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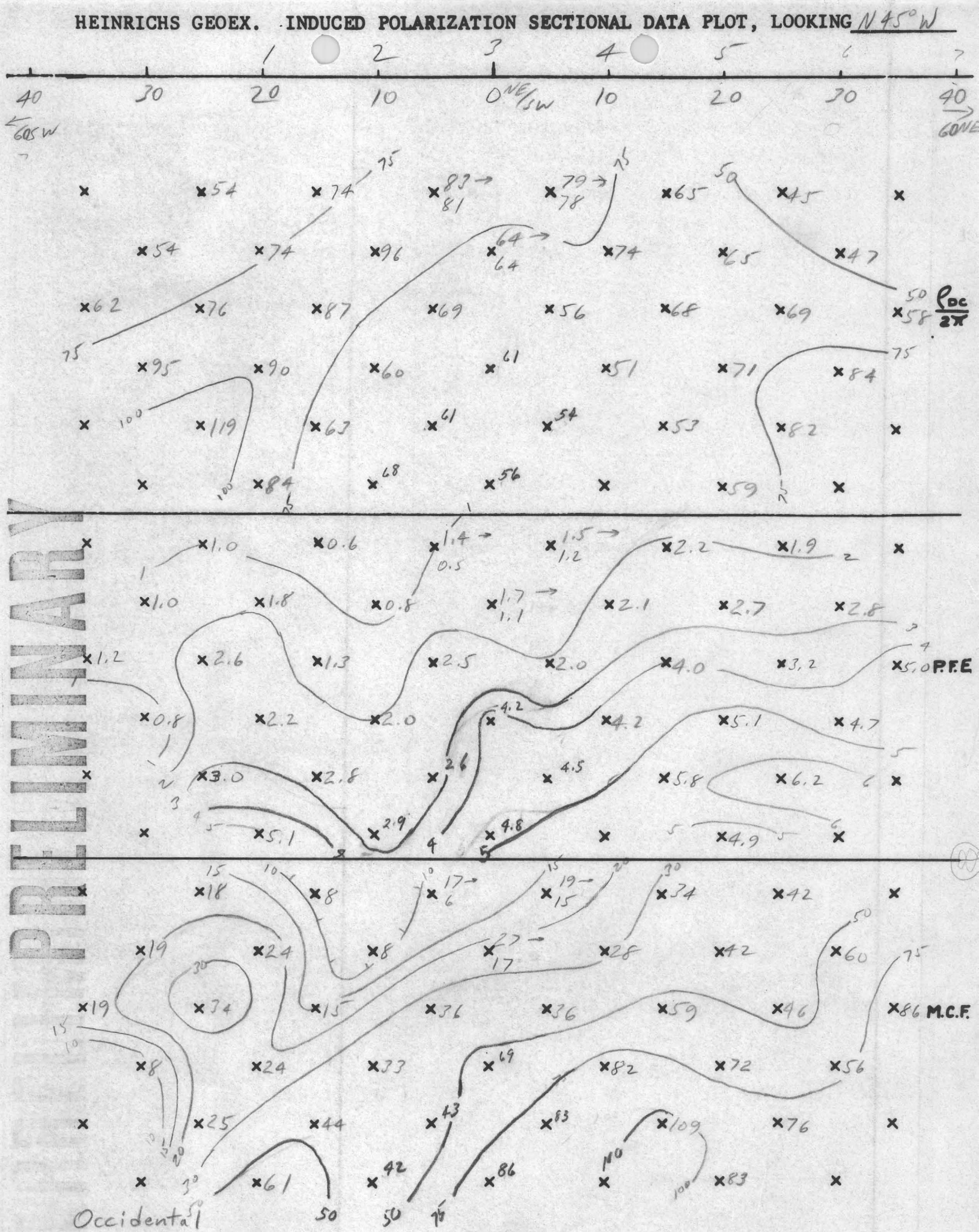
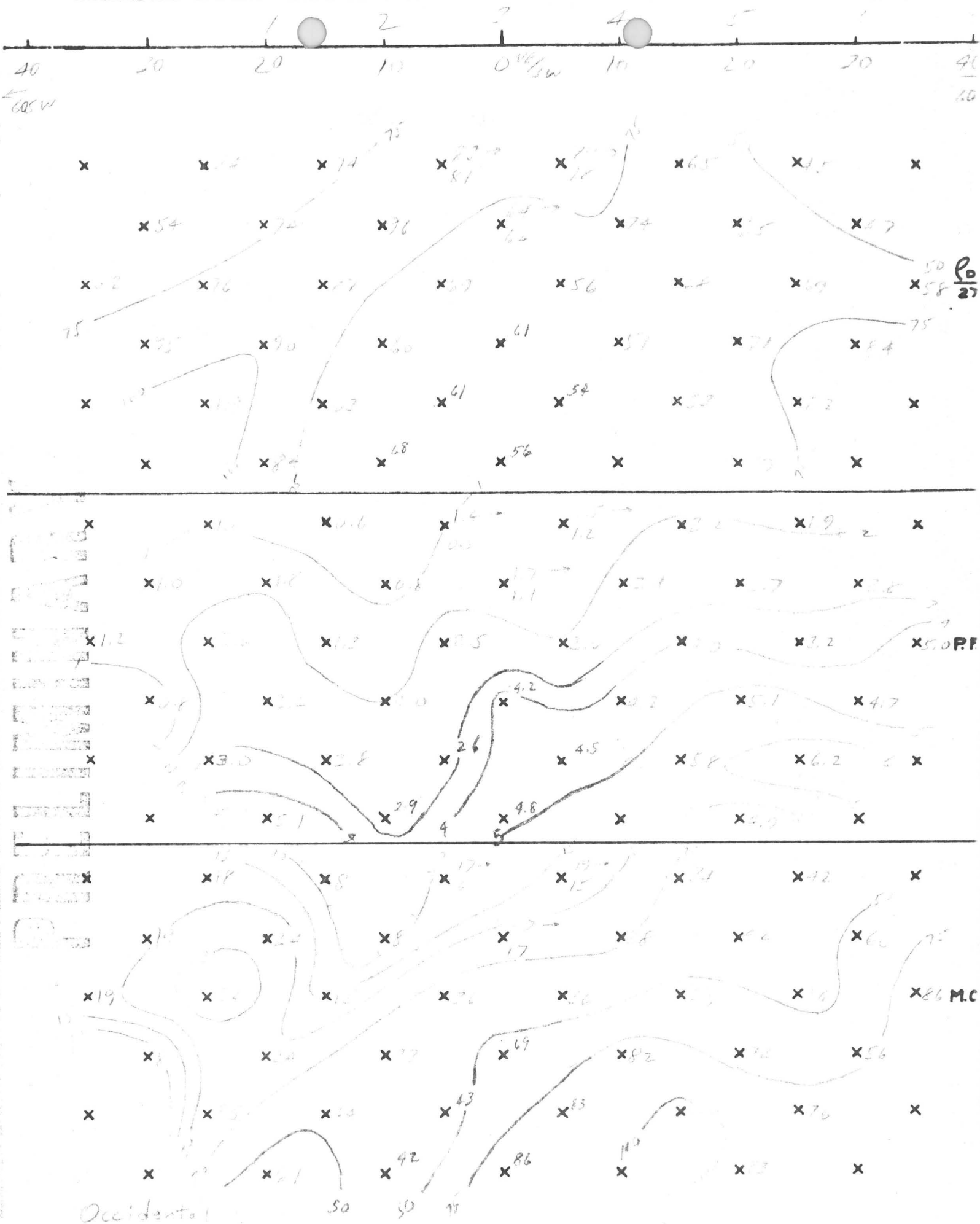
HEINRICHS GEOEX. INDUCED POLARIZATION SECTIONAL DATA PLOT, LOOKING N 45° W



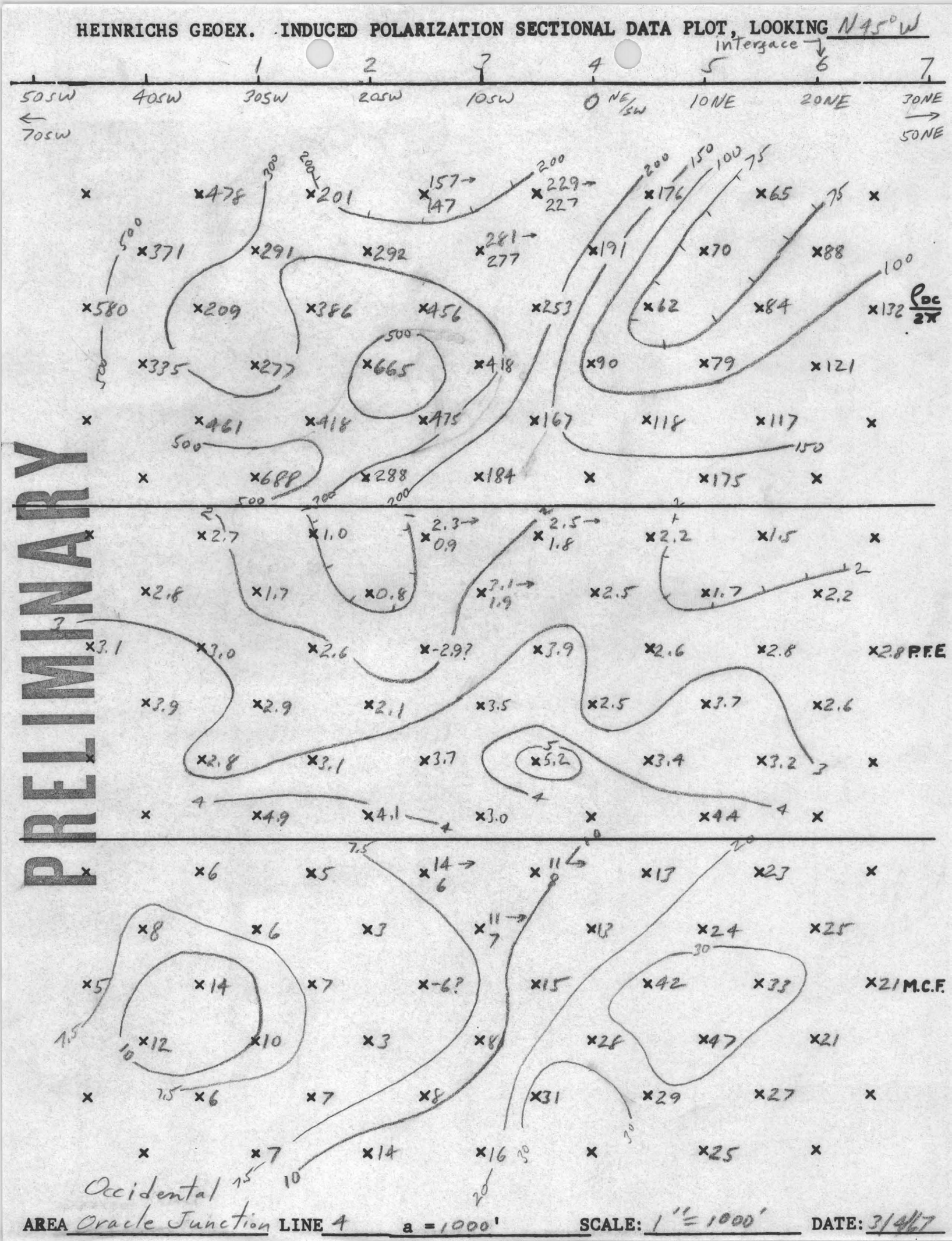
AREA Oracle Junction LINE 3 a = 1000' SCALE: 1"=1000' DATE: 7/1/67

HEINRICHS GEOEX. INDUCED POLARIZATION SECTIONAL DATA PLOT, LOOKING



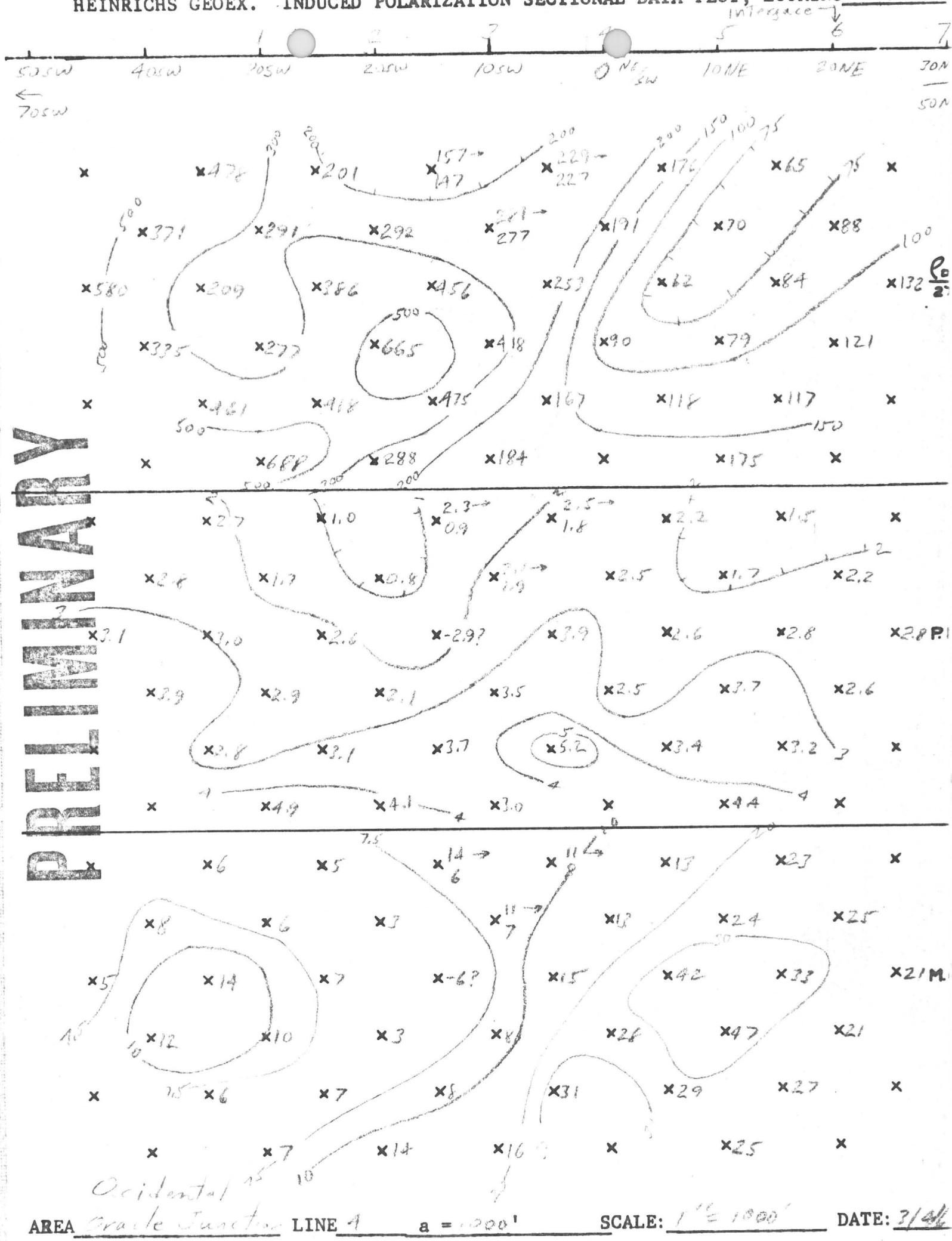
AREA Oracle Junction LINE a = SCALE: DATE:

HEINRICHS GEOEX. INDUCED POLARIZATION SECTIONAL DATA PLOT, LOOKING N45°W



AREA Oracle Junction LINE 4 a = 1000' SCALE: 1" = 1000' DATE: 3/4/67

HEINRICHS GEOEX. INDUCED POLARIZATION SECTIONAL DATA PLOT, LOOKING



AREA Oracle Junction LINE 4 a = 1000' SCALE: 1" = 1000' DATE: 3/4/

HEINRICHS GEOEX. INDUCED POLARIZATION SECTIONAL DATA PLOT, LOOKING 120SW

HEINRICHS GEOEX. INDUCED POLARIZATION SECTIONAL DATA PLOT, LOOKING NE/SW

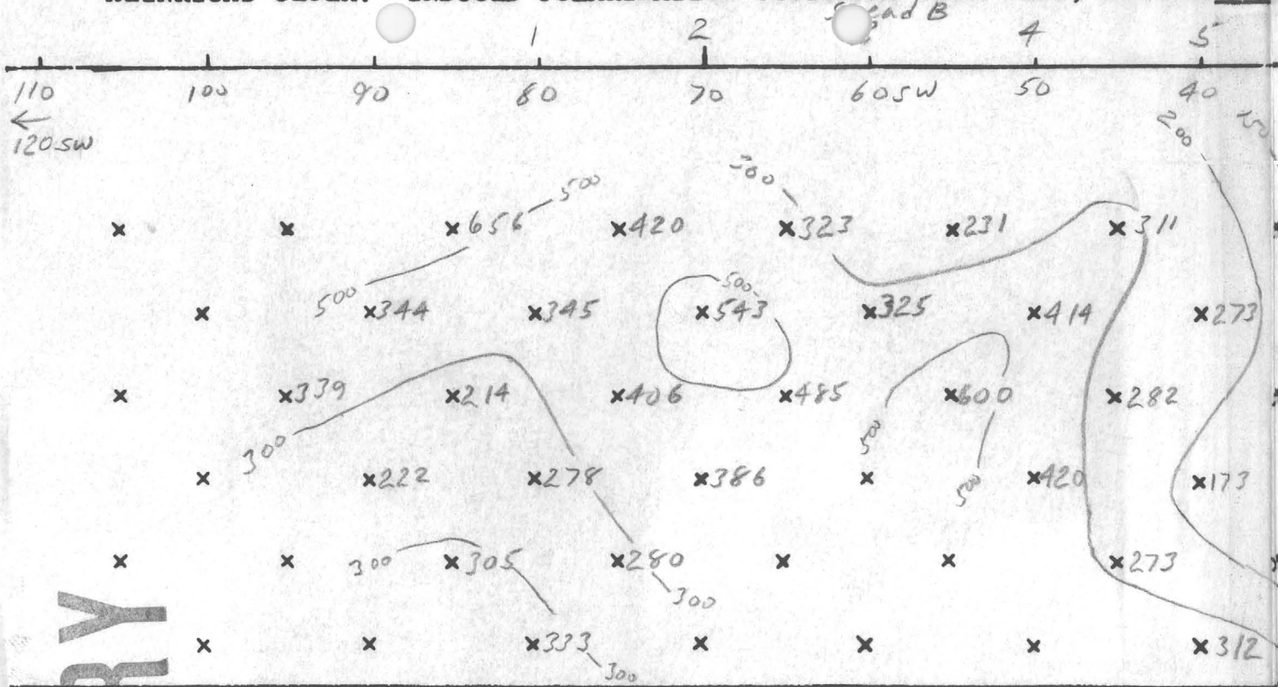
Occidental

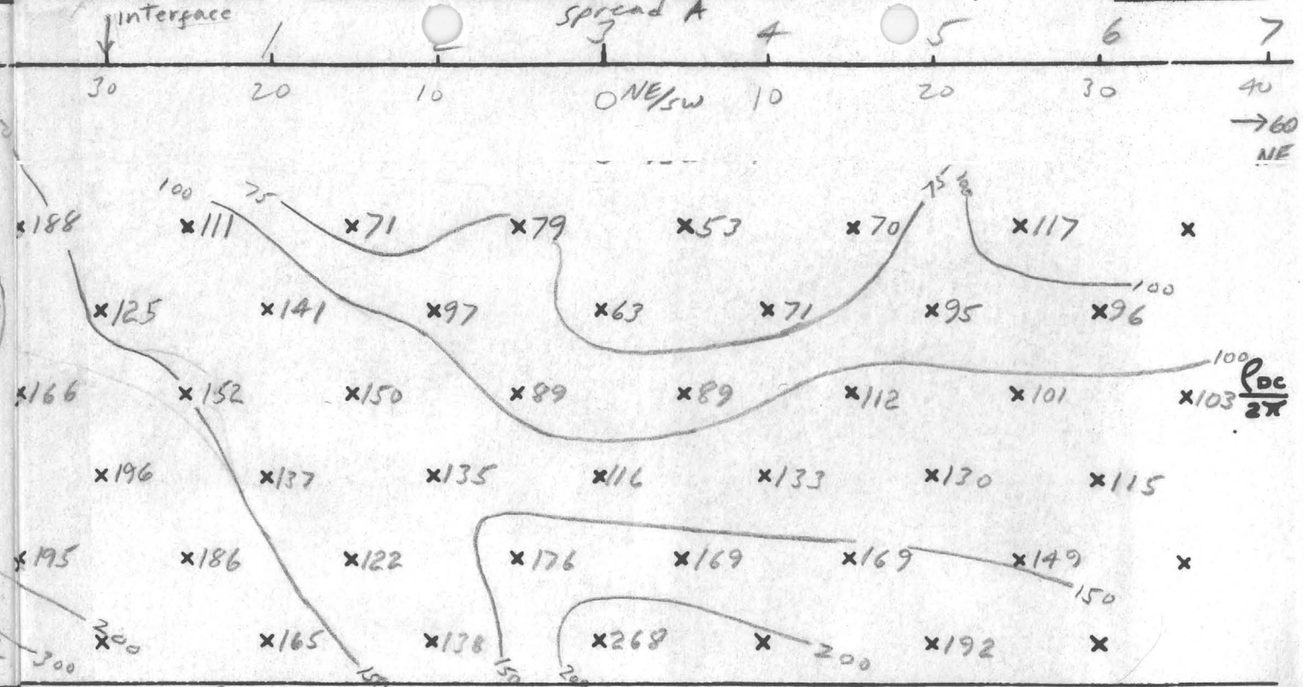
AREA Oracle Junction LINE 2 a = 1000' SCALE: DATE:

LINE 2 a = 1000' SCALE: 1" = 1000' DATE: 2/2/67

HEINRICHS GEOEX. INDUCED POLARIZATION SECTIONAL DATA PLOT, LOOKING

HEINRICHS GEOEX. INDUCED POLARIZATION SECTIONAL DATA PLOT, LOOKING N45°W





P.F.E.

M.C.F.

Occidental

AREA Oracle Junction LINE 2 a = 1000' SCALE: _____ DATE: _____

LINE 2 a = 1000' SCALE: 1"=1000' DATE: 2/23/67

HEINRICHS GEOEX. INDUCED POLARIZATION SECTIONAL DATA PLOT, LOOKING N 45° W

SECTIONAL DATA PLOT, LOOKING N 45° W

Spread B

Spread A

60 SW 50 SW 40 SW 30 SW 20 SW 10 SW 0 10 NE 20 NE

80 SW

30 NE 40 NE 50 NE 60 NE

P.F.E.

M.C.F.

Occidental

AREA Oracle Junction LINE SCALE: 1" = 400' DATE:

SCALE: 1" = 400' DATE:

HEINRICHS GEOEX. INDUCED POLARIZATION SECTIONAL DATA PLOT, LOOKING N 45° W

Spread B

1 2 3 4 5

60 SW 50 SW 40 SW 30 SW 20 SW 10 SW 0 10 NE 20 NE

← 80 SW

SECTIONAL DATA PLOT, LOOKING N 45° W

Spread A

2 3 4 5

30 NE 40 NE 50 NE 60 NE

PRELIMINARY

P.F.E

M.C.F.

Occidental

AREA Oracle Junction LINE 1 a = 1000' SCALE: 1" = 1000' DATE:

SCALE: 1" = 1000' DATE:

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page _____

Project Occidental Line 1 cont. Field date 2-20-67 Data page 4 Comp. date 2-21-67. Comp by DBC

(A) Send	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5		
(B) Receive	0-10W	10W →	20W	20W →		30W	30W →			40W		
(C) n separation	1	1	2	1	2	3	1	2	3	4		
(D) I	7	7	7	7	7	7	7	7	7	7		
(E) Vdc (avg)	385.5	396	99.3	397	103.4	40.2	281	87.4	36.9	19.0		
(F) DCcal	0.5319148	→										
(G) Kn x 10^{-3}	3.0	3.0	12.0	3.0	12.0	30.0	3.0	12.0	30.0	60.0		
(H) ρdc=ExFxGx10^3/D	88	90.3	90.5	90.5	94.3	91.6	64.1	79.7	84.1	86.6		
(I) Vac Σ												
(J) AC noise x 2												
(K) Vac(corr) = $\sqrt{I^2 - J^2}$	380	380	95.0	382	99.6	38.8	270.4	84.0	35.2	17.96		
(L) AC-DC cal.	0.9787234	→										
(M) ρdc/ρac=ExL/K	0.992889	1.0199	1.023	1.0172	1.016	1.014	1.017	1.018	1.0259	1.035		
(N) PFE=(M-1)(10^2)	-0.7	2.0	2.3	1.7	1.6	1.4	1.7	1.8	2.6	3.5		
(O) MCF=(M-1)(10^5)/H	-8 ?	22	25	19	17	15	27	23	31	40		

Project _____ Line _____ Field date _____ Data page 5 Comp. date _____ Comp by _____

(A) Send	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5				
(B) Receive	40W →			50W →	50W →			60W				
(C) n separation	2	3	4	5	3	4	5	6				
(D) I	7	7	7	7	7	7	7	7				
(E) Vdc (avg)	106.0	54.8	27.6	15.65	47.8	32.72	17.7	11.76				
(F) DCcal	0.5319148	→										
(G) Kn x 10^{-3}	12.0	30.0	60.0	105.0	30.0	60.0	105.0	168.0				
(H) ρdc=ExFxGx10^3/D	96.7	124.9	125.8	124.9	108.96	149.2	141.2	150.1				
(I) Vac Σ												
(J) AC noise x 2												
(K) Vac (corr) = $\sqrt{I^2 - J^2}$	102.4	52.4	26.4	14.9	45.4	31.2	17.0	11.22				
(L) AC-DC cal.	0.9787234	→										
(M) ρdc/ρac =ExL/K	1.031	1.0235	1.023	1.02798	1.030	1.026	1.019	1.0258				
(N) PFE=(M-1)(10^2)	3.1	2.4	2.3	2.8	3.0	2.6	1.9	2.6				
(O) MCF=(M-1)(10^5)/H	32	19	18	22	28	17	13	17				

HEINRICHS GEOEXPLORATION COMPANY

INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project Occidental Line 1 cont Field date 2-20-67 Data page 6 Comp. date 2-21-67. Comp by DBC

(A) Send	1-2	2-3	3-4	1-2	2-3	1-2			cal			
(B) Receive	60 w →		→ 70w	70w	→ 80w	80w → 90w			1-2			
(C) n separation	4	5	6	5	6							
(D) I	7	7	7	7	7				1			
(E) Vdc (avg)	34.74	25.97	15.71	23.6	19.0				188.0			
(F) DCcal	0.5319148	→	→	→	→							
(G) Kn x 10^{-3}	60.0	105.0	168.0	105.0	168.0							
(H) ρdc=ExFxGx10^3/D	158.4	207.2	200.55	188.3	242.6							
(I) Vac Σ												
(J) AC noise x 2												
(K) Vac(corr) = $\sqrt{I^2 - J^2}$	31.24	24.7	15.0	22.4	18.0				184.0			
(L) AC-DC cal.	0.9787234	→	→	→	→							
(M) ρ dc/ρac=ExL/K	1.088	1.0290	1.025	1.0317	1.033							
(N) PFE=(M-1)(10^2)	8.8	2.9	2.5	3.1	3.3							
(O) MCF=(M-1)(10^5)/H	56 ?	14	12	16	14							

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

(A) Send												
(B) Receive												
(C) n separation												
(D) I												
(E) Vdc (avg)												
(F) DCcal												
(G) Kn x 10^{-3}												
(H) ρ dc=ExFxGx10^3/D												
(I) Vac Σ												
(J) AC noise x 2												
(K) Vac (corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.												
(M) ρdc/ρac =ExL/K												
(N) PFE=(M-1)(10^2)												
(O) MCF=(M-1)(10^5)/H												

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT Occidental
LINE 1 HALF Cont SP. DATE 2-20-67

SEND	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5
RECEIVE	0-10W	10W-20W	→	20W-30W	→	→	30W-40W	→	→	→
RANGE	300	300	100	300	100	100	300	100	30	30
DC 1	195.5	198	49.5	199	51.8	20.0	141	44.4	18.6	9.40
DC 2	190.0	198	49.8	198	51.6	20.2	140	43.0	18.3	9.60
DC 3	195.5	198	49.5	199	51.8	20.0	141	44.4	18.6	9.40
DC 4	190.0	198	49.8	198	51.6	20.2	140	43.0	18.3	9.60
DC 5										
DC 6										
DC 7										
DC 8										
DC AVG.	385.5	396	99.3	397	103.4	40.2	281	87.4	36.9	19.0
AC 1	190	190	47.5	191	49.8	19.4	135.2	42.0	17.6	8.98
AC 2	190	190	47.5	191	49.8	19.4	135.2	42.0	17.6	8.98
AC AVG.	380	380	95.0	382	99.6	38.8	270.4	84.0	35.2	17.96
S.P.	-6.1	+11.6		-16.4			-3.1			
AC NOISE	.05	.07		.04			.02			
POT RES.										

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT Occidental
LINE 1 HALF Cont SP. ____ DATE 2-20-67

SEND	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5		
RECEIVE	40-50W	←	←	←	50W-60W	←	←	←		
RANGE	100	100	30	30	100	30	30	10		
DC 1	52.6	27.4	14.0	9.05 8.60	24.0	15.8	8.00	5.78 5.58		
DC 2	53.4	27.4	13.5	6.50 7.00	23.8	16.9	9.70	6.26 6.38		
DC 3	52.6	27.4	14.3	9.20 8.50	24.0	15.9	8.00	5.58 5.42		
DC 4	53.4	27.4	13.2	6.30 7.10	23.8	16.8	9.70	6.26 6.48		
DC 5			14.6	9.40		15.9	8.00	5.62 5.34		
DC 6			13.0	6.60		16.8	9.70	6.18 6.66		
DC 7			14.5	9.00				5.52 5.06		
DC 8			13.0	6.90				6.00 6.96		
DC AVG.	106.0	54.8	27.6	15.65	47.8	32.72	17.7	11.76		
AC 1	51.2	26.2	13.2	7.45	22.7	15.6	8.50	5.60		
AC 2	51.2	26.2	13.2	7.45	22.7	15.6	8.50	5.62		
AC AVG.	102.4	52.4	26.4	14.9	45.4	31.2	17.0	11.22		
S.P.	+2.8				-4.2					
AC NOISE	.06				.04					
POT RES.										

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT Occidental
LINE 1 HALF Cont SP. DATE 2-20-67

SEND	1-2	2-3	3-4	1-2	2-3	1-2		cal.		
RECEIVE	60W-70W →			70W-80W →		80-90W		1-2		
RANGE	30	30	30	30	30			300		
DC 1	17.0	12.55	8.25	12.0	9.20			94.0		
DC 2	17.8	13.40	7.50	11.6	10.0			94.0		
DC 3	16.9	12.50	8.30	12.0	8.90			94.0		
DC 4	17.9	13.50	7.45	11.6	10.3			94.0		
DC 5	16.7	12.50	8.30	12.0	8.80					
DC 6	18.1	13.50	7.50	11.6	10.2					
DC 7					8.90					
DC 8					10.40					
DC AVG.	34.74	25.97	15.71	23.6	19.11			188.0		
AC 1	15.62	12.35	7.50	11.2	9.00			92.0		
AC 2	15.62	12.35	7.50	11.2	9.00			92.0		
AC AVG.	31.24	24.7	15.0	22.4	18.0			184.0		
S.P.	+0.5			+0.2						
AC NOISE	.02			.05						
POT RES.										

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT Occidental 2 20 U

LINE 1 HALF cent SP. 1 DATE

SEND	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5
RECEIVE	→	→	→	→	→	→	→	→	→	→
RANGE										
VOLTAGE	350	425	350	425	425	350	400	425	425	350
CURRENT	7	7	7	7	7	7	7	7	7	7
SEND	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5		CAL 1-2
RECEIVE										
RANGE										
VOLTAGE	400	425	425	350	390	425	425	350		100
CURRENT	7	7	7	7	7	7	7	7		1

FREQUENCIES AC ___ DC

SENDER NO. 6644 S

OPERATOR Loren

RECEIVER NO.

OPERATOR

COMMENTS:

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT Occidental

LINE 1 HALF CONT SP. 1 DATE 20 47

PAGE 4

SEND	1 - 2	2 - 3	3 - 4	1 - 2	2 - 3	1 - 2				
RECEIVE	→		→	→	→	→				
RANGE										
VOLTAGE	390	425	425	390	425					
CURRENT	7	7	7	7	7	7				
SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										

FREQUENCIES Ac (F) Dc (B)

SENDER NO. 66445

OPERATOR Luen

RECEIVER NO.

OPERATOR

COMMENTS:

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project Occidental Line 1 Cont. Field date 2-17-67 Data page 2-3 Comp. date_____. Comp by DBC

(A) Send	1-2	2-3	3-4	4-5	1-2	2-3	3-4	1-2	2-3	1-2	Cal	
(B) Receive	20w →			10w	30w →		20w	40w →	30w	50w-40w	1-2	
(C) n separation	3	4	5	6	4	5	6	5	6	6		
(D) I	6	6	6	6	6	6	6	6	6	6	1	
(E) Vdc (avg)	44.0	20.5	13.0	6.69	22.2	11.2	7.53	12.46	6.95	10.63	195.0	
(F) DCcal	0.51282 →										→	
(G) Kn x 10^{-3}	30.0	60.0	105.0	168.0	60.0	105.0	168.0	105.0	168.0	168.0		
(H) ρdc=ExFxGx10^3/D	113	105	117	96	114	101	108	113	100	153		
(I) Vac Σ												
(J) AC noise x 2												
(K) Vac(corr) =$\sqrt{I^2 - J^2}$	42.0	19.6	12.2	6.28	21.2	10.7	7.14	11.76	6.48	9.94	191.0	
(L) AC-DC cal.	0.9794871 →										→	
(M) ρ dc/ρac=ExL/K	1.0261	1.0245	1.0437	1.0434	1.0256	1.0253	1.03298	1.0378	1.0505	1.047887		
(N) PFE=(M-1)(10^2)	2.6	2.5	4.4	4.3	2.6	2.5	3.3	3.8	5.1	4.7		
(O) MCF=(M-1)(10^5)/H	23	24	38	45	23	25	31	34	51	31		

Project_____ Line 1 Cont Field date_____ Data page_____ Comp. date_____ Comp by_____

(A) Send												
(B) Receive												
(C) n separation												
(D) I												
(E) Vdc (avg)												
(F) DCcal												
(G) Kn x 10^{-3}												
(H) ρ dc=ExFxGx10^3/D												
(I) Vac Σ												
(J) AC noise x 2												
(K) Vac (corr) =$\sqrt{I^2 - J^2}$												
(L) AC-DC cal.												
(M) ρdc/ρac =ExL/K												
(N) PFE=(M-1)(10^2)												
(O) MCF=(M-1)(10^5)/H												

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project Occidental Line 1 Cont Field date 2-17-67 Data page_____ Comp. date_____. Comp by R.P.

(A) Send	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5		
(B) Receive	30-40 E	20-30E	→	10-20E	→	→	0-10E	→	→	→		
(C) n separation	1	1	2	1	2	3	1	2	3	4		
(D) I	6	→	→	→	→	→	→	→	→	→		
(E) Vdc (avg)	300.5	384	90.8	339	109.5	40.0	408	88.9	44.2	20.0		
(F) DCcal	.528											
(G) Kn x 10^{-3}	3.0	3.0	12.0	3.0	12.0	30.0	3.0	12.0	30.0	60.0		
(H) ρdc=ExFxGx10^3/D	80	102	96	90	116	106	108	94	117	106		
(I) Vac Σ												
(J) AC noise x 2												
(K) Vac(corr) = $\sqrt{I^2 - J^2}$	291	270.4	87.2	326	105	38	39.6	86.0	42.8	19.04		
(L) AC-DC cal.	.984											
(M) ρ dc/ρac=ExL/K	1.014	1.033	1.023	1.022	1.027	1.036	1.013	1.015	1.016	1.032		
(N) PFE=(M-1)(10^2)	1.4	3.3	2.3	2.2	2.7	3.6	1.3	1.5	1.6	3.2		
(O) MCF=(M-1)(10^5)/H	17	32	24	24	23	34	12	16	14	30		

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

(A) Send	1-2	2-3	3-4	4-5	col							
(B) Receive	10-W-0	→	→	→	1-2							
(C) n separation	2	3	4	5								
(D) I	6	→	→	→	1							
(E) Vdc (avg)	109.5	41.5	24.6	12.2	189							
(F) DCcal												
(G) Kn x 10^{-3}	12.0	30.0	60.0	105.0								
(H) ρ dc=ExFxGx10^3/D	116	110	130	113								
(I) Vac Σ												
(J) AC noise x 2												
(K) Vac (corr) = $\sqrt{I^2 - J^2}$	105.0	39.8	23.3	11.46	186							
(L) AC-DC cal.												
(M) ρdc/ρac =ExL/K	1.027	1.027	1.039	1.048								
(N) PFE=(M-1)(10^2)	2.7	2.7	3.9	4.8								
(O) MCF=(M-1)(10^5)/H	23	25	30	42								

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT Occ.
LINE 1 HALF Cont SP. DATE

SEND	1-2	2-3	3-4	1-2	2-3	1-2		cal.		
RECEIVE	30W-20W	→	→	40W-30	→	50W-40W		1-2		
RANGE	30	10	10	10	10	10		300		
DC 1	11.1	5.45	3.45	6.14	4.14 4.42	4.84 4.04		97.5		
DC 2	11.1	5.80	4.06	6.38	2.98 2.44	5.88 5.54		97.5		
DC 3	11.1	5.35	3.35	6.00	4.04 3.96	5.18 4.66		97.5		
DC 4	11.1	5.88	4.22	6.48	2.98 2.72	5.20 6.76		97.5		
DC 5		5.26	3.38	5.96	4.44 4.42	3.92 5.08				
DC 6		5.94	4.22	6.56	2.76 2.48	6.20 6.62				
DC 7		5.35	3.26	5.80	3.96 4.34	4.52 4.20				
DC 8		5.82	4.26	6.74	2.72 2.40	6.40 6.18				
DC AVG.	22.2	11.20	7.53	12.46	6.948	10.628		195.0		
AC 1	10.6	5.35	3.57	5.88	3.24	4.97		95.5		
AC 2	10.6	5.35	3.57	5.88	3.24	4.97		95.5		
AC AVG.	21.2	10.7	7.14	11.76	6.48	9.94		191.0		
S.P.	-18.1			-2.4		-2.0				
AC NOISE	.03			.03						
POT RES.										

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT OCC.
LINE 1 HALF Cont SP. ___ DATE 2-17-67

SEND	1-2	2-3	3-4	4-5	cal	1-2	2-3	3-4	4-5	
RECEIVE	10W-0	←	←	→	1-2	20W-10W	←	←	→	
RANGE	100	30	30	10	300	100	30	30	10	
DC 1	54.0	21.0	11.55	5.98	94.5	22.6	9.50	6.50	3.20	
DC 2	55.5	20.5	13.05	6.16	94.5	21.4	11.0	6.55	3.48	
DC 3	54.0	21.0	11.55	6.06	94.5	22.6	9.50	6.45	3.22	
DC 4	55.5	20.5	13.05	6.10	94.5	21.4	11.0	6.50	3.38	
DC 5				5.96				6.50	3.40	
DC 6				6.22				6.50	3.28	
DC 7				6.18				6.50	3.36	
DC 8				6.03				6.50	3.40	
DC AVG.	109.5	41.5	24.6	12.20		44.0	20.5	13.0	6.69	
AC 1	52.5	19.9	11.65	5.73	93.0	21.0	9.80	6.10	3.14	
AC 2	52.5	19.9	11.65	5.73	93.0	21.0	9.80	6.10	3.14	
AC AVG.	105.0	39.8	23.3	11.46		42.0	19.6	12.2	6.28	
S.P.	-7.0					+14.0				
AC NOISE	.02									
POT RES.										

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT OCCIDENTAL
LINE 1 HALF Cont SP. ___ DATE ___

SEND	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5
RECEIVE	30-40E	20-30E	→	10-20E	→	→	0-10E	→	→	→
RANGE	300	300	100	300	100	30	1000	100	100	30
DC 1	150.5	192	45.4	169	55.5	20.0	204	44.8	22.4	9.50
DC 2	150.0	192	45.4	170	54.0	20.0	204	44.1	21.8	10.50
DC 3	150.5	192	45.4	169	55.5	20.0	204	44.8	22.4	9.50
DC 4	150.0	192	45.4	170	54.0	20.0	204	44.1	21.8	10.50
DC 5										
DC 6										
DC 7										
DC 8										
DC AVG.	300.5	384	90.8	339	109.5	40.0	408	88.9	44.2	20.0
AC 1	145.5	185.2	43.6	163	52.5	19.0	198	43.0	21.4	9.52
AC 2	145.5	185.2	43.6	163	52.5	19.0	198	43.0	21.4	9.52
AC AVG.	291.0	270.4	87.2	326	105.0	38.0	396	86.0	42.8	19.04
S.P.	-6.0	+2.3		-12.4			-1.6			
AC NOISE	.02	.02		.02			.02			
POT RES.										

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT Occidental

LINE 1 HALF CNT SP. 1 DATE 2-20

SEND	1-2	2-3	3 4	1-2	2 3	3 4	1-2	2 3	1-2	
RECEIVE	→	→	→	→	→	→	→	→	→	
RANGE										
VOLTAGE	300	325	400	300	325	400	300	325	300	
CURRENT	6	6	6	6	6	6	6	6	6	
SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										

FREQUENCIES A C (E) D G (B)

SENDER NO. 66445

OPERATOR Loren

RECEIVER NO.

OPERATOR

COMMENTS:

problem with function switch does not work consistently

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT Occidental

LINE 1 HALF ENT SP. 1 DATE

PAGE 1

SEND	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5
RECEIVE	→	→	→	→	→	→	→	→	→	→
RANGE										
VOLTAGE										
CURRENT	6	6	6	6	6	6	6	6	6	6

SEND	1-2	2 3	3 4	4 5	1-2	2 3	3 4	4 5		
RECEIVE	→	→	→	→	→	→	→	→	CAL 1-2	CAL 1-2
RANGE					2 -	20 -	67		2-20	
VOLTAGE					300	325	400	375	50	
CURRENT	6	6	6	6	6	6	6	6	1	1

FREQUENCIES AC (F) DC (B)

SENDER NO. 66445 MK 4

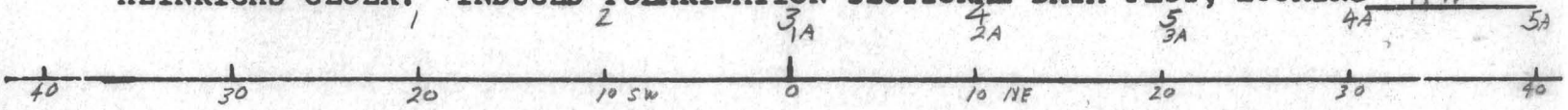
OPERATOR Loren

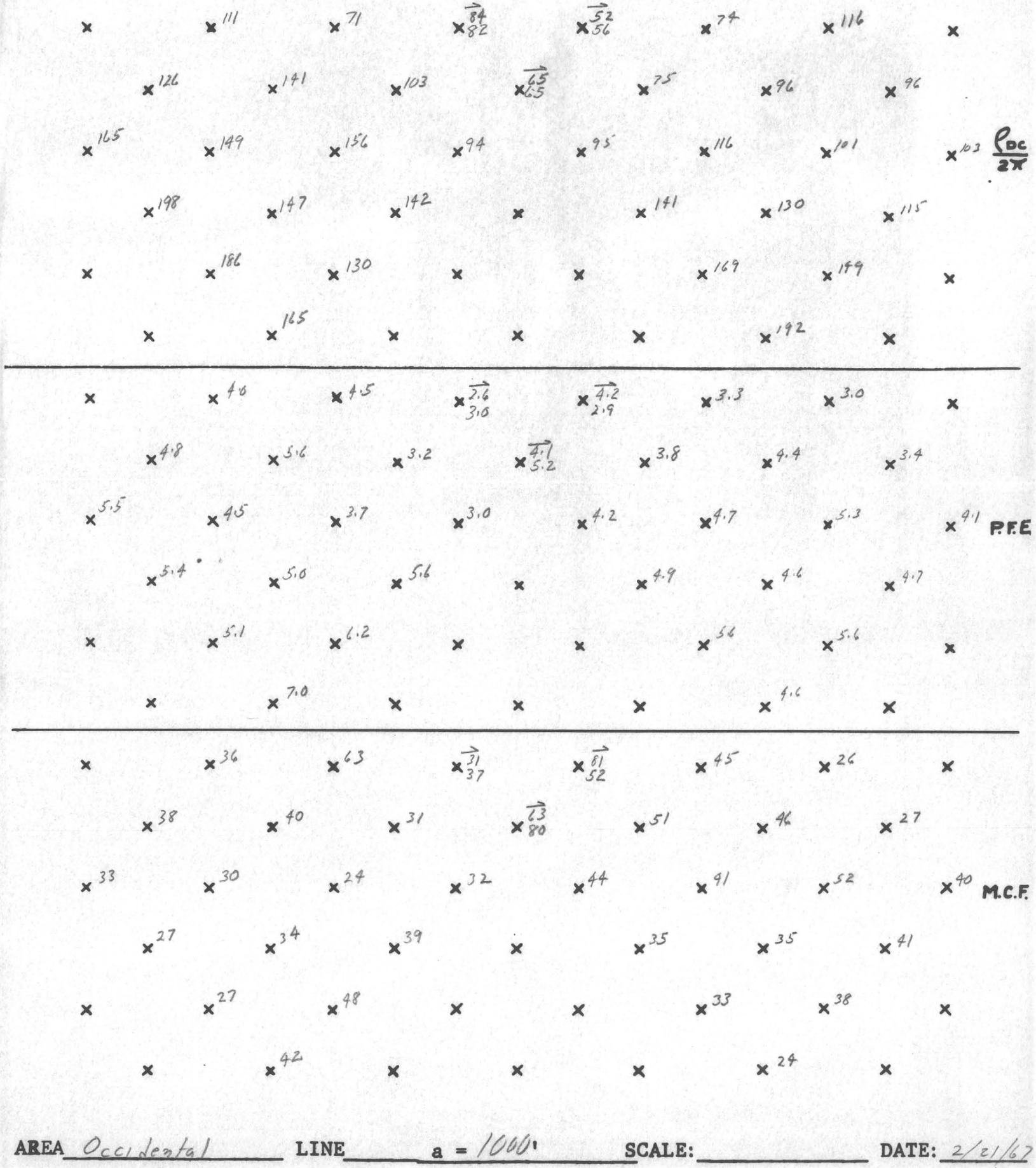
RECEIVER NO.

OPERATOR RON

COMMENTS:

HEINRICHS GEOEX. INDUCED POLARIZATION SECTIONAL DATA PLOT, LOOKING NW





AREA Occidental LINE a = 1000' SCALE: DATE: 2/21/67

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page 2

Project Occidental Line #2 SE½ Field date 2/21/67 Data page _____ Comp. date _____. Comp by ~~OSF~~ RF

(A) Send	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5		
(B) Receive	0-10	10-20	←	20-30	←	←	30-40	←	←	←		
(C) n separation												
(D) I	6 amp	→	→									
(E) Vdc (avg)	204	297	59.4	360	93.8	34.14	404	129	56.9	25.92		
(F) DCcal	.54945											
(G) Kn x 10^{-3}	3.0	3.0	12.0	3.0	12.0	30.0	3.0	12.0	30	60		
(H) ρ dc=ExFxGx10^3/D	56	82	65	71	103	94	111	141	156	142		
(I) Vac Σ	198	288	56.4	344	90.8	33.10	388	122	54.8	24.5		
(J) AC noise x 2												
(K) Vac(corr) = $\sqrt{I^2 - J^2}$	.05	.02		.02			.02					
(L) AC-DC cal.	.99901											
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2)	2.9	3.0	5.2	4.5	3.2	3.0	4.0	5.6	3.7	5.6		
(O) MCF=(M-1)(10^5)/H	52	37	80	63	31	32	36	40	24	39		
	−2.3	4.5		−13.0			+2.0					

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

(A) Send	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5				1-2
(B) Receive	40-50	←	←	←	50-60	←	←	←				cal
(C) n separation												
(D) I	6 amp	→	→									
(E) Vdc (avg)	114.6	54.4	26.9	13.99	60.2	36.01	19.37	10.72				182
(F) DCcal	.549											
(G) Kn x 10^{-3}	12	30	60	105	30	60	105	168				
(H) ρ dc=ExFxGx10^3/D	126	149	147	130	165	198	186	165				
(I) Vac Σ	109.2	52	25.4	12.68	57.0	34.1	18.4	10.00				180
(J) AC noise x 2												
(K) Vac (corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	.999											
(M) ρdc/ρac =ExL/K								7.1				
(N) PFE=(M-1)(10^2)	4.8	4.5	5.0	6.2	5.5	5.4	5.1	7.0				
(O) MCF=(M-1)(10^5)/H	38	30	34	48	33	27	27	42				

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT Occidental

LINE 4 HALF W SP. / DATE 3 2 67

PAGE

SEND	1'2	2-3	1-2	3-4	2-3	1-2	4-5	3 4	2 3	1-2
RECEIVE	→	→	→	→	→	→	→	→	→	→
RANGE										
VOLTAGE	370	350	430	350	340	440	415	300	300	440
CURRENT	5	5	5	5	5	5	4	4	4	5
SEND	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2		CAL
RECEIVE	→	→	→	→	→	→	→	→		4-5
RANGE										
VOLTAGE	415	300	300	440	415	300	300	440		115
CURRENT	4	4	4	5	4	4	4	5		1

FREQUENCIES B E

SENDER NO. 66445

OPERATOR Lowell

RECEIVER NO.

OPERATOR Bob

COMMENTS:

10.11

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT OCCIDENTAL
LINE 4 HALF NE SP. DATE 3-2

SEND	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2		CAL
RECEIVE	40	—	—	50	50	—	—	60		4-5
RANGE	30	30	10	10	30	10	10	10		300
DC 1	28.5	10.7	5.12	5.31	17.4	7.90	4.14	5.10		97
DC 2	28.0	11.0	5.00	5.52	16.5	7.62	4.18	4.98		96
DC 3	28.5	10.7	5.08	5.25	17.4	7.84	4.20	5.00		97
DC 4	28.0	11.0	5.05	5.62	16.4	7.64	4.28	5.02		96
DC 5			5.23	5.15	17.4	7.90	4.25	5.02		
DC 6			~~5.00~~	5.51	16.5	7.66	4.30	5.05		
DC 7			~~5.18~~	5.58		7.90	4.30	5.00		
DC 8			~~5.28~~	5.20		7.70	4.57	5.08		
DC AVG.	56.5	21.7	10.17	10.82	33.9	15.599	8.59	10.046		19x3
AC 1	27.5	10.5	4.88	5.20	16.4	7.54	4.14	4.79		96
AC 2	27.5	10.5	4.88	5.20	16.4	7.54	4.14	4.78		96
AC AVG.	55.0	21.0	9.76	10.40	32.8	15.08	8.28	9.57		192
S.P.	-4.4	—	—	→	+3.6					
AC NOISE	.10	—	—	→	.12					
POT RES.										

<-

1-2	2-3	1-2
5.05	4.45	5,33
5,04	4.30	5,58
5.00	4.40	5,55
5.05	4.14	5,48
5,05	4.44	5,[illegible]
5.00	4.27	5,52
	4.39	5.38
		5.40
		5.42
		5.43
		5.40
		5.

FENCE, POWR LINE, AND ROAD
AT 4/5,000 FT.

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT Occidental
LINE 4 HALF NE SP. ____ DATE 3-2

PAGE 1

SEND	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2
RECEIVE	0-10	10 —	20	20 —	—	30	30 —	—	—	40
RANGE	300	1000	300	300	100	100	100	30	10	10
DC 1	253	367	111	284	74.5	40.0	83.0	22.4	78.0	7.00
DC 2	252	372	116	284	79.2	41.0	84.2	22.6	82.2	7.30
DC 3	253	366	110	284	74.3	40.3	83.0	22.4	79.0	7.18
DC 4	253	370	116	283	79.5	41.3	84.0	22.6	82.8	7.20
DC 5		367		284	74.3	40.1	83.0		78.2	7.25
DC 6		372		283	79.5	41.5	84.0		80.2	7.25
DC 7						40.3			79.0	6.78
DC 8						41.2			80.5	7.40
DC AVG.	506	737.8	226	567	153.72	81.46	167.0	45.0	15.99	143.89
AC 1	246	358	109	276	74.6	39.5	81.8	22.0	7.75	6.98
AC 2	246	356	109	276	74.6	39.5	81.8	22.0	7.75	6.98
AC AVG.	492	716	218	552	149.2	79.0	163.6	44.0	15.50	13.96
S.P.	.70	.18	→	.09	—	→	.14	—	—	→
AC NOISE	.42	+2.9	→	+5.3	—	→	+1.0	?	—	→
POT RES.										

1-2
7.18
7.18
7.23
7.20
7.05
7.25

NE 1/2

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Project Oracle Junct Occidental Line 4 Field date May 2 Data page _____ Comp. date _____. Comp by 090 Page _____

(A) Send	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2		4-5
(B) Receive	0-10	10-20	—	20-30	—	—	30-40	—	—	—		cal
(C) n separation												
(D) I	5	5	5	5	5	5	4	4	4	5		1
(E) Vdc (avg)	506	737.8	226	567	153.72	81.46	167.0	45.0	15.99	143.89		193
(F) DCcal	.5181											
(G) Kn x 10^{-3}	3	3	12	3	12	30	3	12	30	60		
(H) ρ dc=ExFxGx10^3/D	157.3	229.4	281.0	176.3	191.1	253.2	64.9	69.9	62.1	89.5		
(I) Vac Σ												
(J) AC noise x 2												
(K) Vac(corr) = $\sqrt{I^2 - J^2}$	492.	716.	218.	552.	149.2	78.0	163.6	44.0	15.50	13.96		192
(L) AC-DC cal.	.9948											
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2)	2.3	2.5	3.1	2.2	2.5	3.9	1.5	1.7	2.6	2.5		
(O) MCF=(M-1)(10^5)/H	14	10.9	11.	13	13	15	23	24	42	28		

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

(A) Send	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2				
(B) Receive	40-50	—	—	—	50-60	—	—	—				
(C) n separation												
(D) I	4	4	4	5	4	4	4	5				
(E) Vdc (avg)	56.5	21.7	10.17	10.82	33.9	15.549	8.59	10.046				
(F) DCcal												
(G) Kn x 10^{-3}	12	30	60	105	30	60	105	168				
(H) ρ dc=ExFxGx10^3/D	87.8	84.3	79.0	118	131.7	120.8	116.8	174.9				
(I) Vac Σ												
(J) AC noise x 2												
(K) Vac (corr) = $\sqrt{I^2 - J^2}$	55.0	21.0	9.76	10.40	32.8	15.08	8.28	9.57				
(L) AC-DC cal.												
(M) ρdc/ρac =ExL/K												
(N) PFE=(M-1)(10^2)	2.2	2.8	3.7	3.4	2.8	2.6	3.2	4.4				
(O) MCF=(M-1)(10^5)/H	25	33	47	29	21	21	27	25				

INT 85

PAGE 1

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT Occidental
LINE 4 HALF SW SP. ____ DATE 3-3

SEND	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5
RECEIVE	0-10	10 —	20	20	—	30	30			40
RANGE	1000	1000	300	1000	300	300	1000	300	100	100
DC 1	452	292	137	400	146	91	790	146	77.2	67.4
DC 2	450	292	137	400	145	90	790	144	75.5	65.0
DC 3	455	292	138	400	146	92	790	146	77.0	67.0
DC 4	452	292	138	400	145	90	790	145	75.5	65.8
DC 5	452		138							67.2
DC 6	452		138							64.8
DC 7										
DC 8										
DC AVG.	452.2	292	137.7	400	145.5	90.8	790	145.2	76.3	66.2
AC 1	442	288	134.5	394	144.5	93	765	142	74.0	64.5
AC 2	442	288	134.5	394	143	93	764	142	74.0	64.5
AC AVG.	442				143.75		764.5			
S.P.	+3.0	+7.6	→	+7.6	——→		-5.6			
AC NOISE	.18	.12	→	1.3	——→		.05			
POT RES.										

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT OCCIDENTAL
LINE 4 HALF SW SP. ___ DATE 3-3

SEND	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5		CAL
RECEIVE	40			50	50			60		1-2
RANGE	300	100	30	30	300	100	30	10		300
DC 1	154	41.8	27.5	23.1	95.5	33.9	26.2	8.10		99
DC 2	154	41.2	27.8	23.0	97.0	32.0	26.2	8.05		100
DC 3	154	41.8	27.5	23.3	95.0	34.2	26.2	8.35		99
DC 4	154	41.7	27.6	23.0	98.0	32.5	26.2	8.15		100
DC 5		41.8	27.5	23.4	95.5	34.8		7.95		
DC 6		41.2	27.7	22.9	97.0	32.5		8.30		
DC 7						~~29.8~~		7.78		
DC 8				23.1		~~33.2~~		8.40		
DC AVG.	154	41.6	27.6	23.1	96.4	33.2	26.2	8.12		
AC 1	149	40.2	26.7	22.3	93	31.9	25.3	7.70		98
AC 2	149	40.2	26.7	27.3	93	31.9	25.4	7.70		98
AC AVG.										
S.P.	-.9			→	+.9					
AC NOISE	.14			→	.18					
POT RES.										

4-5	2-3
8.20	33.7
7.75	32.8
7.48	34.2
7.70	32.5
8.32	
7.83	
8.17	

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT Occidental

LINE 4 HALF ____ SP. 1 DATE 3-3-67

PAGE

SEND	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5
RECEIVE	→	→	→	→	→	→	→	→	→	→
RANGE										
VOLTAGE	500	450	500	425	450	500	450	425	450	500
CURRENT	6	6	6	6	6	6	5	6	6	6
SEND	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5		Col 1-2
RECEIVE	→	→	→	→	→	→	→	→		
RANGE										
VOLTAGE	450	400	450	500	450	425	450	180		125
CURRENT	5	6	6	6	5	6	6	2		1

FREQUENCIES B E

SENDER NO. 6644 S

OPERATOR Lorenz

RECEIVER NO. 3641

OPERATOR Bob

COMMENTS:

W/2

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Project OCCIDENTAL Line #4 Field date 3/3/67 Data page _____ Comp. date 3/4/67 . Comp by RPF

(A) Send	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5		
(B) Receive	0-10	10 —	20	20 —		30	30 —			40		
(C) n separation												
(D) I	6	6	6	6	6	6	5	6	6	6		
(E) Vdc (avg)	452	292	138.7	400	145.5	90.85	790	143.7	76.3	66.2		
(F) DCcal	1.005											
(G) Kn x 10^{-3}	3	3	12	3	12	30	3	12	30	60		
(H) ρ dc=ExFxGx10^3/D	227	147	277	201	292	456	476	291	386	665		
(I) Vac Σ	442	288	134.5	394	143.75	93	765	142	74	64.5		
(J) AC noise x 2												
(K) Vac(corr) = $\sqrt{I^2 - J^2}$	.995	"										
(L) AC-DC cal.	.9849	——→										
(M) ρ dc/ρac=ExL/K	1.8	0.9	1.9	1.0	0.8	-2.0?	2.7	1.7	2.6	2.1		
(N) PFE=(M-1)(10^2)	.72	-.13	1.0	-.007	-.30	-3.9	1.7	.36	2.2	1.0		
(O) MCF=(M-1)(10^5)/H	3.1	-.88	3.6	-.034	-1.0	-8.5	3.6	1.2	5.7	1.5		
	8	6	7	5	3	-6?	6	6	7	3		

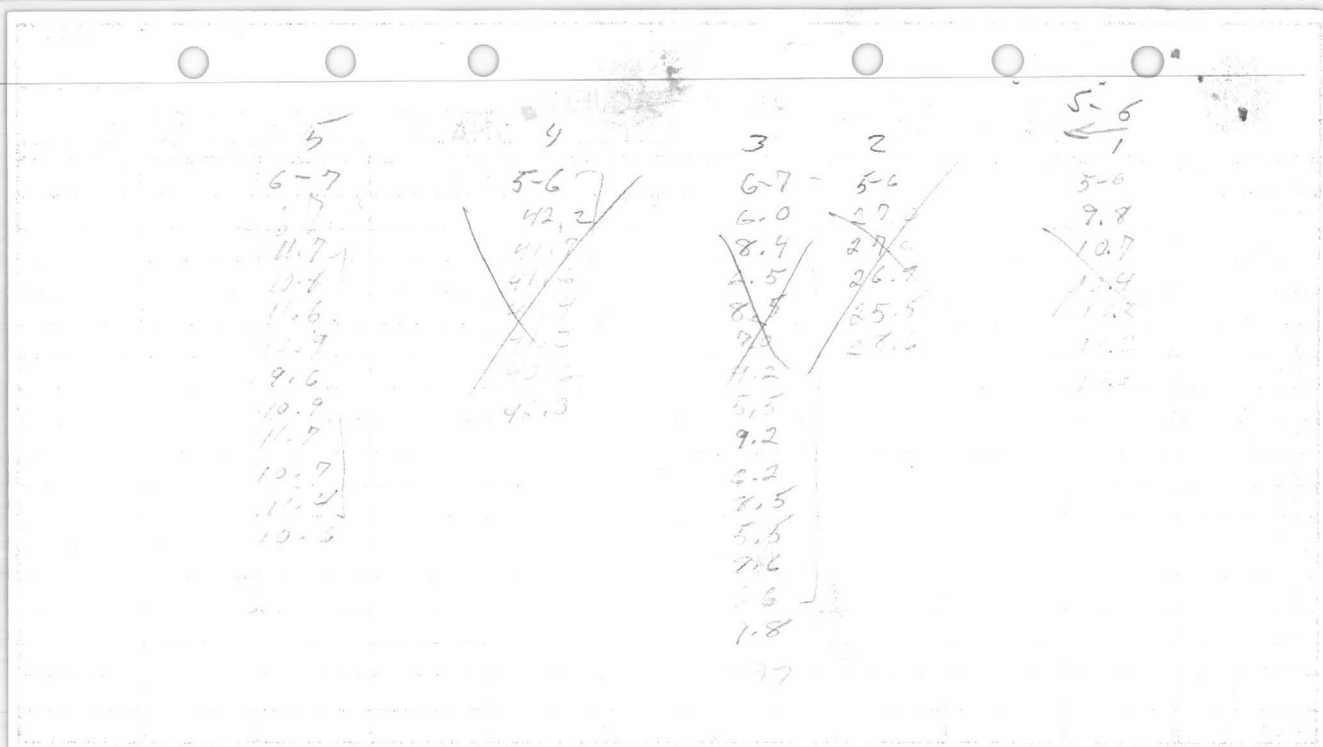
Project _____ Line _____ Field date _____ Data page _____ Comp. date _____ Comp by _____

(A) Send	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5		CAL		
(B) Receive	40 —			50	50 —			0		1-2		
(C) n separation												
(D) I	5	6	6	6	5	6	6	2		1		
(E) Vdc (avg)	154	41.6	27.6	23.175	96.425	37.5 / 33.3	26.2	8.12		99.5		
(F) DCcal	1.005											
(G) Kn x 10^{-3}	12	30	60	105	30	60	105	168				
(H) ρ dc=ExFxGx10^3/D	371	209	277	418	580	335	461	688				
(I) Vac Σ	149	40.2	26.7	22.3	93	31.9	25.35	7.7		.98		
(J) AC noise x 2												
(K) Vac (corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	.9849	——→										
(M) ρdc/ρac =ExL/K	2.8	3.0	2.9	3.1	3.1	3.9	2.8	4.9				
(N) PFE=(M-1)(10^2)	1.8	1.9	1.8	4.9	1.9	2.9	1.8	4.2				
(O) MCF=(M-1)(10^5)/H	4.8	9.0	6.5	12	3.3	9	3.9	6.1				
	8	14	10	7	5	12	6	7				

HEINRICHS GEOEXPLORATION CO. PROJECT OCCIDENTAL

I.P. RECEIVER NOTES LINE 4 HALF 3 SP. ___ DATE 3-3

SEND	5-6	5-6	6-7	5-6	6-7					
RECEIVE	40-50	30 — 40		20 — 30						
RANGE	30	30	30	100	30					
DC 1	10.0	26.5	6.0	42.0	10.4					
DC 2	10.3	27.6	9.6	41.0	10.0					
DC 3	10.0	26.5	6.0	40.9	11.5					
DC 4	10.6	26.6	9.4	42.5	12.6					
DC 5	9.9	27.5	6.4	41.5	9.5					
DC 6	10.6	27.6	7.9	40.8	11.2					
DC 7	9.9	27.4	7.5	43.0	13.1					
DC 8	10.9	26.5	8.8	41.5	11.4					
DC AVG.	10.27	26.95	7.86	41.8	11.190					
AC 1	9.8	25.9	7.3	40.8	10.3					
AC 2	9.8	25.9	7.4	40.0	10.5					
AC AVG.	9.8	25.9	7.35	40.0	10.5					
S.P.	+1.5	-20.3	→	+3.5						
AC NOISE	.10	.15	→	.18						
POT RES.										



HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT Occidental

LINE 4 HALF ___ SP. 2 DATE 3 3 67

PAGE

SEND	5-6	5-6	6-7	5-6	6-7					
RECEIVE	→	→	→	→	→					
RANGE										
VOLTAGE	500	500	475	500	450					
CURRENT	6	6	7	6	7					
SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										

FREQUENCIES B E

SENDER NO. 6644 5

OPERATOR Loren

RECEIVER NO. 3641

OPERATOR Bob

COMMENTS:

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Project Occidental Line 4 Field date _____ Data page _____ Comp. date _____. Comp by _____

(A) Send	5-6	5-6	6-7	5-6	6-7								
(B) Receive	40-50	30	40	20	30								
(C) n separation	6	5	6	4	5								
(D) I	6.0	6.0	7.0	6.0	7.0								
(E) Vdc (avg)	10.25	26.99	7.80	41.6	11.10								
(F) DCcal	1.005	→											
(G) Kn x 10^{-3}	168	105	168	60	105								
(H) ρdc=ExFxGx10^3/D	288	475	1854	428	169								
(I) Vac Σ	9.8	25.9	7.35	42.0	12.5								
(J) AC noise x 2													
(K) Vac(corr) = $\sqrt{I^2 - J^2}$	.995												
(L) AC-DC cal.	.984	→											
(M) ρ dc/ρac=ExL/K													
(N) PFE=(M-1)(10^2)	3.1 4.1	2.8 3.7	4.4 3.0	2.8	4.9 5.2								
(O) MCF=(M-1)(10^5)/H	11 14	5.9 8	23 16	6.68	29 31								

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

(A) Send													
(B) Receive													
(C) n separation													
(D) I													
(E) Vdc (avg)													
(F) DCcal													
(G) Kn x 10^{-3}													
(H) ρ dc=ExFxGx10^3/D													
(I) Vac Σ													
(J) AC noise x 2													
(K) Vac (corr) = $\sqrt{I^2 - J^2}$													
(L) AC-DC cal.													
(M) ρdc/ρac =ExL/K													
(N) PFE=(M-1)(10^2)													
(O) MCF=(M-1)(10^5)/H													

GEOEXPLORATION COMPANY

P.O. BOX 6571, TUCSON, ARIZONA, 85703.
PHONE: (AREA CODE 602) 623-0578
Cable: GEOEX-

I.P. COMPUTING FORM

PROJECT Oracle Junction

CLIENT Occidental "a" SPACING 1000' DATE 3/1/67

LINE 3 SPREAD 1 BEARING N45°E - S45°W

HALF NE																			
SEND	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2
RECEIVE	0-1	1-2	→	2-3	→	→	3-4	→	→	→	4-5	→	→	→	5-6 NE	→	→	→
(1) CURRENT IN AMPS: I	3	3	3	6	5 1/2	4	6	6	4	4	6	6	4	4	6	6	4.5	4.5
(2) V(DC AVG.) MILLIVOLTS	82.0	78.5	15.83	128.5	24.45	7.38	89.5	32.3	9.03	3.38	23.5	13.7	4.69	1.99	11.47	8.33	3.47	1.56
(3) K_n / 1000	3	3	12	3	12	30	3	12	30	60	12	30	60	105	30	60	105	168
$P_{DC}/2\pi$ =(2)(3)(DC CAL)/(1)	83	79	64	65	74	56	45	65	68	51	47	69	71	53	58	84	82	59
(4) V(AC AVG.) MILLIVOLTS	81.0	77.5	15.6	126	24.0	7.25	88.0	31.5	8.70	3.25	22.9	13.3	4.47	1.885	10.95	7.97	3.275	1.49
(5) AC NOISE MILLIVOLTS	0.K																	
(6) V(AC CORR) MILLIVOLTS *																		
PFE=[(2)(AC/DC CAL)/(6)-1]100	1.4	1.5	1.7	2.2	2.1	2.0	1.9	2.7	4.0	4.2	2.8	3.2	5.1	5.8	5.0	4.7	6.2	4.9
MCF=1000 PFE/P_{DC}/2π	17	19	27	34	28	36	42	42	59	82	60	46	72	109	86	56	76	83
SP IN MILLIVOLTS																		

CALIBRATION	HALF NE
SEND	4-5
RECEIVE	2 NE?
(1) CURRENT IN MILLIAMPS: I CAL	1000
(2) V CAL (DC AVG.) MILLIVOLTS	99.25
DC CAL = (1)/10 (2)	1.008
(3) V CAL (AC AVG.) MILLIVOLTS	99.5
AC/DC CAL = (3)/(2)	1.002

COMPUTED BY: C.S.L.

CHECKED BY:

RECEIVER OPERATOR: Bob E.

FORMULAS:

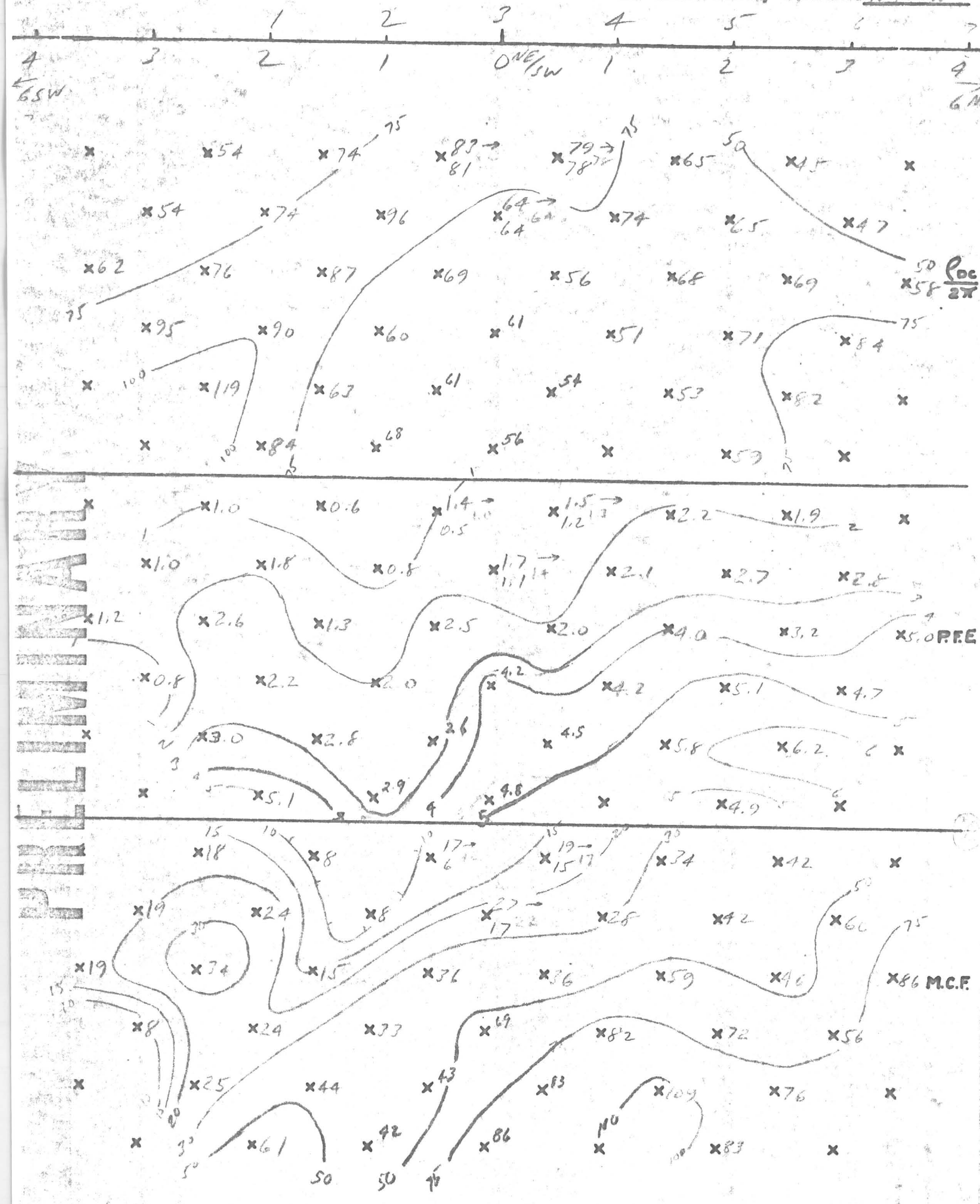
$K_n = \frac{an(n+1)(n+2)}{2}$ (a is in feet)

* $V(AC\ CORR) = (6) = \sqrt{(4)^2 - (5)^2}$

USE ONLY IF AC NOISE x 10 IS GREATER THAN V(AC AVG.) OTHERWISE USE (4)

HALF	SEND / RECEIVE
(1) CURRENT IN AMPS: I	
(2) V(DC AVG.) MILLIVOLTS	
(3) K_n / 1000	
$P_{DC}/2\pi$ =(2)(3)(DC CAL)/(1)	
(4) V(AC AVG.) MILLIVOLTS	
(5) AC NOISE MILLIVOLTS	
(6) V(AC CORR) MILLIVOLTS *	
PFE=[(2)(AC/DC CAL)/(6)-1]100	
MCF=1000 PFE/P_{DC}/2π	
SP IN MILLIVOLTS	

HEINRICHS GEOEX. INDUCED POLARIZATION SECTIONAL DATA PLOT, LOOKING N 45° W



AREA Oracle June Occidental LINE 3 a = 1000' SCALE: 1" = 1000' DATE:

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project *Occidental* Line *#3 NE½* Field date *Feb. 28* Data page_____ Comp. date_____. Comp by_____

(A) Send	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2		
(B) Receive	0-1.0	1.0 —	2.0	2.0 —		3.0	3.0 —			4.0		
(C) n separation	1	1	2	1	2	3	1	2	3	4		
(D) I	3.0	3.0	3.0	6.0		4.0	6.0	6.0	4.0	4.0		
(E) Vdc (avg)	82.4	78.5	15.83	128.5	24.45	7.38	89.5	32.3	9.03			
(F) DCcal	1.008	—	>									
(G) Kn x 10^{-3}	3	3	12	3	12	30	3	12	30	60		
(H) ρ dc=ExFxGx10^3/D	83	79	64	65		56	45	65	68			
(I) Vac Σ	82.0	77.5	15.6	126	24.0	7.25	88.0	31.5	8.70	3.25		
(J) AC noise x 2	—											
(K) Vac(corr) =$\sqrt{I^2 - J^2}$	—											
(L) AC-DC cal.	1.003	—	>									
(M) ρ dc/ρac=ExL/K	1.009	1.018	1.019	1.022								
(N) PFE=(M-1)(10^2)	0.9	1.8	1.9	2.2								
(O) MCF=(M-1)(10^5)/H												

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

(A) Send	4-5	3-4	2-3	1-2	4-5	3-4	2-3	2-1			Cal. 4-5	
(B) Receive	4.0 —			5.0	5.0 —			6.0				
(C) n separation	2	3	4	5	3	4	5	6				
(D) I	6.0	6.0	4.0		6.0	6.0	4.5	4.5			1.00	
(E) Vdc (avg)	23.5	13.7	4.71	1.99	11.5	8.33		1.56			99.25	
(F) DCcal	1.008	—	>									
(G) Kn x 10^{-3}	12	30	60	105	30	60	105					
(H) ρ dc=ExFxGx10^3/D	47	69	71		58	84						
(I) Vac Σ	22.9	13.3	4.47	1.89	10.95	7.97	3.28	1.49			99.5	
(J) AC noise x 2	—											
(K) Vac (corr) =$\sqrt{I^2 - J^2}$	—											
(L) AC-DC cal.	1.003	—	>									
(M) ρdc/ρac =ExL/K												
(N) PFE=(M-1)(10^2)												
(O) MCF=(M-1)(10^5)/H												

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project Occidental Oracle Junction Line 3 Field date 7/28 Data page_____ Comp. date_____. Comp by RF

(A) Send	5-6	5-6	6-7	5-6	6-7		6-7					
(B) Receive	70-80	60-70	——	50-60	——		Cal					
(C) n separation	3	10	3	10	10		300					
(D) I	6	——	——	——	——		1					
(E) Vdc (avg)	2.400	3.420	1.948	5.977	3.041		98					
(F) DCcal	1.02						1.02					
(G) Kn x 10^{-3}	168	105	168	60	105							
(H) ρdc=ExFxGx10^3/D	68.5	61.04	55.6	60.98	54.30							
(I) Vac Σ												
(J) AC noise x 2	.15	.13		.06								
(K) Vac(corr) = $\sqrt{I^2 - J^2}$	2.31	3.30	1.84	5.68	2.88		97					
(L) AC-DC cal.	.990											
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2)	2.9	2.6	4.8	4.2	4.5							
(O) MCF=(M-1)(10^5)/H	42	43	86	69	83							
	-1.5	-4.8	→	-.4								

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

(A) Send												
(B) Receive												
(C) n separation												
(D) I												
(E) Vdc (avg)												
(F) DCcal												
(G) Kn x 10^{-3}												
(H) ρ dc=ExFxGx10^3/D												
(I) Vac Σ												
(J) AC noise x 2												
(K) Vac (corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.												
(M) ρdc/ρac =ExL/K												
(N) PFE=(M-1)(10^2)												
(O) MCF=(M-1)(10^5)/H												

PAGE

HEINRICHS GEOEXPLORATION CO. PROJECT OCCIDENTAL

I.P. RECEIVER NOTES LINE 3 HALF 3 SP. ____ DATE 12-28

SEND	5-6	5-6	6-7	5-6	6-7			CAL		
RECEIVE	~~40-30~~	~~50-40~~ → 70		~~40-30~~ → 60				6-7		
RANGE	3	10	3	10	10			300		
DC 1	2.39	3.37	1.82	5.90	3.01			98		
DC 2	2.28	3.51	2.03	6.00	3.10			98		
DC 3	2.53	3.38	1.98	5.97	3.00			98		
DC 4	2.23	3.41	1.90	5.99	3.01			98		
DC 5	2.56	3.49	1.99	5.97	3.00					
DC 6	2.34	3.42	1.90	5.99	3.12					
DC 7	2.43	3.42	2.06	5.98	2.99					
DC 8	2.37	3.36	1.90	5.98	3.13					
DC AVG.	2.393	3.428	1.960	5.977	3.041					
AC 1	2.31	3.30	1.94	5.68	2.88			97		
AC 2	2.31	3.30	1.94	5.68	2.88			97		
AC AVG.										
S.P.	-6.5	-4.8	→	-.4	→					
AC NOISE	.15	.13	→	.06	→					
POT RES.										

1	2	3
5-5	5-6	5-7
2.34	3.38	2.14
2.48	3.44	1.72
2.14	3.33	2.56
2.62	3.50	1.78
2.51		2.11
2.30		1.79
2.44		2.15
2.30		[illegible]
2.42		[illegible]
2.35		
2.40		

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT OCCIDENTAL

LINE #3 HALF N½ SP. / DATE 2-28-87

PAGE

SEND	1-2	2-3	1-2	34-	2-3	1-2	45	3-4	2-3	1-2
RECEIVE	0-1000	1000 —	2000	2000 +	—	3000	3000	—		4000
RANGE										
VOLTAGE	230	370	320	same 400	1ST 500 / 2ND 400	same 425	390	400	400	425
CURRENT	3	3	3	6 AMPS	5 / 4	4	6	6	4 0	4
SEND	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2	cor 4-5	
RECEIVE	4000	—		5000	5000	—		6000		
RANGE										
VOLTAGE	390	400	400	400	370	400	450	475	100	
CURRENT	6	6	4	4	6	6	4½	4½	1	

FREQUENCIES B E

SENDER NO. 6645

OPERATOR L. TURNER

RECEIVER NO. 3641

OPERATOR Bob - F

COMMENTS:

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES INT 89

PROJECT O CONFIDENTIAL

LINE #3 HALF NE½ SP. ____ DATE ____

SEND	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2
RECEIVE	0-10	10 —	20	20 —		30	30			40
RANGE	300	100	30	300	30	10	100	10.0	30	10
DC 1	86/815	78.5	15.6	129	23.6	7.30	89.5	31.5	90.5	3.20
DC 2	81/825	78.5	16.1	128	25.3	7.45	89.5	33.0	90.0	3.65
DC 3	86/820	78.5	15.5	129	23.6	7.30	89.5	31.5	90.5	3.30
DC 4	80/820	78.5	16.1	128	25.3	7.45	89.5	33.0	90.0	3.45
DC 5	82.0									3.25
DC 6	81.5									3.40
DC 7	82.5									3.25
DC 8	81.5									3.50
DC AVG.	82.48	78.5	15.83	128.5	24.45	7.38	89.5	32.3	90.3	3.38
AC 1	83/810	77.5	15.6	126	24.0	7.25	88.0	31.5	87.0	3.25
AC 2	83/810	77.5	15.6	126	24.0	7.25	88.0	31.5	87.0	3.25
AC AVG.	82.0/810	77.5	15.6	126	24.0	7.25	88.0	31.5	87.0	3.25
S.P.	-.7	+15.1	→	-10.0	→	→	+2.3	→	→	→
AC NOISE	.13	.25	→	.06 mV	→	→	.10	→	→	→
POT RES.										

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT _____
LINE ____ HALF NE¼ SP. ____ DATE ____

SEND	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2	CAL	
RECEIVE	40			50	50			CO	4-5	
RANGE	30	30	10	3	30	10	10	3		
DC 1	23.7	13.5	4.75	1.97	11.4	8.56	3.40	128 162	99.5	
DC 2	23.2	14.0	4.65	2.06	11.5	8.30	3.40	167 1.63	99.0	
DC 3	23.7	13.3	4.70	1.98	11.5	8.19	3.70	153 162	99.5	
DC 4	23.3	14.2	4.65	2.12	11.5	8.40	3.44	1.63 1.27	99.0	
DC 5		13.2		1.85		8.21	3.20	1.28 1.61		
DC 6		14.1		2.11		8.65	3.57	1.85 1.57		
DC 7				1.85		7.98	3.47	1.52 1.84		
DC 8			4.69	2.13		8.61	3.58	1.60 1.22		
DC AVG.	23.5	13.7	4.71	1.99	11.47	8.33	3.47	1.56	99.25	
AC 1	22.9	13.3	4.47	1.88	11.0	7.97	3.28	1.49	99.5	
AC 2	22.9	13.3	4.47	1.89	10.9	7.97	3.27	1.49	99.5	
AC AVG.	22.9	13.3	4.47	1.885	10.95	7.97	NOTE 3.28	1.49	99.5	
S.P.	-4.0				-4.2		OVER			
AC NOISE	10				.06					
POT RES.										

(2-3)
3.39
3.82
3.07
3.88
~~3.40~~
3.97
2.78

3.40
3.42
3.53
3.07
3.70
3.55
3.37

3.82
3.13

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT ACCIDENTAL
LINE 3 HALF SW SP. DATE 2-28

SEND	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5	CAL	
RECEIVE	40			50	50			60	1-2	
RANGE	30	30	10	3	30	10	10	3		
DC 1	19.5	11.2	6.65	2.66	9.0	6.5.5	4.93	2.18	98	
DC 2	20.0	11.2	6.55	2.64	9.2	6.58	5.02	2.28	98	
DC 3	19.5	11.2	6.63	2.78	8.9	6.63	4.98	2.08	98	
DC 4	19.8	11.2	6.54	2.54	9.3	6.63	5.02	2.24	98	
DC 5	19.5		6.68	2.73	8.7	6.55	4.90	2.20		
DC 6	19.8		6.37	2.44	9.5	6.90	5.28	2.22		
DC 7			6.60	2.64		6.43	4.87	2.22		
DC 8			6.68	2.45		6.95	5.19	2.16		
DC AVG.	19.69	11.2	6.61	2.658	9.107	6.79	5.02	2.20		
AC 1	19.3	10.8	6.40	2.54	8.9	6.85	4.82	2.07	97	
AC 2	19.3	10.8	6.40	2.58	8.9	6.85	4.82	2.07	97	
AC AVG.	19.3	10.8	6.40	2.58	8.9	6.85	4.82	2.07		
S.P.	-1.2	→	→	→	-11.1	→	→	→		
AC NOISE	.32	→	→	→	.09	→	→	→		
POT RES.										

2nd			1st
4-5	3-4	2-3	4-5
2.27	5.32	6.40	2.80
2.17	4.72	6.75	2.65
2.34	5.38	6.60	2.84
2.13	4.78	7.55	2.65
2.35		6.72	2.81
2.28		7.48	2.54
2.25		6.63	2.70
2.14		7.63	2.53
2.18		6.65	2.74
			2.51

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT OCCIDENTAL
LINE 3 HALF SW SP. ____ DATE 2-28

SEND	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5
RECEIVE	0-10	10 —	20	20 —	—	30	30 —	—	—	40
RANGE	300	300	30	300	100	30	100	30	30	10
DC 1	116	117	23.7	110	33.0	10.0	78.8	27.3	13.1	4.50
DC 2	114	120	23.5	106	36.7	10.3	78.8	27.3	12.6	4.26
DC 3	116	118	23.7	109	33.0	10.0	78.8	26.9	12.8	4.28
DC 4	114	120	23.5	106	36.7	10.3	78.8	27.2	12.7	4.28
DC 5		118		110				27.3	13.0	4.58
DC 6		120						26.9	12.5	4.37
DC 7										Mark pwr!
DC 8				7.8	34.65					
DC AVG.	115	118.83	23.6	108.2	35.35	10.15	78.8	27.16	12.8	4.48
AC 1	114	117	23.1	106	34.3	9.8	77.2	26.4	12.5	4.30
AC 2	113	117	23.1	106	34.2	9.8	77.2	26.4	12.5	4.30
AC AVG.	113.5	117	23.1	106	34.26	9.8	77.2	26.4	12.5	4.30
S.P.	+1.9	+5.4	→	(-1.18 ↑	→	→	-12.6	→	→	→
AC NOISE	.41	.32	→	(-5.4)	→	→	.08	→	→	→
POT RES.										

PWR LINES at 3400 ft

45'

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT Occidental

LINE 3 HALF 2 SP cont DATE 7-28-61

PAGE

SEND	4 5	3 4	4 5	2-3	3 4	4-5	1-2	2-3	3 4	4 5
RECEIVE	1000	1000	2000	2000	—	3000	3000	—	—	4000
RANGE										
VOLTAGE	290	300	290	325	300	290	325	325	300	290
CURRENT	4 ½	4 ½	4 ½	4 ½	4 ½	4 ½	4 ½	4 ½	4 ½	4 ½
SEND	1 2	2 3	3 4	4 5	1-2	2-3	3-4	4-5		CAL 1-2
RECEIVE	4000	—	—	5000	5000	—	—	6000		
RANGE	(2) SAME									
VOLTAGE	325	325	300	290	325	325	300	290		
CURRENT	4 ½	4 ½	4 ½	4 ½	4 ½	4 ½	4 ½	4 ½		

FREQUENCIES B E

SENDER NO. 66445

OPERATOR Loren

RECEIVER NO. 3641

OPERATOR Bob

COMMENTS:

CAL 2-3

—

—

110

1

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page 1

Project OCCIDENTAL Line 3 SW½ Field date 2-28 Data page _____ Comp. date 2-28 . Comp by RPF

(A) Send	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5		CAL
(B) Receive	0-10	10 —	20	20 —		30	30 —			40		
(C) n separation										1		
(D) I	4.5 →				24.85					4.48		
(E) Vdc (avg) ×	.115	118.83	23.6	~~137.8~~	~~35.35~~	10.15	78.8	27.16	12.8	~~4.45~~		
(F) DCcal	1.02 →											
(G) Kn x 10^{-3}	3.0	3.0	12.0	3.0	12.0	30.0	3.0	12.0	30.0	60.0		
(H) ρdc=ExFxGx10^3/D	78	81	64	74	96	69	54	74	87	60		
(I) Vac Σ ×	113.5	117	23.1	106	34.35	9.8	77.2	26.4	12.5	4.30		
(J) AC noise x 2	—											
(K) Vac(corr) =$\sqrt{I^2 - J^2}$	—											
(L) AC-DC cal.	.989 →											
(M) ρdc/ρac=ExL/K										2.0		
(N) PFE=(M-1)(10^2)	~~.29~~ 1.2	0.53	1.1	~~1.0~~ 0.6	~~2.0~~ 0.8	2.5	1.0	1.8	1.3	~~2.4~~		
(O) MCF=(M-1)(10^5)/H	3.7 15	~~6.56~~	17	13 8	21 8	36	18	24	15	~~40~~ 33		

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

(A) Send	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5				
(B) Receive	40			50				60				
(C) n separation	—											
(D) I	4.5 →			8		97						
(E) Vdc (avg) ×	19.69	11.2	6.61	~~2.67~~	9.07	~~6.79~~	5.02	2.20				
(F) DCcal	1.02 →											
(G) Kn x 10^{-3}	12.0	30.0	60.0	105.0	30.0	60.0	105.0	168.0				
(H) ρdc=ExFxGx10^3/D	54	76	90	63	62	~~92~~ 95	119	84				
(I) Vac Σ ×	19.3	10.8	6.40	2.58	8.9	6.85	4.82	2.07				
(J) AC noise x 2	—											
(K) Vac (corr) =$\sqrt{I^2 - J^2}$	—											
(L) AC-DC cal.	.989											
(M) ρdc/ρac =ExL/K												
(N) PFE=(M-1)(10^2) ×	~~.98~~ 1.0	2.6	2.2	~~1.7~~ 1.8	1.2	~~1.9~~ 0.8	3.0	5.1				
(O) MCF=(M-1)(10^5)/H	~~18~~ 19	34	24	~~29~~ 44	19	~~21~~ 8	25	61				

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT Occidental

LINE 3 HALF 1ST SP. 2 DATE 3-1-67

PAGE

(5 6) (5 6) (6 [illegible]) (5-6) (6-7)

SEND	1-2	1-2	2-3	1-2	2-3			CAL 6-7		
RECEIVE										
RANGE	→	———	→	———	→					
VOLTAGE	390	390	450	400	440			90		
CURRENT	7	7	7	6	6			1		
SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										

FREQUENCIES B E

SENDER NO. 6644S

OPERATOR Loren

RECEIVER NO.

OPERATOR Bob

COMMENTS:

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT Occidental

LINE 2 HALF CONT SP. 1 DATE 7 21 6

SEND	1 2	2 3	1 2	3-4	2 3	1 2	4-5	3-4	2-3	1-2
RECEIVE	→	→	→	→	→	→	→	→	→	→
RANGE										
VOLTAGE	325	290	330	350	290	330	390	350	290	325
CURRENT	6	6	6	6	6	6	6	6	6	6
SEND	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2		CAL 4-5
RECEIVE	→	→	→	→	→	→	→	→		
RANGE										
VOLTAGE	475	350	290	325	475	350	290	325		100
CURRENT	6	6	6	6	6	6	6	6		1

FREQUENCIES A C (E) D L (B)

SENDER NO. 66445

OPERATOR Loren

RECEIVER NO.

OPERATOR

COMMENTS:

sometimes will not come up to 6 amps must change MA to 100 then to 200

CAL. 1 - 2 line 2 SP 2

multiplier x10

current control 0.048

mA 100

DC AMPERES 1

Volts 100

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PROJECT Occidental

LINE 2 HALF NE½ SP. 1 DATE 2-21-67

6A

PAGE 7

SEND	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2
RECEIVE	0-10	10-20 NE →		20-30 →			30-40 →			→
RANGE	300	300	100	300	100	30	300	100	30	30
DC 1	152	95.0	29.0	134	33.8	18.1	211	45.4	21.45	13.6
DC 2	152	95.0	29.8	135	34.8	16.3	212	42.0	20.80	12.0
DC 3	152	95.0	29.0	134	33.8	18.1	211	45.4	21.45	13.7
DC 4	152	95.0	29.8	135	34.8	16.3	212	42.0	20.80	11.9
DC 5										13.8
DC 6										11.8
DC 7										13.8
DC 8										11.8
DC AVG.	304	190	58.6	269	68.6	34.4	423	87.4	42.25	179.4/7
AC 1	148	91.0	28.2	130	33.0	16.48	205	41.8	20.15	12.2
AC 2	148	91.0	28.2	130	33.0	16.48	205	41.8	20.15	12.2
AC AVG.	296	182	56.4	260	66	32.96	410	83.6	40.30	29.9
S.P.	-3.1	-1.9		-0.3			+13.9			
AC NOISE	.04	.04		.02			.02			
POT RES.										

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT Occidental
LINE 2 HALF NE½ SP. 1 DATE 2-21-67

SEND	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2	col	
RECEIVE	40-50			>	50-60			>	4-5	
RANGE	100	30	30	30	30	30	30	30	300	
DC 1	43.4	17.8	11.1	7.65	19.3	9.20	7.50	6.90	91.0	
DC 2	43.6	19.1	12.6	9.90	18.0	11.7	8.10	5.50	91.0	
DC 3	43.4	17.8	11.0	7.65	19.4	9.10	7.50	6.90	91.0	
DC 4	43.6	19.1	12.7	9.90	18.0	11.8	8.10	5.50	91.0	
DC 5			10.9		19.6	9.00	7.30	7.00		
DC 6			12.8		17.8	11.8	8.20	5.40		
DC 7			10.9		19.6	9.00	7.30	7.20		
DC 8			12.8		17.8	12.0	8.30	5.30		
DC AVG.	87.0	36.9	23.67	17.55	37.41	20.86	15.54	12.46	182	
AC 1	42.0	17.5	11.3	8.30	17.95	9.95	7.35	5.95	90.0	
AC 2	42.0	17.5	11.3	8.30	17.95	9.95	7.35	5.95	90.0	
AC AVG.	84	35.0	22.6	16.6	35.90	19.90	14.70	11.90	180	
S.P.	-22.2				+5.1					
AC NOISE	.02				.02					
POT RES.										

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT Occidental

LINE 2 HALF ~~East~~ SP. 1 DATE 2-21-6

PAGE 6

SEND	4-5	3-4	4-5	2-3	3-4	4-5	1 2	2 3	3 4	4-5
RECEIVE	→	→	→	→	→	→	→	→	→	→
RANGE										
VOLTAGE	450	340	450	290	325	450	320	290	340	450
CURRENT	6	6	6	6	6	6	6	6	6	6
SEND	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5		CAL 1-2
RECEIVE	→	→	→	→	→	→	→	→		
RANGE										
VOLTAGE	320	290	340	450	320	290	340	450		75
CURRENT	6	6	6	6	6	6	6	6		1

FREQUENCIES AC (E) _____ DC (B)

SENDER NO. 6644 S

OPERATOR Tom

RECEIVER NO.

OPERATOR

COMMENTS:

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PROJECT Occidental

LINE 2 HALF SW½ SP. 1 DATE 2-21-67

SEND	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5
RECEIVE	0-10	10-20	→	20-30	→	→	30-40	→	→	→
RANGE	300	300	100	300	100	30	300	300	100	30
DC 1	102	149	30.0	181	44.8	16.7	201	65.0	29.7	12.5
DC 2	102	148	29.4	179	49.0	17.4	203	64.0	27.2	13.4
DC 3	102	149	30.0	181	44.8	16.9	201	65.0	29.7	12.5
DC 4	102	148	29.4	179	49.0	17.2	203	64.0	27.2	13.5
DC 5						16.9				12.4
DC 6						17.2				13.5
DC 7										
DC 8										
DC AVG.	204	297	59.4	360	93.8	34.14	404	129	56.9	25.92
AC 1	99.0	144	28.2	172	45.4	16.55	194	61.0	27.4	12.25
AC 2	99.0	144	28.2	172	45.4	16.55	194	61.0	27.4	12.25
AC AVG.	198	288	56.4	344	90.8	33.10	388	122	54.8	24.50
S.P.	-2.3	+4.5		-13.0			+2.0			
AC NOISE	.05	.02		.02			.02			
POT RES.										

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT Occidental
LINE 2 HALF SW 1/2 SP. -1 DATE 2-21-67

SEND	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5	cal	
RECEIVE	40-50	→	→	→	50-60	→	→	→	1-2	
RANGE	100	100	30	10	100	30	30	10	300	
DC 1	56.6	28.4	13.0	6.58	28.8	18.1	8.90	5.24	91.0	
DC 2	58.0	26.0	13.7	6.88	31.4	17.8	10.50	5.52	91.0	
DC 3	56.6	28.4	13.0	6.60	28.8	18.4	8.80	5.10	91.0	
DC 4	58.0	26.0	13.7	7.00	31.4	17.5	10.60	5.56	91.0	
DC 5				6.28		18.5	8.80	5.14		
DC 6				7.20		17.5	10.60	5.60		
DC 7				6.38		18.6	8.70	5.20		
DC 8				7.16		17.4	10.70	5.54	182	
DC AVG.	114.6	54.9	26.7	13.49	60.2	36.01	19.37	10.72	182	
AC 1	54.6	26.0	12.7	6.34	28.5	17.05	9.20	5.00	90.0	
AC 2	54.6	26.0	12.7	6.34	28.5	17.05	9.20	5.00	90.0	
AC AVG.	109.2	52	25.4	12.68	57.0	34.1	18.4	10.00	180	
S.P.	+3.4				+4.4					
AC NOISE	.02				.02					
POT RES.										

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT Occidental

LINE 2 HALE Cent SP. 1 DATE 2.22.67

SEND	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5
RECEIVE	20-10NE	———	———	0-10SW	———	——→	10SW-20SW	———	———	——→
RANGE										
VOLTAGE	400	400	400	300	400	400	300	350	380	350
CURRENT	4	4	4	4	4	4	4	4	4	4
SEND	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5		
RECEIVE	20SW 30SW	———	———	——→	30SW-40SW		———	——→		
RANGE										
VOLTAGE	250	325	380	350	250	325	390	350		
CURRENT	4	4	4	4	4	4	4	4		

FREQUENCIES AC ——— DC

SENDER NO. 66445

OPERATOR Jerome

RECEIVER NO.

OPERATOR Ron

COMMENTS:

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT_____

LINE____ HALF____ SP.____ DATE____

SEND	1-2	2-3	3-4			CAL 1-2				
RECEIVE	40SW	- 50	3W							
RANGE										
VOLTAGE	250	325	390			100				
CURRENT	4	4	4			100 4.8				
SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										

FREQUENCIES AC ____ DC

SENDER NO. 66445

OPERATOR Lawn

RECEIVER NO.

OPERATOR Ron

COMMENTS:

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PROJECT Occidental

LINE 2 HALF 3 SP. ____ DATE 2-22-67

PAGE 1

SEND	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5
RECEIVE	ZONE-10	10-0 →	→	0-10 SW →	→	→	10-SW-20 SW →	→	→	→
RANGE	300	300	100	300	100	30	300	30	30	30
DC 1	155.0	87.0	30.1	65.0	21.5	13.1	92.0	19.6	10.9	8.50
DC 2	154.5	86.0	31.4	64.0	22.6	14.8	95.0	19.9	10.7	7.80
DC 3	155.0	87.0	30.1	65.0	21.5	13.1	92.0	19.5	10.9	8.40
DC 4	154.5	86.0	31.4	64.0	22.6	14.8	95.0	20.0	10.7	8.10
DC 5								19.5		8.30
DC 6								20.0		8.10
DC 7										8.30
DC 8										8.10
DC AVG.	154.7	86.5	30.75	64.5	22.05	13.95	93.5	19.75	10.8	8.20
AC 1	149.8	83.0	29.5	62.0	21.2	13.3	90.5	18.80	10.25	7.80
AC 2	149.8	83.0	29.5	62.0	21.2	13.3	90.5	18.80	10.25	7.80
AC AVG.										
S.P.	+2.4	-7.0		-12.2			+3.8			
AC NOISE	.03	.08		.02			.03			
POT RES.		Powerline								

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT Occidental
LINE 2 HALF 3 SP. ____ DATE 2-22-67

SEND	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3
RECEIVE	20SW-30SW	→	→	→	30-SW	40-SW	→	→	40SW-	50SW →
RANGE	100	30	30	30	30	30	30	10	30	10
DC 1	31.4	11.5	8.10	6.50	17.5	7.20	6.50	6.42	8.30	404
DC 2	28.0	10.3	7.10	6.10	20.1	9.50	6.40	6.10	8.70	448
DC 3	31.4	11.5	8.10	6.60	17.5	7.20	6.50	6.44	8.10	396
DC 4	28.0	10.3	7.10	6.00	20.1	9.50	6.40	6.02	8.60	444
DC 5	7.4		8.10	6.50				6.58	8.10	416
DC 6	10.7		7.10	6.10				6.18	8.50	454
DC 7	29.7			6.50				6.20	8.40	400
DC 8				6.10				6.04	8.50	440
DC AVG.	29.7	10.9	7.60	6.30	18.8	8.35	6.45	6.25	8.4	4.25
AC 1	28.2	10.3	7.20	6.10	18.1	7.80	6.10	5.82	8.00	4.00
AC 2	28.2	10.3	7.20	6.10	18.1	7.80	6.10	5.82	8.00	4.00
AC AVG.										
S.P.	-11.6				-4.3					
AC NOISE	.02				.02					
POT RES.										

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT Occidental
LINE 2 HALF 3 SP. ____ DATE 2-22-67

SEND	3-4		cal.							
RECEIVE	40-50cu		1-2							
RANGE	10		300							
DC 1	3.44		98.0							
DC 2	3.42		98.0							
DC 3	3.44		98.0							
DC 4	3.52		98.0							
DC 5	3.46									
DC 6	3.44									
DC 7	3.48									
DC 8	3.42									
DC AVG.	3.45									
AC 1	3.22		96.5							
AC 2	3.22		96.5							
AC AVG.										
S.P.										
AC NOISE										
POT RES.										

HEINRICHS GEOEXPLORATION COMPANY

INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project OCCIDENTAL Line #2 "A" Field date 2-22-67 Data page_____ Comp. date 2-24-67. Comp by RPF

(A) Send	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5		CAL
(B) Receive	20 NE 10	10-0	→	0-10 SW	→	→	10 SW	20 SW	→	→		1-2
(C) n separation	1	1	2	1	2	3	1	2	3	4		
(D) I	4 AMP →											
(E) Vdc (avg)	154.7	86.5	30.75	64.5	22.05	13.95	93.5	19.45	10.8	8.2		98.0
(F) DCcal	1.02											
(G) Kn x 10^{-3}	3.0	3.0	12	3.0	12	30	3.0	12	30	60		
(H) ρ dc=ExFxGx10^3/D	118	66	94	49	67	107	71	60	83	125		
(I) Vac Σ	149.8	83.0	29.5	62.0	21.2	13.3	90.5	18.8	10.25	7.80		96.5
(J) AC noise x 2												
(K) Vac(corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	.984											
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2)	1.6	2.5	2.6	2.4	2.3	3.2	1.7	3.4	3.7	3.4		
(O) MCF=(M-1)(10^5)/H	14	38	28	49	34	30	24	57	45	27		

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

(A) Send	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3	3-4	
(B) Receive	20 SW	→	→	30 SW	30 SW	→	→	40 SW	40 SW	→	50 SW	
(C) n separation	2	3	4	5	3	4	5	6	4	5	6	
(D) I	4 AMP →											
(E) Vdc (avg)	29.7	10.9	7.6	6.30	18.8	8.35	6.45	6.25	8.4	4.25	3.45	
(F) DCcal	1.02											
(G) Kn x 10^{-3}	12	30	60	105	30	60	105	168	60	105	168	
(H) ρ dc=ExFxGx10^3/D	~~88~~ 91	83	116	169	144	128	176	268	126	114	138	
(I) Vac Σ	28.2	10.3	7.2	6.1	18.1	7.8	6.10	5.02	6.0	4.3	3.22	
(J) AC noise x 2												
(K) Vac (corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	.984											
(M) ρdc/ρac =ExL/K	3.7											
(N) PFE=(M-1)(10^2)	0.74	4.1	3.9	1.6	2.2	5.3	4.0	5.7	3.3	4.5	5.4	
(O) MCF=(M-1)(10^5)/H	1.64	49	34	9.5	15	41	23	21	26	39	39	

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page 1

Project Occidental Line #2 NE ½ Field date 2/21/67 Data page _____ Comp. date _____. Comp by GGH RF

(A) Send	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2		
(B) Receive	0-10	10-20	—	20-30	—		30-40	—				
(C) n separation												
(D) I	6 amps	→	→									
(E) Vdc (avg)	304	190	58.8	269	68.6	34.4	423	87.4	42.25	25.63		
(F) DCcal	.549											
(G) Kn x 10^{-3}	3.0	3.0	12.0	3.0	12	30	3.0	12	30	60		
(H) ρ dc=ExFxGx10^3/D	84	52	65	74	75	95	116	96	116	141		
(I) Vac Σ	296	182	56.4	260	66	32.96	416	83.6	40.30	24.4		
(J) AC noise x 2	.04	.04		.02			.02					
(K) Vac(corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	.989											
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2)	1.6	3.2	3.1	2.3	2.4	3.2	2.0	3.4	3.7	3.9		
(O) MCF=(M-1)(10^5)/H	19	61	48	31	37	34	17	35	32	28		
	-3.1	-1.9		-0.3			+13.9					

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

(A) Send	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2			4-5	
(B) Receive	40-50	—	—	—	50-60	—	—	—			Cal	
(C) n separation												
(D) I	6	→	→	→	→	→	→	→				
(E) Vdc (avg)	87	36.9	23.67	17.55	37.91	20.86	15.54	12.46			182	
(F) DCcal	.549											
(G) Kn x 10^{-3}	12	30	60	105	30	60	105	168				
(H) ρ dc=ExFxGx10^3/D	96	101	130	169	103	115	149	192				
(I) Vac Σ	84.0	35.6	22.6	16.6	35.96	19.90	19.70	11.90			180	
(J) AC noise x 2	.02				.02							
(K) Vac (corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	.989											
(M) ρdc/ρac =ExL/K												
(N) PFE=(M-1)(10^2)	2.4	4.3	3.6	4.6	3.1	3.7	4.6	3.6				
(O) MCF=(M-1)(10^5)/H	25	43	28	27	30	32	31	19				
	-22.2				+5.1							

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page 2

Project Occidental Line #2 SE¼ Field date 2-21-67 Data page _____ Comp. date 2-23-67. Comp by RPF

(A) Send	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5		
(B) Receive	0-10	10 —	20	20 —	—	30	30 —	—	—	40		
(C) n separation												
(D) I	6 AMP	→										
(E) Vdc (avg)	404	297	59.4	360	93.8	34.14	404	129	56.9	25.72		
(F) DCcal	.549											
(G) Kn x 10^{-3}	3.0	3.0	12	3.0	12	30	3.0	12.0	30	60		
(H) ρ dc=ExFxGx10^3/D	56	82	65	71	103	94	111	141	156	142		
(I) Vac Σ	198	288	56.4	344	90.8	33.10	388	122	54.8	24.5		
(J) AC noise x 2	.05	.02		.02			.02					
(K) Vac(corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	.989											
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2)	1.9	2.0	4.2	3.5	2.2	2.0	3.0	4.6	2.7	4.6		
(O) MCF=(M-1)(10^5)/H	34	24	65	49	21	21	27	33	17	32		
	-2.3	+4.5		-13			+2.0					

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

(A) Send	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5				1-2
(B) Receive	40 —	—	—	50	50 —	—	—	60				CAL
(C) n separation												
(D) I	6 AMP →											
(E) Vdc (avg)	114.6	54.4	26.7	13.49	60.2	36.01	14.37	10.72				182
(F) DCcal	.549											
(G) Kn x 10^{-3}	12	30	60	105	30	60	105	168				
(H) ρ dc=ExFxGx10^3/D	126	149	147	130	165	198	186	165				
(I) Vac Σ	109.2	52	25.4	12.68	57.0	34.1	18.4	10.0				
(J) AC noise x 2												180
(K) Vac (corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	.989											
(M) ρdc/ρac =ExL/K												
(N) PFE=(M-1)(10^2)	3.8	3.5	4.0	5.2	4.5	4.4	4.1	6.1				
(O) MCF=(M-1)(10^5)/H	30	23	27	40	27	22	22	37				

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PROJECT Occidental

LINE #2 HALF SW SP. B DATE 3-7

SEND	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5
RECEIVE	60-70	70 —	— 80	80 —		— 90	90			— 100
RANGE	1000	1000	300	1000	300	100	1000	300	100	30
DC 1	308	434	110	558	179	63.2	870	115	54.6	25.3
DC 2	308	434	109	558	181	65.6	870	114	53.4	26.1
DC 3	308	434	111	558	179	63.0	870	115	54.4	25.1
DC 4	308	434	109	557	181	65.8	870	114	53.4	25.9
DC 5						62.8				25.5
DC 6						65.9				25.8
DC 7										25.5
DC 8										25.6
DC AVG.	308	434	109.4	557.8	180	64.4	870	114.5	53.9	25.6
AC 1	298	422	106	539	174	62.0	839	111	52.2	24.6
AC 2	298	422	106	539	174	62.0	839	110	52.2	24.6
AC AVG.										
S.P.	+7.1	-5.7	→	-7.4	→	→	-1.0			
AC NOISE	.22	.24	→	.18	→	→	.15			
POT RES.										

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES INT 98

PROJECT OCCIDENTAL
LINE #2 HALF SW SP. B DATE 3-9

SEND	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5		CALC
RECEIVE	180			1800	170			180W		2-3
RANGE	300	30	30	30	100	30	30	10		
DC 1	114	28.5	17.9	10.7	45.4	15.0	11.5	7.90		99
DC 2	114	28.1	19.0	10.6	44.8	14.7	11.5	7.88		100
DC 3	114	28.8	17.9	10.6	45.2	14.7	11.5	7.90		99
DC 4	114	28.3	18.8	10.7	45.6	14.6	11.8	7.80		105
DC 5		28.5	18.0	10.6	45.0	14.9	11.4	7.86		
DC 6		28.5	18.8	10.6	45.0	14.6	11.6	7.88		
DC 7		28.4	17.9			15.0	11.6	7.90		
DC 8		28.4	19.1			14.6	11.5	7.92		
DC AVG.	114	28.4	18.41	10.63	45.0	14.73	11.56	7.88		
AC 1	110.5	27.7	18.0	10.4	43.8	14.3	11.2	7.54		99
AC 2	110.5	27.7	17.9	10.4	43.8	14.4	11.2	7.54		99
AC AVG.										
S.P.	-11.1	→	→	→	+11.1					
AC NOISE	.10	→	→	→	.08					
POT RES.										

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT OCCIDENTAL

LINE 2 HALF SW¼ SP. B DATE 8-7-67

PAGE

SEND	4/5	3/4	4/5	3/3	3/4	4/5	1/2	2/3	3/4	4/5
RECEIVE										
RANGE										
VOLTAGE	410	300	410	280	300	420	480	280	300	420
CURRENT	4	4	4	4	4	4	4	4	4	4
SEND	1/2	2/3	3/4	4/5	1/2	2/3	3/4	4/5		occ 2-3
RECEIVE										
RANGE										
VOLTAGE	480	280	300	420	460	280	300	420		100
CURRENT	4	4	4	4	4	4	4	4		1

FREQUENCIES B E

SENDER NO. 66445

OPERATOR D.S.

RECEIVER NO.

OPERATOR

COMMENTS:

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT Occidental
LINE #2 HALF NE SP. B DATE 3-7

SEND	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2
RECEIVE	40-50	50 ——	40	40 ——	——	30	30	——	——	20
RANGE	1000	1000	300	1000	300	100	300	100	100	30
DC 1	420	302	106	410	135	79.9	250	90.0	37.0	27.5
DC 2	420	301	104	410	137	77.8	245	89.2	37.0	27.7
DC 3	420	302	106	408	134	79.6	249	90.0	37.0	27.4
DC 4	420	301	104	410	138	78.8	245	89.2	37.0	27.5
DC 5				409	134	79.0	248			28.0
DC 6				410	136	78.0	245			27.4
DC 7						79.4				27.8
DC 8						77.8				27.0
DC AVG.	420	301.5	105	409	135.9	78.8	247	89.6	37.0	27.6
AC 1	408	294	102	399	132	76.0	239	86.4	35.9	26.4
AC 2	409	293	102	399	132	76.0	239	86.4	35.9	26.4
AC AVG.										
S.P.	-1.1	-1.4	→	-10.7	——→		-2.6	——	——→	
AC NOISE	.28	.20	→	.18	——→		.08	——	——→	
POT RES.										

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT Occidental
LINE #2 HALF WE SP. B DATE 3-7

SEND	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2		CAL
RECEIVE	20	—	—	100	10	—	—	0		3-4
RANGE	100	30	30	30	30	30	10	10		99
DC 1	41.2	22.0	11.2	105	20.3	12.5	7.20	7.50		98
DC 2	40.4	22.0	11.6	103	20.0	13.0	7.52	7.16		99
DC 3	41.3	22.1	11.1	105	20.5	12.4	7.10	7.48		98
DC 4	40.4	21.8	11.5	99	20.1	13.0	7.30	7.30		
DC 5		22.3	11.4	104	20.3	12.3	7.30	6.99		
DC 6		21.8	11.4	9.9	20.3	13.2	7.48	7.30		
DC 7				104	20.2	12.2	7.08	7.78		
DC 8				10.1	20.5	13.1	7.54	6.86		
DC AVG.	40.8	22.0	11.38	10.24	20.26	12.70	7.31	7.31		
AC 1	40.0	21.4	11.0	9.9	19.6	12.3	7.04	7.02		98
AC 2	40.0	21.4	11.0	9.9	19.6	12.3	7.04	7.02		98
AC AVG.										
S.P.	+1.0	?	→		-1.2					
AC NOISE	.08	—	→		.06					
POT RES.										

14.56
14.44
14.60
14.54

59
4 236
20

14.59

7.295

2-3
7.38
7.20
7.22
7.56
~~7.40~~
7.20
7.34

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT OCCIDENTAL

LINE 2 HALF ~~NE~~ SP. B DATE ~~3-7-67~~

PAGE

SEND	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2
RECEIVE										
RANGE										
VOLTAGE	~~480~~	260	480	300	260	480	400	300	260	460
CURRENT	4	4	4	4	4	4	4	4	4	4
SEND	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2		~~2-3~~ 3-4
RECEIVE										
RANGE										
VOLTAGE	400	300	260	460	400	300	260	460		100
CURRENT	4	4	4	4	4	4	4	4		1

FREQUENCIES ____ ____

SENDER NO.

OPERATOR

RECEIVER NO.

OPERATOR

COMMENTS:

GEOEXPLORATION COMPANY

BOX 5671. TUCSON, ARIZONA, 85703.
PHONE (AREA CODE 602) 623-0578
Cable: GEOEX

I.P. COMPUTING FORM

PROJECT Oracle

CLIENT Occidental "a" SPACING 1000' DATE 3/16/67

LINE 2 Spread B SPREAD B BEARING N45°E

HALF NE	SEND	1-2	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2	4-5	3-4	2-3	1-2
	RECEIVE	60-50W	50-40W	→	40-30W	→	→	30-20W	→	→	→	20-10W	→	→	→	10W-0E W	→	→	→
) CURRENT IN AMPS: I		4																	→
) V(DC AVG.) MILLIVOLTS		420	301.5	105	409	135.9	78.8	247	89.6	37.0	27.6	40.8	22.0	11.38	10.24	20.26	12.7	7.31	7.31
) K_n / 1000		3	3	12	3	12	30	3	12	30	60	12	30	60	105	80	60	105	168
DC /2π =(2)(3)(DC CAL)/(1)		320	230	320	311	414	600	188	273	282	420	124	167	173	273	154	193	195	312
) V(AC AVG.) MILLIVOLTS		408.5	292.5	102	399	132	76.0	239	86.9	35.9	26.4	40.0	21.4	11.0	9.9	19.6	12.3	7.04	7.02
)AC NOISE MILLIVOLTS		O.K																	
) V(AC CORR) MILLIVOLTS																			
FE=[(2)(AC/DC CAL)/(6)-1]100																			
CF = 1000 PFE/P_{DC}/2π		2.3	2.2	2.4	2.0	2.4	3.2	2.8	3.2	2.5	4.0	1.5	2.3	2.9	2.9	2.9	2.7	3.3	3.6
P IN MILLIVOLTS		7	10	8	6	6	5	15	12	9	10	12	14	17	11	19	14	17	12

CALIBRATION	HALF	NE	SW
END		3-4	2-3
ECEIVE		50W	70W
) CURRENT IN MILLIAMPS: I CAL		1000	1000
) V CAL (DC AVG.) MILLIVOLTS		98.5	99.5
DC CAL = (1)/10 (2)		1.015	1.005
3) V CAL (AC AVG.) MILLIVOLTS		98.0	99.0
C/DC CAL = (3)/(2)		.995	.995

COMPUTED BY:

CHECKED BY:

RECEIVER OPERATOR

FORMULAS:

$K_n = \frac{an(n+1)(n+2)}{2}$ (a is in feet)

$V(AC\ CORR) = (6) = \sqrt{(4)^2 - (5)^2}$

USE ONLY IF AC NOISE x 10 IS GREATER THAN V(AC AVG.) OTHERWISE USE (4)

HALF	SEND	4-5	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5
	RECEIVE	60-70W	70-80	→	80-90W	→	→	90-100	→	→	→	100-110W	→	→	→	110-120W	→	→	→
) CURRENT IN AMPS: I		4																	→
) V(DC AVG.) MILLIVOLTS		308	434	109.8	557.8	180	64.4	870	114.5	53.9	25.6	114	26.4	18.41	10.63	45.0	14.73	11.56	7.88
) Kn /1000		3	3	12	3	12	30	3	12	30	60	12	30	60	105	80	60	105	168
DC / 2π =(2)(3)(DC CAL) /(1)		232	327	331	420	543	485	656	345	406	386	344	214	278	280	339	222	305	333
) V(AC AVG.) MILLIVOLTS		298	422	106	539	174	62.0	839	110.5	52.2	24.6	110.5	27.7	17.95	10.4	43.8	14.35	11.2	7.54
5) AC NOISE MILLIVOLTS		O.K.																	
6) V(AC CORR) MILLIVOLTS																			
FE=[(2)(AC/DC CAL)/(6)-1]100																			
CF=1000PFE/P_{DC}/2π		2.8	2.3	3.1	3.0	2.9	3.4	3.2	3.1	2.7	3.5	2.7	2.0	2.0	1.7	2.2	2.1	2.7	4.0
P IN MILLIVOLTS		12	7	9	7	5	7	5	9	7	9	8	9	7	6	6	9	9	12

HEINRICHS GEOEX. INDUCED POLARIZATION SECTIONAL DATA PLOT, LOOKING_____

×	× 71	× 49	× 66	× 118	×	×	×		
	× 91	× 60	× 67	× 94	×	×	×		
× 144	× 83	× 83	× 107	×	×	×	×	$\frac{\rho_{DC}}{2\pi}$	
× 128	× 128	× 116	× 125	×	×	×	×		
× 114	× 176	× 169	×	×	×	×	×		
	× 138	× 268	×	×	×	×	×		

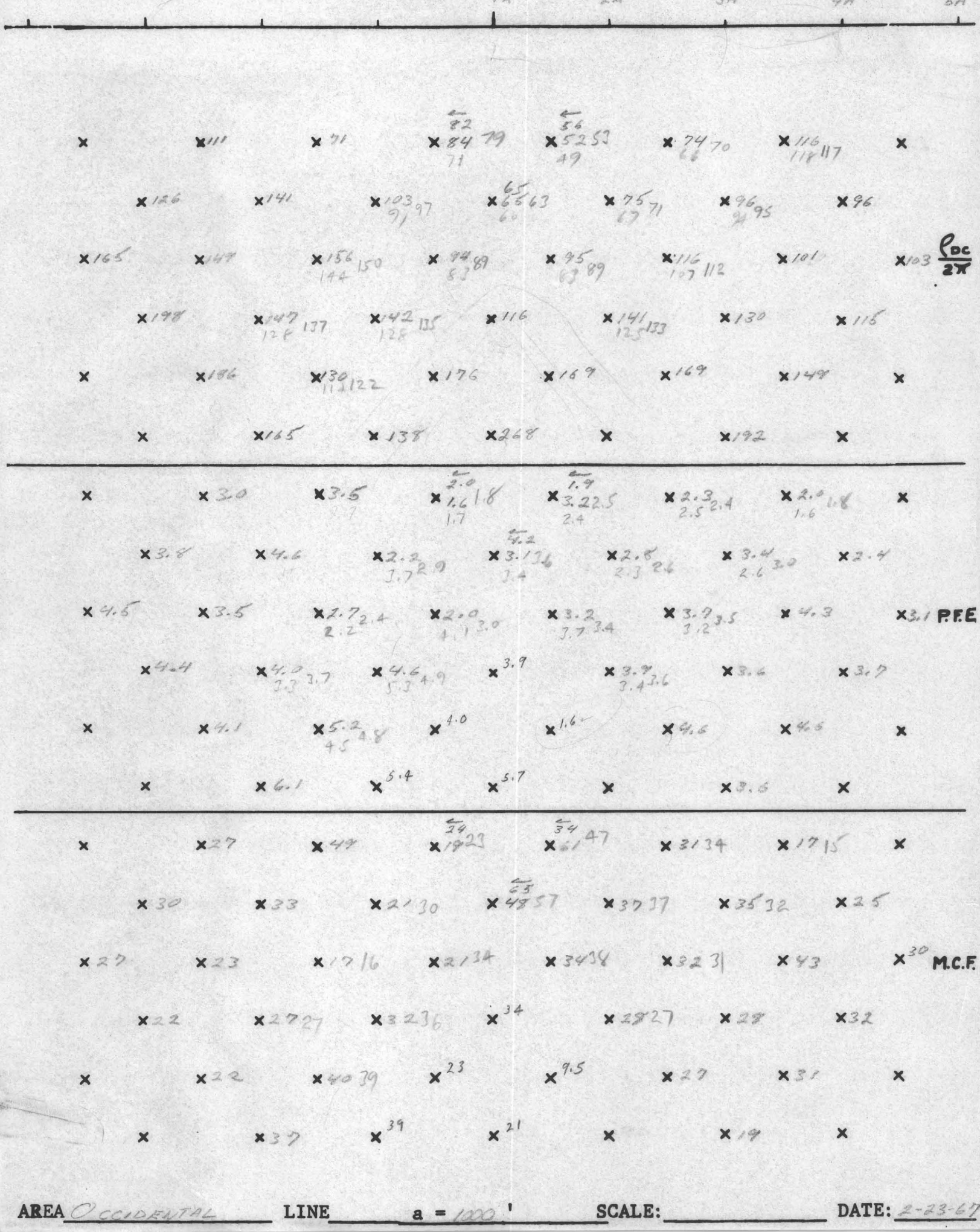
×	× 1.7	× 2.4	× 2.5	× 1.6	×	×	×		
	× 3.7	× 3.4	× 2.3	× 2.6	×	×	×		
× 2.2	× 4.1	× 3.7	× 3.2	×	×	×	×	P.F.E	
× 3.3	× 5.3	× 3.9	× 3.4	×	×	×	×		
× 4.5	× 4.0	× 1.6	×	×	×	×	×		
	× 5.4	× 5.7	×	×	×	×	×		

×	× 24	× 44	× 38	× 14	×	×	×		
	× 41	× 57	× 34	× 28	×	×	×		
× 15	× 49	× 45	× 30	×	×	×	×	M.C.F.	
× 26	× 41	× 34	× 27	×	×	×	×		
× 39	× 23	× 9.5	×	×	×	×	×		
	× 39	× 21	×	×	×	×	×		

AREA_____ LINE_____ a = ' SCALE:_____ DATE:_____

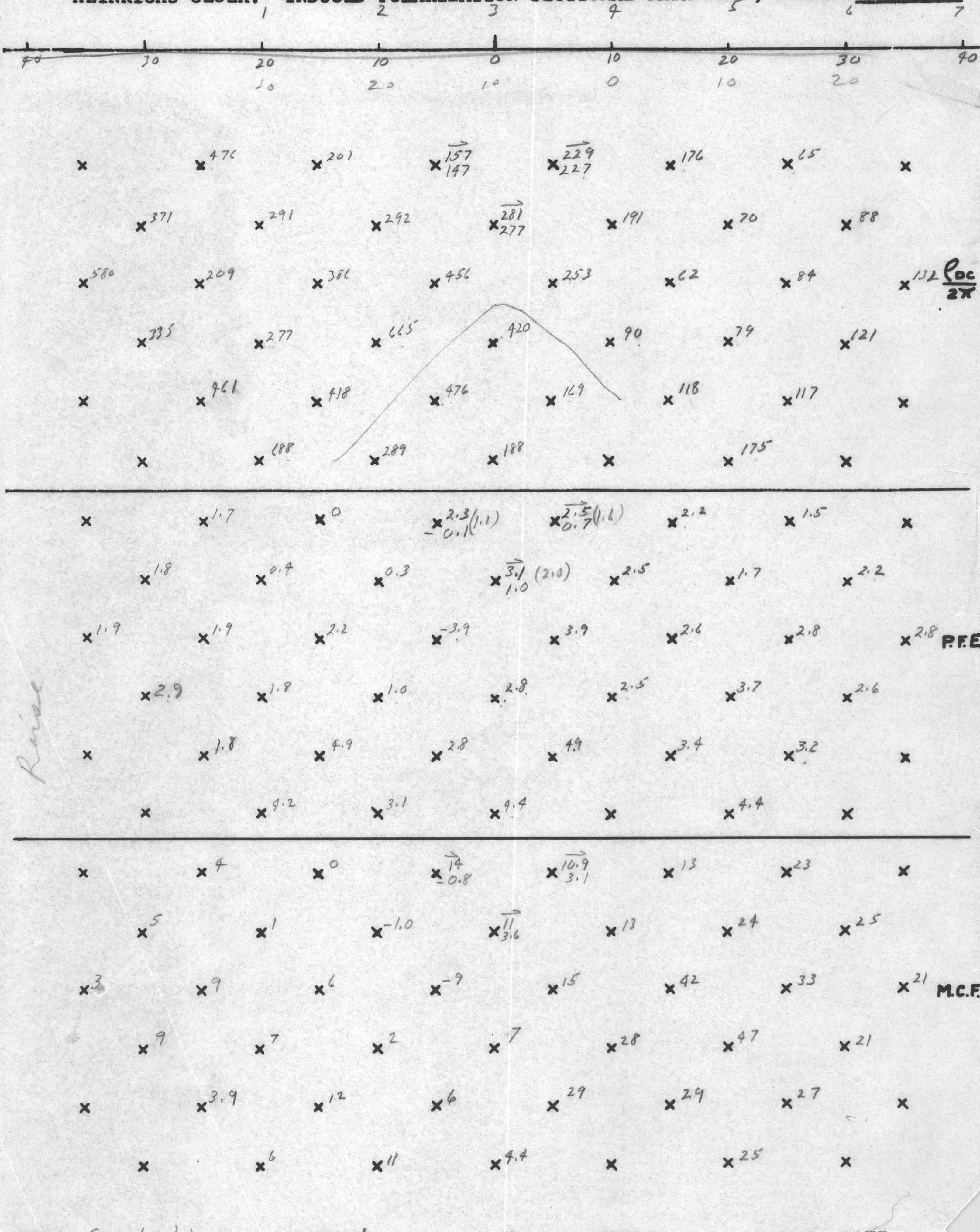
HEINRICHS GEOEX. INDUCED POLARIZATION SECTIONAL DATA PLOT, LOOKING NW

1 2 3 1A 4 2A 5 3A 4A 6A



AREA Occidental LINE a = 1000' SCALE: DATE: 2-23-67

HEINRICHS GEOEX. INDUCED POLARIZATION SECTIONAL DATA PLOT, LOOKING NW



AREA Occidental LINE 4 a = ' SCALE: DATE:

S T A T E M E N T

March 30, 1967

Occidental International Corp.
P. O. Drawer O
174 Comstock Avenue
Winter Park, Florida 32789

Re: I. P. Survey
Oracle, Arizona
Our Job - B118-67
Revised Billing

Credit your billing on the above captioned project dtd March 8, 1967 in the amount of $350.00, based on conference of Geoex staff and Charles Elliott, Occidental Consultant.

Credit as follows:

Computation, office staff	$ 100.00
1 crew day @ $250.00/day	250.00
Total	$ 350.00

cc: Mr. Ron Haxby

Note: Consideration for basis of revised billing were poor filed production & computation time.
Rancher access problems were a factor in the poor production, however we do feel and adjustment is warranted in ay case.

S T A T E M E N T

HEINRICHS GEOEXPLORATION COMPANY

806 WEST GRANT ROAD, TUCSON, ARIZONA, 85703. P.O. BOX 5671. PHONE: (AREA CODE 602) 623-0578

March 30, 1967

Occidental International Corp.
P. O. Drawer O
174 Comstock Avenue
Winter Park, Florida 32789

Re: I. P. Survey
Oracle, Arizona
Our Job - B118-67
Revised Billing

Credit your billing on the above captioned project dtd March 8, 1967 in the amount of $350.00, based on conference of Geoex staff and Charles Elliott, Occidental Consultant.

Credit as follows:

Computation, office staff	$ 100.00
1 crew day @ $250.00/day	250.00
Total	$ 350.00

Considerations ~~for~~ basis of revised billing were: 1. poor field production
2. ~~duplication~~ poor production ~~of~~ computation time
3.

cc: Mr. Ron Haxby

RANCHER access problems were a factor in the poor production we do feel an adj. is warranted in any case.

Occidental

P.A.H. recommendation

Computation time 20 hours make	10 hours
Drafting and typist	3
Interp checking, consultation, phone 31 hours revised	21
	34 hours

200.00

Field days

Feb	18	1 day	1
"	25	1, 1, 1 (hooked up ff pot), 1/2, 1/2	1, 1, 1, 1/2, 1/2
Mar	4	1/2, 1, 1/2, 1, 1	1/2, 1, 1/2, 1, 1
Mar	11	1, 1	1/2, 1
		11 days	8 + 2 days at 50% = 9 days

7 1/2 spreads = 8 days ± 1000' dyn.

500.00

Revised billing
Credit your billing of
3/?/67 in amount of 380.00
based on conference
E.G.H., C.S.L. P.A.H. (of Geo... staff) & C.E. consultant to Oxy

TO

Mr. Ron Haxby
5550 N. Maria Drive
Tucson, Arizona 85704

HEINRICHS GEOEXPLORATION COMPANY
808 W. GRANT ROAD - P. O. BOX 5671
TUCSON, ARIZONA 85703
Area Code 602 Phone 623-0578
Geophysical Exploration Research Engineering

SUBJECT: Our Job B118-67 DATE: 3/17/67

2ND FOLD

Dear Mr. Haxby,

In answer to your request (to Paul Head), I am sending you copies of the crew sheets on the above captioned job.

These will give you the details of work done on a daily basis.

If I can be of further service, please let me know.

Sincerely,

Dorothy F. Bunting - BK

1ST FOLD

PLEASE REPLY TO ⟶ SIGNED

DATE SIGNED

SEND WHITE AND PINK COPIES WITH CARBON INTACT. PINK COPY IS RETURNED WITH REPLY.

DETACH THIS COPY—RETAIN FOR ANSWER

HEINRICHS GEOEXPLORATION COMPANY

806 WEST GRANT ROAD, TUCSON, ARIZONA, 85703. P.O. BOX 5671. PHONE: (AREA CODE 602) 623-0578

March 14, 1967

Mr. Ronald Haxby
Occidental International Corporation
5550 North Maria Drive
Tucson, Arizona 85704

Dear Mr. Haxby:

Here is the letter report you requested on the induced polarization survey conducted in the Oracle Junction Area, Pinal County, Arizona, during the interim February 17 to March 7, 1967.

Four lines were surveyed in the area of interest, all on 1000 foot dipole spacings and 1/2 mile line separations. All four lines are N45E-S45W and stations are measured from a 0-NE/SW baseline (see plan). A total of 56,000 feet were traversed of which 36,000 feet is subsurface plotted data. At the request of your consultant, Mr. Elliott, we filled in several of the deeper (larger "n") readings, which are worthwhile, but cost somewhat more to obtain in routine preliminary reconnaissance work and are therefore, sometimes left out on a statistically valid calculated risk basis. A plan sketch and four sectional data sheets are included.

No indications of significant sulfide polarization effects were seen on any of the lines. Some increase in frequency effects were seen with depth, but mainly in the areas of deeper alluvium to the northeast and can be attributed mostly to inductive coupling interference. After correcting for the coupling effects, the remaining values are typical background frequency effects for alluvium and barren granitic material. Therefore, within the area surveyed, down to around 2000 feet below surface, there are no large porphyry-type sulfide bodies evident.

The apparent resistivities show a major interface striking NNE and going through Line 2 at about 30SW and Line 4 at 20NE. This interface shows more resistive material to the west and may be a granite-alluvium fault scarp.

Apparently the exposed mineralization represents a minor series of small veins or possibly some sort of segregation phenomenon. Spatially the mineral may have migrated from considerable distance, or represents deep roots of former mineral long since removed.

If we can be of further service to you, please let us know.

Very truly yours,

HEINRICHS GEOEXPLORATION COMPANY

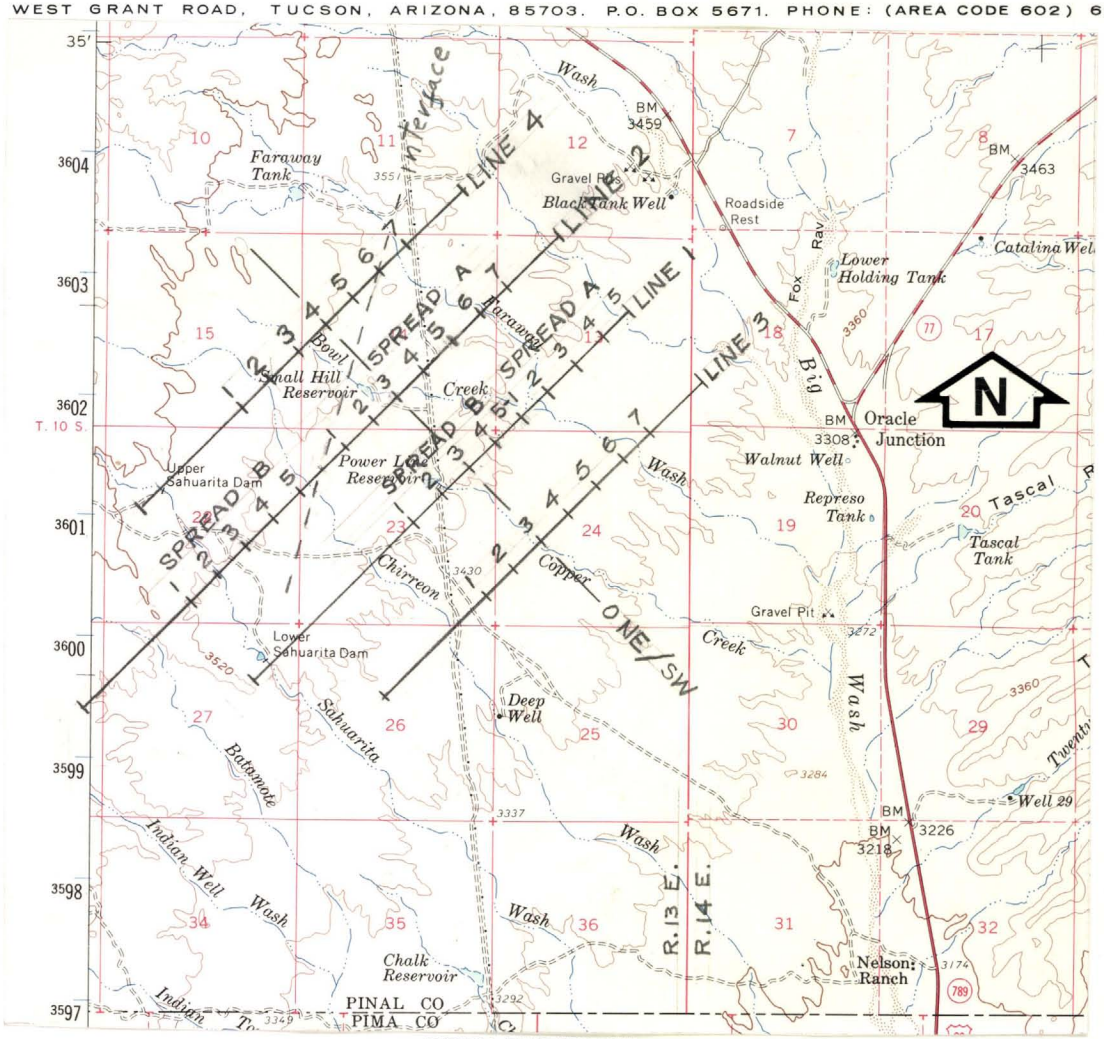
Chris S. Ludwig

Chris S. Ludwig
Senior Geophysicist

CSL:jc
Enclosures

HEINRICHS GEOEXPLORATION COMPANY

806 WEST GRANT ROAD, TUCSON, ARIZONA, 85703. P.O. BOX 5671. PHONE: (AREA CODE 602) 623-0578



PRELIMINARY
INDUCED POLARIZATION
LOCATION PLAN
ORACLE JUNCTION AREA

For

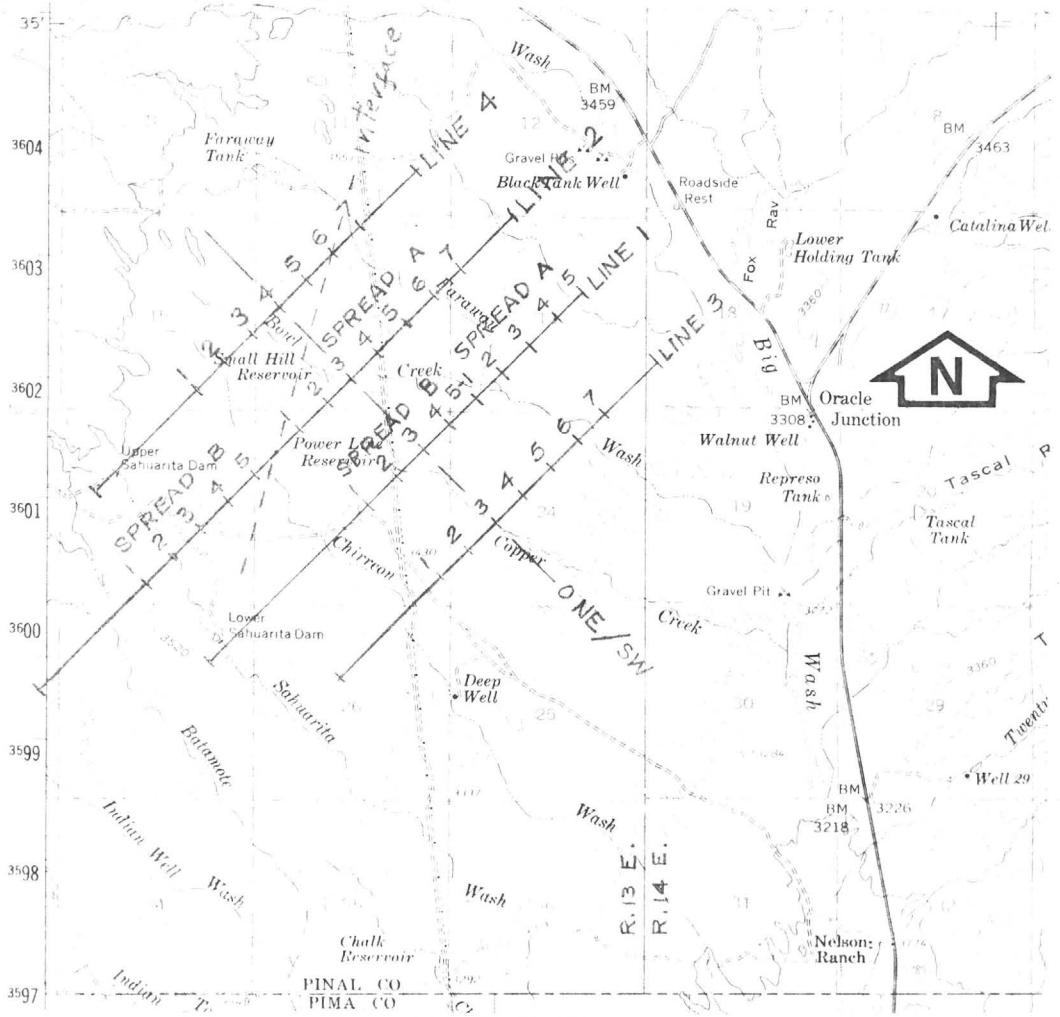
OCCIDENTAL INTERNATIONAL CORPORATION

Scale: 1" = 1 mile March 1967

DATA FROM ORACLE, ARIZONA 15' QUADRANGLE
PINAL COUNTY, ARIZONA

HEINRICHS GEOEXPLORATION COMPANY

806 WEST GRANT ROAD, TUCSON, ARIZONA, 85703. P.O. BOX 5671. PHONE: (AREA CODE 602) 623-0578



PRELIMINARY
INDUCED POLARIZATION
LOCATION PLAN
ORACLE JUNCTION AREA

For

OCCIDENTAL INTERNATIONAL CORPORATION

Scale: 1" = 1 mile March 1967

DATA FROM ORACLE, ARIZONA 15' QUADRANGLE
PINAL COUNTY, ARIZONA

S T A T E M E N T

March 14, 1967

Occidental International Corp.
P. O. Drawer O
174 Comstock Avenue
Winter Park, Florida 32789

Re: I. P. Survey
Oracle, Arizona Area
Job E118-67

Week ending March 11, 1967 3 man crew - 2 days @ $250.00/day	$ 500.00
Vehicle rental - 2 days @ $20.00/day (2 veh.)	40.00
Mileage - 200 miles @ 12¢/mile	24.00
Supplies	7.29
Computation & compilation 170	185.00
Total	$ 756.29
Balance	1,272.61
Total Due	$ 2,028.90

cc: Mr. Ron Haxby

BILLING

CLIENT Occidental BILLING NO. _____

AREA _____ TYPE OF WORK I.P.

DATE	CHARGE	AMOUNT
wk end 3/11		
2 man crew - 2 days @ 250.00/day		500.00 ~~00~~
wk end 3/11		
Depelchak - 4 hrs. ✓ Ludwig - 8 hrs. ✓	12	120.00
3/14		
Ludwig - 5 hrs. ✓ - 50 Jennid - 2 hrs. ✓ - 10 Downs - 1 hr. ✓ - 5	65	65.00 185.00
VEHICLE RENTAL: 2 days @ 20.00/day		~~40.00~~
MILEAGE: 200 miles @ .13¢/mi.		24.00
EXPENSES: LIVING & TRAVEL		
MAPS		
MISC. 10.00		7.29 ~~6.69~~
PHONE		
REPORT:		
TOTAL HOURS:		
REMARKS, ETC:		
	TOTAL	136.29 ~~130.69~~

March 8, 1967

S T A T E M E N T

Occidental International Corp.
P. O. Drawer O
174 Comstock Avenue
Winter Park, Florida 32789

re: Oracle I.P., Ariz.,
Our billing - B118-67.

Week ending Feb. 18, 1967		
One day @ $250.00/day		$ 250.00
Week ending Feb. 25, 1967		
Four days @ $250.00/day		1000.00
One day		N-C
Week ending March 4, 1967		
Three days at $250.00/day		750.00
Two days - 1/2 day each @ $250.00/day		250.00
Vehicle rental:		
One day - two vehicles, five days - two vehicles, five days - two vehicles.		220.00
Mileage: 84, 500, & 520 @ 0.12¢/mile		132.48
Computation	3F 20 54	340.00
Misc. supplies		29.43
Communications		.70
	Sub total	$2972.61
	Advance	1700.00
	Total	1272.61

cc: Mr. Ron Haxby

BILLING

B118-67

CLIENT Occidental

BILLING NO. 1

AREA Pinal Co, Ariz.

TYPE OF WORK I.P.

DATE	CHARGE	AMOUNT
wk end 2/18/67	- 1 day @ 250.00/day	250.00
wk end 2/25	- 4 day @ " "	1000.00
	1 day (~~?~~	N/C
wk end 3/4	- 3 days @ 250.00/day	750.00
	2 days 1/2 day ea @ 250.00/day	250.00
Cooley - 1 hr; Fidelchuk - ~~5~~ 10 hrs; Geal - 1~~8~~ "; Ludwig - ~~3~~ 11; Palmer - 1 "	34 hrs	~~420.00~~ 340.00
~~Cooley - 1~~ ~~Fidelchuk 4~~		

VEHICLE RENTAL: 1 day (2 veh) 5 day (2 veh), 5 day (2 veh) — 220.00

MILEAGE: 84, 500, 520, @ 12¢ mile — 132.48

EXPENSES: LIVING & TRAVEL

MAPS

MISC. 1% — 29.43

PHONE 50 + 15/15 — .70

REPORT:

TOTAL HOURS:

REMARKS, ETC:

TOTAL 2972.61

Adv. 1700.00

1272.61

cc Mr. Ron Horsley

HEINRICHS GEOEXPLORATION COMPANY
CREW AND EXPENSE STATEMENT

HEINRICHS GEOEX

WEEK ENDING Feb 18. 1967
NAME OF PROJECT Occidental
CREW CHIEF R. Palmer
ADDRESS

TYPE OF WORK I.P.
ENTER ALL TIME AND ALL EXPENSES FOR EACH MAN

	NAME	HOURS														Wages (do not use)	Vehicle		Other Expenses			Description or Remarks	Record of Work Done
		GP	TR	C	MNT	GY	SVY	SMP	HE	DRI	DFT	OF	SPV	UN			No.	Mi.	Lodging	Meals	Misc.		
	Brt. Fwd. (Do not use)																						
SUN.																							
MON.																							
TUES.																							
WED																							
THURS.																							
FRI.	R.P.	8	1	1	2												3	42				Layed out line 1 Ran pants Cky. Fell	
	Loren	8	1		2												24	42					
	Pete	8	1		2																		
	Kiff	8	1		2																		
SAT.	R.P.											1											
	Cum. Total (Do not use)																						

GP - Geophysical
TR - Travel Time
C - Computing
MNT - Equip. Maint.
SVY - Survey
SMP - Sampling
HE - Heavy Exploration
DRI - Drilling
OF - Office
SPV - Supervision
UN - Unclassified

Report Compiled by
Notes

HEINRICHS GEOEXPLORATION COMPANY
CREW AND EXPENSE STATEMENT

78180
78301

HEINRICHS GEOEX

WEEK ENDING Feb 25 1967
NAME OF PROJECT Occidental Pet. Co.
CREW CHIEF Ron. Palmer
ADDRESS

TYPE OF WORK I.P.
ENTER ALL TIME AND ALL EXPENSES FOR EACH MAN

Day	NAME	GP	TR	C	MNT	GY	SVY	SMP	HE	DRI	DF T	OF	SPV	UN	Wages (do not use)	Vehicle No.	Vehicle Mi.	Lodging	Meals	Misc.	Description or Remarks	Record of Work Done
	Brt. Fwd. (Do not use)																					
SUN.																						
MON.	Ron	8½	1½													6	50					Completed line 1.
	Pete	8½	1½													25	50				✓ Gull chg	
	Loren	8½	1½																			
	Kirt	8½	1½																			
TUES.	Ron	8	1½													6	50					Layed out & Ran Line 2
	Pete	8	1½													25	50				✓ Gull chg	
	Loren	8	1½																			
	Kirt	8	1½																			
WED	Ron	4	1½		4½											6	50	[illegible]			✓ Gull chg	Ran Sp 3 Line 2. Equip trouble Layed out Line 3
	Pete	6½	1½		2											25	50					
	Loren	6½	1½		2																	
	Kirt	6½	1½		2																	
THURS.	Ron	3½	1½		2							2				6	50				½	Sender breakdown Layed out rest of line 3.
	Pete	5½	1½									2				25	50					
	Loren	5½	1½									2										
	Kirt	5½	1½									2										
FRI.	BOB/HARRY	9	1½													6	50				✓ ½	RAN ⅓ of LINE #3 UNTIL MK 4 BROK DOWN
	PETE	8	1½													25	50					
	LOREN	8	1½																			
	KIRT	8	1½																			
SAT.																						
	Cum. Total (Do not use)															aos. 1939						

GP - Geophysical
TR - Travel Time
C - Computing
MNT - Equip. Maint.
SVY - Survey
SMP - Sampling
HE - Heavy Exploration
DRI - Drilling
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UN - Unclassified

Report Compiled by
Notes

10@d 50¢@.12

HEINRICHS GEOEXPLORATION COMPANY
CREW AND EXPENSE STATEMENT

HEINRICHS GEOEX

WEEK ENDING MAR. 4 19 67
NAME OF PROJECT OCCIDENTAL
CREW CHIEF BOB FREDERICKS
ADDRESS

TYPE OF WORK I.P.
ENTER ALL TIME AND ALL EXPENSES FOR EACH MAN

	NAME	HOURS GP	TR	C	MNT	GY	SVY	SMP	HE	DRI	DFT	OF	SPV	UN	Wages (do not use)	Vehicle No.	Mi.	Other Expenses Lodging	Meals	Misc.	Description or Remarks	Record of Work Done
	Brt. Fwd. (Do not use)																					
SUN.																						
MON.	BOB	2	2		6											Toy	50				OMAN BREAK DOWN FOLLOWED BY MK 4 FAILURE	PUT IN 3 PITS LINE #4 *
	LORAN	2	2		6											CMC	50		½ day			½
	HARRY	5	1		4											25	100					
	KIRT	5	1		4																	
TUES.	BOB	9	1½	1	½											Toy	50					RAN BOTH SIDES OF LINE #3
	LORAN	9	1½													25	50		1 day			1
	HARRY	9	1½	1																		
	PETE	9	1½																			
WED	BOB/HARRY	5	1½		4											Toy	50				GEN. MALFUNCTION	RAN SP 'B' C 3 ½ OF LINE 3
	LORAN	5	1½		4											25	70		½ day			½
	PETE	5	1½		4																	
	KIRT	5	1½		4																	
THURS.	BOB/HARRY	9	1½													Toy	50					PUT IN LINE 4 AND RAN INF ½
	LORAN	9	1½													25	50		1 day			1
	PETE	9	1½																			
	KIRT	9	1½																			
FRI	BOB	9	1½													Toy	50					RAN SW ½ LINE 9 AND FILLED IN CENTER
	HARRY	9	1½													25	50		1 day			1
	PETE	9	1½																			
	LORAN	9	1½																			
SAT.																						
	Cum. Total (Do not use)																					

GP - Geophysical
TR - Travel Time
C - Computing
MNT - Equip. Maint.
SVY - Survey
SMP - Sampling
HE - Heavy Exploration
DRI - Drilling
OF - Office
SPV - Supervision
UN - Unclassified

Report Compiled by BOB
Notes

HEINRICHS GEOEXPLORATION COMPANY
CREW AND EXPENSE STATEMENT

WEEK ENDING MARCH 11 19 67
NAME OF PROJECT OCCIDENTAL
CREW CHIEF BOB FEDELCHAK
ADDRESS

TYPE OF WORK I.P.
ENTER ALL TIME AND ALL EXPENSES FOR EACH MAN

	NAME	HOURS GP	TR	C	MNT	GY	SVY	SMP	HE	DRI	DFT	OF	SPV	UN	Wages (do not use)	Vehicle No.	Vehicle Mi.	Other Expenses Lodging	Meals	Misc.	Description or Remarks	Record of Work Done
	Brt. Fwd. (Do not use)																					
SUN.																						
MON.	BOB	5½	1½		2											25	50					SET UP LINE 2 SP "B" *
	PETE	5½	1½		2											GMC	50					
	LORAN	5½	1½		2																	
		5½	1½		2																	
TUES.	BOB	8½	1½													25	50				V.W. BROKE DOWN BUT WAS REPAIRED IN FIELD	RAN LINE 2 SP "B"
	PETE	8½	1½													GMC	50					
	BUZZ	8½	1½																			
WED																						
THURS.																						
FRI.																						
SAT.																						
	Cum. Total (Do not use)																					

GP - Geophysical
TR - Travel Time
C - Computing
MNT - Equip. Maint.
SVY - Survey
SMP - Sampling
HE - Heavy Exploration
DRI - Drilling
OF - Office
SPV - Supervision
UN - Unclassified

Report Compiled by R.P.F.
Notes

CARD NO. 184 601 113 6 HUMBLE

8 68 0299149

MO. GOOD THROUGH YR.

AMERICAN

SOLD TO

HEINRICHS GEOEXPL COMPANY

19886 - mil

THANK YOU

SOLD BY

W G RICH 81223
TUCSON ARIZ 16

DATE 2 24 67

CUSTOMER'S COPY
THIS IS A CREDIT SALE

PRODUCTS		QUANTITY	PRICE	AMOUNT
GAS: AMERICAN Super Premium	AMERICAN Regular			
OIL: ☐ LDO ☐ Super-PERMALUBE	☐ PERMALUBE ☐ AMOLUBE ☐ QUAKER STATE			
700 x 15 tube				3 95
				1 00
				12
			TOTAL CHARGE	$ 5 07

T.B.A. BUDGET PLAN
NO DOWN PAYMENT
☐ 3 MOS. OVER $15
☐ 6 MOS. OVER $50
☐ 9 MOS. OVER $75
☐ 12 MOS. OVER $100

TGR 108
LICENSE NUMBER

ARIZ
STATE

UNDERSIGNED AGREES TO PAY SERVICE CHARGES APPLICABLE TO BUDGET PLAN PURCHASES AS STATED ON REVERSE SIDE.

X GOODS AS SHOWN HEREON AND COPY OF THIS INVOICE RECEIVED.

PURCHASER

FORM U-090-D REV. 7-64

0 1 2 3 4 5 6 7 8 9

CUSTO[illegible] AGREES TO PAY AMERICAN OIL COMPANY UPON RECE[illegible] STATEMENT FOR ALL PURCHASES, INCLUDING SERV[illegible] [illegible]RGES NOT EXCEEDING 1½% PER MONTH THAT MAY BE IMPOSED ON PAST DUE BALANCES.

FEDERAL, STATE AND LOCAL TAXES, WHEN APPLICABLE, ARE INCLUDED IN PRICE AND AMOUNT.

AMERICAN GASOLINES ARE BARGAINS - BUT DIRECT TA[illegible]
ADD SOME 50 PER CENT TO WHAT YOU PAY FOR EACH GA[illegible]

STATE AND FEDERAL MOTOR FUEL TAXES IN CENTS PER GALLON

(As of July 1, 1964)

Federal Tax 4c a Gallon

TOTAL TAX (STATE AND FEDERAL) IN EACH STATE, AS FOLLOWS:

Ala.	11¢	Ill.	9¢	Mont.	10¢	R. I.	11¢
Alaska	12¢	Ind.	10¢	Neb.	11¢	S. C.	11¢
Ariz.	10¢	Ia.	10¢	Nev.	10¢	S. D.	10¢
Ark.	10½¢	Kans.	9¢	N. H.	11¢	Tenn.	11¢
Calif.	11¢	Ky.	11¢	N. J.	10¢	Tex.	9¢
Colo.	10¢	La.	11¢	N. M.	10¢	Utah	10¢
Conn.	10¢	Me.	11¢	N. Y.	10¢	Vt.	10½¢
Del.	10¢	Md.	11¢	N. C.	11¢	Va.	11¢
D. C.	10¢	Mass.	9½¢	N. D.	10¢	Wash.	11½¢
Fla.	11¢	Mich.	10¢	Ohio	11¢	W. Va.	11¢
Ga.	10½¢	Minn.	10¢	Okla.	10½¢	Wisc.	10¢
Hawaii	9¢	Miss.	11¢	Ore.	10¢	Wyo.	9¢
Idaho	10¢	Mo.	9¢	Pa.	11¢		

(Not included: county and municipal gasoline taxes: state and local taxes)

Customer agrees to the following for purchases made on 3, 6, 9, and 12 month budget plan.

1. Customer agrees to pay the time sale price for each item purchased consisting of:
   a. The cash sale price, and
   b. An amount of credit service charge computed at 1½% of the balance, or such lesser amounts as permitted by laws of the state in which sale is made, at the beginning of each monthly billing period, until the full amount of purchase plus service charge is paid.
2. Customer's monthly statement will include a notice showing original purchase amount, unpaid balance, current monthly service charge thereon, and current monthly installment due.
3. Customer agrees to pay monthly installment when due. If customer fails to pay any installment in full when due, full balance shall become immediately due at option of company.
4. Customer has the right to pay in advance.
5. Customer paying full balance upon receipt of first statement and notifies company, may deduct the service charge for that particular installment.

CARD NO. 184 601 113 6 8 68 00210

SOLD TO HEINRICHS GEOEXPL COMPANY

SOLD BY S S #3182
TUCSON ARIZ
DON COOKEY

DATE 2 24 67

ORDER NO. Mileage | CAR NO. 784456

ORIGINAL

For goods and services listed hereon, customer agrees to pay Seller, or its or his assignee, on or before 30 days from receipt of statement, at the principal office and place of business of Seller, or to Humble Oil & Refining Co. at Houston, Texas, if it be seller or assignee.

ITEM	QTY.	Price Incl. Tax	AMOUNT
ENCO EXTRA ☐ ENCO PLUS ☐ ENCO ☐	6.0		21 0
UNIFLO ☐ ENCO EX. M.O. ☐ ENCO M.O. ☐			
LUBRICATION ☐ WASHING ☐			
		SALES TAX	
LI NO. & STATE CR 185		TOTAL	$ 21 0

RECEIVED BY Robert Goldstein

THIS IS A CREDIT SALE TICKET
Statement to be rendered later.

HUMBLE OIL & REFINING CO.
and dealers in ENCO products.

Happy Motoring!

ENCO

8674962

Total ... all applicable federal, state and local taxes.

946-0557 (M-66)

CUSTOMER NUMBER 602 300 795 5

CARD NO. 00327

SOLD TO HEINRICHS GEOEX

#25

SOLD BY [illegible] 2375 N ALVERSON TUCSON ARIZONA

TOTAL AMOUNT INCLUDES ALL APPLICABLE STATE, FEDERAL AND LOCAL TAXES

DATE 2 21 67

LICENSE NO. AC-5146

COMPANY CAR NO.

MERCHANDISE OR SERVICE	QUANT.	PRICE	AMOUNT
☐ PREMIUM NO-NOX ☐ HALF HALF ☒ GULF TANE	6.1	339	327
☐ GULFPRIDE SINGLE G ☐ GULFPRIDE MOTOR ☐ GULF-LUBE			

SALES TAX

Total Amt. 327

PURCHASER'S SIGNATURE X [signature]

ALWAYS PRESENT TRAVEL CARD TO YOUR DEALER

GULF OIL PRODUCTS

Thank You — Gulf — Come Back Again

SOLD BY GM

CUSTOMER DELIVERY TICKET

9-E[illegible] MFS 10-66 052(WC) 257488

CARD NO. 184 291 953 0

HUMBLE FINCO. 0299244

SOLD TO JOHN W LANGS

6 67 ◀ MO. GOOD THROUGH ◀ YR.

AMERICAN

PURCHASER

FORM U-090-D REV. 7-64

SOLD BY W G RICH 81223 TUCSON ARIZ 16

DATE 3 3 67

CUSTOMER'S COPY
THIS IS A CREDIT SALE

	PRODUCTS		QUANTITY	PRICE	AMOUNT
GAS	AMERICAN Super Premium	AMERICAN Regular	15.0	32.9	3 93
OIL	☒ LDO	☐ PERMALUBE			
	☐ Super-PERMALUBE	☐ AMOLUBE			
		☐ QUAKER STATE			

T.B.A. BUDGET PLAN
NO DOWN PAYMENT
- ☐ 3 MOS. OVER $15
- ☐ 6 MOS. OVER $50
- ☐ 9 MOS. OVER $75
- ☐ 12 MOS. OVER $100

JJK-720
LICENSE NUMBER

ARIZ
STATE

UNDERSIGNED AGREES TO PAY SERVICE CHARGES APPLICABLE TO BUDGET PLAN PURCHASES AS STATED ON REVERSE SIDE.

X

GOODS AS SHOWN HEREON AND COPY OF THIS INVOICE RECEIVED.

CUSTOMER AGREES TO PAY AMERICAN OIL COMPANY UPON RECEIPT OF STATEMENT FOR ALL PURCHASES, INCLUDING SERVICE CHARGES NOT EXCEEDING 1½% PER MONTH THAT MAY BE IMPOSED ON PAST DUE BALANCES.

$ 3 93

TOTAL CHARGE

FEDERAL, STATE AND LOCAL TAXES, WHEN APPLICABLE, ARE INCLUDED IN PRICE AND AMOUNT.

AMERICAN GASOLINES ARE BARGAINS - BUT DIRECT TAXES ALONE ADD SOME 50 PER CENT TO WHAT YOU PAY FOR EACH GALLON

STATE AND FEDERAL MOTOR FUEL TAXES IN CENTS PER GALLON

(As of July 1, 1964)

Federal Tax 4¢ a Gallon

TOTAL TAX (STATE AND FEDERAL) IN EACH STATE, AS FOLLOWS:

Ala.	11¢	Ill.	9¢	Mont.	10¢	R. I.	11¢
Alaska	12¢	Ind.	10¢	Neb.	11¢	S. C.	11¢
Ariz.	10¢	Ia.	10¢	Nev.	10¢	S. D.	10¢
Ark.	10½¢	Kans.	9¢	N. H.	11¢	Tenn.	11¢
Calif.	11¢	Ky.	11¢	N. J.	10¢	Tex.	9¢
Colo.	10¢	La.	11¢	N. M.	10¢	Utah	10¢
Conn.	10¢	Me.	11¢	N. Y.	10¢	Vt.	10½¢
Del.	10¢	Md.	11¢	N. C.	11¢	Va.	11¢
D. C.	10¢	Mass.	9½¢	N. D.	10¢	Wash.	11½¢
Fla.	11¢	Mich.	10¢	Ohio	11¢	W. Va.	11¢
Ga.	10½¢	Minn.	10¢	Okla.	10½¢	Wisc.	10¢
Hawaii	9¢	Miss.	11¢	Ore.	10¢	Wyo.	9¢
Idaho	10¢	Mo.	9¢	Pa.	11¢		

(Not included: county and municipal gasoline taxes: state and local taxes)

Customer agrees to the following for purchases made on 3, 6, 9, and [illegible] month budget plan.

1. Customer agrees to pay the time sale price for each item purchased consisting of:
   a. The cash sale price, and
   b. An amount of credit service charge computed at 1½% of the balance, or such lesser amounts as permitted by laws of the state in which sale is made, at the beginning of each monthly billing period, until the full amount of purchase plus service charge is paid.
2. Customer's monthly statement will include a notice showing original purchase amount, unpaid balance, current monthly service charge thereon, and current monthly installment due.
3. Customer agrees to pay monthly installment when due. If customer fails to pay any installment in full when due, full balance shall become immediately due at option of company.
4. Customer has the right to pay in advance.
5. Customer paying full balance upon receipt of first statement and notifies company, may deduct the service charge for that particular installment.

184 291 953 0 00513

CARD NO.

6 67

SOLD TO

JOHN W LANGS

ORIGINAL

For goods and services listed hereon, customer agrees to pay Seller, or its or his assignee, on or before 30 days from receipt of statement, at the principal office and place of business of Seller, or to Humble Oil & Refining Co. at Houston, Texas, if it be seller or assignee.

SOLD BY

3182
TUCSON ARIZ
DON COOKEY

DATE	ORDER NO.	CAR NO.
3 2 67		32

ITEM	QTY.	Price Incl. Tax	AMOUNT	
ENCO EXTRA ☐ ENCO PLUS ☐ ENCO ☐	9.0		5	13
UNIFLO ☐ ENCOL EX. M.O. ☐ ENCO M.O. ☐				
Labor			2	00
22181.5000				
LUBRICATION ☐ WASHING ☐				
		SALES TAX		
LICENSE & STATE K 720		TOTAL	$ 5	13

RECEIVED BY John W Langs

THIS IS A CREDIT SALE TICKET
Statement to be rendered later.

HUMBLE OIL & REFINING CO.
and dealers in ENCO products.

ENCO

Happy Motoring!

8675080

Total includes all applicable federal, state and local taxes.

946-0557 (M-66)

CARD NO. 184 601 113 6 00

8 68

SOLD TO

HEINRICHS GEOEXPL COMPANY

ORIGINAL

For goods and services listed hereon, customer agrees to p… or its or his assignee, on or before 30 days from receipt of sta… at the principal office and place of business of Seller, or to Hu… Oil & Refining Co. at Houston, Texas, if it be seller or assignee.

SOLD BY

#3182
TUCSON ARIZ
DON COOKEY

DATE	ORDER NO.	CAR NO.
3 1 67		

ITEM	QTY.	Price Incl. Tax	AMOUNT	
ENCO EXTRA ☐ ENCO PLUS ☐ ENCO ☐				
UNIFLO ☐ ENCO EX. M.O. ☐ ENCO M.O. ☐				
Tire Repair			2	00
LUBRICATION ☐ WASHING ☐				
		SALES TAX		
LICENSE & STATE		TOTAL	$ 2	00

RECEIVED BY

THIS IS A CREDIT SALE TICKET
Statement to be rendered later.

HUMBLE OIL & REFINING CO.
and dealers in ENCO products.

ENCO

Happy Motoring!

Total includes all applicable federal, state and local taxes.

946-0537 (M-66)

CARD NO. 71 384 3710 3

SOLD TO: DUPLICATE HINRICHS

for U. W. Trailer

Heinrichs Geo Exploration

ORIGINAL TEXACO INVOICE

SOLD BY: 71 381 ...

SIGNATURE

X

DATE

3-7-67

THANK YOU

PRICE AND AMOUNT INCLUDES ALL APPLICABLE FEDERAL, STATE AND LOCAL TAXES. TERMS: PAYABLE WITHOUT DISCOUNT UPON RECEIPT OF MONTHLY STATEMENT OF PURCHASES. A SERVICE CHARGE WILL BE ADDED FOR PAST DUE BALANCES.

MERCHANDISE OR SERVICE	QUAN.	PRICE	AMOUNT
TEXACO GASOLINE SKY CHIEF ☐ FIRE CHIEF ☐			
TEXACO MOTOR OIL HAVOLINE ☐ TEXACO ☐			
Tire Repair Trailer			2 00
T4074826	TOTAL CHARGE $		2 00

STATE	LICENSE NUMBER
	KC-8409

PURCHASER'S CAR NUMBER

PURCHASER'S ORDER NUMBER

FORM S-199D 9-66

CARD NO.

SOLD TO

VW Trailer

~~#~~

Hew Richs

ORIGINAL TEXACO INVOICE

SOLD BY

W AND H TEXACO
TUCSON ARIZONA
71 361 38605

SIGNATURE

X Robert Fedbeder

DATE

3 8 67

THANK YOU

PRICE AND AMOUNT INCLUDES ALL APPLICABLE FEDERAL, STATE AND LOCAL TAXES. TERMS: PAYABLE WITHOUT DISCOUNT UPON RECEIPT OF MONTHLY STATEMENT OF PURCHASES. A SERVICE CHARGE WILL BE ADDED FOR PAST DUE BALANCES.

MERCHANDISE OR SERVICE	QUAN.	PRICE	AMOUNT	
TEXACO GASOLINE SKY CHIEF ☐ FIRE CHIEF ☒	6,0	35.9	2	16
TEXACO MOTOR OIL HAVOLINE ☐ TEXACO ☐				
Less				12
TOTAL CHARGE $			2	04

STATE	LICENSE NUMBER
ARIZ	AC5146

PURCHASER'S CAR NUMBER

PURCHASER'S ORDER NUMBER

T6074865

FORM S-199D 9-66

Occidental

3/7/67

Invoice

Breakdown expenses of operating days etc

Interpretation only Letter report

CALL ~~Friday~~ Thurs.

how report is coming

Dorothy Ahn

February 22, 1967

HEINRICHS GEOEXPLORATION COMPANY

806 WEST GRANT ROAD, TUCSON, ARIZONA, 85703. P.O. BOX 5671. PHONE: (AREA CODE 602) 623-0578

Occidental International Corp.
P. O. Drawer O
174 Comstock Avenue
Winter Park, Florida 32789

Attn: Mr. Richard Mayberry, Vice-President

Gentlemen:

Since our letter of February 16, the induced polarization survey in Pinal County, Arizona has been expanded as directed by Mr. Haxby and transmitted to us by Mr. C. Elliott. Our original estimate of about $1,800.00 is now revised to approximately $3,500.00. The advance on account should be an additional $800.00 making a total of $1,700.

Our services are at the rate of:

$250.00 per crew day
Stand-by time due to weather or at client request is half the daily crew rate.
Expenses: Vehicle $10.00 per day plus $0.12 per mile.
Communications, reproductions and miscellaneous supplies at cost.
Compilation of data, interpretation by staff $100.00 per day.
Billings will be submitted on a bi-monthly basis.

Client will be responsible for any costs or liability for trespass for our crew and/or equipment during the course of the survey.

If the above meets with your approval, please so indicate by signing, dating and returning the enclosed carbon copy as provided.

Sincerely yours,
HEINRICHS GEOEXPLORATION CO.

Paul A Head

PAH:jh

Paul A. Head
Geophysicist

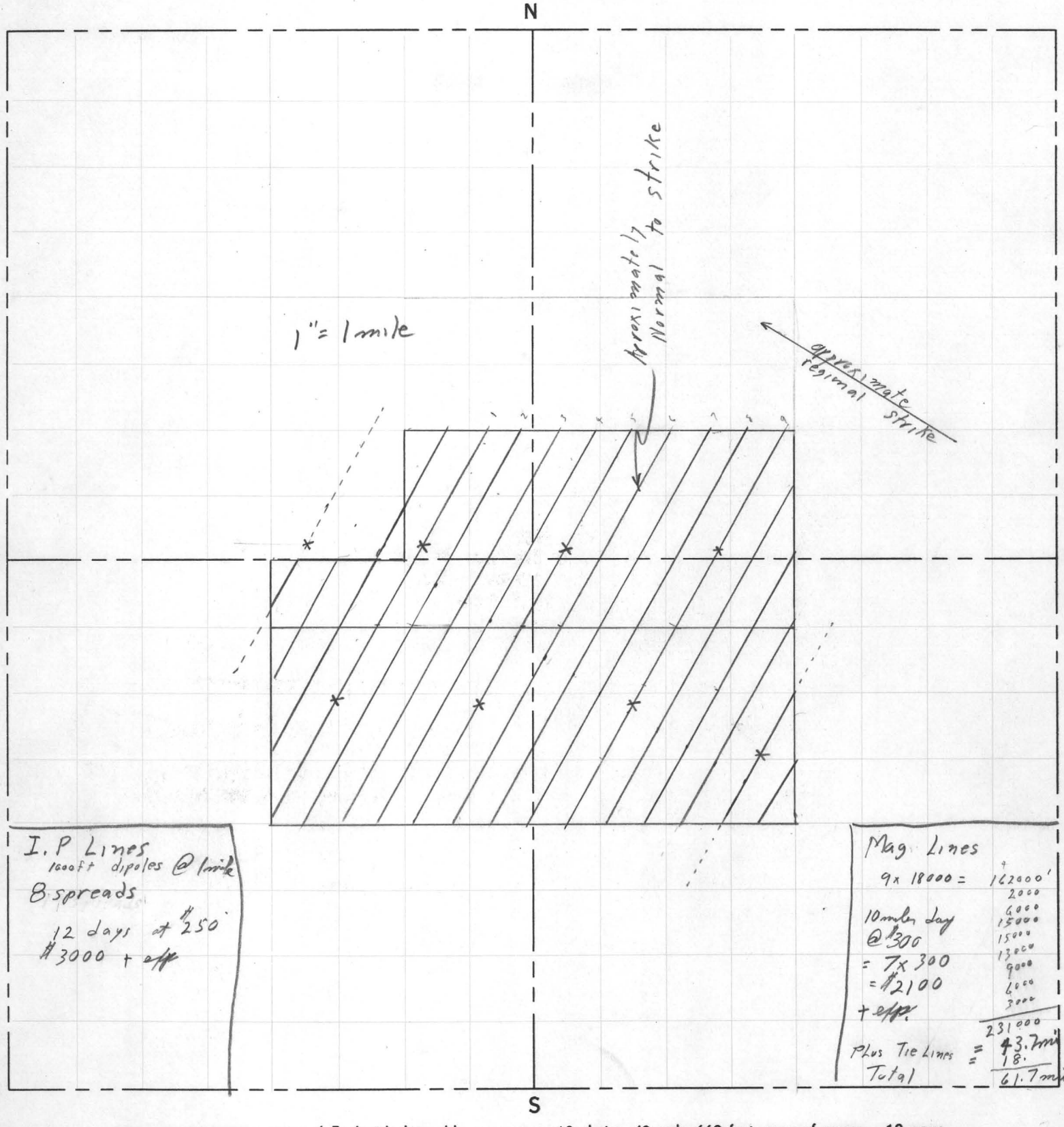
Accepted: Ronald L. Haxby

Date: 2/27/67

cc: Ron Haxby

Occidental

SCALE FOR SECTION, 660 Ft.=1 Inch. { Each side large blue squares = 20 chains, 80 rods, 1320 feet; area of square 40 acres. Each side small red squares = 5 chains, 20 rods, 330 feet; area of square 2½ acres.



I. P Lines
1000 ft dipoles @ 1 mile
8 spreads
12 days at $250
$3000 + eff

Mag Lines
9 x 18000 = 162000'
2000
6000
15000
15000
13000
9000
6000
3000
231000
Plus Tie Lines = 43.7 mi
18.
Total 61.7 miles

SCALE FOR QUARTER SECTION, 330 Ft.=1 Inch. { Each side large blue squares = 10 chains, 40 rods, 660 feet; area of square 10 acres. Each side small red squares = 2½ chains, 10 rods, 165 feet; area of square .625 of 1 acre.

PRONTO LAND MEASURE 660 - 330 MAP SHEET

PRONTO LAND MEASURE

?

Occidental International & Mineral Corp

Attn Mr Ben Happy

5550 N Mona St.

Tucson, Ariz (85704)

Dear Mr Harby,

The following is our job estimate for the magnetic and induced polarization surveys near Oracle Junction that you have requested. We have estimated that the magnetic programme will require about 62 line miles whether done on the ground or by airborne magnetometry.

Using 100 ft station density on lines spaced 1/4 mile apart, approximately 20 days will be required to cover the assigned area with a hand held, 20 gamma sensitivity instrument. The total field and office cost of this would amount to about ~~[illegible]~~ $4000.00. ~~Excluding all office charges.~~

← The Momag covering the same ground should cost approximately $3000.00 at the worst and perhaps a little over $1000 ~~again excluding office charges~~

← Airmag will cost approximately $1500 for the completed job including interpretation, report, and maps.

~~Office~~ time ~~is charged at the rate of $100 per staff day~~. ~~for any of the three methods~~. After a finished contour map is completed the interpretation of magnetic data from any of the three systems will ~~cost~~ about the same. However, preparation of these maps will vary greatly in time required. Airmag data requiring much more office time to produce a map than either ground method.

Eight spreads of 1000 ft dipoles -

if the terrain permits drawing straight line traverses.

Occidental International

Ron Harby

2/15/67

22 Line miles I.P.

1 mile spacing down to ½ mile

Dipole - Dipole

× × × × ×

.025

.05

3.0

10. Days

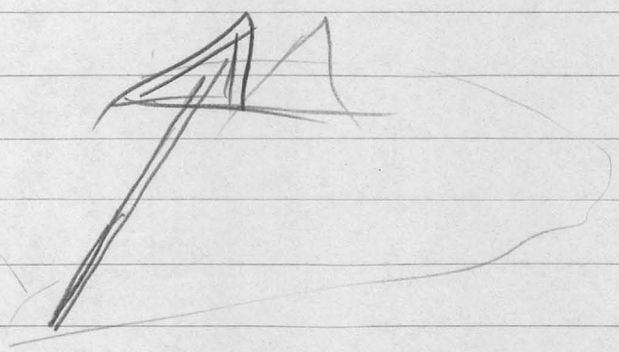
11 Days

300

3300.

500

$3800.00



Availability ?

Inquiry

2/9/67

Occidental International Minerals Corp.
5550 N. Moria St.
Tucson, Ariz 85704

Attn. Ron Haxby
887 1936

Gravity
1500 - 3600 Vertical
400-600' wide mile long

40% magnetite
4-5 g/cm³

tactile $5000.00

Recon 1/2

how much to process
500,000 acres — ~~36~~ sect. x ~~36~~ Sections
24" x 24" one edge mountains

200.00/crew day + expenses
Vehicle $10.00/$0.10 15 12 27 Fallon

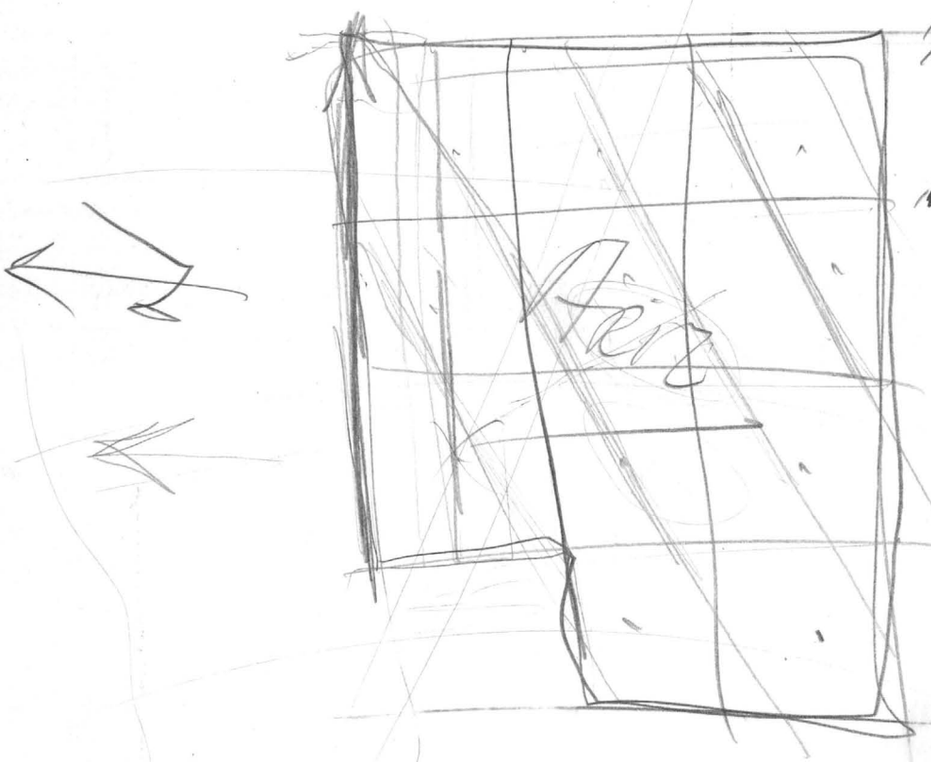
1 mile spacing 100.00 STAFF/day

Grobbin

Production 30 day

15-20 Dollows / station

Brochures on I.P. Services & equipment



1/4 mile magnetics

1 mile spacing I.R
1000' dipole

15.00 - 20.00/sta. NEVADA — Gravity

Oracle, Junction flat easy country — Ariz. I.P. 250/day 2700 I.P. & Mmag or Airmag @ 300/day $1700 mmag

JOB PARTICULARS

Job No._____
Taken By_____
Date_____

Client

Requested by

Area of survey

Purpose

Field address of client

Commence date

Sepia base map from client or alternatives

Credit check

Advance

Billing to

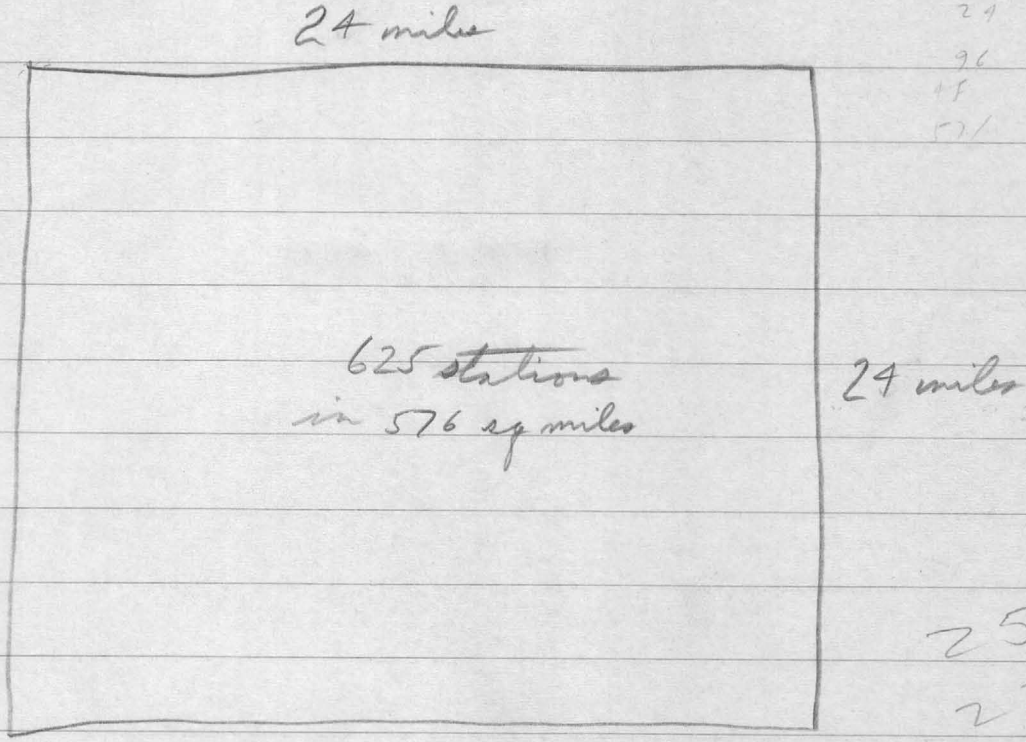
Reports to following persons, addresses and number or copies

References in our files

Special instructions or remarks from client

*Special notes where applicable

24
24
96
48
576



250
270
8
160
2500
2660

60 days × ~~1~~200 12,000 + 1500 ~~[illegible]~~

15 $/ ≈ 600 9,000

Write formal
on I. P. & MAG.
& Gravity

300
4
1200
500
1700

February 16, 1967

Occidental International & Minerals Corp.
P. O. Drawer O
174 Comstock Avenue
Winter Park, Florida 32789

Attn: Mr. Richard Mayberry, Vice President

Gentlemen:

Your local representative, Mr. Ronald L. Haxby has engaged our firm to do an induced polarization survey in Pinal County, Arizona, with work to begin immediately.

Our crew left for the field this morning to start this program.

This is a letter request for an advance on account in the amount of half of the estimated program. Presently the total project will be about $1,800.00, with results of the survey to determine further work if any. Thus we would like $900.00 to credit to your account.

Sincerely yours,
HEINRICHS GEOEXPLORATION COMPANY

E. Grover Heinrichs
Vice President

EGH:jh
cc: R. Haxby, Tucson

OCCIDENTAL INTERNATIONAL CORPORATION

EXPLORATION AND GEOLOGY DIVISION

RONALD L. HAXBY

MINING AND COMPUTER APPLICATIONS ENGINEER

MAIN EXPLORATION OFFICES
POST OFFICE DRAWER O
174 COMSTOCK AVENUE
WINTER PARK, FLORIDA 32789
TELEPHONE (305) 647-6394
TELEX 056-4416
CABLE INTEROXY

TUCSON OFFICE
5550 NORTH MARIA DRIVE
TUCSON, ARIZONA 85704
TELEPHONE (602) 887-1936

4-4-67

Mr. Grover Heinrichs
Heinrichs Geoexploration Company
P.O. Box 5671
Tucson, Arizona 85703

Dear Grover:

I received your letter of March 30th crediting OXY with $350.00 on the Copper Creek job. I am now satisfied with the billing.

Regards,

Ron

Ronald L. Haxby

RLH/h

OCCIDENTAL INTERNATIONAL AND MINERALS CORPORATION
MINERALS EXPLORATION DIVISION

POST OFFICE DRAWER O
174 COMSTOCK AVENUE
WINTER PARK, FLORIDA 32789

TELEPHONE (305) 647-6394
TELEX 0-56-4416
TWX (810) 853-0260
CABLE: OXYMINE

FEBRUARY 24, 1967

HEINRICHS GEOEXPLORATION COMPANY
POST OFFICE BOX 5671
TUCSON, ARIZONA 85703

GENTLEMEN

IN RESPONSE TO YOUR LETTER OF FEBRUARY 22, 1967, WE ARE ENCLOSING OUR CHECK NO. 358 IN THE AMOUNT OF $1700.00, ADVANCE PAYMENT FOR THE INDUCED POLARIZATION SURVEY IN PINAL COUNTY, ARIZONA.

A COPY OF YOUR LETTER HAS BEEN SIGNED BY MR. RICHARD C. MAYBERRY AND IS BEING RETURNED WITH THIS LETTER.

VERY TRULY YOURS

Carol Sharp

(MRS.) CAROL SHARP
SECRETARY TO MR. MAYBERRY

CC: MR. RON HAXBY

February 22, 1967

HEINRICHS GEOEXPLORATION COMPANY

806 WEST GRANT ROAD, TUCSON, ARIZONA, 85703. P.O. BOX 5671. PHONE: (AREA CODE 602) 623-0578

Occidental International Corp.
P. O. Drawer O
174 Comstock Avenue
Winter Park, Florida 32789

Attn: Mr. Richard Mayberry, Vice-President

Gentlemen:

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Communications, reproductions and miscellaneous supplies at cost.
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Billings will be submitted on a bi-monthly basis.

Client will be responsible for any costs or liability for trespass for our crew and/or equipment during the course of the survey.

If the above meets with your approval, please so indicate by signing, dating and returning the enclosed carbon copy as provided.

Sincerely yours,
HEINRICHS GEOEXPLORATION CO.

Paul A Head

PAH:jh

Paul A. Head
Geophysicist

Accepted: Richard C. Mayberry

Date: 2/24/67

cc: Ron Haxby

Occidental Petroleum

2/22/67

Boyd Wilson

Falcon Valley

297 2375

Fence crossed in two places not at gates by I. P. crew. Will notify ~~Fred~~ Sheriff & honor bond on state land

February 22, 1967

Occidental International Corp.
P. O. Drawer O
174 Comstock Avenue
Winter Park, Florida 32789

Attn: Mr. Richard Mayberry, Vice-President

Gentlemen:

Since our letter of February 16, the induced polarization survey in Pinal County, Arizona has been expanded as directed by Mr. Haxby and transmitted to us by Mr. C. Elliott. Our original estimate of about $1,800.00 is now revised to approximately $3,500.00. The advance on account should be an additional $800.00 making a total of $1,700.

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Sincerely yours,
HEINRICHS GEOEXPLORATION CO.

PAH:jh

Paul A. Head
Geophysicist

Accepted:_____

Date:_____

cc: Ron Haxby

RONALD L. HAXBY

MINING AND COMPUTER APPLICATIONS ENGINEER

OCCIDENTAL INTERNATIONAL CORPORATION

MAIN OFFICE:
P. O. DRAWER O
174 COMSTOCK AVENUE
WINTER PARK, FLORIDA 32789
TEL. (305) 647-6394

TUCSON OFFICE:
5550 NORTH MARIA DRIVE
TUCSON, ARIZONA 85704
TEL. (602) 887-1936

TELEX 0-56-4416
CABLE INTEROXY

JOB PARTICULARS

Job No.
Taken By Paul Reed + CJH
Date Feb 15, 1967

Client OCCIDENTAL INTERNATIONAL CORP.

Requested by

RONALD L HAXBY

Area of survey

2 miles west of Oracle Junction
Pinal Co.

Purpose

I. P. 1000ft dipoles 5 spreads

Field address of client

5530 N MARIA DRIVE
Tucson (602) 887-1936

Commence date

Feb 17, 1967

Sepia base map from client or alternatives

No

Credit check Approved by Haxby
Requested Feb 16

Advance $900 total estimated job $1800 subject to data obtained in field

Billing to Main office P.O. Drawer O
174 Comstock Ave
Winter Park FLorida (305) 647-6394

Reports to following persons, addresses and number or copies

No formal report, wants letter summarizing job, interpretation and billing. Neat field Data sheets only

References in our files

U.S. G.S. Quad ORACLE, ARIZ

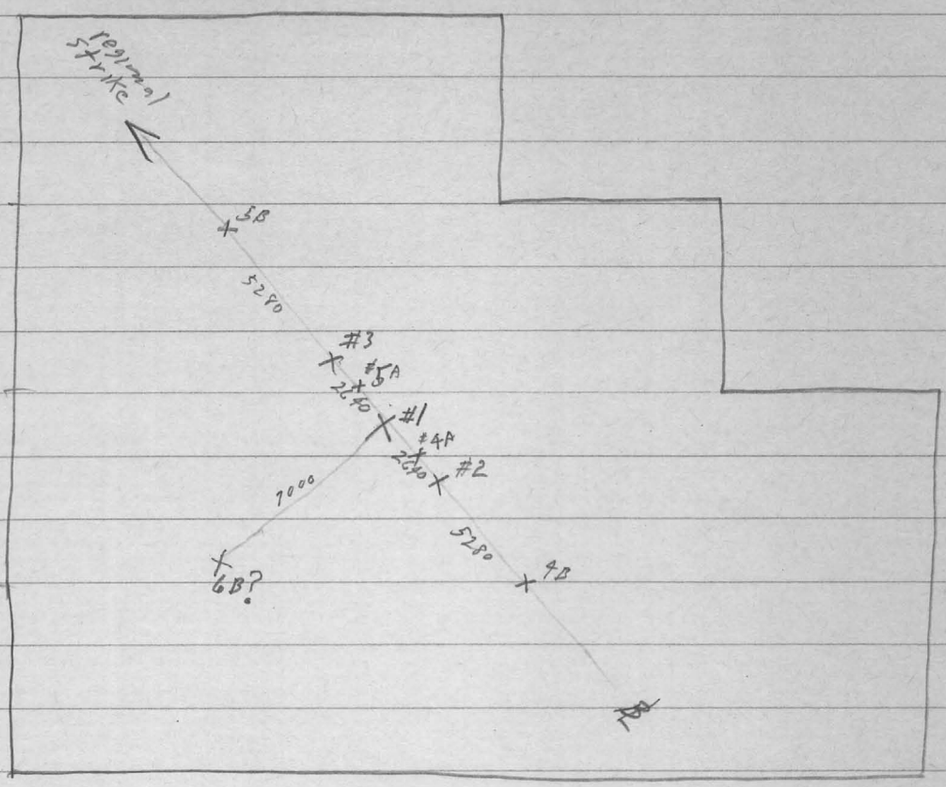
Special instructions or remarks from client

Line priority contingent on results (see notes)

*Special notes where applicable

Feb 16, 1968

Occidental



spread #1 — if positive

#2 + #3 if " if negative

#4A + #5A if #4B + #5B + #6B?

if #1 is negative

#2 + #3 should be one mile from

#1 on strike indicated

#4 + 5 to be directed later

Oracle Quad

{ T 10S R 13E Sec 10, 11, 13, 14, 15, 22, 23, 25, 26, 27
{ T 10S R 12E Sec 19, 30

1/2 mile 500' dipole linear trend N 45° ± E
5 spreads as outlined vicinity of NE cor Sec 23

Friday Feb 17,
Occidental International & Minerals Corp.
Mr. Richard Mayberry - Vice Pres.
174 Comstock Ave.
Winter Park, Fla.

Arvela paid for ?

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

UNITED STATES
DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS

ORACLE QUADRANGLE
ARIZONA
15 MINUTE SERIES (TOPOGRAPHIC)

Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

Topography from aerial photographs by photogrammetric methods
Aerial photographs taken 1958. Advance field check 1959

Polyconic projection. 1927 North American datum
10,000-foot grid based on Arizona coordinate system, central zone
1000-meter Universal Transverse Mercator grid ticks,
zone 12, shown in blue

Dashed land lines indicate approximate locations
Land lines unsurveyed in parts of T. 10 S.–Rs. 15 and 16 E.,
and T. 11 S.–R. 15 E.

SCALE 1:62500

CONTOUR INTERVAL 80 FEET
DATUM IS MEAN SEA LEVEL

ROAD CLASSIFICATION
Heavy-duty
Medium-duty
Light-duty
Unimproved dirt
U. S. Route
State Route

APPROXIMATE MEAN DECLINATION, 1959

ARIZONA
QUADRANGLE LOCATION

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER 25, COLORADO OR WASHINGTON 25, D. C.
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

ORACLE, ARIZ.
N3230—W11045/15

1959

INTERIOR-GEOLOGICAL SURVEY, WASHINGTON, D. C.-1961-NS-T
MR 6040