CONTACT INFORMATION
Mining Records Curator
Arizona Geological Survey
3550 N. Central Ave, 2nd floor
Phoenix, AZ, 85012
602-771-1601
http://www.azgs.az.gov
inquiries@azgs.az.gov

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HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT B.S. & K 566
LINE A HALF W E SP. 1 DATE 7-29-70

PAGE 1

SEND	4-3	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2
RECEIVE	CAL	0.6-0.9W	→	0.3-0.6W	→	→	0-0.3W	→	→	→
RANGE	10	1.0	1.0	10	0.1	0.1	10	1.0	0.1	0.1
DC 1	0.0	0.8	0.6	2.2	1.5	1.6	2.3	1.7	1.3	1.4
DC 2										
DC 3 I	2000	1.5	1.5	2	1.5	1.5	2	2	1.5	1.5
DC 4 K_n		0.9	3.6	0.9	3.6	9	0.9	3.6	9	18
DC 5										
DC 6 ρ		20	29	95	22	28	347	145	28	33
DC 7 PFE		0.8	0.6	2.2	1.5	1.6	2.3	1.7	1.3	1.4
DC 8 MCF		41	20	23	67	57	7	12	46	43
DC AVG.										
AC 1	201	32.8	12.3	212	9.40	4.73	774	80.7	4.72	2.74
AC 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AC AVG.										
S.P.		-20.8		+4.8			+10.8			
AC NOISE										
POT RES.		1K		0.5K			1K			

LOTS OF RUSTY CANS & EQUIPMENT LYING AROUND CENTER.

PARALLEL PARTIAL BURIED PIPE 2½"-3" diameter WITHIN 100' OF LINE.

POWER LINE @ STA. 0.3 W

"NO KNOWN N-S BURIED PIPELINE NEAR LINE" - ABE K.

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT B.S.E.K 566
LINE A HALF E SP. 1 DATE 7-29-76

SEND	5-6	4-5	3-4	2-3	1-2	6-7	5-6	4-5	3-4	2-3
RECEIVE	0-.3E	→	→	→	→	.3-.6E	→	→	→	→
RANGE	10	10	1.0	0.1	0.1	10	1.0	1.0	0.1	.01
DC 1	3.1	2.5	1.6	0.7	0.4	2.0	2.8	2.1	0.7	1.3
DC 2										
DC 3 I	1.5	2	2	1.5	1.5	1.5	1.5	2	2	1.5
DC 4 K_n	0.9	3.6	9	18	31.5	0.9	3.6	9	18	31.5
DC 5										
DC 6 ρ	400	442	145	27	31	260	214	229	68	14
DC 7 PFE	3.1	2.5	1.6	0.7	0.4	2.0	2.8	2.1	0.7	1.3
DC 8 MCF	8	6	11	26	13	8	13	9	10	92
DC AVG.										
AC 1	670	247	32.4	2.25	1.47	436	89.5	51.2	7.59	0.677
AC 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AC AVG.										
S.P.	+27.9					+23.8				
AC NOISE										
POT RES.	1K					3K				

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT B.S.A.K 566
LINE A HALF E SP. 1 DATE 7-29-2

SEND	1-2	6-7	5-6	4-5	3-4	2-3	6-7	5-6	4-5	3-4
RECEIVE	.3-.6E	.6-.9E	———	———	———	——→	.9-1.2E	———	———	——→
RANGE	0.01	10	1.0	1.0	0.1	.01	1.0	1.0	1.0	0.1
DC 1	0.8	2.0	2.7	1.9	0.8	1.5	2.2	2.9	2.1	1.0
DC 2										
DC 3 I	1.5	1.5	1.5	2	2	1.5	1.5	1.5	2	2
DC 4 K_n	50.4	3.6	9	18	31.5	50.4	9	18	31.5	50.4
DC 5										
DC 6 ρ	17	263	219	264	77	15	319	289	370	104
DC 7 PFE	0.8	2.0	2.7	1.9	0.8	1.4	2.2	2.9	2.1	1.0
DC 8 MCA	46	8	12	7	10	92	7	10	6	10
DC AVG.										
AC 1	.501	110	36.7	29.5	4.89	0.454	53.4	24.2	23.6	4.15
AC 2	0.0	0.0	0.4	0.0	0.0	0.2	0.0	0.0	0.0	0.0
AC AVG.										
S.P.		+4.8					+10.9			
AC NOISE										
POT RES.		1K					2K			

HEINRICHS GEOEXPLORATION CO.

I.P. RECEIVER NOTES

GROUNDED FENCE @ 1.4 E

PROJECT B.S. & K 566

LINE A HALF E SP. 1 DATE 7-29

SEND	6-7	5-6	4-5							
RECEIVE	1.2-1.5	→	→							
RANGE	1.0	1.0	1.0							
DC 1	2.2	3.0	2.2							
DC 2										
DC 3 I	1.5	1.5	2							
DC 4 K_n	18	31.5	30.4							
DC 5										
DC 6 P	257	234	313							
DC 7 PFE	2.2	3.0	2.2							
DC 8 MEF	9	13	7							
DC AVG.										
AC 1	21.5	11.2	12.5							
AC 2	0.0	0.0	0.0							
AC AVG.										
S.P.	−3.5									
AC NOISE										
POT RES.	4 K									

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT B. S. & K 566

LINE A HALF E SP. 1 DATE 7-29-7

PAGE 1

SEND	4-3	3-2	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2
RECEIVE	CAL	0.6-0.9W	→	0.3-0.6W	→	→	0-0.3W	→	→	→
RANGE	4C	4C	4C	4C	4C	4C	4C	4C	4C	4C
VOLTAGE	180	270	270	170	260	270	250	180	260	270
CURRENT	2.0	1.5	1.5	2.0	1.5	1.5	2.0	2.0	1.5	1.5
SEND	5-6	4-5	3-4	2-3	1-2	6-7	5-6	4-5	3-4	2-3
RECEIVE	0-0.3E	→	→	→	→	0.3-0.6E	→	→	→	→
RANGE	4C	4C	4C	4C	4C	4C	4C	4C	4C	4C
VOLTAGE	200	250	180	260	260	260	200	240	180	260
CURRENT	1.5	2.0	2.0	1.5	1.5	1.5	1.5	2.0	2.0	1.5

FREQUENCIES 3 0.3

SENDER NO. 9662-S

OPERATOR STEVE CRUZE

RECEIVER NO. 20693-K

OPERATOR BILL FREEMAN

COMMENTS:

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT B.S. & K 566

LINE A HALF E SP. 1 DATE 7-29-76

SEND	1-2	6-7	5-6	4-5	3-4	2-3	6-7	5-6	4-5	3-4
RECEIVE	0.3-0.6E	0.6-0.9E	←	←	←	→	0.9-1.2E	←	←	→
RANGE	4C	4C	4C	4C	4C	4C	4C	4C	4C	4C
VOLTAGE	260	260	200	240	180	260	260	200	240	180
CURRENT	1.5	1.5	1.5	2.0	2.0	1.5	1.5	1.5	2.0	2.0
SEND	6-7	5-6	4-5							
RECEIVE	1.2-1.5E	←	→							
RANGE	4C	4C	4C							
VOLTAGE	260	200	240							
CURRENT	1.5	1.5	2.0							

FREQUENCIES 3 0.3

SENDER NO.

OPERATOR

RECEIVER NO.

OPERATOR

COMMENTS:

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT B.S. & K 566
LINE A HALF W SP. DATE

SEND	.9-1.2w	1.2-1.5	2-3	3-4	4-5	5-6	6-7	1.5-1.8	1-2	2-3
RECEIVE	S.P	S.P	1.8-2.1w	~	~	~	→	S.P	2.1-2.4	→
RANGE	ONLY	ONLY	0.1	0.1	0.1	0.1	0.1	ONLY	1.0	0.1
DC 1 (I)	1-2		0.3	0.0	0.6	1.5	1.1		0.9	0.3
DC 2 (V)	3-4									
DC 3 I	1.5?		1.5	2	2	1.5	1.5	1.5	1.5	2.0
DC 4 Km	1.0 0.9 →	RANGE	0.9	3.6	9	18	31.5		0.9	3.6
DC 5	0.4	PFE								
DC 6 P	8.3		4.1	7.6	33	31	34		6.7	3.5
DC 7 PFE	1.0		0.3	0.0	0.6	1.5	1.1		0.9	0.3
DC 8 MCF	12.1		73	0	18	49	32		135	86
DC AVG.										
AC 1	13.9 mv		6.86	4.27	7.45	2.57	1.65		11.2	1.94
AC 2	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0
AC AVG.										
S.P.	+1.6	+10.9	-7.3					+0.6	+21.8	
AC NOISE										
POT RES.	+2K	.5K	1K					1.5K	2K	

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT B.S. & K 566
LINE A HALF W SP. 1 DATE 2-27-20

SEND	3-4	4-5	5-6	6-7	1-2	2-3	3-4	4-5	5-6	1-2
RECEIVE	2.1-2.4	→	→	→	2.4-2.7	→	→	→	→	2.7-3.0
RANGE	0.1	0.1	0.1	0.1	0.1	.01	0.1	0.1	0.1	.01
DC 1	0.0	0.7	1.9	1.5	0.6	1.3	0.1	0.6	2.0	1.5
DC 2										
DC 3 I	2	2	1.5	1.5	1.5	1.5	2	2	1.5	1.5
DC 4 K_n	9	18	31.5	50.4	3.6	9	18	31.5	50.4	9
DC 5										
DC 6 ρ	9.6	41	36	39	6.3	4.5	9.8	40	35	5.7
DC 7 ρ_{eff}	0.0	0.7	1.9	1.5	0.6	1.7	0.1	0.6	2.0	1.5
DC 8 MCF	0	17	53	38	96	289	10	15	57	264
DC AVG.										
AC 1	2.14	4.55	1.72	1.17	2.62	.753	1.09	2.54	1.05	.950
AC 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AC AVG.										
S.P.					+0.7					+18.0
AC NOISE										
POT RES.					2K					9K

HEINRICHS GEOEXPLORATION CO.
I.P. RECEIVER NOTES

PROJECT B.S.&K 566
LINE A HALF W SP. 1 DATE 7-29-76

PAGE 7

SEND	2-3	3-4	4-5	1-2	2-3	3-4				
RECEIVE	2.7-3	——→	——→	3-3.3	——→	——→				
RANGE	.01	0.01	0.01	.01	.01	.01				
DC 1	1.1	1.1	1.0	1.8	1.4	0.8				
DC 2										
DC 3 I	1.5	2	2	1.5	1.5	2				
DC 4 Km	18	31.5	50.4	18	31.5	50.4				
DC 5										
DC 6 ρ	3.9	9.1	39	6.6	4.7	11				
DC 7 Eff	1.1	1.1	1.0	1.8	1.4	0.8				
DC 8 MCF	282	121	25	275	299	75				
DC AVG.										
AC 1	.327	.578	1.57	.549	.224	.428				
AC 2	0.0	0.0	0.0	0.0	0.0	0.0				
AC AVG.										
S.P.				-21.7						
AC NOISE										
POT RES.				2K						

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT B.S.&K 566

LINE A HALF W SP. 1 DATE 7/29/74

SEND	4-5	2-3	3-4	4-5	5-6	6-7	1-2	2-3	3-4	4-5
RECEIVE	Cal	1.8-2.1W	→	→	→	→		→	→	→
RANGE		4C	4C	4C	4C	4C	4C	4C	4C	4C
VOLTAGE		250	170	240	200	250	260	250	170	240
CURRENT		1.5	2.0	2.0	1.5	1.5	1.5	1.5	2.0	2.0
SEND	5-6	6-7	1-2	2-3	3-4	4-5	5-6	1-2	2-3	3-4
RECEIVE	→	→		→	→	→	→		→	→
RANGE	4C	4C	4C	4C	4C	4C	4C	4C	4C	4C
VOLTAGE	200	260	260	250	170	240	200	260	250	170
CURRENT	1.5	1.5	1.5	1.5	2.0	2.0	1.5	1.5	1.5	2.0

FREQUENCIES 3.0 0.3

SENDER NO.

OPERATOR

RECEIVER NO.

OPERATOR

COMMENTS:

SEND 1-2 FOR PICK UP @ SENDER

1.5 amps @ 260 V

HEINRICHS GEOEXPLORATION CO.

I. P. SENDER NOTES

PROJECT B.S. & K 566

LINE 1 HALF W SP. 1 DATE 7/29/20

SEND	4-5	1-2	2-3	3-4						
RECEIVE	→		→	→				→		→
RANGE	4C	4C	4C	4C						
VOLTAGE	240	260	250	170						
CURRENT	2.0	1.5	1.5	2.0						
SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										

FREQUENCIES 2.0 0.3

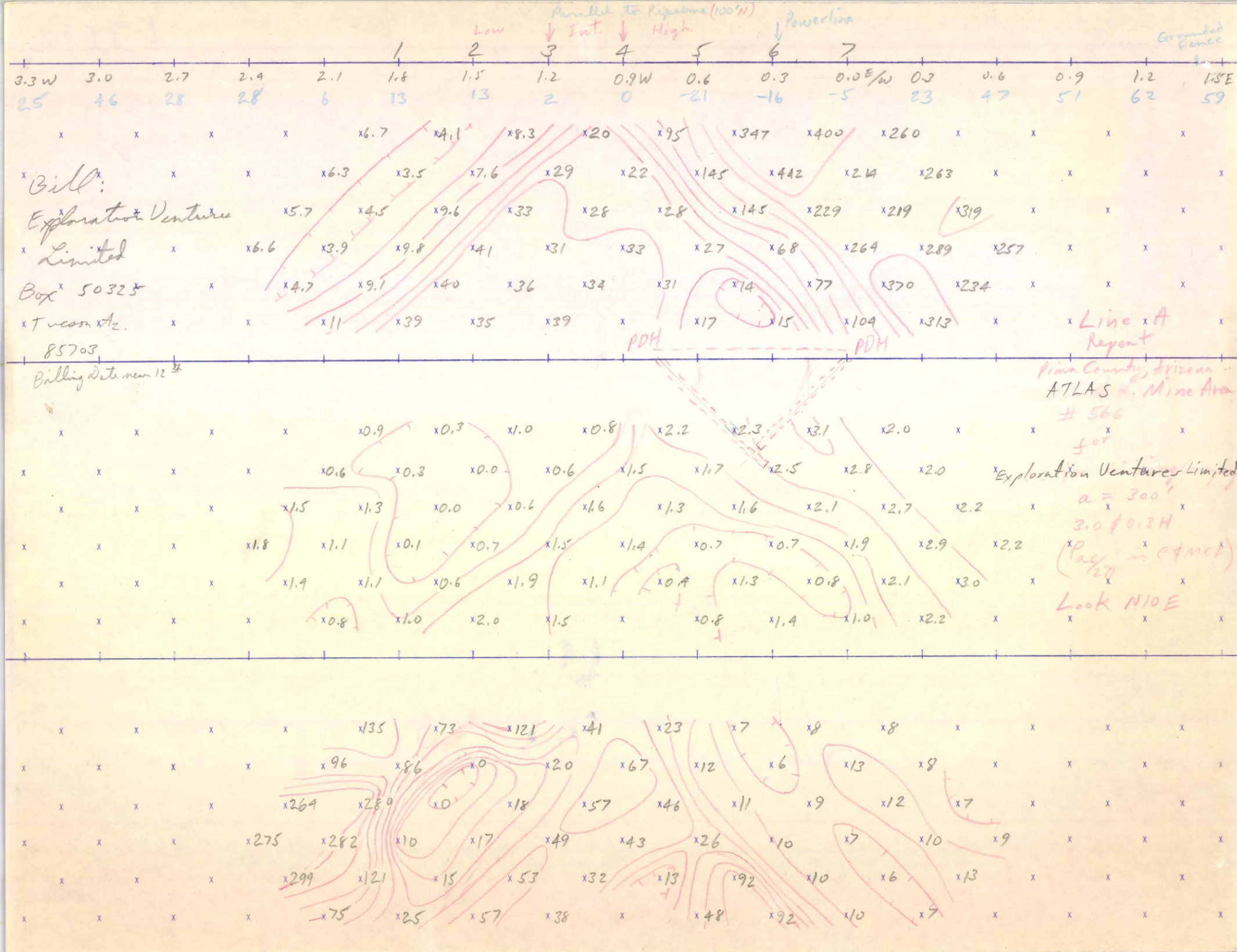
SENDER NO.

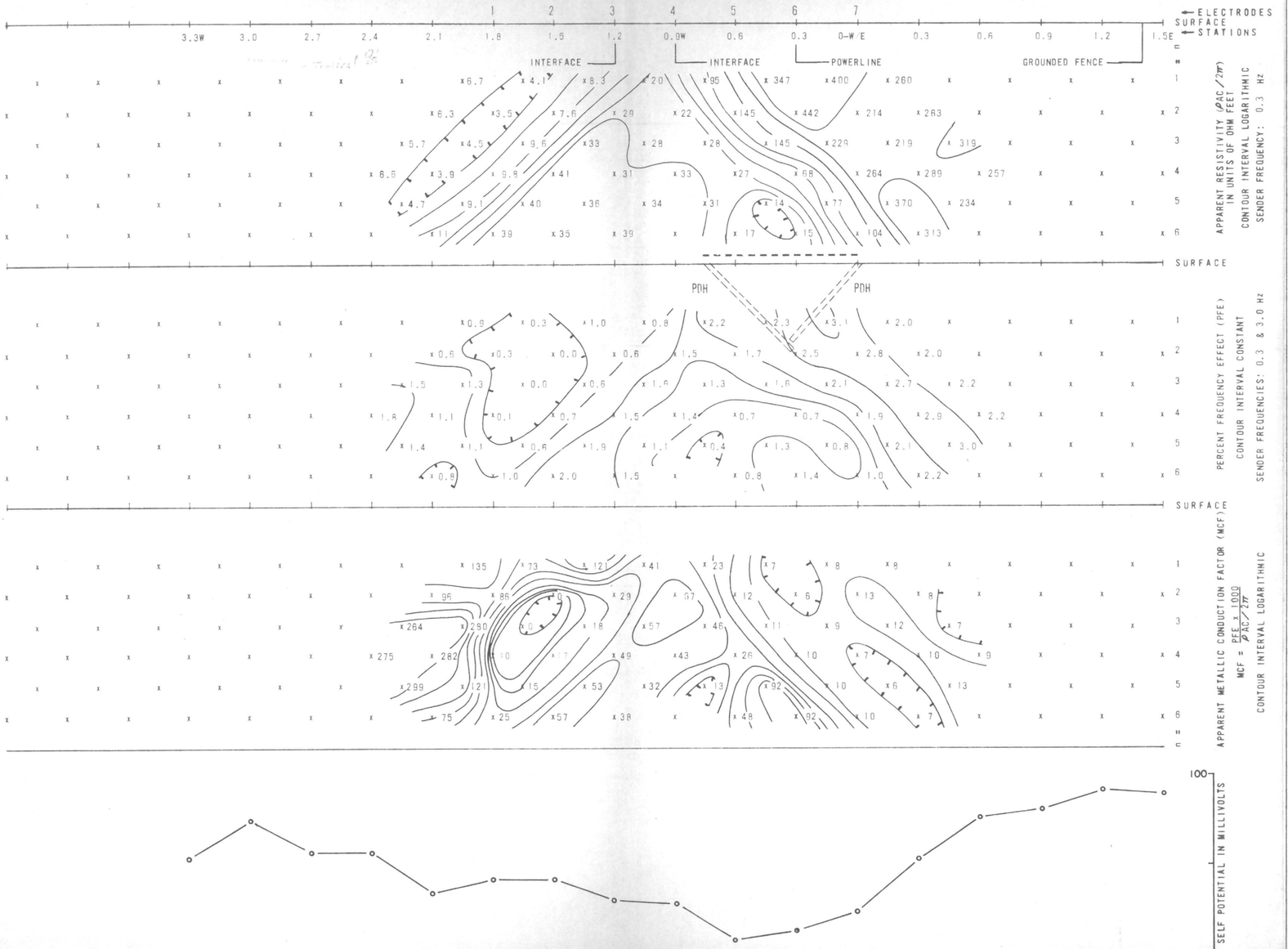
OPERATOR

RECEIVER NO.

OPERATOR

COMMENTS:


Low
Parallel to Pipeline (100'N)
Int.
High
Powerline
Grounded Fence
1 2 3 4 5 6 7
3.3W 3.0 2.7 2.4 2.1 1.8 1.5 1.2 0.9W 0.6 0.3 0.0E/W 0.3 0.6 0.9 1.2 1.5E
25 46 28 28 6 13 13 2 0 -21 -16 -5 23 47 51 62 59
Bill:
Exploration Ventures
Limited
Box 50325
Tucson Az.
85703
Billing Date near 12th
PDH
PDH
Line A
Report
Pima County, Arizona
ATLAS
Mine Area
566
for
Exploration Ventures Limited
a = 300'
3.0 f 0.3H
(Pace = estimated)
Look N10E



566-70

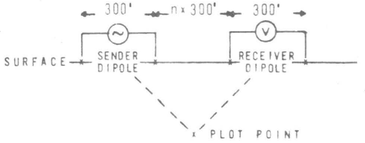
LINE NO.
"A" REPEAT
SPREAD(S)

INDUCED POLARIZATION TRAVERSE SECTIONAL DATA SHEET for EXPLORATION VENTURES LIMITED

RELATIVE ANOMALY STRENGTH

VERY WEAK — WEAK — MODERATE — STRONG

DIPOLE DIPOLE ELECTRODE ARRAY



AREA
ATLAS MINE
PIMA COUNTY, ARIZONA
LOOKING
N 10° E

DATE
AUGUST 1970

HEINRICHS
GEOEXPLORATION COMPANY
GEOPHYSICAL ENGINEERS

AUSTRALIA
(SYDNEY)
39 Hume Street
Crows Nest, NSW
Phone: 439-1793

U.S.A.
Post Office Box 5964
Tucson, Arizona 85703
Phone: (602) 623-0578
Cable: GEOEX, Tucson

Geol Jobs 552

F

HEINRICHS GEOEXPLORATION COMPANY

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

August 4 1970

Mr. A. Kalaf
Exploration Ventures Limited
Box 50325
Tucson, Arizona 85703

Re: I.P. Survey, Repeat Line "A"
Atlas Mine Area

D S+K

Dear Mr. Kalaf:

This letter is to serve as a brief report on the line of I.P. we ran last Wednesday at the Atlas Mine near Silverbell, Pima County, Arizona. This line was run over the (June 1960) McPhar Line "A" on 300 foot dipoles and oriented about N80W. Apparently some of the old McPhar stations were recovered. We restaked the line and used the McPhar coordinates except that ours are numbered in thousands of feet rather than hundreds. Therefore, our center is labeled 0.9W rather than 9W as labeled by McPhar, but they are the same point.

Slightly different frequencies were used (3.0 and 0.3 Hz compared to McPhar's 2.5 and 0.25 Hz),but the technical response should be roughly the same because both pairs of frequencies have a times 10 spread.

The old McPhar and the new GEOEX data agree reasonably well although the GEOEX data is of higher quality and deeper readings were obtained. This is due to less interference being present because of the inoperative mine plus later model equipment used.

The McPhar interpretation was apparently based mainly on the metal factors (MF) and appears to show an anomaly centered near 9W. The presented GEOEX data incorporates the percent frequency effects (PFEs) as well as metal factors (MCFs on GEOEX). The added PFE interpretation indicates that the anomaly is actually east of 9W and has a source (or sources) lying somewhere between

Cont'd.....

Cont'd.....

7.5W and OE/W (0.75W to OE/W on our plot). This eastward shift may explain your negative vertical drill results at 9W. All of this is of course in lieu of any nearby unknown primary artificial effects, none of which were noted, except as shown on the sectional plot, and which we consider of secondary significance.

The strength of I.P. response on this anomaly is rather weak but could be quite significant considering the high sphalerite (non-responsive) content typical in the Atlas Mine ore. Also, the anomalism is entirely within high resistivity material - likely limestone which is the main host rock. Therefore, it is recommended that this anomaly be tested for its possible economic significance by drilling.

There is a definite possibility that the anomaly is caused by several narrow sources but not far enough apart to be individually resolved. A line of more detailed I.P. coverage on 100 foot stations should be run to better define these targets (or target) for drilling and would take one day to complete. In that the existing data suggests that the source (or sources) of anomalous response comes to within 100 feet of the surface, 100 foot dipole coverage will penetrate deep enough and give three times better resolution than the 300' dipole data.

The existing data suggest that if the anomaly has a single source it is centered near 0.45W (our grid) and has considerable fringing responsive material. Alternatively, if two sources are involved, they will perhaps be centered near 0.6W and 0.15W (our grid).

There is no obvious associated resistivity correlation with this anomalism except indirectly it may be related to the major change further west near 0.9W (our grid). However, there is a minor self potential low correlating with the I.P. anomaly lending further evidence to a probable sulfide cause (rather than graphite, iron or manganese oxides or clay, etc.).

The resistivity shows a major change, near the center of the line, from high resistivity material (limestone?) to the east and very low resistivity material (alluvium?) to the west. There may be a transition zone of intermediate resistivity material roughly between the stations 0.9W and 1.2W (our grid) labeled as electrical interfaces on the sectional plot.

Cont'd.....

Cont'd.....

In lieu of the detailed I.P. coverage, two 45° drill holes are suggested which should test both interpretations. One hole is recommended collared near 0.75W (our grid) angled 45° to the east and about 600 feet in total length. The other hole should be collared near OE/W and be angled 45° to the west and about 500 feet in total length. These two holes should test the complete width of anomalous response at about the proper depth. Of course, were the detailed I.P. coverage available, cheaper vertical drill holes could probably be positioned to evaluate the targets equally well and at a more shallow depth.

If this further work proves encouraging, consideration should be given to running a detailed I.P. grid in the Atlas Mine vicinity. There has been so much improvement in experience, equipment and interpretational aids since the original 1960 survey that new and valuable information will almost surely result.

Enclosed please find three prints of the Sectional Data Sheet for Line "A" Repeat. If you have any questions please feel free to contact us.

Sincerely yours,
HEINRICHS GEOEXPLORATION COMPANY

Chris S. Ludwig

Chris S. Ludwig
Senior Geophysicist

Approved By:

Registered Professional Engineer (Mining)
CERTIFICATE EXPIRES
WALTER E. HEINRICHS, JR.
DEC. 31, 19
ARIZONA, U.S.A.

Walter E. Heinrichs, Jr.
President

Enclosures:

CSL/re: