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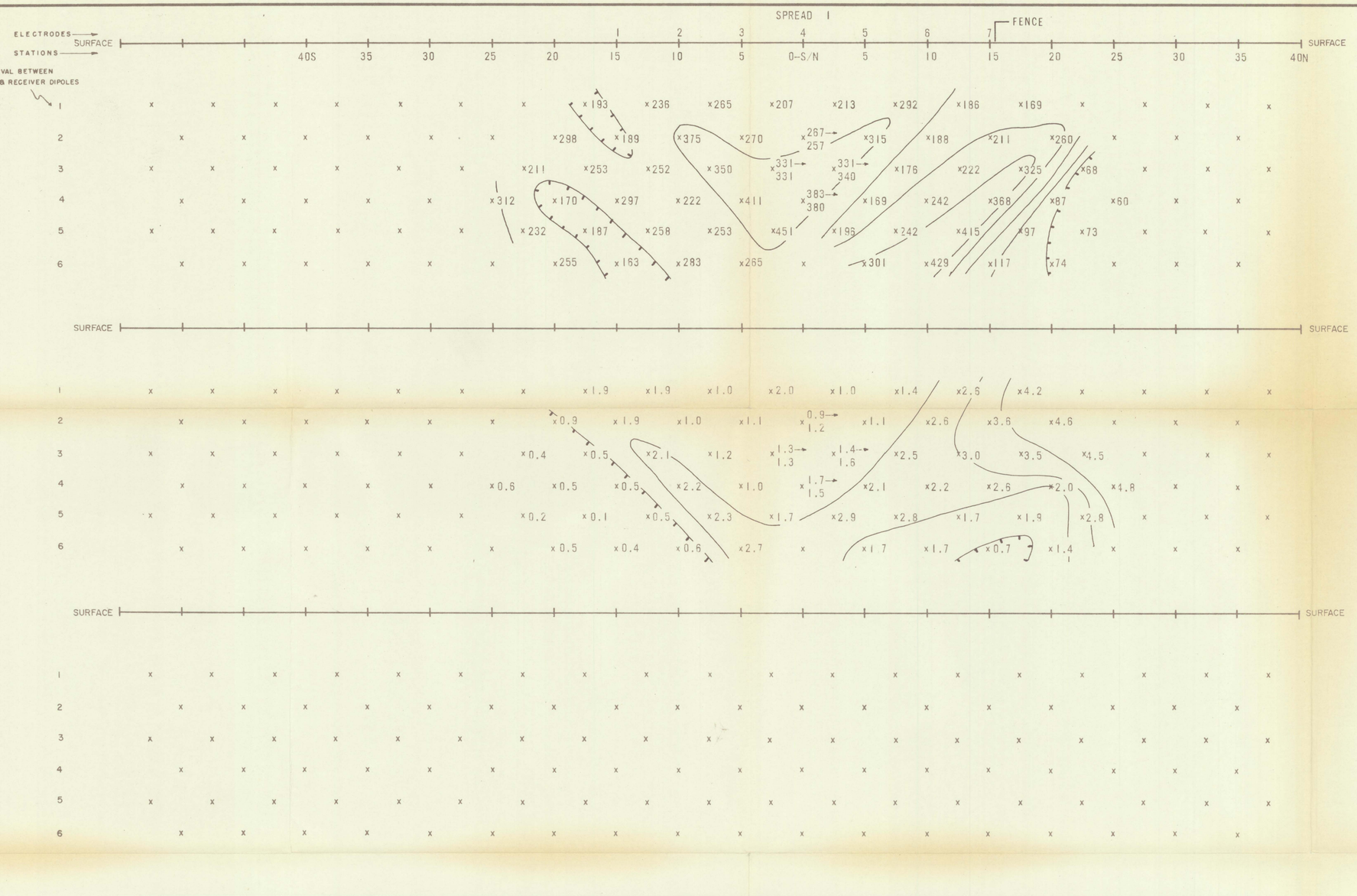
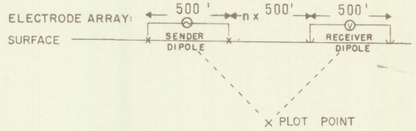
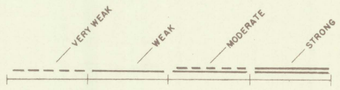


EXPLANATION



RELATIVE ANOMALY STRENGTH



LOOKING WESTERLY

File

FRIJOLE CLAIM GROUP
HELVETIA AREA
PIMA COUNTY, ARIZONA

SECTIONAL DATA SHEET

LINE NO. 1 (SPREAD 1)

INDUCED POLARIZATION TRAVERSE

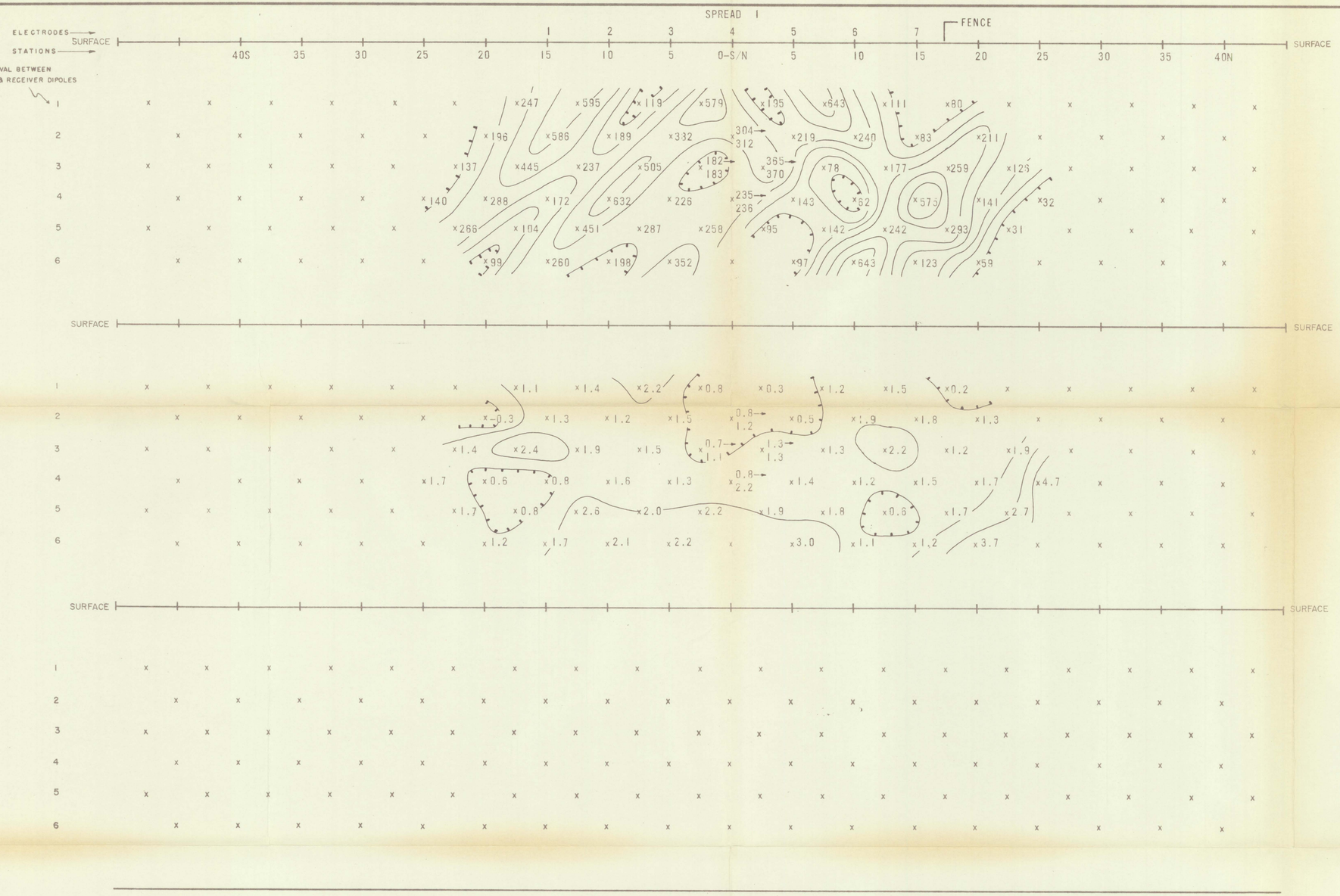
HEINRICHS GEOEXPLORATION COMPANY

SCALE: 1" = 500' DATE: AUG 1968

FOR

SUPERIOR OIL COMPANY

HEINRICHS GEOEXPLORATION COMPANY
geophysical engineers
POST OFFICE BOX 5671, TUCSON, ARIZONA, 85703
Phone: 602/623-0578
Cable: GEOEX, Tucson
vancouver
sydney



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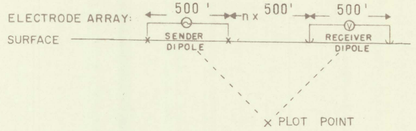


RELATIVE ANOMALY STRENGTH

LOOKING WESTERLY

FRIJOLE CLAIM GROUP
HELVETIA AREA
PIMA COUNTY, ARIZONA

SECTIONAL DATA SHEET

LINE NO. 2 (SPREAD 1)

INDUCED POLARIZATION TRAVERSE

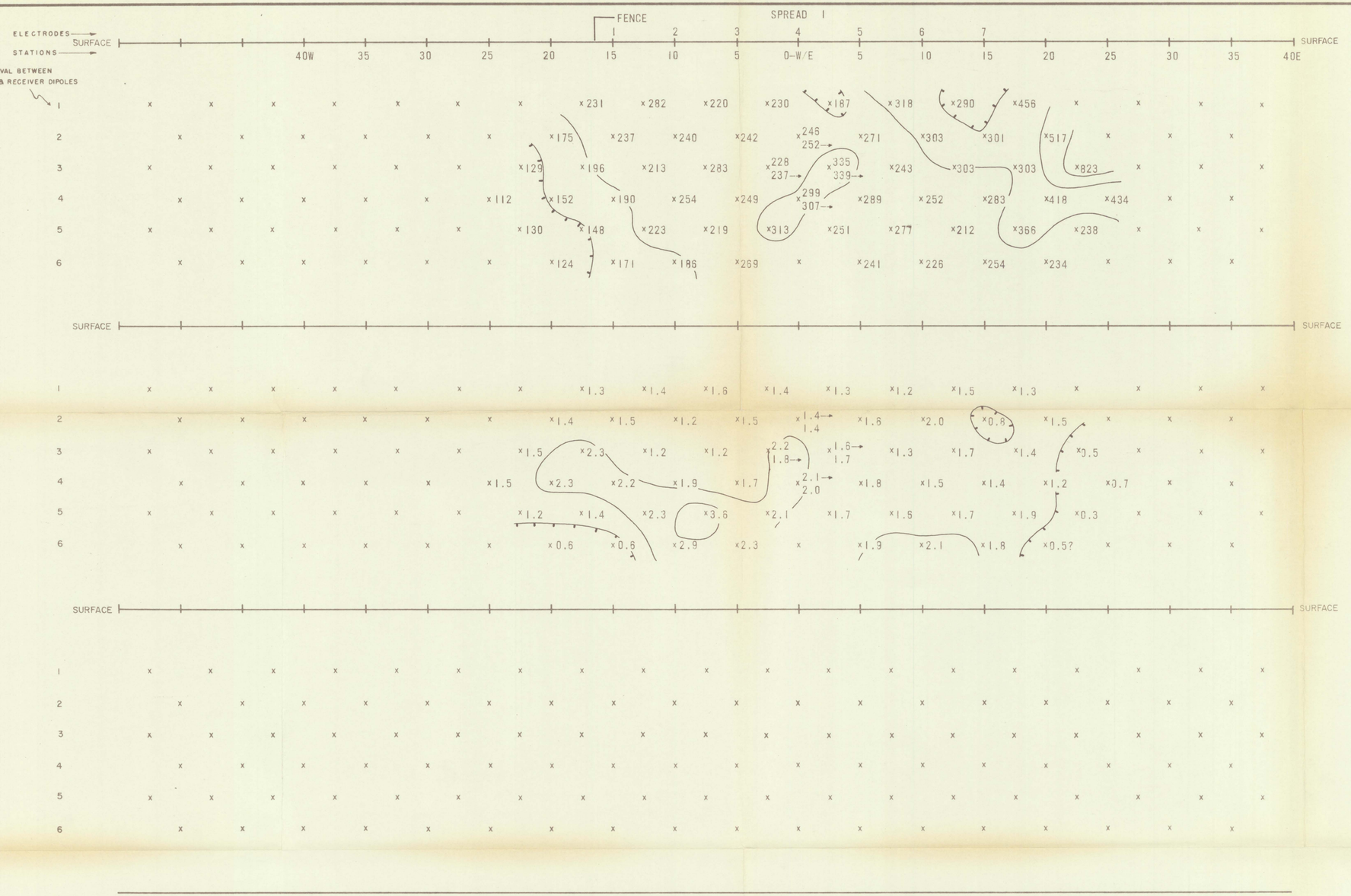
HEINRICHS GEOEXPLORATION COMPANY

SCALE: 1" = 500' DATE: SEP 1968

FOR

SUPERIOR OIL COMPANY

HEINRICHS
GEOEXPLORATION COMPANY
POST OFFICE BOX 5671, TUCSON, ARIZONA, 85703
Phone: 602/623-0578 Cable: GEOEX, Tucson
geophysical engineers
vancouver
sydney



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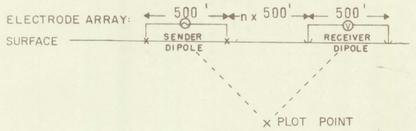

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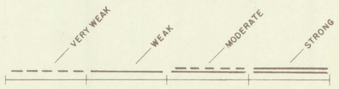


LOOKING NORTH

FRIJOLE CLAIM GROUP
HELVETIA AREA
PIMA COUNTY, ARIZONA

SECTIONAL DATA SHEET

LINE NO. 3 (SPREAD I)

INDUCED POLARIZATION TRAVERSE

HEINRICHS GEOEXPLORATION COMPANY

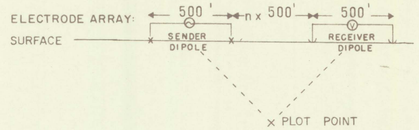
SCALE: 1" = 500' DATE: SEP 1968

FOR

SUPERIOR OIL COMPANY

HEINRICHS GEOEXPLORATION COMPANY
POST OFFICE BOX 5671, TUCSON, ARIZONA, 85703
Phone: 602/623-0578 Cable: GEOEX, Tucson
geophysical engineers
vancouver
sydney

EXPLANATION



RELATIVE ANOMALY STRENGTH

LOOKING NORTH

FRIJOLE CLAIM GROUP
HELVETIA AREA
PIMA COUNTY, ARIZONA

SECTIONAL DATA SHEET

LINE NO. 4 (SPREAD I)

INDUCED POLARIZATION TRAVERSE

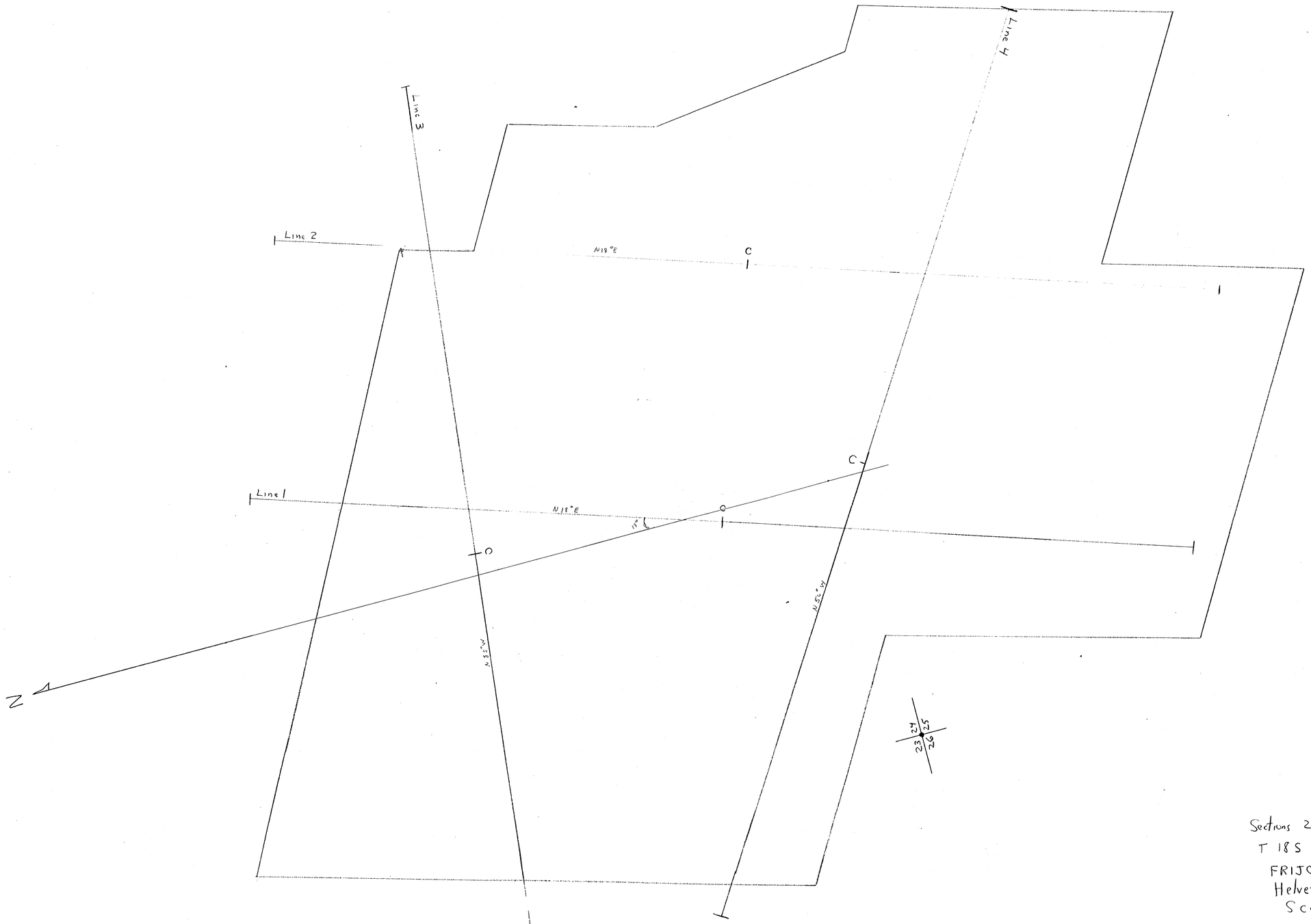
HEINRICHS GEOEXPLORATION COMPANY

SCALE: 1" = 500' DATE: SEP 1968

FOR

SUPERIOR OIL COMPANY

HEINRICHS
GEOEXPLORATION COMPANY
POST OFFICE BOX 5671, TUCSON, ARIZONA, 85703
Phone: 602/623-0578 Cable: GEOEX, Tucson
vancouver
sydney
geophysical engineers

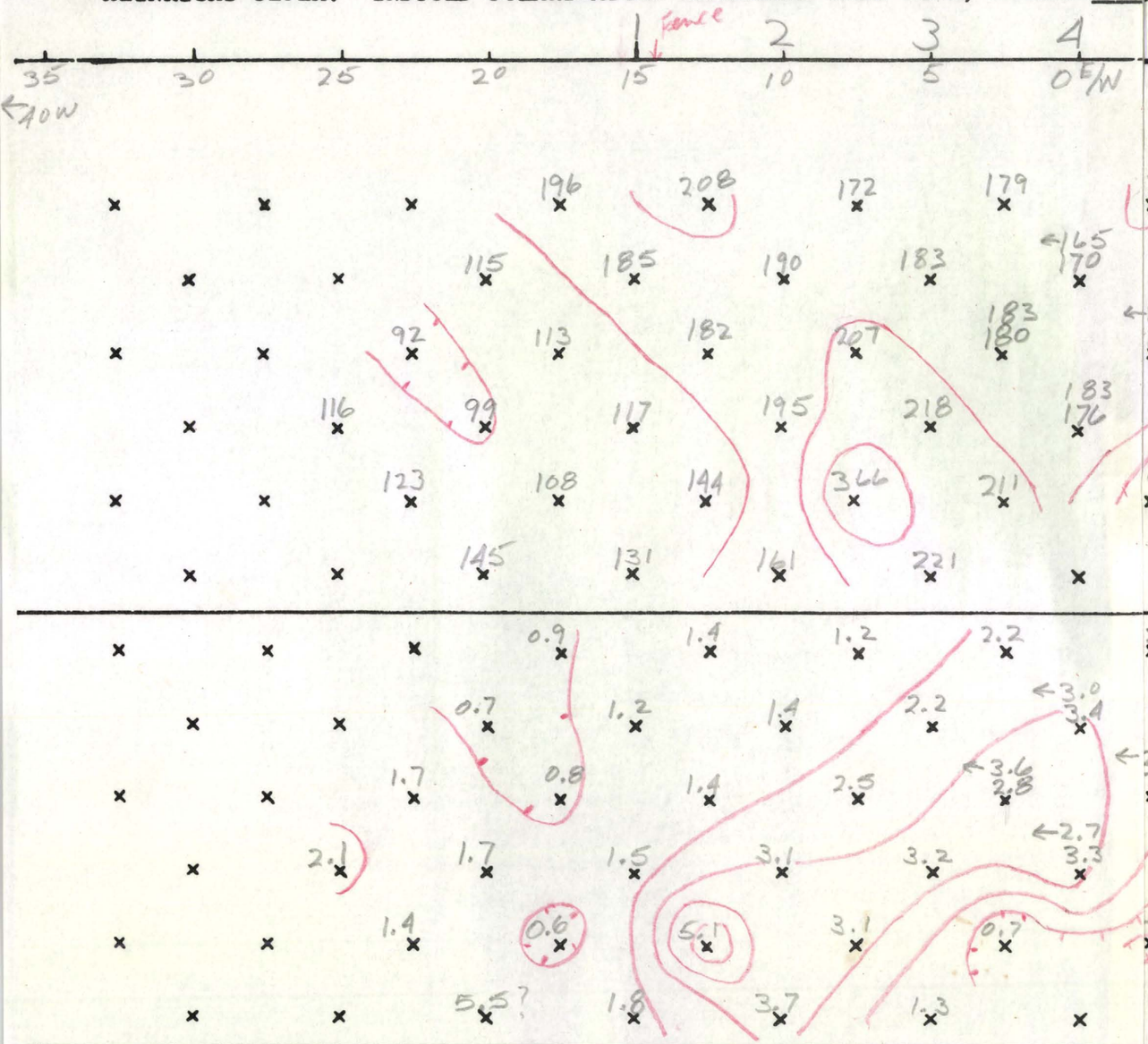


Sections 23, 24, 25, & 26
T 18 S R 15 E
FRIJOLE GROUP
Helvetia, Arizona
Scale 1" = 200'

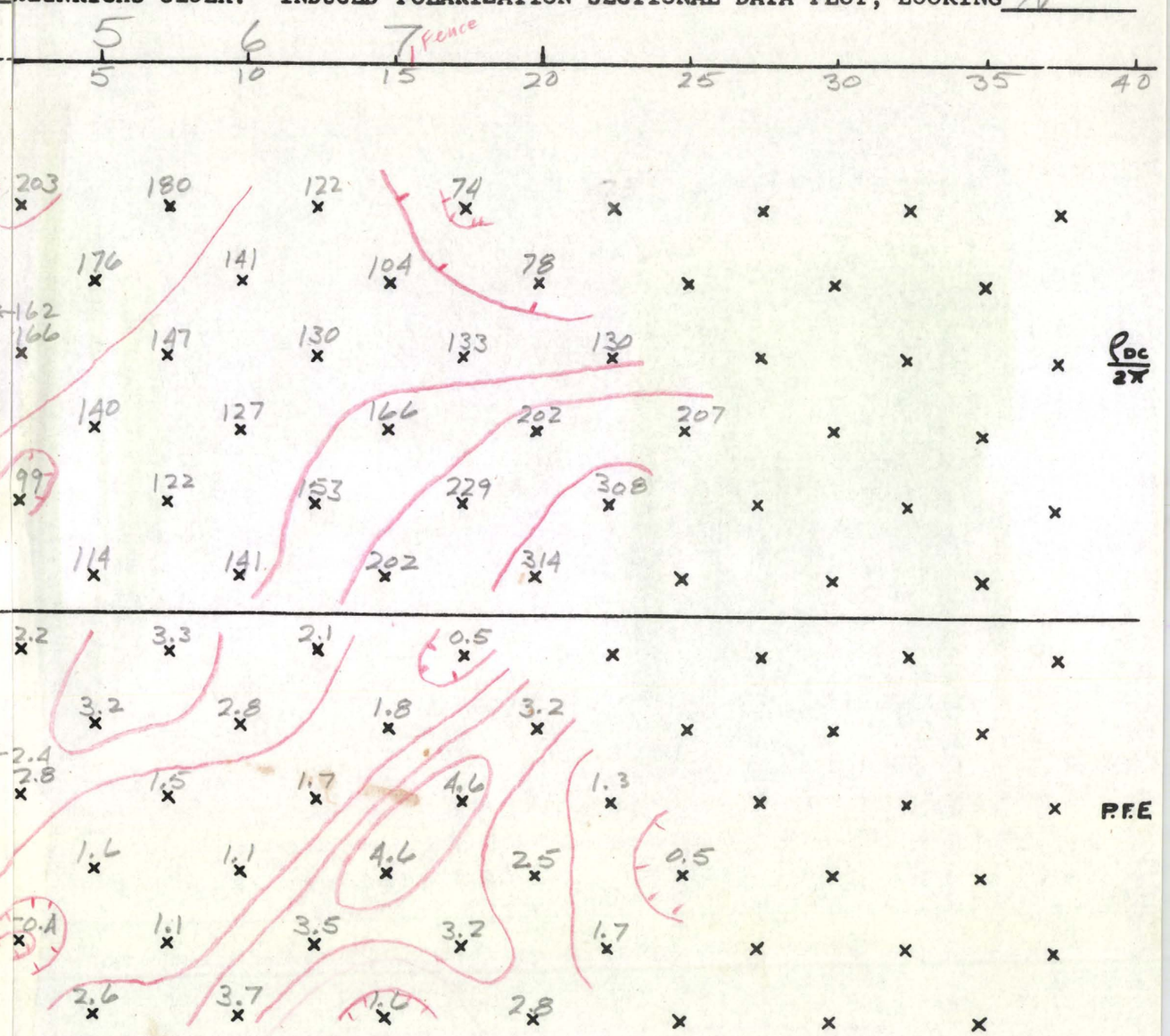
HEINRICHS GEOEX. INDUCED POLARIZATION SECTIONAL DATA PLOT, LOOKING

AREA HALVITA LINE #3 a = 500 ' SCALE: 1" = 0 DATE: SEPT 68 LINE a = ' SCALE: DATE:

HEINRICHS GEOEX. INDUCED POLARIZATION SECTIONAL DATA PLOT, LOOKING



HEINRICHS GEOEX. INDUCED POLARIZATION SECTIONAL DATA PLOT, LOOKING N



ρ_{DC} / σ

P.F.E

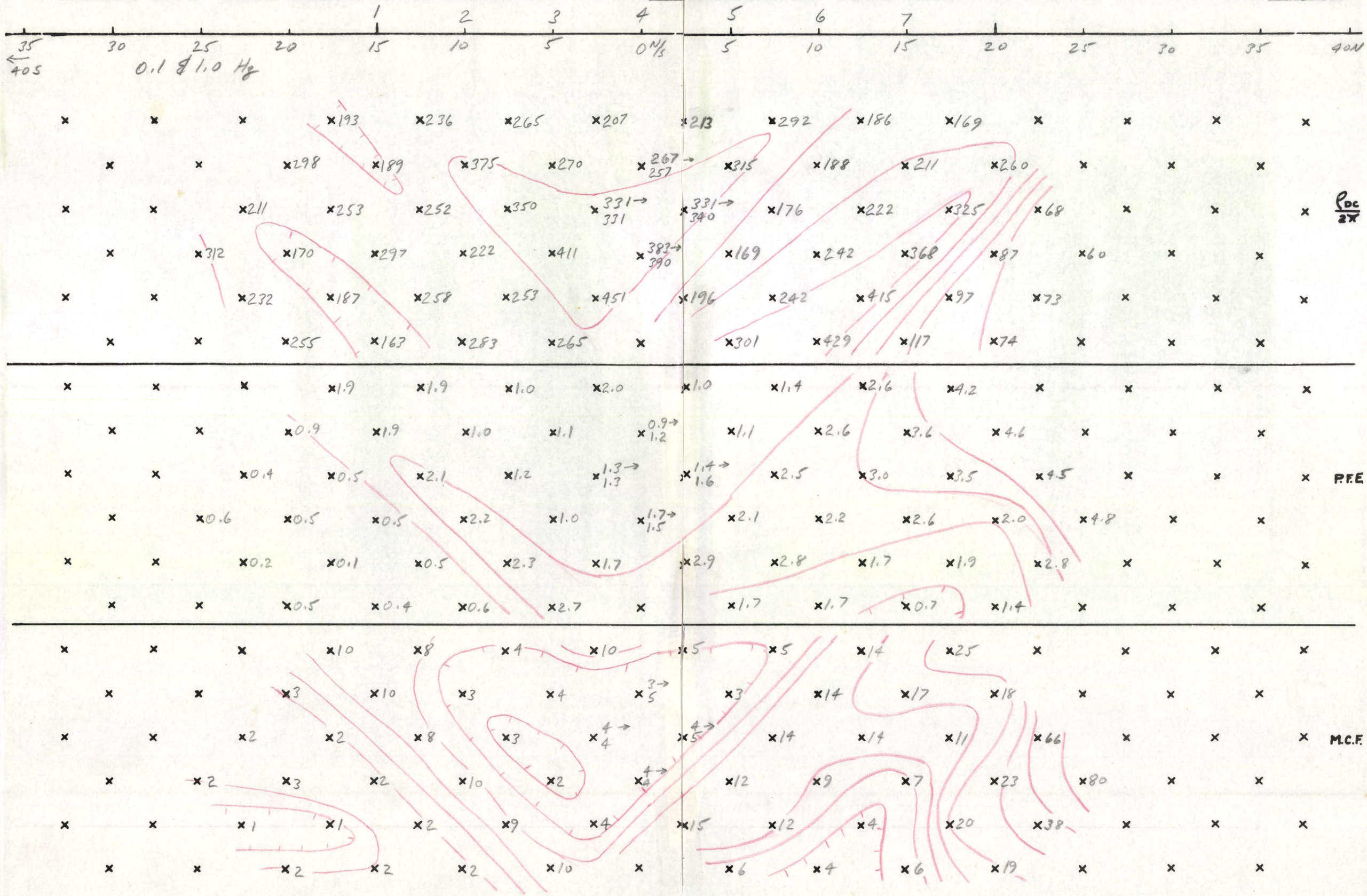
M.C.F.

Superior Oil

AREA HELVITIA LINE 4 SPRL a = 500' SCALE: DATE:

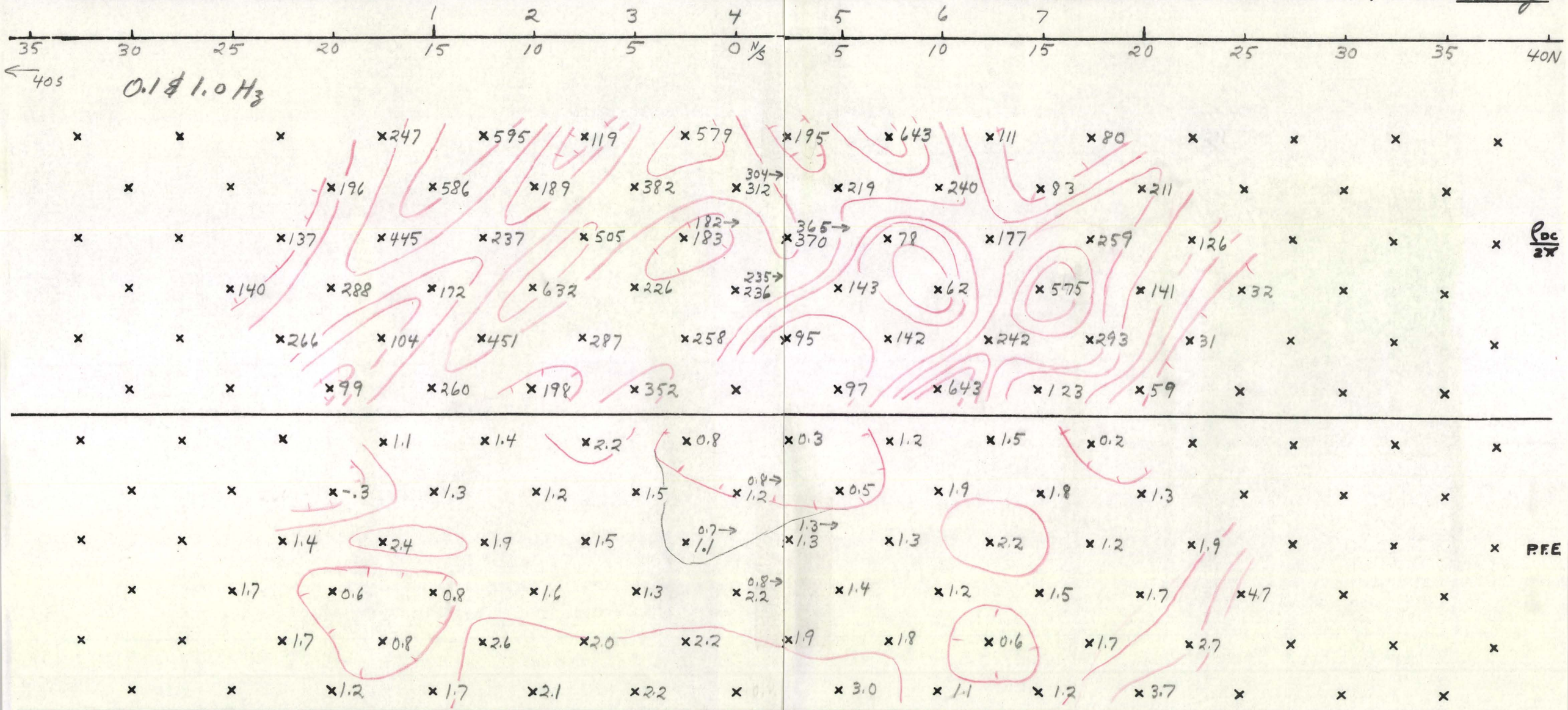
LINE 4 SPRL a = 500' SCALE: DATE: SEPT 68

HEINRICHS GEOEX. INDUCED POLARIZATION SECTIONAL DATA PLOT, LOOKING



AREA Helvetia S.O. LINE 1 a = 500' SCALE: 1" = 500' DATE: Aug. 1968 LINE a = ' SCALE: DATE:

HEINRICHS GEOEX. INDUCED POLARIZATION SECTIONAL DATA PLOT, LOOKING ___ HEINRICHS GEOEX. INDUCED POLARIZATION SECTIONAL DATA PLOT, LOOKING W by



AREA Helvetia S.O. LINE 2 a = 500' SCALE: 1" = 500' DATE: Sept. 6, 1968 LINE ___ a = ' SCALE: ___ DATE: ___

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT Helvetia - Sup. 6-289
LINE 1 HALF 5 SP. 1 DATE 30 aug 5

PAGE 1

SEND	4-5	5-6	6-7	3-4	4-5	5-6	6-7	2-3	3-4	4-5
RECEIVE										
RANGE										
DC 1	-3.0	1.8	.7	0.0	2.8	2.2	.2	1.6	.1	4.1
DC 2	6.9	.6	2.5	1.8	-.8	.1	2.4	2.1	1.6	-1.8
DC 3	-3.1	1.4	.6	-.1	2.8	2.2	.2	1.5	.2	4.2
DC 4	6.9	.7	2.3	1.8	-.9	.1	2.4	1.9	1.7	-1.9
DC 5	-3.1	1.3	.6	-.1	2.8			1.5	0.	4.2
DC 6	6.9	.7	2.3		-.9			2.0	1.8	-1.9
DC 7		1.4	.6					1.5	-.1	4.1
DC 8		.7	2.3					1.9	1.8	-1.9
DC AVG.	1.91	1.05	1.49	0.86	0.97	1.15	1.30	1.75	0.0 0.88	1.14
AC 1	132.	82.8	13.6	171.	43.5	43.1	25.0	302	60.5	22.5
AC 2	-0-	-0-	-0-	-.1	-.1	-0-	-.1	-.1	-.1	0.0
AC AVG.										
S.P.	-24.8			-4.5				+3.1		
AC NOISE			.02							
~~POT RES.~~ Corr PFE	2.0	1.2	1.6	1.0	1.1	1.3	1.5	1.9	1.0	1.2

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT Helvetia - Sup
LINE 1 HALF S SP. 1 DATE 30 Aug

PAGE

SEND	5-6	6-7	1-2	2-3	3-4	4-5	5-6	6-7	1-2	2-3
RECEIVE										
RANGE										
DC 1	.3	-1.0	1.6	2.0	2.8	5.2	6.0	2.9	.8	-1.2
DC 2	1.5	4.2	2.0	1.7	1.1	-1.1	-1.7	2.2	.7	2.2
DC 3	.2	-1.3	1.6	2.0	2.9	5.4	6.1	3.0	.7	-1.8
DC 4	1.4	4.4	1.9	1.6	1.1	-1.2	-1.8	2.0	.7	2.2
DC 5	.4	-1.4	1.5	2.0	2.8	5.6	6.2	3.2	.8	-1.1
DC 6	1.2	4.2	1.9	1.7	1.1	-1.3	-1.8	1.9	.5	2.0
DC 7	.3	-1.2	1.5	2.0	2.9	5.8	6.3	3.3	.7	-1.5
DC 8	1.4	4.3	1.9	1.6	1.1	-1.6	-1.9	1.7	.6	2.2
DC AVG.	.84	1.51	1.74	1.13	1.98	2.14	2.19	2.56	0.70	0.36
AC 1	26.5	16.5	247.	60.3	16.1	7.08	9.20	6.00	96.3	32.8
AC 2	-.2	-.1	-.1	-0-	-0-	-0-	-0-	-.1	-.1	-.1
AC AVG.										
S.P.			+6.2						+0.5	
AC NOISE		.02					2.3	.02	0.9	0.5
POT RES.	1.0	1.7	1.9	1.9	2.1	2.2	CAL.	OVER		

	CAL
DC 1	-1.8
2	1.6
3	-1.8
4	1.6
5	-1.8
6	1.6
7	
8	
	-0.1
AC 1	97.7
AC-2	-0-
AC.AV.	

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT Helvetia - Sop
LINE 1 HALF 5 SP. ____ DATE 30 Aug

PAGE

SEND	3-4	4-5	5-6	1-2	2-3	3-4	4-5	1-2	2-3	3-4
RECEIVE										
RANGE										
DC 1	3.0	-.4	1.6	1.0	23.1	6.1	4.8	0.0	-.9	-12.1
DC 2	-3.0	5.2	-1.8	-2.8	-23.0	-5.1	-4.5	.9	.5	12.2
DC 3	3.0	-5.0	5.0	2.8	23.2	6.7	5.8	-.1	0.0	-11.6
DC 4	-1.4	6.1	-3.0	-2.1	-23.3	-8.2	-3.9	1.2	0.0	12.4
DC 5	1.4	-5.8	1.1	2.5	22.9	8.8	5.0	-.4	.2	-10.2
DC 6	-1.4	6.2	+2.4	-3.1	-23.0	-8.7	-3.7	1.5	-.2	13.0
DC 7	2.9	8.0	-1.8	3.1	22.2	7.2	4.1	-.6	.8	-12.1
DC 8	-1.5	-9.7	2.0	-3.0	-23.1	-6.9	-4.8	1.7	-.8	11.4
DC AVG.	0.32	0.49	0.33	0.34	-0.14	0.24	0.20	0.48	0.06	0.48
AC 1	9.64	4.77	6.54	27.4	11.0	3.47	1.89	20.2	8.61	2.95
AC 2	-.2	+.1	-0-	-0-	-1.0	-0-	+.2	-0-	-.1	+.1
AC AVG.										
S.P.				+1.0				+0.6		
AC NOISE			.03				.08			.03
POT RES.	0.5	0.5	0.6	0.4	0.5	0.1	0.4	0.6	0.2	0.5

PAGE

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT 289-68

LINE 1 HALF 5 SP. 1 DATE 8/3/68

SEND	4-5	5-6	6-7	3-4	4-5	5-6	6-7	2-3	3-4	4-5
RECEIVE										
RANGE	Hi									
VOLTAGE	320	340	250	230	320	340	255	340	230	320
CURRENT	1.0	2.0	2.0	1.0	1.0	2.0	2.0	2.0	1.0	1.0
SEND	5-6	6-7	1-2	2-3	3-4	4-5	5-6	6-7	1-2	2-3
RECEIVE										
RANGE	Hi									
VOLTAGE	340	255	340	340	230	320	340	255	340	340
CURRENT	2.0	2.0	2.0	2.0	1.0	1.0	2.0	2.0	2.0	2.0

FREQUENCIES 1.0 0.1

SENDER NO. 13691-5

OPERATOR Bob S

RECEIVER NO.

OPERATOR Jim B

COMMENTS: Pick up Tx Fuses

Col 1-2

V 165

C 1.0

PAGE

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT 289-68

LINE 1 HALF S SP. 1 DATE 8-30

SEND	3-4	4-5	5-6	1-2	2-3	3-4	4-5	1-2	2-3	3-4
RECEIVE										
RANGE	Hi									
VOLTAGE	230	320	340	340	340	230	320	340	340	230
CURRENT	1.0	1.0	2.0	2.0	2.0	1.0	1.0	2.0	2.0	1.0
SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										

FREQUENCIES 1.0 0.1

SENDER NO. 13671-5

OPERATOR Bob S

RECEIVER NO.

OPERATOR JM B

COMMENTS:

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT HELVETIA - Superior
LINE 1 HALF N SP. 1 DATE 29 aug

SEND	3-4	2-3	1-2	4-5	3-4	2-3	1-2	5-6	4-5	3-4
RECEIVE	5		10	10			15	15		5
RANGE	X10		X.10.	X-10	X-1.	1.0	X1.0	X-10	X1.0	X1.0
DC 1	-.4	-.8	1.3	1.3	1.3	.4 1.6	1.0	2.4	1.9	1.2
DC 2	1.6	2.1	1.2	1.2	.7	1.0 1.0	2.6	2.5	4.0	3.9
DC 3	.4	-.8	1.3	1.2	1.2	.9 1.5	.8	2.4	.8	1.0
DC 4	1.6	2.2	1.3	1.3	.8	1.0 1.0	2.4	2.4	4.3	3.4
DC 5	.3	-.9	1.2	1.3	1.0	.8 1.6	.5	2.5	.5	1.2
DC 6	1.6	2.3	1.3	1.2	.8	.9 1.0	2.4	2.4	4.2	3.2
DC 7	-.3	-1.0	1.0	1.3	1.0	.9 1.6	.6	2.5	.4	2.0
DC 8	1.6	2.4	1.4	1.3	.8	.8 .8	2.9	2.4	4.4	2.7
DC AVG.	0.97	0.67	1.24	1.26	0.94	1.27	1.59	2.44	2.48	2.38
AC 1	21.0	87.7	43.3	19.1	77.5	43.3	25.0	24.1	30.4	17.1
AC 2	+.1	-.2	0.0	0.0	-.1	0.0	0.0	-.1	-.1	0.0
AC AVG.										
S.P.	-[illegible]	-15.5		+4.9				-94.4	30.4	
AC NOISE			.06				.05	2.6	2.6	2.5
POT RES.	1.0	0.9	1.3	1.4	1.1	1.4	1.7	NOTE OTHER SIDE		

20KR PPE

GROUNDED SILT FENCE ~90° TO LINE
~50' N. OF PIT #7

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT Helvetia - Superior
LINE 1 HALF N SP. 1 DATE 29 aug

SEND	2-3	1-2	6-7	5-6	4-5	3-4	2-3	1-2	CAL-1	
RECEIVE		20	20					25.	6-7(2)	
RANGE	X1.0	X.1	X10	X-1	X-1	X-1	X.1	X.1	X10	
DC 1	2.0	-.1	3.4	4.4	4.2	3.5	4.9	6.9	-.2	
DC 2	1.7	5.2	4.7	2.4	2.7	.8	.9	-5.1	0.0	
DC 3	2.4	-.2	3.8	4.8	2.4	3.6	5.8	8.9	-.2	
DC 4	1.2	5.8	4.2	2.5	4.1	-.7	1.5	-7.9	0.0	
DC 5	2.4	-.4	3.8	4.2	2.1	5.5	3.1	14.0		
DC 6	1.5	6.8	4.3	2.8	2.3	-.5	2.0	-9.1		
DC 7	2.4	-1.2	3.8	4.2	3.6	4.4	3.3	10.2		
DC 8	1.2	7.0	4.2	2.6	2.2	-.5	1.1	-6.8		
DC AVG.	1.89	2.78	4.06	3.49	2.91	2.09	2.80	1.58	-0.1	
AC 1	11.0	72.3	26.9	67.5	14.3	11.8	89.2	70.1	19.9	
AC 2	-.3	+.1	-.1	0.0	0.0	-.1	+.2	0.0	0.0	
AC AVG.										
S.P.			+3.8							
AC NOISE		.05							.05	
POT RES.	2.1	2.9	4.2	3.6	3.0	2.2	2.8	1.7		

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT Helvetia - Superior
LINE ____ HALF ____ SP. ____ DATE ____

SEND	6-7	5-6	4-5	3-4	2-3	6-7	5-6	4-5	3-4	
RECEIVE	25				30	30			35	
RANGE	X10	X1.0	1.0	1.0	1.0	1.0	.1	.1	.1	
DC 1	0.5	0.6	0.4	1.9	0.8	2.3	4.0	-1.8	-0.5	
DC 2	8.2	6.0	5.0	1.1	2.2	6.9	1.1	10.1	1.1	
DC 3	0.8	0.9	-0.8	2.9	1.2	3.2	2.6	-10.0	-1.3	
DC 4	8.2	5.7	6.0	0.2	1.8	4.9	0.7	+15.0	4.4	
DC 5	0.6	1.2	-0.8	2.7	1.4	3.9	5.4	-9.0	3.2	
DC 6	8.4	6.0	5.2	0.7	2.0	4.6	-3.0	12.2	0.7	
DC 7	0.2	0.6	-0.4	2.9	0.8	3.8	5.2	-9.8	-4.1	
DC 8	8.4	6.4	5.8	0.0	2.4	3.4	-1.4	12.1	7.3	
DC AVG.	4.41	3.41	2.47	1.64	1.57	4.31	1.90	1.78	0.60	
AC 1	10.3	41.7	11.91	11.6	10.0	10.8	73.6	25.9	26.8	
AC 2	-.2	±0.0	0.0	0.0	0.0	-0.2	0.0	0.0	0.0	
AC AVG.										
S.P.	-1.4					-8.5				
AC NOISE					.06				.06	
POT RES.	4.6	3.5	2.6	1.7	1.7	4.5	2.0	1.9	0.7	

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PROJECT _____

LINE _____ HALF _____ SP. _____ DATE _____

SEND	6-7	5-6	4-5							
RECEIVE	35		40							
RANGE			X.1							
DC 1	10.1	19.8	-7.0							
DC 2	0.0	-13.1	10.1							
DC 3	8.8	18.8	-10.1							
DC 4	0.2	-9.2	12.2							
DC 5	8.2	15.2	-8.1							
DC 6	.8	-10.2	11.1							
DC 7	9.0	19.1	-8.0							
DC 8	-2.3	-14.0	11.1							
DC AVG.	4.74	3.18	1.32							
AC 1	54.0	34.8	12.5							
AC 2	+.1	+1	0.0							
AC AVG.										
S.P.	+8.3									
AC NOISE			?							
POT RES.	4.8	2.8	1.4							

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT Halvica Superior

LINE 1 HALF N SP. 1 DATE 29-8-68

PAGE 1

SEND	3-4	2-3	1-2	4-5	3-4	2-3	1-2	5-6	4-5	3-4
RECEIVE	500N		1000N	10			15N	15N		
RANGE	Hi									
VOLTAGE	360	325	340	330	356	325	340	340	330	355
CURRENT	1.5	2.0	2.0	1.0	1.5	2.0	2.0	2.0	1.0	1.5
SEND	2-3	1-2	6-7	5-6	4-5	3-4	2-3	1-2	6-7	5-6
RECEIVE		20N	20N					25	25	
RANGE	Hi									
VOLTAGE	325	340	310	340	330	355	325	340	310	340
CURRENT	2.0	2.0	2.50	2.0	1.0	1.5	2.0	2.0	2.50	2.0

FREQUENCIES 1.0 .1

SENDER NO. 13 671-5

OPERATOR Bob Silva

RECEIVER NO. [redacted]

OPERATOR Jim B

COMMENTS: (2) 6-7
V 245
C 2.0

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT Halvica Superior

LINE 1 HALF N SP. 1 DATE 29-8-6

PAGE 2

SEND	4-5	3-4	2-3	6-7	5-6	4-5	3-4	2-3		
RECEIVE	—	—	30N	30N	—	—	—	35N		
RANGE										
VOLTAGE	330	355	325	310	440	460	460			
CURRENT	1.0	1.5	2.0	2.50	2.6	1.44	1.95			
SEND	6-7	5-6	3-4							
RECEIVE	35N	—	40							
RANGE	Hi	—								
VOLTAGE	360	440	460							
CURRENT	2.85	2.6	1.44							

FREQUENCIES _____ _____

SENDER NO.

OPERATOR

RECEIVER NO.

OPERATOR Jim B.

COMMENTS:

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project S.O. Helvetia Line 1-5½ Field date 8/30/68 Data page_____ Comp. date 8/31/68. Comp by C.S.L.

(A) Send	45	56	67	34	45	56	67	23	34	45	56	67
(B) Receive	5-10S	→	→	10-15S	→	→	→	15-20S	→	→	→	→
(C) n separation	1	2	3	1	2	3	4	1	2	3	4	5
(D) I	1	2	2	1	1	2	2	2	1	1	2	2
(E) Vdc (avg)												
(F) DCcal												
(G) Kn x 10^{-3}	1.5	6	15	1.5	6	15	30	1.5	6	15	30	52.5
(H) ρ dc=ExFxGx10^3/D	207	257	340	265	270	331	390	236	375	350	411	451
(I) Vac Σ	132	82.8	43.6	171	43.5	43.1	25.0	302	60.5	22.5	26.5	16.5
(J) AC noise x 2												
(K) Vac(corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.												
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2) Corr	2.0	1.2	1.6	1.0	1.1	1.3	1.5	1.9	1.0	1.2	1.0	1.7
(O) MCF=(M-1)(10^5)/H	10	5	5	4	4	4	4	8	3	3	2	4

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

(A) Send	12	23	34	45	56	67	12	23	34	45	56	12
(B) Receive	20-25S	→	→	→	→	→	25-30S	→	→	→	→	30-35S
(C) n separation	1	2	3	4	5	6	2	3	4	5	6	3
(D) I	2	2	1	1	2	2	2	2	1	1	2	2
(E) Vdc (avg)												
(F) DCcal												
(G) Kn x 10^{-3}	1.5	6	15	30	52.5	84	6	15	30	52.5	84	15
(H) ρ dc=ExFxGx10^3/D	193	189	252	222	253	265	298	253	297	258	283	211
(I) Vac Σ	247	60.3	16.1	7.08	9.20	6.00	96.3	32.8	9.64	4.77	6.54	27.4
(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) Corr	1.9	1.9	2.1	2.2	2.3	2.7	0.9	0.5	0.5	0.5	0.6	0.4
(O) MCF=(M-1)(10^5)/H	10	10	8	10	9	10	3	2	2	2	2	2

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project S.O. Helvetia Line 1 (N½S½) Field date_____ Data page_____ Comp. date 8/31/68 . Comp by C.S.L.

(A) Send	56	45	34	67	56	45		CAL				
(B) Receive	30-35N	cont.	→	35-40N	→							
(C) n separation	4	5	6	4	5	6						
(D) I	2.6	1.44	1.95	2.85	2.6	1.44		2.0				
(E) Vdc (avg)												
(F) DCcal								(1.005)				
(G) Kn x 10^{-3}	30	52.5	84	30	52.5	84						
(H) ρ dc=ExFxGx10^3/D	87	97	117	60	73	74						
(I) Vac Σ	7.36	2.59	2.68	5.40	3.48	1.25		199				
(J) AC noise x 2												
(K) Vac(corr) =$\sqrt{I^2 - J^2}$												
(L) AC-DC cal.												
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2) Corr	2.0	1.9	0.7	4.8	2.8	1.4						
(O) MCF=(M-1)(10^5)/H	23	20	6	80	38	19						

N½

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

(A) Send	23	34	45	12	23	34		CAL				
(B) Receive	30-35S	cont	→	35-40S	→							
(C) n separation	4	5	6	4	5	6						
(D) I	2	1	1	2	2	1		1				
(E) Vdc (avg)												
(F) DCcal								(1.024)				
(G) Kn x 10^{-3}	30	52.5	84	30	52.5	84						
(H) ρ dc=ExFxGx10^3/D	170	187	163	312	232	255						
(I) Vac Σ	11.0	3.47	1.89	20.2	8.61	2.95		97.7				
(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) Corr	0.5	0.1	0.4	0.6	0.2	0.5						
(O) MCF=(M-1)(10^5)/H	3	1	2	2	1	2						

S½

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project S.O. Helvetia Line 1 N½ Field date 29/30/8/68 Data page_____ Comp. date 8/31/68. Comp by G.S.L.

(A) Send	34	23	12	45	34	23	12	56	45	34	23	12
(B) Receive	5-10N	→	→	10-15N	→	→	→	15-20N	→	→	→	→
(C) n separation	1	2	3	1	2	3	4	1	2	3	4	5
(D) I	1.5	2.0	2.0	1.0	1.5	2.0	2.0	2.0	1.0	1.5	2.0	2.0
(E) Vdc (avg)												
(F) DCcal												
(G) Kn x 10^{-3}	1.5	6	15	1.5	6	15	30	1.5	6	15	30	52.5
(H) ρ dc=ExFxGx10^3/D	213	267	331	292	315	331	383	186	188	176	169	196
(I) Vac Σ	210	87.7	43.3	191	77.5	43.3	25.0	241	30.4	17.1	11.0	7.23
(J) AC noise x 2												
(K) Vac(corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.												
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2) Corr	1.0	0.9	1.3	1.4	1.1	1.4	1.7	2.6	2.6	2.5	2.1	2.9
(O) MCF=(M-1)(10^5)/H	5	3	4	5	3	4	4	14	14	14	12	15

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

(A) Send	67	56	45	34	23	12	67	56	45	34	23	67
(B) Receive	20-25N	→	→	→	→	→	25-30N	→	→	→	→	30-35N
(C) n separation	1	2	3	4	5	6	2	3	4	5	6	3
(D) I	2.5	2.0	1.0	1.5	2.0	2.0	2.5	2.0	1.0	1.5	2.0	2.5
(E) Vdc (avg)												
(F) DCcal												
(G) Kn x 10^{-3}	1.5	6	15	30	52.5	84	6	15	30	52.5	84	15
(H) ρ dc=ExFxGx10^3/D	169	211	222	242	242	301	260	325	368	415	429	68
(I) Vac Σ	269	67.5	14.3	11.8	8.92	7.01	103	41.7	11.91	11.6	10.0	10.8
(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) Corr	4.2	3.6	3.0	2.2	2.8	1.7	4.6	3.5	2.6	1.7	1.7	4.5
(O) MCF=(M-1)(10^5)/H	25	17	14	9	12	6	18	11	7	4	4	66

PAGE 1

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT _____

LINE 2 HALF N SP. 1 DATE 8/2/76

SEND	3-4	2-3	1-2	4-5	3-4	2-3	1-2	5-6	4-5	3-4
RECEIVE	5/1000	→	→	1000	→	→	1500	1500	→	→
RANGE	Hi	Hi	Lo	Lo	Hi	Hi	Lo	Lo	Lo	Hi
VOLTAGE	360	320	440	600	360	320	460	520	600	360
CURRENT	1.5	1.0	1.25	1.25	1.5	1.0	1.25	1.25	1.25	1.5
SEND	2-3	1-2	6-7	56	4-5	3-4	2-3	1-2	6-7	5-6
RECEIVE	→	2000	2000	→	→	→	→	2500		
RANGE	Hi	Lo	Hi	Lo	Lo	Hi	Hi	Lo	Lo	Lo
VOLTAGE	320	460	380	520	600	360	320	460	460	580
CURRENT	1.0	1.25	1.25	1.25	1.25	1.50	1.0	1.25	1.50	1.4

FREQUENCIES 1.0 0.1

SENDER NO. 1A672-S

OPERATOR

RECEIVER NO.

OPERATOR

COMMENTS:

Cal 5-6
Hi V 420
C 1.0

PAGE

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT _____

LINE 2 HALF N SP. 1 DATE 9/5

SEND	4-5	3-4	2-3	6-7	5-6	4-5	3-4	6-7	5-6	4-5
RECEIVE										
RANGE	Lo	Hi	Hi	Lo	Lo	Lo	Hi	Lo	Lo	Lo
VOLTAGE	680	420	470	460	580	680	420	460	580	680
CURRENT	1.4	1.8	1.4	1.5	1.4	1.4	1.8	1.5	1.4	1.4
SEND	3-4									
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										

FREQUENCIES 10 0.1

SENDER NO. 14672S

OPERATOR Bob S

RECEIVER NO.

OPERATOR

COMMENTS:

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

PROJECT HELVETIA

LINE 2 HALF N SP. 1 DATE 2 Sept

PAGE

SEND	3-4	2-3	1-2	4-5	3-4	2-3	1-2	5-6	4-5	3-4
RECEIVE	5		10	10			15	15		
RANGE	X 10	X-1	X-1	X-10	X-1.	X-1.	X-.1	X-1.	X-1.	X-.1
DC 1	0.0	-.8	-7.5	.9	4.8	1.9	1.0	-.7	6.0	-3.0
DC 2	.9	3.6	8.6	1.8	-3.3	.8	1.1	4.0	3.9	5.1
DC 3	0.0	-1.2	-7.2	.9	4.8	2.8	2.0	-.6	0.0	-.9
DC 4	.9	2.4	9.0	1.7	-3.5	← 0.0	-1.2	3.9	3.9	3.7
DC 5		-.1	-7.0	1.0	4.5	← 2.3	4.6	-.4		-.9
DC 6		1.8	7.6	1.7	-3.2	.7	-2.3	3.9		3.5
DC 7		-.6	-5.9	1.0	4.2	2.3	3.2	-.3		-.6
DC 8		1.7	9.9	1.5	-3.2	.5	-1.5	3.8		3.2
DC AVG.	.45	.91	.90	1.33	.61	1.44	1.02	1.72	1.95	1.43
AC 1	193.	49.8	14.9	525	54.2	23.8	9.64	90.7	48.6	7.61
AC 2	-0-	-0-	-0-	-0-	-.1	-0-	-0-	-0-	-.2	-0-
AC AVG.										
S.P.	+25.6			-8.8				-15.2		
AC NOISE			.09				.02			
POT RES.	0.3	0.8	.7	1.2	.5	1.3	.8	1.5	1.9	1.3

CALC I

X-1

	.5
	0.0
	.5
	0.0
AC1	99.1
AC2	0.0

5-6

CALC II

X-1

	1	0.0
DC	2	0.1
	3	0.0
	4	0.1
	5	
	6	
AC1		99.1
AC2		-0-

5-6

NOTE -
GROUNDED STEEL FENCE
~ 200' N OF #7, AT ~ 90°
TO LINE, SAME FENCE
& RELATIONSHIP TO LINE
AS LINE #1 -

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT HELVETIA
LINE 2 HALF N SP. 1 DATE 2 Sept

PAGE

SEND	2-3	1-2	6-7	5-6	4-5	3-4	2-3	1-2	6-7	5-6
RECEIVE		20	20					25	25	
RANGE	X-.1	X-.1	X-1.	X-1.	X-1.	X-.1	X-.1	X-.1	X-1.	X-1.
DC 1	1.8	3.9	-.8	3.0	2.7	6.0	2.0	2.8	-2.6	-3.0
DC 2	1.3	0.0	-.2	1.1	2.3	-1.2	-4.2	-1.9	5.4	3.2
DC 3	2.0	5.5	-.8	2.9	2.8	3.0	10.0	3.5	-2.5	-2.6
DC 4	1.4	1.1	-.2	1.1	2.1	-3.0	-3.9	-3.7	5.6	5.7
DC 5	.9	1.3		3.1	2.0	7.1	7.0	3.4	-2.6	-3.0
DC 6	3.5	1.3		.5	2.8	-1.6	-3.9	-2.2	5.6	5.6
DC 7	-1.0	2.8		3.2	2.0	2.8	11.1	3.6	-2.7	-3.1
DC 8	4.0	1.7		.8	3.7	-.3	-7.0	-3.2	5.7	6.0
DC AVG.	1.57	2.11	.3	1.97	2.42	1.42	1.94	1.43	1.48	1.33
AC 1	4.67	2.19	66.2	16.9	14.3	3.04	2.64	1.43	51.7	23.7
AC 2	-0-	-0-	-.1	-.1	-0-	-0-	-0-	+.1	-0-	-.1
AC AVG.										
S.P.			+15.5						-27.5	
AC NOISE		.02						.01		
POT RES.	1.4	1.9	.2	1.8	2.2	1.2	1.8	3.0	1.3	1.2

B-289

PAGE

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT Helvetia

LINE 2 HALF S SP. 1 DATE 9/3

SEND →	4-5	5-6	6-7	3-4	4-5	5-6	6-7	1-2	2-3	3-4
RECEIVE	5		10	10			15	15		
RANGE	Lo	Hi	Lo	Hi	Lo	Hi	Lo	Lo	Hi	Hi
VOLTAGE	680	380	600	340	710	400	600	920	310	340
CURRENT	1.5	1.0	.6	1.5	1.5	1.0	.6	1.5	1.0	1.5
SEND	4-5	5-6	6-7	1-2	2-3	3-4	4-5	5-6	6-7	1-2
RECEIVE			20	20					25	2
RANGE	Lo	Hi	Lo	Lo	Hi	Hi	Lo	Hi	Lo	Lo
VOLTAGE	710	400	600-700	530	310	340	710	400	600-700	530
CURRENT	1.5	1.0	.6	1.5	1.0	1.5	1.5	1.0	.6	1.5

FREQUENCIES 1.0 0.10

SENDER NO. 14672-5

OPERATOR Bob S

RECEIVER NO.

OPERATOR Jim B

COMMENTS: 6-7
AC V 580-700
DC 580-750

Cal
V 920
C 1.5

B-259

PAGE

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT Helvetia

LINE 2 HALF 5 SP. 1 DATE 8/3

SEND	2-3	3-4	4-5	5-6	1-2	2-3	3-4	4-5	1-2	2-3
RECEIVE										
RANGE	Hi	Hi	Lo	Hi	Lo	Hi	Hi	Lo	Lo	Hi
VOLTAGE	310	350	470	400	530	325	350	420	530	310
CURRENT	1.0	1.5	1.0	1.0	1.5	1.0	1.5	1.0	1.5	1.0
SEND	3-4									
RECEIVE										
RANGE	Hi	-								
VOLTAGE	360	3								
CURRENT	1.5									

FREQUENCIES 1.0 0.10

SENDER NO. 1462-5

OPERATOR Bob S

RECEIVER NO.

OPERATOR Jim B

COMMENTS:

$$\rightarrow \quad 0.0 + 2(0.8 + 0.1 + 0.7 + 0.1 + 1.2 + 0.7) + 0.9$$

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HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT HELVETIA B-289
LINE 2 HALF 5 SP. 1 DATE 9/3

PAGE

SEND	4-5	5-6	6-7	3-4	4-5	5-6	6-7	2-3	3-4	4-5
RECEIVE	5		10	10			15			D
RANGE	X 10	X-1	X-1	X-10	X-1	X-1	X.1	X-10	X-1	X-1
DC 1	0.0	3.5	-4.1	2.1	2.1	9.2	+5.5	.4	1.7	-1.0
DC 2	.8	-1.2	6.0	1.8	.2	-7.4	.5	1.8	-.4	3.4
DC 3	.1	3.0	-4.1	2.1	2.1	9.3	2.9	.5	2.2	-1.1
DC 4	.7	-1.1	6.2	1.8	.3	-7.0	2.0	1.8	-.3	3.8
DC 5	.1	2.8	-4.7		2.2	7.6	1.7	.3	1.8	-1.6
DC 6	1.2	-.9	6.8		.6	-7.2	1.8	2.0	-.1	4.0
DC 7	.7	2.1	-5.0		2.1	8.2	1.2	.3	2.0	-2.0
DC 8	.9	-.5	7.0		.6	-6.3	2.0	1.9	-.1	4.4
DC AVG.	0.58	0.89	1.95	1.95	1.26	.71	1.98	1.12	.86	1.17
AC 1	574.0	51.4	14.6	116.0	94.2	12.1	4.63	391.0	46.8	49.8
AC 2	-.1	-.1	-.1	-0-	-0-	-.2	+.1	-.1	-.1	-.1
AC AVG.										
S.P.	+27.0			-13.6				+23.1		
AC NOISE			.02				.02	CAL	OVER	
POT RES.	.8	1.2	1.3	2.2	1.5	1.16	2.2	1.4	1.2	1.5

	CAL
DC 1	-.6
2	.1
3	-.6
4	.1
5	
6	
AC 1	150
AC 2	-0-

-0.25

+0.25

X-10

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT Helvetia B-289
LINE 2 HALF 3 SP. 1 DATE 9/3

PAGE

SEND	5-6	6-7	1-2	2-3	3-4	4-5	5-6	6-7	1-2	2-3
RECEIVE		20	20					25	25	
RANGE	X.1	X-.1	X-10	X-1.	X-1.	X-1.	X-.1	X-.1	X-1.	X.1
DC 1	-.5	-3.0	1.5	1.7	4.1	3.2	-.8	-4.7	-.5	0.0
DC 2	3.8	7.2	.2	.5	-1.8	-.5	5.1	8.4	-.2	4.0
DC 3	-3.8	-7.6	1.6	1.8	4.8	3.1	-1.4	-3.1	-.1	-.1
DC 4	7.8	15.2	.2	.3	-1.5	-.7	4.6	7.2	-.8	4.3
DC 5	-7.3	-14.1	1.6	2.0	4.9	3.4	-1.8	-4.3	-.2	-.4
DC 6	11.0	20.0	.2	.1	-1.6	-.9	7.2	7.1	-1.2	5.8
DC 7	-11.0	-18.2	1.6	2.0	5.0	4.4	-4.8	-3.0	.1	-.8
DC 8	15.5	24.7	.2	.1	-1.4	-1.0	7.8	7.8	-2.9	5.0
DC AVG.	1.14	1.91	.89	1.09	1.71	1.36	1.77	1.98	-.59	2.19
AC 1	7.45	2.88	244.0	96.4	23.3	31.1	5.36	2.46	50.6	29.0
AC 2	+.1	-.1	-0-	-.1	+.1	-0-	-0-	-0-	-0-	-0-
AC AVG.										
S.P.			+13.6						+0.6	
AC NOISE		.03						.02		
POT RES.	1.3	2.2	1.1	1.3	1.9	1.6	2.0	2.2	-.3	2.4

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

B-289

PROJECT Helvetia
LINE 2 HALF 3 SP. 1 DATE 9/3

PAGE

SEND	3-4	4-5	5-6	1-2	2-3	3-4	4-5	1-2	2-3	3-4
RECEIVE	—		30	30	—	—	36	35	—	40
RANGE	X.1	X-.1	X.1	X-1.	X.1	X.1	X.1	X.1	X.1	X-.1
DC 1	1.7	1.4	-6.0	2.1	0.6	5.0	-.3	9.6	-6.9	-12.9
DC 2	0.0	1.0	7.2	0.0	0.1	-7.0	3.1	-6.3	14.0	17.0
DC 3	1.1	10.0	-6.7	2.0	1.0	8.0	3.0	7.8	-12.6	-16.1
DC 4	-.8	-7.5	7.7 +	.3	-.8	-5.2	-5.5	-6.1	15.2	21.1
DC 5	2.3	11.1	-7.11	1.9	1.1	11.8 -	7.4	7.6	-13.9	-10.8 -
DC 6	-1.8	-3.0	8.3 X	.8	.1	-11.2 -	-1.8	-1.8	17.2	11.2
DC 7	3.5	7.4	-7.5	1.1	.2	11.0	3.5	4.6	-12.1	-10.2
DC 8	-3.0	-6.2	8.6	1.5	.1	-8.2	.8	-.2	14.0	10.5
DC AVG.	.52	2.37	1.83	1.13	.25	.42	1.42	1.46	1.62	.99
AC 1	8.53	8.38	2.31	13.5	9.07	2.96	3.04	6.98	4.98	1.74
AC 2	-0-	-0-	-0-	-0-	-.2	-.2	-.1	+.1	+.3	+.1
AC AVG.										
S.P.				+7.7						
AC NOISE			.08				.08			.08
POT RES.	.8	2.6	2.1	1.4	.6	.8	1.7	1.7	1.7	1.2

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project S.O. Helvetia Line 2 Field date 9/2/68 Data page_____ Comp. date 9/6/68. Comp by W.R

(A) Send	34	23	12	45	34	23	12	56	45	34	23	12
(B) Receive	5-10N	→	→	10-15N	→	→	→	15-20N	→	→	→	→
(C) n separation	1	2	3	1	2	3	4	1	2	3	4	5
(D) I	1.5	1.0	1.25	1.25	1.5	1.0	1.25	1.25	1.25	1.5	1.0	1.25
(E) Vdc (avg)												
(F) DCcal	1.009	→	→	→	→	→	→	→	→	→	→	→
(G) Kn x 10^{-3}	1.5	6	15	1.5	6	15	30	1.5	6	15	30	52.5
(H) ρ dc=ExFxGx10^3/D	195	304	182	643	219	365	235	111	240	78	143	95
(I) Vac Σ	193.	49.8	14.9	525	54.2	23.8	9.64	90.7	48.6	7.61	4.67	2.19
(J) AC noise x 2												
(K) Vac(corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.												
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2)	0.3	0.8	0.7	1.2	0.5	1.3	0.8	1.5	1.9	1.3	1.4	1.9
(O) MCF=(M-1)(10^5)/H	2	3	4	2	2	4	3	14	8	17	10	20

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

(A) Send	67	56	45	34	23	12	67	56	45	34	23	67
(B) Receive	20-25N	→	→	→	→	→	25-30N	→	→	→	→	30-35N
(C) n separation	1	2	3	4	5	6	2	3	4	5	6	3
(D) I	1.25	1.25	1.25	1.50	1.0	1.25	1.50	1.4	1.4	1.8	1.4	1.5
(E) Vdc (avg)												
(F) DCcal	1.009	→	→	→	→	→	→	→	→	→	→	→
(G) Kn x 10^{-3}	1.5	6	15	30	52.5	84	6	15	30	52.5	84	15
(H) ρ dc=ExFxGx10^3/D	80	83	177	62	142	97	211	259	575	242	643	126
(I) Vac Σ	66.2	16.9	14.3	3.04	2.64	1.43	51.7	23.7	26.2	8.18	10.5	12.3
(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)	0.2	1.8	2.2	1.2	1.8	3.0	1.3	1.2	1.5	0.6	1.1	1.9
(O) MCF=(M-1)(10^5)/H	3	22	12	19	13	31	6	5	3	2	2	15

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

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Project S.O. Helvetia Line 2 Field date 9/3/68 Data page_____ Comp. date 9/5/68. Comp by W. R.

	5½	5-1										
(A) Send	45	56	67	34	45	56	67	23	34	45	56	67
(B) Receive	5-105	→	→	10-155	→	→	→	15-205	→	→	→	→
(C) n separation	1	2	3	1	2	3	4	1	2	3	4	5
(D) I	1.5	1.0	.6	1.5	1.5	1.0	.6	1.0	1.5	1.5	1.0	.6
(E) Vdc (avg)												
(F) DCcal	(1.000)	—	—	—	—	—	—	—	—	—	—	—
(G) Kn x 10^{-3}	1.5	6	15	1.5	6	15	30	1.5	6	15	30	52.5
(H) ρ dc=ExFxGx10^3/D	579	312	370	119	382	183	236	595	189	505	226	258
(I) Vac Σ	574.0	51.4	14.6	116.0	94.2	12.1	4.63	391.0	46.8	49.8	7.45	2.88
(J) AC noise x 2												
(K) Vac(corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.												
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2)	0.8	1.2	1.3	2.2	1.5	1.1	2.2	1.4	1.2	1.5	1.3	2.2
(O) MCF=(M-1)(10^5)/H	1	4	4	18	4	6	9	2	6	3	6	9

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

(A) Send	12	23	34	4-5	56	67	12	23	34	45	56	12
(B) Receive	1	2	3	4	5	6	2	3	4	5	6	3
(C) n separation	20-255	→	→	→	→	→	25-305	→	→	→	→	30-355
(D) I	1.5	1.0	1.5	1.5	1.0	.6	1.5	1.0	1.5	1.0	1.0	1.5
(E) Vdc (avg)												
(F) DCcal	(1.000)	—	—	—	—	—	—	—	—	—	—	—
(G) Kn x 10^{-3}	1.5	6	15	30	52.5	84	6	15	30	52.5	84	15
(H) ρ dc=ExFxGx10^3/D	247	586	237	632	287	352	196	445	172	451	198	137
(I) Vac Σ	244.0	96.4	23.3	31.1	5.36	2.46	50.6	29.0	8.53	8.38	2.31	13.5
(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)	1.1	1.3	1.9	1.6	2.0	2.2	-.3	2.4	0.8	2.6	2.1	1.4
(O) MCF=(M-1)(10^5)/H	4	2	8	3	7	6	-2	5	5	6	11	10

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project S.O. Helvetia Line 2 Field date 9/3/68 Data page_____ Comp. date 9/5/68. Comp by W.R.

(A) Send	2-3	34	45	12	23	34				CAL		
(B) Receive	30-35S	→	→	35-40S	→	→						
(C) n separation	4	5	6	4	5	6						
(D) I	1.0	1.5	1.0	1.5	1.0	1.5				1.5		
(E) Vdc (avg)												
(F) DCcal	(1.000)	→	→	→	→	→				1.000		
(G) Kn x 10^{-3}	30	52.5	84	30	52.5	84						
(H) ρ dc=ExFxGx10^3/D	288	104	260	140	266	99						
(I) Vac Σ	9.07	2.96	3.04	6.90	4.98	1.74				1.50		
(J) AC noise x 2												
(K) Vac(corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.										(+0.25)		
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2)	0.6	0.8	1.7	1.7	1.7	1.2						
(O) MCF=(M-1)(10^5)/H	2	8	7	12	6	12						

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 COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project S.O. Helvetia Line 2 Field date 9/2/68 Data page_____ Comp. date 9/6/68. Comp by W.R.

(A) Send	56	45	34	67	56	45						
(B) Receive	30-35N	→	→	35-40N	→	→						
(C) n separation	4	5	6	4	5	6						
(D) I	1.4	1.4	1.8	1.5	1.4	1.4						
(E) Vdc (avg)												
(F) DCcal	1.009	→	→	→	→	→						
(G) Kn x 10^{-3}	30	52.5	84	30	52.5	84						
(H) ρ dc=ExFxGx10^3/D	141	293	123	32	31	59						
(I) Vac Σ	6.40	7.61	2.59	1.50	.790	.944						
(J) AC noise x 2												
(K) Vac(corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.												
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2)	1.7	1.7	1.2	4.7	2.7	3.7						
(O) MCF=(M-1)(10^5)/H	12	6	10	147	87	63						

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 B-289

LINE 3 HALF E SP. 1 DATE Sept

PAGE 1

SEND	3-4	2-3	1-2	4-5	3-4	2-3	1-2	5-6	4-5	3-4
RECEIVE	5		15	10			15	15		
RANGE	X-10	X-1	X-1	X10	X-1	X-1	X-1	X10	X-1	X-1
DC 1	2.9	2.3	-.6	.2	2.8	4.6	12.1	.1	-1.0	1.2
DC 2	1.4	1.7	4.0	1.0	1.2	-2.2	-9.7	1.8	3.1	.1
DC 3	1.2	-.3	-2.8	.4	2.1	6.5	12.3	.3	-.5	2.9
DC 4	-.5	1.5	4.0	1.1	-.1	-4.0	-8.0	1.4	2.9	-2.3
DC 5	1.0	-.2	1.0	.2	2.6	5.7	10.0	.7	-.1	4.0
DC 6	-.9	2.0	1.8	1.0	-1.5	-2.5	-6.9	1.4	3.0	-2.8
DC 7	.9	1.0	-1.0	.4	2.5	5.1	9.9	.2	.8	4.1
DC 8	-.5	1.9	5.0	.9	-1.1	-3.2	-7.0	1.5	3.0	-2.2
DC AVG.	0.80	0.93	1.31	0.66	1.09	1.33	1.45	0.96	1.46	0.79
AC 1	156	52.7	21.0	284	56.5	28.2	13.6	27.1	67.1	20.3
AC 2	-0-	-0-	-0-	-0-	-0-	+.2	-0-	-0-	-0-	-0-
AC AVG.										
S.P.	+0.5			-1.4				-8.7		
AC NOISE			.01				.08			
POT RES.	1.3	1.4	1.8	1.2	1.6	1.7	2.0	1.5	2.0	1.3

x-10

-.9
-.1
-.9
-.1
127
-0-

-0.5

+0.5

6-7

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT TB-289
LINE E HALF E SP. 1 DATE Sept 68

SEND	2-3	1-2	6-7	5-6	4-5	3-4	2-3	1-2	6-7	5-6
RECEIVE		20	20					25	25	
RANGE	X-1	X.1	X-10	X-1	X-1	X-1	X.1	X.1	X-10	X-1.0
DC 1	7.6	-11.1	.6	2.6	6.8	-2.1	-6.0	-7.1	1.8	6.2
DC 2	-6.0	12.9	.9	-1.8	-4.2	3.8	8.9	8.0	.2	-4.1
DC 3	7.5	-13.0	.6	2.4	6.0	-3.5	-10.2	-2.6	1.8	6.3
DC 4	-4.0	17.7	1.0	-1.8	-4.4	7.2	11.8	3.9	.2	-4.2
DC 5	2.9	-15.7	.6	2.9	6.7	-5.8	-6.2	-1.8		6.2
DC 6	.2	21.2	1.0	-2.4	-5.0	8.0	9.0	4.5		-4.3
DC 7	4.0	-20.0		2.8	7.3	-4.0	-8.2	-2.0		6.6
DC 8	2.5	22.1		-1.7	-3.4	4.2	11.8	7.1		-4.2
DC AVG.	1.34	1.23	0.78	0.36	1.16	0.96	1.14	1.43	1.00	0.93
AC 1	12.0	6.35	61.	70.9	26.9	10.5	6.61	3.81	172.	28.2
AC 2	-0-	-0-	-0-	-.1	-0-	-0-	-.1	-0-	+.1	+.2
AC AVG.										
S.P.			-8.1					+1.2		
AC NOISE		.07						.06		
POT RES.	1.8	1.7	1.3	0.8	1.7	1.5	1.6	1.9	1.5	1.4

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT B-289
LINE 3 HALF E SP. 1 DATE Sept 68

SEND	4-5	3-4	2-3	6-7	5-6	4-5	3-4	6-7	5-6	4-5
RECEIVE			30	30			35	35		40
RANGE	X-1	X-.1	X.1	X10	X-1.	X.1	X-.1	X-1.	X.1	X.1
DC 1	-1.8	.6	3.2	7.2	7.5	1.9	-7.1	.8	-3.8	-11.0
DC 2	3.7	1.9	1.4	-6.8	-6.0	.6	11.0	-.1	3.4	-4.4
DC 3	-2.0	-.6	2.0	7.4	7.3	2.0	-8.2	.5	-3.8	-21.4
DC 4	4.6	2.8	1.8	-6.7	-5.8	.6	11.0	-.2	3.4	1.6
DC 5	-2.6	-.5	2.5	7.4	7.3	2.0	-6.7	.5	-3.7	-19.0
DC 6	4.0	2.7	-.9	-6.8	-6.0	1.0	8.1	-.2	3.1	.8
DC 7	-2.6	.6	3.0	7.4	7.3	1.8	-7.7	.5	-3.2	-18.8
DC 8	4.2	2.1	0.0	-6.7	-6.0	1.8	10.9	-.2	3.0	.2
DC AVG.	0.90	1.18	1.63	0.31	0.69	1.37	1.34	0.19	-0.17	-8.95
AC 1	12.6	5.04	3.35	111.	19.6	9.24	3.78	29.2	6.45	3.74
AC 2	-0-	-.1	-0-	-.2	-0-	-0-	+.1	-0-	-.2	-8.
AC AVG.										
S.P.				+55						
AC NOISE			.04				.06			
POT RES.	1.4	1.7	2.1	0.5	1.2	1.9	1.8	0.7	0.3	0.5?

PAGE

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT _____

LINE 3 HALF ____ SP. 1 DATE ____

SEND	3-4	2-3	1-2	4-5	3-4	2-3	1-2	5-6	4-5	3-4
RECEIVE	0 —	—	— 5	5 —	—	—	— 10	10 —	—	—
RANGE	LO'	Hi'	LO	LO	Hi'	Hi'	LO	Hi'	LO	Hi'
VOLTAGE	470	460	420	550	470	460	420	380	550	470
CURRENT	1.25	1.25	1.33	1.333	1.25	1.25	1.333	1.4	1.333	1.25
SEND	2-3	1-2	6-7	5-6	4-5	3-4	2-3	1-2	6-7	5-6
RECEIVE	—	— 15	15 —	—	—	—	— 20	20	—	—
RANGE	Hi'	LO	Hi	Hi'	LO	LO	Hi	LO	Hi'	Hi'
VOLTAGE	460	420	380	380	550	470	460	420	380	380
CURRENT	1.25	1.33	2.0	1.4	1.333	1.25	1.25	1.333	2.0	1.4

FREQUENCIES 1.0 0.1

SENDER NO. 13671-S

OPERATOR Bob S

RECEIVER NO. ?

OPERATOR Jim B

COMMENTS:

PAGE

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT _____

LINE 3 HALF ____ SP. 1 DATE ____

SEND	4-5	3-4	2-3	6-7	5-6	4-5	3-4	6-7	5-6	4-5
RECEIVE			25							
RANGE	Lo	Lo	Hi	Hi	Hi	Lo	Lo	Hi	Hi	Lo
VOLTAGE	550	470	460	380	380	550	470	380	380	550
CURRENT	1.333	1.25	1.28	2.0	1.4	1.33	1.25	2.0	1.4	1.333
SEND										500 1.20
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										

FREQUENCIES 1.0 0.1

SENDER NO.

OPERATOR

RECEIVER NO.

OPERATOR

COMMENTS:

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT HELVETIA
LINE 3 HALF W SP. 1 DATE 6 Sept 66

PAGE 1

SEND	4-5	5-6	6-7	3-4	4-5	5-6	6-7	2-3	3-4	4-5
RECEIVE	5		10	10			15	15		
RANGE	X-10	X-1.0	X-1.0	X-10	X-1.0	X 1.0	X-1.0	X-10	X-1.0	X-1.0
DC 1	3.2	-1.8	.9	4.8	5.5	-1.5	4.5	-3.2	-7.2	-3.9
DC 2	-1.4	2.9	1.8	-2.3	-3.8	7.1	-1.9	4.9	-8.2	7.4
DC 3	3.2	-1.5	.2	4.8	4.0	-4.7	6.8	-3.2	-6.3	-4.1
DC 4	-1.4	4.1	1.2	-2.7	-.2	10.8	-5.1	5.0	7.8	5.2
DC 5		-1.5	1.2	4.9	1.9	-8.2	8.2	-3.1	-7.1	-5.0
DC 6		3.8	.7	-2.7	.8	9.8	-5.1	4.9	8.1	2.9
DC 7		-1.6	2.0	5.0	1.4	-6.1	7.8	-3.0	-4.8	3.2
DC 8		3.0	.8	-3.1	1.0	10.8	-4.2	4.9	5.1	-.7
DC AVG.	0.90	0.97	1.14	1.12	1.05	1.80	1.55	0.91	0.73	0.71
AC 1	15.4	51.5	50.5	147.0	40.5	19.0	22.4	236.	40.3	14.0
AC 2	-0-	-0-	-.1	-0-	-0-	+.1	-.1	-0-	-.1	-0-
AC AVG.										
S.P.	-7.9			+.03			.	-41.8		
AC NOISE			.05				.06	1.4	1.2	1.2
POT RES.	1.4	1.4	1.6	1.6	1.5	2.2	2.1	NOTE E	CAL OVER	

CAC 1

	X-10
DC1	-3.9
2	3.0
3	-3.9
4	3.0
5	
6	
7	
8	
AC1	153
AC2	-0-

-0.45

+0.45

NOTE- GROUNDED STEEL FENCE ~ 150° W OF ELEC. #1, STRIKES LINE ~ 90°

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT Helvetia
LINE 3 HALF W SP. 1 DATE 6 Sept 68

SEND	5-6	6-7	1-2	2-3	3-4	4-5	5-6	6-7	1-2	2-3
RECEIVE		20	20					25	25	
RANGE	X-1.0	X-1.0	X10	X-1.0	X-1.0	X-.1	X-.1	X-.1	X-1.0	X-1.0
DC 1	-6.9	2.7	-1.8	-1.6	4.9	-5.1	-9.0	-9.8	3.1	9.9
DC 2	6.8	-1.3	3.8	4.2	-3.8	13.6	15.0	10.0	-1.1	-9.1
DC 3	-4.1	1.4	-1.8	-2.8	7.9	-12.3	-13.2	-7.2	3.4	10.0 X
DC 4	8.8	2.8	3.9	4.5	-13.0	13.0	21.0	7.0 X	-2.1	-9.9
DC 5	-7.2	1.8	-1.8	-2.7	12.9	-13.2	2.1	-6.1	4.3	11.2
DC 6	12.6	-2.7	3.5	3.8	-10.6	24.8	15.2	5.8	-3.2	-10.2
DC 7	-8.0	10.0	-1.8	-1.4	17.1	-22.0	-21.0	-4.6	5.2	12.0
DC 8	5.3	-4.2	3.5	3.2	-14.2	17.2	15.0	5.2	-3.4	-11.4
DC AVG.	1.16	1.61	0.82	0.92	0.84	1.42	3.16	1.83	0.91	1.86
AC 1	10.4	13.5	310	49.6	14.3	8.49	5.13	7.19	58.5	16.3
AC 2	-.1	-0-	-.1	-.2	+.2	-0-	-0-	-0-	-0-	-0-
AC AVG.										
S.P.			+16.1						+20.1	
AC NOISE		.1						.1		
POT RES.	1.7	2.1	1.3	1.5	1.2	1.9	3.6	2.3	1.4	2.3

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT HELVETIA
LINE 3 HALF W SP. 1 DATE 6 Sept 68

SEND	3-4	4-5	5-6	1-2	2-3	3-4	4-5	1-2	2-3	3-4
RECEIVE			30	30			35	35		40
RANGE	X.1	X-.1	X-.1	X-1.0	X.1	X.1	X-.1	X-.1	X.1	X.1
DC 1	13.2	3.2	-4.5	9.1	11.8	-4.0	7.8	-12.5	8.6	-5.3
DC 2	-12.8	2.0	6.9	-9.1	-9.8	3.7	-8.8	18.4	-9.0	6.8
DC 3	9.8	.2	-3.8	13.5	10.1 X	-8.1 X	9.6	-15.2	9.2	-8.9
DC 4	-1.1	.7	12.8	14.1	-8.8	5.4	-9.8	18.6	-9.9	18.1
DC 5	11.2	1.0	-.4	13.9	9.4	-4.2	4.1	-15.6	14.6 X	-14.1
DC 6	-.6	4.0	7.6	-10.0	-10.0	7.8	-8.6	16.8	-17.3	9.0
DC 7	-1.0	3.7	-9.2	16.6	11.0	-3.6	17.2	-22.0	19.1	-11.4
DC 8	10.0	-.8	11.1	-16.1	-9.1	5.0	-15.0	25.0	-12.1	8.4
DC AVG.	1.73	1.83	2.46	1.04	1.86	0.97	0.14	1.04	0.71	0.15
AC 1	6.33	4.24	2.74	17.3	7.09	3.96	2.65	7.53	3.50	1.94
AC 2	-0-	-0-	-0-	-0-	-0-	-.1	-.1	+.2	+.2	+.1
AC AVG.										
S.P.				-.06				-19.0		
AC NOISE			.08				.18			.19
POT RES.	2.2	2.3	2.9	1.5	2.3	1.4	0.6	1.5	1.2	0.6

PAGE

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT _____

LINE 3 HALF W SP. 1 DATE 9/6

SEND	4-5	5-6	6-7	3-4	4-5	5-6	6-7	2-3	3-4	4-5
RECEIVE										
RANGE	Hi	Hi	Hi	Hi	Hi	Hi	Hi	Hi	Hi	Hi
VOLTAGE	470	400	460	380	470	400	460	440	380	470
CURRENT	1.0	1.25	2.25	1.0	1.0	1.25	2.25	1.25	1.0	1.0
SEND	5-6	6-7	1-2	2-3	3-4	4-5	5-6	6-7	1-2	2-3
RECEIVE										
RANGE	Hi	Hi	Hi	Hi	Hi	Hi	Hi	Hi	Hi	Hi
VOLTAGE	400	450	440	440	380	470	400	460	440	440
CURRENT	1.25	2.25	2.0	1.25	1.0	1.0	1.25	2.25	2.0	1.25

FREQUENCIES 1.0 0.1

SENDER NO. 13671-5

OPERATOR Bob S

RECEIVER NO.

OPERATOR Jim B

COMMENTS:

Cal 1-2
V 460
C 1.5

PAGE

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT _____

LINE _____ HALF _____ SP. _____ DATE _____

SEND	3-4	4-5	5-6	1-2	2-3	3-4	4-5	1-2	2-3	3-4
RECEIVE										
RANGE	Hi	Hi	Hi	Hi	Lo	Lo	Lo	Hi	Lo	Lo
VOLTAGE	380	470	400	440	500	550	620	440	500	500
CURRENT	1.0	1.0	1.25	2.0	1.4	1.4	1.30	2.0	1.4	1.30
SEND	4-5									
RECEIVE										
RANGE	Lo									
VOLTAGE	600									
CURRENT	1.30									

FREQUENCIES _____ _____

SENDER NO.

OPERATOR

RECEIVER NO.

OPERATOR

COMMENTS:

EAST 1/2

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page 1

Project B289 Line 3 SPR1 Field date SEPT Data page 1 Comp. date 12-9-68 Comp by DA

(A) Send	3-4	2-3	1-2	4-5	3-4	2-3	1-2	5-6	4-5	3-4	2-3	1-2
(B) Receive	500/1000			1000			1500	1500				2000
(C) n separation	X10	X1	X1	X10	X1	X1	X1	X10	X1	X1	X1	X.1
(D) I	1.25	1.25	1.33	1.333	1.25	1.25	1.333	1.4	1.333	1.25	1.25	1.33
(E) Vdc (avg)												
(F) DCcal												
(G) Kn x 10^{-3}	1.5	6.0	15.0	1.5	6.0	15.0	30.0	1.5	6.0	15.0	30.0	52.5
(H) ρ dc=ExFxGx10^3/D	187	252	237	318	271	339	307	290	303	243	289	251
(I) Vac Σ	156	52.7	21.0	284.0	56.5	28.2	13.6	271.	67.1	20.3	12.0	6.35
(J) AC noise x 2												
(K) Vac(corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.												
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2)	1.3	1.4	1.8	1.2	1.6	1.7	2.0	1.5	2.0	1.3	1.8	1.7
(O) MCF=(M-1)(10^5)/H	7	6	8	4	6	5	7	5	7	5	6	7

Project Line Field date Data page 2 Comp. date Comp by

(A) Send	6-7	5-6	4-5	3-4	2-3	1-2	6-7	5-6	4-5	3-4	2-3	
(B) Receive	2000					2500	2500				3000	
(C) n separation	X10	X1	X1	X1	X.1	X.1	X10	X1	X1	X.1	X.1	
(D) I	2.0	1.4	1.333	1.25	1.25	1.333	2.0	1.4	1.333	1.25	1.25	
(E) Vdc (avg)												
(F) DCcal												
(G) Kn x 10^{-3}	1.5	6.0	15.0	30.0	52.5	84.0	6.0	15.0	30.0	52.5	84.0	
(H) ρ dc=ExFxGx10^3/D	456	301	303	252	277	241	517	303	283	212	226	
(I) Vac Σ	611.0	70.85	26.9	10.5	6.605	3.81	172.5	28.3	12.6	5.035	3.35	
(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)	1.3	0.8	1.7	1.5	1.6	1.9	1.5	1.4	1.4	1.7	2.1	
(O) MCF=(M-1)(10^5)/H	3	3	6	6	6	8	3	5	5	8	9	

E½

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page 2

Project B 289 Line 3 SPR 1 Field date SEPT 68 Data page 13 Comp. date 12-9-68. Comp by DA

(A) Send	6-7	5-6	4-5	3-4		6-7	5-6	4-5		(A)		
(B) Receive	3000			3500		3500		4000				
(C) n separation	X10	X1	X.1	X.1		X1	X.1	X.1				
(D) I	2.0	1.4	1.33	1.25		2.0	1.4	1.33		1.25?		
(E) Vdc (avg)												
(F) DCcal										(0.984)		
(G) Kn x 10^{-3}	15	30	52.5	84.0		30.0	52.5	84				
(H) ρ dc=ExFxGx10^3/D	823	418	366	254		434	238	234				
(I) Vac Σ										127		
(J) AC noise x 2	110.9	19.6	9.24	3.775		29.2	6.44	3.74				
(K) Vac(corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.										(+0.5)		
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2)	0.5	1.2	1.9	1.8		0.7	0.3	~~0.5?~~				
(O) MCF=(M-1)(10^5)/H	1	3	5	7		2	1	2?				

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 COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page 1

Project Sup. O. Helvetia Line 3-W 1/2 Field date 6 Sept 68 Data page ~~9 Sept 6~~ Comp. date 9 Sept 68. Comp by C.S.L

(A) Send	4-5	5-6	6-7	3-4	4-5	5-6	6-7	2-3	3-4	4-5	5-6	6-7
(B) Receive	5-10W	→	→	10-15W	→	→	→	15-20W	→	→	→	→
(C) n separation	1	2	3	1	2	3	4	1	2	3	4	5
(D) I	1	1.25	2.25	1	1	1.25	2.25	1.25	1	1	1.25	2.25
(E) Vdc (avg)												
(F) DCcal												
(G) Kn x 10^{-3}	1.5	6	15	1.5	6	15	30	1.5	6	15	30	52.5
(H) ρ dc=ExFxGx10^3/D	230	246	335	220	242	228	299	282	240	283	249	313
(I) Vac Σ	154?	51.5	50.5	147	40.5	19.0	22.4	236	40.3	19.0	10.4	13.5
(J) AC noise x 2												
(K) Vac(corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.												
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2) CORR	1.4	1.4	1.6	1.6	1.5	2.2	2.1	1.4	1.2	1.2	1.7	2.1
(O) MCF=(M-1)(10^5)/H	6	6	5	7	6	10	7	5	5	4	7	7

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

(A) Send	1-2	2-3	3-4	4-5	5-6	6-7	1-2	2-3	3-4	4-5	5-6	1-2
(B) Receive	20-25W	→	→	→	→	→	25-30W	→	→	→	→	30-35W
(C) n separation	1	2	3	4	5	6	2	3	4	5	6	3
(D) I	2	1.25	1	1	1.25	2.25	2	1.25	1	1	1.25	2
(E) Vdc (avg)												
(F) DCcal												
(G) Kn x 10^{-3}	1.5	6	15	30	52.5	84	6	15	30	52.5	84	15
(H) ρ dc=ExFxGx10^3/D	231	237	213	254	219	269	175	196	190	223	186	129
(I) Vac Σ	310	49.6	14.3	8.47	5.13	7.19	58.5	16.3	6.33	4.24	2.74	17.3
(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) CORR	1.3	1.5	1.2	1.9	3.6	2.3	1.4	2.3	2.2	2.3	2.9	1.5
(O) MCF=(M-1)(10^5)/H	6	6	6	8	16	9	8	12	12	10	16	12

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page 2

Project Sup. O. Helvetia Line 3-W 1/2 Field date 6 Sept 68 Data page _____ Comp. date 9 Sept 68. Comp by CSL

(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) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2)												
(O) MCF=(M-1)(10^5)/H												

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

(A) Send	2-3	3-4	4-5	1-2	2-3	3-4		CAL				
(B) Receive	30-35W →			35-40W	→							
(C) n separation	4	5	6	4	5	6						
(D) I	1.4	1.4	1.3	2	1.4	1.3		1.5				
(E) Vdc (avg)												
(F) DCcal								(0.980)				
(G) Kn x 10^{-3}	30	52.5	84	30	52.5	84						
(H) ρ dc=ExFxGx10^3/D	152	148	171	112	130	124						
(I) Vac Σ	7.09	3.96	2.65	7.53	3.50	1.94		153				
(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) corr.	2.3	1.4	0.6	1.5	1.2	0.6		-0.45	1.45			
(O) MCF=(M-1)(10^5)/H	15	10	4	13	9	5						

PAGE 1

B-289 - LINE 4 E 1/2

SEPT 11, 1968

ST	3-4 5	2-3	1-2 10	4-5 10	3-4	2-3	1-2 15	5-6 15	4-5	3-4
RANGE	X-10	X-1.0	X-1.0	X 10	X 1.0	X 1.0	X-10	X 1.0	X 1.0	X 1.0
PC- 1	2.0	2.8	3.1	3.1	2.5	1.4	-0.1	4.8	-3.2	-.9
2	2.2	3.8	2.6	3.2	3.8	5.0	7.2	-.8	8.2	3.8
3	2.0	2.9	3.1	3.2	2.0	-.3	2.3	4.8	-3.0	-.6
4	2.2	3.2	1.2	3.0	4.2	6.3	5.0	-.8	8.6	3.6
5	2.0	3.1	3.9	3.3	2.1	-1.0	1.0		-3.5	-.7
6	2.2	3.5	1.0	3.1	3.9	5.2	5.8		9.2	3.6
7		3.0	4.8	3.1	2.0	0.1	1.2		-4.2	-1.6
8		3.8	1.0	3.2	4.3	5.0	5.4		10.0	4.5
9		2.8	4.3		1.8	0.1	1.1		-4.0	-1.9
10		4.0	1.0		4.8	5.7	4.0		9.0	4.7
AC 1	269.0	55.4	23.6	147.0	51.7	21.8	11.5	72.9	29.0	19.6
AC 2	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	+.2	-0-
SP	-2.4			-9.4						
AC Noise			.05				.04			

CAL OVER

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT _____

LINE ____ HALF ____ SP. ____ DATE ____

PAGE

SEND										
RECEIVE				CAL	5-6					
RANGE			RANGE	X-1						
VOLTAGE			DC 1	.1						
CURRENT			2	-.3						
SEND			3	.1						
RECEIVE			4	-.3						
RANGE			5							
VOLTAGE			6							
CURRENT		DC AV								

FREQUENCIES AC

SENDER NO. ~1

OPERATOR 2

RECEIVER NO. AC AV

OPERATOR

COMMENTS: Note grounded steel fence crosses line 60.8 at very low angle (~10°) ~ 50' ENE of elec. -0- #7. Same fence as found on lines 1 & 2

PAGE 2

B-289 - LINE 4 E 1/2 Sept 11 - 1968

STAT	2-1	1-2 20	6-7 25	5-6	4-5	3-4	2-3	1-2 30	6-7 30	5-6
RANGE	X 0.1	X 0.1	X 1.0	X 1.0	X 1.0	X 0.1	X 0.1	X 0.1	X 1.0	X 0.1
DC-1	4.0	4.6	.4	-1.8	4.3	3.2	7.9	-4.8	-3.8	-4.2
2	-1.0	-5.2	.3	5.0	-1.2	-.8	-10.2	2.0	9.2	13.8
3	4.2	4.8	.6	-1.6	4.7	2.8	12.8	-1.8	-3.5	-4.0
4	-2.7	~~-9.0~~	0.0	4.9	-1.9	-1.1	-14.5	.8	8.9	11.8
5	5.1	6.1	1.2	-1.3	4.9	3.7	16.2	.6	-3.0	-1.7
6	-1.3	-5.5	-1.0	5.0	-1.7	-2.5	-15.2	-.1	8.9	10.8
7	5.0	4.2	2.0	-1.5	5.0	4.9	16.2	3.1	-3.8	-2.3
8	-.5	-6.7	-1.4	4.9	-1.8	-3.0	-15.3	-9.8	8.8	11.2
9	3.6	5.1	2.0	-2.3	4.9	4.9	15.8	18.1	-3.6	-2.9
10	-1.9 ✓	-5.2 ✓	-.9 ✓	6.2 ✓	-1.7 ✓	-2.8 ✓	-15.0 ✓	22.2	15.0 ✓	12.0 ✓
AC-1	9.32	3.85	62.3	15.5	10.8	8.49	4.66	2.94	15.9	7.15
2	+.1	+.1	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-
SP-			+32.1							
AC Noise		.05						.7		

PAGE

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT _____

LINE _____ HALF _____ SP. _____ DATE _____

SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										
SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										

FREQUENCIES _____ _____

SENDER NO.

OPERATOR

RECEIVER NO.

OPERATOR

COMMENTS:

PAGE 3 B-289- LINE 4 C 1/2 11 SEPT 1968

STATION	4-5	3-4	2-3	6-7	5-6	4-5	3-4	6-7	5-6	4-5
	X 0.1	X 0.1	X 0.1	X 1.0	X 0.1	X 0.1	X 0.1	X 0.1	X 0.1	X 0.1
DC - 1	-2.3	-3.0	-.3	9.7	-2.8	4.1	.3	-6.0	-10.2	-4.1
2	11.9	9.9	11.2	-7.5	8.0	3.0	1.0	6.0	14.2	11.0
3	-2.2	-3.2	-7.4	8.2	-3.4	3.8	1.8	-6.1	-12.3	-6.2
4	8.9	9.9	14.0	-7.4	9.0	2.1	2.9	8.0	16.2	11.4
5	0.0	-3.0	-4.8	9.5	-4.3	3.5	-.8	-8.7	-12.7	-5.0
6	10.5	9.8	10.6	-9.0	9.7	2.3	5.1	8.5	15.0	10.0
7	-2.0	-2.2	-3.4	10.1	-4.9	2.9	-3.1	-7.0	-12.0	-4.1
8	10.2	9.4	10.8	-9.9	9.4	3.2	5.9	8.6	17.1	7.8
9	.8	-2.4	-5.1	11.8	-5.2	3.5	-.4	-8.0	-14.3	-1.7
10	7.3	8.0	13.4	-10.2	9.1	2.4	2.0	10.3	16.2	5.6
AC 1	6.72	5.71	3.27	10.9	5.98	4.72	4.80	8.71	5.40	4.05
2	+.1	-0-	-0-	-.1	-0-	+.1	-0-	+.2	-0.0	-0-
SP -				-3.5						
AC Noise			.05				.06			.06

PAGE

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT _____

LINE ____ HALF ____ SP. ____ DATE ____

SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										
SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										

FREQUENCIES _____ _____

SENDER NO.

OPERATOR

RECEIVER NO.

OPERATOR

COMMENTS:

PAGE

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT _____

LINE 4 HALF W SP. 1 DATE _____

SEND	4-5	3-4	2-3	6-7	5-6	4-5	3-4	6-7	5-6	4-5
RECEIVE			25	25						
RANGE	Hi	Hi	Hi	Hi	Lo	Hi	Hi	Hi	Lo	Hi
VOLTAGE	420	440	340	420	500	420	440	420	540	420
CURRENT	1.25	2.0	2.0	1.25	.9	1.10	2.0	1.25	.925	1.10
SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										

FREQUENCIES 1.0 0.1

SENDER NO. 13671-S

OPERATOR Bob S

RECEIVER NO.

OPERATOR Jim B

COMMENTS:

PAGE

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT _____

LINE 4 HALF E SP. 1 DATE _____

SEND	3-4	2-3	1-2	4-5	3-4	2-3	1-2	5-6	4-5	3-4
RECEIVE	0 —	—	— 5	5 —	—	—	— 10	10 —	—	—
RANGE	Hi	Hi	Hi	Hi	Hi	Hi	Hi	Lo	Hi	Hi
VOLTAGE	320	340	340	470	320	340	340	500	470	320
CURRENT	2.0	2.0	2.0	1.25	2.0	2.0	2.0	.9	1.25	2.0
SEND	2-3	1-2	6-7	5-6	4-5	3-4	2-3	1-2	6-7	5-6
RECEIVE	—	— 15	15 —	—	—	—	—	— 20	20 —	—
RANGE	Hi	Hi	Hi	Lo	Hi	Hi	Hi	Hi	Hi	Lo
VOLTAGE	340	340	400	500	470	320	340	380	400	500
CURRENT	2.0	2.0	1.25	.9	1.25	2.0	2.0	2.20	1.25	.9

FREQUENCIES 1.0 0.1

SENDER NO. 13671-S

OPERATOR Bob S

RECEIVER NO.

OPERATOR Jim B

COMMENTS: Cal 5-6
Lo X 500
C .6

Pot on Current Control
Set on 1 MA

010

3014
.2428

PAGE

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT Helvetia
LINE 4 HALF W SP. 1 DATE Sept

SEND	5-6	6-7	1-2	2-3	3-4	4-5	5-6	6-7	1-2	2-3
RECEIVE		20	20					25	25	
RANGE	X-0.1	X0.1	X10	X1.0	X-1	X0.1	X0.1	X0.1	X1.0	X0.1
DC 1	.3	7.1	1.1	1.0	-1.5	6.0	-.8	5.1	1.1	.6 0.8
DC 2	2.7	-5.2	.3	-.8	4.2	.1	9.1	-2.6	1.1	-1.0 -1.0
DC 3	2.0	4.0	1.0	2.6	.2	2.6	-5.9	12.8	1.2	1.7 .4
DC 4	5.9	-4.1	.3	-.4	1.7	2.0	17.1	-12.9	-1.6	0.0 3.2
DC 5	-2.6	8.8	1.1	3.1	1.8	11.0	-13.8	13.1	3.0	2.0 -2.2
DC 6	15.2	-8.7	.3	-.4	-.8	-7.8	9.2	-15.1	-1.9	4.8 -5.1
DC 7	-7.0	8.9	1.0	2.8	1.5	10.7	1.2	18.8	2.0	-6.7 7.0
DC 8	9.1	-6.4	.3	-1.3	.8	-3.1	5.0	-20.3	-1.8	1.8 -.1
DC AVG.	2.99	0.58	0.67	0.96	1.18	2.86	2.71	1.11	0.49	0.56
AC 1	6.45	5.09	264	38.7	15.2	7.50	6.20	3.31	38.6	9.55
AC 2	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-
AC AVG.										
S.P.			+3.4						-1.6	
AC NOISE		.06						.05		
POT RES.										

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT Helvetia
LINE 4 HALF W SP. 1 DATE 11 Sept

PAGE

SEND	4-5	5-6	6-7	3-4	4-5	5-6	6-7	2-3	3-4	4-5
RECEIVE	5		10	10			15			
RANGE	X10	X1.0	X1.0	X10	X1.0	X1.0	X0.1	X-10	X-1.0	X.1
DC 1	2.7	-1.0	3.8	2.0	7.8	5.9	-3.8	[illegible].8	4.9	2.3
DC 2	1.3	6.7	0.0	-.1	-3.1	2.1	9.8	-1.9	-1.1	2.8
DC 3	3.0	-1.7	4.8	2.0	6.2	4.8	-1.7	.2	3.8	-4.2
DC 4	1.1	7.2	-.1	-.1	-2.4	3.2	3.9	2.5	-.6	10.0
DC 5	2.8	-2.0	4.4		8.1	6.1	-3.0	-.4	2.2	-3.0
DC 6	1.2	8.3	-.9		-4.8	1.0	9.9	2.6	-.8	7.8
DC 7	3.1	-2.7	5.8		7.0	3.5	-2.8	0.0	3.0	-.7
DC 8	1.0	8.6	-1.0		-2.5	.8	6.1	2.6	-1.3	4.2
DC AVG.	2.05	2.80	2.20	0.95	1.95	3.44	2.46	1.21	1.19	2.28
AC 1	119.0	24.4	13.4	144.0	30.3	10.8	7.54	174.0	39.7	15.1
AC 2	-0-	-0-	-0-	-0-	-.1	-0-	-0-	-0-	-0-	-.1
AC AVG.										
S.P.	-15.5			-.02				-9.5		
AC NOISE			.17				.07			
POT RES.										

CAL 1

		2-3
DC	1	0.0
	2	-.8
	3	0.0
	4	-.8
AC	1	122.0
	2	-0-

X-10

CAL 2

		1-2
		X-10
DC	1	-.1
	2	0.0
	3	-.1
	4	0.0
AC	1	153.
	2	-0-

NOTE... GROUNDED STEEL
PEAKS ~ 50' E OF ELEC
#1, HITS LINE ~ 90°

54,000 48

PAGE

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT Helvetia
LINE 4 HALF W SP. 1 DATE 11 Sept

SEND	3-4	4-5	5-6	1-2	2-3	3-4	4-5	1-2	2-3	3-4
RECEIVE			30	35			40	40		45
RANGE	X0.1	X0.1	X0.1	X1.0	X0.1	X0.1	X0.1	X0.1	X0.1	X0.1
DC 1	0.0	-8.1	5.9	-5.0	-2.8	3.0	-10.1	7.8	-3.1 /	-4.8 / 9.1
DC 2	4.2	11.4	-10.1	5.9	6.1	-3.7	19.1	.5	3.0 /	-3.2 -1.8
DC 3	5.0	-5.8	8.7	-6.1	.5	-3.6	-3.7	5.0	-1.0 /	14.2 2.0
DC 4	4.2	8.0	8.1	7.0 X	5.4	8.0	12.2	-4.9	7.1 /	-13.6 -1.0
DC 5	-9.1	-4.9 X-A	5.8	-6.8	-6.8	6.9	-22.1	5.3	-10.3	7.1 5.1
DC 6	14.2	5.1	3.0	8.3	8.0	-1.5	15.6	-1.7	-5.0	-5.2 -2.3
DC 7	-16.2	-5.0	18.1	-6.8	-6.9	-6.0	-8.2	6.0	3.1	13.9 9.1
DC 8	13.8	7.6	-23.7	7.4	11.2	1.9	7.7	-2.2	11.0	-15.2 -4.0
DC AVG.	1.31	4.89	3.53	1.54	1.50	0.36	1.59	1.86	1.21	5.31
AC 1	4.90	2.92	1.69	10.8	4.04	2.60	1.72	6.72	2.93	2.08
AC 2	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	+.1
AC AVG.										
S.P.				+20.8						
AC NOISE			.08				.05			.04
POT RES.										

PAGE

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT _____

LINE 4 HALF W SP. 1 DATE _____

SEND	3-4	4-5	5-6	1-2	2-3	3-4	4-5	1-2	2-3	3-4
RECEIVE										
RANGE	Hi	Hi	Lo	Hi	Hi	Hi	Hi	Hi	Hi	Hi
VOLTAGE	440	470	520	410	460	440	470	410	460	440
CURRENT	1.25	1.10	19	1.75	1.25	1.25	1.10	1.75	1.25	1.25
SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										

FREQUENCIES 1.0 0.1

SENDER NO. 13671-5

OPERATOR Bob S

RECEIVER NO.

OPERATOR Jim B

COMMENTS:

PAGE

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT _____

LINE 4 HALF w/ SP. 1 DATE _____

SEND	4-5	5-6	6-7	3-4	4-5	5-6	6-7	2-3	3-4	4-5
RECEIVE	0		5	5			10	10		
RANGE	Hi	Lo	Hi	Hi	Hi	Lo	Lo	Hi	Hi	Hi
VOLTAGE	420	500	420	430	420	500	420	460	440	430
CURRENT	1.0	.9	1.25	1.25	1.0	.9	1.25	1.25	1.25	1.10
SEND	5-6	6-7	1-2	2-3	3-4	4-5	5-6	6-7	1-2	2-3
RECEIVE		15								
RANGE	Lo	Hi	Hi	Hi	Hi	Hi	Lo	Hi	Hi	Hi
VOLTAGE	540	440	460	460	440	420	540	440	460	460
CURRENT	.9	1.25	2.0	1.25	1.25	1.10	.9	1.25	2.0	1.25

FREQUENCIES 1.0 0.1

SENDER NO. 13671-5

OPERATOR Bob S

RECEIVER NO.

OPERATOR Jim B

COMMENTS: Cal 2-3 Hi V 440 C 1.25

Cal 1-2 Hi V 400 C 1.5

PFE Cal +0.1000 E 1/2

B-289

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page 1

Project SUPERIOR HELVITIA Line A SPR 1 Field date 10-9-68 Data page 1 Comp. date 11-9-68 Comp by DA

(A) Send	3-4	2-3	1-2	4-5	3-4	2-3	1-2	5-6	4-5	3-4	2-3	1-2
(B) Receive	500		1000	1000			1500	1500				2000
(C) ~~n separation~~ RANGE	X10	10	1	10	1	1	1	10	1	1	.1	.1
(D) I	2.0			1.25	2.0			0.9	1.25	2.0		
(E) Vdc (avg)	2.100	3.278	2.661	3.15	3.08	2.66	3.24	2.000	2.689	1.400	1.494	0.7556
(F) DCcal	0.9868											
(G) Kn x 10^{-3}	1.5	6.0	15.0	1.5	6.0	15	30	1.5	6.0	15	30	52.5
(H) ρ dc=ExFxGx10^3/D	203	170	180	180	176	166	176	122	141	147	140	99
(I) Vac Σ	269.0	55.4	23.6	147.0	57.7	21.8	11.5	72.9	29.0	19.6	9.32	3.84
(J) AC noise x 2												
(K) Vac(corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	0.1000											
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2)	2.2	3.4	2.8	3.3	3.2	2.8	3.3	2.1	2.8	1.5	1.6	-0.4
(O) MCF=(M-1)(10^5)/H												

-2.4 -9.4

Project _____ Line _____ Field date _____ Data page 2 Comp. date _____ Comp by _____

(A) Send	6-7	5-6	4-5	3-4	2-3	1-2	6-7	5-6	4-5	3-4	2-3	5-6
(B) Receive	2000					2500	2500				3000	CAL
(C) n separation	X10	1.0	1.0	0.1	0.1	0.1	10	1.0	0.1	0.1	0.1	X-1
(D) I	1.25	0.9	1.25	2.0	2.0	2.20	1.25	0.9	1.25	2.0	2.0	0.6
(E) Vdc (avg)	0.383	1.70	1.58	1.01	1.000	2.51	3.06	4.51	4.51	3.41	3.61	
(F) DCcal												
(G) Kn x 10^{-3}	1.5	6.0	15.0	30.0	52.5	84.0	6.0	15.0	30.0	52.5	84.0	
(H) ρ dc=ExFxGx10^3/D	74	104	130	127	122	114	78	133	166	153	141	
(I) Vac Σ	62.3	15.5	10.8	8.49	1.66	2.94	15.9	7.75	6.72	5.71	3.27	0.8
(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)	0.5	1.8	1.7	1.1	1.1	2.6	3.2	4.6	4.6	3.5	3.7	
(O) MCF=(M-1)(10^5)/H												

FENCE 50'ENE ELECTRODE #7

E 1/2

289

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page 2

Project HELVITIA-50 Line 4 Spr 1 Field date 10-9-68 Data page 3 Comp. date 1-9-68. Comp by DA

(A) Send	6-7	5-6	4-5	3-4		6-7	56	4-5				
(B) Receive	3000			3500		3500		4000				
(C) n separation	X 1.0	0.1	0.1	0.1		0.1	0.1	0.1				
(D) I	1.25	0.9	1.10	2.0		1.25	.925	1.10				
(E) Vdc (avg)	1.19	2.38	3.06	1.51		0.38	1.58	2.66				
(F) DCcal												
(G) Kn x 10^{-3}	15.0	30.0	52.5	84.0		30.0	52.5	84.0				
(H) ρ dc=ExFxGx10^3/D	130	202	229	202		207	308	314				
(I) Vac Σ	10.8	5.98	4.72	4.80		8.70	5.40	4.05				
(J) AC noise x 2												
(K) Vac(corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.												
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2)	1.3	2.5	3.2	1.6		0.5	1.7	2.8				
(O) MCF=(M-1)(10^5)/H												

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												

W 1/2

HEINRICHS GEOEXPLORATION COMPANY

INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page 3

Project HELVETIA SO. Line A SPR 1 Field date 11-9-68 Data page 4 Comp. date 11-9-68 Comp by DA

(A) Send	4-5	5-6	6-7	3-4	4-5	5-6	6-7	2-3	3-4	4-5	5-6	6-7
(B) Receive	500		1000	10			15	15				20
(C) n separation	X10	1.0	1.0	10	1.0	1.0	0.1	10	1.0	1.0	.1	.1
(D) I	1.0	0.9	1.25	1.25	1.0	0.9	1.25	1.25	1.25	1.10	0.9	1.25
(E) Vdc (avg)	119.0	24.4	13.4	144.0	30.3	10.8	7.54	174.0	39.7	15.1	6.45	5.09
(F) DCcal	98232											
(G) Kn x 10^{-3}	1.5	6.0	15.0	1.5	6.0	15.0	30.0	1.5	6.0	15.0	30.0	52.5
(H) ρ dc=ExFxGx10^3/D												
(I) Vac ~~Σ~~ ρ	179	165	162	172	183	183	183	208	190	207	218	211
(J) AC noise x 2												
(K) Vac(corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal. +	0.2000											
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2)	2.2	3.0	2.4	1.2	2.2	3.6	2.7	1.4	1.4	2.5	3.2	0.7
(O) MCF=(M-1)(10^5)/H												

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

(A) Send	1-2	2-3	3-4	4-5	5-6	6-7	1-2	2-3	3-4	4-5	5-6	
(B) Receive	20					25	25				30	
(C) n separation	10	1.0	1.0	0.1	0.1	0.1	1.0	.1	.1	.1	.1	
(D) I	2.0	1.25	1.25	1.10	0.9	1.25	2.0	1.25	1.25	1.10	0.9	
(E) Vdc (avg)	264.0	38.7	15.2	7.50	6.20	3.31	38.6	9.55	4.90	2.92	1.69	
(F) DCcal												
(G) Kn x 10^{-3}	1.5	6.0	15.0	30.0	52.5	84.0	6.0	15.0	30.0	52.5	84.0	
(H) ρ dc=ExFxGx10^3/D												
(I) Vac Σ												
(J) AC noise x 2	196	185	182	195	366	221	115	113	117	144	161	
(K) Vac (corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.												
(M) ρdc/ρac =ExL/K												
(N) PFE=(M-1)(10^2)	0.9	1.2	1.4	3.1	3.1	1.3	0.7	0.8	1.5	5.1	3.7	
(O) MCF=(M-1)(10^5)/H												

CAL'S 2-3 1-2

TX 1.25 1.5

RX 127 .98425 153 .98039

W ½

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page 4

Project HELVETIA SO Line 1 Field date 11-9-68 Data page 6 Comp. date 11-9-68 Comp by DP

(A) Send	1-2	2-3	3-4	4-5		1-2	2-3	3-4				
(B) Receive	30			35		35		40				
(C) n separation	1.0	.1	.1	.1		.1	.1	.1				
(D) I	1.75	1.25	1.25	1.10		1.75	1.25	1.25				
(E) Vdc (avg)	10.8	4.04	2.60	1.72		6.72	2.93	2.08				
(F) DCcal												
(G) Kn x 10^{-3}	15	30	52.5	84		30	525	84				
(H) ρ dc=ExFxGx10^3/D												
(I) Vac Σ												
(J) AC noise x 2	92	99	108	131		116	123	145				
(K) Vac(corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.												
(M) ρ dc/ρac=ExL/K												
(N) PFE=(M-1)(10^2)	1.7	1.7	0.6	1.8		2.1	1.4	5.5 ?				
(O) MCF=(M-1)(10^5)/H												

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												