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HEINRICHS GEOEXPLORATION COMPANY
MINERAL ENGINEERING CONSULTANTS AND CONTRACTORS
GEOPHYSICAL, GEOLOGICAL AND ECONOMIC APPRAISALS
TUCSON, ARIZONA

WALTER E. HEINRICHS, JR.
E. GROVER HEINRICHS

PHONE: MAIN 2-4202
806-808 WEST GRANT ROAD
MAIL: P. O. BOX 5671

September 6, 1962

Mr. E. F. Reed
Chief Geologist
Inspiration Consolidated Copper Co.
Inspiration, Arizona

Re: Mary Claim Group
Pima District
Pima County, Arizona

Dear Bert:

This will bring matters up to date regarding repeat work done at our own expense following our initial report of May, 1962 and supplemental report of June-July, 1962.

What was done was a little more detail hand magnetics and a repeat of I.P. line 2 (rather than line 6 as was previously discussed or mentioned). This decision was based on what hopefully might add most to the overall picture.

The new results do not materially change the situation. Actually the magnetic feature now appears to be more of a NW-SE striking nose, possibly an extension of the stronger anomalism to the west. Conceivably, it could be an alluvial concentration of magnetite sand, but more likely is a bedrock effect. If bedrock, it most probably dips NE and is bounded on both sides by faulting. Thus, it could be a large dike or sill, but seems more apt to be a separate igneous or sedimentary block. Magnetic depth thumb rule indication is less than 1000'.

I.P. line 2 repeat data essentially agrees well with the previous results, indicating modest I.P. effects in almost exactly the same place as before, even though the new line was centered and offset 1000' further east. Therefore, the probability of valid data is good. Unquestionably, there is a low resistivity zone which appears to follow approximately along the NW part of the triangle which is the SE¼ of the SE¼ of the section, although the coverage on the south, southeast and east may be a little marginal.

In any event, this is the feature of potential interest. On the negative side, it could also be due to black sand and/or a channel of wet alluvium below the water table, but somehow, (like the magnetics) seems to be more of a bedrock effect. There is an apparent general NE-SW lineation to much of the electrical data which is normal to the immediate magnetic strike, but parallel to the trend of the nearby exposures and Cooper's San Xavier Thrust. This tends to indicate fault effects, and if so, also infers intersections with the magnetic lineations. Actually, there are a few regional magnetic suggestions and locally maybe even a very weak wiggle and bedrock scarp effect in the magnetics which conforms to NE-SW lineation. Electrically, there is some impression of easterly dip and northerly plunge with indications somewhat shallower than 1000'.

Considering the general situation in the Pima District and if the effects are due to a concentration of sulfides, this appears to be a pretty good wild-cat or blind drill hole target. If not, of course it will still be nice for everyone to learn more about what we can and cannot do with geophysics.

Attached are two (2) extra copies of this letter and three (3) copies each of the New Magnetic plot and composite profile and sectional data sheet of the repeat I.P. data on line 2.

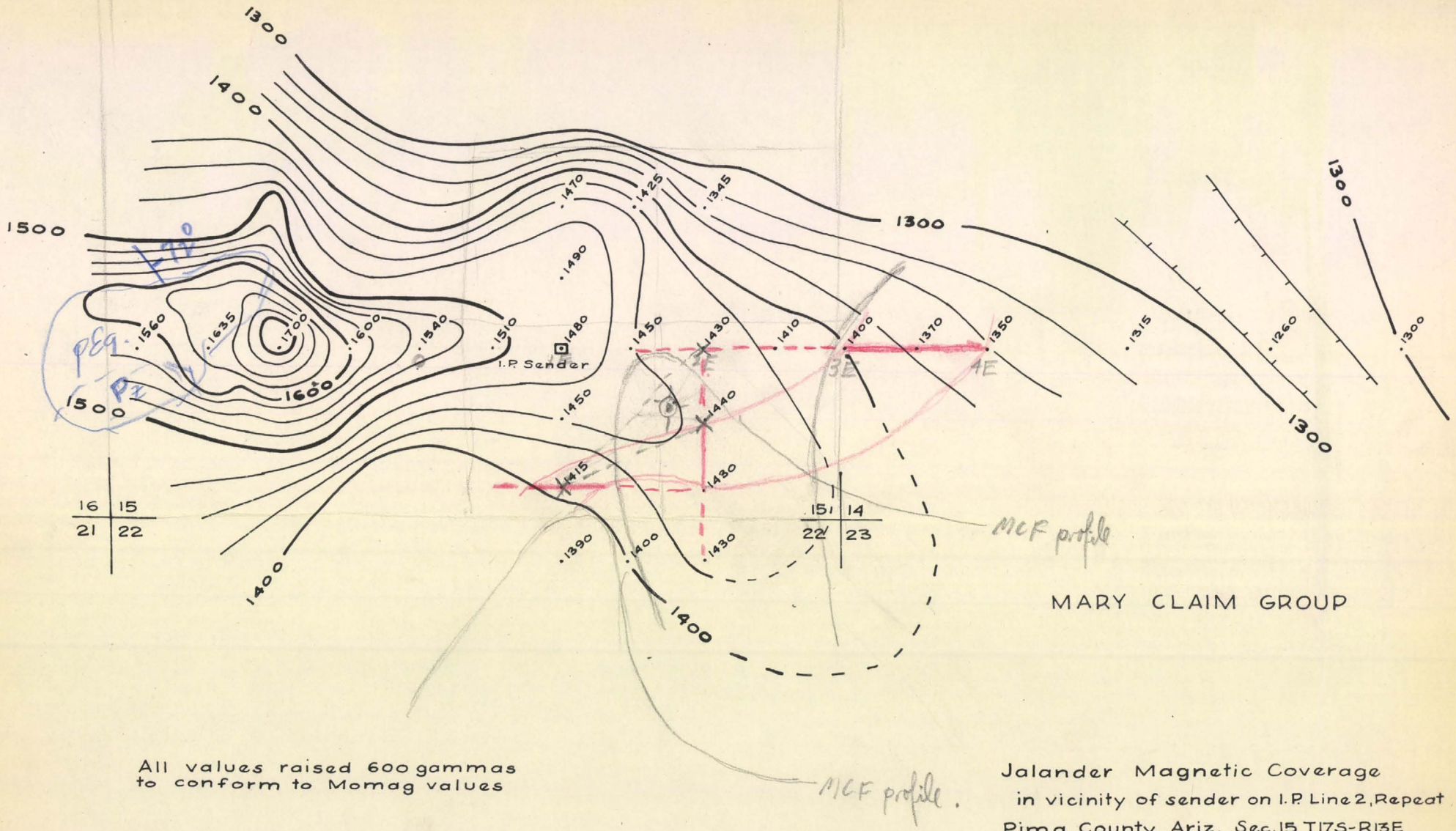
When convenient, I suggest we personally go over all of the data to date in detail with either yourself and/or Hugh.

Faithfully,

Heinrichs Geoexploration Company

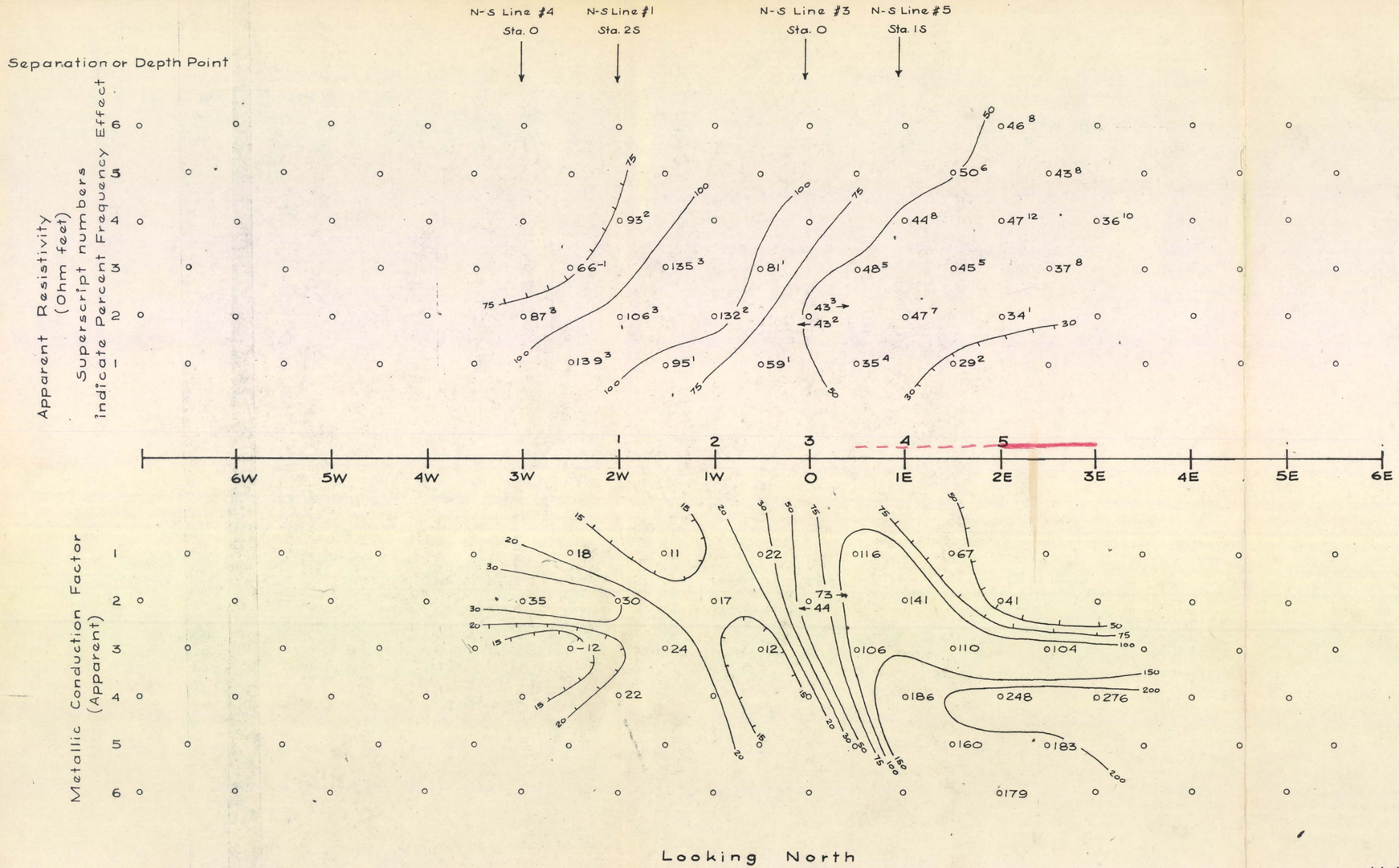
WEH:jmd
Encl: 2

Walter E. Heinrichs, Jr.
President



All values raised 600 gammas to conform to Momag values

Jalander Magnetic Coverage
in vicinity of sender on I.P. Line 2, Repeat
Pima County, Ariz. Sec. 15, T17S-R13E
for
INSPIRATION CON. COPPER CO.
by
Heinrichs Geoexploration Co.
1" = 1000 C.I. 25 gammas
Aug. 1962



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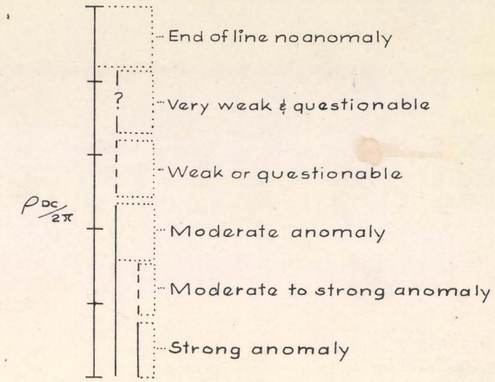


C.I. = Logarithmic

(( )) indicates questionable data

M.C.F.

MARY CLAIM GROUP AREA

SECTIONAL DATA SHEET

for

INSPIRATION CON. COPPER CO.

LINE No. 2 A, Repeat

INDUCED POLARIZATION SURVEY

HEINRICHS GEOEXPLORATION CO.

Scale 1" = 1000'

Date Aug. 1962

SUPPLEMENTAL INDUCED POLARIZATION

Mary Claim Group
Pima District, Pima County, Arizona

for
INSPIRATION CONSOLIDATED COPPER COMPANY
Inspiration, Arizona

COPY

June - July 1962

by
HEINRICHS GEOEXPLORATION COMPANY
P. O. Box 5671 Tucson, Arizona

INTRODUCTION

Attached are four copies each of the following:

1. Sectional data sheets and composite profiles of the new Line 6.
2. Third-separation level contours of P.F.E., M.C.F., and resistivity in ohm-feet rho DC/2pi of the area.
3. Self potential contours of the area.
4. Revised plan map of the area, including location of the new line, previous lines, magnetic contours, etc.

In order to better point up the anomalous zone, we have added dashed red lines to the sectional data sheets and correspondingly, to the new plan maps. These data can also be similarly added to the plan maps and sectional data sheets submitted previously with the original report.

CONCLUSIONS AND RECOMMENDATIONS

As stated before, we believe the coincidence of concentration of effects on several different lines and different methods in this one area, although weak as the interpretation grading system on the sectional data sheets indicate, still represent a definite anomaly. Data previous to Line 6 was mostly anomalous in the deepest and least reliable 5th and 6th separation levels. However, Line 6 shows an apparently related

effect somewhat shallower, maybe to as little as 500' deep. The higher P.F.E.'s farther west are tentatively disregarded because of the low M.C.F.'s and extremely high associated resistivities. The latter, apparently caused by outcropping limestone which gave considerable trouble in good-ground contact resistances. At some later date, we may try to repeat this part of the line in order to investigate how best to handle this sort of problem in the future.

Line 6 results further substantiate the mild magnitude, but definite S. P. low in the area.

The resultant center of all effects is now moved to the approximate center of the magnetic anomaly, about 125' SE of the location monument of Mary 22. Since the effects seem to coincide so well with the magnetic anomaly, considerations for a more accurate drill hole location might be based on a move to the exact location of the magnetic apex. This could be determined by a few quick NE - SW hand mag profiles across the anomaly.

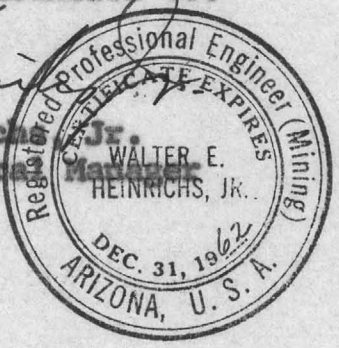
MISCELLANEOUS

For the record, on behalf of labor affidavit requirements to the claim owners, GEOEX personnel involved in the work were: Walter E. Heinrichs, Jr., E. Grover Heinrichs, Franklin A. Seward, Chris S. Ludwig, W. J. Keith, and J. E. Reeves., and the additional cost of this line exceeded $600.00 making a total cost of completed work applying toward 1961 - 1962 assessment in excess of $3,600.00.

Respectfully submitted,

HEINRICHS GEOEXPLORATION CO.

Walter E. Heinrichs, Jr.
President & General Manager



COPY

July 5, 1962
P. O. Box 5671
Tucson, Arizona

GEOPHYSICAL SURVEY

MARY CLAIM GROUP

Pima District, Pima County, Arizona

for
INSPIRATION CONSOLIDATED COPPER COMPANY
Inspiration, Arizona

COPY

May 1962

by
HEINRICHS GEOEXPLORATION COMPANY
P. O. BOX 5671 TUCSON, ARIZONA

TABLE OF CONTENTS

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Recommendations & Conclusions	1
Results	3

Attachments:

5 Sectional Data Sheets

5 composite profiles

1 Plan Map

COPY

INTRODUCTION

During the period work was being done for you on the Fox Claim Group in the Pima District (our geophysical report of February - March 1962) we mentioned to Mr. Olmstead several other similar possibilities known to us in the district. The area of this report, Sec. 15, T 17 S, R 13 E, is one of these wherein some potentially interesting magnetic anomalism had been previously obtained for other clients. Bed rock exposures are few and neither definitely encouraging nor discouraging. Therefore, in order to further appraise the area and the possible economic significance of the magnetic indications, further geophysical reconnaissance by induced polarization methods had been recommended to determine if there was any associated concentration of sulfides.

Accordingly we were authorized to obtain a 60 day option from the owners on behalf of Inspiration and field work started immediately on 2 May and continued through completion on 18 May. A total of 5 lines were run, three on 1000' dipole spacing and two on 500', giving approximately 28,000' of profile information at depth.

RECOMMENDATIONS AND CONCLUSIONS

While results did not give positive-strong indications of definite major sulfide concentration well within our penetration limits, nevertheless, a very interesting, and possibly

significant correlation was obtained near the NW corner of the SE¼ of the SE¼ of the section. Here the definite NW-SE trending magnetic high of about 100 gammas relief coincides well with a somewhat broader, but similar trending self potential low of 25 to 50 millivolts relief, and in the same area near the intersection of I. P. lines 2 and 5, we have weak, but definite indication of sulfide effects increasing with depth. The latter interpretation is made from a fair concentration of several data points which appear to be positively above background level for the area as well as being in the range of probable sulfide indication. However, these data also seem to be barely within our apparent range of penetration depth for 1000' dipole spacing in this area and therefore also where the data is probably the least reliable.

Based on a rule of thumb depth to cause estimate of 1000' +/- 25% for the magnetic feature, the above inferences are not at all unreasonable. Although the absolute magnitude of the S. P. low is similar to the approximate degree of background variation possible, it is felt to be too broad and too regular to be merely background effect. Furthermore, such an effect if not merely background, would have a good chance to be due to oxidizing sulfide.

In view of the fair speculative potential apparently still remaining in the Pima District, it is felt that these results at least warrant trying to hold the area for the time being.

The not too strong absolute magnitude indications may be due to detectibility depth as much as anything and if so, must be somewhat over ridden by the good multiple correlation which even if only coincidental, cannot be ignored.

At present, except for the little additional assessment expenditure now required, we are a little undecided if any more geophysics is justified for further ideas on whether or where to drill and wish to give this further consideration. In lieu of this, the intersection of I. P. lines 2 & 5 is the recommended site, with an initial planned depth of 1,500'. Dip effects are indefinite, but a NE component is tentatively assigned.

RESULTS

As shown on the attached plan map, I. P. Line #1 was centered 100' N of the common corner of Mary 9, 10, 11, 12 claims and extended north and south across the claim group. Line #2 ran east-west across the group centered 320' west of the common corner of Mary 6, 4, 21 & 23 claims. Line #4 centered 320' east of the common westerly corner of Mary 3 & 5 on their common side line and ran north and south. Line #3 ran north-south from electrode #4 of Line #2 near the middle of the common side line of Mary 21 & 23 and Line #5 north-south from electrode #5 of Line #2, 360' east of the common corner of Mary 21, 22, 23 & 24. Lines #1, #2 & #5 used a 1,000' electrode-dipole interval and Lines #3 & #4, a 500' interval. Geology and topography are from U.S.G.S. Bull. 1112-C by Cooper, 1960.

Please note for plotting convenience, that the Sectional Data Sheets for only the 500' dipole interval lines 3 & 4, are plotted at 1" = 500' and must be looked at accordingly. All of the rest of the data are plotted at 1" = 1,000'.

Referring to the Sectional Data Sheets and composite profiles, the highest resistivity noted is 402 units obtained on Line 4 over the small outcropping hill on Mary 3 Claim. Also, the over all resistivity level is generally higher in this vicinity as recorded on much of Line 4, near the center of Line 1, and the west end of Line 2. This is a normal expectation considering the somewhat siliceous nature of the outcropping material. From here, the near surface resistivities decrease strongly toward the east and also more or less decrease to the north and south reflecting effect of the lower resistivity alluvial cover in these directions. Except for the outcrop area and the south ends of Lines 3 & 5, the resistivities increase rather strongly with depth (especially toward the north and east). This suggests some combination of E-W or NW-SE trending structural and/or stratigraphic interface, a substantial relative difference in alluvial depth and/or composition and probable N or NE dip more or less in conformity with the reconnaissance magnetic picture.

Maximum I. P. background appears to be about 5% percent frequency effect. If this is correct, the strongest-shallowest,

consistent anomalism is on 7 depth points from the 4th to the 6th separation level centered at 2.25 E on Line 2, confirmed by three points on the 5th and 6th separation at station 2S on Line 5, with a similar effect also noted at 2N on Line 5. On Line 5 one interpretation of these effects is that of something lying below a flattish N-S interface, but on Line 2 the effect suggests more concentration in a possibly steeper attitude. Other very weak I. P. anomalism is noted on four points--2nd, 3rd and 4th separation at 0.5S Line 4 on the south west flanks of the major mag. high and 3 points on the 2nd and 3rd separation on the south end of Line 3.

Unfortunately, the relative lack of data points in the 5th and 6th separation makes it somewhat more difficult to present these data in plan and for similar reasons, and in order not to be misleading, they are only plotted on the sectional data sheets and are not shown on the composite profiles. The S. P. data is presented only on the composite profiles. Therefore, for the time being, a full analysis of all data requires simultaneous study of all three modes of data compilation. Such a study shows a broad S. P. low centering at the intersection of Lines 2 and 3 and striking NW-SE, about parallel, but offset a little en echelon from the mag high nearby. From this point, the strongest concentration of I. P. effects are 1,000' east and also about 1,400 ft. southeast (sort of bracketing the mag

high near its SE end). Such an S.P. offset, from experience, is not considered unusual or at all unfavorable.

Although additional significant factors may be involved in the data, the above summarizes those which are felt most important for the present.

Heinrichs Geoexploration personnel involved in the work were Fred Armstrong, James Reeves, Chris S. Ludwig, David F. Graff, W. J. Keith, Irene Bucher, Grover and Walter Heinrichs. Cost of the survey to date exceeded $3,000.00.

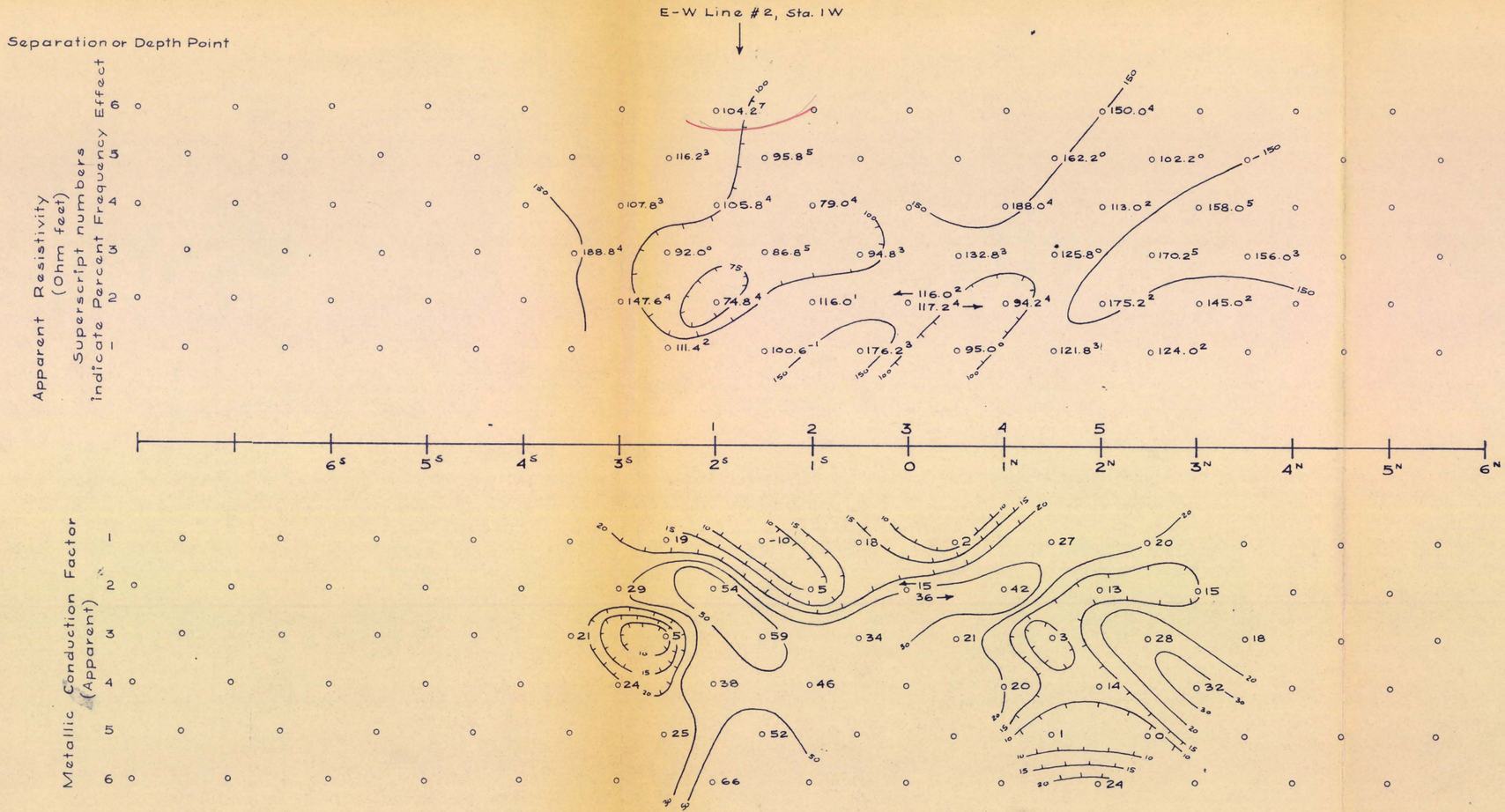
Respectfully submitted,

HEINRICHS GEOEXPLORATION COMPANY

Walter E. Heinrichs, Jr.
President & General Manager

Registered Professional Engineer (Mining)
CERTIFICATE EXPIRES
WALTER E. HEINRICHS, JR.
DEC. 31, 1962
ARIZONA, U.S.A.

26 May 1962
P. O. Box 5671
Tucson, Arizona



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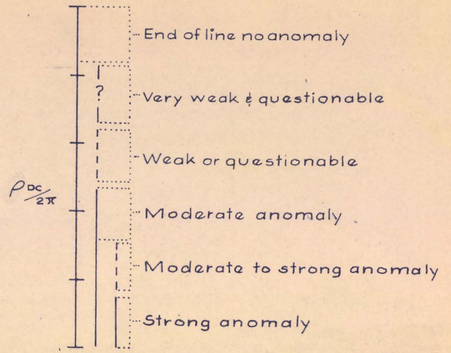


C.I. = Logarithmic

(( )) indicates questionable data

M.C.F.

Mary Claim Group Area

SECTIONAL DATA SHEET

for

INSPIRATION CON. COPPER CO.

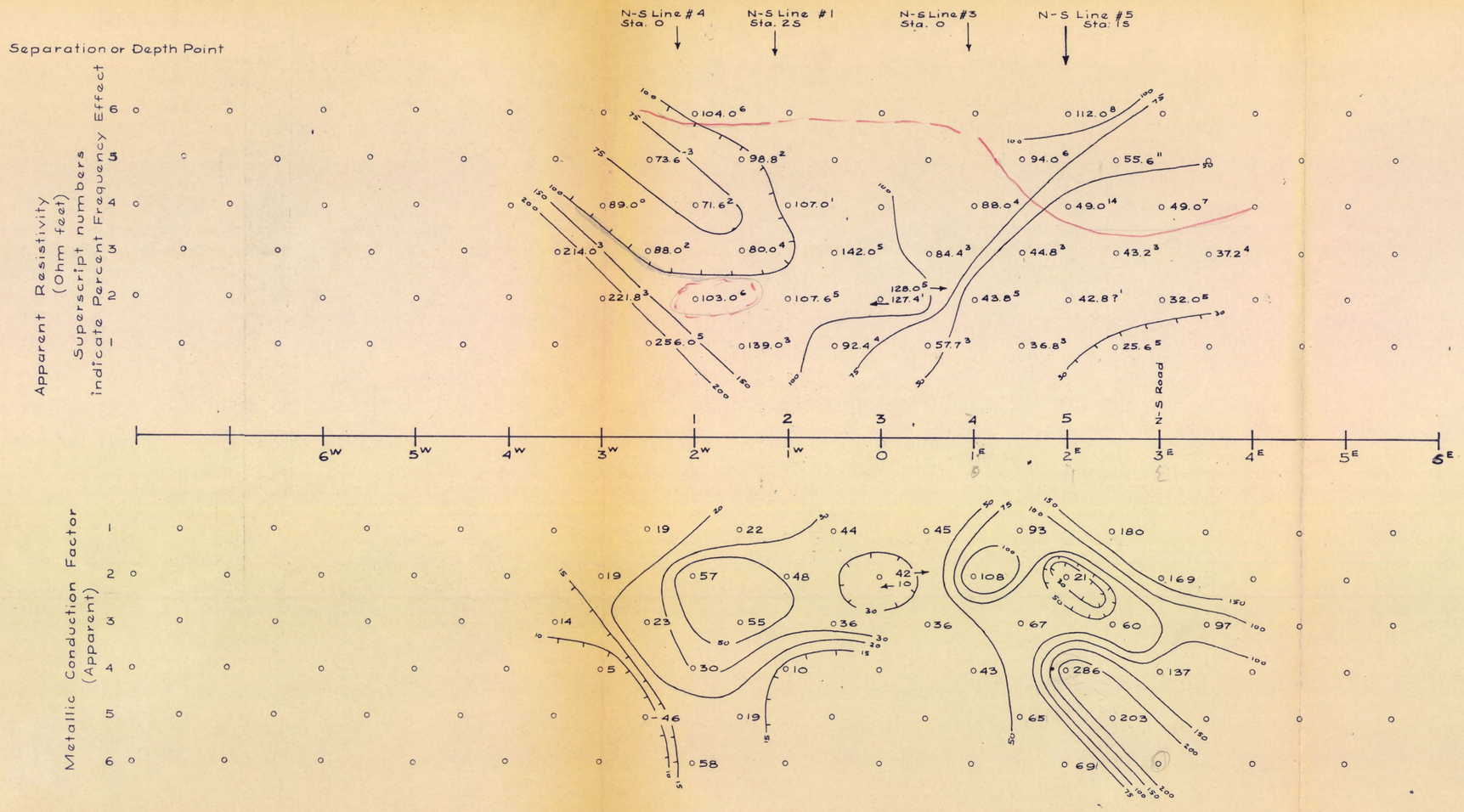
LINE No. 1 Spr. 1

INDUCED POLARIZATION SURVEY

HEINRICHS GEOEXPLORATION CO.

Scale 1" = 1000'

Date May 1962



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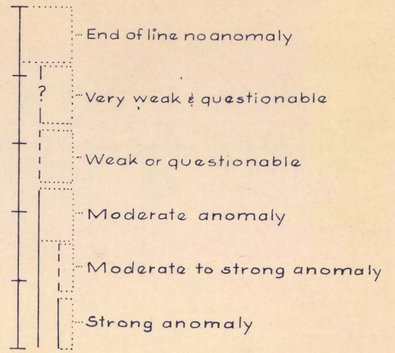


C.I. = Logarithmic

(( )) indicates questionable data

M.C.F.

Mary Claim Group Area

SECTIONAL DATA SHEET

for

INSPIRATION CON. COPPER CO.

LINE No. 2 Spr. 2

INDUCED POLARIZATION SURVEY

HEINRICHS GEOEXPLORATION CO.

Scale 1" = 1000'

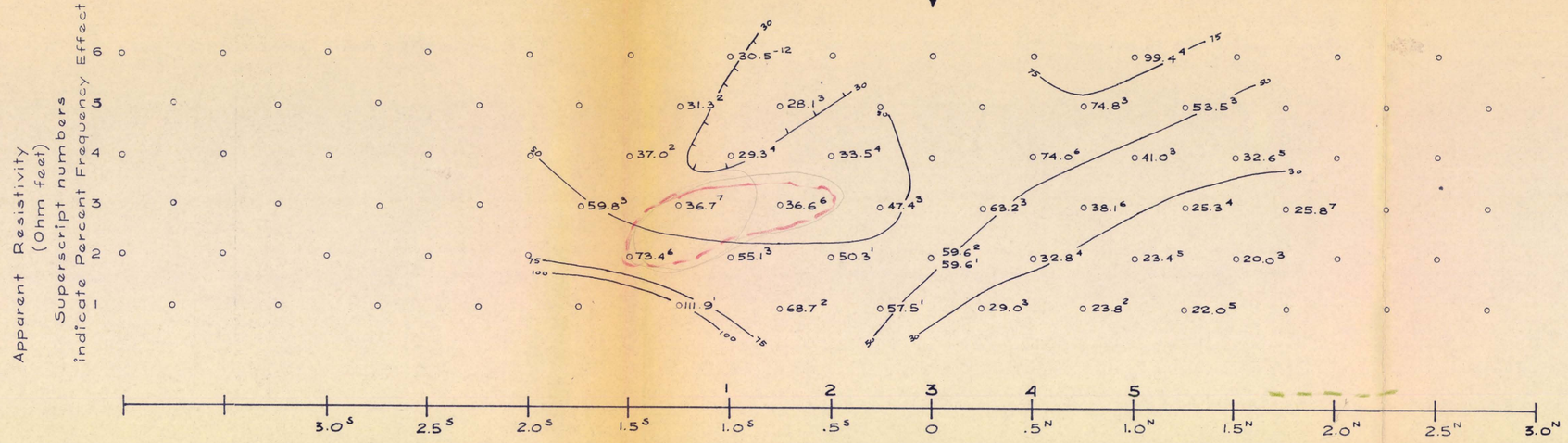
Date May 1962

E-W Line 6 Sta 1E

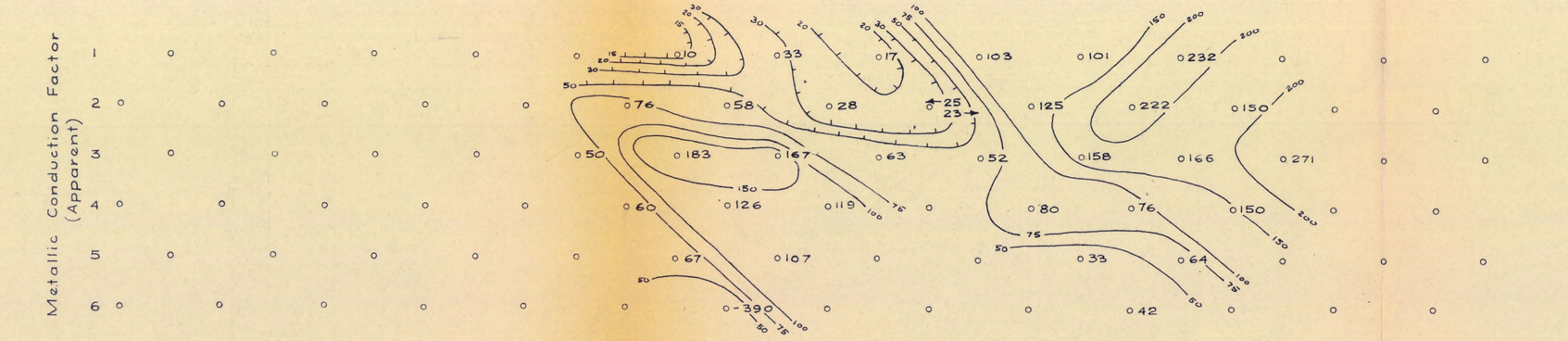
E-W Line #2, Sta. 1E

Separation or Depth Point

Apparent Resistivity (Ohm feet) Superscript numbers indicate Percent Frequency Effect

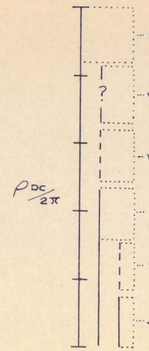


Metallic Conduction Factor (Apparent)



Looking West

INTERPRETATION LEGEND



C.I. = Logarithmic

(( )) indicates questionable data

M.C.F.

Mary Claim Group Area

SECTIONAL DATA SHEET

for

INSPIRATION CON. COPPER CO.

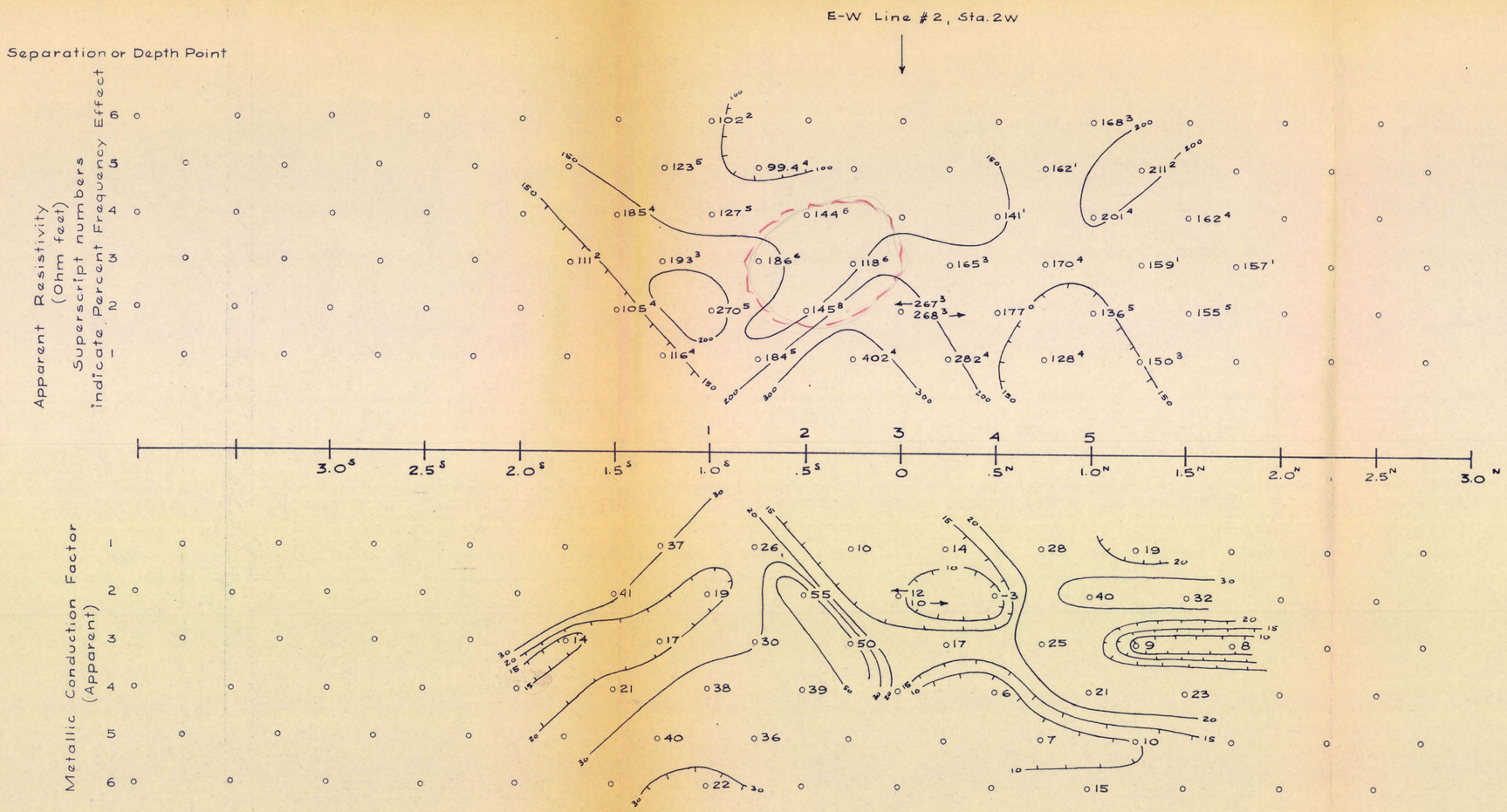
LINE No. 3 Spr. 3

INDUCED POLARIZATION SURVEY

HEINRICHS GEOEXPLORATION CO.

Scale 1"=500'

Date May 1962



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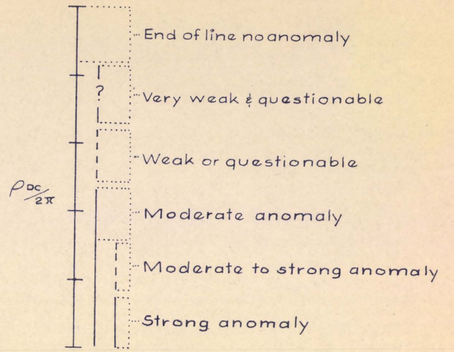


C.I. = Logarithmic

(( )) indicates questionable data

M.C.F.

Mary Claim Group Area

SECTIONAL DATA SHEET

for

INSPIRATION CON. COPPER CO.

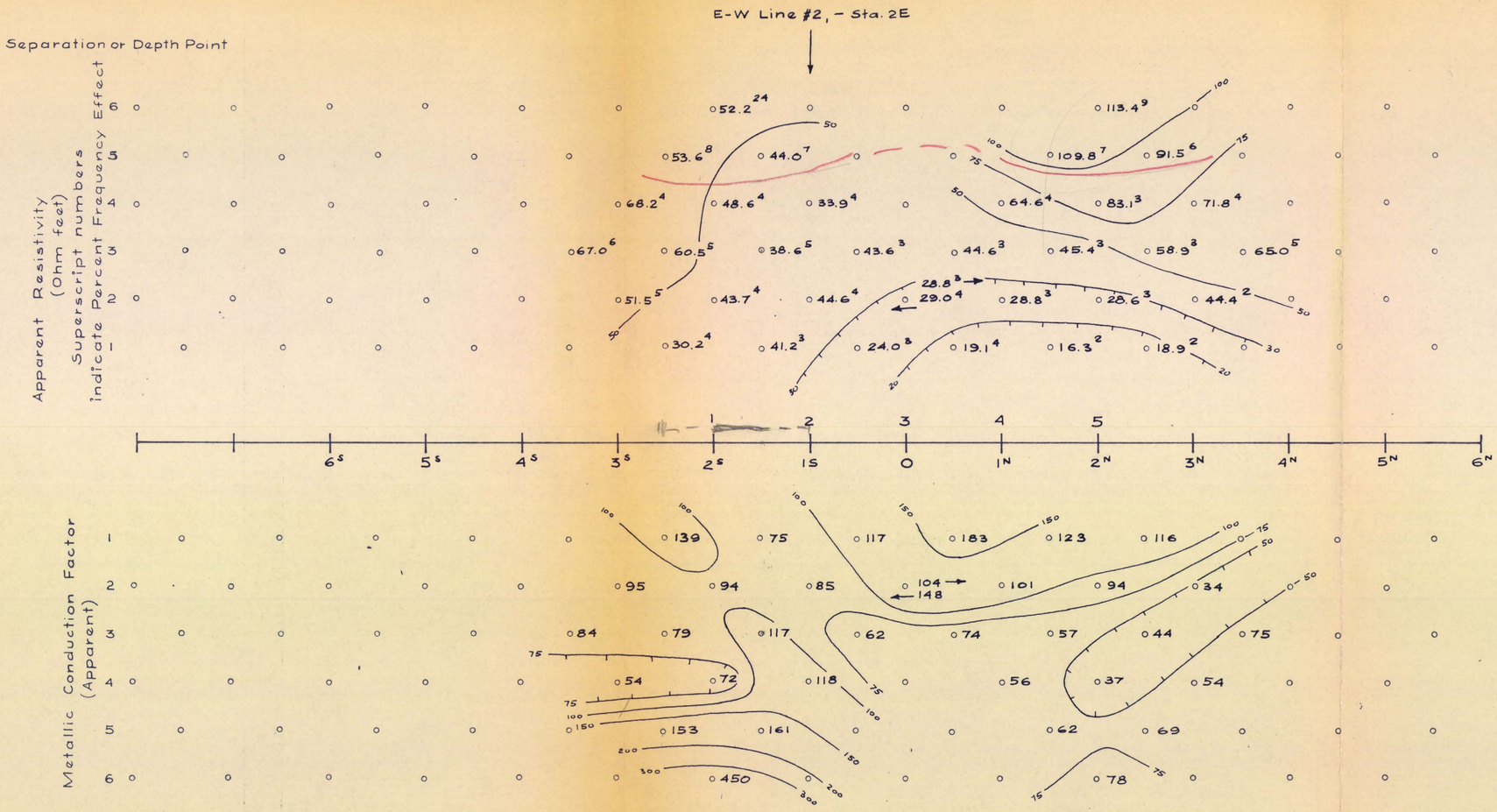
LINE No. 4 Spr. 4

INDUCED POLARIZATION SURVEY

HEINRICHS GEOEXPLORATION CO.

Scale 1" = 500'

Date May 1962



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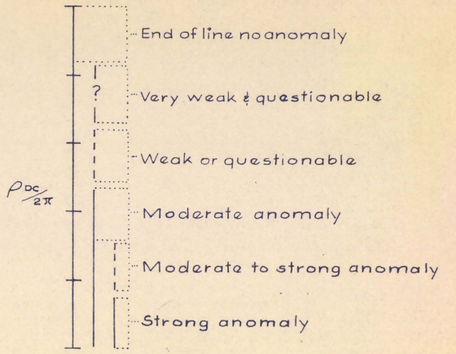


C.I. = Logarithmic

(( )) indicates questionable data

M.C.F.

Mary Claim Group Area

SECTIONAL DATA SHEET

for

INSPIRATION CON. COPPER CO.

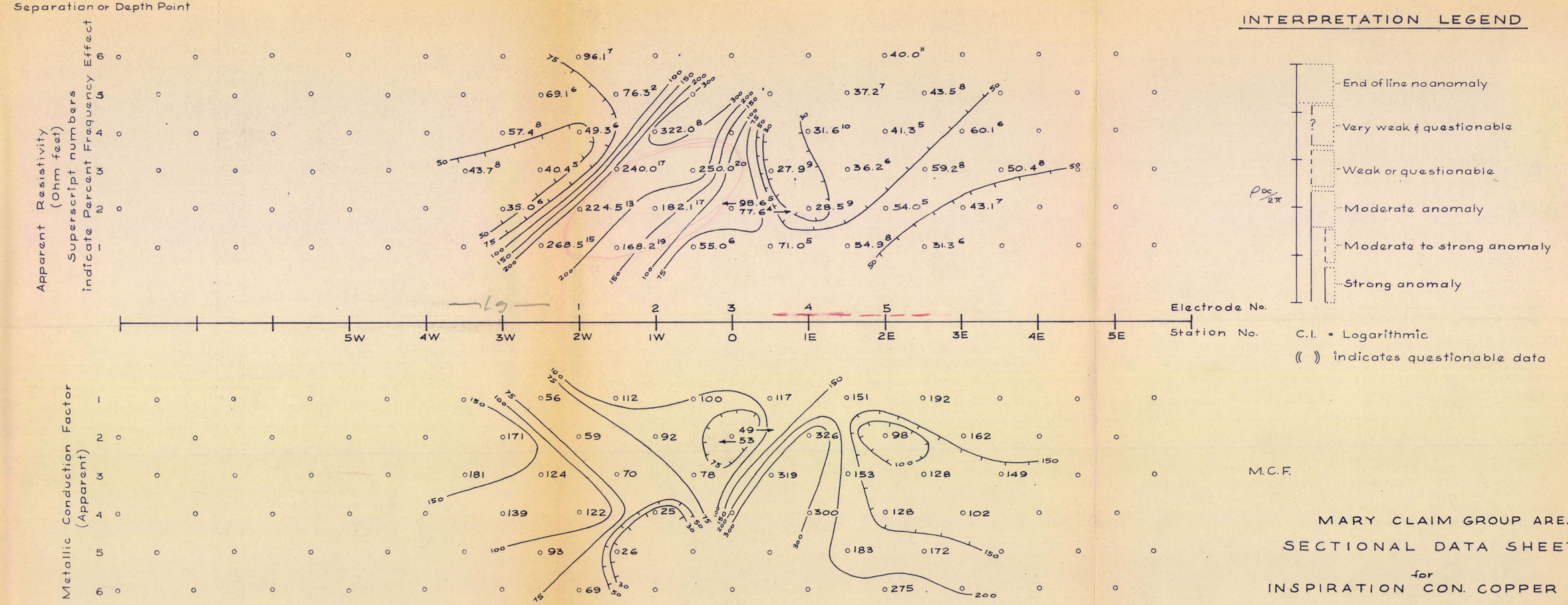
LINE No. 5 Spr. 5

INDUCED POLARIZATION SURVEY

HEINRICHS GEOEXPLORATION CO.

Scale 1" = 1000'

Date May 1962



INTERPRETATION LEGEND

C.I. = Logarithmic

(( )) indicates questionable data

M.C.F.

MARY CLAIM GROUP AREA

SECTIONAL DATA SHEET

for

INSPIRATION CON. COPPER CO.

LINE No. 6

INDUCED POLARIZATION SURVEY

HEINRICHS GEOEXPLORATION CO.

Scale 1" = 1000'

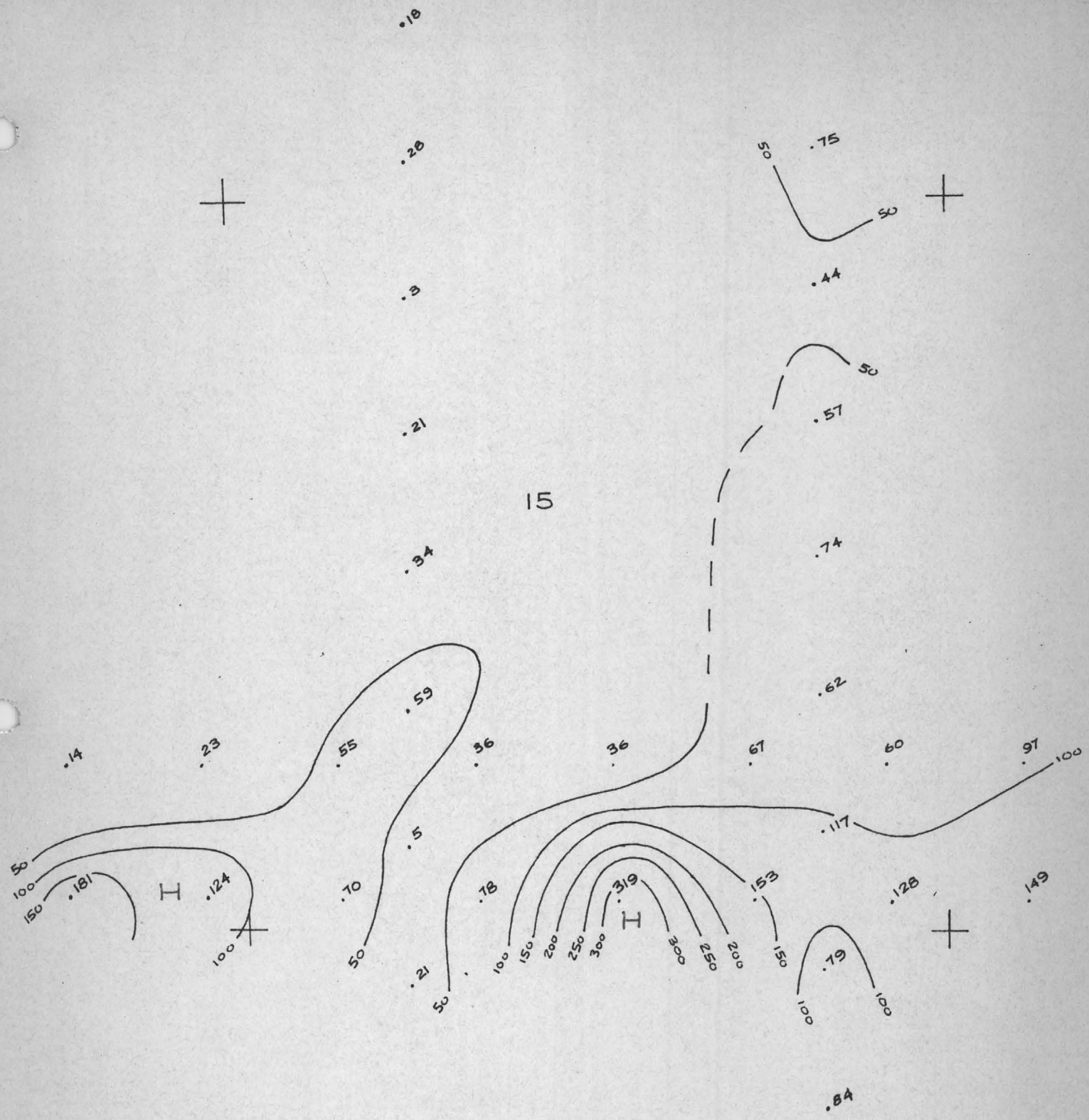
Date June 1962

LOCATION:

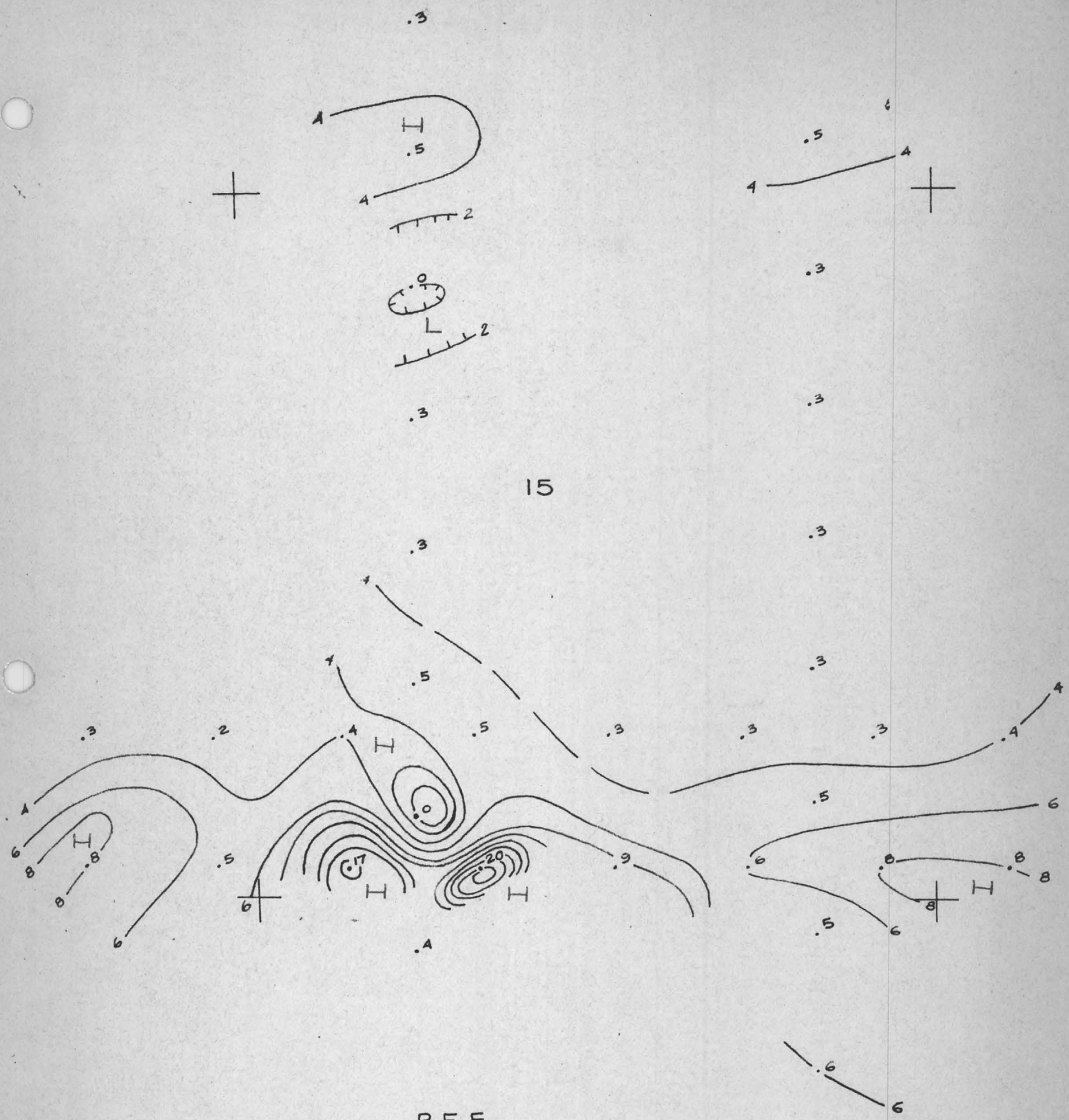
Station 0 3000' W. of E. Sec. Line

200' N of S. Sec. Line

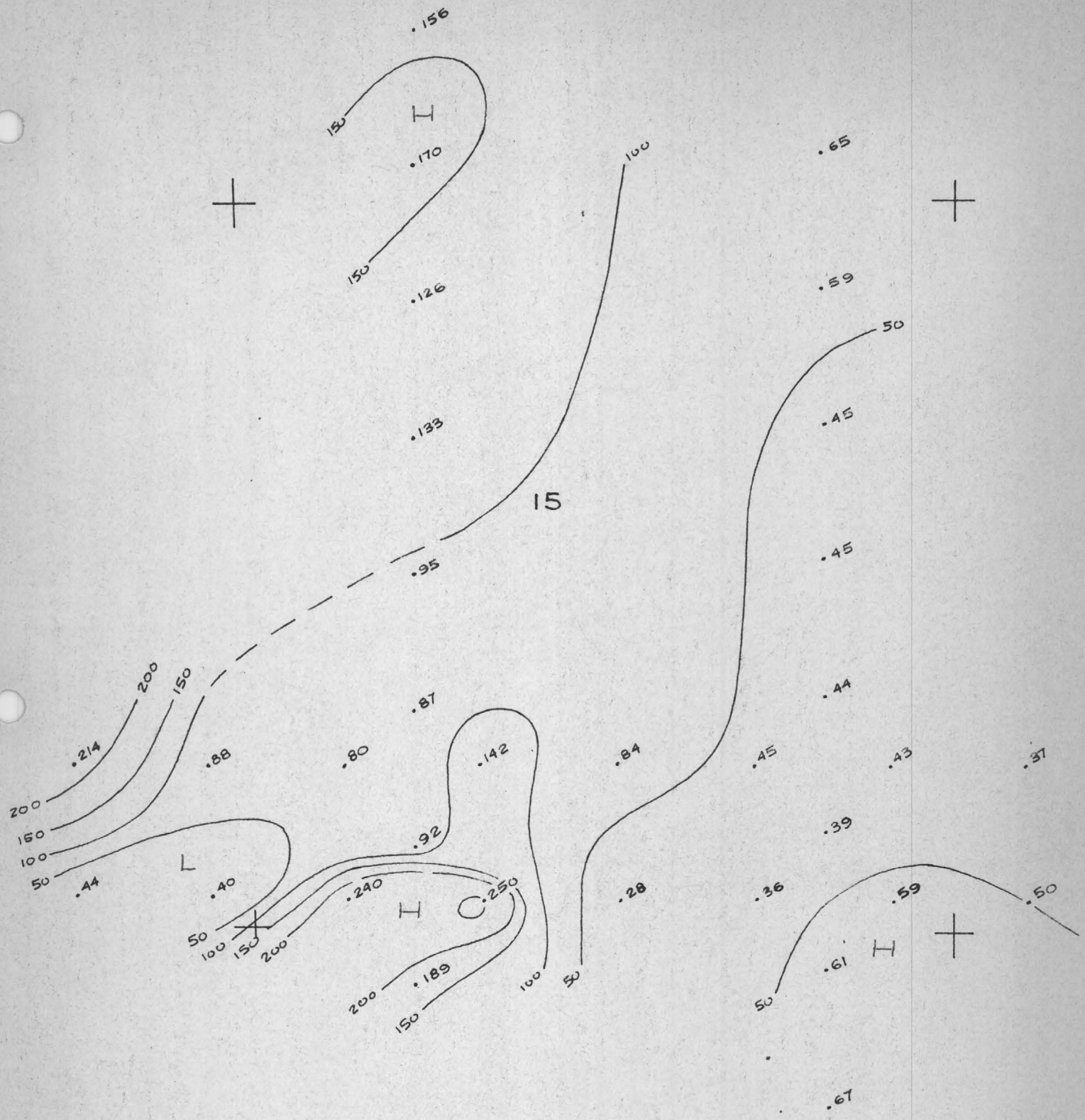
Line bearing approx. East-West



M. C. F.
3rd Separation I.P. Contours
Mary Claim Group
Pima Co., Ariz. T. 17S. - R. 13E.
for
INSPIRATION CON. COPPER CO.
by
Heinrichs Geoexploration Co.
Scale: 1" = 1000' C.I. = 50 units
June 1962



P. F. E.
3rd Separation I. P. Contours
Mary Claim Group
Pima Co., Ariz. T. 17 S. – R. 13 E.
for
INSPIRATION CON. COPPER CO.
by
Heinrichs Geoexploration Co.
Scale: 1" = 1000' C.I. = 2 units
June 1962



OHM FEET ρDC/2π

3rd Separation I.P Contours

Mary Claim Group

Pima Co., Ariz. T.17S. - R.13E.

for

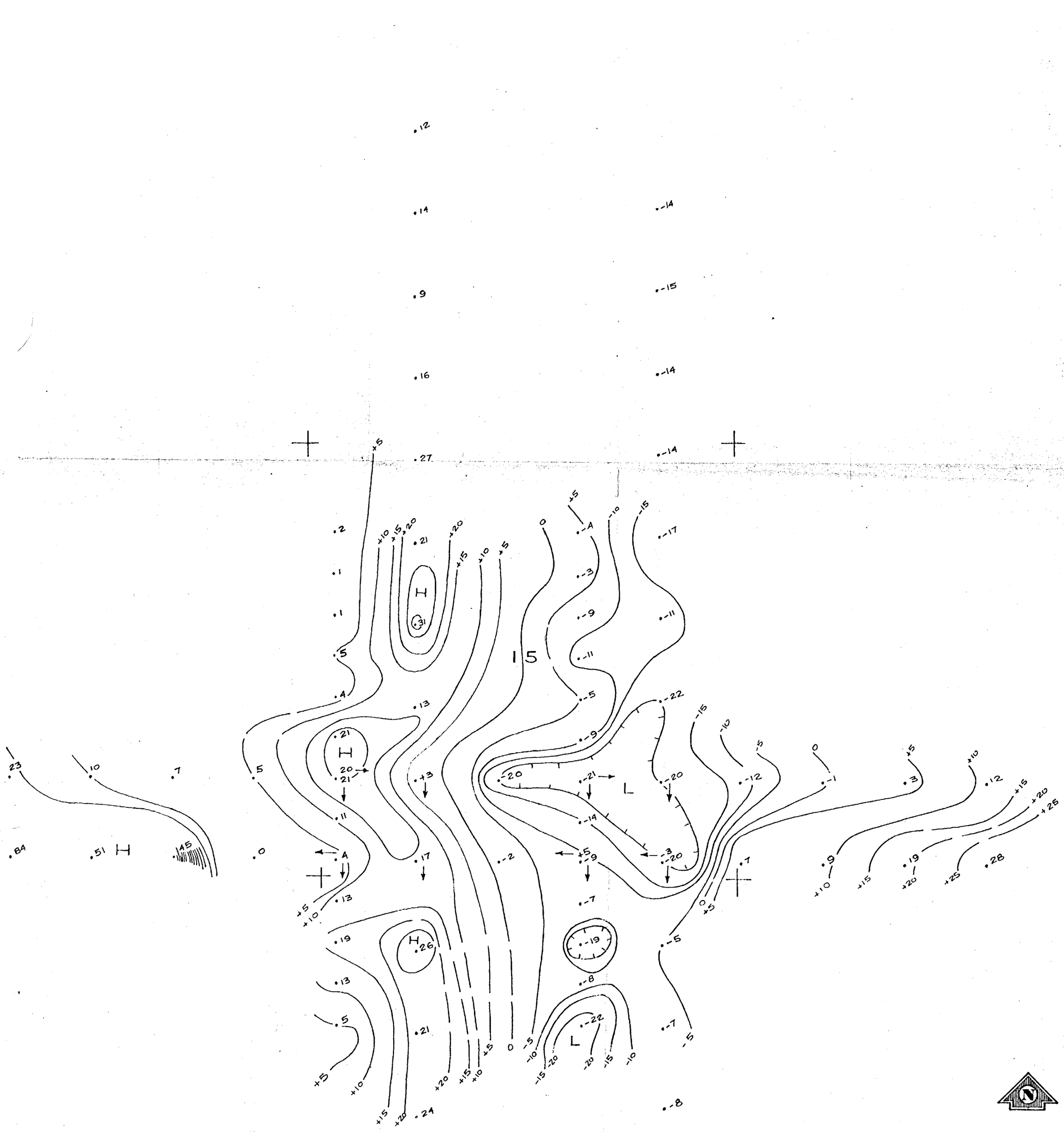
INSPIRATION CON. COPPER CO.

by

Heinrichs Geoexploration Co.

Scale: 1" = 1000' C.I. = 50 units

June 1962



S.P. Survey Contours
Mary Claim Group
Pima Co., Ariz. T.17S. - R.13E.
for
INSPIRATION CON. COPPER CO.
by
Heinrichs Geoexploration Co.
Scale: 1" = 1000' C.I. = 5 M/V
June 1962

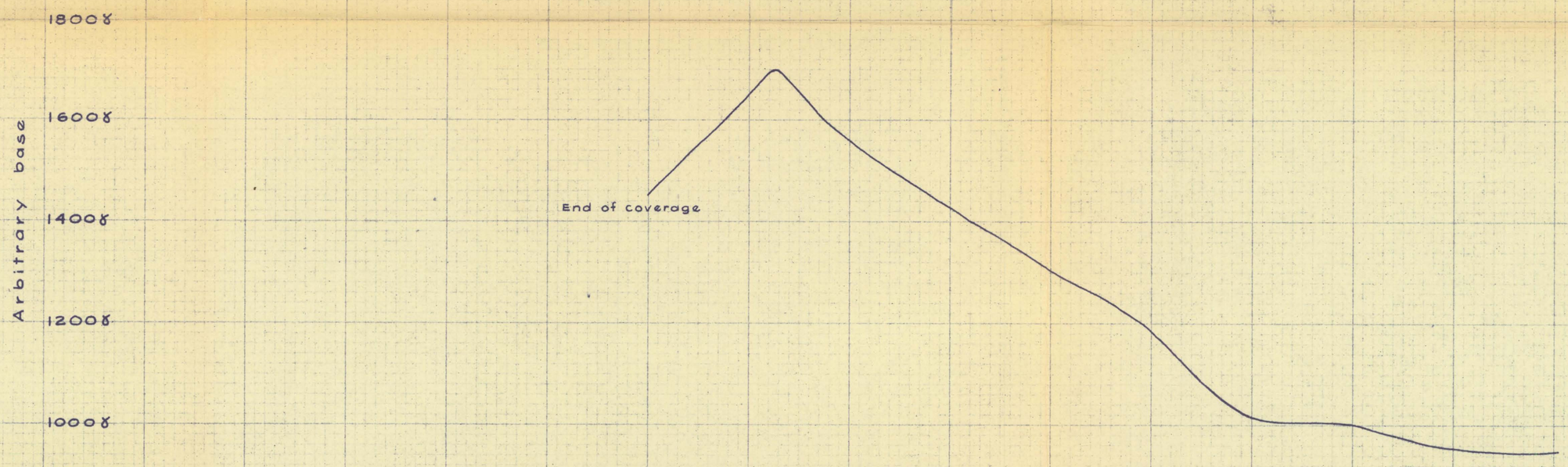
E-W Line #2
Sta. 1W

6S 5S 4S 3S 2S 1S 0 1N 2N 3N 4N 5N 6N

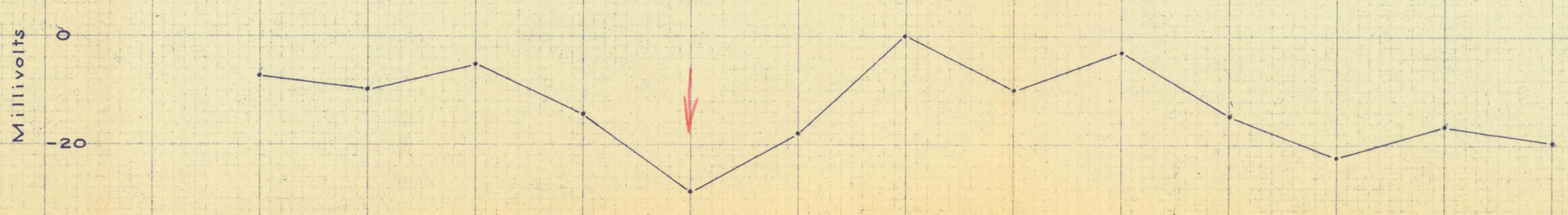
Thousands of feet

Looking West

Alluvium



TOTAL INTENSITY MAGNETIC PROFILE by MOBILE MAGNETOMETER



SELF POTENTIAL PROFILE

INDUCED POLARIZATION PROFILES

COMPOSITE PROFILES
LINE 1 - SPREAD 1

Mary Claim Group Area
Sec. 15, T17S - R13E
Pima Mining District
Pima County, Arizona

for
INSPIRATION CONSOLIDATED COPPER CO.
by

Heinrichs Geoexploration Company
May 1962 Scale: 1" = 1000'

6W 5W 4W 3W 2W 1W 0 1E 2E 3E 4E 5E 6E

Thousands of feet

Looking North

Arbitrary base 1400γ 1200γ

End of coverage End of coverage

TOTAL INTENSITY MAGNETIC PROFILE by MOBILE MAGNETOMETER

Millivolts 140 120 100 80 60 40 20 0

SELF POTENTIAL PROFILE

100 200 40 200 100 20 0 0 0

First Separation

Second Separation

Third Separation

600 300 60 100 200 40 200 100 20

Fourth Separation

INDUCED POLARIZATION PROFILES

Metallic Conduction factor 0
Resistivity ohm feet 2" 0
Percent Frequency Effect 0

COMPOSITE PROFILES
LINE 6

Mary Claim Group Area
Sec 15, T17S - R13E
Pima Mining District
Pima County, Arizona

for
INSPIRATION CONSOLIDATED COPPER CO.

by
Heinrichs Geoexploration Company
June 1962 Scale: 1"=1000'

DARD - ®
TO THE INCH

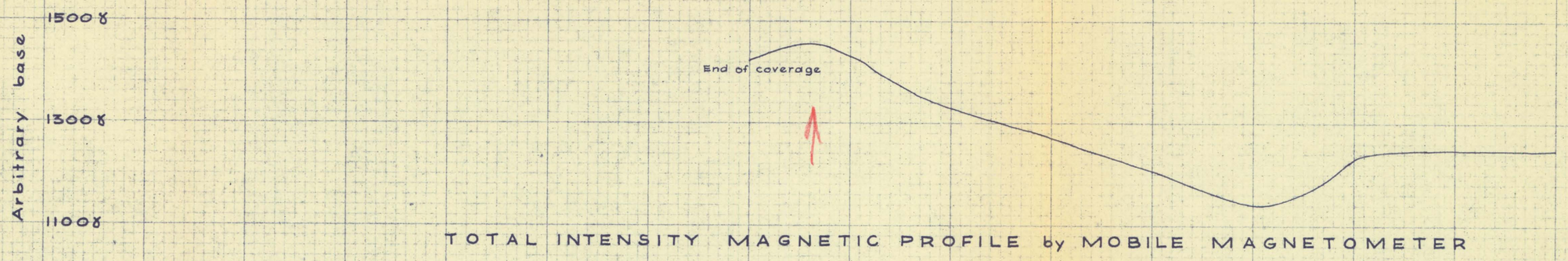
E-W Line #2
Sta. 2E

6S 5S 4S 3S 2S 1S 0 1N 2N 3N 4N 5N 6N

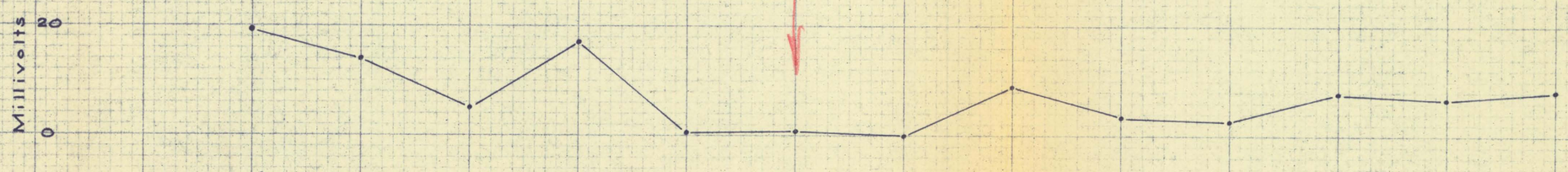
Thousands of feet

Looking West

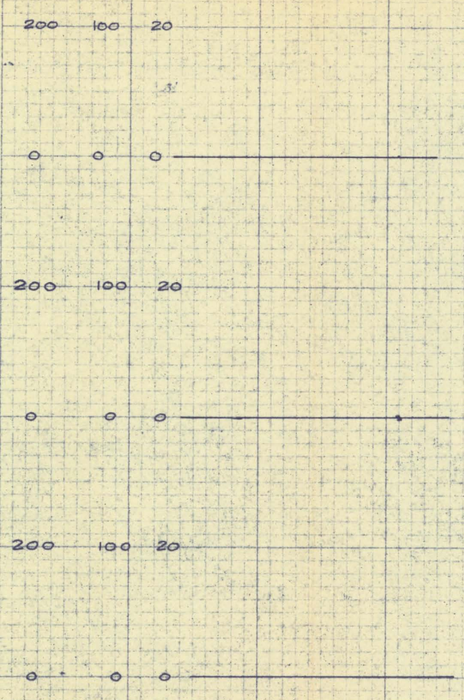
Alluvium

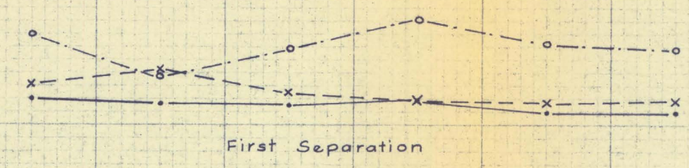


TOTAL INTENSITY MAGNETIC PROFILE by MOBILE MAGNETOMETER

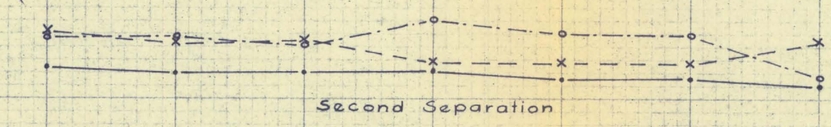


SELF POTENTIAL PROFILE





First Separation



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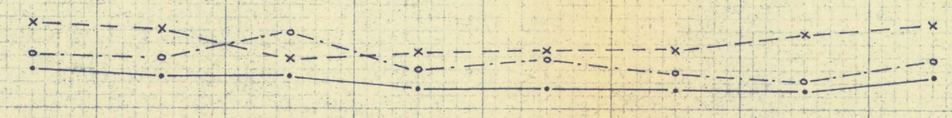
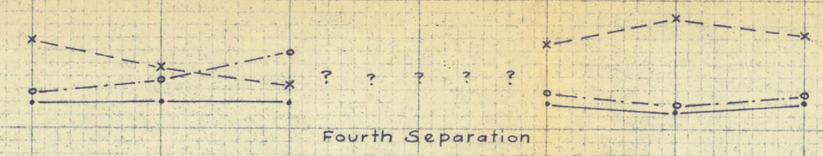
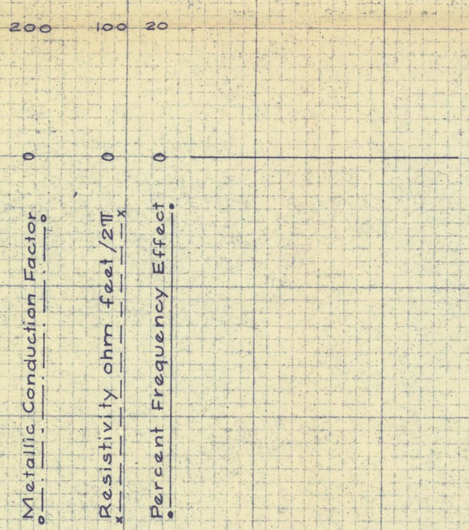


Third Separation



Fourth Separation

INDUCED POLARIZATION PROFILES

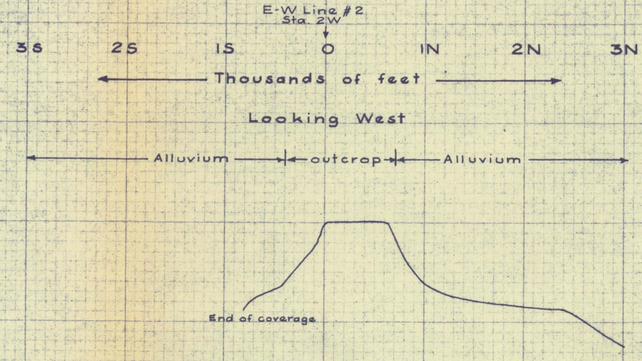


COMPOSITE PROFILES
LINE 5 - SPREAD 5

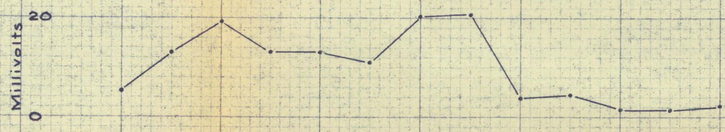
Mary Claim Group Area
Sec. 10 & 15, T17S - R13E
Pima Mining District
Pima County, Arizona

for
INSPIRATION CONSOLIDATED COPPER CO.
by

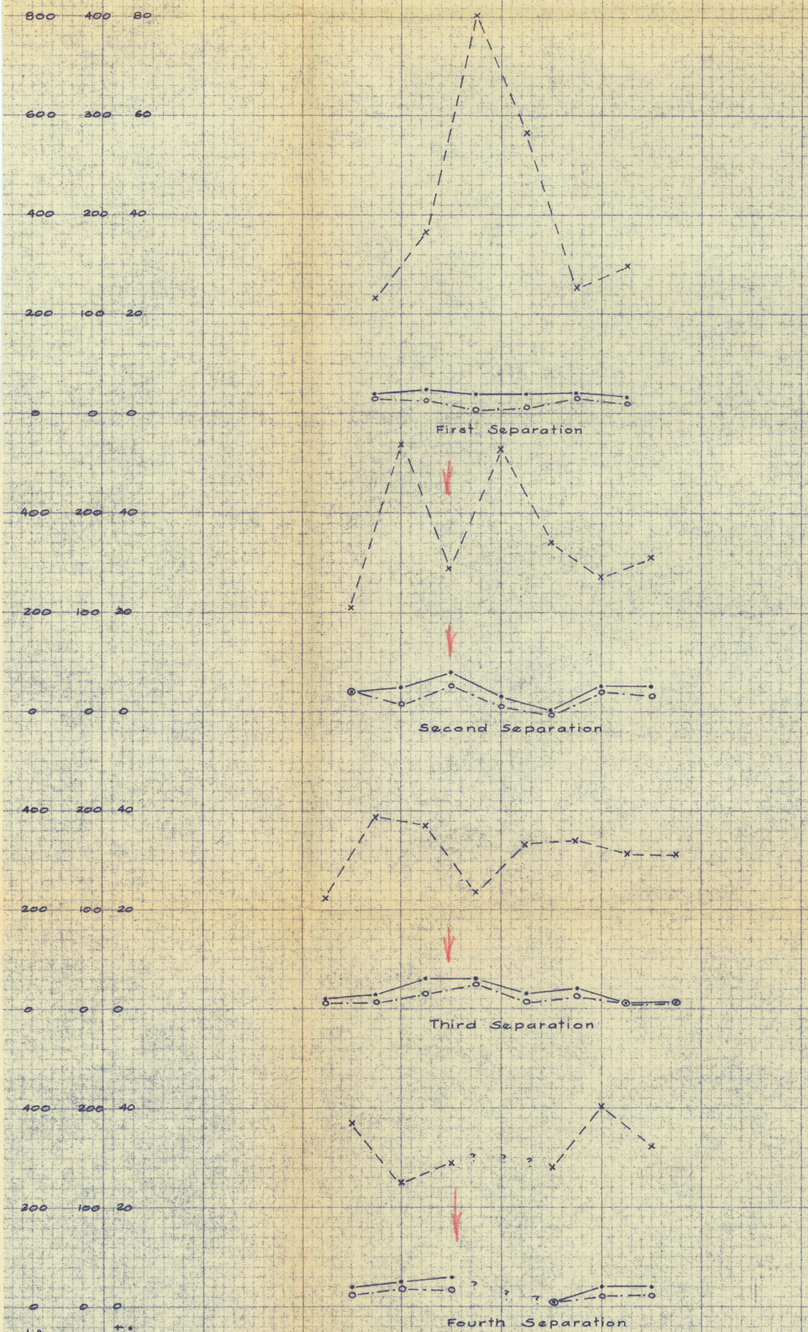
Heinrichs Geoexploration Company
May 1962 Scale: 1"=1000'



TOTAL INTENSITY MAGNETIC PROFILE by MOBILE MAGNETOMETE



SELF POTENTIAL PROFILE

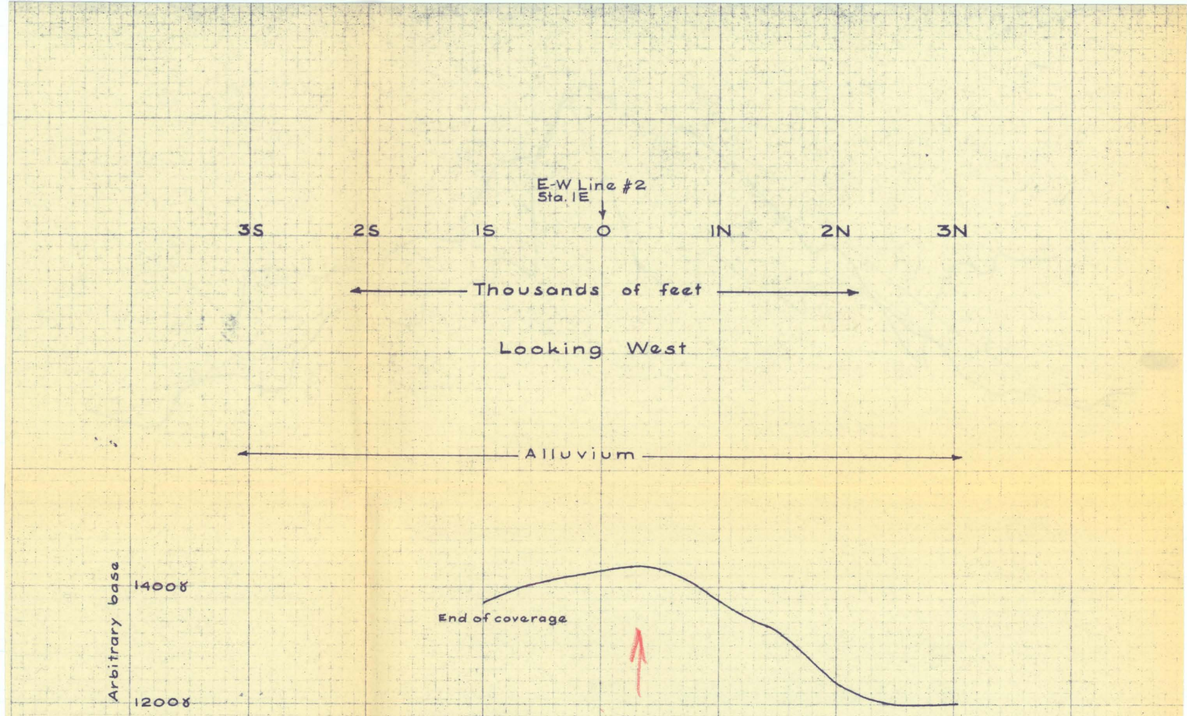


INDUCED POLARIZATION PROFILES

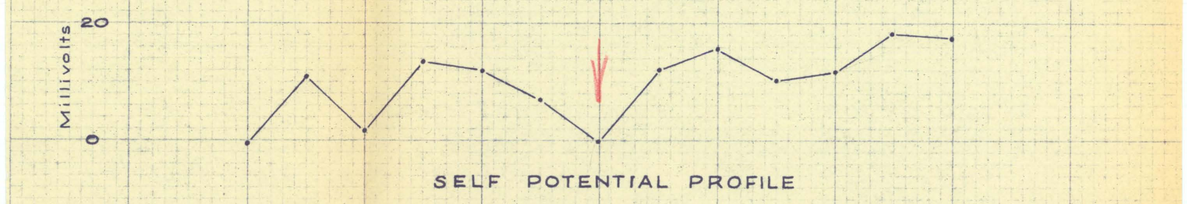
COMPOSITE PROFILES
LINE 4 - SPREAD 4

Mary Claim Group Area
Sec. 15, T17S - R13E
Pima Mining District
Pima County, Arizona

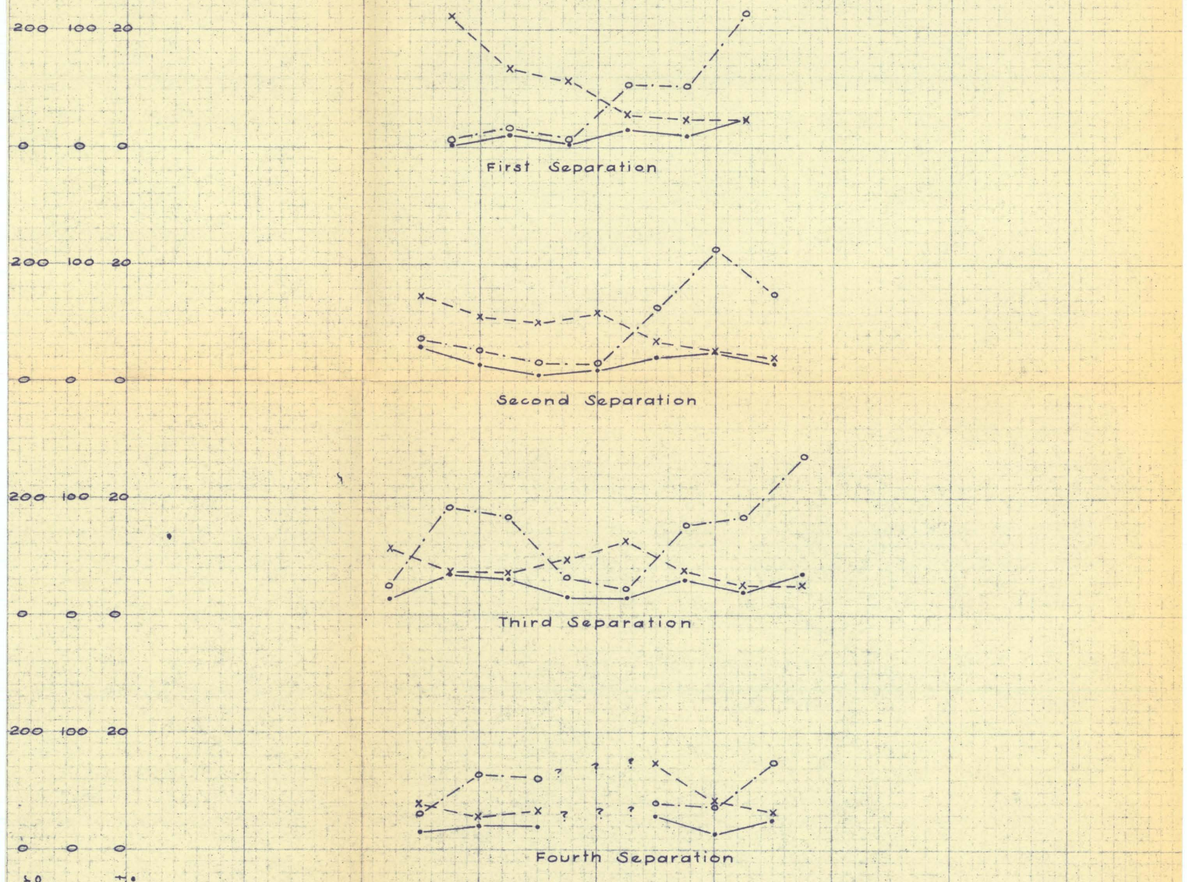
for
INSPIRATION CONSOLIDATED COPPER CO.
by
Heinrichs Geoexploration Company
May 1962 Scale: 1" = 1000'



TOTAL INTENSITY MAGNETIC PROFILE by MOBILE MAGNETOMETER



SELF POTENTIAL PROFILE



INDUCED POLARIZATION PROFILES

COMPOSITE PROFILES
LINE 3 - SPREAD 3

Mary Claim Group Area
Sec. 15, T 17S - R 13 E
Pima Mining District
Pima County, Arizona

for

INSPIRATION CONSOLIDATED COPPER CO.

by

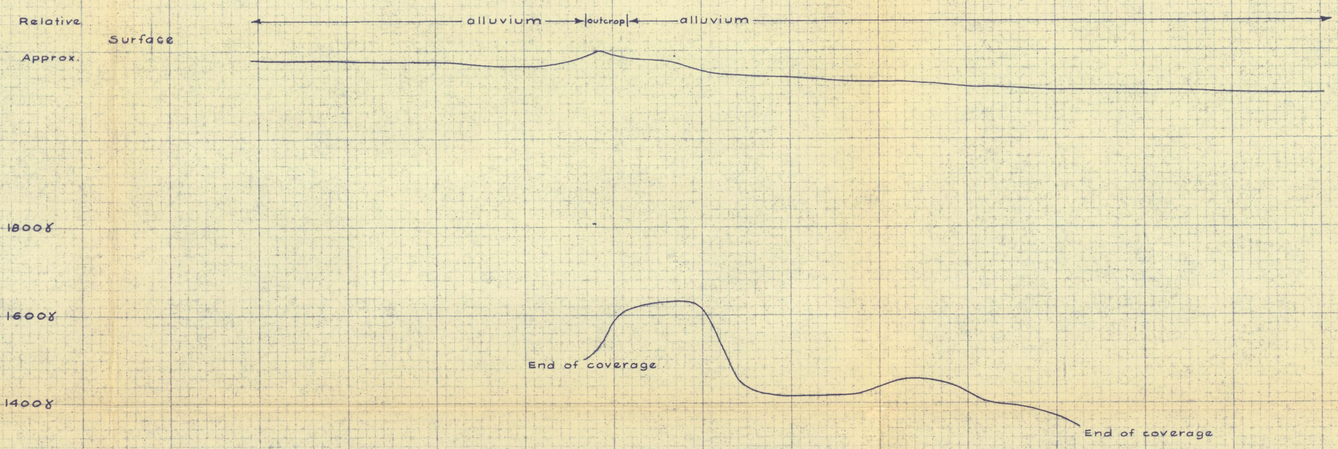
Heinrichs Geoexploration Company
May 1962 Scale: 1"=1000'

N-S Line #4 Sta. 0 | N-S Line #1 Sta. 2S | N-S Line #3 Sta. 0 | N-S Line #5 Sta. 1S

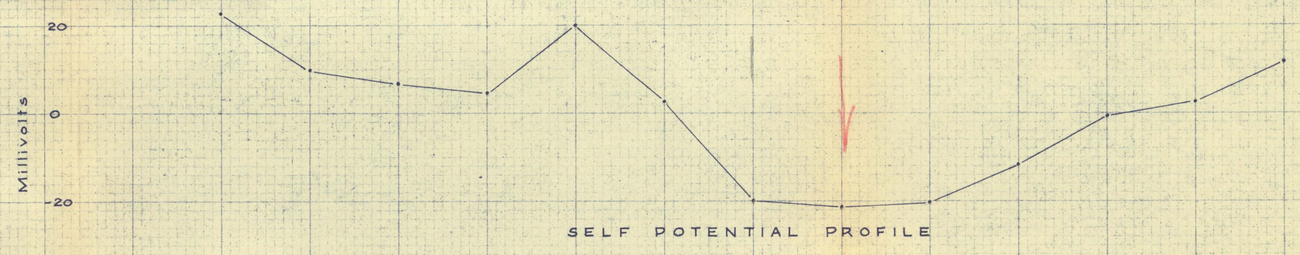
6W 5W 4W 3W 2W 1W 0 1E 2E 3E 4E 5E 6E

Thousands of feet

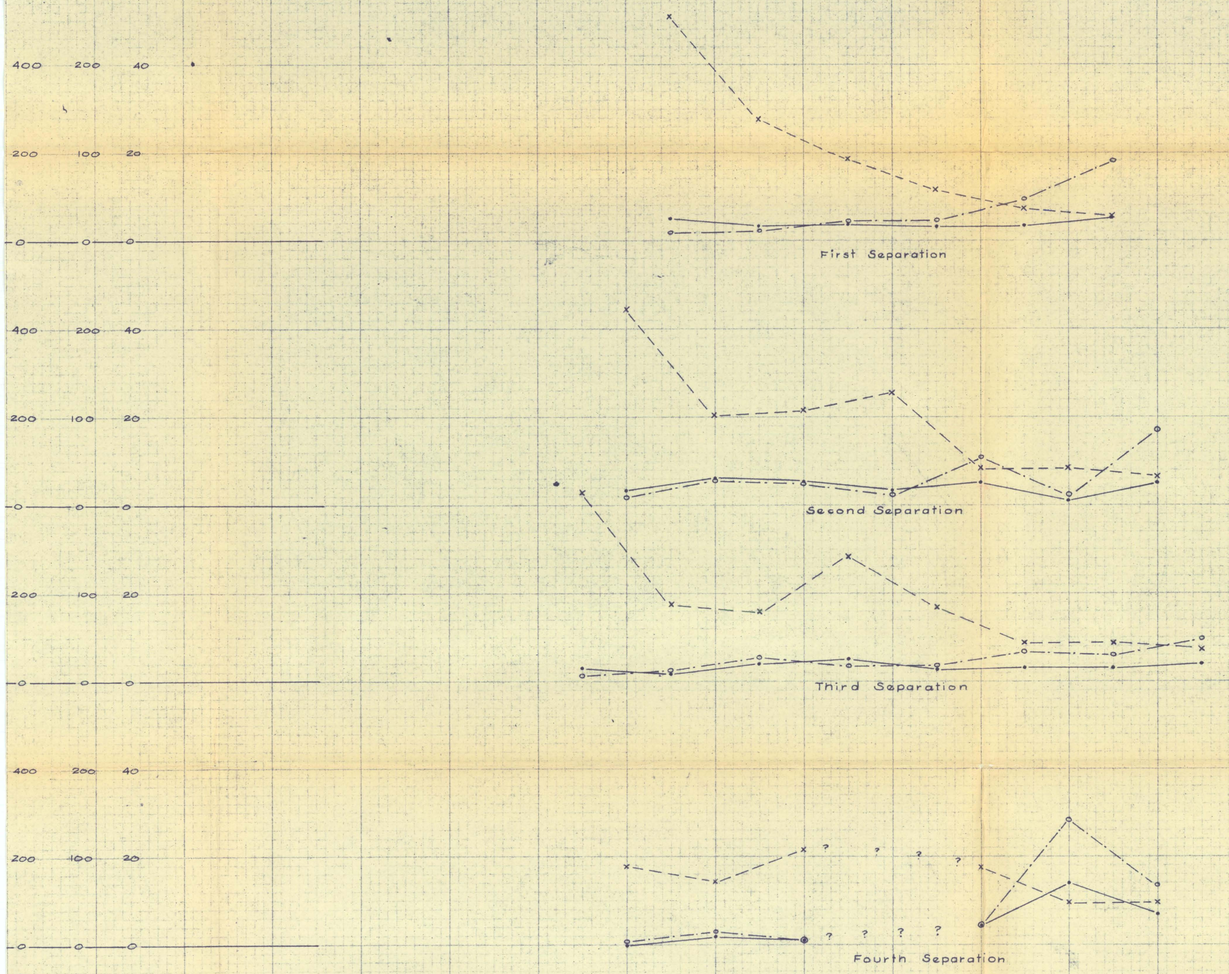
Looking North



TOTAL INTENSITY MAGNETIC PROFILE by MOBILE MAGNETOMETER



SELF POTENTIAL PROFILE

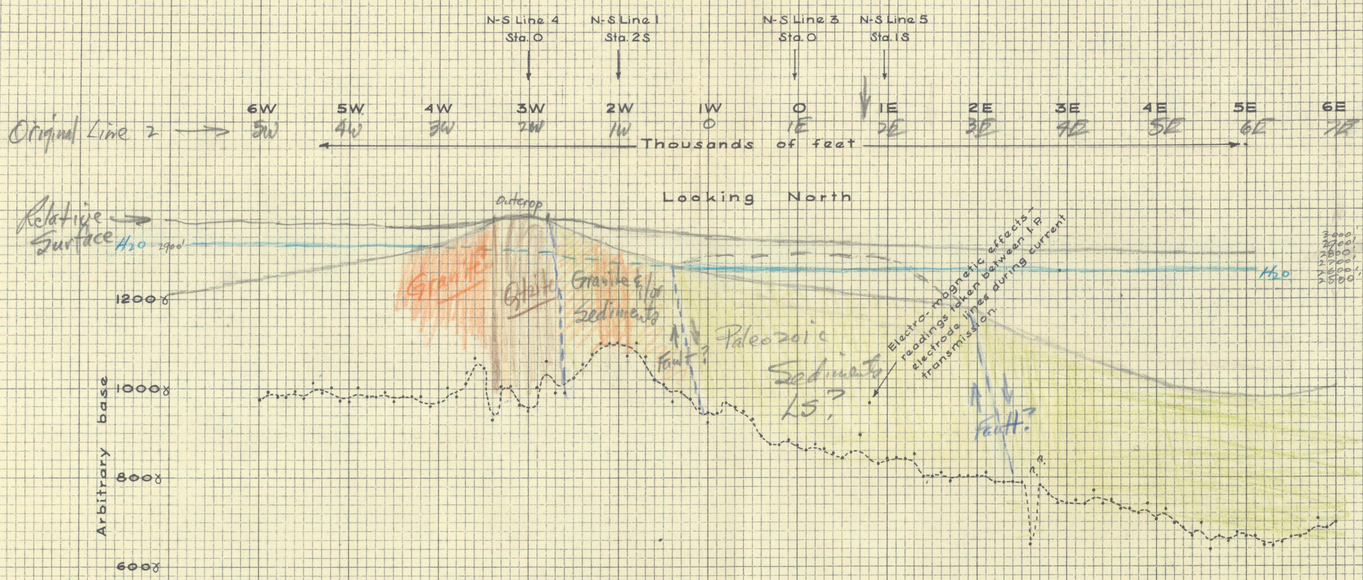


INDUCED POLARIZATION PROFILES

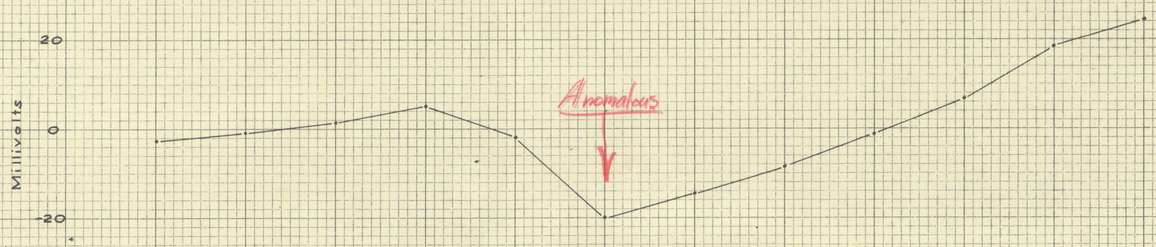
COMPOSITE PROFILES
LINE 2 - SPREAD 2

Mary Claim Group Area
Sec. 15, T17S - R13E
Pima Mining District
Pima County, Arizona

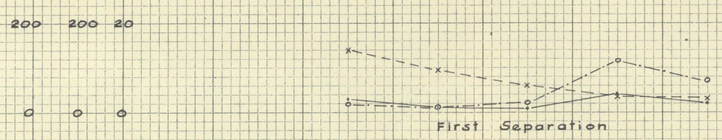
for
INSPIRATION CONSOLIDATED COPPER CO.
by
Heinrichs Geoexploration Company
May 1962 Scale: 1"=1000'

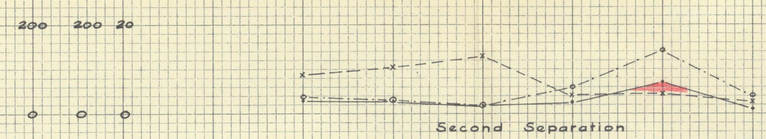


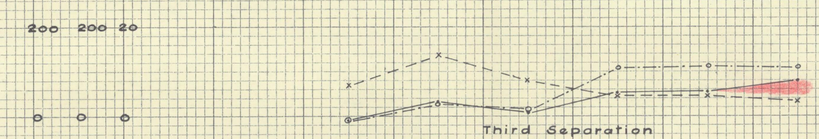
VERTICAL INTENSITY MAGNETIC PROFILE by JALANDER INSTRUMENT

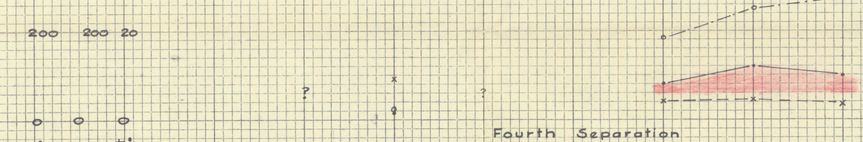


SELF POTENTIAL PROFILE









Metallic Conduction Factor
Resistivity ohm feet/2π
Percent Frequency Effect

INDUCED POLARIZATION PROFILES

COMPOSITE PROFILES & Geologic Section
LINE 2 - REPEAT

Mary Claim Group Area
Sec. 15, T17S - R13E
Pima Mining District
Pima County, Arizona

for

INSPIRATION CONSOLIDATED COPPER CO.

by

Heinrichs Geoexploration Company
August 1962 Scale: 1" = 1000'

GEOPHYSICAL SURVEY

MARY CLAIM GROUP

Pima District, Pima County, Arizona

for
INSPIRATION CONSOLIDATED COPPER COMPANY
Inspiration, Arizona

May 1962

by
HEINRICHS GEOEXPLORATION COMPANY
P. O. BOX 5671 TUCSON, ARIZONA

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Recommendations & Conclusions	1
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Attachments:

5 Sectional Data Sheets

5 composite profiles

1 Plan Map

INTRODUCTION

During the period work was being done for you on the Fox Claim Group in the Pima District (our geophysical report of February - March 1962) we mentioned to Mr. Olmstead several other similar possibilities known to us in the district. The area of this report, Sec. 15, T 17 S, R 13 E, is one of these wherein some potentially interesting magnetic anomalism had been previously obtained for other clients. Bed rock exposures are few and neither definitely encouraging nor discouraging. Therefore, in order to further appraise the area and the possible economic significance of the magnetic indications, further geophysical reconnaissance by induced polarization methods had been recommended to determine if there was any associated concentration of sulfides.

Accordingly we were authorized to obtain a 60 day option from the owners on behalf of Inspiration and field work started immediately on 2 May and continued through completion on 18 May. A total of 5 lines were run, three on 1000' dipole spacing and two on 500', giving approximately 28,000' of profile information at depth.

RECOMMENDATIONS AND CONCLUSIONS

While results did not give positive-strong indications of definite major sulfide concentration well within our penetration limits, nevertheless, a very interesting, and possibly

significant correlation was obtained near the NW corner of the SE¼ of the SE¼ of the section. Here the definite NW-SE trending magnetic high of about 100 gammas relief coincides well with a somewhat broader, but similar trending self potential low of 25 to 50 millivolts relief, and in the same area near the intersection of I. P. lines 2 and 5, we have weak, but definite indication of sulfide effects increasing with depth. The latter interpretation is made from a fair concentration of several data points which appear to be positively above background level for the area as well as being in the range of probable sulfide indication. However, these data also seem to be barely within our apparent range of penetration depth for 1000' dipole spacing in this area and therefore also where the data is probably the least reliable.

Based on a rule of thumb depth to cause estimate of 1000' +/- 25% for the magnetic feature, the above inferences are not at all unreasonable. Although the absolute magnitude of the S. P. low is similar to the approximate degree of background variation possible, it is felt to be too broad and too regular to be merely background effect. Furthermore, such an effect if not merely background, would have a good chance to be due to oxidizing sulfide.

In view of the fair speculative potential apparently still remaining in the Pima District, it is felt that these results at least warrant trying to hold the area for the time being.

The not too strong absolute magnitude indications may be due to detectibility depth as much as anything and if so, must be somewhat over ridden by the good multiple correlation which even if only coincidental, cannot be ignored.

At present, except for the little additional assessment expenditure now required, we are a little undecided if any more geophysics is justified for further ideas on whether or where to drill and wish to give this further consideration. In lieu of this, the intersection of I. P. lines 2 & 5 is the recommended site, with an initial planned depth of 1,500'. Dip effects are indefinite, but a NE component is tentatively assigned.

RESULTS

As shown on the attached plan map, I. P. Line #1 was centered 100' N of the common corner of Mary 9, 10, 11, 12 claims and extended north and south across the claim group. Line #2 ran east-west across the group centered 320' west of the common corner of Mary 6, 4, 21 & 23 claims. Line #4 centered 320' east of the common westerly corner of Mary 3 & 5 on their common side line and ran north and south. Line #3 ran north-south from electrode #4 of Line #2 near the middle of the common side line of Mary 21 & 23 and Line #5 north-south from electrode #5 of Line #2, 360' east of the common corner of Mary 21, 22, 23 & 24. Lines #1, #2 & #5 used a 1,000' electrode-dipole interval and Lines #3 & #4, a 500' interval. Geology and topo graphy are from U.S.G.S. Bull. 1112-C by Cooper, 1960.

Please note for plotting convenience, that the Sectional Data Sheets for only the 500' dipole interval lines 3 & 4, are plotted at 1" = 500' and must be looked at accordingly. All of the rest of the data are plotted at 1" = 1,000'.

Referring to the Sectional Data Sheets and composite profiles, the highest resistivity noted is 402 units obtained on Line 4 over the small outcropping hill on Mary 3 Claim. Also, the over all resistivity level is generally higher in this vicinity as recorded on much of Line 4, near the center of Line 1, and the west end of Line 2. This is a normal expectation considering the somewhat siliceous nature of the outcropping material. From here, the near surface resistivities decrease strongly toward the east and also more or less decrease to the north and south reflecting effect of the lower resistivity alluvial cover in these directions. Except for the outcrop area and the south ends of Lines 3 & 5, the resistivities increase rather strongly with depth (especially toward the north and east). This suggests some combination of E-W or NW-SE trending structural and/or stratigraphic interface, a substantial relative difference in alluvial depth and/or composition and probable N or NE dip more or less in conformity with the reconnaissance magnetic picture.

Maximum I. P. background appears to be about 5% percent frequency effect. If this is correct, the strongest-shallowest,

consistent anomalism is on 7 depth points from the 4th to the 6th separation level centered at 2.25 E on Line 2, confirmed by three points on the 5th and 6th separation at station 2S on Line 5, with a similar effect also noted at 2N on Line 5. On Line 5 one interpretation of these effects is that of something lying below a flattish N-S interface, but on Line 2 the effect suggests more concentration in a possibly steeper attitude. Other very weak I. P. anomalism is noted on four points--2nd, 3rd and 4th separation at 0.5S Line 4 on the south west flanks of the major mag. high and 3 points on the 2nd and 3rd separation on the south end of Line 3.

Unfortunately, the relative lack of data points in the 5th and 6th separation makes it somewhat more difficult to present these data in plan and for similar reasons, and in order not to be misleading, they are only plotted on the sectional data sheets and are not shown on the composite profiles. The S. P. data is presented only on the composite profiles. Therefore, for the time being, a full analysis of all data requires simultaneous study of all three modes of data compilation. Such a study shows a broad S. P. low centering at the intersection of Lines 2 and 3 and striking NW-SE, about parallel, but offset a little en echelon from the mag high nearby. From this point, the strongest concentration of I. P. effects are 1,000' east and also about 1,400 ft. southeast (sort of bracketing the mag

high near its SE end). Such an S.P. offset, from experience, is not considered unusual or at all unfavorable.

Although additional significant factors may be involved in the data, the above summarizes those which are felt most important for the present.

Heinrichs Geoexploration personnel involved in the work were Fred Armstrong, James Reeves, Chris S. Ludwig, David F. Graff, W. J. Keith, Irene Bucher, Grover and Walter Heinrichs. Cost of the survey to date exceeded $3,000.00.

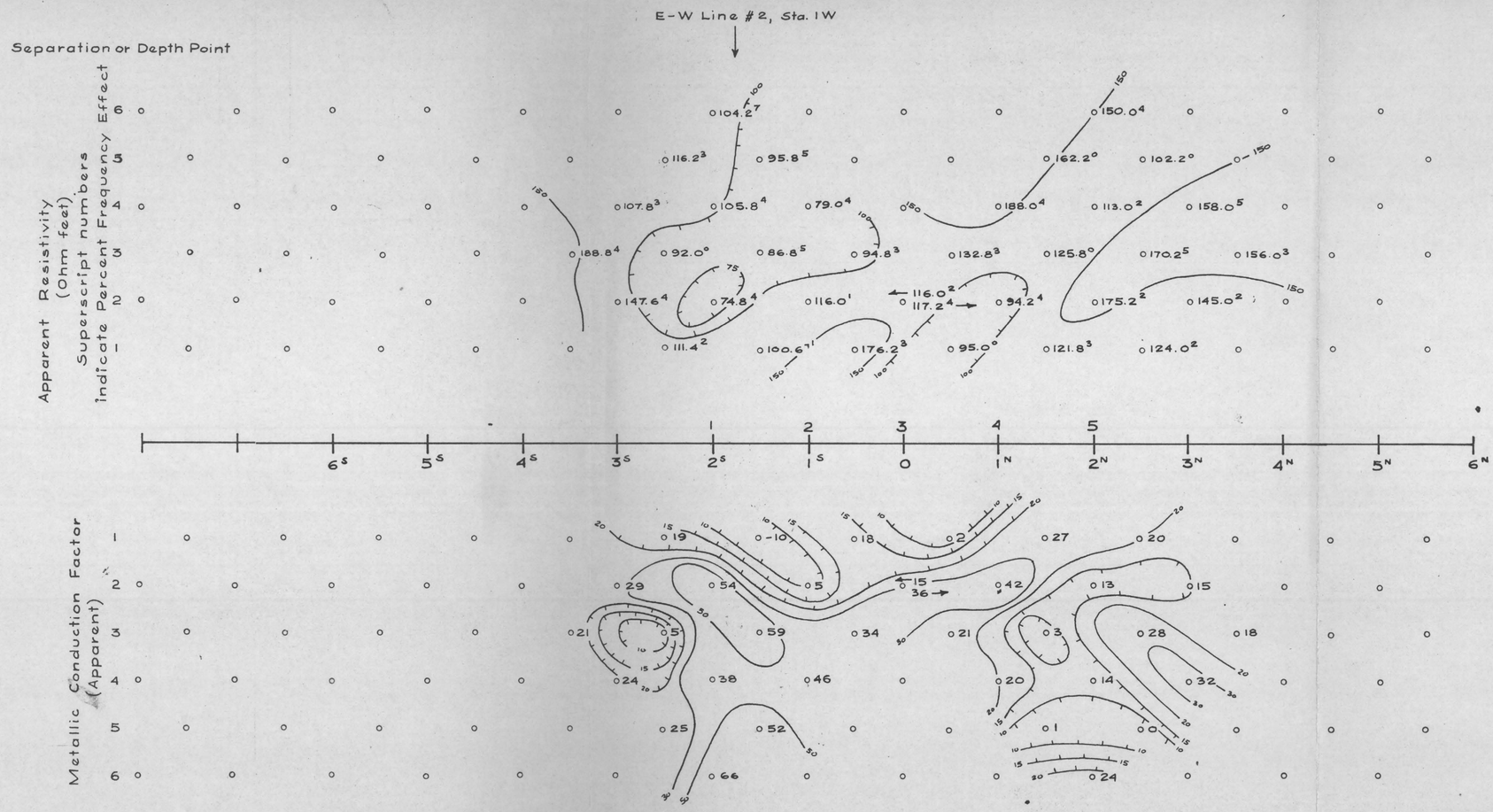
Respectfully submitted,

HEINRICHS GEOEXPLORATION COMPANY

Walter E. Heinrichs, Jr.
President & General Manager

Registered Professional Engineer (Mining)
CERTIFICATE EXPIRES
WALTER E. HEINRICHS, JR.
DEC. 31, 1962
ARIZONA, U.S.A.

26 May 1962
P. O. Box 5671
Tucson, Arizona



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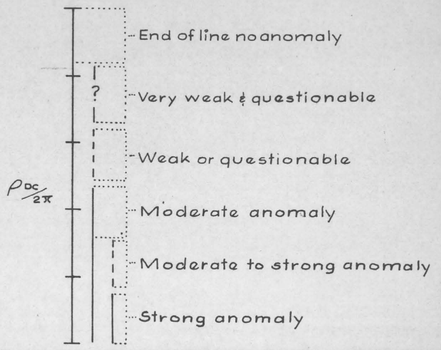


C.I. = Logarithmic

(( )) indicates questionable data

M.C.F.

Mary Claim Group Area

SECTIONAL DATA SHEET

for

INSPIRATION CON. COPPER CO.

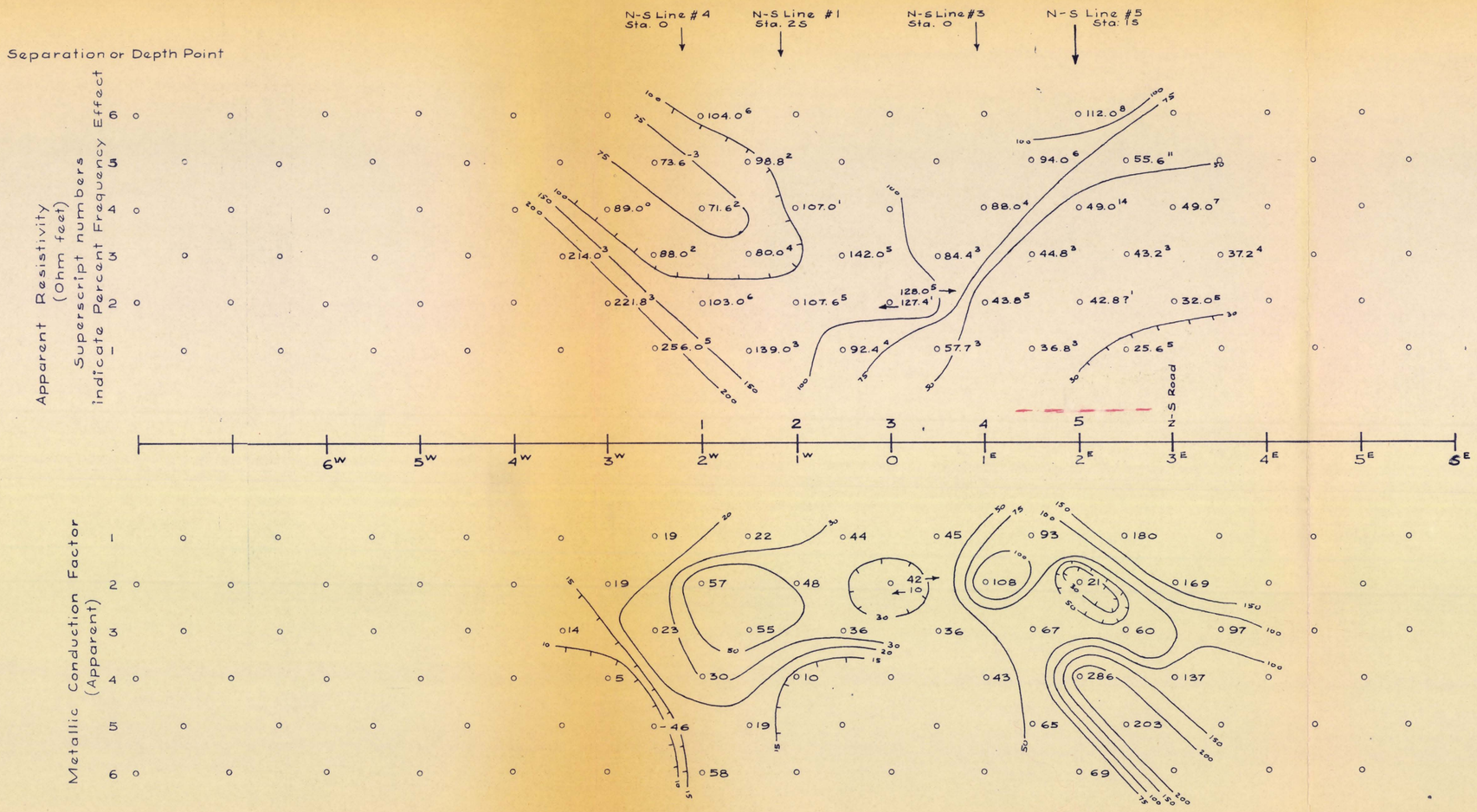
LINE No. 1 Spr. 1

INDUCED POLARIZATION SURVEY

HEINRICHS GEOEXPLORATION CO.

Scale 1" = 1000'

Date May 1962



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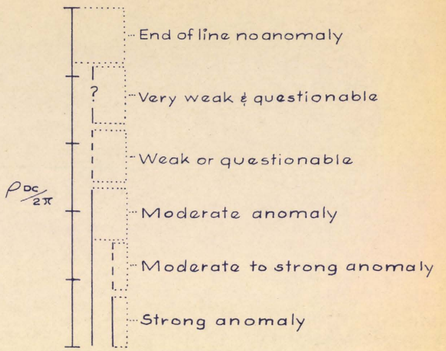


C.I. = Logarithmic

(( )) indicates questionable data

M.C.F.

Mary Claim Group Area

SECTIONAL DATA SHEET

for

INSPIRATION CON. COPPER CO.

LINE No. 2 Spr. 2

INDUCED POLARIZATION SURVEY

HEINRICHS GEOEXPLORATION CO.

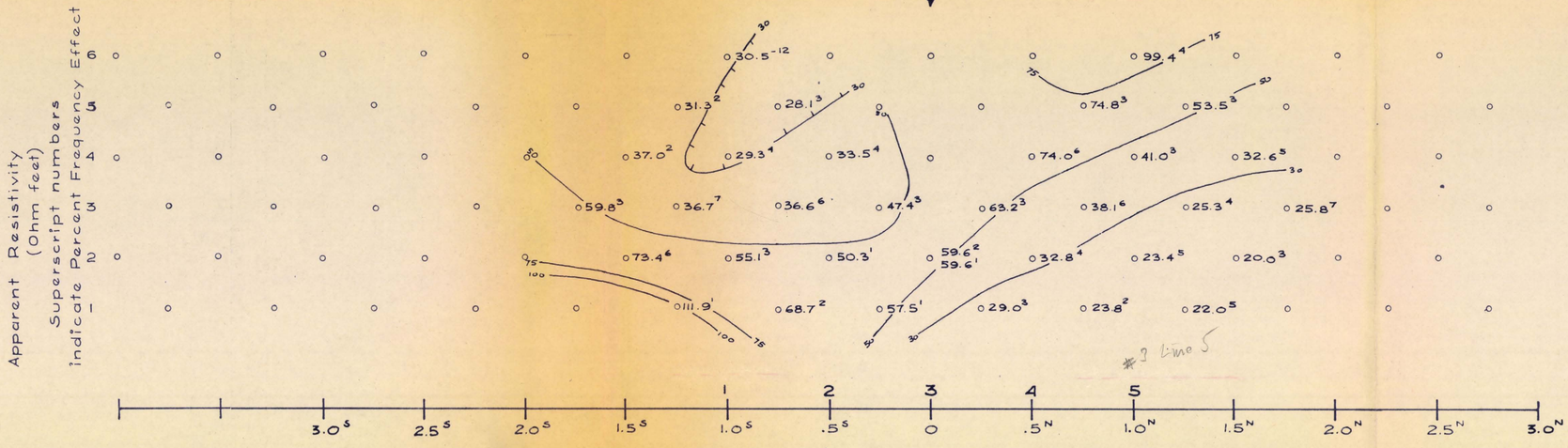
Scale 1"=1000'

Date May 1962

E-W Line #2, Sta. 1E

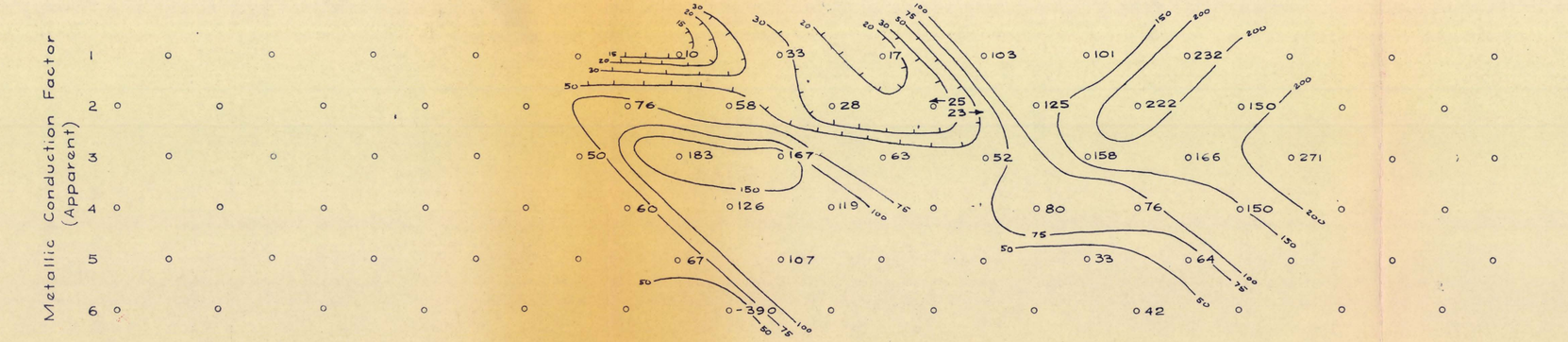
Separation or Depth Point

Apparent Resistivity (Ohm feet)
Superscript numbers indicate Percent Frequency Effect



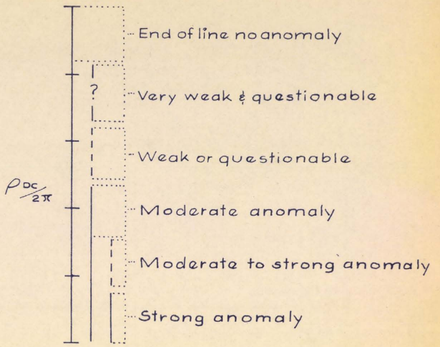
#2 Line 5

Metallic Conduction Factor (Apparent)



Looking West

INTERPRETATION LEGEND



C.I. = Logarithmic

(( )) indicates questionable data

M.C.F.

Mary Claim Group Area

SECTIONAL DATA SHEET

for

INSPIRATION CON. COPPER CO.

LINE No. 3 Spr. 3

INDUCED POLARIZATION SURVEY

HEINRICHS GEOEXPLORATION CO.

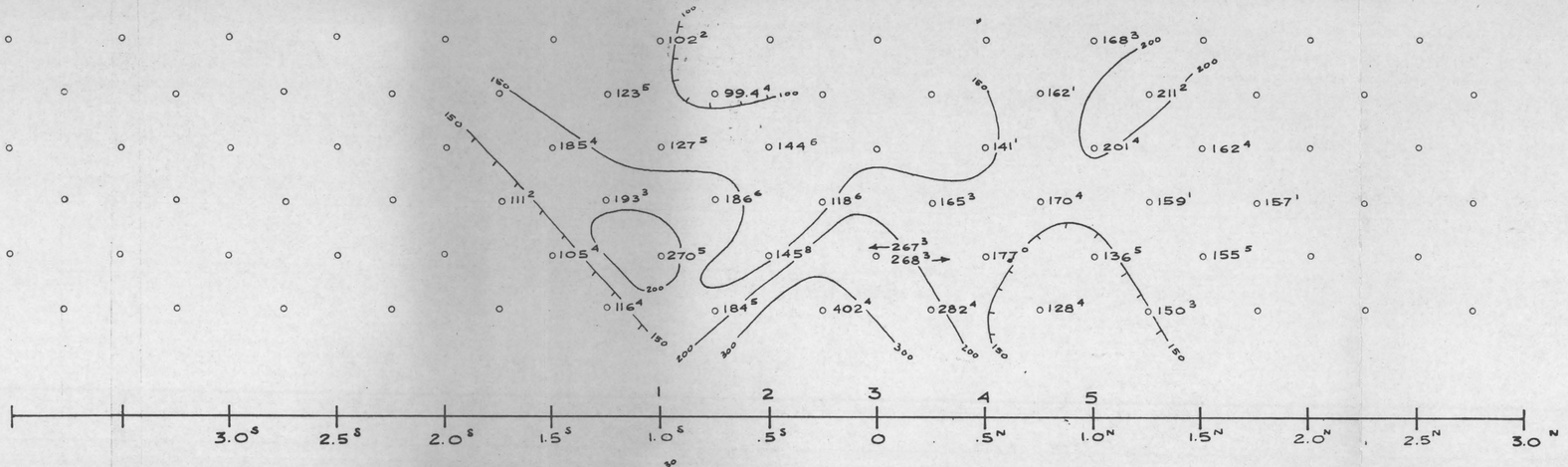
Scale 1" = 500'

Date May 1962

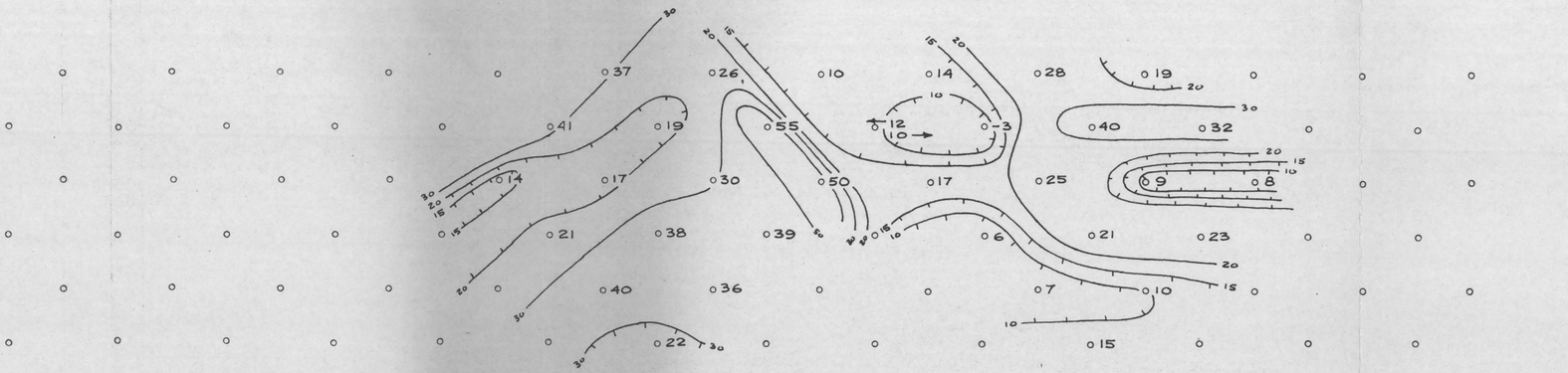
E-W Line #2, Sta. 2W

Separation or Depth Point

Apparent Resistivity (Ohm feet)
Superscript numbers indicate Percent Frequency Effect

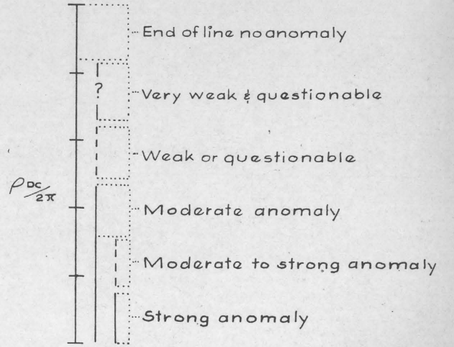


Metallic Conduction Factor (Apparent)



Looking West

INTERPRETATION LEGEND



C.I. = Logarithmic

(( )) indicates questionable data

M.C.F.

Mary Claim Group Area

SECTIONAL DATA SHEET

for

INSPIRATION CON. COPPER CO.

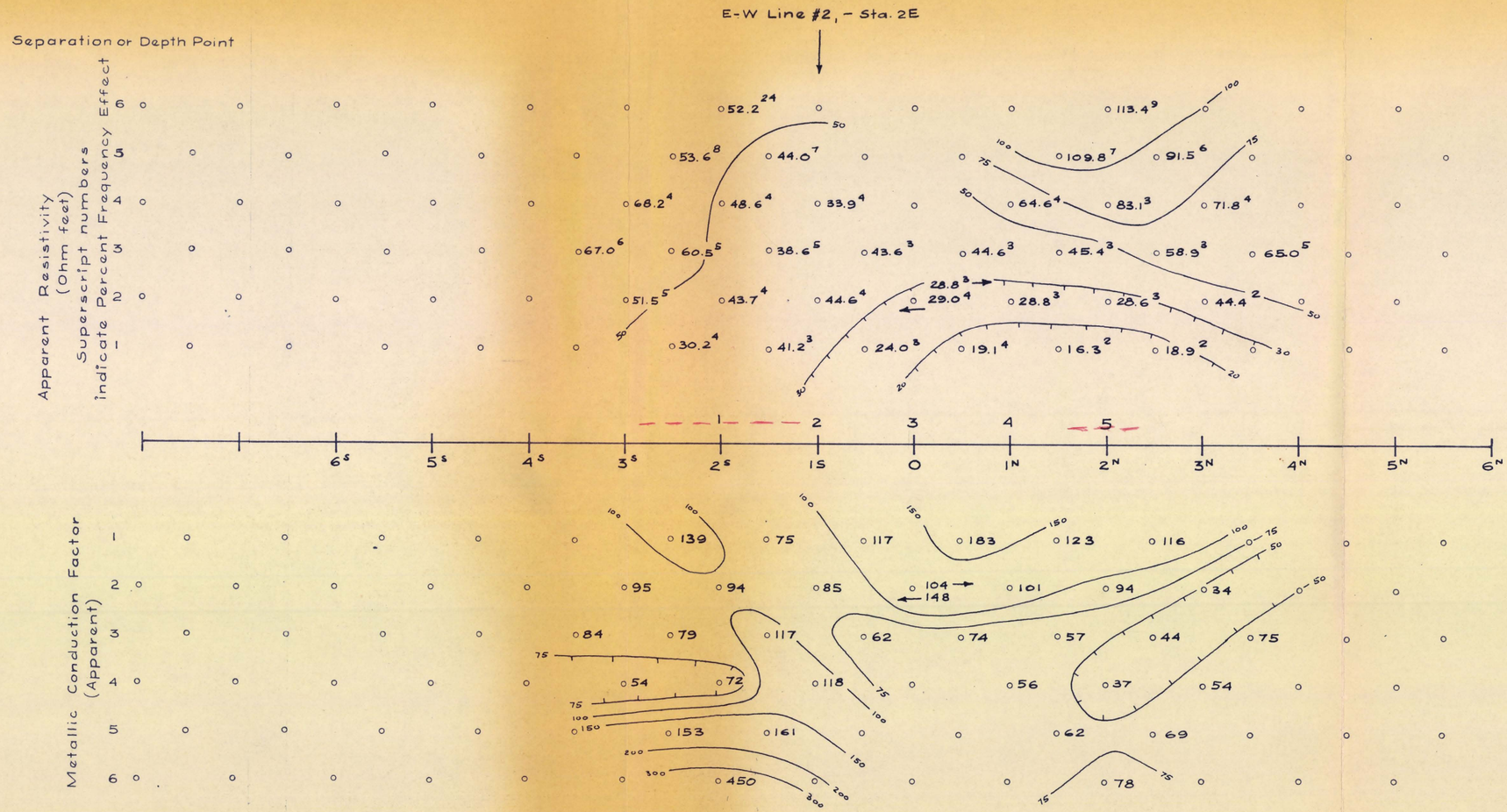
LINE No. 4 Spr. 4

INDUCED POLARIZATION SURVEY

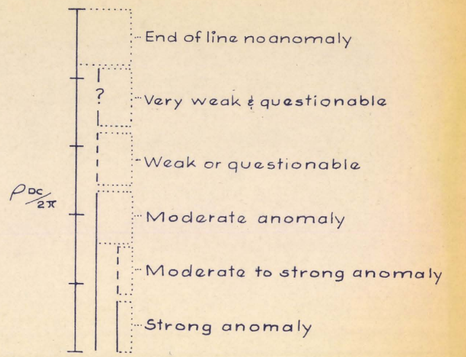
HEINRICHS GEOEXPLORATION CO.

Scale 1" = 500'

Date May 1962



INTERPRETATION LEGEND



C.I. = Logarithmic

(( )) indicates questionable data

M.C.F.

Mary Claim Group Area

SECTIONAL DATA SHEET

for

INSPIRATION CON. COPPER CO.

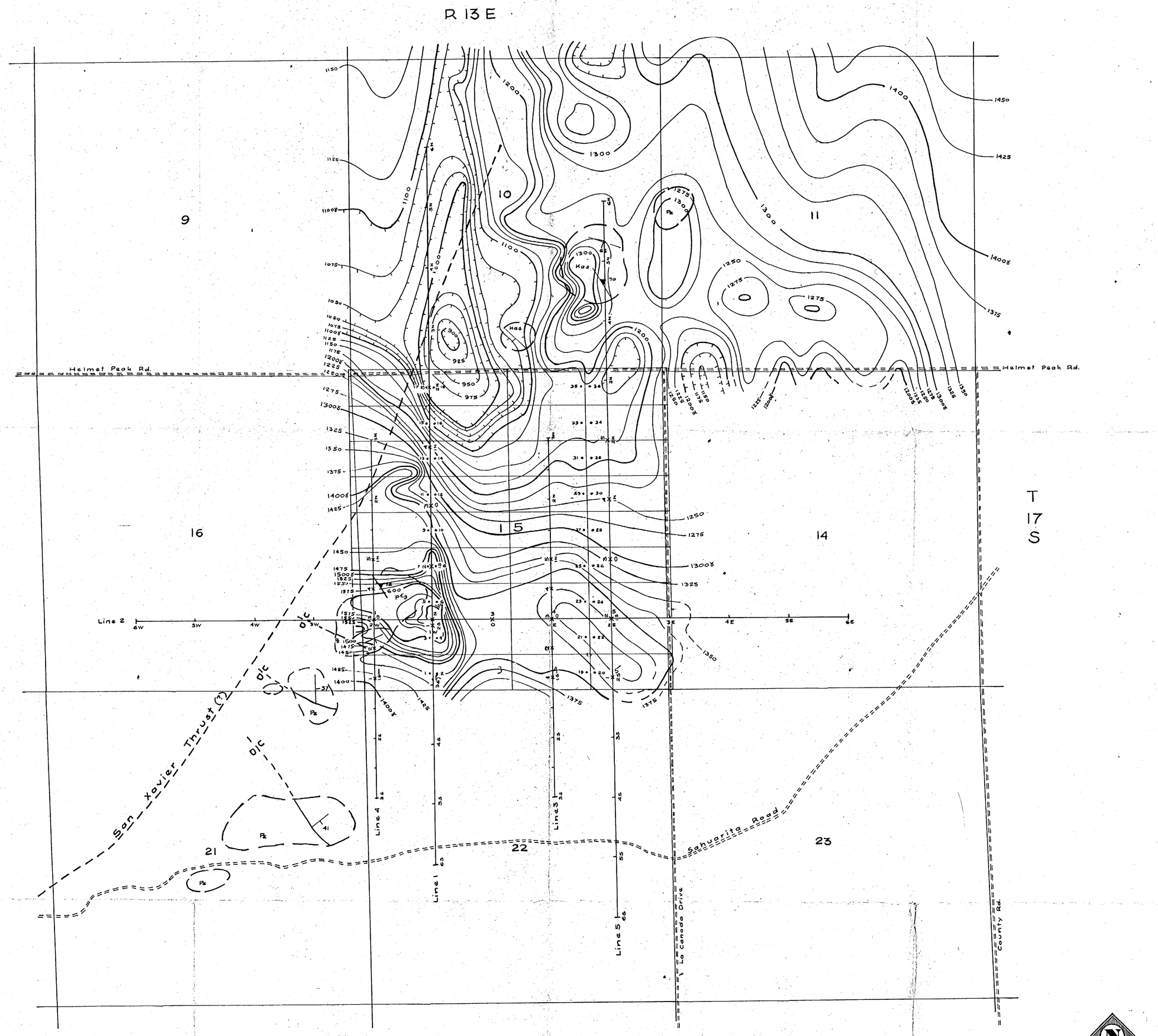
LINE No. 5 Spr. 5

INDUCED POLARIZATION SURVEY

HEINRICHS GEOEXPLORATION CO.

Scale 1" = 1000'

Date May 1962



LEGEND

- Roads
- I. P. Line (Electrode No. 1 2 3; Station No. 3W 2W 1W 0 1E)
- Fault
- Strike & dip of beds
- Strike & dip of foliation
- Pz — Paleozoic sed. rocks
- pЄg — Granite
- Kas — Sedimentary-volcanic complex
- 24 — Mary Claim Number and Location

HEINRICHS GEOEXPLORATION COMPANY
P.O. Box 5671 Tucson, Arizona

MAGNETIC CONTOURS, — GEOLOGY, and INDUCED POLARIZATION INDEX
FOR
INSPIRATION CON. COPPER CO.

Mary Claim Group Area
Pima Mining District
Pima County, Arizona

SCALE: 1" = 1000'	CONTOUR INTERVAL: 25γ	REVISIONS
	DATA BY: W. E. H. & E. G. H.	
DATE: May 1962	SHEET OF	
DRAWN BY: I.B.	DRAWING NO.:	FILE:

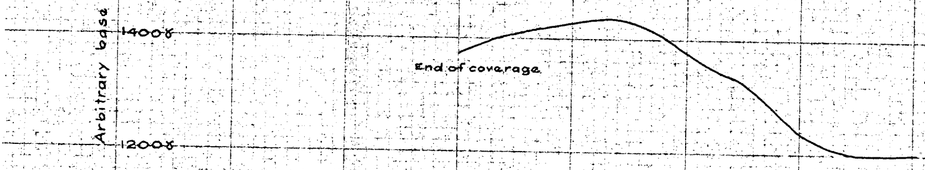
E-W Line #2
Sta. 1E

3S 2S 1S 0 1N 2N 3N

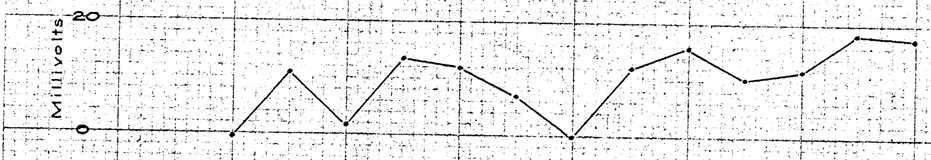
← Thousands of feet →

Looking West

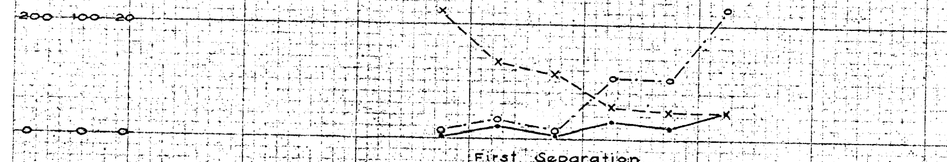
← Alluvium →



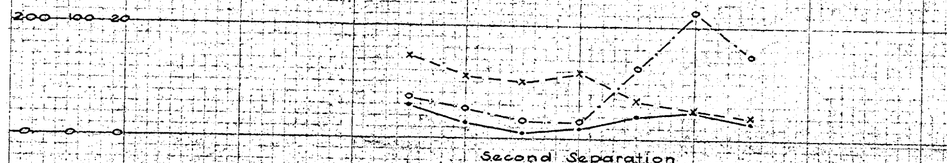
TOTAL INTENSITY MAGNETIC PROFILE by MOBILE MAGNETOMETER



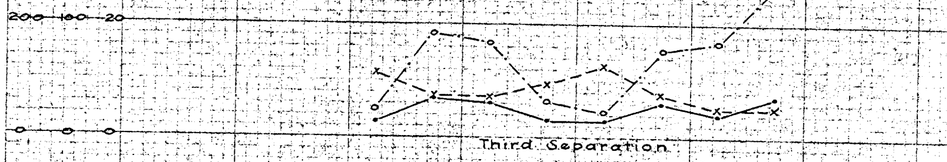
SELF POTENTIAL PROFILE



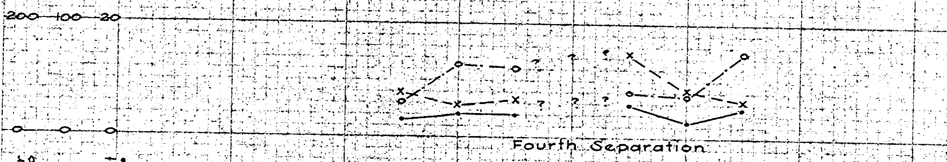
First Separation



Second Separation



Third Separation



Fourth Separation

INDUCED POLARIZATION PROFILES

Metallic Conduction Factor
Resistivity ohm feet / 2πx
Percent Frequency Effect

COMPOSITE PROFILES
LINE 3 - SPREAD 3

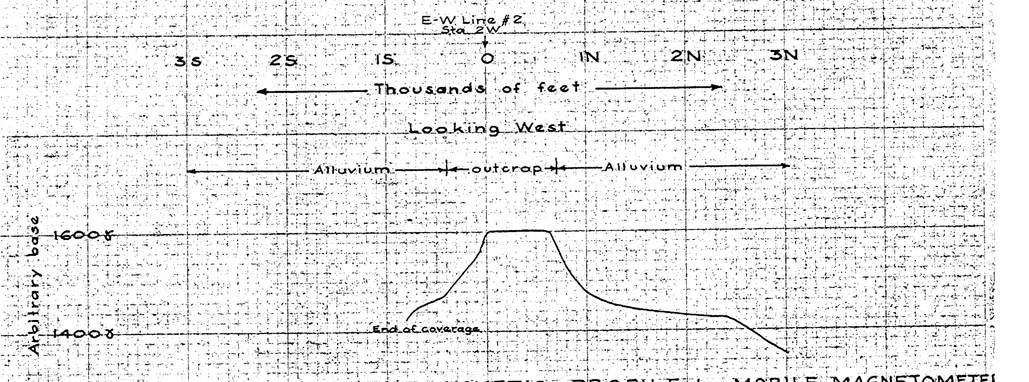
Mary Claim Group Area
Sec. 15, T.17S - R.13E
Pima Mining District
Pima County, Arizona

for

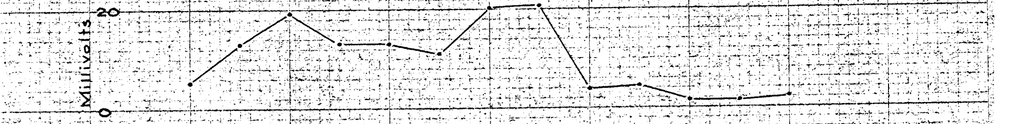
INSPIRATION CONSOLIDATED COPPER CO.

by

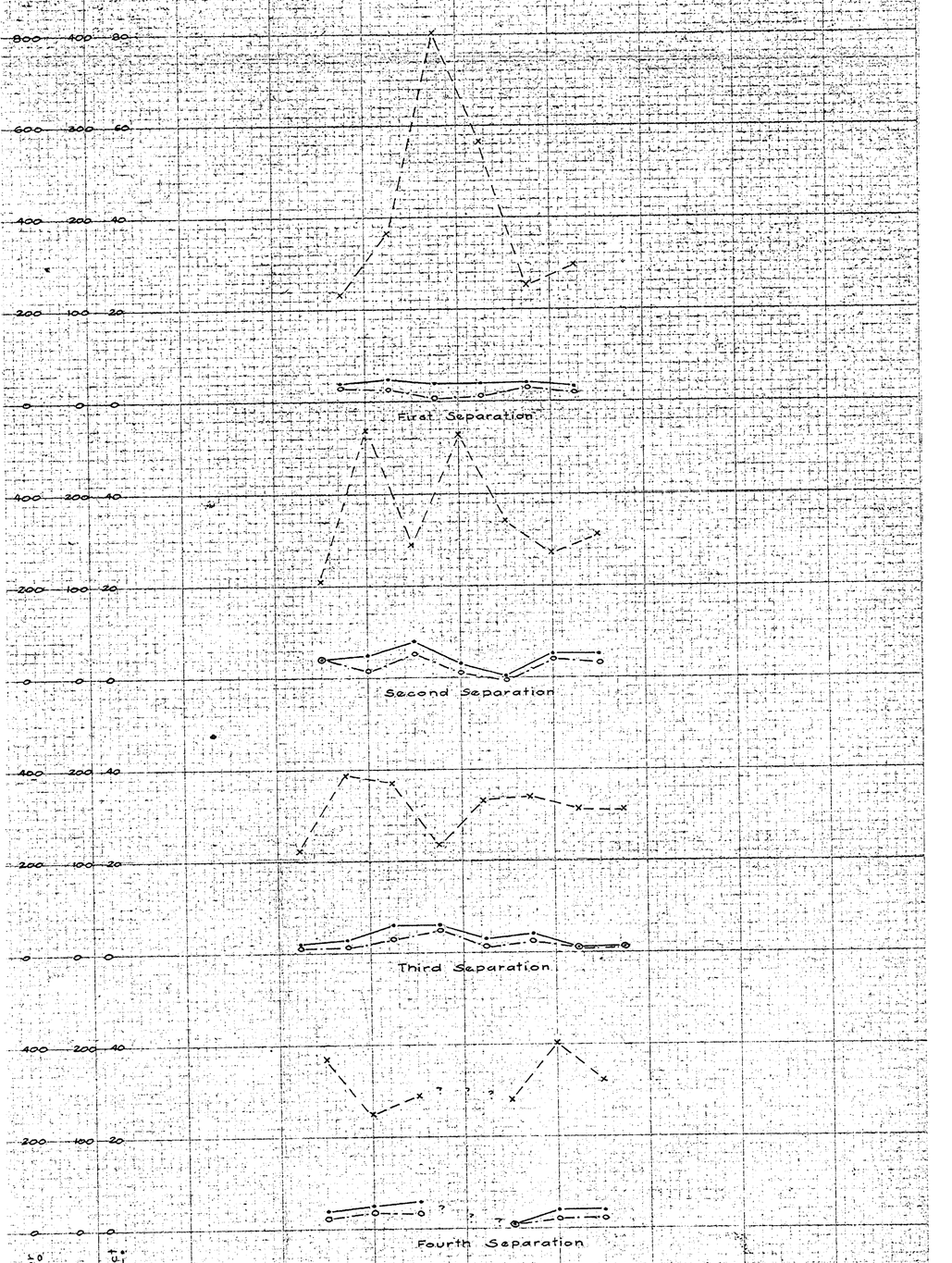
Heinrichs Geoexploration Company
May 1962 Scale: 1"=1000'



TOTAL INTENSITY MAGNETIC PROFILE by MOBILE MAGNETOMETER



SELF POTENTIAL PROFILE



INDUCED POLARIZATION PROFILES

COMPOSITE PROFILES
LINE 4 - SPREAD 4

Mary Claim Group Area
Sec. 15, T17S - R13E
Pima Mining District
Pima County, Arizona

for
INSPIRATION CONSOLIDATED COPPER CO.
by
Heinrichs Geoexploration Company
May 1962 Scale: 1" = 1000'

E-W Line #2
Sta. 1W

6S 5S 4S 3S 2S 1S 0 1N 2N 3N 4N 5N 6N

Thousands of feet

Looking West

Alluvium

Arbitrary base

18000

16000

14000

End of coverage

12000

10000

TOTAL INTENSITY MAGNETIC PROFILE by MOBILE MAGNETOMETER

Millivolts

0

-20

SELF POTENTIAL PROFILE

400 200 40

200 100 20

0 0 0

First Separation

200 100 20

0 0 0

Second Separation

200 100 20

0 0 0

Third Separation

200 100 20

0 0 0

Fourth Separation

INDUCED POLARIZATION PROFILES

Metallic Conduction Factor

Resistivity ohm feet / 2π

Percent Frequency Effect

COMPOSITE PROFILES
LINE I - SPREAD I

Mary Claim Group Area
Sec 15, T17S - R13E
Pima Mining District
Pima County, Arizona

for

INSPIRATION CONSOLIDATED COPPER CO.

by

Heinrichs Geoexploration Company

May 1962 Scale 1" = 1000'

E-W Line #2
Sta. 2E

6S 5S 4S 3S 2S 1S 0 1N 2N 3N 4N 5N 6N

Thousands of feet

Looking West

Alluvium

TOTAL INTENSITY MAGNETIC PROFILE by MOBILE MAGNETOMETER

Arbitrary base

1500 ɣ

1300 ɣ

1100 ɣ

End of coverage

SELF POTENTIAL PROFILE

Millivolts

20 0

First Separation

Second Separation

Third Separation

Fourth Separation

? ? ? ? ?

INDUCED POLARIZATION PROFILES

200 100 20 0 0 0

Metallic Conduction Factor

Resistivity ohm feet/2π $\frac{x}{x}$

Percent Frequency Effect

COMPOSITE PROFILES
LINE 5 - SPREAD 5

Mary Claim Group Area
Sec. 10 & 15, T17S - R13E
Pima Mining District
Pima County, Arizona

for
INSPIRATION CONSOLIDATED COPPER CO.
by
Heinrichs Geoexploration Company
May 1962 Scale: 1" = 1000'

N-S Line #4 Sta. 0

N-S Line #1 Sta. 2S

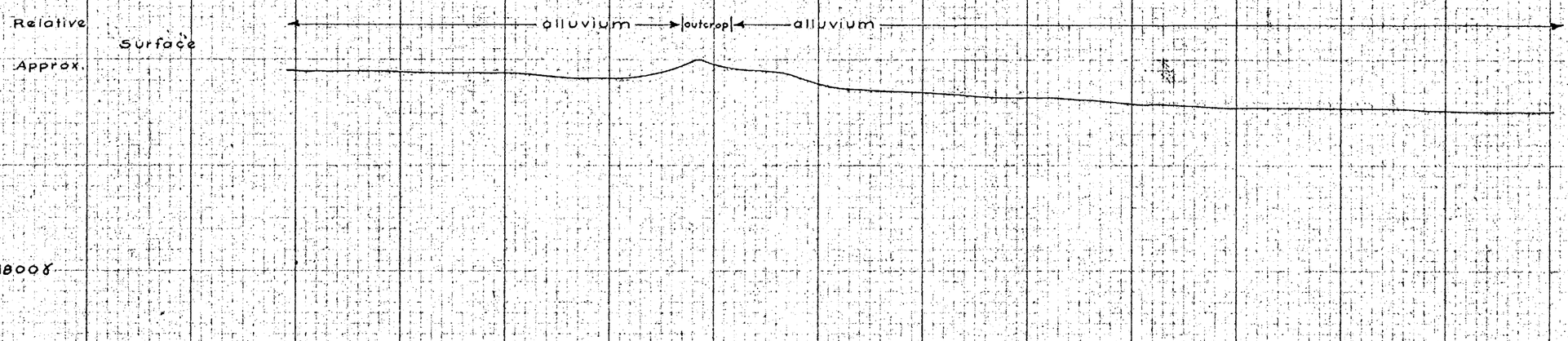
N-S Line #3 Sta. 0

N-S Line #5 Sta. 1S

6W 5W 4W 3W 2W 1W 0 1E 2E 3E 4E 5E 6E

Thousands of feet

Looking North

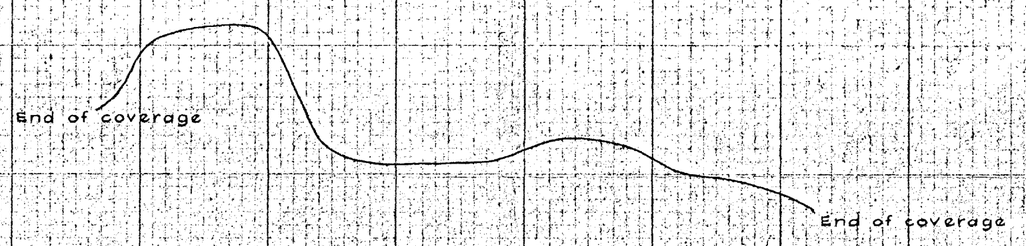


Arbitrary base

18008

16008

14008



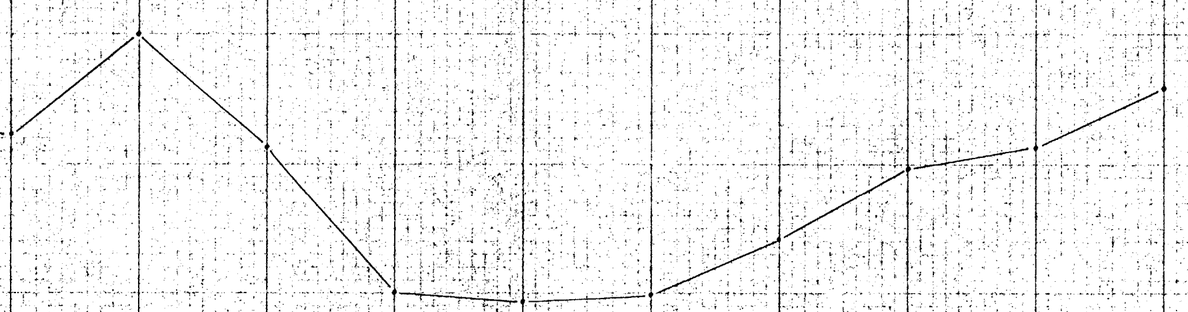
TOTAL INTENSITY MAGNETIC PROFILE by MOBILE MAGNETOMETER

Millivolts

20

0

-20

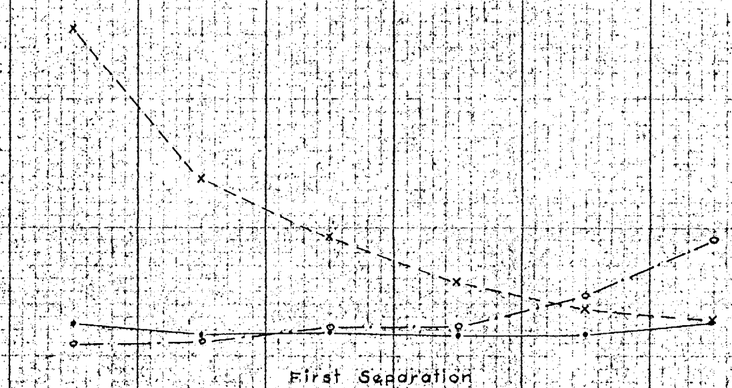


SELF POTENTIAL PROFILE

400 200 40

200 100 20

0 0 0

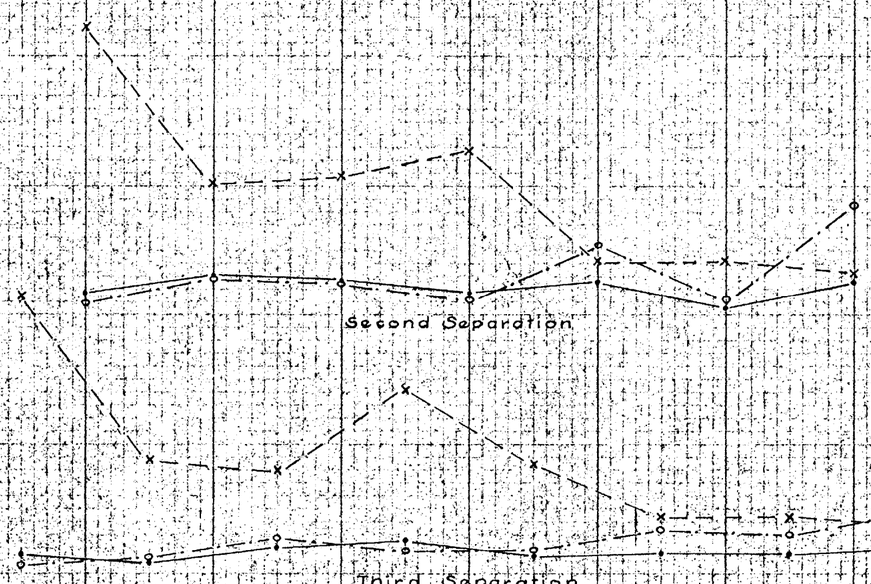


First Separation

400 200 40

200 100 20

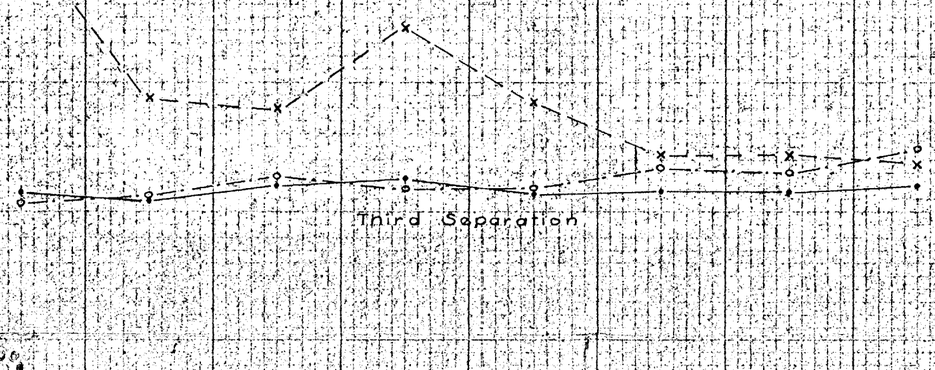
0 0 0



Second Separation

200 100 20

0 0 0

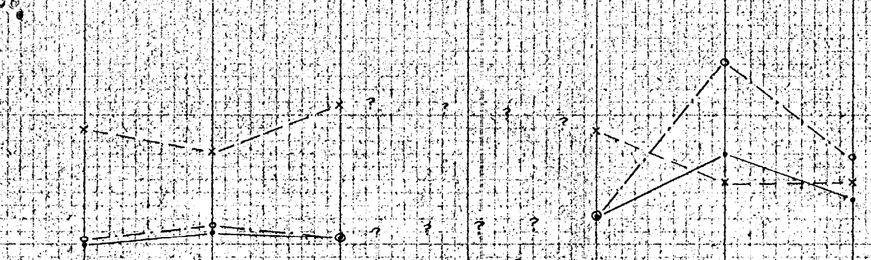


Third Separation

400 200 40

200 100 20

0 0 0



Fourth Separation

Metallic Conduction Factor

Resistivity ohm feet 2πx

Percent Frequency Effect

INDUCED POLARIZATION PROFILES

COMPOSITE PROFILES
LINE 2 - SPREAD 2

Mary Claim Group Area
Sec. 15, T. 17S - R. 13 E.
Pima Mining District
Pima County, Arizona

for
INSPIRATION CONSOLIDATED COPPER CO.
by
Heinrichs Geoexploration Company
May 1962 Scale: 1" = 1000

SUPPLEMENTAL INDUCED POLARIZATION

Mary Claim Group
Pima District, Pima County, Arizona

for
INSPIRATION CONSOLIDATED COPPER COMPANY
Inspiration, Arizona

June - July 1962

by
HEINRICHS GEOEXPLORATION COMPANY
P. O. Box 5671 Tucson, Arizona

INTRODUCTION

Attached are four copies each of the following:

1. Sectional data sheets and composite profiles of the new Line 6.
2. Third-separation level contours of P.F.E., M.C.F., and resistivity in ohm-feet rho DC/2pi of the area.
3. Self potential contours of the area.
4. Revised plan map of the area, including location of the new line, previous lines, magnetic contours, etc.

In order to better point up the anomalous zone, we have added dashed red lines to the sectional data sheets and correspondingly, to the new plan maps. These data can also be similarly added to the plan maps and sectional data sheets submitted previously with the original report.

CONCLUSIONS AND RECOMMENDATIONS

As stated before, we believe the coincidence of concentration of effects on several different lines and different methods in this one area, although weak as the interpretation grading system on the sectional data sheets indicate, still represent a definite anomaly. Data previous to Line 6 was mostly anomalous in the deepest and least reliable 5th and 6th separation levels. However, Line 6 shows an apparently related

effect somewhat shallower, maybe to as little as 500' deep. The higher P.F.E.'s farther west are tentatively disregarded because of the low M.C.F.'s and extremely high associated resistivities. The latter, apparently caused by outcropping limestone which gave considerable trouble in good-ground contact resistances. At some later date, we may try to repeat this part of the line in order to investigate how best to handle this sort of problem in the future.

Line 6 results further substantiate the mild magnitude, but definite S. P. low in the area.

The resultant center of all effects is now moved to the approximate center of the magnetic anomaly, about 125' SE of the location monument of Mary 22. Since the effects seem to coincide so well with the magnetic anomaly, considerations for a more accurate drill hole location might be based on a move to the exact location of the magnetic apex. This could be determined by a few quick NE - SW hand mag profiles across the anomaly.

MISCELLANEOUS

For the record, on behalf of labor affidavit requirements to the claim owners, GEOEX personnel involved in the work were: Walter E. Heinrichs, Jr., E. Grover Heinrichs, Franklin A. Seward, Chris S. Ludwig, W. J. Keith, and J. E. Reeves., and the additional cost of this line exceeded $600.00 making a total cost of completed work applying toward 1961 - 1962 assessment in excess of $3,600.00.

Respectfully submitted,

HEINRICHS GEOEXPLORATION COMPANY

Walter E. Heinrichs, Jr.
President & General Manager

July 5, 1962
P. O. Box 5671
Tucson, Arizona