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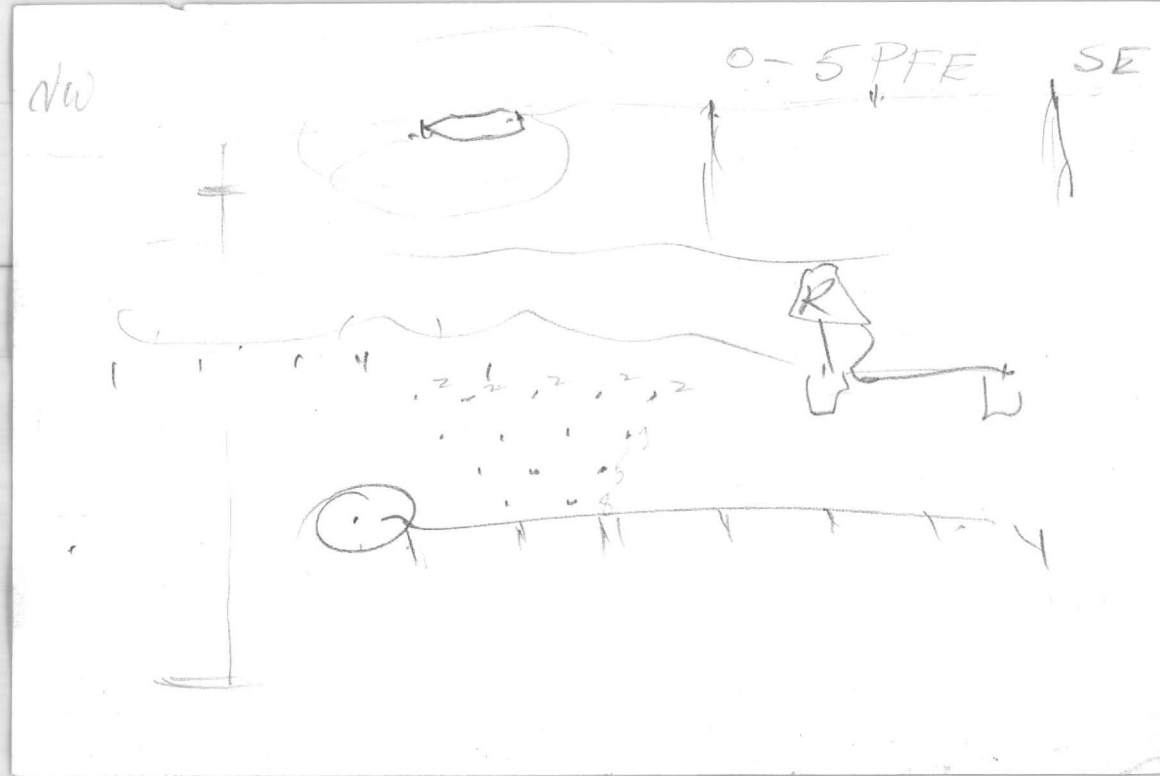
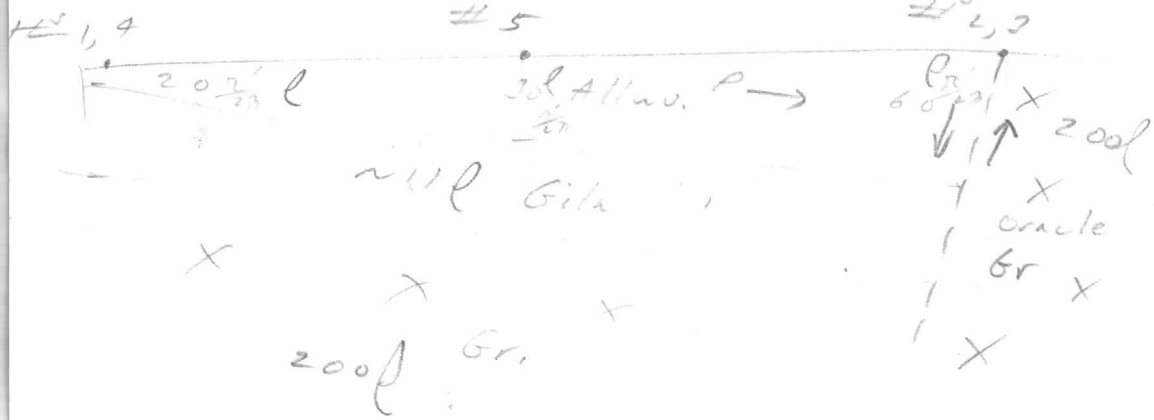

NW
0 - 5 PFE
SE
R


#1, 4
#5
#2, 3
20 ft l
30 ft Alluv. P
60 ft
200 l
~11 l Gila
Oracle
Gr
200 l Gr.

INDUCED POLARIZATION

and

GRAVITY SURVEYS

Falcon Valley Area
Pinal County, Arizona

for

DUVAL CORPORATION
Tucson, Arizona

August 1963

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

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2. Sectional Data Sheets
   - Line 1
   - Line 2
   - Line 3
   - Line 5
   - Line 6

3. Wenner Depth Probe
   - Line 4

4. Sectional Interpretation

5. Gravity Profiles
   - 1, 2, 3, & 4

INTRODUCTION

A total of six separate induced polarization spreads were completed.

In addition to this, four gravity profiles were run, totalling about 25 miles of traverse. The location of the gravity profiles and resulting data contours as well as the location of the six induced polarization spreads are shown on the Oracle Quadrangle Composite Map.

The induced polarization traverse results and Wenner depth probe are presented in a sectional manner for plotting and interpretational convenience only. The gravity data, in addition to the contour map, is presented in profile form.

CONCLUSIONS

No anomalous frequency effects were noticed on any of the six lines; just normal background variation (-1 to +3 percent frequency effect). Except for Lines 2 and 3 which were run near or on granite outcrop thereby giving quite high resistivities and good signal strength, the apparent resistivities were very low giving poor signal strength throughout the rest of the area. Because of the strong electrical storm noise encountered this time of year, the signal to noise ratio in the low resistivity areas was most of the time poor enough to only allow data out to what we call the "third separation" which is probably indicative

of the material down to 1,000 to 1,500 feet in depth. If data were obtainable on the "deeper" 4th, 5th and 6th separations, some information on any possible sulfide content of material about 2,000 feet deep might be available and this is the approximate depth to crystalline basement as determined by resistivity.

The resistivity data on Lines 1, 4, 5 and 6 indicates an approximation of a three layer situation with the surface layer from about 200 feet to 1,500 feet in thickness, increasing to the east and to the north and having resistivities from 20 to 60 ohm-ft/2pi. The middle layer is about 1,200 to 1,800 feet in thickness, probably increasing to the east, and has a resistivity of about 8 to 15 ohm-ft./2pi.

The third layer lies about 1,500 to 2,000 feet or more below the surface, perhaps deepest near Line 5 and has a resistivity around 200 ohm-ft/2pi.

These three layers are interpreted respectfully as probably being one of the following possibilities: alluvium, Gila conglomerate, and crystalline bedrock or unsaturated Gila with a veneer of alluvium, saturated Gila and crystalline bedrock.

On Line 2, a near vertical contact was crossed in the vicinity of 1.0E with alluvium and/or Gila conglomerate to the west and granite to the east. Line 3 was apparently run nearly along and parallel to the steep contact as apparent resistivity values were obtained intermediate in magnitude between those for the granite and valley fill.

To better determine the shape and bounding features of this bedrock basin, gravity data was taken along four profiles and contoured. The eastern bounding feature of this basin is a steep dipping fault-like structure with a surface projection about 600 feet easterly from the Canada del Oro intersection on the Oracle Highway and striking about N 23° W - S 23° E. This lineation is noticable on the aerial photograph of this area and is undoubtedly the same feature as was noticed on I. P. Lines 2 and 3. Assuming densities (which can vary about +/- 15%) of 2.00 g/cm^3 for the valley fill and 2.67 g/cm^3 for the granite, a depth of fill around 2,000 feet to the west would be necessary to produce such an anomaly.

The deepest portion of the basin trends about N 45° W, deepening slightly to the north and intersects I. P. Line 5 at about 1.5N.

The western boundary is not so well defined as the eastern and may be several fault-like breaks in slope. The gravity values are higher on the western side of the basin by at least 12 milligals indicating a more dense rock type to the west or a regional gradient in that direction, or a combination of both and thus, complicating the interpretation.

On Profile 1, two interesting "buried ridges" were encountered, the largest is about 0.8 mile NE of BM 3463 on the Oracle Highway and the smaller one is near BM 3647. Several other similar

features appear on Profile 2 between I. P. Lines 1 and 6. These features could be due to buried ridges or hills several hundred feet above the general bedrock slope.

The depth of the basin in the western half is difficult to determine gravity-wise but is probably compatable as an order of magnitude with the indicated resistivity depths of about 1,500 ft.

RECOMMENDATIONS

Considering the depth to bedrock, about twice as deep as was originally anticipated, this area may now be of less interest. However, if drilling is still desired, the bedrock highs found on Profiles 1 and 2 are the most interesting features encountered. More gravity data would be necessary to better determine the shape, depth and extent of these features; in fact, a 1,000 foot grid with surveyed stations would perhaps be required to best do the job. Induced polarization run during more "electrically quiet" time of year and thus allowing larger dipole spacings could be beneficial. Experimental work with extremely high powered equipment might also help, but would likely approach drill testing costs.

Personnel involved in the field exploration assisting geophysicist Mr. Chris Ludwig were as follows: F. Hanly, K. Hensen, P. Salcido, M. Padilla, G. Fedrico, D. Heinrichs and R. Palmer.

Respectfully submitted,

HEINRICHS GEOEXPLORATION COMPANY

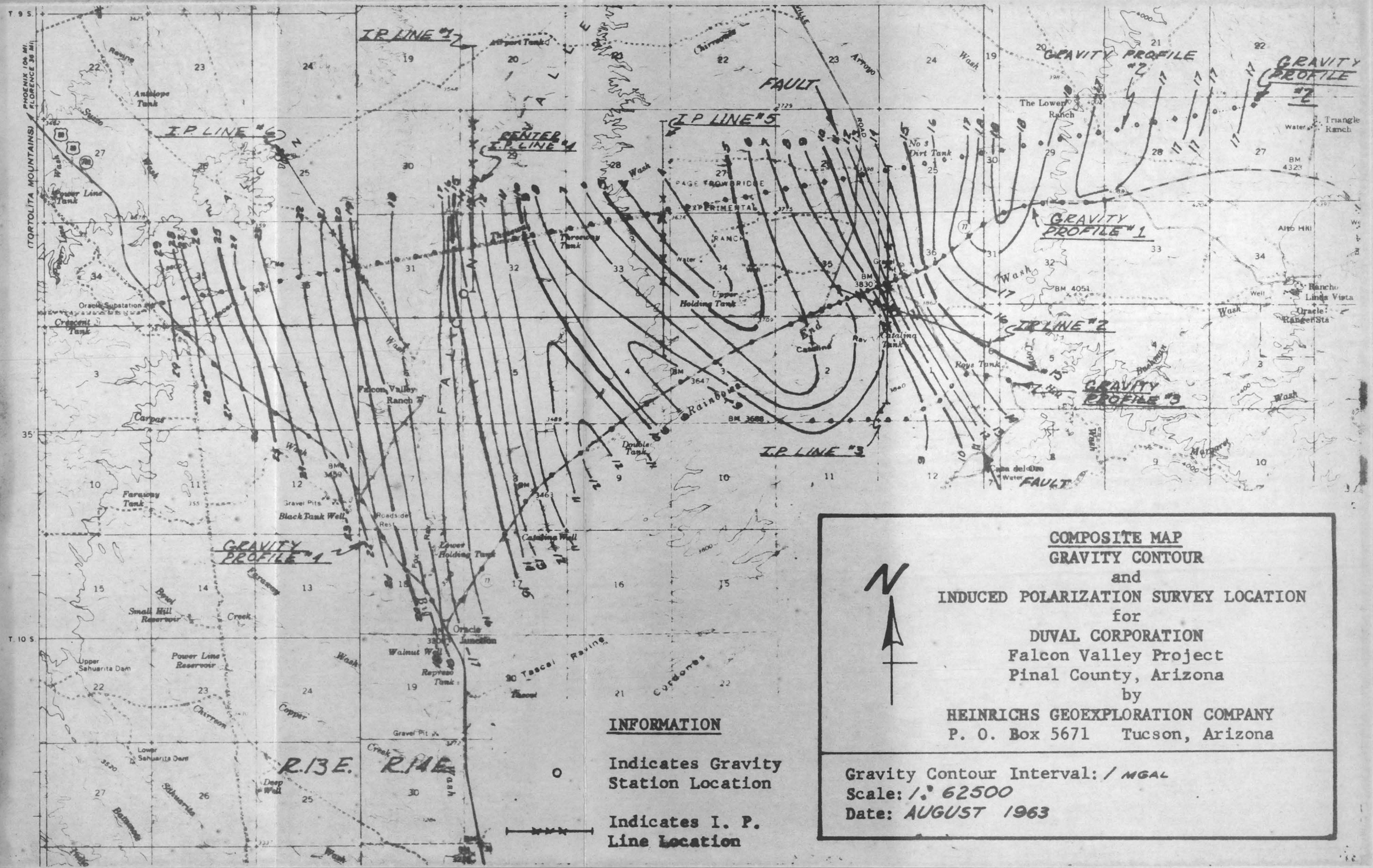
Chris S. Ludwig

Chris. S. Ludwig
Exploration Geophysicist

Approved:

Walter E. Heinrichs, Jr.
President & General Manager

August 23, 1963
P. O. Box 5671
Tucson, Arizona


COMPOSITE MAP
GRAVITY CONTOUR
and
INDUCED POLARIZATION SURVEY LOCATION
for
DUVAL CORPORATION
Falcon Valley Project
Pinal County, Arizona
by
HEINRICHS GEOEXPLORATION COMPANY
P. O. Box 5671 Tucson, Arizona
Gravity Contour Interval: 1 MGAL
Scale: 1" 62500
Date: AUGUST 1963
INFORMATION
Indicates Gravity Station Location
Indicates I. P. Line Location
N
I.P. LINE #7
I.P. LINE #6
CENTER I.P. LINE #4
I.P. LINE #5
I.P. LINE #3
I.P. LINE #2
GRAVITY PROFILE #1
GRAVITY PROFILE #2
GRAVITY PROFILE #3
FAULT
FALCON
T. 9 S.
T. 10 S.
R. 13 E.
R. 14 E.
(TORTOLITA MOUNTAINS)
PHOENIX 106 MI.
FLORENCE 36 MI.
Antelope Tank
Power Line Tank
Oracle Substation
Crescent Tank
Carpas
Farasway Tank
Falcon Valley Ranch
Black Tank Well
Gravel Pits
Roadside Rest
Lower Holding Tank
Small Hill Reservoir
Power Line Reservoir
Upper Sahuarita Dam
Lower Sahuarita Dam
Walnut Well
Oracle Junction
Represo Tank
Deep Well
Tascal Ravine
Cardones
Page Experimental Ranch
Upper Holding Tank
Throwaway Tank
Rainbow
Double Tank
Catalina Well
Catalina Tank
Rays Tank
No 3 Dirt Tank
The Lower Ranch
Triangle Ranch
Rancho Linda Vista
Oracle Ranger Sta
Cañada del Oro
Mercury
Copper
Chirreon
Sahuarita
Batamote
Hidalgo
Wash
Arroyo
Road
Creek
Canyon
Ridge
Pass
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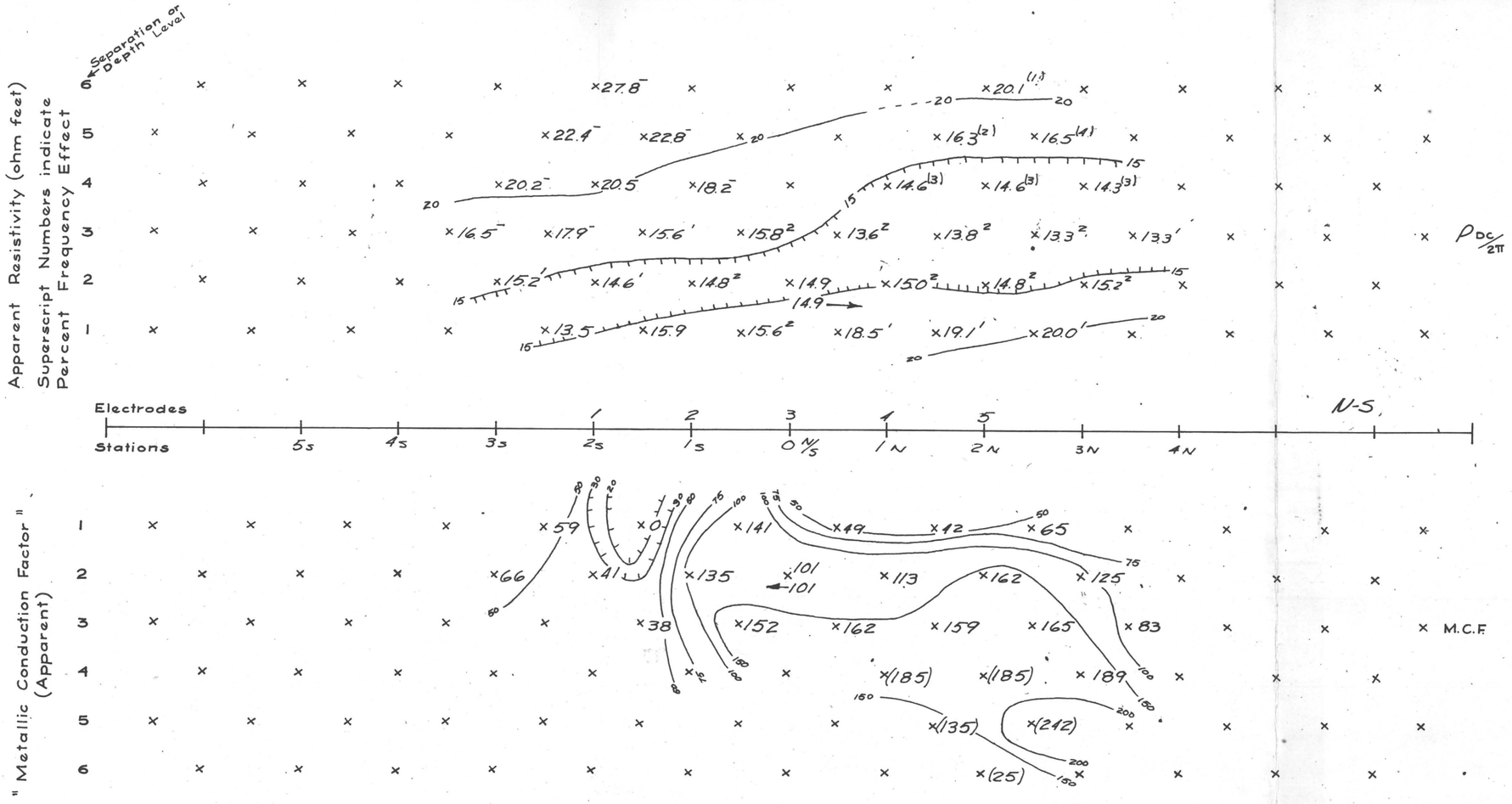
BM 3688
BM 3463
BM 4051
BM 4323
Alto Hill



LEGEND

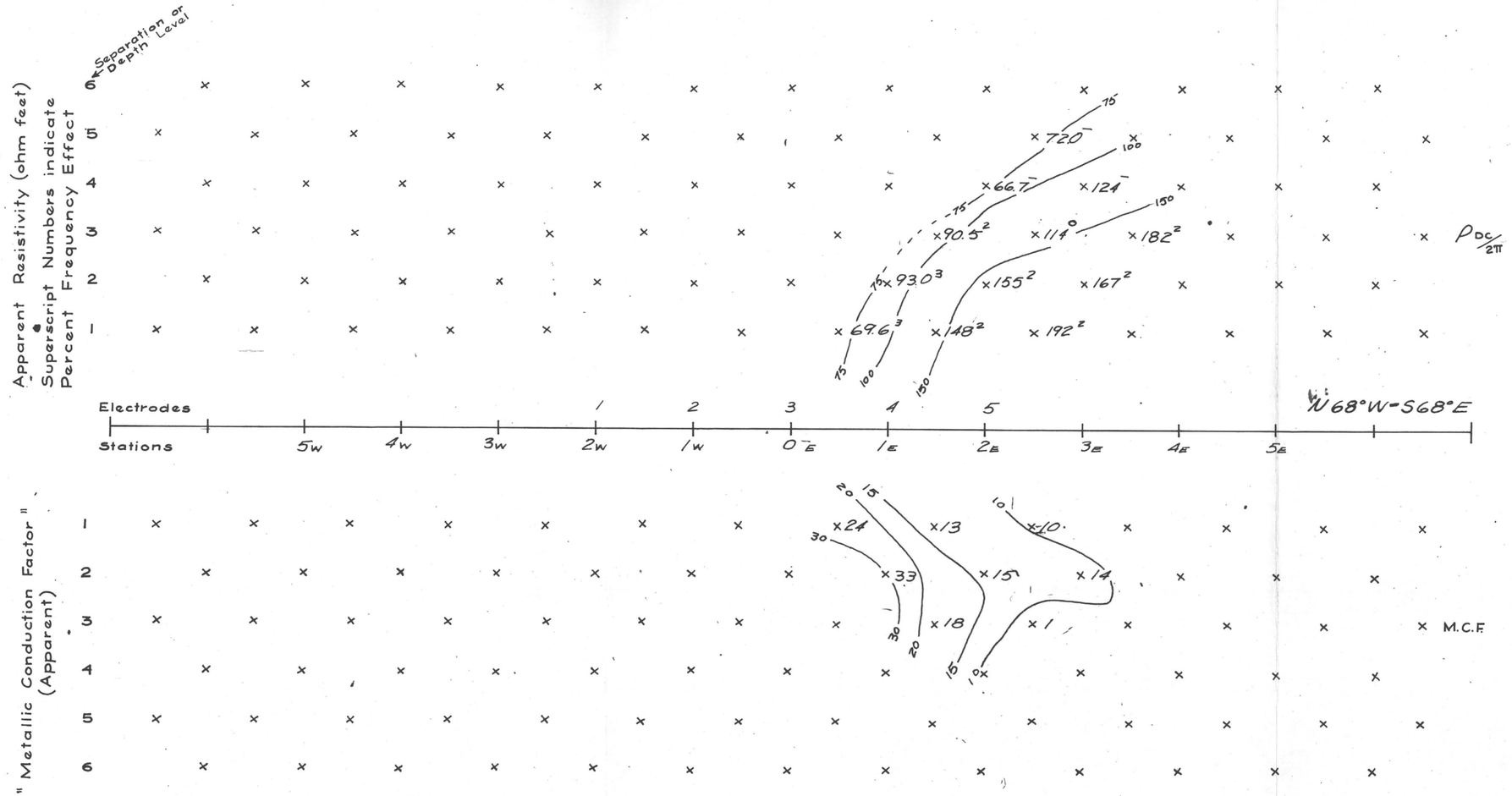
- End of Line
- Station
- No Anomaly
- Very Weak
- Weak
- Moderate
- Strong

Contour interval: Logarithmic
(.) indicates questionable data

SECTIONAL DATA SHEET
LINE No. 1 SPREAD. 1 S½ N½
INDUCED POLARIZATION SURVEY
HEINRICHS GEOEXPLORATION COMPANY
SCALE: 1"=1000' DATE: JULY, 1963
for

DUVAL CORPORATION
FALCON VALLEY

PINAL COUNTY, ARIZONA
SEC. 20, 29, 32 T. 9 S., R. 14 E.



LEGEND

- End of Line
- Station
- No Anomaly
- Very Weak
- Weak
- Moderate
- Strong

Contour interval: Logarithmic
( ) indicates questionable data

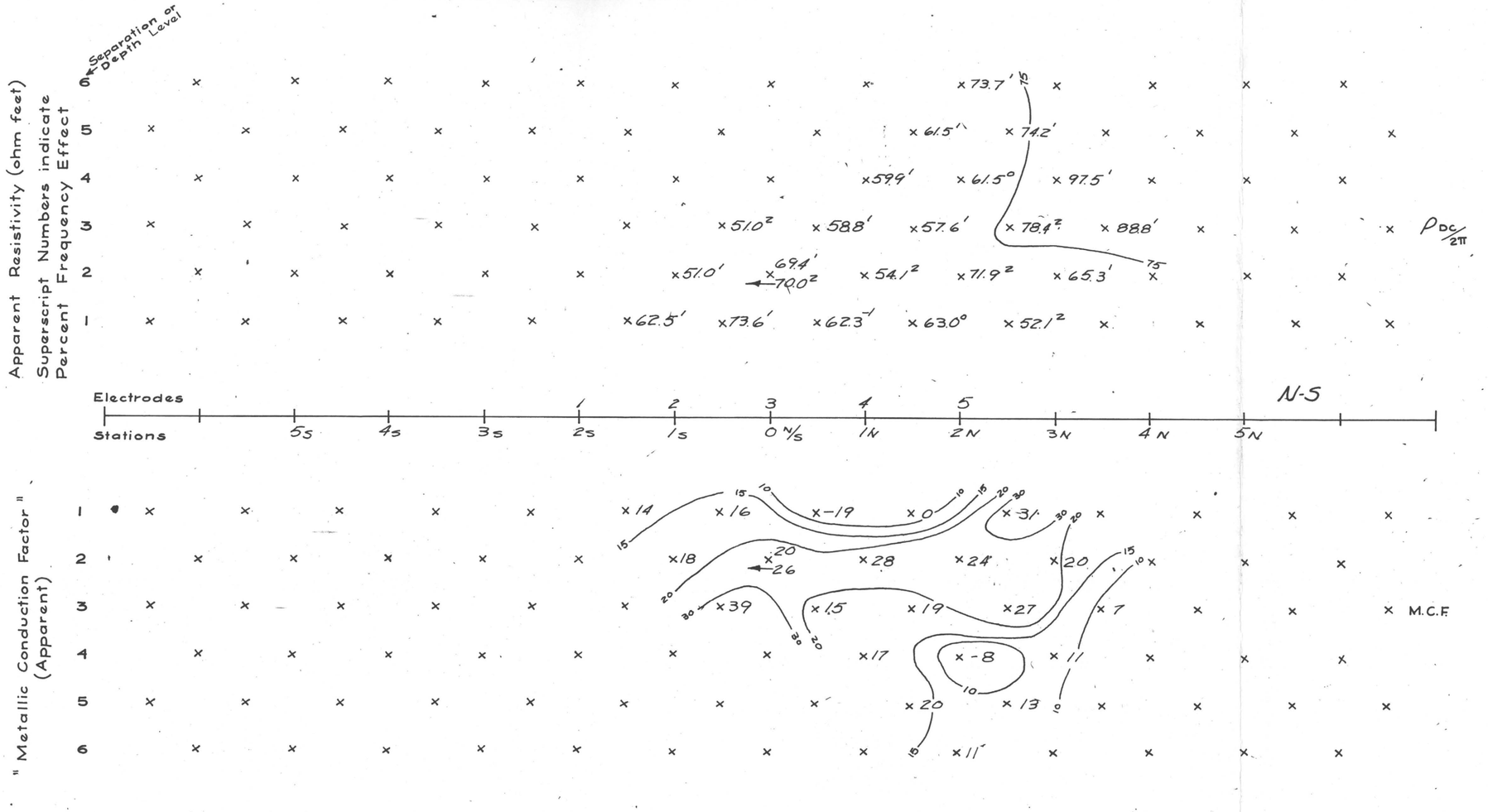
SECTIONAL DATA SHEET
LINE No. 2 SPREAD 1 E½
INDUCED POLARIZATION SURVEY
HEINRICHS GEOEXPLORATION COMPANY
SCALE: 1"=1000' DATE: JULY, 1963

FOR

DUVAL CORPORATION

FALCON VALLEY

PINAL COUNTY, ARIZONA
SEC. 35, 36 T. 9S., R. 14 E.
SEC. 1, 6 T. 10S., R. 14 E.



LEGEND

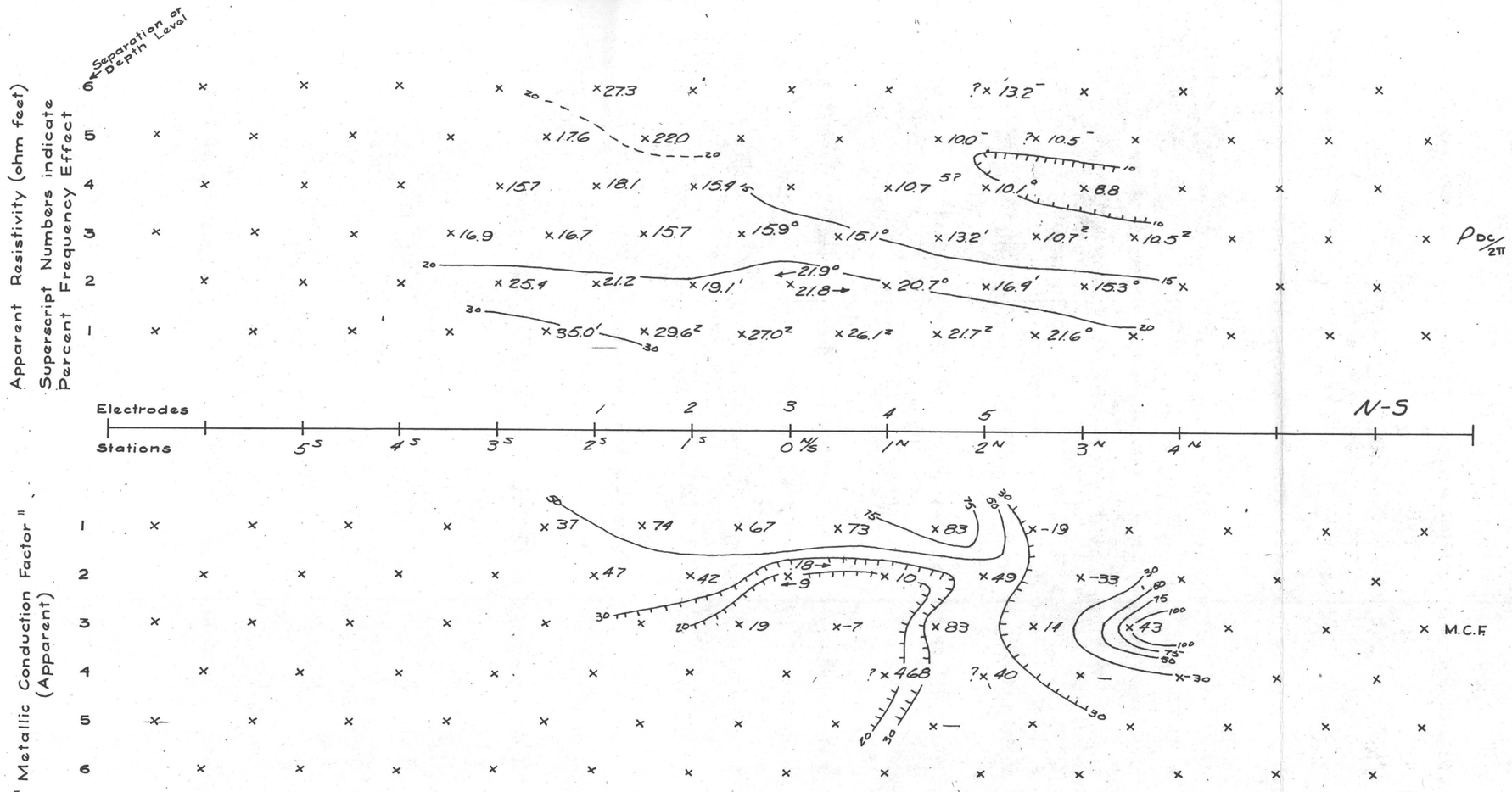
- End of Line
- Station
- No Anomaly
- Very Weak
- Weak
- Moderate
- Strong

Contour interval: Logarithmic
( ) indicates questionable data

SECTIONAL DATA SHEET
LINE No. 3 SPREAD / N½ S½
INDUCED POLARIZATION SURVEY
HEINRICHS GEOEXPLORATION COMPANY
SCALE: 1"=1000' DATE: JULY, 1963

FOR
DUVAL CORPORATION

FALCON VALLEY
PINAL COUNTY, ARIZONA
SEC. 25, 36 T.9E. R.14E.
SEC. 1 T.10E. R.14E.



LEGEND

- End of Line
- Station
- No Anomaly
- Very Weak
- Weak
- Moderate
- Strong

Contour interval: Logarithmic
( ) indicates questionable data

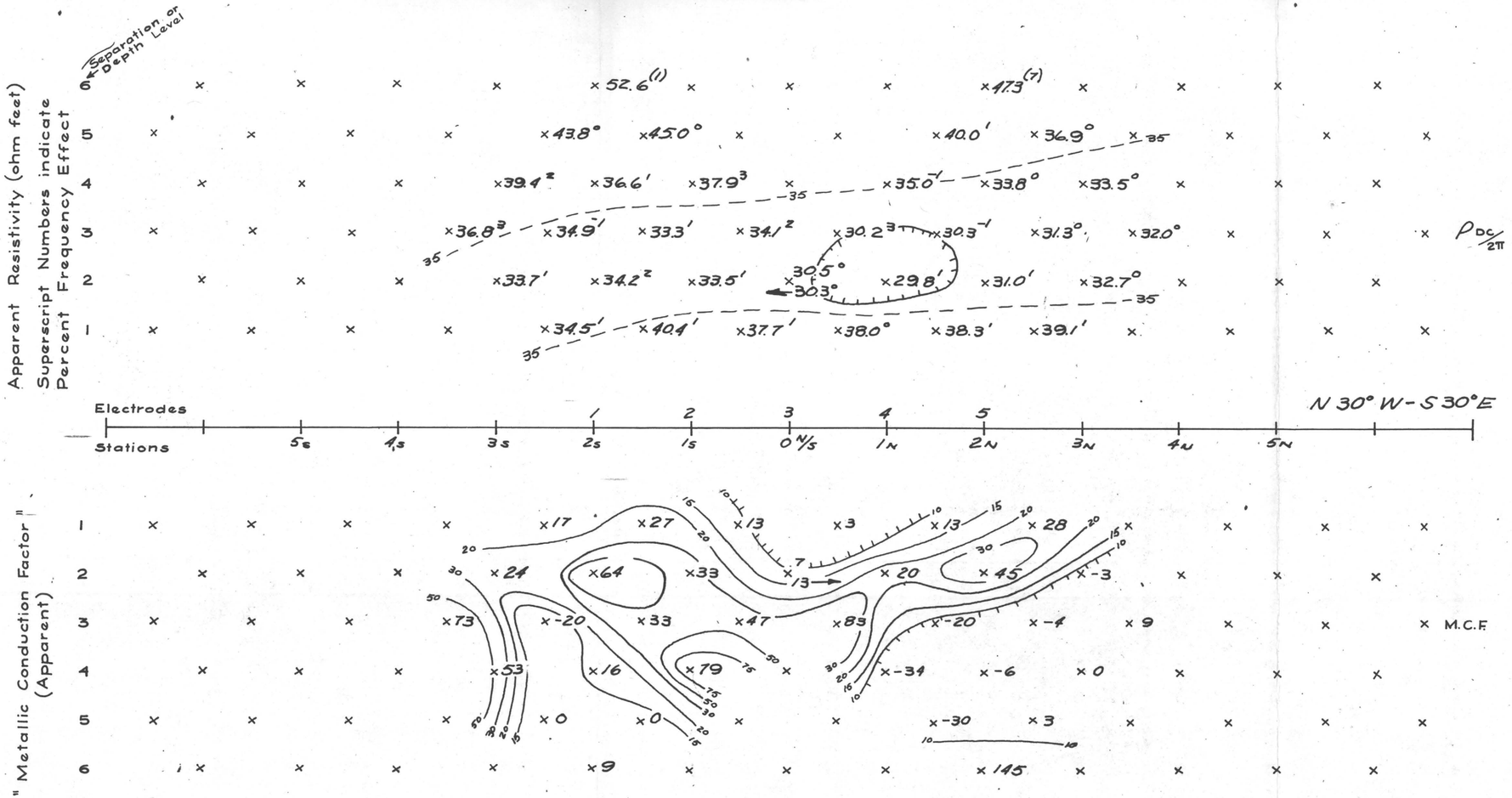
SECTIONAL DATA SHEET
LINE No. 5 SPREAD 1 N½ S½
INDUCED POLARIZATION SURVEY
HEINRICHS GEOEXPLORATION COMPANY
SCALE: 1"=1000' DATE: AUGUST 1963

FOR

DUVAL CORPORATION

FALCON VALLEY

PINAL COUNTY, ARIZONA
SEC. 28, 33 T.9 E. R.14 E.
SEC. 4 T.9 E. R.14 E.



LEGEND

- End of Line
- Station
- No Anomaly
- Very Weak
- Weak
- Moderate
- Strong

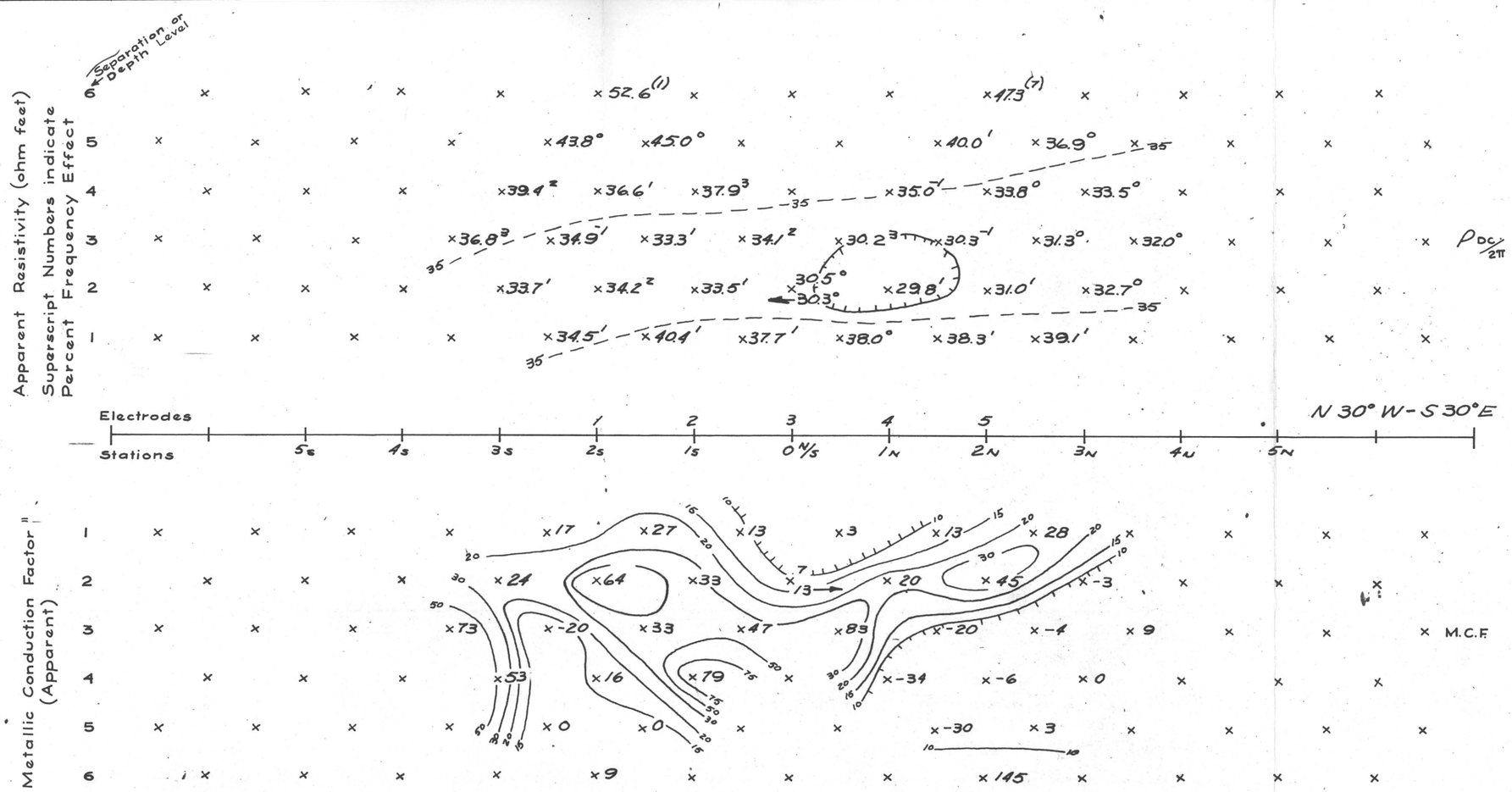
Contour interval: Logarithmic
( ) indicates questionable data

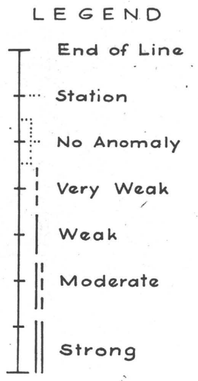
SECTIONAL DATA SHEET
LINE No. 6 SPREAD / N½S½
INDUCED POLARIZATION SURVEY
HEINRICHS GEOEXPLORATION COMPANY
SCALE: 1"=1000' DATE: AUGUST, 1963

FOR

DUVAL CORPORATION
FALCON VALLEY

PINAL COUNTY, ARIZONA
SEC. 25, 36 T. 9 S. R. 13 E.





Contour interval: Logarithmic
( ) indicates questionable data

SECTIONAL DATA SHEET
LINE No. 6 SPREAD / N½S½
INDUCED POLARIZATION SURVEY
HEINRICHS GEOEXPLORATION COMPANY
SCALE: 1"=1000' DATE: AUGUST, 1963

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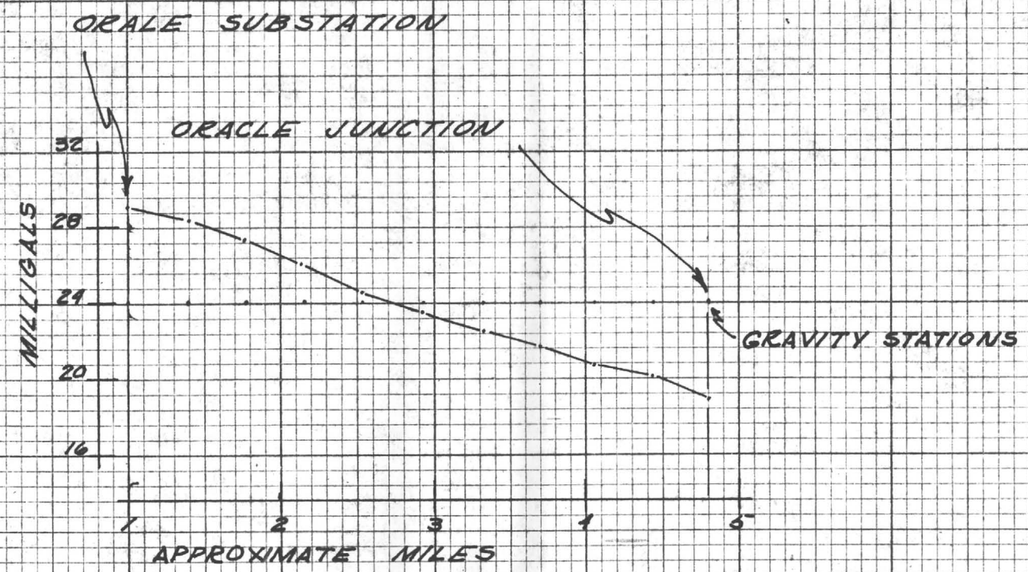
SEC. 25, 36 T. 9 S. R. 13 E.

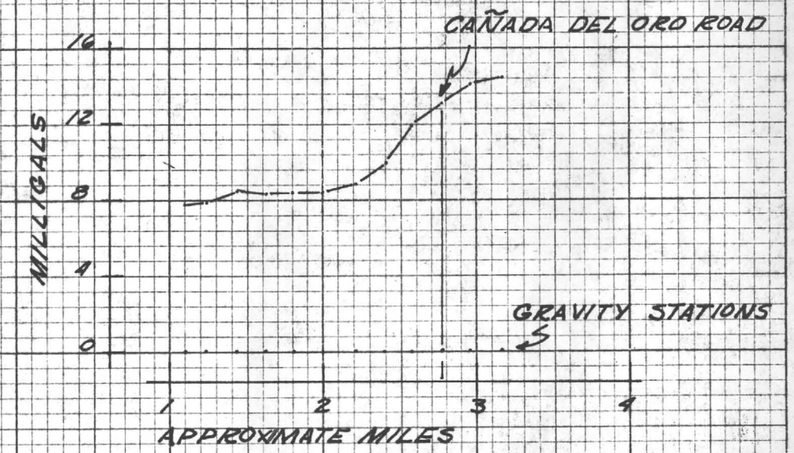


GRAVITY PROFILE #4

ALONG FLORENCE HIGHWAY

LOOKING NE

SEC. 2,12,18 T10S., R.13&14E.



GRAVITY PROFILE #3

LOOKING NNW

SEC 1,2,11,12; T10S, R14E.

HEINRICHS GEOEXPLORATION COMPANY

GRAVITY PROFILES 3 & 4

FOR

DUVAL CORPORATION

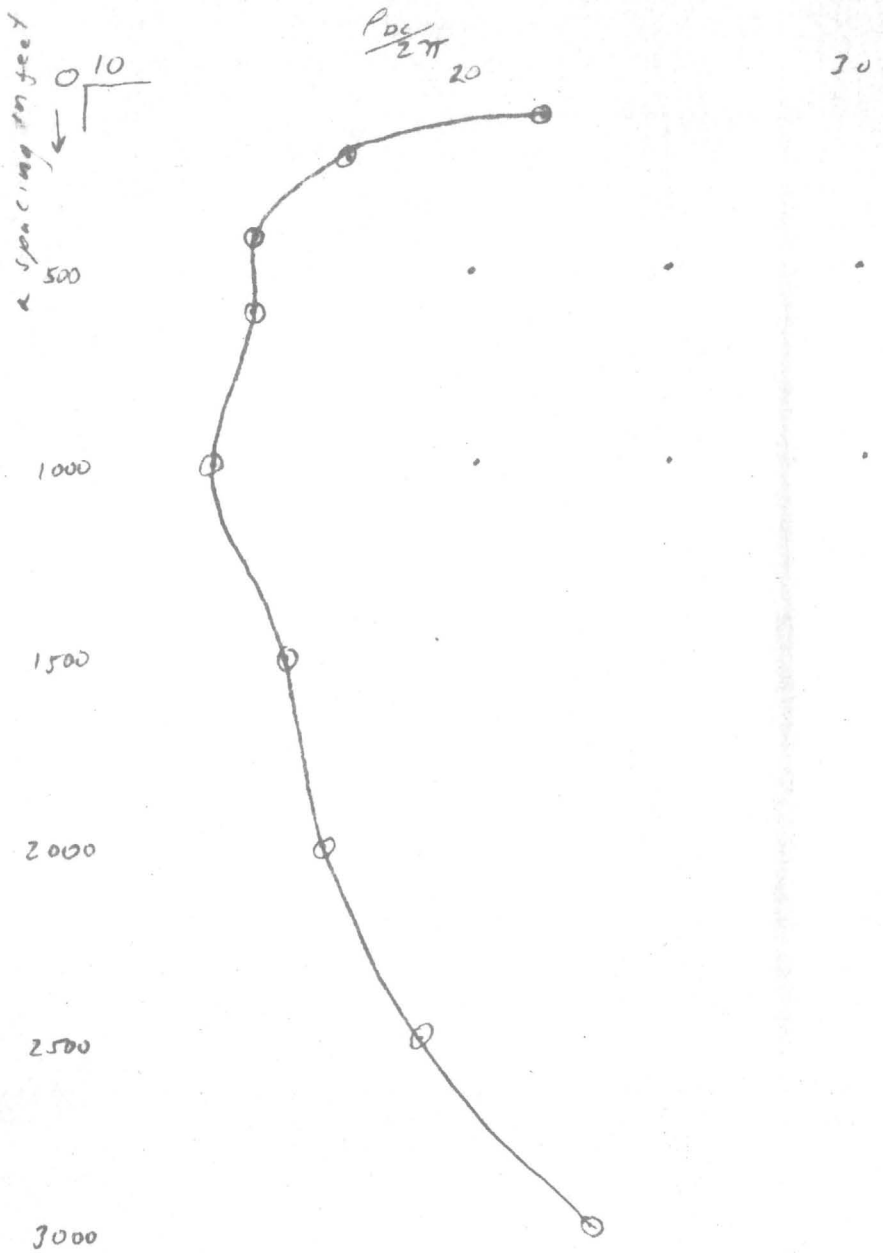
FALCON VALLEY

PINAL COUNTY, ARIZONA

DATE: JULY 1963

K+E 10 X 10 TO THE INCH 359-5DLG KEUFFEL & ESSER CO. MADE IN U.S.A.

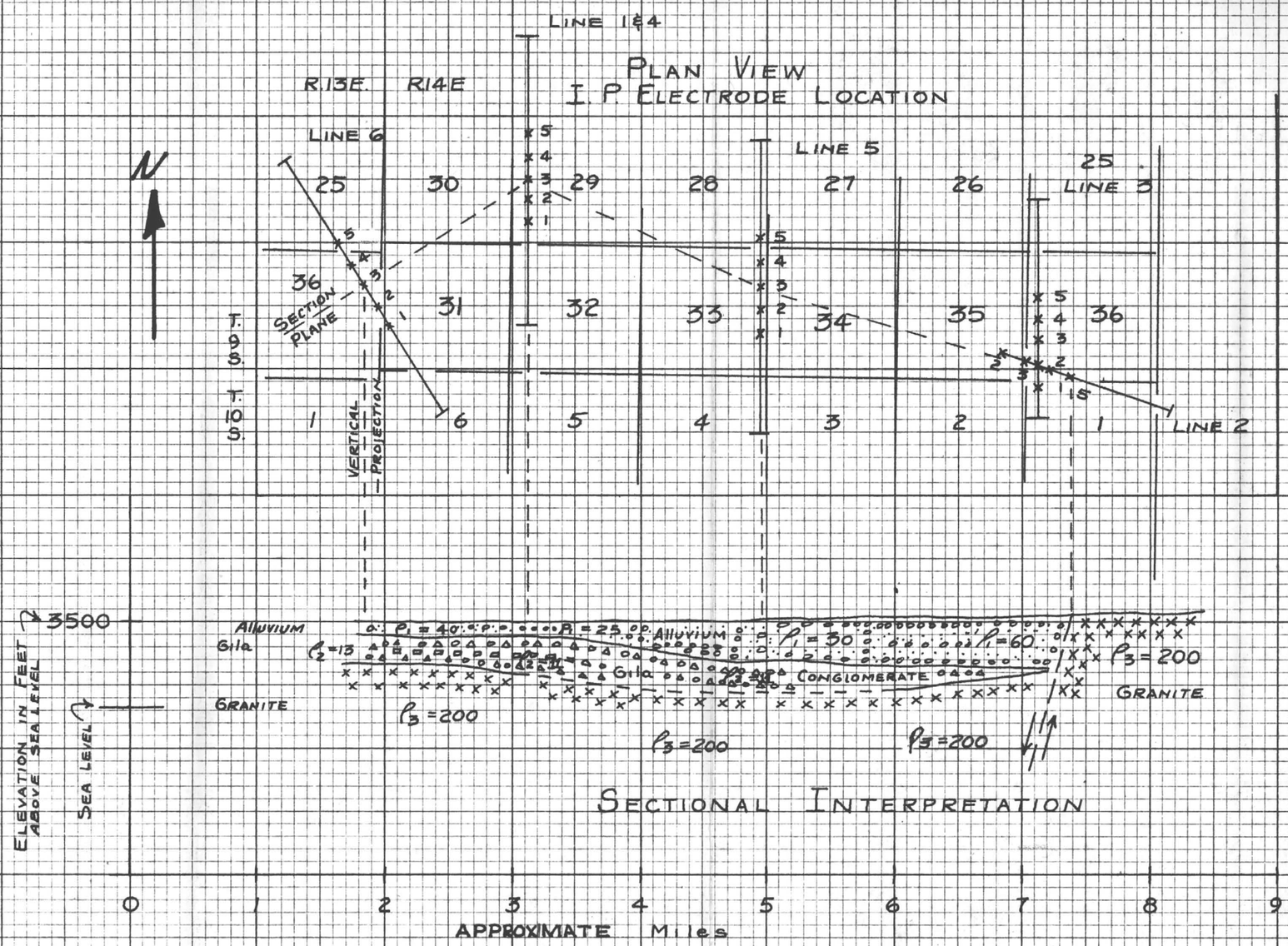
Wenner Depth Probe Line 4



Interpretation

$\rho = 11 \Omega ft/2\pi$

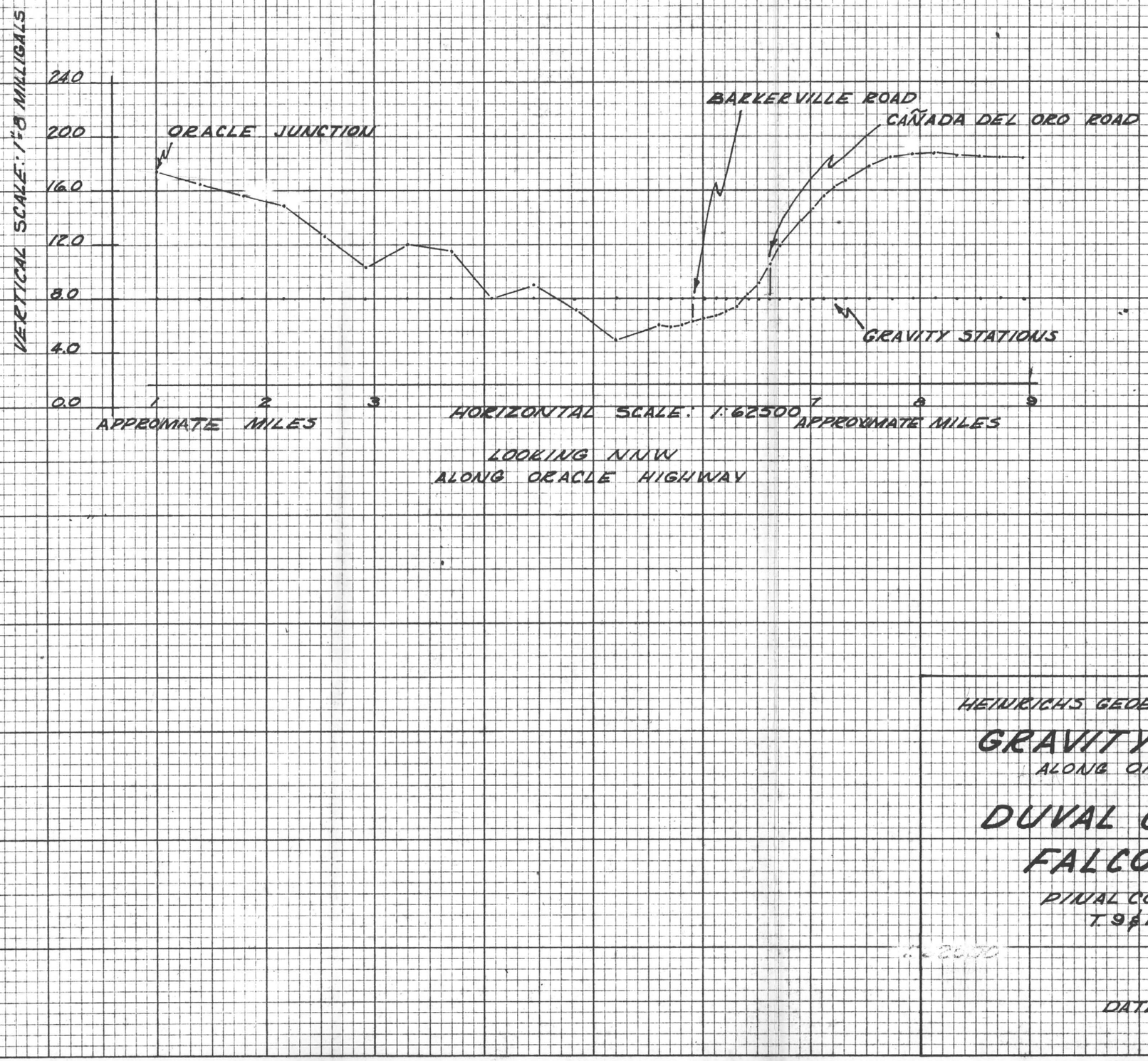
$\rho = 210 \Omega ft/2\pi$



SECTIONAL INTERPRETATION

HEINRICHS GEOEXPLORATION CO.
INDUCED POLARIZATION SURVEY
SECTIONAL RESISTIVITY INTERPRETATION

FALCON VALLEY
PINAL COUNTY, ARIZONA
FOR
DUVAL CORPORATION
DATE: JULY, 1963



HEINRICHS GEOEXPLORATION COMPANY

GRAVITY PROFILE #1

ALONG ORACLE HIGHWAY

FOR

DUVAL CORPORATION

FALCON VALLEY

PINAL COUNTY, ARIZONA

T. 9 & 10 S. R. 14 & 15 S.

DATE: JULY 1963

K+E 10 X 10 TO THE INCH KEUFFEL & ESSER CO. 359-5DLG MADE IN U.S.A.

HEINRICHS GEOEXPLORATION COMPANY

GRAVITY PROFILE #2

ALONG POWERLINE

FOR

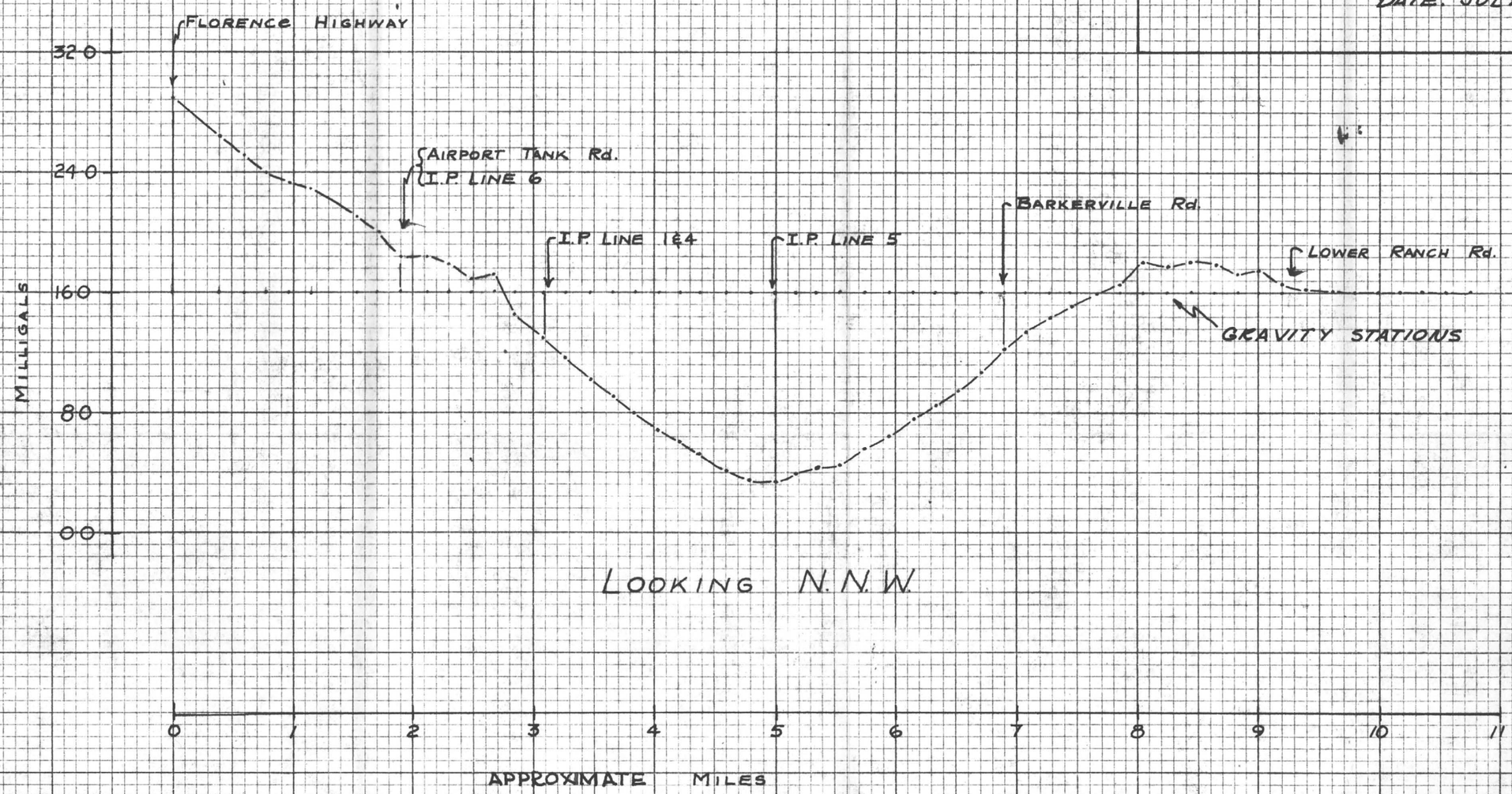
DUVAL CORPORATION

FALCON VALLEY

PINAL COUNTY, ARIZONA

T. 9 S. R. 13, 14, 15 E.

DATE: JULY 1963



K+E 10 X 10 TO THE INCH 359-5DLG KEUFFEL & ESSER CO. MADE IN U.S.A.

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Respectfully submitted,

HEINRICHS GEOEXPLORATION COMPANY

Chris S. Ludwig

Chris. S. Ludwig
Exploration Geophysicist

Approved:

Walter E. Heinrichs, Jr.
President & General Manager

August 23, 1963
P. O. Box 5671
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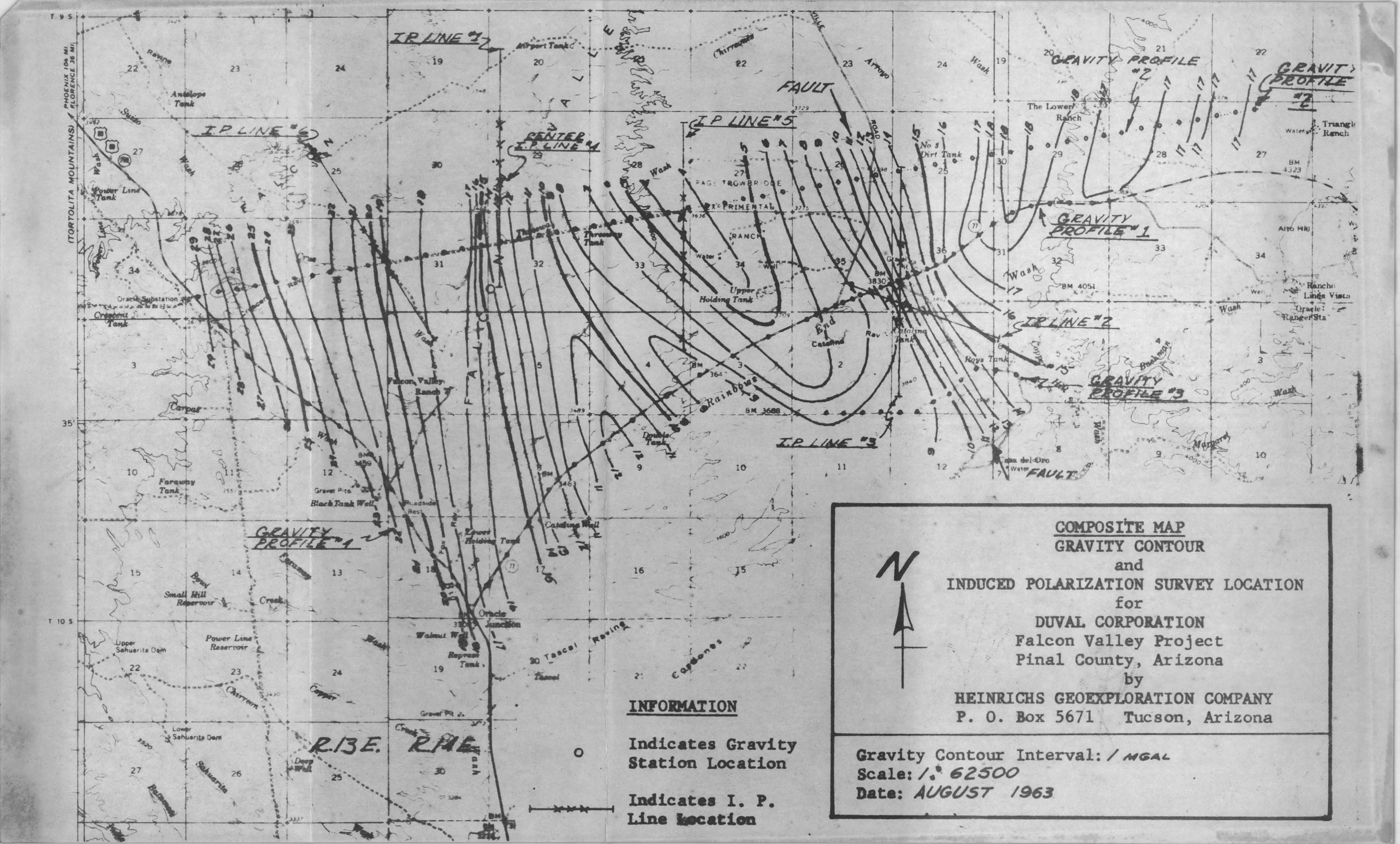
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Falcon Valley Ranch
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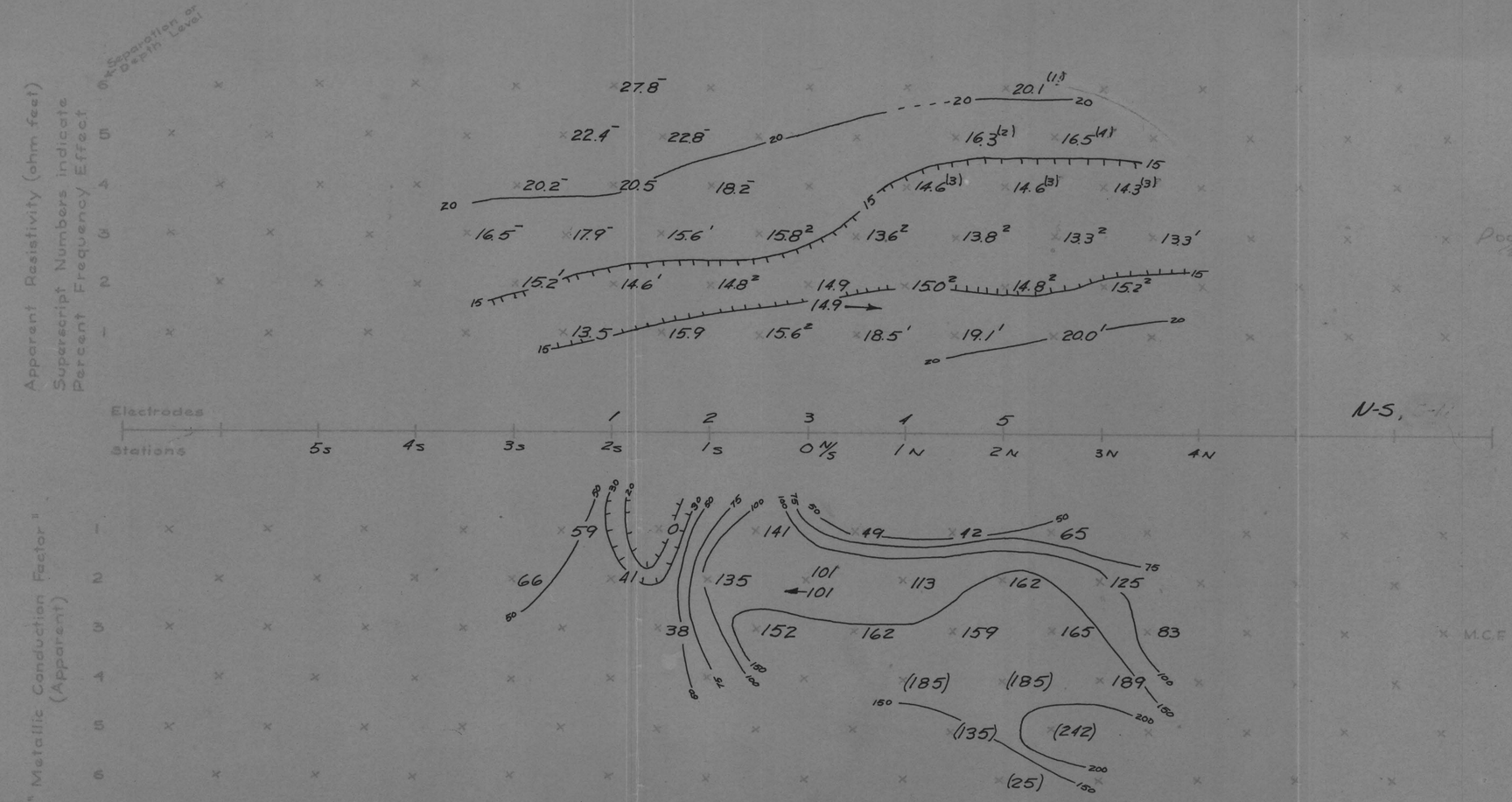
Black Tank Well
Roadside Res.
Lower Holding Tank
Oracle Junction
Walnut Well
Represa Tank
Tascal Ravine
Cascones
Catalina Well
Airport Tank
Chimney
Arroyo
Upper Holding Tank
Rainbow
Double Tank
BM 3688
BM 3830
BM 4051
BM 4323
BM 3464
BM 3460
BM 3467
BM 3214
PAGE TROWBRIDGE EXPERIMENTAL RANCH
Water Well
Gravel Pit
Catalina
Holding Tank
Hays Tank
No. 5 Dirt Tank
The Lower Ranch
Triangle Ranch
Alto Hill
Rancho Linda Vista
Oracle Ranger Sta.
Buckman
Marjorie
Casa del Oro
Water
Wash
Ravine
Creek
Canyon
Bayou
Cherryvale
Sahuarita
Rainbow
Tunnel
Road



N-S,

LEGEND

- End of Line
- Station
- No Anomaly
- Very Weak
- Weak
- Moderate
- Strong

Contour interval: Logarithmic
( ) indicates questionable data

SECTIONAL DATA SHEET

LINE No. 1 SPREAD. 1 S½ N½

INDUCED POLARIZATION SURVEY

HEINRICHS GEOEXPLORATION COMPANY

SCALE: 1"=1000' DATE: JULY, 1963

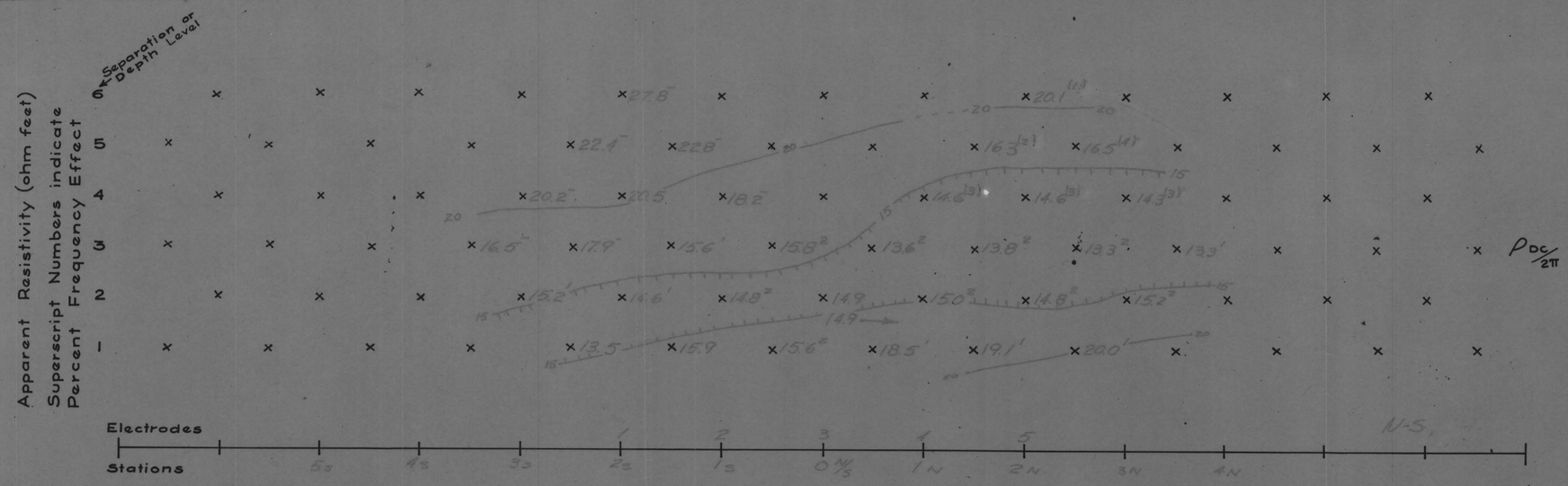
for

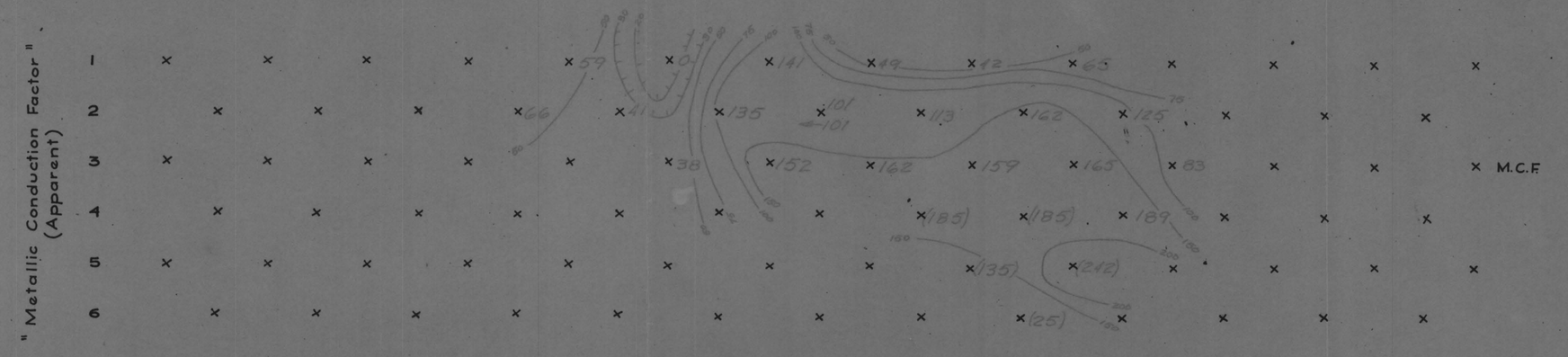
DUVAL CORPORATION

FALCON VALLEY

PINAL COUNTY, ARIZONA

SEC. 20, 29, 32 T. 9 S., R. 14 E.





LEGEND

- End of Line
- Station
- No Anomaly
- Very Weak
- Weak
- Moderate
- Strong

Contour interval: Logarithmic
(.) indicates questionable data

SECTIONAL DATA SHEET

LINE No. 1 SPREAD 1 Sta. N½

INDUCED POLARIZATION SURVEY

HEINRICHS GEOEXPLORATION COMPANY

SCALE: 1"=1000' DATE: JULY, 1963

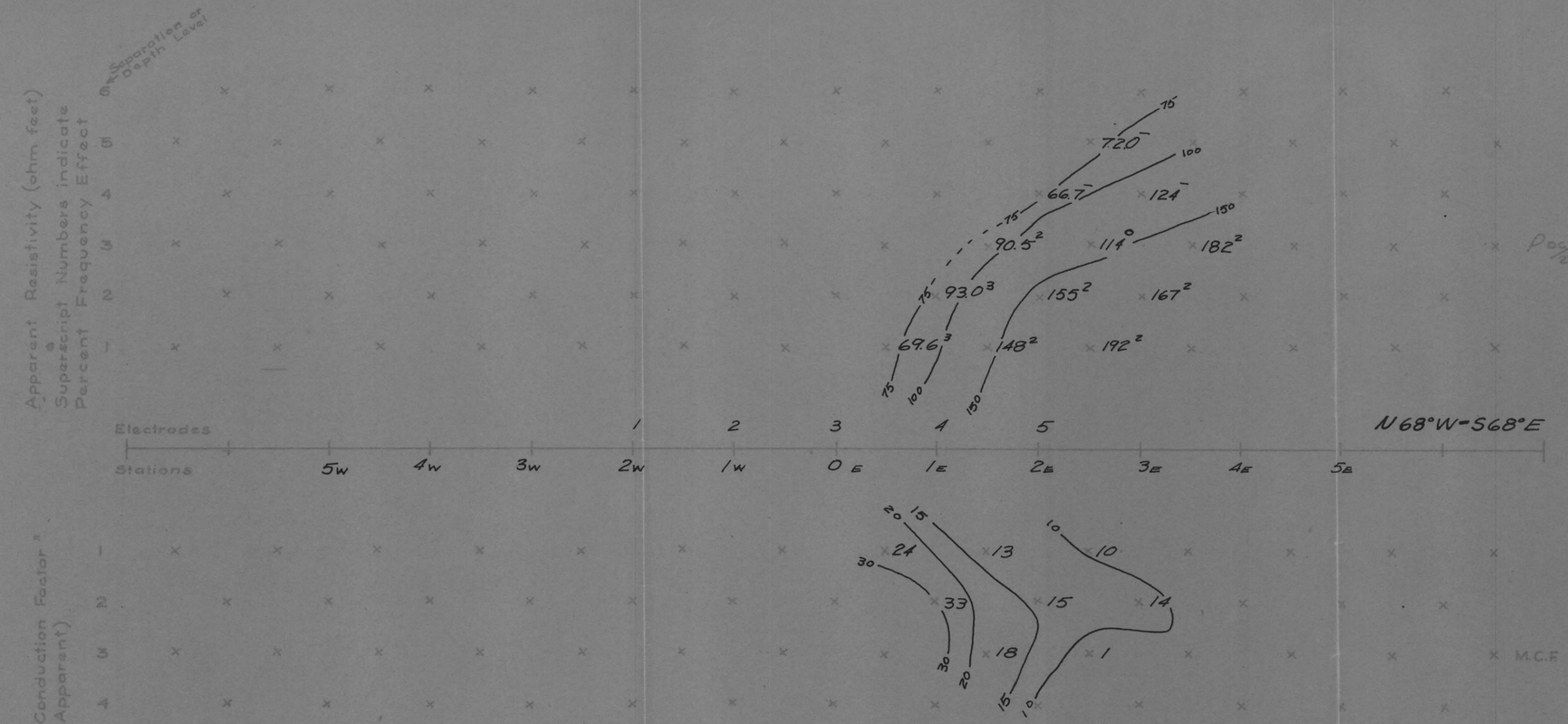
for

DUVAL CORPORATION

FALCON VALLEY

PINAL COUNTY, ARIZONA

SEC. 20, 29, 32 T. 9 S., R. 14 E.



LEGEND

- End of Line
- Station
- No Anomaly
- Very Weak
- Weak
- Moderate
- Strong

Contour interval: Logarithmic
( ) indicates questionable data

SECTIONAL DATA SHEET

LINE No. 2 SPREAD 1 E½

INDUCED POLARIZATION SURVEY

HEINRICHS GEOEXPLORATION COMPANY

SCALE 1"=1000' DATE JULY, 1963

FOR

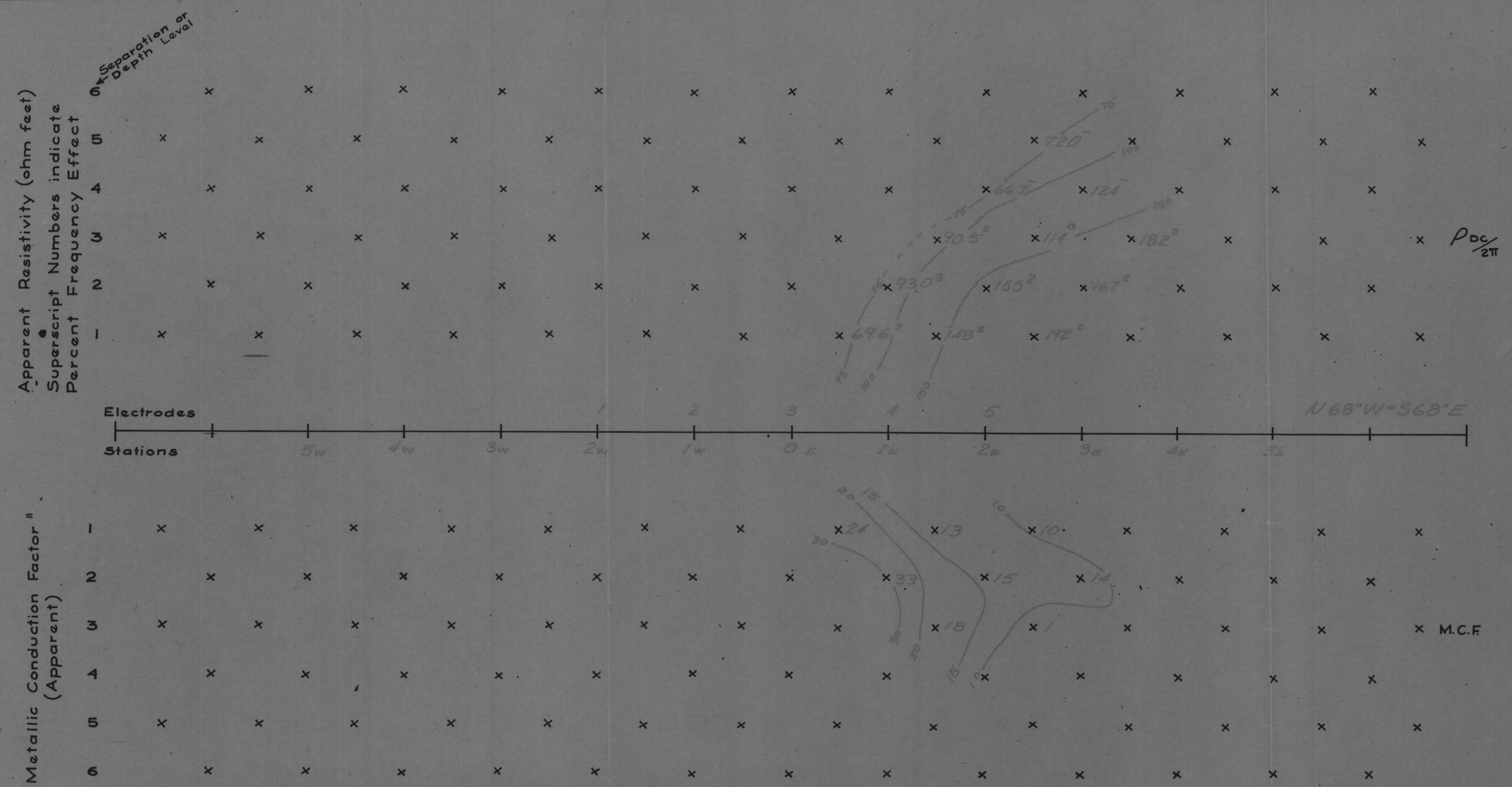
DUVAL CORPORATION

FALCON VALLEY

PINAL COUNTY, ARIZONA

SEC. 35, 36 T. 9 S., R. 14 E.

SEC. 1, 6 T. 10 S., R. 14 E.



LEGEND

- End of Line
- Station
- No Anomaly
- Very Weak
- Weak
- Moderate
- Strong

Contour interval: Logarithmic
( ) indicates questionable data

SECTIONAL DATA SHEET

LINE No. 2 SPREAD 1 E½

INDUCED POLARIZATION SURVEY

HEINRICHS GEOEXPLORATION COMPANY

SCALE: 1"=1000' DATE: JULY, 1963

FOR

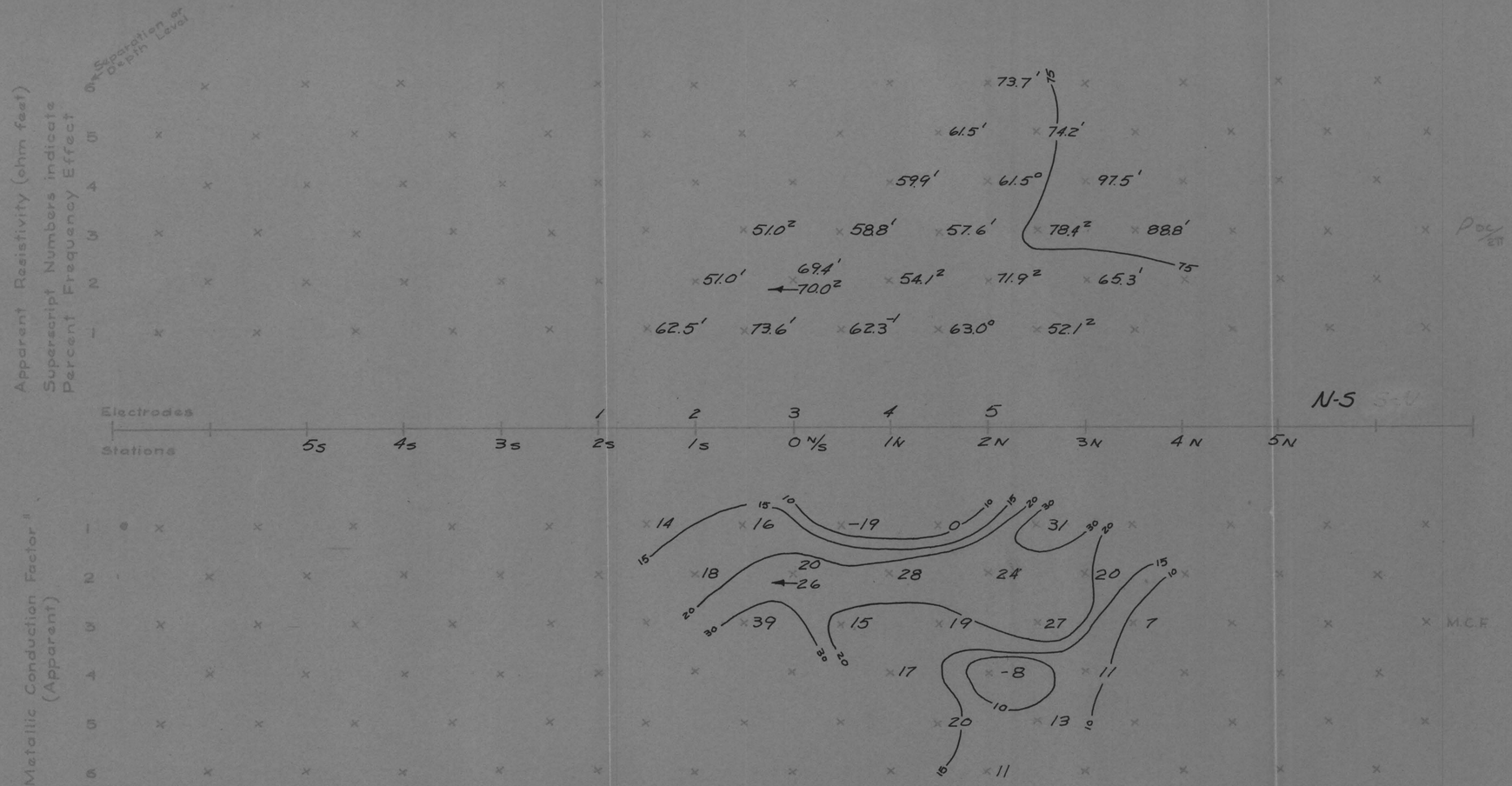
DUVAL CORPORATION

FALCON VALLEY

PINAL COUNTY, ARIZONA

SEC. 35, 36 T.9S., R.14E.

SEC. 1, 6 T.10S., R.14E.



LEGEND

- End of Line
- Station
- No Anomaly
- Very Weak
- Weak
- Moderate
- Strong

Contour interval: Logarithmic
( ) indicates questionable data

SECTIONAL DATA SHEET

LINE No. 3 SPREAD 1 N 1/2 S 1/2

INDUCED POLARIZATION SURVEY

HEINRICHS GEOEXPLORATION COMPANY

SCALE: 1"=1000' DATE: JULY, 1963

FOR

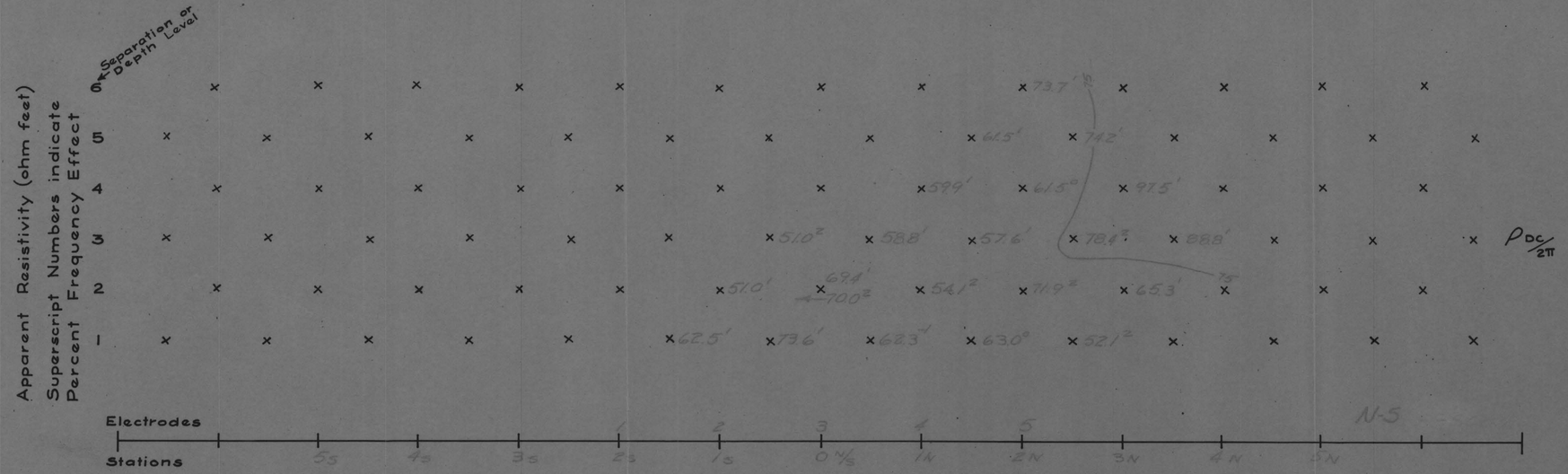
DUVAL CORPORATION

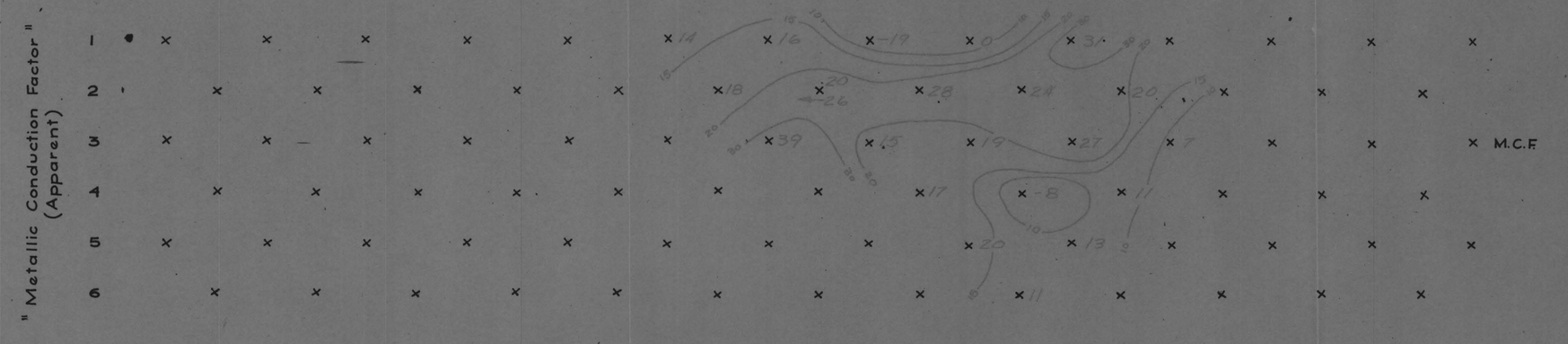
FALCON VALLEY

PINAL COUNTY, ARIZONA

SEC. 25, 36 T.9 E. R.14 E.

SEC. 1 T.10 E. R.14 E.





LEGEND

- End of Line
- Station
- No Anomaly
- Very Weak
- Weak
- Moderate
- Strong

Contour interval: Logarithmic
( ) indicates questionable data

SECTIONAL DATA SHEET

LINE No. 3 SPREAD 1 N½ S½

INDUCED POLARIZATION SURVEY

HEINRICHS GEOEXPLORATION COMPANY

SCALE: 1"=1000' DATE: JULY, 1963

FOR:

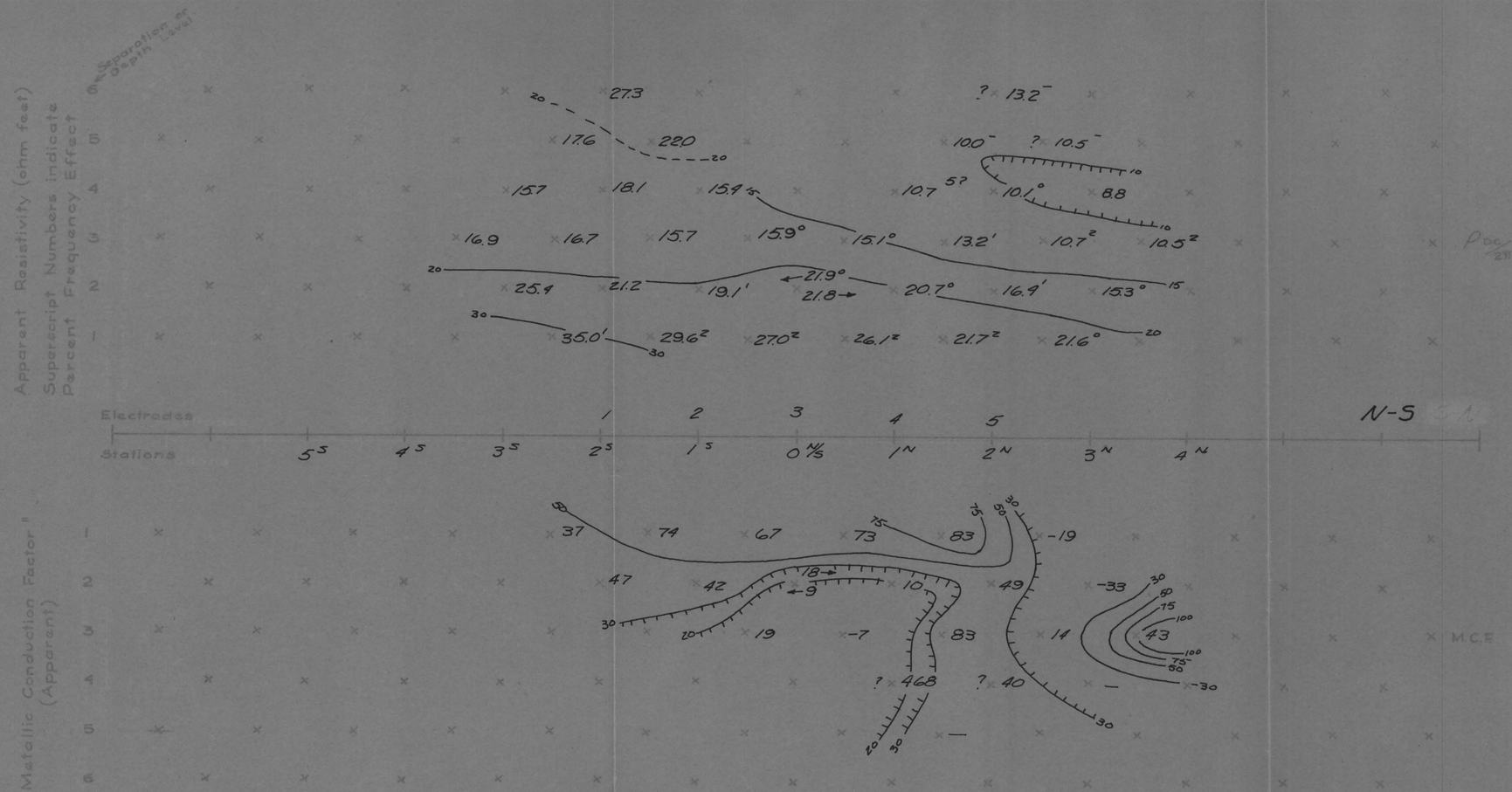
DUVAL CORPORATION

FALCON VALLEY

PINAL COUNTY, ARIZONA

SEC. 25, 36 T.9 E. R.14 E.

SEC. 1 T.10 E. R.14 E.



LEGEND

- End of Line
- Station
- No Anomaly
- Very Weak
- Weak
- Moderate
- Strong

Contour interval: Logarithmic
( ) indicates questionable data

SECTIONAL DATA SHEET

LINE No. 5 SPREAD 1 N½ S½

INDUCED POLARIZATION SURVEY

HEINRICHS GEOEXPLORATION COMPANY

SCALE: 1"=1000' DATE: AUGUST 1963

FOR

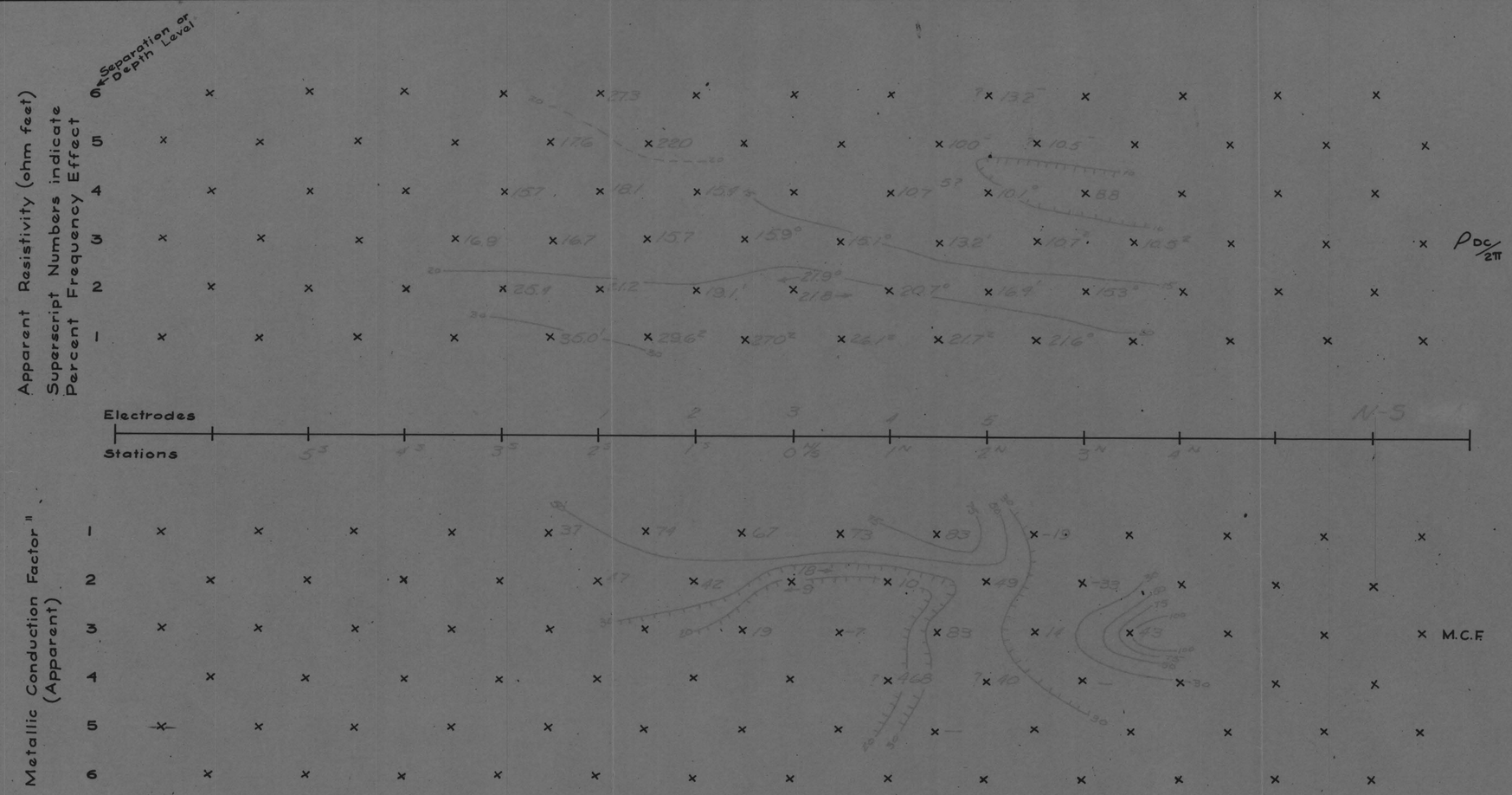
DUVAL CORPORATION

FALCON VALLEY

PINAL COUNTY, ARIZONA

SEC. 28, 33 T.9 E. R.14 E.

SEC. 4 T.9 E. R.14 E.



LEGEND

- End of Line
- Station
- No Anomaly
- Very Weak
- Weak
- Moderate
- Strong

Contour interval: Logarithmic
( ) indicates questionable data

SECTIONAL DATA SHEET

LINE No. 5 SPREAD 1 1½ 5½

INDUCED POLARIZATION SURVEY

HEINRICHS GEOEXPLORATION COMPANY

SCALE: 1"=1000' DATE: AUGUST 1963

FOR

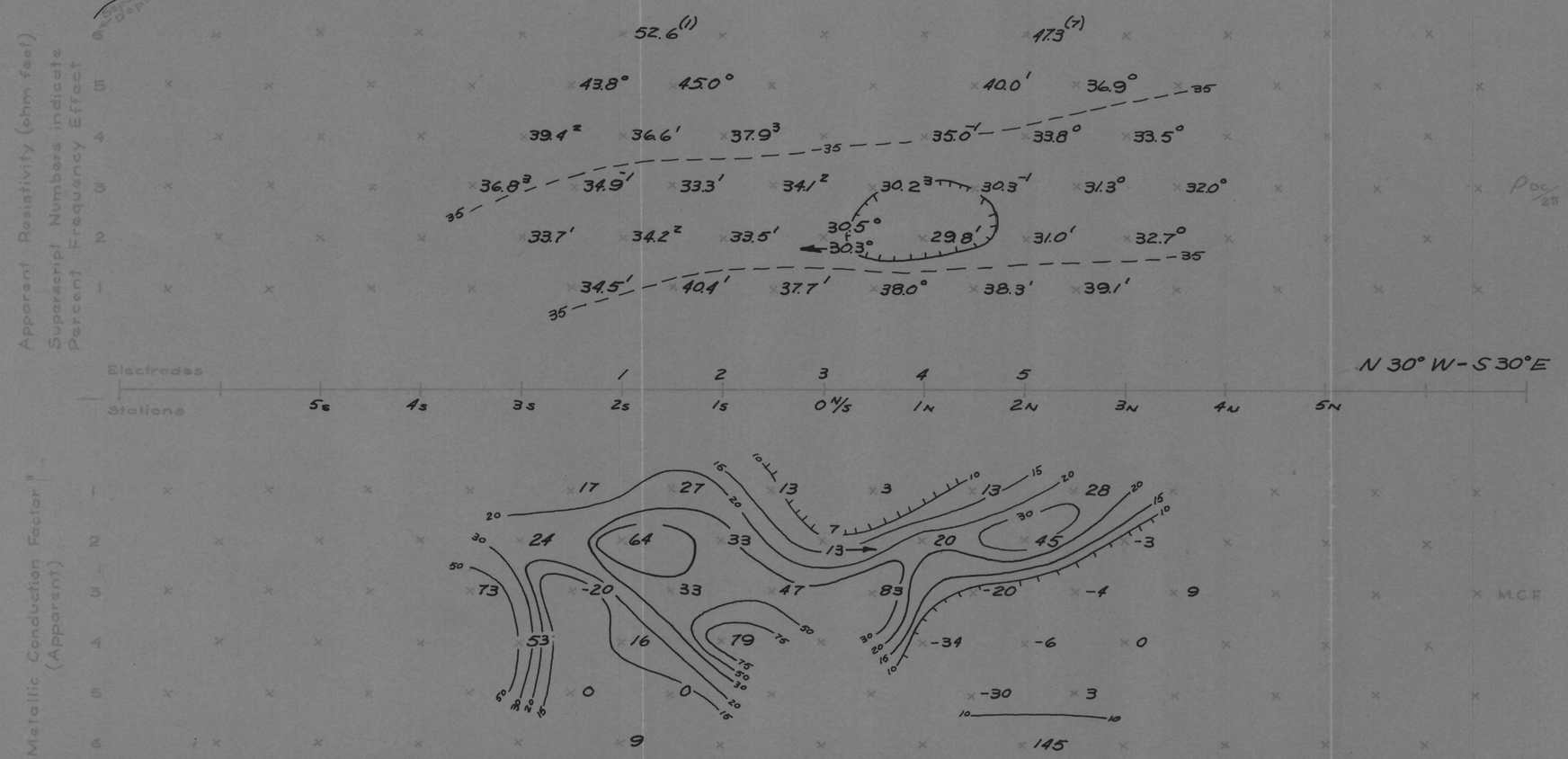
DUVAL CORPORATION

FALCON VALLEY

PINAL COUNTY, ARIZONA

SEC. 28, 33 T9E. R.14E.

SEC. 4 T8E. R.14E.



LEGEND

- End of Line
- Station
- No Anomaly
- Very Weak
- Weak
- Moderate
- Strong

Contour interval: Logarithmic
( ) indicates questionable data

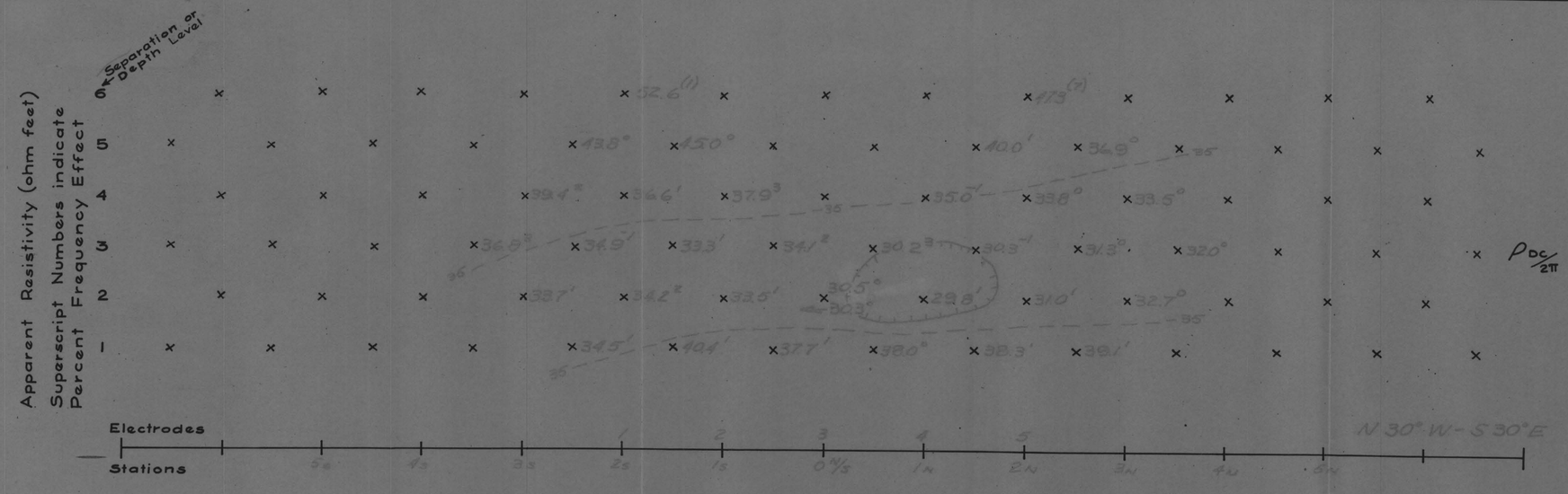
SECTIONAL DATA SHEET
LINE No. 6 SPREAD / N½S½
INDUCED POLARIZATION SURVEY
HEINRICHS GEOEXPLORATION COMPANY
SCALE: 1"=1000' DATE: AUGUST, 1963

FOR

DUVAL CORPORATION

FALCON VALLEY

PINAL COUNTY, ARIZONA
SEC. 25, 36 T. 9 S. R. 13 E.



LEGEND

- End of Line
- Station
- No Anomaly
- Very Weak
- Weak
- Moderate
- Strong

Contour interval: Logarithmic
( ) indicates questionable data

SECTIONAL DATA SHEET

LINE No. 6 SPREAD 1 N43½

INDUCED POLARIZATION SURVEY

HEINRICHS GEOEXPLORATION COMPANY

SCALE: 1"=1000' DATE: AUGUST, 1963

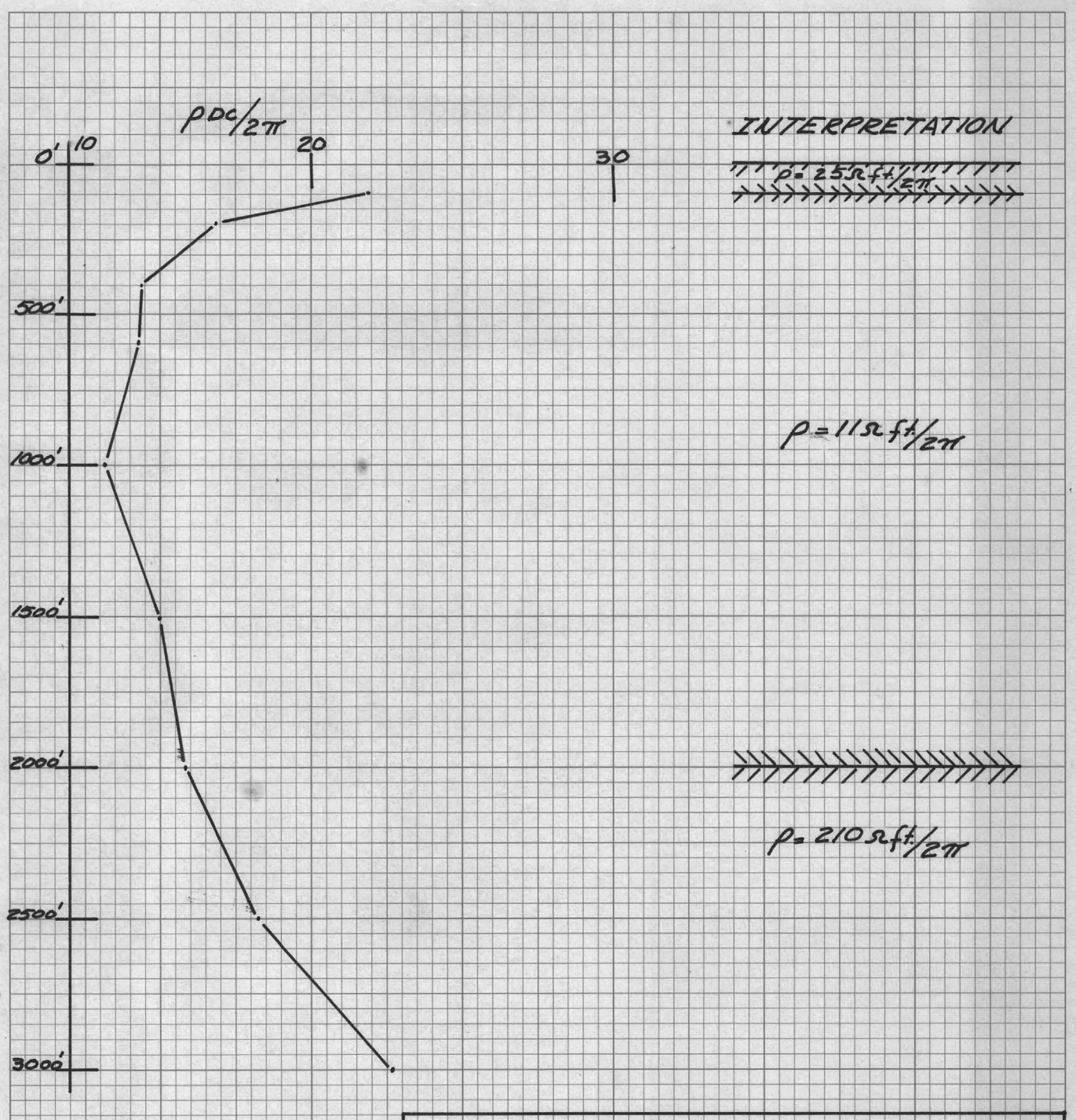
FOR

DUVAL CORPORATION

FALCON VALLEY

PINAL COUNTY, ARIZONA

SEC. 25, 36 T.8 S. R. 13 E.

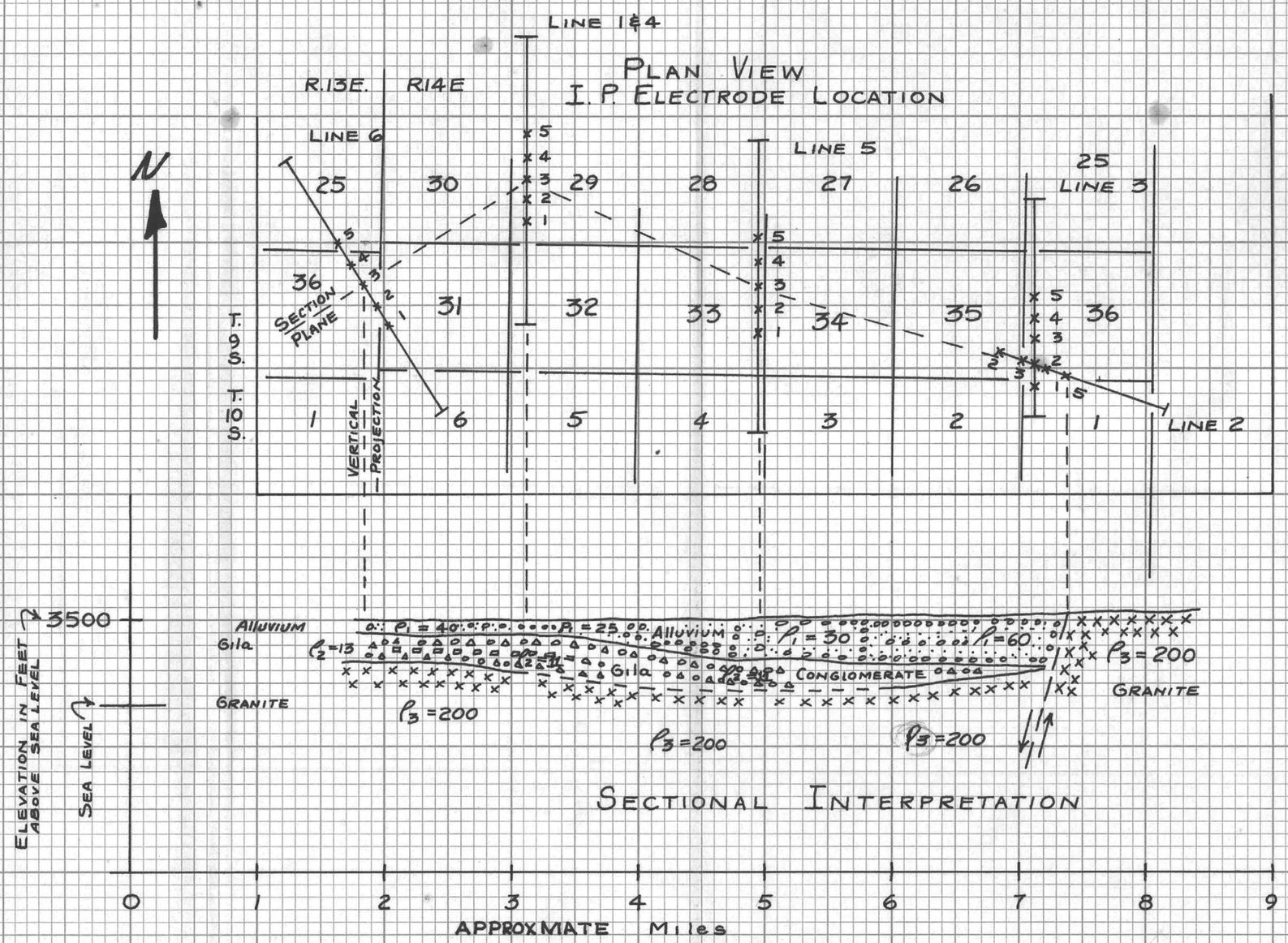


HEINRICHS GEOEPLORATION CO.
INDUCED POLARIZATION SURVEY
WENNER DEPTH PROBE

LINE NO. 4
FALCON VALLEY
PINAL COUNTY, ARIZONA
SEC. 20, 29, 32, T. 9 S., R. 14 E.
for

DUVAL CORPORATION
SCALE: HOR: 1" = 10 ρDC/2π, VER. 1" = 500'
DATE: JULY, 1963

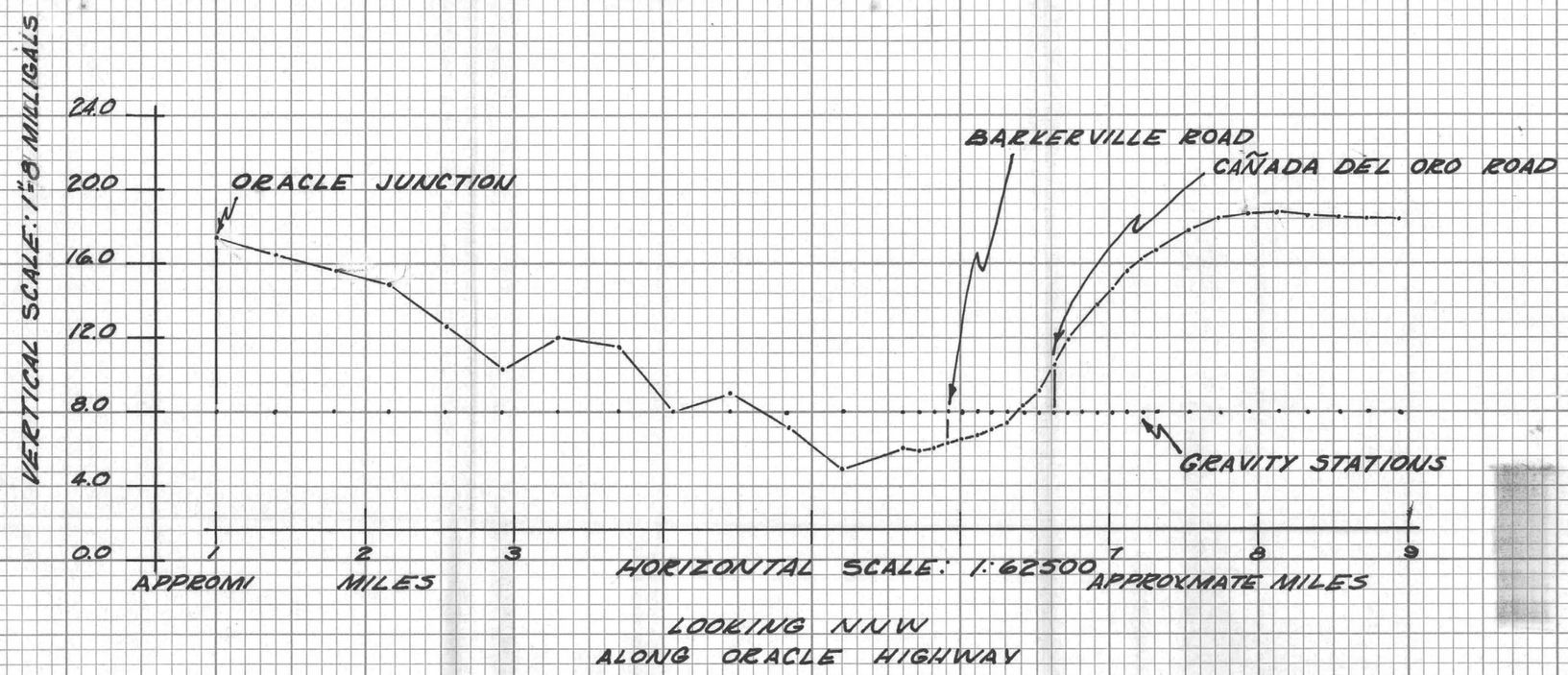
EUGENE DIETZGEN CO.
MADE IN U. S. A.
NO. 340R-10 DIETZGEN GRAPH PAPER
10 X 10 PER INCH



SECTIONAL INTERPRETATION

HEINRICHS GEOEXPLORATION CO.
INDUCED POLARIZATION SURVEY
SECTIONAL RESISTIVITY INTERPRETATION

FALCON VALLEY
PINAL COUNTY, ARIZONA
FOR
DUVAL CORPORATION
DATE: JULY, 1963



HEINRICHS GEOEXPLORATION COMPANY

GRAVITY PROFILE #1

ALONG ORACLE HIGHWAY

FOR

DUVAL CORPORATION

FALCON VALLEY

PINAL COUNTY, ARIZONA

T. 9 & 10 S. R. 14 & 15 S.

1:62500

C.S.L.

DATE: JULY 1963

K+E 10 X 10 TO THE INCH 359-5DLG
KEUFFEL & ESSER CO. MADE IN U.S.A.

Gravity Profile # 2 Along Powerline

HEINRICHS GEOEXPLORATION COMPANY

GRAVITY PROFILE #2

ALONG POWERLINE

FOR

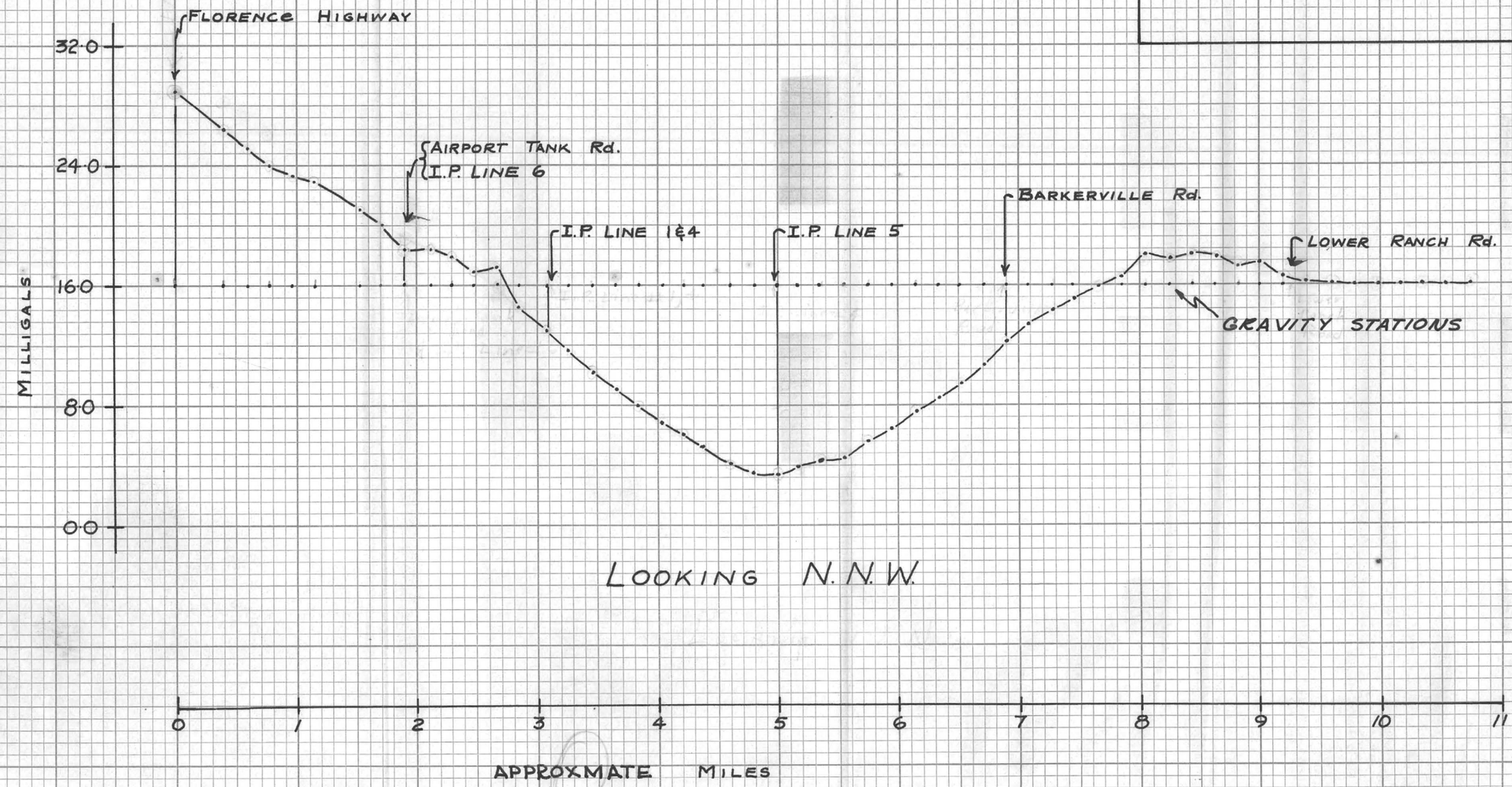
DUVAL CORPORATION

FALCON VALLEY

PINAL COUNTY, ARIZONA

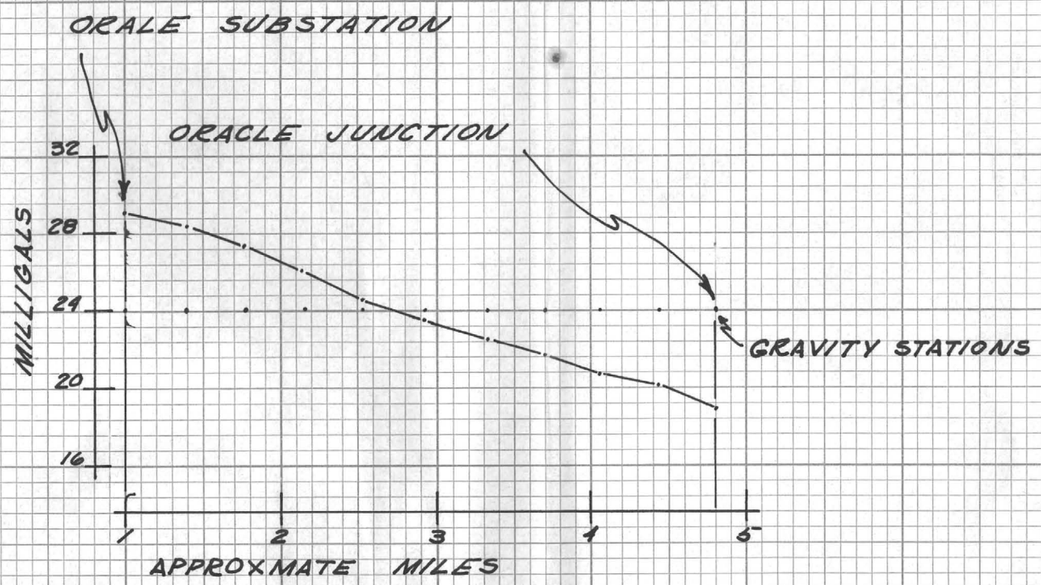
T. 9 S. R. 13, 14, 15 E.

DATE: JULY 1963



Horizontal Scale

K&E 10 X 10 TO THE INCH 359-5DLG KEUFFEL & ESSER CO. MADE IN U.S.A.

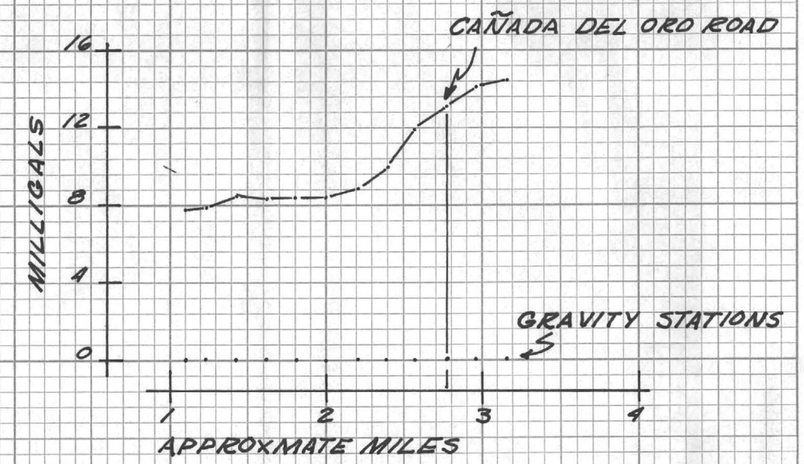


GRAVITY PROFILE #4

ALONG FLORENCE HIGHWAY

LOOKING NE

SEC. 2, 12, 18 T.10S., R.13&14E.



GRAVITY PROFILE #3

LOOKING NNW

SEC. 1, 2, 11, 12; T.10S, R.14E.

FALT

HEINRICHS GEOEXPLORATION COMPANY

GRAVITY PROFILES 3 & 4 FOR DUVAL CORPORATION FALCON VALLEY

PINAL COUNTY, ARIZONA

DATE: JULY 1963

K+E 10 X 10 TO THE INCH 359-5DLG KEUFFEL & ESSER CO. MADE IN U.S.A.

INDUCED POLARIZATION SENDER NOTES

Project: DOV3L Line: 1 sp x 1 5½ Date: 7-22-63

Send	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3	3-4
Receive	→		→		→	→			→	→	DC ONLY	DC ONLY
Time	2x9	2x9	2x9	2x9	2x9	2x9	2x9	2x9	2x9	2x9	2x9	2x9
Range	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
Current	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Send	4-5	1-2	2-3	3-4	4-5		CAL					
Receive	~~ONLY DC~~	DC ONLY	DC ONLY	DC ONLY	DC ONLY		1-2					
Time	2x9	2x9	2x9	2x9	2x9		2x5	2x6				
Range	1.50	1.50	1.50	1.50	1.50		1.50	1.50				
Current	1800	1800	1800	1800	1800		1000	1200				

ORACLE Junction 8/8/63

Proj.

Gil FREDRICO

MAG Notes - JALANDER

Sta.	Polarity ESens	Read.	Remarks
1.5	+2	105	
1.5W	+2	123	
1.6W	+2	126	
1.7W	+2	94	
1.8W	+2	86	
1.9W	+2	93	
2.0W	+2	114	

TRI MK. REG. U.S. PAT. OFF.

ORIGINAL COPR. 1910 BY J. C. PARKER

LEFAX, PHILADELPHIA 7, PA., MADE IN U.S.A.

ORIGINAL COPR. 1910 BY J. O. PARKER

TRI MK. REG. U.S. PAT. OFF.

L FALCON VALLEY
PROJ.
GIL FEDERICO
MAG. NOTES JALANDER

STA.	POI. FEED.		LINE 3
	+ CONS.		
0	+2	120	
.1E	+2	85	
.2E	+2	101	
.3E	+2	104	
.4E	+2	105	
.5E	+2	124	
.6E	+2	87	
0	+2	115	
.1W	+2	116	
.2W	+2	102	
.3W	+2	114	
.4W	+2	81	
.5W	+2	121	

OLD BASE

+2 131

LEFAX, PHILADELPHIA 7, PA., MADE IN U.S.A.

INDUCED POLARIZATION SENDER NOTES

Project: Falcon Valley Line: 5-Spur 1-N½ Date: 6/1/67

Send	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2	4-5	3-4	2-3
Receive	1-2N	→	2-3N	→	→	3-4N	→	→	→	4-5N	→	→
~~Time~~												
Range	9X2	→	→	→	→	→	→	→	→	→	→	→
Current	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Send	1-2	4-5	3-4	2-3	1-2							
Receive	→	1-6N	→	→	→							
~~Time~~												
Range	→	→	→	→	→							
Current	1800	1800	1800	1800	1800							

INDUCED POLARIZATION SENDER NOTES

Project: Falcon Valley Line: 5-Syu1 1-N½ going South Date: 8/1/63

Send	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5			
Receive	S →	→	S →	→	→	S →	→	→	→			
~~Time~~	omit	/	/	/	/	/	/	/	/			
Range	9x2	→	→	→	→	→	→	→	→			
Current	1800	1800	1800	1800	1800	1800	1800	1800	1800			
Send	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5				
Receive	S →	→	→	→	S →	→	→	→				
Time	omit	/	/	/	/	/	/	/				
Range	9x2	→	→	→	→	→	→	→				
Current	1800	1800	1800	1800	1800	1800	1800	1800				

INDUCED POLARIZATION SENDER NOTES

Project: Falcon Valley Line: _____ Date: 8/5/63

Send	34	45	23	34	45	12	23	34	45	12	23	34
Receive	S →		S →			S →				S →		
Time												
Range												
Current	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Send	45	12	23	34	45							
Receive	S →	S →										
Time												
Range												
Current	1800	1800	1800	1800	1800							

INDUCED POLARIZATION SENDER NOTES

project: Falcon Valley Line: _____ Date: 8/6/63

Send	23	12	34	23	12	45	34	23	12	45	34	23
Receive	N		N			N				N		
Time												
Range												
Current	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Send	12	45	34	23	12							
Receive	N	N										
Time												
Range												
Current	1800	1800	1800	1800	1800							

INDUCED POLARIZATION SENDER NOTES

Project: _____ Line: _____ Date: _____

Send												
Receive												
Time												
Range												
Current												
Send												
Receive												
Time												
Range												
Current												

INDUCED POLARIZATION SENDER NOTES

Project: Duvel Oracle Line: 3 spread 1 Date: July 27 '63

Send	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2	45	34	2-3
Receive	4-5 N	→	→	→	→	→	→	→	→	→	→	→
Time												
Range	2x9											
Current	1800	→	→	→	→	→	→	→	→	→	→	→
Send	1-2	4-5	3-4	2-3	1-2	Cal	→	2-3	34	45	34	4-5
Receive	→	→	→	→	→	—		→	→	→	—	—
Time												
Range						5.2	6xc					
Current	→	→	→	→	→	1800	1200	1800	→	→	→	→

INDUCED POLARIZATION SENDER NOTES

Project: Duval Line: I Spr2 N ½ Date: 7-24-63

Send	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	2-2	4-5	3-4	2-3
Receive	→		→			→						
Time												
Range	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
Current	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Send	1-2	4-5	3-4	2-3	1-2		CAL				OHMS	-170 -240
Receive	→				→							
Time												
Range	1.50	1.50	1.50	1.50	1.50							
Current	1800	1800	1800	1800	1800							

INDUCED POLARIZATION SENDER NOTES

Project: Duval-Ovracka Line: 2 Spread 1 Date: 7-25-63

Send	2-3	3-4	2-3	4-5	3-4	2-3	4-5	3-4	2-3	4-5	3-4	2-3
Receive	1-2E	2-3E	→	3-4E	→	→	4-5E	→	→	5-6E	→	→
Time												
Range	2x8	→	→	→	→	→	→	→	→	→	→	→
Current	1600	→	→	→	→	→	→	→	→	→	→	→
Send	Cal											
Receive												
Time												
Range	2x5	2x6	→									
Current	1000	1200	→									

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____

Project: Falcon Valley Line: 5 - Sp. 1 - N½ Int.Cal 57.0 Date: 8/1/63

Send	2-7	1-2	3-4	2-7	1-2	4-5	3-4	2-7	1-2	4-5	3-4	2-7
Rec.	1-2N	3	2-3N		3	3-4N			3	4-5N		
Time	30	3	30	3	3	30	3	3	3	3	3	3
DC-1	8.0 7.8	1.80 1.72	7.0 7.3 6.9 6.4	1.63 1.54	.60 .45 .57 .59	6.8 7.2	1.54 1.71 1.71 1.13	.47 .40 .38 .52	.12 .22 .11	1.67 1.62 .81 1.71	.37 .22 .20 .25	.20 .14 .17 .08
DC-2	8.7 8.0	1.70 1.70	6.8 6.4 7.0 7.0	1.71 1.69	.34 .94 .42 .37	7.4 6.5	1.50 .92 1.48 .47	.39 .42 .49 .32	.22 .10 .27	1.72 .80 1.60 1.38	.29 .47 .50 .38	.09 .12 .15 .15
Σ	16.7 16.8	3.50 3.42	13.8 13.8 13.9 13.8	3.33 3.23	.94 .69 .99 .96	13.3 13.7	2.54 2.63 2.95 2.60	.86 .82 .87 .84	.34 .32 .34	3.39 2.42 3.42 3.43	.66 .67 .70 .66	.23 .23 .32 .24
DC-3	8.1 8.5	1.70 1.76	7.0 6.9	1.59 1.58	.41 .59 .37 .40	6.2 7.5	1.50 1.02	.49 .30 .39 .35	.21 .18	1.54 1.8 .84 1.17	.40 .43	.17
Dc-4	8.4 8.1	1.76 1.70	6.7 7.0	1.67 1.72	.52 .38 .49 .56	7.5 6.3	1.10 1.60	.37 .56 .42 .51	.13 .18	.75 1.40 1.54 1.28	.28 .26	.12
Σ	16.5 16.6	3.46 3.46	13.7 13.9	3.26 3.30	.93 .97 .91 .96	13.7 13.7	2.60 2.62	.66 .86 .81 .84	.34 .36	2.42 1.68 2.38 2.24	.68 .69	.33
DC-AV	16.6	3.46	13.8	3.29	.96	13.7	2.61	.84	.34	2.43	.68	.32
AC-1	8.10	1.70	6.75	1.64	.48	6.85	1.28	.41	.18	1.27	.33	.16
AC-2	8.10	1.71	6.75	1.60	.48	6.85	1.28	.42	.18	1.21	.34	.16
Σ	16.2	3.41	13.5	3.24	.96	13.7	2.56	.83	.36	2.42	.67	.32
S. P.	-12.8	7	+0.9			+4.5				+0.6		
AC-N	.07		.12			.07				.12		
T.C.	53.0											

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____

Project: Falcon Valley Line: S-Spr. 1-N2 Int.Cal _____ Date: 6/1/6

Send	1-2	4-5	3-4	2-3	1-2		CAL	→	→	→		
Rec.	→	5-6A	→	→	→		7-2	→	→	→		
Time	3	3	3				100	300	100	300		
DC-1	.07 .13	.39 .42 .34 .44	.17				53.8	52	64.1	63		
DC-2	.16 .12	.26 .22 .34 .26	100				53.8	52	64.1	63		
Σ	.23 .22	.65 .64 .68 .70	5mv				107.6	104	128.2	126		
DC-3	.07	.31 .33 .41 .52					53.8	52	64.1	63		
Dc-4	.17	.35 .32 .22 .12					53.8	52	64.1	63		
Σ	.20	.66 .65 .63 .64					107.6	104	128.2	126		
DC-AV	.23 ??	.67					107.6	104	128.2	126		
AC-1	.09	.33	.14	.09	.07		52.8	52.0	62.8	62.5		
AC-2	.09	.33	.14	.10	.08		53.2	52.0	62.8	62.5		
Σ	.18 ??	.66	.28	.19	.15		106.0	104	125.6	125		
S. P.	→	13.0	→	→	→							
AC-N	→	.06	→	→	→							
	→	→	→	→	→							

2-3 34 45

2-3s →

30

18.8

9.2

9.1 3.03 1.01

18.2 1.50 .57

1.29 .57

.99 .12

.94

-1.7

9.0

9.8 18.8 9.4

10.0

8.2 18.2 9.6

10.1 9.35

18.5

8.4

8.6

10.1 18.7 9.35

9.4

10.2

8.4 18.6

10.1 8.7

8.2 10.4

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____

Project: Falcon Valley Line: 11/63 < 8/2/63 → Int.Cal _____ Date: 8/2/63

Send	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3	3-4
Rec.	1-2.5	→	2-3.5	→	→	3-4.5			→	4-5.5	→	
Time	30	3	30	3	3	30	3	3	3	10	3	3
DC-1	8.8 8.3	1.80 1.60	9.8 9.5	1.70 1.49	.53 .49	10.7 11.8	1.72 1.60	.32 .52	.20 .29 .32 .20	2.10 2.00	.61 .46	.19 .20
DC-2	8.3 8.0	1.70 1.58	9.3 9.4	1.56 1.60	.51 .54	11.6 10.3	1.59 1.60	.68 .49	.33 .19 .19 .28	1.95 2.00	.41 .61	.38 .38
Σ	17.1 17.2	3.50 3.48	19.1 18.9	3.06 3.09	1.05 1.03	22.1 22.6	3.31 3.40	1.00 1.01	.53 .49 .51 .48	4.05 4.00	1.07 1.07	.57 .58
DC-3	8.0 8.6	1.84 1.58	9.3 9.7	1.71 1.32	.48 .49	10.9 11.8	1.70 1.68	.45 .51	.18 .22 .20 .27	2.00 1.93	.61 .45	.21 .20
Dc-4	8.2 8.6	1.67 1.90	9.7 9.4	1.37 1.58	.54 .54	11.9 10.5	1.65 1.70	.56 .49	.30 .25 .18 .22	2.00 2.10	.45 .61	.36 .38
Σ	17.2 17.2	3.47 3.48	19.0 19.0	3.08 3.10	1.02 1.00	22.2 22.3	3.35 3.38	1.01 1.02	.48 .49 .48 .49	4.00 4.02	1.06 1.06	.74 .75
DC-AV	17.2	3.48	19.0	3.08	1.02	22.2	3.36	1.00	.49	4.02	1.06	.575
AC-1	8.4	1.71	9.2	1.50?	.65?	10.9	1.70			1.95		
AC-2	8.4	1.71	9.2	1.50?		10.9	1.70			1.97		
Σ	16.8	3.42	18.4	2.00?		21.8	3.40			3.92		
S. P.	+8.9	→	+9.4	→	→	-5.6	→		→	-7.3	→	
AC-N	.30	→	.40	→	→	.45	→		→	.5	→	
T.C.	53.0											

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____

Project: Falcon Valley Line: 5-Spn 1-5½ Int.Cal _____ Date: 8/1/63

Send	4-5	1-2	2-3	3-4	4-5							
Rec.	→	5-65			→							
Time	3	3	3	3	3							
DC-1	.20 .3	.60 .59	.28 .26	.13 .20 .19	.19 .13							
DC-2	.20 .2	.60 .61	.22 .27	.12 .13 .16	.18 .18							
Σ	.20 .40	1.20 1.20	.50 .49	.31 .33 .35								
DC-3	.23 .19	.60 .59	.20 .29	.18 .18	.18 .18							
Dc-4	.18 .21	.60 .61	.20 .21	.14 .13	.13 .13							
Σ	.39 .40	1.20 1.20	.50 .50	.32 .31								
DC-AV	.40	1.20	.50	.32	.31							
AC-1		.60	.25									
AC-2		.60	.25									
Σ		1.20	.50									
S. P.	→	+4.8										
AC-N	→	←	.22		→							
I.G.					→							

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____

Project: Falcon Valley Line: 6-Spur 2-5½ Int.Cal _____ Date: 4/15/65

Send	7-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3	3-4
Rec.	1-25	→	2-35	→	→	3-45			→	4-55	—	
~~Range~~ Time	30	10	30	10	3	30	10	3	3	10	3	3
DC-1	11.6 11.6	2.54 2.42	13.0 13.0	2.62 2.79	1.10 1.19	11.2 10.8	2.58 2.55	1.06 1.08	.58 .60 .67 .58	2.90 2.40	1.30 1.35	.70 .40 .49 .47
DC-2	12.5 12.5	2.36 2.40	12.8 12.8	2.70 2.64	1.10 1.04	11.0 11.2	2.55 2.58	1.04 1.06	.63 .67 .57 .62	2.50 2.35	.90 .92	.48 .81 .60 .66
Σ	24.1 24.1	4.90 4.82	25.8 25.8	5.32 5.38	2.20 2.18	22.2 22.1	5.41 5.43	2.14 2.14	1.21 1.21 1.20 1.20	5.40 5.75	2.20 2.27	1.18 1.21 1.09 1.13
DC-3	12.6	2.42 2.47	12.9	2.63 2.67	1.08 1.16	10.9 11.2	2.47 2.63	1.10 1.04	.68 .59 .65 .61	2.82 2.52	1.12 1.00	.60 .53 .50 .47
Dc-4	11.6	2.49 2.37	13.0	2.72 2.69	1.12 1.02	11.3 10.8	2.63 2.84	1.07 1.08	.53 .64 .56 .61	2.60 2.89	1.12 1.20	.60 .64 .68 .74
Σ	24.2	4.85 4.84	25.9	5.35 5.36	2.28 2.18	22.2 22.1	5.46 5.47	2.17 2.17	1.21 1.21 1.21 1.22	5.42 5.36	2.24 2.20	1.20 1.17 1.18 1.21
DC-AV	24.1	4.83	25.8	5.35	2.18	22.1	5.46	2.13	1.21	5.38	2.23	1.17
AC-1	11.9	2.38	12.6	2.62	1.05	10.8	2.65	1.05	.58	2.65	1.10	.58
AC-2	11.8	2.38	12.6	2.60	1.07	10.9	2.63	1.03	.58	2.63	1.10	.57
Σ	23.7	4.76	25.2	5.22	2.12	21.7	5.28	2.08	1.16	5.28	2.20	1.15
S. P.	+0.7	→	+3.9	→	→	+11.4	→	→	→	+3.2	—	
AC-N	.8	→	.15	→	.18	.17	→	→	→	.15	—	
I. C.	53.0	→	→	→	→							

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____

Project: Falcon Valley Line: 6-Spur 1-5½ Int.Cal _____ Date: 6/15/6

Send	4-5	1-2	2-3	3-4	4-5			C-2	→	→	→	
Rec.	→	1-65	→	→	→			2-3	→	→	→	
Time	3	3	3	3	3			100	300	100	300	
DC-1	.52 .47 .50 .47	1.38 1.31	.61 .85 .48 .50	.42 .27	.40 .28 .32 .20			54.1	52.5	64.4	63	
DC-2	.34 .42 .32 .32	.98 1.03	.67 .80 .79 .78	.77 .42	.22 .32 .26 .20			53.9	52.5	64.4	63.5	
Σ	.86 .89 .82 .79	2.36 2.34	1.28 1.35 1.27 1.28	.79 .79	.62 .60 .58 .60			108.0	105	128.8	126.5	
DC-3	.52 .48 .54 .46	1.38 1.27	.8 .72 .42 .57	.29 .28	.42 .28 .28 .37			53.9	52.5	64.4	63	
Dc-4	.34 .27 .28 .22	.98 1.07	.98 .92 .82 .70	.51 .50	.21 .29 .30 .22			54.1	52.5	64.4	63.5	
Σ	.86 .86 .82 .80	2.36 2.34	1.79 1.24 1.29 1.27	.80 .78	.69 .59 .58 .59			108.0	105	128.8	126.5	
DC-AV	.82	2.35	1.26	.79	.60			108.0	105	128.8	126.5	
AC-1	.40	1.3	.61	.39	.30			53.0	52.0	63.4	63.0	
AC-2	.41	1.13	.61	.39	.29			53.0	52.0	63.5	63.0	
Σ	.81	2.26	1.22	.78	.59			106.0	104	126.9	126.0	
S. P.	→	-9.0	→	→	→							
AC-N	→	.12	→	→	→							
F.G.	→	53.6	→	→	→							

INDUCED POLARIZATION - RECEIVER NOTES

PAGE _____

Project: Falcon Valley Line: 6-Spur 1 - N2 Int.Cal _____ Date: 8/6/63

Send	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2	4-5	3-4	2-3
Rec.	1-2N	→	2-3N	→	→	3-4N			→	4-5N		
~~Range~~ Time	30	10	30	10	3	30	10	3	3	10	3	3
DC-1	12.3 11.9	2.40 2.60	12.2 12.7	2.29 2.41 2.49 2.33	.90 .87 .90 .87	12.9	2.37 2.18 2.8 2.60	1.23 .62	.62 .61 .60 .61	2.72 2.60	.88 .89 .90 .99	.60 .52 .59 .47
DC-2	12.0 12.4	2.45 2.30	12.3 11.8	2.58 2.24 2.38 2.43	1.07 1.03 1.02 1.03	12.1	1.65 2.79 2.20 2.45	.70 1.28	.49 .49 .53 .50	2.48 2.66	1.12 1.06 1.12 .99	.57 .57 .49 .62
Σ	24.3 24.3	4.85 4.90	24.5 24.5	4.81 4.72 4.87 4.8	1.97 1.93 1.92 1.90	25.0	5.02 4.97 5.01 4.95	1.93 1.90	1.11 1.10 1.13 1.11	5.20 5.26	2.00 1.95 2.02 1.98	1.07 1.09 1.08 1.09
DC-3	11.8 12.5	2.33 2.54	12.0	2.50 2.38	.80 1.10	12.1	2.37 2.63	1.11 1.07	.50 .62	2.67 2.64	.89 .90 1.08 1.10	.59 .52
Dc-4	12.5 11.8	2.56 2.74	12.5	2.24 2.40	1.17 .85	12.9	2.56 2.26	.86 .88	.67 .49	2.61 2.57	1.06 1.11 1.00 .92	.51 .56
Σ	24.3 24.3	4.89 4.82	24.5	4.74 4.78	1.97 1.95	25.0	4.99 4.69	1.97 1.95	1.17	5.24 5.21	1.94 2.01 2.08 2.02	1.10 1.08
DC-AV	24.3	4.88	24.5	4.77	1.93	25.0	4.96	1.94	1.12	5.23	2.00	1.08
AC-1	12.0	2.40	12.1	2.34	.93	12.2	2.41	.97	.56	2.58	.99	.54
AC-2	12.0	2.40	12.0	2.35	.93	12.2	2.42	.96	.56	2.59	.99	.53
Σ	24.0	4.80	24.1	4.69	1.86	24.4	4.83	1.93	1.12	5.17	1.98	1.07
S. P.	-1.8	→	-16.6	→	→	+14.7	→	→	→	-8.1	→	→
AC-N	0.10	→	0.10	→	→	0.12	→	→	→	0.10	→	→
Z. C.	53.8	→	→	→	→	→	→	→	→	53.7	→	→

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____

Project: Falcon Valley Line: 6-Spur 2-N½ Int.Cal _____ Date: 8/6/63

Send	1-2	4-5	2-4	2-3	1-2		CAL					
Rec.	→	+-6N		→								
Time	7	3	3	3	3							
DC-1	.36 .36	1.27 1.03	.51 .47 .44 .49	.37 .32	.19 .28 .31 .14							
DC-2	.37 .37	.98 1.02	.56 .61 .62 .56	.38 .38	.33 .27 .23 .29							
Σ	.73 .73	2.05 2.05	1.07 1.04 1.07 1.05	.70 .70	.52 .55 .54 .57							
DC-3	.42 .52	1.04 .90	.40 .32 .42 .24	.29 .37	.21 .20 .24 .12							
Dc-4	.30 .32	1.02 1.16	.67 .78 .64 .86	.41 .33	.22 .29 .20 .42							
Σ	.72 .74	2.06 2.06	1.07 1.10 1.06 1.10	.70 .70	.53 .59 .54 .54							
DC-AV	.73	2.05	1.07	.70	.54							
AC-1	.37	1.01	.53	.34	.26							
AC-2	.36	1.01	.57	.35	.24							
Σ	.73	2.02	1.06	.69	.50							
S. P.	→	+15.0	→	→	→							
AC-N	→	.11	→	→	→							
F.C.	→	→	→	→	→							

INDUCED POLARIZATION - RECEIVER NOTES PAGE 1

Project: Duval-Oracle Line: 1-Spr.1-5½ Int.Cal Date: 7/2/6

Send	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3	3-4
Rec.	1-25	→	2.25	→	→	2-45	→	→	→	4 55	→	
~~Time~~ Range	10	3	10	3	3	10	3	3	3	3	3	
DC-1	4.81	1.21 1.22	4.81 4.80	1.17 1.28	.59 .38	4.16 4.22	1.23 1.13	.48 .52 .30 .30	.32 .30	1.22 1.25	.53 .58	.23 .17 .17 .22
DC-2	4.77	1.08 1.10	4.96 4.95	1.09 1.01	.37 .58	4.12 4.16	1.00 1.10	.49 .48 .52 .42	.24 .26	1.09 1.17	.57 .57	.40 .38 .43 .44
Σ	9.58	2.29 2.32	9.77 9.79	2.26 2.29	.96 .96	8.28 8.20	2.23 2.23	.97 1.00 .95 .92	.56 .56	2.31 2.42	1.10 1.15	.63 .61 .60 .66
DC-3	4.77	1.08 1.11	4.19 [illegible]	1.03 1.03	.53 .45	4.12 4.77	1.12 1.18	.53 .43 .60 .41	.30	1.08 1.13	.60 .63	.30 .27
Dc-4	4.81	1.19 1.13	4.85	1.25 1.26	.46 .48	4.25 4.84	1.17 1.09	.39 .48 .38 .58	.26	1.26 1.19	.49 .44	.32 .34
Σ	9.58	2.27 2.28	9.75	2.29 2.29	.99 .96	8.37 8.19	2.29 2.28	.92 .97 .98 .97	.56	2.39 2.32	1.09 1.03	.63 .61
DC-AV	9.58	2.29	9.77	2.28	.967	8.31	2.26	.96	.56	2.34	1.10	.63
AC-1	4.60	1.11	4.77	1.10	.47	4.05	1.11	.48		1.15	.63	
AC-2	4.57	1.11	4.79	1.10	.47	4.05	1.10	.47		1.13	.61	
Σ	9.17	2.22	9.56	2.20	.940	8.10	2.21	.95		2.28	1.24	
S. P.	+9.2	→	+14.2	→	→	-17.5	→	→	→	-13.1	→	
AC-N		.2-4.0 mm	.08	→	→	.20	→	→	→		.27	
F.C.	52.4	→										

3	n = 1	9.0	27
12	2	2.3	28
30	3	.98	29
60	4	.48	32
105	5	.40	41
168	6		

INDUCED POLARIZATION - RECEIVER NOTES PAGE 2

Project: Duval Oracle Line: 1 - Sprl S ½ Int.Cal Date: 72263

Send	4-5	1-2	2-3	3-4	4-5		CAL	→	→	→	→	
Rec.	→	5-6 5	→	→	→		1-2	→	→	→	→	
~~Time~~							100	300	100	300		
DC-1	.21 .22	.46 .56	.32 .26 .25 .32	.23 .20	.17 .14		51.7	50.5	61.8	61		
DC-2	.19 .20	.53 .45	.30 .32 .36 .32	.17 .15	.15 .16		51.7	50.5	62.0	61		
Σ	.40 .42	1.01 1.01	.62 .64 .64 .62	.40 .38	.32 .30		103.4	101	123.8	122		
DC-3	.24 .20 .20 .27	.51	.22 .30 .23 .24	.23 .21	.12 .11		51.7	50.5	62.0	61		
Dc-4	.12 .20 .20 .13	.50	.32 .32 .34 .34	.19 .18	.18 .19		51.7	50.5	62.2	61		
Σ	.40 .40 .40 .40	1.01	.60 .62 .61 .62	.42 .39	.30 .30		103.4	101	124.2	122		
DC-AV	.40	1.01	.62	.392	.305		103.4	101	124.0	122		
AC-1	✓						50.5	50.5	60.3	60.5		
AC-2							50.5	50.5	60.3	60.5		
Σ							101.0	101	120.6	121		
S. P.		+12.5	→	→	→							
AC-N	.30	.25	→	→	→							
Inl.												

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____

Project: Duval - Oracle Line: 1-Jan/ N½ Int.Cal _____ Date: 7/29

Send	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2	4-5	3-4	2-3
Rec.	1-2N	→	2-3N	→	→	3-4N	→	→	→	4-5N	→	→
Time ~~Range~~	10	3	10	3	3	30	3	3	3	3	3	3
DC-1	5.44 5.40	1.11	5.60 6.08	1.11 1.29	.44.4 .48.5	6.30	1.03 1.11	36.39 .42.48	.27 .22	1.23 1.22	.44.33 .20	.22 .2
DC-2	5.44 5.97	1.18	6.13 5.58	1.23 1.02	.39.39 .33.29	6.00	1.19 1.19	.49.42 .36.38	.18 .27	1.10 1.12	.38.50 .41	.23
Σ	11.25 .57	2.29	11.73 11.66	2.34 2.31	.83.82 .85.82	12.30	2.22 2.30	.85.85 .78.76	.45 .45	2.33 2.34	.82.83 .81	.45
DC-3	5.97 5.97	1.17	5.60 5.50	1.11 1.26	.43 .43	6.00	1.20 1.13	.43 .42	.20 .20	1.10 1.13	.50.42 .33.41	.22
Dc-4	5.44 5.44	1.12	6.13 6.27	1.18 1.02	.39 .37	6.30	1.10 1.13	.43 .42	.25 .25	1.23 1.20	.32.41 .47.42	.23
Σ	11.40 11.41	2.29	11.73 11.72	2.29 2.28	.86 .84	12.30	2.30 2.26	.86 .84	.45 .45	2.33 2.30	.82.83 .80.83	.45
DC-AV	11.37	2.29	11.72	2.30	.84	12.30	2.27	.85	.45	2.33	.82	.45
AC-1	5.48	1.11	5.67	1.11	.41	6.05	1.09	.415	.22	1.13	.40	.22
AC-2	5.50	1.11	5.65	1.12	.41	6.02	1.09	.415	.22	1.12	.40	.22
Σ	10.98	2.22	11.32	2.23	.82	12.07	2.18	.83	.44	2.25	.80	.44
S. P.	.2	→	+6.7	→	→	-9.8	→	→	→	+1.9	→	→
AC-N	.13	→	.08	→	→	.08	→	→	→	.08	→	→
I.C.	52.6	→	→	→	→	3N in	150'N	+ in	52.6	→	→	→

168
.22

306
336

369

37.0

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____

Project: Duval-Orac Line: 1-Spur-N½ Int.Cal _____ Date: 7/24/62

Send	1-2	4-1	3-4	2-3	1-2		CAL					
Rec.	→	5-6N	→		→							
~~Time~~ Range	3	3	3	3	3							
DC-1	.13 .09 .13 .18	.43 .40	.22	.15 .15	.11 .16							
DC-2	.14 .20 .09 .12	.39 .42	.22	.13 .14	.11 .12		#5	or	2.0 N is 460' E & 140' N			
Σ	.27 .29 .26 .30	.82 .82	.44	.28 .29	.22 .22						of 8/19 8/30	
DC-3	.12 .14	.08 .43	.22	.18 .16 .18 .17	.11 .12							
Dc-4	.17 .16	.44 .39	.22	.11 .13 .11 .12	.11 .10							
Σ	.29 .30	.82 .82	.44	.29 .26 .29 .24	.22 .22							
DC-AV	.285	.82	.44	.29	.22			4 77	23 1			
AC-1	.14	.41	.22	.14	.11			6	1			
AC-2	.14	.40	.21	.14	.11			462	134			
Σ	.28	.81	.43	.28	.22							
S. P.	→	+3.2	→		→							
AC-N	→	.08	→		→							
I. C.	→		→		→							

63
1,771 40
28
60

38 × 3

29
12

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____

Project: Duval-Ovac Line: 2-Sper. 1-E½ (N 68°E) Int.Cal _____ Date: 7/25/67

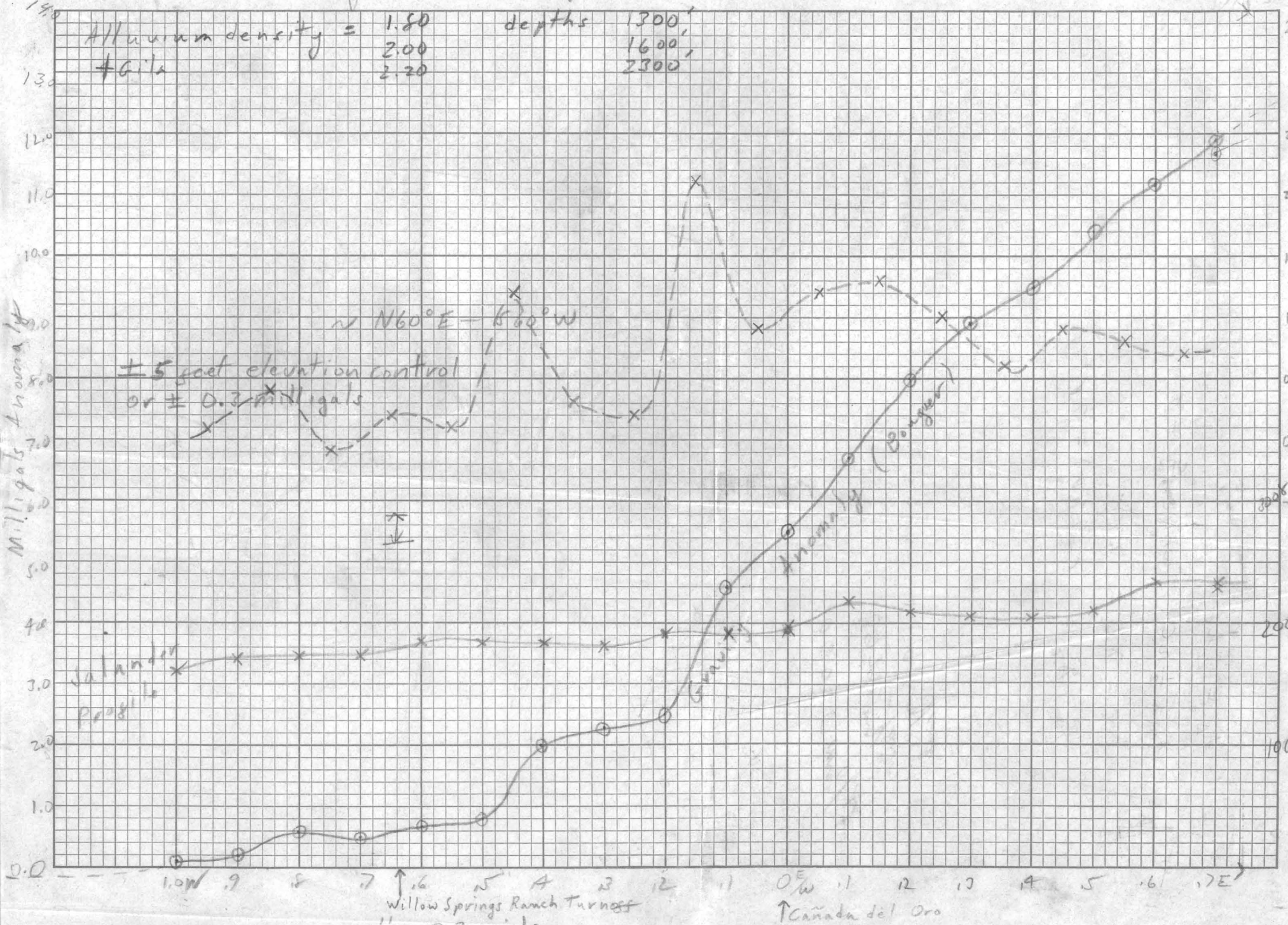
Send	2-3	3-4	2-3	4-5	3-4	2-3	4-5	3-4	2-3	4-5	3-4	2-3
Rec.	1-2E	2-3E	→	3-4E	→	→	4-5E	→	→	5-6E	→	→
~~Time~~ Range	30	100	30	100	30	10	30	10	3	10	3	3
DC-1	19.0	42.0 42.0	6.6 6.2	54.0 55.8	11.7 10.9	2.55 2.25	11.8	2.40 2.95	1.10 1.20	5.05	1.80 1.50	.60 .70
DC-2	19.2	41.7 41.7	6.4 7.0	54.3 52.5	10.2 11.0	2.25 2.82	11.7	3.95 2.55	.83 .60	5.22	1.70 2.10	.50 .80
Σ	38.2	83.7 83.7	13.0 13.2	108.3 108.3	21.9 21.9	5.10 5.10	23.5	6.35 6.50	1.93 1.80	10.27	3.50 3.60	1.10 1.20
DC-3	19.1	41.7 41.7	6.4 6.7	54.6	11.4 10.8	2.55	11.6	2.85 3.60	.60 1.35	5.22	1.70 2.00	.30 .25
Dc-4	19.1	41.5 41.7	6.6 6.4	53.7	10.3 11.1	2.85	11.9	3.65 2.70	1.35 .50	5.05	1.70 1.90	.80 1.00
Σ	38.2	83.2 83.4	13.0 13.1	108.3	21.7 21.9	5.10	23.5	6.50 6.70	1.95 1.85	10.27	3.40 3.40	1.10 1.25
DC-AV	38.2	83.5	13.1	108.4	21.9	5.10	23.5	6.41	1.88	10.27	3.50	1.16
AC-1	18.3	40.3	6.30	52.0	10.6	2.50	11.3	3.18	9?	4.95	X	X
AC-2	18.3	40.3	6.30	52.0	10.5	2.48	11.3	3.15	X	4.95	X	
Σ	36.6	80.6	12.6	104.0	21.1	4.98	22.6	6.33		9.90		
S. P.	+6.0	+7.7	→	-2.5	→	→	-24.0	→	→	21.5	→	→
AC-N	.30	.20	→	.40	→	→	.40	→	→	→	→	→
I.C.	526	→	→	→	→	→	→	→	→	→	→	→

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____

Project: Duval Line: 2 Int.Cal _____ Date: 7/2/6

Send	C-4	→		→								
Rec.	2-3	→		→								
~~Time~~ Bay	100	300	100	300								
DC-1	53.2	52	64.2	63.0								
DC-2	53.7	52	64.0	63.0								
Σ	106.9	104	128.2	126								
DC-3	53.7	52	64.0	63.0								
Dc-4	53.2	52	64.2	63.0								
Σ	106.9	104	128.2	126								
DC-AV	106.9	104	128.2	126								
AC-1	52.4	52	62.7	62.5								
AC-2	52.4	52	62.7	62.5								
Σ	104.8	104	125.4	125								
S. P.												
AC-N												

Gravity Profile Along Oracle Highway / Falcon Valley Project

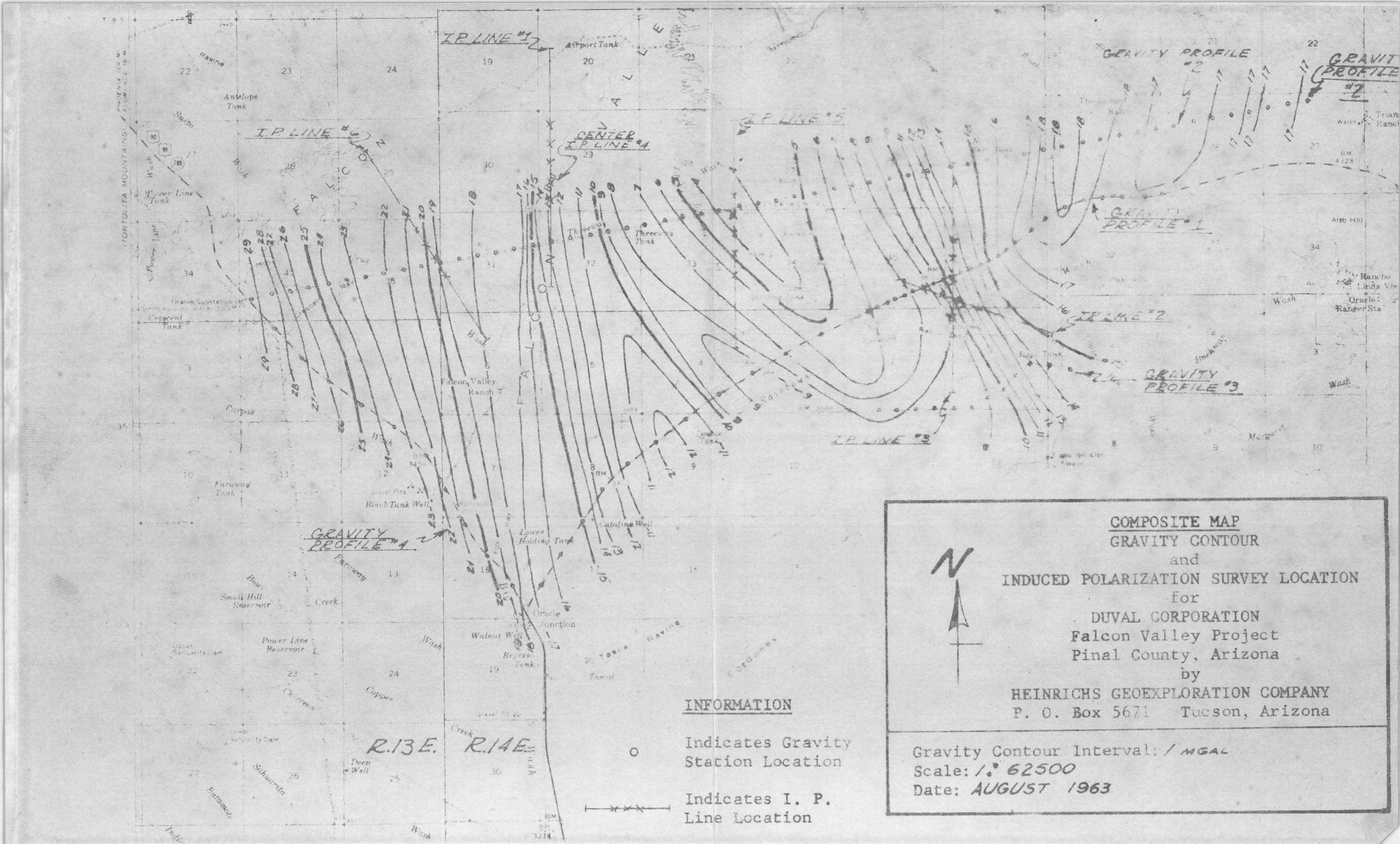


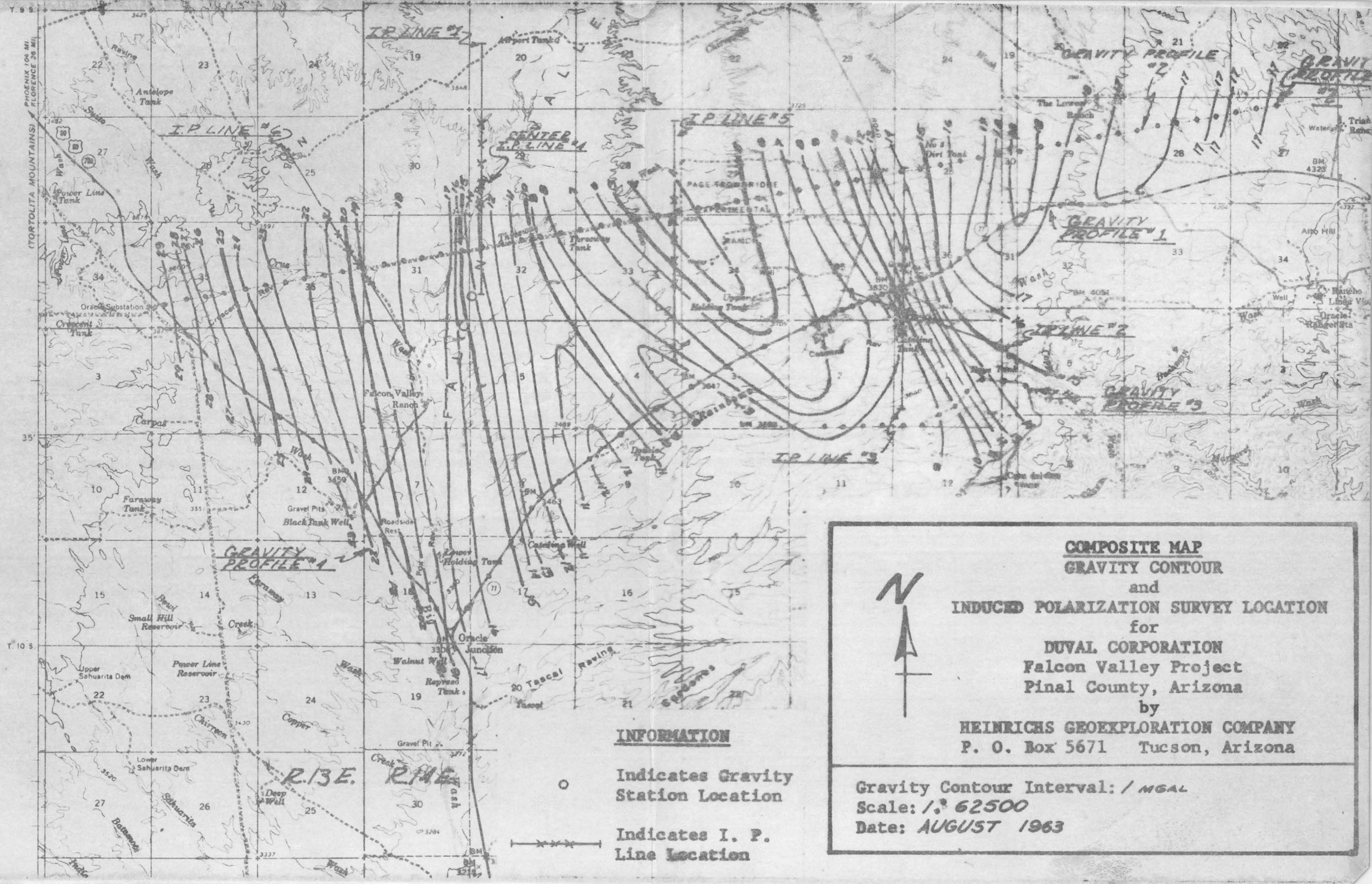
K+E 10 X 10 TO THE INCH 359-5DG
KEUFFEL & ESSER CO. MADE IN U.S.A.

Work drawings
I.P. work-sheet
Lines.
1, 23, 56 = 5
Wenner dept
Proba
1 — 1
Sectional
interpretation — 1
Gravity Profiles
1, 2, 3, 4 — 4

Total. 10

Prime Geometry. — 1
Sucker map — 11


I.P. LINE #1
I.P. LINE #6
CENTER I.P. LINE #4
I.P. LINE #5
I.P. LINE #2
I.P. LINE #3
GRAVITY PROFILE #1
GRAVITY PROFILE #2
GRAVITY PROFILE #3
GRAVITY PROFILE #4
FALCON VALLEY
Airport Tank
Antelope Tank
Falcon Valley Ranch
Black Tank Well
Lower Holding Tank
Catalina Well
Oracle Junction
Walnut Well
Small Hill Reservoir
Power Line Reservoir
Oracle Substation
Crescent Tank
Threeway Tank
Rancho Linda Vista
Oracle Ranger Sta
R.13E.
R.14E.
INFORMATION
Indicates Gravity Station Location
Indicates I. P. Line Location
N
COMPOSITE MAP
GRAVITY CONTOUR
and
INDUCED POLARIZATION SURVEY LOCATION
for
DUVAL CORPORATION
Falcon Valley Project
Pinal County, Arizona
by
HEINRICHS GEOEXPLORATION COMPANY
P. O. Box 5671 Tucson, Arizona
Gravity Contour Interval: 1 MGAL
Scale: 1" 62500
Date: AUGUST 1963


COMPOSITE MAP
GRAVITY CONTOUR
and
INDUCED POLARIZATION SURVEY LOCATION
for
DUVAL CORPORATION
Falcon Valley Project
Pinal County, Arizona
by
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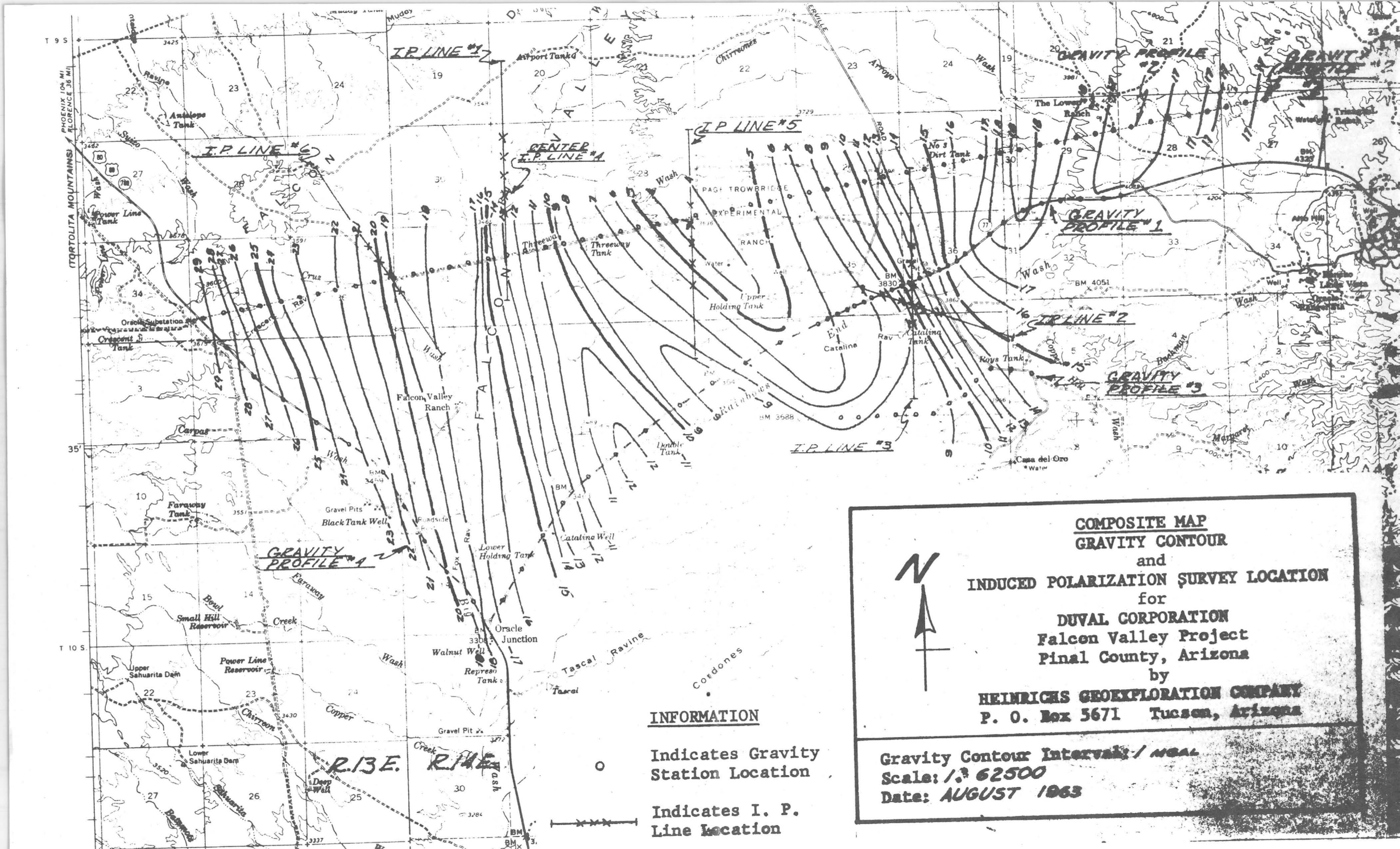
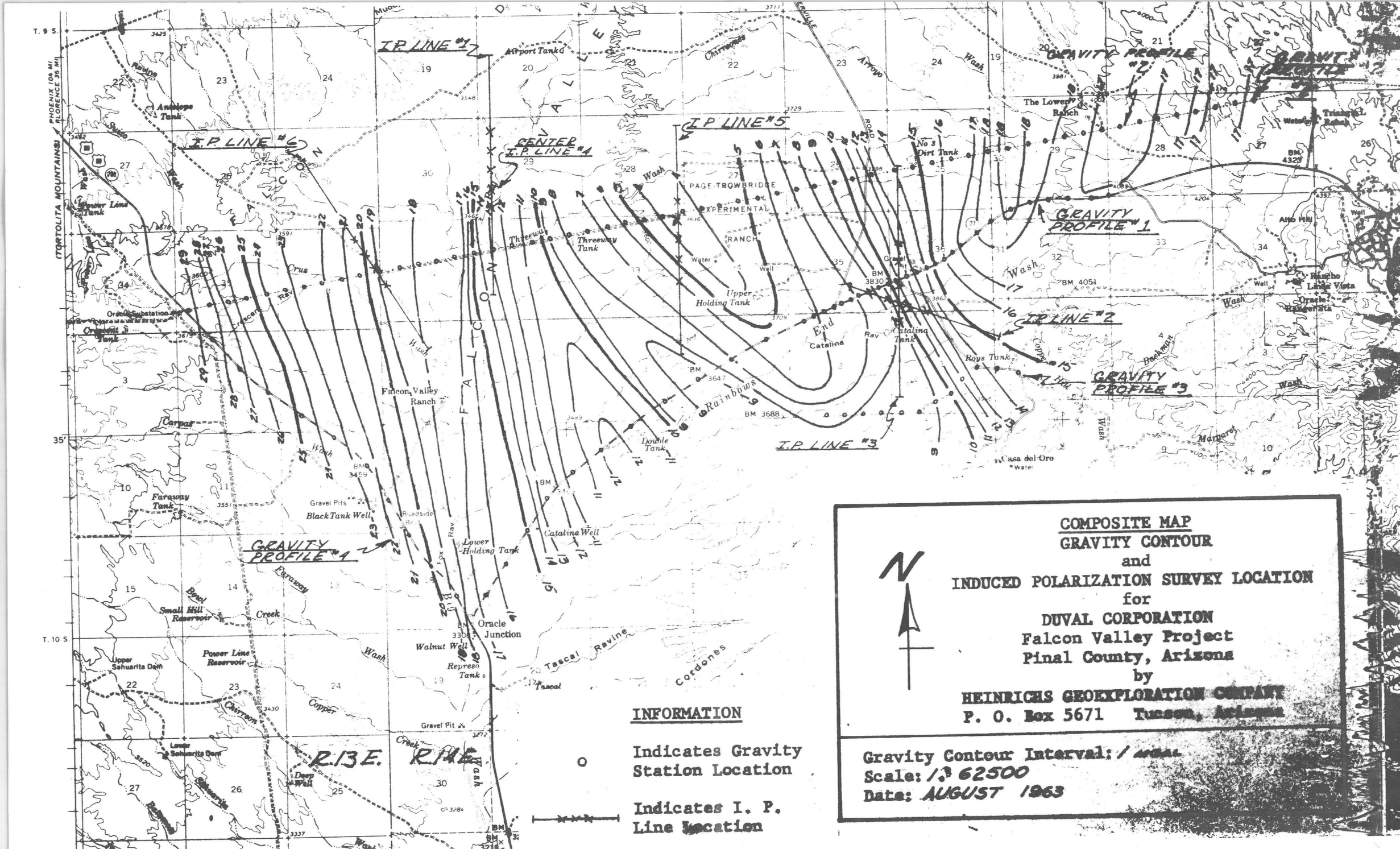
P. O. Box 5671 Tucson, Arizona
Gravity Contour Interval: 1 MGAL
Scale: 1" = 62500
Date: AUGUST 1963
INFORMATION
Indicates Gravity Station Location
Indicates I. P. Line Location
N
I.P. LINE #7
I.P. LINE #6
I.P. LINE #5
I.P. LINE #3
I.P. LINE #2
CENTER I.P. LINE #1
GRAVITY PROFILE #1
GRAVITY PROFILE #2
GRAVITY PROFILE #3
GRAVITY PROFILE #4
T. 9 S.
T. 10 S.
R. 13 E.
R. 14 E.
(TORTOLITA MOUNTAINS)
PHOENIX 104 MI.
FLORENCE 26 MI.
Falcon Valley Ranch
Oracle Junction
Oracle Substation
Black Tank Well
Gravel Pits
Small Hill Reservoir
Upper Sahuarita Dam
Lower Sahuarita Dam
Power Line Reservoir
Walnut Well
Represo Tank
Lower Holding Tank
Upper Holding Tank
Roadside Rest
Deep Well
Tescal Ravine
Tescal
Sahuarita
Chiveen
Copper
Carpas
Faraway Tank
Crescent Tank
Power Line Tank
Antelope Tank
Airport Tank
Turquoise Tank
Dunbar Tank
No. 3 Dirt Tank
The Lowery Ranch
Alto Hill
Rancho Linda Vista
Oracle Station
Page Ranch Experimental Ranch
Cottonwood
Cane Golden Ranch
Water
Well
Gravel Pit
BM 3429
BM 4329
BM 4051
BM 3630
BM 3647
BM 3689
BM 3463
BM 3284
BM 3337
BM 3214


COMPOSITE MAP
GRAVITY CONTOUR
and
INDUCED POLARIZATION SURVEY LOCATION
for
DUVAL CORPORATION
Falcon Valley Project
Pinal County, Arizona
by
HEINRICHS GEOEXPLORATION COMPANY
P. O. Box 5671 Tucson, Arizona
Gravity Contour Interval: 1 MGAL
Scale: 1:62500
Date: AUGUST 1963
INFORMATION
Indicates Gravity Station Location
Indicates I. P. Line Location
I.P. LINE #1
I.P. LINE #2
I.P. LINE #3
I.P. LINE #5
I.P. LINE #6
CENTER I.P. LINE #1
GRAVITY PROFILE #1
GRAVITY PROFILE #2
GRAVITY PROFILE #3
GRAVITY PROFILE #4
FALCON VALLEY
(TORTOLITA MOUNTAINS)
PHOENIX 104 MI
FLORENCE 36 MI
T 9 S
T 10 S
R.13 E.
R.14 E.
Antelope Tank
Power Line Tank
Oracle Substation
Crescent Tank
Falcon Valley Ranch
Carpas
Faraway Tank
Gravel Pits
Black Tank Well
Roadside
Small Hill Reservoir
Upper Sahuarita Dam
Power Line Reservoir
Lower Sahuarita Dam
Deep Well
Oracle Junction
Walnut Well
Represo Tank
Tascal Ravine
Tascal
Cordones
Gravel Pit
Lower Holding Tank
Catalina Well
Upper Holding Tank
Threeway Tank
Airport Tank
Chirreones
PAGE TROWBRIDGE EXPERIMENTAL RANCH
Catalina Tank
End Catalina
Rays Tank
Casa del Oro
No 3 Dirt Tank
The Lower Ranch
Triangle Ranch
Rainbows
Double Tank
BM 3830
BM 4051
BM 3688
BM 4320
Water
Well
Gravel Pit
Copper Creek
Chirreon
Sahuarita
Bonel
Cruz
Rev
Fox
Mudoy
Arroyo
Wash
Ravine
Sycio
Cruce
Faraway
Bockman
Mirrors
Mirrors
Ano Nuevo
Rancho Linda Vista
Tucson Water Works
Mud Hill
Cruzville
Dry Valley
Dry Valley Road


COMPOSITE MAP
GRAVITY CONTOUR
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for
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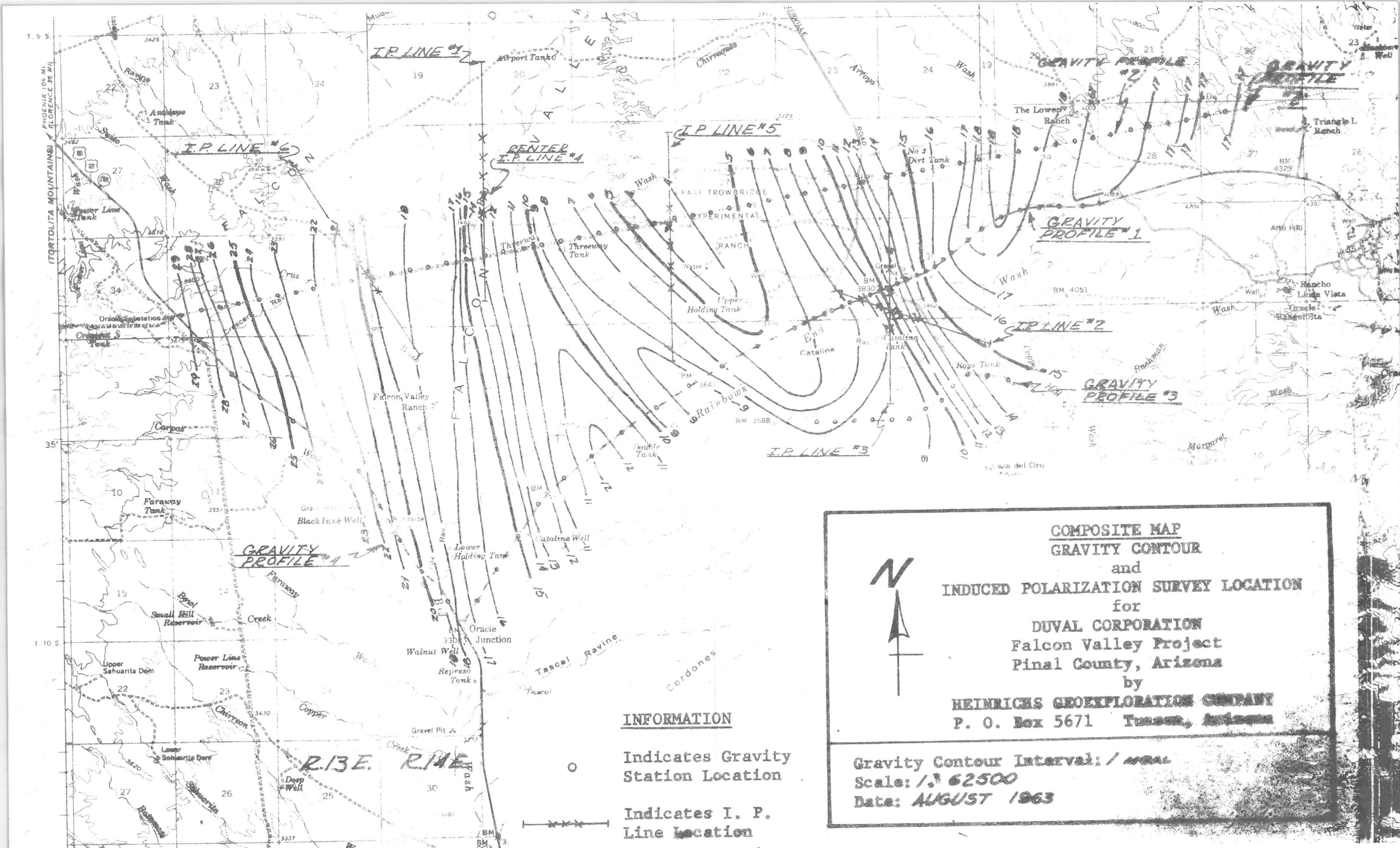
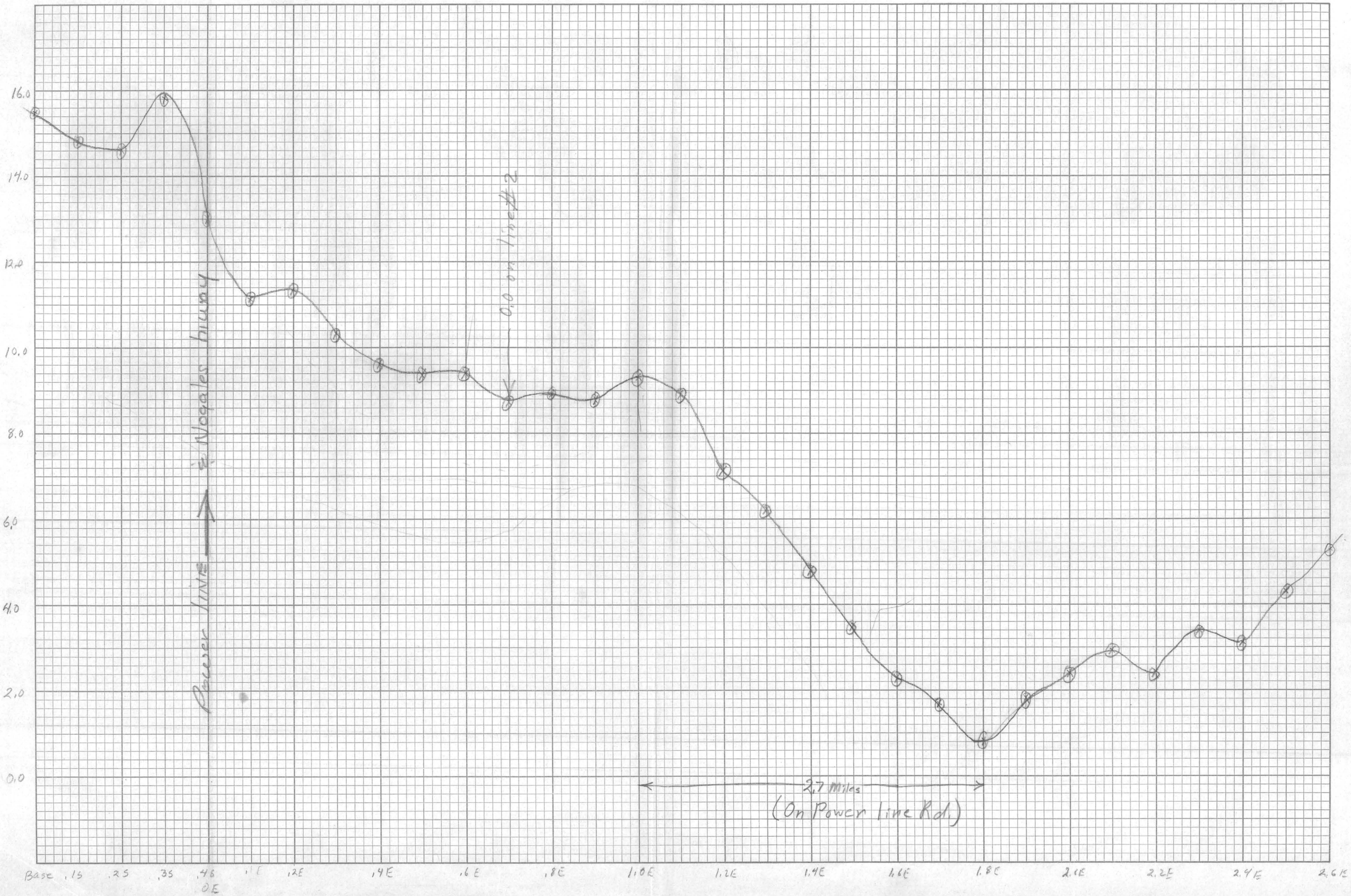
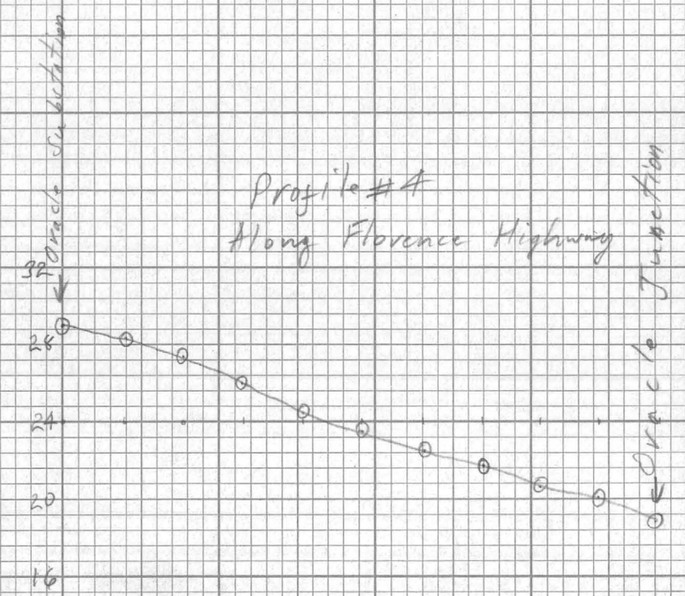
Falcon Valley Project
Pinal County, Arizona
by
HEINRICHS GEOEXPLORATION COMPANY
P. O. Box 5671 Tucson, Arizona
Gravity Contour Interval: 1 MGAL
Scale: 1:62500
Date: AUGUST 1963
INFORMATION
Indicates Gravity Station Location
Indicates I. P. Line Location
I.P. LINE #1
I.P. LINE #2
I.P. LINE #3
I.P. LINE #4
I.P. LINE #5
I.P. LINE #6
GRAVITY PROFILE #1
GRAVITY PROFILE #2
GRAVITY PROFILE #3
GRAVITY PROFILE #4
CENTER
FALCON
VALLEY
PAGE-TROWBRIDGE EXPERIMENTAL RANCH
Falcon Valley Ranch
Oracle Junction
Casa del Oro
The Lower Ranch
Catalina
Rainbows End
Upper Holding Tank
Lower Holding Tank
Threeway Tank
Catalina Tank
Rays Tank
No 3 Dirt Tank
Double Tank
Catalina Well
Walnut Well
Represo Tank
Black Tank Well
Faraway Tank
Small Hill Reservoir
Power Line Reservoir
Upper Sahuarita Dam
Lower Sahuarita Dam
Antelope Tank
Airport Tank
Crossroads Tank
Oracle Substation
Gravel Pits
Gravel Pit
Tascal Ravine
Cordones
Copper Creek
Carpar
Arno Hill
Rancho Lago Vista
Oracle Trailer Sta
Triangle L Ranch
Water Well
R.13E.
R.14E.
T. 9 S.
T. 10 S.
35'
PHOENIX 104 MI
FLORENCE 35 MI
(TORTOLITA MOUNTAINS)

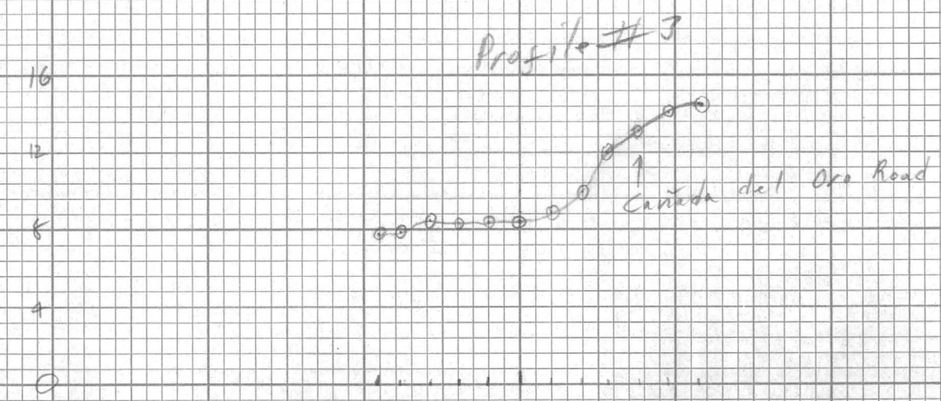

COMPOSITE MAP
GRAVITY CONTOUR
and
INDUCED POLARIZATION SURVEY LOCATION
for
DUVAL CORPORATION
Falcon Valley Project
Pinal County, Arizona
by
HEINRICHS GEOEXPLORATION COMPANY
P. O. Box 5671 Tucson, Arizona
Gravity Contour Interval: 1 mgal
Scale: 1" = 2500
Date: AUGUST 1963
INFORMATION
Indicates Gravity Station Location
Indicates I. P. Line Location
N
I.P. LINE #1
I.P. LINE #2
I.P. LINE #3
I.P. LINE #4
I.P. LINE #5
I.P. LINE #6
CENTER I.P. LINE #4
GRAVITY PROFILE #1
GRAVITY PROFILE #2
GRAVITY PROFILE #3
GRAVITY PROFILE #4
FALCON VALLEY
Falcon Valley Ranch
Oracle Junction
Catalina
Rainbows End
Upper Holding Tank
Lower Holding Tank
Threeway Tank
Airport Tank
Antelope Tank
Faraway Tank
Black Tank Well
Catalina Well
Walnut Well
Represo Tank
Small Hill Reservoir
Power Line Reservoir
Upper Sahuarita Dam
Lower Sahuarita Dam
Deep Well
Gravel Pit
Rays Tank
No 3 Dirt Tank
The Lower Ranch
Triangle L Ranch
Rancho Linda Vista
Casa del Oro
Tortolita Mountains
Phoenix 104 Mi.
Florence 36 Mi.
T. 9 S.
T. 10 S.
R. 13 E.
R. 14 E.

EA 94019



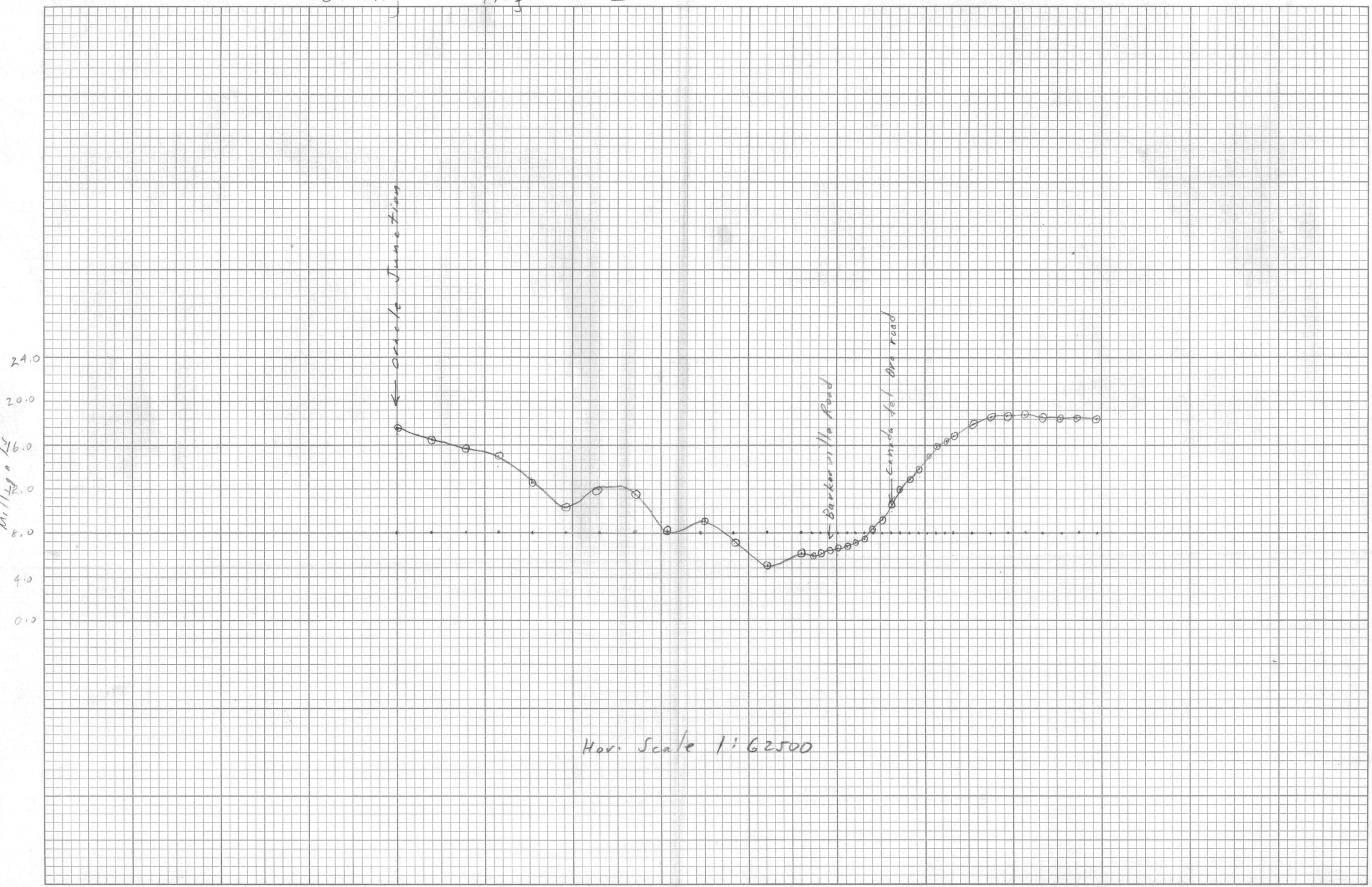
K+E 10 X 10 TO THE INCH 359-5DLG
KEUFFEL & ESSER CO. MADE IN U.S.A.





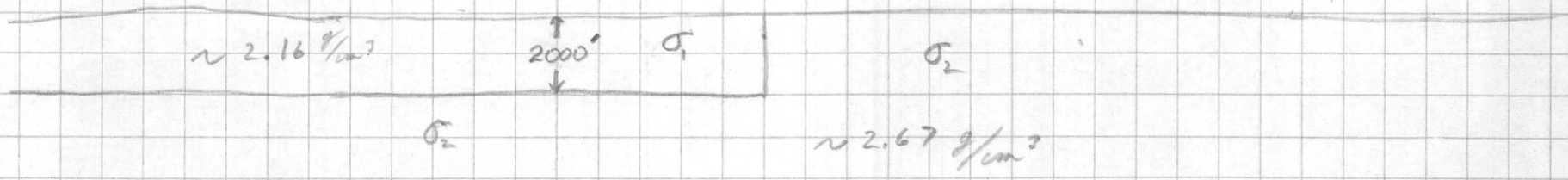
K&E 10 X 10 TO THE INCH 359-5DLG
KEUFFEL & ESSER CO. MADE IN U.S.A.

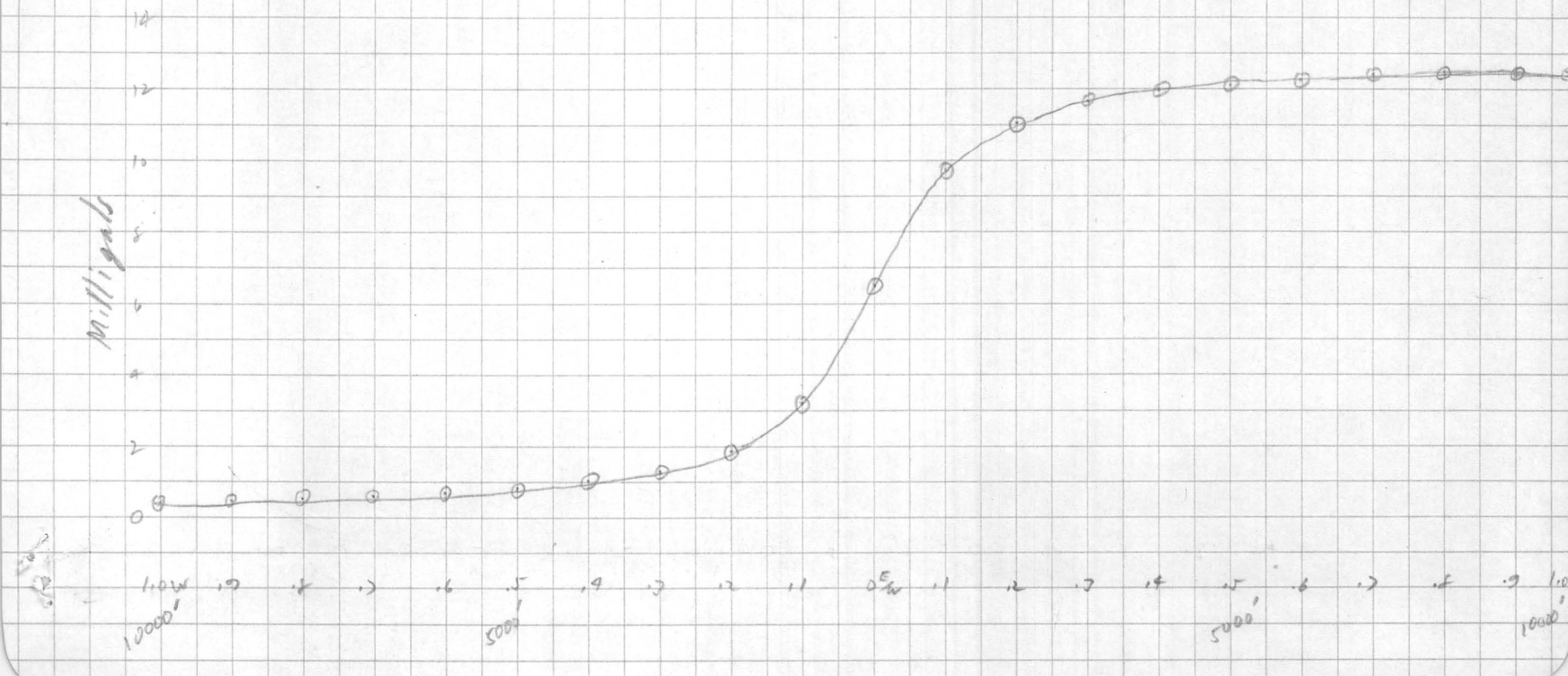
Gravity Profile # 1



$\sigma_2 - \sigma_1 = 0.51\ g/cm^2$

$2.67 - 2.16 = 0.51$





$\frac{1}{\pi}\tan^{-1}\frac{x}{z} = \frac{1}{2}$

$\frac{1}{\pi} \times \frac{\pi}{2} = \frac{1}{2} \quad \therefore \frac{\pi}{2} = \tan^{-1}\frac{x}{z}$

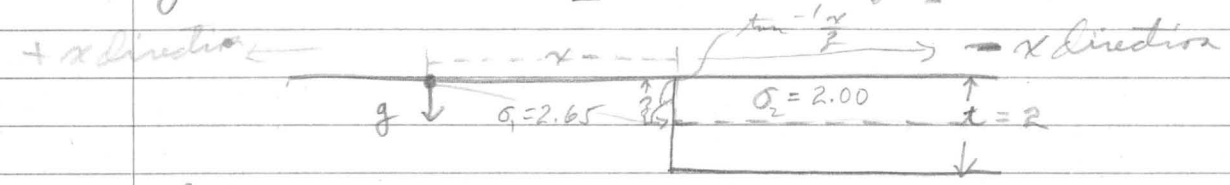
$\therefore \tan\frac{\pi}{2} = \frac{x}{z}$

$1 = \frac{x}{z}$

$x = z$

$$g = 12.77\,\sigma t\left[\frac{1}{2} + \frac{1}{\pi}\tan^{-1}\frac{x}{z}\right]$$

Distances in kilofeet



$t = 2$

$z = 1$

$\sigma = \sigma_1 - \sigma_2 = 0.65 \quad \approx 0.51$

$$\therefore g = (12.77)(0.65)(2)\left[\frac{1}{2} + \frac{1}{\pi}\tan^{-1}\frac{x}{1}\right]$$

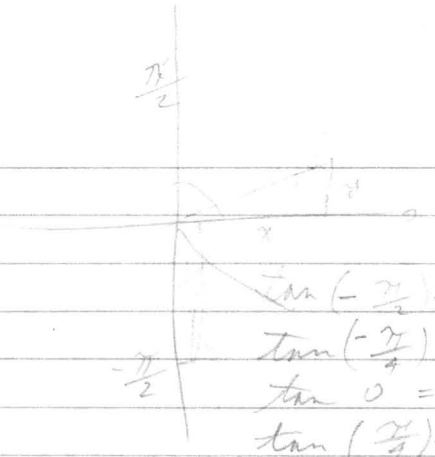
$$g = 16.60\left[\frac{1}{2} + \frac{1}{\pi}\tan^{-1}x\right]$$

$$g = 8.30 + 5.28\tan^{-1}x$$

$\therefore \tan^{-1}x$ for $x =$

0	is	0	in radians
1		45° 0′	$\frac{\pi}{4}$
2		63° 26′	1.107
3		71° 34′	1.249
4		75° 58′	1.326
5		78° 41′	1.373
6		80° 32′	1.406
7		81° 52′	1.428
8		82° 52′	1.446
9		83° 40′	1.460
10		84° 18′	1.472

$\therefore g_0 = 8.30 + 0$	$= 8.30$	$\times .784$ 6.50 ft in − direction		8.30	6.50
$g_1 = 8.30 + 4.15$	$= 12.45$	9.76		4.15	3.25
$g_2 = 8.30 + 5.85$	$= 14.15$	11.09		2.45	1.92
$g_3 = 8.30 + 6.59$	$= 14.89$	11.66		1.71	1.34
$g_4 = 8.30 + 7.00$	$= 15.30$	11.99		1.30	1.02
$g_5 = 8.30 + 7.25$	$= 15.55$	12.19		1.05	0.83
$g_6 = 8.30 + 7.43$	$= 15.73$	12.33		0.87	0.68
$g_7 = 8.30 + 7.54$	$= 15.84$	12.42		0.76	0.60
$g_8 = 8.30 + 7.64$	$= 15.94$	12.50		0.66	0.52
$g_9 = 8.30 + 7.70$	$= 16.00$	12.54		0.60	0.47
$g_{10} = 8.30 + 7.78$	$= 16.08$	12.60		0.52	0.41
↓ ~	16.60	13.00		0.00	0.00



$\tan\left(-\frac{\pi}{2}\right) = -\infty$

$\tan\left(-\frac{\pi}{4}\right) = -1$

$\tan 0 = 0$

$\tan\left(\frac{\pi}{4}\right) = 1$

$\tan\left(\frac{\pi}{2}\right) = \infty$

$\therefore \tan(-\theta) = -\tan(\theta)$

if Alluvium + Gila = $\boxed{1.80\ g/cm^3}$

then control is 2.67

$$\frac{-1.80}{.87\ g/cm^3}$$

$$.87\ g/cm^3 \times \frac{.034\ mg/ft}{2.67\ g/cm^3} = .011\ \frac{mg}{ft}$$

$$-10\ mgal = x \times .011\ mg/ft$$

$$-910\ ft$$

$$-14\ mgal = x \times .011\ mg/ft$$

$$\boxed{= -1300\ ft}$$

& if Allu + Gila = 2.20

$$\boxed{-2300\ ft}$$

Take Gravity
Meter & 2 altimeters
& Jalender

$2.67 \propto .034$ mg/ft

$2.00 \propto .025$ mg/ft

$-0.67 \propto -.009$ mg/ft

$\frac{x}{.034} = \frac{2}{2.67}$

$-.009\,x\,(\frac{mg}{ft}) = \frac{10\,mg}{2.67}$

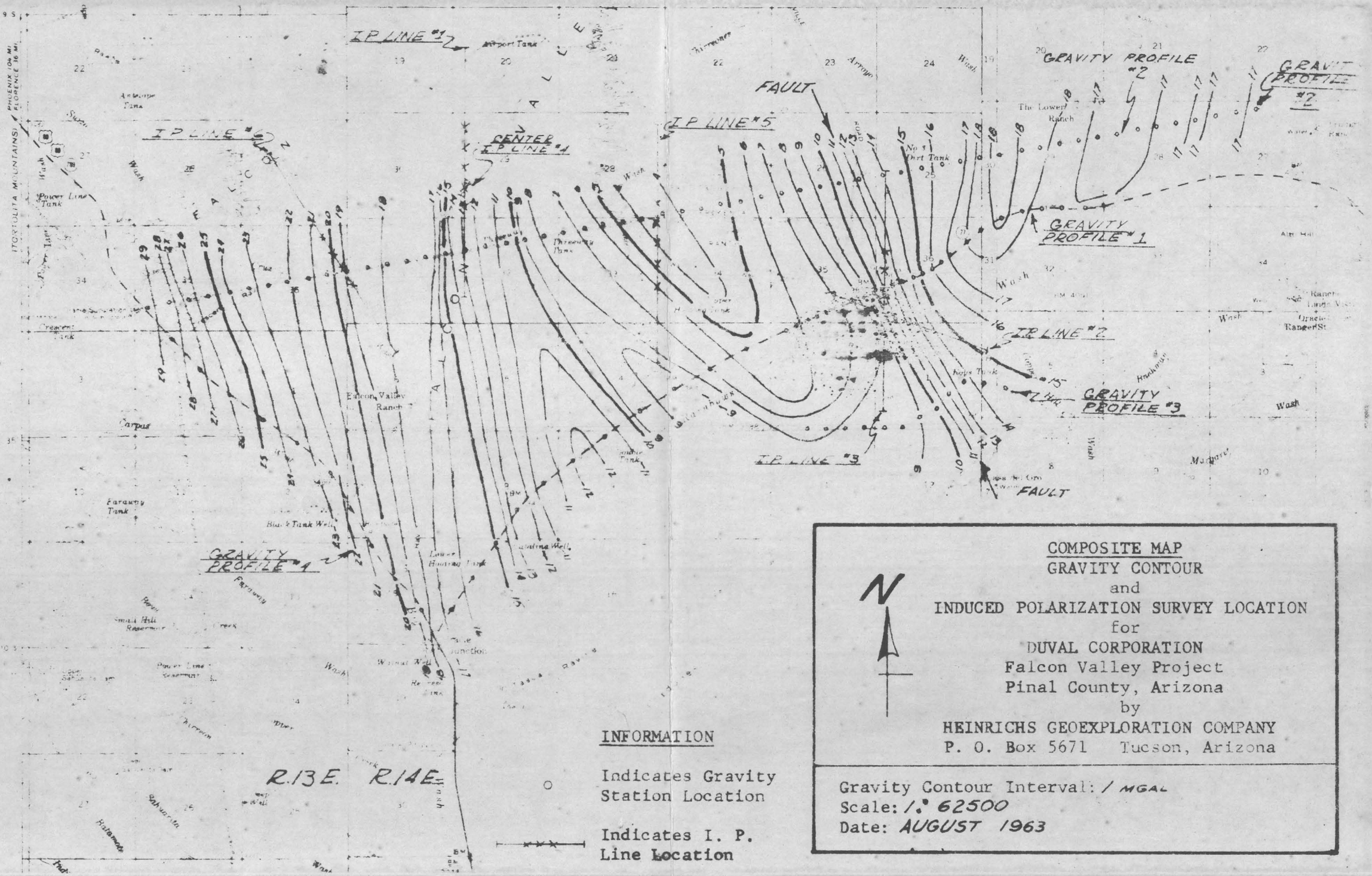
min $x = \frac{-10\ ft}{.009} = -1100$ ft

ave $x = \frac{-14\ ft}{.009} = \boxed{-1600\ ft}$

assuming granite is 2.67 g/cm³
& alluvium + bila
$= \boxed{2.00\ g/cm^3}$

$$\begin{array}{r} 3430 \\ 3296 \\ \hline 134 \end{array}$$

$$\begin{array}{r} 3305 \\ 134 \\ \hline 3171 \end{array}$$

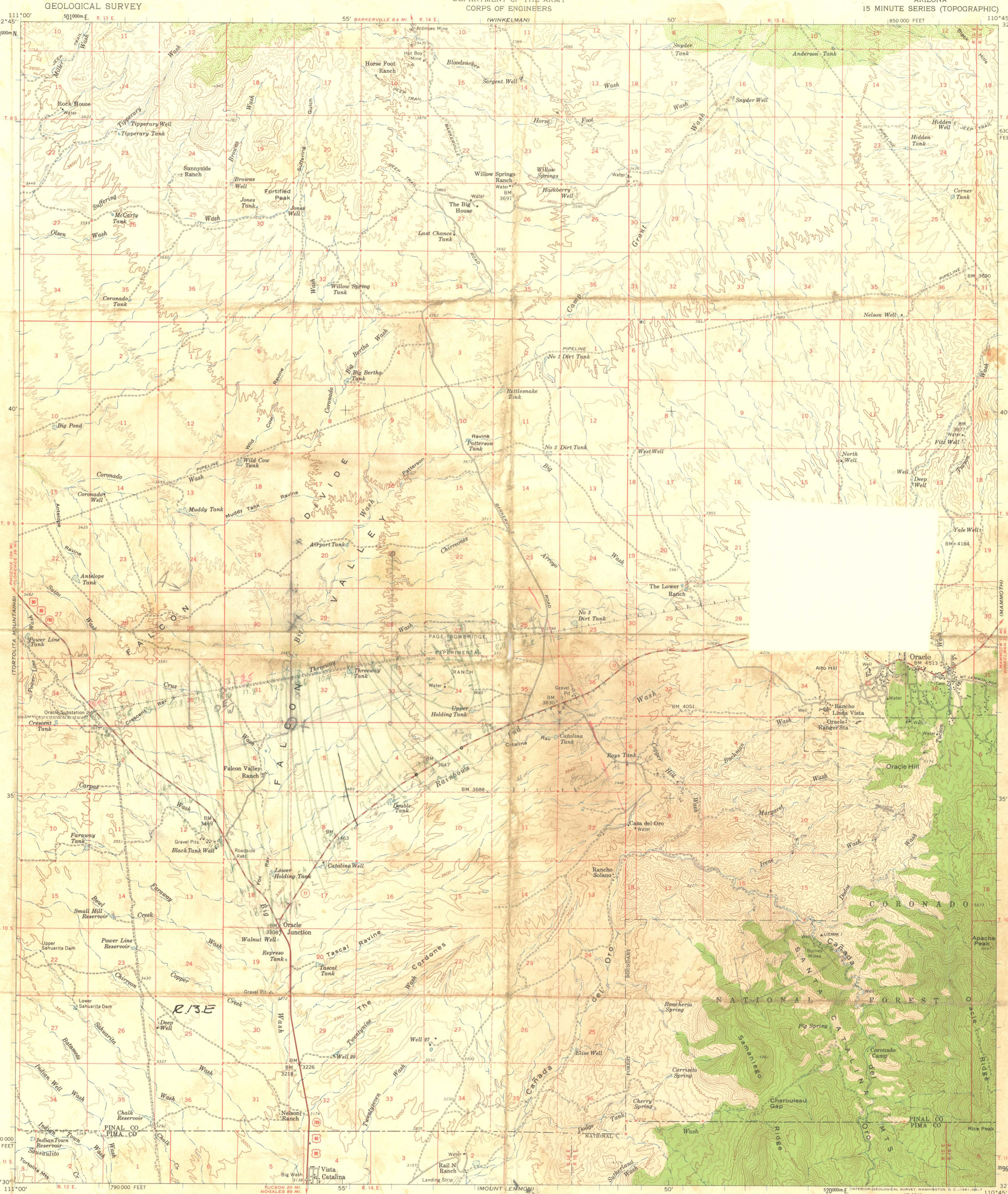

IP LINE #1
IP LINE #6
CENTER IP LINE #4
IP LINE #5
FAULT
GRAVITY PROFILE #2
GRAVITY PROFILE #2
GRAVITY PROFILE #1
IP LINE #2
GRAVITY PROFILE #3
IP LINE #3
FAULT
GRAVITY PROFILE #4
R.13E.
R.14E.
INFORMATION
Indicates Gravity Station Location
Indicates I. P. Line Location
N
COMPOSITE MAP
GRAVITY CONTOUR
and
INDUCED POLARIZATION SURVEY LOCATION
for
DUVAL CORPORATION
Falcon Valley Project
Pinal County, Arizona
by
HEINRICHS GEOEXPLORATION COMPANY
P. O. Box 5671 Tucson, Arizona
Gravity Contour Interval: 1 MGAL
Scale: 1" 62500
Date: AUGUST 1963

MARKED

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.

TRUE NORTH
MAGNETIC NORTH
13½°
APPROXIMATE MEAN DECLINATION, 1959

SCALE 1:62500

1 ½ 0 1 2 3 4 MILES

3000 0 3000 6000 9000 12000 15000 18000 21000 FEET

1 .5 0 1 2 3 4 5 KILOMETERS

CONTOUR INTERVAL 80 FEET
DATUM IS MEAN SEA LEVEL

ARIZONA
QUADRANGLE LOCATION

ROAD CLASSIFICATION

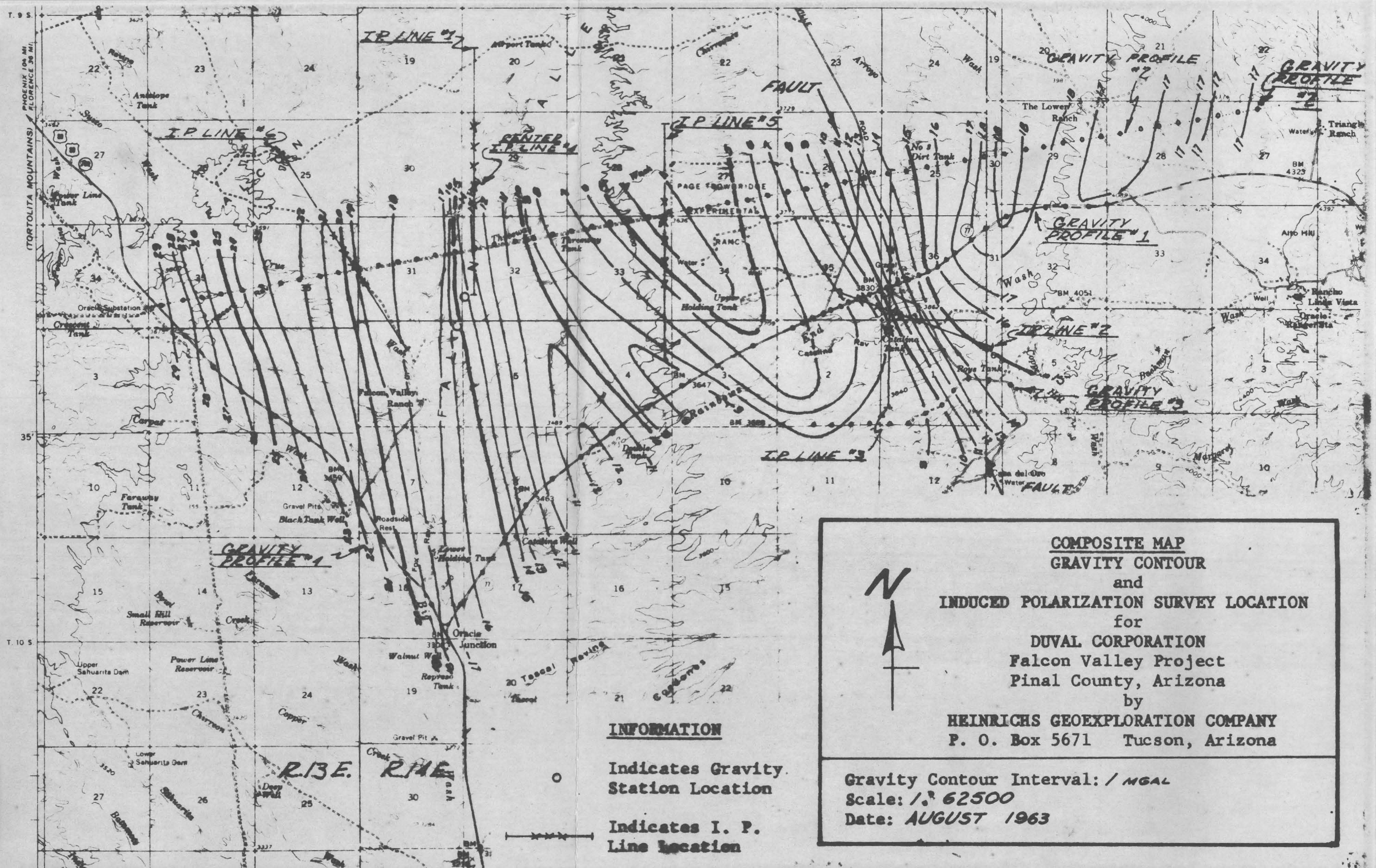
Heavy-duty — Light-duty
Medium-duty — Unimproved dirt
U. S. Route — State Route

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

INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D. C.—1961—N5—T
MR 6040

ORACLE, ARIZ.
N3230—W11045/15

1959



COMPOSITE MAP

GRAVITY CONTOUR

and

INDUCED POLARIZATION SURVEY LOCATION

for

DUVAL CORPORATION

Falcon Valley Project

Pinal County, Arizona

by

HEINRICHS GEOEXPLORATION COMPANY

P. O. Box 5671 Tucson, Arizona

Gravity Contour Interval: 1 MGAL

Scale: 1:62500

Date: AUGUST 1963

INFORMATION

o Indicates Gravity Station Location

—×—×— Indicates I. P. Line Location

HEINRICHS GEOEXPLORATION COMPANY

INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project Duval – Oracle Line 1 – Spr. 1 – N½ Field date 7/24/63 Data page_____ Comp. date 7/24/63. Comp by C.S.L.

(A) Send	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2	4-5	3-4	2-3
(B) Receive	1-2N	→	2-3N	→	→	3-4N	→	→	→	4-5N	→	→
(C) n separation	55	37	57	37	14	20	36	14	7	37	13	7
(D) I	1800	→	→	→	→	→	→	→	→	→	→	→
(E) Vdc (avg)	11.37	2.29	11.72	2.30	.84	12.30	2.27	.85	.45	2.33	.82	.45
(F) DCcal	.977	→	→	→	→	→	→	→	→	→	→	→
(G) Kn x 10^{-3}	3	12	3	12	30	3	12	30	60	12	30	60
(H) ρ dc=ExFxGx10^3/D	18.5	14.9	19.1	15.0	13.6	20.0	14.8	13.8	14.6	15.2	13.3	14.6
(I) Vac Σ	10.98	2.22	11.32	2.23	.82	12.07	2.18	.83	.44	2.25	.80	.44
(J) AC noise x 2												
(K) Vac(corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	.975	.985	.973	.985	.999	.995	.986	.999	1.003	.995	.999	1.003
(M) ρ dc/ρac=ExL/K	1.009	1.015	1.008	1.017	1.022	1.013	1.024	1.022	1.027	1.019	1.022	1.027
(N) PFE=(M-1)(10^2)	1	2	1	2	2	1	2	2	3 ?	2	2	3 ?
(O) MCF=(M-1)(10^5)/H	49	101	42	113	162	65	162	159	185	125	165	185

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

(A) Send	1-2	4-5	3-4	2-3	1-2							
(B) Receive	→	5-6N	→	→	→							
(C) n separation	5	12	7	5	4							
(D) I	→	→	→	→	→							
(E) Vdc (avg)	.285	.82	.44	.29	.22							
(F) DCcal	→	→	→	→	→							
(G) Kn x 10^{-3}	105	30	60	105	168							
(H) ρ dc=ExFxGx10^3/D	16.3	13.3	14.3	16.5	20.1							
(I) Vac Σ	.280	.81	.43	.28	.22							
(J) AC noise x 2												
(K) Vac (corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	1.004	.999	1.003	1.004	1.005							
(M) ρdc/ρac =ExL/K	1.022	1.011	1.027	1.049	1.005							
(N) PFE=(M-1)(10^2)	2 ?	1	3 ?	4 ?	1 ?							
(O) MCF=(M-1)(10^5)/H	135	83	189	242	25							

~~11.50~~
~~.95~~
~~10.55~~

9.50
.85
8.65

13.3

204
148
56

5600
75
5525

297
148
149

502
75
427

154
75
79

13.30
1.18
12.12

952
148
804

298
177
121

~~277~~

204
177
27

1.54
.29
1.25

5 4 3 2 1 5

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project Duval - Ore Line 1 - Spread - 5½ Field date 7/23/63 Data page — Comp. date 7/23/63. Comp by C.S.L.

(A) Send	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3	3-4
(B) Receive	1-2 S	→	2-3 S	→	→	3-4 S	→	→	→	4-5 S	→	
(C) n separation ~~% S.D.~~	46	37	48	37	16	41	37	16	—	38	21	
(D) I	1800											
(E) Vdc (avg)	9.58	2.29	9.77	2.28	.967	8.31	2.26	.96	.56	2.34	1.10	.67
(F) DCcal USED	.977											
(G) Kn x 10^{-3}	3	12	3	12	30	3	12	30	60	12	30	60
(H) ρ dc=ExFxGx10^3/D	15.6	14.9	15.9	14.8	15.8	13.5	14.6	15.6	18.2	15.2	17.9	20.5
(I) Vac Σ	9.17	2.22	9.56	2.20	.940	8.10	2.21	.95	—	2.28	1.24	—
(J) AC noise x 2											.54	
(K) Vac(corr) = $\sqrt{I^2 - J^2}$											1.12	
(L) AC-DC cal.	.980	.985	.979	.985	.997	.983	.985	.997		.985	.994	
(M) ρ dc/ρac=ExL/K	1.022	1.015	1.000	1.020	1.024	1.008	1.006	1.006		1.010	.976	
(N) PFE=(M-1)(10^2)	2	2	0	2	2	1	1	1		1	-2	
(O) MCF=(M-1)(10^5)/H	141	101	0	135	152	59	41	38		66	-134	

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

(A) Send	4-5	1-2	2-3	3-4	4-5		CAL					
(B) Receive	→	5-6 S			→		1-2					
(C) n separation							51	17	60	20	DC cal factor	
(D) I							1000	1000	1200	1200		
(E) Vdc (avg)	.40	1.01	.62	.392	.305		103.4	101	124.0	122	= $\frac{I_{DC}}{V_{DC}}$	
(F) DCcal = $\frac{I_{DC}}{V_{DC}}$							.968	.990	.968	.984		
(G) Kn x 10^{-3}	105	70	60	105	168			~ .977				
(H) ρ dc=ExFxGx10^3/D	22.8	16.5	20.2	22.4	27.8							
(I) Vac Σ							101.0	101	120.6	121	AC-DC cal =	
(J) AC noise x 2											$\frac{V_{AC}}{V_{DC}}$	
(K) Vac (corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.							.976	1.000	.973	.993		
(M) ρdc/ρac =ExL/K												
(N) PFE=(M-1)(10^2)												
(O) MCF=(M-1)(10^5)/H												

$$.95 = k = \frac{\ell_2 - 15}{\ell_2 + 15}$$

15

$$\cancel{14.2 + .95\ell_2 = 15 - \ell_2}$$

$$.8 = 1.95\ell_2$$

$$.95\ell_2 + 14.5 = \ell_2 - 15$$

$$.05\ell_2 = 29.5$$

$$\ell_2 = 590$$

1000'

1050

10P.

.7

HEINRICHS GEOEXPLORATION COMPANY

INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project Duval-Oracle Line 2-3 pr. 1-5E Field date 7/25/63 Data page_____ Comp. date 7/26/63. Comp by C.S.L.

(A) Send	2-3	3-4	2-3	4-5	3-4	2-3	4-5	3-4	2-3	4-5	3-4	2-3
(B) Receive	1-2E	2-3E	→	3-4E	→	→	4-5E	→	→	5-6E	→	→
(C) ~~n separation~~ Range	61	40	21	52	35	25	38	32		50		
(D) I	1600	→	→	→	→	→	→	→	→	→	→	→
(E) Vdc (avg)	38.2	83.5	13.1	108.4	21.9	5.10	23.5	6.41	1.88	10.27	3.50	1.16
(F) DCcal USED	.947	~~.984~~	~~.994~~	~~.977~~	~~.987~~	~~.992~~	~~.985~~	~~.988~~		~~.979~~		
(G) Kn x 10^{-3}	3	3	12	3	12	30	12	30	60	30	60	105
(H) ρ dc=ExFxGx10^3/D	69.6	148	93.0	192	155	90.5	167	114	66.7	182	124	72.0
(I) Vac Σ	36.6	80.6	12.6	104.0	21.1	4.98	22.6	6.33	—	9.90	—	—
(J) AC noise x 2												
(K) Vac(corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	.974	.984	.994	.975	.987	.992	.985	.988		.979		
(M) ρ dc/ρac=ExL/K	1.017	1.019	1.031	1.020	1.024	1.016	1.023	1.001		1.015		
(N) PFE=(M-1)(10^2)	2	2	3	2	2	2	2	0		2		
(O) MCF=(M-1)(10^5)/H	24	13	33	10	15	18	14	1		8		

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

(A) Send								CAL	→	→	→	
(B) Receive								2-3	→	→	→	
(C) n separation								52	17	63	21	
(D) I								1000	1000	1200	1200	
(E) Vdc (avg)								106.9	104	128.2	126	
(F) DCcal								.936	.962	.936	.953	
(G) Kn x 10^{-3}								~	.947			
(H) ρ dc=ExFxGx10^3/D												
(I) Vac Σ								104.8	104	125.4	125	
(J) AC noise x 2												
(K) Vac (corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.								980	1.000	.978	994	
(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 Doval-Onack Line 3 Spread I Field date 7-27-63 Data page 1 Comp. date_____. Comp by_____

(A) Send	2-3	4-5	3-4	2-3	1-2	4-5	34	2-3	1-2	4-5	34	23
(B) Receive	1-2N	→	2-3N	→	→	→	→	→	→	4-5N	→	→
(C) ~~n separation~~ % Scale	20	54	20	42	56	54	56	60	31	50	24	32
(D) I	1800	→	→	→	→	→	→	→	→	→	→	→
(E) Vdc (avg)	39.3	10.95	39.8	8.55	3.71	32.9	11.35	3.64	1.89	10.30	4.95	1.94
(F) DCcal Used .951	→	→	→	→	→	→	→	→	→	→	→	→
(G) Kn x 10^{-3}	3	12	3	12	30	3	12	30	60	12	30	60
(H) ρ dc=ExFxGx10^3/D	62.23	62.54	63.0	54.1	58.8	52.1	71.9	57.6	59.9	65.3	78.4	61.5
(I) Vac Σ	39.6	10.73	39.6	8.38	3.66	32.2	11.10	3.58	1.86	10.10	4.82	1.94
(J) AC noise x 2												
(K) Vac(corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal. USED	.995	→	→	→	→	→	→	→	→	→	→	→
(M) ρ dc/ρac=ExL/K	.988	1.014	1.000	1.015	1.009	1.016	1.017	1.011	1.010	1.013	1.021	.995
(N) PFE=(M-1)(10^2)	-1	1	0	2	1	2	2	1	1	1	2	0
(O) MCF=(M-1)(10^5)/H	-19	20	0	28	15	31	24	19	17	20	27	-8

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

(A) Send	1-2	4-5	3-4	2-3	12	2-3	3-4	45	34	45	Cal	→
(B) Receive	→	5-6N	→	→	→	2-35	→	→	1-25	→	2-3	→
(C) n separation % Scale	18	28	51	22	14	19.5	40	52	23	54	100 300	100 300
(D) I	→	→	→	→	→	→	→	→	→	→	1000	1000
(E) Vdc (avg)	1.11	5.60	3.08	1.34	.83	39.5	8.05	3.22	46.5	11.06	106.9 104	127.7 125
(F) DCcal	→	→	→	→	→	→	→	→	→	→	.940 .960	.940 .960
(G) Kn x 10^{-3}	105	30	60	105	168	3	12	30	3	12		
(H) ρ dc=ExFxGx10^3/D	61.5	88.4	97.5	74.2	73.7	62.5	51.0	51.0	73.6	70.0	105.6 104	124.7 124
(I) Vac Σ	1.09	5.54	3.03	1.32	.82	39.0	7.94	3.14	45.7	10.90	↓	↓
(J) AC noise x 2	1012	1006	1011	1010	1009	1009	1009	1020	1012	1018		
(K) Vac (corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	→	→	→	→	→	→	→	→	→	→	992 1.000	977 1.000
(M) ρdc/ρac =ExL/K	1012	1006	1011	1010	1008	1009	1009	1020	1012	1018		
(N) PFE=(M-1)(10^2)	1	1	1	1	1	1	1	2	1	—		
(O) MCF=(M-1)(10^5)/H	20	7	11	13	11	14	18	39	16	26		

S →
← N

Falcon Valley Wenner
Depth $\rho_a \times \frac{1}{2}$

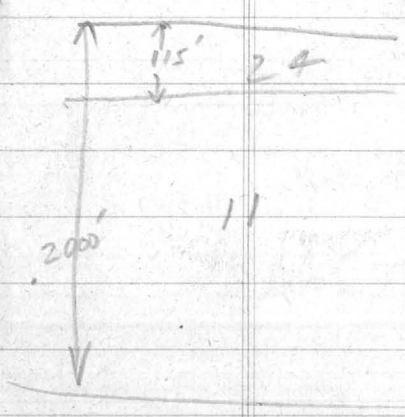
Wenner Calculations

$\rho_a = \frac{V_a}{I}$ D.C. cal

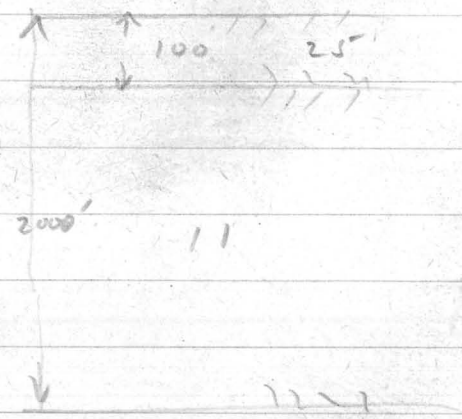
D.C. .950

$I = 1000$

a = 100	= .1 V	21.8
200	.2 V	16.8
400	.4 V	14.4
600	.6 V	14.4
1000	V	13.1
1500	1.5 V	15.0
2000	2 V	15.8
2500	2.5 V	18.7
3000	3 V	22.6



100



$\rho_1 : \rho_2 : \rho_3$
5 : 2 : 40

very high
210+

210

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INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project Falcon Valley Line 5 Spread 1N Field date 8-1-63 Data page_____ Comp. date_____. Comp by_____

(A) Send	2-3	12	3-4	2-3	12	45	34	23	12	45	34	23
(B) Receive	1-2N	→	2-3N	→	→	3-4N	→	→	→	4-5N	→	→
(C) n separation % Scale	27	57	23	54	16	23	43	14	6	41	11	5
(D) I	1800	→	→	→	→	→	→	→	→	→	→	→
(E) Vdc (avg)	16.6	3.46	13.8	3.29	.96	13.7	2.61	.84	.34	2.43	.68	.32
(F) DCcal USED	.945	→	→	→	→	→	→	→	→	→	→	→
(G) Kn x 10^{-3}	3	12	3	12	30	3	12	30	60	12	30	60
(H) ρ dc=ExFxGx10^3/D	26.1	21.8	21.7	20.7	15.1	21.6	16.4	13.2	10.7	15.3	10.7	10.1
(I) Vac Σ	16.2	3.41	13.5	3.29	.96	13.7	2.56	.83	.36	2.42	.67	.32
(J) AC noise x 2												
(K) Vac(corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	.994	.981	.996	.983	.999	.996	.988	1.060	1.003	.989	1.001	1.004
(M) ρ dc/ρac=ExL/K	1.019	.996	1.018	.998	.999	.996	1.004	1.011	.950	.995	1.015	1.004
(N) PFE=(M-1)(10^2)	2	0	2	0	0	0	1	1	-5	0	2	0
(O) MCF=(M-1)(10^5)/H	73	-18	83	-10	-7	-19	49	83	-468	-33	14	40
									52/17	12/52	67/27	21/43

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

(A) Send	1-2	45	34	2-3	12	3-4 45	2-3 3-4	4-5	CAL			
(B) Receive	→	5-6N	→	→	→				2-3			
(C) n separation % Scale	—	11	—	—	—	28 57	31 50	—	1000	1000	1200	1200
(D) I	→	→	→	→	→	→	→	→	107.6	104	128.2	126
(E) Vdc (avg)	.23?	.67	~	~	~	17.2 3.48	19.0 3.08	1.02	.930	.961	.935	.953
(F) DCcal	→	→	→	→	→				~	.945		
(G) Kn x 10^{-3}	105	30	60	105	168	3 12	3 12	30				
(H) ρ dc=ExFxGx10^3/D	12.7/10.0	10.5	8.8?	10.5	13.2	27.0 21.5	29.9 19.4	16.0				
(I) Vac Σ	.18	.66	.28	.19	.15	16.8 3.42	18.9 3.00	—	106.0	104	125.6	125
(J) AC noise x 2												
(K) Vac (corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.		1.001				.994 .981	.993 .989		.985	1.000	.979	.992
(M) ρdc/ρac =ExL/K		1.015				1.018 1.998	1.023 1.011					
(N) PFE=(M-1)(10^2)	—	2	—	—	—	2 0	2 1	—				
(O) MCF=(M-1)(10^5)/H		143				67 -9	77 55					

91
66 45
179

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project Falcon Valley Line 5-Spur 1-5½ Field date 8/2/63 Data page_____ Comp. date 8/2/63. Comp by C.S.G.

(A) Send	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2
(B) Receive	2-35	→	→	3-45	→	→	→	4-55	→	→	→	5-65
(C) n separation ~~S.D.~~												
(D) I	1800	→	→	→	→	→	→	→	→	→	→	→
(E) Vdc (avg)	18.8	3.03	1.01	22.2	3.36	1.00	.49	4.02	1.06	.575	.40	1.20
(F) DCcal USED	.944	→	→	→	→	→	→	→	→	→	→	→
(G) Kn x 10^{-3}	3	12	30	3	12	30	60	12	30	60	105	30
(H) ρdc=ExFxGx10^3/D	29.6	19.1	15.9	35.0	21.2	15.7	15.4	25.4	16.7	18.1	22.0	18.9
(I) Vac Σ	18.3	2.99	1.14	21.8	3.40							
(J) AC noise x 2			.55		.20							
(K) Vac(corr) = $\sqrt{I^2 - J^2}$			1.00		3.31							
(L) AC-DC cal. USED	.995	→	→	→	→	→	→	→	→	→	→	→
(M) ρdc/ρac=ExL/K	1.022	1.008	1.003	1.013	1.010							
(N) PFE=(M-1)(10^2)	2	1	0	1	1							
(O) MCF=(M-1)(10^5)/H	74	42	19	37	47							

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

(A) Send	2-3	3-4	4-5									
(B) Receive	→	→	→									
(C) n separation												
(D) I	→	→	→									
(E) Vdc (avg)	.50	.32	.31									
(F) DCcal	→	→	→									
(G) Kn x 10^{-3}	60	105	168									
(H) ρdc=ExFxGx10^3/D	15.7	17.6	27.3									
(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 2

Project Falcon Valley Line 6 Spur N½ Field date 8/6/63 Data page _____ Comp. date 8/6/63 . Comp by C.S.L.

(A) Send	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2	4-5	3-4	2-3
(B) Receive	1-2N	→	2-3N	→	→	3-4N	→	→	→	4-5N	→	→
(C) ~~n separation~~												
(D) I	1800											
(E) Vdc (avg)	24.3	4.88	24.5	4.77	1.93	25.0	4.96	1.94	1.12	5.23	2.00	1.08
(F) DCcal USED	.940											
(G) Kn x 10^{-3}	3	12	3	12	30	3	12	30	60	12	30	60
(H) ρ dc=ExFxGx10^3/D	38.0	30.5	38.3	29.8	30.2	39.1	31.0	30.3	35.0	32.7	31.3	33.8
(I) Vac Σ	24.6	4.80	24.1	4.69	1.86	24.4	4.83	1.93	1.12	5.17	1.98	1.07
(J) AC noise x 2												
(K) Vac(corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal. Used	.988											
(M) ρ dc/ρac=ExL/K	1.001	1.004	1.005	1.006	1.025	1.011	1.014	.994	.988	.999	.999	.998
(N) PFE=(M-1)(10^2)	0	0	1	1	3	1	1	-1	-1	0	0	0
(O) MCF=(M-1)(10^5)/H	3	13	13	20	83	24	45	-20	-34	-3	-4	-6

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

(A) Send	1-2	4-5	3-4	2-3	1-2							
(B) Receive	→	5-6N	→	→	→							
(C) ~~n separation~~												
(D) I	→	→	→	→	→							
(E) Vdc (avg)	.73	2.15	1.07	.70	.54							
(F) DCcal	→	→	→	→	→							
(G) Kn x 10^{-3}	105	30	60	105	168							
(H) ρ dc=ExFxGx10^3/D	40.0	32.0	33.5	38.4	47.3							
(I) Vac Σ	.73	2.02	1.06	.69	.50							
(J) AC noise x 2	400											
(K) Vac (corr) = $\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	.988	→	→	→	→							
(M) ρdc/ρac =ExL/K	.984	1.003	1.000	1.001	1.069							
(N) PFE=(M-1)(10^2)	-1	0	0	0	7							
(O) MCF=(M-1)(10^5)/H	-30	9	0	3	145							

HEINRICHS GEOEXPLORATION COMPANY

INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page 1

Project Falcon Valley Line 6-Spur 1-5½ Field date 8/5/63 Data page _____ Comp. date 8/6/63. Comp by C.S.L.

(A) Send	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3	3-4
(B) Receive	1-25	→	2-35	→	→	3-45	→	→	→	4-55	→	→
(C) ~~n separation~~ 2.5.D.	40	24	42	26	35	36	26	35	19	26	37	19
(D) I	1500	→	→	→	→	→	→	→	→	→	→	→
(E) Vdc (avg) 1	24.1	4.83	25.8	5.35	2.18	22.1	5.46	2.13	1.21	5.38	2.23	1.17
(F) DCcal USED	.940	→	→	→	→	→	→	→	→	→	→	→
(G) Kn x 10^{-3}	3	12	3	12	30	3	12	30	60	12	30	60
(H) ρ dc=ExFxGx10^3/D	37.2	30.3	40.4	33.5	34.1	34.5	34.2	33.3	37.9	33.7	34.9	36.6
(I) Vac Σ 2	23.7	4.76	25.2	5.22	2.12	21.7	5.28	2.08	1.16	5.28	2.22	1.15
(J) AC noise x 2												
(K) Vac(corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal. USED	.988	→	→	→	→	→	→	→	→	→	→	→
(M) ρ dc/ρac=ExL/K ✓	1.005	1.002	1.011	1.011	1.016	1.006	1.022	1.011	1.030	1.068	.993	1.006
(N) PFE=(M-1)(10^2)	1	0	1	1	2	1	2	1	3	1	-1	1
(O) MCF=(M-1)(10^5)/H	13	7	27	33	47	17	64	33	79	24	-20	16

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

(A) Send	4-5	1-2	2-3	3-4	4-5		CDL	→	→	→		
(B) Receive	→	5-65	→	→	→		24	→	→	→		
(C) n separation	13	38	20	13	10		53	17	63	21		
(D) I	→	→	→	→	→		1000	1000	1200	1200		
(E) Vdc (avg)	.82	2.35	1.26	.79	.60		108.0	105	126.8	126.5		
(F) DCcal	→	→	→	→	→		.925	.953	.932	948		
(G) Kn x 10^{-3}	105	30	60	105	168		.940					
(H) ρ dc=ExFxGx10^3/D	45.0	36.8	39.4	43.4	52.6							
(I) Vac Σ	.81	2.26	1.22	.78	.59		106.0	104	126.9	126.0		
(J) AC noise x 2												
(K) Vac (corr) $=\sqrt{I^2 - J^2}$												
(L) AC-DC cal.	→	→	→	→	→		981	.990	.995	995		
(M) ρdc/ρac =ExL/K	1.000	1.027	1.021	1.060	1.005							
(N) PFE=(M-1)(10^2)	0	3	2	0	1			~	.988			
(O) MCF=(M-1)(10^5)/H	0	73	53	0	9							

INDUCED POLARIZATION - RECEIVER NOTES PAGE II

Project: Owen/Oracle Line: 7-Spr. 1-N2 Int.Cal _____ Date: 12/16

Send	1-2	4-5	3-4	7-3	1-25	2-3	3-4	4-5	3-4	4-5	CAL	→
Rec.	→	5-6N			→	2-35	→		1-25	→	2-3	→
~~Range~~ Time	3	10	3	3	3	100	10	3	100	10	100 300	100 300
DC-1	.50 .97	2.78 2.96	1.73 1.50	.91 1.11	.48 .52	19.7	4.04 4.05	1.56 1.67	23.0 23.6	5.40 5.45	530 52	127 62.5
DC-2	.60 .64	2.89 2.63	1.32 1.55	.40 .21	.37 .30	19.8	4.05 4.00	1.67 1.56	23.3 22.8	5.70 5.60	532 52	64.0 62.5
Σ	1.10 1.11	5.62 5.61	2.02 2.05	1.31 1.32	.85 .83	39.5	8.09 8.05	3.13 3.23	46.3 46.4	11.08 11.05	106.4 104	127.7 125
DC-3	.70 .77	2.48 2.40	1.28 1.60	.50 .60	.60 .40	19.8	4.00	1.59 1.63	23.3 23.5	5.60 5.45	530 52	64.0 62.5
Dc-4	.41 .38	2.10 2.80	1.22 1.52	.83 .80	.28 .47	19.7	4.06	1.63 1.59	23.3 23.2	5.65 5.60	532 52	63.7 62.5
Σ	1.11 1.11	5.58 5.60	3.10 3.12	1.32 1.40	.83 .83	39.5	8.06	3.22 3.22	46.6 46.7	11.05 11.05	106.4 104	127.7 125
DC-AV	1.11	5.60	2.08	1.34	.83	39.5	8.05	3.22	46.5	11.06	106.4 104	127.7 125
AC-1	.54	2.77	1.52	.66	.42	19.6	3.97	1.57	22.8	5.40	528 52	62.3 62
AC-2	.55	2.77	1.52	.66	.40	19.4	3.97	1.50	22.9	5.40	528 52	62.4 62
Σ	1.09	5.54	3.04	1.32	.82	39.0	7.94	3.14	45.7	10.80	105.6 104	124.7 124
S. P.	→	0.0			→	42.7	→		-3.5	→		
AC-N	→	.12			→	.20 + [illegible]			.20	→		
I.C.	→											

168
.83

504
1349

139.44

40
3

120

40×3

1

18)1200

INDUCED POLARIZATION - RECEIVER NOTES PAGE I

Project: Duval - Oracle Line: 3-Spur 1-10½ Int.Cal _____ Date: 7/27/67

Send	2-3	1-2	3-4	2-3	1-2	4-5	3-4	2-3	1-2	4-5	3-4	2-3
Rec.	1-2N	→	2-3N	→	→	3-4N			→	4-5N		
Time	100	10	100	10	3	30	10	3	3	10	10	3
DC-1	20.0 20.0	5.40 5.80	19.8	4.37 4.40	2.25 1.53	15.9 15.8	5.57	1.88 2.01 1.73 1.52	1.03 1.02	5.20 5.15	2.90 2.36	1.09 1.20
DC-2	19.7 19.6	5.60 5.15	20.0	4.21 4.05	1.50 2.13	17.2 17.3	5.78	1.73 1.52 1.92 2.13	.88 .88	5.08 5.18	2.57 2.58	.81 .76
Σ	39.2 39.2	11.00 10.95	39.8	8.58 8.45	3.75 3.66	33.1 33.8	11.35	3.61 3.6 3.65 3.6	1.89 1.90	10.28 10.33	4.93 4.94	1.90 1.96
DC-3	19.2 19.9	5.70 5.22	20.0	4.22 4.15	1.90 1.92	17.2 17.4	5.78	1.68 1.97	1.15 .90	5.15 5.05	2.33 2.12	1.03 .98
Dc-4	20.0 19.4	5.20 5.75	19.8	4.41 4.40	1.83 1.78	15.8 15.4	5.57	2.00 1.65	1.95 .97	5.18 5.22	2.62 2.77	.93 .94
Σ	39.2 39.3	10.95 10.93	39.8	8.63 8.55	3.73 3.70	33.0 32.2	11.35	3.68 3.62	1.90 1.87	10.33 10.27	4.95 4.94	1.96 1.92
DC-AV	39.3	10.95	39.8	8.55	3.71	32.9	11.35	3.64	1.89	10.30	4.95	1.94
AC-1	19.8	5.25	19.8	4.18	1.83	16.1	5.55	1.79	.94	5.05	2.42	.98
AC-2	19.8	5.38	19.8	4.20	1.83	16.1	5.55	1.79	.92	5.05	2.40	.96
Σ	39.6	10.73	39.6	8.38	3.66	32.2	11.10	3.58	1.86	10.10	4.82	1.94
S. P.	-14.0	→	+5.4	→	→	-6.1	→	→	→	+2.5	→	→
AC-N	.10	→	.20	→	→	.15	→	→	→	.15	→	→
I. C.	52.5	→										

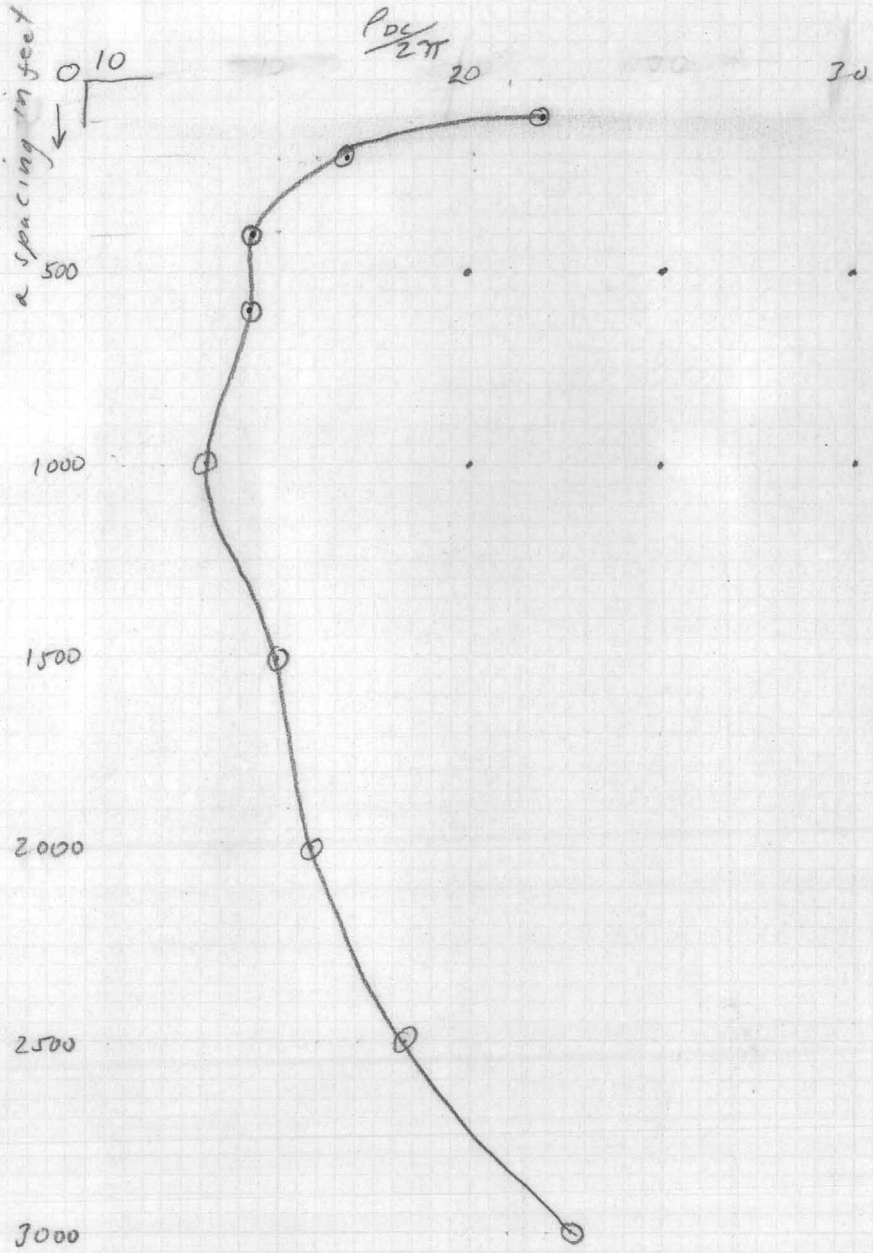
INDUCED POLARIZATION - RECEIVER NOTES PAGE _____

Project: Duval-Otero Line: 4 Wenner Int.Cal _____ Date: 2/20/63

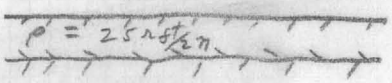
Station	1	2	3	4	5	6	7	8	9			
Send												
Rec.												
Range Time	300	100	100	30	10	10	10	10	10			
DC-1	109	41.3	18.5	12.0	6.9	4.97 5.16	4.20 3.77	3.65 3.75	3.15 4.05			
DC-2	109	42.6	17.5	12.1	6.2	5.16 4.97	3.70 4.23	3.45 3.60	4.40 3.20			
Σ	218	83.9	36.0	24.1	13.1	10.13 10.13	7.90 8.00	7.30 7.35	7.65 7.25			
DC-3	109	41.2	17.5	12.1	6.3	5.05 4.60	4.25 3.64	3.88 3.28	3.20 4.10			
Dc-4	109	42.9	18.5	12.0	6.8	4.80 4.05	3.67 4.33	3.40 4.00	4.45 [illegible]			
Σ	218	84.1	36.0	24.1	13.1	9.85 [illegible]	7.92 8.26	7.28 7.28	7.65			
DC-AV	218	84.0	36.0	24.1	13.1	9.99	7.91	7.30	7.52			
AC-1	108.5	41.8	18.0	12.0	9.7	11.1	12.3	13.3	14.2			
AC-2	108.5	41.7	18.0	11.9	9.7	11.1	11.3	13.3	14.2			
Σ	217	83.5	36.0	23.9	19.4	22.2	24.6	26.6	28.4			
S. P.	+12.0	+5.0	-2.0	+7.7	-6.5	-20.1	+4.2	+5.9				
AC-N	.08	.10	.08	.10	.12	.12	.16	storm noise				
I.C.	—	—	53.0	—								

$$\begin{array}{r} 5200 \\ 3950 \\ \hline 1250 \end{array}$$

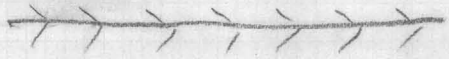
Wenner Depth Probe Line 4



Intergretation



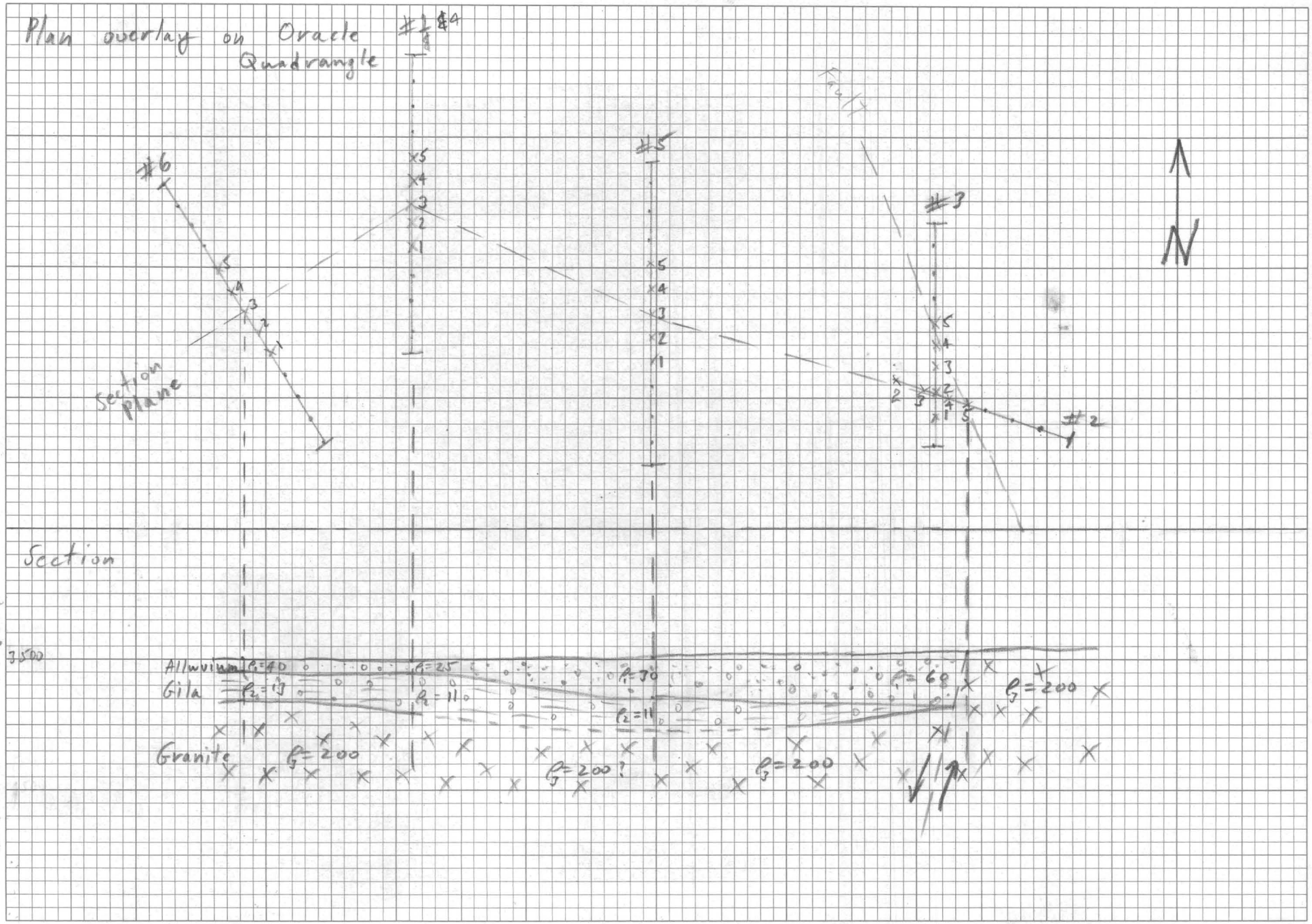
$\rho = 11\ \Omega ft/2\pi$



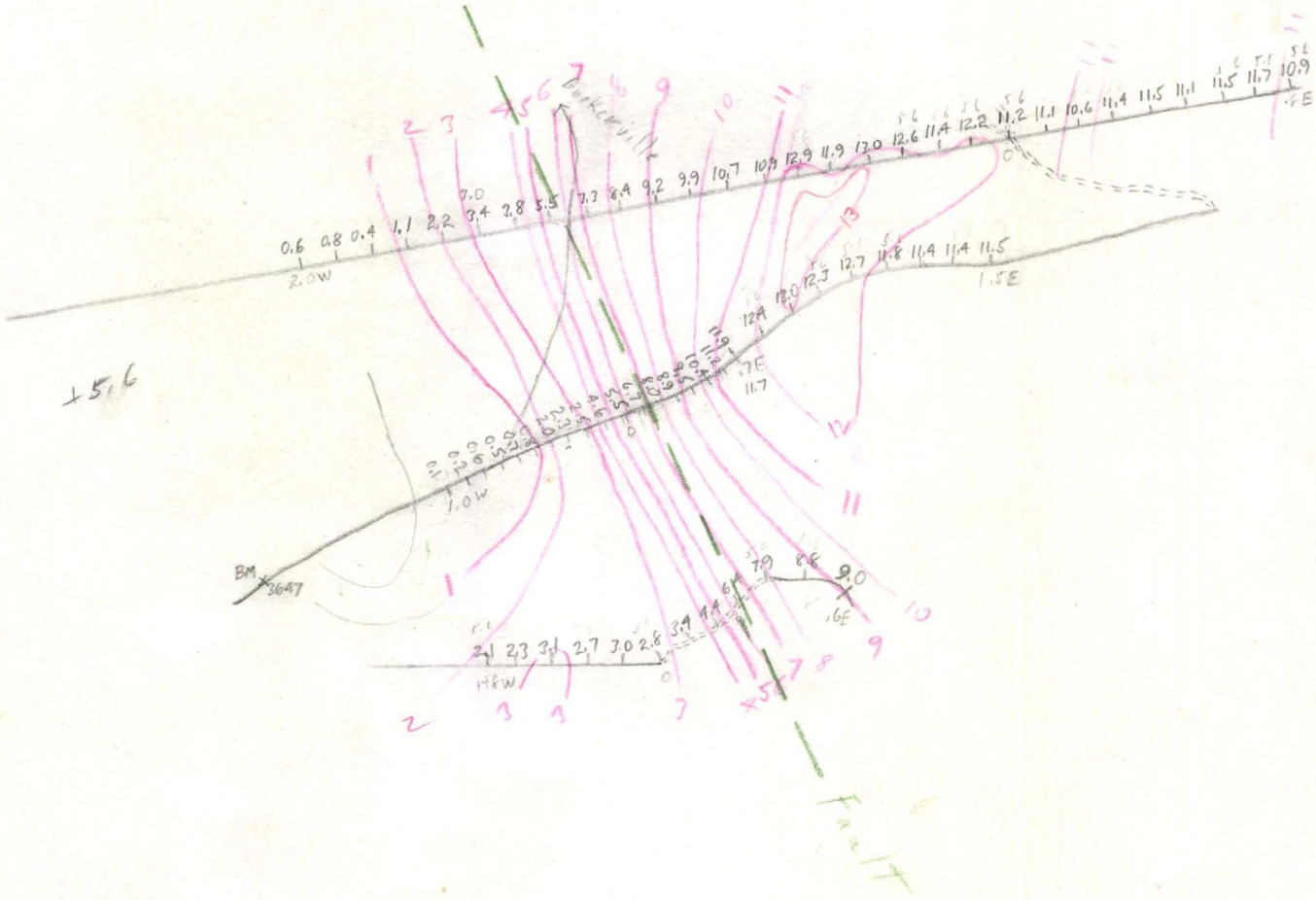
$\rho = 210\ \Omega ft/2\pi$

10 X 10 TO THE INCH 12 5469
NON-REPRODUCIBLE LINES
KEUFFEL & ESSER CO.
MADE IN U.S.A.

Wenner Depth Probe : Line 4



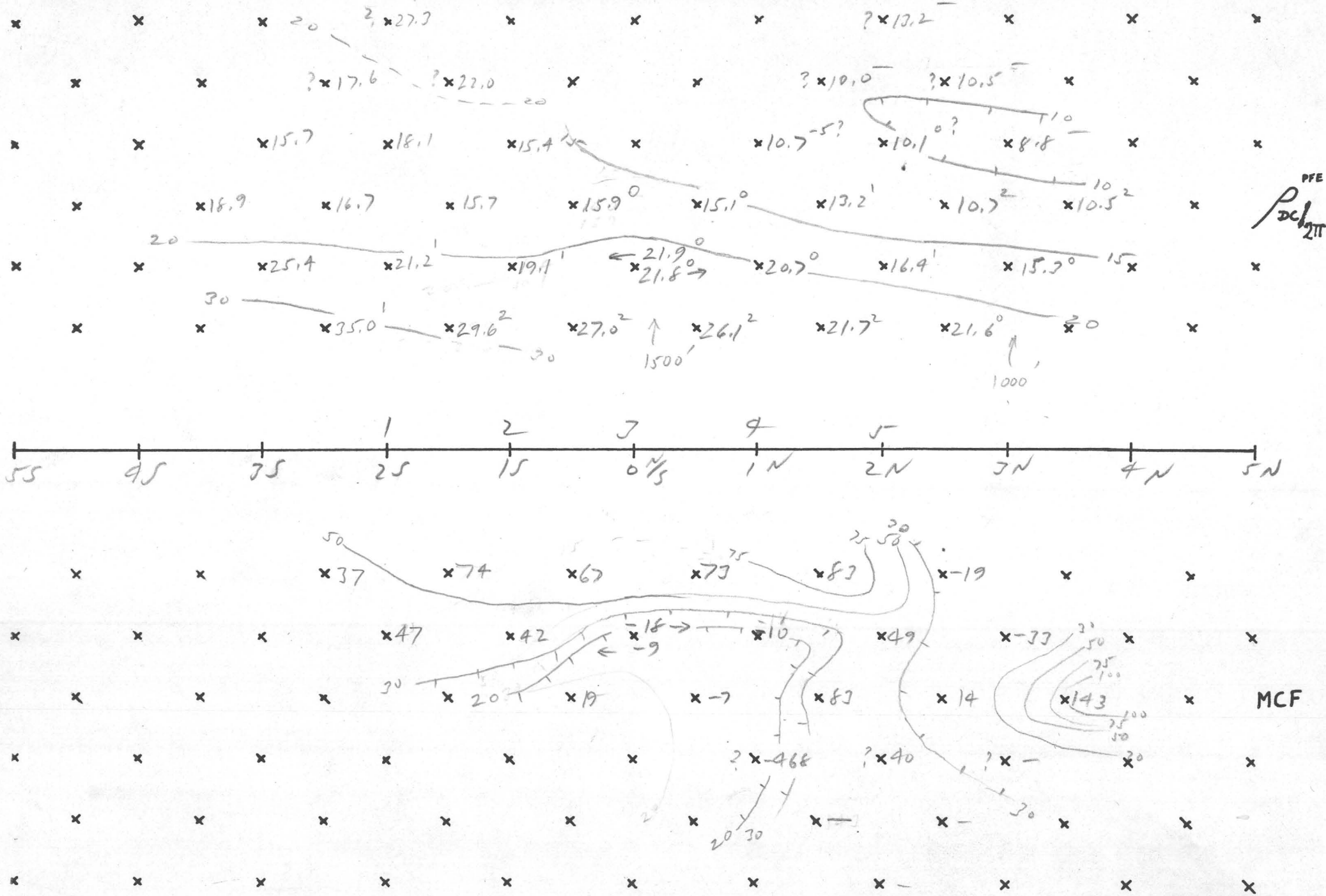
NO. 340R-10 DIETZGEN GRAPH PAPER
10 X 10 PER INCH
EUGENE DIETZGEN CO.
MADE IN U. S. A.



17.5
16.8
16.0
15.1
14.5
13.6
12.3
11.1
10.2
8.1
7.9
7.6
6.4
6.3
6.1
6.2
5.8
5.7

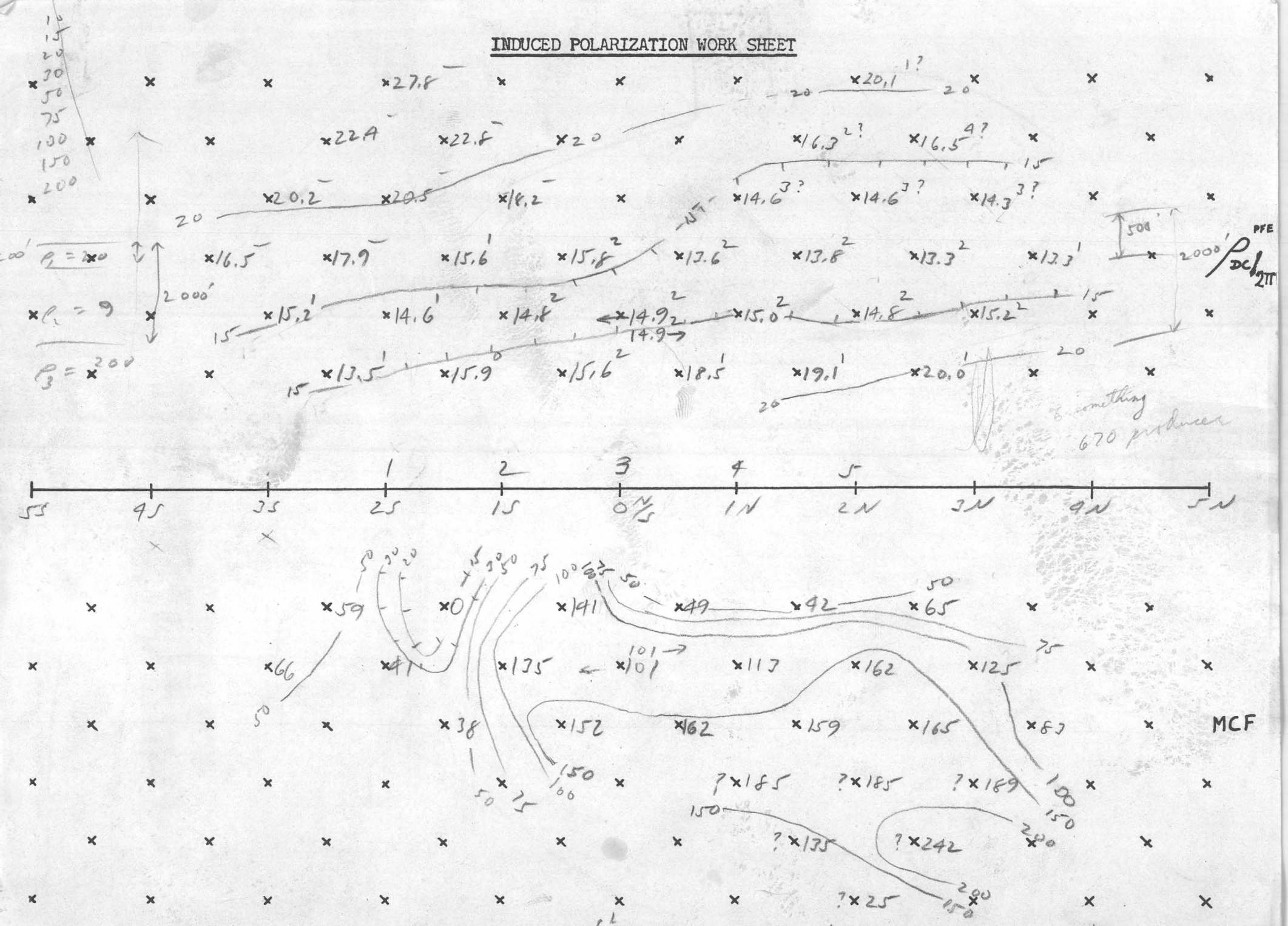
Basement - 3rd layer?

INDUCED POLARIZATION WORK SHEET



Area Falcon Valley - Line 5 - Spr. 1 - N½ Scale 1" = 1000' Date 8/1/63

INDUCED POLARIZATION WORK SHEET



Area Duval - Oracle - Line 1 - Spv. 1 Scale 1" = 1000' Date 7/23/63

1.12 1.10

1.56 1.60

2.68 2.70

1000

$$\frac{a\,n(n+1)(n+2)}{2} = K_n$$

$$K_1 = 3000$$

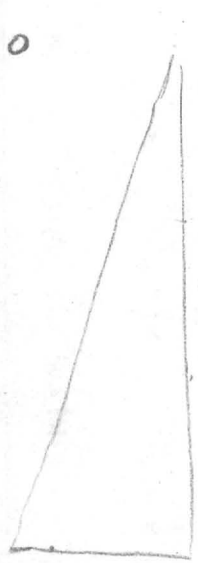
$$\frac{P_2 - 13}{P_2 + 13} = .7$$

$$P_2 = .7P_2 + 9.1$$

22.1

$$.3P_2 = 22.1$$

$$P_2 = \frac{22.1}{.3}$$



$$P_{DL} = \frac{V \times \text{col} \times K_n}{I} =$$

$$\frac{10 \times 3000}{100}$$

9.1

$$\frac{1}{12} + \frac{1}{30} = \frac{1}{P}$$

$$\frac{42}{390}$$

30

$$\frac{P - 30}{P + 30} = -.4$$

$$P - 30 = -.4P - 12$$

$$1.4P = 18$$

$$\frac{100{,}000}{30}$$

3300000

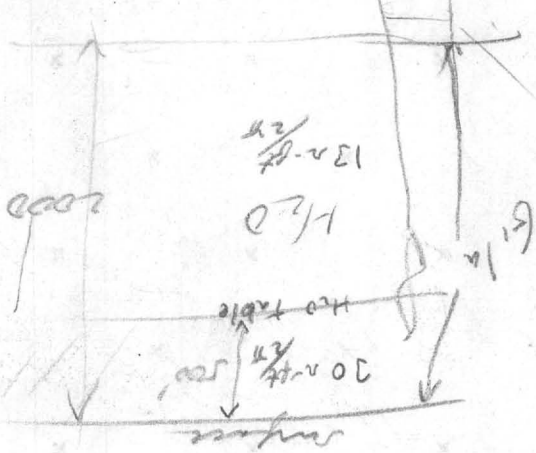
500,000

3000

$$\frac{\log 10^3}{150}$$

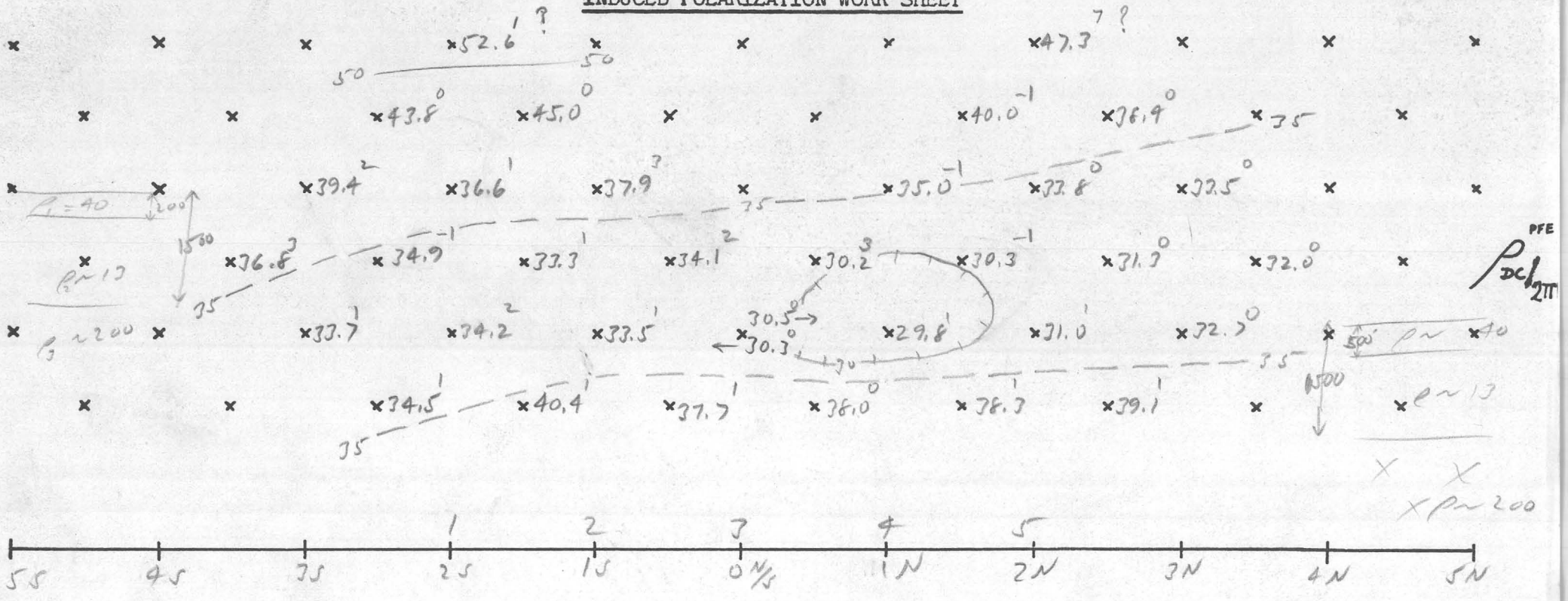
$$\frac{1}{12} \times \frac{1''}{2.54\,cm} \times \frac{144}{12''}$$

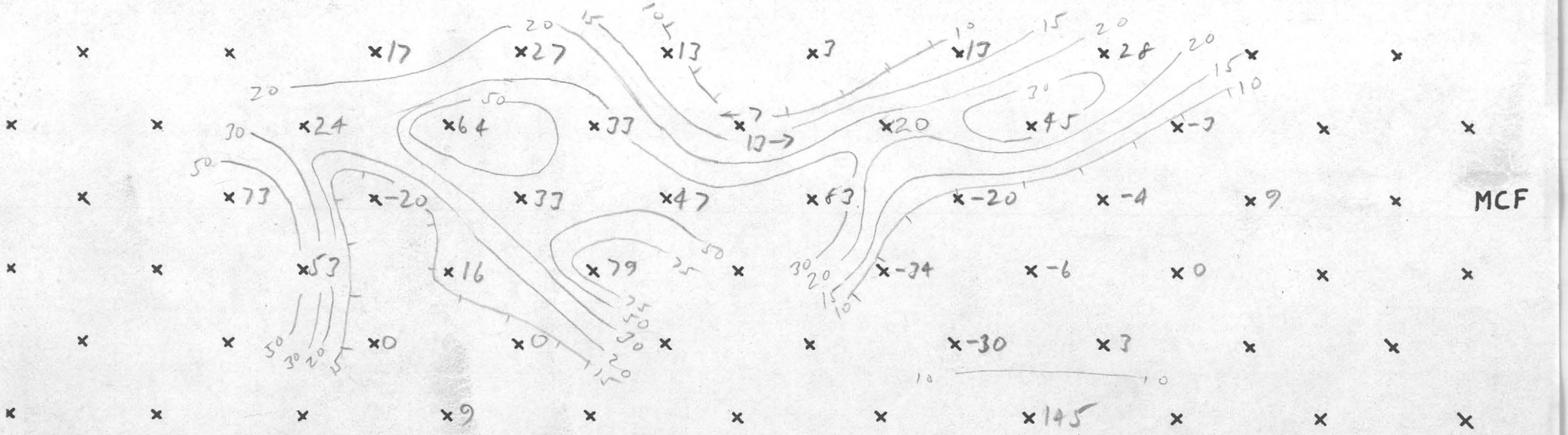
$$10^6 \text{ sq cm}$$



LINE 6

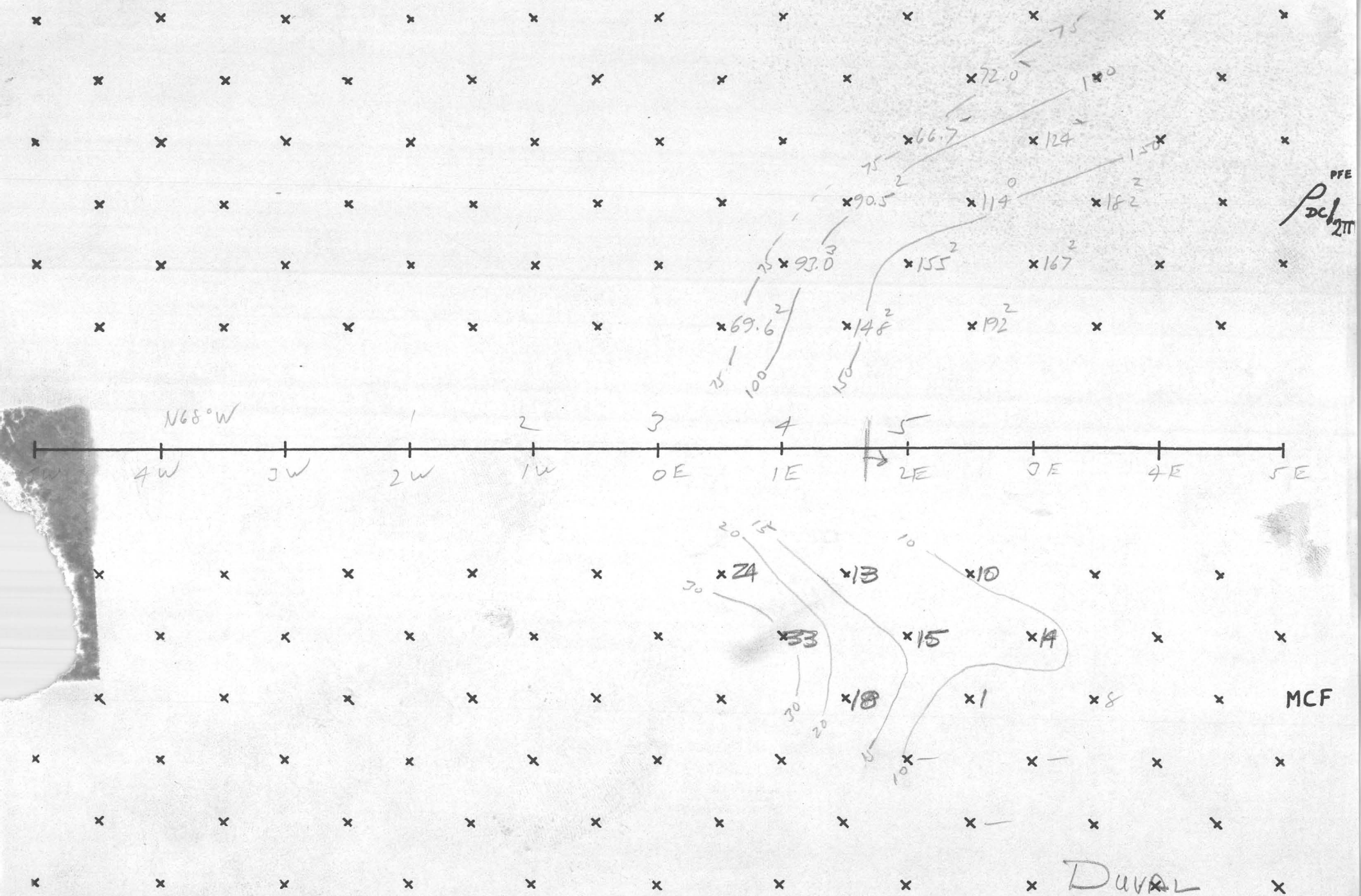
INDUCED POLARIZATION WORK SHEET





Area Falcon Valley Line 6 - Sprl - N & S ½ N30°W Scale 1" = 1000' Date 8/6/63

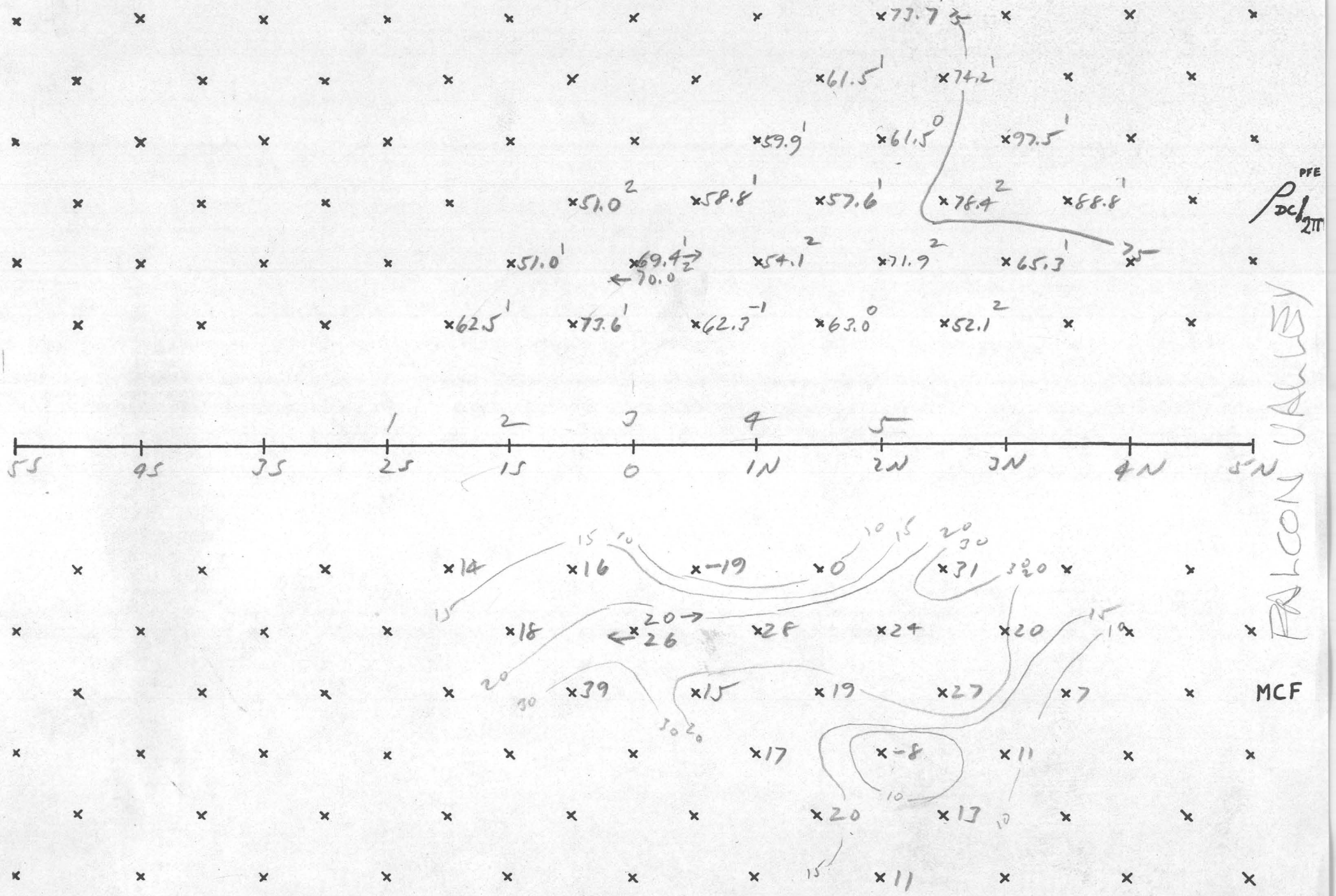
INDUCED POLARIZATION WORK SHEET



Area Duval - Line 2 Spread 1 E½ Scale 1" = 1000' Date 7/24-25/63

DUVAL

INDUCED POLARIZATION WORK SHEET

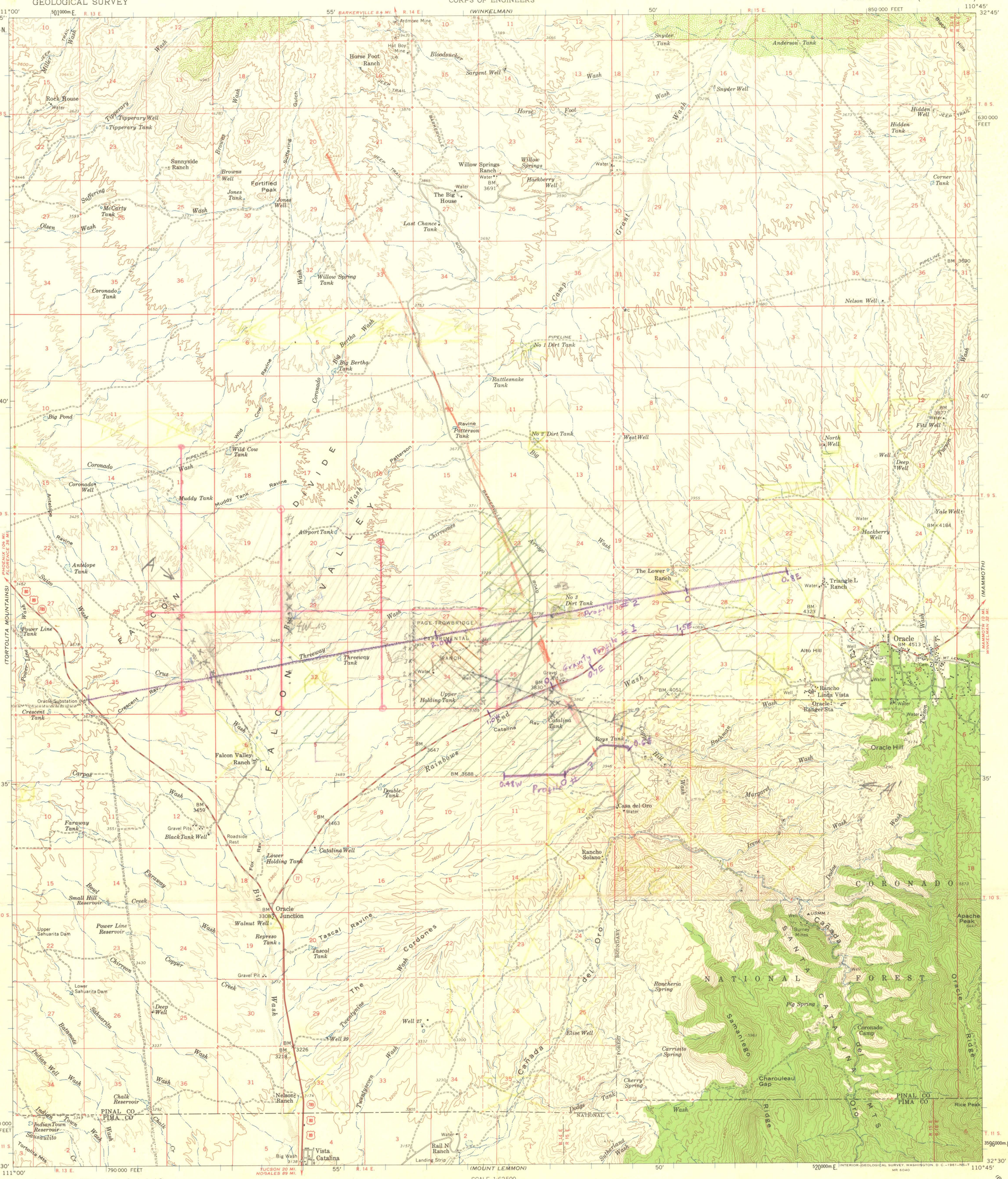


Area Duval - Oracle - Line 3 - Span 1 - N½ Scale 1" = 1000' Date 7/29/83

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

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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.

TRUE NORTH
MAGNETIC NORTH
13½°
APPROXIMATE MEAN DECLINATION, 1959

SCALE 1:62500

1 ½ 0 1 2 3 4 MILES

3000 0 3000 6000 9000 12000 15000 18000 21000 FEET

1 .5 0 1 2 3 4 5 KILOMETERS

CONTOUR INTERVAL 80 FEET
DATUM IS MEAN SEA LEVEL

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

ARIZONA
QUADRANGLE LOCATION

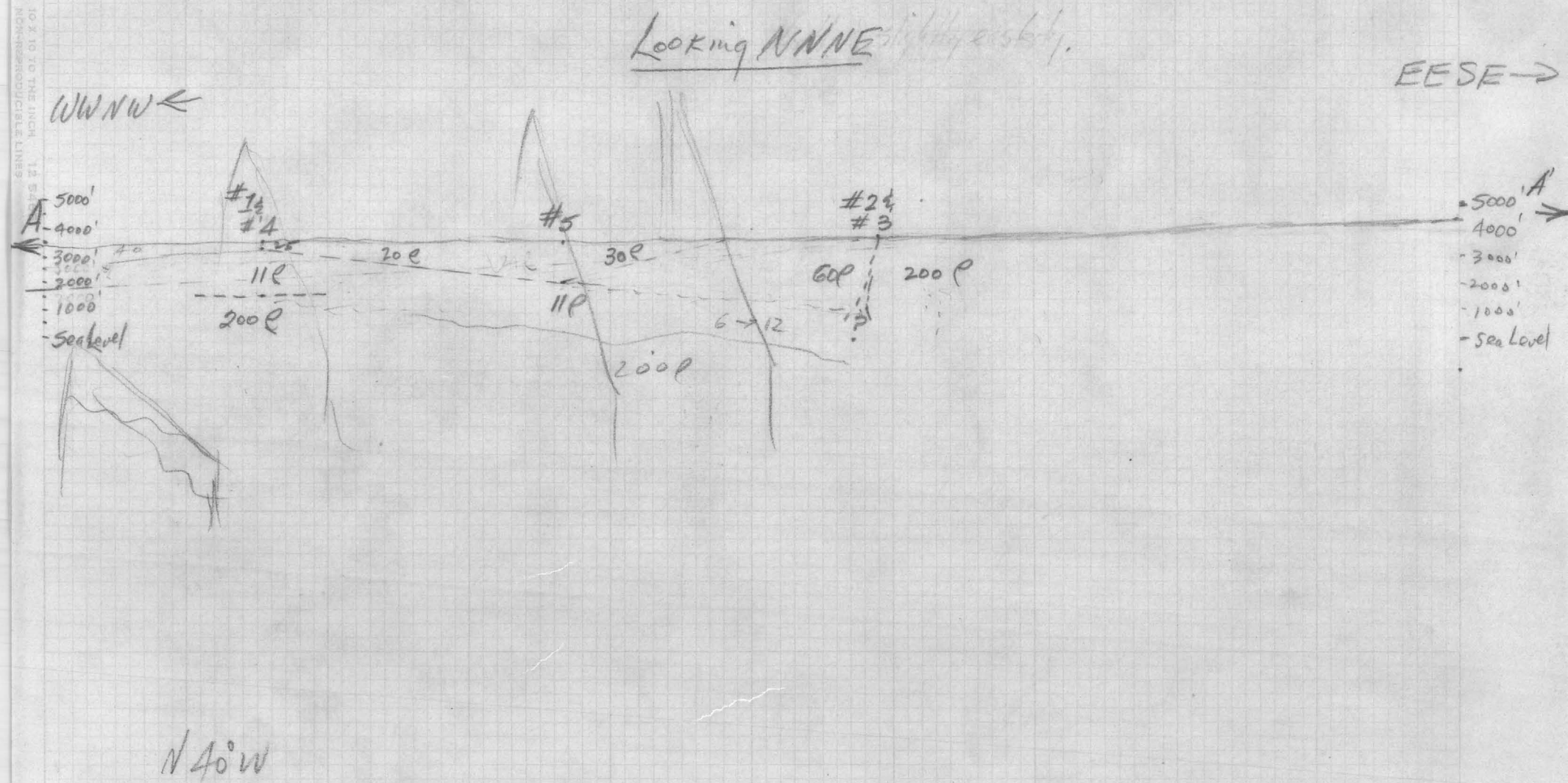
ROAD CLASSIFICATION

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

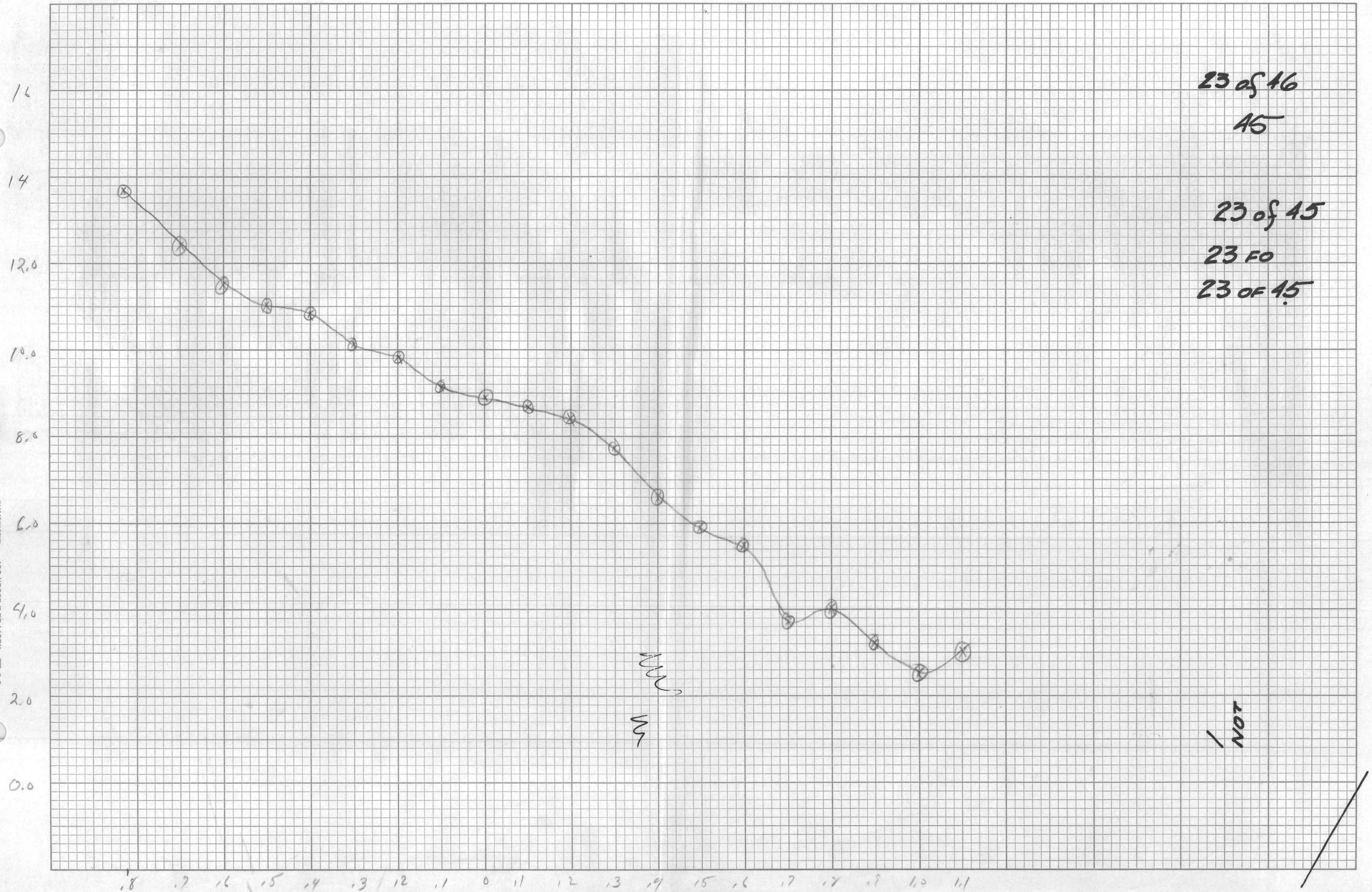
ORACLE, ARIZ.
N3230—W11045/15

1959

INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D. C.—1961—N5—7
MR 6040



Duval
Falcon Valley
8/1/63
C.S.L. - K.H. - W.E.H.



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