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# DATA ON WELLS AND PUMP IRRIGATION

AGRICULTURAL ENGINEERING DEPARTMENT

AGRICULTURAL EXPERIMENT STATION — UNIVERSITY OF ARIZONA

TUCSON, ARIZONA

NAME: Simpson - Mt. Fagan Rnch well Approx 2½ mile N. of Hs ADDRESS: Vail

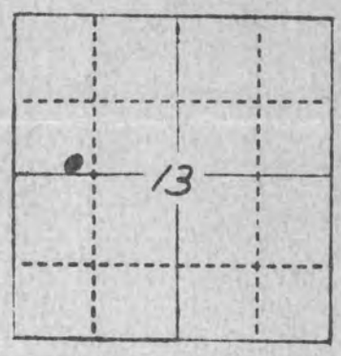
WELL: Location SW NW Sec. 13, Twp. 17S, R 15E

Use, domestic, stock, or irrigation ..... acres

Type drilled Casing see back of sheet

Perforations 6" & 8" pipe perforated under water

Drilled by CWP Date:




El. T.C. = 3363.93 LOG

| FROM Feet | TO Feet | MATERIAL | FROM Feet | TO Feet | MATERIAL |
|---|---|---|---|---|---|
| 0 | 1 | soil | | | |
| 2 | 420 | boulders and gravel and clay | | | Al & or pantano ? |
| 420 | 650 | cemented boulders | | ? | " & / or Bedrock ?? |
| 650 | 700 | gravel and boulders | | | |
| 700 | 720 | cemented gravel, hard | | | |
| 720 | 742 | clay - gravel struck water 725' | | | |
| 742 | 947 | cemented gravel, hard | | | |
| | | | | | |
| | | | | R.J.S. | 701. 9-25-56 |
| | | | | R.J.S. | 702.4 5-29-57 |
| | | | | Crane | 704. 4-22-58 |
| | | | | Crane-Sh.L | 704.4 Feb 59 |
| | | | | | 70 |

WATER LEVEL: Depth from surface when drilled 725 feet. Date

Present depth to water ..... feet. Date

Notes on fluctuation of water level Later rose to 700 feet See W.L. card

PUMP: Make Venson Jack Type Large Size Size

Diam. of bowls ..... Number of stages

Diam. of column 4" Diam. discharge ..... Diam. suction

Rated capacity in G. P. M. ..... at ..... feet head, at ..... R. P. M.

Amount of discharge ..... G. P. M. measured by means of

Drawdown ..... feet when pumping ..... G. P. M. Total lift ..... feet

ENGINE OR MOTOR: Make ..... Type ..... Size ..... H. P.

Drive: direct-connected ..... belted ....., or geared

Fuel consumption or power input

Description of installation

Date: 10/13/59 (Signed) CWP

SEE OTHER SIDE FOR MISCELLANEOUS DATA

T610110

# DATA ON WELLS AND PUMP IRRIGATION

AGRICULTURAL ENGINEERING DEPARTMENT

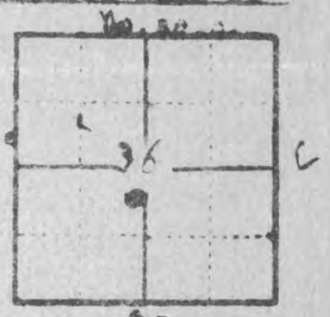
AGRICULTURAL EXPERIMENT STATION — UNIVERSITY OF ARIZONA

TUCSON, ARIZONA

El. 3199.15

NAME: Charles B. Beach — ADDRESS: VAIL ARIZONA

WELL: Location NE SW Sec. 36, Twp. 16S, R. 15E




Use, domestic, stock, or irrigation ..... acres

Type drilled — Casing 604' Casing & 29' Open hole

Perforations .....

Drilled by C. W. Pistor, Con't. — Date March 1927

LOG

| FROM Feet | TO Feet | MATERIAL | FROM Feet | TO Feet | MATERIAL |
|---|---|---|---|---|---|
| 0 | 30 | Sandy clay | | | |
| 30 | 74 | " " | | | |
| 74 | 117 | Clay | | | |
| 117 | 170 | Sandy clay | | | |
| 170 | 198 | Boulders | | | |
| 198 | 230 | Sandy clay | | | |
| 230 | 237 | Clay | | | |
| 237 | 423 | Sandy clay | | | |
| 423 | 430 | Clay | | | |
| 430 | 520 | Sandy clay | | | |
| 520 | 538 | Cemented sand | | | |
| 538 | 572 | Sandy clay | | | |
| 572 | 600 | Water sand | | | |
| 600 | 620 | Porous sand | | | |
| | | | | | |

Partial ???

over

WATER LEVEL: Depth from surface when drilled 562 feet. Date March 1927

Present depth to water ..... feet. Date .....

Notes on fluctuation of water level Jan 1945 - (Note from C. Beach - depth to water 505' - says Pistor wrong in log) — OK RC — CW P was OK RJS

PUMP: Make ..... Type cylinder at 576 Size 2-3/4" x 24"

Diam. of bowls ..... Number of stages .....

Diam. of column 3" — Diam. discharge ..... Diam. suction .....

Rated capacity in G. P. M. ..... at ..... feet head, at ..... R. P. M.

Amount of discharge ..... G. P. M. measured by means of .....

Drawdown ..... feet when pumping ..... G. P. M. Total lift ..... feet

ENGINE OR MOTOR: Make ..... Type ..... Size ..... H. P.

Drive: direct-connected ..... belted ....., or geared .....

Fuel consumption or power input .....

Description of installation Samson Windmill, 18 foot

Date: 1939 — (Signed) Log book of C. W. Pistor

SEE OTHER SIDE FOR MISCELLANEOUS DATA

T610110

# DATA ON WELLS AND PUMP IRRIGATION

AGRICULTURAL ENGINEERING DEPARTMENT

AGRICULTURAL EXPERIMENT STATION
TUCSON, ARIZONA

UNIVERSITY OF ARIZONA

#1 EAST

NAME: Vail Compressor Station ADDRESS: Vail, Arizona

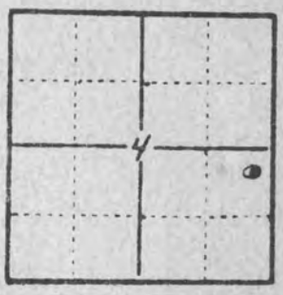
WELL: Location NE4 SE4 Sec. 4 L, Twp. 16 S., R. 15 E.

Use, domestic, stock, or irrigation ..... acres

Type Drilled Casing .....

Perforations .....

Drilled by .....




LOG

| FROM Feet | TO Feet | MATERIAL | FROM Feet | TO Feet | MATERIAL |
|---|---|---|---|---|---|
| 0 | 20 | bouldera gravel | | | |
| 20 | 40 | gravel | | | |
| 40 | 45 | sand | | | |
| 45 | 70 | gravel | | | |
| 70 | 180 | gravel | | | |
| 180 | 235 | gravel | | | |
| 235 | 375 | streaks of clay | | | |
| 375 | | water | | | |
| 375 | 455 | sand, gravel, water | | | |
| 455 | 495 | sand, gravel, clay, water | | | |
| 495 | 505 | clay | | | |
| | | Pantano " | | | |
| | | See other log #2 | | | |

WATER LEVEL: Depth from surface when drilled 375 feet. Date .....

Present depth to water 359 feet. Date S.W.L. at time of test

Notes on fluctuation of water level SEE OVER FOR TEST DATA

PUMP: Make ..... Type ..... Size .....

Diam. of bowls ..... Number of stages .....

Diam. of column ..... Diam. discharge ..... Diam. suction .....

Rated capacity in G. P. M. ..... at ..... feet head, at ..... R. P. M.

Amount of discharge ..... G. P. M. measured by means of .....

Drawdown ..... feet when pumping ..... G. P. M. Total lift ..... feet

ENGINE OR MOTOR: Make ..... Type ..... Size ..... H. P.

Drive: direct-connected ..... belted ..... or geared .....

Fuel consumption or power input .....

Description of installation .....

Date: 7/20/53 (Signed) RJS

SEE OTHER SIDE FOR MISCELLANEOUS DATA

T 61011 D

# INDUCED POLARIZATION SENDER NOTES

Project: Spring Valley Line: 4 Spread 2 S End Date: 3/23/62

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Send | | 2-3 | 1-2 | 3-4 | 2-3 | 1-2 | 4-5 | 3-4 | 2-3 | 1-2 | 4-5 | 3-4 |
| Receive | | 0-750 | → | 750-1500 | → | | 1500-2250 | → | → | → | 2250-3000 | |
| Time | | 1343 | 1346 | 1403 | 1408 | 1414 | 1436 | 1440 | 1446 | 1450 | 1512 | 1517 |
| Range | Varies → | 150<br>2.0 | 150 | 165 | 150 | 150 | 170 | 152 | 155 | 155 | 160 | 165 |
| Current | | 1830<br>1830 | 1840<br>1835 | 1805<br>1805 | 1825<br>1820 | 1810<br>1805 | 1790<br>1790 | 1785<br>1780 | 1780<br>1780 | 1780<br>1775 | 1750<br>1745 | 1760<br>1750 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Send | 2-3 | 1-2 | 4-5 | 3-4 | 2-3 | 12 | Cal | 4-5 | | | | |
| Receive | → | → | 3000-3750 | → | | | 750 | → | → | → | → | |
| Time | 1520 | 1525 | 1538 | 1543 | 1546 | 1554 | 1325 | 1327 | 1329 | 1608 | 1613 | 1616 |
| Range | 152<br>2.0 | 152 | 163 | 160 | 160 | 150 | .30 | .20 | .50 | .20 | .30 | .50 |
| Current | 1760<br>1760 | 1760<br>1760 | 1745<br>1735 | 1750<br>1745 | 1755<br>1750 | 1750<br>1745 | 275<br>275 | 190<br>195 | 530<br>530 | 185<br>185 | 280<br>280 | 505<br>505 |

?

INDUCED POLARIZATION - RECEIVER NOTES PAGE 1

Project: Spr. Valley H2O Line: 4-Spread 2-S Int.Cal .53+ Date: 3/23/62

| 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. | 4-5 → | | 5-6S | → | | | | | | | | |
| Time | 13:43 | 13:46 | 14:03 | 14.08 | 14:14 | 14:36 | 14:40 | 14:45 | 14:50 | 15:13 | 15:27 | |
| DC-1 | 17.7<br>17.8 | 3.4<br>3.45 | 20.1<br>19.7 | 3.55<br>3.55 | 1.02<br>1.00 | 20.0<br>20.2 | 3.95<br>3.90 | 1.02<br>1.08 | 0.42<br>0.42 | 4.60<br>4.60 | 1.13<br>1.16 | 0.39 |
| DC-2 | 17.8<br>17.7 | 3.45<br>3.40 | 19.4<br>20.1 | 3.55<br>3.55 | 1.00<br>1.02 | 19.8<br>19.7 | 3.75<br>3.70 | 0.94<br>0.92 | 0.33<br>0.32 | 4.60<br>4.60 | 1.15<br>1.16 | 0.39 |
| Σ | 35.5<br>35.5 | 6.85<br>6.85 | 39.5<br>39.8 | 7.10<br>7.10 | 2.02<br>2.02 | 39.8<br>39.9 | 7.70<br>7.60 | 1.96<br>2.00 | .75<br>.74 | 9.20<br>9.20 | 2.28<br>2.32 | .78 |
| DC-3 | 17.7<br>17.9 | 3.45<br>3.40 | 19.7<br>20.2 | 3.55<br>3.50 | 1.00<br>" | 19.8<br>19.8 | 3.95<br>3.95 | 0.98<br>0.98 | 0.43<br>0.40 | 4.65<br>4.65 | 1.17<br>1.17 | 0.39 |
| Dc-4 | 17.9<br>17.7 | 3.40<br>3.45 | 19.8<br>19.5 | 3.50<br>3.60 | 1.00<br>" | 20.3<br>20.3 | 3.70<br>3.70 | 0.98<br>0.98 | 0.30<br>0.35 | 4.55<br>4.55 | 1.15<br>1.14 | 0.39 |
| Σ | 35.6<br>35.6 | 6.85<br>6.85 | 39.5<br>39.7 | 7.05<br>7.10 | 2.00<br>2.00 | 40.1<br>40.1 | 7.65<br>7.65 | 1.96<br>1.96 | .73<br>.75 | 9.20<br>9.20 | 2.32<br>2.31 | .78 |
| DC-AV | 35.55 | 6.85 | 39.6 | 7.09 | 2.01 | 40.0 | 7.67 | 1.97 | .742 | 9.20 | 2.31 | .78 |
| AC-1 | 17.5 | 3.40 | 19.2 | 3.55 | 1.02 | 18.7 | 3.65 | 0.95 | 0.37 | 4.65 | 1.16 | 0.40 |
| AC-2 | ✓" | " | 19.2 | " | " | " | " | ✓ | ✓ | 4.65 | 1.16 | ✓ |
| Σ | 35.0 | 6.80 | 38.4 | 7.10 | 2.04 | 37.4 | 7.30 | 1.90 | .74 | 9.30 | 2.32 | .80 |
| S. P. | +1.6 | | +11.0 | | +10.6 | +1.0 | | | +1.0 | | | |
| AC-N | 0.06 | | | | 0.07 | | | | 0.07 | | | |
| | | | | | | | | | | | | |

INDUCED POLARIZATION - RECEIVER/NOTES PAGE 2

Project: Spray Valley H20 Line: 4-Spread 2-S Int.Cal 53.5 / 53.0 Date: 3/23/02

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Slend | 1-2 | 4-5 | 3-4 | 2-3 | 1-2 | 0.3 | 0.2 | 0.5 | 0.2 | 0.3 | 0.5 | |
| Rec. | | | | | | 4-5 | | | | | | |
| Time | 15:22 | | | | | 13:25 | 13:27 | 13:29 | 16:08 | 16:12 | 16:16 | |
| DC-1 | 0.20 | 1.34 | 0.41 | 0.18 | 0.125 | 14.7<br>14.7 | 10.0<br>10.1 | 28.5<br>28.5 | 10.0 | 15.1 | ~~28.0~~ | Cold? |
| DC-2 | 0.20 | 1.34 | 0.41 | 0.18 | 0.125 | 14.7<br>14.7 | 10.1<br>10.0 | 28.5<br>28.5 | 10.0 | " | 27.5 | |
| Σ | .40 | 2.68 | .81 | .36 | .25 | 29.4 | 20.1 | 57.0 | 20.0 | 30.2 | 55.0 | |
| DC-3 | 0.20 | 1.34 | 0.41 | 0.18 | 0.125 | | | | | | 27.5 | |
| Dc-4 | 0.20 | 1.34 | 0.41 | 0.18 | 0.125 | | | | | | 27.5 | |
| Σ | .40 | 2.68 | .81 | .36 | .25 | | | | | | | |
| DC-AV | .40 | 2.68 | .81 | .36 | .25 | 29.4 | 20.1 | 57.0 | 20.0 | 30.2 | 55.0 | |
| AC-1 | 0.19 | 1.36 | 0.42 | 0.20 | 0.125 | 14.7 | 10.1 | 28.5 | 9.9 | 15.25 | 28.5 | |
| AC-2 | " | " | " | " | " | " | " | " | " | " | | |
| Σ | .38 | 2.72 | .84 | .40 | .25 | 29.4 | 20.2 | 57.0 | 19.8 | 30.5 | 57.0 | |
| S. P. | +1.4 | +2± | -2.6 | -3.1 | -2.9 | | | | | | | |
| AC-N | 0.06 | | | | 0.05 | | | | | | | |
| | | | | | | | | | | | | |

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project Spring Valley Line 4-Spr 2-5½ Field date 3/23/62 Data page_____ Comp. date 3/24/62. Comp by C.S.L.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (A) Send | 4-5 | 2-3 | 1-2 | 3-4 | 2-3 | 1-2 | 4-5 | 3-4 | 2-3 | 1-2 | 4-5 | 3-4 |
| (B) Receive | CAL | .75-1.50S | → | 1.50-2.25S | → | → | 2.25-3.00S | → | → | → | 3.00-3.75S | → |
| (C) n separation | | 1 | 2 | 1 | 2 | 3 | 1 | 2 | 3 | 4 | 2 | 3 |
| (D) I | | 1830 | 1837 | 1805 | 1822 | 1807 | 1790 | 1782 | 1780 | 1777 | 1747 | 1755 |
| (E) Vdc (avg) | | 35.55 | 6.85 | 39.6 | 7.09 | 2.01 | 40.0 | 7.67 | 1.97 | .742 | 9.20 | 2.31 |
| (F) DCcal USED | .925 | | | | | | | | | | | |
| (G) Kn x $10^{-3}$ a=750' | | 2.25 | 9.00 | 2.25 | 9.00 | 22.5 | 2.25 | 9.00 | 22.5 | 45.0 | 9.00 | 22.5 |
| (H) $\rho$ dc=ExFxGx$10^3$/D | | 40.4 | 31.0 | 45.6 | 32.4 | 23.2 | 46.5 | 35.9 | 23.0 | 17.4 | 43.8 | 27.4 |
| (I) Vac $\Sigma$ | | 35.0 | 6.80 | 38.4 | 7.10 | 2.04 | 37.4 | 7.30 | 1.90 | .74 | 9.20 | 2.32 |
| (J) AC noise x 2 | | .12 | .12 | .14 | .14 | .14 | .14 | .14 | .14 | .14 | .12 | .12 |
| (K) Vac(corr) = $\sqrt{I^2 - J^2}$ | | 35.0 | 6.80 | 38.4 | 7.10 | 2.04 | 37.4 | 7.30 | 1.90 | .725 | 9.20 | 2.32 |
| (L) AC-DC cal. USED | 1.005 | | | | | | | | | | | |
| (M) $\rho$ dc/$\rho$ac=ExL/K | | 1.020 | 1.012 | 1.038 | 1.003 | .990 | 1.073 | 1.057 | 1.042 | 1.029 | [illegible] | 1.001 |
| (N) PFE=(M-1)($10^2$) | | 2 | 1 | 4 | 0 | -1 | 7 | 6 | 4 | 3 | [illegible] | 0 |
| (O) MCF=(M-1)($10^5$)/H | | 49 | 39 | 83 | 9 | -43 | 157 | 159 | 183 | 167 | -11 | 4 |

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (A) Send | 2-3 | 1-2 | 4-5 | 3-4 | 2-3 | 1-2 | 4-5 | → | → | → | → | → |
| (B) Receive | → | → | 3.75-4.50S | → | → | → | CAL | → | → | → | → | → |
| (C) n separation | 4 | 5 | 3 | 4 | 5 | 6 | | | | | | |
| (D) I | 1760 | 1760 | 1740 | 1747 | 1752 | 1747 | 275 | 195 | 570 | 185 | 280 | 505 |
| (E) Vdc (avg) | .78 | .40 | 2.68 | .81 | 36 | .25 | 29.4 | 20.1 | 57.0 | 20.0 | 30.2 | 55.0 |
| (F) DCcal | | | | | | | .935 | .970? | .930 | .925 | .927 | .920 |
| (G) Kn x $10^{-3}$ | 45.0 | 78.75 | 22.5 | 45.0 | 78.75 | 126 | | | ~.925 | | | |
| (H) $\rho$ dc=ExFxGx$10^3$/D | 18.4 | 16.5 | 32.1 | 19.7 | 15.0 | 16.7 | | | | | | |
| (I) Vac $\Sigma$ | .80 | .38 | 2.72 | .84 | .40 | .25 | 29.4 | 20.2 | 57.0 | 19.8 | 30.5 | 57.0 |
| (J) AC noise x 2 | .12 | .12 | .10 | .10 | .10 | .10 | | | | | | |
| (K) Vac (corr) = $\sqrt{I^2 - J^2}$ | .791 | .361 | 2.72 | .835 | .387 | .229 | | | | | | |
| (L) AC-DC cal. | | | | | | | 1.000 | 1.005 | 1.000 | .990 | 1.010 | 1.037 |
| (M) $\rho$dc/$\rho$ac =ExL/K | .990 | 1.113 | .990 | .975 | .936 | 1.098 | | | | | | |
| (N) PFE=(M-1)($10^2$) | -1 | 11 | -1 | -2 | -6 | 10 | | | | | | |
| (O) MCF=(M-1)($10^5$)/H | -54 | 685 | -31 | -130 | -426 | 587 | | | | | | |

# INDUCED POLARIZATION SENDER NOTES

Project: Spring Valley Line: 4 Spread #2 N End Date: 3/23/62

| Send | | 3-4 | 4-5 | 2-3 | 3-4 | 4-5 | 1-2 | 2-3 | 3-4 | 4-5 | 1-2 | 2-3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Receive | | 0-750 | → | 750-1500 | | → | 1500-2250 | | → | | 2250-3000 | |
| Time | | 915 | 921 | 9:45 | 951 | 954 | 10:12 | 10:15 | 10:18 | 1023 | 1045 | 1048 |
| Range | Variation Settle | → 2.0 | 172 | 160 | 160 | 170 | 170 | 170 | 170 | 170 | 170 | 160 → |
| Current | | 1855 1855 | 1850 1850 | 1835 1840 | 1835 1835 | 1820 1820 | 1820 1825 | 1825 1825 | 1810 1810 | 1800 1795 | 1765 1765 | 1760 1760 |

| Send | 3-4 | 4-5 | 1-2 | 2-3 | 3-4 | 4-5 | Cal | 1-2 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Receive | → | | 3000-3750 | | | → | 750 | → | | 1500 | → | |
| Time | 1052 | 1055 | 1117 | 1122 | 1126 | 1129 | 9:00 | 9:02 | 9:05 | 1158 | 1206 | 1202 |
| Range | 180 2.0 | 180 | 190 | 160 | 160 | 170 → | .50 | .75 | 1.0 | .50 | .75 | 1.0 |
| Current | 1750 1745 | 1730 1730 | 1750 1750 | 1745 1745 | 1725 1725 | 1710 1710 | 535 540 | 690 685 | 1070 1075 | 510 510 | 605 605 | 1020 1035 |

Ω | 1-2 = 125 | 2-3 = 150 | 3-4 = 160 | 4-5 = 180

INDUCED POLARIZATION - RECEIVER NOTES PAGE 1

Project: Spring Valley Hill Line: Line 4 Spread 2N Int.Cal 53+ Date: 3/23/62

| 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 | → | 0-1 | — | — | 0-1N | — | — | → | 1N-2N | — | — |
| Time | 9:15 | 9:21 | 9:45 | 9:51 | 9:54 | 10:12 | 10:15 | 10:18 | 10:23 | 10:45 | 10:48 | 10:52 |
| DC-1 | 14.7<br>14.7 | 6.8<br>6.6 | 12.3<br>12.3 | 2.75<br>2.65 | 0.97<br>0.90 | 11.3<br>11.3 | 2.45<br>2.45 | 0.83<br>0.83 | 0.38<br>0.38 | 2.30<br>2.30 | 0.78<br>0.78 | 0.36<br>0.40 |
| DC-2 | 14.6<br>14.8 | 6.6<br>6.8 | 12.3<br>12.3 | 2.65<br>2.75 | 0.90<br>1.00 | 11.5<br>11.5 | 2.35<br>2.35 | 0.84<br>0.83 | 0.38<br>0.36 | 2.35<br>2.35 | 0.78<br>0.78 | 0.38<br>0.32 |
| Σ | 29.3<br>29.4 | 13.4<br>13.4 | 24.6<br>24.6 | 5.40<br>5.40 | 1.87<br>1.90 | 22.8<br>22.8 | 4.80<br>4.80 | 1.67<br>1.66 | .76<br>.74 | 4.65<br>4.65 | 1.56<br>1.56 | .74<br>.72 |
| DC-3 | 14.7<br>14.6 | 6.6<br>6.0 | 12.3<br>12.3 | 2.70<br>2.70 | 0.95<br>0.97 | 11.3<br>11.5 | 2.40<br>2.40 | 0.85<br>0.82 | 0.36<br>0.40 | 2.35<br>2.30 | 0.82<br>0.76 | 0.36<br>0.37 |
| Dc-4 | 14.8<br>14.8 | 7.0<br>6.5 | 12.3<br>12.3 | 2.75<br>2.75 | 0.96<br>0.91 | 11.5<br>11.3 | 2.40<br>2.40 | 0.82<br>0.84 | 0.38<br>0.34 | 2.30<br>2.35 | 0.76<br>0.82 | 0.38<br>0.37 |
| Σ | 29.3<br>29.4 | 13.5<br>13.5 | 24.6<br>24.6 | 5.45<br>5.45 | 1.91<br>1.88 | 22.8<br>22.8 | 4.80<br>4.80 | 1.67<br>1.66 | .74<br>.74 | 4.65<br>4.65 | 1.58<br>1.58 | .75<br>.74 |
| DC-AV | 29.4 | 13.48 | 24.6 | 5.43 | 1.89 | 22.8 | 4.80 | 1.665 | .743 | 4.65 | 1.57 | .73 |
| AC-1 | 14.5 | 6.7 | 12.2 | 2.73 | 0.95 | 11.4 | 2.40 | 0.84 | 0.39 | 2.35 | 0.79 | 0.37 |
| AC-2 | 14.5 | 6.6 | " | 2.74 | 0.94 | 11.4 | 2.40 | 0.84 | 0.38 | 2.35 | 0.78 | 0.37 |
| Σ | 29.0 | 13.3 | 24.4 | 5.47 | 1.89 | 22.8 | 4.80 | 1.68 | .77 | 4.70 | 1.57 | .74 |
| S. P. | +0.4 | +0.4 | -2.35 | — | -2.6 | +15.2 | — | — | — | -8.8 | — | — |
| AC-N | 0.08 | 0.07 | — | — | — | — | — | — | — | 0.08 | — | — |

INDUCED POLARIZATION - RECEIVER NOTES PAGE 2

Project: Spr. Valley H2O Line: Line 4 Spr 2N Int.Cal 53.5 / 53.5 Date: 3/20

| Send | 4-5 | 1-2 | 2-3 | 3-4 | 4-5 | 0.3 | 0.5 | 0.75 | 1.0 | 0.50 | 0.75 | 1.0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rec. | 1N-2N | 2N-3N | | | | 1-2 | | | | | | |
| Time | 10:55 | 11:17 | 11:22 | 11:26 | 11:29 | 8:55 | 9:00 | 9:02 | 9:05 | 11:58 | 12:00 | 12:03 |
| DC-1 | 0.20<br>0.20 | 0.76<br>0.73 | 0.35<br>0.36 | 0.20<br>0.20 | 0.13<br>0.13 | 15.4<br>15.4 | 27.5<br>27.5 | 35.5<br>35.5 | 56.5<br>55.5 | 28.8<br>28.8 | 35.5<br>35.5 | 56.2<br>56.2 |
| DC-2 | 0.21<br>0.21 | 0.74<br>0.77 | 0.34<br>0.33 | 0.20<br>0.20 | 0.13<br>0.13 | 15.4<br>15.4 | 27.5<br>27.5 | 35.5<br>35.5 | 56.5<br>56.5 | 27.8<br>27.8 | "<br>" | 56.3<br>56.3 |
| Σ | .41<br>.41 | 1.50<br>1.50 | .69<br>.69 | .40<br>.40 | .26<br>.26 | [illegible] | 55 | 71.0 | 113.0 | 55.6 | 71.0 | 112.6 |
| DC-3 | 0.20<br>0.20 | 0.77<br>0.73 | 0.34<br>0.35 | 0.20<br>0.20 | 0.13<br>0.13 | | | | | | | |
| Dc-4 | 0.20<br>0.20 | 0.77<br>0.77 | 0.35<br>0.34 | 0.20<br>0.20 | 0.13<br>0.13 | | | | | | | |
| Σ | .40<br>.40 | 1.50<br>1.50 | .69<br>.69 | .40<br>.40 | .26<br>.26 | 30.8 | | | | | | |
| DC-AV | .405 | 1.50 | .69 | .40 | .26 | 30 | 55.0 | 71.0 | 113.0 | 55.6 | 71.0 | 112.6 |
| AC-1 | 0.21 | 0.76 | 0.34 | 0.20 | 0.13 | Switch | 28.5 | 36.5 | 57.0 | 28.3 | 36.3 | 57.0 |
| AC-2 | 0.21 | 0.76 | 0.34 | 0.20 | 0.13 | " | 28.5 | 36.5 | 57.0 | " | " | " |
| Σ | .42 | 1.52 | .68 | .40 | .26 | | 57.0 | 73.0 | 114.0 | 56.6 | 72.6 | 114.0 |
| S. P. | -8.8 | +2.7 | | | +2.7 | | | | | | | |
| AC-N | 0.07 | | | | 0.05 | | | | | | | |

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project Spring Valley Line 4 - Spr 2 - Nt Field date 3/23/62 Data page_____ Comp. date 3/24/62 . Comp by C. S. L.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (A) Send | 1-2 | 3-4 | 4-5 | 2-3 | 3-4 | 4-5 | 1-2 | 2-3 | 3-4 | 4-5 | 1-2 | 2-3 |
| (B) Receive | CAL | .25-1.50N | → | 1.50-1.25N | → | → | 2.25-2.00N | → | → | → | 2.00-2.25N | → |
| (C) n separation | | 1 | 2 | 1 | 2 | 3 | 1 | 2 | 3 | 4 | 2 | 3 |
| (D) I | | 1855 | 1850 | 1838 | 1835 | 1820 | 1823 | 1825 | 1810 | 1798 | 1765 | 1760 |
| (E) Vdc (avg) | | 29.4 | ((6.74)) | 24.6 | 5.43 | 1.89 | 22.8 | 4.80 | 1.655 | 0.743 | 4.65 | 1.57 |
| (F) DCcal USED | .925 | | | | | | | | | | | |
| (G) Kn x $10^{-3}$ | | 2.25 | 9.00 | 2.25 | 9.00 | 22.5 | 2.25 | 9.00 | 22.5 | 45.0 | 9.00 | 22.5 |
| (H) $\rho$ dc=ExFxGx$10^3$/D | | 33.0 | ((30.3)) | 27.9 | 24.6 | 21.6 | 26.0 | 21.9 | 18.2 | 17.2 | 21.9 | 18.6 |
| (I) Vac $\Sigma$ | | 29.0 | ((6.65)) | 24.4 | 5.47 | 1.89 | 22.5 | 4.50 | 1.68 | .73 | 4.70 | 1.57 |
| (J) AC noise x 2 | | .16 | .16 | .16 | .16 | .16 | .16 | .16 | .16 | .16 | .16 | .14 |
| (K) Vac(corr) = $\sqrt{I^2 - J^2}$ | | 29.0 | ((6.65)) | 24.4 | 5.47 | 1.89 | 22.5 | 4.50 | 1.68 | .753 | 4.70 | 1.57 |
| (L) AC-DC cal. USED | 1.020 | | | | | | | | | | | |
| (M) $\rho$ dc/$\rho$ac=ExL/K | | 1.035 | ((1.034)) | 1.030 | 1.013 | 1.020 | 1.020 | 1.020 | 1.011 | 1.008 | 1.010 | 1.020 |
| (N) PFE=(M-1)($10^2$) | | 4 | ((3)) | 3 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 2 |
| (O) MCF=(M-1)($10^5$)/H | | 106 | ((112)) | 107 | 53 | 93 | 77 | 91 | 57 | 46 | 46 | 107 |

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (A) Send | 3-4 | 4-5 | 1-2 | 2-3 | 3-4 | 4-5 | | | | | | |
| (B) Receive | → | → | 3.75-4.50N | → | → | → | | | | | | |
| (C) n separation | 4 | 5 | 3 | 4 | 5 | 6 | | | | | | |
| (D) I | 1748 | 1730 | 1750 | 1745 | 1725 | 1710 | 538 | 688 | 1073 | 510 | 405 | 1070 |
| (E) Vdc (avg) | 0.73 | 0.405 | 1.50 | 0.69 | 0.40 | 0.26 | 55.0 | 71.6 | 113.0 | 55.6 | 71.6 | 112.6 |
| (F) DCcal | | | | | | | .979 | .969 | .950 | .919 | .853 | .916 |
| (G) Kn x $10^{-3}$ | 45.0 | 78.75 | 22.5 | 45.0 | 78.75 | 126 | | USE | .925 | | | |
| (H) $\rho$ dc=ExFxGx$10^3$/D | 16.4 | 17.1 | 17.8 | 16.5 | 16.9 | 17.8 | | | | | | |
| (I) Vac $\Sigma$ | .74 | .42 | 1.52 | .68 | .40 | .26 | 57.0 | 73.0 | 114.0 | 56.6 | 72.6 | 114.0 |
| (J) AC noise x 2 | .14 | .14 | .10 | .10 | .10 | .10 | | | | | | |
| (K) Vac (corr) = $\sqrt{I^2 - J^2}$ | 0.726 | 0.396 | 1.52 | 0.672 | 0.387 | 0.24 | | | | | | |
| (L) AC-DC cal. | | | | | | | 1.037 | 1.029 | 1.009 | 1.018 | 1.022 | 1.012 |
| (M) $\rho$dc/$\rho$ac =ExL/K | 1.026 | 1.043 | 1.008 | 1.048 | 1.053 | 1.106 | | | | | | |
| (N) PFE=(M-1)($10^2$) | 3 | 4 | 1 | 5 | 5 | 11 | | | ~1.020 | | | |
| (O) MCF=(M-1)($10^5$)/H | 158 | 251 | 45 | 291 | 314 | 596 | | | | | | |

# INDUCED POLARIZATION SENDER NOTES

Project: Spring Valley Line: 4 Spread #1 S- end Date: 3/22/68

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Send | | 2-3 | 1-2 | 4-3 | 2-3 | 1-2 | 4-5 | 3-4 | 2-3 | 1-2 | 5-4 | 3-4 |
| Receive | | 0-750 → | | 750-1500 → | | | 1500-2250 → | | | | 2250-3000 | |
| Time | | 1319 | 1323 | 1338 | 1341 | 1345 | 1358 | 1405 | 1410 | 1413 | 1439 | 1444 |
| Range | | 2.0 | 220 → | 220 | 220 | 220 | 220 → | 220 | 220 | 220 | 220 | 200 → |
| Current | | 1745<br>1750 | 1750<br>1750 | 1755<br>1760 | 1760<br>1760 | 1750<br>1750 | 1750<br>1750 | 1755<br>1750 | 1750<br>1750 | 1735<br>1735 | 1735<br>1730 | 1730<br>1725 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Send | 2-3 | 1-2 | 5-4 | 3-4 | 2-3 | 1-2 | Cal on 4-5 | | | | | |
| Receive | → | | 3000-3750 → | | | | | | | | | |
| Time | 1447 | 1449 | 1503 | 1510 | 1513 | 1516 | 1307 | 1309 | 1311 | 1535 | 1537 | 1539 |
| Range | 200<br>2.0 | 200 | 200 | 200 | 200 → | 200 | 2.0 | 1.5 | 1.0 | 2.0 | 1.5 | 1.0 |
| Current | 1725<br>1725 | 1705<br>1700 | 1735<br>1740 | 1735<br>1720 | 1720<br>1720 | 1705<br>1700 | 1730<br>1735 | 1395<br>1390 | 1005<br>1010 | 1730<br>1730 | 1400<br>1395 | 1015<br>1015 |

INDUCED POLARIZATION - RECEIVER NOTES PAGE 2

Project: Spring Valley Line: 4 - 5½ Int.Cal 53.5 Date: 3/22/62

| Send | 2-3 | 1-2 | 4-5 | 3-4 | 2-3 | 1-2 | 4-5 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rec. | → | → | 3.75-4.50 S | → | → | → | C+L | | | | | |
| Time | 14:47 | 14:50 | 15:03 | 15:08 | 15:13 | 15:17 | 13:07 | 13:09 | 13:11 | 15:35 | 15:37 | 15:39 |
| DC-1 | .28<br>.30 | .17<br>.16 | .75<br>.72 | .33<br>.33 | .18<br>.20 | .14<br>.13 | 95.5 | 76.0 | 56.5 | 93.0 | 75.0 | 56.2 |
| DC-2 | .32<br>.31 | .16<br>.17 | .75<br>.78 | .32<br>.33 | .20<br>.17 | .12<br>.13 | 95.5 | 76.0 | 56.5 | 93.0 | 75.0 | 56.2 |
| Σ | .60<br>.61 | .33<br>.33 | 1.50<br>1.50 | .65<br>.66 | .38<br>.37 | .26<br>.26 | 191.0 | 152.0 | 113.0 | 186.0 | 150.0 | 112.4 |
| DC-3 | .32<br>.28 | .18<br>.14 | .73<br>.76 | .32<br>.32 | .11<br>.18 | .15<br>.11 | 95.5 | 76.0 | 56.5 | 93.0 | 75.0 | 56.2 |
| Dc-4 | .28<br>.33 | .15<br>.19 | .77<br>.74 | .33<br>.33 | .18<br>.19 | .11<br>.15 | 95.5 | 76.0 | 56.5 | 93.0 | 75.0 | 56.2 |
| Σ | .60<br>.69 | .33<br>.37 | 1.50<br>1.50 | .65<br>.65 | .37<br>.37 | .26<br>.26 | 191.0 | 152.0 | 113.0 | 186.0 | 150.0 | 112.4 |
| DC-AV | .605 | .33 | 1.50 | .652 | .372 | .26 | 191.0 | 152.0 | 113.0 | 186.0 | 150.0 | 112.4 |
| AC-1 | .30 | .17 | .75 | .33 | .18 | .13 | 96.0 | 76.5 | 56.5 | 93.5 | 76.0 | 56.5 |
| AC-2 | .30 | .16 | .75 | .32 | .18 | .13 | 96.0 | 76.5 | 56.5 | 93.5 | 76.0 | 56.5 |
| Σ | .60 | .33 | 1.50 | .650 | .36 | .26 | 192.0 | 153.0 | 113.0 | 187.0 | 152.0 | 113.0 |
| S. P. | | +9.4 | | | | +11.1 | | | | | | |
| AC-N | | .05 | | | | .05 | | | | | | |
| | | | | | | | | | | | | |

INDUCED POLARIZATION - RECEIVER NOTES PAGE 1

Project: Spring Valley Line: 4 5½ Int.Cal 53.5 Date: 3/22/62

| Send | 4-5 | 2-3 | 1-2 | 3-4 | 2-3 | 1-2 | 4-5 | 3-4 | 2-3 | 1-2 | 4-5 | 3-4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rec. | CAL | .75-1.50 | 5 → | 1.50-2 | 255 → | → | 2.75-3.00 | 5 | → | → | 3.00- | 3.75 5 |
| Time | | 13:19 | 13:23 | 13:38 | 13:41 | 13:45 | 13:55 | 14:05 | 14:10 | 14:13 | 14:39 | 14:44 |
| DC-1 | | 10.3<br>10.3 | 2.02<br>1.96 | 10.3<br>10.4 | 2.01<br>2.00 | .63<br>.63 | 10.4<br>10.3 | 1.82<br>1.83 | .62<br>.62 | .30<br>.28 | 2.08<br>2.09 | .65<br>.65 |
| DC-2 | | 10.4<br>10.4 | 1.96<br>2.02 | 10.2<br>10.2 | 1.98<br>1.98 | .62<br>.62 | 10.2<br>10.4 | 1.93<br>1.91 | .58<br>.58 | .26<br>.27 | 2.08<br>2.08 | .64<br>.64 |
| Σ | | 20.7<br>20.7 | 3.98<br>3.98 | 20.5<br>20.6 | 3.99<br>3.98 | 1.25<br>1.25 | 20.6<br>20.7 | 3.75<br>3.79 | 1.20<br>1.20 | .56<br>.55 | 4.16<br>4.17 | 1.29<br>1.29 |
| DC-3 | | 10.3<br>10.3 | 1.98<br>1.96 | 10.3<br>10.3 | 2.00<br>2.02 | .63<br>.65 | 10.3<br>10.3 | 1.88<br>1.88 | .62<br>.62 | .30<br>.32 | 2.10<br>2.07 | .63<br>.62 |
| Dc-4 | | 10.4<br>10.4 | 2.00<br>2.02 | 10.2<br>10.2 | 1.98<br>1.98 | .63<br>.61 | 10.4<br>10.3 | 1.85<br>1.85 | .58<br>.58 | .25<br>.25 | 2.07<br>2.09 | .65<br>.66 |
| Σ | | 20.7<br>20.7 | 3.98<br>3.98 | 20.5<br>20.5 | 3.98<br>4.00 | 1.26<br>1.26 | 20.7<br>20.6 | 3.73<br>3.73 | 1.20<br>1.20 | .55<br>.57 | 4.16<br>4.17 | 1.28<br>1.28 |
| DC-AV | | 20.7 | 3.98 | 20.5 | 3.99 | 1.255 | 20.65 | 3.74 | 1.20 | .558 | 4.165 | 1.285 |
| AC-1 | | 10.3 | 1.95 | 10.2 | 1.97 | .63 | 10.3 | 1.85 | .60 | .27 | 2.04 | .64 |
| AC-2 | | 10.4 | 1.95 | 10.2 | 1.97 | .63 | 10.3 | 1.86 | .60 | .27 | 2.04 | .64 |
| Σ | | 20.7 | 3.90 | 20.4 | 3.94 | 1.26 | 20.6 | 3.71 | 1.20 | .54 | 4.08 | 1.28 |
| S. P. | | | -0.7 | | | +18.7 | | | | -4.3 | | |
| AC-N | | | .07 | | | .07 | | | | .05 | | |
| | | | | | | | | | | | | |

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project Spring Valley Line 4 - 5½ Field date 3/22/62 Data page_____ Comp. date 3/23/62. Comp by C.S.L.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (A) Send | 4-5 | 2-3 | 1-2 | 3-4 | 2-3 | 1-2 | 4-5 | 3-4 | 2-3 | 1-2 | 4-5 | 3-4 |
| (B) Receive | CAL | .75-1.505 | → | 1.50-2.255 | → | → | 2.25-3.005 | → | → | → | 3.00-3.755 | → |
| (C) n separation | | 1 | 2 | 1 | 2 | 3 | 1 | 2 | 3 | 4 | 2 | 3 |
| (D) I | | 1748 | 1750 | 1758 | 1760 | 1750 | 1750 | 1752 | 1750 | 1735 | 1732 | 1727 |
| (E) Vdc (avg) | | 20.3 | 3.98 | 20.5 | 3.99 | 1.255 | 20.65 | 3.74 | 1.20 | .558 | 4.165 | 1.285 |
| (F) DCcal USED | .915 | | | | | | | | | | | |
| (G) Kn x $10^{-3}$ | | 2.25 | 9.00 | 2.25 | 9.00 | 22.5 | 2.25 | 9.00 | 22.5 | 45.0 | 9.00 | 22.5 |
| (H) $\rho$ dc=ExFxGx$10^3$/D | | 24.4 | 18.7 | 24.0 | 18.6 | 14.8 | 24.3 | 17.6 | 14.1 | 13.2 | 19.8 | 15.3 |
| (I) Vac $\Sigma$ | | 20.3 | 3.90 | 20.4 | 3.94 | 1.26 | 20.6 | 3.71 | 1.20 | .54 | 4.08 | 1.28 |
| (J) AC noise x 2 | | .14 | .14 | .14 | .14 | .14 | .10 | .10 | .10 | .10 | [illegible] | .10 |
| (K) Vac(corr) = $\sqrt{I^2 - J^2}$ | | 20.3 | 3.90 | 20.4 | 3.94 | 1.252 | 20.6 | 3.71 | 1.20 | .53 | [illegible] | 1.28 |
| (L) AC-DC cal. USED | 1.005 | | | | | | | | | | [illegible] | |
| (M) $\rho$ dc/$\rho$ac=ExL/K | | 1.005 | 1.028 | 1.010 | 1.019 | 1.007 | 1.009 | 1.013 | 1.005 | 1.059 | [illegible] | 1.010 |
| (N) PFE=(M-1)($10^2$) | | 1 | 3 | 1 | 2 | 1 | 1 | 1 | 1 | 6 | 3 | 1 |
| (O) MCF=(M-1)($10^5$)/H | | 20 | 150 | 42 | 102 | 43 | 37 | 74 | 35 | 446 | 136 | 65 |

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (A) Send | 2-3 | 1-2 | 4-5 | 3-4 | 2-3 | 1-2 | 4-5 | → | → | → | → | → |
| (B) Receive | → | → | .75-4.505 | → | → | → | CAL | → | → | → | → | → |
| (C) n separation | 4 | 5 | 3 | 4 | 5 | 6 | | | | | | |
| (D) I | 1725 | 1702 | 1728 | 1727 | 1722 | 1722 | 1733 | 1732 | 1008 | 1730 | [illegible] | 1015 |
| (E) Vdc (avg) | .605 | .33 | 1.50 | .652 | .372 | .26 | 191.0 | 152.0 | 117.0 | 136.0 | 150.0 | 112.0 |
| (F) DCcal | | | | | | | .909 | .917 | .893 | .930 | .931 | .902 |
| (G) Kn x $10^{-3}$ | 45.0 | 78.75 | 22.5 | 45.0 | 78.75 | 12.6 | | ~ .915 | | | | |
| (H) $\rho$ dc=ExFxGx$10^3$/D | 14.4 | 14.0 | 17.8 | 15.5 | 15.6 | 17.6 | | | | | | |
| (I) Vac $\Sigma$ | .60 | .33 | 1.50 | .650 | .36 | .26 | 192.0 | 152.0 | 117.0 | 137.0 | 152.0 | 117.0 |
| (J) AC noise x 2 | .10 | .10 | .10 | .10 | .10 | .10 | | | | | | |
| (K) Vac (corr) = $\sqrt{I^2 - J^2}$ | .592 | .315 | 1.50 | .642 | .347 | .24 | | | | | | |
| (L) AC-DC cal. | | | | | | | 1.005 | 1.006 | 1.000 | 1.004 | 1.012 | 1.005 |
| (M) $\rho$dc/$\rho$ac =ExL/K | 1.028 | 1.052 | 1.005 | 1.020 | 1.077 | 1.090 | | | | | | |
| (N) PFE=(M-1)($10^2$) | 3 | 5 | 1 | 2 | 8 | 9 | | ~ 1.005 | | | | |
| (O) MCF=(M-1)($10^5$)/H | 194 | 371 | 28 | 129 | 494 | 511 | | | | | | |

# INDUCED POLARIZATION SENDER NOTES

Project: Spring Valley Line: 4 North end Spread Date: 3/22/62

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Send | | 3-4 | 4-5 | 2-3 | 3-4 | 4-5 | 1-2 | 2-3 | 3-4 | 4-5 | 1-2 | 2-3 |
| Receive | | 0-750 | → | 750-1500 | → | | 1500-2250 | | → | | 2250 | 3000 |
| Time | | 917 | 925 | 941 | 948 | 952 | 1013 | 1045 | 1048 | 1051 | 1110 | 1115 |
| Range | | 2.0 | 2.0 | 2.0 | 220 2.0 | 220 → | 225 | 225 | 220 | 235 | 220 | 220 |
| Current | ? | 1955 1960 | 1960 1965 | 1835 1835 | 1820 1820 | 1815 1810 | 1795 1795 | 1755 1760 | 1760 1760 | 1750 1750 | 1740 1735 | 1735 1735 |
| Send | 3-4 | 4-5 | 1-2 | 2-3 | 3-4 | 4-5 | Cal | on 1-2 | | | | |
| Receive | → | | 3000-3750 | | → | | | | | | | |
| Time | 1117 | 1119 | 1137 | 1143 | 1150 | 11:55 | 9:07 | 9:10 | 9:13 | 12:17 | 23 1219 | 1221 |
| Range | 228 2.0 | 223 | 223 | 223 | 223 | 225 | 2.00 | 1.50 | 1.0 | 2.0 | 1.5 | 1.0 |
| Current | 1730 1725 | 1715 1715 | 1710 1710 | 1715 1710 | 1705 1700 | 1695 1690 | 1970 1975 | 1480 1480 | 1080 1085 | 1690 1690 | 1355 1350 | 1000 1000 |

R 1-2 = 200 / 2-3 = 100 / 3-4 = 200 / 4-5 = 210

Run # 2 on Cal

~~-840~~
~~.30~~
~~300~~
~~300~~

~~907~~
~~2.0~~
~~1970~~
~~1975~~

INDUCED POLARIZATION - RECEIVER NOTES 195 207 PAGE 1

Project: Spring Valley Line: 4 N 1/2 Int.Cal 49.9 53.5 10:35 a.m. Date: 3/22/62

| 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. | .75- | 1.5 → | 1.5 - | 2.25 | → | 2.25 | -3.0 | → | → | 3.0 | -3.75 | → |
| Time | 9:17 | 9:25 | 9:41 | 9:48 | 9:52 | 10:13 | 10:45 | 10:48 | 10:51 | 11:10 | 11:15 | 11:17 |
| DC-1 | 8.9<br>9.2 | 1.90<br>1.90 | 9.7<br>9.7 | 1.73<br>1.70 | .58<br>.58 | 8.6<br>8.6 | 1.84<br>1.79 | .56<br>.51 | .26<br>.24 | 1.95<br>2.03 | .62<br>.60 | .25<br>.25 |
| DC-2 | 9.1<br>8.8 | 1.88<br>1.88 | 9.7<br>9.7 | 1.73<br>1.77 | .57<br>.57 | 8.6<br>8.6 | 1.79<br>1.84 | .51<br>.56 | .24<br>.26 | 2.07<br>1.93 | .60<br>.62 | .25<br>.25 |
| Σ | 18.0<br>18.0 | 3.78<br>3.78 | 19.4<br>19.4 | 3.48<br>3.47 | 1.15<br>1.15 | 17.2<br>17.2 | 3.63<br>3.63 | 1.07<br>1.07 | .50<br>.50 | 3.96<br>3.96 | 1.22<br>1.22 | .50<br>.50 |
| DC-3 | 8.8<br>9.2 | 1.87<br>1.92 | 9.7<br>9.7 | 1.77<br>1.73 | .59<br>.56 | 8.6<br>8.6 | 1.83<br>1.80 | 0.54<br>.55 | .22<br>.23 | 1.94<br>2.04 | .61<br>.62 | .26<br>.24 |
| Dc-4 | 9.2<br>8.8 | 1.91<br>1.85 | 9.7<br>9.7 | 1.70<br>1.74 | .56<br>.58 | 8.6<br>8.6 | 1.80<br>1.84 | 0.53<br>.52 | .28<br>.27 | 2.03<br>1.91 | .61<br>.60 | .24<br>.26 |
| Σ | 18.0<br>18.0 | 3.78<br>3.77 | 19.4<br>19.4 | 3.47<br>3.47 | 1.15<br>1.14 | 17.2<br>17.2 | 3.63<br>3.63 | 1.07<br>1.07 | .50<br>.50 | 3.97<br>3.95 | 1.22<br>1.22 | .50<br>.50 |
| DC-AV | 18.0 | 3.78 | 19.4 | 3.47 | 1.15 | 17.2 | 3.63 | 1.07 | .50 | 3.96 | 1.22 | .50 |
| AC-1 | 8.8 | 1.84 | 9.5 | 1.69 | .57 | 8.4 | 1.80 | 0.54 | 0.26 | 1.93 | .60 | .25 |
| AC-2 | 8.9 | 1.84 | 9.5 | 1.69 | .57 | 8.4 | 1.80 | 0.53 | 0.26 | 1.93 | .60 | .25 |
| Σ | 17.7 | 3.68 | 19.0 | 3.38 | 1.14 | 16.8 | 3.60 | 1.07 | 0.52 | 3.86 | 1.20 | .50 |
| S. P. | | -7.9 | | | +1.0 | | | | +1.2 | | | |
| AC-N | | .07 | | | .08 | | New Tube | | .06 | | | |
| | | | | | | 2581 to 3.75 S.O. | line 3 | 2.25 in | 258' | | | |

INDUCED POLARIZATION - RECEIVER NOTES PAGE 2

Project: Spring Valley Line: 4 N½ Int.Cal 53.5 Date: 3/22/62

12:05 P.M.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Send | 4-5 | 1-2 | 2-3 | 3-4 | 4-5 | | CAL | 1-2 | | | | | |
| Rec. | → | 3.75 | - 45 | → | | | | | | | | | |
| Time | 11:19 | 11:37 | 11:43 | 11:50 | 11:55 | | 9:08 | 9:10 | 9:13 | 12:17 | 12:19 | 12:21 | |
| DC-1 | .15<br>.13 | .72<br>.62 | .33<br>.33 | .19<br>.14 | .13<br>.05 | | 91.0 | 72.2 | 53.5 | 93.0 | 75.0 | 55 | 55.5 |
| DC-2 | .13<br>.15 | .67<br>.77 | .24<br>.24 | .12<br>.16 | .08<br>.15 | | 91.0 | 72.2 | 53.5 | 93.0 | 75.0 | 55 | 56.2 |
| Σ | .28 28 | 1.39<br>1.39 | .57<br>.57 | .30 30 | .21<br>.20 | | 182.0 | 144.4 | 107.0 | 186.0 | 150.0 | 110 | 111.7 |
| DC-3 | .16<br>.13 | .72<br>.68 | .27<br>.28 | .14<br>.14 | .08<br>.13 | | 91.0 | 72.2 | 53.5 | 93.0 | 75.0 | 55 | 55.5 |
| Dc-4 | .12<br>.15 | .68<br>.72 | .31<br>.34 | .17<br>.17 | .13<br>.08 | | 91.0 | 72.2 | 53.5 | 93.0 | 75.0 | 55 | 56.2 |
| Σ | .28<br>.28 | 1.40<br>1.40 | .58 58 | .31 31 | .21 21 | | 182.0 | 144.4 | 107.0 | 186.0 | 150.0 | 110 | 111.7 |
| DC-AV | .28 | 1.395 | .575 | .305 | .208 | | 182.0 | 144.4 | 107.0 | 186.0 | 150.0 | 110 | 111.7 |
| AC-1 | .15 | .68 | .29 | .16 | .13 | | 91.5 | 71.5 | 53.8 | 94.0 | 76.0 | 56 | 56.2 |
| AC-2 | .15 | .68 | .29 | .16 | .13 | | 91.5 | 71.5 | 53.8 | 94.0 | 76.0 | 56 | 56.2 |
| Σ | .30 | 1.36 | .58 | .32 | .26 | | 183.0 | 143.0 | 107.6 | 188.0 | 152.0 | 112 | 112.4 |
| S. P. | +6.1 | | | | +5.0 | | | | | | 76.0 | | |
| AC-N | .05 | | | | .05 | | | | | | | | |

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page_____

Project Spring Valley Line 4 - N½ Field date 7/22/62 Data page_____ Comp. date 7/23/62. Comp by C. S. L.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (A) Send | CAL | 3-4 | 4-5 | 2-3 | 3-4 | 4-5 | 1-2 | 2-3 | 3-4 | 4-5 | 1-2 | 2-3 |
| (B) Receive | 1-2 | .75-1.50N | → | 1.50-2.25N | → | → | 2.25-3.00N | → | → | → | 3.00-3.75N | → |
| (C) n separation | | 1 | 2 | 1 | 2 | 3 | 1 | 2 | 3 | 4 | 2 | 3 |
| (D) I | | 1858 | 1863 | 1835 | 1820 | 1812 | 1795 | 1758 | 1760 | 1750 | 1737 | 1735 |
| (E) Vdc (avg) | | 18.0 | 3.78 | 19.4 | 3.47 | 1.15 | 17.2 | 3.63 | 1.07 | .50 | 3.86 | 1.22 |
| (F) DCcal USED | 1.020 | ← | | | | → | 1.020 | .910 | ← | | | |
| (G) Kn x $10^{-3}$ a=750' | | 2.25 | 9.00 | 2.25 | 9.00 | 22.5 | 2.25 | 9.00 | 22.5 | 45.0 | 9.00 | 22.5 |
| (H) ρ dc=ExFxGx$10^3$/D | | 22.2 | 18.6 | 24.3 | 17.5 | 14.6 | 22.0 | 16.9 | 12.4 | 11.7 | 18.7 | 14.4 |
| (I) Vac Σ | | 17.7 | 3.68 | 19.0 | 3.38 | 1.14 | 16.8 | 3.60 | 1.07 | .52 | 3.86 | 1.20 |
| (J) AC noise x 2 | | .14 | .14 | .16 | .16 | .16 | .12 | .12 | .12 | .12 | .10 | .10 |
| (K) Vac(corr) = $\sqrt{I^2 - J^2}$ | | 17.7 | 3.68 | 19.0 | 3.38 | 1.13 | 16.8 | 3.60 | 1.063 | .506 | 3.86 | 1.20 |
| (L) AC-DC cal. USED | 1.010 | | | | | | | | | | | |
| (M) ρ dc/ρac=ExL/K | | 1.027 | 1.038 | 1.031 | 1.036 | 1.029 | 1.034 | 1.020 | 1.017 | 1.000 | 1.037 | 1.028 |
| (N) PFE=(M-1)($10^2$) | | 3 | 4 | 3 | 4 | 3 | 3 | 2 | 2 | 0 | 4 | 3 |
| (O) MCF=(M-1)($10^5$)/H | | 122 | 204 | 127 | 206 | 199 | 154 | 118 | 137 | 0 | 198 | 195 |

↑ TUBE CHANGE

Project_____ Line_____ Field date_____ Data page_____ Comp. date_____ Comp by_____

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (A) Send | 3-4 | 4-5 | 1-2 | 2-3 | 3-4 | 4-5 | CAL | → | → | → | → | → |
| (B) Receive | → | → | 3.75-4.50N | → | → | → | 1-2 | → | → | → | → | → |
| (C) n separation | 4 | 5 | 3 | 4 | 5 | 6 | 1873 | | | | | |
| (D) I | 1727 | 1715 | 1710 | 1712 | 1702 | 1692 | ~~1973~~ | 1480 | 1083 | 1690 | 1752 | 1000 |
| (E) Vdc (avg) | .50 | .28 | 1.395 | .575 | .305 | .208 | ~~182.0~~ | 144.4 | 107.0 | 186.0 | 150.0 | 110 |
| (F) DCcal | | | | | → | .910 | ~~1.083~~ | 1.023 | 1.013 | .910 | .902 | .910 |
| (G) Kn x $10^{-3}$ | 45.0 | 78.75 | 22.5 | 45.0 | 78.75 | 126 | 1.030 | | ↖ TUBE CHANGE ↗ | | | |
| (H) ρ dc=ExFxGx$10^3$/D | 11.9 | 11.7 | 16.7 | 13.7 | 12.8 | 14.1 | | ~1.020 | | ~ | .910 | |
| (I) Vac Σ | .50 | .30 | 1.36 | .58 | .32 | .26 | 183.0 | 143.0 | 107.6 | 188.0 | 152.0 | 112 |
| (J) AC noise x 2 | .10 | .10 | .10 | .10 | .10 | .10 | | | | | | |
| (K) Vac (corr) = $\sqrt{I^2 - J^2}$ | .49 | .283 | 1.36 | .57 | .304 | .24 | | | | | | |
| (L) AC-DC cal. | | | | | | | 1.006 | .990 | 1.006 | 1.010 | 1.013 | 1.019 |
| (M) ρdc/ρac =ExL/K | 1.030 | 1.000 | 1.036 | 1.020 | 1.012 | .877 | | | | | | |
| (N) PFE=(M-1)($10^2$) | 3 | 0 | 4 | 2 | 1 | -12 | | ~1.010 | | | | |
| (O) MCF=(M-1)($10^5$)/H | 252 | 0 | 216 | 146 | 94 | -876 | | | | | | |

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____

Project: Corona Line: 1N Int.Cal 54.0 Date: 11/18/61

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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. | .75-1.50 N | | 1.50-2.25 N | → | 2.25-3.00 N | | → | 3.00-3.75 N | | | | |
| Time | 13:04 | 13:07 | 13:19 | 13:22 | 13:25 | 13:41 | 13:44 | 13:46 | 13:49 | 13:59 | 14:03 | 14:05 |
| DC-1 | 15.7<br>15.8 | 2.50<br>2.50 | 17.4<br>17.5 | 3.98<br>3.98 | 1.30<br>1.27 | 15.5<br>15.5 | 3.82<br>3.85 | 1.20<br>1.20 | .50<br>.48 | 4.10<br>4.10 | 1.39<br>1.35 | .58<br>.60 |
| DC-2 | 15.5<br>15.5 | 2.61<br>2.63 | 17.3<br>17.4 | 4.02<br>4.00 | 1.37<br>1.40 | 14.8<br>14.9 | 3.78<br>3.75 | 1.26<br>1.26 | .60<br>.61 | 4.10<br>4.10 | 1.43<br>1.47 | .57<br>.55 |
| Σ | 31.2<br>31.3 | 5.16<br>5.13 | 34.7<br>34.9 | 8.00<br>8.98 | 2.67<br>2.67 | 30.3<br>30.4 | 7.60<br>7.60 | 2.46<br>2.46 | 1.10<br>1.09 | 8.20<br>8.20 | 2.82<br>2.82 | 1.15<br>1.15 |
| DC-3 | 15.8<br>15.9 | 3.95<br>3.92 | 17.6<br>17.6 | 4.00<br>3.99 | 1.32<br>1.35 | 15.6<br>15.7 | 3.90<br>3.88 | 1.19<br>1.18 | .47<br>.50 | 4.07<br>4.05 | 1.35<br>1.36 | .60<br>.59 |
| Dc-4 | 15.5<br>15.5 | 3.70<br>3.75 | 17.5<br>17.5 | 3.99<br>3.97 | 1.29<br>1.30 | 14.9<br>14.9 | 3.72<br>3.75 | 1.21<br>1.18 | .60<br>.58 | 4.17<br>4.15 | 1.45<br>1.42 | .56<br>.57 |
| Σ | 31.3<br>31.4 | 7.15<br>7.15 | 35.1<br>35.1 | 7.99<br>7.96 | 2.61<br>2.65 | 30.5<br>30.5 | 7.61<br>7.63 | 2.45<br>2.46 | 1.07<br>1.08 | 8.20<br>8.20 | 2.80<br>2.79 | 1.12<br>1.16 |
| →DC-AV | 31.3 | 7.135 | 34.95 | 7.98 | 2.65 | 30.45 | 7.61 | 2.46 | 1.085 | 8.20 | 2.81 | 1.155 |
| AC-1 | 15.6 | 3.56 | 17.4 | 3.96 | 1.30 | 15.3 | 3.82 | 1.22 | .53 | 4.13 | 1.38 | .58 |
| AC-2 | 15.6 | 3.56 | 17.4 | 3.96 | 1.30 | 15.3 | 3.82 | 1.22 | .53 | 4.13 | 1.38 | .58 |
| →Σ | 31.2 | 7.12 | 34.8 | 7.92 | 2.60 | 30.6 | 7.64 | 2.44 | 1.06 | 8.26 | 2.76 | 1.16 |
| S. P. | ← | +3.7 | ← | ← | +1.5 | ← | ← | ← | -12.3 | ← | ← | ← |
| AC-N | ← | .07 | ← | ← | .05 | ← | ← | ← | .09 | ← | ← | ← |
| | | | | | | | | | | | | |

# INDUCED POLARIZATION SENDER NOTES

Project: [illegible] Line: 1 N Date: 11/15/61

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 | .75- | 1.50N | [illegible] | 2.25N | → | 2.25- | 3.00N | → | → | 3.00- | 3.75N | → |
| Time | 1304 | 1307 | 1319 | 1322 | 1325 | 1341 | 1344 | 1346 | 1349 | 1359 | 1403 | 1405 |
| Range | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Current | 1940 | 1970 | 1950 | 1950 | 1950 | 1930 | 1950 | 1950 | 1950 | 1925 | 1940 | 1940 |
| Send | 1-2 | 4-5 | 3-4 | 2-3 | 1-2 | | 4-5 | → | → | → | → | → |
| Receive | → | 3.75- | 4.50N | → | → | | CAL | → | → | → | → | → |
| Time | 1407 | 1417 | 1420 | 1423 | 1425 | | 1252 | 1255 | 1257 | 1732 | 1733 | 1735 |
| Range | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | .3 | .5 | .75 | .3 | .5 | .75 |
| Current | 1940 | 1900 | 1910 | 1910 | 1910 | | 300 | 560 | 720 | 300 | 560 | 710 |

3 ft a point 300' NW of Fagan Rd ½ mi SW of BM 3337

# INDUCED POLARIZATION SENDER NOTES

Project: [illegible] Line: 1N Date: [illegible]

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Send | 1-2 | 1-5 | 5-6 | 1-2 | 1-2 | | | | | | | |
| Receive | [illegible] | 3.25 | 4.50 | [illegible] | [illegible] | | | | | | | |
| Time | | | | | | | | | | | | |
| Range | | | | | | | | | | | | |
| Current | | | | | | | | | | | | |
| Send | | | | | | 4-5 | 3-6 | 2-5 | 1-2 | | | |
| Receive | | | | | | 200 | 195 | 180V | 180V | | | |
| Time | | | | | | [illegible] | [illegible] | [illegible] | [illegible] | | | |
| Range | | | | | | | | | | | | |
| Current | | | | | | | | | | | | |

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____

Project: Corona Line: 1N Int.Cal 57.8 Date: 11/26/

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Send | 1-2 | 4-5 | 3-4 | 2-3 | 1-2 | | CAL | → | → | → | → | → |
| Rec. | → | 7.75-8.50N | → | → | → | | 4-5 | → | → | → | → | → |
| Time | 14:07 | 14:17 | 14:20 | 14:23 | 14:25 | | 12:52 | 12:55 | 12:57 | | | |
| DC-1 | .32<br>.31 | 1.16<br>1.15 | .50<br>.49 | .27<br>.29 | .18<br>.22 | | 15.2 | 29.0 | 36.2 | | | |
| DC-2 | .32<br>.32 | 1.17<br>1.21 | .53<br>.54 | .27<br>.27 | .17<br>.14 | | 15.2 | 29.0 | 36.2 | | | |
| Σ | .64<br>.63 | 2.35<br>2.36 | 1.03<br>1.03 | .54<br>.53 | .35<br>.36 | | 30.4 | 58.0 | 72.4 | | | |
| DC-3 | .32<br>.32 | 1.15<br>1.15 | .47<br>.43 | .23<br>.30 | .28<br>.23 | | 15.1 | 29.0 | 36.2 | | | |
| Dc-4 | .32<br>.32 | 1.19<br>1.20 | .56<br>.60 | .23<br>.27 | .13<br>.13 | | 15.1 | 29.0 | 36.2 | | | |
| Σ | .64<br>.64 | 2.34<br>2.35 | 1.03<br>1.03 | .53<br>.53 | .35<br>.36 | | 30.2 | 58.0 | 72.4 | | | |
| DC-AV | .64 | 2.35 | 1.03 | .53 | .355 | | 30.3 | 58.0 | 72.4 | | | |
| AC-1 | .30 | 1.18 | .52 | .27 | .16 | | 15.3 | 29.8 | 36.2 | | | |
| AC-2 | .30 | 1.18 | .52 | .27 | .16 | | 15.3 | 29.8 | 36.2 | | | |
| Σ | .60 | 2.36 | 1.04 | .54 | .320 | | 30.6 | 59.6 | 72.4 | | | |
| S. P. | -6.1 | ← | | | +1.8 | | | | | | | |
| AC-N | .06 | ← | | | .02 | | | | | | | |
| | | | | | | | | | | | | |

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page 1

Project Corona Line 1 N Field date 11/14/61 Data page _____ Comp. date 11/20/61. 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 | .75-1.50N | → | 1.50-2.25N | → | → | 2.25-3.00N | → | → | → | 3.00-3.75N | → | → |
| (C) n separation | 1 | 2 | 1 | 2 | 3 | 1 | 2 | 3 | 4 | 2 | 3 | 4 |
| (D) I | 1940 | 1970 | 1950 | 1950 | 1950 | 1930 | 1950 | 1950 | 1950 | 1925 | 1940 | 1940 |
| (E) Vdc (avg) | 31.3 | 7.135 | 34.95 | 7.98 | 2.65 | 30.45 | 7.61 | 2.46 | 1.085 | 8.20 | 2.81 | 1.155 |
| (F) DCcal | .981 | .980 | .976 | .974 | .974 | .969 | .968 | .967 | .967 | .964 | .963 | .962 |
| (G) Kn x $10^{-3}$ | 2.25 | 9.00 | 2.25 | 9.00 | 22.5 | 2.25 | 9.00 | 22.5 | 45.0 | 9.00 | 22.5 | 45.0 |
| (H) $\rho$dc=ExFxGx$10^3$/D | 35.6 | 32.0 | 39.4 | 35.8 | 29.8 | 34.4 | 34.0 | 27.4 | 24.2 | 36.9 | 31.4 | 25.8 |
| (I) Vac $\Sigma$ | 31.2 | 7.12 | 34.8 | 7.92 | 2.60 | 30.6 | 7.64 | 2.44 | 1.04 | 8.26 | 2.76 | 1.16 |
| (J) AC noise x 2 | .14 | .14 | .10 | .10 | .10 | .18 | .18 | .18 | .18 | .12 | .12 | .12 |
| (K) Vac(corr) = $\sqrt{I^2 - J^2}$ | 31.2 | 7.12 | 34.8 | 7.92 | 2.60 | 30.6 | 7.64 | 2.44 | 1.04 | 8.26 | 2.76 | 1.153 |
| (L) AC-DC cal. Vdc/Vac USED | 1.015 | | | | | | | | | | | |
| (M) $\rho$dc/$\rho$ac=ExL/K | 1.019 | 1.018 | 1.020 | 1.022 | 1.034 | 1.010 | 1.011 | 1.023 | 1.059 | 1.009 | 1.032 | 1.017 |
| (N) PFE=(M-1)($10^2$) | 2 | 2 | 2 | 2 | 3 | 1 | 1 | 2 | 6 | 1 | 3 | 2 |
| (O) MCF=(M-1)($10^5$)/H | 53 | 56 | 51 | 61 | 114 | 29 | 32 | 84 | 244 | 24 | 102 | 66 |

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

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (A) Send | 1-2 | 4-5 | 3-4 | 2-3 | 1-2 | CAL | → | → | → | → | → | → |
| (B) Receive | → | 3.75-4.50N | → | → | → | 4-5 | → | → | 1-2 | | | |
| (C) n separation | 5 | 3 | 4 | 5 | 6 | | | | | | | |
| (D) I | 1940 | 1900 | 1910 | 1910 | 1910 | 300 | 560 | 720 | 300 | 560 | 720 | 1890 |
| (E) Vdc (avg) | .64 | 2.35 | 1.03 | .53 | .355 | 70.3 | 58.0 | 72.4 | 32.3 | 60.0 | 76.8 | 200 |
| (F) DCcal | .961 | .959 | .958 | .957 | .956 | .991 | .966 | .994 | .929 | .934 | .937 | .945 |
| (G) Kn x $10^{-3}$ | 78.75 | 22.5 | 45.0 | 78.75 | 126 | | | | | | | |
| (H) $\rho$ dc=ExFxGx$10^3$/D | 24.9 | 26.7 | 23.2 | 20.9 | 22.4 | | | | | | | |
| (I) Vac $\Sigma$ | .60 | 2.36 | 1.04 | .54 | .320 | 30.6 | 59.6 | 72.4 | 32.6 | 60.0 | 78.4 | 206 |
| (J) AC noise x 2 | .12 | .04 | .04 | .04 | .04 | | | | | | | |
| (K) Vac (corr) = $\sqrt{I^2 - J^2}$ | .59 | 2.36 | 1.04 | .54 | .318 | | | | | | | |
| (L) AC-DC cal. | → | → | → | → | → | 1.010 | 1.028 | 1.000 | 1.010 | 1.050 | 1.020 | 1.030 |
| (M) $\rho$dc/$\rho$ac =ExL/K | 1.100 | 1.010 | 1.006 | 1.000 | 1.132 | $\rho$ ~ | 12:55 P.M. | | | $\rho$ ~ | 1:25 P.M. | |
| (N) PFE=(M-1)($10^2$) | 10 | 1 | 1 | 0 | 13 | | | USED | 1.015 | | | |
| (O) MCF=(M-1)($10^5$)/H | 400 | 37 | 26 | 0 | 590 | | | | | | | |

# INDUCED POLARIZATION SENDER NOTES

Project: CORONA Line: 15 Date: 13 NOV 61

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Send | 1-2 | 3-4 | 4-5 | 2-3 | 3-4 | 4-5 | 1-2 | 2-3 | 3-4 | 4-5 | 1-2 | 2-3 |
| Receive | CAL | .75-1.50 → | | 1.50-2.25 | | → | 2.25-3.05 | | | → | 3.0-3.75 | |
| Time | | 1535 | 1537 | 1558 | 1600 | 1602 | 1616 | 1618 | 1622 | 1625 | 1637 | 1639 |
| Range | | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Current | → | 1920 | 1930 | 1920 | 1920 | 1930 | 1900 | 1920 | 1920 | 1920 | 1900 | 1910 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Send | 3-4 | 4-5 | 1-2 | 2-3 | 3-4 | 4-5 | 1-2 | | | | | → |
| Receive | | → | 3.25-4.50 | | | → | CAL | | | | | → |
| Time | 1641 | 1643 | 1654 | 1656 | 1658 | | 1522 | 1524 | 1526 | 1528 | | |
| Range | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | .3 | .5 | .75 | 2.0 | | |
| Current | 1910 | 1910 | 1890 | 1900 | 1900 | 1900 | 300 | 560 | 720 | 1890 | | |

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____

Project: Corona Line: 15 Int.Cal 5+4 Date: 11/15/61

| 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. | .75 | .05 | 1.50 | 2.255 | → | 2.25 | 3.005 | → | → | 3.00 | 3.25 | → |
| Time | 15:35 | 15:37 | 15:58 | 16:00 | 16:02 | 16:16 | 16:19 | 16:22 | 16:25 | 16:37 | 16:39 | 16:41 |
| DC-1 | 14.7<br>14.8 | 3.46<br>3.45 | 15.2<br>15.3 | 3.30<br>3.30 | 1.19<br>1.19 | 17.0<br>17.0 | 3.43<br>3.43 | 1.15<br>1.17 | .51<br>.51 | 3.64<br>3.62 | 1.10<br>1.12 | .50<br>.45 |
| DC-2 | 14.9<br>14.9 | 3.60<br>3.60 | 15.0<br>15.0 | 3.22<br>3.22 | 1.05<br>1.04 | 17.3<br>17.3 | 3.68<br>3.68 | 1.13<br>1.11 | .59<br>.59 | 3.58<br>3.60 | 1.12<br>1.17 | .55<br>.62 |
| Σ | 29.6<br>29.7 | 7.04<br>7.05 | 30.2<br>30.3 | 6.52<br>6.52 | 2.24<br>2.23 | 34.3<br>34.4 | 7.11<br>7.11 | 2.28<br>2.28 | 1.10<br>1.10 | 7.22<br>7.22 | 2.22<br>2.25 | 1.05<br>1.07 |
| DC-3 | 14.8<br>14.8 | 3.47<br>3.45 | 15.3<br>15.4 | 3.30<br>3.28 | 1.22<br>1.23 | 17.0<br>17.0 | 3.43<br>3.42 | 1.19<br>1.19 | .51<br>.50 | 3.60<br>3.60 | 1.08<br>1.03 | .40<br>.37 |
| Dc-4 | 15.0<br>15.0 | 3.58<br>3.60 | 15.0<br>15.1 | 3.22<br>3.24 | 1.03<br>1.01 | 17.4<br>17.4 | 3.68<br>3.69 | 1.10<br>1.10 | .59<br>.60 | 3.60<br>3.62 | 1.17<br>1.22 | .65<br>.70 |
| Σ | 29.8<br>29.8 | 7.05<br>7.05 | 30.3<br>30.5 | 6.52<br>6.52 | 2.25<br>2.24 | 34.4<br>34.4 | 7.11<br>7.11 | 2.29<br>2.29 | 1.10<br>1.10 | 7.20<br>7.23 | 2.25<br>2.25 | 1.05<br>1.07 |
| DC-AV | 29.7 | 7.06 | 30.3 | 6.52 | 2.24 | 34.4 | 7.11 | 2.285 | 1.10 | 7.22 | 2.24 | 1.06 |
| AC-1 | 14.9 | 3.55 | 15.2 | 3.29 | 1.12 | 17.2 | 3.54 | 1.13 | .55 | 3.55 | 1.09 | .50 |
| AC-2 | 14.9 | 3.55 | 15.2 | 3.29 | 1.12 | 17.2 | 3.54 | 1.13 | .55 | 3.55 | 1.09 | .50 |
| Σ | 29.8 | 7.10 | 30.4 | 6.58 | 2.24 | 34.4 | 7.08 | 2.26 | 1.10 | 7.10 | 2.18 | 1.00 |
| S. P. | ← | -1.7 | ← | | +15.2 | ← | | | +5.3 | ← | | |
| AC-N | ← | .08 | ← | | .07 | ← | | | .07 | ← | | |
| | | | | | | | | | | | | |

N-S Fence @ 2.25 + 100' S

S P 4-3 + 1127

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____

Project: Cokana Line: 18 Int.Cal 54.2 Date: [illegible]

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Send | 4-5 | 1-2 | 2-3 | 3-4 | 4-5 | | 1-2 | → | → | → | → | |
| Rec. | → | 2.75 | 4.50 | → | → | | 1-2 | | → | 4-5 | → | |
| Time | 16:[illegible] | 16:54 | 16:56 | 16:58 | 17:01 | 15:28 | 15:22 | 15:28 | 15:26 | 17:32 | 17:32 | 17:35 |
| DC-1 | .30<br>.28 | 1.09<br>.97 | .47<br>.47 | .25<br>.23 | .18<br>.18 | 100 | 16.2 | 30.0 | 38.5 | 16.1 | 30.0 | 37.7 |
| DC-2 | .35<br>.37 | 1.26<br>1.09 | .50<br>.50 | .31<br>.30 | .22<br>.22 | 100 | 16.2 | 30.0 | 38.5 | 16.0 | 30.0 | 37.5 |
| Σ | .65<br>.65 | 2.06<br>2.06 | .97<br>.97 | .56<br>.56 | .40<br>.40 | 200 | 32.4 | 60.0 | 77.0 | 32.1 | 60.0 | 75.2 |
| DC-3 | .25<br>.22 | .97<br>.95 | .47<br>.47 | .23<br>.23 | .18<br>.18 | 100 | 16.1 | 30.0 | 38.3 | 16.1 | 30.0 | 37.7 |
| Dc-4 | .40<br>.49 | 1.09<br>1.11 | .50<br>.50 | .32<br>.33 | .21<br>.21 | 100 | 16.1 | 30.0 | 38.3 | 16.0 | 30.0 | 37.5 |
| Σ | .65<br>.66 | 2.06<br>2.06 | .97<br>.97 | .56<br>.56 | .40<br>.40 | 200 | 32.2 | 60.0 | 76.6 | 32.1 | 60.0 | 75.2 |
| DC-AV | .65 | 2.06 | .97 | .56 | .40 | 200 | 32.3 | 60.0 | 76.8 | 32.1 | 60.0 | 75.2 |
| AC-1 | .30 | 1.01 | .45 | .24 | .17 | 103 | 16.3 | 31.5 | 39.2 | 16.2 | 30.5 | 38.5 |
| AC-2 | .30 | 1.01 | .45 | .24 | .17 | 103 | 16.3 | 31.5 | 39.2 | 16.2 | 30.5 | 38.5 |
| Σ | .60 | 2.02 | .90 | .48 | .34 | 206 | 32.6 | 63.0 | 78.4 | 32.4 | 61.0 | 77.0 |
| S. P. | -1.0 | ← | | | -11.4 | | | | | | | |
| AC-N | .08 | ← | | | .07 | | | | | | | |
| | | | | | | | | | | | | |

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page 2

Project Corona Line 15 Field date 11/18/61 Data page _____ Comp. date 11/20/61. 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 | .75-1.505 | → | 1.50-2.255 | → | → | 2.25-3.005 | → | → | → | 3.00-3.755 | → | → |
| (C) n separation | 1 | 2 | 1 | 2 | 3 | 1 | 2 | 3 | 4 | 2 | 3 | 4 |
| (D) I | 1920 | 1930 | 1920 | 1920 | 1930 | 1900 | 1920 | 1920 | 1920 | 1900 | 1910 | 1910 |
| (E) Vdc (avg) | 29.7 | 7.06 | 30.3 | 6.52 | 2.24 | 34.4 | 7.11 | 2.285 | 1.10 | 7.22 | 2.24 | 1.06 |
| (F) DCcal USED | .935 | | | | | | | | | | | |
| (G) Kn x $10^{-3}$ | 2.25 | 9.00 | 2.25 | 9.00 | 22.5 | 2.25 | 9.00 | 22.5 | 45.0 | 9.00 | 22.5 | 45.0 |
| (H) $\rho$ dc=ExFxGx$10^3$/D | 32.6 | 30.8 | 33.2 | 28.6 | 24.4 | 38.0 | 31.1 | 25.0 | 24.1 | 31.9 | 24.7 | 23.4 |
| (I) Vac $\Sigma$ | 29.8 | 7.10 | 30.4 | 6.58 | 2.24 | 34.4 | 7.08 | 2.26 | 1.10 | 7.10 | 2.18 | 1.00 |
| (J) AC noise x 2 | .16 | .16 | .14 | .14 | .14 | .14 | .14 | .14 | .14 | .16 | .16 | .16 |
| (K) Vac(corr) = $\sqrt{I^2 - J^2}$ | 29.8 | 7.10 | 30.4 | 6.58 | 2.24 | 34.4 | 7.08 | 2.26 | 1.09 | 7.10 | 2.18 | .99 |
| (L) AC-DC cal. USED | 1.020 | | | | | | | | | | | |
| (M) $\rho$ dc/$\rho$ac=ExL/K | 1.017 | 1.016 | 1.017 | 1.010 | 1.020 | 1.020 | 1.024 | 1.031 | 1.030 | 1.038 | 1.048 | 1.091 |
| (N) PFE=(M-1)($10^2$) | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 3 | 3 | 4 | 5 | 7 |
| (O) MCF=(M-1)($10^5$)/H | 52 | 52 | 51 | 35 | 82 | 53 | 77 | 124 | 125 | 113 | 194 | 389 |

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 | → | 3.75-4.505 | → | → | → | 1-2 | → | → | → | 4-5 | | |
| (C) n separation | 5 | 3 | 4 | 5 | 6 | | | | | | | |
| (D) I | 1910 | 1890 | 1900 | 1900 | 1900 | | | | | 300 | 560 | 710 |
| (E) Vdc (avg) | .65 | 2.06 | .93 | .56 | .40 | | | | | 32.1 | 60.0 | 75.2 |
| (F) DCcal | | | | | | .929 | .934 | .937 | .945 | .935 | .934 | .944 |
| (G) Kn x $10^{-3}$ | 78.75 | 22.5 | 45.0 | 78.75 | 126 | | | | ~ .935 | | | |
| (H) $\rho$ dc=ExFxGx$10^3$/D | 25.0 | 22.9 | 20.6 | 21.7 | 24.8 | | | | | | | |
| (I) Vac $\Sigma$ | .60 | 2.02 | .90 | .48 | .34 | | | | | 32.4 | 61.0 | 77.0 |
| (J) AC noise x 2 | .16 | .14 | .14 | .14 | .14 | | | | | | | |
| (K) Vac (corr) = $\sqrt{I^2 - J^2}$ | .58 | 2.02 | .89 | .46 | .31 | | | | | | | |
| (L) AC-DC cal. | | | | | | 1.010 | 1.050 | 1.020 | 1.030 | 1.010 | 1.019 | 1.022 |
| (M) $\rho$dc/$\rho$ac =ExL/K | 1.143 | 1.040 | 1.068 | 1.242 | 1.318 | | ~ 15.25 | | | | ~ 17.25 | |
| (N) PFE=(M-1)($10^2$) | 14 | 4 | 7 | 24 | 32 | | | | | | | |
| (O) MCF=(M-1)($10^5$)/H | 572 | 174 | 330 | 1113 | 1282 | | | | | | | |

1.022

INDUCED POLARIZATION - RECEIVER NOTES PAGE 1

Project: Spring Valley Line: 3 - Spr 1, 5½ Int.Cal 49.9 Date: 3/17/62

| Send | 4-5 | 2-3 | 1-2 | 3-4 | 2-3 | 1-2 | 4-5 | 3-4 | 2-3 | 1-2 | 4-5 | 3-4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rec. | CAL | .05-1.50S → | | 1.50-2.25S → | | | 2.25-3.00S → | | | | 3.00-3.75S | |
| Time | | 1228 | 1230 | 1244 | 1246 | 1248 | 1257 | 1300 | 1302 | 1305 | 1314 | 1316 |
| DC-1 | S.P. | 7.60<br>7.60 | 1.50<br>1.50 | 6.62<br>6.62 | 1.18<br>1.24 | 0.41<br>0.41 | 6.40<br>6.62 | 1.29<br>1.27 | 0.39<br>0.42 | 0.20<br>0.17 | 1.32<br>1.35 | 0.40<br>0.42 |
| DC-2 | 0-.75S | 7.50<br>7.50 | 1.50<br>1.50 | 6.62<br>6.60 | 1.24<br>1.18 | 0.41<br>0.41 | 6.62<br>6.40 | 1.31<br>1.33 | 0.41<br>0.38 | 0.17<br>0.20 | 1.33<br>1.30 | 0.42<br>0.40 |
| Σ | | 16.1 | 3.0 | 13.22 | 2.42 | 0.82 | 13.02 | 2.60 | 0.80 | 0.37 | 2.65 | 0.82 |
| DC-3 | | 7.59<br>7.60 | 1.51<br>1.49 | 6.60<br>6.62 | 1.20<br>1.22 | 0.41<br>0.40 | 6.62<br>6.40 | 1.35<br>1.34 | 0.38<br>0.43 | 0.20<br>0.21 | 1.30<br>1.37 | 0.42<br>0.41 |
| Dc-4 | | 7.52<br>7.50 | 1.49<br>1.51 | 6.62<br>6.60 | 1.22<br>1.20 | 0.41<br>0.42 | 6.40<br>6.62 | 1.25<br>1.26 | 0.42<br>0.37 | 0.17<br>0.16 | 1.35<br>1.28 | 0.40<br>0.42 |
| Σ | | 16.1<br>16.1 | 3.0 | 13.22 | 2.42 | 0.82 | 13.02 | 2.80 | 0.80 | 0.37 | 2.65 | 0.82<br>3 |
| DC-AV | | 16.1 | 3.0 | 13.22 | 2.42 | 0.82 | 13.02 | 2.60 | 0.80 | 0.37 | 2.65 | 0.82 |
| AC-1 | | | 1.47 | | | 0.40 | | | | 0.20 | | |
| AC-2 | | | 1.47 | | | 0.40 | | | | 0.20 | | |
| Σ | | | | | | 0.80 | | | | 0.40 | | |
| S. P. | +4.8 | | -7.4 | | | +10.3 | | | | -1.4 | | |
| AC-N | | | .07 | | | .08 | | | | .09 | | |
| | | | | | | | | | | | | |

| | | | |
|---|---|---|---|
| 21 | .23 | 14 | 20 |
| 16 | .14 | 23 | 17 |
| | | .37 | 37 |
| .37 | .37 | | |

| | | | |
|---|---|---|---|
| 10 | 10 | 08 | 11 |
| 10 | 10 | 12 | 09 |

| | |
|---|---|
| 06 | 08 |
| 06 | |

INDUCED POLARIZATION - RECEIVER NOTES PAGE 2

Project: Spring Valley Line: 3 Spl 5½ Int.Cal 49.8 Date: 7/17/62

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Send | 2-3 | 1-2 | 4-5 | 3-4 | 2-3 | 1-2 | 4-5 | → | → | → | → | → |
| Rec. | → | → | 3.05-4.505 | → | → | → | CAL | → | → | → | → | → |
| Time | 1317 | 1323 | 1336 | 1343 | 1344 | 1346 | | | | 1402 | 1404 | 1405 |
| DC-1 | 0.17<br>0.19 | 0.10<br>0.09 | 0.52<br>0.51 | 0.21<br>0.23 | 0.10<br>0.10 | 0.06<br>0.06 | 14.1 | 32.5 | 71.0 | 14.0 | 32.2 | 69 |
| DC-2 | 0.19<br>0.17 | 0.10<br>0.11 | 0.39<br>0.40 | 0.16<br>0.14 | 0.10<br>0.10 | 0.06<br>0.06 | 14.2 | 32.5 | 71.0 | 14.0 | 32.2 | 69 |
| Σ | 0.36 | 0.20<br>0.20 | 0.91 | 0.37 | 0.20 | 0.12 | 28.3 | 65.0 | 142.0 | 28.0 | 64.4 | 138 |
| DC-3 | 0.17<br>0.19 | 0.09<br>0.09 | 0.41<br>0.45 | 0.14<br>0.20 | 0.08<br>0.11 | .07<br>.08 | 14.1 | 32.5 | 71.0 | 14.0 | 32.2 | 69 |
| Dc-4 | 0.19<br>0.17 | 0.11<br>0.10 | 0.50<br>0.46 | 0.23<br>0.17 | 0.12<br>0.09 | .05<br>.04 | 14.2 | 32.5 | 71.0 | 14.0 | 32.2 | 69 |
| Σ | 0.36 | 0.20<br>0.19 | 0.91 | 0.37 | 0.20 | 0.12 | 28.3 | 65.0 | 142.0 | 28.0 | 64.4 | 138 |
| DC-AV | 0.36 | 0.20 | 0.91 | 0.37 | 0.20 | 0.12 | 28.3 | 65.0 | 142.0 | 28.0 | 64.4 | 138 |
| AC-1 | | 0.15 | | | | | | | | | | |
| AC-2 | | 0.15 | | | | | | | | | | |
| Σ | | 0.30 | | | | | | | | | | |
| S. P. | | -2.5 | | | | -8.0 | | | | | | |
| AC-N | | .09 | | | | .17 | | | | | | |
| | | | | | | | | | | | | |

INDUCED POLARIZATION - RECEIVER NOTES PAGE 1

Project: Spring Valley Line: 3 - Spr. 1 N½ Int.Cal 49.8 Date: 3/17/80

| Send | 1-2 | 3-4 | 4-5 | 2-3 | 3-4 | 4-5 | 1-2 | 2-3 | 3-4 | 4-5 | 1-2 | 2-3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rec. | CAL | .75-1.50 N → | | 1.50-2.25 N → | | → | 2.25-3.00 N → | | | → | 3.00-3.75 N | |
| Time | | 15:08 | 15:11 | 15:25 | 15:31 | 15:31 | 15:35 | 15:40 | 15:45 | 15:50 | 16:05 | 16:10 |
| DC-1 | | 5.39<br>5.38 | 1.12<br>1.17 | 5.15<br>5.20 | 1.10<br>1.09 | .42<br>.41 | 5.20<br>5.20 | 1.02<br>1.00 | .40<br>.40 | .20<br>.19 | 1.01<br>1.07 | .37<br>.36 |
| DC-2 | | 5.40<br>5.40 | 1.19<br>1.18 | 5.18<br>5.12 | 1.02<br>1.03 | .36<br>.37 | 5.35<br>5.35 | 1.05<br>1.08 | .37<br>.38 | .18<br>.20 | 1.02<br>0.97 | .35<br>.36 |
| Σ | | 10.79<br>10.78 | 2.35<br>2.35 | 10.33<br>10.32 | 2.12<br>2.12 | .78<br>.78 | 10.55<br>10.55 | 2.07<br>2.08 | .77<br>.78 | .38<br>.39 | 2.03<br>2.04 | .72<br>.72 |
| DC-3 | | 5.39<br>5.38 | 1.15<br>1.15 | 5.20<br>5.20 | .99<br>1.08 | .40<br>.40 | 5.18<br>5.17 | 1.00<br>0.98 | .37<br>.36 | .21<br>.20 | 1.01<br>1.04 | .35<br>.30 |
| Dc-4 | | 5.42<br>5.47 | 1.20<br>1.20 | 5.12<br>5.11 | 1.13<br>1.03 | .38<br>.38 | 5.36<br>5.35 | 1.08<br>1.10 | .40<br>.40 | .18<br>.18 | 1.03<br>.99 | .36<br>.41 |
| Σ | | 10.81<br>10.81 | 2.35<br>2.35 | 10.32<br>10.30 | 2.12<br>2.11 | .78<br>.78 | 10.54<br>10.52 | 2.08<br>2.08 | .77<br>.76 | .39<br>.38 | 2.04<br>2.03 | .78<br>.81 |
| DC-AV | | 10.80 | 2.35 | 10.32 | 2.12 | .78 | 10.54 | 2.08 | .77 | .385 | 2.035 | .715 |
| AC-1 | | | | | | | | | | | | |
| AC-2 | | | | | | | | | | | | |
| Σ | | | | | | | | | | | | |
| S. P. | +7.6 | | +10.6 | | | +1.9 | | | | +2.2 | | |
| AC-N | | | | | | | | | | | | |
| | | | | | | | | | | | | |

INDUCED POLARIZATION - RECEIVER NOTES PAGE 2

Project: Spring Valley Line: 3. Spr 1 - N½ Int.Cal 49.8 Date: 3/17/61

| Send | 3-4 | 4-5 | 1-2 | 2-3 | 3-4 | 4-5 | 1-2 | → | → | → | → | → |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rec. | → | → | 3.75- | 4.50 N | → | → | CAL | → | → | → | 16:52 | → |
| Time | 16:15 | | 1627 | 1630 | 1633 | 1636 | 14:58 | 15:00 | 15:03 | 16:47 | 16:48 | 15:49 |
| DC-1 | .20<br>.20 | .13<br>.10 | .30<br>.42 | .21<br>.19 | .10<br>.10 | .08<br>.08 | 13.6 | 32.3 | 70.5 | 14.3 | 33.0<br>25.5 | 71.0 |
| DC-2 | .18<br>.18 | .10<br>.14 | .40<br>.28 | .12<br>.14 | .10<br>.10 | .08<br>.08 | 13.7 | 32.5 | 70.8 | 14.3 | 33.0<br>25.5 | 71.0 |
| Σ | .38<br>.38 | .23<br>.24 | .70<br>.70 | .33<br>.33 | [illegible] | [illegible] | 27.3 | 64.8 | 141.3 | 28.6 | 66.0<br>51.0 | 142.0 |
| DC-3 | .20<br>.20 | .17<br>.09 | .39<br>.31 | .15<br>.17 | .10<br>.10 | .08<br>.08 | 13.6 | 32.3 | 70.5 | 14.3 | 33.0<br>25.5 | 71.0 |
| Dc-4 | .18<br>.19 | .08<br>.15 | .31<br>.40 | .17<br>.14 | .10<br>.10 | .08<br>.08 | 13.7 | 32.5 | 70.8 | 14.3 | 33.0<br>25.5 | 71.0 |
| Σ | .38<br>.39 | .25<br>.24 | .70<br>.71 | .32<br>.31 | .20<br>.20 | .16<br>.16 | 27.3 | 64.8 | 141.3 | 28.6 | 66.0<br>51.0 | 142.0 |
| DC-AV | .38 | .24 | .70 | .32 | .20 | .16 | 27.3 | 64.8 | 141.3 | 28.6 | 66.0<br>51.0 | 142.0 |
| AC-1 | | | | | | | 13.6 | 32.9 | 69.2 | | | |
| AC-2 | | | | | | | 13.6 | 33.0 | 69.2 | | | |
| Σ | | | | | | | 27.2 | 65.9 | 138.4 | | | |
| S. P. | | -4.7 | | | | +6.4 | | ↑ | | | | |
| AC-N | | | | | | | | | | | | |
| | | | | | | | | | | | | |

INDUCED POLARIZATION SENDER NOTES

Project: Valley Springs Line: 3 S.E. End Date: 3/17/62

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Send | | 2-3 | 1-2 | 3-4 | 2-3 | 1-2 | 4-5 | 3-4 | 2-3 | 1-2 | 4-5 | 3-4 |
| Receive | | 0-7.50 → | | 750-1500 SE → | | | 1500-2250 SE → | | | | | |
| Time | | 1228 | 1230 | 1244 | 1246 | 1248 | 1257 | 1300 | 1302 | 1305 | 1314 | 1316 |
| Range | | 2.0 | 2.0 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 |
| Current | | 1820 | 1805 | 1440 | 1430 | 1420 | 1440 | 1430 | 1430 | 1420 | 1445 | 1440 |
| Send | | | | | | | | | | | | |
| Receive | | | | | | | | | | | | |
| Time | | | | | | | | | | | | |
| Range | | | | | | | | | | | | |
| Current | | | | | | | | | | | | |

Ω | 5-4 = 40 | 3-4 = 60 | 2-3 = 90 | 1-2 = ?175 |

# INDUCED POLARIZATION SENDER NOTES

Project: SPRING VALLEY Line: 3 N Date: 17 MAR 62

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Send | 1-2 | 3-4 | 4-5 | 2-3 | 3-4 | 4-5 | 1-2 | 2-3 | 3-4 | 4-5 | 1-2 | 2-3 |
| Receive | CAL. | .75-1.5 | N. → | 1.5-2.2 | 5N → | | 2.25- | 3.0 N. | → | | 3.0-3. | 7N. |
| Time | | 1508 | 1511 | 1525 | 1528 | 1531 | 1535 | 1540 | 1545 | 1550 | 1605 | 1610 |
| Range | | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | → | | | | → |
| Current | | 1405 | 1405 | 1400 | 1410 | 1400 | 1405 | 1400 | 1400 | 1400 | 1400 | 1400 |
| Send | 3-4 | 4-5 | 1-2 | 2-3 | 3-4 | 4-5 | 1-2 | | | | | |
| Receive | → | | 3.75- | 4.5N → | | | CAL. | | | | | |
| Time | 1615 | 1618 | 1627 | 1630 | 1633 | | 14:50 | 1500 | 1503 | 1647 | 1652 | 164 |
| Range | → | | | | | | .3 | .75 | 1.5 | .3 | .75 | 1.5 |
| Current | 1400 | 1400 | 1400 | 1400 | 1400 | 1380 | 275 | 655 | 1420 | 295 | 660 | 1420 |

BEARING N 58° W S 58° E 1700 N. OF 1/4 3 AND 2

INDUCED POLARIZATION SENDER NOTES

Project: Spring Valley Line: 3 S. E. End Date: 3/17/62

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Send | 2-3 | 1-2 | 5-4 | 3-4 | 2-3 | 1-2 | Cal | | | | | |
| Receive | | | | | | | 4-5 | | | | | |
| Time | 1317 | 1323 | 1336 | 1343 | 1344 | 1346 | 1228 | | | 1402 | 1404 | 1405 |
| Range | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | .30 | .75 | 1.5 | .30 | .75 | 1.5 |
| Current | 1425 | 1405 | 1415 | 1420 | 1410 | 1400 | 285 | 655 | 1435 | 290 | 665 | 1435 |
| Send | | | | | | | | | | | | |
| Receive | | | | | | | | | | | | |
| Time | | | | | | | | | | | | |
| Range | | | | | | | | | | | | |
| Current | | | | | | | | | | | | |

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page 5

Project Spring Valley Line 3N Field date 3/17/62 Data page _____ Comp. date 3/17/62. Comp by [illegible]

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (A) Send | 1-2 | 3-4 | 4-5 | 2-3 | 3-4 | 4-5 | 1-2 | 2-3 | 3-4 | 4-5 | 1-2 | 2-3 |
| (B) Receive | C42 | .75-1.50N → | | 1.50-2.25N → | | | 2.25-3.00N → | | | | 3.00-3.25N | — |
| (C) n separation | | 1 | 2 | 1 | 2 | 3 | 1 | 2 | 3 | 4 | 2 | 3 |
| (D) I | | 1405 | 1405 | 1400 | 1410 | 1400 | 1405 | 1400 | 1400 | 1400 | 1400 | 1400 |
| (E) Vdc (avg) | | 10.80 | 2.35 | 10.32 | 2.12 | 0.78 | 10.54 | 2.08 | 0.77 | 0.385 | 2.035 | .715 |
| (F) DCcal USED | 1.010 | | | | | | | | | | | |
| (G) Kn x $10^{-3}$ | | 2.25 | 9.00 | 2.25 | 9.00 | 22.5 | 2.25 | 9.00 | 22.5 | 45.0 | 9.00 | 22.5 |
| (H) ρ dc=ExFxGx$10^3$/D | | 17.4 | 15.2 | 16.8 | 13.7 | 12.7 | 17.0 | 13.5 | 12.5 | 12.6 | 13.2 | 11.6 |
| (I) Vac Σ | | | | | | | | | | | | |
| (J) AC noise x 2 | | | | | | | | | | | | |
| (K) Vac(corr) = $\sqrt{I^2 - J^2}$ | | | | | | | | | | | | |
| (L) AC-DC cal. | | — | — | — | — | — | — | — | — | — | — | — |
| (M) ρ dc/ρac=ExL/K | | | | | | | | | | | | |
| (N) PFE=(M-1)($10^2$) | | | | | | | | | | | | |
| (O) MCF=(M-1)($10^5$)/H | | | | | | | | | | | | |

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

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (A) Send | 3-4 | 4-5 | 1-2 | 2-3 | 3-4 | 4-5 | | | | | | |
| (B) Receive | → | → | 2.75-4.50N → | | | → | | | | | | |
| (C) n separation | 4 | 5 | 3 | 4 | 5 | 6 | | | | | | |
| (D) I | 1400 | 1400 | 1400 | 1400 | 1400 | 1380 | 275 | 655 | 1020 | 295 | 660 | 1420 |
| (E) Vdc (avg) | .38 | .24 | .70 | .32 | .20 | .16 | 27.3 | 68.8 | 141.3 | 28.6 | 65.0 | 142.0 |
| (F) DCcal | | | | | | | 1.007 | 1.011 | 1.004 | 1.030 | 1.000 | 1.000 |
| (G) Kn x $10^{-3}$ | 45.0 | 78.75 | 22.5 | 45.0 | 78.75 | 126 | | | ~1.010 | | | |
| (H) ρ dc=ExFxGx$10^3$/D | 12.3 | 13.6 | 11.4 | 10.4 | 11.4 | "14.8" | | | | | | |
| (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 6

Project SPRING VALLEY VAIL Line 3 S Field date 17 MAR 82 Data page _____ Comp. date 17 MAR 82 Comp by C.S.K.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (A) Send | 4-5 | 2-3 | 1-2 | 3-4 | 2-3 | 1-2 | 4-5 | 3-4 | 2-3 | 1-2 | 4-5 | 3-4 |
| (B) Receive | CAL | .75-1.5S. | → | 1.5-2.25S. | → | → | 2.25-3.0S. | → | → | → | 3.0-3.75S. | → |
| (C) n separation | | 1 | 2 | 1 | 2 | 3 | 1 | 2 | 3 | 4 | 2 | 3 |
| (D) I | | 1820 | 1805 | 1440 | 1430 | 1420 | 1440 | 1430 | 1430 | 1420 | 1445 | 1440 |
| (E) Vdc (avg) | | 16.1 | 3.0 | 13.22 | 2.42 | 0.82 | 13.02 | 2.60 | 0.80 | 0.37 | 2.65 | 0.82 |
| (F) DCcal USED | 1.025 | | | | | | | | | | | |
| (G) Kn x $10^{-3}$ | | 2.25 | 9.0 | 2.25 | 9.0 | 22.5 | 2.25 | 9.0 | 22.5 | 45.0 | 9.0 | 22.5 |
| (H) $\rho$ dc=ExFxGx$10^3$/D | | 20.4 | 15.3 | 21.2 | 15.6 | 13.3 | 20.8 | 16.8 | 12.9 | 12.0 | 16.9 | 13.1 |
| (I) Vac $\Sigma$ | | | | | | | | | | | | |
| (J) AC noise x 2 | | | | | | | | | | | | |
| (K) Vac(corr) = $\sqrt{I^2 - J^2}$ | | | | | | | | | | | | |
| (L) AC-DC cal. | | | | | | | | | | | | |
| (M) $\rho$ dc/$\rho$ac=ExL/K | | | | | | | | | | | | |
| (N) PFE=(M-1)($10^2$) | | | | | | | | | | | | |
| (O) MCF=(M-1)($10^5$)/H | | | | | | | | | | | | |

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

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (A) Send | 2-3 | 1-2 | 4-5 | 3-4 | 2-3 | 1-2 | | | | | | |
| (B) Receive | → | → | 3.75-4.5S. | → | → | → | | → | → | → | → | → |
| (C) n separation | 4 | 5 | 3 | 4 | 5 | 6 | CAL. | → | → | → | → | → |
| (D) I | 1425 | 1405 | 1415 | 1420 | 1410 | 1400 | 285 | 655 | 1435 | 290 | 665 | 1435 |
| (E) Vdc (avg) | 0.36 | 0.20 | 0.91 | 0.37 | 0.20 | 0.12 | 28.3 | 65.0 | 142.0 | 28.0 | 64.0 | 138 |
| (F) DCcal | | | | | | | 1.007 | 1.008 | 1.010 | 1.035 | 1.040 | 1.040 |
| (G) Kn x $10^{-3}$ | 45.0 | 78.75 | 22.5 | 45.0 | 78.75 | 126.0 | → | → | → | → | → | → |
| (H) $\rho$ dc=ExFxGx$10^3$/D | 11.6 | 11.5 | 14.8 | 12.0 | 11.4 | 11.1 | | | ~ | 1.025 | | |
| (I) Vac $\Sigma$ | | | | | | | | | | | | |
| (J) AC noise x 2 | | | | | | | | | | | | |
| (K) Vac (corr) = $\sqrt{I^2 - J^2}$ | | | | | | | | | | | | |
| (L) AC-DC cal. | → | → | → | → | → | → | → | → | → | → | → | → |
| (M) $\rho$dc/$\rho$ac =ExL/K | | | | | | | | | | | | |
| (N) PFE=(M-1)($10^2$) | | | | | | | | | | | | |
| (O) MCF=(M-1)($10^5$)/H | | | | | | | | | | | | |

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____

Project: Spring Valley Line: 2-Spr 1 N½ Int.Cal 50.0 Date: 3/15/62

| Send | 3-4 | 4-5 | 1-2 | 2-3 | 3-4 | 4-5 | 1-2 | → | → | → | → | → |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rec. | → | → | 3.75 - | 4.50N | → | → | CAL | → | → | → | → | → |
| Time | 15:33 | 15:36 | 15:45 | 15:50 | 15:52 | 15:58 | 13:50 | 13:53 | 13:55 | 16:19 | 16:22 | |
| DC-1 | .15<br>.15 | .07<br>.09 | .46<br>.49 | .18<br>.19 | .10<br>.08 | .05<br>.05 | 15.2 | 28.0 | 56.0 | 15.2 | 28.0 | 55.0 |
| DC-2 | .15<br>.15 | .08<br>.06 | .45<br>.42 | .17<br>.16 | .08<br>.10 | .06<br>.06 | 15.3 | 28.0 | 56.0 | 15.2 | 28.0 | 55.0 |
| Σ | .30<br>.30 | .15<br>.15 | .91<br>.91 | .35<br>.35 | .18<br>.18 | .11<br>.11 | 30.5 | 56.0 | 112.0 | 30.4 | 56.0 | 110.0 |
| DC-3 | .15<br>.15 | .07<br>.06 | .41<br>.47 | .17<br>.20 | .08<br>.10 | .07<br>.08 | 15.2 | 28.0 | 56.0 | 15.2 | 28.0 | 55.0 |
| Dc-4 | .15<br>.15 | .08<br>.09 | .51<br>.44 | .16<br>.13 | .10<br>.08 | .04<br>.04 | 15.3 | 28.0 | 56.0 | 15.2 | 28.0 | 55.0 |
| Σ | .30<br>.30 | .15<br>.15 | .92<br>.91 | .33<br>.33 | .18<br>.18 | .11<br>.12 | 30.5 | 56.0 | 112.0 | 30.4 | 56.0 | 110.0 |
| DC-AV | .30 | .15 | .91 | .34 | .18 | .11 | 30.5 | 56.0 | 112.0 | | | |
| AC-1 | .15 | .11 | .43 | .18 | .11 | .10 | 15.1 | 28.0 | 56.2 | 15.1 | 28.0 | 55.2 |
| AC-2 | .15 | .10 | .43 | .18 | .11 | .09 | 15.2 | 28.0 | 56.2 | 15.0 | 28.0 | 55.3 |
| Σ | .30 | .21 | .86 | .36 | .22 | .19 | 30.3 | 56.0 | 112.4 | 30.1 | 56.0 | 110.5 |
| S. P. | | -7.5 | | | | 13.7 | | | | | | |
| AC-N | .06 | .06 | | 4/9 | .06 | .05 | | | | | | |
| | #1 located @ 1/4 corner bearing N58°W & S58E | | | | | | | | | | | |

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____

Project: Spring Valley Line: 2 Sr. 1 N½ Int.Cal 50.0 Date: 3/15/62

| Send | 1-2 | 3-4 | 4-5 | 2-3 | 3-4 | 4-5 | 1-2 | 2-3 | 3-4 | 4-5 | 1-2 | 2-3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rec. | CAL | .75-1.50N→ | | 1.50-2.25N | | → | 2.25- | 3.00 | | → | 3.00- | 3.75N |
| Time | | 14:00 | 14:06 | 14:48 | 14:52 | 14:54 | 15:11 | 15:13 | 15:16 | 15:18 | 15:29 | 15:30 |
| DC-1 | S.P. | 8.8<br>8.8 | 1.48<br>1.50 | 7.49<br>7.50 | 1.35<br>1.34 | .39<br>.37 | 6.95<br>6.95 | 1.10<br>1.10 | .30<br>.41 | .15<br>.16 | 1.27<br>1.19 | .35<br>.32 |
| DC-2 | 0.075N | 8.9<br>8.9 | 1.45<br>1.43 | 7.55<br>7.55 | 1.30<br>1.30 | .40<br>.42 | 6.80<br>6.78 | 1.10<br>1.11 | .40<br>.29 | .15<br>.14 | 1.20<br>1.29 | .33<br>.36 |
| Σ | | 17.7<br>17.7 | 2.93<br>2.93 | 15.04<br>15.05 | 2.65<br>2.64 | .79<br>.79 | 13.75<br>13.73 | 2.20<br>2.21 | .70<br>.70 | .30<br>.30 | 2.47<br>2.48 | .68<br>.68 |
| DC-3 | | 8.8<br>8.8 | 1.47<br>1.50 | 7.50<br>7.50 | 1.33<br>1.33 | .41<br>.37 | 6.98<br>7.0 | 1.10<br>1.08 | .36<br>.37 | .13<br>.16 | 1.21<br>1.29 | .35<br>.31 |
| Dc-4 | | 8.9<br>8.9 | 1.45<br>1.43 | 7.55<br>7.55 | 1.33<br>1.33 | .38<br>.41 | 6.90<br>6.85 | 1.11<br>1.13 | .34<br>.32 | .16<br>.14 | 1.27<br>1.18 | .32<br>.38 |
| Σ | | 17.7<br>17.7 | 2.92<br>2.93 | 15.05<br>15.05 | 2.66<br>2.66 | .79<br>.78 | 13.88<br>13.85 | 2.21<br>2.21 | .70<br>.69 | .30 .29 | 2.48<br>2.47 | .67<br>.69 |
| DC-AV | | 17.7 | 2.93 | 15.09 | 2.65 | .79 | 13.80 | 2.21 | .70 | .30 | 2.47 | .68 |
| AC-1 | | 8.5 | 1.40 | 7.20 | 1.28 | .38 | 6.58 | 1.07 | .34 | .145 | 1.17 | .33 |
| AC-2 | | 8.6 | 1.41 | 7.20 | 1.28 | .38 | 6.58 | 1.07 | .34 | .145 | 1.17 | .34 |
| Σ | | 17.1 | 2.81 | 14.4 | 2.56 | .76 | 13.16 | 2.14 | .68 | .290 | 2.34 | .77 |
| S. P. | +10.1 | | -3.4 | | | +31.3 | | | | -4.9 | | |
| AC-N | | | .06 | | | .08 | | | | .05 | | |
| | | | | | | | | | | | | |

# INDUCED POLARIZATION SENDER NOTES

Project: SPRING VALLEY VAIL Line: 2 N. Date: 3-15-62

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Send | 1-2 | 3-4 | 4-5 | 2-3 | 3-4 | 4-5 | 1-2 | 2-3 | 3-4 | 4-5 | 1-2 | 2-3 |
| Receive | CAL | .75-1.5 N → | | 1.5-2.25 N → | | | 2.25-3.0 N → | | | | 3.0-3.75 N - | |
| Time | | 1400 | 1406 | 1448 | 1452 | 1454 | 1511 | 1513 | 1516 | 1518 | 1529 | 1530 |
| Range | | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | — | — | — | — | — |
| Current | | 1515 1500 AC | 1500 | 1515 | 1500 | 1500 | 1500 | 1500 | 1500 | 1500 | 1500 | 1500 |
| Send | 3-4 | 4-5 | 1-2 | 2-3 | 3-4 | 4-5 | 1-2 | — | — | — | — | → |
| Receive | → | | 3.75-4.50 N - | | → | | CAL | — | — | — | — | → |
| Time | 1533 | 1536 | 1545 | 1550 | 1552 | 1558 | | | | 1619 | 1622 | 162 |
| Range | — | — | — | — | — | → | 3 | .5 | 1.0 | .3 | .5 | 1.0 |
| Current | 1495 | 1495 | 1500 | 1490 | 1480 | 1480 | 300 FINAL | 560 | 1100 110 AC | 300 | 555 | 1080 |

558

INDUCED POLARIZATION - RECEIVER NOTES PAGE _____

Project: Spring Valley Line: 2 S1/2 Int.Cal 49.9 Date: 3/16/62

| 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. | .75-1.5 | → | 1.5 | -2.25 | → | 2.25 | -3.0 | → | → | 3.0 | -3.7 | 5 — |
| Time | 13:20 | 13:24 | 14:30 | 14:33 | 14:38 | 14:50 | 15:00 | 15:02 | 15:05 | 15:18 | 15:21 | 15:25 |
| DC-1 | 9.1<br>9.1 | 1.45<br>1.45 | 9.1<br>9.1 | 1.37<br>1.35 | .40<br>.42 | 9.2<br>9.3 | 1.58<br>1.59 | .41<br>.41 | .15<br>.18 | 1.40<br>1.43 | .41<br>.41 | .17<br>.20 |
| DC-2 | 9.1<br>9.1 | 1.46<br>1.46 | 9.1<br>9.1 | 1.40<br>1.40 | .42<br>.40 | 9.2<br>9.1 | 1.58<br>1.57 | .41<br>.41 | .20<br>.18 | 1.41<br>1.40 | .40<br>.40 | .19<br>.16 |
| Σ | 18.2<br>18.2 | 2.91<br>2.91 | 18.2<br>18.2 | 2.77<br>2.75 | .82<br>.82 | 18.4<br>18.4 | 3.16<br>3.16 | .82<br>.82 | .35<br>.36 | 2.81<br>2.83 | .81<br>.81 | .36<br>.36 |
| DC-3 | 9.1<br>9.1 | 1.45<br>1.46 | 9.1<br>9.1 | 1.32<br>1.32 | .42<br>.42 | 9.2<br>9.2 | 1.56<br>1.56 | .45<br>.39 | .16<br>.19 | 1.44<br>1.44 | .40<br>.42 | .15<br>.13 |
| Dc-4 | 9.1<br>9.1 | 1.45<br>1.46 | 9.1<br>9.1 | 1.42<br>1.42 | .41<br>.41 | 9.2<br>9.2 | 1.60<br>1.60 | .38<br>.43 | .19<br>.16 | 1.39<br>1.38 | .41<br>.39 | .21<br>.23 |
| Σ | 18.2<br>18.2 | 2.91<br>2.91 | 18.2<br>18.2 | 2.74<br>2.74 | .83<br>.83 | 18.4<br>18.4 | 3.16<br>3.16 | .83<br>.82 | .35<br>.35 | 2.83<br>2.82 | .81<br>.81 | .36<br>.36 |
| DC-AV | 18.2 | 2.91 | 18.2 | 2.74 | .8225 | 18.4 | 3.16 | .82 | .352 | 2.82 | .81 | .36 |
| AC-1 | 8.9 | 1.41 | 8.8 | 1.33 | .40 | 8.9 | 1.51 | .41 | .18 | 1.34 | .41 | .18 |
| AC-2 | 8.9 | 1.41 | 8.8 | 1.33 | .40 | 9.0 | 1.51 | .41 | .18 | 1.34 | .41 | .20 |
| Σ | 17.8 | 2.82 | 17.6 | 2.66 | .80 | 17.9 | 3.02 | .82 | .36 | 2.68 | .82 | .38 |
| S. P. | | -7.3 | | | -4.5 | | | | -1.8 | | | |
| AC-N | | 0.10 | | | .12 | | | | .08 | | | .10 |
| | | | | | | | | | | | | |

Much noise
Even internal calibration

INDUCED POLARIZATION - RECEIVER NOTES PAGE

Project: Spring Valley Line: 2 Sol 5½ Int.Cal 49.8 Date: 3/16/62

| Send | 1-2 | 4-5 | 3-4 | 2-3 | 1-2 | S.P. | CAL. | 4-5 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rec. | → | 3.75 | 4.5 | → | | 0-.75 | | | | | | |
| Time | 15:29 | 15:43 | 15:45 | 15:48 | 15:53 | | 13:05 | 13:08 | 13:17 | 16:24 | 16:26 | 16:28 |
| DC-1 | .10<br>.10 | .00<br>.99 | .18<br>.16 | .08<br>.11 | .06<br>.06 | | 15.3 | 34.5 | 55.0 | 15.3 | 35.3 | 55.8 |
| DC-2 | .08<br>.08 | .53<br>.02 | .20<br>.20 | .13<br>.10 | .09<br>.08 | | 15.3 | 34.5 | 55.0 | 15.3 | 35.3 | 55.8 |
| Σ | .18<br>.18 | .93<br>.91 | .38<br>.38 | .21<br>.21 | .14<br>.15 | | 30.6 | 69.0 | 110.0 | 30.6 | 70.6 | 111.6 |
| DC-3 | .11<br>.11 | .09<br>.91 | .17<br>.17 | .08<br>.12 | .08<br>.08 | | 15.3 | 34.5 | 55.0 | 15.3 | 35.3 | 55.8 |
| Dc-4 | .07<br>.07 | .48<br>.53 | .21<br>.21 | .13<br>.09 | .06<br>.08 | | 15.3 | 34.5 | 55.0 | 15.3 | 35.3 | 55.8 |
| Σ | .18<br>.18 | .91<br>.91 | .38<br>.38 | .21<br>.21 | .12<br>.16 | | 30.6 | 69.0 | 110.0 | 30.6 | 70.6 | 111.6 |
| DC-AV | .18 | .93 | .38 | .21 | .14 | | 30.6 | 69.0 | 110.0 | 30.6 | 70.6 | 111.6 |
| AC-1 | .18 | .97 | .22 | .13 | .12 | | 15.1 | 34.3 | 54.5 | 15.1 | 35.1 | 55.8 |
| AC-2 | .18 | .97 | .22 | .13 | .12 | | 15.1 | 34.3 | 54.5 | 15.1 | 35.1 | 55.8 |
| Σ | .36 | 94 | .44 | .26 | .24 | | 30.2 | 68.6 | 109.0 | 30.2 | 70.2 | 111.6 |
| S. P. | +17.9 | | | | -32.7 | +11.5 | | | | | | |
| AC-N | .12 | | | | .10 | | | | | | | |
| | | | | | | | | | | | | |

# INDUCED POLARIZATION SENDER NOTES

Project: Valley Spring Line: 2 South - Half Date: 3/16/62

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Send | 3-2 | 2-1 | 5-4 | 4-3 | 3-2 | 2-1 | Cal | | | | | |
| Receive | → | → | 3.75-4.5 | | → | | 4-5 | | | | | |
| Time | 1525 | 1529 | 1543 | 1545 | 1548 | 1553 | 1305 | 1308 | 1317 | 1624 | 1626 | 1628 |
| Range | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | .30 | .75 | 1.0 | .30 | .75 | 1.0 |
| Current DC | 1500 | 1500 | 1500 | 1495 | 1495 | 1490 | DC 305 | 701 | 1115 | 300 | 700 | 1095 |
| Current AC | 1500 | 1495 | 1495 | 1490 | 1490 | 1490 | AC 300 | 700 | 1120 | 300 | 695 | 1100 |
| Send | | | | | | | | | | | | |
| Receive | | | | | | | | | | | | |
| Time | | | | | | | | | | | | |
| Range | | | | | | | | | | | | |
| Current | | | | | | | DC<br>AC | | | | | |

# INDUCED POLARIZATION SENDER NOTES

Project: Spring Valley Line: 2 South Half Date: 3/16/62

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Send | | 2-3 | 1-2 | 4-3 | 3-2 | 2-1 | 5-4 | 4-3 | 3 2 | 2-1 | 5-4 | 4-3 |
| Receive | | .75-1.5 | → | 1.5- | 2.25 | → | 2.25 → | 3.00 | → | | 3.0- | 3.75 |
| Time | | 1320 | 1324 | 1430 | 1433 | 1438 | 1457 | 1500 | 1502 | 1505 | 1518 | 1521 |
| Range | | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 |
| Current | DC<br>AC | 1515<br>1530 | 1525<br>1525 | 1535<br>1520 | 1515<br>1510 | 1505<br>1505 | 1525<br>1515 | 1510<br>1505 | 1506<br>1502 | 1500<br>1500 | 1510<br>1505 | 1500<br>1500 |
| Send | | | | | | | | | | | | |
| Receive | | | | | | | | | | | | |
| Time | | | | | | | | | | | | |
| Range | | | | | | | | | | | | |
| Current | DC<br>AC | | | | | | | | | | | |

Ω | 1-2 = 100 | 2-3 = 75 | 3-4 = 200 | 4-5 = 250

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page 3

Project (VAIL) SPRING VALLEY Line 2 N. Field date 15MAR62 Data page _____ Comp. date 16MAR62. Comp by _____

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (A) Send | 1-2 | 3-4 | 4-5 | 2-3 | 3-4 | 4-5 | 1-2 | 2-3 | 3-4 | 4-5 | 1-2 | 2-3 |
| (B) Receive | CAL | .75-1.5N. | → | 1.5-2.25N | → | → | 2.25-3.0N | — | — | → | 3.0-3.75N | — |
| (C) n separation | | 1 | 2 | 1 | 2 | 3 | 1 | 2 | 3 | 4 | 2 | 3 |
| (D) I | | 1508 | 1500 | 1515 | 1500 | 1500 | 1500 | 1500 | 1500 | 1500 | 1500 | 1500 |
| (E) Vdc (avg) | | 14.7 | 2.93 | 15.09 | 2.65 | .79 | 13.80 | 2.21 | .70 | .30 | 2.47 | .68 |
| (F) DCcal USED | .990 | | | | | | | | | | | |
| (G) Kn x $10^{-3}$ | | 2.25 | 9.00 | 2.25 | 9.00 | 22.5 | 2.25 | 9.00 | 22.5 | 45.0 | 9.00 | 22.5 |
| (H) $\rho$ dc=ExFxGx$10^3$/D | | 26.2 | 17.4 | 22.2 | 15.7 | 11.7 | 20.5 | 13.1 | 10.4 | 8.9 | 14.7 | 10.1 |
| (I) Vac $\Sigma$ | | 17.1 | 2.81 | 14.4 | 2.56 | .76 | 13.16 | 2.14 | .68 | .290 | 2.34 | .77 |
| (J) AC noise x 2 | | 0.12 | 0.12 | 0.16 | 0.16 | 0.16 | 0.10 | 0.10 | 0.10 | 0.10 | 0.12 | 0.12 |
| (K) Vac(corr) = $\sqrt{I^2 - J^2}$ | | | | | | .74 | | | .67 | .27 | | .76 |
| (L) AC-DC cal. USED | 1.000 | — | — | — | — | — | — | — | — | — | — | — |
| (M) $\rho$ dc/$\rho$ac=ExL/K | | 1.035 | 1.042 | 1.049 | 1.034 | 1.067 | 1.049 | 1.033 | 1.045 | 1.114 | 1.055 | .895 |
| (N) PFE=(M-1)($10^2$) | | 4 | 4 | 5 | 3 | 7 | 5 | 3 | 5 | 11 | 6 | -10 |
| (O) MCF=(M-1)($10^5$)/H | | | | | | | | | | | | |

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

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (A) Send | 3-4 | 4-5 | 1-2 | 2-3 | 3-4 | 4-5 | 1-2 | — | — | — | — | → |
| (B) Receive | → | → | 3.75-4.5N. | — | — | → | CAL | — | — | — | — | → |
| (C) n separation | 4 | 5 | 3 | 4 | 5 | 6 | | | | | | |
| (D) I | 1495 | 1495 | 1500 | 1490 | 1480 | 1480 | 3∞ | 560 | 1100 1105 AC. | 300 | 555 | 1080 |
| (E) Vdc (avg) | .30 | .15 | .91 | .34 | .18 | .11 | 30.5 | 56.0 | 112.0 | 30.4 | 56.0 | 110.0 |
| (F) DCcal | | | | | | | .985 | 1.000 | .986 | .988 | .990 | .982 |
| (G) Kn x $10^{-3}$ | 45.0 | 78.75 | 22.5 | 45.0 | 78.75 | 126 | — | — | — | — | — | — |
| (H) $\rho$ dc=ExFxGx$10^3$/D | 8.9 | 7.8 | 13.5 | 10.1 | 9.5 | 9.3 | | | .990 | | | |
| (I) Vac $\Sigma$ | .30 | .21 | .86 | .36 | .22 | .19 | 30.3 | 56.0 | 112.4 | 30.1 | 56.0 | 110.5 |
| (J) AC noise x 2 | 0.12 | 0.12 | 0.10 | 0.10 | 0.10 | 0.10 | | | | | | |
| (K) Vac (corr) = $\sqrt{I^2 - J^2}$ | .276 | .173 | .855 | .346 | .196 | .162 | | | | | | |
| (L) AC-DC cal. | — | — | — | — | — | — | .994 | 1.000 | 1.004 | .991 | 1.000 | 1.005 |
| (M) $\rho$dc/$\rho$ac =ExL/K | 1.088 | .867 | 1.064 | .982 | .920 | .680 | | | ~1.000 | | | |
| (N) PFE=(M-1)($10^2$) | 9 | -13 | 6 | -2 | -8 | -32 | | | | | | |
| (O) MCF=(M-1)($10^5$)/H | | | | | | | | | | | | |

HEINRICHS GEOEXPLORATION COMPANY
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Page 4

Project SPRING VALLEY Line 2 S Field date 16 MAR Data page 2 Comp. date 16 MAR . Comp by

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (A) Send | 4-5 | 2-3 | 1-2 | 3-4 | 2-3 | 1-2 | 4-5 | 3-4 | 2-3 | 1-2 | 4-5 | 3-4 |
| (B) Receive | CAL. | .75-1.5S | | 1.5-2.25S | | | 2.25-3.0S. | | | | 3.0-3.75S. | |
| (C) n separation | | 1 | 2 | 1 | 2 | 3 | 1 | 2 | 3 | 4 | 2 | 3 |
| (D) I | | 1515 1530 | 1525 | 1535 1520 | 1515 1510 | 1505 | 1525 1515 | 1510 1505 | 1505 | 1500 | 1510 | 1500 |
| (E) Vdc (avg) | | 18.2 | 2.91 | 18.2 | 2.74 | .825 | 18.4 | 3.16 | .82 | .352 | 2.82 | .81 |
| (F) DCcal USED | 1.000 | | | | | | | | | | | |
| (G) Kn x $10^{-3}$ | | 2.25 | 9.0 | 2.25 | 9.0 | 22.5 | 2.25 | 9.0 | 22.5 | 45.0 | 9.0 | 22.5 |
| (H) ρ dc=ExFxGx$10^3$/D | | 27.0 | 17.2 | 26.7 | 16.3 | 12.3 | 27.2 | 18.9 | 12.2 | 10.5 | 16.2 | 12.1 |
| (I) Vac Σ | | 17.8 | 2.82 | 17.6 | 2.66 | .80 | 17.9 | 3.02 | .82 | .36 | 2.68 | .82 |
| (J) AC noise x 2 | | .20 | .20 | .24 | .24 | .24 x | .16 | .16 | .16 x | .16 x | .20 | .20 x |
| (K) Vac(corr) = $\sqrt{I^2 - J^2}$ | | | | | | | | | | | | |
| (L) AC-DC cal. USED | .995 | | | | | | | | | | | |
| (M) ρ dc/ρac=ExL/K | | | | | | | | | | | | |
| (N) PFE=(M-1)($10^2$) | | | | | | | | | | | | |
| (O) MCF=(M-1)($10^5$)/H | | | | | | | | | | | | |

Project Line Field date Data page Comp. date Comp by

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (A) Send | 2-3 | 1-2 | 4-5 | 3-4 | 2-3 | 1-2 | 4-5 | | | | | |
| (B) Receive | | | 3.75-4.5S | | | | CAL | | | | | |
| (C) n separation | 4 | 5 | 3 | 4 | 5 | 6 | | | | | | |
| (D) I | 1500 | 1500 1495 | 1500 1495 | 1495 1490 | 1495 1490 | 1490 | 30.5 D. 300 A. | 700 | 1115 D. 1120 A. | 300 | 700 695 | 1095 1100 |
| (E) Vdc (avg) | .36 | .18 | .93 | .38 | .21 | .14 | 30.6 | 69.0 | 110.0 | 30.6 | 70.6 | 111.6 |
| (F) DCcal | | | | | | | .996 | 1.013 | 1.015 | .981 | .992 | .978 |
| (G) Kn x $10^{-3}$ | 45.0 | 78.75 | 22.5 | 45.0 | 78.75 | 126.0 | | | | | | |
| (H) ρ dc=ExFxGx$10^3$/D | 10.8 | 9.4 | 13.9 | 11.4 | 11.1 | 11.8 | | | ~1.00 | | | |
| (I) Vac Σ | .38 | .36 | .94 | .44 | .26 | .24 | 30.2 | 68.6 | 109.0 | 30.2 | 70.2 | 111.6 |
| (J) AC noise x 2 | .20 x | .24 x | .20 x | .20 x | .20 x | .20 x | .987 | .994 | .991 | .987 | .995 | 1.000 |
| (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 | | | | | | | | | | | | |

*Water Development Corporation*

CONSULTANTS IN GROUND-WATER HYDROLOGY

3938 SANTA BARBARA AVENUE
TUCSON, ARIZONA

PHONE: EAST 6-1133
CABLE: WADEVCO, TUCSON

December 4, 1961

Mr. Orland Fiandaca
149 N. Stone Avenue
Tucson, Arizona

Dear Mr. Fiandaca:

In reply to your request for this firm to undertake an investigation of the ground-water supply available to Secs. 2, 13, 14, and 24, T. 17 S., R. 15 E.

We understand that you need a water supply for a proposed subdivision. The water demand would require a firm supply from wells amounting to at least 2,200 gpm and probably 2,500 gpm. This estimate includes only the water required for a planned population of about 10,000 people and for an 80-acre golf course. Not included in this estimate is the water required for 20 acres of land in Sec. 2, planned for local business, 160 acres in Sec. 13 planned as townsite, 160 acres in Sec. 13 planned as a regional park, 10 acres in Sec. 13 planned for clubhouse and recreation, nor for 320 acres in Sec. 14 planned as a regional park.

Little factual information is available and this information indicates that it will be difficult to develop the required quantity of water. For example, a well in Sec. 13 did not encounter any water above a depth of 725 feet, where 15 feet of water-bearing material was found. The water level in this well is 700 feet below the land surface. The work required at this stage consists mainly of conducting a geophysical investigation supplemented by collection and study of all available well records and geologic information. Completion of this required work will result in selection of sites for two or more test holes if it then appears that the expense of drilling test holes is warranted. Proof of an adequate water supply will be at hand only after at least two test holes have been completed with favorable results.

The cost of the work leading to selection of sites for test holes will be $3,000 to $3,500, including geophysical work to be done by Heinrichs Geoexploration Company in the amount of $1,500 to $2,000. In view of the likelihood that results will be unfavorable, we request that the sum of $3,000 be deposited in escrow subject to payment to us upon completion and submittal of our report.

The report will be prepared as soon as possible after geophysical work is completed, probably within 3 days thereafter.

If this proposal is acceptable to you, the work leading to selection of sites for test holes can begin as soon as the deposit has been made and you have signified your acceptance by signature on the attached copy of this letter.

Very truly yours,

Leonard C. Halpenny

LCH:s

# DATA ON WELLS AND PUMP IRRIGATION

O P Y

AGRICULTURAL ENGINEERING DEPARTMENT

AGRICULTURAL EXPERIMENT STATION — UNIVERSITY OF ARIZONA

TUCSON, ARIZONA

NAME: Charles Beach Simpson ADDRESS:

WELL: Location NE SE NW Sec. 21, Twp. 16S, R16E

Use, domestic, stock, or irrigation Stock acres

Type Drilled Casing 623' of 6"

Perforations

Drilled by CWP Nov. 1946 Date:

LOG

| FROM Feet | TO Feet | MATERIAL | FROM Feet | TO Feet | MATERIAL |
|---|---|---|---|---|---|
| 0 | 3 | Soil | | | |
| 3 | 9 | Red Caliche | | | |
| 9 | 63 | Gravel, Boulders, Clay | | | |
| 63 | 123 | Sand, Boulders | | | |
| 123 | 170 | Cemented Sand | | | |
| 170 | 345 | Sand Gravel Caves | | | Red, the driller said |
| 345 | 354 | Cemented Sand | | | struck water at |
| 354 | 401 | Gray Lime | | | 589' and it rose |
| 401 | 407 | Gray Schist | | | to 580'. |
| 407 | 452 | Red Schist | | | |
| 452 | 456 | Gray Schist | | | |
| 456 | 470 | Red Schist | | | |
| 470 | 480 | Gray Schist | | | |
| 480 | 590 | Gray Schist Crevices | | | |
| 590 | 629 | Gray Schist Crevices - Water | | | |

al & or pantano ???

B.R. ?

?

WATER LEVEL: Depth from surface when drilled 584 feet. Date November 1946

Present depth to water feet. Date

Notes on fluctuation of water level See Water Level Card

S.W.L. 3/26/59 = 586.83' Top casing.

PUMP: Make Type Size

Diam. of bowls Number of stages

Diam. of column Diam. discharge Diam. suction

Rated capacity in G. P. M. at feet head, at R. P. M.

Amount of discharge G. P. M. measured by means of

Drawdown feet when pumping G. P. M. Total lift feet

ENGINE OR MOTOR: Make Windmill Type Size H. P.

Drive: direct-connected belted, or geared

Fuel consumption or power input

Description of installation

Date: (Signed) By phone from CWP RJS

SEE OTHER SIDE FOR MISCELLANEOUS DATA

T610110

# DATA ON WELLS AND PUMP IRRIGATION

AGRICULTURAL ENGINEERING DEPARTMENT

AGRICULTURAL EXPERIMENT STATION — UNIVERSITY OF ARIZONA

TUCSON, ARIZONA

#2 E 2950.37

NAME: Vail Compressor Station ADDRESS: Vail, Arizona

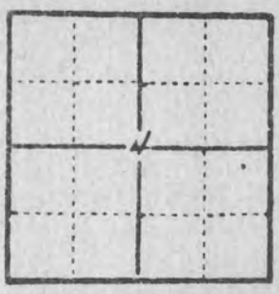
WELL: Location NE¼SE¼ Sec. 41, Twp. 16, R. 15

Use, domestic, stock, or irrigation ..... acres

Type Drilled Casing .....

Perforations .....

Drilled by ..... Date: .....



LOG

| FROM Feet | TO Feet | MATERIAL | FROM Feet | TO Feet | MATERIAL |
|---|---|---|---|---|---|
| 0 | | | | | |
| 15 | 80 | gravel sand boulders | | | |
| 80 | 465 | sand gravel water | | | |
| 465 | 510 | red clay Paulins ? | | | |

WATER LEVEL: Depth from surface when drilled 265 feet. Date .....

Present depth to water ..... feet. Date .....

Notes on fluctuation of water level .....

PUMP: Make ..... Type ..... Size .....

Diam. of bowls ..... Number of stages .....

Diam. of column ..... Diam. discharge ..... Diam. suction .....

Rated capacity in G. P. M. ..... at ..... feet head, at ..... R. P. M.

Amount of discharge ..... G. P. M. measured by means of .....

Drawdown ..... feet when pumping ..... G. P. M. Total lift ..... feet

ENGINE OR MOTOR: Make ..... Type ..... Size ..... H. P.

Drive: direct-connected ..... belted ....., or geared .....

Fuel consumption or power input .....

Description of installation .....

Date: 7/20/55 (Signed) RJS

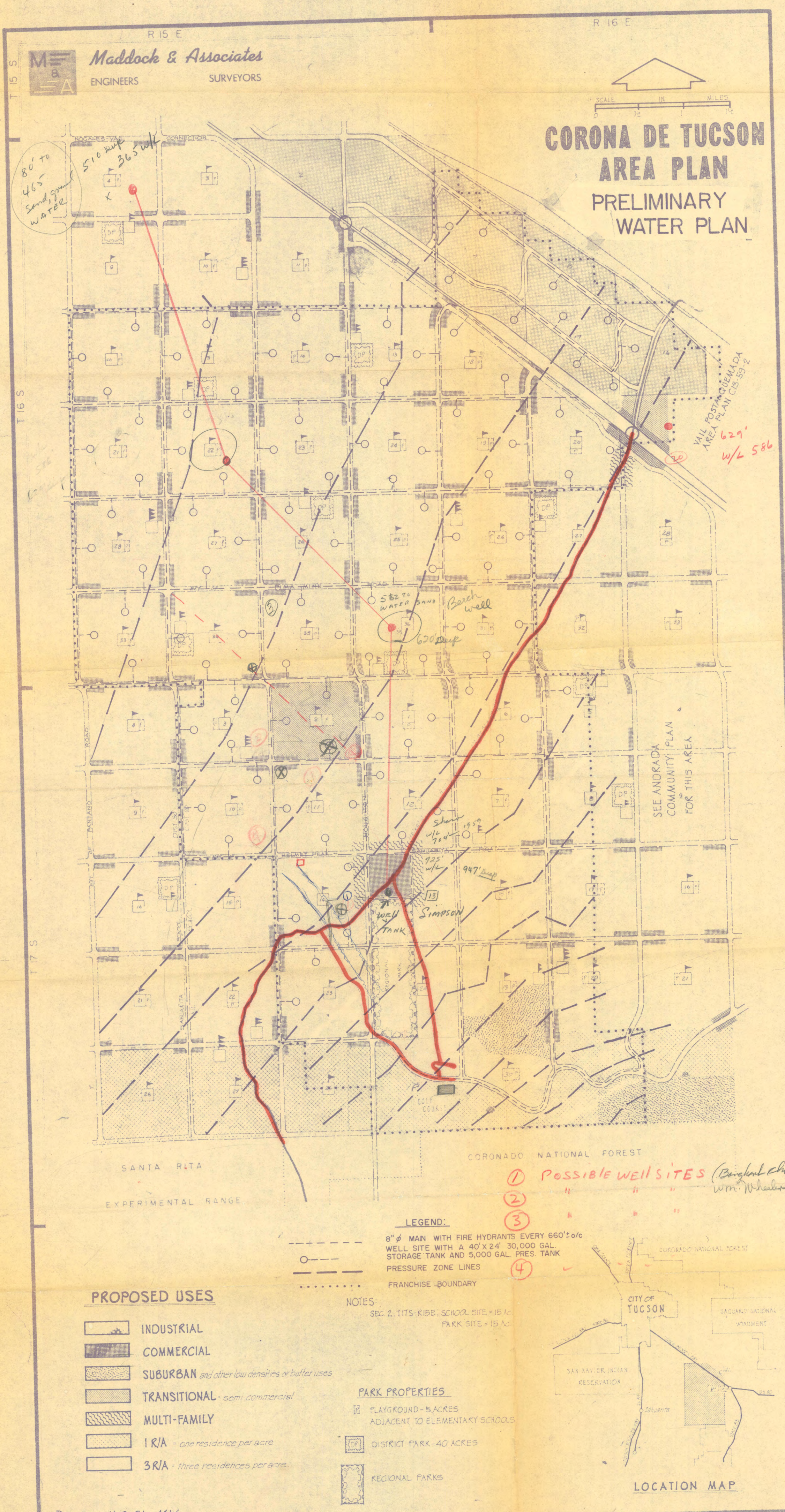
SEE OTHER SIDE FOR MISCELLANEOUS DATA

T610110

Maddock & Associates
ENGINEERS SURVEYORS

# CORONA DE TUCSON AREA PLAN

## PRELIMINARY WATER PLAN




LEGEND:

8" ø MAIN WITH FIRE HYDRANTS EVERY 660'± o/c

WELL SITE WITH A 40'X 24' 30,000 GAL. STORAGE TANK AND 5,000 GAL. PRES. TANK

PRESSURE ZONE LINES

FRANCHISE BOUNDARY

NOTES:
SEC. 2. T17S-R15E, SCHOOL SITE = 15 Ac.
PARK SITE = 15 Ac.

## PROPOSED USES

- INDUSTRIAL
- COMMERCIAL
- SUBURBAN and other low densities or buffer uses
- TRANSITIONAL = semi-commercial
- MULTI-FAMILY
- 1 R/A = one residence per acre
- 3 R/A = three residences per acre.

PARK PROPERTIES

- PLAYGROUND - 5 ACRES ADJACENT TO ELEMENTARY SCHOOLS
- DISTRICT PARK - 40 ACRES
- REGIONAL PARKS




LOCATION MAP

REVISED 11-6-61 M.W.

C13-60-22 CITY-COUNTY PLANNING DEPT (jn)

# Land Developer Asks City Water

To Walt

Date 11/28/61 Time 9 a.m.

**WHILE YOU WERE OUT**

M Bill Wheeler

of

Phone Ay 83391

| | | | |
|---|---|---|---|
| TELEPHONED | X | PLEASE CALL | X |
| CALLED TO SEE YOU | | WILL CALL AGAIN | |
| WANTS TO SEE YOU | | URGENT | |

Message Call when you get in

Operator

Efficiency Line No. 2725

Memo from

WALTER E. HEINRICHS, JR.

Orlando Fiandaca
305
Pima Blg.

T16S R15E
½ N Tier 17S-15E

6528 E. 22nd St.
AX 8-3391

HAWLEY & HAWLEY
ASSAYERS AND CHEMISTS, INC.
DOUGLAS, ARIZONA

Re: Orland Fiandaca

Grover: Ask me about this.

W.

Walt —

attached is the plat of the "Frandaca - project" — I understand that Frandaca is in financial difficulties at the present time, so be sure to have a tight contract if you do work for him.

The loan company will require that he drill test wells and have pumping tests. Make sure that he understands this.

Regards
Bill

NOV 1961
GEOEX

Water Development Corporation
CONSULTANTS IN GROUND-WATER HYDROLOGY

3938 SANTA BARBARA AVENUE
TUCSON, ARIZONA

PHONE: EAST 6-1133
CABLE: WADEVCO, TUCSON

December 11, 1961

DEC 1961
GEOEX

Mr. Orland Fiandaca
149 North Stone Avenue
Tucson, Arizona

Dear Mr. Fiandaca:

With reference to the proposed water-supply investigation of the area south of Vail, Arizona:

We held the period December 6-11 open for the purpose of initiating the work you desired from us. During that period we heard nothing from your office.

The pressure of other work requires our immediate attention, and we can no longer set aside time to be available immediately when needed by you. There are four legal cases on which we are working that will require our full attention and effort from the date of this letter through at least February 15, 1962.

Very truly yours,

Leonard C. Halpenny

LCH:s

cc: W. F. Guyton
Heinrichs Geoexploration Co.

PLANNING THE WEST

# MADDOCK AND ASSOCIATES-ENGINEERS, INC.

Mr. Kirby Atwell
Business Funds, Inc.
824 Bettes Building
201 Main Street
Houston 2, Texas

November 6, 1961

Re: Corona de Tucson, Hydrology
Report Supplement
Our Job No. T-611102

Dear Mr. Atwell:

In answer to your request for additional information supplemental to the Hydrology Report previously submitted, I have discussed your questions with Mr. Shaw and wish to offer the following addenda:

First, regarding proposed well locations; We are enclosing 5 copies of the Preliminary Water Plan of Corona de Tucson showing the proposed well locations and principal pipe lines.

Secondly, regarding your questions on recharge; Mr. Shaw's report estimates 5,100 acre feet per year of runoff from the mountains and another 1,000 acre feet per year from the valley floor. The entire amount is not now computed in the total water budget. If it were collected by dentention basins and recharge wells such as are in use in the high plains of Texas, this 6,100 acre feet per year would provide in itself more than 50% excess over the demand of 20,000 persons drawing at the rate of 5 persons per acre feet per year. Our approach in this report was to draw first upon existing groundwater which is quite adequate for the first few years of demand, and construct such recharge improvements as might be required after observation of needs in the future.

You might be interested in our basis of the frequently used figure of 5 persons per acre foot per year. This figure reduces to an average daily consumption of 178 gallons per capita per day, which is about double national average. Over many years of records, the City of Tucson average has varied from 150-165 gallons per capita per day.

Next, regarding storage; The 85,000 acre feet instorage has been selected all within 24 sections of T-16S, R-15E and Sections 2,3, & 4 of T-17S, R-15E, regard-

less of whether the land is our deeded land or under state lease. These particular areas have been selected because of the wide spacing in groundwater contours determined from the tabulated information in Bulletin 288 on wells of the area.

To summarize our figures, we have the following pertinent facts:

1. Groundwater in storage .....85,000 acre feet.
2. Consumption for 20,000 persons ..... 4,000 acre feet per year.
3. Natural recharge present .....2,000 to 3,000 acre feet per year.
4. Potential developed recharge... 4,000 acre feet per year.

In closing, we want to impress upon you that the hydrological approach to this development is:

a. Develop a system drawing upon existing storage at the outset.

b. Measure drawdown and natural recharge from careful operational records.

c. Provide supplemental recharge capacity as found necessary for stable water budget.

Very truly yours,

MADDOCK & ASSOCIATES - ENGINEERS, INC.

Wm H. Wheeler

Wm. H. Wheeler, P.E.

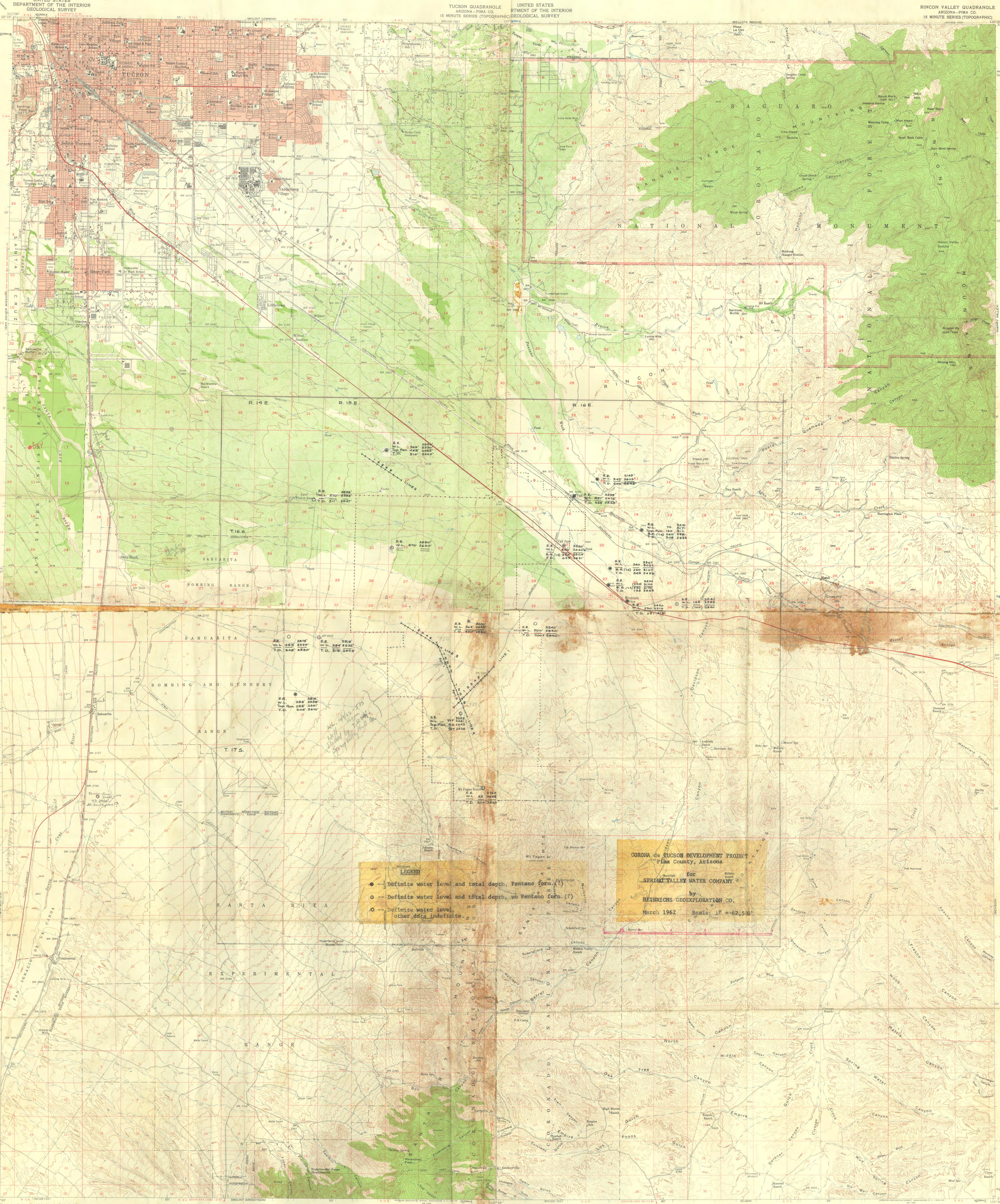
cc:
Orland Fiandaca
Carl Reinhard
R.J. Shaw

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

TUCSON QUADRANGLE
ARIZONA–PIMA CO.
15 MINUTE SERIES (TOPOGRAPHIC)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

RINCON VALLEY QUADRANGLE
ARIZONA–PIMA CO.
15 MINUTE SERIES (TOPOGRAPHIC)




Mapped, edited, and published by the Geological Survey
Control by USGS and USC&GS
Topography from aerial photographs by ER-55 plotter
Aerial photographs taken 1955–1956. Field check 1958
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
Unchecked elevations are shown in brown

SCALE 1:62500
CONTOUR INTERVAL 40 FEET
DATUM IS MEAN SEA LEVEL

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

APPROXIMATE MEAN DECLINATION, 1958

QUADRANGLE LOCATION

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

SAHUARITA, ARIZ.
N3145—W11045/15
1958

Mapped, edited, and published by the Geological Survey
Control by USGS, USC&GS and USCE
Topography from aerial photographs by ER-55 plotter
Aerial photographs taken 1955. Field check 1958
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
Unchecked elevations are shown in brown

SCALE 1:62500
CONTOUR INTERVAL 40 FEET
DATUM IS MEAN SEA LEVEL

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

APPROXIMATE MEAN DECLINATION, 1958

QUADRANGLE LOCATION

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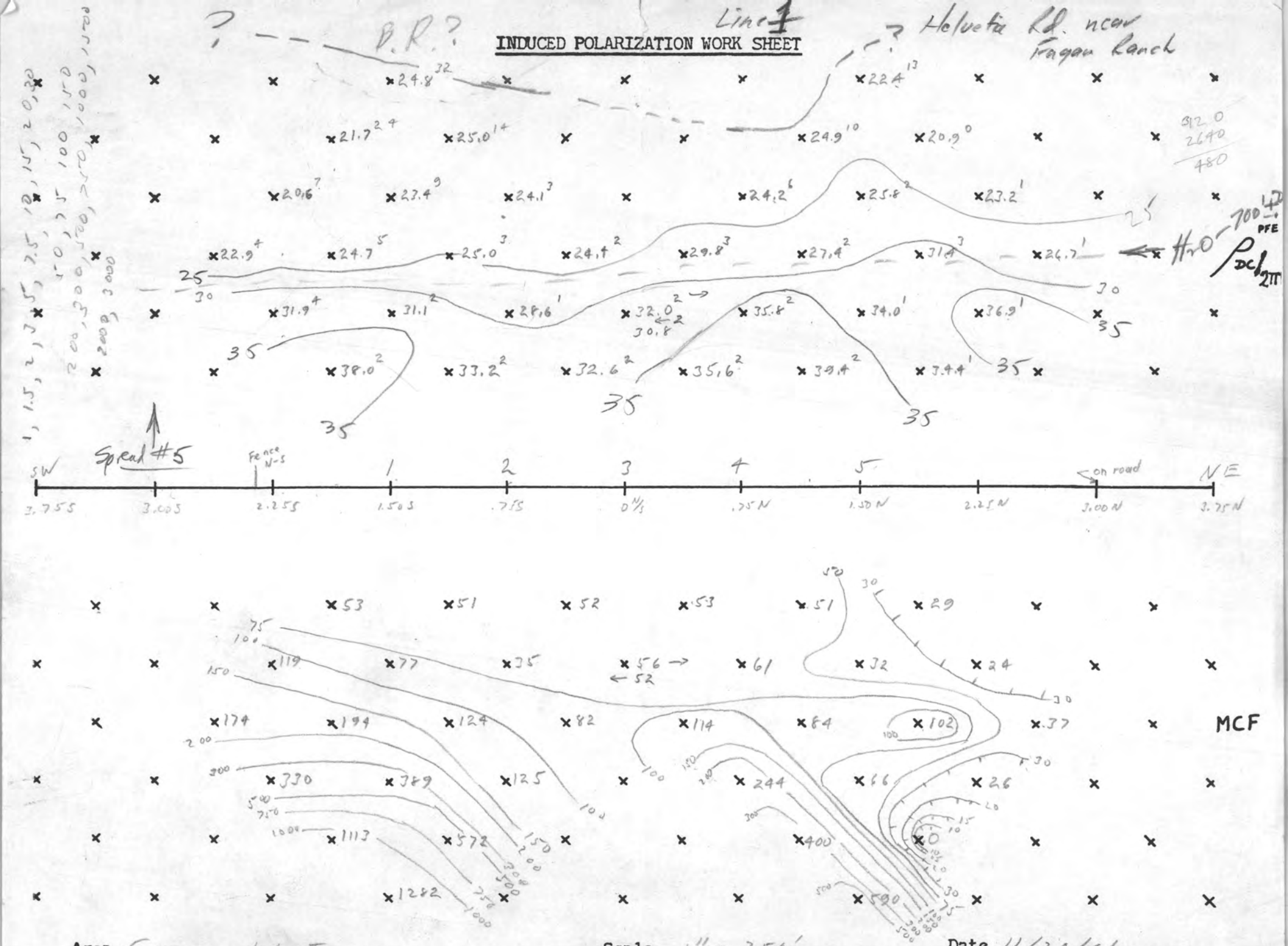
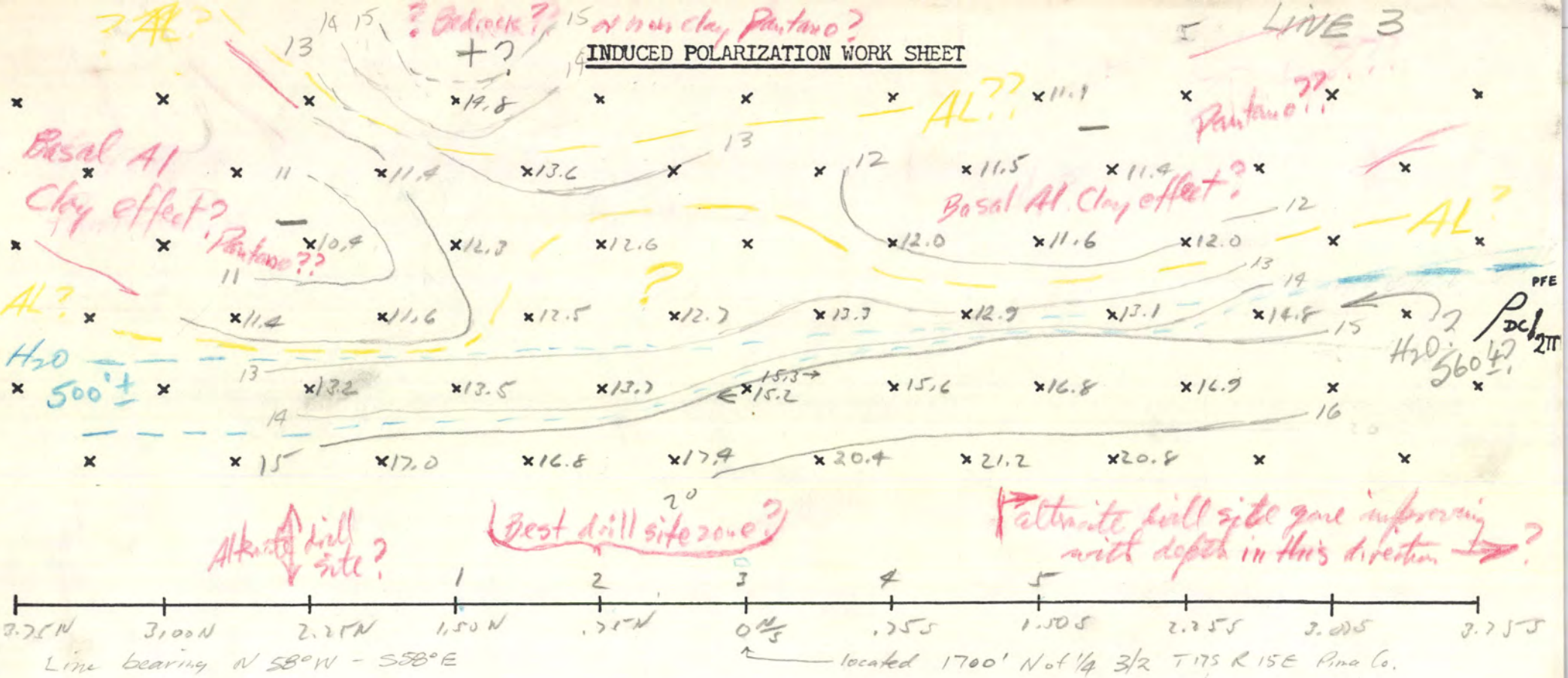
EMPIRE MOUNTAINS, ARIZ.
N3145—W11030/15
1958

# INDUCED POLARIZATION WORK SHEET




Area Corona del Tucson Scale 1" = 750' Date 11/20/61

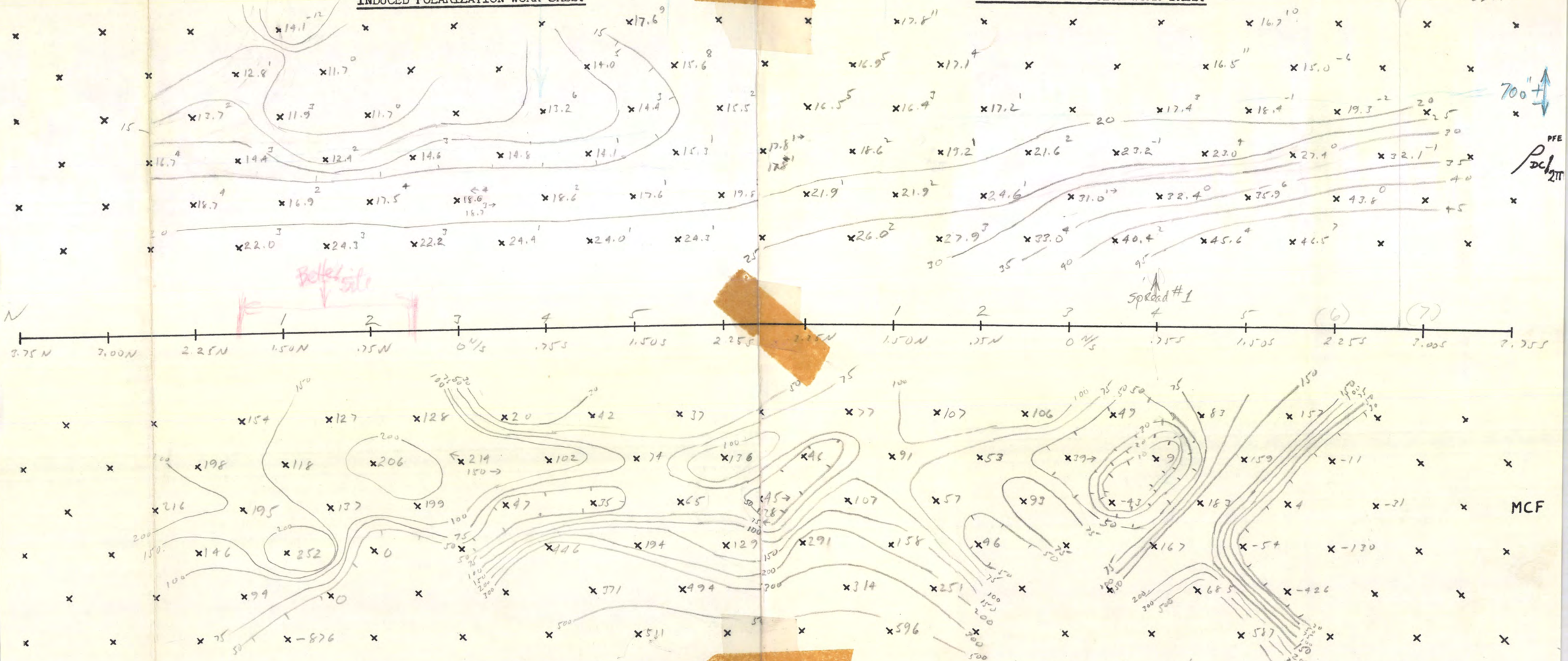



Notes: Whole zone below $H_2O$ may be to high ρ for Pantano as at El Paso sites, Devries & Dunham. So Pantano may be missing here or may be a higher-ρ version of Pantano (more porous & permeable - or less clay ??) or this zone could be a more shaley-clayey tighter - less porous & permeable version of the deeper alluvium. In any event is very doubtful bedrock. Otherwise more like El Paso spread than spread 1. where ρ is much higher average.

MCF

Area Spring Valley - Line 3 for N & S ½ Scale 1" = 750' Date 3/17/62

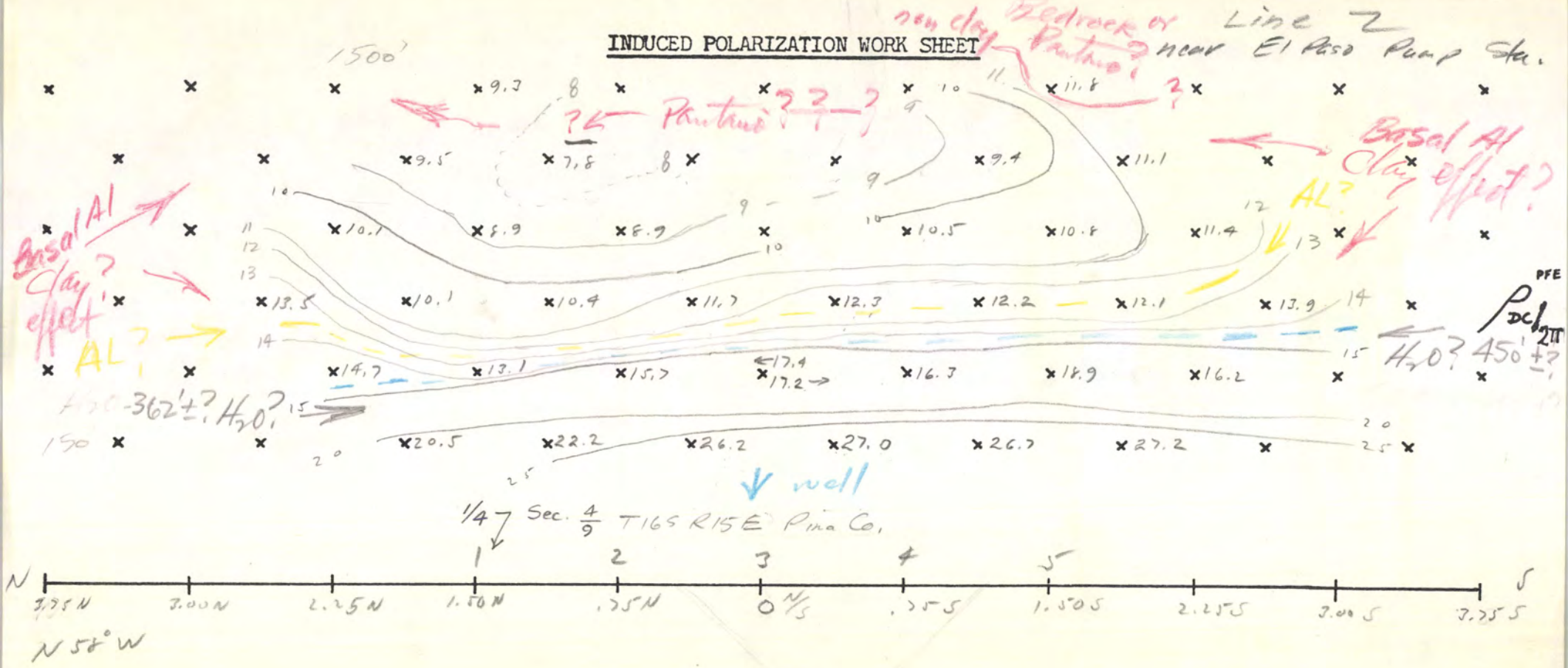
INDUCED POLARIZATION WORK SHEET




Area Spring Valley - Line 4 N&S ½ Scale 1" = 750' Date 3 Valley - Line 4 - Spr 2 N&S ½ Scale 1" = 750' Date 3/24/62

INDUCED POLARIZATION WORK SHEET

Line 2 near El Paso Pump Sta.




Best known well area opposite projection from lowest ℄ zone – however this is well below $H_2O$ level allowing for a fair section of porous permeable Al below water at base of al and above clay or Pantano? Like spread 2 somewhat but much lower than 1

MCF

Area Spring Valley – Corona – Line 2, Spr 1 N&S ½ Scale 1" = 750' Date 3/16/62

*Water Development Corporation*

CONSULTANTS IN GROUND-WATER HYDROLOGY

3938 SANTA BARBARA AVENUE
TUCSON, ARIZONA

PHONE. EAST 6-1133
CABLE: WADEVCO, TUCSON

March 28, 1962

Spring Valley

MAR 1962 GEOEX

Heinrichs GeoExploration Co.
P. O. Box 5671
Tucson, Arizona

INVOICE PROJECT 1861-3
Property near Mt. Fagan Ranch

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PUMPING TEST

Professional Services

| | |
|---|---|
| Donald K. Greene -- 1-3/8 days @ $75.00<br>(3-22, 1/2 day opening well;<br>3-23, 7/8 day testing well) | $103.12 |
| Gordon E. Davis -- 1/2 day @ $75.00<br>(3-22, 1/2 day opening well;<br>3-23, 7/8 day testing well n.c.) | 37.50 |
| Travel expenses -- 110 mi. @ 12¢<br>(3-22, 55 mi.; 3-23, 55 mi.) | 13.20 |
| Rental of electric drill and purchase of bolt | 4.44 |
| Subtotal | $158.26 |

ANALYSIS OF WATER SUPPLY

Professional Services

| | |
|---|---|
| L. C. Halpenny -- 1 day @ $100<br>(3-25, 1 day preparation of letter report) | $100.00 |
| TOTAL | $258.26 |

#3249
5/1/62

LOG OF CORONA DE TUCSON WELL NO. 1

Location: (D-17-15) 2 dcd

MAY 1964
GEOEX

| Interval (feet) | | Description |
|---|---|---|
| 0 | 80 | Medium to coarse sand, gray |
| 80 | 100 | Medium to coarse sand, some red clay |
| 100 | 110 | Medium to coarse sand, gray |
| 110 | 150 | Medium to very coarse sand, some red clay |
| 150 | 160 | Very coarse sand, gray |
| 160 | 170 | Medium to coarse sand, gray |
| 170 | 180 | Very coarse sand to fine gravel, gray |
| 180 | 210 | Medium sand to fine gravel, gray |
| 210 | 250 | Medium to very coarse sand, gray |
| 250 | 290 | Coarse to very coarse sand, gray |
| 290 | 320 | Fine to very coarse sand, gray |
| 320 | 330 | Fine to very coarse sand, some fine gravel, gray |
| 330 | 380 | Fine to very coarse sand, gray |
| 380 | 410 | Very coarse sand, gray |
| 410 | 460 | Very coarse sand and fine gravel, gray |
| 460 | 510 | Very coarse sand, fine and medium gravel, gray |
| 510 | 540 | Medium sand to coarse gravel, brown |
| 540 | 550 | Medium sand to fine gravel, brown |
| 550 | 580 | Medium sand to medium gravel, gray |
| 580 | 620 | Medium sand to coarse gravel, red-brown |
| 620 | 670 | Fine to coarse sand, gray |
| 670 | 700 | Fine sand to medium gravel, brown |
| 700 | 710 | Fine sand to medium gravel, light brown |
| 710 | 780 | Medium sand to medium gravel, light gray |
| 780 | 800 | Very fine to medium sand, few small gravels, light brown |
| 800 | 849 | Coarse sand to medium gravel, light brown. |

Walt:

580 ft was picked as the contact between the younger and older(?) alluvium.

Don