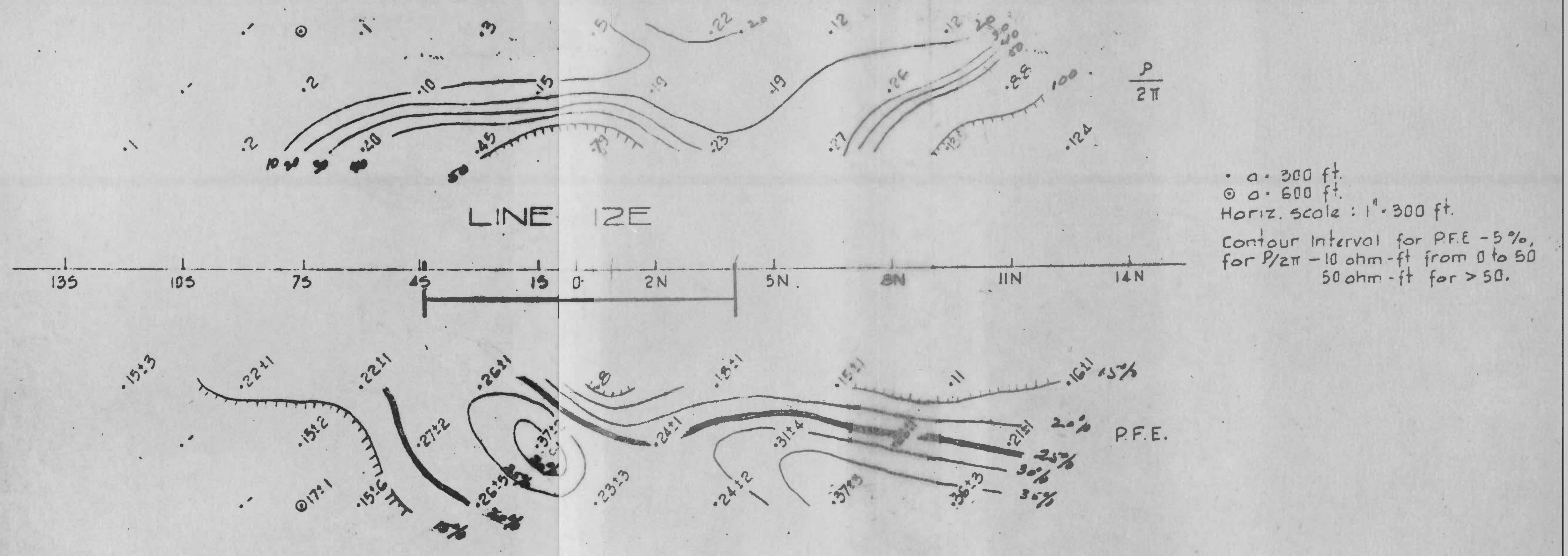
• a = 300 ft.
⊙ a = 600 ft.
Horiz. scale: 1" = 300 ft
× unable to obtain reading
Contour interval for PFE - 5%,
for ρ/2π - 10 ohm-ft from 0 to 50
-50 ohm-ft betw. 50 & 200
-100 ohm-ft for > 200

ACE



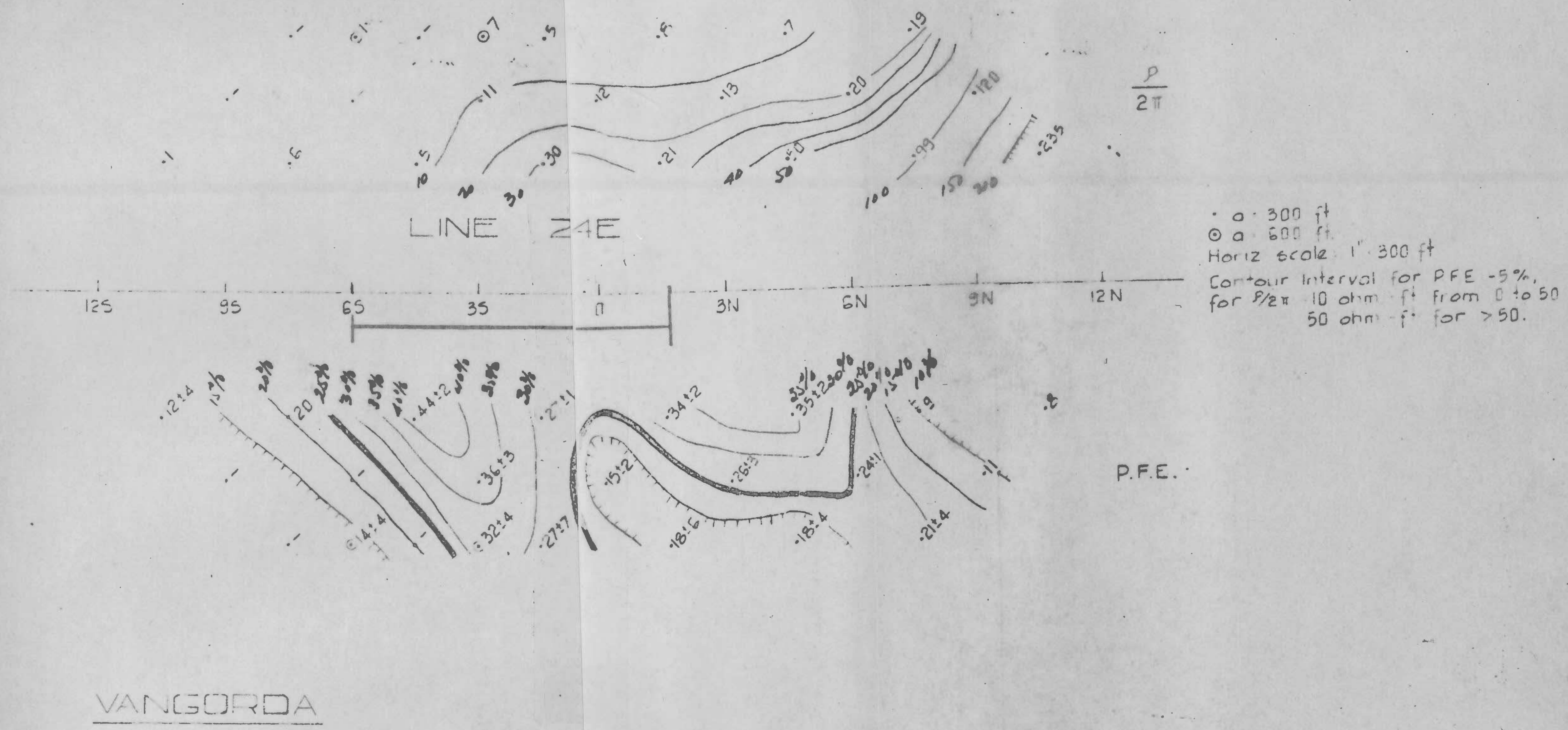
a = 300 ft
Horiz. scale: 1" = 300 ft
x unable to obtain reading
Contour Interval for P.F.E. - 5%,
for ρ/2π - 10 ohm from 0 to 50
ρ/2π
LINE 44E
21S
18S
15S
12S
9S
6S
3S
0
3N
6N
9N
12N
P.F.E.
DEA
North part of line is off-set 150 ft. east of south part of line.


ORE ZONE = 25% P.F.E.
GRAPHITE = 20 P.F.E.
ρ/2π
• a = 300 ft.
⊙ a = 600 ft.
Horiz. scale: 1" = 300 ft.
Contour Interval for P.F.E. - 5%,
for ρ/2π - 10 ohm-ft from 0 to 50
50 ohm-ft for > 50
LINE O
12S
9S
6S
3S
0
3N
6N
9N
12N
P.F.E.
VANGORDA



ρ/2π
LINE 12E
13S
10S
7S
4S
1S
0
2N
5N
8N
11N
14N
P.F.E.
• a = 300 ft.
⊙ a = 600 ft.
Horiz. Scale : 1" = 300 ft.
Contour Interval for P.F.E. – 5 %,
for ρ/2π – 10 ohm-ft from 0 to 50
50 ohm-ft for > 50.

VANGORDA



LINE 24E
12S
9S
6S
3S
0
3N
6N
9N
12N
ρ/2π
P.F.E.
· a · 300 ft
⊙ a · 600 ft
Horiz scale 1" · 300 ft
Contour Interval for PFE -5%,
for ρ/2π 10 ohm ft from 0 to 50
50 ohm ft for >50.
VANGORDA