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Rosemont
Magnetic

INDUCED POLARIZATION SURVEY

Rosemont Area

Pima County, Arizona

for

D. T. Mc Millan

February 1961

by

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

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MAP
Sectional Data Sheets, Lines #1, #2, #3
" " " Supplement #1, Lines #4, #5

Plan Map, March 1961
Plan Map, April 1961 (Supplement #1)

INTRODUCTION

During the month of February 1961, Heinrichs GEOEXploration Company conducted induced polarization investigations in the Rosemont Springs Area over portions of Sections 29, 30, 31 and 32, T18S, R16E. This work was performed at the request of Mr. Donald T. Mc Millan for Guggenheim Bros.

The survey consisted of three observed lines, each of which traversed 12,000 ft. on the surface and each yielding about 7,000 ft. of subsurface information.

CONCLUSIONS AND RECOMMENDATIONS

1. At least two distinct zones of anomalism are observed and possibly three. The first zone appears on the north end of Lines #2 and #3 and is definite anomalism if somewhat unusual in character. The second and most significant zone of anomalism is between 3S and 4S on Line #3. The zone is apparently not exceedingly wide and may be contained within the 1,000 ft. dipole spacing. The third questionably anomalous zone may exist at the north end of Line #1.

2. The second anomalous zone on the south end of Line #3 should be examined in detail. Lines should be run using a 250 or 500 ft. dipole spacing to limit and delineate the anomalous zone.

3. The first zone is definitely anomalous and may be worthy of further detailed examination if the geologic situation

indicates such to be warranted.

METHOD

The induced polarization method is based on the somewhat peculiar electrical properties of sulfide particles, and more particularly those of iron, copper and lead. Sulfide particles react to electrical currents much in the manner of miniature capacitors. A rock mass containing sulfide particles will offer a lower impedence to an alternating current than its resistance to a direct current. Hence when a direct current is applied across a pair of current electrodes in the vicinity of a disseminated sulfide body, the potential drop between two potential electrodes some given distance from the current electrodes will be greater than when an alternating current is applied to the first two electrodes. Three separate quantities are computed from the data acquired in the field. The first is the D.C. resistivity. The second is the percent frequency effect. The third quantity is the so called "metallic conduction factor" (a misnomer) which is simply the frequency effect divided by the D.C. resistivity.

The property of induced polarization is not entirely unique to sulfide particles but with sufficient geological knowledge anomalism due to sulfides can be normaly interpreted apart from that possibly due to graphite, magnetite, clay particles, etc.

PROCEDURE

Each line consisted of one spread of five co-linear electrodes set 1,000 ft. apart and observations were made in accordance with the dipole-dipole or Eltran configuration mode of operation. This permits the evaluation of 33 depth or data points per setup and covers 12,000 profile feet.

The center of Line #1 was located at the intersection of the McCleary Canyon Road with the Wasp Canyon Road about 1,000 ft. N 40° E of the SW Cor. Section 29 and was run in a north-south direction. Line #2 was centered at the same location and run approximately N 55° W - S 55° E. Line #3 was centered on about the south Section Line of Section 30 about 2550 ft. west of the SE corner.

The survey was complicated by rough terrain and heavy vegetation requiring the receiver operator to "go portable" and making the laying and pick up of wires difficult. A further complication was the presence of cattle and vehicular traffic accounting for numerous breaks in the sender wires, all of which contributed to an unusually high cost per profile mile. During the course of running Line#3 an equipment malfunction was experienced and five days were lost as a result of this. Work done just prior to the malfunction was repeated to check the data and test the equipment, at no cost to the client.

Line #1 required two and a half days to run. Although the information obtained is considered to be of some value and is

included with this report, no charge is being made for these services.

Line #2 required two and a half days to run at a cost of $625.00 or about $275.00 per profile mile exclusive of vehicle costs.

Line #3 required three days to run at a cost of $750.00 or about $330.00 per profile mile. The average cost for 1,000 ft. dipoles in gentle terrain with light vegetation is usually about $175.00 to $225.00 per profile mile. Including Line #1 a total of 6.81 profile miles was surveyed at a cost for services of $1,375.00 or a cost of about $201.00 per profile mile. All cost figures are exclusive of vehicle expenses.

The data is presented in "section". The D.C. resistivity is plotted above the horizontal line and the percent frequency effect as a superscript to this value. The metal factor (MCF) is plotted below the line. It should be emphasized that the presentation has no linear vertical scale and that the points are plotted at the intersection of 45° lines extending from the center of sender and receiver positions as a matter of convenience. The actual depths of the profiles are an indeterminant function of the D.C. resistivity. In general it can be said that the data acquired will be from a depth of from 0.2 to 2.0 times the dipole spacing. The data is contoured "logarithmically", again as a matter of convenience in interpretation only.

INTERPRETATION

Line #1 showed no significant anomalism other than a possible zone of interest between 3N and 4N as indicated by slightly anomalous frequency effects of 7 and 5 and metal factors of 57 and 41. A geologic contact of some sort apparently exists between 1S and 1N and may possibly be attributed to a thicker zone of alluvium in this area. The resistivity picture indicates a thickening of alluvium to the south.

Line #2 shows anomalism between stations 1W and 5W with the most definite moderate to strong anomalism between 3W and 5W becoming weak or questionable abruptly between 4W and 5W, moderate between 2W and 3W and weak or questionable between 1W and 2W. There is also some possible indication of anomalism between 1E and 2E but this is highly questionable and may only be a reflection of decreasing resistivity due to thickening alluvium. The anomaly between 3W and 4W is of most significant interest. This anomaly presents an unusual picture (from the standpoint of large disseminated sulfide zones) of appearing to "bottom". This might conceivably be due to such a dissemination actually bottoming within the limits of electrical measurement or to the mineralization being confined to thin or narrow bands of sulfides relatively wide spaced. Data to the third and often fourth separation (depth point) is usually dependable with the fifth and sixth separations often questionable.

Normally, anomalous values due to a large disseminated sulfide body will increase to some degree with depth and be bounded on the sides by more or less parallel inclined metal factor contours which are not connected across the "bottom" of the anomaly. In this case the values decrease with depth and must be closed across the bottom. This rather unusual situation is reflected in the resistivity picture as well.

Line #3 shows the most definite and significant anomalism. The same unusual anomaly as that observed on Line #2 exists between at least 1S and 3N cutting off abruptly between 3N and 4N. The moderate to strong anomalism between 3S and 5S is the most significant feature on this line. In this case the anomalism is "normal". The transition between the northernmost anomalism and the second area is somewhat obscure. It will be noted that the normal increase in metal factor anomalism with depth is again reflected normally in the resistivity section.

Respectfully submitted,

HEINRICHS GEOEXPLORATION COMPANY

Franklin A. Seward, Jr.

Franklin A. Seward, Jr.
Geophysicist

February 1961
P. O. Box 5671
Tucson, Arizona

SUPPLEMENT # 1

To A Report on
INDUCED POLARIZATION SURVEYS

Rosemont Area
Pima County

March, 1961

INTRODUCTION

Following completion of I. P. surveys in February, 1961 and subsequent interpretation of data, additional work to substantiate initial results was requested by Mr. D. T. McMillan. As previously recommended the electrode spacing was reduced to 500 ft. in order to provide more definitive and detailed information. The work consisted of two lines parallel to and 1,000 ft. south and west of Lines #2 and #3 in the vicinity of anomalism previously observed.

CONCLUSIONS AND RECOMMENDATIONS

1. The anomalism so far observed and reported is considered to be definitely due to sulfide involvement. No discrete interpretation of concentration, depth to, or thickness of the sulfide zone can be made without more definitive geological information.

2. Certainly more induced polarization work at this time would be valuable in delineating the mineralized zone or zones but in all probability would not further aid in the selection

ROSEMONT PROJECT

Pima County, Arizona

MOBILE MAGNETOMETER SURVEY

for

Donald T. McMillan

February 1961

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

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Location Map Showing Traverses	Frontispiece
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Conclusions & Recommendations	1
Interpretations of Magnetics	2
Procedures	5

NOTE: Mobile Magnetic Records are in the original report only.

INTRODUCTION

During the last week of January 1961, several discussions were held between Mr. Donald T. McMillan and Heinrichs GEOEXploration Company concerning the advisability and/or possible value to be gained from a magnetic survey over and around a claim group located principally in Sections 29, 30 & 31, T18S, R16E, Pima County Arizona. On January 31, 1961, Mr McMillan authorized GEOEX to make a reconnaissance survey, with the mobile magnetometer, over the existing roads and some washes and ridges, to determine if any anomalous areas could be rapidly located or if structural trends could be mapped. This survey was completed on February 1, 1961 with Mr. McMillan present as observer and guide.

CONCLUSIONS AND RECOMMENDATIONS

There were no sharp deviations on the magnetic records over the area of interest that would indicate isolated anomalism caused by locally strong concentrations of magnetite. There are gradual changes in level indicative of faulting, thickening and thinning of alluvial cover and/or changes in the sedimentary bedrock formations. Possibly some geologic trends can be inferred from these. However, no further detailed magnetic work is recommended at this time. As additional information is gathered by other means, a justification for more magnetometer surveys may be shown.

Other geophysical methods should be considered as an adjunct to geologic inferences in locating drill sites. We recommend

several induced polarization profiles across the claim group at a normal angle to any known or inferred mineralized trends.

INTERPRETATION OF THE MAGNETICS

Record #1. This is mainly southerly along the Sonoita Road, and excluding artificial effects from cars, culverts, bridges, etc., it shows considerable anomalism. This record, which is off the area of interest, was made on the way in to obtain a regional background picture to aid in interpretation of data that would be obtained over the claim group. There are many outcrops along the road, well exposed in road cuts, so the anomalies here can be readily checked visually. Geologically the area is comprised of Cretaceous sediments and Tertiary andesites and latites. Undoubtedly much of the anomalism is due to the volcanics. Turning westerly onto the Rosemont Camp Road, at a point about 1500 ft. in, the record shows a magnetic deviation that dips slightly low then climbs higher for a change of 140 gammas. This indicates formational change or faulting. Near the end of the record, east of point "A", there are two anomalous highs of about 125 gammas and 150 gammas. These also are at a formational break as is evidenced by the drop in level on to the west as shown by the continuation of this run on Record #2. These anomalies east of point "A" suggest some faulting and the cause of anomalism might be volcanic intrusion along a fault, or magnetite from contact metamorphism. There is outcrop and it can be readily checked on the ground.

Record #2 shows a long, gradual decline in level westerly to about 1200 ft. beyond point "E". In this distance of about 7500 ft. the level drops about 200 gammas indicating gradually increasing thickness of alluvium and/or lower susceptibility sedimentary formations. The record then shows a fairly rapid rise of about 75 gammas and holds this level to point "F". This indicates formational change.

Record #3 was a short run to cross an old mine. A minor high was due to the dump, but in crossing the area, which is a known fault, the record level is about 50 gammas higher on the south side.

Record #4 shows occasional minor level changes all of which are attributed to changes in gravel and alluvial thickness. There were many directional changes and the traverse was on roads, ridges and in washes and shows nothing of significance.

Record #5 shows nothing of interest until approaching and passing the claim location post for MONT 35. Here there is a broad low amplitude high of 125 gammas with the high point at some mine workings. Other than a broad shallow concentration of magnetite, possibly formational, the anomaly could conceivably be caused by something as much as 500 ft. deep. On-the-ground investigation around these workings should reveal the cause of this high and its association with mineral. This being the one anomaly of mineral significance found near the claim group, after a ground

investigation it might be deemed advisable to try to trace this anomaly onto your ground by means of a hand magnetometer. Near the end of the record the level had climbed slightly and this is interpreted as being mass effect from the hillside we were ascending.

Record #6 shows erratic readings and a fairly sharp change in level upward in the vicinity of two old cabins. There are old adits and workings here and a contact with possible faulting indicated by the magnetic picture. This zone is not far south of the anomaly on Record #5 and possibly is related to it along a NW-SE strike.

Record #7 indicates a formational change about 1800 ft. northwest from point "C" and another one about 3,000 ft. from "C" in the same direction. There is a small high of approximately 100 gammas at about 6500 ft. Cause of this is unknown but if it is on the claim group or in your area of interest, it would warrant a ground check for outcrop in the vicinity. The rest of the record shows little of interest.

Record #8 shows only a minor level change, lower to the west.

Record #9 is somewhat erratic due to causes such as concentrations of magnetite in the wash, high walls and banks in places, rough going, sharp turns, variety of rock types in the wash. It appears, however, that there may be a formational contact about 500 - 600 ft. from the starting point.

Record #10 shows a gradual drop of about 60 gammas over a distance of a mile,going westerly. There is a small anomalous feature about 600 ft. west of point "U" but it appears to have minor significant interest.

Record #11 also shows a gradual drop of about 75 gammas in a distance of over a mile, going westerly. No other significance.

In general the area is a magnetic low and maximum low is near the SE part of Section 30 and northeast part of Section 31. This suggests either a thickening of sedimentary formations here, or a basement of very acid igneous rock. Since some anomalism was found in crossing old workings, at least some of the mineralization in the district is associated with a low magnetite content.

PROCEDURES

The instrument is a Gulf licensed flux-gate type, total intensity magnetometer mounted on a Dodge Powerwagon. Variations in the total earth's field are continuously recorded on chart paper on a recorder geared to the vehicle drive. Record is made at whatever speed the vehicle can be driven, according to terrain conditions. On this project most of the existing roads and trails across and around the claim group were traversed, as well as some ridges and washes. A total of about 22 miles of record were made of which about 10 miles were on the Sonoita Road and into the area, thus 12 were made in the area of interest. For the purpose of

of a drill site or in any quantitative interpretation without additional geological or drill hole information unless a zone of distinctly more intense anomalism were observed.

3. The induced polarization anomalism is of sufficient intensity as to recommend further geological evaluation and may warrant at least one or two test holes to determine the degree of sulfide involvement.

PROCEDURE

Line #4 was run parallel to Line #2 with its center located about 1,000 ft. southwest at about station 1.5W on Line #2.

Line #5 was run north-south with its center located about 1,000 ft. due west of station 4.35S on Line #3. As previously stated, these lines utilized 500 ft. electrode spacing and were centered approximately on a projection of the anomalous zones observed in the reconnaissance survey.

No difficulties were experienced other than those due to the rugged terrain and heavy vegetation.

INTERPRETATION

Anomalism on Line #4 approximately coincided with and equalled in character that Observed on Line #2. It should be pointed out that some change in observed results always accompanies a change in electrode spacing due to the geometric considerations. In this case, correlation is considered to be

excellent. The two most intense zones of anomalism are located from 0.5E to 0.5W and from 1.5W to 2.0N. Anomalism is terminated abruptly between .5E and 1.0E. Again a barren or only shallowly mineralized zone is evident probably between .5W and 1.5W. There is no discrete termination of anomalism on the western end of the line but there is again some indication of a barren or shallow zone between 2.0W and 2.5W.

Anomalism observed on Line #5 may not be as discrete as might be desired. Apparently moderate anomalism is observed throughout the length of the line with probably the most intense zone between .5N and 1.0N decreasing to the south. There is no cut off at the north or south ends of the line. Two depth points show very strong anomalism that are not possible of discrete interpretation other than that they are probably due to increased sulfide involvement in very limited zones. A possible interpretation may be that mineralization becomes thinner but more intense at the southern end of this line.

Respectfully submitted,

HEINRICHS GEOEXPLORATION Co.

Franklin A. Seward, Jr.

Franklin A. Seward, Jr.
Geophysicist

April 5, 1961
Tucson, Arizona

getting greater detail the recorder was set to record on scales of 100 ft. to the inch horizontally and 50 gammas per half inch vertically. The charts are to be read looking lengthwise with higher values to the right. This type of recorder allows for ten effective chart widths by letting the trace cross the paper and continue again from the other side as necessary. To avoid confusion, values have been plotted at intervals on the records. An arbitrary base level was picked at the start and assigned a value of 1000 gammas. Each dot on the paper represents an interval along the ground of 5 ft. Certain natural and cultural features noted in passing were marked on the records for control. Basic control is by a letter system whereby letters were assigned to identifiable points on the ground and keyed to both the base map and the records.

Registered Professional Engineer (Mining)
CERTIFICATE EXPIRES
WALTER E.
HEINRICHS, JR.
DEC. 31, 1961
ARIZONA, U.S.A.

Respectfully submitted,

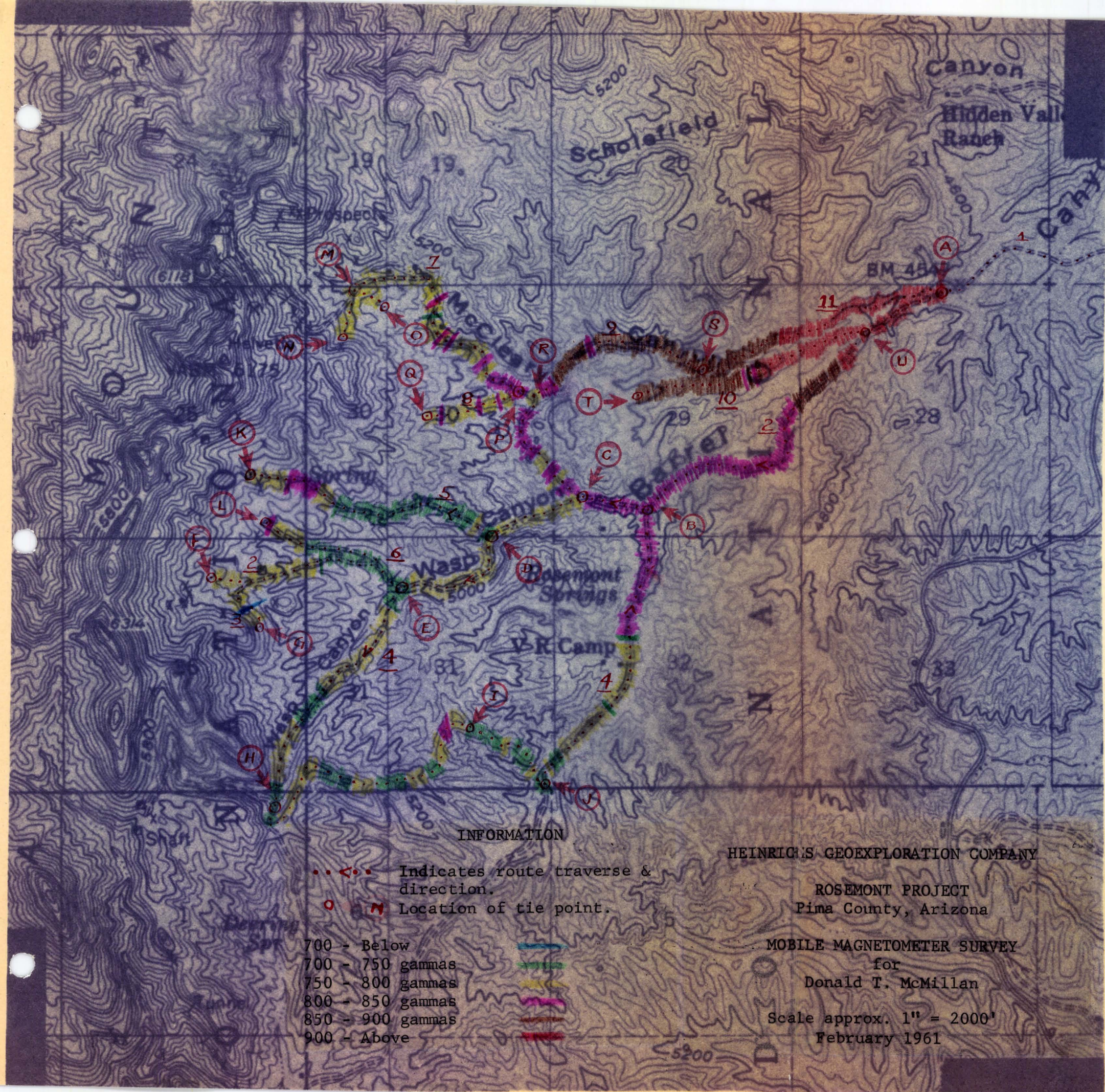
HEINRICHS GEOEXPLORATION COMPANY

John W. Marlatt

John W. Marlatt, Geologist

Walter E. Heinrichs, Jr.
President & General Manager

February 7, 1961
P. O. Box 5671
Tucson, Arizona


Canyon
Hidden Valley Ranch
Scholefield
McClean Canyon
Barrel
Wasp Canyon
Rosemont Springs
V R Camp
BM 4547
INFORMATION
Indicates route traverse & direction.
Location of tie point.
700 - Below
700 - 750 gammas
750 - 800 gammas
800 - 850 gammas
850 - 900 gammas
900 - Above
HEINRICHS GEOEXPLORATION COMPANY
ROSEMONT PROJECT
Pima County, Arizona
MOBILE MAGNETOMETER SURVEY
for
Donald T. McMillan
Scale approx. 1" = 2000'
February 1961

ROSEMONT PROJECT

Pima County, Arizona

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Registered Professional Engineer (Mining)
CERTIFICATE EXPIRES
WALTER E.
HEINRICHS, JR.
DEC. 31, 1961
ARIZONA, U.S.A.

Respectfully submitted,

HEINRICHS GEOEXPLORATION COMPANY

John W. Marlatt

John W. Marlatt, Geologist

Walter E. Heinrichs, Jr.
President & General Manager

February 7, 1961
P. O. Box 5671
Tucson, Arizona

GUGGENHEIM BROTHERS, SPECIAL ACCOUNT
120 BROADWAY, NEW YORK 5, N. Y.

DATE May 24, 1961 CHECK NO. 3743

Your statement of April 7, 1961 re: Induced Polarization Investigations, Rosemont Project	846	20
DISCOUNT		
APPROVED	846	20

RECEIVED MAY 26 1961

DETACH AND KEEP THIS STATEMENT

GUGGENHEIM BROTHERS
120 BROADWAY
NEW YORK 5, N. Y.

RECEIVED MAY 26 1961

May 24, 1961

Heinrichs Geoexploration Company
P.O. Box 5671
Tucson, Arizona

Gentlemen:

We enclose, herewith, our check in the amount of $846.20 for payment of your invoice dated April 7, 1961.

We regret the delay in payment, which was caused by the fact that this invoice had been mislaid.

Very truly yours,

GUGGENHEIM BROTHERS

BY: A. Van de Maele

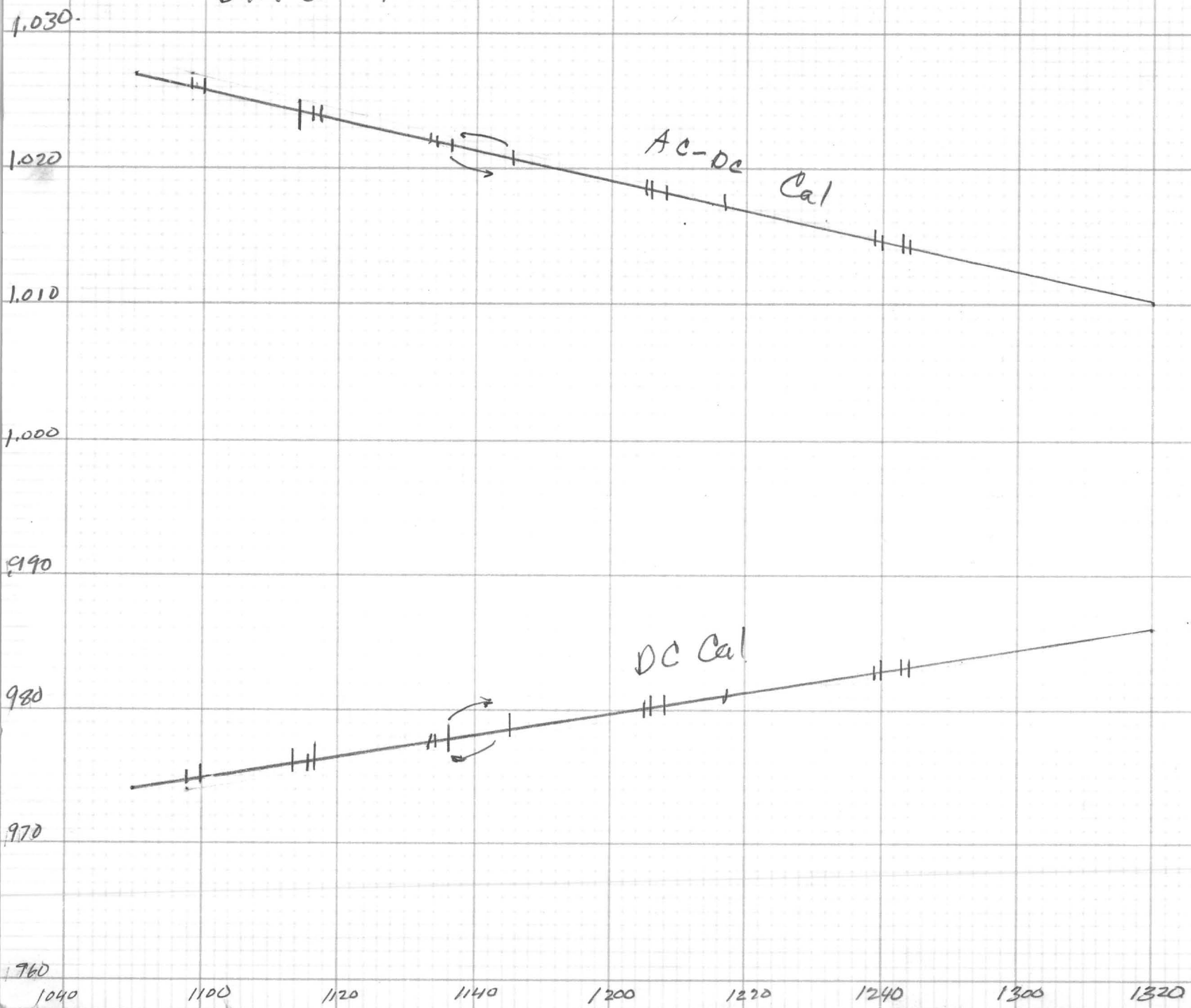
A. Van de Maele

AVdeM:VT
Enclosure

cc: Mr. Donald T. McMillan
6737 E. Opatus Street
Tucson, Arizona

Rosemont Project.
Line #2"
Data of 15/Feb/61

Calib – 720 mils



a = 1000'

HEINRICHS GEOEXPLORATION COMPANY

INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page 3

Project Rosemont Line 2N Field date 15/Feb/61 Data page 1 & 2 Comp. date 15/Feb/61. Comp by TOL

(A) Send	2-3	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3
(B) Receive	CAL	1N-2N →		2N-3N →			3N-4N →				4N-5N →	
(C) n separation		1	2	1	2	3	1	2	3	4	2	3
(D) I	710	1420	1420	1430	1410	1400	1420	1410	1400	1400	1410	1420
(E) Vdc (avg)	730	27.7	6.55	23.6	8.93	2.99	13.11	5.13	3.40	1.31	6.66	3.73
(F) DCcal	.974	.975	.975	.976	.976	.976	.977	.978	.978	.978	.980	.980
(G) Kn x 10^{-3}		3	12	3	12	30	3	12	30	60	12	30
(H) ρdc=ExFxGx10^3/D		57.0	59.0	48.6	74.1	62.5	27.1	42.6	71.1	54.8	83.4	77.2
(I) Vac Σ	750	27.0	6.56	23.2	8.80	3.08	12.76	4.98	3.34	1.32	6.60	3.60
(J) AC noise x 2	↓	0.00										→
(K) Vac(corr) = $\sqrt{I^2 - J^2}$		27.0	6.56	23.2	8.80	3.08	12.76	4.98	3.34	1.32	6.60	3.60
(L) AC-DC cal.	1.027	1.026	1.026	1.024	1.024	1.024	1.022	1.022	1.021	1.022	1.018	1.018
(M) ρdc/ρac=ExL/K		1.051	1.021	1.041	1.040	.998	1.051	1.050	1.040	1.016	1.026	1.051
(N) PFE=(M-1)(10^2)		5	2	4	4	0	5	5	4	2	3	5
(O) MCF=(M-1)(10^5)/H		90	39	84	54	-3	188	117	56	29	31	66

Project Sam C	Line		Field date		Data page		Comp. date				Comp by	
(A) Send	3-4	4-5	1-2	2-3	3-4	4-5	2-3	2-3	→		→	
(B) Receive	4N-5N →		5N-6N →			→	CAL	Cal	→		→	
(C) n separation	4	5	3	4	5	6						
(D) I	1390	1390	1400	1400	1390	1390	720	520	710	520	720	
(E) Vdc (avg)	3.02	1.25	3.20	2.09	1.92	.81	730	500	730	536	730	
(F) DCcal	.980	.981	.983	.983	.983	.983	.986	1.040	.974	.971	.986	
(G) Kn x 10^{-3}	60	105	30	60	105	168						
(H) ρdc=ExFxGx10^3/D	128	92.6	67.4	88.0	143	96.1						
(I) Vac Σ	2.96	1.20	3.16	2.10	1.92	.84	738	514	750	518	738	
(J) AC noise x 2	.10	.10	.06	.06	.06	.06	↓					
(K) Vac (corr) = $\sqrt{I^2 - J^2}$	2.96	1.20	3.16	2.10	1.92	.83						
(L) AC-DC cal.	1.018	1.017	1.015	1.015	1.014	1.014	1.010	1.028	1.027	.968	1.010	
(M) ρdc/ρac =ExL/K	1.039	1.059	1.028	1.011	1.014	.990						
(N) PFE=(M-1)(10^2)	4	6	3	1	1	-1						
(O) MCF=(M-1)(10^5)/H	30	64	42	13	10	-10						

3-4.

INDUCED POLARIZATION SENDER NOTES

Project: ROCKMONT Line: 2S GRAFF Date: 15.FEB61

Send		2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2	4-5	3-4
Receive	CAL	1-2S	→	2-3S	→		3-4S			→	4-5S	→
Time		1415	1417	1436	1438	1440	1502	1503	1504	1505	1528	1531
Range		1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Current		1425	1400	1420	1400	1380	1410	1400	1400	1390	1410	1400
Send	2-3	1-2	4-5	3-4	2-3	1-2			3-4	3-4		
Receive	→	→	5-6S	→	→	→			CAL	CAL	CAL	CAL
Time	1533	1534	1600	1601	1603	1605			1405	1406	1634	1635
Range	1.5	1.5	1.5	1.5	1.5	1.5			.5	.75	.5	.75
Current	1390	1380	1405	1400	1400	1390			510	710	510	700

INDUCED POLARIZATION SURVEY - RECEIVER NOTES PAGE 3

Project: Rosemont Line: 2S Int. Cal. 51.0 Date: 2-15-61

Send	3-4	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2	4-5	3-4
Rec.	cal	1-2S →		2-3S →			3-4S				4-5S	
Time		1415	1417	1436	1438	1440	15:02	15:03	15:04	15:05	15:28	15:31
DC-1		14.9	3.30	13.7	3.81	1.27	11.4	3.50	1.43	.52	2.87	1.40
		14.8	3.34	13.6	3.81	1.26	11.6	3.52	1.48	.55	2.81	1.40
DC-2		15.0	3.10	13.4	3.61	1.18	11.3	3.31	1.39	.58	2.76	.95
		14.8	3.08	13.4	3.61	1.20	11.3	3.30	1.37	.54	2.74	.96
Σ		29.9	6.40	27.1	7.42	2.46	22.7	6.81	2.82	1.10	5.55	2.35
		29.6	6.42	27.0	7.42	2.46	22.9	6.82	2.85	1.09		2.36
DC-3		14.7	3.34	13.7	3.80	1.25	11.6	3.20	1.45	.56	2.82	1.40
		14.6	3.35	13.7	3.81	1.25	11.5	3.20	1.46	.58	2.80	1.40
DC-4		14.7	3.07	13.4	3.62	1.20	11.3	3.58	1.38	.56	2.72	.95
		14.8	3.08	13.4	3.61	1.19	11.3	3.58	1.37	.54	2.73	.95
Σ		29.4	6.41	27.1	7.42	2.45	22.9	6.78	2.83	1.12	5.54	2.35
		29.4	6.43	27.1	7.42	2.44	22.8	6.78	2.83	1.12	5.55	2.35
DC-AV		29.6	6.42	27.1	7.42	2.45	22.8	6.80	2.83	1.11	5.55	2.35
AC-1		14.7	3.22	13.5	3.74	1.24	11.2	3.45	1.44	.56	2.72	1.22
AC-2		14.7	3.22	13.5	3.74	1.24	11.2	3.45	1.44	.56	2.72	1.22
Σ		29.4	6.44	27.0	7.48	2.48	22.4	6.90	2.88	1.12	5.44	2.44
S. P.		+0.2	+2	-12.0	-12.0	-12.0	-7.4	-7.4	-7.4	-7.4	+3.6	+3.6
AC-N		.04	.04	.05	.05	.05	0	0	0	0	.06	.06

INDUCED POLARIZATION SURVEY - RECEIVER NOTES PAGE 4

Project: Rosemont Line: 2S Int. Cal. 51.6 Date: 2-15-6

Send	2-3	1-2	4-5	3-4	2-3	1-2		3-4	3-4	3-4	3-4
Rec	→	→	5-6S	→	→	→		Cal	Cal	Cal	Cal
Time	15:33	15:34	16:00	16:01	16:03			1405	1406	1634	1635
DC-1	.68 .67	.21 .22	1.18 1.17	.60 .60	.30 .31	.15		26.5	36.5	26.7	36.2
DC-2	.50 .50	.25 .25	1.15 1.14	.57 .60	.31 .30			26.5	36.5	26.7	36.2
Σ	1.18 1.17	.46 .47	2.33 2.31	1.17 1.20	.61 .61			53.0	73.0	53.4	72.4
DC-3	.67 .67	.25 .26	1.19 1.21	.55 .52	.32 .30			26.5	36.5	26.7	36.2
DC-4	.51 .51	.25 .24	1.10 1.09	.65 .65	.30 .32			26.5	36.5	26.7	36.2
Σ	1.18 1.18	.50 .50	2.29 2.30	1.20 1.17	.62 .62			53.0	73.0	53.4	72.4
DC-AV.	1.18	.48	2.31	1.19	.62			53.0	73	53.4	72.4
AC-1	.61	.25	1.21	.62	.34			25.6	37.3	26.0	36.6
AC-2	.61	.25	1.21	.62	.34			25.6	37.3	26.0	36.6
Σ	1.22	.50	2.42	1.24	.68			51.2	74.6	52.0	73.2
S.P.	+3.6	+3.6	+2.9	+2.9	+2.9						
AC-N	.06	.06	.05	.05	.05						

INDUCED POLARIZATION SENDER NOTES 1000 a

Project: ROSEMONT Line: 2N GRATT Date: 15. FEB. 81

Send		3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3
Receive	CAL	1-2N	→	2-3N	→		3-4N	→		→	4-5N	→
Time		1058	1100	1114	1116	1117	1133	1134	1145	1136	1205	1206
Range		1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Current		1420	1420	1430	1410	1400	1420	1410	1400	1400	1410	1420
Send	3-4	4-5	1-2	2-3	3-4	4-5			2-3	2-3	2-3	
Receive	→	→	5-6N	→	→	→			CAL	CAL	CAL	CAL
Time	1208	1217	1239	1240	1243	1244			1050	1054	1317	1320
Range	1.5	1.5	1.5	1.5	1.5	1.5			.5	.75	.5	
Current	1390	1390	1400	1400	1390	1390			520	710	520	720

INDU[illegible] POLA[illegible] SURVEY - RECEIVER [illegible]TES [illegible]GE [illegible] a=1000'

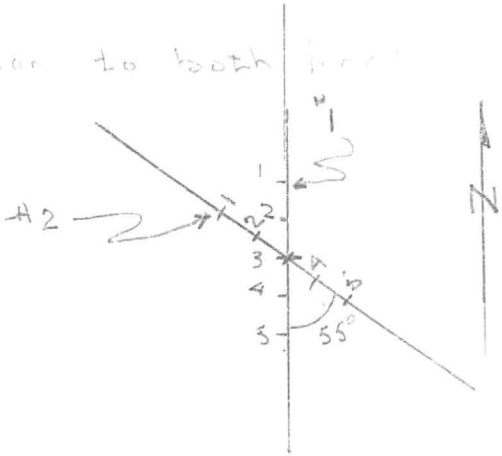
Project: RPS Line: 2N Int. Cal. 49.5 Date: 2-15-61

Send	2-3	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3
Rec.	Cal	1-2N	→	2-3N	→		3-4N	→		→	4-5N	→
Time		10:58	11:00	11:14	11:16	11:17	11.33	11:34	11:45	11:36	12:05	12:06
DC-1		14.0 14.1	3.0 3.02	11.8 11.8	4.65 4.40	1.36 1.35	6.15 6.18	2.65 2.56	1.76 1.98	.65 .72	3.35 3.33	1.90 1.98
DC-2		13.6 13.6	3.55 3.49	11.8 11.8	4.40 4.50	1.66 1.62	6.92 7.00	2.46 2.39	1.60 1.46	.64 .51	3.31 3.48	2.04 2.23
Σ		27.6 27.7	6.55 6.51	23.6 23.6	8	3.02 2.97	13.07 13.19	5.11 5.32	3.36 3.44	.29 .29	6.66 6.71	3.94 3.75
DC-3		14.1 14.1	3.00 2.92	11.7 11.7	4.52 4.60	1.34 1.31	6.05 6.05	2.25 2.50	1.88 1.77	.68 .55	3.10 3.05	1.46 1.65
DC-4		13.6 12.6	3.63 3.65	11.9 11.8	4.28 4.35	1.67 1.65	7.00 7.10	2.80 2.50	1.61 1.55	.70 .74	3.53 3.61	2.15 1.97
Σ		27.7 27.7	6.55 6.68	23.6 23.5	8.31 8.95	3.01 2.96	13.05 13.15	5.08 5.[illegible]	3.49 3.32	.33 .29	6.63 6.66	3.67 3.62
DC-AV.		27.7	6.55	23.6	8.93	2.99	13.11	5.13	3.40	1.31	6.66	3.73
AC-1		13.5	3.28	11.6	4.40	1.54	6.38	2.49	1.67	.66	3.30	1.80
AC-2		13.5	3.28	11.6	4.40	1.54	6.38	2.49	1.67	.66	3.30	1.80
Σ		27.0	6.56	23.2	8.80	3.08	12.76	4.98	3.34	1.32	6.60	3.60
S.P.		-1.5	-1.5			-10.4				+6.4		
AC-N		0	0			0				.0		

This line (#2) bears N55° W

line #1 bears NS

#3 electrode common to both lines



INDUCED POLARIZATION - RECEIVER NOTES PAGE _____ 9=1000

Project: Basement Line: 2N Inc.Cal Date: 15/Feb/9

Send	3-4	4-5	1-2	2-3	3-4	4-5		2-3	2-3	2-3	2-3	
Rec.	4-3N	→	5-6N			→		Cal	Cal	Cal	Cal	
Time	12:08	12:17	12:39	12:40	12:43	12:44		1050	1054	1317	1320	
DC-1	1.42 1.62	.62 .56	1.50 1.62	1.05 1.06	.90 .89	.39 .38		25.0	36.5	26.6	36.5	
DC-2	1.48 1.45	.68 .65	1.69 1.62	1.06 1.00	1.00 1.03	.42 .44		25.0	36.5	26.6	36.5	
Σ	2.90 3.07	1.30 1.21	3.19 3.24	2.11 2.06	1.90 1.92	.81 .82		50.0	73.0	53.6	73.0	
DC-3	1.40 1.38	.60 .46	1.53 1.51	1.16 1.08	.82 .81	.35 .33		25.0	36.5	26.6	36.5	
Dc-4	1.66 1.59	.69 .75	1.63 1.67	.94 1.03	1.16 1.08	.45 .47		25.0	36.5	26.6	36.5	
Σ	3.06 2.97	1.29 1.21	3.21 3.18	2.10 2.11	1.98 1.89	.80 .80		50.0	73.0	53.6	73.0	
C-AV	3.02	1.25	3.20	2.09	1.92	.81		50.0	73.0	53.6	73.0	
C-1	1.48	.60	1.58	1.05	.96	.42		25.7	37.5	25.9	36.9	
AC-2	1.48	.60	1.58	1.05	.96	.42		25.7	37.5	25.9	36.9	
Σ	2.96	1.20	3.16	2.10	1.92	.84		51.4	75.0	51.8	73.8	
S. P.		+6.6				-5.7						
AC-N		.05				.03						

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INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page 4

Project Rosemont Line 2-S Field date 15/Feb/61 Data page 3 & 4 Comp. date 16/Feb. Comp by [illegible]

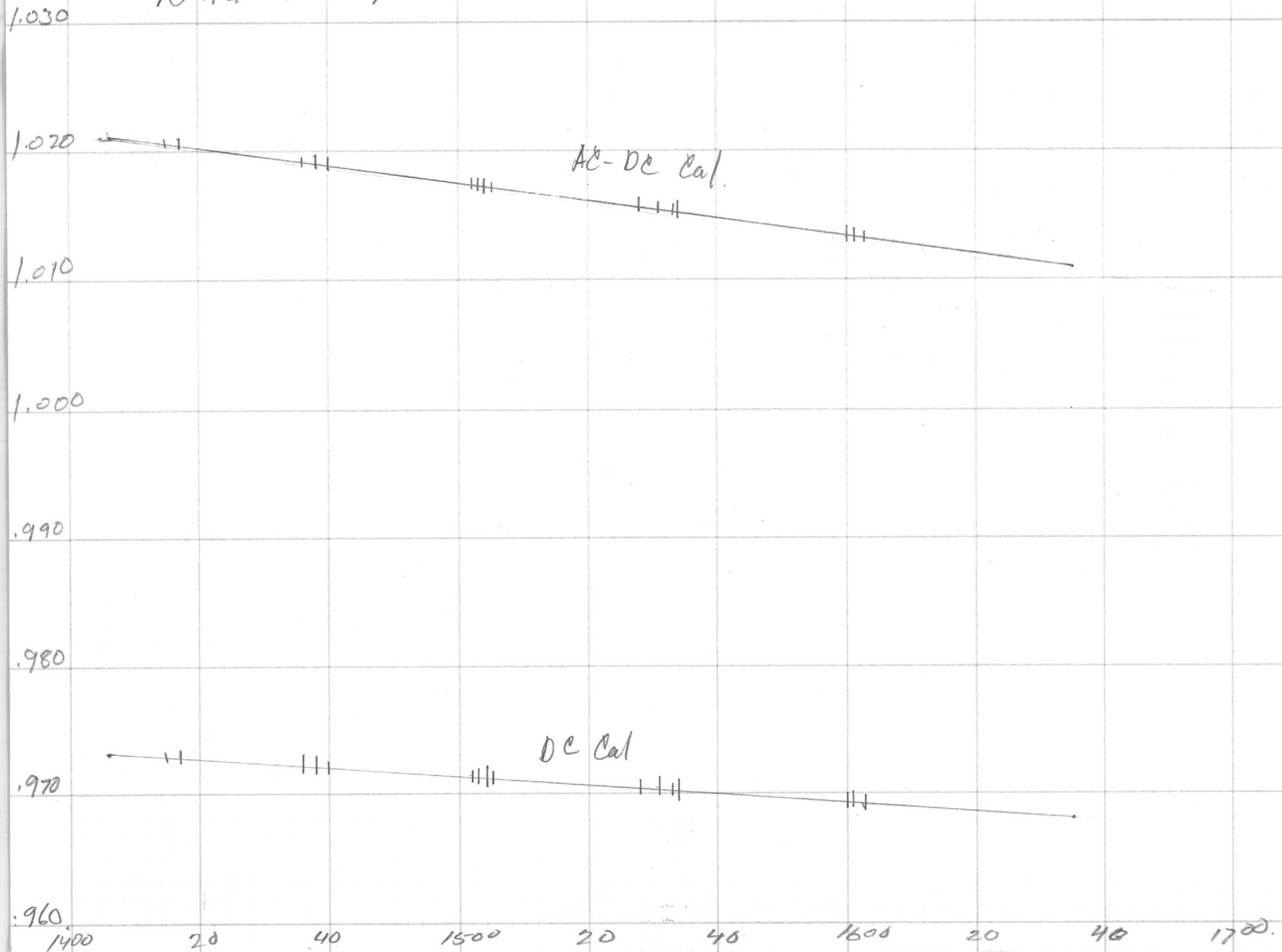
(A) Send	3-4	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2	4-5	3-4
(B) Receive	CAL	1-2s →		2s-3s →			3s-4s			→	4s-5s →	
(C) n separation		1	2	1	2	3	1	2	3	4	2	3
(D) I		1425	1400	1420	1400	1380	1410	1400	1400	1390	1410	1400
(E) Vdc (avg)		29.6	6.42	27.1	7.42	2.45	22.8	6.80	2.83	1.11	5.55	2.35
(F) DCcal	.973	.973	.973	.972	.972	.972	.971	.971	.971	.971	.970	.970
(G) Kn x 10^{-3}		3	12	3	12	30	3	12	30	60	12	30
(H) ρ dc=ExFxGx10^3/D		60.0	53.5	55.6	61.8	51.8	47.1	56.6	58.9	46.6	45.8	48.8
(I) Vac Σ		29.4	6.44	27.0	7.48	2.48	22.4	6.90	2.88	1.12	5.44	2.44
(J) AC noise x 2		.08	.08	.10	.10	.10	0	0	0	0	.12	.12
(K) Vac(corr) = $\sqrt{I^2 - J^2}$		29.4	6.44	27.0	7.48	2.48	22.4	6.90	2.88	1.12	5.44	2.44
(L) AC-DC cal.	1.021	1.020	1.020	1.019	1.019	1.019	1.017	1.017	1.017	1.017	1.015	1.015
(M) ρ dc/ρac=ExL/K		1.028	1.016	1.020	1.010	1.005	1.035	1.001	1.000	1.009	1.035	.978
(N) PFE=(M-1)(10^2)		3	2	2	1	1	4	0	0	1	4	-2
(O) MCF=(M-1)(10^5)/H		47	30	36	16	10	74	2	0	19	76	-44

Project Same Line → Field date Data page Comp. date Comp by [illegible]

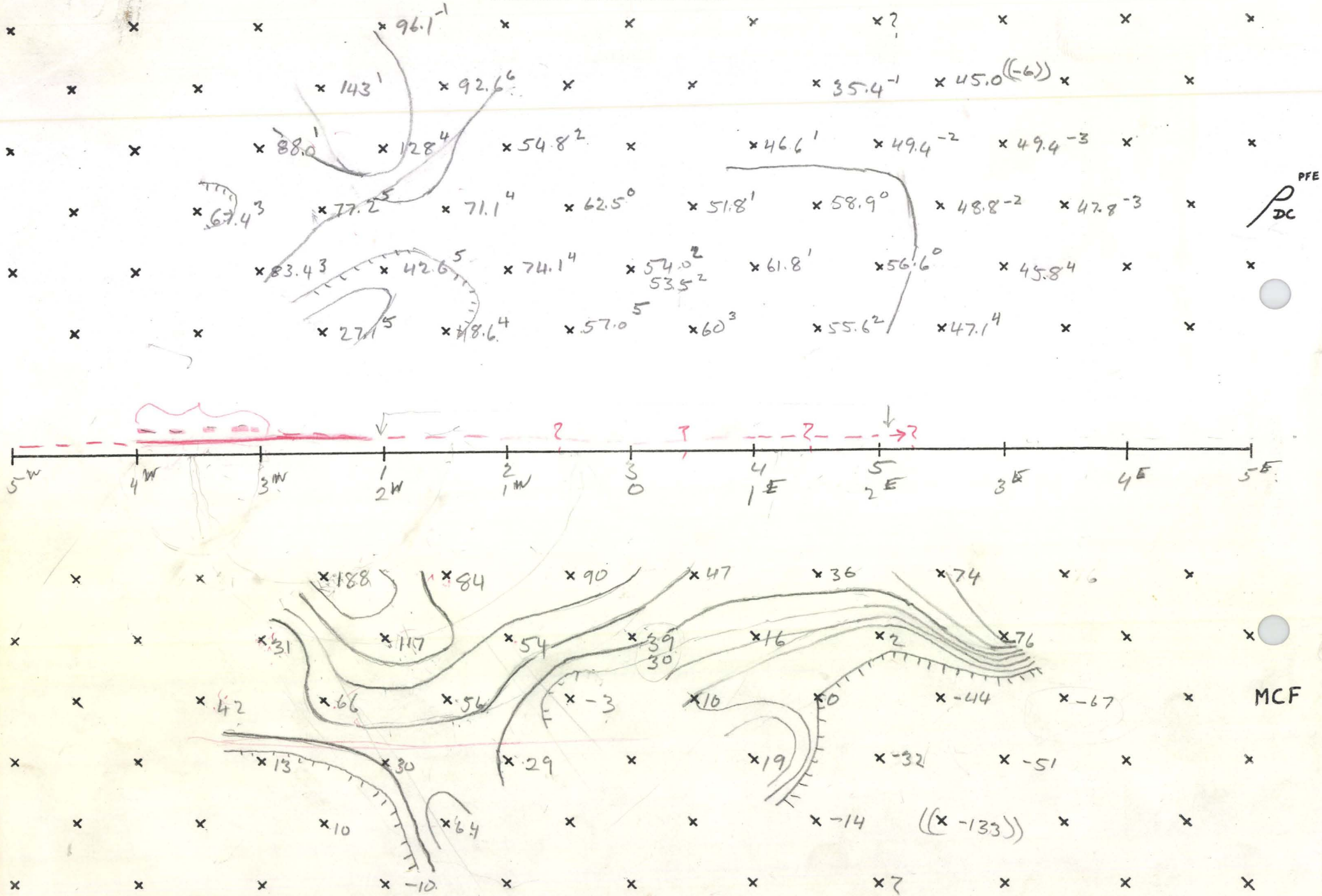
(A) Send	2-3	1-2	4-5	3-4	2-3	1-2	3-4		3-4	3-4	3-4	3-4
(B) Receive	4s-5s →		5s-6s			→	Cal		CAL	CAL	CAL	CAL
(C) n separation	4	5	3	4	5	6						
(D) I	1390	1380	1405	1400	1400	1390			510	710	510	700
(E) Vdc (avg)	1.18	.48	2.31	1.19	.62	—			530	730	534	724
(F) DCcal	.970	.970	.969	.969	.969	—	.968		.964	.973	.956	.968
(G) Kn x 10^{-3}	60	105	30	60	105	168						
(H) ρ dc=ExFxGx10^3/D	49.4	35.4	47.8	49.4	45.0							
(I) Vac Σ	1.22	.50	2.42	1.24	.68	—						
(J) AC noise x 2	.12	.12	.10	.10	.10							
(K) Vac (corr) = $\sqrt{I^2 - J^2}$	1.22	.49	2.42	1.24	.67				512	746	520	732
(L) AC-DC cal.	1.015	1.015	1.013	1.013	1.013	NG	1.011		.966	1.021	.975	1.011
(M) ρdc/ρac =ExL/K	.984	.995	.968	.975	.940							
(N) PFE=(M-1)(10^2)	-2	-1	-3	-3	((-6))							
(O) MCF=(M-1)(10^5)/H	-32	-14	-67	-51	((-133))							

Rosemont Project.
Line #2-S.
Data of 15/Feb/61.

Cal. 710 mils

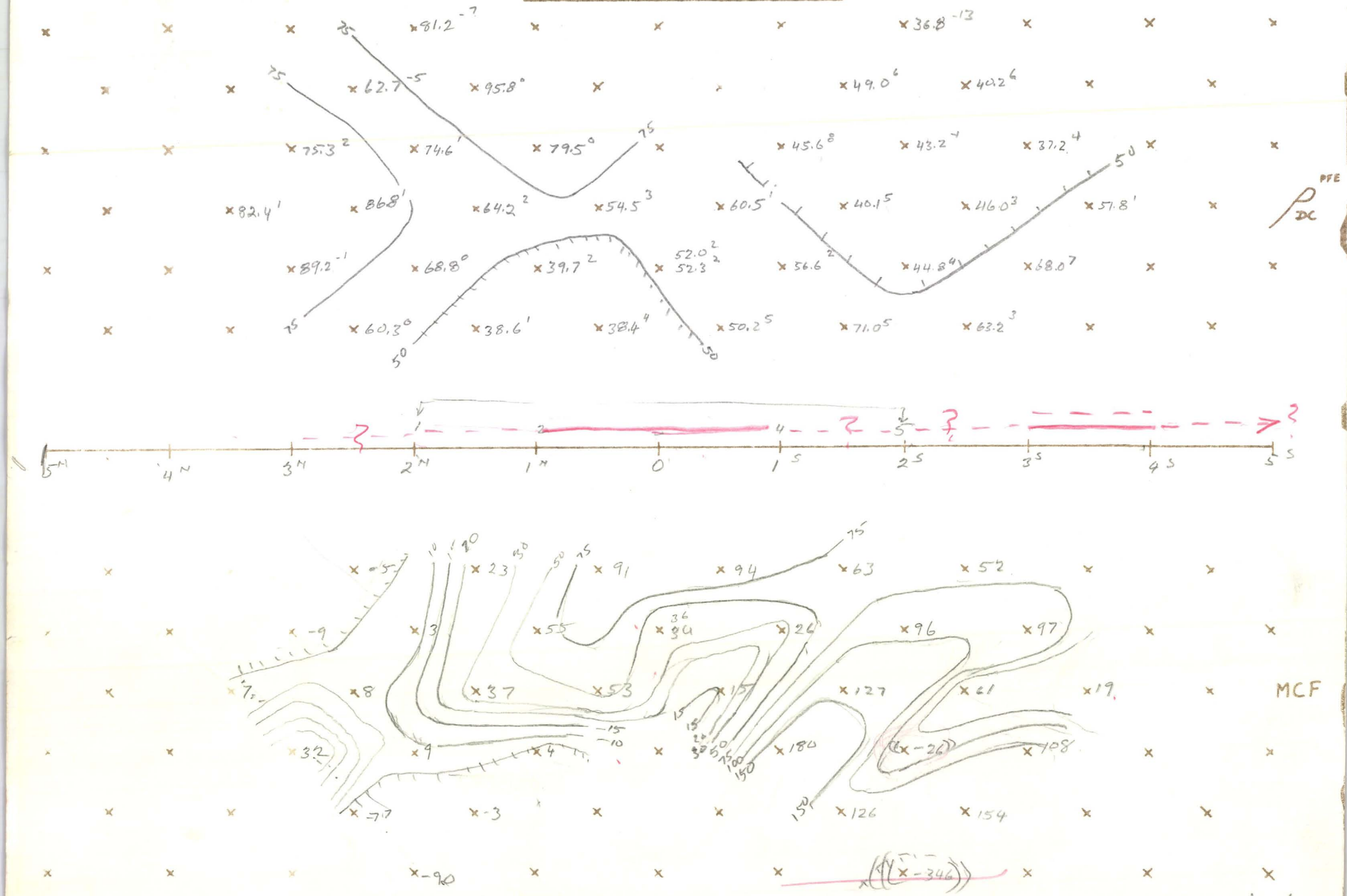


INDUCED POLARIZATION WORK SHEET



Area Rosemont Line #2 - N55°W Scale 1" = 1000' Date 15/Feb/64

INDUCED POLARIZATION WORK SHEET



Area Rosemont Line #3 Scale 1"=1000' Date of 27/Feb - 28/Feb

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INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page _____

Project *Rosemont* Line *5 S* Field date *Mar. 30, 61* Data page _____ Comp. date *Mar. 31, 61* Comp by *C. S. L.*

(A) Send	3-4	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2	4-5	3-4
(B) Receive	CAL	.5-1.05	→	1.0-1.55	→	→	1.5-2.05	→	→	→	2.0-2.55	
(C) n separation		1	2	1	2	3	1	2	3	4	2	3
(D) I		1425	1415	1400	1405	1400	1415	1400	1400	1400	1410	1390
(E) Vdc (avg)		21.4	6.78	21.1	4.95	2.81	29.7	6.05	2.49	1.96	5.36	2.12
(F) DCcal USED	1.030											
(G) Kn x 10^{-3}		1.5	6.0	1.5	6.0	15	1.5	6.0	15	30	6.0	15
(H) ρ dc=ExFxGx10^3/D		23.2	29.6	23.3	21.8	31.0	32.0	26.7	27.5	43.2	23.5	23.6
(I) Vac Σ		21.4	6.86	21.2	4.64	2.84	29.0	6.04	2.58	1.98	5.00	2.16
(J) AC noise x 2		.00	.00	.10	.10	.10	.08	.08	.08	.08	.06	.06
(K) Vac(corr) = $\sqrt{I^2 - J^2}$		21.4	6.86	21.2	4.64	2.84	29.0	6.04	2.58	1.98	5.00	2.16
(L) AC-DC cal. USED	1.040											
(M) ρ dc/ρac=ExL/K		1.040	1.028	1.037	1.110	1.029	1.050	1.041	1.004	1.029	1.117	1.021
(N) PFE=(M-1)(10^2)		4	3	4	11	3	5	4	0	3	12	2
(O) MCF=(M-1)(10^5)/H		172	95	159	505	94	156	154	15	67	498	89

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INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page _____

Project *Rosemont* Line *5 S* Field date *Mar. 30, 61* Data page _____ Comp. date *Mar. 31, 61* Comp by *C. S. L.*

(A) Send	2-3	1-2	4-5	3-4	2-3	1-2	3-4	3-4				
(B) Receive	→	→	2.5-3.05	→	→	→	CAL	CAL				
(C) n separation	4	5	3	4	5	6		Mechanical gen. not on (current)				
(D) I	1400	1390	1405	1385	1390	1380		(305	540	725)	280	495	700
(E) Vdc (avg)	1.21	1.07	2.04	1.08	.68	.64		28.2	49.8	67.4	27.0	48.8	67.8
(F) DCcal						USED	1.030	1.081	1.082	1.077	1.038	1.013	1.032
(G) Kn x 10^{-3}	30	52.5	15	30	52.5	84					(1.030)		
(H) ρ dc=ExFxGx10^3/D	26.7	41.6	22.4	24.1	26.4	40.1							
(I) Vac Σ	1.28	1.10	2.06	1.16	.74	.68		28.4	47.0	71.0	26.8	46.0	70.2
(J) AC noise x 2	.06	.06	.04	.04	.04	.04							
(K) Vac (corr) = $\sqrt{I^2 - J^2}$	1.28	1.10	2.06	1.16	.74	.68							
(L) AC-DC cal.						USED	1.040	1.007	.945	1.052	.994	.943	1.036
(M) ρdc/ρac =ExL/K	.985	1.012	1.029	.969	.956	.980							
(N) PFE=(M-1)(10^2)	-1	1	3	-3	-4	-2				(1.040)			
(O) MCF=(M-1)(10^5)/H	-56	29	129	-129	-167	-50							

	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2	4-5	3-4
						15.25					
	[illegible]	[illegible]	[illegible]	[illegible]	11.26	11.42	[illegible]	11.44	11.45	[illegible]	[illegible]
	10.5	3.40	10.5	2.58	[illegible]	14.9	[illegible]	1.33	.89	[illegible]	[illegible]
	10.4	3.40	10.5	[illegible]	[illegible]	14.9	[illegible]	1.37	.87	2.34	[illegible]
	11.0	3.37	10.6	2.37	1.39	14.5	[illegible]	1.16	1.06	2.98	[illegible]
	11.0	3.38	10.6	[illegible]	1.39	[illegible]	3.20	[illegible]	1.10	3.07	[illegible]
	21.5	6.77	21.1	4.95	2.81	[illegible]	6.04	2.49	1.95	[illegible]	2.11
	21.4	6.78	21.1	4.99	[illegible]	[illegible]	[illegible]	2.49	1.99	5.41	2.12
	10.4	3.39	10.5	[illegible]	[illegible]	[illegible]	[illegible]	1.41	.81	[illegible]	[illegible]
	10.4	3.39	10.5	2.58	1.42	15.0	[illegible]	1.47	.78	2.42	1.06
	11.0	3.39	10.6	[illegible]	1.39	14.3	3.26	1.07	1.13	[illegible]	[illegible]
	11.0	3.39	10.6	[illegible]	1.38	[illegible]	3.32	1.04	1.18	[illegible]	1.07
	21.4	6.78	21.1	4.93	[illegible]	[illegible]	[illegible]	2.48	1.94	5.32	2.12
	21.4	6.78	21.1	4.93	[illegible]	[illegible]	[illegible]	2.51	1.96	5.32	2.17
	21.4	6.78	21.1	4.95	[illegible]	29.3	[illegible]	2.49	1.96	5.36	2.12
	10.7	3.43	10.6	2.32	[illegible]	14.5	3.02	1.29	.99	2.50	1.08
	10.7	3.43	10.6	2.32	1.42	14.5	3.02	1.29	.99	2.50	1.08
	21.4	6.86	21.2	4.64	2.84	29.0	6.04	2.58	1.98	5.00	2.16
	-4.7	→	+2.5	—	—	-1.4	—		→	+5.6	—
	.00	→	.05			.04			→	.03	—

INDUCED POLARIZATION RECEIVER NOTES PAGE

Project: [illegible] Line: [illegible] Date: [illegible]

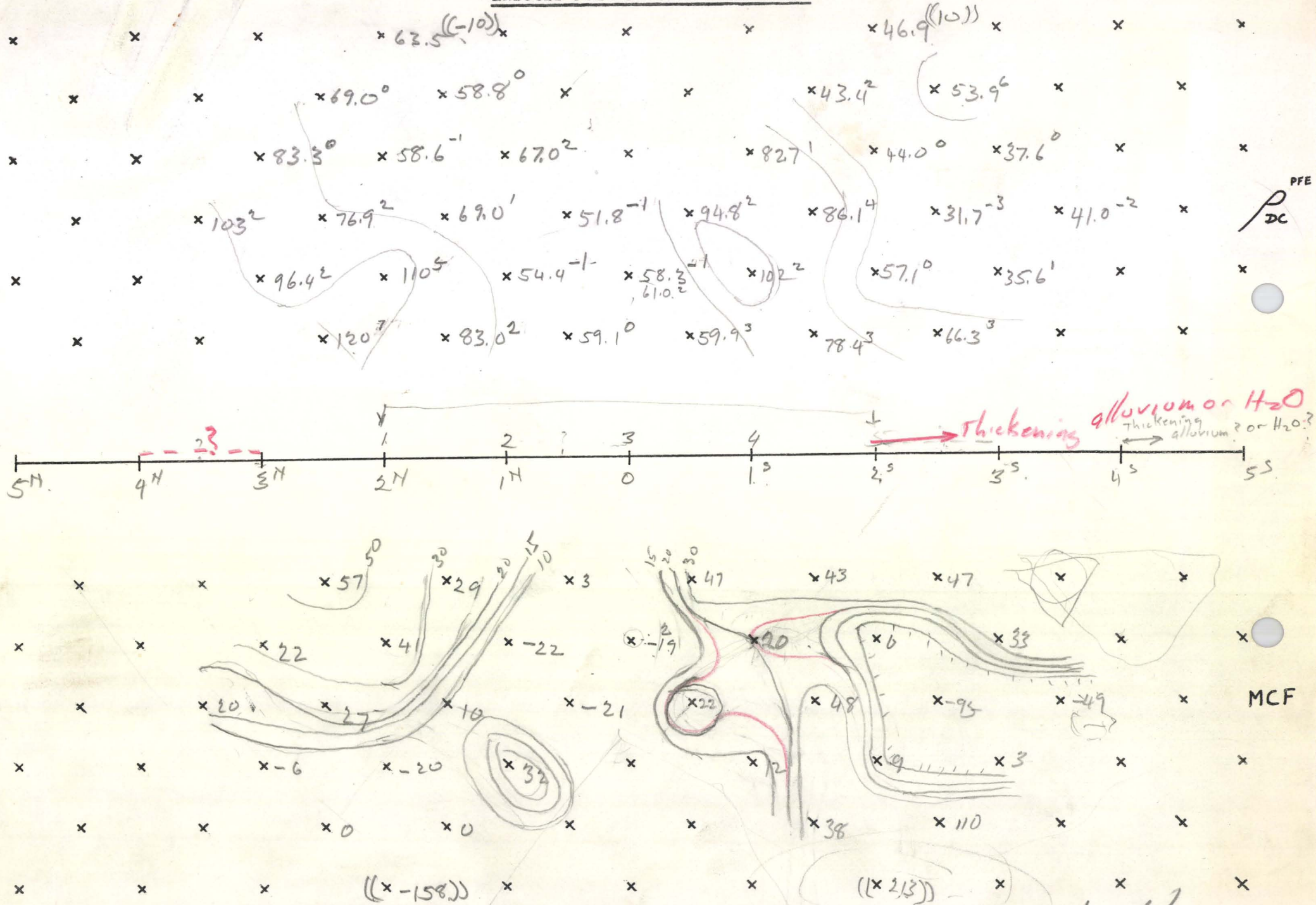
							305	540	725			
end	2-3	1-2	4-5	3-4	2-3	1-2	3-4	3-4	3-4	3-4	3-4	3-4
ec.	[illegible]	→	25-30	→	→	→	Cal	Cal	Cal			
ime	[illegible]	12 07	1214	1215	1216		1100	1101	1102	1511	1512	1513
C-1	.61 .60	.55 .56	.95 .93	57 58	.34 .34	31 31	14.1	24.9	33.7	13.5	24.4	33.9
C-2	.59 .58	.50 .51	1.10 1.11	50 49	.34 .34	32 32	14.1	24.9	33.7	13.5	24.4	33.9
Σ	1.20 1.22	1.05 1.07	2.05 2.04	1.07 1.07	.68 .68	.63 .63	28.2	49.8	67.4	27.0	48.8	67.8
C-3	.60 .66	.56 .53	.91 .90	60 60	35 35	30 28	14.1	24.9	33.7	13.5	24.4	33.9
C-4	.56 .55	.52 .54	1.12 1.13	48 48	33 33	35 37	14.1	24.9	33.7	13.5	24.4	33.9
Σ	1.22 1.21	1.08 1.07	2.03 2.03	1.08 1.08	.68 .68	.63 .65	28.2	49.8	67.4	27.0	48.8	67.8
-AV	1.21	1.07	2.04	1.08	.68	.64	28.2	49.8	67.4	27.0	48.8	67.8
-1	.64	.55	1.03	.56	.37	.34	14.2	23.5	35.5	13.4	23.0	35.1
C-2	.64	.55	1.03	.56	.37	.34	14.2	23.5	35.5	13.4	23.0	35.1
Σ	1.28	1.10	2.06	1.12	.74	.68	28.4	47.0	71.0	26.8	46.0	70.2
. P.	→		+0.1	→								
C-N			.02	→								

INDUCED POLARIZATION SENDER NOTES

project: ROSCMONT Line: 55 Date: 30 MAR 81

Send	3-4	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2	4-5	3-4
Receive	CAL											
Time		1106	1107	1124	1125	1126	1142	1143	1144	1145	1200	1201
Range		1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Current		1425	1415	1400	1405	1400	1415	1400	1400	1400	1410	1390
Send	2-3	1-2	4-5	3-4	2-3	1-2	3-4	—	—	—	—	—
Receive							CAL	—	—	—	—	—
Time	1202	1203	1214	1215	1216	1218	1100	1101	1102			
%Range	1.5	—	—	—	—	—	.3	.5	.75	.3	.5	.75
Current	1400	1390	1405	1385	1390	1380	305	540	725			

INDUCED POLARIZATION WORK SHEET



Area Rosemont Line #1 Scale 1" = 1000' Date 12/Feb/61

Contour Int. = Log

Data of 10-11 Feb/61

INDUCED POLARIZATION RECEIVER NOTES PAGE 2

Project Line 1N Inc. Cal. Date: 10/Feb/01

Send	3-4	4-5	1-2	2-3	3-4	4-5		2-3	2-3	2-3	2-3	
Rec.	4-5N	→	5-6N	→		→		Cal	Cal	Cal	Cal	
Time	1654	1656	1713	1715	1716	1717		1500		1750	1752	
DC-1	.63 .65	.43 .59	2.30 2.27	1.01 1.01	.42 .38	31 31		192	350	200	350	
DC-2	.71 .70	.30 .19	2.52 2.55	.98 .99	.52 .30	23 24		192	350	200	350	
Σ	1.34 1.35	.73 .77	4.82 4.82	1.99 2.00	.94 .88	.54 .55		394	700	400	700	
DC- 3	.61 .58	.50 .50	2.24 2.25	.98 .91	.38 .37	29 35		192	350	200	350	
DC-4	.75 .74	.20 .30	2.55 2.58	1.02 1.05	.49 .53	.20 .19		192	350	200	350	
Σ	1.36 1.32	.70 .80	4.79 4.83	2.00 1.96	.87 .90	.49 .54		394	700	400	700	
DC-Av	1.34	.77	4.72	1.99	.90	.52						
AC-1	.68	.39	2.31	1.00	.45	.29		189	350	193	350	
AC- 2	.68	.39	2.31	1.00	.45	.29		189	350	193	350.	
Σ	1.36	.78	4.62	2.00	.90	.58		378	700	386	700	
S.P.		-11.5	-3.9									
AC-N	.05	.05		.03								

INDUCED POLARIZATION SURVEY - RECEIVER NOTES PAGE 1

Project: Rosemont Line: 1N Int. Gen. 51.5 Date: 10/Feb/61

Send		3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3
Rec.		1-2N	→	2-3N	→	→	3-4N	→	→	→	4-5N	→
Time		1501	1503	1531	1533	1535	1624				1651	
DC-1		13.5 13.5	3.31 3.30	19.4 19.3	3.13 3.13	1.16 1.17	27.7 27.6	6.21 6.18	1.60 1.66	.86 .93	5.10 5.15	1.56 1.64
DC-2		13.6 13.6	3.37 3.39	19.3 19.2	3.10 3.10	1.20 1.21	27.0 27.1	6.28 6.38	1.52 1.48	.63 .61	5.90 5.88	1.91 1.85
Σ		27.1 27.1	6.68 6.69	38.7 38.5	6.23 6.23	2.36 2.38	54.7 54.7	12.49 12.56	3.12 3.14	1.49 1.54	11.00 11.03	3.47 3.49
DC-3		13.5 13.5	3.29 3.29	19.2 19.2	3.13 3.13	1.15 1.15	27.6 27.6	6.10 6.12	1.65 1.64	.95 .95	5.18 5.03	1.74 1.70
DC-4		13.6 13.6	3.38 3.37	19.2 19.2	3.08 3.05	1.22 1.23	27.0 27.0	6.40 6.39	1.51 1.56	.61 .60	5.70 5.96	1.81 1.90
Σ		27.1 27.1	6.67 6.66	38.4 38.4	6.21 6.18	2.37 2.38	54.6 54.6	12.50 12.51	3.16 3.20	1.56 1.55	11.08 10.99	3.65 3.60
DC-AV.		27.1	6.68	38.50	6.21	2.37	54.65	12.53	3.16	1.53	11.02	3.52
AC-1		13.5	3.38	18.8	3.15	1.20	25.7	6.00	1.57	.75	5.40	1.72
AC-2		13.5	3.38	18.8	3.15	1.20	25.7	6.00	1.57	.75	5.40	1.72
Σ		27.0	6.76	37.6	6.30	2.40	51.40	12.00	3.14	1.50	10.80	3.44
S.P.		-1.8	-1.8	-4.6	-4.6	-4.6	+30.8		+31.6			-11.7
AC-N		.05	.05	.05	.05	.05			.04			

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page 1

Project Rosemont Line #1-N. Field date 10/Feb/61 Data page 1 Comp. date 11/Feb/61 Comp by [illegible]

A) Send	2-3	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3
B) Receive	Cal	1^N-2^N	→	2^N-3^N	→	→	3^N-4^N	→	→	→	4^N-5^N	→
C) n separation		1	2	1	2	3	1	2	3	4	1	3
D) I	700	1375	1375	1375	1370	1375	1370	1375	1375	1370	1375	1375
E) Vdc (avg)	700	27.1	6.68	38.50	6.21	2.37	54.65	12.53	3.16	1.53	11.02	3.52
F) DCcal	1.000	→	→	→	→	→	→	→	→	→	→	→
G) Kn x 10^{-3}		3	12	3	12	30	3	12	30	60	12	30
H) ρ dc=ExFxGx10^3/D		59.1	58.3	83.0	54.4	51.8	120.	110.	69.0	67.0	96.4	76.9
I) Vac Σ		27.0	6.76	32.6	6.30	2.40	51.40	12.00	3.14	1.50	10.80	3.44
J) AC noise x 2		.10	.10	.10	.10	.10	.10	.10	.10	.08	.08	.08
K) Vac(corr) = $\sqrt{I^2 - J^2}$	700	27.0	6.76	32.6	6.30	2.40	51.40	12.00	3.14	1.50	10.80	3.44
L) AC-DC cal.	1.000	→	→	→	→	→	→	→	→	→	→	→
M) ρ dc/ρac=ExL/K		1.002	.989	1.024	.988.	.989.	1.069	1.045	1.007	1.020.	1.021	1.021
N) PFE=(M-1)(10^2)		0	-1	2	-1	-1	7	5	1	2	2	2
O) MCF=(M-1)(10^5)/H		3	-19	29.	-22	-21	57	41	10	32	22.	27

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page 1

Project Rosemont Line #1-N Field date 10/Feb/61 Data page 2 Comp. date 11/Feb/61 Comp by [illegible]

(A) Send	3-4	4-5	1-2	2-3	3-4	4-5	2-3		2-3	2-3	2-3	2-3
(B) Receive	4^N-5^N	→	5^N-6^N	→	→	→	Cal		Cal	→	→	→
(C) n separation	4	5	3	4	5	6						
(D) I	1370	1375	1375	1370	1370	1375	700		400	700	400	700.
(E) Vdc (avg)	1.34	.77	4.72	1.99	.90	.52	700		394	700	400	700
(F) DCcal	1.000	→	→	→	→	→	1.000		1.015	1.000	1.000	1.000
(G) Kn x 10^{-3}	60	105	30	60	105	168						
(H) ρ dc=ExFxGx10^3/D	58.6	58.8	103	83.3	69.0.	63.5						
(I) Vac Σ	1.36	.78	4.62	2.00	0.90	0.58			378	700	386	700
(J) AC noise x 2	.10	.10	.08	.06	.06	.06						
(K) Vac (corr) = $\sqrt{I^2 - J^2}$	1.36	.77	4.62	2.00	.90	.58	700					
(L) AC-DC cal.	1.000	→	→	→	→	→	1.000.		.960.	1.000	.965	1.000
(M) ρdc/ρac =ExL/K	.988	1.000	1.021	.995.	1.000	.900						
(N) PFE=(M-1)(10^2)	-1	0	2	0	0	-10						
(O) MCF=(M-1)(10^5)/H	-20	0	20	-6	0	-158.						

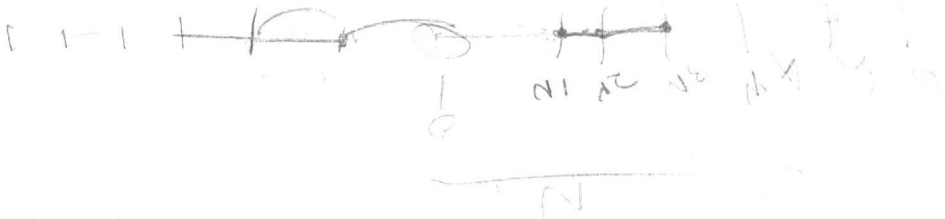
CUR.	ELECT.	TIME
400 MA	(2-3)	CAL
700	(2-3)	
1375	(2-3)	
400	(2-3)	
700	(2-3)	
END	CAL	
1375	(3-4)	1501
1375	(4-5)	1503
1375	(2-3)	1531
1370	(3-4)	1535
1375	(4-5)	1537
1370	(1-2)	1624
1375	(2-3)	1626
1375	(3-4)	1629
1370	(4-5)	1631
1375	(1-2)	
1375	(2-3)	
1370	(3-4)	
1375	(4-5)	

CUR	ELECTRODE	TIME
1375	(1-2)	
1370	(2-3)	
1370	(3-4)	
1375	(4-5)	
400 MA	(2-3)	CAL
700 MA	(2-3)	
300 MA		

INDUCED POLARIZATION RECEIVER NOTES PAGE 1

Project: Beaumont Line: 1S Int.Cal 50.00 Date: 2-11-61

Send	3-4	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2	4-5	3-4
Rec.	Cal	1-2S	→	2-3S	→	→	3-4S	→	→	→	4-5S	→
Time		11:07	11:09	11:33	11:35	11:36	12:15	12:18	12:20	12:22	1245	1248
DC-1		13.6 13.6	3.61 3.53	18.0 18.0	5.90 6.10	2.22 2.19	14.8 14.7	3.39 3.40	1.90 1.80	.89 .79	2.15 2.10	.69 .71
DC-2		13.8 13.6	3.35 3.40	18.0 18.0	5.65 5.50	2.10 2.11	15.5 15.5	3.10 3.02	2.00 2.00	1.01 1.02	2.03 2.04	.74 .75
Σ		27.4 27.4	6.96 6.93	36.00 36.00	11.55 11.67	4.32 4.30	30.3 30.2	6.49 6.42	3.90 3.80	1.90 1.81	4.14 4.14	1.43 1.46
DC-3		13.6 13.6	3.52 3.60	18.0 18.1	6.02 5.95	2.13 2.16	14.8 14.8	3.46 3.52	1.90 1.81	.85 .88	2.15 2.17	.69 .69
DC-4		13.8 13.8	3.30 3.30	17.9 17.9	5.60 5.68	2.11 2.14	15.4 15.5	3.00 2.98	1.93 2.06	.96 1.00	2.00 1.99	.76 .77
Σ		27.4 27.4	6.87 6.90	35.9 [illegible]	11.64 11.63	4.24 4.30	30.2 30.3	6.46 6.50	3.83 3.87	1.81 1.88	4.15 4.16	1.45 1.46
C-AV		27.4	6.92	36.00	11.61	4.30	30.25	6.47	3.85	1.85	4.15	1.45
C-1		13.6	3.52	17.7	5.80	2.14	14.9	3.30	1.88	.93	2.08	.76
AC-2		13.6	3.52	17.7	5.80	2.14	14.9	3.30	1.88	.93	2.08	.76
Σ		27.2	7.04	35.4	11.60	4.28	29.80	6.60	3.76	1.86	4.16	1.52
S. P.		-1.7	-1.7	-14.3	-14.3	-14.3	+6.3	+6.3	+6.3	+6.3	2.6	2.6
AC-N		.04	.04	.05	.05	.05	.05	.05	.05	.05		



INDUCED POLARIZATION SURVEY - RECEIVER NOTES PAGE 2

Project: Rosemont Line: 1' Int. Cal. Date: 11/Feb/61

Send	2-3	1-2	4-5	3-4	2-3	1-2		3-4	3-4	3-4	3-4
Rec.	4-5S	→	5-6S	→	→	→		Cal	Cal	Cal	Cal
Time	1250	13:00	1325	1327	1330	1332					
DC-1	42 44	.26 .20	1.01 1.03	40. 38	.21 .28	21 25		19.7	35.5	19.7	36.0
DC-2	58 55	.35 .41	.90 .92	48 48	49 38	15 15		19.7	35.5	19.7	36.0
Σ	1.00 .99	.61 .61	1.91 1.95	.88 .86	70 66	36 40		39.4	71.0	39.4	72.0
DC-3	43 41	.26 .32	1.02 1.08	36 32	31 25	24 25		19.7	35.5	19.7	36.0
DC-4	58 58	.28 .24	87 88	55 52	40 46	12 13		19.7	35.5	19.7	36.0
Σ	1.01 .99	.54 .56	1.89 1.96	.91 .84	71 71	36 38		39.4	71.0	39.4	72.0
DC-AV.	1.00	.58	1.93	.87	.70	.38		39.4			
AC-1	51	.30	1.00	.45	.35	.20		20.0	36.0	20.0	36.5
AC-2	51	.30	1.00	.45	.35	.20		20.0	36.0	20.0	36.5
Σ	1.02	.60	2.00	.90	.70	.40		40.0	72.0	40.0	73.0
S.P.	-2.5	-2.5									
AC-N	.08	.08	.03	.03	.03	.03					

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page 2

Project Rosemont Line #1 - 5 Field date 11/Feb/61 Data page 1 Comp. date 11/Feb/61 Comp by JAL

) Send	3-4	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2	4-5	3-4
) Receive	Cal	1^s-2^s →		2^s-3^s	→		3^s-4^s	→			4^s-5^s →	
) n separation		1	2	1	2	3	1	2	3	4	2	3
) I		1400	1390	1400	1390	1380	1380	1370	1350	1350	1400	1370
) Vdc (avg)		27.4	6.92	36.00	11.61	4.30	30.25	6.47	3.85	1.85	4.15	1.45
) DCcal		1.020	1.020	1.015	1.014	1.014	1.006	1.005	1.005	1.005	1.000	.999
) Kn x 10^{-3}		3	12	3	12	30	3	12	30	60	12	30
) ρ dc=ExFxGx10^3/D		59.9	61.0	78.4	102	94.8	66.3	57.1	86.1	82.7	35.6	31.7
) Vac Σ		27.2	7.04	35.4	11.60	4.28	29.80	6.60	3.76	1.86	4.16	1.52
) AC noise x 2		.08	.08	.10	→							
) Vac(corr) = $\sqrt{I^2 - J^2}$		27.2	7.04	35.4	11.60	4.28	29.80	6.60	3.76	1.86	4.16	1.52
)AC-DC cal.	1.020	1.020	1.020	1.019	1.019	1.019	1.018	1.017	1.017	1.017	1.016	1.016
) ρ dc/ρac=ExL/K		1.028	1.001	1.034	1.020	1.021	1.031	.994	1.041	1.010	1.012	.970
) PFE=(M-1)(10^2)		3	0	3	2	2	3	0	4	1	1	-3
) MCF=(M-1)(10^5)/H		47	2	43	20	22	47	0	48	12	33	-95

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page

Project Same Line Field date Data page Comp. date Comp by

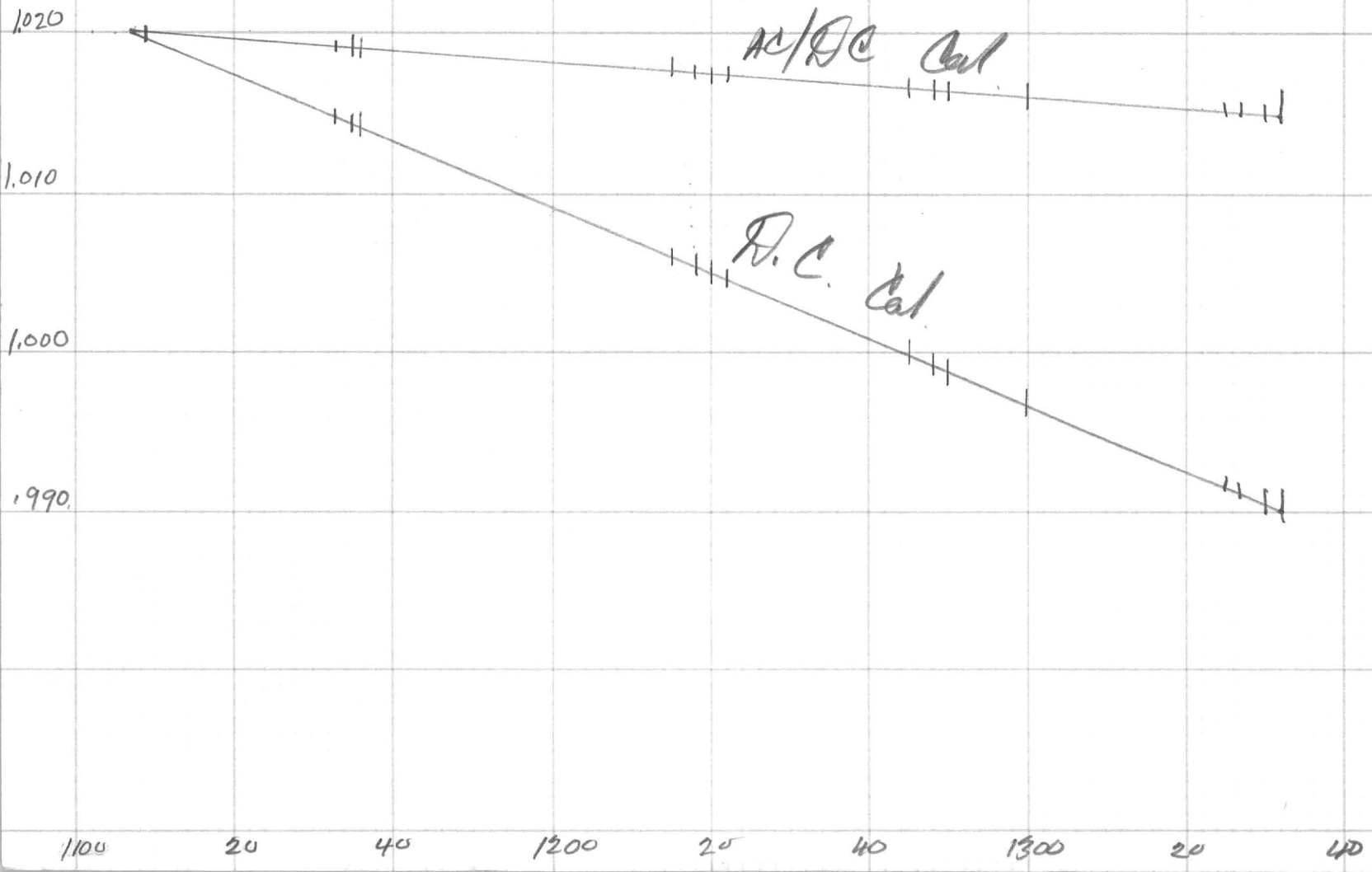
A) Send	2-3	1-2	4-5	3-4	2-3	1-2		3-4 →			
B) Receive	4^s-5^s →		5^s-6^s	→				Cal →			
C) n separation	4	5	3	4	5	6					
D) I	1360	1400	1400	1375	1350	1350		400	710	390	710
E) Vdc (avg)	1.00	.58	1.93	.87	.70	.38		39.4	71.0	39.4	72.0
F) DCcal	.999	.997	.992	.991	.990	.990		1.020	1.000	.990	.986
G) Kn x 10^{-3}	60	105	30	60	105	168					
H) ρ dc=ExFxGx10^3/D	44.0	43.4	41.0	37.6	53.9	46.9					
I) Vac Σ	1.02	.60	2.00	.90	.70	.40		40.0	72.0	40.0	73.0
J) AC noise x 2	.16	.16	.06	→							
K) Vac (corr) = $\sqrt{I^2 - J^2}$	1.01	.58	2.00	.88	.67	.35					
L) AC-DC cal.	1.016	1.016	1.015	1.015	1.015	1.015		1.020	1.012	1.015	1.015
M) ρ dc/ρac =ExL/K	1.004	1.016	.980	1.001	1.060	1.100					
N) PFE=(M-1)(10^2)	0	2	-2	0	6	10					
O) MCF=(M-1)(10^5)/H	9	38	-49	3	110	213					

Send	3-4	3-4	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2
Rec	Col	CAC	1-2S	—	2-3S	—	—	3-4S	—	—	—
Current	400	410	1400	1390	1400	1390	1380	1380	1370	1350	1350
Time	—	—	1107	1109	1133	1135	1138	1215	1218	1220	1222

SEND	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2
REC	4-5S	—	—	—	5-6S	—	—	—
I	1400	1370	1360	1400	1400	1375	1350	1350
TIME	1245	1248	1250	1300				

SEND	3-4	3-4
REC		
I	390	410
	CAC	CAC

Rosemont Line #1-S.
Data of 11/Feb/61.



INDUCED POLARIZATION - RECEIVER NOTES PAGE

Project: Rosemont Line: 3 N Int.Cal 52.5 Date: 21/Feb

Send	2-3	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3
Rec.	Cal	1-2N	→	2-3N	→	→	3-4N	→	→	→	4-5N	→
Time		11:55	12:00	12:16	12:20	12:21	12:38	12:40	12:41	12:45	13:03	13:23
DC-1		9.2	2.28	10.04	2.47	1.00	14.6	4.02	1.40	.51	6.40	2.52
		9.0	2.38	10.02	2.45	1.12	14.7	4.03	1.41	.55	6.32	2.00
DC-2		10.5	2.35	10.06	2.48	.70	15.8	4.28	1.60	.80	5.95	2.52
		10.4	2.33	10.08	2.42	.61	15.7	4.20	1.58	.76	6.20	3.02
Σ		19.7	[illegible]	20.10	4.92	1.70	30.2	8.33	[illegible]	1.31	[illegible]	5.04
		19.6	4.71	20.12	4.87	1.78	30.4	8.27	[illegible]	[illegible]	[illegible]	[illegible]
DC-3		9.5	2.23	10.09	2.52	1.16	14.7	4.11	1.44	.50	6.42	2.62
		9.1	2.22	10.05	2.50	1.18	14.7	4.15	1.47	.36	6.60	2.95
DC-4		10.3	2.38	10.00	2.40	.68	15.6	4.18	1.56	.82	5.88	2.12
		9.8	2.31	10.00	2.45	.67	15.7	4.12	1.51	.90	5.60	2.05
Σ		19.9	[illegible]	20.09	4.92	1.84	30.3	8.29	[illegible]	[illegible]	12.50	4.74
		19.7	4.53	20.05	4.95	1.85	30.4	8.22	[illegible]	1.26	12.20	5.00
C-AV		19.6	4.65	20.08	4.92	1.78	30.4	8.27	2.99	1.30	12.36	4.95
C-1		9.9	2.26	10.05	2.40	.90	14.9	4.18	1.48	.66	6.00	2.35
AC-2		9.9	2.26	10.05	2.40	.90	14.9	4.18	1.48	.66	6.00	2.36
Σ		19.8	4.52	20.1	4.8	1.80	29.8	8.36	2.96	1.32	12.00	4.70
S. P.		+0.7	+0.7	-10.8	-10.8	-10.8				+22.7		
AC-N		.06	.06	.04	.04	.04	.05	.05	.05	.05	.05	.05

3-4

1.02
.86
.75
1.89
2.10

1.99
2.00

4-5

.52
1.16
1.30

.80
1.32
1.12

.42
.88
.60
.32
1.02
1.20

2-3

.86
.80
.83
.88
1.69
1.68

5-6 3-4

.86
.85
.89
.80
.75
.68
.52
.50
.30
.27
.82
.77

INDUCED POLARIZATION RECEIVER NOTES PAGE

Project Bossemont . Line 3 N Int.Cal. 52.5 Date: 21/Feb

end	3-4	4-5	1-2	2-3	3-4	4-5	2-3	2-3	2-3	2-3	2-3
ec.	→	→	S-6N	→	→	→	cal	Cal	Cal	cal	cal
me	13:28	[illegible]	14:01	14:10	14:11	14:12		11:50	11:51	1629	1630
DC-1	1.03 1.35	[illegible] .68	1.78 1.91	.91 .79	.50 .57	.22 .31		27.0	37.0	27.0	36.2
DC-2	.86 .75	.18 .22	1.52 1.38	.73 .90	.23 .28	.10 .12		27.0	37.0	27.0	36.2
Σ	1.89 2.10	.87 .90	3.30 3.29	1.64 1.69	.73 .85	.32 .43		54.0	74.0	54.0	72.4
DC- 3	.52 .50	[illegible]	1.86 1.59	.85 .90	.52 .50	.28 .29		27.0	37.0	27.0	36.2
DC-4	1.42 1.75	.11 .52	1.52 1.88	.73 .80	.30 .27	.20 .20		27.0	37.0	27.0	36.2
Σ	1.94 2.25	1.16 .84	3.38 3.47	1.58 1.70	.82 .77	.48 .44		54.0	74.0	54.0	72.4
C-Av	2.05	.97	33.6	1.65	.79	.42					
C-1	[illegible]	.52	1.76	.81	.39	.20		26.2	37.8	26.2	37.2
C- 2	2.00	.52	1.76	.81	.39	.20		26.2	37.8	26.2	37.2
Σ	2.00	1.04	3.52	1.62	.78	.40		52.4	75.6	52.4	74.4
S.P.											
AC-N	.05	.05	.05	.05	.05	.05					

INDUCED POLARIZATION SENDER NOTES

Project: ROSEMONT Line: 3N Date: 21 FEB 81

Send		3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3
Receive	CAL	1-2N	→	2-3N	→		3-4N	→			4-5N	—
Time		1155	1158	1218	1220	1221	1237	1239	1241	1245	1303	1307
Range		1.5	1.0	1.5	1.5	1.0	1.5	1.5	1.5	1.0	1.5	1.5
Current		1420	1000	1420	1400	1000	1430	1410	1410	1010	1440	1400
Send	3-4	4-5	1-2	2-3	3-4	4-5			2-3	2-3	2-3	2-3
Receive	→	→	5-6N	→					CAL		CAL	
Time	1326	1331	1401	1410	1411	1412			1150	1151	1629	1630
Range	1.5	1.0	1.5	1.5	1.5	1.0			.5	.75	.5	.75
Current	1400	1010	1430	1400	1400	1010			520	720	520	710

INDUCED POLARIZATION SENDER NOTES

Project: ROSEMONT Line: 3S Date: 21 FEB 61

Send		2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2	4-5	3-4
Receive	CAL	1-2S	→	2-3S	→	→	3-4S	→	→	→	4-5S	—
Time		1529	1531	1553	1554	1555						
Range		1.5	1.5	1.5	1.5	1.5	1.	1.	1.	1.	1.	1.
Current		1400	1400	1410	1400	1400						
Send	2-3	1-2	4-5	3-4	2-3	1-2			—		2-3	2-3
Receive	→	→	5-6S	→	→	→			CAL	CAL	CAL	CAL
Time											1629	1630
Range	1.	1.	1.	1.	1.	1.					.5	.75
Current											520	710

INDUCED POLARIZATION SURVEY - RECEIVER NOTES PAGE

Project: Line: 3S Int.Cal. Date:

Send		2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2	4-5	3-4
Rec.	Cal	1-2S	→	2-3S		→	3-4S			→	4-5S	→
Time		15:29	15:31	[illegible]	[illegible]	15:55						
DC-1		13.7 14.5	3.15 2.99	17.5 17.8	[illegible]	1.36 [illegible]						
DC-2		10.5 10.1	3.32 3.40	17.8 17.5	[illegible] 3.80	[illegible] 1.25						
Σ			6.32									
DC-3		14.6 15.0	3.00 2.98	17.1 17.5	3.15 [illegible]	1.26 1.23						
DC-4		10.0 9.2	3.37 3.57	17.6 17.6	[illegible] [illegible]	1.77 1.73						
Σ			6.55									
DC-AV			6.41									
AC-1		12.0	3.22	17.2	3.45	1.50						
AC-2		12.0	3.22	17.2	3.45	1.50						
Σ			6.44									
S. P.		+48.5	→+110*			+12.2						
AC-N		.05	.05			.05						

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INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Project Rosemont Line #3 N Field date 2/21/61 Data page _____ Comp. date _____ Comp. by FAS

(A) Send	2-3	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3
(B) Receive	Cal	1N 2N →		2N-3N →			3N-4N →				4N-5N →	
(C) n separation		1	2	1	2	3	1	2	3	4	2	3
(D) I	720	1420	1000	1420	1400	1000	1430	1410	1410	1010	1440	1400
(E) Vdc (avg)		19.6	4.65	20.68	4.92	1.78	30.4	8.27	2.99	1.30	12.36	4.95
(F) DCcal	.973	.974	.974	.975	.975	.975	.977	.977	.977	.977	.978	.978
(G) Kn x 10^{-3}		3	12	3	12	30	3	12	30	60	12	30
(H) ρdc=ExFxGx10^3/D *		40.3	54.4	41.4	41.1	52.1	62.4	68.8	62.2	75.5	100.8	103.8
(I) Vac Σ		19.8	4.52	20.10	4.8	1.80	29.8	8.36	2.96	1.32	12.00	4.70
(J) AC noise x 2		.12	.12	.08	.08	.08	.10 →					
(K) Vac(corr) = $\sqrt{I^2 - J^2}$		19.8	4.52	20.10	4.8	1.80	29.8	8.36	2.96	1.31	12.00	4.70
(L) AC-DC cal.	1.025	1.026 →										
(M) ρ dc/ρac=ExL/K		1.014	1.052	1.025	1.051	1.015	1.046	1.046	1.035	1.019	1.055	1.080
(N) PFE=(M-1)(10^2)		1	5	3	5	2	5	5	4	2	6	8
(O) MCF=(M-1)(10^5)/H		35	96	60	124	29	74	67	56	25	55	77

Project	Line		Field date		Data page		Comp. date				Comp. by	
(A) Send	3-4	4-5	1-2	2-3	3-4	4-5	2-3					
(B) Receive	4N-5N →		5N-6N →									
(C) n separation	4	5	3	4	5	6						
(D) I	1400	1010	1430	1400	1400	1010	720					
(E) Vdc (avg)	2.05	.97	3.36	1.65	.79	.42						
(F) DCcal	.978	.978	.979	.979	.979	.979	.981					
(G) Kn x 10^{-3}	60	105	30	60	105	168						
(H) ρ dc=ExFxGx10^3/D	85.9	98.5	69.0	69.2	58.0	68.5						
(I) Vac Σ	2.00	1.04	3.52	1.62	.78	.40						
(J) AC noise x 2	.10	.10 →										
(K) Vac (corr) = $\sqrt{I^2 - J^2}$	2.00	1.03	3.52	1.62	.77	.387						
(L) AC-DC cal.	1.026 →						1.027					
(M) ρdc/ρac =ExL/K	1.000	.966	.980	1.007	1.051	1.118						
(N) PFE=(M-1)(10^2)	0	-3	-2	1	5	12						
(O) MCF=(M-1)(10^5)/H	0	-34	-29	10	89	172						

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

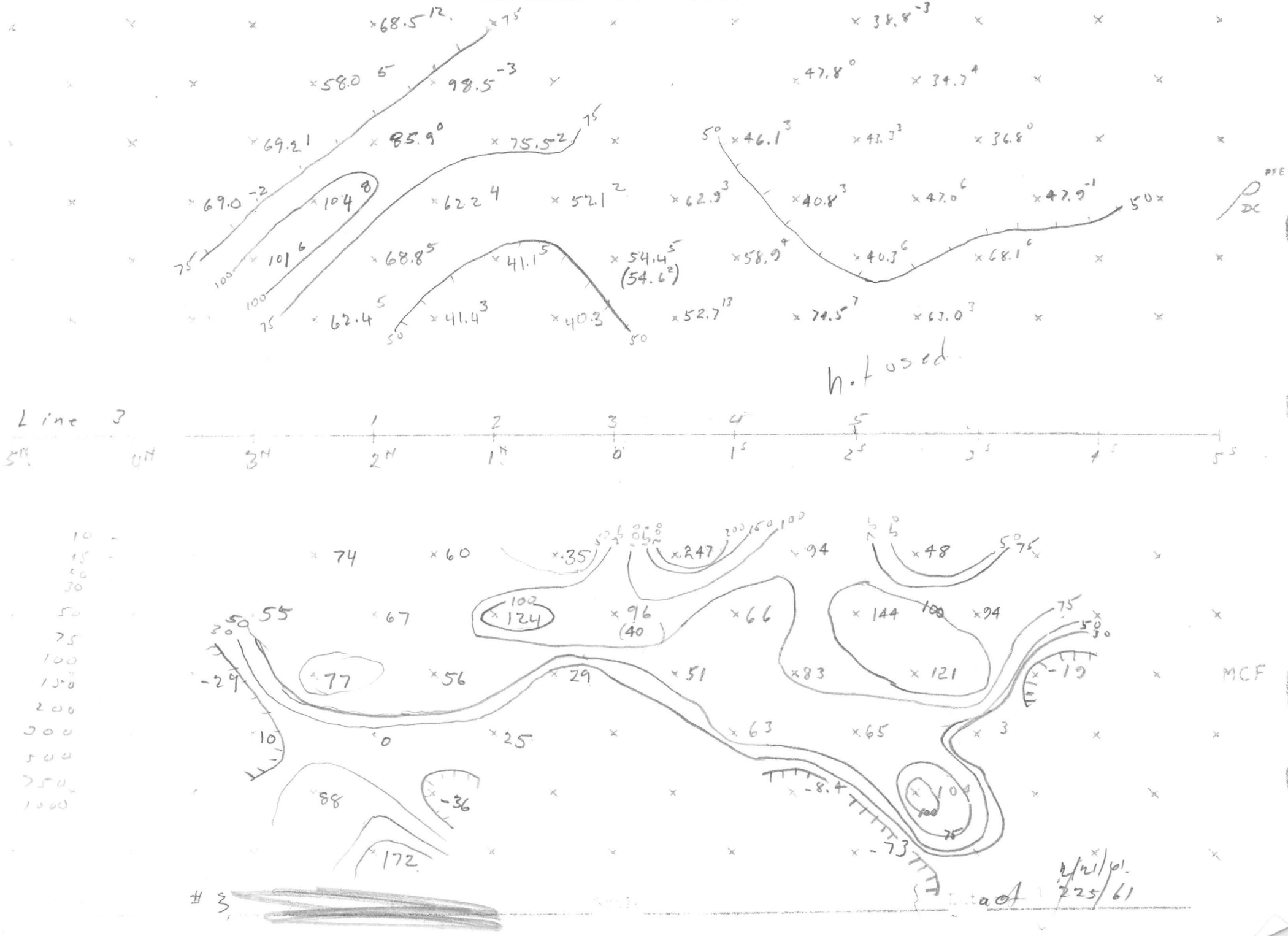
Project Rosemont Line 3 N Field date 2-21-61 Data page _____ Comp. date _____ Comp by _____ Page _____

(A) Send	2-3	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3
(B) Receive	Cal	1-2N	→	2-3N	→	→	3-4N	→	→	→	4-5N	→
(C) n separation		1	2	1	2	3	1	2	3	4	2	3
(D) I	520	1420	1000	1420	1400	1000	1430	1410	1410	1010	1440	1400
(E) Vdc (avg)	540	19.6	4.65	20.08	4.92	1.78	30.4	8.27	2.99	1.30	12.36	4.95
(F) DCcal	.963	.963	.963	.963	.963	.963	.963	.963	.963	.963	.963	.963
(G) Kn x 10^{-3}		3	12	3	12	30	3	12	30	60	12	30
(H) ρdc=ExFxGx10^3/D		39.8	53.7	41.0	40.6	51.5	61.4	67.7	61.3	74.3	99.0	102.1
(I) Vac Σ	524	19.8	4.52	20.10	4.8	1.80	29.8	8.36	2.96	1.32	12.00	4.70
(J) AC noise x 2		.12	.12	.08	.08	.08	.10	.10	.10	.10	.10	.10
(K) Vac(corr) = $\sqrt{I^2 - J^2}$		19.8	4.52	20.10	4.8	1.80	[illegible]	[illegible]	2.96	1.31	12.00	4.70
(L) AC-DC cal.	.970	.970	.970	.970	.970	.970	.970	.970	.970	.970	.970	.970
(M) ρdc/ρac=ExL/K		0.960	0.998	0.967	0.994	0.960	0.990	0.960	0.981	0.963	0.999	1.021
(N) PFE=(M-1)(10^2)		-4	0	-3	-1	-4	-1	-4	-2	-4	0	2
(O) MCF=(M-1)(10^5)/H		-100	-3.72	-80.6	-14.8	-77.8	-16.3	-59.1	-31.0	-49.8	-1.01	

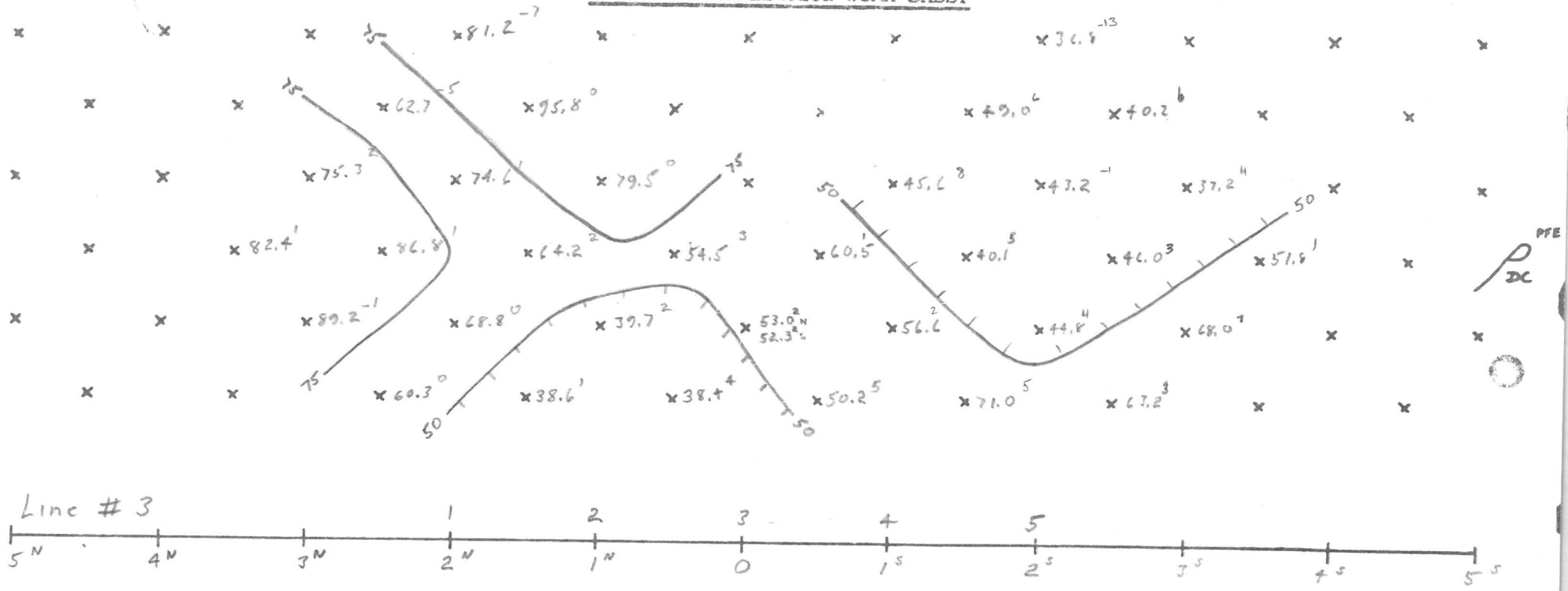
Project _____ Line _____ Field date _____ Data page _____ Comp. date _____ Comp by _____

(A) Send	3-4	4-5	1-2	2-3	3-4	4-5	2-3					
(B) Receive	4-5N	→	5-6N	→	→	→	Cal					
(C) n separation	4	5	3	4	5	6						
(D) I	1400	1010	1430	1400	1400	1010	520					
(E) Vdc (avg)	2.05	1.23	3.36	1.65	.79	.42	540					
(F) DCcal	.963	.963	.963	.963	.963	.963	.963					
(G) Kn x 10^{-3}	60	105	30	60	105	168						
(H) ρdc=ExFxGx10^3/D	84.6	123.0	67.8	69.1	57.1	67.3						
(I) Vac Σ	2.00	1.04	3.52	1.62	.78	.40	524					
(J) AC noise x 2	.10	.10	.10	.10	.10	.10						
(K) Vac (corr) = $\sqrt{I^2 - J^2}$	2.00	1.03	3.52	1.63	.77	.387						
(L) AC-DC cal.	.970	.970	.970	.970	.970	.970	.970					
(M) ρdc/ρac =ExL/K	0.992	1.159	0.926	0.988	1.027	1.052						
(N) PFE=(M-1)(10^2)	-1	16	-7	-1	3	5						
(O) MCF=(M-1)(10^5)/H												

INDUCED POLARIZATION WORK SHEET



INDUCED POLARIZATION WORK SHEET



Area 3 N - Rosemont

Scale

Date

INDUCED POLARIZATION RECEIVER NOTES PAGE

Project: Rosemont Line: 3N Int.Cal 52.2 Date: 27/Feb

		1400	1007	1400	1400	1003						
Send	2-3	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3
Rec.		1-2N	→	2-3N		→	3-4N			→	4-5N	→
Time		1329	1331	1416	1418	1420	1459	1500	1502	1504	1527	1529
DC-1		9.62 9.72	2.40 2.36	10.0 10.0	2.42 2.38	.92 .90	15.2 15.2	4.25 4.30	1.52 1.50	62 65	5.80 5.80	2.10 2.03
DC-2		9.68 9.60	2.13 2.14	9.4 9.4	2.51 2.54	.94 .95	14.7 14.7	4.10 4.17	1.57 1.61	67 71	5.20 5.25	2.15 2.27
Σ		19.30 19.32	4.53 4.50	19.4 19.4	4.93 4.92	1.86 1.85	29.9 29.9	8.35 8.47	3.09 3.11	[illegible]	11.00 11.05	4.25 4.30
DC-3		9.60 9.60	2.41 2.35	9.9 10.0	2.34 2.36	.92 .87	15.2 15.2	4.20 4.20	1.46 1.38	67 68	5.80 5.90	2.04 1.98
Dc-4		9.68 9.70	2.13 2.15	9.4 9.4	2.58 2.58	.96 .98	14.7 14.7	4.40 4.30	1.70 1.72	69 70	5.19 5.11	2.22 2.25
Σ		19.28 19.30	4.54 4.50	19.3 19.4	4.92 4.99	1.88 1.85	29.9 29.9	8.60 8.50	3.16 3.10	[illegible]	10.99 11.01	4.26 4.23
C-AV		19.30	4.52	19.4	4.93	1.86	29.9.	8.48	3.11	135	11.01	4.26
C-1		9.70	2.32	10.0	2.51	.94	15.6	4.40	1.58	.70	5.77	2.20
AC-2		9.70	2.32	10.0	2.51	.94	15.6	4.40	1.58	.70	5.77	2.20
Σ		19.40	4.64	20.0	5.02	1.88	31.2	8.80	3.16	1.40	11.54	4.40
S. P.		+5.9	+5.9	+6.6			+9.4					
AC-N		.06	.06	.05	.05	.05	.05					

INDUCED POLARIZATION SURVEY - RECEIVER NOTES PAGE ____

Project: Rosemont Line: 3N Int. Cal. ____ Date: 27/Feb

Send	3-4	4-5	1-2	2-3	3-4	4-5	2-3					
Rec	4-5 N →		5-6N			>						
Time	1530	1532	1601	1603	1605							
DC-1	91 93	50 56	1.90 1.89	87 87	47 47	25 19						
DC-2	90 88	40 43	2.17 2.13	98 96	41 40	26 30						
Σ	1.81 1.81	0.89 .9	4.07 4.02	1.93 1.93	0.81 .81	.51 .45						
DC-3	98 99	48 55	1.95 1.88	92 91	50 48	22 31						
DC-4	85 86	44 37	2.10 2.21	94 95	35 41	20 26						
Σ	1.83 1.85	0.92 .92	4.05 4.09	1.86 1.88	0.85 .89	.42 .57						
DC-AV.	1.82	.93	4.06	1.85	.87	.49						
AC-1	.94	.48	2.10	.94	.47	.27						
AC-2	.94	.48	2.10	.94	.47	.27						
Σ	1.88	.96	4.20	1.88	.94	.54						
S.P.	+17.0					+3.0						
AC-N	.05	.05	.05	.05	.05	.05						

INDUCED POLARIZATION SURVEY - RECEIVER NOTES PAGE ____

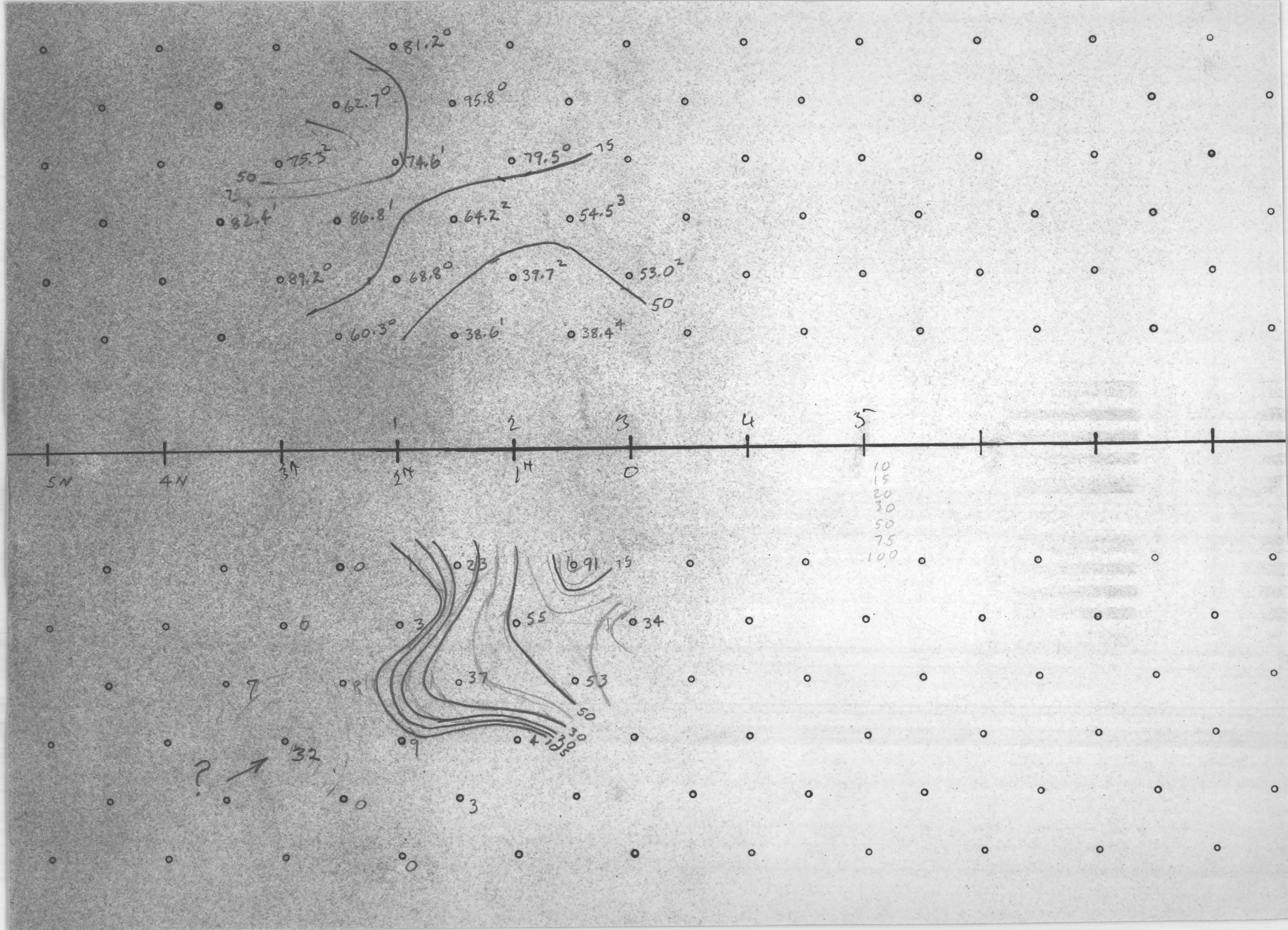
Project: Rosemont Line: Cu 16 3N Int.Cal. _____ Date: 27/Feb

Send	2-3	2-3	2-3		2-3	2-3	2-3					
Rec.	280	510	705									
Time	1308	1313	1315		1713	1715	1716					
DC-1	144.0	260	362		144	255	350					
DC-2	144.0	260	362		144	255	350					
Σ	288	520	724		288	510	700					
DC-3	144.0	260	362		144	255	350					
DC-4	144.0	260	362		144	255	350					
Σ	288	520	724		288	510	700					
DC-AV	288	520	724		288	510	700					
AC-1	151.0	270	388		151	265	370					
AC-2	151.0	270	388		151	265	370					
Σ	302	540	776		302	530	740					
S. P.	973	983	.975									
AC-N	1.049	1.039	1.072									

INDUCED POLARIZATION SENDER NOTES

Project: ROSEMONT Line: 3N Date: 27 FEB 61

Send		3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3
Receive	CAL	1-2N		2-3N			3-4N				4-5	
Time		1329	1331	1416	1418	1420	1459	1500	1502	1504	1527	1529
Range		1.5	1.0	1.5	1.5	1.0	1.5	1.5	1.5	1.0	1.3	1.5
Current		1480	1004	1480	1460	1003	1460	1450	1410	1000	1455	1445
Send	3-4	4-5	1-2	2-3	3-4	4-5	2-3	2-3	2-3	2-3	2-3	2-3
Receive			5-6				CAL	CAL	CAL	CAL	CAL	CAL
Time	1530	1532					1307	1313	1315	1713	1715	1716
Range	1.5	1.0					.3	.5	.75	.3	.5	.75
Current	1435	1000					280	510	710	280	500	693



81.2°
62.7°
95.8°
75.3²
74.6¹
79.5°
75
50
82.4¹
86.8¹
64.2²
54.5³
89.2°
68.8°
39.7²
53.0²
50
60.3°
38.6¹
38.4⁴
1
2
3
4
5
5N
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INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page _____

Project Rosemont Line 3N Field date 27FEB61 Data page _____ Comp. date 28FEB61 . Comp by JER

(A) Send	2-3	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3
(B) Receive		1-2N	→	2-3N	→	→	3-4N	→	→	→	4.5N	→
(C) n separation		1	2	1	2	3	1	2	3	4	2	3
(D) I		1480	1004	1480	1460	1003	1460	1450	1440	1000	1455	1445
(E) Vdc (avg)		19.30	4.52	19.4	4.93	1.86	29.9	8.48	3.11	135	11.01	4.26
(F) DCcal		.981	→	→	→	→	→	→	→	→	→	→
(G) Kn x 10^{-3}		3	12	3	12	30	3	12	30	60	12	30
(H) ρ dc=ExFxGx10^3/D		38.4	53.0	38.6	39.7	54.5	60.3	68.8	64.2	79.5	89.2	86.8
(I) Vac Σ		19.40	4.62	20.0	5.02	1.88	31.2	8.80	3.16	1.40	11.54	4.40
(J) AC noise x 2		.12	.12	.10	.10	.10	.1	.10	.10	.10	.10	.10
(K) Vac(corr) = $\sqrt{I^2 - J^2}$		19.40	4.62	20.0	5.02	1.88	31.2	8.80	3.16	1.40	11.54	4.40
(L) AC-DC cal.		1.005	1.022	1.031	1.018	1.011	1.043	1.038	1.016	1.037	1.048	1.033
(M) ρ dc/ρac=ExL/K		1.035	1.018	1.009	1.022	1.029	.997	1.002	1.024	1.003	.992	1.007
(N) PFE=(M-1)(10^2)		3.5	1.8	0.9	2.2	2.9	-.3	.2	2.4	0.3	-0.8	0.7
(O) MCF=(M-1)(10^5)/H		91	34	23	55	53	—5	3	37	4	—9	8

Project _____ Line _____ Field date _____ Data page _____ Comp. date _____ Comp by _____

(A) Send	3-4	4-5	1-2	2-3	3-4	4-5	2-3					
(B) Receive	4-5N	→	5-6N	→	→	→						
(C) n separation	4	5	3	4	5	6						
(D) I	1435	1000	1450	1442	1430	995						
(E) Vdc (avg)	1.82	.93	4.06	1.85	.87	.49						
(F) DCcal	.981	→	→	→	→	→						
(G) Kn x 10^{-3}	60	105	30	60	105	168						
(H) ρ dc=ExFxGx10^3/D	74.6	95.8	82.4	75.3	62.7	81.2						
(I) Vac Σ	1.88	.96	4.20	1.88	.94	.54						
(J) AC noise x 2	.10	.10	.10	.10	.10	.10						
(K) Vac (corr) = $\sqrt{I^2 - J^2}$	1.88	.97	4.20	1.88	.95	.55						
(L) AC-DC cal.	1.033	1.043	1.034	1.016	1.092	1.122						
(M) ρdc/ρac =ExL/K	1.007	.997	1.006	1.024	.952	.927						
(N) PFE=(M-1)(10^2)	0.7	-0.3	0.6	2.4	-4.8	-7.3						
(O) MCF=(M-1)(10^5)/H	9	-3	7	32	—77	—90						

INDUCED POLARIZATION RECEIVER NOTES PAGE

Project: Rosemont Line: 4E Int.Cal Date: 3-27

Send	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3
Rec.	.5-1E	→	1-15E	→		15-2E	→			2-2.5E	→
Time	1400	1402	1428	1430	1433	1448	1449	1451	1452	1508	1511
DC-1	23.4 23.6	4.40 4.40	12.3 12.3	2.60 2.83	.88 1.22	33.8 33.8	4.20 4.23	1.41 1.32	.57 .55	10.2 10.2	2.33 2.30
DC-2	20.9 21.3	4.48 4.48	13.0 12.8	2.86 2.72	.92 .66	33.5 33.5	4.60 4.49	1.31 1.45	.66 .62	10.6 10.6	2.09 2.12
Σ	44.3 44.9	8.88 8.88	25.3 25.1	5.46 5.55	1.80 1.88	67.3 67.3	8.80 8.72	2.72 2.77	1.23 1.17	20.8 20.8	4.42 4.42
DC-3	23.6 23.7	4.46 4.42	12.4 12.4	2.57 2.64	.84 1.28	33.9 33.9	4.30 4.21	1.60 1.41	.57 .58	10.2 10.2	2.13 2.20
Dc-4	21.0 21.2	4.44 4.40	12.9 12.7	2.97 2.80	.90 .84	33.4 33.4	4.53 4.57	1.13 1.28	.58 .59	10.5 10.6	2.28 2.23
Σ	44.6 44.9	8.88 8.88	25.3 25.1	5.54 5.44	1.74 1.82	67.3 67.3	8.83 8.78	2.73 2.69	1.15 1.17	20.7 20.8	4.41 4.43
C-AV	44.7	8.87	25.2	5.50	1.81	67.3	8.78	2.73	1.18	20.8	4.42
C-1	21.4	4.30	12.2	2.57	.97	33.8	4.27	1.31	.59	10.3	2.14
AC-2	21.4	4.30	12.2	2.57	.97	33.8	4.27	1.31	.59	10.3	2.14
Σ	42.8	8.60	24.4	5.14	1.94	67.6	8.54	2.62	1.18	20.6	4.28
S. P.	+9.1		-12.6			-8.5				-8.5	
AC-N	.07		.06			.04				.02	

INDUCED POLARIZATION SURVEY - RECEIVER NOTES - PAGE

Project: Rosemont Line: 4E 2 Int. Cal. Date: 3-27

Send	3-4	4-5	1-2	2-3	3-4	4-5
Rec.	2-2.5E	→	2.5-3E			→
Time	1513	1515	1526	1529	1531	1539
DC-1	73 78	41 44	3.80 3.57	1.07 1.28	47 70	30 15
DC-2	99 91	50 49	3.40 3.75	1.03 .8	40 26	27 40
Σ	1.72 1.69	.91 .93	7.20 7.32	2.10 2.09	.87 .96	.57 .63
DC-3	90 91	28 58	3.73 3.74	1.04 1.31	40 68	32 24
DC-4	82 77	60 32	3.59 3.62	1.10 .75	48 31	.19 .41
Σ	1.72 1.68	.85 .90	7.32 7.32	2.14 2.06	.88 .99	.51 .65
DC-AV.	1.70	.91	7.28	2.10	.93	.59
AC-1	88	.44	3.57	1.11	.51	.32
AC-2	.88	.44	3.57	1.11	.51	.32
Σ	1.76	.88	7.14	2.22	1.02	.64
S.P.	-8.5		-13.1			
AC-N	.02		.06			

INDUCED POLARIZATION SURVEY - RECEIVER NOTES PAGE

Project: Rosemont Line: 4E Int.Cal. Date:

Send	2-3	2-3	2-3		2-3	2-3	2-3					
Rec.	Cal	Cal	Cal		Cal	Cal	Cal					
Time	1350	1351	1352		1552	1553	1554					
DC-1	13.7	25.0	34.3		13.9	24.9	34.0					
DC-2	13.7	25.0	34.3		13.9	24.9	34.0					
Σ	27.4	50.0	68.6		27.8	49.8	68.0					
DC-3	13.7	25.0	34.3		13.9	24.9	34.0					
DC-4	13.7	25.0	34.3		13.9	24.9	34.0					
Σ	27.4	50.0	68.6		27.8	49.8	68.0					
DC-AV	27.4	50.0	68.6		27.8	49.8	68.0					
AC-1	13.7	23.5	35.1		13.8	23.4	35.3					
AC-2	13.7	23.5	35.1		13.8	23.4	35.3					
Σ	27.4	47.0	70.2		27.6	46.8	70.6					
S. P.												
AC-N												

INDUCED POLARIZATION SENDER NOTES

Project: ROSEMONT Line: Date: 27 MAR 61

Send	2-3	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3
Receive	CAL											
Time		1400	1402	1428	1430	1433	1448	1449	1451	1452	1508	1511
Range		1.0	1.0	1.0	.75	.75	1.5	1.5	1.0	1.0	1.5	1.5
Current		1010	1000	1000	700	700	1420	1400	1000	1000	1420	1400
Send	3-4	4-5	1-2	2-3	3-4	4-5	2-3					
Receive							CAL					
Time	1513	1515	1526	1529	1531	1534	1350	1351	1352	1552	1553	1554
%Range	1.0	1.0	1.5	1.5	1.0	1.0	.3	.5	.75	.3	.5	.75
Current	1000	1000	1400	1390	1000	1000	280	493	700	285	495	710

INDUCED POLARIZATION RECEIVER NOTES PACK

Project Rosemont . Line 4W Int. Cal. Date: 3-28

end	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2	4-5	3-4
ec.	5-1W →		1-1.5W →			15-2W →				2-2.5W →	
me	1048	1050	1164	1108	1110	1129	1132	1135	1139	1155	1200
DC-1	22.5	4.40	683	240	.98	11.5	3.20	1.40	78	2.51	1.38
	22.6	4.48	731	250	1.40	11.5	2.77	.91	67	2.40	.96
DC-2	22.8	4.72	780	3.00	138	16.7	2.28	.91	60	2.54	.71
	22.7	4.68	728	2.90	.96	10.8	2.61	1.42	72	2.53	1.17
Σ	45.3	9.12	14.63	5.40	2.36	22.2	5.48	2.31	1.38	5.05	2.09
	45.3	9.16	14.59	5.40	2.36	22.3	5.38	2.33	1.39	4.93	2.13
DC-3	22.5	4.50	747	2.40	.92	11.1	2.70	1.52	37	2.63	1.01
	22.5	4.20	728	2.20	1.42	11.2	2.91	1.02	46	2.42	1.29
DC-4	22.8	4.72	728	3.02	1.38	11.2	2.72	.72	1.00	2.42	1.01
	22.6	4.90	743	2.42	1.01	11.2	2.48	1.41	.95	2.60	.79
Σ	45.3	9.22	14.75	5.42	2.30	22.3	5.42	2.24	1.37	5.05	2.02
	45.1	9.10	14.71		2.43	22.7	5.39	2.43	1.35	5.02	2.08
C-Av	45.3	9.15	14.67	5.41	2.36	22.3	5.42	2.33	1.37	5.01	2.08
C-1	21.4	4.50	6.95	2.72	1.28	10.9	2.70	1.10	.67	2.39	1.06
C-2	21.4	4.50	6.95	2.72	1.28	10.9	2.70	1.10	.61	2.39	1.06
Σ	42.8	9.00	13.90	5.44	2.56	21.8	5.40	2.20	1.34	4.78	2.12
S.P.	-2.4		+13.1			+3.9				+8.7	
AC-N	.03		03			.03				.02	

3.20
2.77
2.28
2.61
3.18
2.87
2.37

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.91
.91
1.92
1.15

1.91
2.29

3.00
2.90

1.18

07
29
30
38
98
1.40
1.38

1.40
1.03
1.36
2.30

INDUCED POLARIZATION - RECEIVER NOTES PAGE

Project: Rosemont Line: 4W Int.Cal Date: 3-28

Send	2-3	1-2	4-5	3-4	2-3	1-2	3-4	3-4	3-4	3-4	3-4	3-4
Rec.	2-25W	→	25-30	→	→	→	Cal	Cal	Cal	Cal	Cal	Cal
Time	1205	1207	1230	1233	1238	1241	1038	1039	1040	1308	1309	1310
DC-1	50 49	32 32	1.56 1.36	.81 1.07	.31 .37	.32 .54	13.7	24.5	34.0	13.6	24.8	34.0
DC-2	58 59	41 45	2.51 2.61	1.07 .92	.65 .66	.41 .23	13.7	24.5	34.0	13.6	24.8	34.0
Σ	1.08 1.08	.73 .77	4.07 4.97	1.88 1.99	.96 1.03	.73 .77	27.4	49.0	68.0	27.2	49.6	68.0
DC-3	54 41	20 28	1.33 1.29	.87 .91	.42 .81		13.7	24.5	34.0	13.6	24.8	34.0
DC-4	47 72	57 49	2.58 2.67	1.12 1.02	.53 .22		13.7	24.5	34.0	13.6	24.8	34.0
Σ	1.01 1.13	.77 .77	3.91 3.96	1.99 1.93	.95 1.03		27.4	49.0	68.0	27.2	49.6	68.0
C-AV	1.08	.76	3.98	1.95	.99	.75	27.4	49.0	68.0	27.2	49.6	68.0
C-1	.55	.39	1.91	.96	.53	.43	13.6	22.8	34.2	13.5	23.0	34.4
AC-2	.55	.39	1.91	.96	.53	.43	13.6	22.8	34.2	13.5	23.0	34.4
Σ	1.10	.78	3.82	1.92	1.06	.86	27.2	45.6	68.4	27.0	46.0	68.8
S. P.	+.87		+29.0									
AC-N	.02		.02									

INDUCED POLARIZATION SENDER NOTES

Project: ROSEMONT Line: 4W Date: 28 MAR 61

Send	3-4	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2	4-5	3-4
Receive	CAL											
Time		1048	1050	1104	1108	1110	1129	1132	1135	1139	1155	1200
Range		1.0	1.0	.75	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Current		1025	1020	700	1025	1020	1025	1010	1020	1010	1025	1000
Send	2-3	1-2	4-5	3-4	2-3	1-2	3-4					
Receive							CAL					
Time	1205	1207	1230	1233	1238	1241	1038	1039	1040	1308	1309	1310
Range	1.0	1.0	1.0	1.0	1.0	1.0	.5	.5	.75	.3	.5	.75
Current	1010	1000	1010	1000	1000	1000	283	500	700	280	500	700

Elem.	R
1-2	500
2-3	400 Ω
3-4	500 Ω
4-5	450 Ω

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INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page _____

Project Rosemont Line 4E Field date Mar. 27, 61 Data page _____ Comp. date Mar. 28, 61 Comp by C.S.L.

(A) Send	2-3	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3
(B) Receive	CAL	.5-1.0E →		1.0-1.5E	→		1.5-2.0E →				2.0-2.5E	
(C) n separation		1	2	1	2	3	1	2	3	4	2	3
(D) I		1010	1000	1000	700	700	1420	1400	1000	1000	1420	1400
(E) Vdc (avg)		44.7	8.67	25.2	5.50	1.81	67.3	8.78	2.73	1.18	20.8	4.48
(F) DCcal USED	1.030											
(G) Kn x 10^{-3}		1.5	6.0	1.5	6.0	1.5	1.5	6.0	1.5	30	6.0	1.5
(H) ρ dc=ExFxGx10^3/D		68.4	54.9	38.9	48.6	40.0	73.2	38.8	42.2	36.5	90.6	48.8
(I) Vac Σ		42.8	8.60	24.4	5.14	1.94	67.6	8.54	2.62	1.18	20.6	4.28
(J) AC noise x 2		.14	.14	.12	.12	.12	.08	.08	.08	.08	.04	.04
(K) Vac(corr) = $\sqrt{I^2 - J^2}$		42.8	8.60	24.4	5.14	1.94	67.6	8.54	2.62	1.18	20.6	4.28
(L) AC-DC cal. USED	1.030											
(M) ρ dc/ρac=ExL/K		1.076	1.062	1.063	1.102	.961	1.025	1.060	1.072	1.030	1.040	1.062
(N) PFE=(M-1)(10^2)		8	6	6	10	-4	3	6	7	3	4	6
(O) MCF=(M-1)(10^5)/H		111	113	162	210	-98	34	155	171	82	44	127

Project Rosemont Line 4E Field date Mar. 27, 61 Data page _____ Comp. date Mar. 28, 61 Comp by C.S.L.

(A) Send	3-4	4-5	1-2	2-3	3-4	4-5	2-3	2-3				
(B) Receive	→		2.5-3.0E	→			CAL	CAL				
(C) n separation	4	5	3	4	5	6						
(D) I	1000	1000	1400	1390	1000	1000		280	493	700	285	495	710
(E) Vdc (avg)	1.70	.91	7.28	2.10	.93	.59		27.4	50.0	68.6	27.8	49.8	68.0
(F) DCcal						USED	1.030	1.021	.986	1.019	1.025	.994	1.044
(G) Kn x 10^{-3}	30	52.5	15	30	52.5	84							
(H) ρ dc=ExFxGx10^3/D	52.5	49.2	80.4	46.7	50.3	51.0							
(I) Vac Σ	1.76	.88	7.14	2.22	1.02	.64		27.4	47.0	70.2	27.6	46.8	70.6
(J) AC noise x 2	.04	.04	.12	.12	.12	.12							
(K) Vac (corr) = $\sqrt{I^2 - J^2}$	1.76	.88	7.14	2.22	1.01	.63							
(L) AC-DC cal.						USED	1.030	1.030	.940	1.022	.994	.940	1.039
(M) ρdc/ρac =ExL/K	.995	1.066	1.050	.976	.949	.965							
(N) PFE=(M-1)(10^2)	0	7	5	-2	-5	-3							
(O) MCF=(M-1)(10^5)/H	-10	134	62	-51	-101	-69							

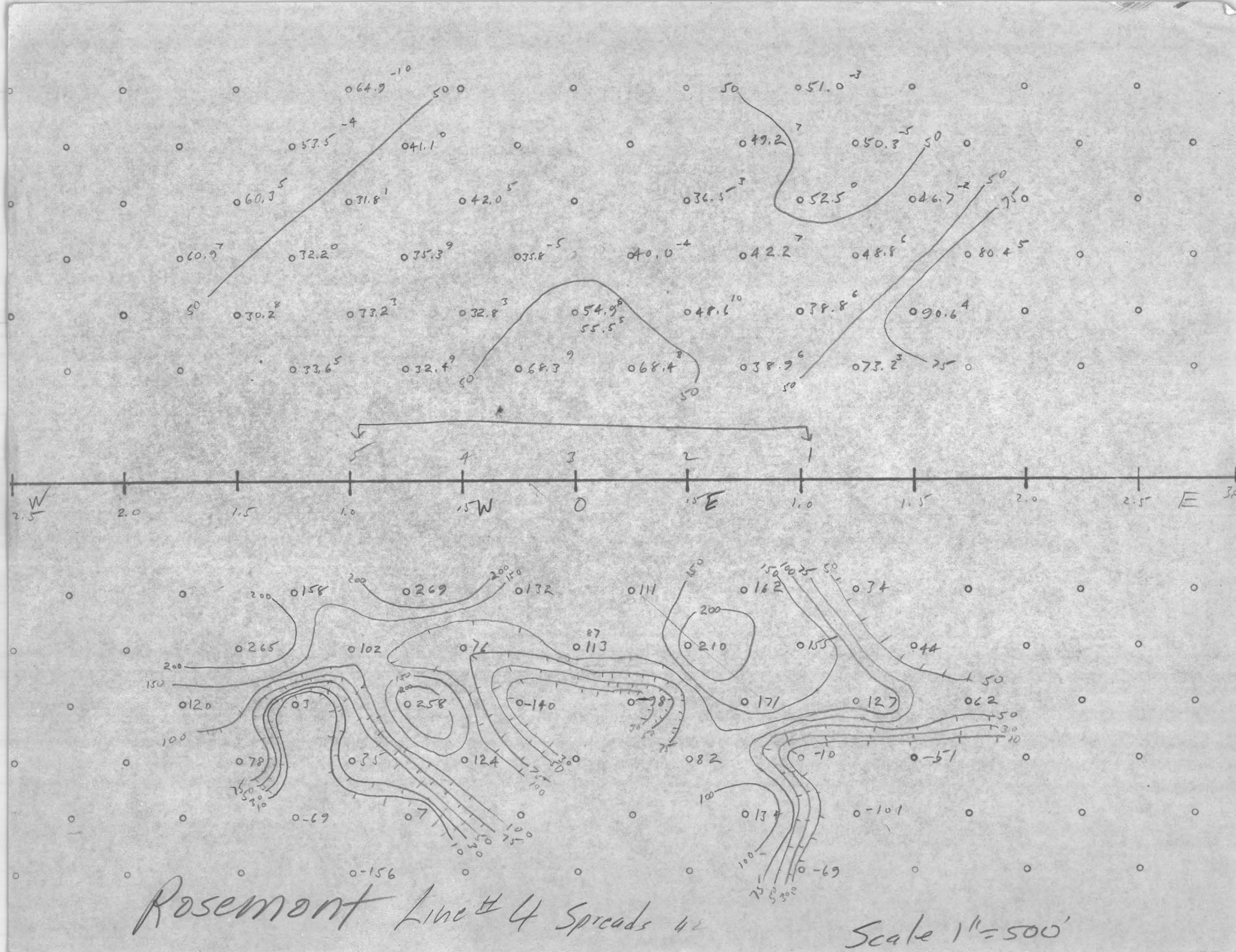
HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Project *Rosemont* Line *4 W* Field date *Mar. 28, 61* Data page _____ Comp. date *Mar. 29, 61* Comp. by *C.S.L.*

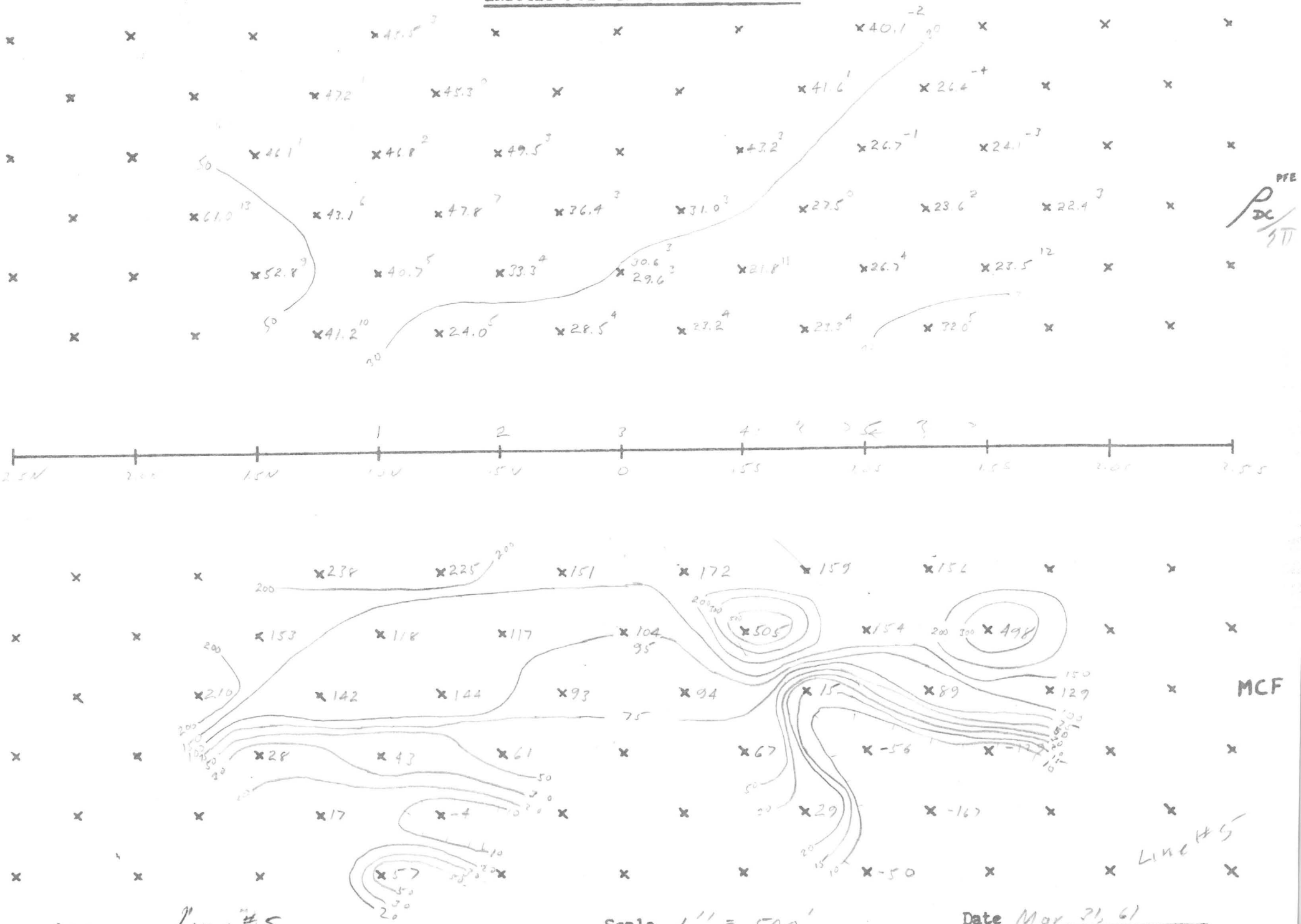
(A) Send	3 – 4	2 – 3	1 – 2	3 – 4	2 – 3	1 – 2	4 – 5	[illegible]	2 – 3	1 – 2	4 – 5	3 – 4
(B) Receive	CAL	.5 – 1.0W →		1.0 – 1.5W →			1.5 – 2.0W →				2.0 – 2.5W	
(C) n separation		1	2	1	2	3	1	2	3	4	2	3
(D) I		1025	1020	700	1025	1020	10[illegible]	1010	1020	1[illegible]	[illegible]25	1000
(E) Vdc (avg)		45.3	9.15	14.67	5.41	2.36	[illegible]	5.42	2.33	1.27	5.01	2.08
(F) DCcal USED	1.030											
(G) Kn x 10^{-3}		1.5	6	1.5	6	15	[illegible]	6	15	30	6	[illegible]
(H) ρ dc=ExFxGx10^3/D		68.3	55.5	32.4	32.8	35.8	33.6	33.2	35.3	42.0	30.2	32.2
(I) Vac Σ		42.8	9.00	13.90	5.44	2.56	21.8	5.40	2.20	1.34	4.78	2.12
(J) AC noise x 2		.06	.06	.06	.06	.06	.06	.06	.06	.06	.04	.04
(K) Vac(corr) = $\sqrt{I^2 - J^2}$		42.8	9.00	13.90	5.44	2.56	21.8	5.40	2.20	1.34	4.78	2.12
(L) AC-DC cal. USED	1.030											
(M) ρ dc/ρac=ExL/K		1.090	1.048	1.067	1.025	.950	1.053	1.034	1.091	1.052	1.080	1.001
(N) PFE=(M-1)(10^2)		9	5	9	3	-5	5	3	9	5	8	0
(O) MCF=(M-1)(10^5)/H		132	87	269	76	-140	158	102	258	124	265	3

Project *Rosemont* Line *4 W* Field date *Mar. 28, 61* Data page _____ Comp. date *Mar. 29, 61* Comp. by *C.S.L.*

(A) Send	2 – 3	1 – 2	4 – 5	3 – 4	2 – 3	1 – 2	3 – 4	3 – 4				
(B) Receive	→	→	2.5 – 3.0W			→	CAL	CAL				
(C) n separation	4	5	3	4	5	6						
(D) I	1010	1000	1010	1000	1000	1000		283	500	700	280	500	700
(E) Vdc (avg)	1.08	.76	3.98	1.95	.22	.75		27.4	49.0	64.0	27.2	49.6	64.0
(F) DCcal						USED	1.030	1.033	1.020	1.029	1.029	1.008	1.029
(G) Kn x 10^{-3}	30	52.5	15	30	52.5	84							
(H) ρ dc=ExFxGx10^3/D	31.8	41.1	60.9	60.3	53.5	64.9							
(I) Vac Σ	1.10	.78	3.82	1.92	1.06	.86		27.2	45.6	64.4	27.[illegible]	46.0	68.4
(J) AC noise x 2	.04	.04	.04	.04	.04	.04							
(K) Vac (corr) = $\sqrt{I^2 - J^2}$	1.10	.78	3.82	1.92	1.06	.86							
(L) AC-DC cal.						USED	1.030	.993	.933	1.000	.993	.928	1.012
(M) ρdc/ρac =ExL/K	1.011	1.003	1.073	1.047	.963	.899							
(N) PFE=(M-1)(10^2)	1	0	7	5	-4	-10							
(O) MCF=(M-1)(10^5)/H	35	7	120	78	-69	-156							

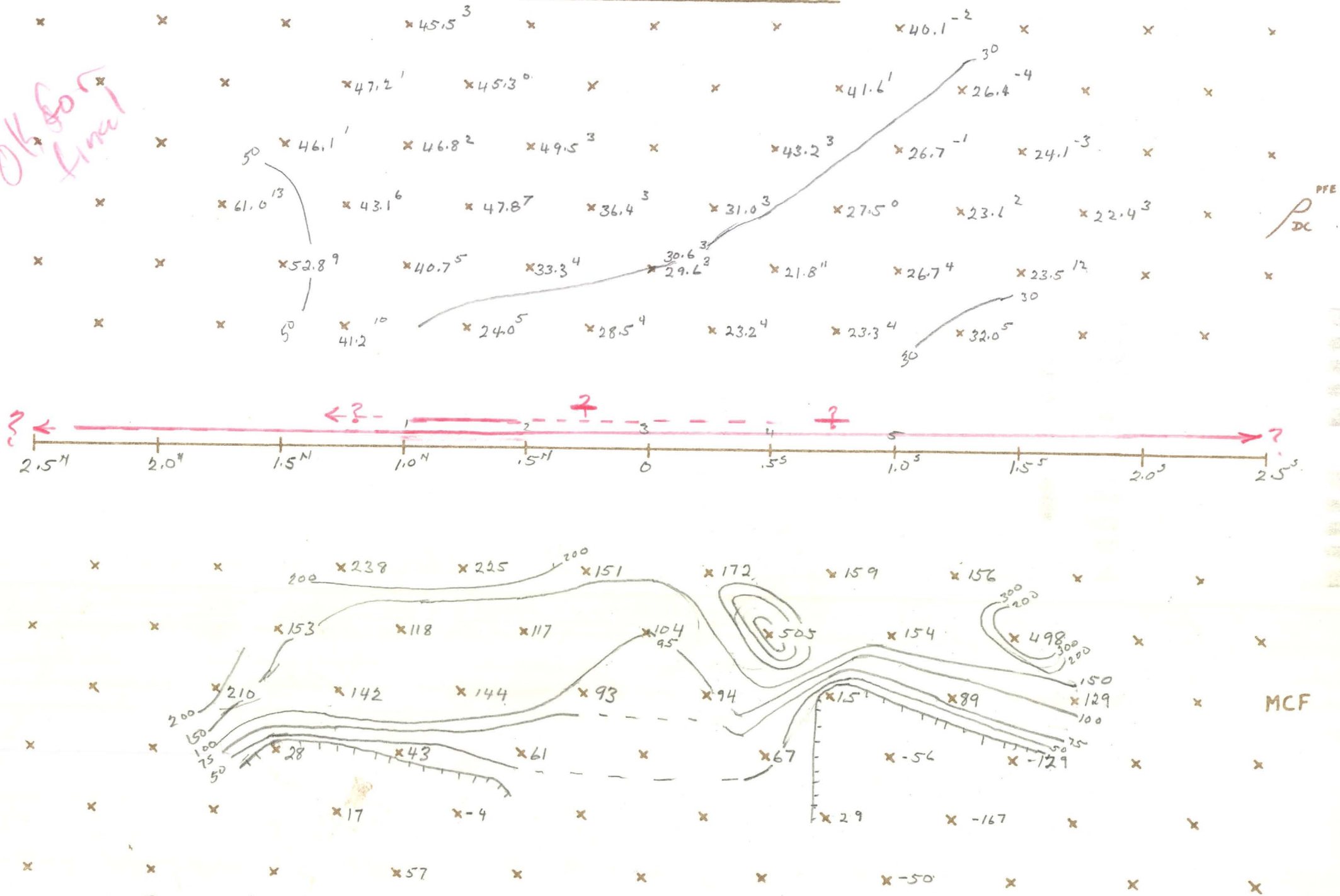

W
E
Rosemont Line # 4 Spreads 4
Scale 1" = 500'

INDUCED POLARIZATION WORK SHEET



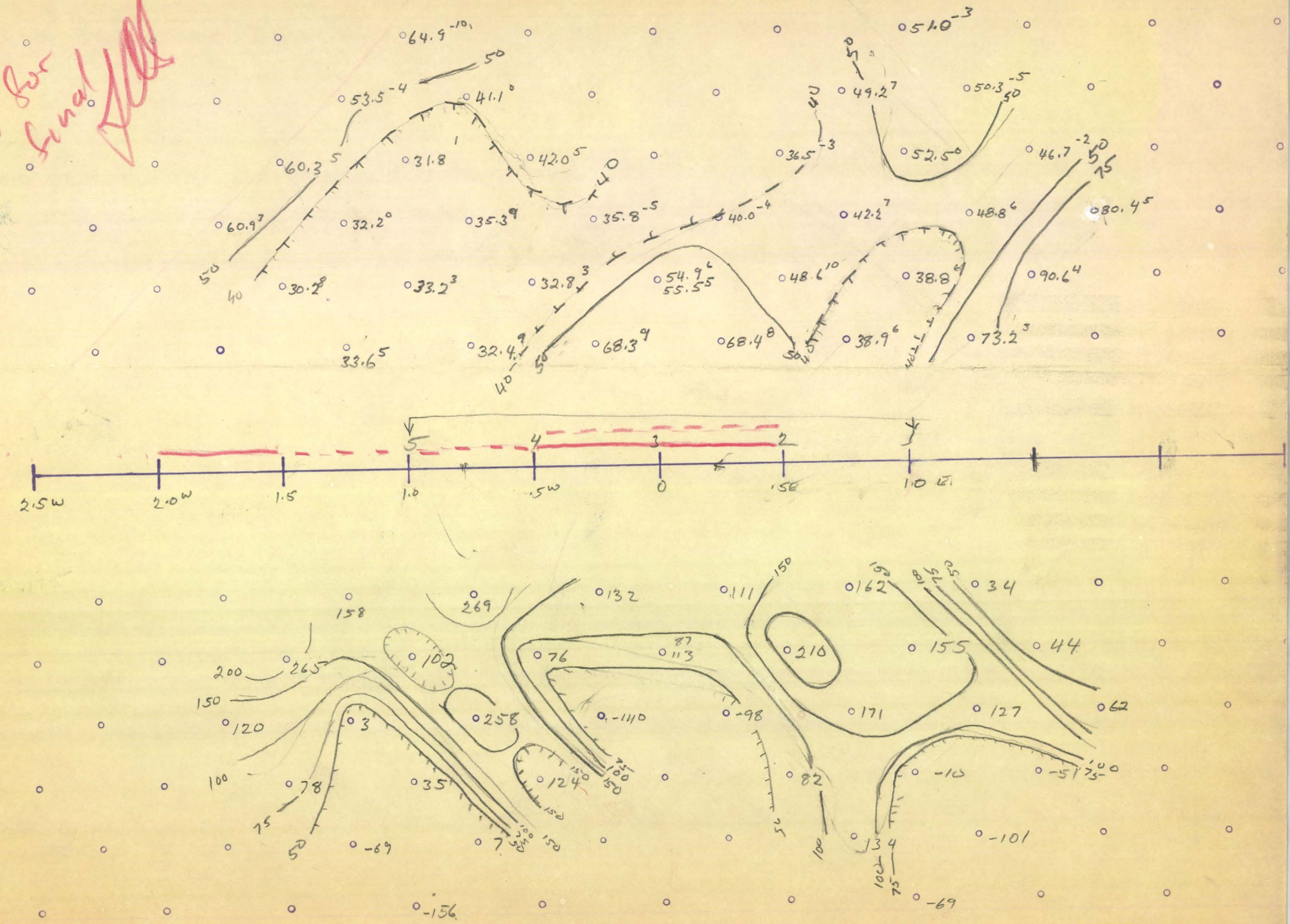
Area Line #5. Scale 1" = 500' Date Mar. 31, 61

INDUCED POLARIZATION WORK SHEET



Area Rosemont Line # 5 Scale 1" = 500 ft Date 31/March/61

ok for final



Rosemont Line #4 Scale 1" = 500'

INDUCED POLARIZATION SURVEY - RECEIVER NOTES PAGE ____

Project: Rosemont Line: # 3-5 Int. Cal. Date: 25/Feb

Send	3-4	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2	4-5	3-4
Rec	Cal	1-2 S	→	2-3 S	→	→	3-4 S	→	→	→	4-5 S	→
Time		1227	1230	1300	1302	1304	1332	1334	1337	1338	1417	1418
DC-1		13.8 13.7	3.60 3.65	18.9 18.9	3.78 3.77	1.51 1.55	11.10 11.09	2.86 2.85	1.01 1.05	.63 .67	2.90 2.93	1.20 1.14
DC-2		12.8 12.9	2.95 3.05	18.2 18.2	3.52 3.52	1.58 1.55	11.14 11.15	2.84 2.80	1.00 .97	.50 .48	3.11 3.08	1.17 1.21
Σ		26.6 26.6	6.55 6.70	37.1 37.1	7.30 7.29	3.09 3.10	22.24 22.24	5.70 5.65	2.01 2.02	1.13 1.15	6.01 6.01	2.37 2.35
DC-3		13.7 13.8	4.00 4.30	18.9 18.9	3.78 3.76	1.52 1.42	11.09 11.09	2.90 2.90	1.06 1.08	.68 .68	3.00 3.00	1.15 1.16
DC-4		12.8 12.7	2.95 2.70	18.2 18.0	3.50 3.48	1.61 1.68	11.15 11.15	2.78 2.78	.96 .94	.46 .44	3.03 2.99	1.18 1.11
Σ		26.5 26.5	6.75 7.00	37.1 36.9	7.28 7.24	3.11 3.10	22.24 22.24	5.68 5.68	2.02 2.02	1.14 1.12	6.03 5.99	2.33 2.27
DC-AV.		26.55	6.75	37.1	7.28	3.11	22.24	5.68	2.02	1.13	6.01	2.34
AC-1		12.4	3.48	18.3	3.70	1.59	11.14	2.83	1.03	.58	2.98	1.17
AC-2		12.4	3.48	18.3	3.70	1.59	11.14	2.83	1.03	.58	2.98	1.17
Σ		24.8	6.96	36.6	7.40	3.18	22.28	5.66	2.06	1.16	5.96	2.34
S.P.		+294.2	→	+13.2	→	→	+2.8	→	→	→	→	→
AC-N		.15	.15	.08	.08	.08	.06	.06	.06	.06		

INDUCED POLARIZATION - RECEIVER NOTES PAGE

Project Rosemont . Line 3S Int.Cal.53.0 Date: 25/Feb/

end	2-3	1-2	4-5	3-4	2-3	1-2	3-4	3-4	3-4	3-4	3-4	
ec.	→	→	5-6 S			→	cal	cal	cal	cal	cal	
ime	1420	1422	1448	1449	1451	1453	1215	1217	1545	1546		
DC-1	.58 .70	.30 .25	1.00 1.07	.40 .41	.25 .26	.19 .19	27.1	37.5	27.1	37.2		
DC-2	.46 .40	.40 .43	.72 .65	.51 .50	.24 .22	.15 .15	27.1	37.5	27.1	37.2		
Σ	.104 .110	.70 .68	1.72 1.72	.91 .91	.49 .48	.34 .34	54.2	75.0	54.2	74.4		
DC-3	.65 .58	.26 .34	1.23 1.39	.41 .24	.31 .33	.20 .25	27.1	37.5	27.1	37.2		
DC-4	.45 .47	.34 .30	.38 .30	.52 .62	.18 .15	.13 .10	27.1	37.5	27.1	37.2		
Σ	.110 .105	.64 .63	1.61 1.69	.93 .87	.49 .48	.33 .35	54.2	75.0	54.2	74.4		
C-Av	1.07	.67	1.69	.91	.49	.34	27.1	39.8	27.2	39.2		
C-1	.55	.36	.90	.48	.25	.19	27.1	39.8	27.2	39.2		
C-2	.55	.36	.90	.48	.25	.19	54.2	79.6	54.4			
Σ	1.10	.72	1.80	.96	.50	.38						
S.P.	-2.2	→	+27.0									
AC-N	.05		.04									

INDUCED POLARIZATION SERIES NOTES

Project: ROSEMONT Line: 3S GRAFF Date: 25 FEB 61

Send		2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2	4-5	3-4
Receive	CAL	1-2S →		2-3S →			3-4S →				4-5S	
Time		1227	1229	1300	1302	1304	1332	1334	1337	1338	1417	1418
Range		1.5	1.5	1.5	1.5	1.5	1.0	1.5	1.5	1.5	1.0	1.5
Current		1425	1400	1410	1400	1400	1000	1410	1400	1390	1000	1410
Send	2-3	1-2	4-5	3-4	2-3	1-2			3-4	3-4	3-4	3-4
Receive	→		5-6S →						CAL	CAL	CAL	CAL
Time	1420	1422	1448	1449	1451	1453			1215	1217	1545	1546
Range	1.5	1.5	1.0	1.5	1.5	1.5			.5	.75	.5	.75
Current	1400	1390	1000	1400	1400	1390			510	710	510	700

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INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Project Rosemont Line 3S Field date 25/Feb/6 Data page _____ Comp. date 26/Feb [illegible] & C.S.L.

(A) Send	3-4	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2	4-5	3-4
(B) Receive	CAL	1S-2S →		2S-3S →			3S-4S →				4S-5S →	
(C) n separation		1	2	1	2	3	1	2	3	4	2	3
-(D) I		1425	1400	1410	1400	1400	1000	1410	1400	1390	1000	1410
+(E) Vdc (avg)		26.55	6.75	37.1	7.28	3.11	22.24	5.68	2.02	1.13	6.01	2.34
+(F) DCcal (.945) →												
+(G) Kn x 10^{-3}		3	12	3	12	30	3	12	30	60	12	30
(H) ρ dc=ExFxGx10^3/D		52.7	54.6	74.5	58.9	62.9	63.0	40.3	40.8	46.1	68.1	47.0
(I) Vac Σ		24.8	6.96	36.6	7.40	3.18	22.28	5.66	2.06	1.16	5.96	2.34
(J) AC noise x 2		.30	.30	.16	.16	.16	.12	.12	.12	.12	.12	.12
(K) Vac(corr) = $\sqrt{I^2 - J^2}$		24.8	6.96	36.6	7.40	3.18	22.28	5.66	2.06	1.16	5.96	2.34
(L) AC-DC cal. (1.057) →												
(M) ρ dc/ρac=ExX/K		1.130	1.022	1.070	1.039	1.032	1.070	1.058	1.034	1.029	1.064	1.057
(N) PFE=(M-1)(10^2)		17	2	7	4	3	3	6	3	3	6	6
(O) MCF=(M-1)(10^5)/H		247	40	94	66	51	48	144	83	63	94	121

Project	Line		Field date		Data page			Comp. date			
(A) Send	2-3	1-2	4-5	3-4	2-3	1-2		3-4	—	—	—
(B) Receive	4S-5S →		5S-6S →								
(C) n separation	4	5	3	4	5	6					
(D) I	1400	1390	1000	1400	1400	1390		510	710	510	700
(E) Vdc (avg)	1.07	.67	1.69	.91	.49	.34	USED	54.2	75.0	54.2	744
(F) DCcal					←		.945	.943	.947	.943	.943
(G) Kn x 10^{-3}	60	105	30	60	105	168					
(H) ρ dc=ExFxGx10^3/D	43.3	47.8	47.9	36.8	34.7	38.8					
(I) Vac Σ	1.10	.72	1.80	.96	.50	.38		542	796	544	784
(J) AC noise x 2	.10	.10	.08	.08	.08	.08					
(K) Vac (corr) = $\sqrt{I^2 - J^2}$	1.10	.71	1.80	.96	.49	.37	USED				
(L) AC-DC cal.					←		1.057	1.000	1.061	1.003	1.052
(M) ρdc/ρac =ExL/K	1.028	.996	.991	1.001	1.036	.971					
(N) PFE=(M-1)(10^2)	3	0	-1	0	4	-3					
(O) MCF=(M-1)(10^5)/H	65	-8	-19	3	109	-73					

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____ Page_____

(A) Send	2-3	3-4	4-5	2-3	3-4	4-5						
(B) Receive	CAL	1-2N	→	2-3N	→							
(C) n separation		1	2	1	2	3	1	2	3	4	2	3
(D) I	510	1484	1005	1480	1460	1003						
(E) Vdc (avg)	520	19.30	4.52	19.4	4.93	1.86						
(F) DCcal	.982	.973 / .983	.973 / .983	.983	.983	.983						
(G) Kn x 10^{-3}		3	12	3	12	30	3	12	30	60	12	30
(H) ρ dc=ExFxGx10^3/D		38.1 / 38.4	50.2 / 51.7	38.7	39.8	54.5						
(I) Vac Σ		19.40	4.64	20.0	5.02	1.88						
(J) AC noise x 2		.12	.12	.10	.10	.10						
(K) Vac(corr) = $\sqrt{I^2 - J^2}$	540	19.40	4.64	20.0	5.02	1.88						
(L) AC-DC cal.	1.038	1.049 / 1.039	1.049 / 1.039	1.039	1.039	1.039						
(M) ρ dc/ρac=ExL/K		1.041 / 1.031	1.021 / 1.010	1.006	1.020	1.028						
(N) PFE=(M-1)(10^2)		4 / 3	2 / 1	1	2	3						
(O) MCF=(M-1)(10^5)/H												

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

(A) Send							2-3	2-3	2-3	2-3	2-3	2-3	2-3
(B) Receive							Cal	Cal	→				
(C) n separation	4	5	3	4	5	6							
(D) I							500	280	510	710	280	500	693
(E) Vdc (avg)							510	288	520	724	288	510	700
(F) DCcal							.982	.940	.982	.982	.940	.982	.976
(G) Kn x 10^{-3}	60	105	30	60	105	168							
(H) ρ dc=ExFxGx10^3/D													
(I) Vac Σ													
(J) AC noise x 2													
(K) Vac (corr) = $\sqrt{I^2 - J^2}$							530	302	540	776	302	530	740
(L) AC-DC cal.							1.041	1.048	1.038	1.071	1.048	1.041	1.056
(M) ρdc/ρac =ExL/K													
(N) PFE=(M-1)(10^2)													
(O) MCF=(M-1)(10^5)/H													

INDUCED POLARIZATION SURVEY - RECEIVER NOTES PAGE ____

Project: [illegible] Line: 35 Int. Cal. 52-0 Date: [illegible]

Send		2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2	4-5	3-4
Rec		1-2S	→	2-3S	→		3-4S	→	→	→	4-5S	→
Time		1108	1109	1140	1141	1143	1208	1210	1212	1214	1234	1235
DC-1		13.0 13.0	3.30 3.22	17.5 17.7	3.60 3.65	1.57 1.59	11.0 11.0	2.85 2.81	95 94	60 39	2.89 2.91	1.15 1.20
DC-2		12.7 12.4	3.25 3.48	18.1 17.8	3.50 3.43	1.32 1.48	10.7 10.7	2.79 2.72	1.03 1.04	51 51	3.00 2.99	1.13 1.10
Σ		25.4 25.4	6.73 6.70	35.6 35.5	7.10 7.08	2.89 2.87	21.7 21.7	5.64 5.53	1.98 1.86	111 110	5.89 5.90	2.28 2.38
DC-3		13.2 12.9	3.12 3.38	17.7 17.5	3.73 3.80	1.60 1.41	11.0 10.8	2.85 2.88	.96 91	64 52	2.90 2.91	1.16 1.16
DC-4		12.3 12.7	3.37 3.20	18.1 17.9	3.28 3.30	1.46 1.55	10.9 11.0	2.75 2.60	1.02 1.06	50 60	2.95 2.97	1.12 1.12
Σ		25.0 25.4	6.49 6.58	35.9 35.4	7.01 7.10	3.06 2.96	21.9 21.8	5.45 5.48	1.98 1.97	112 112	5.85 5.88	2.28 2.28
DC-AV.		25.6	6.58	35.6	7.07	3.00	21.8	5.56	1.98	1.12	5.88	2.28
AC-1		13.0	3.43	18.1	3.70	1.58	11.2	2.83	1.00	.55	2.93	1.18
AC-2		13.0	3.43	18.1	3.70	1.58	11.2	2.83	1.00	.55	2.93	1.18
Σ		26.0	6.86	36.2	7.40	3.16	22.4	5.66	2.00	1.10	5.86	2.36
S.P.		+8.9	→	+6.6	→	→	+6.8	→	→	→		
AC-N		.03	.03	.03	.03		.00					

INDUCED POLARIZATION SURVEY - RECEIVER NOTES PAGE _____

Project: Rosemont Line: 35 Int. Cal. _____ Date:

Send	2-3	1-2	4-5	3-4	2-3	1-2						
Rec.	4-55	→	5-65	→	→	→						
Time	1237	1240	1303	1305	1307	1308						
DC-1	47 50	22 51	92 103	44 37	30 23	18 18						
DC-2	61 59	29 20	75 69	52 38	21 20	13 13						
Σ	108 109	.51 .71	1.67 1.72	96 95	51 43	31 31						
DC-3	49 57	25 25	98 103	46 43	38 32	13 18						
DC-4	62 45	54 45	74 84	38 48	17 21	22 12						
Σ	106 102	.79 .70	1.72 1.81	84 91	55 33	35 30						
DC-AV.	1.06	.68	1.75	.92	.51	.32						
AC-1	.57	.34	.92	.47	.26	.20						
AC-2	.57	.34	.92	.47	.26	.20						
Σ	1.14	.68	1.84	.94	.52	.40						
S.P.	-8.3	-8.3	+23.0									
AC-N	00	00	04	.04								

INDUCED POLARIZATION SURVEY - RECEIVER NOTES PAGE

Project: Rosemont Line: 3-S Int.Cal. 520 Date: 2/28/61

Send	3-4	3-4	3-4		3-4	3-4	3-4					
Rec.	Cal	Cal	Cal		Cal	Cal	Cal					
Time	1058	1039	1100		1349	1350	1351					
DC-1	142	259	355		142	258	354					
DC-2	142	259	355		142	258	354					
Σ	284	518	710		284	516	708					
DC-3	142	259	355		142	258	354					
DC-4	142	259	355		142	258	354					
Σ	284	518	710		284	516	708					
DC-AV	284	518	710									
AC-1	151	268	372		151	267	379					
AC-2	151	268	372		151	267	379					
Σ	302	536	744		302	534	758					
S. P.	1062	1035	1041									
AC-N												

INDUCED POLARIZATION SENDER NOTES

Project: ROSEMONT Line: 3S Date: 28.FEB 61

Send	3-4	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2	4-5	3-4
Receive	CAL	1-2S	→	2-3S	→		3-4S	→		→	4-5S	→
Time		1108	1109	1140	1141	1143	1208	1210	1212	1214	1234	1235
Range		1.5	1.5	1.5	1.5	1.5	1.0	1.5	1.5	1.5	1.0	1.5
Current		1485	1470	1470	1468	1455	1015	1465	1455	1450	1025	1470
Send	2-3	1-2	4-5	3-4	2-3	1-2	3-4	3-4	3-4	3-4	3-4	3-4
Receive	→		5-6S	→			CAL	CAL	CAL	CAL	CAL	CAL
Time	1237	1240	1303	1305	1307	1308	1058	1059	1100	1349	1350	1351
%Range	1.5	1.5	1.0	1.5	1.5	1.5	.3	.5	.75	.3	.5	.75
Current	1455	1440	1002	1465	1450	1445	279	503	688	285	510	710

Used

HEINRICHS GEOEXPLORATION COMPANY

INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page 1

Project Rescement Line 3 S Field date Feb 28, 61 Data page _____ Comp. date Feb 28, 61 Comp by C.S.L.

(A) Send	3-4	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2	4-5	3-4
(B) Receive	CAL	1-2 S	→	2-3 S	→	→	3-4 S	→	→	→	4-5 S	→
(C) n separation		1	2	1	2	3	1	2	3	4	2	3
(D) I		1485	1470	1470	1468	1455	1015	1465	1455	1450	1025	1470
(E) Vdc (avg)		25.[illegible]	6.58	35.6	7.07	3.00	21.8	5.56	[illegible]	1.12	5.88	2.28
(F) DCcal	.971	.977	.973	.978	.978	.978	.982	.983	.983	[illegible]	.987	[illegible]
(G) Kn x 10^{-3}		3	12	3	12	30	3	12	30	60	12	30
(H) ρ dc=ExFxGx10^3/D		50.2	52.3	71.0	56.6	60.5	63.2	44.8	40.1	45.6	68.0	46.0
(I) Vac Σ		26.0	6.86	36.2	7.40	3.16	22.4	5.66	[illegible]	[illegible]	5.86	[illegible]
(J) AC noise x 2		.06	.06	.06	[illegible]	[illegible]	.00	.00	.00	.00	.00	[illegible]
(K) Vac(corr) = $\sqrt{I^2 - J^2}$		26.0	6.86	36.2	7.40	3.16	22.4	5.66	2.00	1.10	5.86	2.76
(L) AC-DC cal.	1.062	1.062	→	→	→	→	→	→	→	→	→	→
(M) ρ dc/ρac=ExL/K		1.047	1.019	1.045	1.015	1.009	1.033	1.043	1.051	1.082	1.066	1.028
(N) PFE=(M-1)(10^2)		5	2	5	2	1	3	4	5	8	7	3
(O) MCF=(M-1)(10^5)/H		94	36	63	26	15	52	96	127	180	97	61

Project Rescement Line 3 S Field date Feb 28, 61 Data page _____ Comp. date Feb 28, 61 Comp by C.S.L.

(A) Send	2-3	1-2	4-5	3-4	2-3	1-2	[illegible]					
(B) Receive	→	→	5-6 S	→	→	→	CAL					
(C) n separation	4	5	3	4	5	6						
(D) I	1455	1440	1002	1465	1450	1445						
(E) Vdc (avg)	1.06	.68	1.75	.92	.51	.32						
(F) DCcal	.987	.988	.991	.992	.992	.992	.999					
(G) Kn x 10^{-3}	60	105	30	60	105	168						
(H) ρ dc=ExFxGx10^3/D	43.2	49.0	51.8	37.3	40.2	36.8						
(I) Vac Σ	1.14	.68	1.84	.94	.52	.40						
(J) AC noise x 2	.00	.00	.08	.08	.08	.08						
(K) Vac (corr) = $\sqrt{I^2 - J^2}$	1.14	.68	1.84	.94	.51	.39						
(L) AC-DC cal.	1.062	→	→	→	→	→	1.062					
(M) ρdc/ρac =ExL/K	.989	1.062	1.010	1.040	1.062	.873						
(N) PFE=(M-1)(10^2)	-1	6	1	4	6	-13						
(O) MCF=(M-1)(10^5)/H	-26	126	19	108	154	-346						

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page _____

Project Rosemont Line 5 N Field date Mar. 30, 61 Data page _____ Comp. date Mar. 31, 61. Comp by C.S.L.

(A) Send	3-4	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3
(B) Receive	CAL	.5-1.0N	→	1.0-1.5N	→	→	1.5-2.0N	→	→	→	2.0-2.5N	→
(C) n separation		1	2	1	2	3	1	2	3	4	2	3
(D) I		1405	1400	1425	1400	1400	1425	1400	1385	1385	1400	1390
(E) Vdc (avg)		25.9	6.93	22.1	7.53	3.30	38.0	9.22	4.28	2.22	11.95	3.88
(F) DCcal USED	1.030											
(G) Kn x 10^{-3}		1.5	6.0	1.5	6.0	15	1.5	6.0	15	60	60	15
(H) ρ dc=ExFxGx10^3/D		28.5	30.6	24.0	33.3	36.4	41.2	40.7	47.8	40.5	52.8	43.1
(I) Vac Σ		25.8	6.96	21.8	7.54	3.32	36.0	9.16	4.16	2.24	11.50	3.80
(J) AC noise x 2		.08	.08	.08	.08	.08	.10	.10	.10	.10	.10	.10
(K) Vac(corr) = $\sqrt{I^2 - J^2}$		25.8	6.96	21.8	7.54	3.32	36.0	9.16	4.16	2.24	11.50	3.80
(L) AC-DC cal. USED	1.040											
(M) ρ dc/ρac=ExL/K		1.043	1.032	1.054	1.039	1.034	1.098	1.048	1.069	1.030	1.081	1.061
(N) PFE=(M-1)(10^2)		4	3	5	4	3	10	5	7	3	8	6
(O) MCF=(M-1)(10^5)/H		151	104	225	117	93	238	118	144	61	153	142

Project Rosemont Line 5 N Field date Mar. 30, 61 Data page _____ Comp. date Mar. 31, 61 Comp by C.S.L.

(A) Send	3-4	4-5	1-2	2-3	3-4	4-5	3-4					
(B) Receive	→	→	2.5-3.0N	→	→	→			Calibration Values			
(C) n separation	4	5	3	4	5	6	CAL					
(D) I	1375	1375	1400	1380	1375	1370			Same as			
(E) Vdc (avg)	2.08	1.15	5.53	2.06	1.20	.72						
(F) DCcal						USED	1.030					
(G) Kn x 10^{-3}	30	52.5	15	30	52.5	84			Line 5 S			
(H) ρ dc=ExFxGx10^3/D	46.8	45.3	61.0	46.1	47.2	45.5						
(I) Vac Σ	2.12	1.20	5.10	2.12	1.24	.74						
(J) AC noise x 2	.10	.10	.08	.08	.08	.08						
(K) Vac (corr) = $\sqrt{I^2 - J^2}$	2.12	1.20	5.10	2.12	1.24	.73						
(L) AC-DC cal.						USED	1.040					
(M) ρdc/ρac =ExL/K	1.020	.998	1.128	1.010	1.008	1.026						
(N) PFE=(M-1)(10^2)	2	0	13	1	1	3						
(O) MCF=(M-1)(10^5)/H	43	-4	210	28	17	57						

Project: Rosemont Well: 5N Lat (Gal) 48.8 Date: May 24

Spec	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3
Time	13.02	13.45	[illegible]	14:00	14:53	1416	1418	1420	1421	1435	1436
DC-1	3.0	3.29	11	3.67	1.67	18.9	4.80	2.08	.95	6.42	2.05
	13.0	3.29	11.1	3.68	1.62	18.9	4.80	2.09	.92	6.50	2.00
	12.9	3.35	11.0	3.86	1.70	19.1	4.42	2.22	1.28	5.58	1.84
DC-2	12.9	3.55	11.0	3.63	1.68	19.1	4.43	2.19	1.28	5.50	1.88
Σ	[illegible]	3.94	22.1	3.53	3.31	38.0	9.22	4.30	2.23	12.08	3.89
	[illegible]	3.94	22.1	3.51	3.30	38.0	9.23	4.28	2.20	12.08	3.88
DC-3	[illegible]	3.41	[illegible]	3.68	1.66	18.8	4.80	2.25	.95	6.64	2.04
	12.9	3.41		3.71	1.70	18.8	4.81	2.23	.92	6.74	2.06
DC-4	12.9	3.37		3.86	1.64	19.1	4.43	2.03	1.27	5.22	1.84
	47.0	3.53	12.9	3.81	1.60	19.1	4.41	2.04	1.30	5.20	1.80
Σ	[illegible]	6.90	22.1	7.54	3.30	37.9	9.23	4.28	2.22	11.86	3.85
	[illegible]	[illegible]	22.0	7.52	3.30	37.9	9.21	4.27	2.22	11.94	3.86
DC-AV.	25.9	6.93	22.1	7.53	3.30	38.0	9.22	4.28	2.22	11.95	3.88
AC-1	12.9	3.48	10.9	3.77	1.66	18.0	4.58	2.08	1.12	5.75	1.90
AC-2	12.9	3.48	10.9	3.77	1.66	18.0	4.58	2.08	1.12	5.75	1.90
Σ	25.8	6.96	21.8	7.54	3.32	36.0	9.16	4.16	2.24	11.50	3.80
S.P.	70.5	→	+14.7			+2.0	→			+8.6	
AC-N	.04	→	.04	→		.05	→			.05	

INDUCED POLARIZATION SURVEY RECEIVER NOTES PAGE

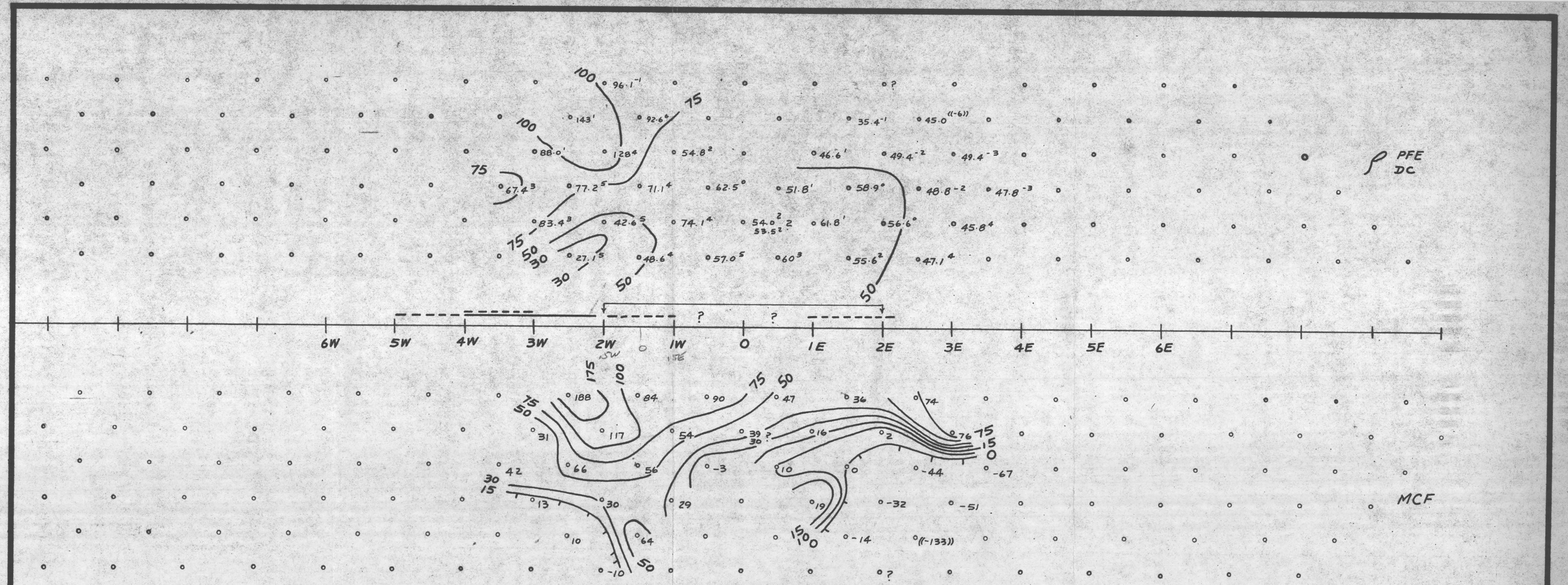
Project [illegible] Line 5 N Int Cal 48.8 [illegible]

Send	3-4	4-5	1-2	2-3	3-4	4-5
Rec.	2-2.5N	→	2.5-3.0N	→	→	→
Time	1438	1439	1450	1451	1452	1454
DC-1	1.00	.70	2.91	1.01	74	37
	.98	.73	2.99	1.02	78	36
	1.09	.43	2.61	1.05	49	37
DC-2	1.11	.45	2.54	1.06	38	34
Σ	2.09	113	5.52	2.06	123	.74
	2.09	118	5.53	2.08	116	.70
DC-3	.97	.68	2.96	1.01	82	40
	.94	69	2.99	1.08	80	39
DC-4	1.10	.48	2.58	1.03	38	31
	1.13	45	2.53	.97	42	33
Σ	2.07	111	5.54	2.04	120	71
	2.07	114	5.52	2.05	122	72
DC-AV	2.08	1.15	5.53	2.06	1.20	.72
AC-1	1.06	.60	2.55	1.06	.62	.37
AC-2	1.06	60	2.55	1.06	.62	.37
Σ	2.12	1.20	5.10	2.12	1.24	.74
S. P.	+8.6	→	+2.4	—		—
AC-N	.05	→	.04			→

INDUCED POLARIZATION SENDER NOTES

Project: ROSEMONT Line: 5N Date: 30 MAR 61

Send	3-4	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3
Receive	CAL											
Time		1343	1345	1359	1400	1403	1416	1418	1420	1421	1435	1436
Range		1.5	—	—	—	—	—	—	—	—	—	—
Current		1405	1400	1425	1400	1400	1425	1400	1385	1385	1400	1390
Send	3-4	4-5	1-2	2-3	3-4	4-5	3-4	—	—	—	—	—
Receive							CAL	—	—	—	—	—
Time	1438	1439	1450	1451	1452	1454	1511	1512	1513			
Range	1.5	—	—	—	—	—	.3	.5	.75	.3	.5	.75
Current	1375	1375	1400	1380	1375	1370	280	495	700			



SECTIONAL DATA SHEET
Rosemont Project
for
D. T. Mc Millan

LINE No. 2

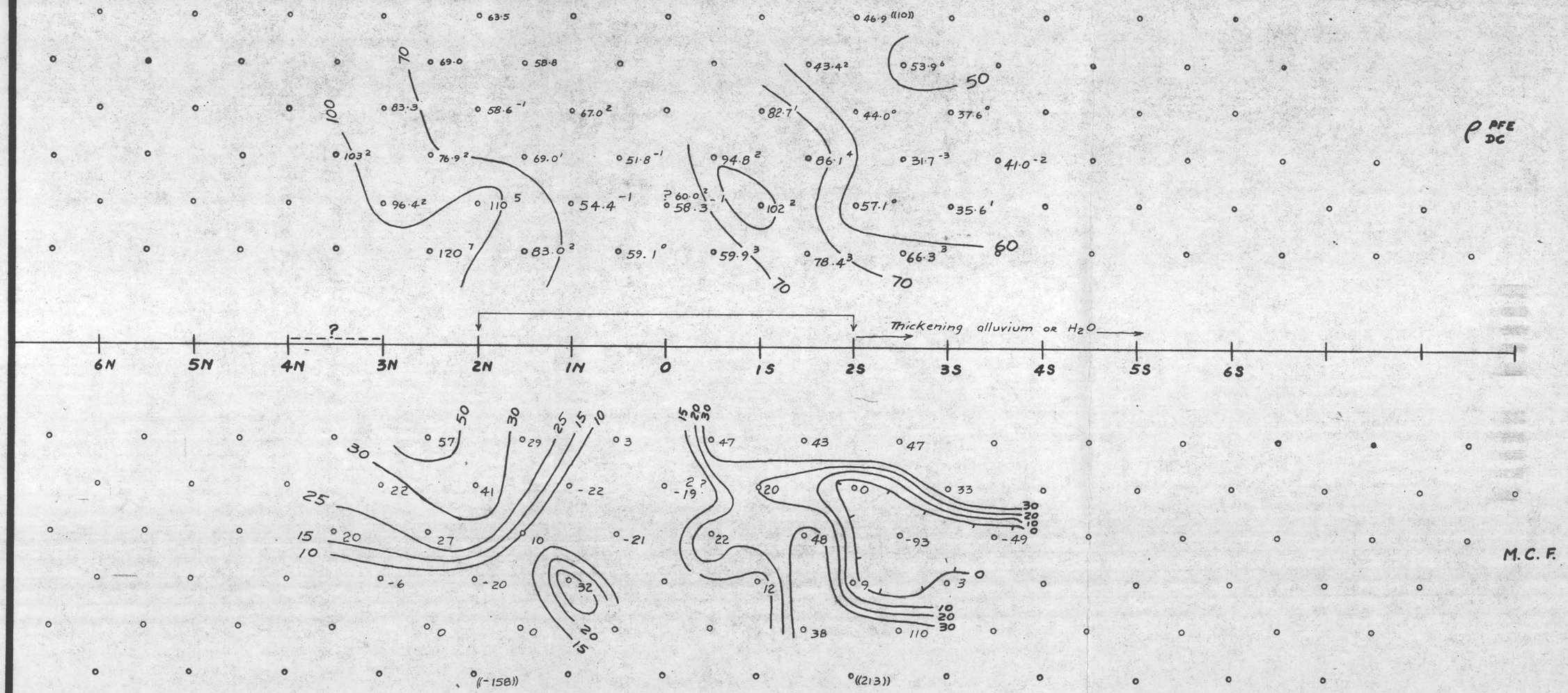
INDUCED POLARIZATION SURVEY

HEINRICHS GEOEXPLORATION COMPANY

SCALE 1" = 1000'
DATE 3/61

C. I. Logarithmic

(( )) Indicates questionable data.

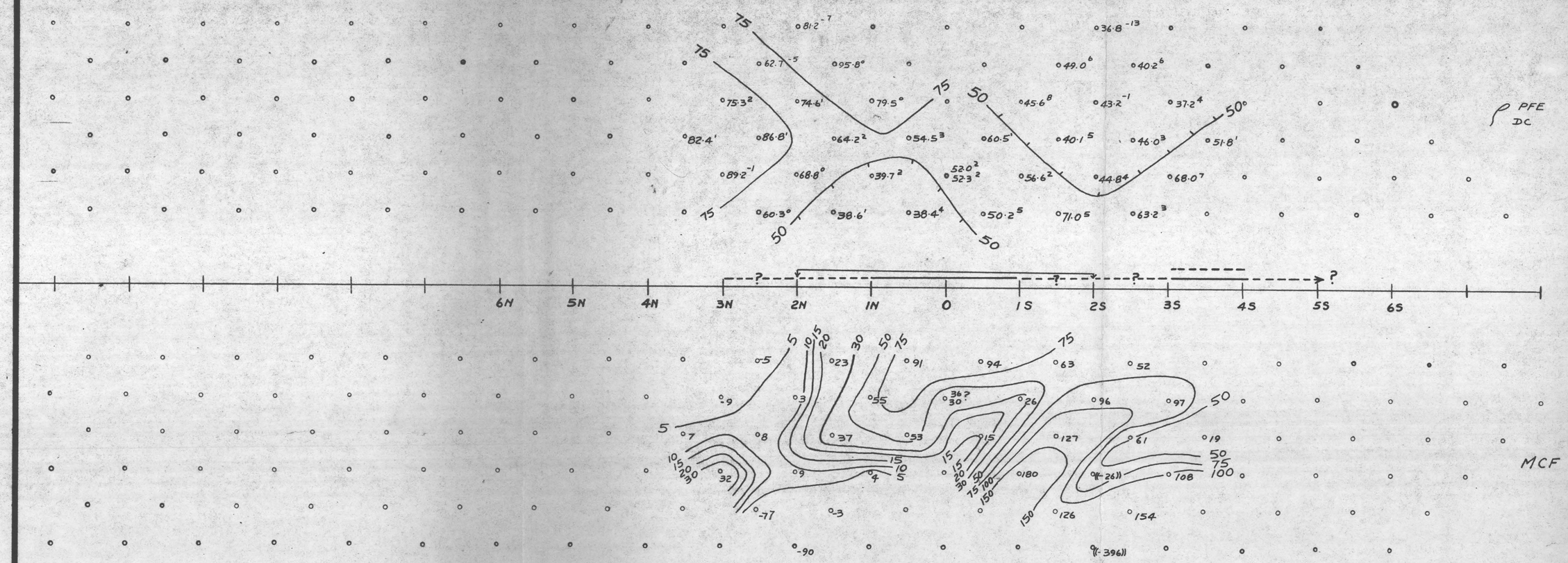


SECTIONAL DATA SHEET
Rosemont Project
for
D. T. Mc Millan

LINE No. 1

INDUCED POLARIZATION SURVEY
HEINRICHS GEOEXPLORATION COMPANY

SCALE 1" = 1000'
DATE 3/61
C. I. Logarithmic
(( )) Indicates Questionable Data.



SECTIONAL DATA SHEET
Rosemont Project
for
D. T. Mc Millan

LINE No. 3

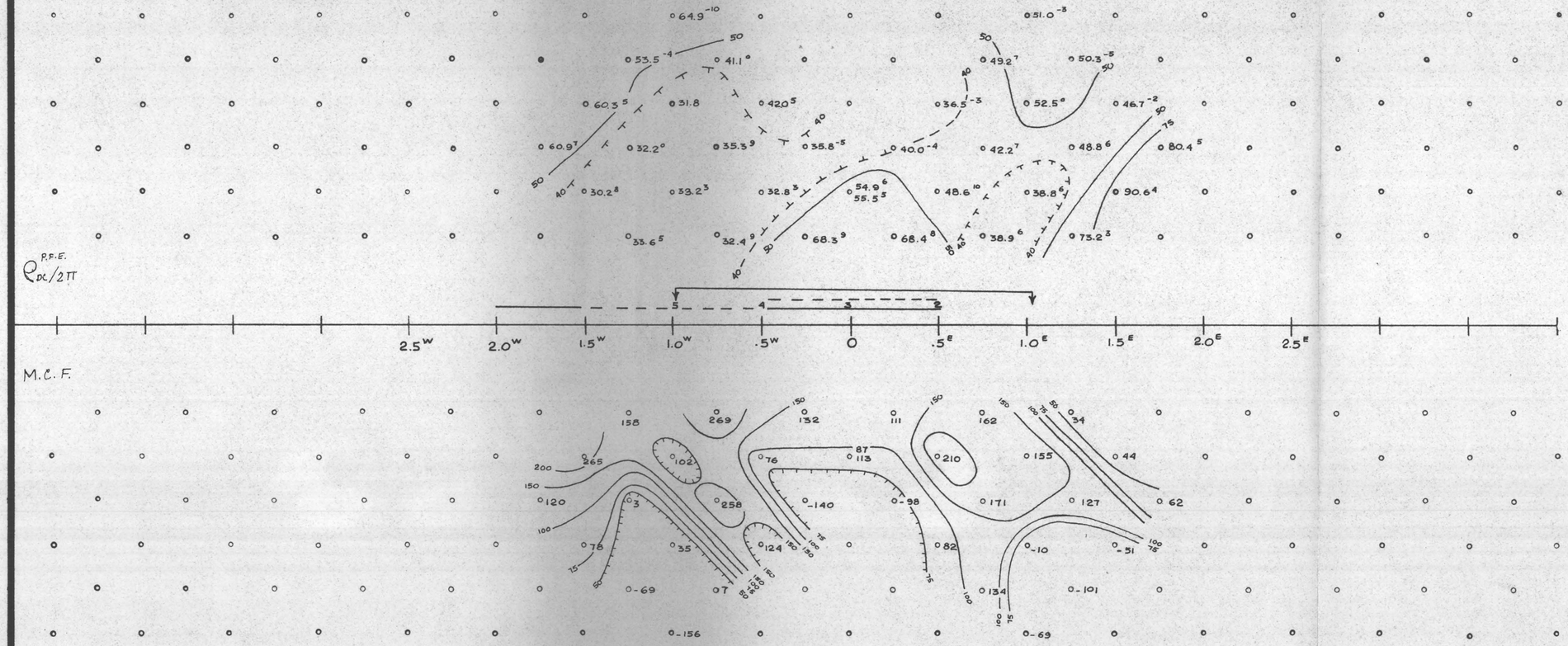
INDUCED POLARIZATION SURVEY

HEINRICHS GEOEXPLORATION COMPANY

SCALE 1" = 1000'
DATE 3/61

C. I. Logarithmic

(( )) Indicates Questionable Data.



END OF LINE
NO ANOMALY

WEAK OR QUESTIONABLE

MODERATE ANOMALY

MODERATE TO STRONG ANOMALY

STRONG ANOMALY

C.I. = LOGARITHMIC

(( )) INDICATES QUESTIONABLE DATA

ROSEMONT PROJECT
for
D. T. McMillan

SECTIONAL DATA SHEET

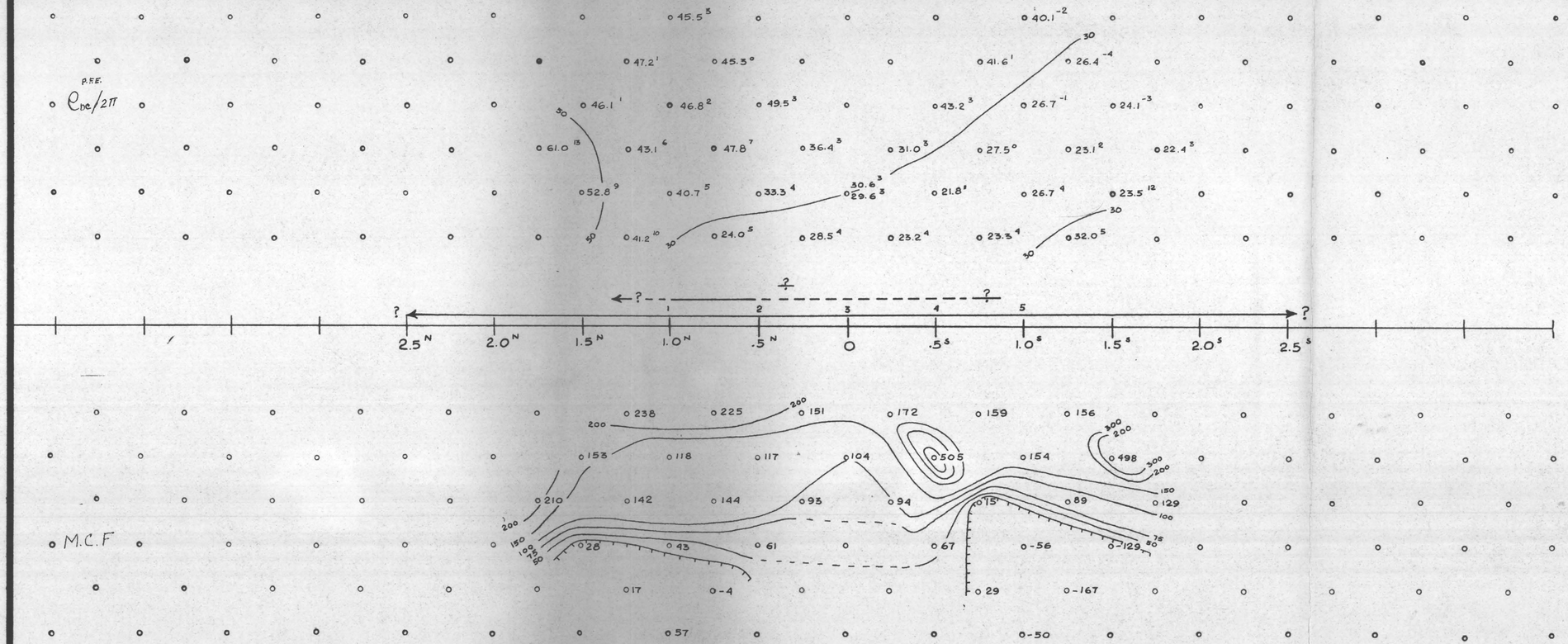
SUPPLEMENT NO. 1

LINE No. 4

INDUCED POLARIZATION SURVEY

HEINRICHS GEOEXPLORATION COMPANY

SCALE 1" = 500'
DATE March 1961



END OF LINE
NO ANOMALY

WEAK OR QUESTIONABLE

MODERATE ANOMALY

MODERATE TO STRONG ANOMALY

STRONG ANOMALY

C.I. = LOGARITHMIC

(( )) INDICATES QUESTIONABLE DATA

ROSEMONT PROJECT
for
D. T. McMillan

SECTIONAL DATA SHEET

SUPPLEMENT NO.1

LINE No. 5

INDUCED POLARIZATION SURVEY

HEINRICHS GEOEXPLORATION COMPANY

SCALE 1" = 500'

DATE March 1961

Rosemont Project

I P

INDUCED POLARIZATION SURVEY

Rosemont Area

Pima County, Arizona

for

D. T. Mc Millan

February 1961

by

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

TABLE OF CONTENTS

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Method	2
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Interpretation	5
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MAP

Sectional Data Sheets, Lines #1, #2, #3
" " " Supplement #1, Lines #4, #5

Plan Map, March 1961
Plan Map, April 1961 (Supplement #1)

INTRODUCTION

During the month of February 1961, Heinrichs GEOEXploration Company conducted induced polarization investigations in the Rosemont Springs Area over portions of Sections 29, 30, 31 and 32, T18S, R16E. This work was performed at the request of Mr. Donald T. Mc Millan for Guggenheim Bros.

The survey consisted of three observed lines, each of which traversed 12,000 ft. on the surface and each yielding about 7,000 ft. of subsurface information.

CONCLUSIONS AND RECOMMENDATIONS

1. At least two distinct zones of anomalism are observed and possibly three. The first zone appears on the north end of Lines #2 and #3 and is definite anomalism if somewhat unusual in character. The second and most significant zone of anomalism is between 3S and 4S on Line #3. The zone is apparently not exceedingly wide and may be contained within the 1,000 ft. dipole spacing. The third questionably anomalous zone may exist at the north end of Line #1.

2. The second anomalous zone on the south end of Line #3 should be examined in detail. Lines should be run using a 250 or 500 ft. dipole spacing to limit and delineate the anomalous zone.

3. The first zone is definitely anomalous and may be worthy of further detailed examination if the geologic situation

indicates such to be warranted.

METHOD

The induced polarization method is based on the somewhat peculiar electrical properties of sulfide particles, and more particularly those of iron, copper and lead. Sulfide particles react to electrical currents (much) in the manner of miniature capacitors. A rock mass containing sulfide particles will offer a lower impedence to an alternating current than its resistance to a direct current. Hence when a direct current is applied across a pair of current electrodes in the vicinity of a disseminated sulfide body, the potential drop between two potential electrodes some given distance from the current electrodes will be greater than when an alternating current is applied to the first two electrodes. Three separate quantities are computed from the data acquired in the field. The first is the D.C. resistivity. The second is the percent frequency effect. The third quantity is the so called "metallic conduction factor" (a misnomer) which is simply the frequency effect divided by the D.C. resistivity.

The property of induced polarization is not entirely unique to sulfide particles but with sufficient geological knowledge anomalism due to sulfides can be normaly interpreted apart from that possibly due to graphite, magnetite, clay particles, etc.

PROCEDURE

Each line consisted of one spread of five co-linear electrodes set 1,000 ft. apart and observations were made in accordance with the dipole-dipole or Eltran configuration mode of operation. This permits the evaluation of 33 depth or data points per setup and covers 12,000 profile feet.

The center of Line #1 was located at the intersection of the McCleary Canyon Road with the Wasp Canyon Road about 1,000 ft. N 40° E of the SW Cor. Section 29 and was run in a north-south direction. Line #2 was centered at the same location and run approximately N 55° W - S 55° E. Line #3 was centered on about the south Section Line of Section 30 about 2550 ft. west of the SE corner.

The survey was complicated by rough terrain and heavy vegetation requiring the receiver operator to "go portable" and making the laying and pick up of wires difficult. A further complication was the presence of cattle and vehicular traffic accounting for numerous breaks in the sender wires, all of which contributed to an unusually high cost per profile mile. During the course of running Line#3 an equipment malfunction was experienced and five days were lost as a result of this. Work done just prior to the malfunction was repeated to check the data and test the equipment, at no cost to the client.

Line #1 required two and a half days to run. Although the information obtained is considered to be of some value and is

included with this report, no charge is being made for these services.

Line #2 required two and a half days to run at a cost of $625.00 or about $275.00 per profile mile exclusive of vehicle costs.

Line #3 required three days to run at a cost of $750.00 or about $330.00 per profile mile. The average cost for 1,000 ft. dipoles in gentle terrain with light vegetation is usually about $175.00 to $225.00 per profile mile. Including Line #1 a total of 6.81 profile miles was surveyed at a cost for services of $1,375.00 or a cost of about $201.00 per profile mile. All cost figures are exclusive of vehicle expenses.

The data is presented in "section". The D.C. resistivity is plotted above the horizontal line and the percent frequency effect as a superscript to this value. The metal factor (MCF) is plotted below the line. It should be emphasized that the presentation has no linear vertical scale and that the points are plotted at the intersection of 45° lines extending from the center of sender and receiver positions as a matter of convenience. The actual depths of the profiles are an indeterminant function of the D.C. resistivity. In general it can be said that the data acquired will be from a depth of from 0.2 to 2.0 times the dipole spacing. The data is contoured "logarithmically", again as a matter of convenience in interpretation only.

INTERPRETATION

Line #1 showed no significant anomalism other than a possible zone of interest between 3N and 4N as indicated by slightly anomalous frequency effects of 7 and 5 and metal factors of 57 and 41. A geologic contact of some sort apparently exists between 1S and 1N and may possibly be attributed to a thicker zone of alluvium in this area. The resistivity picture indicates a thickening of alluvium to the south.

Line #2 shows anomalism between stations 1W and 5W with the most definite moderate to strong anomalism between 3W and 5W becoming weak or questionable abruptly between 4W and 5W, moderate between 2W and 3W and weak or questionable between 1W and 2W. There is also some possible indication of anomalism between 1E and 2E but this is highly questionable and may only be a reflection of decreasing resistivity due to thickening alluvium. The anomaly between 3W and 4W is of most significant interest. This anomaly presents an unusual picture (from the standpoint of large disseminated sulfide zones) of appearing to "bottom". This might conceivably be due to such a dissemination actually bottoming within the limits of electrical measurement or to the mineralization being confined to thin or narrow bands of sulfides relatively wide spaced. Data to the third and often fourth separation (depth point) is usually dependable with the fifth and sixth separations often questionable.

Normally, anomalous values due to a large disseminated sulfide body will increase to some degree with depth and be bounded on the sides by more or less parallel inclined metal factor contours which are not connected across the "bottom" of the anomaly. In this case the values decrease with depth and must be closed across the bottom. This rather unusual situation is reflected in the resistivity picture as well.

Line #3 shows the most definite and significant anomalism. The same unusual anomaly as that observed on Line #2 exists between at least 1S and 3N cutting off abruptly between 3N and 4N. The moderate to strong anomalism between 3S and 5S is the most significant feature on this line. In this case the anomalism is "normal". The transition between the northernmost anomalism and the second area is somewhat obscure. It will be noted that the normal increase in metal factor anomalism with depth is again reflected normally in the resistivity section.

Respectfully submitted,

HEINRICHS GEOEXPLORATION COMPANY

Franklin A. Seward Jr.

Franklin A. Seward, Jr.
Geophysicist

February 1961
P. O. Box 5671
Tucson, Arizona

SUPPLEMENT # 1

To A Report on
INDUCED POLARIZATION SURVEYS

Rosemont Area
Pima County

March, 1961

INTRODUCTION

Following completion of I. P. surveys in February, 1961 and subsequent interpretation of data, additional work to substantiate initial results was requested by Mr. D. T. McMillan. As previously recommended the electrode spacing was reduced to 500 ft. in order to provide more definitive and detailed information. The work consisted of two lines parallel to and 1,000 ft. south and west of Lines #2 and #3 in the vicinity of anomalism previously observed.

CONCLUSIONS AND RECOMMENDATIONS

1. The anomalism so far observed and reported is considered to be definitely due to sulfide involvement. No discrete interpretation of concentration, depth to, or thickness of the sulfide zone can be made without more definitive geological information.

2. Certainly more induced polarization work at this time would be valuable in delineating the mineralized zone or zones but in all probability would not further aid in the selection

of a drill site or in any quantitative interpretation without additional geological or drill hole information unless a zone of distinctly more intense anomalism were observed.

3. The induced polarization anomalism is of sufficient intensity as to recommend further geological evaluation and may warrant at least one or two test holes to determine the degree of sulfide involvement.

PROCEDURE

Line #4 was run parallel to Line #2 with its center located about 1,000 ft. southwest at about station 1.5W on Line #2.

Line #5 was run north-south with its center located about 1,000 ft. due west of station 4.35S on Line #3. As previously stated, these lines utilized 500 ft. electrode spacing and were centered approximately on a projection of the anomalous zones observed in the reconnaissance survey.

No difficulties were experienced other than those due to the rugged terrain and heavy vegetation.

INTERPRETATION

Anomalism on Line #4 approximately coincided with and equalled in character that Observed on Line #2. It should be pointed out that some change in observed results always accompanies a change in electrode spacing due to the geometric considerations. In this case, correlation is considered to be

excellent. The two most intense zones of anomalism are located from 0.5E to 0.5W and from 1.5W to 2.0N. Anomalism is terminated abruptly between .5E and 1.0E. Again a barren or only shallowly mineralized zone is evident probably between .5W and 1.5W. There is no discrete termination of anomalism on the western end of the line but there is again some indication of a barren or shallow zone between 2.0W and 2.5W.

Anomalism observed on Line #5 may not be as discrete as might be desired. Apparently moderate anomalism is observed throughout the length of the line with probably the most intense zone between .5N and 1.0N decreasing to the south. There is no cut off at the north or south ends of the line. Two depth points show very strong anomalism that are not possible of discrete interpretation other than that they are probably due to increased sulfide involvement in very limited zones. A possible interpretation may be that mineralization becomes thinner but more intense at the southern end of this line.

Respectfully submitted,

HEINRICHS GEOEXPLORATION Co.

Franklin A. Seward Jr.

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Geophysicist

April 5, 1961
Tucson, Arizona

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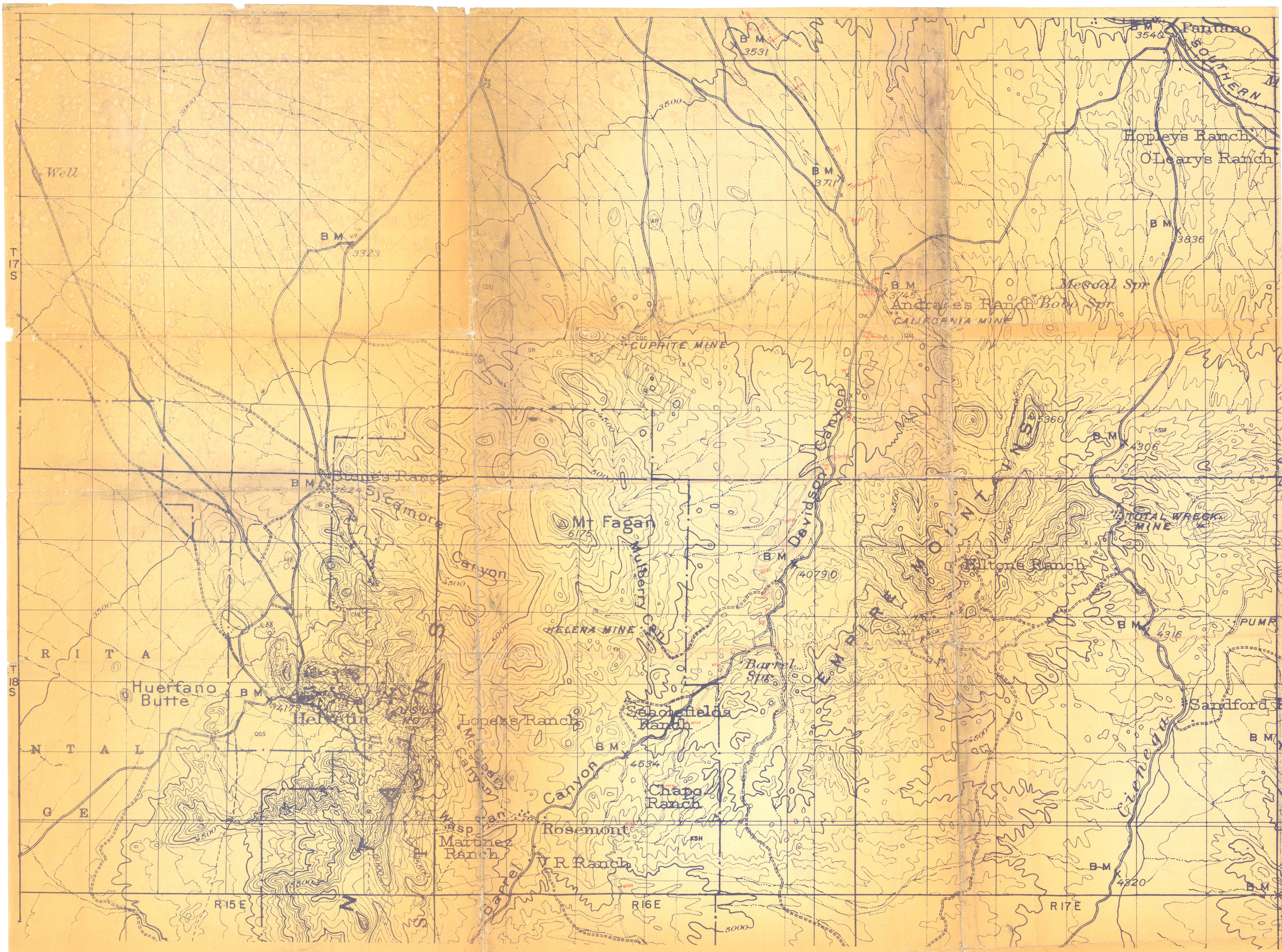

LEGEND

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MINERALS EXPLORATION COMPANY

NORTHERN SANTA RITA MTNS.

PIMA COUNTY ; ARIZONA

E. GROVER HEINRICHS EXPLORATION CONTRACTOR

SCALE 2" = 1 MILE DATE