# UNDERGROUND INJECTION CONTROL

# PERMIT APPLICATION

# FOR

# GROUND RESOURCES, LLC

## UIC PERMIT No. 2R08700008AP

## TARIFF FIELD

# Volume 2 of 4

# (Part 2 of 2)

# Ground Resources, LLC
# Tariff Field
# Permit No. 2R08700008AP

## Appendix A Forms
## Injector Well Logs
## Well Schematics
## E-Logs

# Appendix F
## Area Permit Wells - Injectors

**Ground Resources, LLC**
**2R08700008AP**
**Tariff Field**

| | API No. | Well Name | Well Type | Well Status | Easting | Northing |
|---|---|---|---|---|---|---|
| 1 | 4708700701 | Looney 28 | Fluid Injection | Shut-In | 481656.0 | 4278648.0 |
| 2 | 4708702080 | Tallman 54 | Fluid Injection | Shut-In | 481550.6 | 4277629.1 |
| 3 | 4708702405 | Tallman 55 | Fluid Injection | Shut-In | 481849.0 | 4277612.0 |
| 4 | 4708702406 | Tallman 56 | Fluid Injection | Shut-In | 481763.0 | 4277369.6 |
| 5 | 4708702407 | Tallman 57 | Fluid Injection | Shut-In | 481558.3 | 4277327.8 |
| 6 | 4708702408 | Tallman 58 | Fluid Injection | Shut-In | 481369.9 | 4277506.4 |
| 7 | 4708702409 | Tallman 59 | Fluid Injection | Shut-In | 481337.3 | 4277597.0 |
| 8 | 4708702638 | Looney 7 | Fluid Injection | Shut-In | 481742.0 | 4278369.0 |
| 9 | 4708702778 | MJ Snodgrass 12 | Fluid Injection | Shut-In | 482826.1 | 4279392.6 |
| 10 | 4708702844 | Tallman 40 | Fluid Injection | Shut-In | 482567.9 | 4279365.8 |
| 11 | 4708703096 | Looney 18 | Fluid Injection | Shut-In | 481486.8 | 4279529.4 |
| 12 | 4708703604 | Tallman 61 | Fluid Injection | Shut-In | 481870.8 | 4277883.6 |
| 13 | 4708703605 | Tallman 62 | Fluid Injection | Shut-In | 481870.8 | 4277883.6 |
| 14 | 4708703608 | Tallman 65 | Fluid Injection | Shut-In | 481227.5 | 4277766.9 |
| 15 | 4708703660 | Looney 31 | Fluid Injection | Shut-In | 481758.5 | 4278368.1 |
| 16 | 4708703774 | Looney 40 | Fluid Injection | Shut-In | 481566.4 | 4279126.9 |
| 17 | 4708703775 | Tallman 70 | Fluid Injection | Shut-In | 481889.7 | 4278449.3 |
| 18 | 4708703776 | Tallman 71 | Fluid Injection | Shut-In | 481890.1 | 4278626.5 |
| 19 | 4708703778 | Tallman 73 | Fluid Injection | Shut-In | 482180.5 | 4278899.6 |
| 20 | 4708703781 | Looney 39 | Fluid Injection | Shut-In | 481621.0 | 4278864.0 |
| 21 | 4708703875 | Looney 42 | Fluid Injection | Shut-In | 481435.8 | 4278385.9 |
| 22 | 4708703878 | Tallman 76 | Fluid Injection | Shut-In | 482147.6 | 4278561.5 |
| 23 | 4708703879 | Tallman 75 | Fluid Injection | Shut-In | 482066.8 | 4278465.0 |
| 24 | 4708703880 | Looney 41 | Fluid Injection | Shut-In | 481502.4 | 4279335.9 |
| 25 | 4708704013 | Tallman 64 | Fluid Injection | Shut-In | 481160.3 | 4277629.7 |
| 26 | 4708704078 | Looney 43 | Fluid Injection | Shut-In | 481298.0 | 4279125.0 |
| 27 | 4708704172 | Looney 50 | Fluid Injection | Shut-In | 481191.0 | 4279045.0 |

WVGES O&G Record Reporting System

GEOLOGY UNDERLIES IT ALL
"Pipeline"

Select County: (087) Roane
Enter Permit #: 701
Get Data | Reset

Select datatypes: (Check All)
Location | Production | Plugging
Owner/Completion | Stratigraphy | Sample
Pay/Show/Water | Logs | Btm Hole Loc

Table Descriptions
County Code Translations
Permit-Numbering Series
Usage Notes
Contact Information
Disclaimer
WVGES Main
"Pipeline-Plus" New

WV Geological & Economic Survey:

**Well: County = 087 Permit = 701**

Report Time: Thursday, April 30, 2020 8:23:21 PM

Location Information: View Map

| API | COUNTY | PERMIT | TAX_DISTRICT | QUAD_75 | QUAD_15 | LAT_DD | LON_DD | UTME | UTMN |
|---|---|---|---|---|---|---|---|---|---|
| 4708700701 | Roane | 701 | Smithfield | Tariff | Otter | 38.658343 | -81.208953 | 481619.7 | 4278884.4 |

There is no Bottom Hole Location data for this well

Owner Information:

| API | CMP_DT | SUFFIX | STATUS | SURFACE_OWNER | WELL_NUM | CO_NUM | LEASE | LEASE_NUM | MINERAL_OWN | OPERATOR_AT_COMPLETION | PROP_VD | PROP_TRGT_FM | TFM_EST_PR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708700701 | 12/-/1956 | Original Loc | Completed | W M Looney | 28 | | | | | South Penn Oil (S Penn Nat. Gas) | | | |

Completion Information:

| API | CMP_DT | SPUD_DT | ELEV | DATUM | FIELD | DEEPEST_FM | DEEPEST_FMT | INITIAL_CLASS | FINAL_CLASS | TYPE | RIG | CMP_MTHD | TVD | TMD | NEW_FTG | KOD | G_BEF | G_AFT | O_BEF | O_AFT | NGL_BEF | NGL_AFT | P_BEF | TI_BEF | P_A |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708700701 | 12/-/1956 | -/-/- | 1056 | Ground Level | Tariff Tlmn | Price Fm & equivs | Price Fm & equivs | Development Well | Development Well | Gas w/ Oil Show | unknown | Shot | 2103 | | 2103 | | 0 | 67 | 0 | 0 | | | 0 | 0 | |

Pay/Show/Water Information:

| API | CMP_DT | ACTIVITY | PRODUCT | SECTION | DEPTH_TOP | FM_TOP | DEPTH_BOT | FM_BOT | G_BEF | G_AFT | O_BEF | O_AFT | WATER_QNTY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708700701 | 12/-/1956 | Water | Unknown Water | Vertical | | | 1030 | | | | | | 0 |
| 4708700701 | 12/-/1956 | Water | Unknown Water | Vertical | | | 1130 | | | | | | 0 |
| 4708700701 | 12/-/1956 | Water | Unknown Water | Vertical | | | 1680 | | | | | | 0 |
| 4708700701 | 12/-/1956 | Pay | Gas | Vertical | | | 2090 | Big Injun (Price&eq) | 0 | 0 | | | |

Production Gas Information: (Volumes in Mcf) * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_GAS | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708700701 | Pennzoil Company | 1981 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708700701 | Pennzoil Company | 1982 | 1,385 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708700701 | Pennzoil Company | 1983 | 521 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708700701 | Pennzoil Company | 1984 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708700701 | Pennzoil Products Company | 1989 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708700701 | Pennzoil Products Company | 1990 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708700701 | Pennzoil Products Company | 1991 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708700701 | Pennzoil Products Company | 1992 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708700701 | Pennzoil Products Company | 1993 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708700701 | Pennzoil Products Company | 1994 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708700701 | Pennzoil Products Company | 1995 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708700701 | Triad Resources, Inc. | 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708700701 | Ground Resources, LLC | 2017 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708700701 | Ground Resources, LLC | 2018 | 44 | 0 | 0 | 44 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Production Oil Information: (Volumes in Bbl) ** some operators may have reported NGL under Oil * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_OIL | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708700701 | Pennzoil Company | 1981 | 101 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708700701 | Pennzoil Company | 1982 | 248 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708700701 | Pennzoil Company | 1983 | 438 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708700701 | Pennzoil Company | 1984 | 1,013 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708700701 | Pennzoil Products Company | 1989 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708700701 | Pennzoil Products Company | 1990 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708700701 | Pennzoil Products Company | 1991 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708700701 | Pennzoil Products Company | 1992 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708700701 | Pennzoil Products Company | 1993 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708700701 | Pennzoil Products Company | 1994 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708700701 | Pennzoil Products Company | 1995 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708700701 | Triad Resources, Inc. | 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708700701 | Ground Resources, LLC | 2017 | 0 | | | | | | | | | | | | |
| 4708700701 | Ground Resources, LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Production NGL Information: (Volumes in Bbl) ** some operators may have reported NGL under Oil * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_NGL | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708700701 | Ground Resources, LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Production Water Information: (Volumes in Gallons) * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_WTR | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708700701 | Ground Resources, LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

There is no Stratigraphy data for this well

Wireline (E-Log) Information:

| API | LOG_TOP | LOG_BOT | DEEPEST_FML | LOGS_AVAIL | SCAN | DIGITIZED | GR_TOP | GR_BOT | D_TOP | D_BOT | N_TOP | N_BOT | I_TOP | I_BOT | T_TOP | T_BOT | S_TOP | S_BOT | O_TOP | O_BOT | INCH2 | INCH5 | REDUCED | KOP | LOGMD | ELEV_KB | ELEV_GL | ELEV_DF | LOG_I |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708700701 | 0 | 2115 | | G C,* | Y | N | 0 | 2114 | | | | | | | | | | | 0 | 2115 | N | Y | N | | | | | | |

Comment: *logs: caliper, CCL

Downloadable Log Images: We advise you to save the log image file to your PC for viewing. To do so, right-click the .tif image of interest and select the save option. Then you can direct the file to a location of your choice. Please note these images vary in size and some may take several minutes to download, especially if using a 56k or slower dialup connection.

INJECTOR 0701

| FILENAME |
| --- |
| 4708700701gco.tif |

**Quick Reference Guide for Log File Names** For more info about WVGES scanned logs click here

**geologic log types:**
- d density (includes bulk density, compensated density, density, density porosity, grain density, matrix density, etc.)
- e photoelectric adsorption (PE or Pe, etc.)
- g gamma ray
- i induction (includes dual induction, medium induction, deep induction, etc.)
- l laterolog
- m dipmeter
- n neutron (includes neutron porosity, sidewall neutron--SWN, etc.)
- o other[1]
- s sonic or velocity
- t temperature (includes borehole temperature, BHT, differential temperature, etc.)
- z spontaneous potential or potential

**mechanical log types:**
- b cement bond
- c caliper
- o other[1]
- p perforation depth control or perforate

[1]other logs may include, but are not limited to, such curves as audio, bit size, CCL--casing collar locator, continuous meter, directional survey, gas detector, guard, NCTL--Nuclear Cement Top Locator, radioactive tracer, tension

Injection 0701

There is no Plugging data for this well

There is no Sample data for this well

# APPENDIX A
## Injection Well Form

1) GEOLOGIC TARGET FORMATION Big Injun Sandstone

Depth 2055 Feet (top) 2090 Feet (bottom)

2) Estimated Depth of Completed Well, (or actual depth of existing well): 2155 Feet

3) Approximate water strata depths: Fresh _____ Feet Salt 1030,1130,1681 Feet

4) Approximate coal seam depths: None

5) Is coal being mined in the area? Yes ☐ No ☑

6) Virgin reservoir pressure in target formation 880 psig Source Estimated/Historical

7) Estimated reservoir fracture pressure _____ psig (BHFP)

8) MAXIMUM PROPOSED INJECTION OPERATIONS:

Injection rate (bbl/hour) 25

Injection volume (bbl/day) 200

Injection pressure (psig) 1000

Bottom hole pressure (psig) 2000

9) DETAILED IDENTIFICATION OF MATERIALS TO BE INJECTED, INCLUDING ADDITIVES:
Fresh water and/or produced water from the field and possible biocides as necessary.

Temperature of injected fluid: (°F) Ambient

10) FILTERS (IF ANY)
Anthracite Coal Filters

11) SPECIFICATIONS FOR CATHODIC PROTECTION AND OTHER CORROSION CONTROL
None

# APPENDIX A (cont.)

12. Casing and Tubing Program

| TYPE | Size | New or Used | Grade | Weight per ft. (lb/ft) | FOOTAGE: For Drilling | INTERVALS: Left in Well | CEMENT: Fill-up (Cu. Ft.) |
|---|---|---|---|---|---|---|---|
| Conductor | | | | | | | |
| Fresh Water | 8 5/8" | Used | | | 702 | 702 | No Record |
| Coal | | | | | | | |
| Intermediate 1 | | | | | | | |
| Intermediate 2 | | | | | | | |
| Production | 5 1/2" | Used | | | 1987 | 1987 | 40 sks |
| Tubing | 2 3/8" | | | | | 2055 | |
| Liners | | | | | | | |

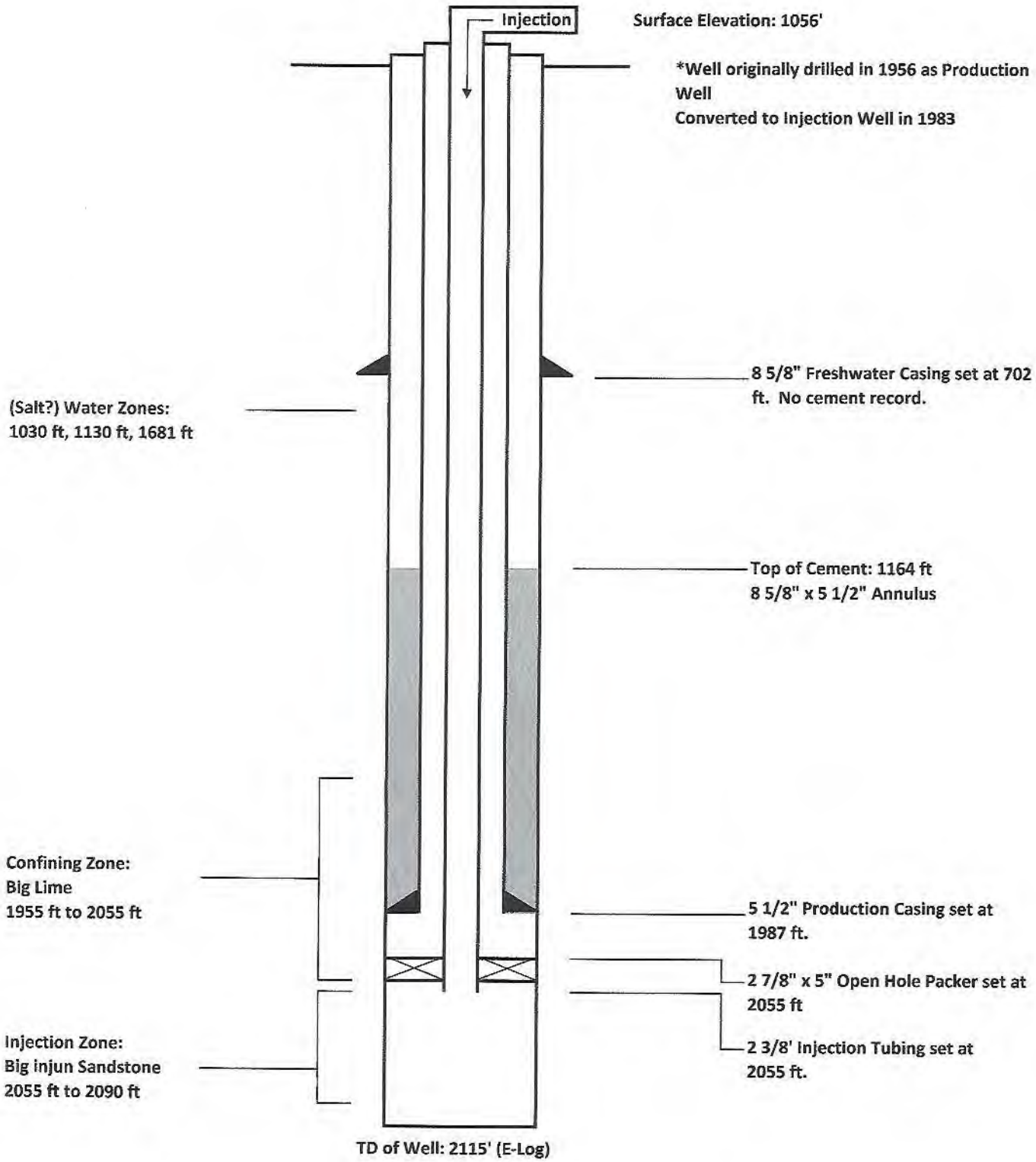
| TYPE | Wellbore Diameter | Casing Size | Wall Thickness | Burst Pressure | Cement Type | Cement Yield (cu. ft./sk) | Cement to Surface ? (Y or N) |
|---|---|---|---|---|---|---|---|
| Conductor | | | | | | | |
| Fresh Water | | 8 5/8" | | | | | No |
| Coal | | | | | | | |
| Intermediate 1 | | | | | | | |
| Intermediate 2 | | | | | | | |
| Production | | 5 1/2" | | | | 40 sks | No |
| Tubing | | 2 3/8" | | | | | |
| Liners | | | | | | | |

| PACKERS | Packer #1 | Packer #2 | Packer #3 | Packer #4 |
|---|---|---|---|---|
| Kind: | Open Hole Packer | | | |
| Sizes: | 2 7/8" | | | |
| Depths Set: | 2055 | | | |

# Well Schematic

## MOONEY 28

## API 47-087-00701



INJECTOR
0701

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES
OIL AND GAS DIVISION 6

Otter

# WELL RECORD

Permit No. ROA-701 | Oil or Gas Well: Oil (KIND)

Company SOUTH PENN NATURAL GAS COMPANY
Address P. O. Box 1280, Parkersburg, W. Va.
Farm W. H. Looney Acres 480
Location (waters) Trace Fork
Well No. 28 Elev. 1056.31
District Smithfield County Roane
The surface of tract is owned in fee by O. D. Bolling
Address Left Hand, W.Va.
Mineral rights are owned by L. D. Looney, et al.
Address Anna, W. Va.
Drilling commenced Nov. 2, 1956
Drilling completed Dec. 12, 1956
Date Shot 12-27-56 From 2071 To 2090
With 40 qts.
Open Flow 28 /10ths Water in 1 1/4" Disc. Inch
/10ths Merc. in Inch
Volume 67 MCF Cu. Ft.
Rock Pressure lbs. hrs.
Oil bbls. 1st 24 hrs.
Fresh water 1030'-1130' feet 1680' feet
Salt water feet feet

| Casing and Tubing | Used in Drilling | Left in Well | Packers |
|---|---|---|---|
| Size | | | |
| 16 | | | Kind of Packer Steel Shoe |
| 13 | | | |
| 10 3/4" | 291' | None | Size of 8" x 10" |
| 8 5/8" | 702' | 702' | 5 3/16" x 6 5/8" |
| 6 5/8" | | | Depth set 702' |
| 5 1/2" | 1987' | 1987' | 1956' |
| 3 | | | Perf. top |
| 2 | | | Perf. bottom |
| Liners Used | | | Perf. top |
| | | | Perf. bottom |

CASING CEMENTED 5 1/2" SIZE No. Ft. Date

COAL WAS ENCOUNTERED AT NONE FEET INCHES
FEET INCHES FEET INCHES
FEET INCHES FEET INCHES

| Formation | Color | Hard or Soft | Top | Bottom | Oil, Gas or Water | Depth Found | Remarks |
|---|---|---|---|---|---|---|---|
| Soil | | | 0 | 8 | | | |
| Sand Rock | | | 8 | 15 | | | |
| Conductor | | | | 15 | | | |
| Slate | | | 15 | 25 | | | |
| Red Rock | | | 25 | 35 | | | |
| Slate | | | 35 | 45 | | | |
| Sand | | | 45 | 95 | | | |
| Slate | | | 95 | 110 | | | |
| Red Rock | | | 110 | 130 | | | |
| Slate | | | 130 | 180 | | | |
| Red Rock | | | 180 | 210 | | | |
| Blue Rock. | | | 210 | 310 | | | |
| 10 3/4" Casing | | | | 291 | | | |
| Red Rock | | | 310 | 420 | | | |
| Slate & Shells | | | 420 | 440 | | | |
| Red Rock | | | 440 | 455 | | | |
| Slate | | | 455 | 467 | | | |
| Red Rock | | | 467 | 495 | OIL | 1030-1130 | |
| Slate & Shells | | | 495 | 540 | | | |
| Red Rock | | | 540 | 590 | | | |
| Slate | | | 590 | 600 | | | |
| Red Rock | | | 600 | 620 | | | |
| Slate | | | 620 | 665 | | | |
| Little Dunkard | | | 665 | 685 | | | |
| Pink Rock | | | 685 | 690 | | | |
| Big Dunkard | | | 690 | 880 | | | |
| 8 5/8" Casing | | | | 702 | | | |
| Slate | | | 880 | 925 | | | |
| Sand | | | 925 | 1020 | | | |
| Slate | | | 1020 | 1030 | | | |
| Sand | | | 1030 | 1130 | Water | 1030-1130 | 12 Bailers over week end. |
| Slate | | | 1130 | 1145 | | | |
| Sand | | | 1145 | 1215 | | | |
| Slate | | | 1215 | 1230 | | | |
| Sand | | | 1230 | 1310 | | | |

(CONTINUED ON OTHER SIDE)

RECEIVED
JAN 2 1970
WEST VIRGINIA
DEPT. OF MINES

(Over)

INDEXOR 0701

| Formation | Color | Hard or Soft | Top | Bottom | Oil, Gas or Water | Depth Found | Remarks |
|---|---|---|---|---|---|---|---|
| Slate & Shells | | | 1310 | 1390 | | | |
| Sand | | | 1390 | 1490 | | | |
| Slate | | | 1490 | 1590 | | | |
| Salt Sand | | | 1590 | 1850 | | | |
| | | | | | Water | 1680 | Hole Full |
| Hole Reduced | | | | 1862 | | 1020-1120 | TS Bottom Oxer. |
| Lime | | | 1850 | 1874 | | | |
| Maxton Sand | | | 1874 | 1900 | | | |
| Slate | | | 1900 | 1903 | | | |
| Little Lime | | | 1903 | 1937 | | | |
| Blue Monday | | | 1937 | 1947 | | | |
| Pencil Cave | | | 1947 | 1955 | | | |
| Big Lime | | | 1955 | 2055 | | | |
| 5 1/2" Casing | | | | 1956 | | | |
| Red Rock | | | | | Gas | 2022-2025 | 12/10 W, 3/8" Disc |
| Big Injun | | | 2055 | 2090 | | | |
| Red Rock | | | | | Gas & Oil Show | 2058-2069 | 28/10 W 1¼" Disc. |
| Slate & Shells | | | | | | | |
| Red Rock | | | | | | | |
| Slate | | | | | Oil | 2070-2090 | Good Show |
| Slate | | | 2090 | 2103 | | | |
| Slate & Shells | | | | | | | |
| Red Rock | | | | | | | |
| TO TOTAL DEPTH | | | | 2103 | | | |
| Blue Rock | | | | | | | |
| Red Rock | | | | | | | |
| Slate | | | | | | | |
| Red INITIAL PRODUCTION | | | | | | | |
| Slate | | | | | | | |
| Oil - Filled up 1000 ft. (72 hours) | | | | | | | |
| Gas - 28/10 W 1¼" Disc. (67 MCF) | | | | | | | |
| Red Rock | | | | | | | |
| Slate | | | | | | | |
| Conductor | | | | | | | |
| Sand Rock | | | | | | | |
| Soil | | | 0 | 8 | | | |

| Formation | Color | Hard or Soft | Top | Bottom | Oil, Gas or Water | Depth Found | Remarks |
|---|---|---|---|---|---|---|---|
| Salt Water | | | | | | | |
| Lime Water | | | | | | | |
| Oil | | | | | | | |
| Rock Pressure | | | | | COAL WAS | RECOVERED AT | HOLE DEPTH INCHES |
| Volume | CU. FEET | | | | | | |
| Open Flow 58 | Hours Press. | | | | CASING CEMENTED | 5½" | SIZE NO. FEET DATE |
| Water 10 Gals. | Hours Press. | | | | | | |
| Date Spud 5-28-56 | Date Rig Up | | | | | | |
| Drilling commenced | | | | | | | |
| Drilling completed | | | | | | | |
| Rigging Right Up | | | | | | | |
| Date Shot 5-29-56 | Quantity | | | | | | |
| Depth of Shot | | | | | | | |
| Depth Cleaned Out | | | | | | | |
| Depth Tubing Set | | | | | | | |
| Casing Left in Well | | | | | | | |
| Rock Pressure | | | | | | | |
| Oil | | | | | | | |
| Water | | | | | | | |
| Gas | | | | | | | |
| Fresh Water | | | | | | | |
| Salt Water | | | | | | | |
| Hole Reduced | | | | | | | |
| Hole Full | | | | | | | |
| Remarks | | | | | | | |

| Formation | Color | Hard or Soft | Top | Bottom | Oil, Gas or Water | Depth Found | Remarks |
|---|---|---|---|---|---|---|---|
| Coal | | | | | | | |
| Total Depth | | | | | | | |
| Casing Used | | | | | | | |
| Size | | | | | | | |
| Depth Set | | | | | | | |
| Sacks Cement | | | | | | | |
| Cement Left in Hole | | | | | | | |
| Cement Left in Casing | | | | | | | |
| Date Shot | | | | | | | |
| Quantity | | | | | | | |
| Depth Cleaned Out | | | | | | | |
| Depth Tubing Set | | | | | | | |
| Rock Pressure | | | | | | | |
| Oil | | | | | | | |
| Water | | | | | | | |
| Gas | | | | | | | |
| Fresh Water | | | | | | | |
| Salt Water | | | | | | | |
| Hole Reduced | | | | | | | |
| Hole Full | | | | | | | |
| Remarks | | | | | | | |

| Formation | Color | Hard or Soft | Top | Bottom | Oil, Gas or Water | Depth Found | Remarks |
|---|---|---|---|---|---|---|---|
| Company | | | | | | | |
| Address | | | | | | | |
| Farm | | | | | | | |
| Location (Acres) | | | | | | | |
| Well No. | | | | | | | |
| District | | | | | | | |
| Date Work Started | | | | | | | |
| Date Completed | | | | | | | |
| Rig Up | | | | | | | |
| Drilling Commenced | | | | | | | |
| Drilling Completed | | | | | | | |
| Date Shot | | | | | | | |
| Depth Shot | | | | | | | |
| Depth Cleaned Out | | | | | | | |
| Depth Tubing Set | | | | | | | |
| Rock Pressure | | | | | | | |
| Oil | | | | | | | |
| Water | | | | | | | |
| Gas | | | | | | | |
| Fresh Water | | | | | | | |
| Salt Water | | | | | | | |
| Hole Reduced | | | | | | | |
| Hole Full | | | | | | | |
| Remarks | | | | | | | |

| Formation | Color | Hard or Soft | Top | Bottom | Oil, Gas or Water | Depth Found | Remarks |
|---|---|---|---|---|---|---|---|
| Coal | | | | | | | |
| Total Depth | | | | | | | |
| Casing Used | | | | | | | |
| Size | | | | | | | |
| Depth Set | | | | | | | |
| Sacks Cement | | | | | | | |
| Cement Left in Hole | | | | | | | |
| Cement Left in Casing | | | | | | | |
| Date Shot | | | | | | | |
| Quantity | | | | | | | |
| Depth Cleaned Out | | | | | | | |
| Depth Tubing Set | | | | | | | |
| Rock Pressure | | | | | | | |
| Oil | | | | | | | |
| Water | | | | | | | |
| Gas | | | | | | | |
| Fresh Water | | | | | | | |
| Salt Water | | | | | | | |
| Hole Reduced | | | | | | | |
| Hole Full | | | | | | | |
| Remarks | | | | | | | |

OIL OR GAS WELL RECORD

Permit No. 101-

COMPANY SOUTH PENN NATURAL GAS CO.

ADDRESS P. O. BOX 1220 PITTSBURGH 30, PA.

FARM W. F. LOONEY

LOCATION (ACRES) 77.000

WELL NO.

DISTRICT GRANT

COUNTY MONROE

DATE COMPLETED 12-20-56

DATE SHOT 5-29-56

DEPTH SHOT 2020

DEPTH CLEANED OUT

TUBING USED 2" 1.7 lb. EUE

DEPTH TUBING SET 2020'

CASING USED 5½" 14 lb. 8 rd.

DEPTH CASING SET 2020'

CEMENT USED 75 sacks

CEMENT LEFT IN HOLE

CEMENT LEFT IN CASING

ROCK PRESSURE

OIL

WATER

GAS

FRESH WATER

SALT WATER

HOLE REDUCED

HOLE FULL

REMARKS

OIL OR GAS PRODUCTION

Initial Production: Oil - Filled up 1000 ft. (72 hours)

Gas - 28/10 W 1¼" Disc. (67 MCF)

OIL OR GAS WELL RECORD

DEPARTMENT OF MINES

APPROVED January 24, 1957

SOUTH PENN NATURAL GAS COMPANY

Owner

By George W. Wilsman

(Title) Land Agent

UIC-IR-1
07-Sep-99

API: 47- 87-00701 S

WEST VIGINIA DIVISION OF ENVIRONMENTAL PROTECTION
SECTION OF OIL AND GAS
UNDERGROUND INJECTION CONTROL PROGRAM

UIC ROUTINE INSPECTION FORM

RECEIVED
Office of Oil and Gas
SEP 28 1999
WV Division of
Environmental Protection

OPERATOR: ENERGY ACQUISITION CORPORATION
FARM: LOONEY, W. M. 28

COUNTY: ROANE DISTRICT: SMITHFIELD

STATUS: ACTIVE LIQUID INJECTION Yes

FLUID TYPE: SALT WATER Yes

WELL CONSTRUCTION INFORMATION

Elevation: 1,056.00 feet

Fresh water casing: 8 5/8" @ 702' / (sks)

Injection Casing: 5 1/2" @ 1987' / 40 (sks)

Injection Formation: BIG INJUN,
at 2055 feet.

WELL OPERATION

Surface Injection
Pressure: 1060 Psi Gauged: 1060 PSI.

OK. 8/28/2000

Injection Rate: 25.0 Bls./Hr Observed: In Meter

ANNULUS MONITORING: Size: 8 5/8" X 5 1/2" Size:

Flow or Pressure: No Flow or Pressure

COMMENTS:

Signed: H. H. Dougherty
District Oil and Gas Inspector

Date 9/23/99

FORM IV-3
(Obverse)
[01-83]

RECEIVED
JAN 17 1984
OIL & GAS DIVISION
DEPT. OF MINES

Date: May 25, 1983
Operator's Well No. W. M. Looney #28
API Well No. 47 - 087 - 701
State County Permit

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES, OIL AND GAS DIVISION

PRE-OPERATION CERTIFICATE
FOR LIQUID INJECTION OR WASTE DISPOSAL WELL

WELL OPERATOR Pennzoil Company DESIGNATED AGENT James A. Crews
Address P. O. Box 1588 Address P. O. Box 1588
Parkersburg, WV 26101 Parkersburg, WV 26101

GEOLOGICAL TARGET FORMATION Big Injun Depth 2055 feet(top) to 2099 feet(Bottom)

Virgin reservoir pressure in target formation 80 psig

Source of information on virgin reservoir pressure Estimate

Perforation intervals _____ Open-hole intervals 2055-2103

MAXIMUM PROPOSED INJECTION OPERATIONS

Volume per hour: 12.5 Bbls. Bottom hole pressure: 1690 psig

DETAILED IDENTIFICATION OF MATERIALS TO BE INJECTED

Liquids to be injected for oil recovery under Code § 22-4-10a: Fresh Water

Wastes to be disposed of: Produced water from waterflood operations to be reinjected

Additives (slurry mediums, inhibitors, solvents, oxidizers, deoxidizers, etc.): Bactericides

Specific Gravity: _____

SPECIFICATIONS FOR CATHODIC PROTECTION AND OTHER CORROSION CONTROL

RECEIVED
MAY 27 1983
OIL & GAS DIVISION
DEPT. OF MINES

FILTERS (IF ANY). Coal Filters

ADDITIONAL DRILLING AS PART OF THE CONVERSION

(Complete and submit Form IV-35, "Well Operator's Report of Drilling, Fracturing and/or Stimulating or Physical Change".)

DETAILS ON NEW CASING AND TUBING PROGRAM AS PART OF THE CONVERSION:

(To be completed below unless the new casing and tubing program is described on a Form IV-35, "Well Operator's Report of Drilling, Fracturing and/or Stimulating or Physical Change", submitted in connection with the permit to which this Form IV-37 preoperation certificate relates.)

| G OR G TYPE | SPECIFICATIONS Size | Grade | Weight per ft. | New | Used | FOOTAGE INTERVALS For drilling | Left in well | CEMENT FILL-UP OR SACKS (Cubic feet) | PACKERS |
|---|---|---|---|---|---|---|---|---|---|
| ctor | | | | | | | | | To be Run on Tubing |
| water | | | | | | | | | Kinds Open Hole Pkr |
| | | | | | | | | | Sizes |
| mediate | 5-1/2 | | | | X | 1987 | 1987 | 40 sks. | 2-7/8" X 5" |
| ction | | | | | | | | | Depths set |
| g | 2-3/8 | J55 | 4.8 | | | | | | 2055 |
| s | | | | | | | | | Perforations: |

(continue on reverse side)

FORM IV-37
(Reverse)
[01-83]

MECHANICAL INTEGRITY TEST

Test method: Run tubing in with seating nipple & standing valve on bottom joint: Set packer - Pressure up to 2000 psi and hold for 20 minutes Release pressure & retrieve standing valve & put on injection.

The undersigned certifies that the test was performed on 11-16, 1983 and demonstrated the mechanical integrity of the well. The test was witnessed by N/A representing the Office of Oil and Gas.

Well Operator Date

THIS WELL IS AUTHORIZED FOR INJECTION.

Signed [illegible] Administrator, Office of Oil and Gas

Date Jan 23, 1989

[NOTE: That the mechanical integrity of this well must be demonstrated again within ninety (90) days of five years from this date in order for injection to continue. Please notify the state inspector 24 hours in advance of the test].

FACILITIES OR SYSTEMS TO PROTECT THE INTEGRITY OF THE GEOLOGICAL TARGET FORMATION FRACTURING THE CONFINING STRATA

APPLICATION FOR VARIANCE (IF ANY) FROM REGULATION 9.01 (a)
[Specify purpose, necessity, and justification]

Pennzoil Company
Well Operator

By: [illegible]

Its District Petroleum Engineer
R.P. 9177

27) CASING AND TUBING PROGRAM

| CASING OR TUBING TYPE | SPECIFICATIONS Size | Grade | Weight per ft. | New | Used | FOOTAGE INTERVALS For drilling | Left in well | CEMENT FILL-UP OR SACKS Cubic ft. | PACKERS To Be Run On Tubing |
|---|---|---|---|---|---|---|---|---|---|
| Conductor | | | | | | | | | Kinds |
| Fresh water | | | | | | | | | Open Hole Pkr |
| Coal | | | | | | | | | Sizes |
| Intermediate | 5-1/2 | | | | X | 1987 | 1987 | 40 sks. | 2-7/8" X 5" |
| Production | | | | | | | | | Depths set |
| Tubing | 2-3/8 | J55 | 4.8 | | | | | | 2055 |
| Liners | | | | | | | | | Perforations |
| | | | | | | | | | Top Bottom |
| | | | | | | | | | |
| | | | | | | | | | |

8) Copies of this Permit Application and the enclosed plat and reclamation plan have been mailed or delivered by hand to the above named coal operator, coal owner(s), and coal lessee on or before the day of the mailing or delivery of this Permit Application to the Department of Mines at Charleston, West Virginia.

he person signing this document shall make the ollowing certification:

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Pennzoil Company
Well Operator

By [signature]

Its District Petroleum Engineer
R.P. 9177

## WAIVER

The undersigned coal operator _____ / owner _____ / lessee _____ / of the coal under this well location has examined this proposed well location. If a mine map exists which covers the area of the well location, the well location has been added to the mine map. The undersigned has no objection to the work proposed to be done at this location, provided, the well operator has complied with all applicable requirements of the West Virginia Code and the governing regulations.

Date: _____, 19____.

By: _____

Its _____

OFFICE USE ONLY

PERMIT

rmit number 47-087-0701-LI June 13 19 83
Date

is permit covering the well operator and well location shown below is evidence of permission anted to drill in accordance with the pertinent legal requirements subject to the conditions ntained herein and on the reverse hereof. Notification must be given to the District Oil d Gas Inspector prior to the construction of roads, locations and pits for any permitted rk. (Refer to No. 10)

addition, the well operator or his contractor shall notify the proper district oil and s inspector 24 hours before actual permitted work has commenced.

rmit expires February 13, 1984 unless work is commenced prior to that date d prosecuted with due diligence.

| Bond: | Agent: | Plat: | Casing: | Fee: |
|---|---|---|---|---|
| Blanket | O.K. M.J. | MJ | MJ | N/A |

Administrator, Office of Oil and Gas

TE: Keep one copy of this permit posted at the drilling location.

1020

# NL McCullough

GAMMA RAY - CCL - 3 ARM CALIPER

FILING NO.

COMPANY PENNZOIL COMPANY

WELL W.M. LOONEY #28

FIELD TARIFF

COUNTY ROANE STATE WV

LOCATION

OTHER SERVICES

TARIFF: WATERSHED FORK

SEC TWP RGE.

ELEVATIONS:

KB.

DF.

GL.

PERMANENT DATUM ELEV

LOG MEASURED FROM TOP OF 5 1/2 CSG.

DRILLING MEASURED FROM

| | |
|---|---|
| DATE | 11/7/83 |
| RUN NO. | ONE |
| TYPE LOG | GR-CALIPER |
| DEPTH DRILLER | 2103' |
| DEPTH LOGGER | 2115' |
| BOTTOM LOGGED INTERVAL | 2112' |
| TOP LOGGED INTERVAL | SURF. |
| TYPE FLUID IN HOLE | WATER |
| SALINITY PPM CL. | - |
| DENSITY LB./GAL. | - |
| LEVEL | FULL |
| MAX. REC. TEMP. DEG. F. | - |
| OPR. RIG TIME | 2 1/2 HOURS |
| RECORDED BY | W.T. RHULE |
| WITNESSED BY | MR. NOEL PUTTSHER |
| DISTRICT | CHARLESTON |

BORE HOLE RECORD

| RUN NO. | BIT | FROM | TO | SIZE | WGT |
|---|---|---|---|---|---|
| | | | | 5 1/2" | |

CASING RECORD

| FROM | TO |
|---|---|
| SURF. | 106' |

FOLD HERE

THIS HEADING AND LOG CONFORMS TO API RECOMMENDED PRACTICE STANDARD PRA

EQUIPMENT DATA

| | |
|---|---|
| RUN NO. | ONE |
| TOOL MODEL NO. | 5547-0 |
| DIAM. | 3.5 |
| DETECT. MODEL NO. | |
| TYPE | SCINT. |
| LENGTH | 3" |

| | |
|---|---|
| RUN NO. | |
| LOG TYPE | |
| TOOL MODEL NO. | |
| DIAM. | |
| DETECT. MODEL NO. | |
| TYPE | |
| LENGTH | |
| SOURCE MODEL NO. | |
| SERIAL NO. | |
| SPACING | |
| TYPE | |
| STRENGTH | |

GENERAL

| | |
|---|---|
| HOIST TRUCK NO. | 84025 |
| INST. TRUCK NO. | |
| TOOL SERIAL NO. | |
| LOG TICKET NO. | 21093 |

LOGGING DATA

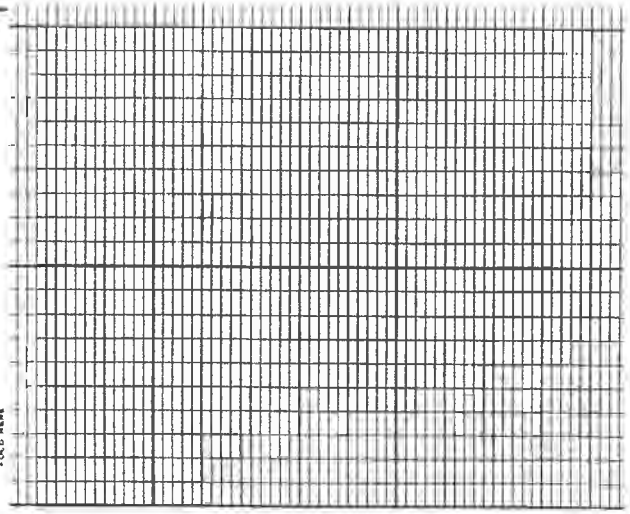
GENERAL

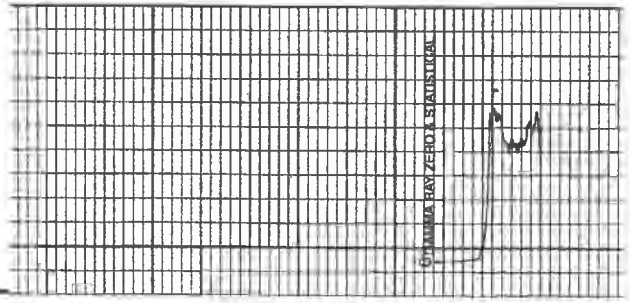
| RUN NO. | DEPTHS FROM | DEPTHS TO | SPEED FT./MIN. | T.C SEC | SENS SETTINGS | ZERO DIV. L. OR R. | API GR. UNITS PER LOG DIV. | T. C. SEC | SENS SETTINGS | ZERO DIV. L. OR R. | API H. UNITS PER LOG DIV. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ONE | 2112' | 0' | 30 | 2 | R-6(X1) D-200 G-300 | .5-L | | | | | |
| ONE | 2112' | 1900' | 30 | | | | | | | | |

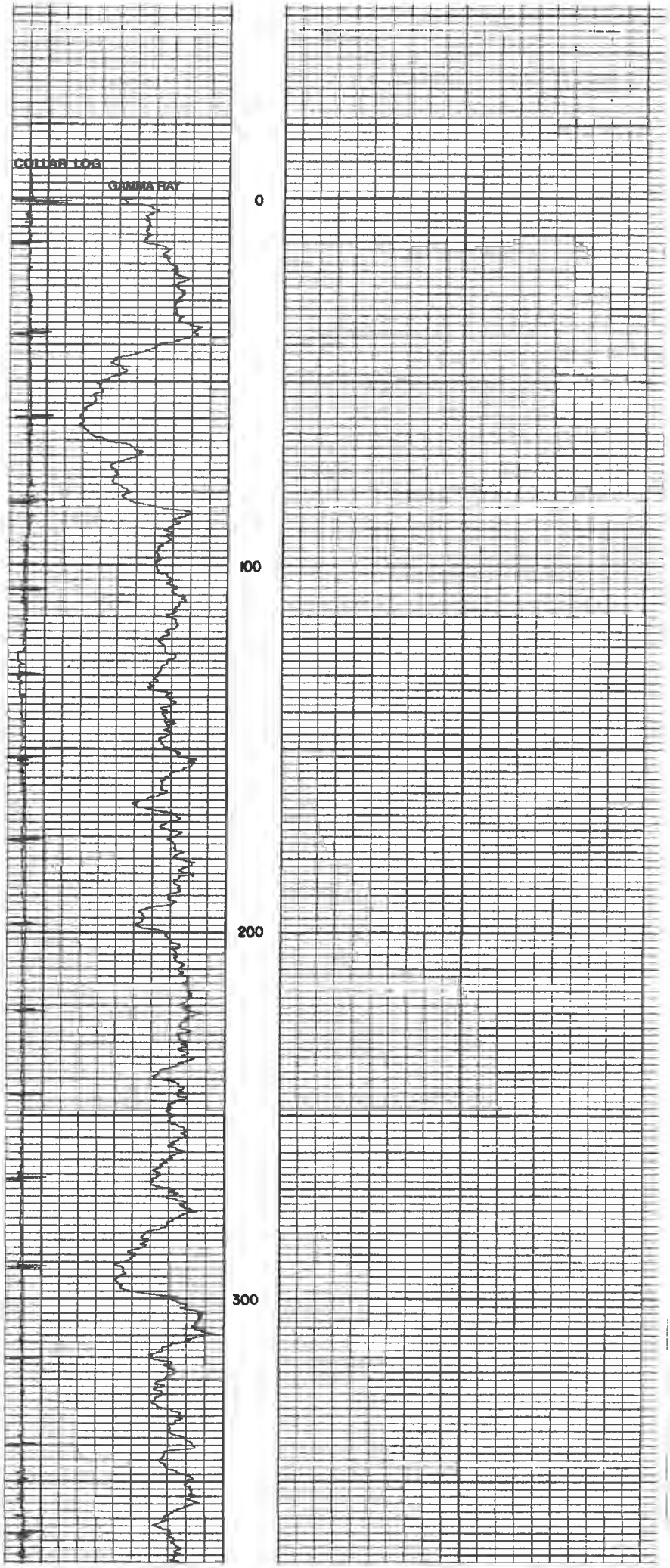
REFERENCE LITERATURE

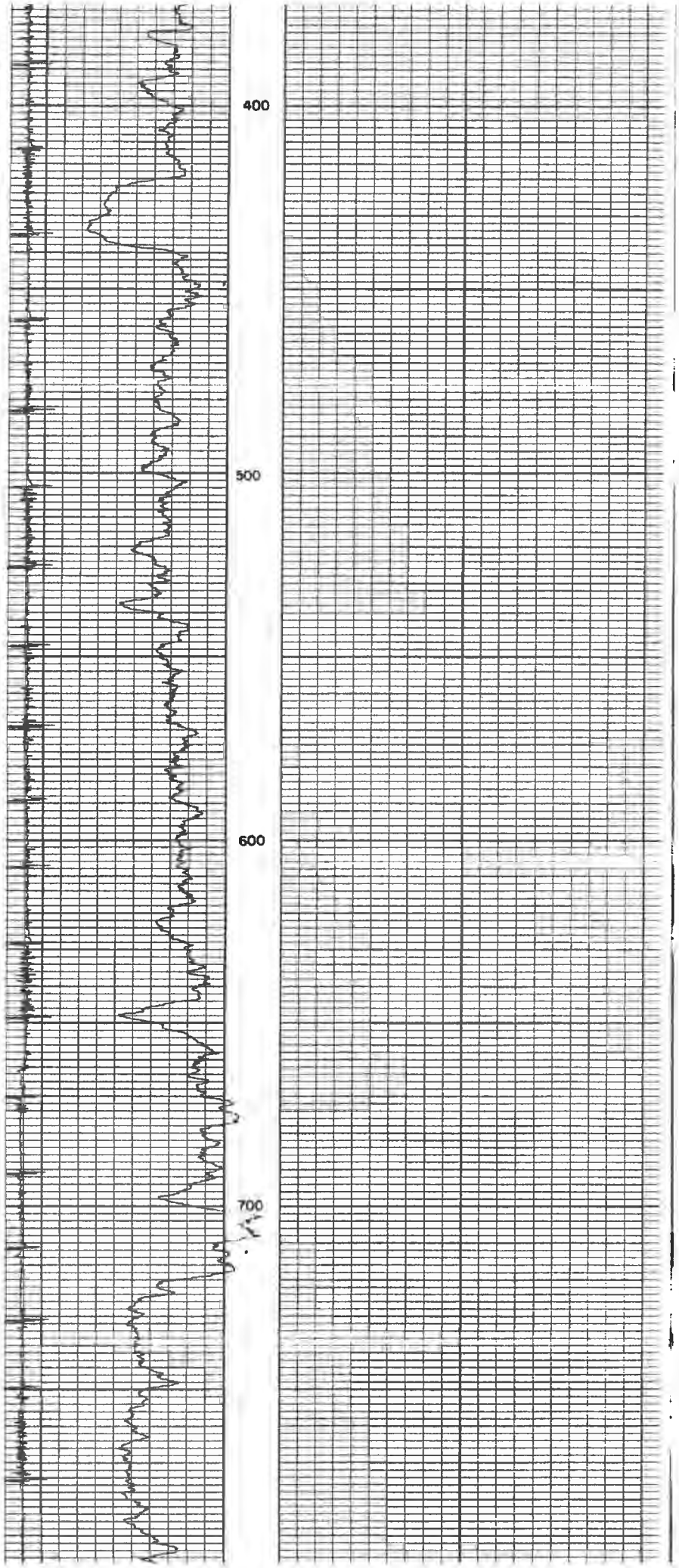
REMARKS:

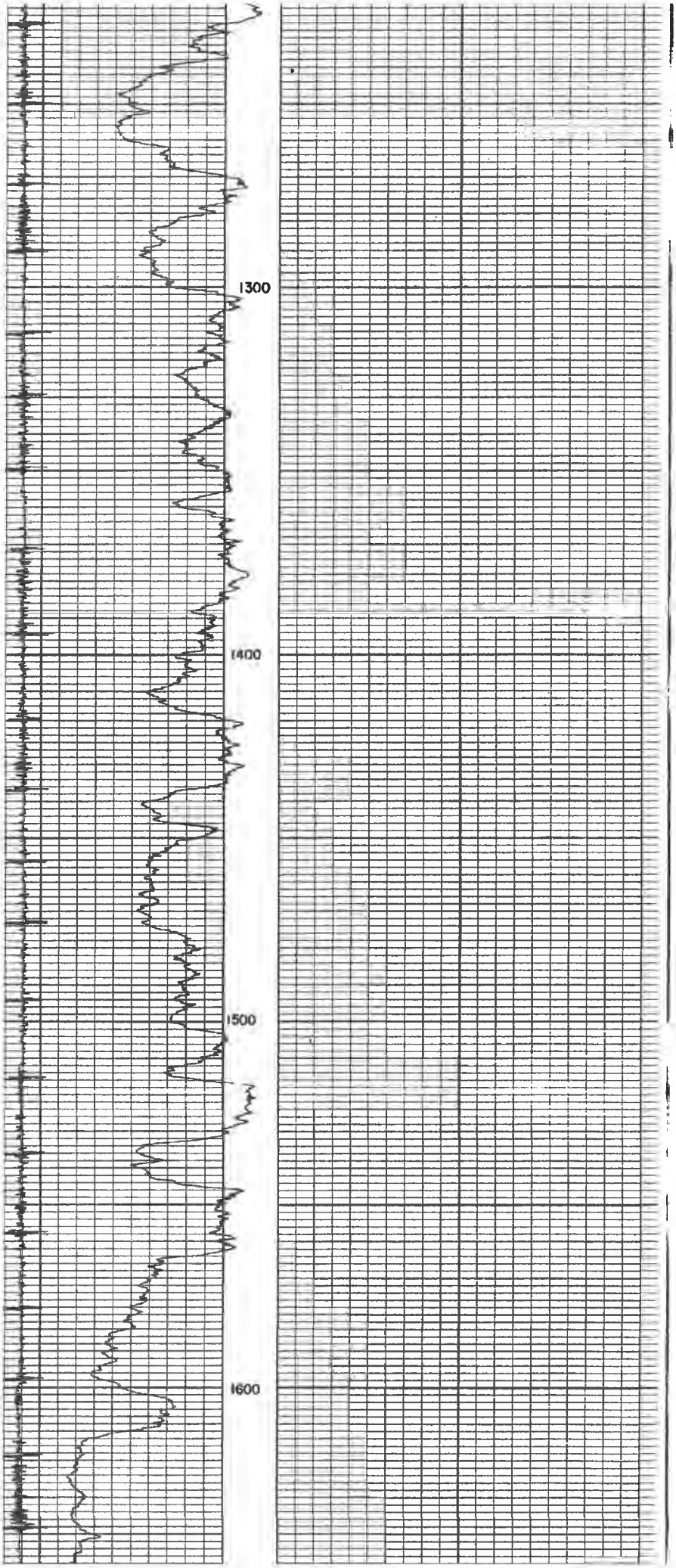
FOLD HERE

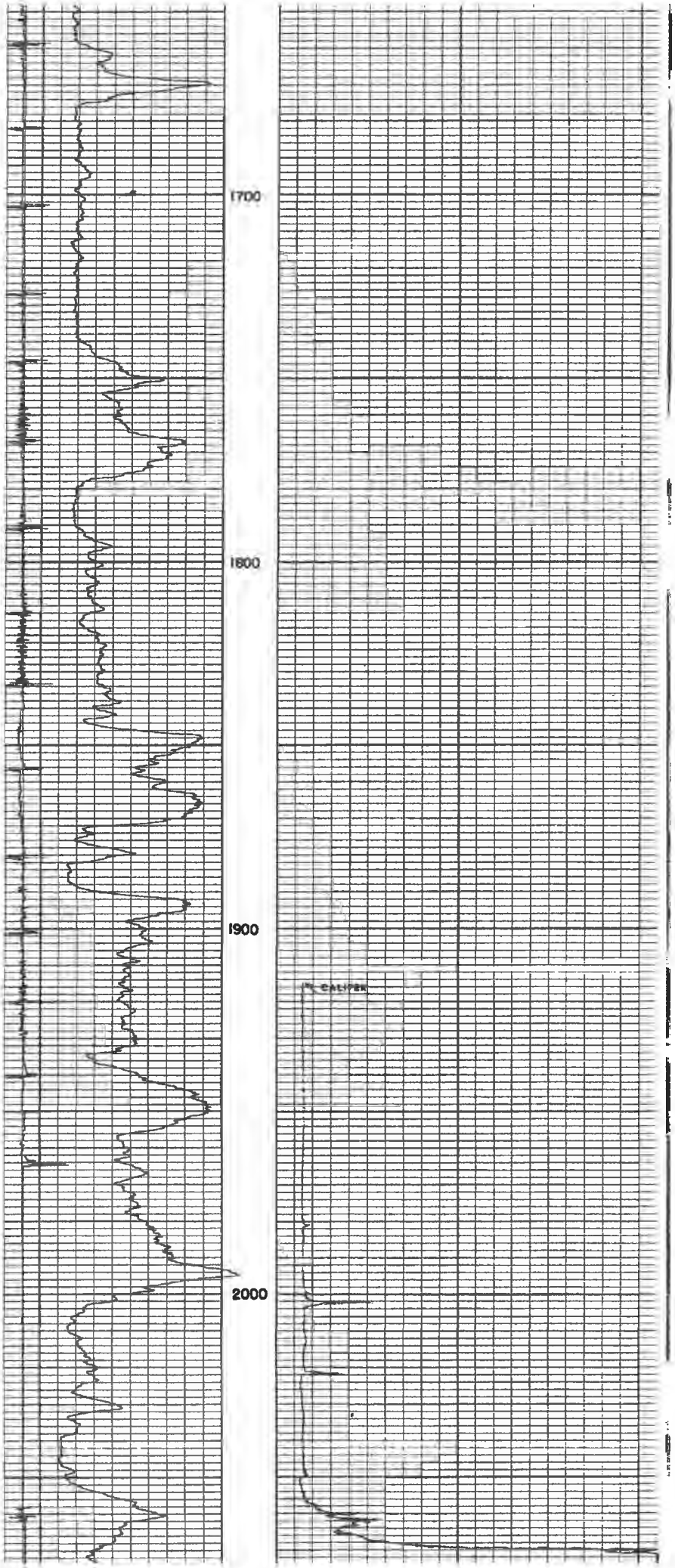


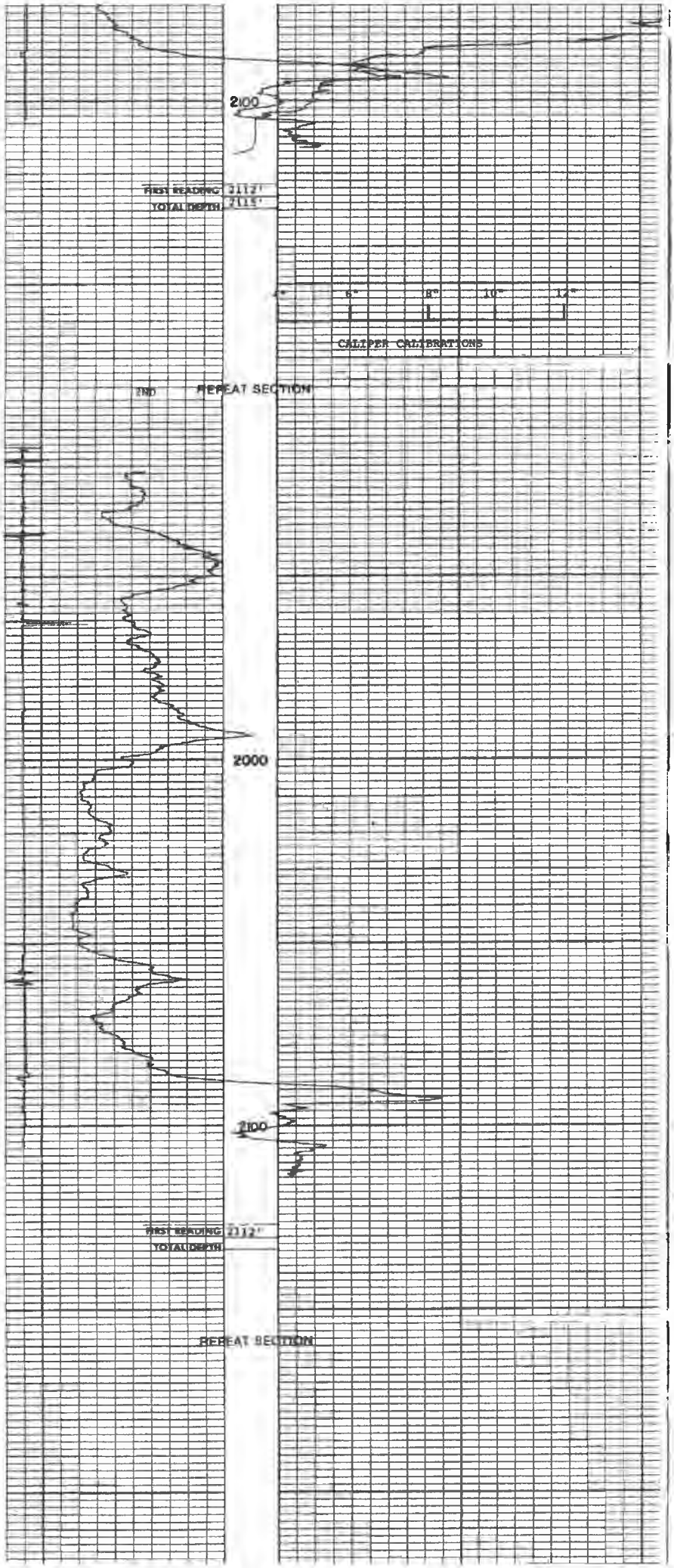


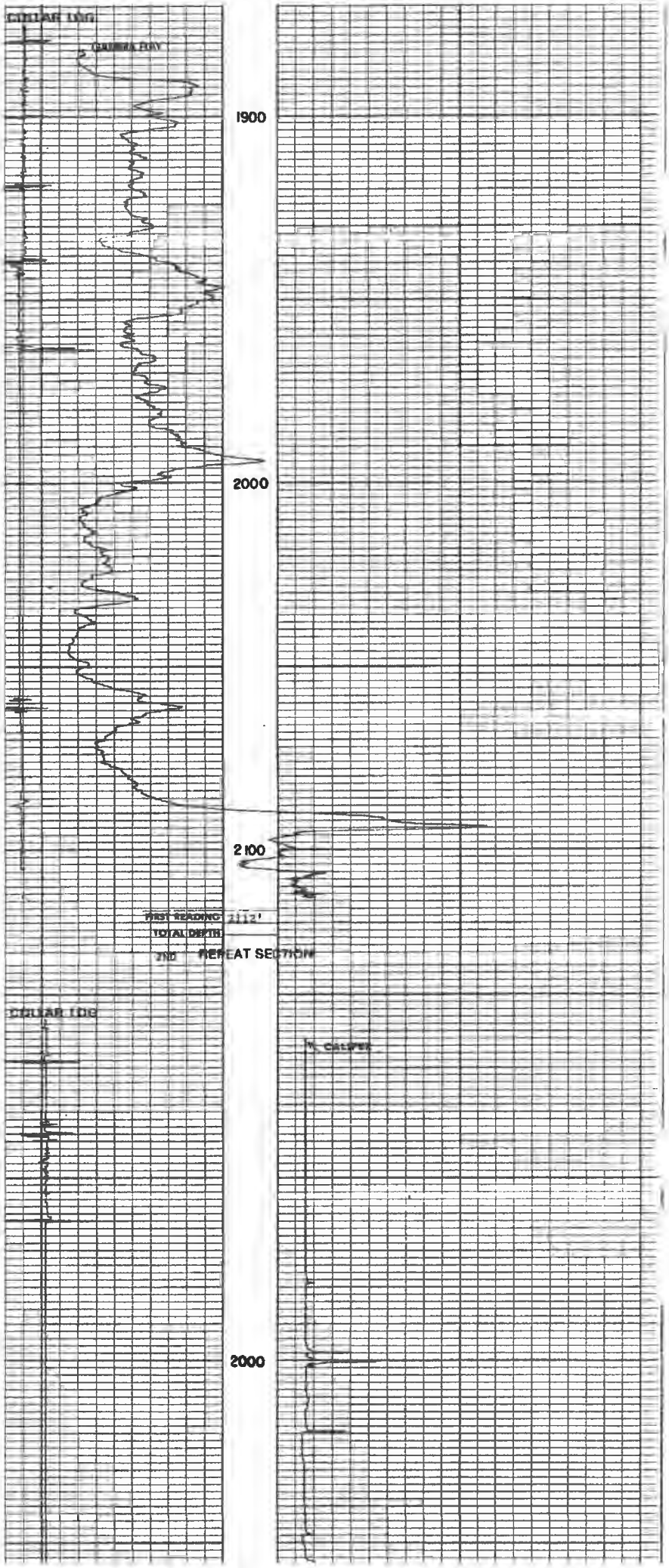

COLLAR LOG
GAMMA RAY
0
100
200
300

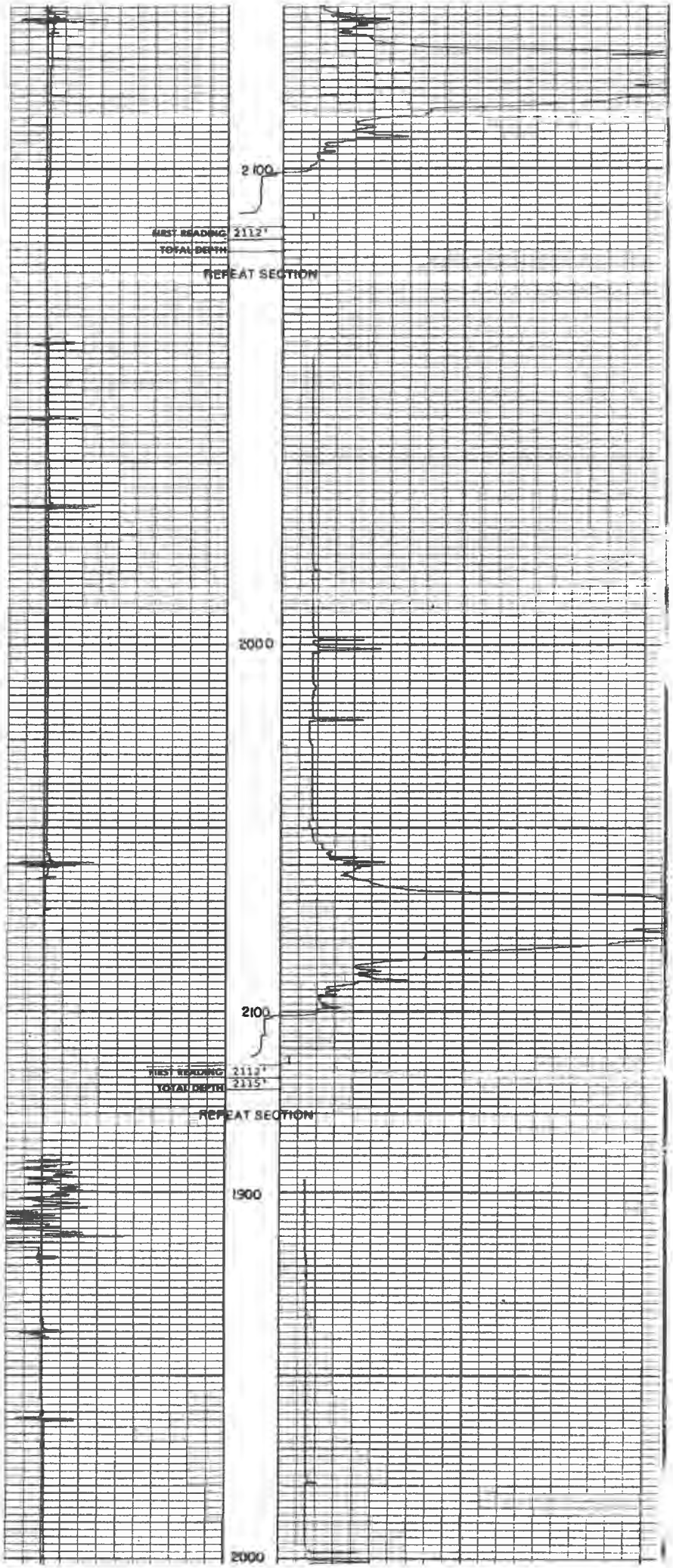

400
500
600
700

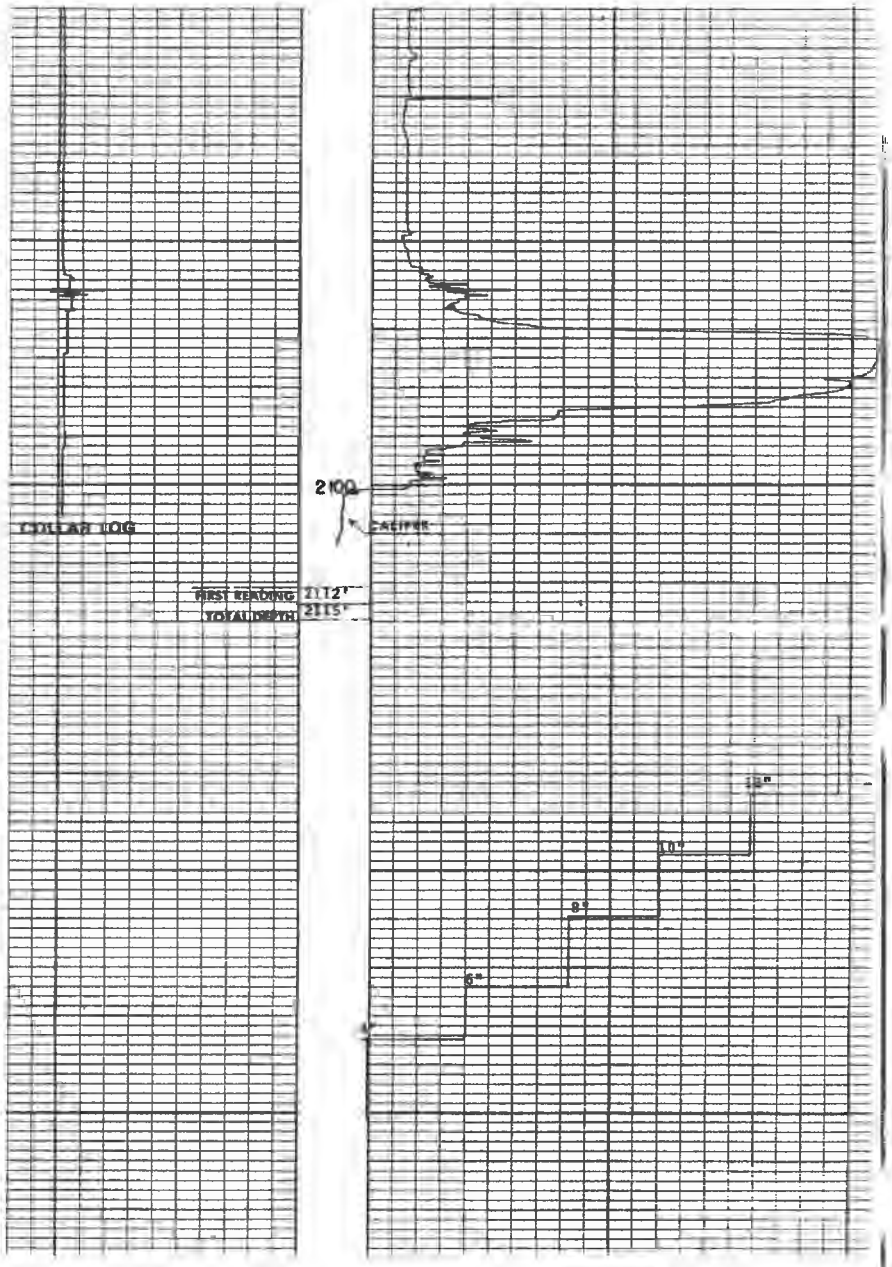

1300
1400
1500
1600


1700
1800
1900
2000
CALIPER


2100
FIRST READING 2112'
TOTAL DEPTH 2115'
4"
6"
8"
10"
12"
CALIPER CALIBRATIONS
2ND REPEAT SECTION
2000
2100
FIRST READING 2112'
TOTAL DEPTH
REPEAT SECTION


COLLAR LOG
GAMMA RAY
1900
2000
2100
FIRST READING 2112'
TOTAL DEPTH
2ND REPEAT SECTION
COLLAR LOG
CALIPER
2000


2100
FIRST READING 2112'
TOTAL DEPTH
REPEAT SECTION
2000
2100
FIRST READING 2112'
TOTAL DEPTH 2115'
REPEAT SECTION
1900
2000


COLLAR LOG
2100
CALIPER
FIRST READING 2112'
TOTAL DEPTH 2115'
12"
10"
8"
6"
4"

"Pipeline"

Select County: (087) Roane
Enter Permit #: 2080
Get Data | Reset

Select datatypes: (Check All)
Location | Production | Plugging
Owner/Completion | Stratigraphy | Sample
Pay/Show/Water | Logs | Btm Hole Loc

Table Descriptions
County Code Translations
Permit-Numbering Series
Usage Notes
Contact Information
Disclaimer
WVGES Main
"Pipeline-Plus" New

WV Geological & Economic Survey:

**Well: County = 87 Permit = 2080**

Report Time: Thursday, April 30, 2020 8:28:36 PM

Location Information: View Map

| API | COUNTY | PERMIT | TAX_DISTRICT | QUAD_75 | QUAD_15 | LAT_DD | LON_DD | UTME | UTMN |
|---|---|---|---|---|---|---|---|---|---|
| 4708702080 | Roane | 2080 | Smithfield | Tariff | Otter | 38.646918 | -81.212203 | 481534 | 4277617.3 |

There is no Bottom Hole Location data for this well

Owner Information:

| API | CMP_DT | SUFFIX | STATUS | SURFACE_OWNER | WELL_NUM | CO_NUM | LEASE | LEASE_NUM | MINERAL_OWN | OPERATOR_AT_COMPLETION | PROP_VD | PROP_TRGT_FM | TFM_EST_PR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702080 | 10/-/1977 | Original Loc | Completed | P A Tallman | 54 | | | | | Pennzoil Company | | | |

Completion Information:

| API | CMP_DT | SPUD_DT | ELEV | DATUM | FIELD | DEEPEST_FM | DEEPEST_FMT | INITIAL_CLASS | FINAL_CLASS | TYPE | RIG | CMP_MTHD | TVD | TMD | NEW_FTG | KOD | G_BEF | G_AFT | O_BEF | O_AFT | NGL_BEF | NGL_AFT | P_BEF | TI_BEF | P_AFT | TI_AFT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702080 | 10/-/1977 | -/-/- | 1137 | Ground Level | Tariff(Tlmn) | Big Injun (Price&eq) | Big Injun (Price&eq) | Development Well | Unsuccessful | Dry | Rotary | unknown | 2181 | | 2181 | | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 |

There is no Pay data for this well

Production Gas Information: (Volumes in Mcf) * 2018 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_GAS | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702080 | Pennzoil Company | 1981 | 1,118 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702080 | Pennzoil Company | 1982 | 1,385 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702080 | Pennzoil Company | 1983 | 520 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702080 | Pennzoil Company | 1984 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702080 | Pennzoil Products Company | 1989 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702080 | Pennzoil Products Company | 1990 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702080 | Pennzoil Products Company | 1991 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702080 | Pennzoil Products Company | 1992 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702080 | Pennzoil Products Company | 1993 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702080 | Pennzoil Products Company | 1994 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702080 | Pennzoil Products Company | 1995 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702080 | Triad Resources, Inc. | 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702080 | Ground Resources, LLC | 2017 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702080 | Ground Resources, LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Production Oil Information: (Volumes in Bbl) ** some operators may have reported NGL under Oil * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_OIL | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702080 | Pennzoil Company | 1981 | 509 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702080 | Pennzoil Company | 1982 | 665 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702080 | Pennzoil Company | 1983 | 629 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702080 | Pennzoil Company | 1984 | 1,030 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702080 | Pennzoil Products Company | 1989 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702080 | Pennzoil Products Company | 1990 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702080 | Pennzoil Products Company | 1991 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702080 | Pennzoil Products Company | 1992 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702080 | Pennzoil Products Company | 1993 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702080 | Pennzoil Products Company | 1994 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702080 | Pennzoil Products Company | 1995 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702080 | Triad Resources, Inc. | 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702080 | Ground Resources, LLC | 2017 | 0 | | | | | | | | | | | | |
| 4708702080 | Ground Resources, LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Production NGL Information: (Volumes in Bbl) ** some operators may have reported NGL under Oil * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_NGL | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702080 | Ground Resources, LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Production Water Information: (Volumes in Gallons) * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_WTR | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702080 | Ground Resources, LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Stratigraphy Information:

| API | SUFFIX | FM | FM_QUALITY | DEPTH_TOP | DEPTH_QUALITY | THICKNESS | THICKNESS_QUALITY | ELEV | DATUM |
|---|---|---|---|---|---|---|---|---|---|
| 4708702080 | Original Loc | 1st Salt Sand | Well Record | 1620 | Reasonable | 169 | Reasonable | 1137 | Ground Level |
| 4708702080 | Original Loc | 2nd Salt Sand | Well Record | 1815 | Reasonable | 115 | Reasonable | 1137 | Ground Level |
| 4708702080 | Original Loc | Little Lime | Well Record | 1934 | Reasonable | 79 | Reasonable | 1137 | Ground Level |
| 4708702080 | Original Loc | Pencil Cave | Well Record | 2015 | Reasonable | 23 | Reasonable | 1137 | Ground Level |
| 4708702080 | Original Loc | Greenbrier Group | Well Record | 2038 | Reasonable | 102 | Reasonable | 1137 | Ground Level |
| 4708702080 | Original Loc | Big Lime | Well Record | 2038 | Reasonable | 102 | Reasonable | 1137 | Ground Level |
| 4708702080 | Original Loc | Loyalhanna | Well Record | 2066 | Reasonable | 74 | Reasonable | 1137 | Ground Level |
| 4708702080 | Original Loc | Big Injun (Price&eq) | Well Record | 2140 | Reasonable | 34 | Reasonable | 1137 | Ground Level |

Wireline (E-Log) Information:

| API | LOG_TOP | LOG_BOT | DEEPEST_FML | LOGS_AVAIL | SCAN | DIGITIZED | GR_TOP | GR_BOT | D_TOP | D_BOT | N_TOP | N_BOT | I_TOP | I_BOT | T_TOP | T_BOT | S_TOP | S_BOT | O_TOP | O_BOT | INCH2 | INCH5 | REDUCED | KOP | LOGMD | ELEV_KB | ELEV_GL | ELEV_DF | LOG_I |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702080 | 90 | 2178 | | G I.D.C * | Y | N | 90 | 2169 | 367 | 2178 | | | 400 | 2174 | | | | | 400 | 2176 | Y | Y | N | | | | | | |

Comment: *logs: caliper, spontaneous potential, CCL

Insert 2080

Downloadable Log Images: We advise you to save the log image file to your PC for viewing. To do so, right-click the .tif image of interest and select the save option. Then you can direct the file to a location of your choice. Please note these images vary in size and some may take several minutes to download, especially if using a 56k or slower dialup connection.

Injector 2080

| FILENAME |
| --- |
| 4708702080gdc_a.tif |
| 4708702080go.tif |
| 4708702080ncs.tif |

**Quick Reference Guide for Log File Names** For more info about WVGES scanned logs click here

**geologic log types:**

- d density (includes bulk density, compensated density, density porosity, grain density, matrix density, etc.)
- e photoelectric adsorption (PE or Pe, etc.)
- g gamma ray
- i induction (includes dual induction, medium induction, deep induction, etc.)
- l laterolog
- m dipmeter
- n neutron (includes neutron porosity, sidewall neutron--SWN, etc.)
- o other[1]
- s sonic or velocity
- t temperature (includes borehole temperature, BHT, differential temperature, etc.)
- z spontaneous potential or potential

**mechanical log types:**

- b cement bond
- c caliper
- o other[1]
- p perforation depth control or perforate

[1]other logs may include, but are not limited to, such curves as audio, bit size, CCL--casing collar locator, continuous meter, directional survey, gas detector, guard, NCTL--Nuclear Cement Top Locator, radioactive tracer, tension

There is no Plugging data for this well

There is no Sample data for this well

2080

# APPENDIX A
## Injection Well Form

1) GEOLOGIC TARGET FORMATION BIG INJUN

Depth 2140 Feet (top) 2174 Feet (bottom)

2) Estimated Depth of Completed Well, (or actual depth of existing well): 2181 Feet

3) Approximate water strata depths: Fresh N/A Feet Salt N/A Feet

4) Approximate coal seam depths: NONE

5) Is coal being mined in the area? Yes ☐ No ☑

6) Virgin reservoir pressure in target formation 880 psig Source ESTIMATED/HISTORICAL

7) Estimated reservoir fracture pressure _____ psig (BHFP)

8) MAXIMUM PROPOSED INJECTION OPERATIONS:

Injection rate (bbl/hour) 25

Injection volume (bbl/day) 200

Injection pressure (psig) 1000

Bottom hole pressure (psig) 2000

9) DETAILED IDENTIFICATION OF MATERIALS TO BE INJECTED, INCLUDING ADDITIVES:

Fresh water and/or produced water from the area and possible bactericides necessary to maintain water quality to improve oil recovery. Not using bactericides at this time, but will submit a MSDS for approval for any used in the future. Additives include Scale inhibitor and THDS (Cleaner).

Temperature of injected fluid: (°F) Ambient

10) FILTERS (IF ANY)

Anthracite Coal Filters

11) SPECIFICATIONS FOR CATHODIC PROTECTION AND OTHER CORROSION CONTROL

None

2080

# APPENDIX A (cont.)

12. Casing and Tubing Program

| TYPE | Size | New or Used | Grade | Weight per ft. (lb/ft) | FOOTAGE: For Drilling | INTERVALS: Left in Well | CEMENT: Fill-up (Cu. Ft.) |
|---|---|---|---|---|---|---|---|
| Conductor | | | | | | | |
| Fresh Water | 8 5/8" | | H-40 | 20# | 364' | 364' | 200sks CTS |
| Coal | | | | | | | |
| Intermediate 1 | | | | | | | |
| Intermediate 2 | | | | | | | |
| Production | 4 1/2" | | J-55 | 9.5# | 2147' | 2147' | 75sks |
| Tubing | 2 3/8" | | | | | 1864' | |
| Liners | | | | | | | |

| TYPE | Wellbore Diameter | Casing Size | Wall Thickness | Burst Pressure | Cement Type | Cement Yield (cu. ft./sk) | Cement to Surface ? (Y or N) |
|---|---|---|---|---|---|---|---|
| Conductor | | | | | | | |
| Fresh Water | | | | | | | |
| Coal | | | | | | | |
| Intermediate 1 | | | | | | | |
| Intermediate 2 | | | | | | | |
| Production | | | | | | | |
| Tubing | | | | | | | |
| Liners | | | | | | | |

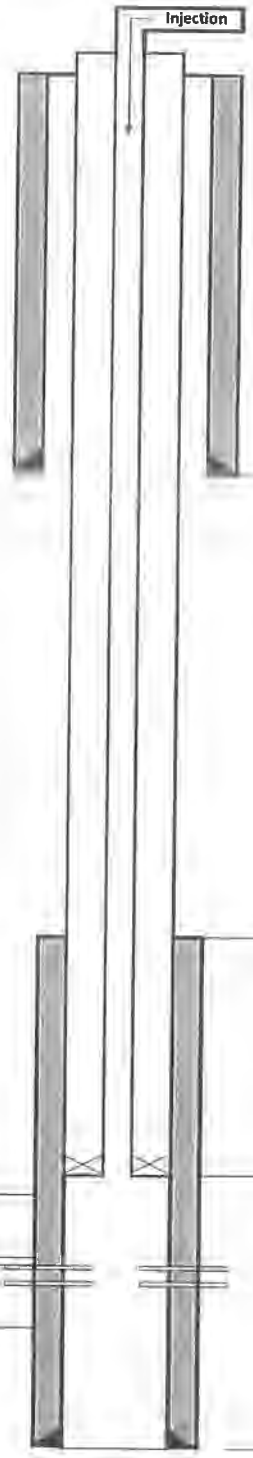
| PACKERS | Packer #1 | Packer #2 | Packer #3 | Packer #4 |
|---|---|---|---|---|
| Kind: | BAKER AD-1 | | | |
| Sizes: | 2 3/8" X 4 1/2" | | | |
| Depths Set: | 1864' | | | |

2080

UPDATED WELL SCHEMATIC

**Tallman 54**
**API 47-087-02080**

Well was worked over in 1980's
See WR-37 for new casing information



OG-10
Rev. 9-71

Injector 2080

RECEIVED
NOV 3 - 1977
OIL & GAS DIVISION
DEPT. OF MINES

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES
# Oil and Gas Division
# WELL RECORD

Rotary X Oil ____
Cable ____ Gas ____
Recycling ____ Comb. ____
Water Flood ____ Storage ____
Disposal ____ (Kind)

Quadrangle Otter
Permit No. Roa-2080

Company Fennzoil Company
Address P. O. Box 1588, Parkersburg, WV 26101
Farm P. A. Tallman Acres 2350
Location (waters) Sycamore Fk. of Ashley Camp Run
Well No. 54 Elev. 1136.62
District Smithfield County Roane
The surface of tract is owned in fee by
Roscoe Jarvis
Address Leftham, WV
Mineral rights are owned by Anna Lee Collins
Address 1009 Main St., Point Pleasant WV
Drilling Commenced 10-11-77
Drilling Completed 10-16-77
Initial open flow ____ cu. ft. ____ bbls.
Final production ____ cu. ft. per day ____ bbls.
Well open ____ hrs. before test ____ RP.
Well treatment details:
Did Not Complete

| Casing and Tubing | Used in Drilling | Left in Well | Cement fill up Cu. ft. (Sks.) |
|---|---|---|---|
| Size 20-16 Cond. | | | |
| 13-10" | | | |
| 9 5/8 | | | |
| 8 5/8 | 364 | 364 | 200 sks. |
| 7 | | | |
| 5 1/2 | | | |
| 4 1/2 | 2147 | 2147 | 75 sks. |
| 3 | | | |
| 2 | | | |
| Liners Used | | | |

Attach copy of cementing record.

Coal was encountered at ____ Feet ____ Inches
Fresh water ____ Feet ____ Salt Water ____ Feet ____
Producing Sand Big Injun Depth

| Formation | Color | Hard or Soft | Top Feet | Bottom Feet | Oil, Gas or Water | *Remarks |
|---|---|---|---|---|---|---|
| Shale | | | 0 | 95 | | |
| Sand | | | 95 | 120 | | |
| Shale & Silt | | | 120 | 168 | | |
| Sand | | | 168 | 230 | | |
| Shale | | | 230 | 341 | | |
| Sand | | | 341 | 354 | | |
| Shale | | | 354 | 463 | | |
| Sand | | | 463 | 476 | | |
| Shale & Silt | | | 476 | 581 | | |
| Sand | | | 581 | 590 | | |
| Shale | | | 590 | 691 | | |
| Sand | | | 691 | 704 | | |
| Shale | | | 704 | 715 | | |
| Sand | | | 715 | 721 | | |
| Shale | | | 721 | 778 | | |
| Sand | | | 778 | 923 | | |
| Shale | | | 923 | 993 | | |
| Sand | | | 993 | 1010 | | |
| Shale | | | 1010 | 1030 | | |
| Sand | | | 1030 | 1053 | | |
| Shale | | | 1053 | 1065 | | |
| Sand | | | 1065 | 1012 | | |
| Shale & Silt | | | 1012 | 1060 | | |
| Sand | | | 1060 | 1072 | | |

(over)

* Indicates Electric Log tops in the remarks section.

2080

| Formation | Color | Hard or Soft | Top Feet | Bottom Feet | Oil, Gas or Water | Remarks |
|---|---|---|---|---|---|---|
| Shale | | | 1072 | 1085 | | |
| Sand | | | 1085 | 1220 | | |
| Shale | | | 1220 | 1231 | | |
| Sand | | | 1231 | 1430 | | |
| Shale | | | 1430 | 1452 | | |
| Sand | | | 1452 | 1468 | | |
| Shale | | | 1468 | 1581 | | |
| Sand | | | 1581 | 1605 | | |
| Shale | | | 1605 | 1620 | | |
| Salt Sand | | | 1620 | 1789 | | |
| Shale | | | 1789 | 1815 | | |
| Salt Sand | | | 1815 | 1930 | | |
| Shale | | | 1930 | 1934 | | |
| Little Lime | | | 1934 | 2013 | | |
| Blue Monday | | | 2013 | 2015 | | |
| Pencil Cave | | | 2015 | 2038 | | |
| Big Lime | | | 2038 | 2066 | | |
| Loyalhanna | | | 2066 | 2140 | | |
| Big Injun | | | 2140 | 2174 | | |
| Shale | | | 2174 | 2181 | | |
| Total Depth | | | | 2181 | | |

Date November 1, 1977

APPROVED PENNZOIL COMPANY

By [illegible]

(Title)

FORM IV-37
(Obverse)
[08-78]

Date: March 17, 19 81
Operator's Well No: P. A. Tallman 54
API Well No: 47 - 087-2080
State County Permit

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES, OIL AND GAS DIVISION

PRE-OPERATION CERTIFICATE
FOR LIQUID INJECTION OR WASTE DISPOSAL WELL

WELL OPERATOR Pennzoil Company
Address P. O. Box 1588
Parkersburg, WV 26101

DESIGNATED AGENT James A. Crews
Address P. O. Box 1588
Parkersburg, WV 26101

GEOLOGICAL TARGET FORMATION Big Injun Depth 2140 feet(top) to 2174 feet(bottom)

Virgin reservoir pressure in target formation 80 psig

Source of information on virgin reservoir pressure Data taken in comparable fields

Perforation intervals Open-hole intervals 2149-2169

MAXIMUM PROPOSED INJECTION OPERATIONS

Volume per hour: 10 BBL/Hr. Bottom hole pressure: 1900 psig

DETAILED IDENTIFICATION OF MATERIALS TO BE INJECTED

Liquids to be injected for oil recovery under Code § 22-4-10a: Fresh Water

Wastes to be disposed of: Produced water from waterflood operations to be re-injected

Additives (slurry mediums, inhibitors, solvents, oxidizers, deoxidizers, etc.): Bactericide

RECEIVED
MAR 20 1981
OIL & GAS DIVISION
DEPT. OF MINES

SPECIFICATIONS FOR CATHODIC PROTECTION AND OTHER CORROSION CONTROL

FILTERS (IF ANY) In-line cartridge filter at injection plant and strainer at wellhead

ADDITIONAL DRILLING AS PART OF THE CONVERSION

*(Complete and submit Form IV-35, "Well Operator's Report of Drilling, Fracturing and/or Stimulating or Physical Change".)*

DETAILS ON NEW, CASING AND TUBING PROGRAM AS PART OF THE CONVERSION:

*(To be completed below unless the new casing and tubing program is described on a Form IV-35, "Well Operator's Report of Drilling, Fracturing and/or Stimulating or Physical Change", submitted in connection with the permit to which this Form IV-37 pre-operation certificate relates.)*

| CASING OR TUBING TYPE | SPECIFICATIONS Size | Grade | Weight per ft | New | Used | FOOTAGE INTERVALS For drilling | Left in well | CEMENT FILL-UP OR SACKS (Cubic feet) | PACKERS |
|---|---|---|---|---|---|---|---|---|---|
| Conductor | | | | | | | | | Kinds |
| Fresh water | | | | | | | | | |
| Coal | | | | | | | | | Sizes |
| Intermediate | | | | | | | | | |
| Production | | | | | | | | | Depths set |
| Tubing | | | | | | | | | |
| Liners | | | | | | | | | Perforations: |
| | | | | | | | | | Top Bottom |
| | | | | | | | | | |
| | | | | | | | | | |

(Continue on reverse side)

FORM IV-37
(Reverse)

(08-78)

MECHANICAL INTEGRITY TEST

Test method: Casing held 1000 psig during frac treatment

The undersigned certifies that the test described above was made on 10/21/ 19 78, and demonstrated the mechanical integrity of the well.

FACILITIES OR SYSTEMS TO PROTECT THE INTEGRITY OF THE GEOLOGICAL TARGET FORMATION OR TO PREVENT FRACTURING THE CONFINING STRATA

APPLICATION FOR VARIANCE (IF ANY) FROM REGULATION 9.01(a)
(Specify purpose, necessity, and justification)

MAY 15 1981

David W. Robinson, Chief, Water Resources Division has filed No Objections to the issuance of the application and the Office of Oil and Gas therefore approves as described in 22-4-2g of the Statute.

Thomas E. Huzzey

Thomas E. Huzzey, Administrator

Pennzoil Company
Well Operator

Supervisor, Surveying & Mapping
Title

2080

WR-37
REV. 5/01

Date: 1/2/2019

Operator's Well Number P A TALLMAN 54

API Well No.: State 47- County 087 - Permit 02080

# STATE OF WEST VIRGINIA
# DEPARTMENT OF ENVIRONMENT-OFFICE OF OIL AND GAS
# PRE-OPERATION CERTIFICATE
# FOR LIQUID INJECTION OR WASTE DISPOSAL WELL

**WELL OPERATOR** Ground Resources, LLC
Address 513 Charleston Road
Spencer, WV 25276

**DESIGNATED AGENT** Steve Bowers
Address 230 Red Bud Road
Ovapa, WV 25164

**GEOLOGICAL TARGET FORMATION** Big Injun Depth 2146' feet(top) to 2175' feet(bottom) TD 2181'

Virgin reservoir pressure in target formation 880 psig

Source of information on virgin reservoir pressure: Historical/Estimated

Perforation intervals _____ Open-hole intervals ~~2144'-2177~~ 2147' - 2181' (NOT OH)

**MAXIMUM PERMITTED INJECTION OPERATIONS**

Well head injection pressure: ~~1100~~ 1000 psig Bottom hole pressure: 2000 psig

Volume per hour: 25 bbls

**DETAILED IDENTIFICATION OF MATERIALS TO BE INJECTED**

Liquids to be injected for oil recovery: Fresh Water and ~~Salt Water~~ Recycled Produced Water

Wastes to be disposed of: N/A

Additives (Slurry mediums, inhibitors, solvents, oxidizers, deoxidizers, etc.)
Scale Inhibitor and THDS (Cleaner)

RECEIVED
Office of Oil and Gas
JAN - 4 2019
WV Department of
Environmental Protection

**SPECIFICATIONS FOR CATHODIC PROTECTION AND OTHER CORROSION CONTROL** _____

**ADDITIONAL DRILLING AS PART OF THE CONVERSION** (Complete form WR-35)

**DETAILS ON NEW CASING AND TUBING PROGRAM AS PART OF THE CONVERSION** ( To be completed below unless the new casing and tubing program is described on a form WR-35, submitted in connection with the permit to which this form WR-37 relates.)

| CASING OR TUBING TYPE | SIZE | GRADE | WEIGHT PER FT. | NEW | USED | FOOTAGE USED IN DRILLING | FOOTAGE LEFT IN WELL | CEMENT USED | PACKERS (KIND, SIZE, DEPTH SET) |
|---|---|---|---|---|---|---|---|---|---|
| CONDUCTOR | | | | | | | | | |
| FRESH WATER | 8 5/8" | | | | | 364' | 364' | CTS (200 sks) | |
| COAL | | | | | | | | | |
| INTERMEDIATE | | | | | | | | | |
| PRODUCTION | 4 1/2" | | | | | 2147' | 2147' | 75 sks | Baker |
| TUBING | 2 3/8 | | | | | | 1864' | | AD-1 |
| LINERS | | | | | | | | | 1864' |

SN

WR37

**MECHANICAL INTEGRITY TEST**

Test Method: Pressure well between 4 1/2 and 2 3/8 to 1,720 psi for thirty minutes.

The undersigned certifies that the test was performed on 1/2/2019, 20___ and demonstrated mechanical integrity of the well. The test was witnessed by Joe Taylor representing the Office of Oil and Gas.

Ground Resources, LLC.
Well Operator

1/2/2019
Date

**THIS WELL IS AUTHORIZED FOR INJECTION.**

Signed Charles T. Bean UIC PROGRAM ~~DIRECTOR~~ Manager

Date 4/9/19

RECEIVED
Office of Oil and Gas
JAN - 4 2019
WV Department of
Environmental Protection

[NOTE: That the mechanical integrity of this well must be demonstrated again within ninety (90) days of five years from this date in order for injection to continue. Please notify the state inspector 24 hours in advance of the test].

Ground Resources, LLC.
Well Operator
By:
Its Agent

SN

RECE
Office of O
JAN - 4 2019
WV Department of
Environmental Protection

JN

2080

Compensated Formation Density Log - Gamma

Schlumberger

# COMPENSATED FORMATION DENSITY LOG

Gamma Gamma

COMPANY PENNZOIL COMPANY

WELL P.A. TALLMAN #54

FIELD SMITHFIELD DIST.

COUNTY ROANE STATE W.VA.

COUNTY ROANE
FIELD or LOCATION
WELL TALLMAN #54
COMPANY PENNZOIL

Location: S55 W35 MAP 72
Sec. Twp. Rge.

API Serial No. ROA-2080

Other Services: DIL

Permanent Datum: GL, Elev.: 1137
Log Measured From KB, 10 Ft. Above Perm. Datum
Drilling Measured From KB

Elev.: K.B. 1147
D.F.
G.L. 1137

| | | | | |
|---|---|---|---|---|
| Date | 10/15/77 | | | |
| Run No. | ONE | | | |
| Depth—Driller | 2181 | | | |
| Depth—Logger | 2180 | | | |
| Btm. Log Interval | 2178 | | | |
| Top Log Interval | 0100 | | | |
| Casing—Driller | 8 5/8 @ 364 | @ | @ | @ |
| Casing—Logger | 373 | | | |
| Bit Size | 6 3/4 & 6 1/8 | | | |
| Type Fluid in Hole | FRESH WATER | | | |
| Fluid Level | FULL | | | |
| Dens. / Visc. | | | | |
| pH / Fluid Loss | ml | ml | ml | ml |
| Source of Sample | | | | |
| $R_m$ @ Meas. Temp. | @ °F | @ °F | @ °F | @ °F |
| $R_{mf}$ @ Meas. Temp. | @ °F | @ °F | @ °F | @ °F |
| $R_{mc}$ @ Meas. Temp. | @ °F | @ °F | @ °F | @ °F |
| Source: $R_{mf}$ / $R_{mc}$ | | | | |
| $R_m$ @ BHT | @ °F | @ °F | @ °F | @ °F |
| Time Since Circ. | | | | |
| Max. Rec. Temp. | 82 °F | °F | °F | °F |
| Equip. / Location | 5704 FAIRMONT | | | |
| Recorded By | HARGREAVES | | | |
| Witnessed By | MR HOOVER | | | |

The well name, location and borehole reference data were furnished by the customer.

FOLD HERE

CHANGES IN MUD TYPE OR ADDITIONAL SAMPLES

Date | Sample No. | Depth - Driller | Type Fluid | Source of Sample | $R_m$ @ Meas. Temp. | $R_{mf}$ @ Meas. Temp. | $R_{mc}$ @ Meas. Temp. | $R_m$ @ BHT | Dens. | Visc.

SCALE CHANGES

Type Log | Depth | Scale 1in Hole | Scale Down Hole

| | | | |
|---|---|---|---|
| pH Fluid Loss | | ml | ml |
| % Water by Vol. | | | |
| % Oil by Vol. | | | |
| % Solids by Vol. | | | |
| Solids Av. Sp. Gr. | | | |

**EQUIPMENT DATA**

| | | |
|---|---|---|
| Run No. | NONE | |
| Pseud Mn. | PCP-EA | 370 |
| Cart No. | PGL-EA | 242 |
| Unit No. | PDH-D | 1037 |
| Sonde No. | PGS-E | 207 |
| Tender | GSR-J | 2595 |
| Calibrator | SCP-BA | |
| Gil Cart. | SGC-JAB | 1075 |
| FTR | | |
| Mem Panel | ILP-CA | 487 |

**BIT SIZE/CASING DATA**

| Bit | From | To | Cas. Size | Cas. Wt | From | To |
|---|---|---|---|---|---|---|
| | | | | | | |

**LOGGING DATA**

| FDC Selectors | | | | | |
|---|---|---|---|---|---|
| Liquid Density | Grain Density | Hole Fluid | Porosity Scale | From | To |
| 1.0 | 2.65 | LIQ. | 30/-10 | REPEAT | |
| 1.0 | 2.68 | " | " | FR | 2140 |
| 1.0 | 2.71 | " | " | 2140 | 1980 |
| 1.0 | 2.68 | " | " | 1980 | LR |

**REMARKS**

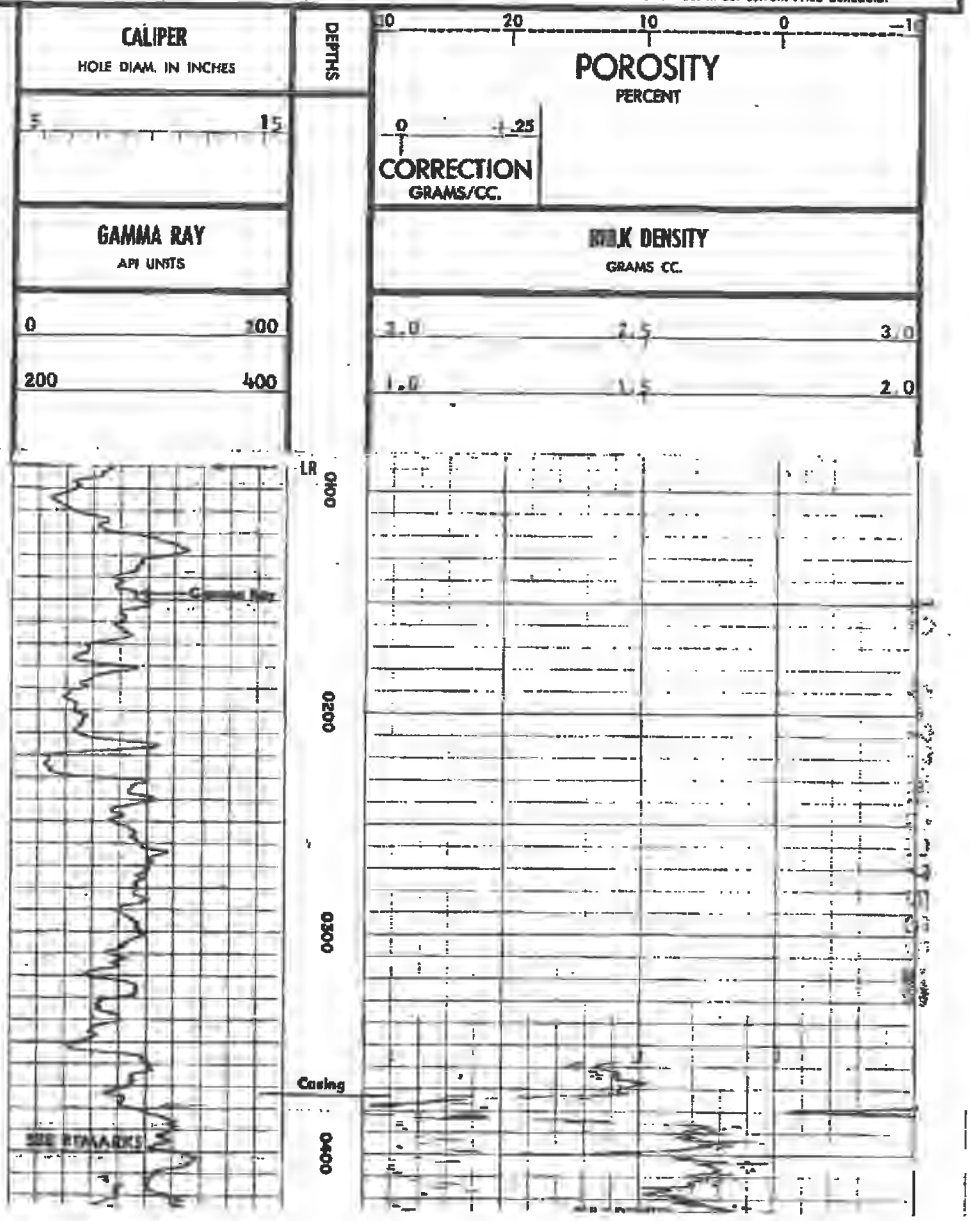
Service Order No. - 27535

CALIPER CURVE NOT WORKING ABOVE 1730'

**CALIBRATION DATA**

| Run No. | Gamma Ray API Scale | Gamma Ray Background CPS | Gamma Ray Total CPS | FDC — Before Log — ACPS $P_1$ | FDC — Before Log — ACPS $P_2$ | FDC — After Log — ACPS $P_1$ | FDC — After Log — ACPS $P_2$ |
|---|---|---|---|---|---|---|---|
| 1 | 0-200 | 80 | 600 | 653 | 1333 | 653 | 1333 |
| 2 | | | | | | | |
| 3 | | | | | | | |
| 4 | | | | | | | |

All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to Clause 4 of our General Terms and Conditions as set out in our current Price Schedule.



COMPENSATION
HUMIDITY
0200
0300
0400
0500
0600
0700
0800
0900
1000
1100
1200

SEE REMARKS
Caliper Curve
Gamma Ray
CORRELATION
POROSITY
2100
2000
1900
1800
1700
1600
1500
1400
1300

FR

| | | |
|---|---|---|
| 0 — 200 | | 2.0 — 2.5 — 3.0 |
| 200 — 400 | | 1.0 — 1.5 — 2.0 |
| **GAMMA RAY** API UNITS | | **BULK DENSITY** GRAMS/CC. |
| 5 — 15 | | 0 — +.25 **CORRECTION** GRAMS/CC. |
| **CALIPER** HOLE DIAM. IN INCHES | DEPTHS | **POROSITY** PERCENT 30 — 20 — 10 — 0 — -10 |

COMPANY PENNZOIL COMPANY

WELL P.A. TALLMAN #54

FIELD SMITHFIELD DIST.

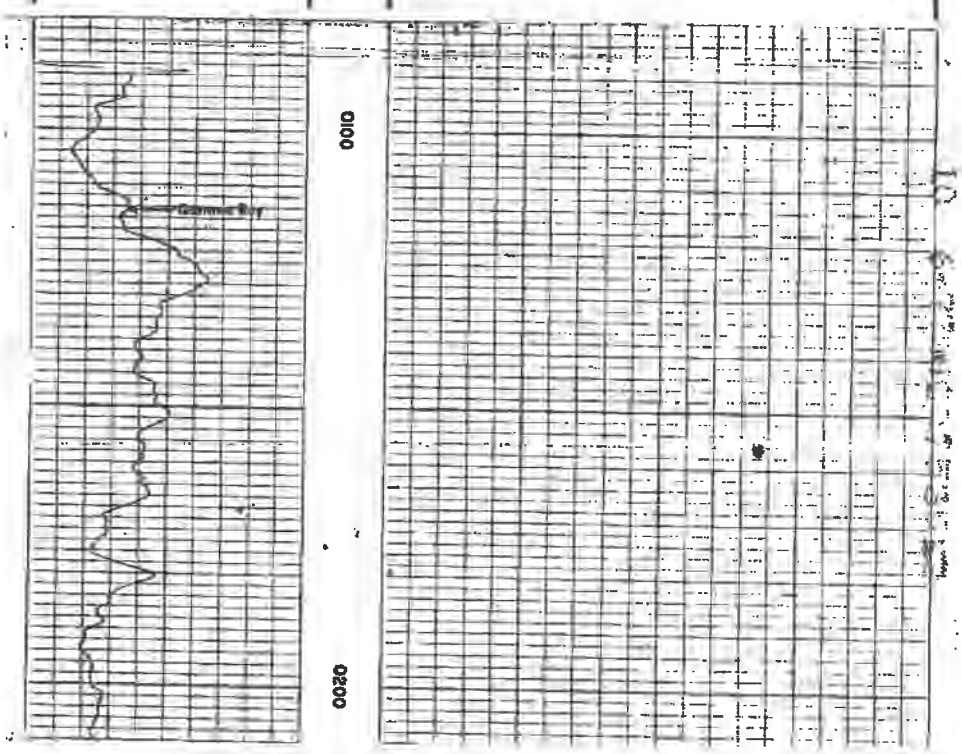
COUNTY ROANE STATE W.VA.

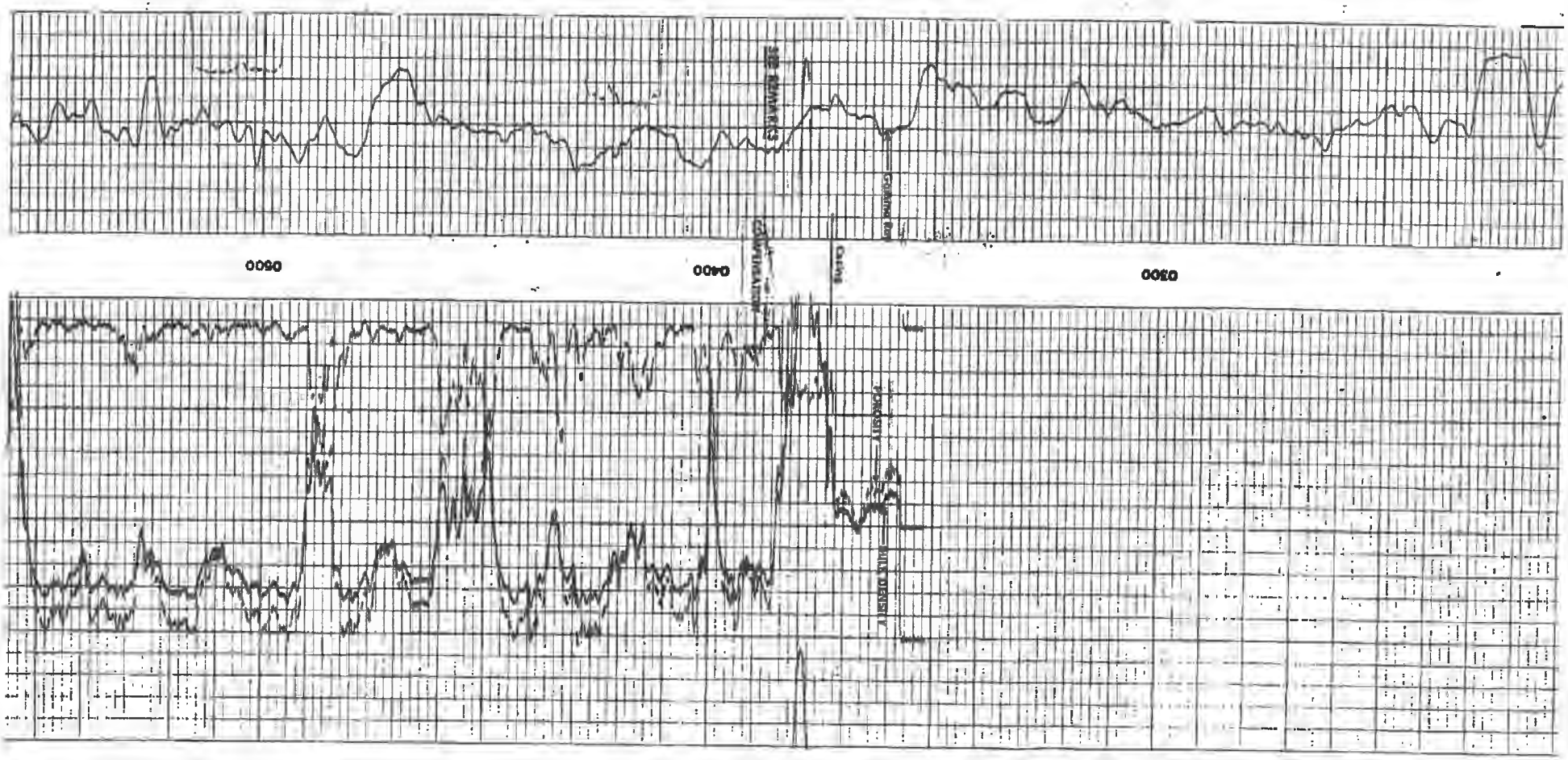
SCHL. FR 2178
SCHL. TD 2180
DRLR TD 2181
Elev:
KB 1147
DF
GL 1137

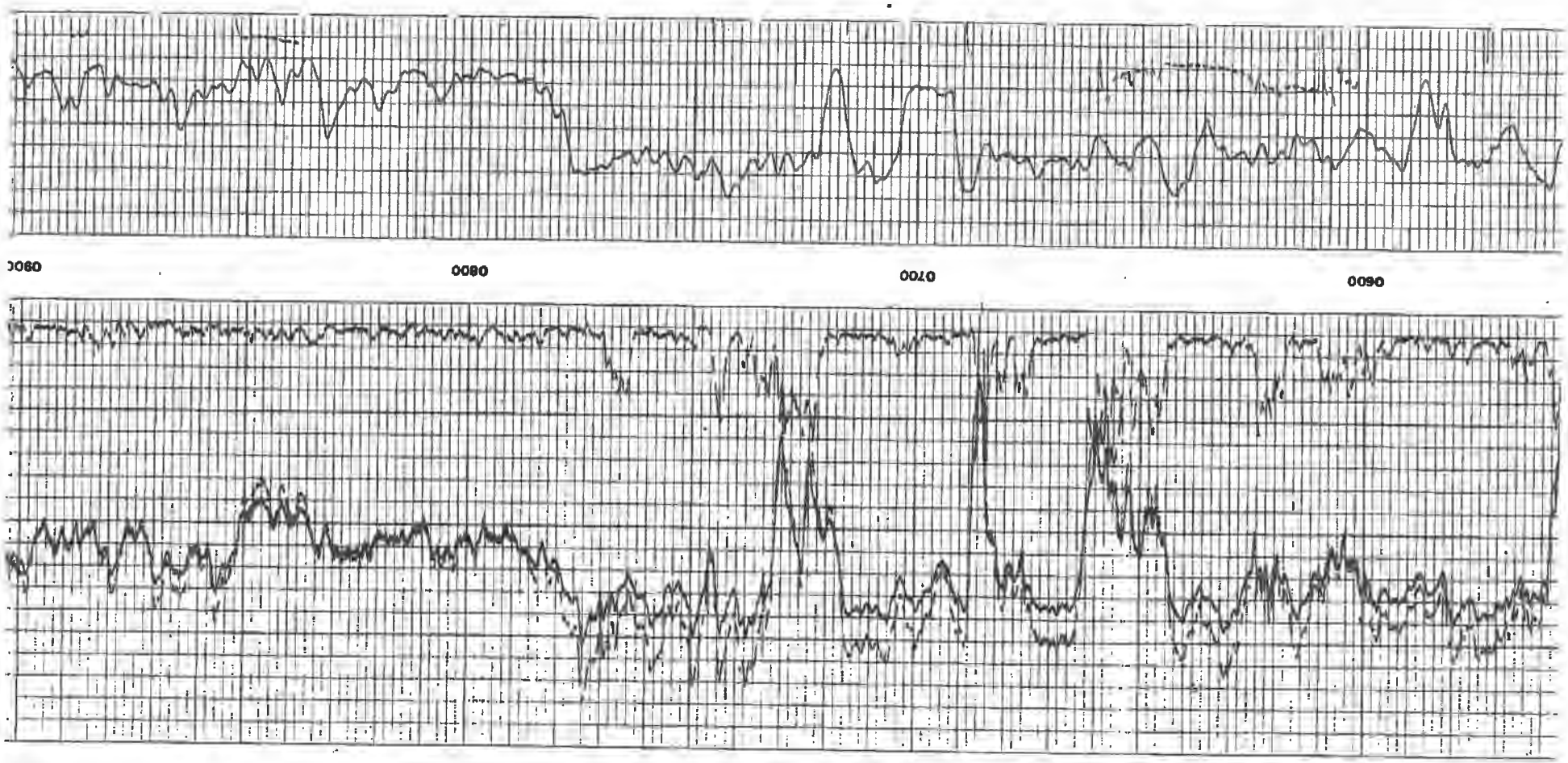
## DETAIL LOG

5" = 100'

| | | |
|---|---|---|
| **CALIPER** HOLE DIAM. IN INCHES | DEPTHS | 30 — 20 — 10 — 0 — -10 **POROSITY** PERCENT |
| 5 — 15 | | 0 — +.25 **CORRECTION** GRAMS/CC. |
| **GAMMA RAY** API UNITS | | **BULK DENSITY** GRAMS/CC. |
| 0 — 200 | | 2.0 — 2.5 — 3.0 |
| 200 — 400 | | 1.0 — 1.5 — 2.0 |




0300
0400
0500
0600
SEE REMARKS
COMPENSATION
Casing
CORRELATION
POROSITY
BULK DENSITY


0600
0700
0800
0900

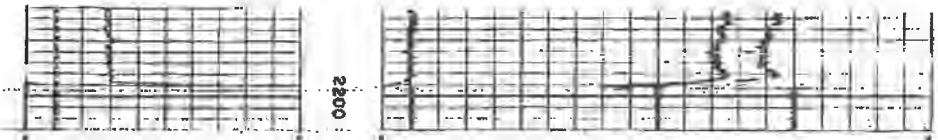
1000
1100
1200

1300
1400
1500

1600
1700
1800
1900
CHEYENNE 216

LOYALHANNA
CONFINING ZONE
2100
Gamma Ray
Caliper Curve
POROSITY
SHALE DENSITY
CONVERSATION
BIG INJUN
INJECTION ZONE
UNMEMORIZED REPEAT SECTION
MEMORIZER OUT—CURVES

INVALID
REPEAT SECTION
1900
2000
2100
Caliper Curve
Gamma Ray
CONDENSATION
POROSITY



2200

| | | |
|---|---|---|
| 0 | | 200 |
| 200 | | 400 |
| **GAMMA RAY** API UNITS | | |
| 5 | | 15 |
| **CALIPER** HOLE DIAM. IN INCHES | | |

| | | |
|---|---|---|
| 2.0 | 2.5 | 3.0 |
| 1.0 | 1.5 | 2.0 |
| **BULK DENSITY** GRAMS/CC. | | |
| 0 | +.25 | |
| **CORRECTION** GRAMS/CC. | | |
| 30 | 20 | 10 | 0 | -10 |
| **POROSITY** PERCENT | | |

DEPTHS

COMPANY PENNZOIL COMPANY

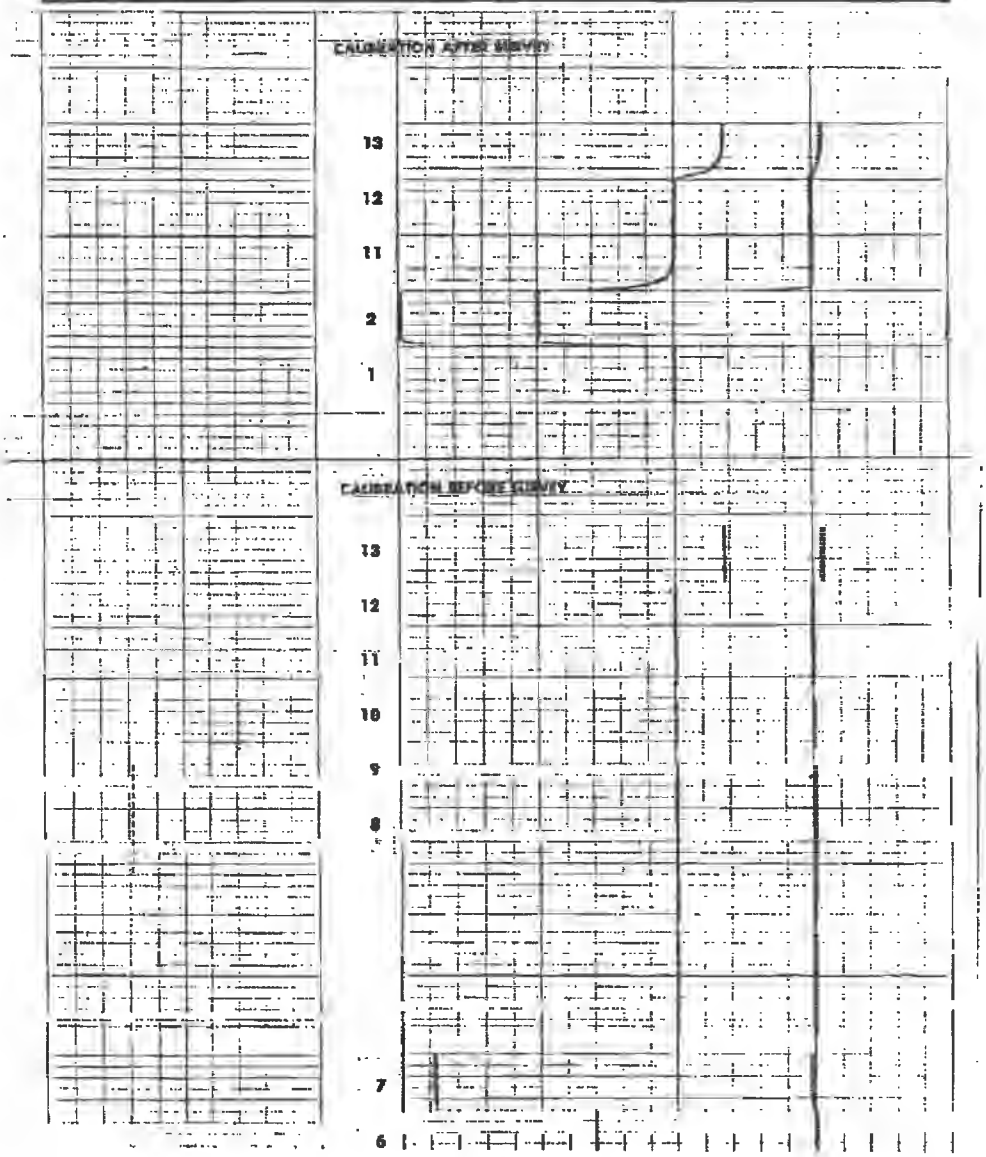
WELL P.A. TALLMAN #56

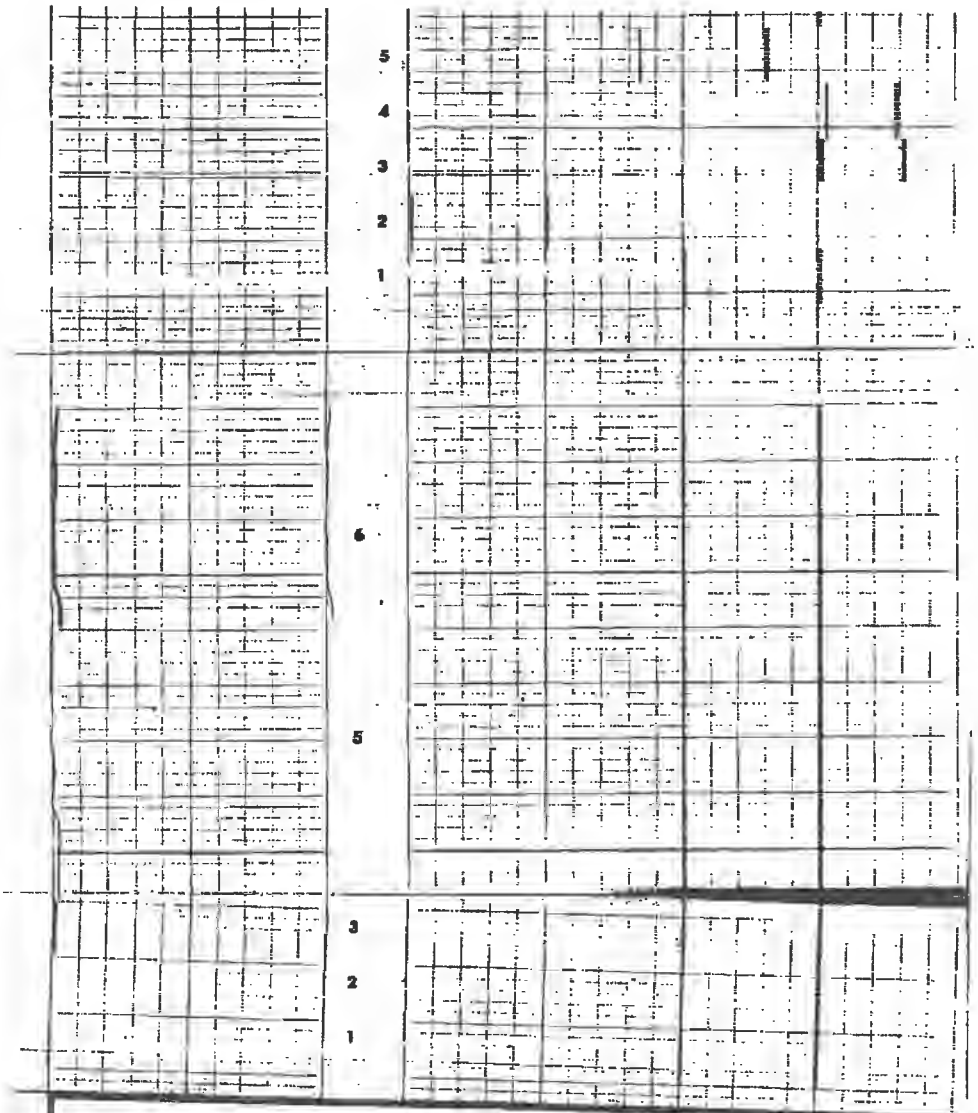
FIELD SMITHFIELD DIST.

COUNTY ROANE STATE W.VA.

SCHL. FR 2178
SCHL. TD 2180
DRLR TD 2181
Elev:
KB 1147
DF
GL 1137

CALIBRATION RECORD






## FORMATION DENSITY COMPENSATED CALIBRATION CODING

1. MECHANICAL ZERO
2. RECORDER SENSITIVITY

PANEL TEST

FDC LIQUID

| | POS | $\rho$ | $\Delta\rho$ |
|---|---|---|---|
| 3. | # 1 | 2.92 | .00 |
| 4. | # 2 | 2.78 | +.14 |
| 5. | # 3 | 2.42 | −.10 |
| 6. | # 4 | 2.35 | .00 |
| 7. | # 5 | 2.08 | .01 |

8. MECHANICAL ZERO CALIPER
9. 8" RING
10. 12" RING
11. TOOL CALIBRATE # 1 SET $\rho = 2.50$
12. TOOL CALIBRATE # 2 SET $\Delta\rho = .00$
13. LOG POSITION $\rho = 2.59$, $\Delta\rho = .015$

## GAMMA RAY CALIBRATION CODING

1. MECHANICAL ZERO
2. ELECTRICAL ZERO
3. RECORDER SENSITIVITY
4. MEMORIZER ADJUSTMENT
5. BACKGROUND
6. CALIBRATE - SOURCE IN PLACE

## CALIBRATION RECORD

COMPANY PENNZOIL COMPANY

WELL P.A. TALLMAN #54

FIELD SMITHFIELD DIST.

COUNTY ROANE STATE W.VA.

SCHL. FR 2178
SCHL. TD 2180
DRLR TD 2181
Elev:
KB 1147
DF
GL 1137

# Log Analysis

Schlumberger

COMPANY: PENNZOIL COMPANY

WELL: P.A. TALLMAN #54

FIELD: SMITHFIELD

COUNTY: ROANE

STATE: W.VA.

| DEPTH | R T | 1/RT | % POROSITY | % WATER | REMARKS |
|---|---|---|---|---|---|
| 2142-44 | 12 | .069 | 16 | 41 | ρMA=2.68 |
| 2144-46 | 13 | .062 | 17 | 36 | Rw=0.05 |
| 2146-48 | 16 | .056 | 20 | 28 | |
| 2148-50 | 15 | .056 | 25 | 22 | |
| 2150-52 | 12 | .062 | 22 | 28 | |
| 2152-54 | 11 | .067 | 21 | 32 | |
| 2154-56 | 12 | .065 | 20 | 33 | |
| 2156-58 | 14 | .060 | 22 | 27 | |
| 2158-60 | 15 | .055 | 18 | 31 | |
| 2160-62 | 15 | .056 | 20 | 28 | |
| 2162-64 | 15 | .056 | 19 | 29 | |
| 2164-66 | 15 | .056 | 21 | 27 | |
| 2166-68 | 13 | .062 | 21 | 30 | |
| 2168-70 | 14 | .060 | 18 | 33 | |
| 2170-72 | 14 | .060 | 0 | 67 | |
| 2172-74 | 10 | NOTE: MEDIUM INDUCTION VALUE USED AT THIS DEPTH AS IT IS BELOW THE FR OF THE DEEP INDUCTION | 13 | 54 | |

$$S_W = \frac{1}{\phi} \sqrt{\frac{R_W}{R_T}}$$

$$\phi = \frac{\rho_{MA} - \rho_B}{\rho_{MA} - \rho_F}$$

All interpretations are opinions based on inferences from electrical and other measurements and we cannot, and do not, guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to Clause 4 of our General Terms and Conditions as set out in our current Price Schedule.

DATE: 10/16/77

LOCATION: FAIRMONT

ENGINEER: HARGREAVES

SWS-1325-C

2080

# Basin Surveys, Inc.

## PERFORATION DEPTH CONTROL

FILING NO.

PERMIT#
N.A.

COMPANY PENNZOIL COMPANY

WELL P. A. TALLMAN #54

FIELD SMITHFIELD DISTRICT

COUNTY ROANE STATE W. VA.

LOCATION:

355' W 35 MAP 72

SEC. TWP. RGE.

OTHER LOGS:

GR-CCL

PERMANENT DATUM GROUND LEVEL ELEV. 1137'
LOG MEASURED FROM KB
DRILLING MEASURED FROM KB

ELEVATIONS:
KB. 1147'
DF.
GL. 1137'

| | | | |
|---|---|---|---|
| DATE | 10-20-78 | | |
| RUN NO. | ONE | | |
| TYPE LOG | GR-CCL | | |
| DEPTH – DRILLER | 2181' | | |
| DEPTH – LOGGER | 2177' | | |
| BOTTOM LOGGED INTERVAL | 2170' | | |
| TOP LOGGED INTERVAL | 1200' | | |
| TYPE FLUID IN HOLE | NONE | | |
| SALINITY PPM CL | | | |
| DENSITY LB./GAL. | | | |
| LEVEL | --- | | |
| MAX. REC. TEMP. – DEG. F | | | |
| OPR. RIG TIME | 2 HRS. | | |
| RECORDED BY | R. HAVERTY | | |
| WITNESSED BY | MR. N JONES | | |

| RUN NO. | BORE HOLE RECORD | | | CASING RECORD | | | |
|---|---|---|---|---|---|---|---|
| | BIT | FROM | TO | SIZE | WGT. | FROM | TO |
| ONE | | | | 4½" | | SURFACE | 2147' |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

THIS HEADING AND LOG CONFORM TO API STANDARD PRACTICE RP-33 ®

## EQUIPMENT DATA

| GAMMA RAY | | | | PERFORATIONS | | | |
|---|---|---|---|---|---|---|---|
| | | | | Type | To | From | No. Shots |
| RUN NO. | ONE | | | | | | |
| TOOL MODEL NO. | GNC#7 | | | | | | |
| DIAM. | 1 75" | | | | | | |
| DETECT. MODEL NO. | APA | | | | | | |
| TYPE | SCINT. | | | | | | |
| LENGTH | 3" | | | | | | |
| | | | | | | | |
| | | | | | | | |
| **GENERAL** | | | | | | | |
| HOIST TRUCK NO. | 207 | | | | | | |
| INST. TRUCK NO. | 207 | | | | | | |
| TOOL SERIAL NO. | | | | | | | |
| | | | | | | | |

## LOGGING DATA

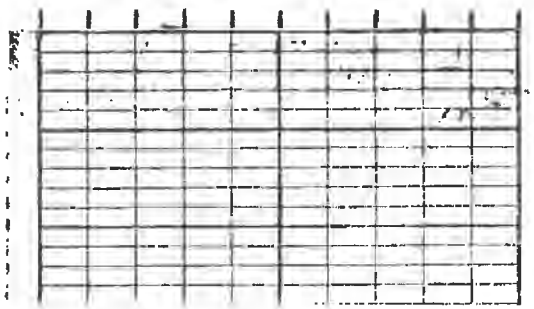
| GENERAL | | | | GAMMA RAY | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| RUN NO. | DEPTHS FROM | DEPTHS TO | SPEED FT/MIN | T.C. SEC. | SENS. SETTINGS | ZERO LOG DIV. | SCALE API G.R. UNITS | | | | |
| ONE | 2170' | 1200' | 30 | 3 | 90 | 0-L | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

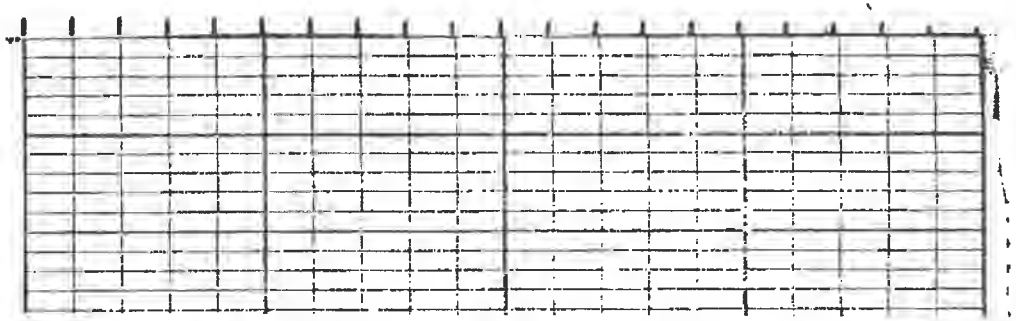
REFERENCE LITERATURE:

REMARKS:

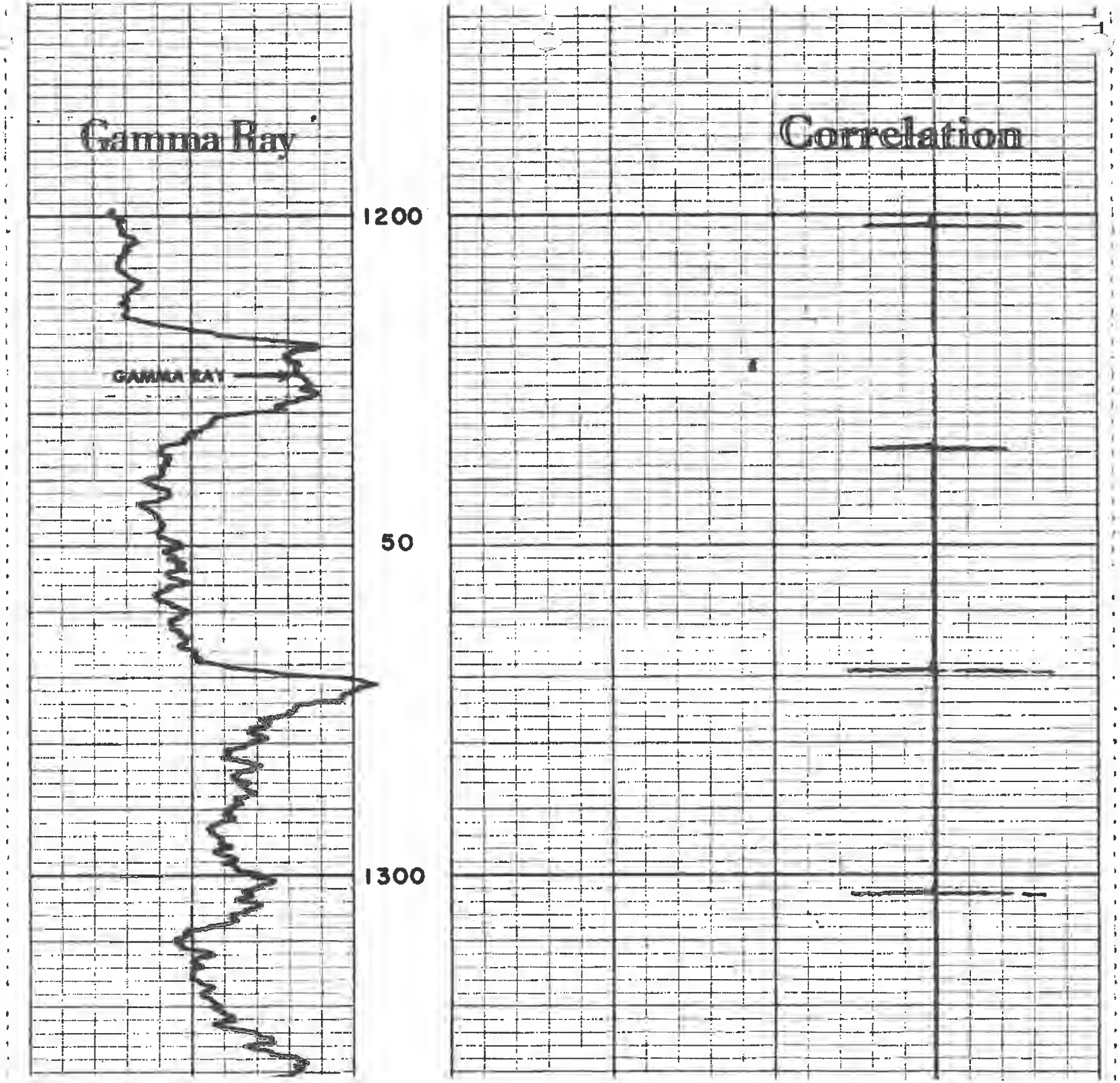
## GAMMA RAY

API GAMMA RAY UNITS



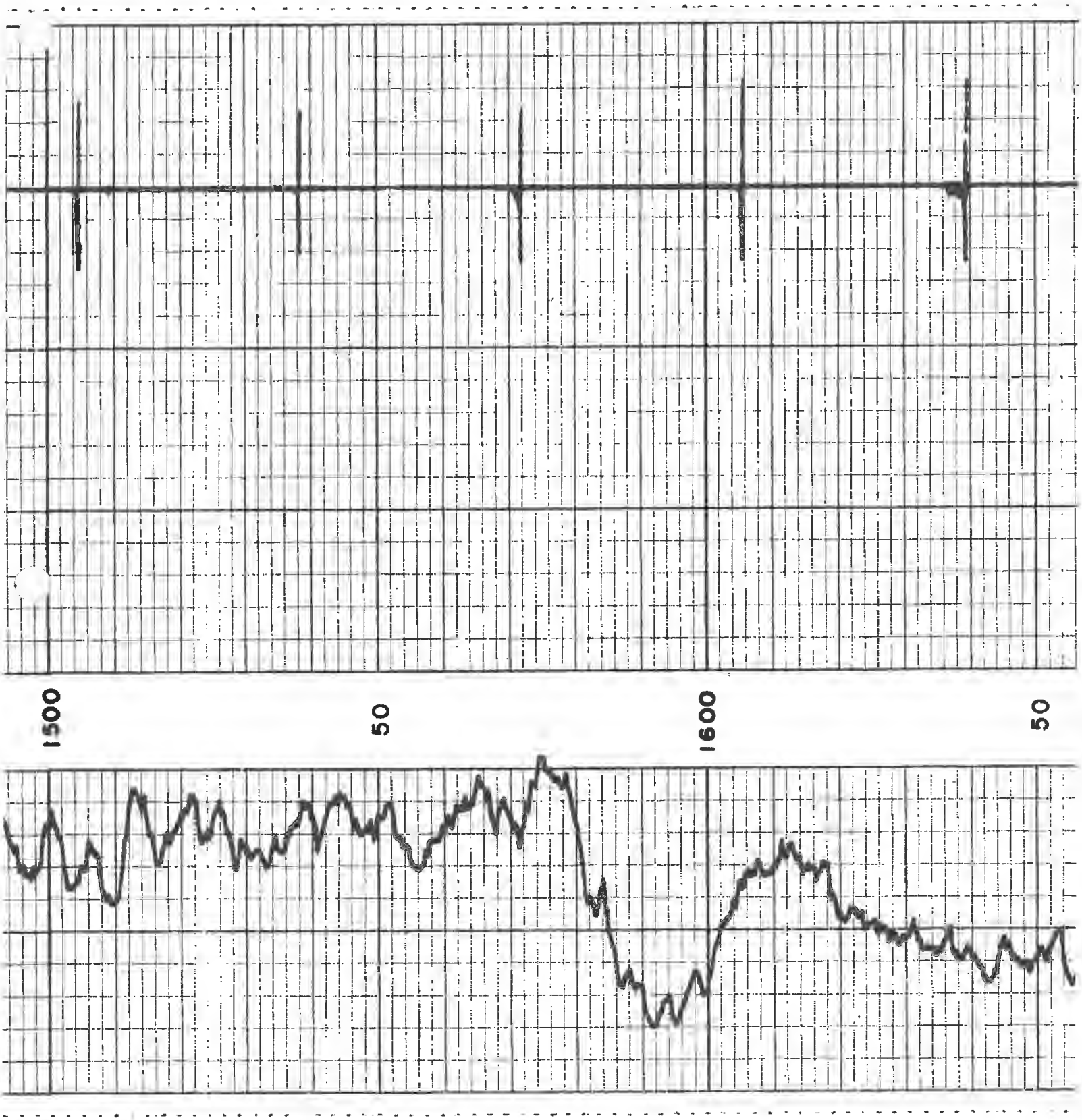


2088

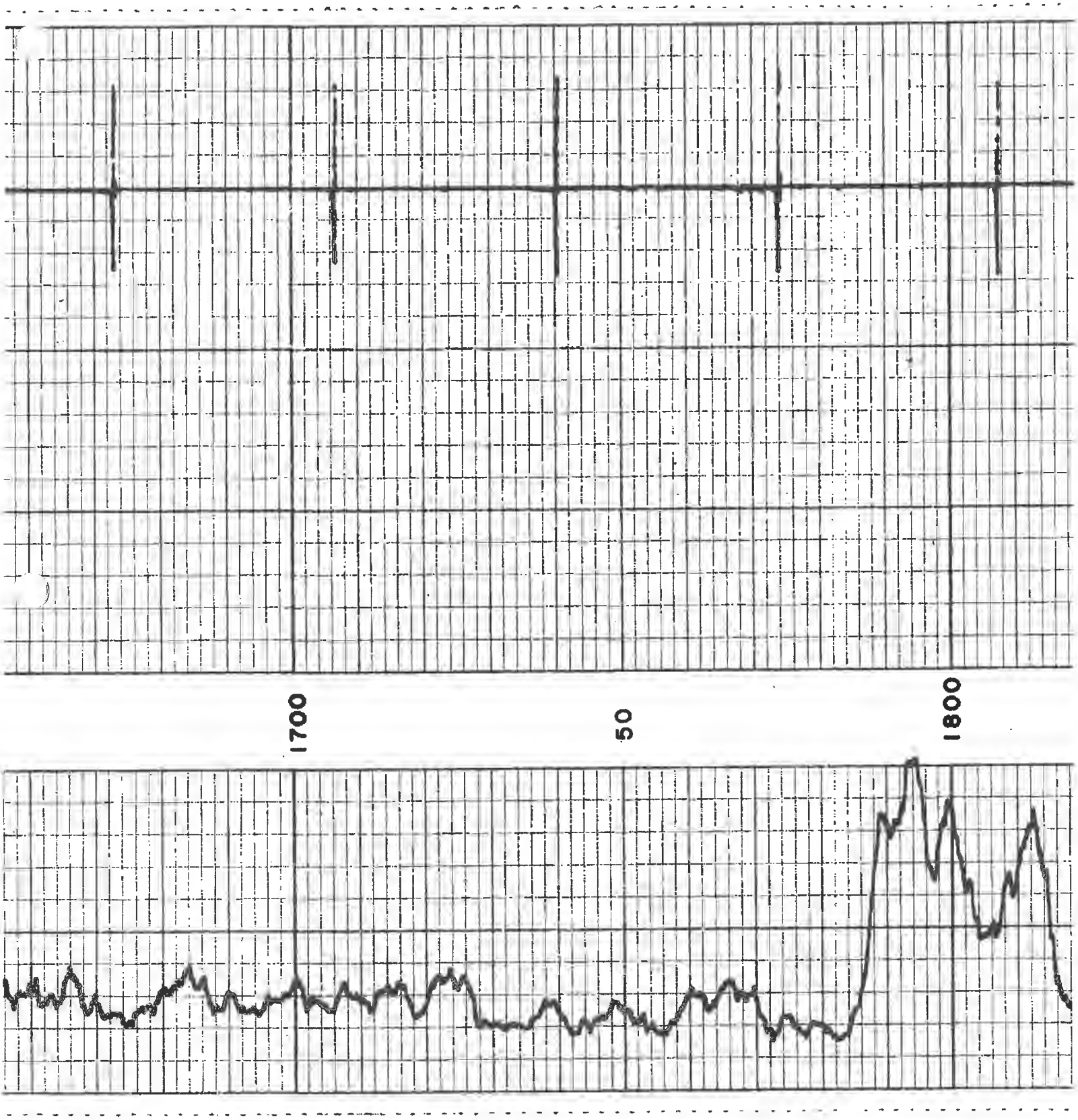



2080

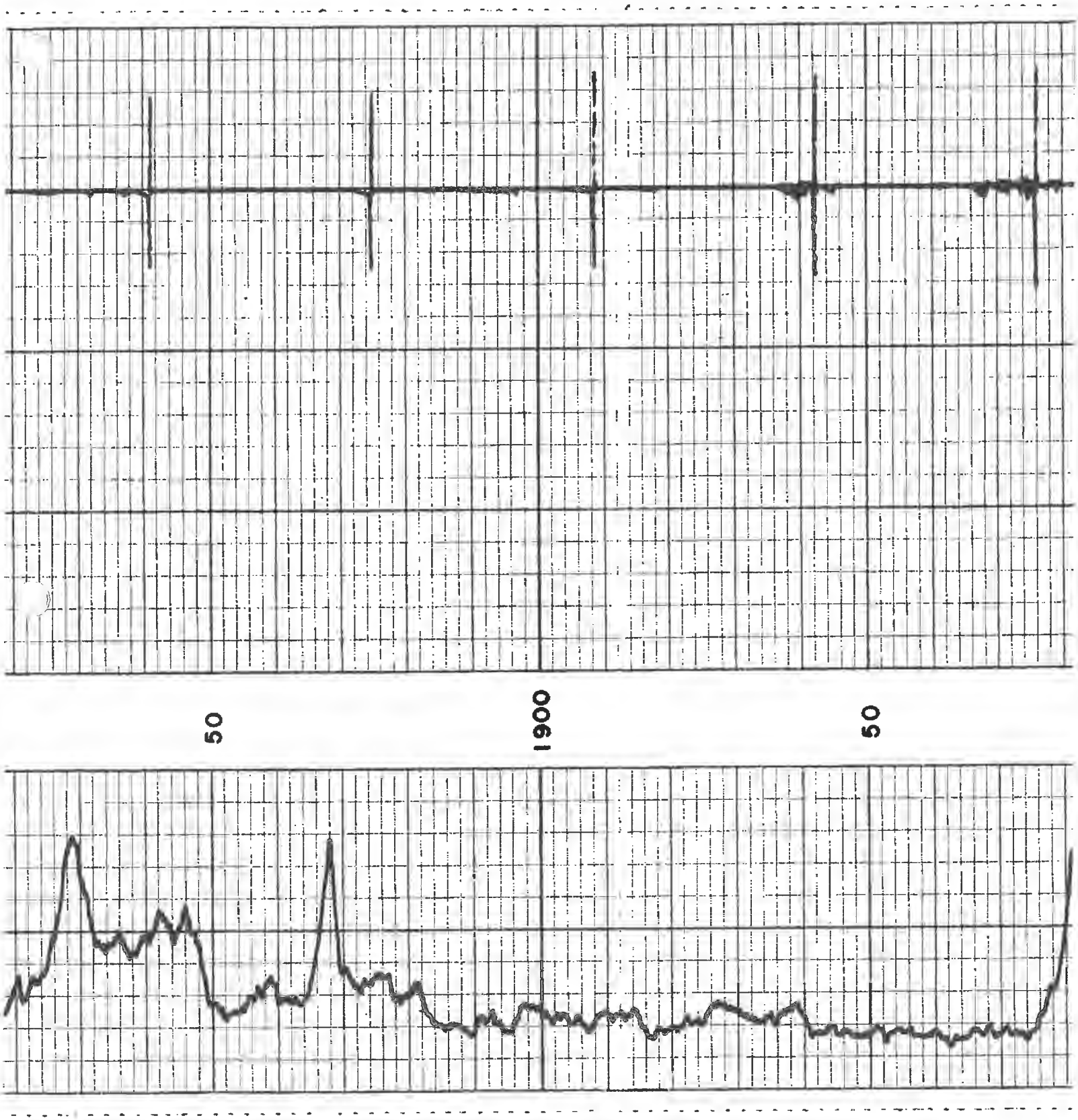
2080

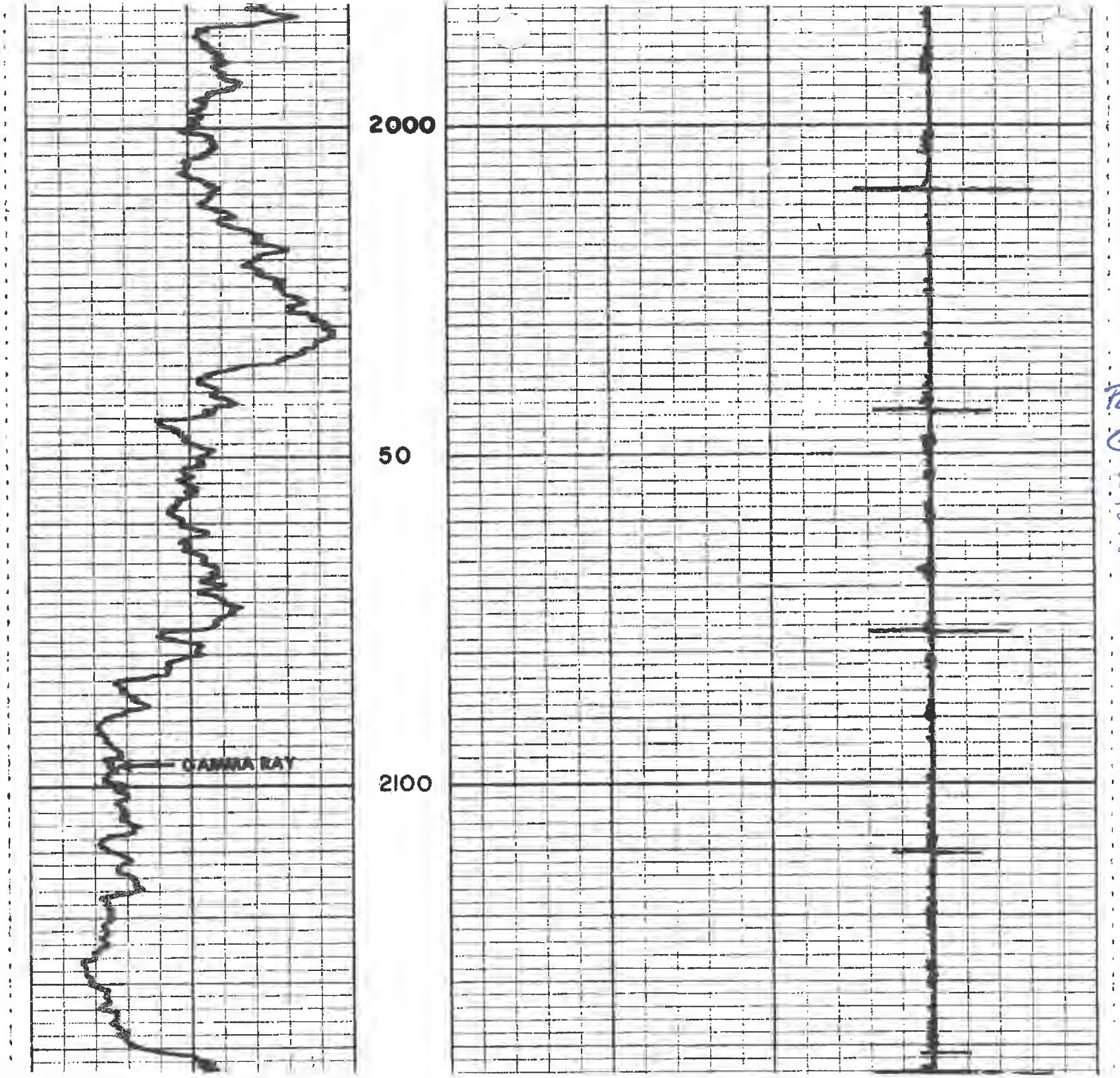


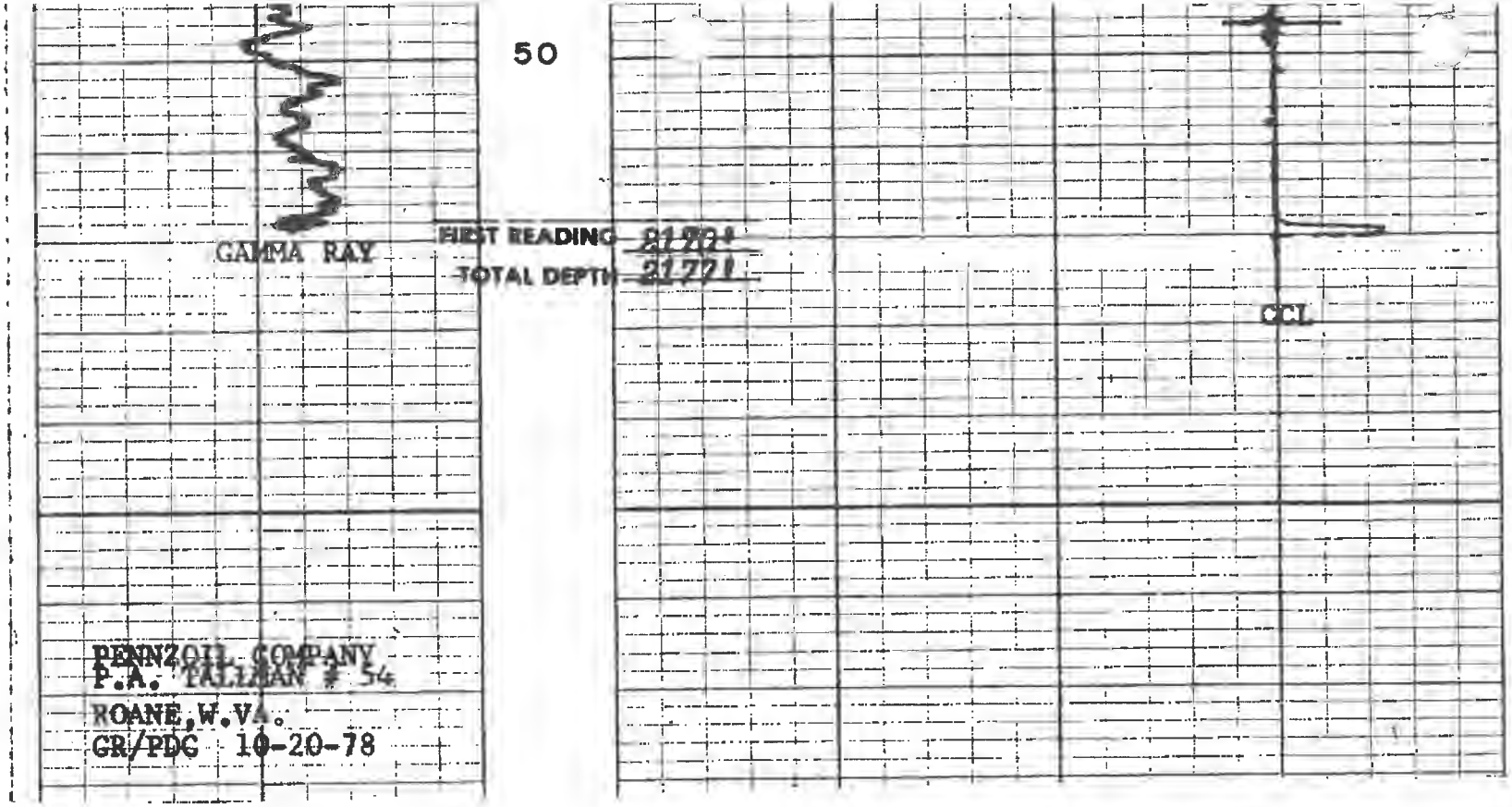
2080



2080




2000
50
2100
GAMMA RAY
PERF:
GL
2147
2181
2080


50
GAMMA RAY
FIRST READING 2170'
TOTAL DEPTH 2171'
CCL
PENNZOIL COMPANY
P.A. TALLMAN # 54
ROANE, W.VA.
GR/PDC 10-20-78

2080

"Pipeline"

Select County: (087) Roane

Enter Permit #: 2405

Get Data | Reset

Select datatypes: (Check All)

- Location
- Owner/Completion
- Pay/Show/Water
- Production
- Stratigraphy
- Logs
- Plugging
- Sample
- Btm Hole Loc

Table Descriptions
County Code Translations
Permit-Numbering Series
Usage Notes
Contact Information
Disclaimer
WVGES Main
"Pipeline-Plus" New

WV Geological & Economic Survey:

**Well: County = 087 Permit = 2405**

Report Time: Monday, May 11, 2020 11:49:22 AM

Location Information: View Map

| API | COUNTY | PERMIT | TAX_DISTRICT | QUAD_75 | QUAD_15 | LAT_DD | LON_DD | UTME | UTMN |
|---|---|---|---|---|---|---|---|---|---|
| 4708702405 | Roane | 2405 | Smithfield | Tariff | Otter | 38.64801 | -81.208598 | 481847.5 | 4277515.8 |

There is no Bottom Hole Location data for this well

Owner Information:

| API | CMP_DT | SUFFIX | STATUS | SURFACE_OWNER | WELL_NUM | CO_NUM | LEASE | LEASE_NUM | MINERAL_OWN | OPERATOR_AT_COMPLETION | PROP_VD | PROP_TRGT_FM | TFM_EST_PR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702405 | 8/-/1978 | Original Loc | Completed | P A Tallman | 55 | | | | | Pennzoil Company | | | |

Completion Information:

| API | CMP_DT | SPUD_DT | ELEV | DATUM | FIELD | DEEPEST_FM | DEEPEST_FMT | INITIAL_CLASS | FINAL_CLASS | TYPE | RIG | CMP_MTHD | TVD | TMD | NEW_FTG | KOD | G_BEF | G_AFT | O_BEF | O_AFT | NGL_BEF | NGL_AFT | P_BEF | TI_BEF | P_AFT | TI_AFT | BH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702405 | 8/-/1978 | -/-/- | 1020 | Ground Level | Tariff(Timn) | Big Injun (Price&eq) | Big Injun (Price&eq) | Service Well | Unsuccessful | Water Injection | Rotary | Acid+Frac | 2103 | | 2108 | | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | |

Pay/Show/Water Information:

| API | CMP_DT | ACTIVITY | PRODUCT | SECTION | DEPTH_TOP | FM_TOP | DEPTH_BOT | FM_BOT | G_BEF | G_AFT | O_BEF | O_AFT | WATER_QNTY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702405 | 8/-/1978 | Horizon | Injection | Vertical | | | 2056 | Big Injun (Price&eq) | 0 | 0 | | | |

Production Gas Information: (Volumes in Mcf) * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_GAS | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702405 | Pennzoil Company | 1981 | 1,118 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702405 | Pennzoil Company | 1982 | 1,385 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702405 | Pennzoil Company | 1983 | 520 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702405 | Pennzoil Company | 1984 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702405 | Pennzoil Products Company | 1989 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702405 | Pennzoil Products Company | 1990 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702405 | Pennzoil Products Company | 1991 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702405 | Pennzoil Products Company | 1992 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702405 | Pennzoil Products Company | 1993 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702405 | Pennzoil Products Company | 1994 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702405 | Pennzoil Products Company | 1995 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702405 | Triad Resources, Inc. | 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702405 | Ground Resources, LLC | 2017 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702405 | Ground Resources LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Production Oil Information: (Volumes in Bbl) ** some operators may have reported NGL under Oil * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_OIL | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702405 | Pennzoil Company | 1981 | 509 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702405 | Pennzoil Company | 1982 | 665 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702405 | Pennzoil Company | 1983 | 629 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702405 | Pennzoil Company | 1984 | 1,030 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702405 | Pennzoil Products Company | 1989 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702405 | Pennzoil Products Company | 1990 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702405 | Pennzoil Products Company | 1991 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702405 | Pennzoil Products Company | 1992 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702405 | Pennzoil Products Company | 1993 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702405 | Pennzoil Products Company | 1994 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702405 | Pennzoil Products Company | 1995 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702405 | Triad Resources, Inc. | 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702405 | Ground Resources, LLC | 2017 | 0 | | | | | | | | | | | | |
| 4708702405 | Ground Resources LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Production NGL Information: (Volumes in Bbl) ** some operators may have reported NGL under Oil * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_NGL | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702405 | Ground Resources LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Production Water Information: (Volumes in Gallons) * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_WTR | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702405 | Ground Resources LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Stratigraphy Information:

| API | SUFFIX | FM | FM_QUALITY | DEPTH_TOP | DEPTH_QUALITY | THICKNESS | THICKNESS_QUALITY | ELEV | DATUM |
|---|---|---|---|---|---|---|---|---|---|
| 4708702405 | Original Loc | Little Lime | Well Record | 1870 | Reasonable | 18 | Reasonable | 1020 | Ground Level |
| 4708702405 | Original Loc | Blue Monday | Well Record | 1898 | Reasonable | 4 | Reasonable | 1020 | Ground Level |
| 4708702405 | Original Loc | Greenbrier Group | Well Record | 1922 | Reasonable | 108 | Reasonable | 1020 | Ground Level |
| 4708702405 | Original Loc | Big Lime | Well Record | 1922 | Reasonable | 108 | Reasonable | 1020 | Ground Level |
| 4708702405 | Original Loc | Big Injun (Price&eq) | Well Record | 2030 | Reasonable | 26 | Reasonable | 1020 | Ground Level |
| 4708702405 | Original Loc | Price Fm & equivs | Well Record | 2056 | Reasonable | 52 | Reasonable | 1020 | Ground Level |

Wireline (E-Log) Information:

| API | LOG_TOP | LOG_BOT | DEEPEST_FML | LOGS_AVAIL | SCAN | DIGITIZED | GR_TOP | GR_BOT | D_TOP | D_BOT | N_TOP | N_BOT | I_TOP | I_BOT | T_TOP | T_BOT | S_TOP | S_BOT | O_TOP | O_BOT | INCH2 | INCH5 | REDUCED | KOP | LOGMD | ELEV_KB | ELEV_GL | ELEV_DF | LOG_MSRD_FRO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702405 | 24 | 2105 | | G D I C * | Y | N | 24 | 2098 | 240 | 2105 | | | 275 | 2100 | | | | | 240 | 2104 | Y | Y | N | | | | | | |

Comment: *logs: caliper, CCL, perforation

2405

2405

Downloadable Log Images: We advise you to save the log image file to your PC for viewing. To do so, right-click the .tif image of interest and select the save option. Then you can direct the file to a location of your choice. Please note these images vary in size and some may take several minutes to download, especially if using a 56k or slower dialup connection.

| FILE NAME |
| --- |
| 4708702405gdc.tif |
| 4708702405gpo.tif |
| 4708702405l.tif |

**Quick Reference Guide for Log File Names** For more info about WVGES scanned logs click here

**geologic log types:**

- d density (includes bulk density, compensated density, density porosity, grain density, matrix density, etc.)
- e photoelectric adsorption (PE or Pe, etc.)
- g gamma ray
- i induction (includes dual induction, medium induction, deep induction, etc.)
- l laterolog
- m dipmeter
- n neutron (includes neutron porosity, sidewall neutron--SWN, etc.)
- o other[1]
- s sonic or velocity
- t temperature (includes borehole temperature, BHT, differential temperature, etc.)
- z spontaneous potential or potential

**mechanical log types:**

- b cement bond
- c caliper
- o other[1]
- p perforation depth control or perforate

[1]other logs may include, but are not limited to, such curves as audio, bit size, CCL--casing collar locator, continuous meter, directional survey, gas detector, guard, NCTL--Nuclear Cement Top Locator, radioactive tracer, tension

There is no Plugging data for this well

There is no Sample data for this well

2405

# APPENDIX A
## Injection Well Form

1) GEOLOGIC TARGET FORMATION BIG INJUN

Depth 2030 Feet (top) 2056 Feet (bottom)

2) Estimated Depth of Completed Well, (or actual depth of existing well): 2108 Feet

3) Approximate water strata depths: Fresh N/A Feet Salt N/A Feet

4) Approximate coal seam depths:

5) Is coal being mined in the area? Yes ☐ No ☑

6) Virgin reservoir pressure in target formation 800 psig Source HISTORICAL/ESTIMATED

7) Estimated reservoir fracture pressure _____ psig (BHFP)

8) MAXIMUM PROPOSED INJECTION OPERATIONS:

Injection rate (bbl/hour) 25

Injection volume (bbl/day) 200

Injection pressure (psig) 1000

Bottom hole pressure (psig) 2000

9) DETAILED IDENTIFICATION OF MATERIALS TO BE INJECTED, INCLUDING ADDITIVES:

Fresh water and/or produced water from the area and possible bactericides necessary to maintain water quality to improve oil recovery. Not using bactericides at this time, but will submit a MSDS for approval for any used in the future. Additives include Scale inhibitor and THDS (Cleaner).

Temperature of injected fluid: (°F) AMBIENT

10) FILTERS (IF ANY)

ANTHRACITE COAL FILTERS

11) SPECIFICATIONS FOR CATHODIC PROTECTION AND OTHER CORROSION CONTROL

NONE

# APPENDIX A (cont.)

2405

12. Casing and Tubing Program

| TYPE | Size | New or Used | Grade | Weight per ft. (lb/ft) | FOOTAGE: For Drilling | INTERVALS: Left in Well | CEMENT: Fill-up (Cu. Ft.) |
|---|---|---|---|---|---|---|---|
| Conductor | | | | | | | |
| Fresh Water | 8 5/8" | | H-40 | 20# | 264' | 264' | 165sks CTS |
| Coal | | | | | | | |
| Intermediate 1 | | | | | | | |
| Intermediate 2 | | | | | | | |
| Production | 4 1/2" | | K-55 | 9.5# | 2094' | 2094' | 100sks |
| Tubing | NONE | | | | | | |
| Liners | | | | | | | |

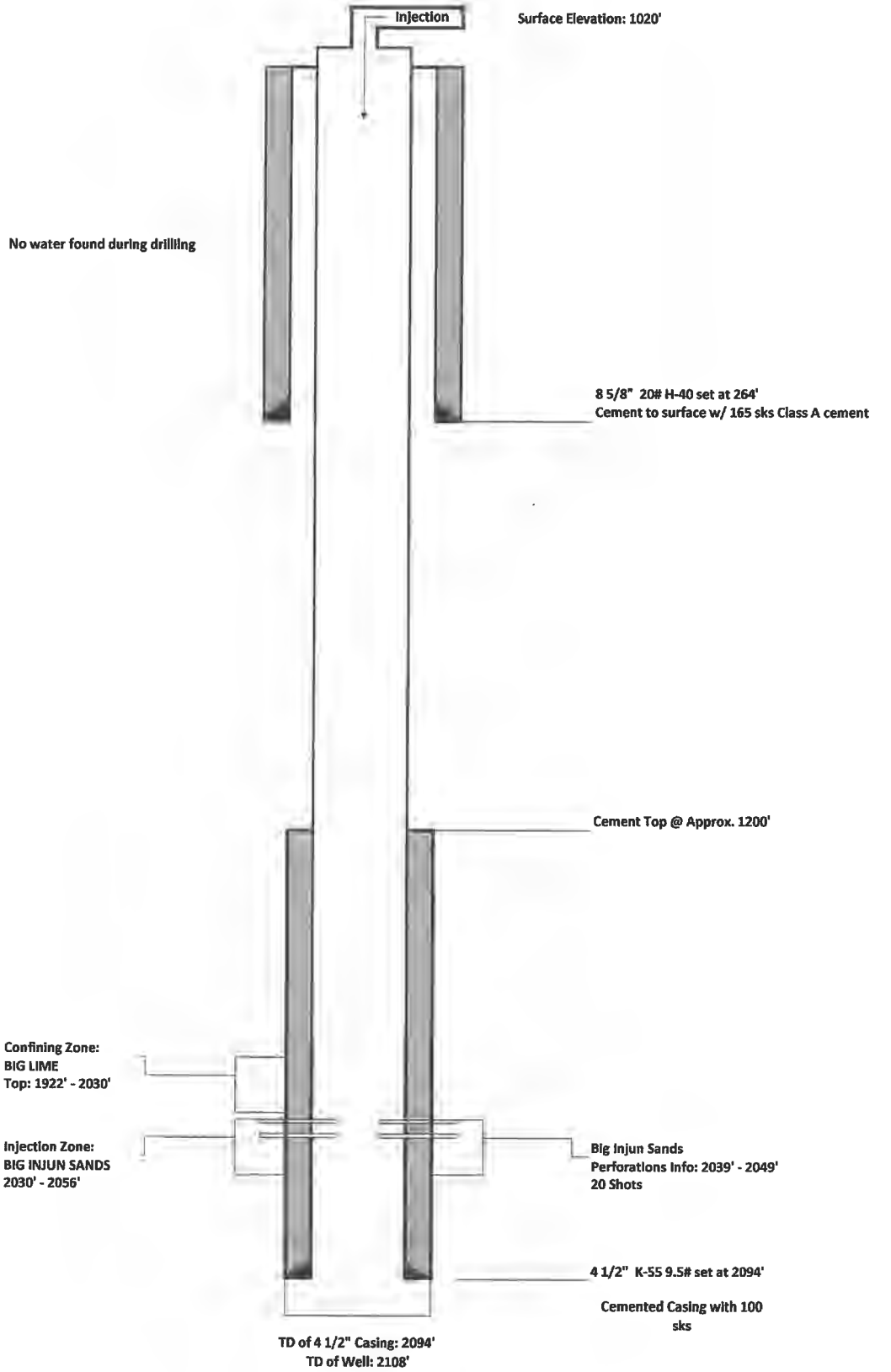
| TYPE | Wellbore Diameter | Casing Size | Wall Thickness | Burst Pressure | Cement Type | Cement Yield (cu. ft./sk) | Cement to Surface ? (Y or N) |
|---|---|---|---|---|---|---|---|
| Conductor | | | | | | | |
| Fresh Water | | | | | | | |
| Coal | | | | | | | |
| Intermediate 1 | | | | | | | |
| Intermediate 2 | | | | | | | |
| Production | | | | | | | |
| Tubing | | | | | | | |
| Liners | | | | | | | |

| PACKERS | Packer #1 | Packer #2 | Packer #3 | Packer #4 |
|---|---|---|---|---|
| Kind: | NONE | | | |
| Sizes: | | | | |
| Depths Set: | | | | |

WELL SCHEMATIC

**Tallman 55**
**API 47-087-2405**

Plans for well to be rehabbed in the future



OG-10
Rev. - 9-71

RECEIVED
MAR 28 1979
OIL & GAS DIVISION
DEPT. OF MINES

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES
Oil and Gas Division

# WELL RECORD

Rotary X Oil ____
Cable ____ Gas ____
Recycling ____ Comb. ____
Water Flood X Storage ____
Disposal ____ (Kind)

Quadrangle Tariff 7.5'

Permit No. Roa-2405

087

Company Pennzoil Company
Address P. O. Box 1588, Parkersburg, WV 26101
Farm P. A. Tallman Acres 2350
Location (waters) Trace Fork
Well No. 55 Elev. 1020.89'
District Smithfield County Roane
The surface of tract is owned in fee by
Larry Combs
Address Newburn, WV
Mineral rights are owned by Anna Lee Collins
Address 1009 Main St., Pt. Pleasant, WV
Drilling Commenced 8-12-78
Drilling Completed 8-16-78
Initial open flow ____ cu. ft. ____ bbls.
Final production ____ cu. ft. per day ____ bbls.
Well open ____ hrs. before test ____ RP.

| Casing and Tubing | Used in Drilling | Left in Well | Cement fill up Cu. ft. (Sks.) |
|---|---|---|---|
| Size | | | |
| 20-16 | | | |
| C | | | |
| 13-10" | | | |
| 9 5/8 | | | |
| 8 5/8 | 264 | 264 | 165 sks. |
| 7 | | | |
| 5 1/2 | | | |
| 4 1/2 | 2094 | 2094 | |
| 3 | | | |
| 2 | | | |
| Liners Used | | | |

Attach copy of cementing record.

Well treatment details:
Fractured 10-20-78 w/138 B KCL Water, 1100# 20/40 sd., 250 Gal. 15% HCL
Water Injection Well

Coal was encountered at ____ Feet ____ Inches
Fresh water ____ Feet ____ Salt Water ____ Feet ____
Producing Sand Big Injun Depth ____

| Formation | Color | Hard or Soft | Top Feet | Bottom Feet | Oil, Gas or Water | * Remarks |
|---|---|---|---|---|---|---|
| Shale | | | | 96 | | |
| Sand | | | 96 | 110 | | |
| Shale | | | 110 | 210 | | |
| Sand | | | 210 | 236 | | |
| Shale | | | 236 | 350 | | |
| Sand | | | 350 | 362 | | |
| Shale & Silt | | | 362 | 576 | | |
| Sand | | | 576 | 592 | | |
| Shale | | | 592 | 670 | | |
| Sand | | | 670 | 830 | | |
| Shale | | | 830 | 864 | | |
| Sand | | | 864 | 906 | | |
| Shale | | | 906 | 920 | | |
| Sand | | | 920 | 1004 | | |
| Shale | | | 1004 | 1044 | | |
| Sand | | | 1044 | 1060 | | |
| Shale | | | 1060 | 1070 | | |
| Sand | | | 1070 | 1112 | | |
| Shale | | | 1112 | 1126 | | |
| Sand | | | 1126 | 1162 | | |
| Shale | | | 1162 | 1178 | | |
| Siltstone | | | 1178 | 1196 | | |
| Sand | | | 1196 | 1208 | | |

* Indicates Electric Log tops in the remarks section.

(over)

APR 16 1979

| Formation Color Hard or Soft | Top Feet | Bottom Feet | Oil, Gas or Water | Remarks |
|---|---|---|---|---|
| Silt & Sand | 1208 | 1306 | | |
| Shale | 1306 | 1344 | | |
| Sand | 1344 | 1358 | | |
| Shale | 1358 | 1362 | | |
| Sand | 1362 | 1368 | | |
| Shale | 1368 | 1482 | | |
| Sand | 1482 | 1546 | | |
| Shale & Silts | 1546 | 1558 | | |
| Sand | 1558 | 1684 | | |
| Shale | 1684 | 1700 | | |
| Sand | 1700 | 1714 | | |
| Shale | 1714 | 1732 | | |
| Sand | 1732 | 1816 | | |
| Shale | 1816 | 1830 | | |
| Sand | 1830 | 1870 | | |
| Little Lime | 1870 | 1898 | | |
| Blue Monday | 1898 | 1902 | | |
| Pencil Cave | 1902 | 1922 | | |
| Big Lime | 1922 | 2030 | | |
| Big Injun | 2030 | 2056 | | |
| Shale | 2056 | 2108 | | |
| Total Depth | | 2108 | | |
| Plug Back Depth | | 2071 | | |

Date March 27, 19 79

APPROVED PENNZOIL COMPANY Owner

By Curtis A. Lemar
(Title)

2405
Perforation
Depth Control

# Basin Surve

PERFORATION DEPTH C

FILING NO.

PERMIT #
ROA-2405

COMPANY PENNZOIL COMPANY

WELL P.A. TALLMAN # 55

FIELD TRACE FORK

COUNTY ROANE STATE

LOCATION: SMITHFIELD DIST.
QUAD:TARIFF 7 1/2

SEC. TWP. RGE.

PERMANENT DATUM GROUND LEVEL ELEV. 1020.89'
LOG MEASURED FROM CORRECTED TO K.B. 10' ABOVE P
DRILLING MEASURED FROM K.B. 10' ABOVE P.D.

| | | | |
|---|---|---|---|
| DATE | 10-20-78 | | |
| RUN NO. | ONE | | |
| TYPE LOG | GR/PDC | | |
| DEPTH – DRILLER | 2108' | | |
| DEPTH – LOGGER | 2071' | | |
| BOTTOM LOGGED INTERVAL | 2070' | | |
| TOP LOGGED INTERVAL | 1200' | | |
| TYPE FLUID IN HOLE | | | |
| SALINITY PPM CL | | | |
| DENSITY LB./GAL. | | | |
| LEVEL | | | |
| MAX. REC. TEMP. – DEG. F | | | |
| OPR. RIG TIME | 1 HR. | | |
| RECORDED BY | YOUNG | | |
| WITNESSED BY | MR. JONES & MR. SANFILIPP | | |

| RUN NO. | BORE HOLE RECORD | | | CASING REC | | |
|---|---|---|---|---|---|---|
| | BIT | FROM | TO | SIZE | WGT. | FROM |
| | 7 7/8" | 1590' | 256' | | | |
| | | | | 8 5/8" | 24 | 0' |
| | 6 3/4" | 1590' | T.D. | | | |
| | | | | 4 1/2" | 9.5 | 0' |

THIS HEADING AND LOG CONFORM TO API STANDARD PRACTICE

ORD
TO
256'
T.D.
ELEVATIONS:
K.B. 1030.89'
D.F.
G.L. 020.89'
OTHER LOGS:
M.V.A.
ONTROL

## EQUIPMENT DATA

| GAMMA RAY | | | |
|---|---|---|---|
| RUN NO. | ONE | | |
| TOOL MODEL NO. | GC-56 | | |
| DIAM. | 1.5" | | |
| DETECT. MODEL NO. | A.P.A. | | |
| TYPE | SCINT | | |
| LENGTH | | | |
| | | | |
| | | | |
| **GENERAL** | | | |
| HOIST TRUCK NO. | 161 | | |
| INST. TRUCK NO. | 161 | | |
| TOOL SERIAL NO. | | | |
| | | | |

| PERFORATIONS | | | |
|---|---|---|---|
| Type | To | From | No. Shots |
| 3 1/8" HOLLOW STEEL CARRIER | 2069½' | 2039½' | 20 |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

## LOGGING DATA

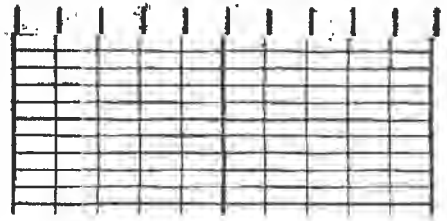
| GENERAL | | | | GAMMA RAY | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| RUN NO. | DEPTHS FROM | DEPTHS TO | SPEED FT/MIN | T.C. SEC. | SENS. SETTINGS | ZERO LOG DIV. | SCALE API G.R. UNITS | | | | |
| 1 | 2071' | 1200 | 30 | 3 | 90 | 0-L | 20 | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

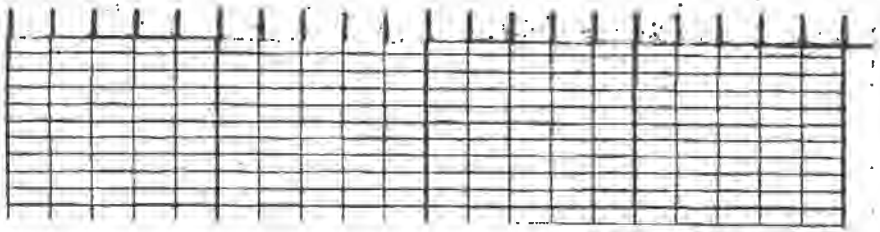
REFERENCE LITERATURE:

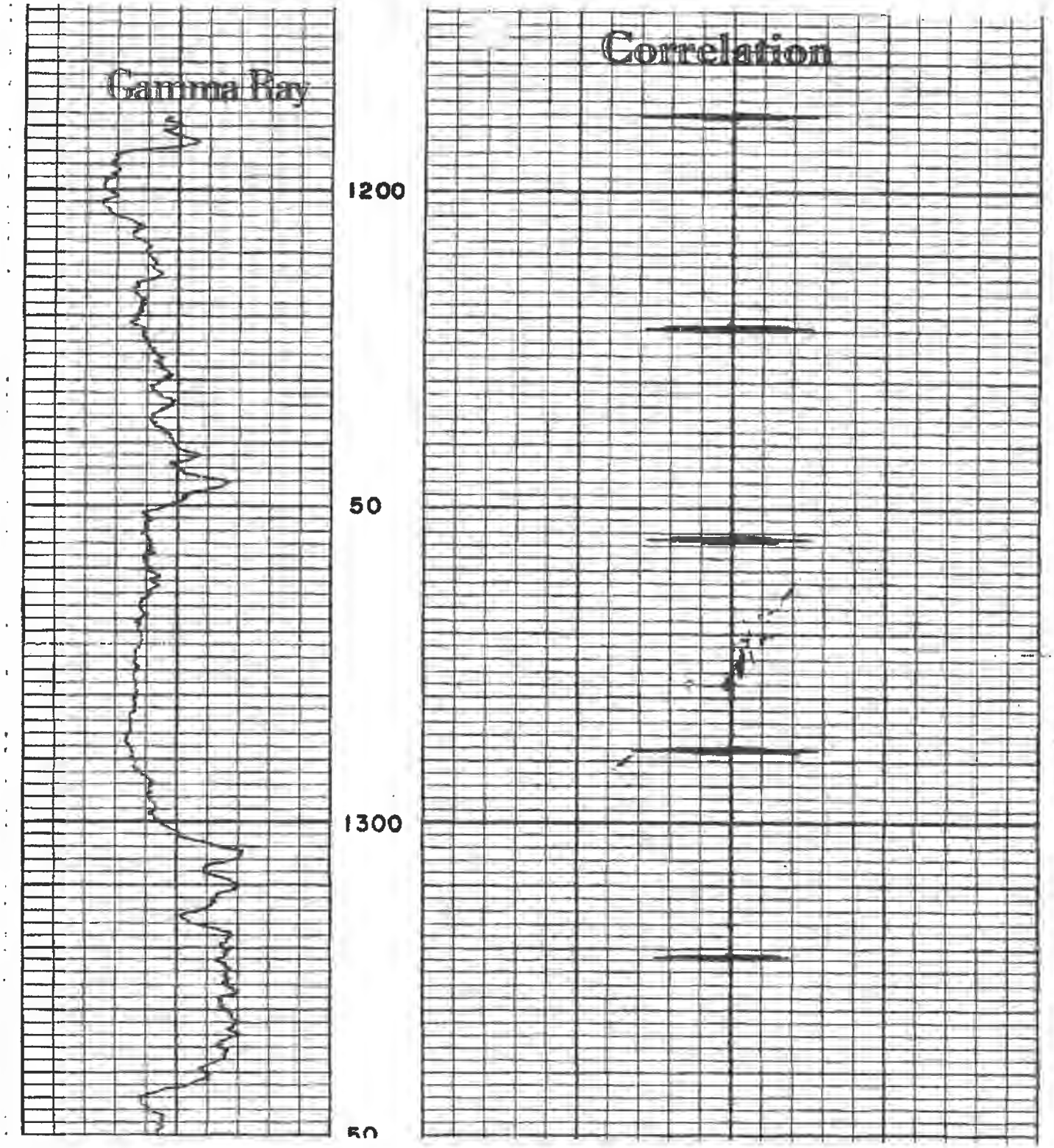
REMARKS:

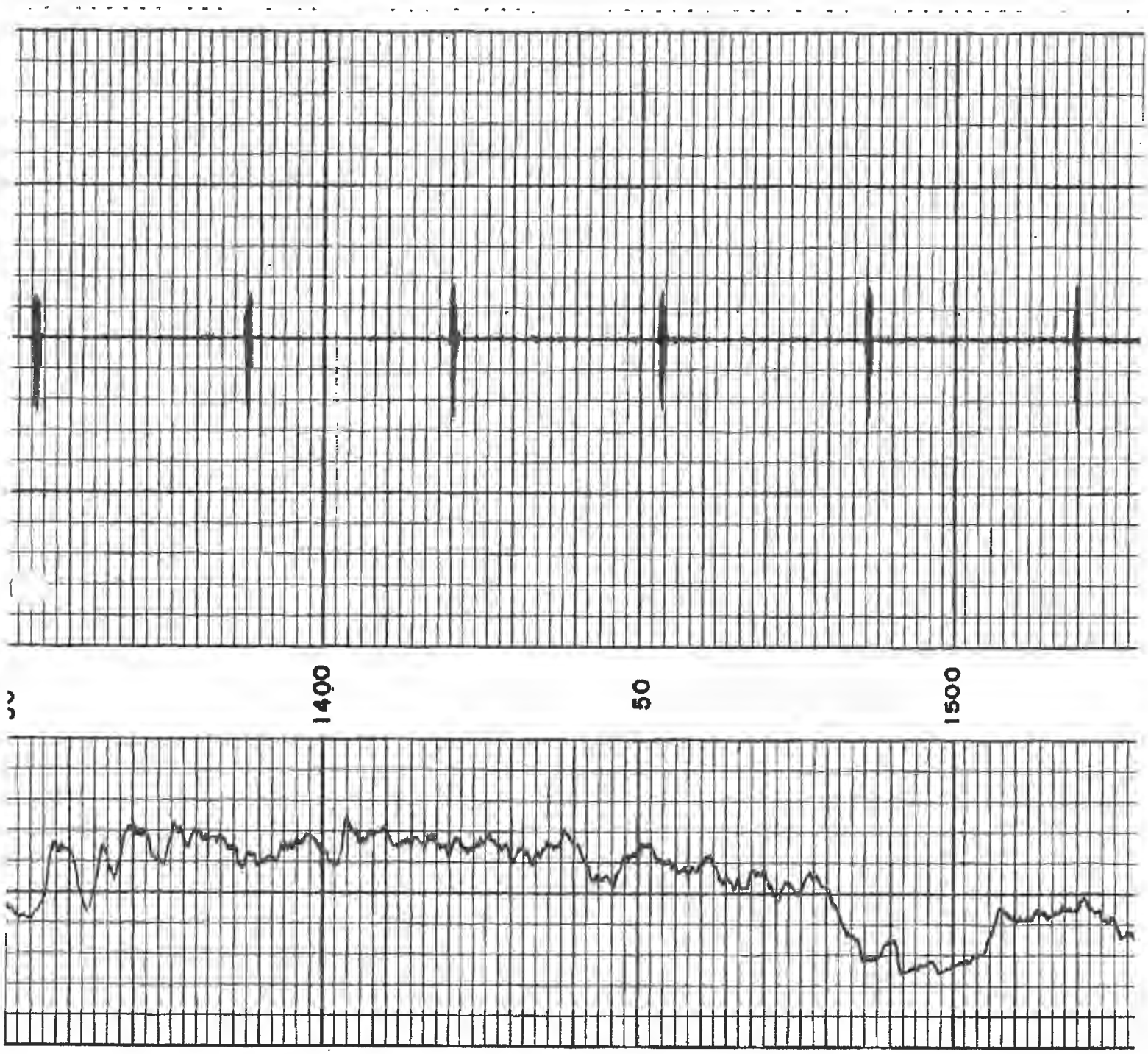
## GAMMA RAY

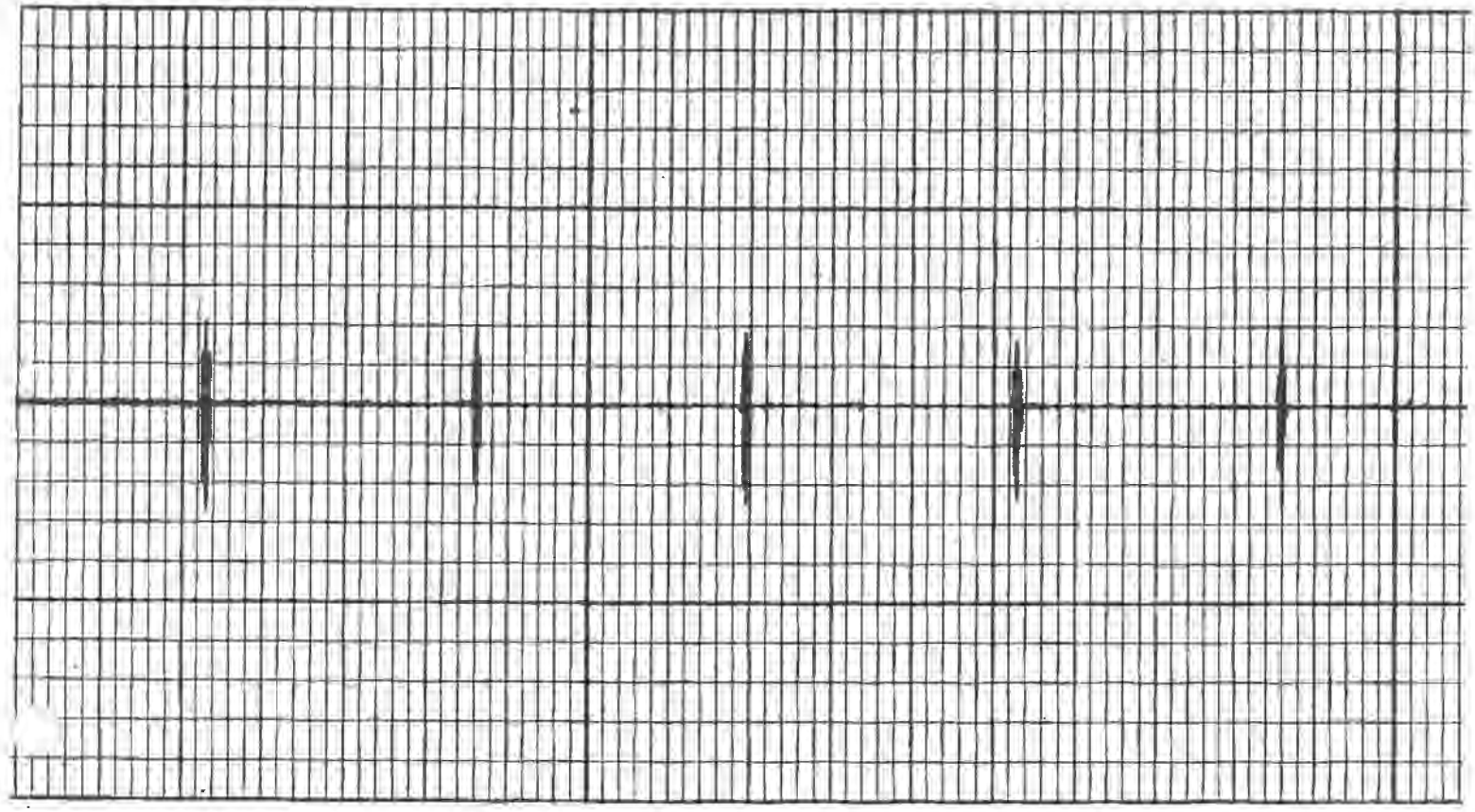
API GAMMA RAY UNITS



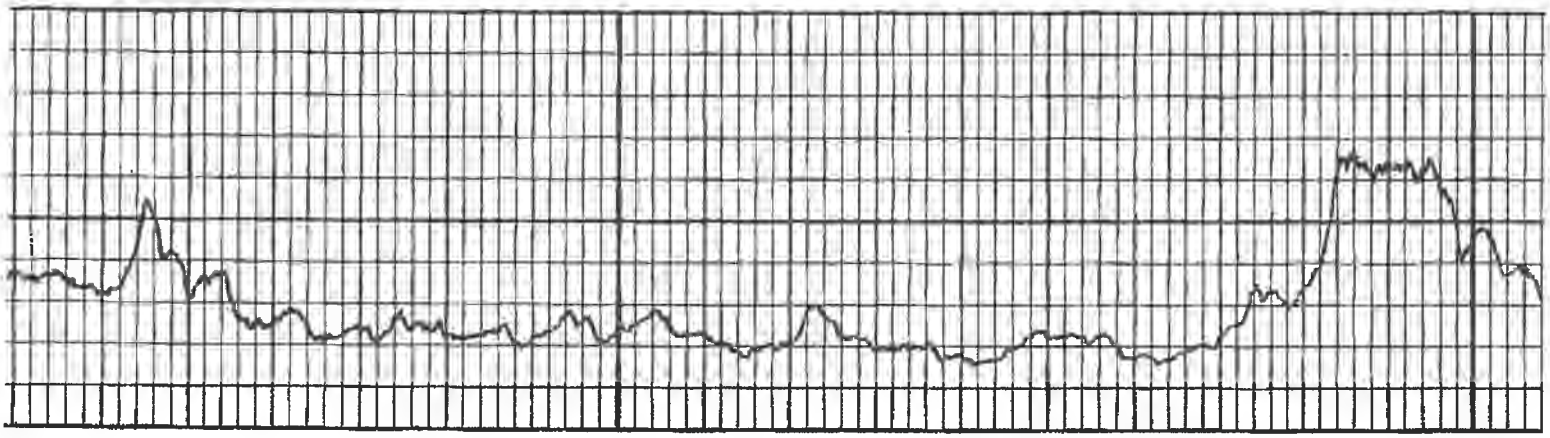



Gamma Ray
Correlation
1200
50
1300
50

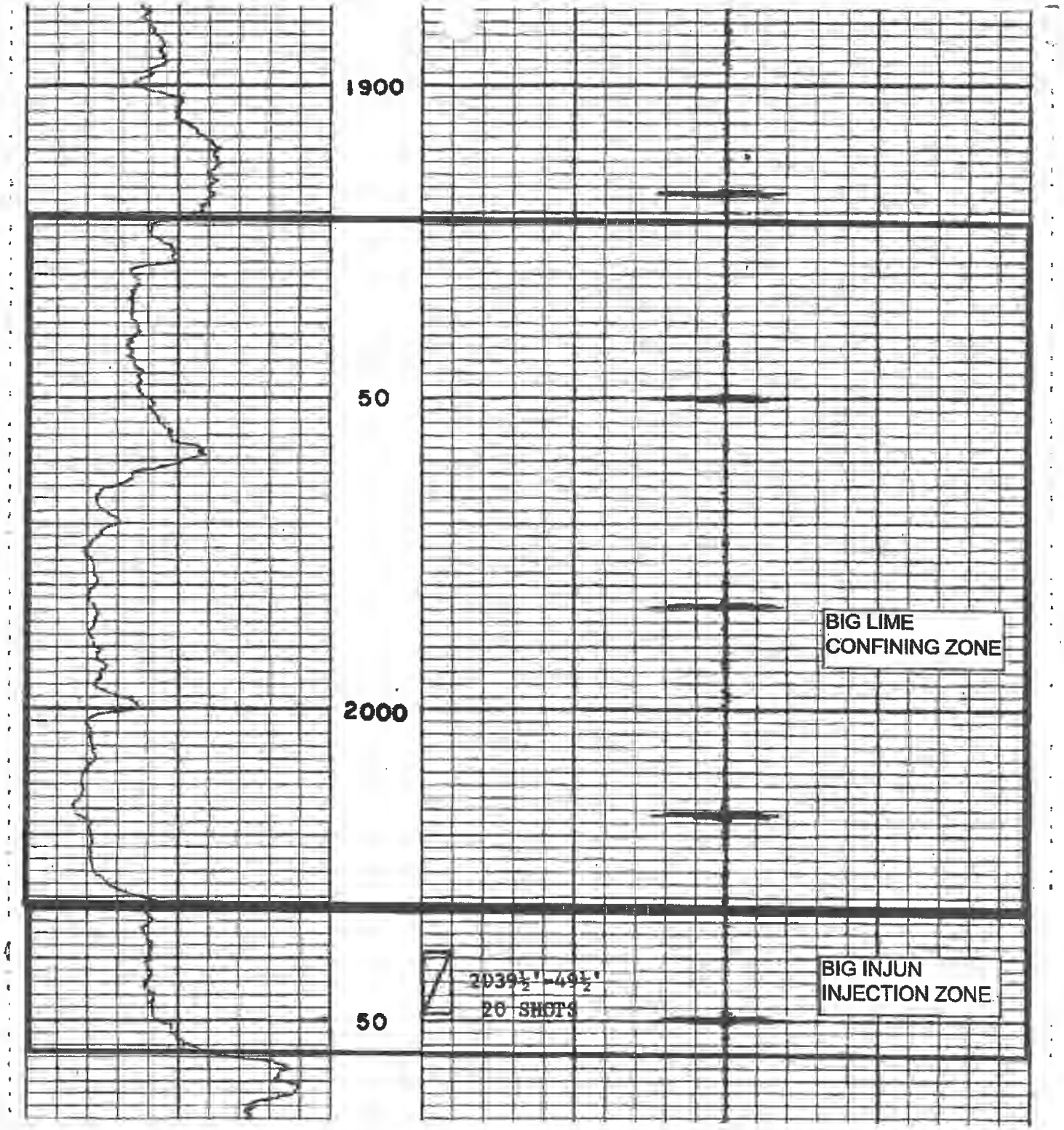

1400
50
1500

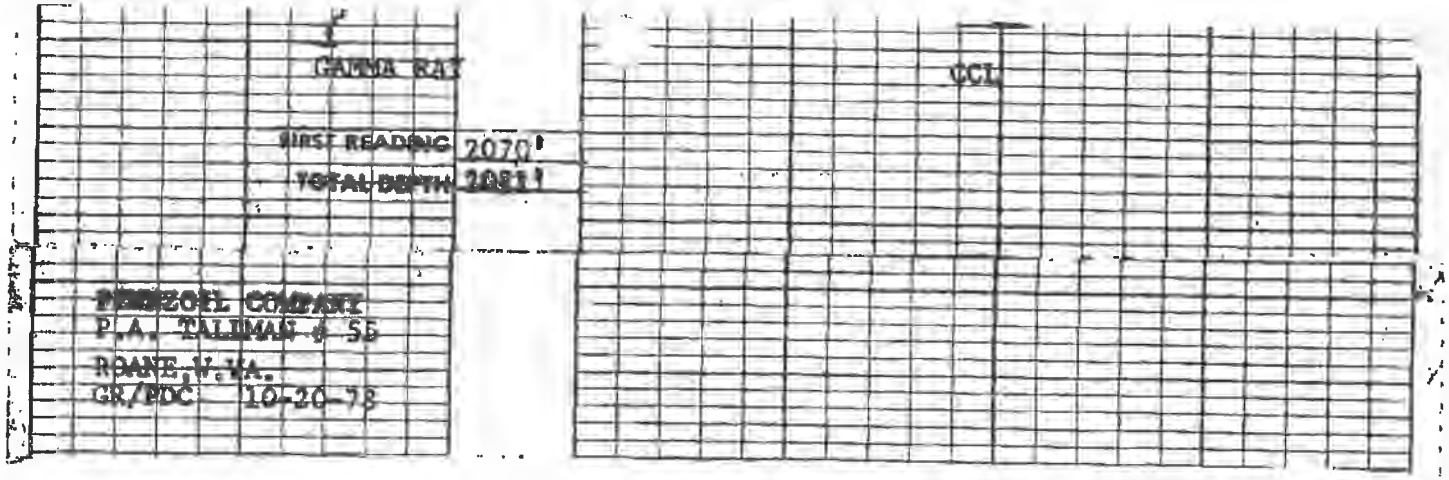


50 1600 50 1700



50
1800
50


1900
50
2000
50
2039½'-49½'
20 SHOTS
BIG LIME
CONFINING ZONE
BIG INJUN
INJECTION ZONE


GAMMA RAY
CCL
FIRST READING 2070'
TOTAL DEPTH 2081'
PENZOIL COMPANY
P.A. TALIMAN # 56
ROANE, W. VA.
GR/PDC 10-20-78

2405
CDL

ROA 2405

WIRELINE SERVICES
GEARHART-OWEN

# COMPENSATED DENSITY LOG

FILING NO.
Roa 2405

COMPANY PENNZOIL COMPANY

WELL P. A. TALLMAN # 55

FIELD TRACE FORK

COUNTY ROANE STATE W. VA.

Location: PERMIT # ROA - 2405
SMITHFIELD DIST.
TARIFF 7.5 QUAD.
Sec. Twp. Rge.

Other Services: INDUCTION

Permanent Datum: GRADED SURF Elev.: 1020.89
Log Measured From K.B. 10' Ft. Above Perm. Datum
Drilling Measured From " "

Elev.: K.B. 1030.89
D.F.
G.L. 1020.89

| | | | |
|---|---|---|---|
| Date | 8-16-78 | | |
| Run No. | ONE | | |
| Type Log | G/R-DEN. | | |
| Depth—Driller | 2108' | | |
| Depth—Logger | 2107' | | |
| Bottom logged interval | 2105' | | |
| Top logged interval | 260' | | |
| Type fluid in hole | DPLG. MUD | | |
| Salinity, PPM Cl. | | | |
| Density | | | |
| Level | | | |
| Max rec. temp., deg F. | 61° F. | | |
| Operating rig time | 2 HR. | | |
| Recorded by | WALTER & COVACH | | |
| Witnessed by | BILL TOOMEY | | |

| Run No. | Bore-Hole Record Bit | From | To | Casing Record Size | Wgt. | From | To |
|---|---|---|---|---|---|---|---|
| | 6 3/4 | 1590' | T.D. | 8 5/8 | 24 | SURF | 256' |
| | 7 7/8 | 256' | 1590' | | | | |

THIS HEADING AND LOG CONFORMS TO API RP 33

Equipment Data

FOLD HERE

| Run No. | Tool No. | Source No. | Panel No. | | Logging Unit | Location |
|---|---|---|---|---|---|---|
| ONE | 2192 | A-627 | 134 | | 7016 | 10092 |

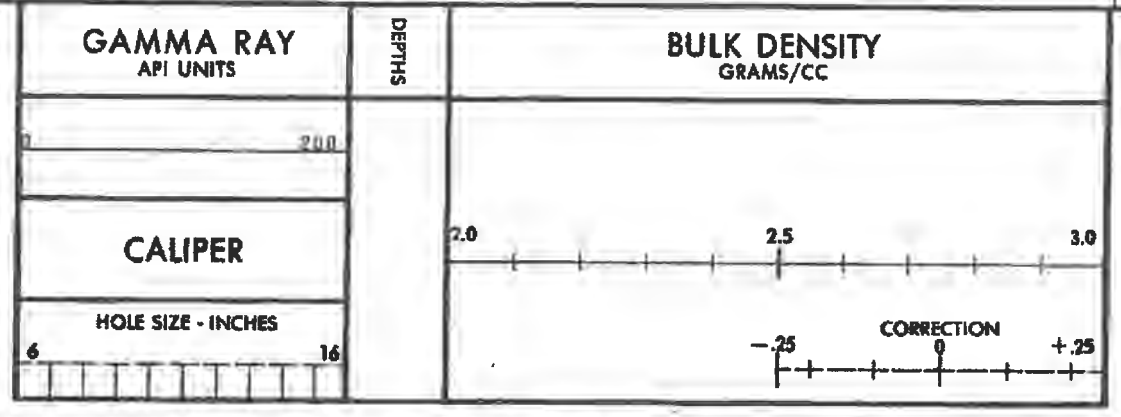
**Calibration Data**

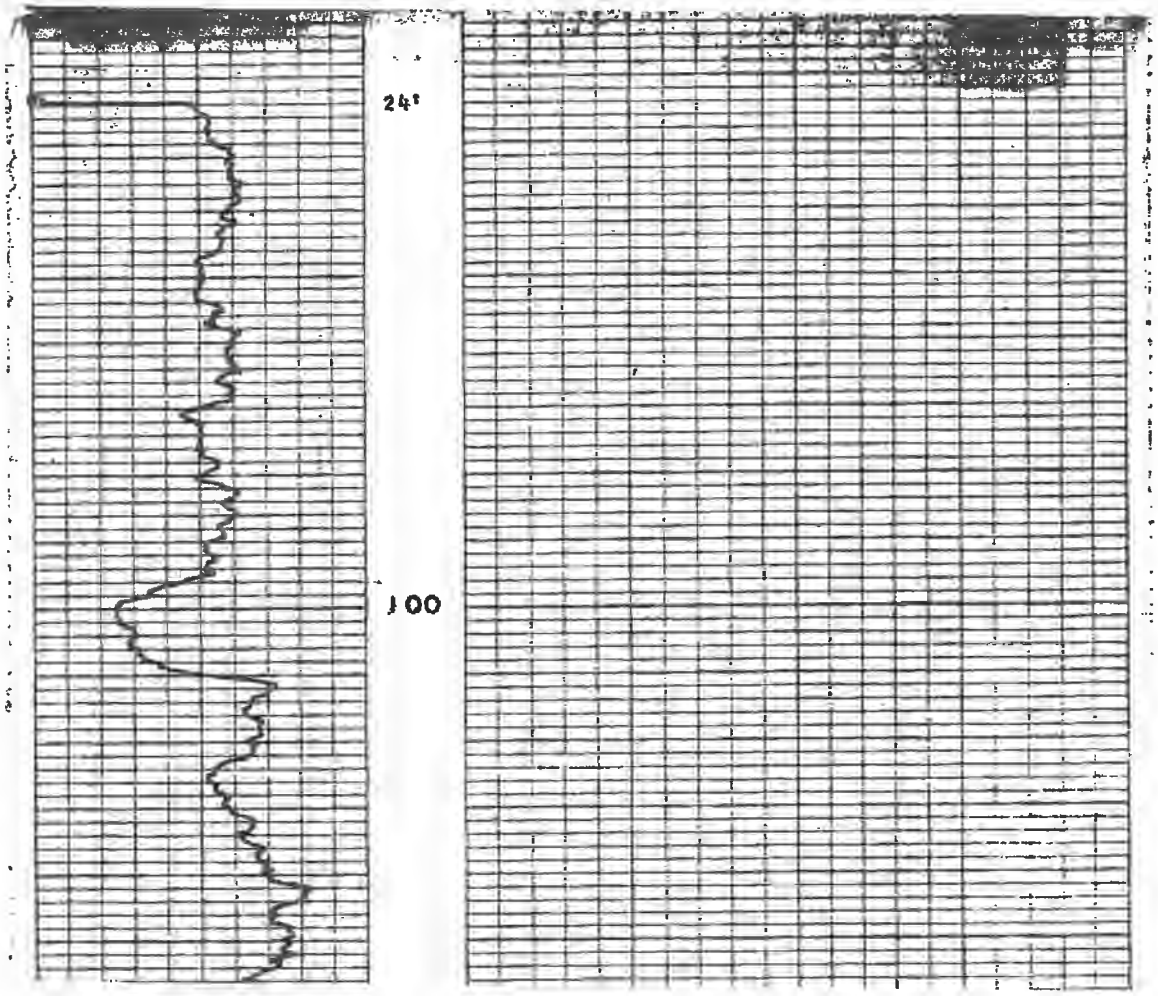
| Run No. | Gamma Ray API Scale | Gamma Ray Background CPS | Gamma Ray Std. CPS | Dc CPS AT | CDT 2.0 | CDT 3.0 | Dc CPS AT | CDT 2.0 | CDT 3.0 |
|---|---|---|---|---|---|---|---|---|---|
| ONE | 0-200 | 48 | 30 | | 550 | 35.7 | | 708 | 117 |

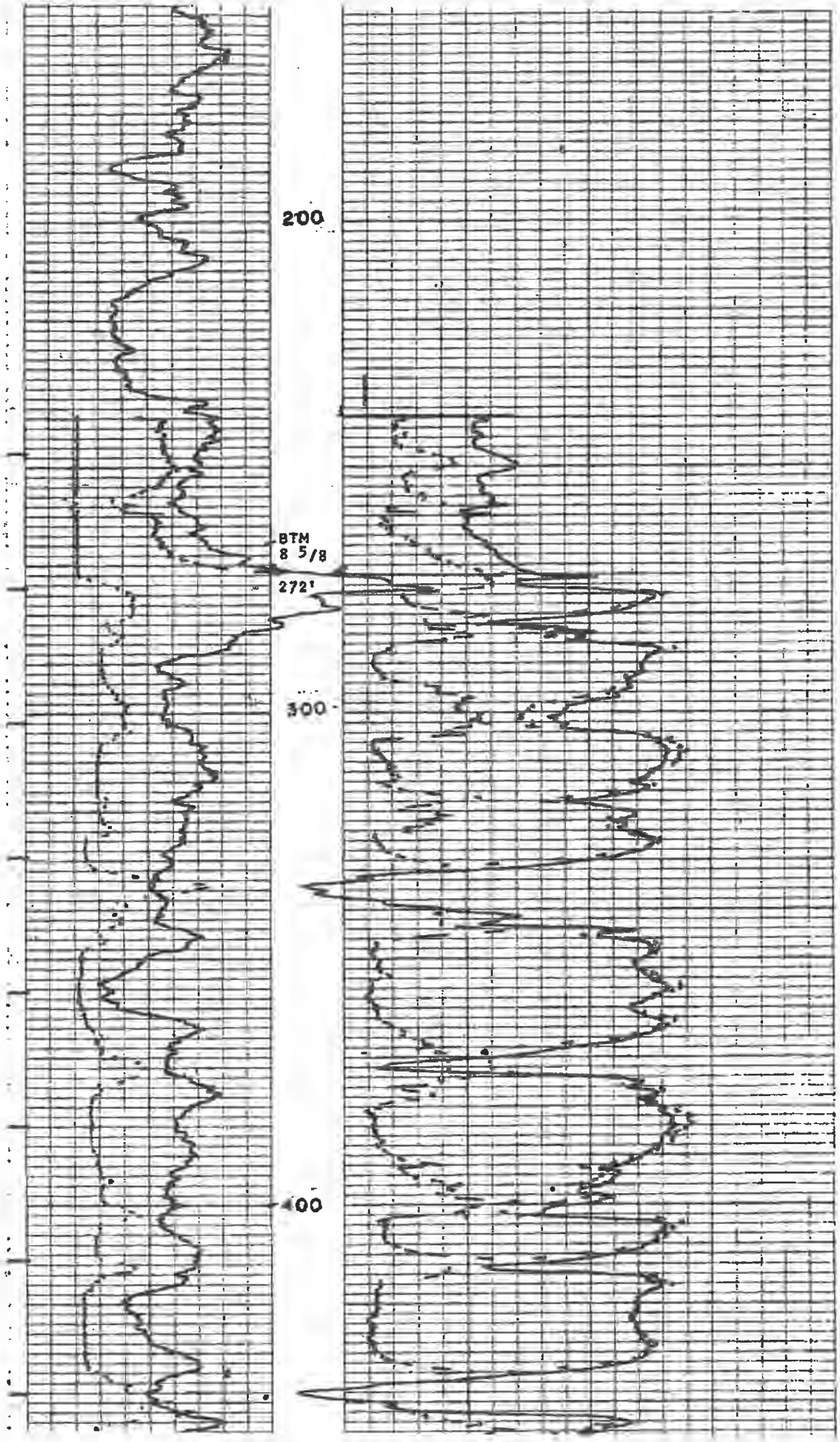
**Logging Data**

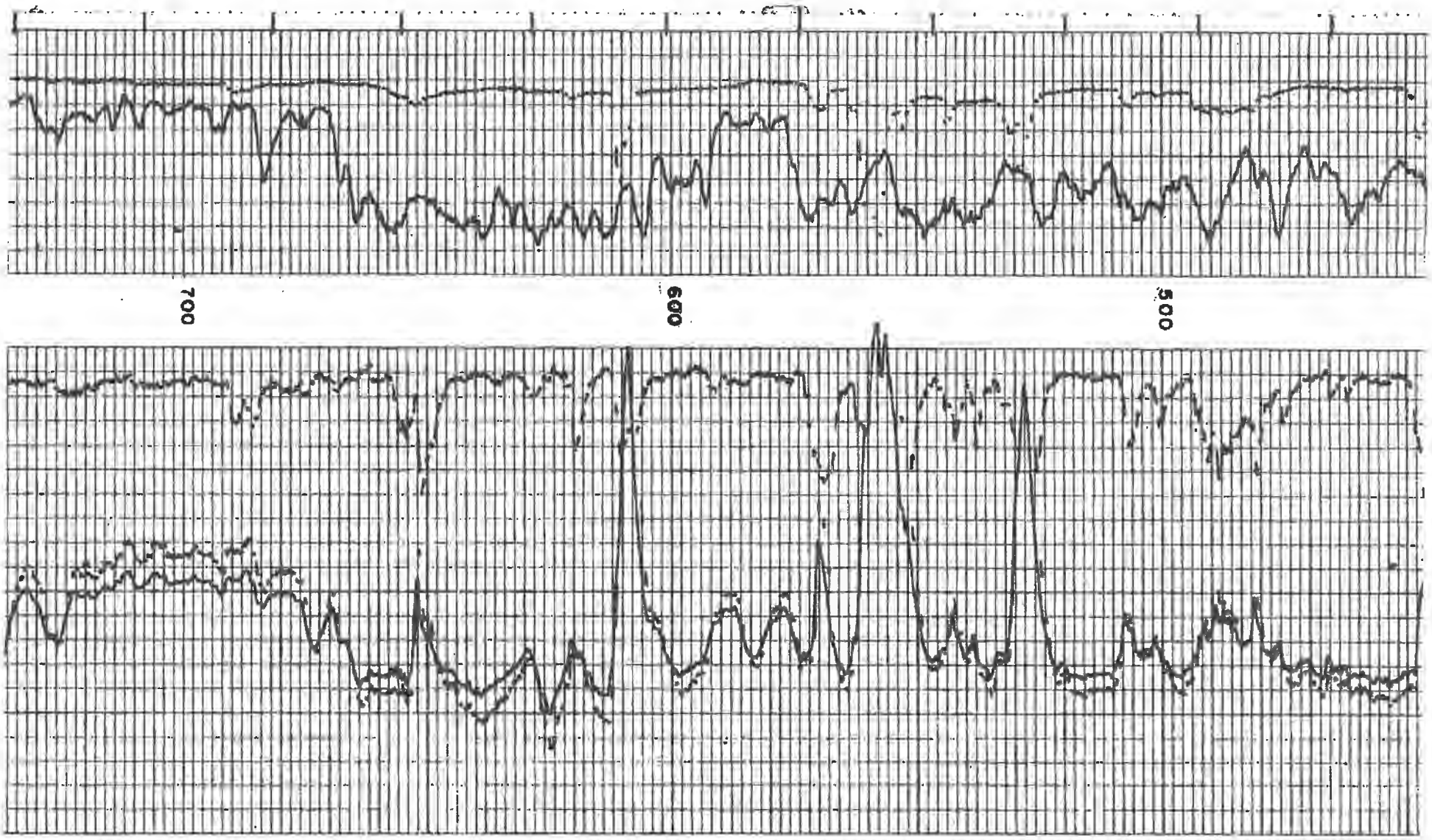
| Run No. | Depths From | Depths To | Speed Ft/Min | GR TC |
|---|---|---|---|---|
| ONE | SURF. | T.D. | 20 | 3 |

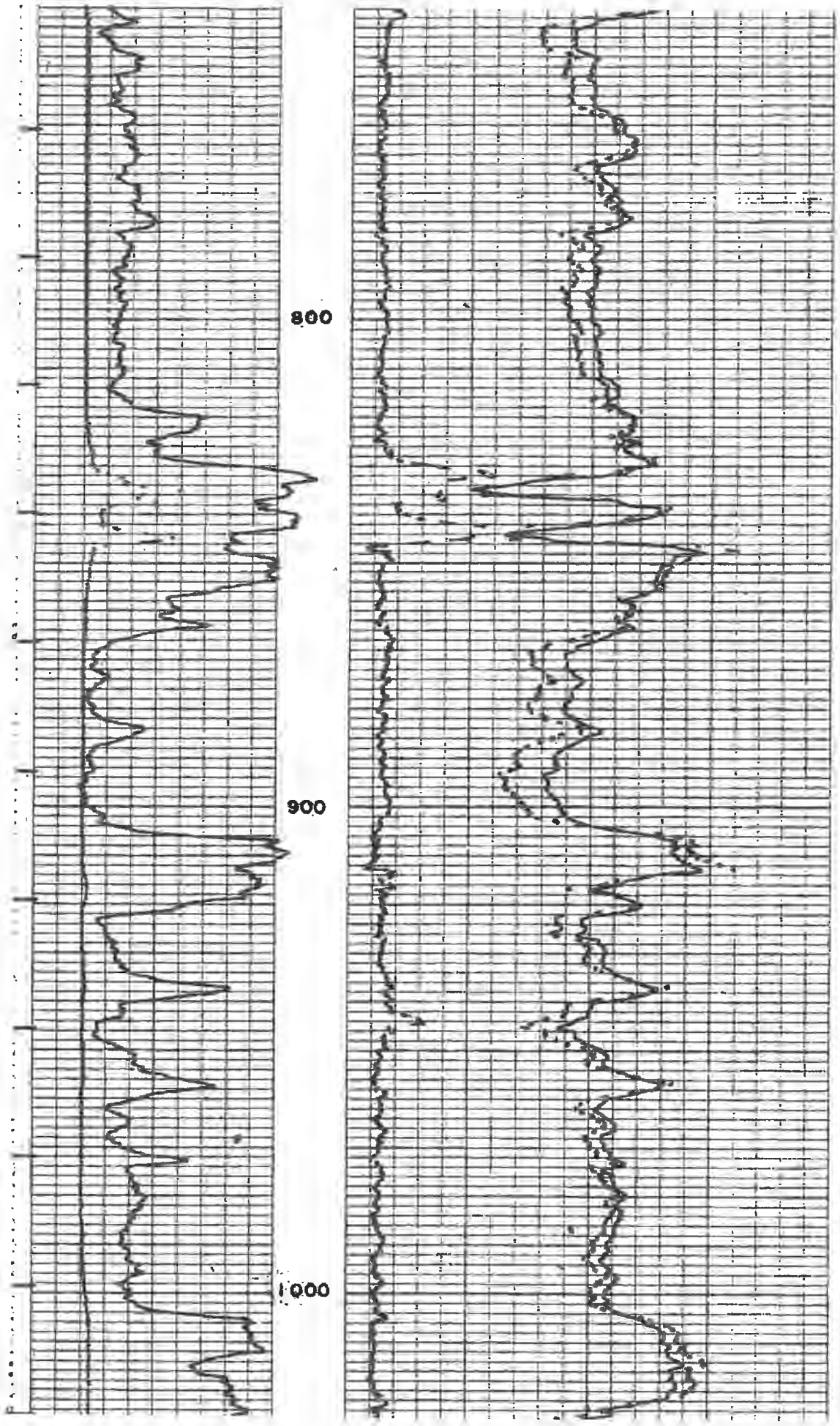
Remarks:

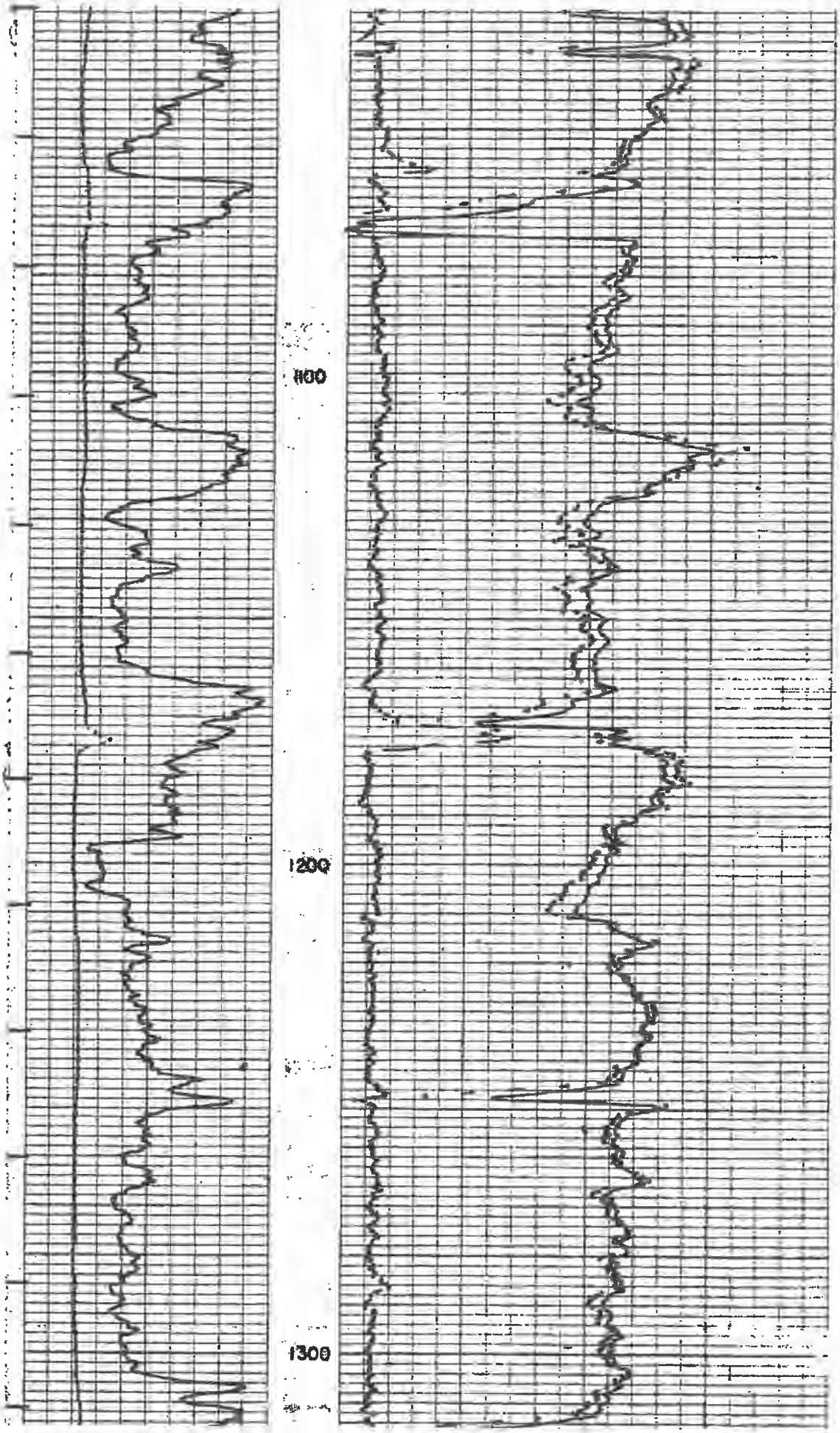


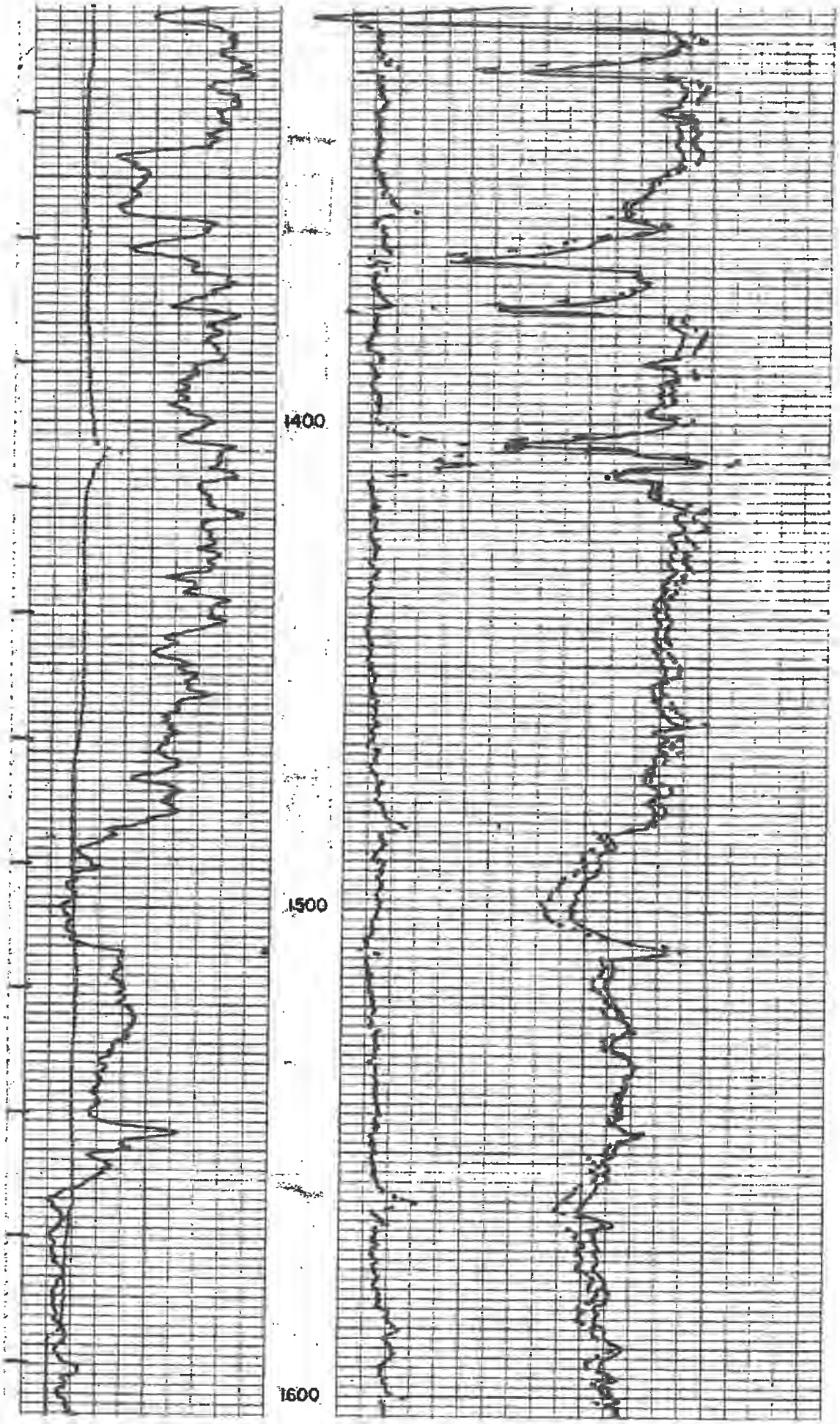



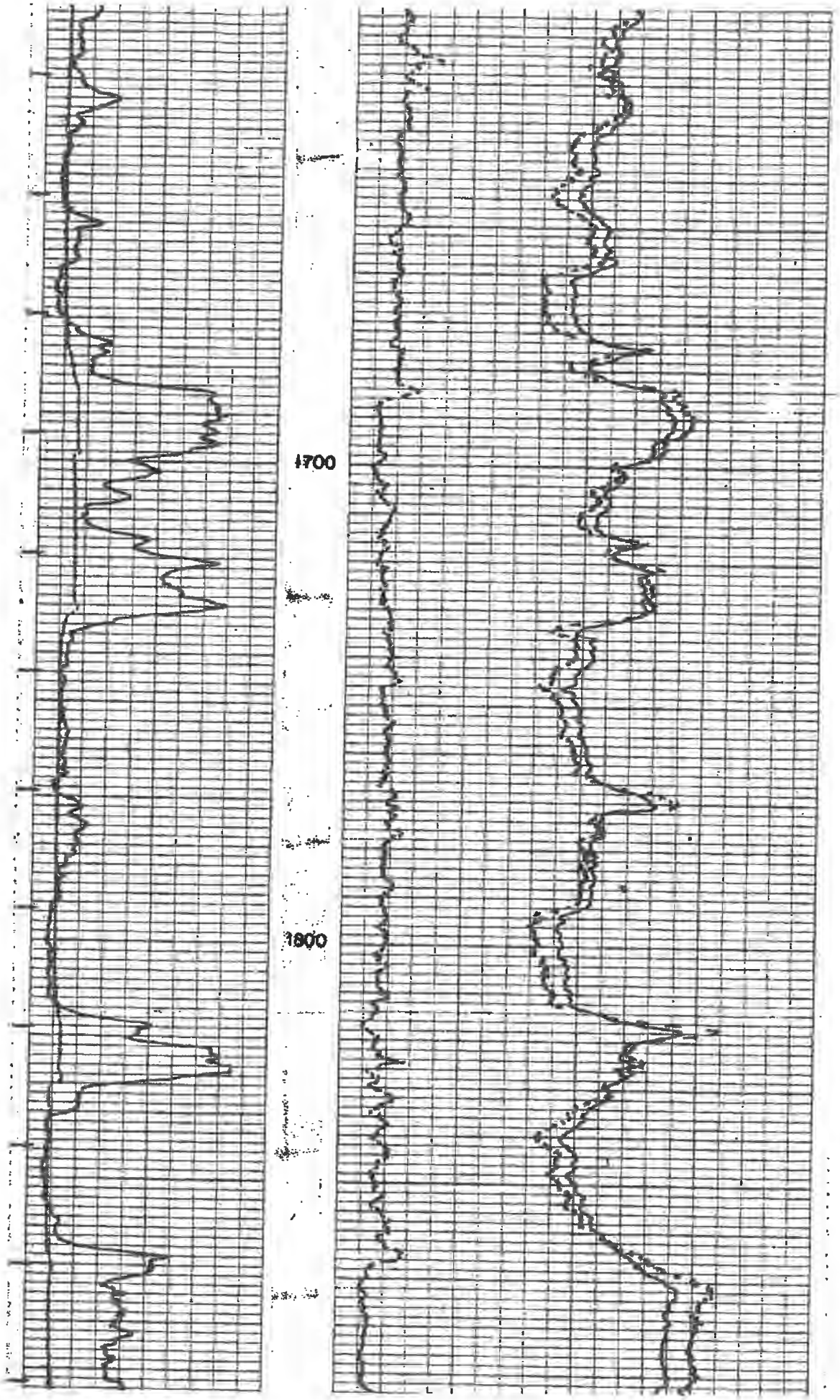

200
BTM
8 5/8
272'
300
400

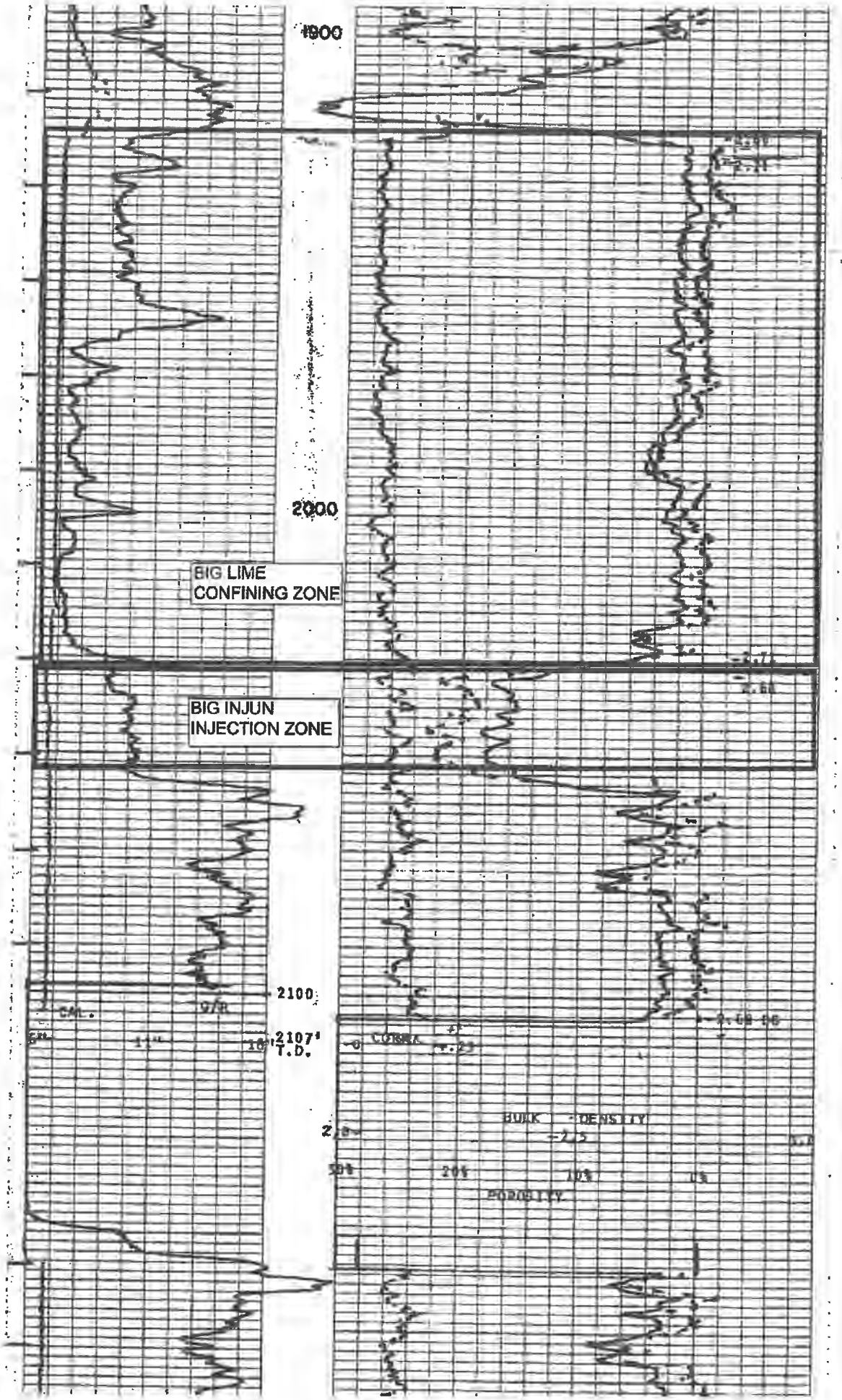

700
600
500

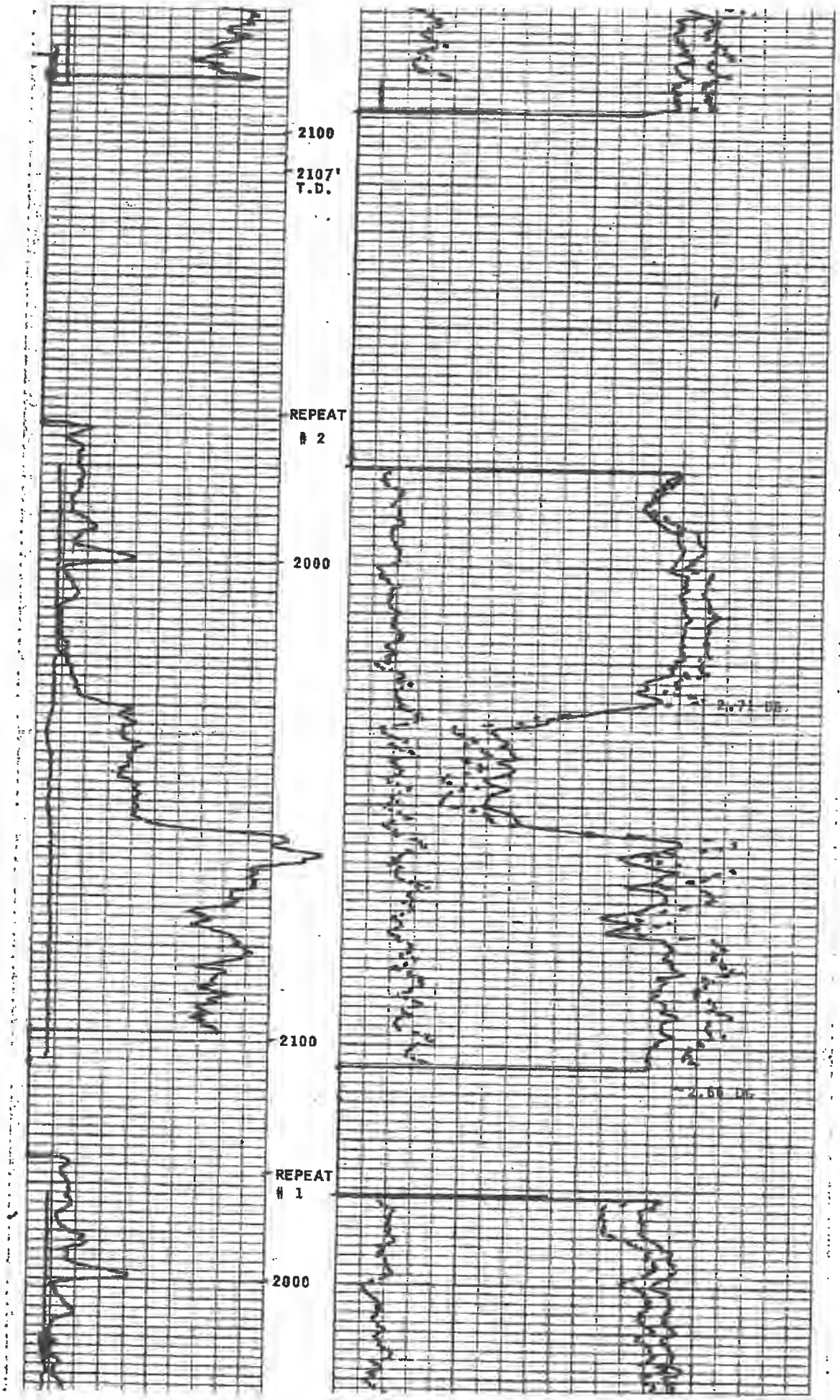

800
900
1000

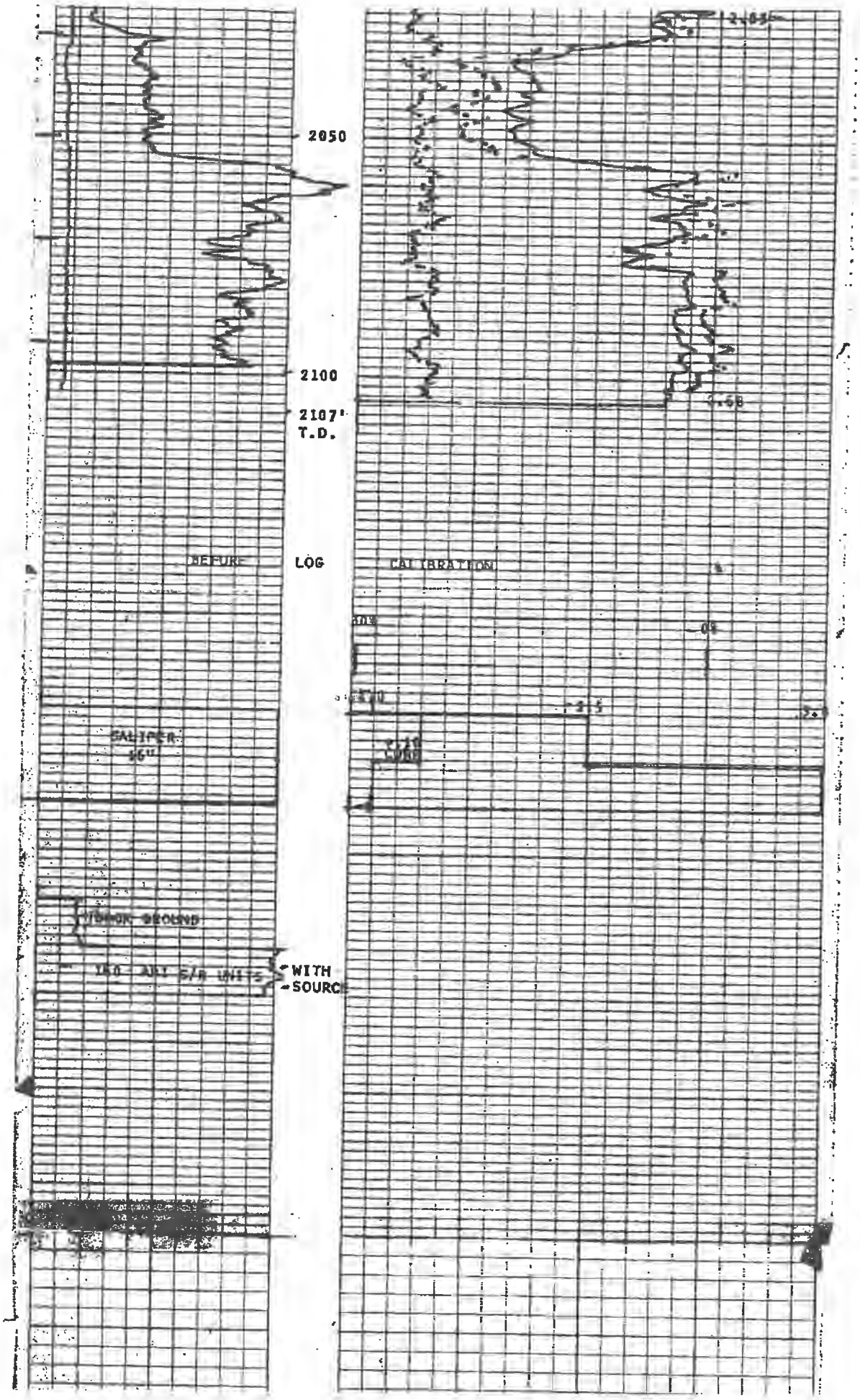

1100
1200
1300

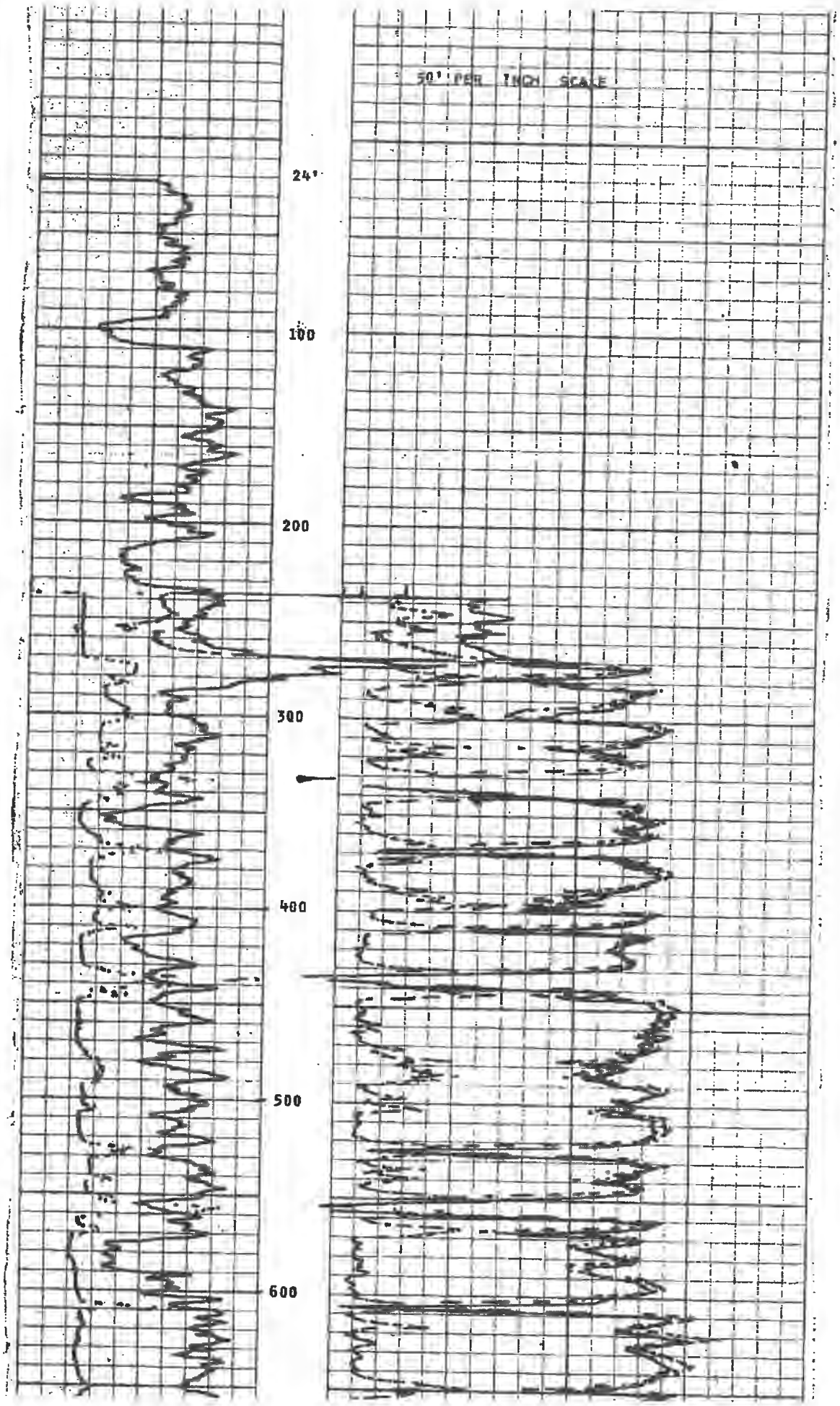

1400
1500
1600

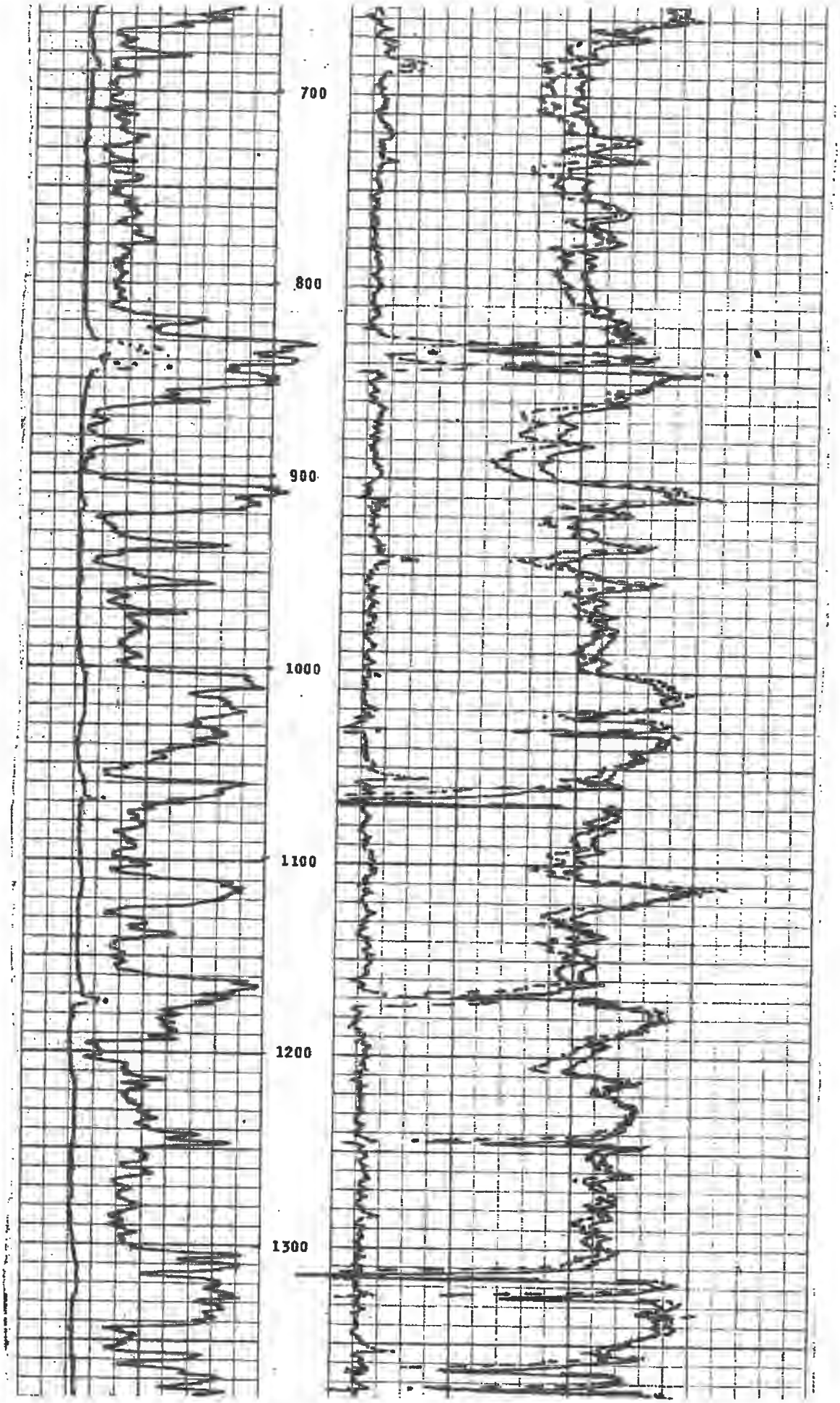

1700
1800

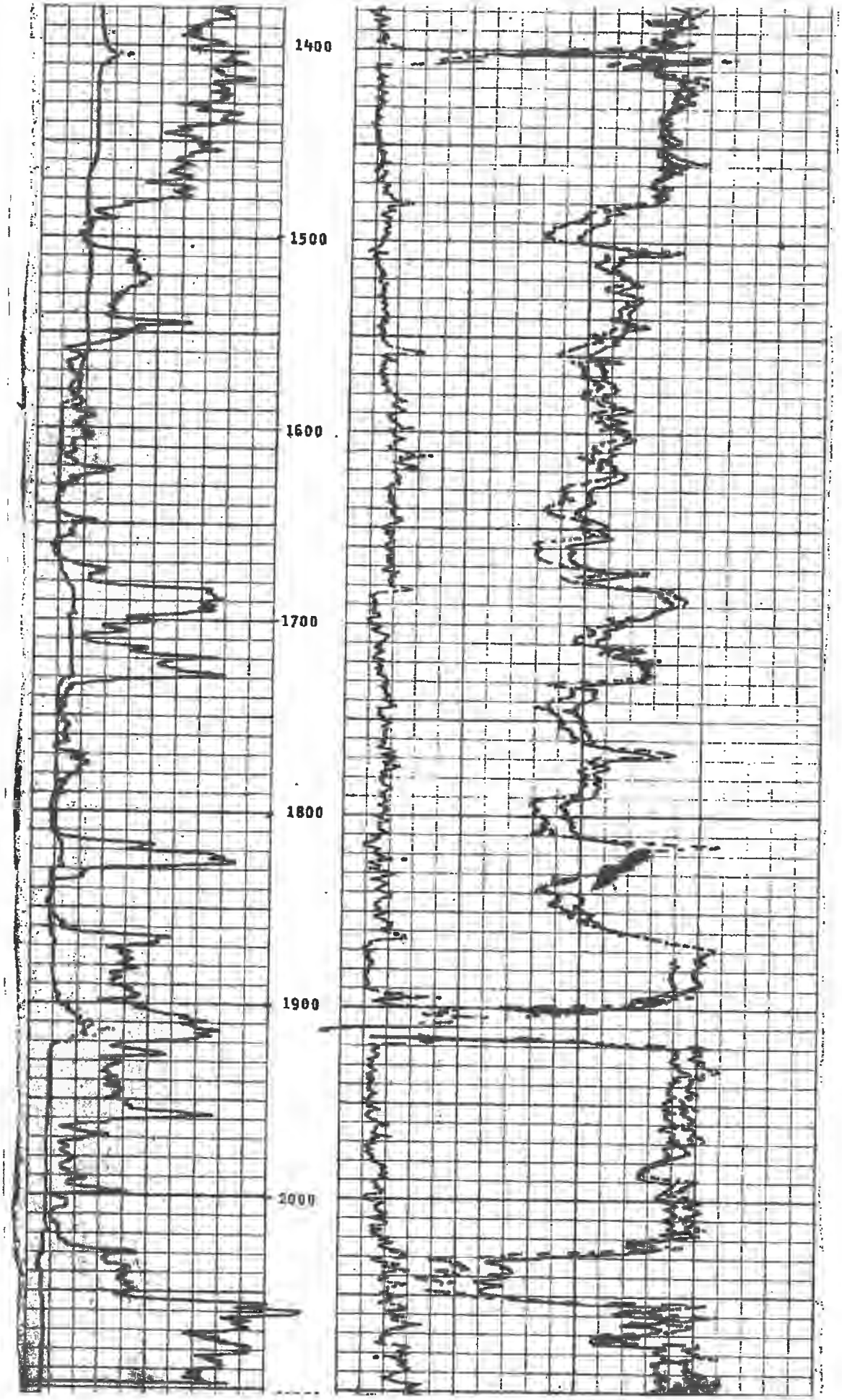

1900
2000
BIG LIME
CONFINING ZONE
BIG INJUN
INJECTION ZONE
2100
CAL.
9/R
2107'
T.D.
COBRA
BULK DENSITY
POROSITY

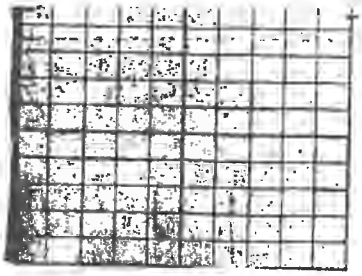

2100
2107'
T.D.
REPEAT
# 2
2000
2.71 DB.
2100
2.00 DB.
REPEAT
# 1
2000


2050
2100
2107'
T.D.
BEFORE
LOG
CALIBRATION
CALIPER
16"
WITH
SOURCE


50' PER INCH SCALE
24'
100
200
300
400
500
600


700
800
900
1000
1100
1200
1300


1400
1500
1600
1700
1800
1900
2000



2107'
T.D.

"Pipeline"

Select County: (087) Roane

Enter Permit #: 2406

Get Data | Reset

Select datatypes: (Check All)

- Location
- Owner/Completion
- Pay/Show/Water
- Production
- Stratigraphy
- Logs
- Plugging
- Sample
- Btm Hole Loc

Table Descriptions
County Code Translations
Permit-Number Inquiries

WV Geological & Economic Survey:

**Well: County = 087 Permit = 2406**

Report Time: Monday, May 11, 2020 12:43:45 PM

Location Information: View Map

| API | COUNTY | PERMIT | TAX_DISTRICT | QUAD_75 | QUAD_15 | LAT_DD | LON_DD | ZONE | UTMN |
|---|---|---|---|---|---|---|---|---|---|
| 4708702406 | Roane | 2406 | Smithfield | Tariff | Other | 38.644691 | -81.209565 | 481763 | 4277369.6 |

There is no Bottom Hole Location data for this well

Owner Information:

| API | CMP_DT | SUFFIX | STATUS | SURFACE_OWNER | WELL_NUM | CO_NUM | LEASE | LEASE_NUM | MINERAL_OWN | OPERATOR_AT_COMPLETION | PROP_VD | PROP_TRGT_FM | TFM_EST_PR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702406 | 9/-/1978 | Original Loc | Completed | P A Tallman | 56 | | | | | Pennzoil Company | | | |

Completion Information:

| API | CMP_DT | SPUD_DT | ELEV | DATUM | FIELD | DEEPEST_FM | DEEPEST_FMT | INITIAL_CLASS | FINAL_CLASS | TYPE | RIG | CMP_MTHD | TVD | TMD | NEW_FTG | KOD | G_BEF | G_AFT | O_BEF | O_AFT | NGL_BEF | NGL_AFT | P_BEF | TI_BEF | P_AFT | TI_AFT | BH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702406 | 9/-/1978 | -/-/- | 1186 | Ground Level | Tariff (Tmn) | Big Injun (Price&eq) | Big Injun (Price&eq) | Service Well | Unsuccessful | Water Injection | Rotary | Acid+Frac | 2252 | | 2252 | | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | |

Pay/Show/Water Information:

| API | CMP_DT | ACTIVITY | PRODUCT | SECTION | DEPTH_TOP | FM_TOP | DEPTH_BOT | FM_BOT | G_BEF | G_AFT | O_BEF | O_AFT | WATER_QNTY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702406 | 9/-/1978 | Horizon | Injection | Vertical | | | 2214 | Big Injun (Price&eq) | 0 | 0 | | | |

Production Gas Information: (Volumes in Mcf) * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_GAS | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702406 | Pennzoil Company | 1981 | 1,118 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702406 | Pennzoil Company | 1982 | 1,385 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702406 | Pennzoil Company | 1984 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702406 | Pennzoil Products Company | 1989 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702406 | Pennzoil Products Company | 1990 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702406 | Pennzoil Products Company | 1991 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702406 | Pennzoil Products Company | 1992 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702406 | Pennzoil Products Company | 1993 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702406 | Pennzoil Products Company | 1994 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702406 | Triad Resources, Inc. | 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702406 | Ground Resources, LLC | 2017 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702406 | Ground Resources, LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Production Oil Information: (Volumes in Bbl) ** some operators may have reported NGL under Oil * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_OIL | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702406 | Pennzoil Company | 1981 | 509 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702406 | Pennzoil Company | 1982 | 665 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702406 | Pennzoil Company | 1984 | 1,030 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702406 | Pennzoil Products Company | 1989 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702406 | Pennzoil Products Company | 1990 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702406 | Pennzoil Products Company | 1991 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702406 | Pennzoil Products Company | 1992 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702406 | Pennzoil Products Company | 1993 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702406 | Pennzoil Products Company | 1994 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702406 | Triad Resources, Inc. | 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702406 | Ground Resources, LLC | 2017 | 0 | | | | | | | | | | | | |
| 4708702406 | Ground Resources, LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Production NGL Information: (Volumes in Bbl) ** some operators may have reported NGL under Oil * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_NGL | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702406 | Ground Resources, LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Production Water Information: (Volumes in Gallons) * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_WTR | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702406 | Ground Resources, LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Stratigraphy Information:

| API | SUFFIX | FM | FM_QUALITY | DEPTH_TOP | DEPTH_QUALITY | THICKNESS | THICKNESS_QUALITY | ELEV | DATUM |
|---|---|---|---|---|---|---|---|---|---|
| 4708702406 | Original Loc | Little Lime | Well Record | 2022 | Reasonable | 28 | Reasonable | 1186 | Ground Level |
| 4708702406 | Original Loc | Blue Monday | Well Record | 2050 | Reasonable | 2 | Reasonable | 1186 | Ground Level |
| 4708702406 | Original Loc | Greenbrier Group | Well Record | 2072 | Reasonable | 108 | Reasonable | 1186 | Ground Level |
| 4708702406 | Original Loc | Big Lime | Well Record | 2072 | Reasonable | 108 | Reasonable | 1186 | Ground Level |
| 4708702406 | Original Loc | Big Injun (Price&eq) | Well Record | 2180 | Reasonable | 28 | Reasonable | 1186 | Ground Level |
| 4708702406 | Original Loc | Undf PRICE blw INJN | Well Record | 2208 | Reasonable | 44 | Reasonable | 1186 | Ground Level |

Wireline (E-Log) Information:

| API | LOG_TOP | LOG_BOT | DEEPEST_FML | LOGS_AVAIL | SCAN | DIGITIZED | GR_TOP | GR_BOT | D_TOP | D_BOT | N_TOP | N_BOT | I_TOP | I_BOT | T_TOP | T_BOT | S_TOP | S_BOT | O_TOP | O_BOT | INCH2 | INCH5 | REDUCED | KOP | LOGMD | ELEV_KB | ELEV_GL | ELEV_DF | LOG_MSRD_FRO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702406 | 0 | 2252 | | G,D,I,C * | Y | N | 0 | 2236 | 436 | 2252 | | | 542 | 2244 | | | | | 436 | 2252 | Y | Y | N | | | | | | |

Comment: *logs: caliper, porforation, CCL, deviation ,azimuth, laterolog; log analysis; 25 inch scale

2406

Downloadable Log Images: We advise you to save the log image file to your PC for viewing. To do so, right-click the .tif image of interest and select the save option. Then you can direct the file to a location of your choice. Please note these images vary in size and some may take several minutes to download, especially if using a 56k or slower dialup connection.

FILENAME
4708702406co.tif
4708702406jdc_a.tif
4708702406ino.tif
4708702406ilz.tif

**Quick Reference Guide for Log File Names** For more info about WVGES scanned logs click here

**geologic log types:**
- d density (includes bulk density, compensated density, density, density porosity, grain density, matrix density, etc.)
- e photoelectric adsorption (PE or Pe, etc.)
- g gamma ray
- i induction (includes dual induction, medium induction, deep induction, etc.)
- l laterolog
- m dipmeter
- n neutron (includes neutron porosity, sidewall neutron–SWN, etc.)
- o other[1]
- s sonic or velocity
- t temperature (includes borehole temperature, BHT, differential temperature, etc.)
- z spontaneous potential or potential

**mechanical log types:**
- b cement bond
- c caliper
- o other[1]
- p perforation depth control or perforate

[1]other logs may include, but are not limited to, such curves as audio, bit size, CCL–casing collar locator, continuous meter, directional survey, gas detector, guard, NCTL–Nuclear Cement Top Locator, radioactive tracer, tension

There is no Plugging data for this well

There is no Sample data for this well

2406

2406

# APPENDIX A
## Injection Well Form

1) GEOLOGIC TARGET FORMATION BIG INJUN

Depth 2180 Feet (top) 2208 Feet (bottom)

2) Estimated Depth of Completed Well, (or actual depth of existing well): 2252 Feet

3) Approximate water strata depths: Fresh N/A Feet Salt N/A Feet

4) Approximate coal seam depths:

5) Is coal being mined in the area? Yes ☐ No ☑

6) Virgin reservoir pressure in target formation 800 psig Source HISTORICAL/ESTIMATED

7) Estimated reservoir fracture pressure _____ psig (BHFP)

8) MAXIMUM PROPOSED INJECTION OPERATIONS:

Injection rate (bbl/hour) 25

Injection volume (bbl/day) 200

Injection pressure (psig) 1000

Bottom hole pressure (psig) 2000

9) DETAILED IDENTIFICATION OF MATERIALS TO BE INJECTED, INCLUDING ADDITIVES:

Fresh water and/or produced water from the area and possible bactericides necessary to maintain water quality to improve oil recovery. Not using bactericides at this time, but will submit a MSDS for approval for any used in the future. Additives include Scale inhibitor and THDS (Cleaner).

Temperature of injected fluid: (°F) AMBIENT

10) FILTERS (IF ANY)

ANTHRACITE COAL FILTERS

11) SPECIFICATIONS FOR CATHODIC PROTECTION AND OTHER CORROSION CONTROL

NONE

2406

# APPENDIX A (cont.)

12. Casing and Tubing Program

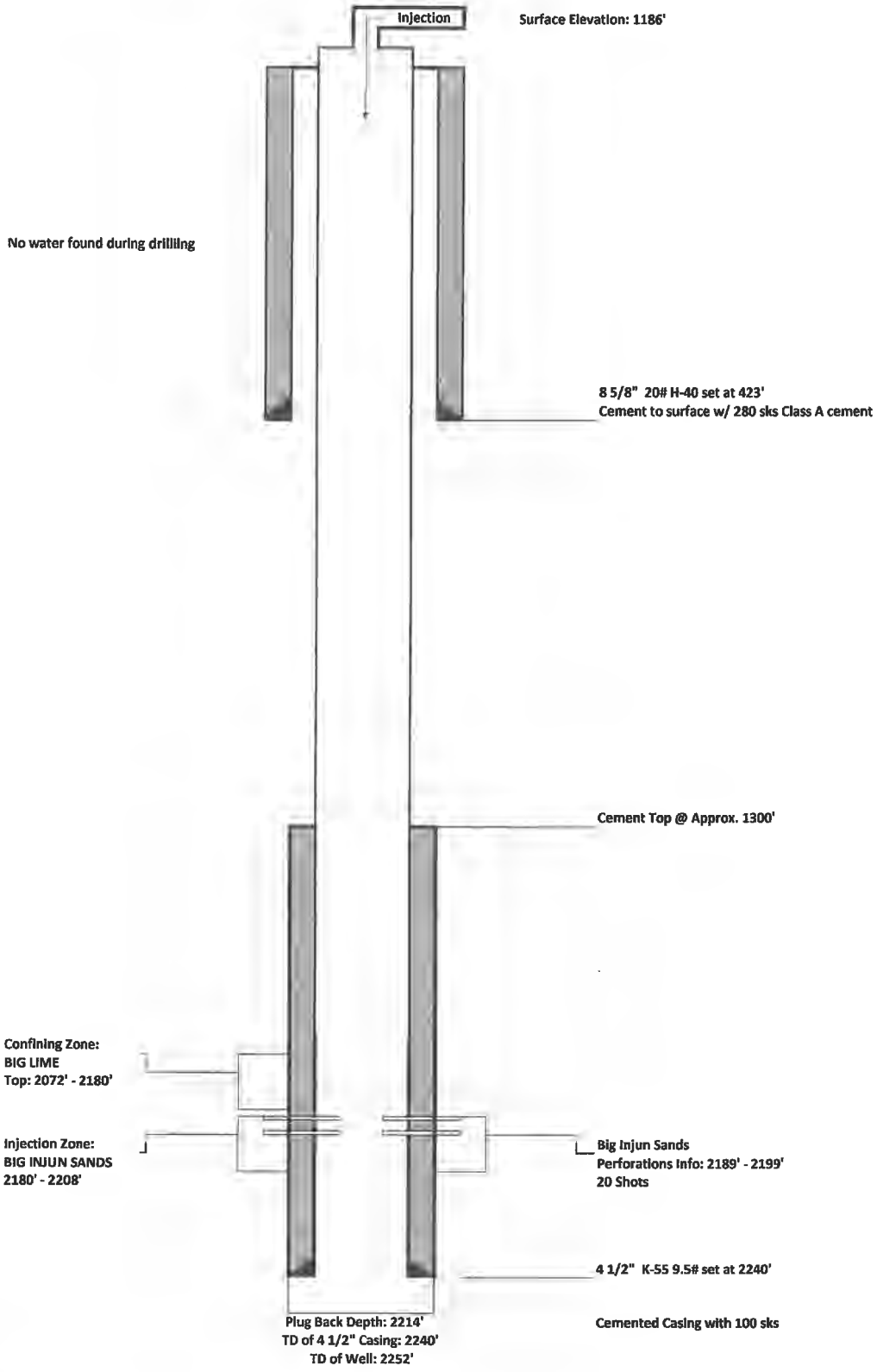
| TYPE | Size | New or Used | Grade | Weight per ft. (lb/ft) | FOOTAGE: For Drilling | INTERVALS: Left in Well | CEMENT: Fill-up (Cu. Ft.) |
|---|---|---|---|---|---|---|---|
| Conductor | | | | | | | |
| Fresh Water | 8 5/8" | | H-40 | 20# | 423' | 423' | 280sks CTS |
| Coal | | | | | | | |
| Intermediate 1 | | | | | | | |
| Intermediate 2 | | | | | | | |
| Production | 4 1/2" | | K-55 | 9.5# | 2240' | 2240' | 100sks |
| Tubing | NONE | | | | | | |
| Liners | | | | | | | |

| TYPE | Wellbore Diameter | Casing Size | Wall Thickness | Burst Pressure | Cement Type | Cement Yield (cu. ft./sk) | Cement to Surface ? (Y or N) |
|---|---|---|---|---|---|---|---|
| Conductor | | | | | | | |
| Fresh Water | | | | | | | |
| Coal | | | | | | | |
| Intermediate 1 | | | | | | | |
| Intermediate 2 | | | | | | | |
| Production | | | | | | | |
| Tubing | | | | | | | |
| Liners | | | | | | | |

| PACKERS | Packer #1 | Packer #2 | Packer #3 | Packer #4 |
|---|---|---|---|---|
| Kind: | NONE | | | |
| Sizes: | | | | |
| Depths Set: | | | | |

# WELL SCHEMATIC

**Tallman 56**
**API 47-087-2406**



2406

OG-10
Rev. - 9-71

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES
# Oil and Gas Division
# WELL RECORD

RECEIVED
FEB 2 1979
GAS DIVISION
DEPT. OF MINES

Rotary X Oil ____
Cable ____ Gas ____
Recycling ____ Comb. ____
Water Flood X Storage ____
Disposal ____ ____ (Kind)

Quadrangle Tariff 7.5'

Permit No. Roa-2406

Company PENNZOIL COMPANY
Address P. O. Box 1588 Parkersburg, WV 26101
Farm P. A. Tallman Acres 2350
Location (waters) Trace Fork
Well No. 56 Elev. 1186.21'
District Smithfield County Roane
The surface of tract is owned in fee by
Robert Townsend
Address Left Hand WV 25251
Mineral rights are owned by Anna Lee Collins
Address 1009 Main St., Point Pleasant WV
Drilling Commenced August 3, 1978
Drilling Completed August 9, 1978
Initial open flow ____ cu. ft. ____ bbls.
Final production ____ cu. ft. per day ____ bbls.
Well open ____ hrs. before test ____ RP.

| Casing and Tubing | Used in Drilling | Left in Well | Cement fill up Cu. ft. (Sks.) |
|---|---|---|---|
| Size | | | |
| 20-16 | | | |
| Cond. | | | |
| 13-10" | | | |
| 9 5/8 | | | |
| 8 5/8 | 423 | 423 | 280 sks. |
| 7 | | | |
| 6 1/2 | | | |
| 4 1/2 | 2240 | 2240 | 100 sks. |
| 3 | | | |
| 2 | | | |
| Liners Used | | | |

Attach copy of cementing record.

Well treatment details:
Fractured 10-20-78 w/142BW, 1100# 20/40 sd., 250 Gal. 15% HCL
Water Injection Well

Coal was encountered at ____ Feet ____ Inches
Fresh water ____ Feet ____ Salt Water ____ Feet ____
Producing Sand Big Injun Depth ____

| Formation | Color | Hard or Soft | Top Feet | Bottom Feet | Oil, Gas or Water | * Remarks |
|---|---|---|---|---|---|---|
| Shale | | | 0 | 140 | | |
| Sand | | | 140 | 170 | | |
| Shale | | | 170 | 202 | | |
| Sand | | | 202 | 222 | | |
| Shale | | | 222 | 378 | | |
| Sand | | | 378 | 388 | | |
| Shale & Silt | | | 388 | 554 | | |
| Sand | | | 554 | 564 | | |
| Shale & Silt | | | 564 | 720 | | |
| Shale | | | 720 | 832 | | |
| Siltstone | | | 832 | 870 | | |
| Sand | | | 870 | 890 | | |
| Shale | | | 890 | 894 | | |
| Sand | | | 894 | 934 | | |
| Shale | | | 934 | 946 | | |
| Sand | | | 946 | 966 | | |
| Shale | | | 966 | 1016 | | |
| Sand | | | 1016 | 1048 | | |
| Shale | | | 1048 | 1072 | | |
| Sand | | | 1072 | 1178 | | |
| Shale | | | 1178 | 1198 | | |
| Sand | | | 1198 | 1220 | | |
| Shale | | | 1220 | 1232 | | |
| Sand | | | 1232 | 1260 | | |

MAR 21 1979

(over)

* Indicates Electric Log tops in the remarks section.

2406

| Formation | Color | Hard or Soft | Top Feet | Bottom Feet | Oil, Gas or Water | Remarks |
|---|---|---|---|---|---|---|
| Shale | | | 1260 | 1280 | | |
| Sand | | | 1280 | 1310 | | |
| Shale | | | 1310 | 1404 | | |
| Sand | | | 1404 | 1444 | | |
| Shale | | | 1444 | 1456 | | |
| Sand | | | 1456 | 1470 | | |
| Shale | | | 1470 | 1530 | | |
| Shale | | | 1530 | 1624 | | |
| Sand | | | 1624 | 1654 | | |
| Siltstone | | | 1654 | 1726 | | |
| Sand | | | 1726 | 1822 | | |
| Shale | | | 1822 | 1842 | | |
| Siltstone | | | 1842 | 1874 | | |
| Sand | | | 1874 | 2022 | | |
| Little Lime | | | 2022 | 2050 | | |
| Blue Monday | | | 2050 | 2052 | | |
| Pencil Cave | | | 2052 | 2072 | | |
| Big Lime | | | 2072 | 2180 | | |
| Big Injun | | | 2180 | 2208 | | |
| Shale | | | 2208 | 2252 | | |
| Total Depth | | | | 2252 | | |
| Plug Back Depth | | | | 2214 | | |

Date February 26, 19 79

APPROVED PENNZOIL COMPANY Owner

By Curtis A. Ferrar

(Title)

2406
Compensated
Formation Density Log

2406

Schlumberger

# COMPENSATED FORMATION DENSITY LOG

Gamma-Gamma

COMPANY PENNZOIL COMPANY

WELL P. A. TALLMAN #56

FIELD SMITHFIELD DISTRICT

COUNTY ROANE STATE WEST VIRGINIA

LOCATION: TRACE FORK - WATERS DISTRICT, SMITHFIELD QUAD. TARIFF 7.5'

| PERMIT NO | SEC | TWP | RANGE |
|---|---|---|---|
| ROA-2406 | - | - | - |

Other Services: DIL FIL

Permanent Datum: G.L. ; Elev.: 1186.21
Log Measured From K.B. 10 Ft. Above Perm. Datum
Drilling Measured From K.B.

Elev.: K.B. 1196.21
D.F. -
G.L. 1186.21

| | | | | |
|---|---|---|---|---|
| Date | 8/8/78 | | | |
| Run No. | ONE | | | |
| Depth—Driller | 2257 | | | |
| Depth—Logger | 2252 | | | |
| Btm. Log Interval | 2253 | | | |
| Top Log Interval | 0 | | | |
| Casing—Driller | 8 5/8 @ 442 | @ | @ | @ |
| Casing—Logger | 436 | | | |
| Bit Size | 7 7/8 TO 1615, 6 3/4 TO T.D. | | | |
| Type Fluid in Hole | MUD | | | |
| Dens. / Visc. | - / - | | | |
| pH / Fluid Loss | - / - ml | ml | ml | ml |
| Source of Sample | - | | | |
| Rm @ Meas. Temp. | - @ - °F | @ °F | @ °F | @ °F |
| Rmf @ Meas. Temp. | - @ - °F | @ °F | @ °F | @ °F |
| Rmc @ Meas. Temp. | - @ - °F | @ °F | @ °F | @ °F |
| Source: Rmf / Rmc | - / - | | | |
| Rm @ BHT | - @ - °F | @ °F | @ °F | @ °F |
| TIME: Circulation Stopped | - | | | |
| TIME: Logger on Bottom | - | | | |
| Max. Rec. Temp. | 83 °F | °F | °F | °F |
| Equip. / Location | 7813 / WOOSTER | | | |
| Recorded By | GOULD | | | |
| Witnessed By Mr. | TOOMEY | | | |

FOLD HERE

The well name, location and bore[illegible] reference data were furnished by the customer.

| RUN NO. | ONE | | | |
|---|---|---|---|---|
| Service Order No. | 25487 | | | |
| Fluid Level | - | | | |
| Salinity, PPM Cl. | - | | | |
| Speed - F.P.M. | - | | | |
| **EQUIPMENT DATA** | | | | |
| Dens. Panel | 221 | | | |
| Dens. Cart. | 1010 | | | |
| Dens. Skid. | 1061 | | | |
| Dens. Sonde | 503 | | | |
| Dens. Source | 3296 | | | |
| Dens. Calibrator | SCALER | | | |
| GR Cart. | 1493 | | | |
| Memorizer Panel | 216 | | | |
| Tape Recorder (TTR) | - | | | |
| Depth Encoder (DRE) | - | | | |
| Pressure Wheel (CPW) | - | | | |
| **CALIBRATION DATA** | | | | |
| GR — BKG. CPS | 70 | | | |
| GR — Source CPS | 440 | | | |
| GR — Sens. - Cal | 0-200 | | | |
| GR — T. C. - Cal | CAL | | | |
| FDC — P1 — Before Log | 414 | | | |
| FDC — P2 — Before Log | 733 | | | |
| FDC — P1 — After Log | 414 | | | |
| FDC — P2 — After Log | 733 | | | |
| **LOGGING DATA** | REPEAT | | | |
| Grain Density | 2.68 | | | |
| Liquid Density | 1.0 | | | |
| Hole Fluid | LIQ | | | |
| Porosity Scale | 30,-10 | | | |
| G.R. T.C. Logged | 2 | | | |
| G.R. Sens. Logged | 200 | | | |
| Zero Div. Left | 0 | | | |
| Scale Per 100 Div. | 200 | | | |

**SCALE CHANGE**

| Type Log | Depth | Up Hole | Down Hole |
|---|---|---|---|
| | | | |

**REMARKS:**

All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to Clause 4 of our General Terms and Conditions as set out in our current Price Schedule.

**CALIPER** DIAM. IN INCHES

6 — 16

**GAMMA RAY** API UNITS

0 — 200

200 — 400

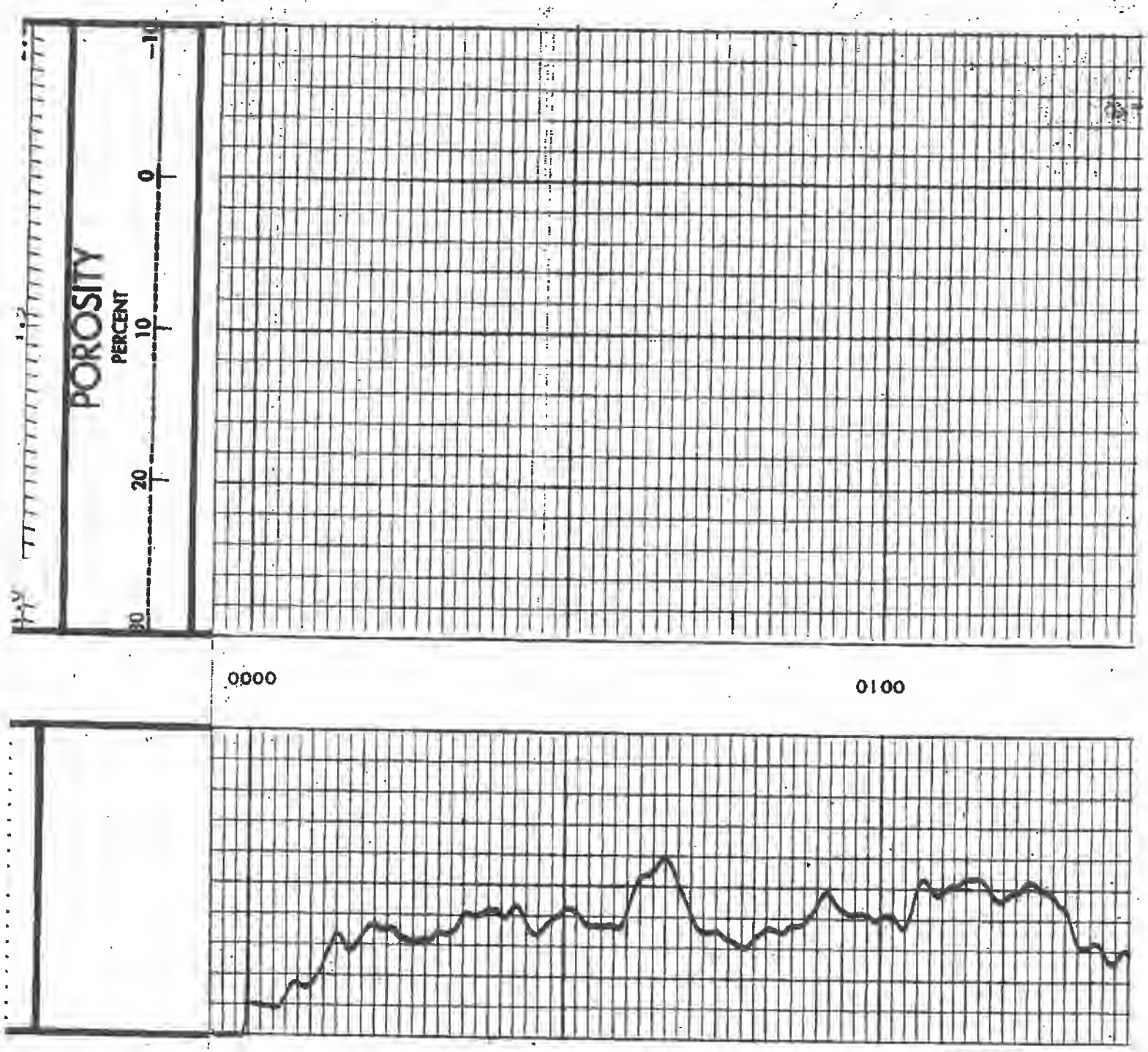
**CORRECTION** GRAMS/CC

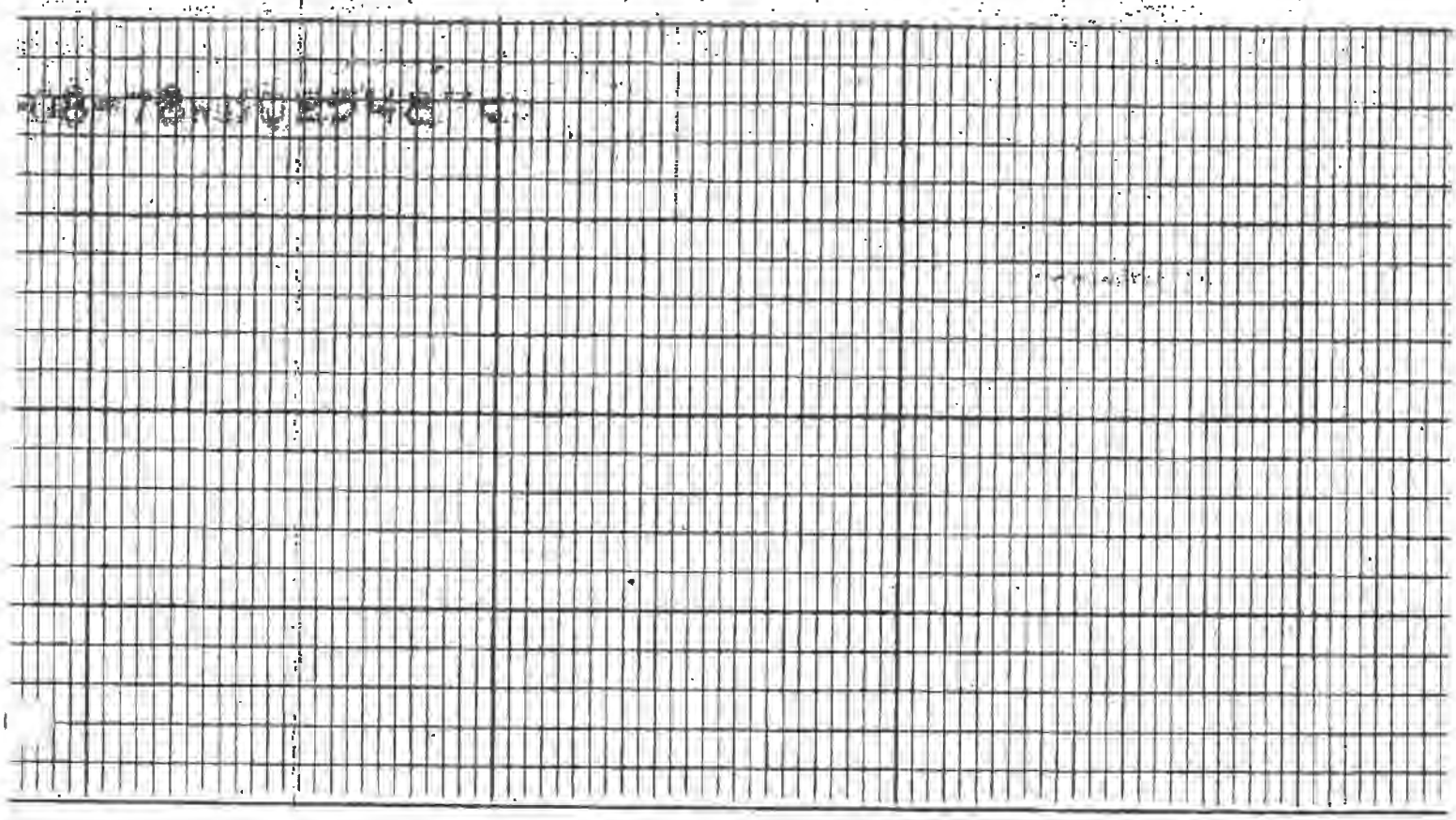
Use this scale when correction curve is presented in Track 2

0 — +.25

**BULK DENSITY** GRAMS/CC

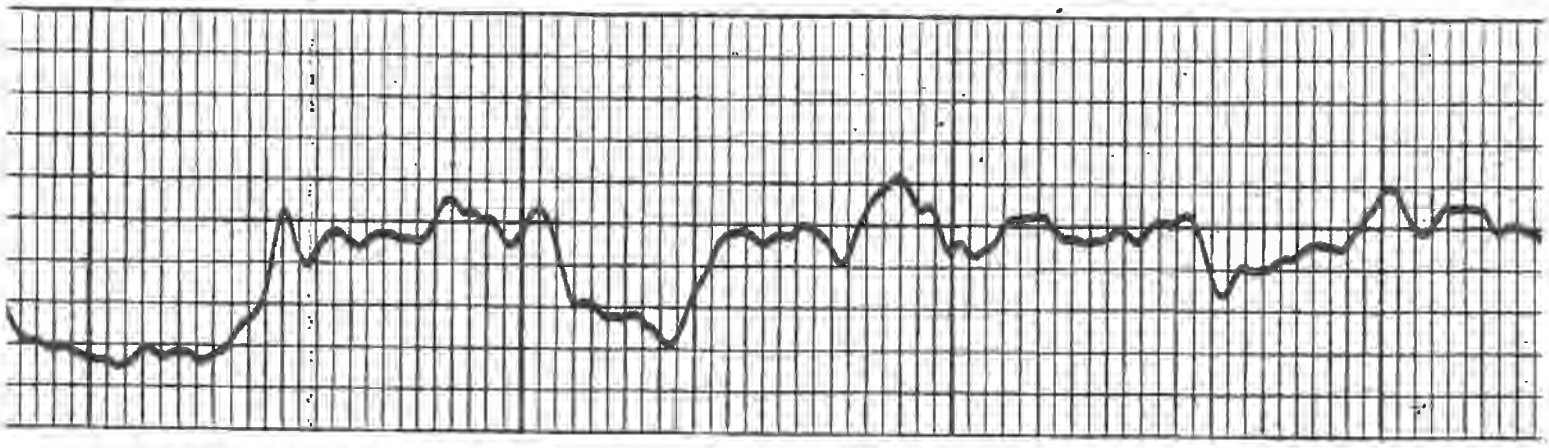
2.0 — 2.5 — 3.0

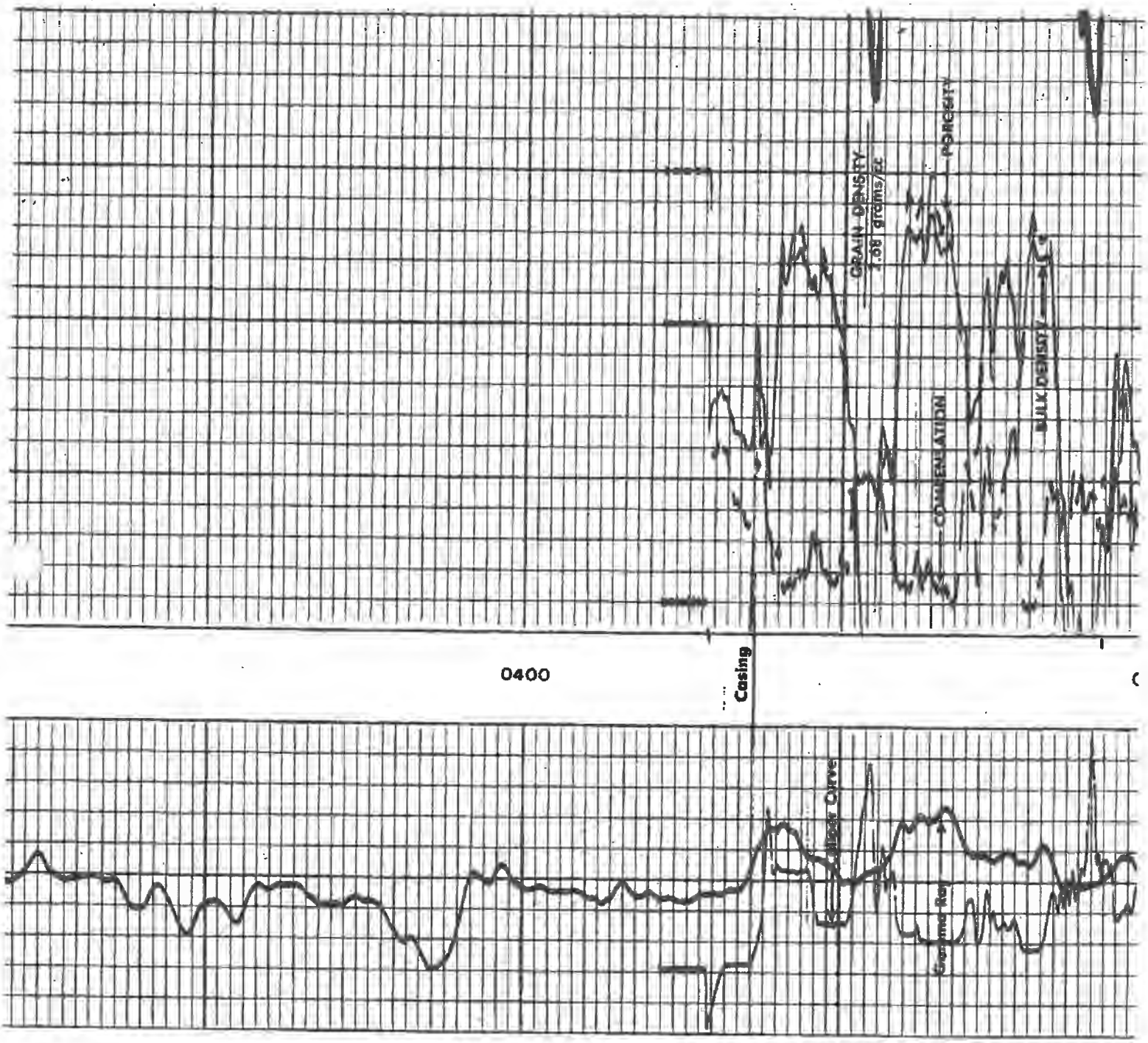

POROSITY
PERCENT
-10
0
10
20
30
0000
0100

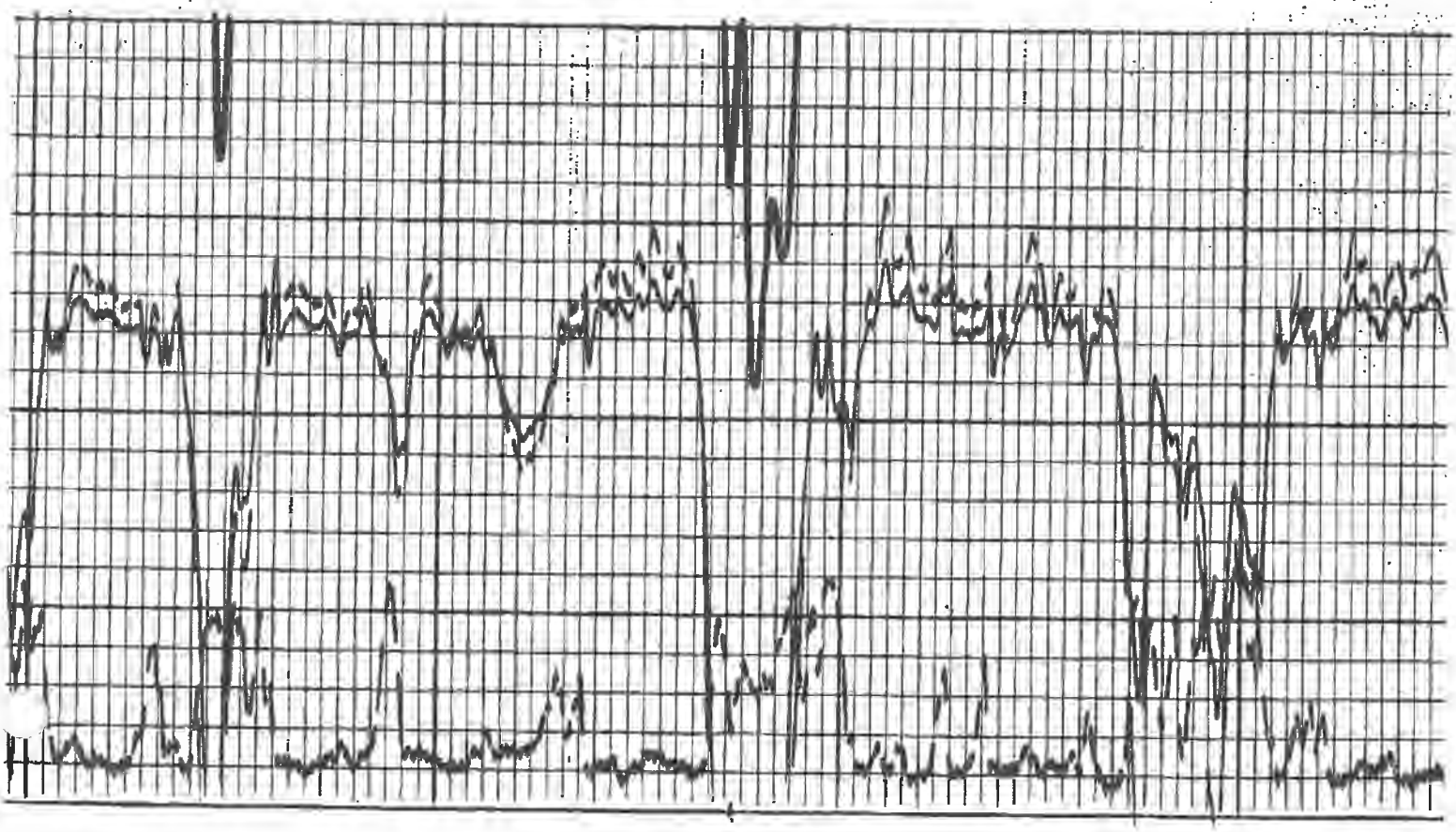


0200

0300

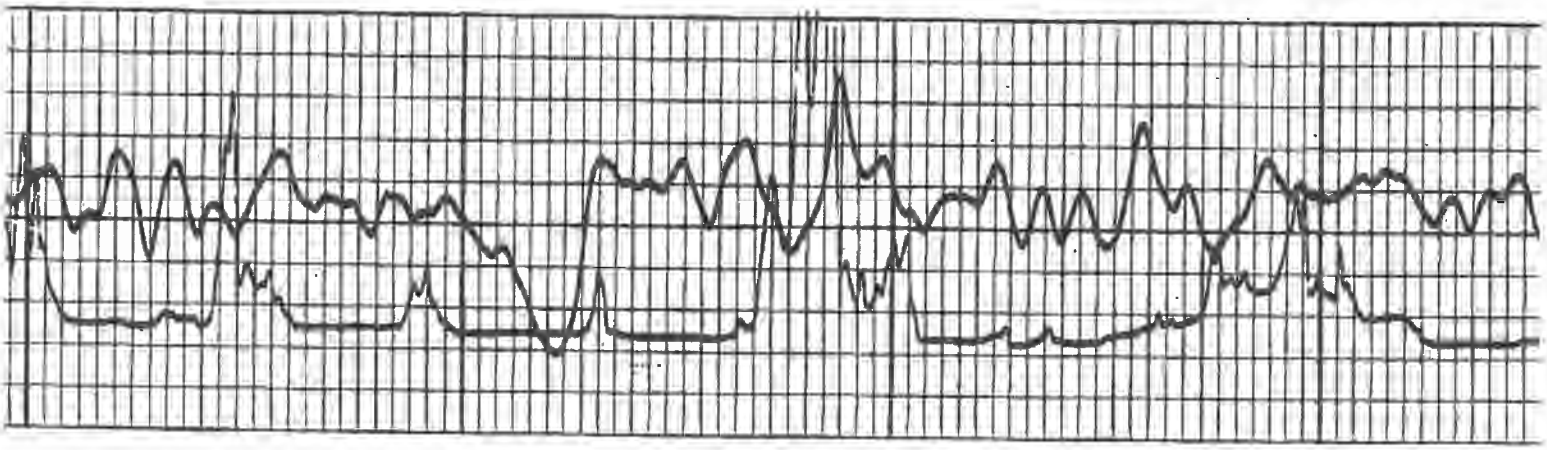


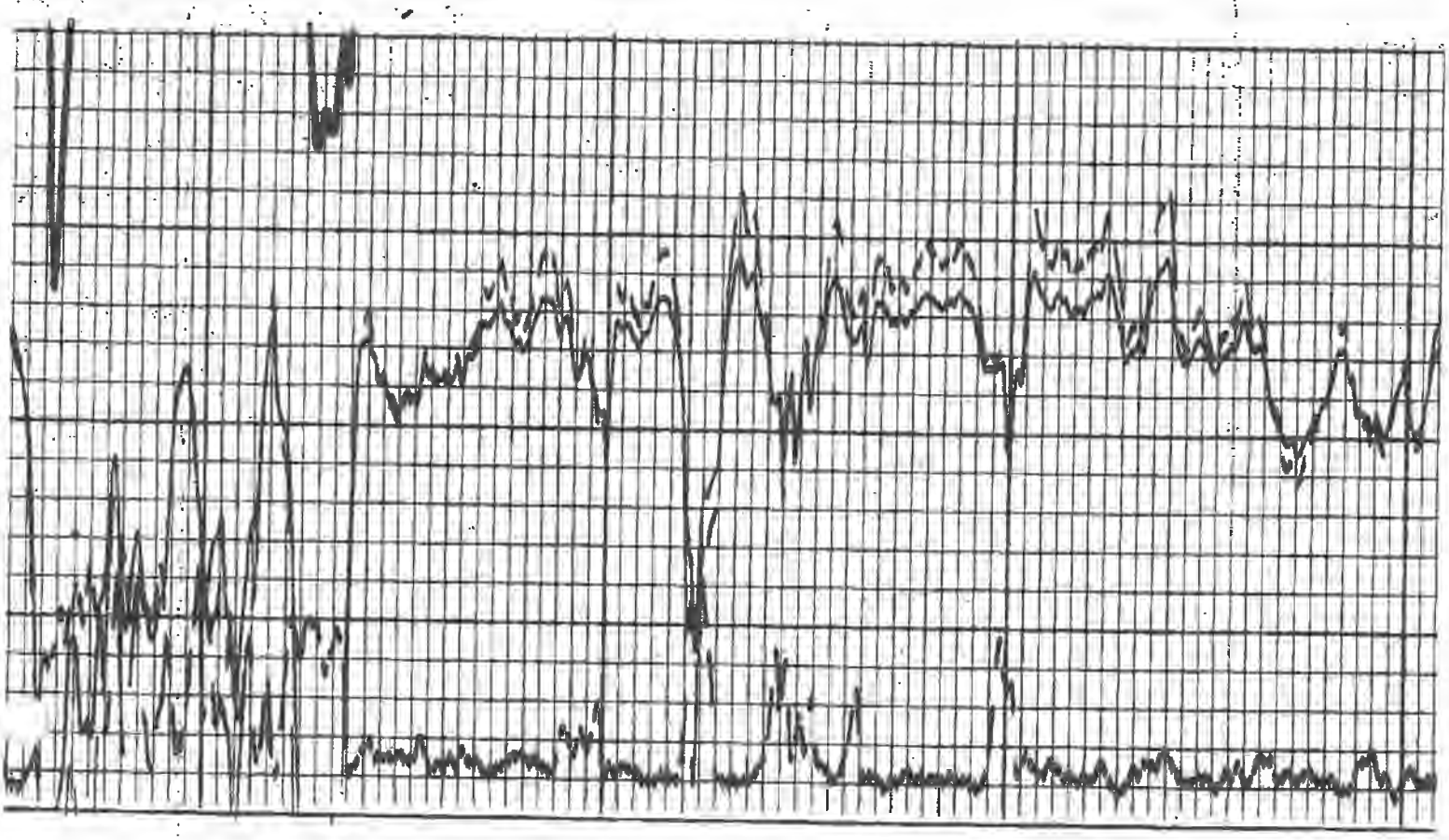

GRAIN DENSITY
1.68 grams/cc
POROSITY
CORRELATION
BULK DENSITY
0400
Casing
Gamma Ray



0500

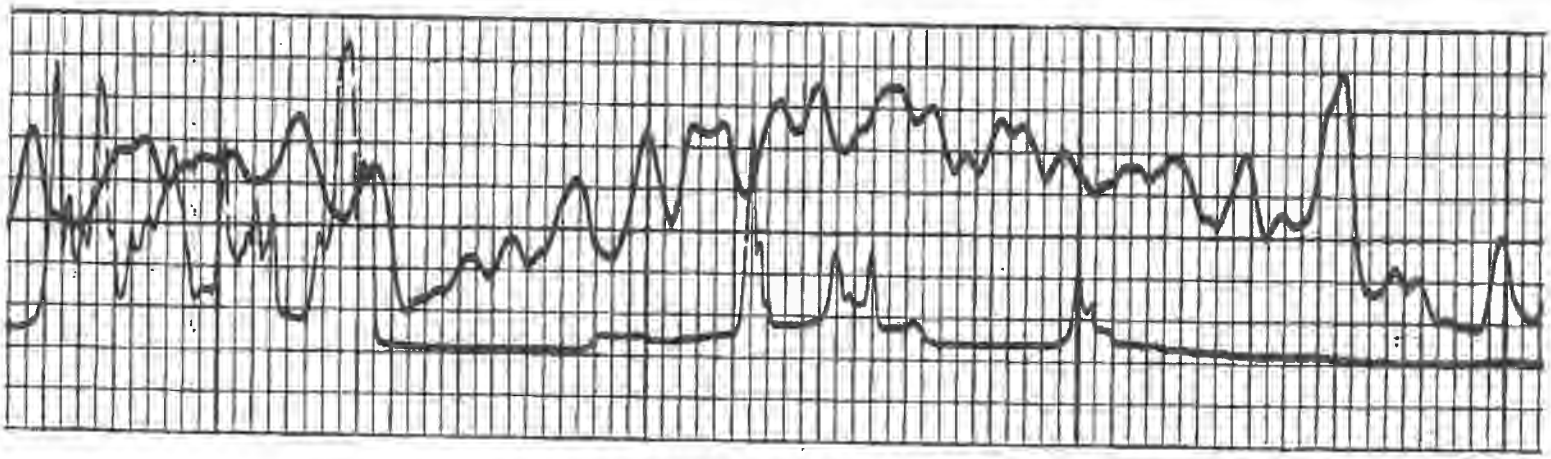
0600

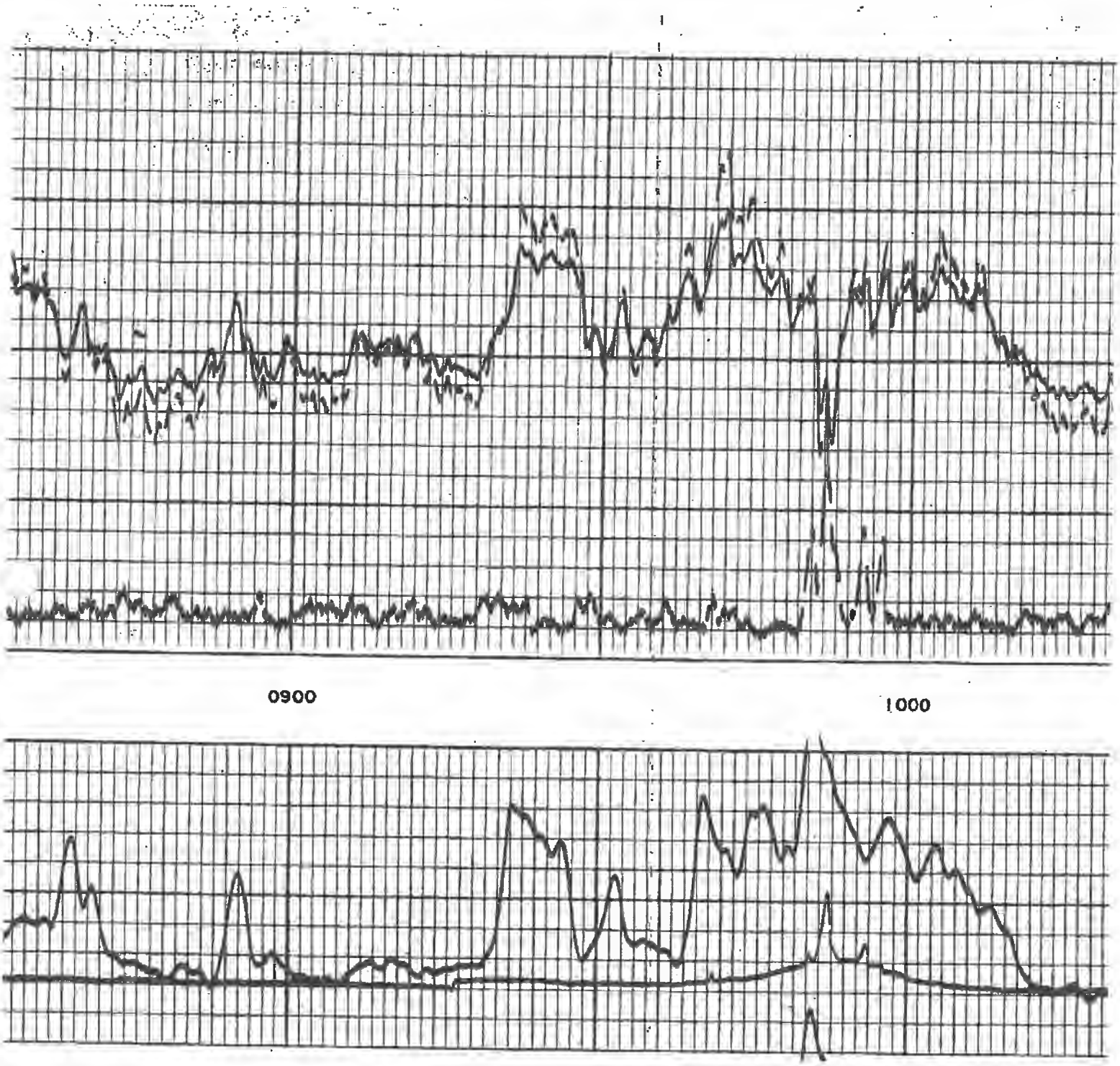


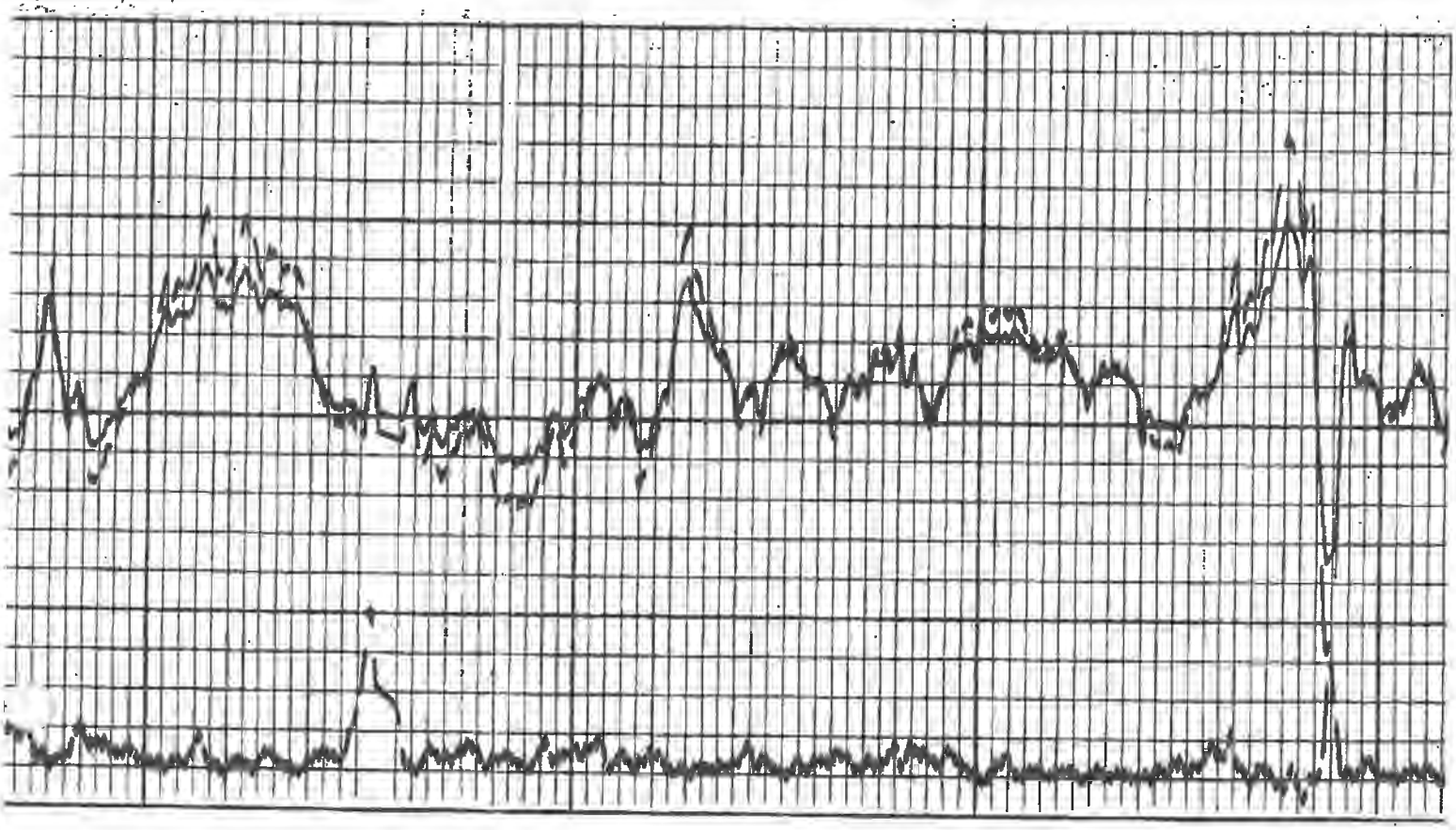


0700

0800

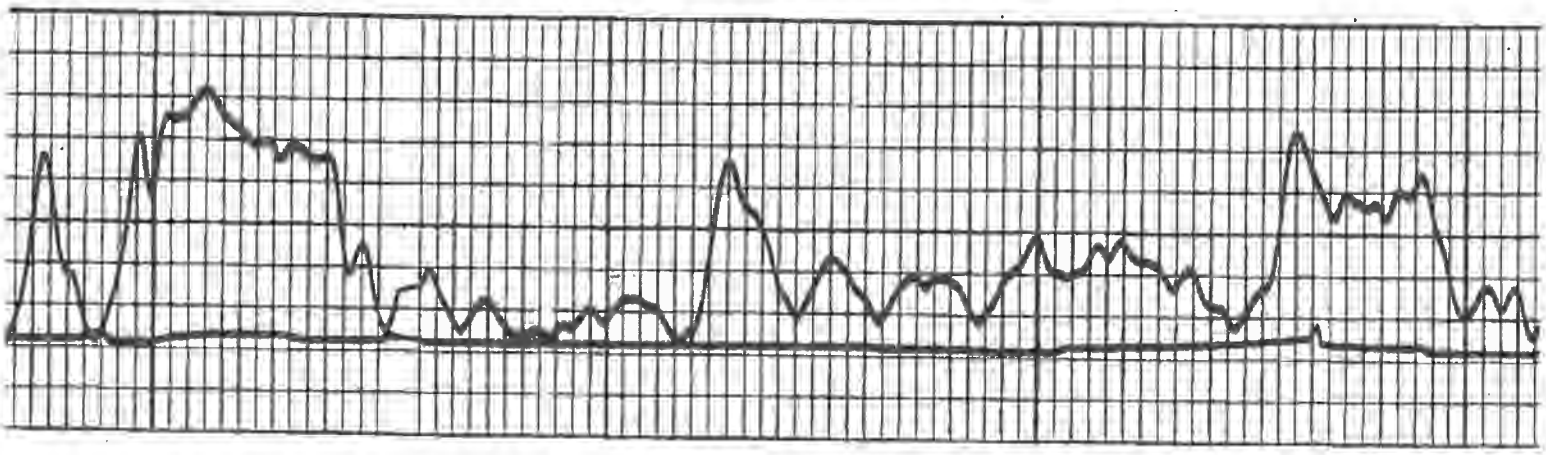


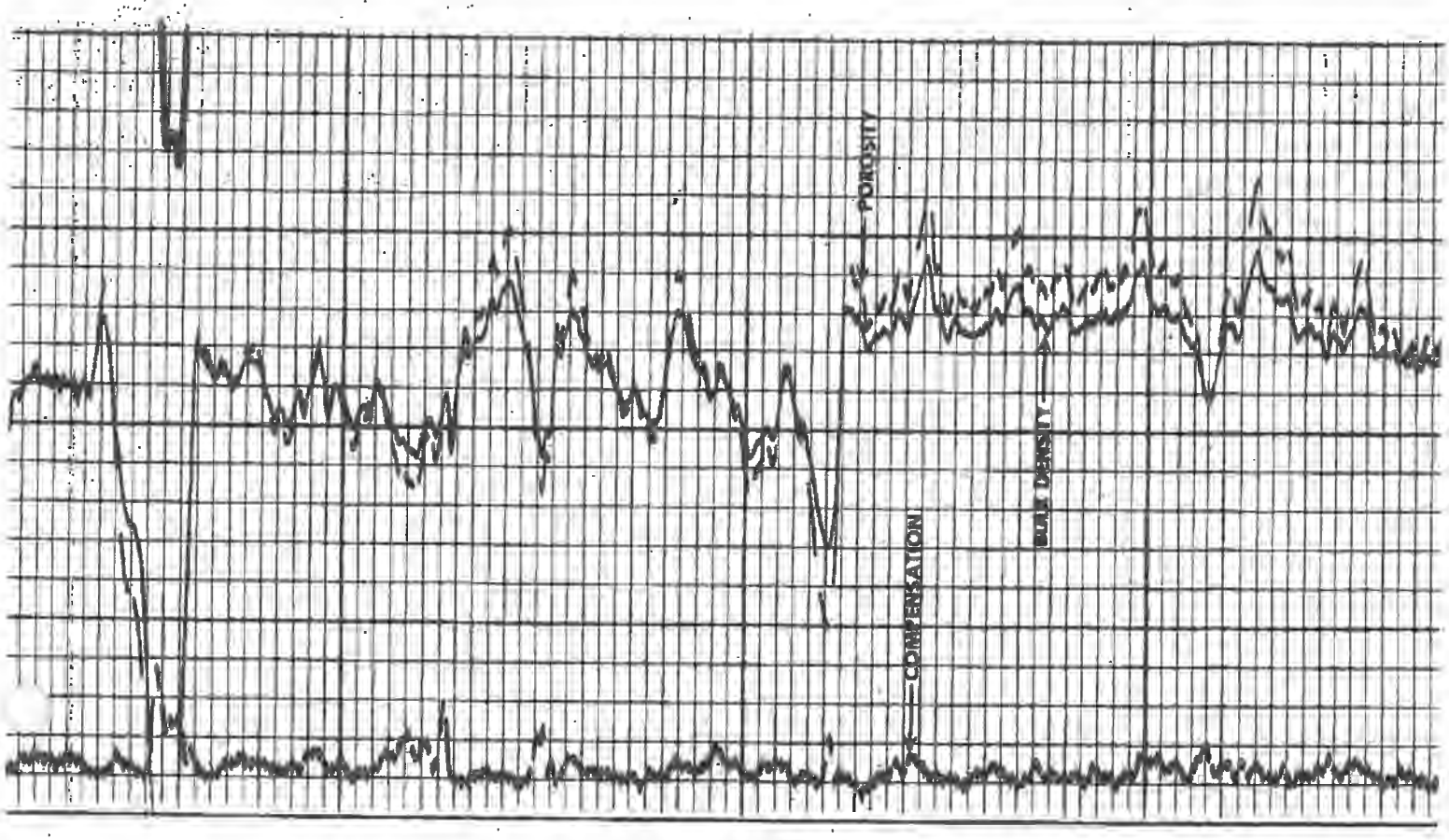

0900
1000



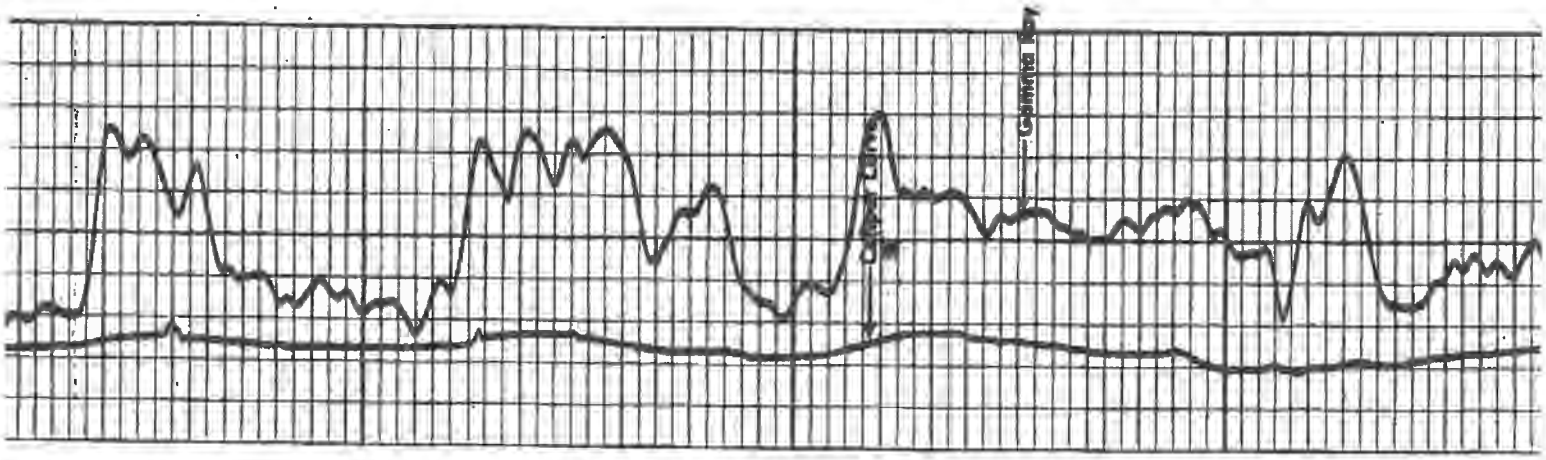
1100

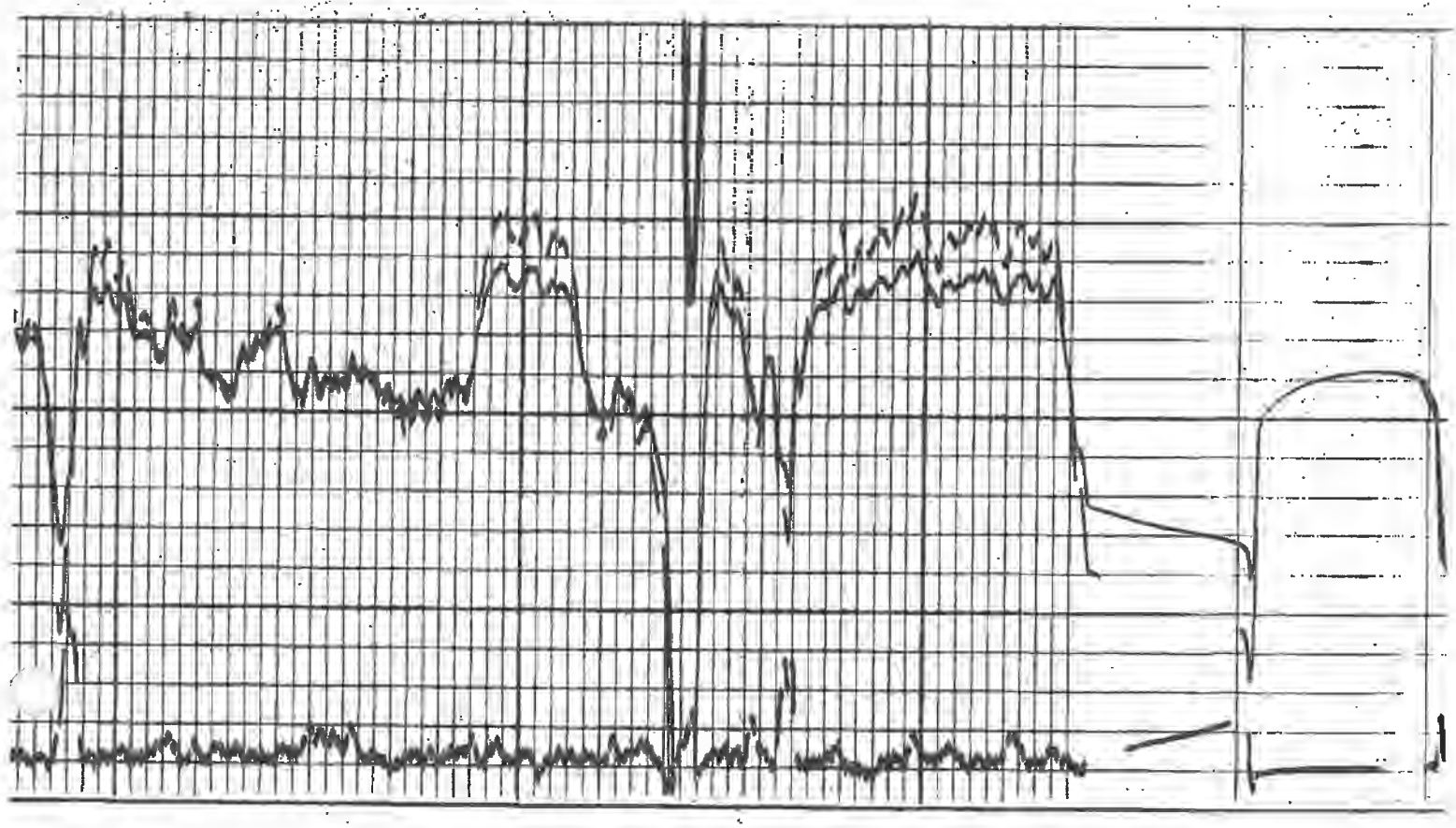
1200



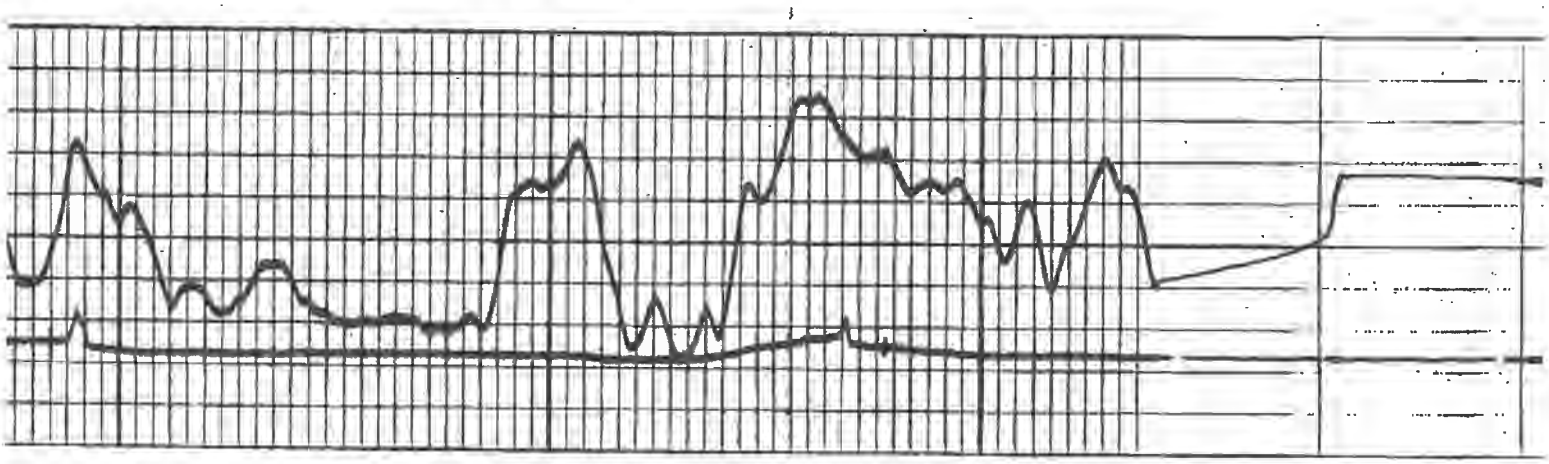


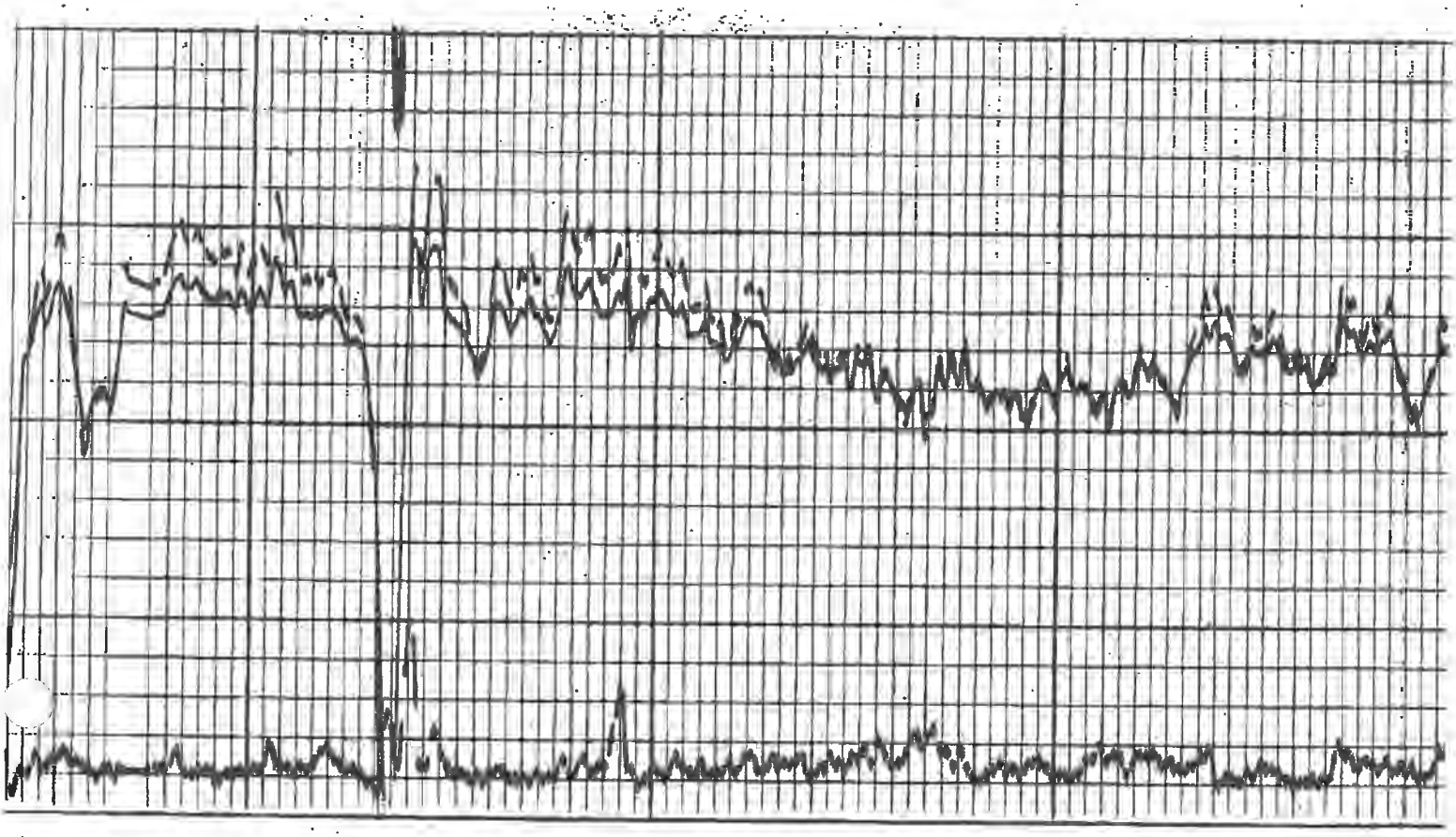

1300





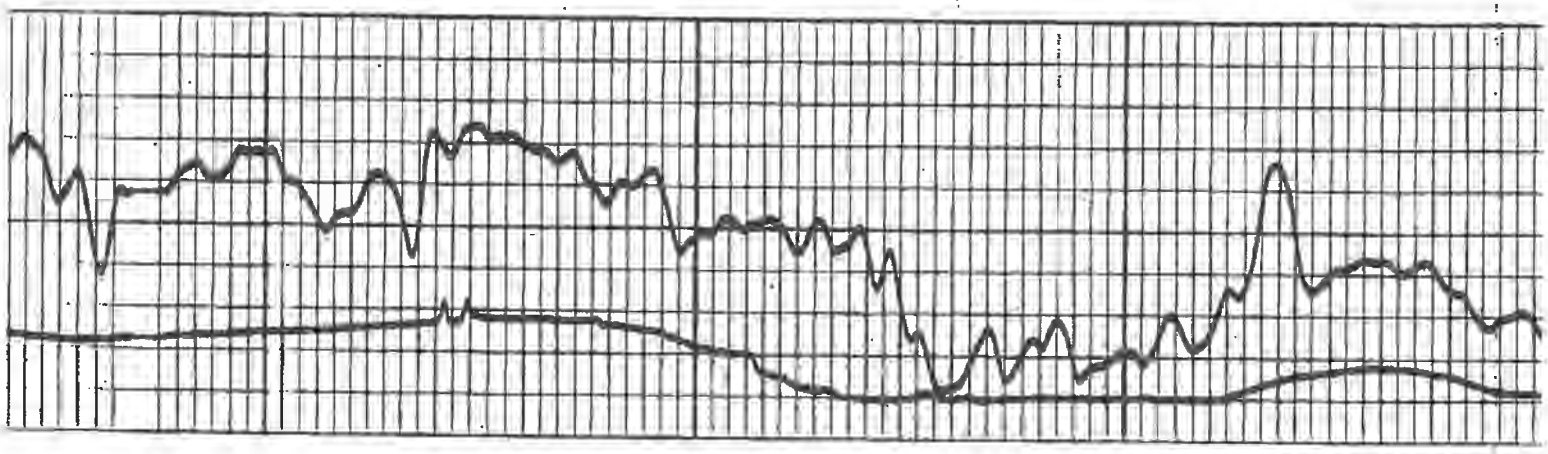
1400 1500

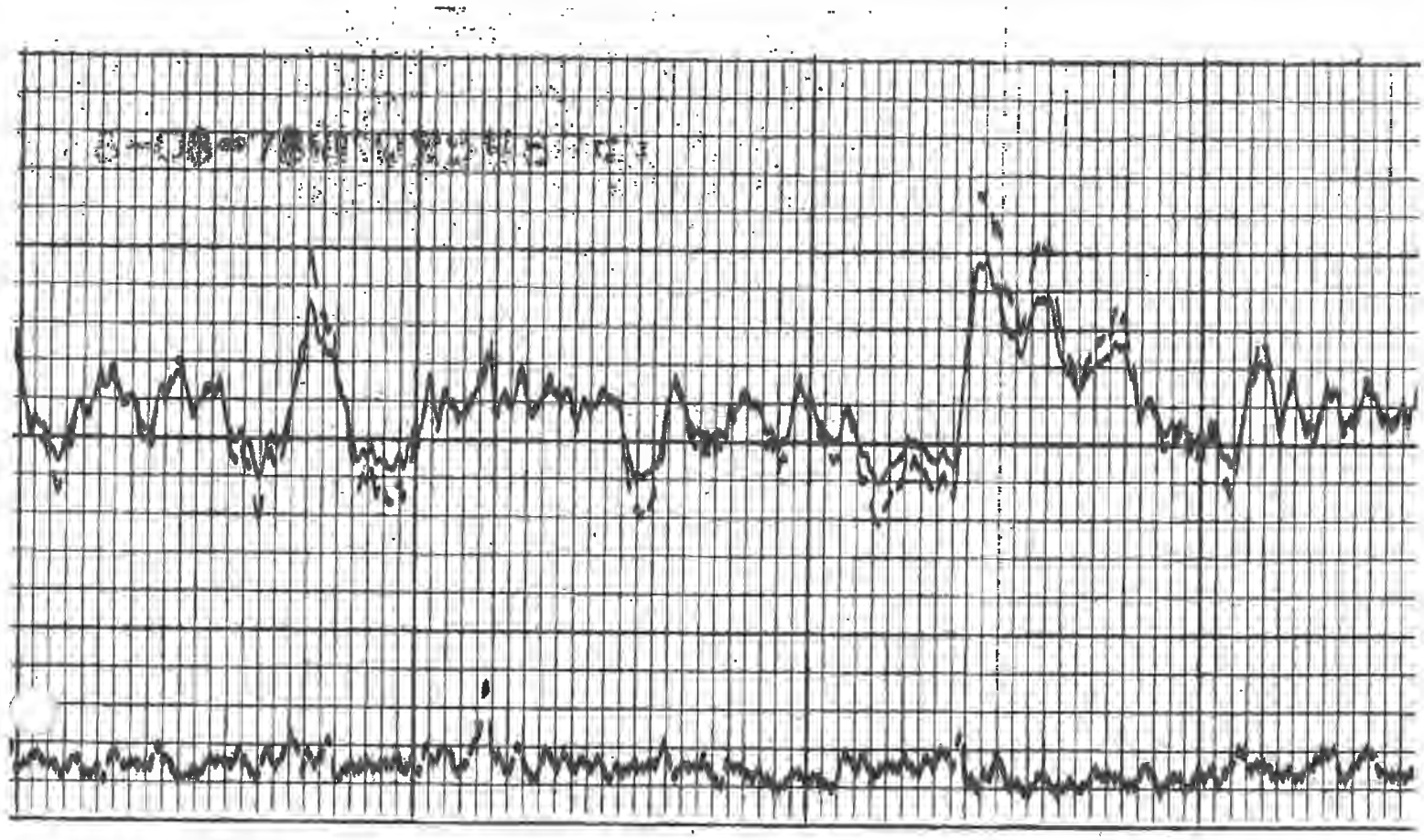




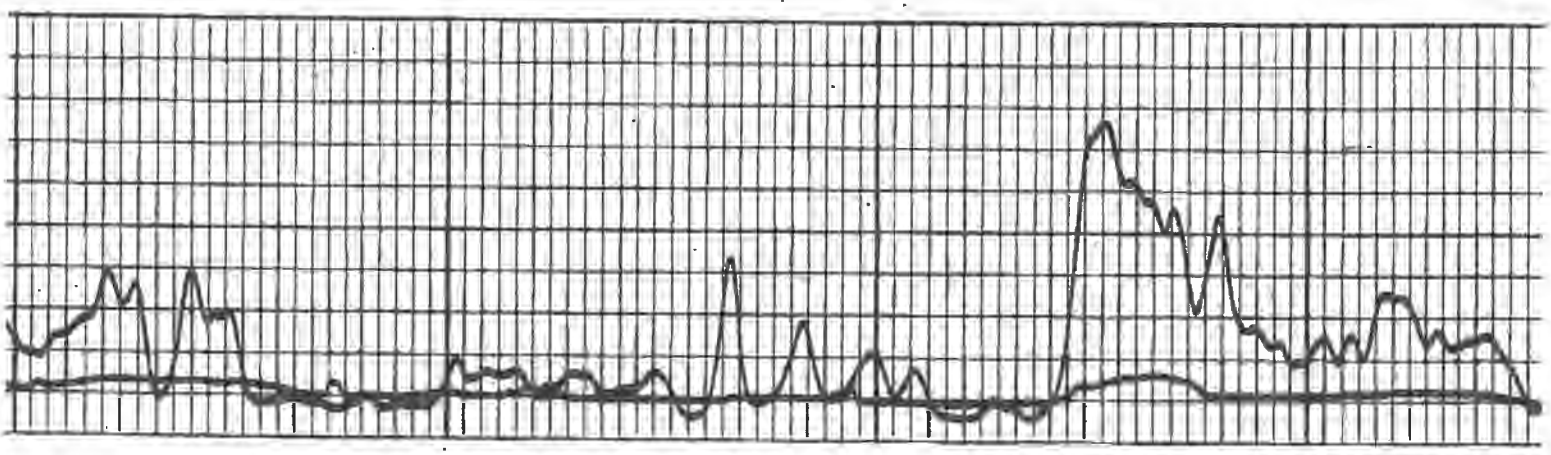
1600

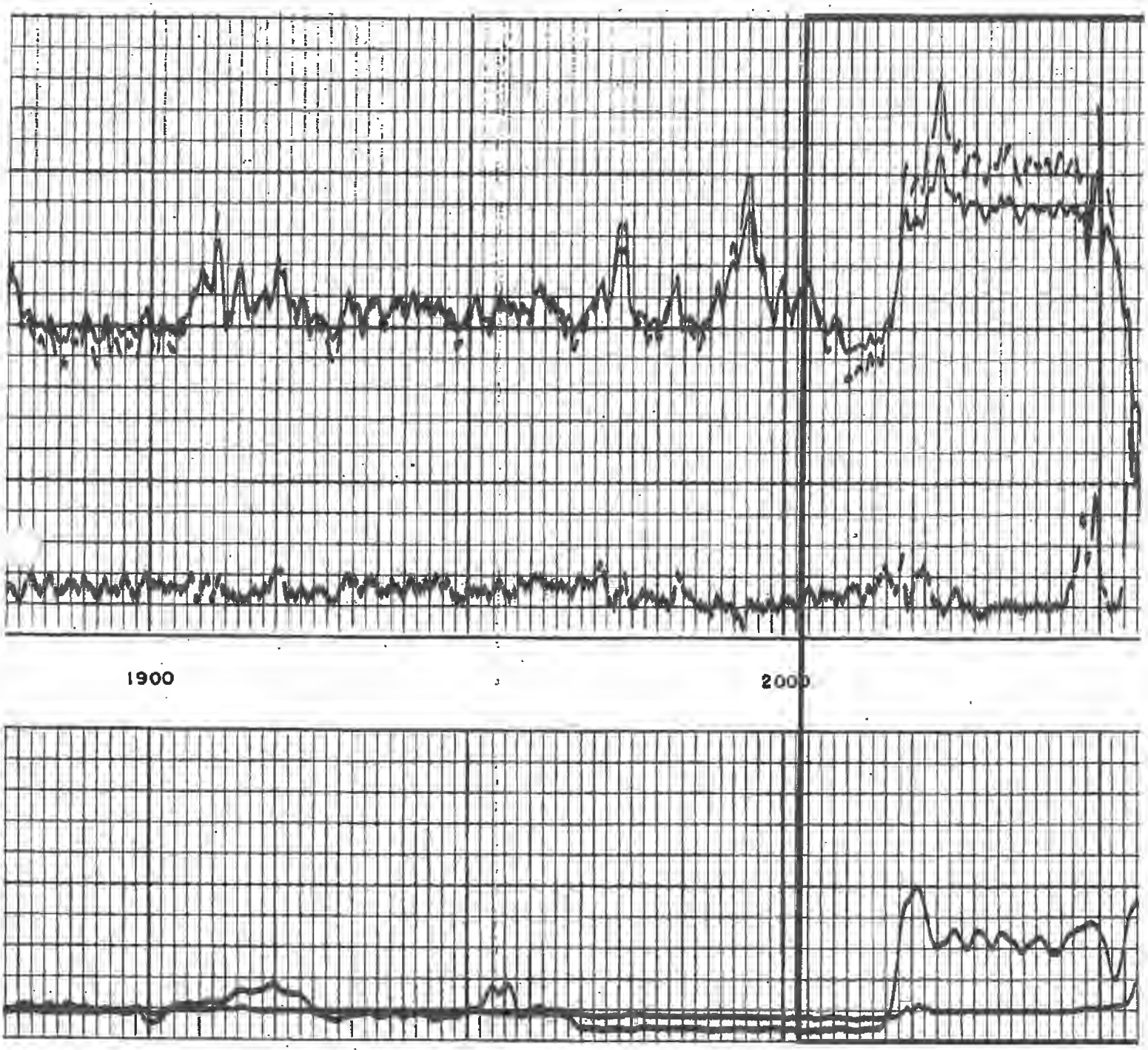
17

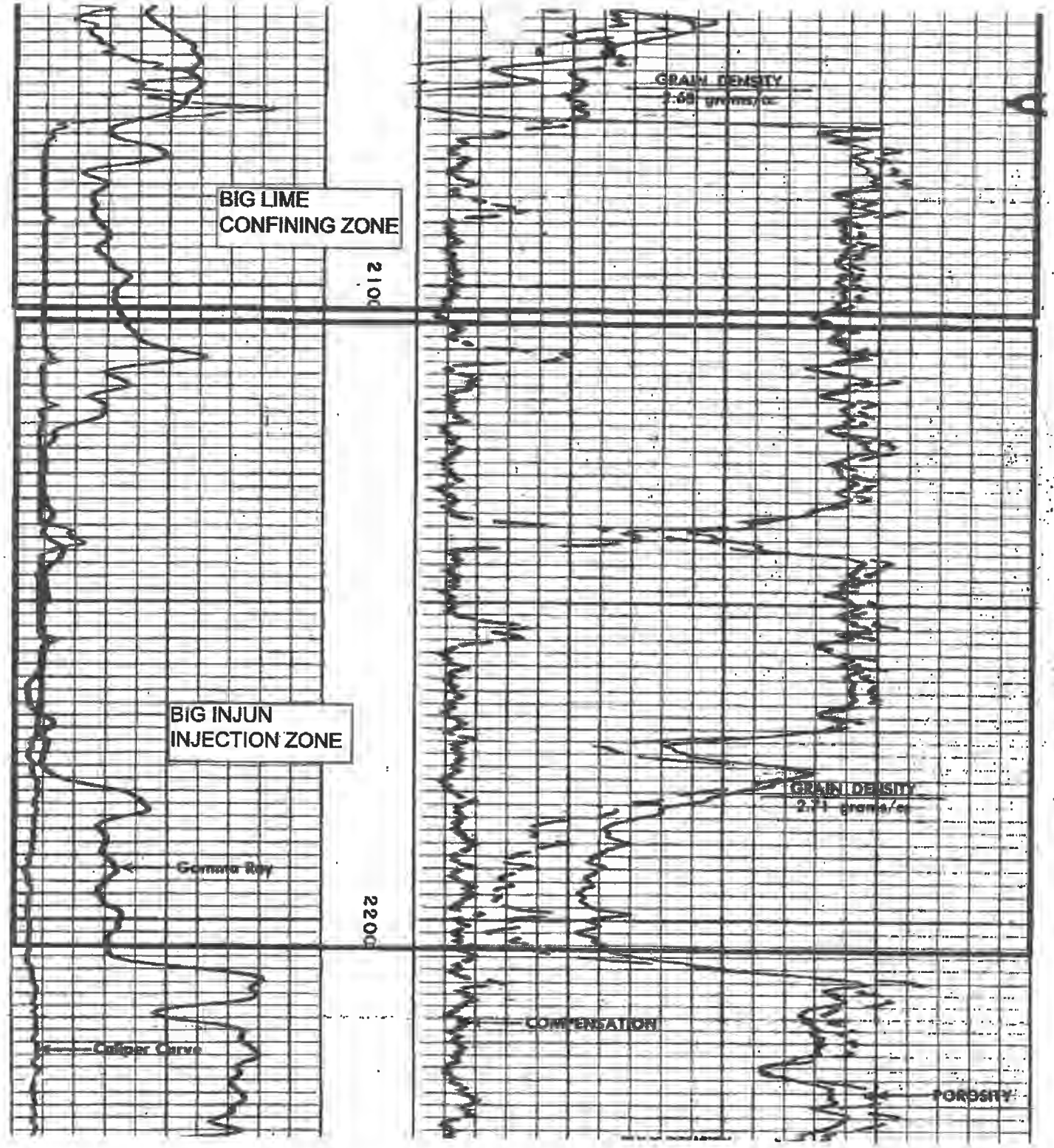


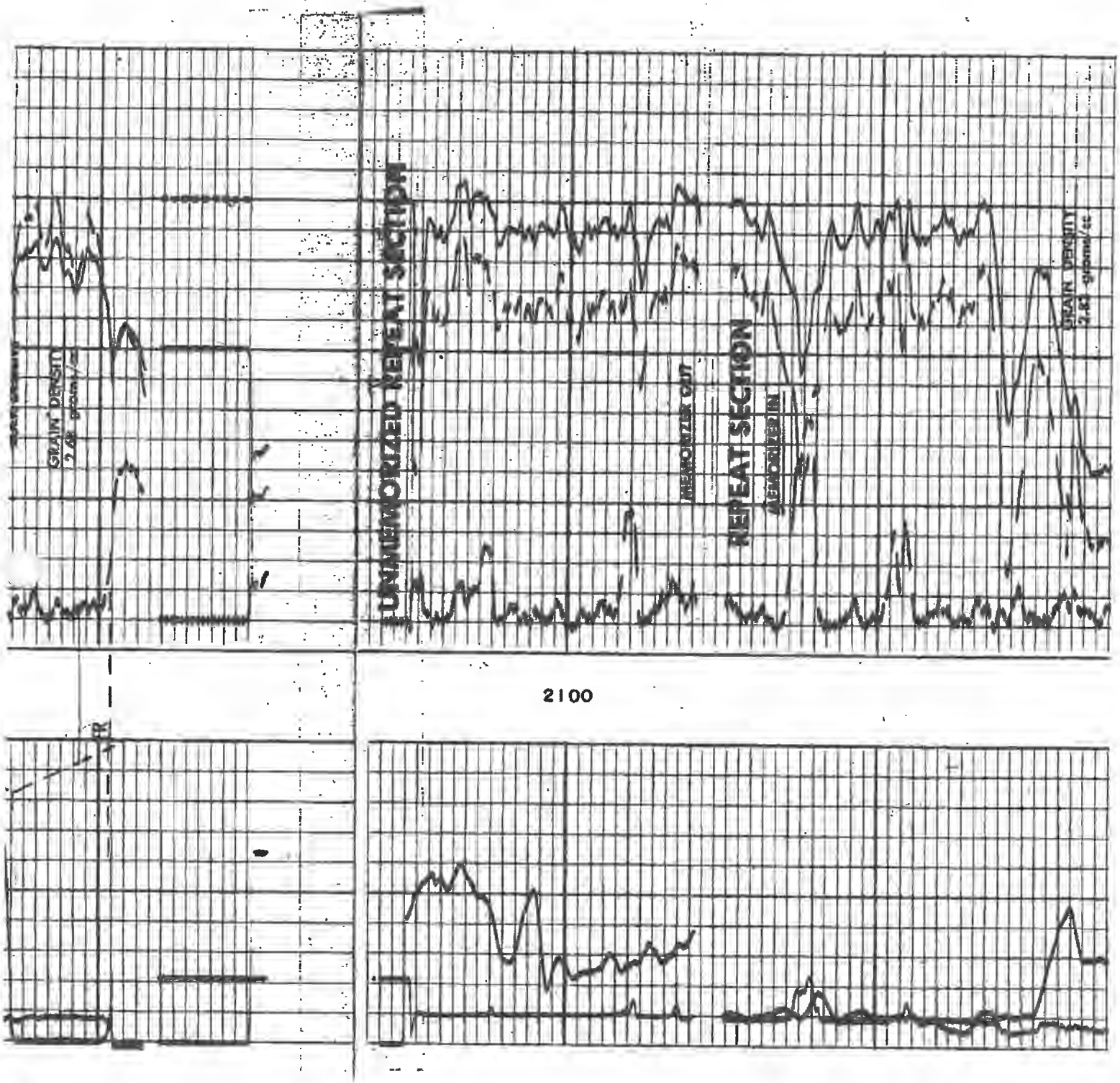


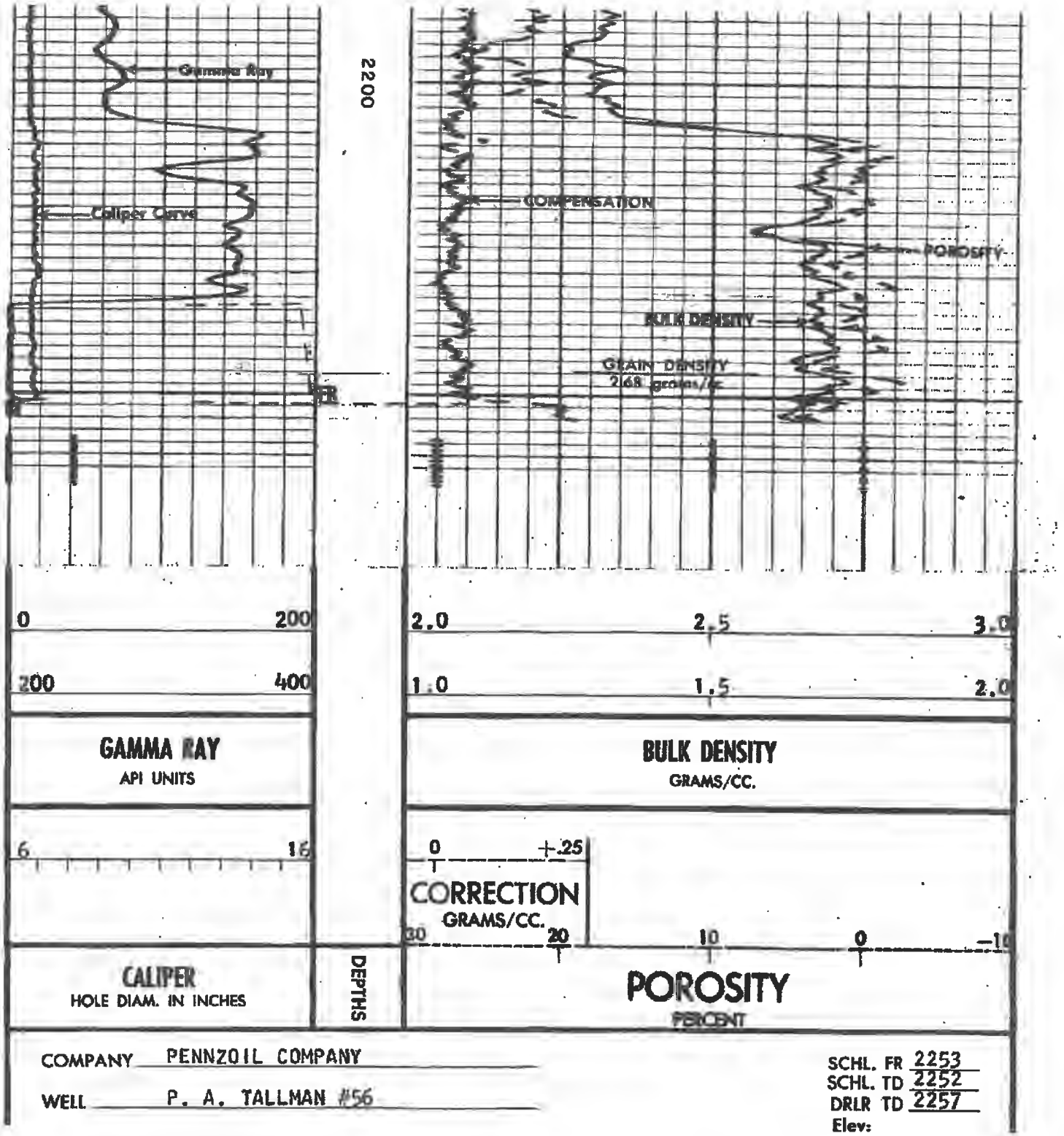
'00 1800




1900
2000


BIG LIME
CONFINING ZONE
2100
BIG INJUN
INJECTION ZONE
2200
Gamma Ray
Caliper Curve
GRAIN DENSITY
2.68 grams/cc
GRAIN DENSITY
2.71 grams/cc
COMPENSATION
POROSITY


GRAIN DENSITY
2.68 grams/cc
UNMEMORIZED REPEAT SECTION
MEMORIZER OUT
REPEAT SECTION
MEMORIZER IN
GRAIN DENSITY
2.68 grams/cc
2100
PR


Gamma Ray
Caliper Curve
2200
COMPENSATION
POROSITY
BULK DENSITY
GRAIN DENSITY
2.68 grams/cc
0
200
200
400
GAMMA RAY
API UNITS
6
16
CALIPER
HOLE DIAM. IN INCHES
DEPTHS
2.0
2.5
3.0
1.0
1.5
2.0
BULK DENSITY
GRAMS/CC.
0
+.25
CORRECTION
GRAMS/CC.
30
20
10
0
-10
POROSITY
PERCENT
COMPANY PENNZOIL COMPANY
WELL P. A. TALLMAN #56
SCHL. FR 2253
SCHL. TD 2252
DRLR TD 2257
Elev:

FIELD SMITHFIELD DISTRICT

COUNTY ROANE STATE W. VA.

KB 1196.21
DF -
GL 1186.21

# CALIBRATION RECORD

CALIBRATION AFTER SURVEY

13

12

11

2

1

CALIBRATION BEFORE SURVEY

13

12

11

10

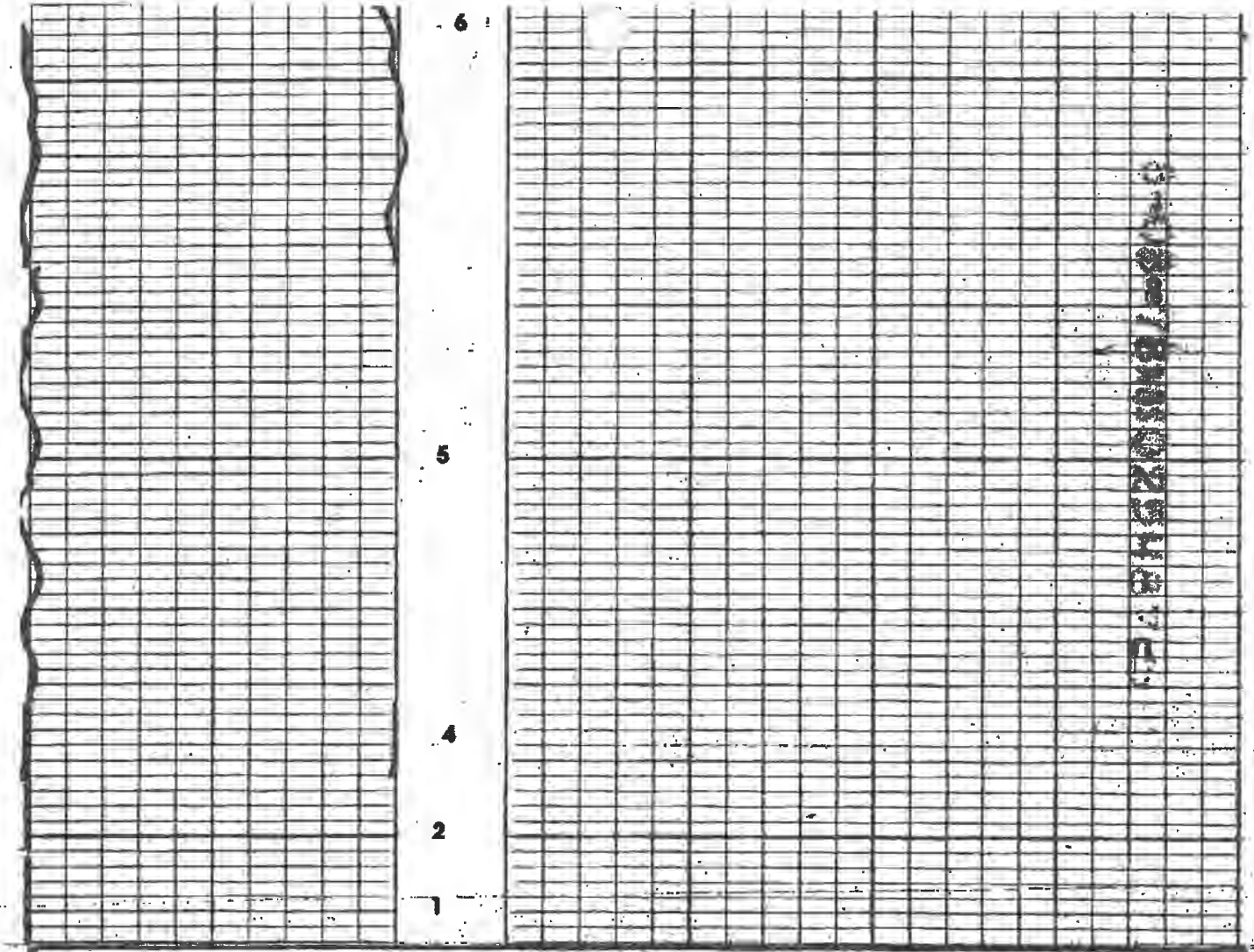
9

8

2

1

CALIBRATION BEFORE SURVEY




## FORMATION DENSITY COMPENSATED CALIBRATION CODING

1. MECHANICAL ZERO
2. RECORDER SENSITIVITY

PANEL TEST

| | POS | FDC LIQUID $\rho$ | $\Delta\rho$ |
|---|---|---|---|
| 3. | # 1 | 2.92 | +.00 |
| 4. | # 2 | 2.78 | +.14 |
| 6. | # 3 | 2.42 | −.10 |
| 6. | # 4 | 2.35 | .00 |
| 7. | # 5 | 2.08 | .01 |

8. MECHANICAL ZERO CALIPER
9. 8" RING
10. 12" RING
11. TOOL CALIBRATE #1 SET $\rho = 2.50$
12. TOOL CALIBRATE #2 SET $\Delta\rho = .00$
13. LOG POSITION $\rho = 2.59$, $\Delta\rho = .015$

## GAMMA RAY CALIBRATION CODING

1. MECHANICAL ZERO
2. ELECTRICAL ZERO
3. RECORDER SENSITIVITY
4. MEMORIZER ADJUSTMENT
5. BACKGROUND
6. CALIBRATE - SOURCE IN PLACE

# Log Analysis

| COMPANY | | WELL |
|---|---|---|
| PENNZOIL COMPANY | | P. A. TALLMAN #56 |
| FIELD: SMITHFIELD DISTRICT | COUNTY: ROANE | STATE: WEST VIRGINIA |

| DEPTH | $\phi_D$ | $R_T$ | $S_W$ | % POROSITY | % WATER | REMARKS |
|---|---|---|---|---|---|---|
| 2182-84 | 18.0 | 12.0 | 30 | | | |
| 2184-86 | 22.5 | 12.0 | 24 | | | |
| 2186-88 | 22.0 | 12.0 | 25 | | | |
| 2188-90 | 22.0 | 13.0 | 24 | | | |
| 2190-92 | 22.0 | 12.0 | 25 | | | |
| 2192-94 | 23.0 | 13.0 | 22 | | | |
| 2194-96 | 25.5 | 15.0 | 19 | | | |
| 2196-98 | 23.0 | 19.0 | 19 | | | |
| 2198-2200 | 22.0 | 18.0 | 20 | | | |
| 2200-02 | 23.5 | 15.0 | 20 | | | |
| 2202-04 | 22.0 | 12.0 | 25 | | | |
| 2204-06 | 21.0 | 12.0 | 26 | | | |

TOTALS:

H = 24 FT

$\phi$ AVE = 22.2%

$\phi$ FT = 5.3

$S_W$ AVE = 23%

$S_{HY}$ AVE = 77%

ASSUME:

$R_W$ = .045 OHM-M

$\rho_G$ = 2.68 GM/CC

$\rho_F$ = 1.0 GM/CC

ANALYSIS FROM REPEAT

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

All interpretations are opinions based on inferences from electrical and other measurements and we cannot, and do not, guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to Clause 4 of our General Terms and Conditions as set out in our current Price Schedule.

| DATE | LOCATION | ENGINEER |
|---|---|---|
| 8/8/78 | WOOSTER | GOULD |

SWS-1323-E

2406
Perforation
Depth Control

# Basin Surveys, Inc.

PERFORATION DEPTH CONTROL

FILING NO.
PERMIT # N.A.
2406

COMPANY: PENNZOIL COMPANY

WELL: P. A. TALIMAN #58

FIELD: SMITHFIELD DISTRICT

COUNTY: ROANE STATE: W. VA.

LOCATION: N. A.

SEC. TWP. RGE.

OTHER LOGS:

PERMANENT DATUM: GROUND LEVEL ELEV. 1186.21'
LOG MEASURED FROM: KB
DRILLING MEASURED FROM: KB

ELEVATIONS: KB 1194' DF. GL 1186.21'

| | | | |
|---|---|---|---|
| DATE | 10-20-78 | | |
| RUN NO. | ONE | | |
| TYPE LOG | GR-CCL | | |
| DEPTH – DRILLER | 2257' | | |
| DEPTH – LOGGER | 2214' | | |
| BOTTOM LOGGED INTERVAL | 2208' | | |
| TOP LOGGED INTERVAL | 1200' | | |
| TYPE FLUID IN HOLE | NONE | | |
| SALINITY PPM CL. | | | |
| DENSITY LB./GAL. | | | |
| LEVEL | ---- | | |
| MAX. REC. TEMP. – DEG. F | | | |
| OPR. RIG TIME | 2½ HRS. | | |
| RECORDED BY | R. HAVERTY | | |
| WITNESSED BY | MR. GEORGE | | |

| RUN NO. | BORE HOLE RECORD BIT | FROM | TO | CASING RECORD SIZE | WGT. | FROM | TO |
|---|---|---|---|---|---|---|---|
| ONE | | | | 4½" | | SURFACE | 2214' |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

THIS HEADING AND LOG CONFORM TO API STANDARD PRACTICE RP-33

EQUIPMENT DATA

| | GAMMA RAY | | | |
|---|---|---|---|---|
| RUN NO. | ONE | | | |
| TOOL MODEL NO. | GR-CCL | | | |
| DIAM. | 1.75" | | | |
| DETECT. MODEL NO. TYPE | 121 SCINTILLATOR | | | |

| PERFORATIONS Type | From | To | No. Shots |
|---|---|---|---|
| GASE GUN | 2189' | 2199' | 20 |

| | |
|---|---|
| TYPE | OUTLET |
| LENGTH | 5' |

**GENERAL**

| | |
|---|---|
| HOIST TRUCK NO. | 207 |
| INST. TRUCK NO. | 207 |
| TOOL SERIAL NO. | |

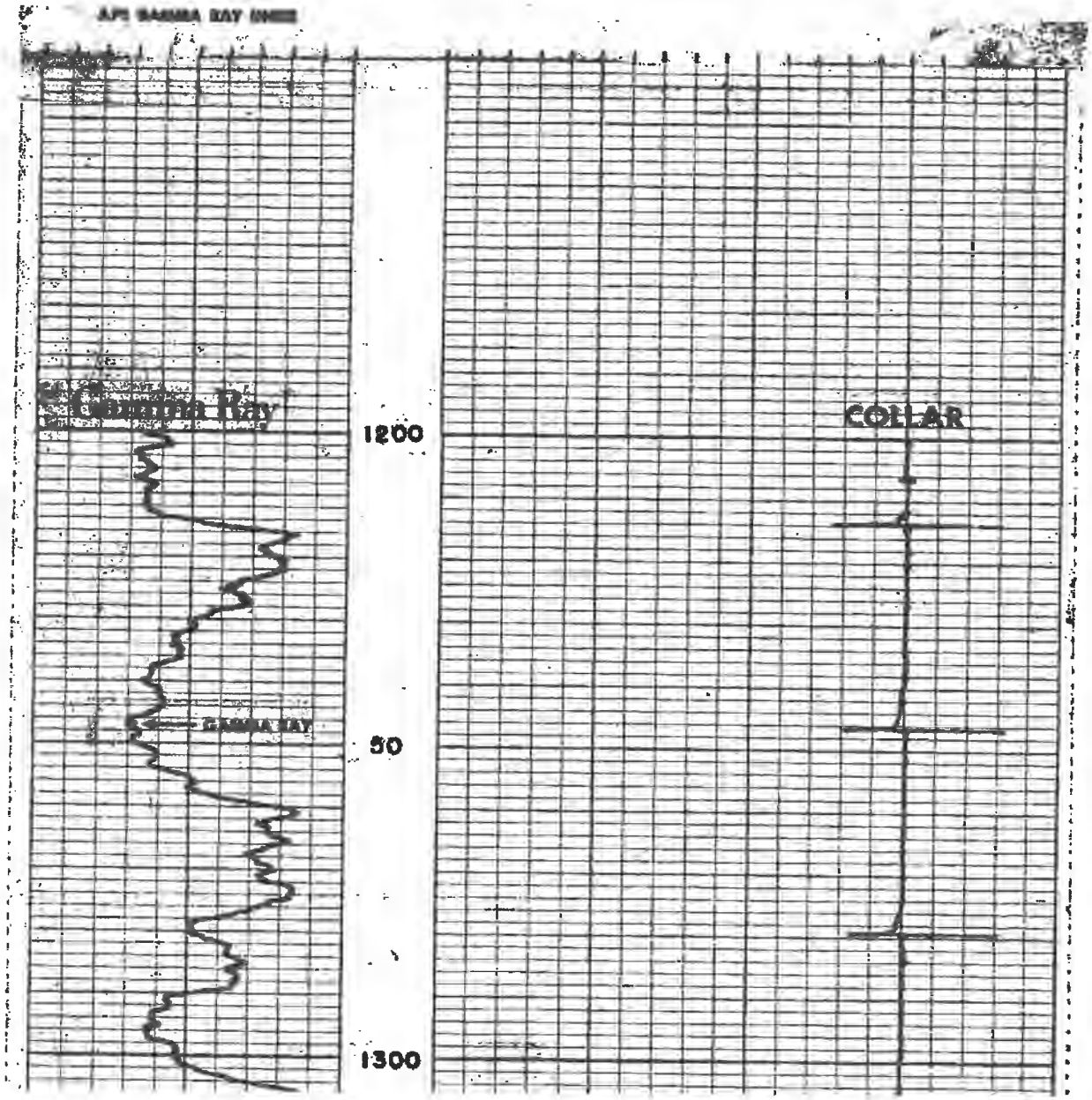
**LOGGING DATA**

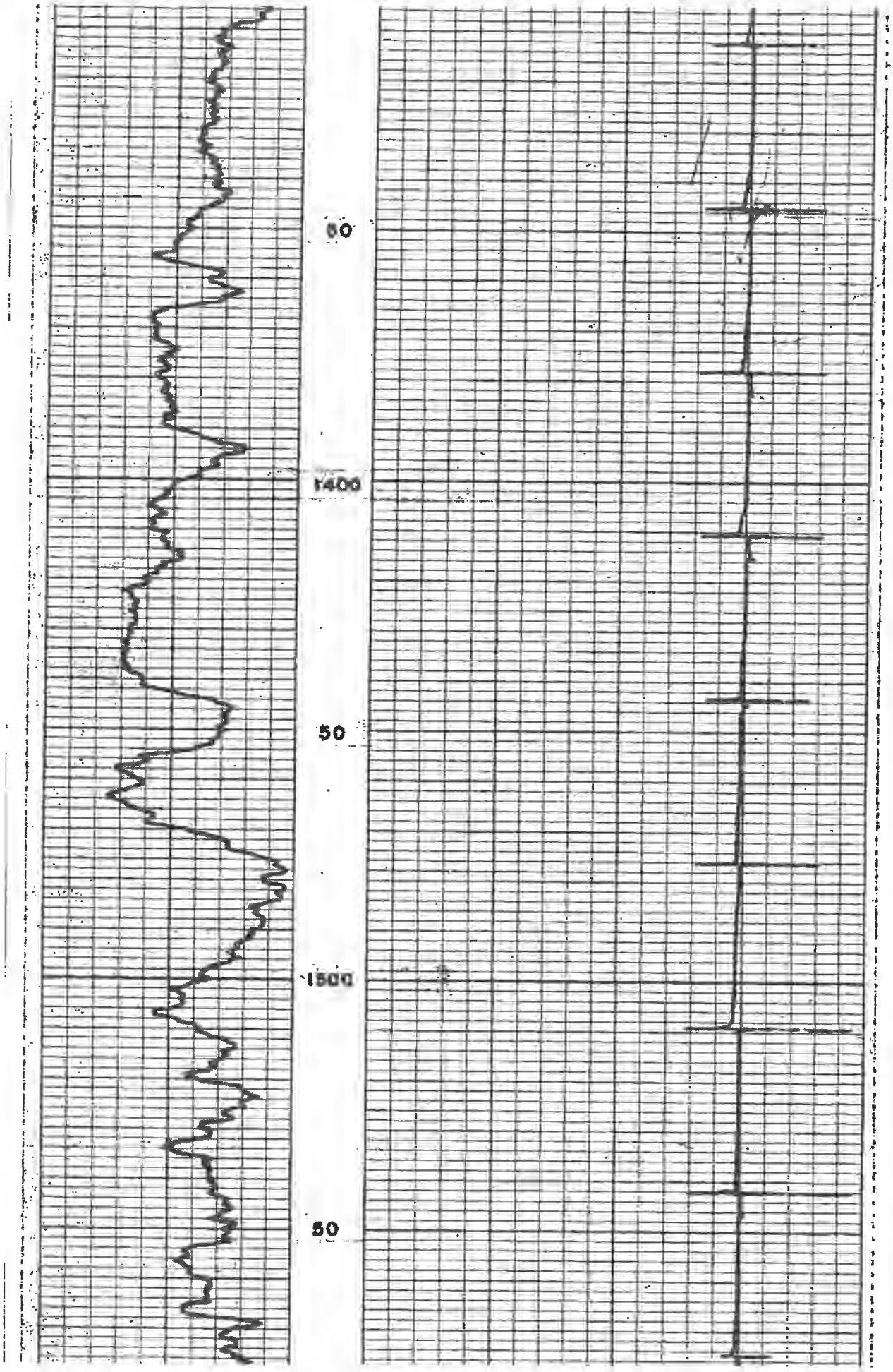
| GENERAL | | | | GAMMA RAY | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| RUN NO. | DEPTHS FROM | DEPTHS TO | SPEED FT/MIN | T.C. SEC. | SENS. SETTINGS | ZERO LOG DIV. | SCALE API G.R. UNITS | | | | |
| ONE | 2208' | 1200' | 50 | 3 | 90 | 0-2 | | | | | |

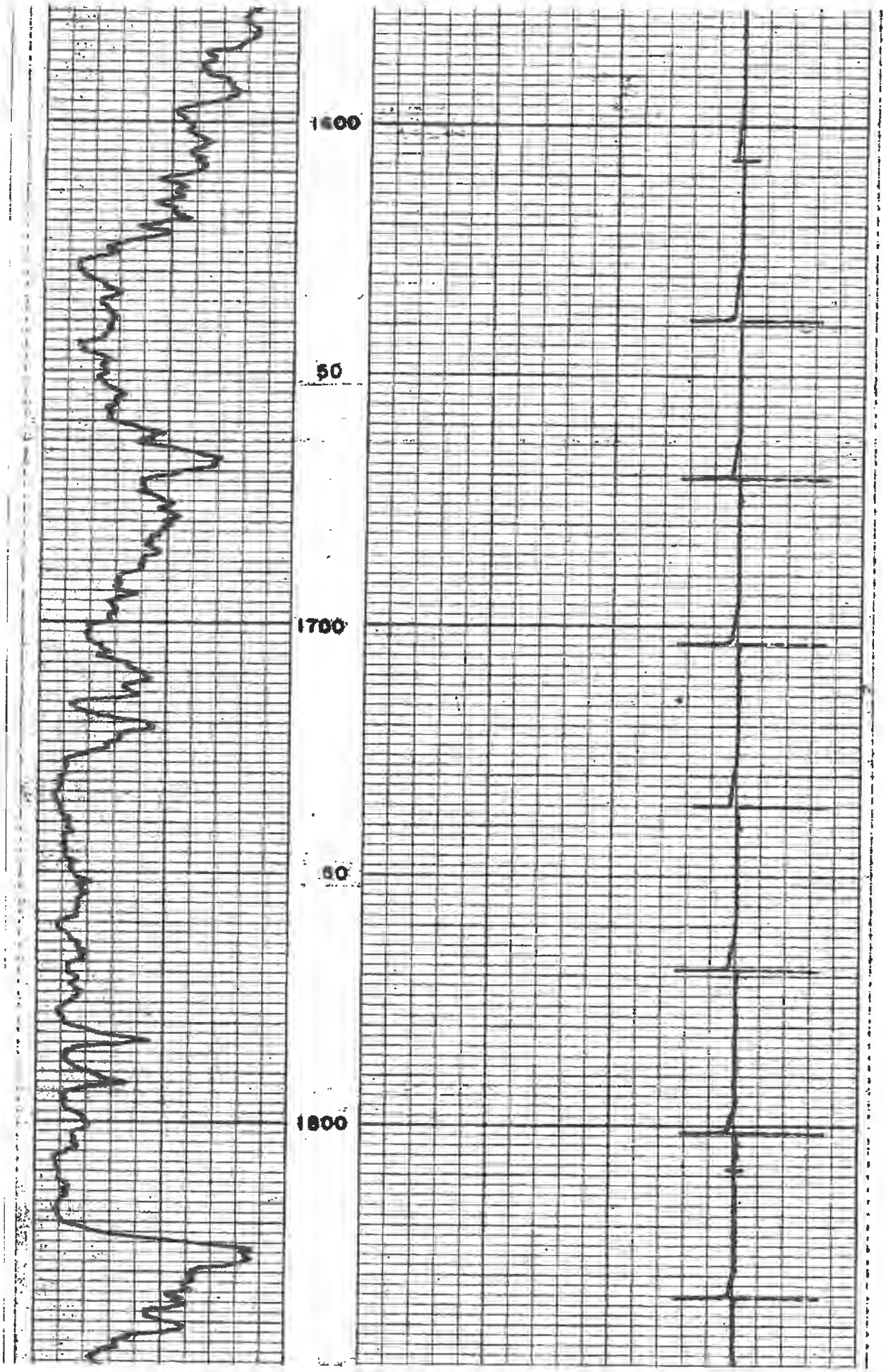
REFERENCE LITERATURE:

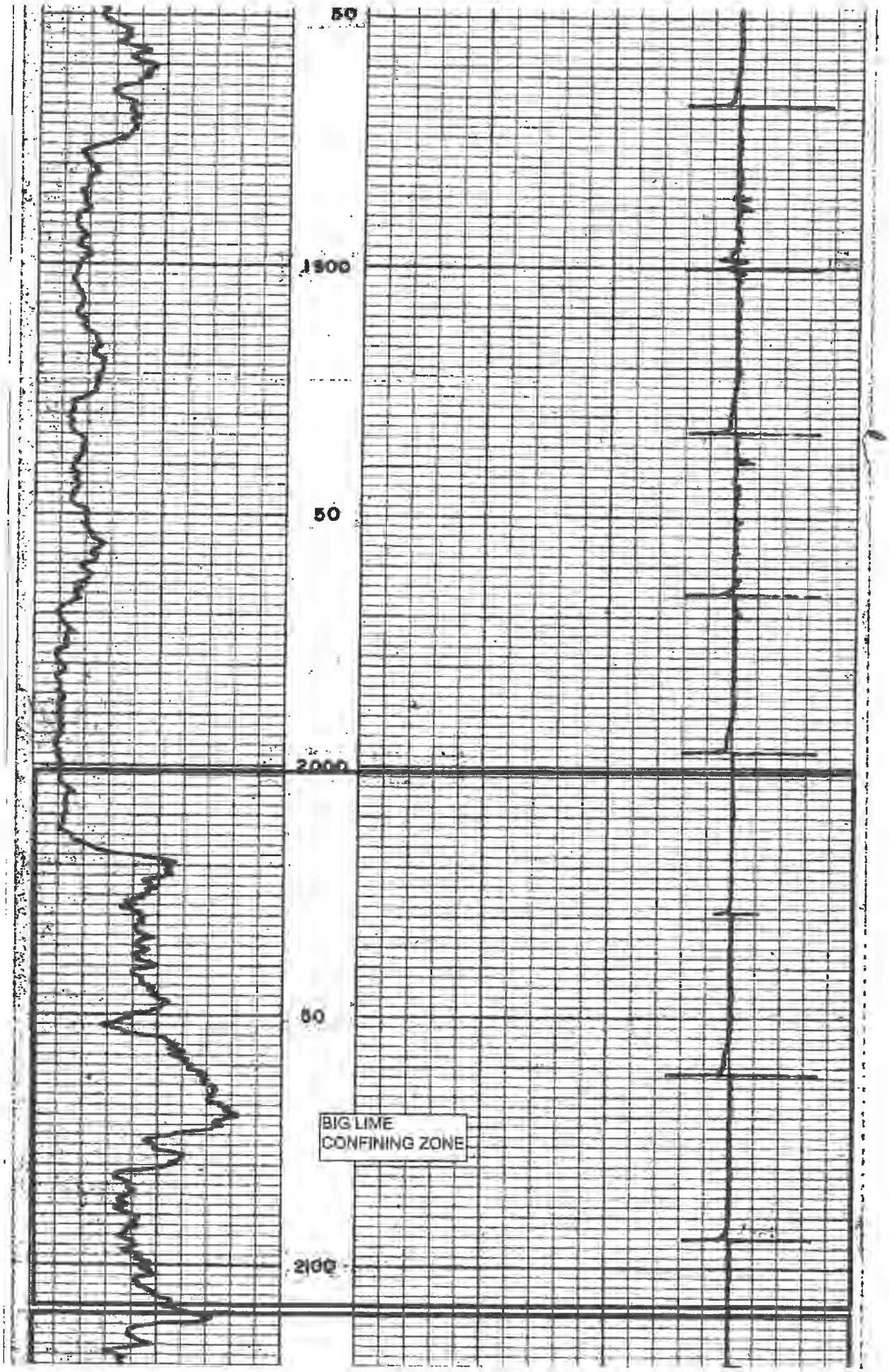
REMARKS:

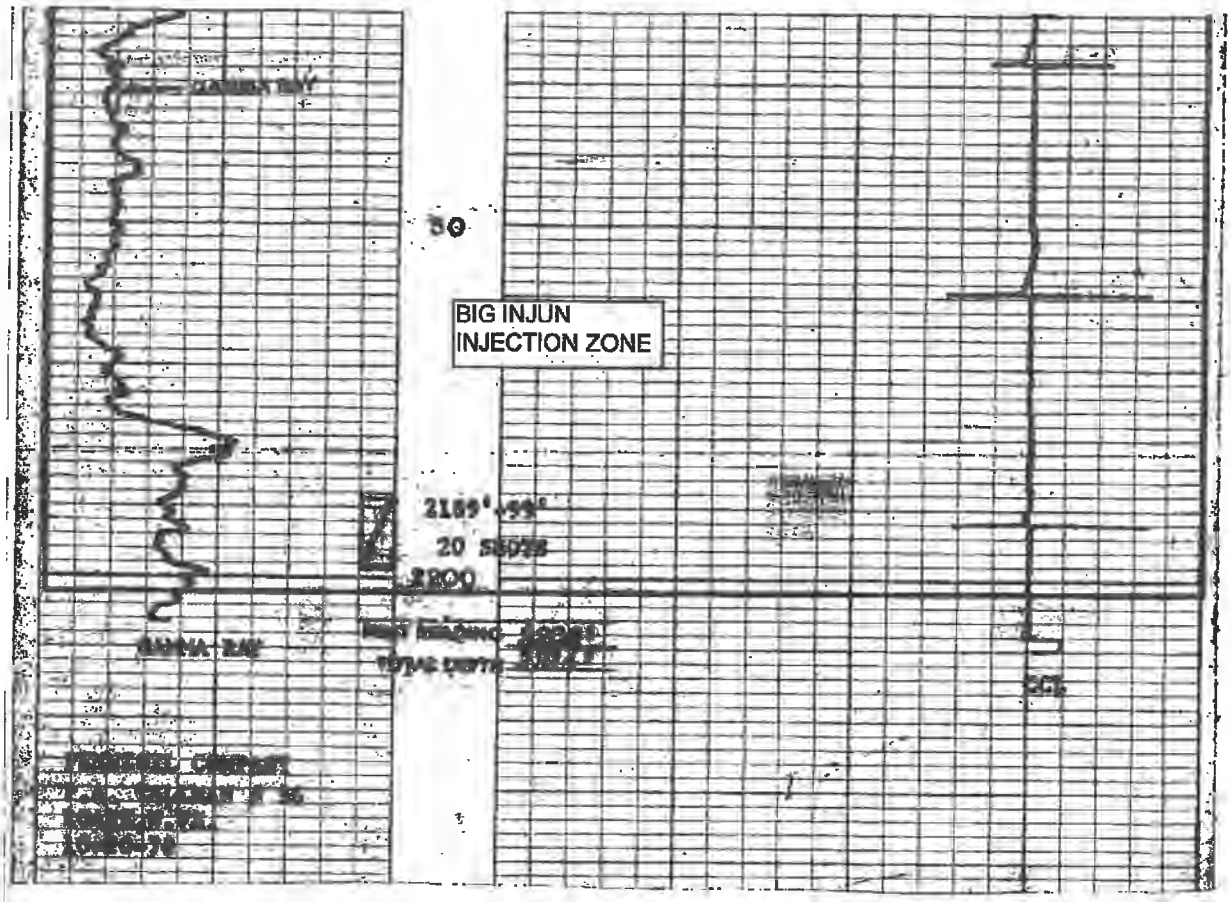
## GAMMA RAY




50
1400
50
1500
50


1600
50
1700
50
1800


50
1500
50
2000
50
BIG LIME
CONFINING ZONE
2100


BIG INJUN
INJECTION ZONE

WVGES GEOLOGY UNDERLIES IT ALL "Pipeline"

Select County: (087) Roane
Enter Permit #: 2407
Get Data | Reset

Select datatypes: (Check All)
Location, Production, Plugging, Owner/Completion, Stratigraphy, Sample, Pay/Show/Water, Logs, Btm Hole Loc

Table Descriptions
County Code Translations
Permit-Numbering Series
Usage Notes
Contact Information
Disclaimer
WVGES Main
"Pipeline-Plus" New

WV Geological & Economic Survey:

## Well: County = 87 Permit = 2407

Report Time: Thursday, April 30, 2020 8:30:06 PM

### Location Information: View Map

| API | COUNTY | PERMIT | TAX_DISTRICT | QUAD_75 | QUAD_15 | LAT_DD | LON_DD | UTME | UTMN |
|---|---|---|---|---|---|---|---|---|---|
| 4708702407 | Roane | 2407 | Smithfield | Tariff | Otter | 38.64431 | -81.211916 | 481558.3 | 4277327.8 |

There is no Bottom Hole Location data for this well

### Owner Information:

| API | CMP_DT | SUFFIX | STATUS | SURFACE_OWNER | WELL_NUM | CO_NUM | LEASE | LEASE_NUM | MINERAL_OWN | OPERATOR_AT_COMPLETION | PROP_VD | PROP_TRGT_FM | TFM_EST_PR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702407 | 8/-/1978 | Original Loc | Completed | P A Tallman | 57 | | | | | Pennzoil Company | | | |

### Completion Information:

| API | CMP_DT | SPUD_DT | ELEV | DATUM | FIELD | DEEPEST_FM | DEEPEST_FMT | INITIAL_CLASS | FINAL_CLASS | TYPE | RIG | CMP_MTHD | TVD | TMD | NEW_FTG | KOD | G_BEF | G_AFT | O_BEF | O_AFT | NGL_BEF | NGL_AFT | P_BEF | TI_BEF | P_AFT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702407 | 8/-/1978 | -/-/- | 1115 | Ground Level | Tariff Tlmn | Big Injun (Price&eq) | Big Injun (Price&eq) | Service Well | Unsuccessful | Water Injection | Rotary | Acid+Frac | 2201 | | 2201 | | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 |

### Pay/Show/Water Information:

| API | CMP_DT | ACTIVITY | PRODUCT | SECTION | DEPTH_TOP | FM_TOP | DEPTH_BOT | FM_BOT | G_BEF | G_AFT | O_BEF | O_AFT | WATER_QNTY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702407 | 8/-/1978 | Horizon | Injection | Vertical | | | 2158 | Big Injun (Price&eq) | 0 | 0 | | | |

### Production Gas Information: (Volumes in Mcf) * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_GAS | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702407 | Pennzoil Company | 1981 | 1,118 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702407 | Pennzoil Company | 1982 | 1,385 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702407 | Nicholson, Arthur & Kenneth | 1983 | 521 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702407 | Pennzoil Company | 1984 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702407 | Pennzoil Products Company | 1989 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702407 | Pennzoil Products Company | 1990 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702407 | Pennzoil Products Company | 1991 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702407 | Pennzoil Products Company | 1992 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702407 | Pennzoil Products Company | 1993 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702407 | Pennzoil Products Company | 1994 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702407 | Pennzoil Products Company | 1995 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702407 | Triad Resources, Inc. | 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702407 | Triad Resources, Inc. | 2007 | 1,870 | 165 | 149 | 173 | 155 | 189 | 195 | 145 | 210 | 116 | 140 | 123 | 110 |
| 4708702407 | Ground Resources, LLC | 2017 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702407 | Ground Resources LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

### Production Oil Information: (Volumes in Bbl) ** some operators may have reported NGL under Oil * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_OIL | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702407 | Pennzoil Company | 1981 | 509 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702407 | Pennzoil Company | 1982 | 665 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702407 | Nicholson, Arthur & Kenneth | 1983 | 629 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702407 | Pennzoil Company | 1984 | 1,030 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702407 | Pennzoil Products Company | 1989 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702407 | Pennzoil Products Company | 1990 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702407 | Pennzoil Products Company | 1991 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702407 | Pennzoil Products Company | 1992 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702407 | Pennzoil Products Company | 1993 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702407 | Pennzoil Products Company | 1994 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702407 | Pennzoil Products Company | 1995 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702407 | Triad Resources, Inc. | 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702407 | Triad Resources, Inc. | 2007 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702407 | Ground Resources, LLC | 2017 | 0 | | | | | | | | | | | | |
| 4708702407 | Ground Resources LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

### Production NGL Information: (Volumes in Bbl) ** some operators may have reported NGL under Oil * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_NGL | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702407 | Ground Resources LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

### Production Water Information: (Volumes in Gallons) * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_WTR | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702407 | Ground Resources LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

### Stratigraphy Information:

| API | SUFFIX | FM | FM_QUALITY | DEPTH_TOP | DEPTH_QUALITY | THICKNESS | THICKNESS_QUALITY | ELEV | DATUM |
|---|---|---|---|---|---|---|---|---|---|
| 4708702407 | Original Loc | Little Lime | Well Record | 1968 | Reasonable | 35 | Reasonable | 1115 | Ground Level |
| 4708702407 | Original Loc | Blue Monday | Well Record | 2003 | Reasonable | 4 | Reasonable | 1115 | Ground Level |
| 4708702407 | Original Loc | Greenbrier Group | Well Record | 2020 | Reasonable | 108 | Reasonable | 1115 | Ground Level |
| 4708702407 | Original Loc | Big Lime | Well Record | 2020 | Reasonable | 108 | Reasonable | 1115 | Ground Level |
| 4708702407 | Original Loc | Big Injun (Price&eq) | Well Record | 2128 | Reasonable | 30 | Reasonable | 1115 | Ground Level |
| 4708702407 | Original Loc | Undf PRICE btw INJN | Well Record | 2158 | Reasonable | 43 | Reasonable | 1115 | Ground Level |

### Wireline (E-Log) Information:

| API | LOG_TOP | LOG_BOT | DEEPEST_FML | LOGS_AVAIL | SCAN | DIGITIZED | GR_TOP | GR_BOT | D_TOP | D_BOT | N_TOP | N_BOT | I_TOP | I_BOT | T_TOP | T_BOT | S_TOP | S_BOT | O_TOP | O_BOT | INCH2 | INCH5 | REDUCED | KOP | LOGMD | ELEV_KB | ELEV_GL | ELEV_DF | LOG_I |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702407 | 4 | 2200 | | G D C * | Y | N | 4 | 2194 | 700 | 2200 | | | | | | | | | 700 | 2200 | Y | Y | N | | | | | | |

Injector 2407

Comment: *logs: caliper, CCL, perforation

Injection 2407

Downloadable Log Images: We advise you to save the log image file to your PC for viewing. To do so, right-click the .tif image of interest and select the save option. Then you can direct the file to a location of your choice. Please note these images vary in size and some may take several minutes to download, especially if using a 56k or slower dialup connection.

| FILENAME |
| --- |
| 4708702407gdc.tif |
| 4708702407gpo.tif |

**Quick Reference Guide for Log File Names** For more info about WVGES scanned logs click here

**geologic log types:**
- d density (includes bulk density, compensated density, density, density porosity, grain density, matrix density, etc.)
- e photoelectric adsorption (PE or Pe, etc.)
- g gamma ray
- i induction (includes dual induction, medium induction, deep induction, etc.)
- l laterolog
- m dipmeter
- n neutron (includes neutron porosity, sidewall neutron--SWN, etc.)
- o other[1]
- s sonic or velocity
- t temperature (includes borehole temperature, BHT, differential temperature, etc.)
- z spontaneous potential or potential

**mechanical log types:**
- b cement bond
- c caliper
- o other[1]
- p perforation depth control or perforate

[1]other logs may include, but are not limited to, such curves as audio, bit size, CCL--casing collar locator, continuous meter, directional survey, gas detector, guard, NCTL--Nuclear Cement Top Locator, radioactive tracer, tension

There is no Plugging data for this well

There is no Sample data for this well

2407

# APPENDIX A
## Injection Well Form

1) GEOLOGIC TARGET FORMATION BIG INJUN

Depth 2128 Feet (top) 2158 Feet (bottom)

2) Estimated Depth of Completed Well, (or actual depth of existing well): 2201 Feet

3) Approximate water strata depths: Fresh N/A Feet Salt N/A Feet

4) Approximate coal seam depths:

5) Is coal being mined in the area? Yes ☐ No ☑

6) Virgin reservoir pressure in target formation 800 psig Source HISTORICAL/ESTIMATED

7) Estimated reservoir fracture pressure _____ psig (BHFP)

8) MAXIMUM PROPOSED INJECTION OPERATIONS:

Injection rate (bbl/hour) 25

Injection volume (bbl/day) 200

Injection pressure (psig) 1000

Bottom hole pressure (psig) 2000

9) DETAILED IDENTIFICATION OF MATERIALS TO BE INJECTED, INCLUDING ADDITIVES:

Fresh water and/or produced water from the area and possible bactericides necessary to maintain water quality to improve oil recovery. Not using bactericides at this time, but will submit a MSDS for approval for any used in the future. Additives include Scale inhibitor and THDS (Cleaner).

Temperature of injected fluid: (°F) AMBIENT

10) FILTERS (IF ANY)

ANTHRACITE COAL FILTERS

11) SPECIFICATIONS FOR CATHODIC PROTECTION AND OTHER CORROSION CONTROL

NONE

# APPENDIX A (cont.)

2407

12. Casing and Tubing Program

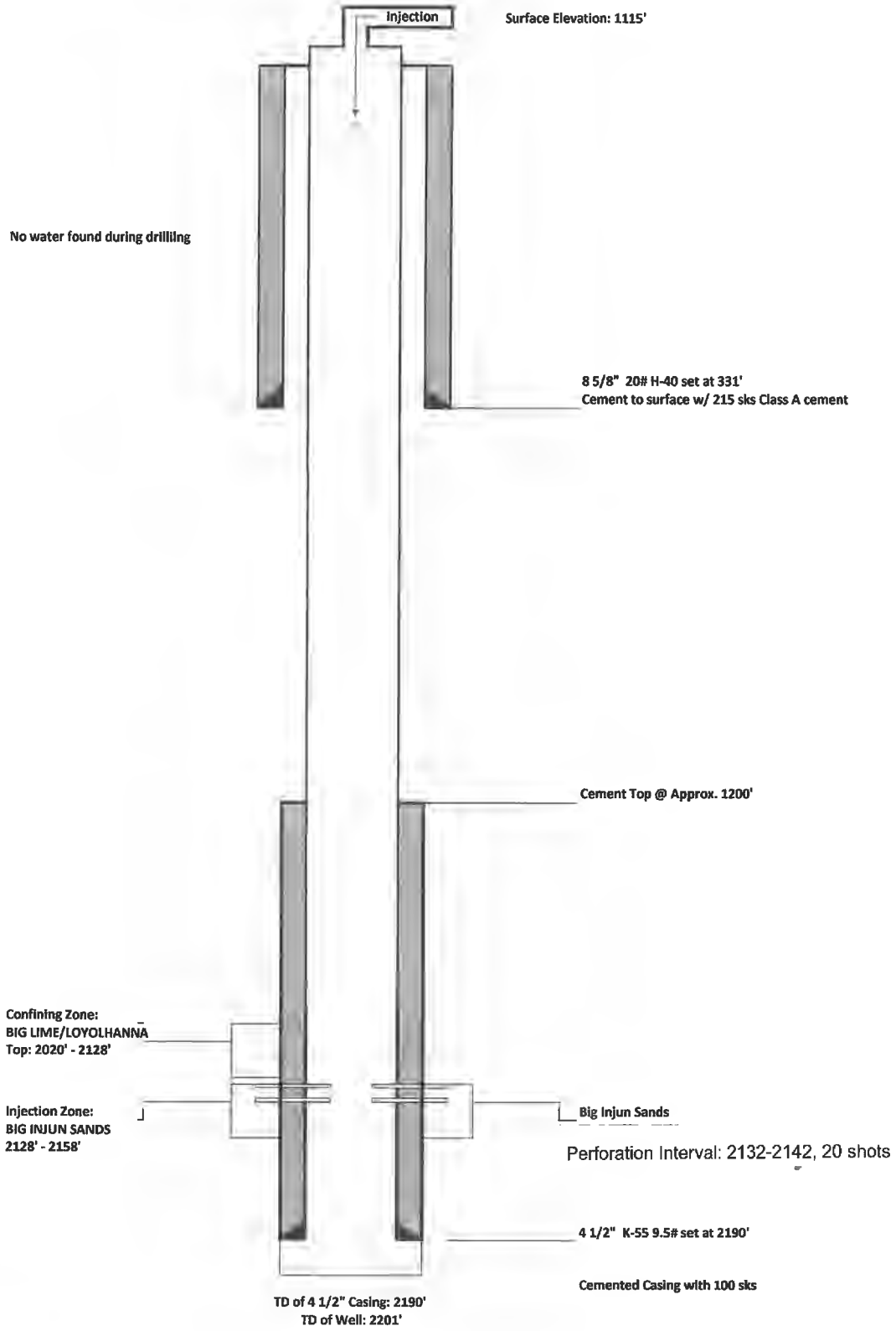
| TYPE | Size | New or Used | Grade | Weight per ft. (lb/ft) | FOOTAGE: For Drilling | INTERVALS: Left in Well | CEMENT: Fill-up (Cu. Ft.) |
|---|---|---|---|---|---|---|---|
| Conductor | | | | | | | |
| Fresh Water | 8 5/8" | | H-40 | 20# | 331' | 331' | 215sks CTS |
| Coal | | | | | | | |
| Intermediate 1 | | | | | | | |
| Intermediate 2 | | | | | | | |
| Production | 4 1/2" | | K-55 | 9.5# | 2190' | 2190' | 100sks |
| Tubing | NONE | | | | | | |
| Liners | | | | | | | |

| TYPE | Wellbore Diameter | Casing Size | Wall Thickness | Burst Pressure | Cement Type | Cement Yield (cu. ft./sk) | Cement to Surface ? (Y or N) |
|---|---|---|---|---|---|---|---|
| Conductor | | | | | | | |
| Fresh Water | | | | | | | |
| Coal | | | | | | | |
| Intermediate 1 | | | | | | | |
| Intermediate 2 | | | | | | | |
| Production | | | | | | | |
| Tubing | | | | | | | |
| Liners | | | | | | | |

| PACKERS | Packer #1 | Packer #2 | Packer #3 | Packer #4 |
|---|---|---|---|---|
| Kind: | NONE | | | |
| Sizes: | | | | |
| Depths Set: | | | | |

# WELL SCHEMATIC

**Tallman 57**
**API 47-087-2407**



INJECTOR 2407

OG-10
Rev. - 9-71

RECEIVED
FEB 27 1979
OIL & GAS DIVISION
DEPT. OF MINES

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES
# Oil and Gas Division
# WELL RECORD

Quadrangle Tariff 7.5' 634 7900.5

Permit No. Roa-2407 1200 W

Rotary X Oil ____
Cable ____ Gas ____
Recycling ____ Comb. ____
Water Flood X Storage ____
Disposal ____ (Kind)

Company Pennzoil Company 648
Address P. O. Box 1588, Parkersburg, WV 26101
Farm P. A. Tallman Acres 2350
Location (waters) Trace Fork
Well No. 57 Elev. 1115.11'
District Smithfield 5 County Roane
The surface of tract is owned in fee by
Roscoe Jarvis
Address Left Hand, WV 25251
Mineral rights are owned by Anna Lee Collins
Address 1009 Main St., Point Pleasant, WV
Drilling Commenced July 29, 1978
Drilling Completed August 3, 1978
Initial open flow ____ cu. ft. ____ bbls.
Final production ____ cu. ft. per day ____ bbls.
Well open ____ hrs. before test ____ RP.

| Casing and Tubing | Used in Drilling | Left in Well | Cement fill up Cu. ft. (Sks.) |
|---|---|---|---|
| Size 20-16 Cond. | | | |
| 13-10" | | | |
| 9 5/8 | | | |
| 8 5/8 | 331 | 331 | 215 sks. |
| 7 | | | |
| 6 1/2 | | | |
| 4 1/2 | 2190 | 2190 | 100 sks. |
| 3 | | | |
| 2 | | | |
| Liners Used | | | |

Attach copy of cementing record.

Well treatment details:
Fractured 10-23-78 w/161BW, 1200# 20/40 sd., 350 Gal. 15% HCL
Water Injection Well

Coal was encountered at ____ Feet ____ Inches
Fresh water ____ Feet ____ Salt Water ____ Feet ____
Producing Sand Big Injun Depth ____

| Formation | Color | Hard or Soft | Top Feet | Bottom Feet | Oil, Gas or Water | * Remarks |
|---|---|---|---|---|---|---|
| Shale & Silt | | | 0 | 92 | | |
| Sand | | | 92 | 114 | | |
| Shale | | | 114 | 150 | | |
| Sand | | | 150 | 166 | | |
| Shale | | | 166 | 306 | | |
| Sand | | | 306 | 332 | | |
| Shale | | | 332 | 436 | | |
| Siltstone | | | 436 | 448 | | |
| Shale | | | 448 | 482 | | |
| Sand | | | 482 | 520 | | |
| Shale | | | 520 | 756 | | |
| Sand | | | 756 | 892 | | |
| Shale | | | 892 | 974 | | |
| Sand | | | 974 | 990 | | |
| Shale | | | 990 | 1002 | | |
| Sand | | | 1002 | 1042 | | |
| Siltstone | | | 1042 | 1098 | | |
| Shale | | | 1098 | 1138 | | |
| Sand | | | 1138 | 1158 | | |
| Shale | | | 1158 | 1252 | | |
| Siltstone | | | 1252 | 1390 | | |
| Shale | | | 1390 | 1346 | | |
| Siltstone | | | 1346 | 1366 | | |
| Shale | | | 1366 | 1526 | | |

(over)

* Indicates Electric Log tops in the remarks section.

INTERP 2 407

| Formation | Color | Hard or Soft | Top Feet | Bottom Feet | Oil, Gas, or Water | Remarks |
|---|---|---|---|---|---|---|
| Sand | | | 1526 | 1540 | | |
| Shale | | | 1540 | 1640 | | |
| Sand | | | 1640 | 1772 | | |
| Shale & Silts | | | 1772 | 1788 | | |
| Siltstone | | | 1788 | 1816 | | |
| Shale & Silts | | | 1816 | 1830 | | |
| Sand | | | 1830 | 1968 | | |
| Little Lime | | | 1968 | 2003 | | |
| Blue Monday | | | 2003 | 2007 | | |
| Pencil Cave | | | 2007 | 2020 | | |
| Big Lime | | | 2020 | 2058 | | |
| Loyalhanna | | | 2058 | 2128 | | |
| Big Injun | | | 2128 | 2158 | | |
| Shale | | | 2158 | 2201 | | |
| Total Depth | | | | 2201 | | |

Date February 26, 79

APPROVED PENNZOIL COMPANY Owner

By [signature]

RECEIVED
APR 15 1981
OIL & GAS DIVISION
DEPT. OF MINES

FORM IV-37
(Obverse)
(08-78)

Date: March 17, 1981
Operator's Well No. P. A. Tallman 57
API Well No. 47 - 087 - 2407 - L1
State County Permit

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES, OIL AND GAS DIVISION

PRE-OPERATION CERTIFICATE
FOR LIQUID INJECTION OR WASTE DISPOSAL WELL

WELL OPERATOR Pennzoil Company
Address P. O. Box 1588
Parkersburg, WV 26101

DESIGNATED AGENT James A. Crews
Address P. O. Box 1588
Parkersburg, WV 26101

GEOLOGICAL TARGET FORMATION Big Injun Depth 2128 feet(top) to 2158 feet(bottom)

Virgin reservoir pressure in target formation 80 psig E-Log 2132-2152

Source of information on virgin reservoir pressure data taken in comparable fields

Perforation intervals 2142-2152 Open-hole intervals

MAXIMUM PROPOSED INJECTION OPERATIONS

Volume per hour: 10 BBl/Hr. Bottom hole pressure: 1900 psig

DETAILED IDENTIFICATION OF MATERIALS TO BE INJECTED

Liquids to be injected for oil recovery under Code § 22-6-10a: Fresh Water

Wastes to be disposed of: Produced water form waterflood operations to be re-injected

Additives (slurry mediums, inhibitors, solvents, oxidizers, deoxidizers, etc.): Bactericide

SPECIFICATIONS FOR CATHODIC PROTECTION AND OTHER CORROSION CONTROL

FILTERS (IF ANY) In-line cartridge filter at injection plant and strainer on wellhead

ADDITIONAL DRILLING AS PART OF THE CONVERSION

*(Complete and submit Form IV-35, "Well Operator's Report of Drilling, Fracturing and/or Stimulating or Physical Change".)*

DETAILS ON NEW CASING AND TUBING PROGRAM AS PART OF THE CONVERSION:

*(To be completed below unless the new casing and tubing program is described on a Form IV-35, "Well Operator's Report of Drilling, Fracturing and/or Stimulating or Physical Change", submitted in connection with the permit to which this Form IV-37 pre-operation certificate relates.)*

| CASING OR TUBING TYPE | SPECIFICATIONS Size | Grade | Weight per ft | New | Used | FOOTAGE INTERVALS For drilling | Left in well | CEMENT FILL-UP OR SACKS (Cubic feet) | PACKERS |
|---|---|---|---|---|---|---|---|---|---|
| Conductor | | | | | | | | | Kinds |
| Fresh water | | | | | | | | | |
| Coal | | | | | | | | | Sizes |
| Intermediate | | | | | | | | | |
| Production | | | | | | | | | Depths set |
| Tubing | | | | | | | | | |
| Liners | | | | | | | | | Perforations: |
| | | | | | | | | | Top Bottom |
| | | | | | | | | | |

(Continue on reverse side)

FORM IV-37
(Reverse)

(03-81)

MECHANICAL INTEGRITY TEST

Test method:

The undersigned certifies that the test above was made on _____, 19____, and demonstrated the mechanical integrity of the well. The above test will be performed again within ninety (90) days of five years from this date and certified to the office.

FACILITIES OR SYSTEMS TO PROTECT THE INTEGRITY OF THE GEOLOGICAL TARGET FORMATION FRACTURING THE CONFINING STRATA

APPLICATION FOR VARIANCE (IF ANY) FROM REGULATION 9-01(a)
(Specify purpose, necessity, and justification)

APRIL 23, 1981

David W. Robinson, Chief, Water Resources Division has filed no objections to the issuance of the application and the Office of Oil and Gas therefore approves as described in 22-4-2g of the statute.

Thomas E. Huzzey

Thomas E. Huzzey, Administrator

Well Operator

By:

Its Pennzoil Company
Well Operator

By Curtis L. Lewis

Its Supervisor, Surveying & Mapping

2407

# Basin Surveys, Inc.

## COMPENSATED DENSITY LOG

FILING NO.
PERMIT # ROA-2407
47-087

COMPANY: PENNZOIL COMPANY
WELL: P.A. TALLMAN # 57
FIELD: SMITHFIELD
COUNTY: ROANE STATE: W.VA.

LOCATION: TRACE FORK QUAD: TARIFF ROAD 7 1/2'
SEC. TWP. RGE.

OTHER SERVICES:

Permanent Datum: GROUND LEVEL ; Elev.: 1115.11
Log Measured From K.B. 10 Ft. Above Perm. Datum
Drilling Measured From K.B.

Elev.: K.B. 1125.11
D.F. 1124.11
G.L. 1115.11

| | |
|---|---|
| Date | 8-2-78 |
| Run No. | ONE |
| Type Log | GR/COMP DEN/CAL |
| Depth—Driller | 2205' |
| Depth—Logger | 2201' |
| Bottom logged interval | 2200' |
| Top logged interval | 0' |
| Type fluid in hole | GEL |
| Salinity, PPM Cl. | |
| Density | |
| Level | |
| Max rec. temp., deg F. | |
| Operating rig time | 3 HRS. |
| Recorded by | FLANAGAN |
| Witnessed by | MR. TOOMEY |

| Run No. | Bore Hole Record Bit | From | To | Casing Record Size | Wgt. | From | To |
|---|---|---|---|---|---|---|---|
| | 7 7/8" | 342' | 1780' | 8 5/8" | | SURF. | 342' |
| | 6 3/4" | 1780' | T.D. | | | | |

THIS HEADING AND LOG CONFORMS TO API RP 33

Equipment Data

| Run No. | Tool No. | Source No. | Panel No. | Logging Unit | Location |
|---|---|---|---|---|---|
| ONE | NCD-CC-23 | A-876 | | 177 | CHARLESTON, W.VA. |

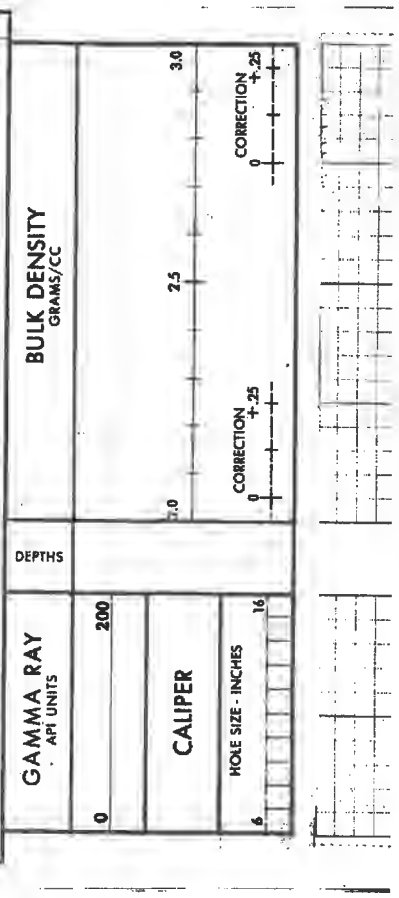
Calibration Data

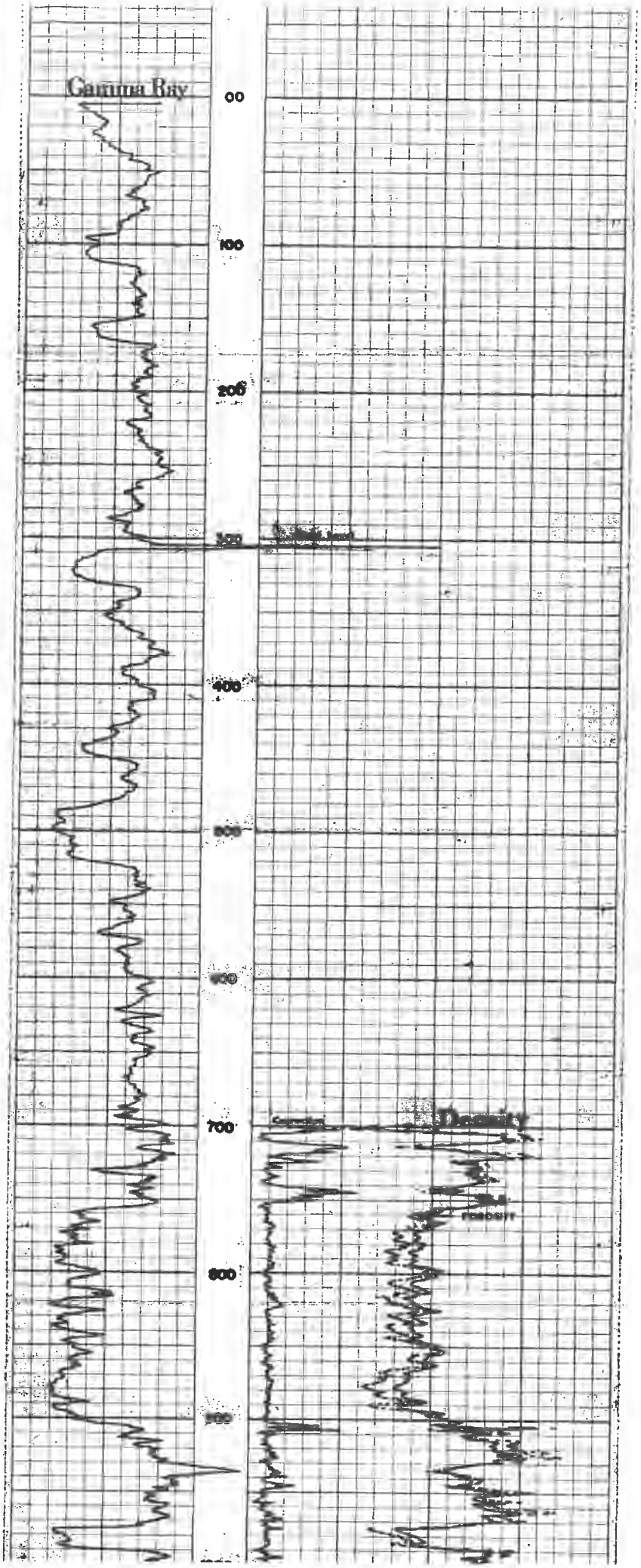
| Run No. | Gamma Ray API Scale | Background CPS | Std. CPS | Dn CPS AT | CPT Dn CPS AT | | |
|---|---|---|---|---|---|---|---|
| ONE | 0-200 | | 2.0 | 3.0 | 2.0 | 3.0 | 166 |
| | | | | 1021 | 1021 | 1021 | |

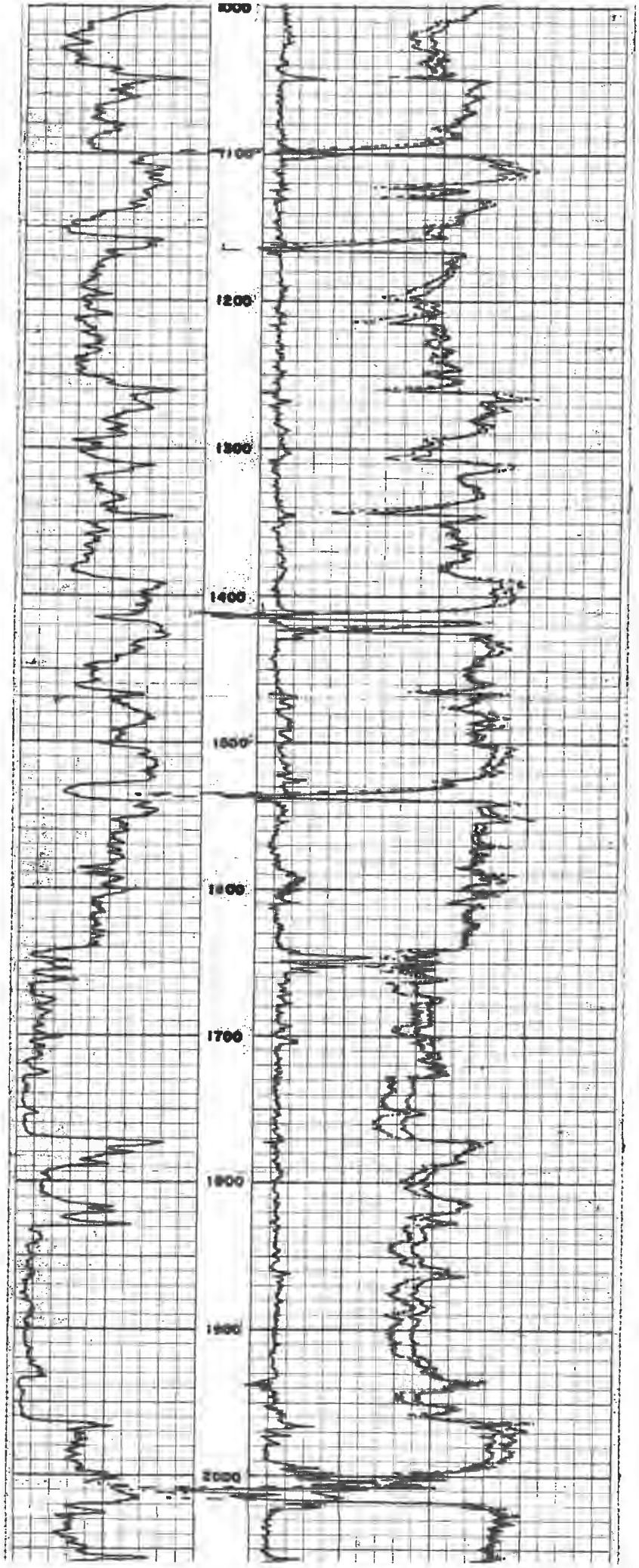
Logging Data

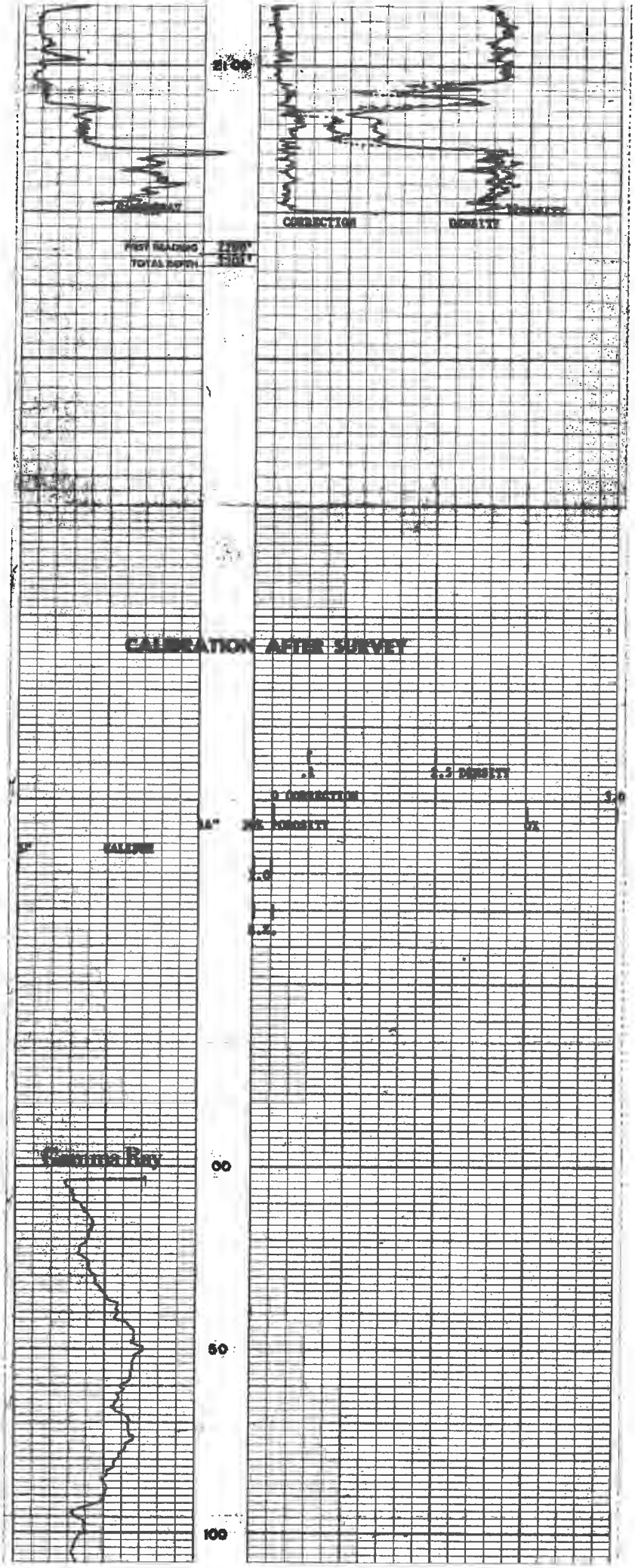
| Run No. | Depth From | To | Speed Ft/Min | GR TC |
|---|---|---|---|---|
| ONE | SURF. | T.D. | 33 | 3 |

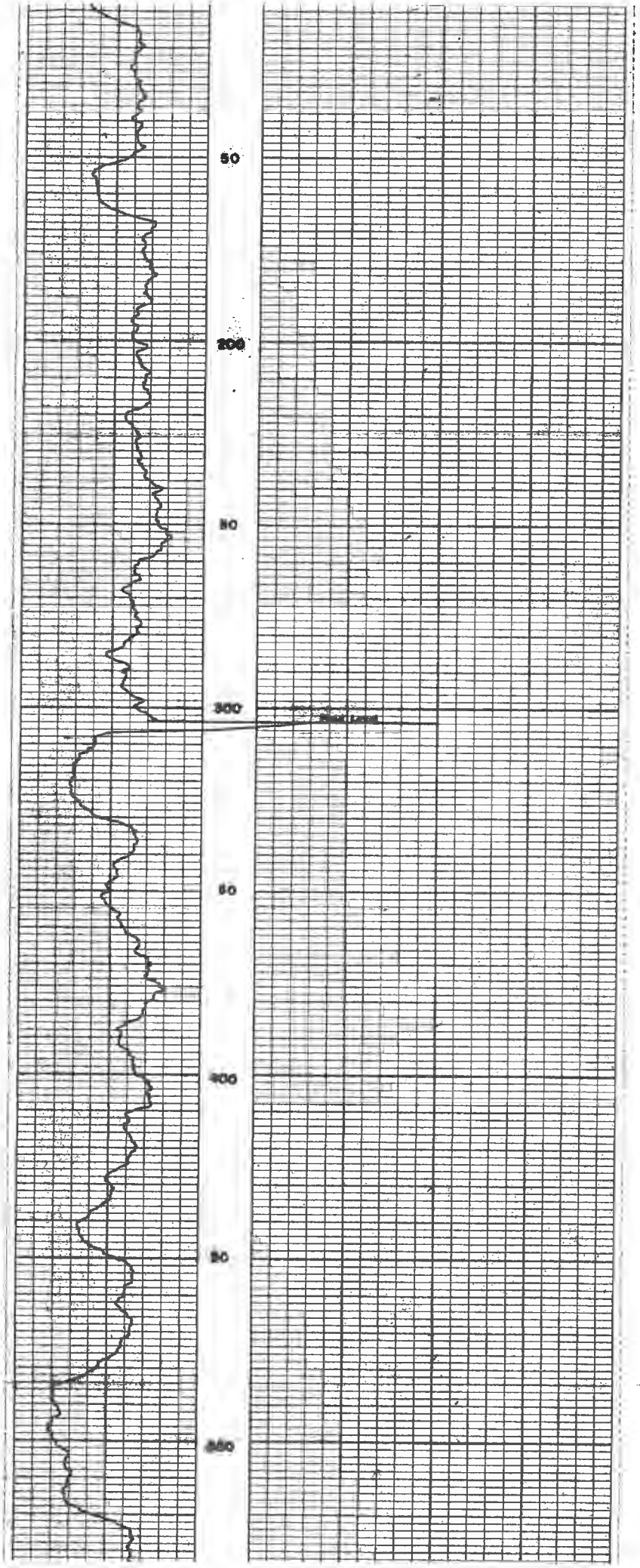
Remarks:

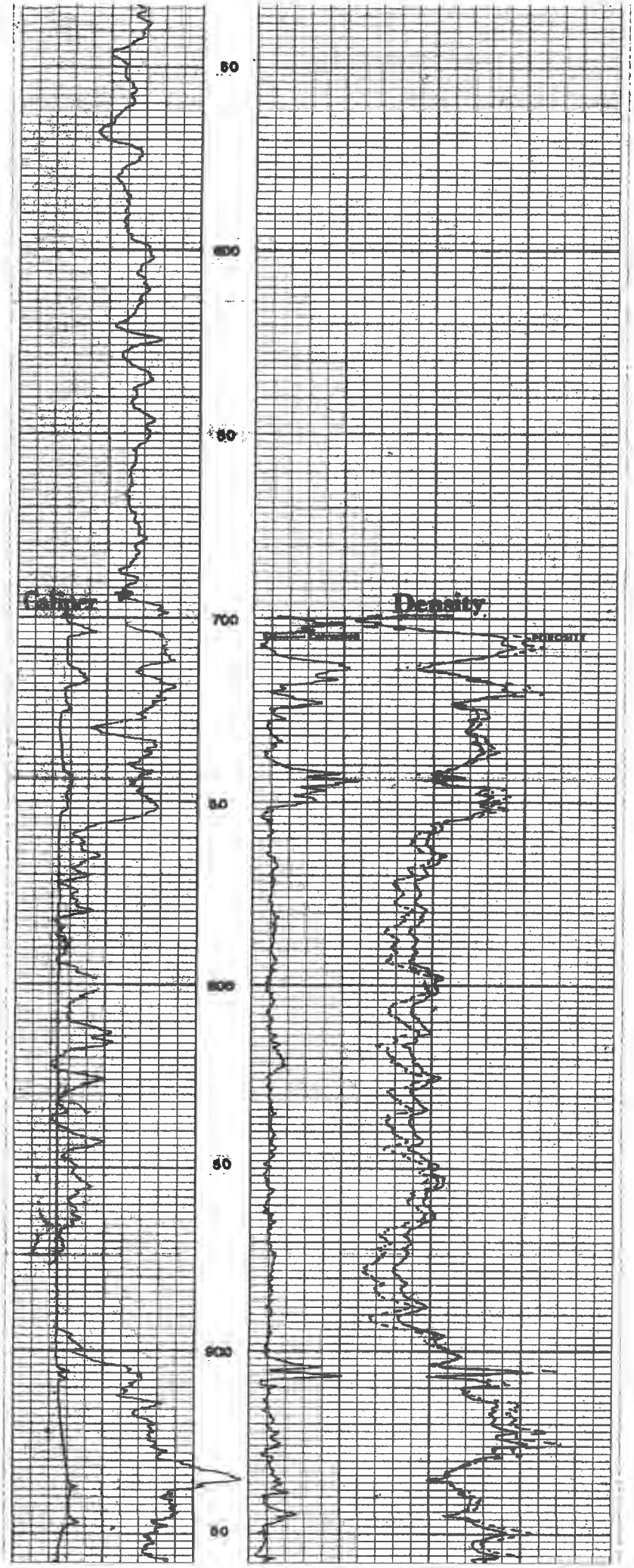


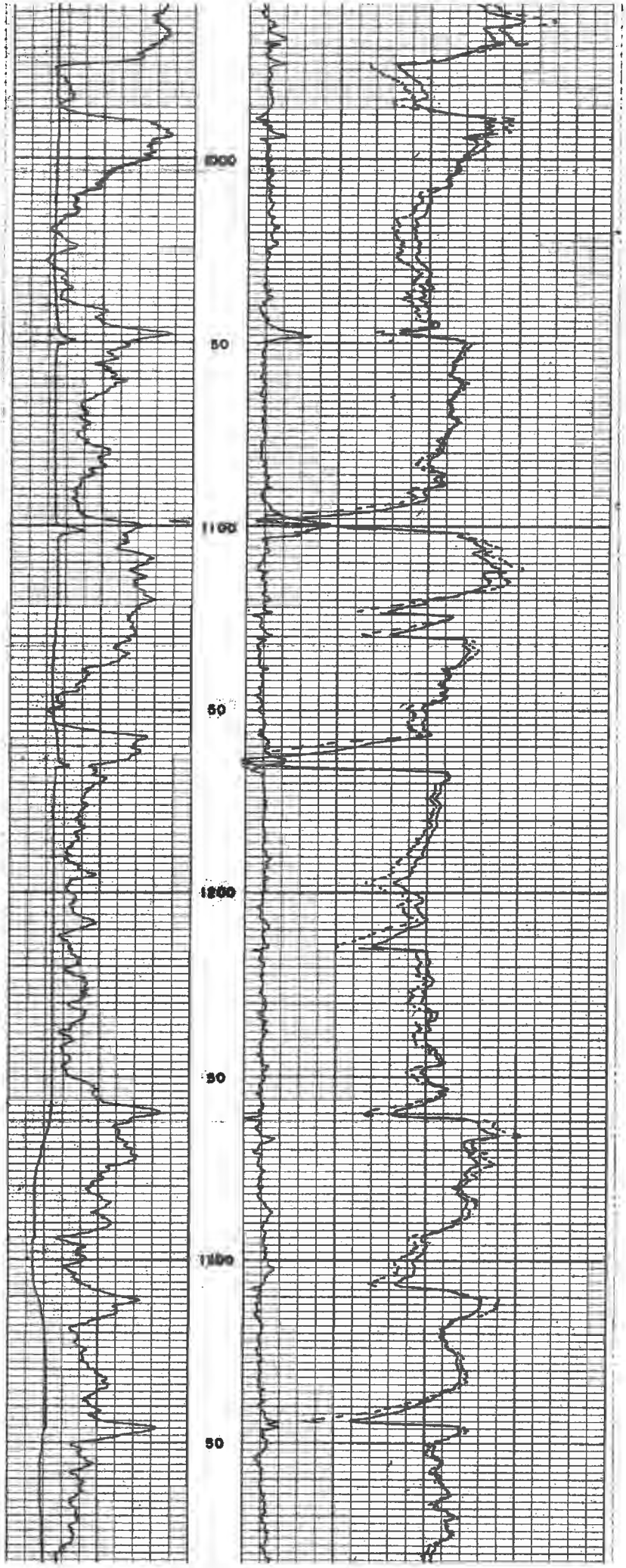

Gamma Ray
00
100
200
300
400
500
600
700
800
900

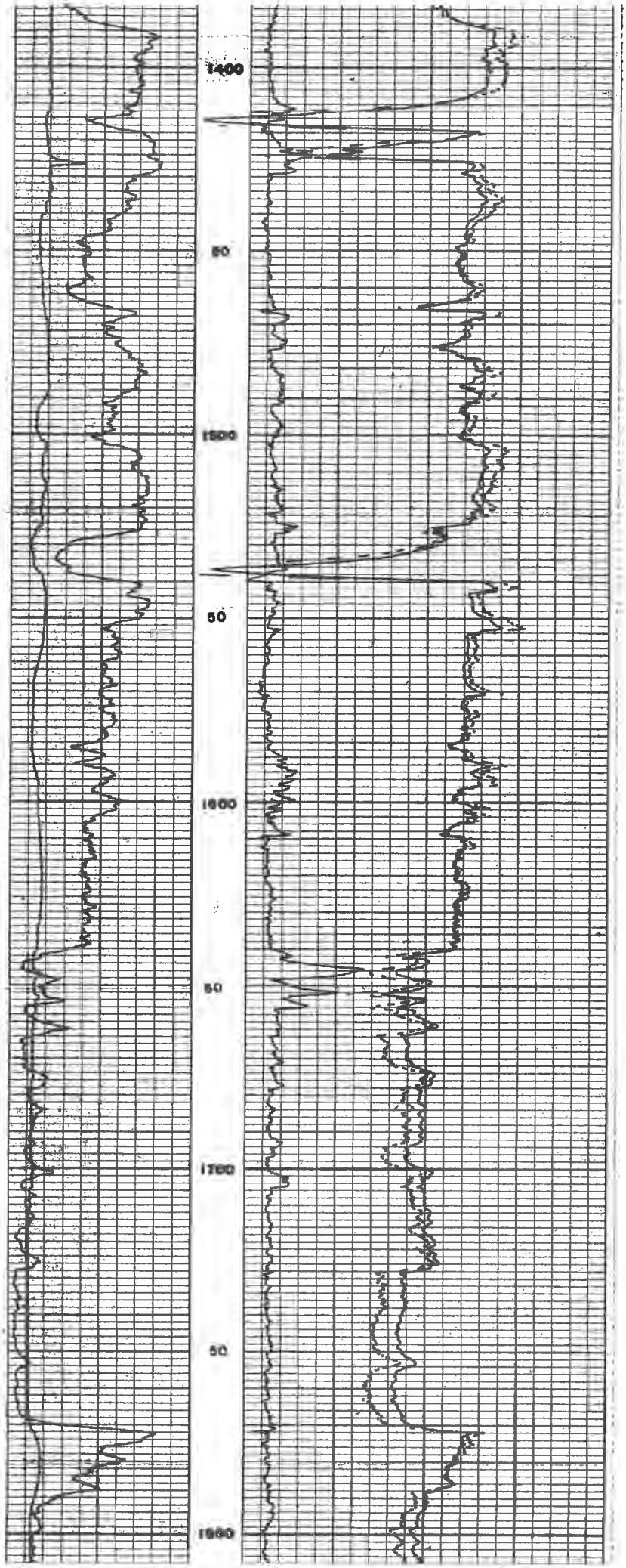

1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000

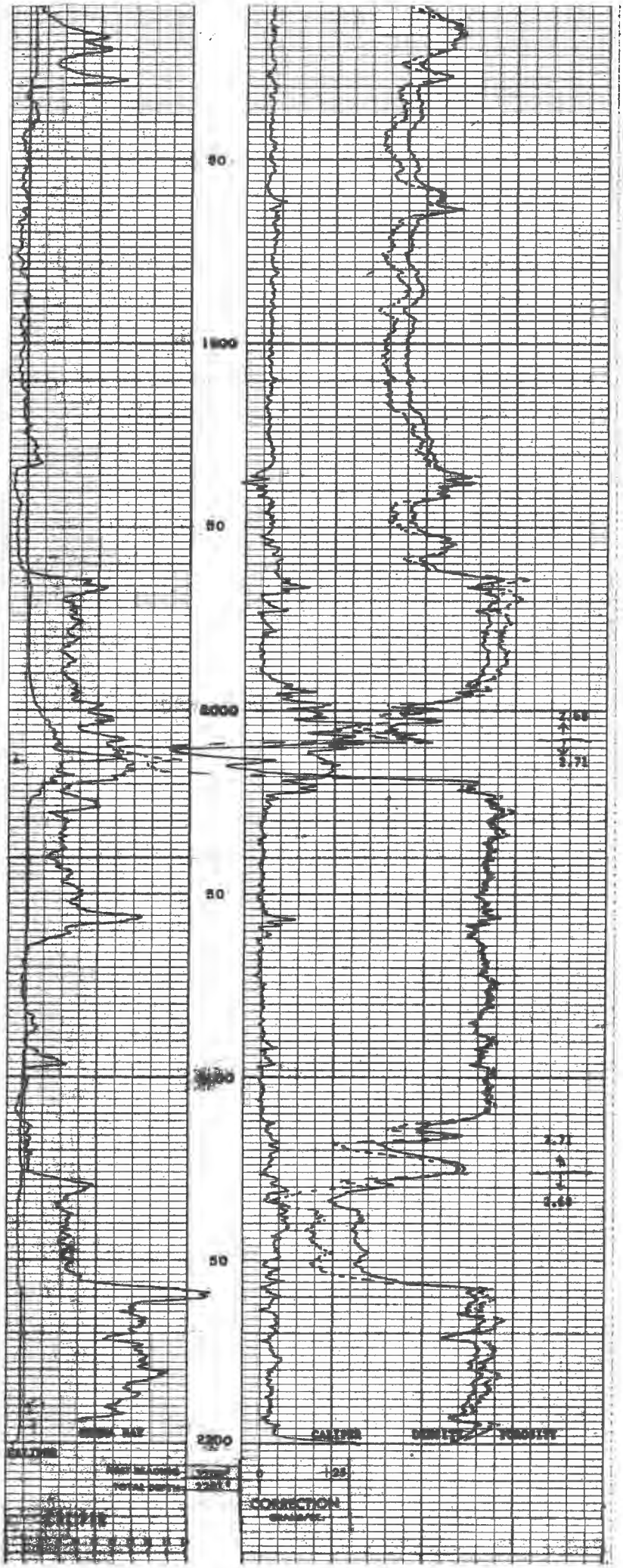

21'00
CORRECTION
DENSITY
FIRST READING
TOTAL DEPTH
CALIBRATION AFTER SURVEY
.5
2.5 DENSITY
0 CORRECTION
3.0
14"
DENSITY
0%
CALIPER
2.0
2.5
Gamma Ray
00
50
100

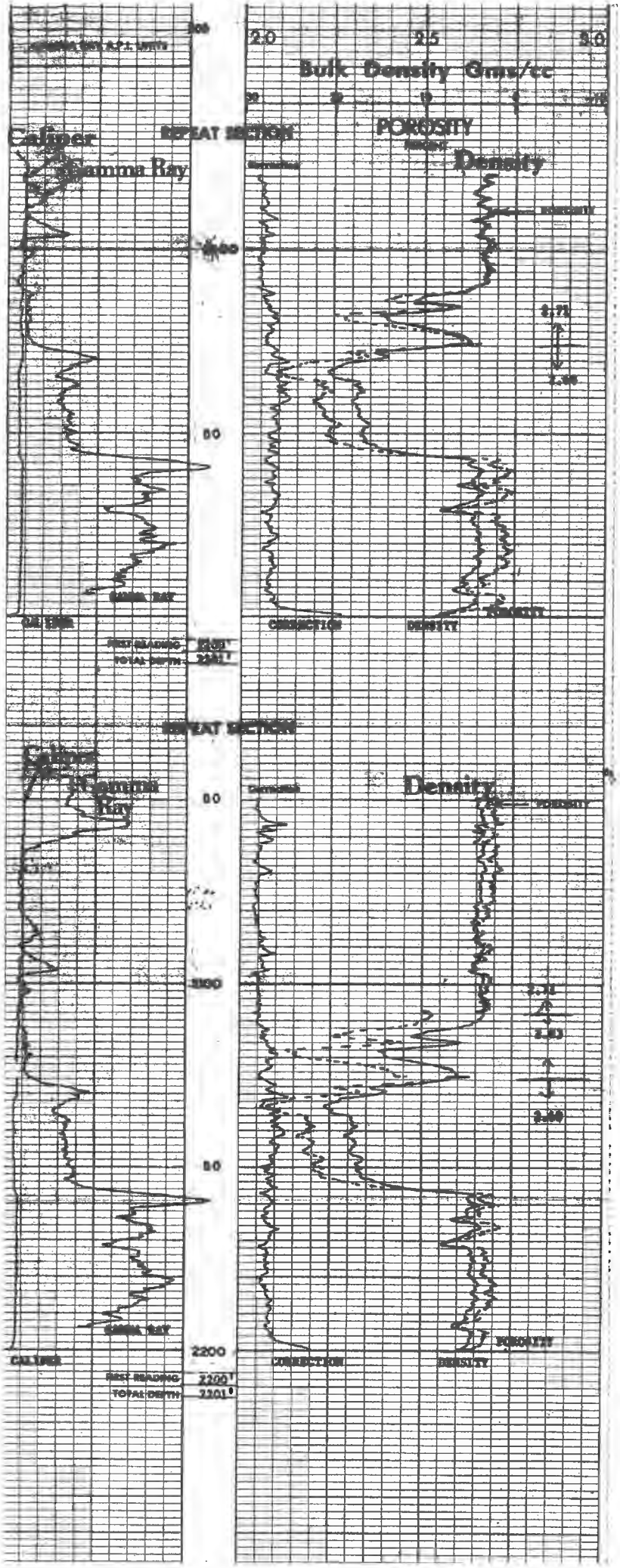

50
200
50
300
50
400
50
500

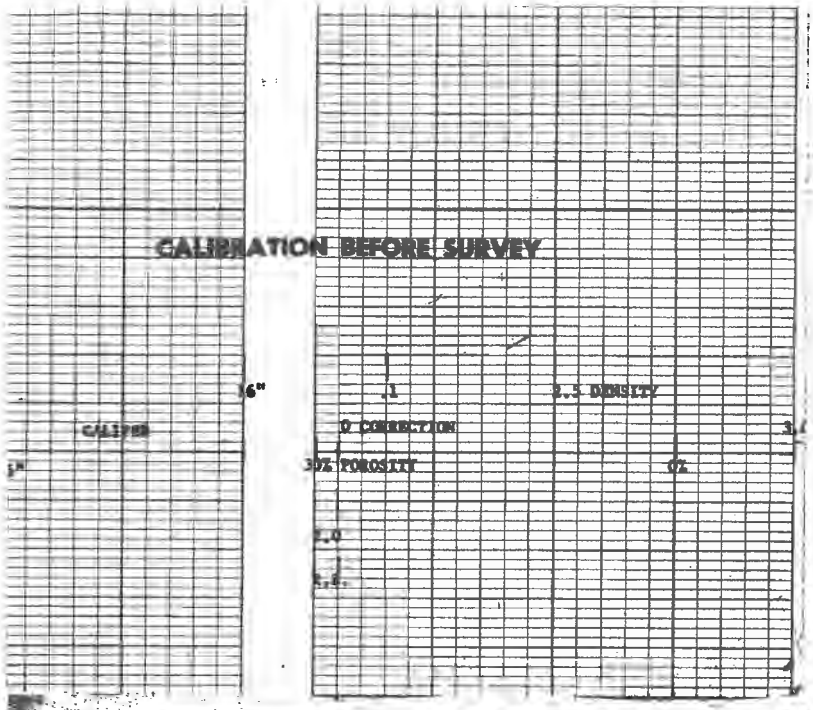

Caliper
Density
700


1000
50
1100
50
1200
50
1300
50


1400
50
1500
50
1600
50
1700
50
1800


50
1900
50
2000
50
2100
50
2200
CALIPER
CORRECTION


2.0
2.5
3.0
Bulk Density Gms/cc
POROSITY
Caliper
Gamma Ray
Density
REPEAT SECTION
CALIPER
GAMMA RAY
CORRECTION
DENSITY
POROSITY
FIRST READING
TOTAL DEPTH
2200
2201




| GAMMA RAY API UNITS | DEPTHS | BULK DENSITY GRAMS/CC |
|---|---|---|
| 0 — 200 | | 1.0 — 2.5 — 3.0 |
| CALIPER | | |
| HOLE SIZE - INCHES 6 — 16 | | CORRECTION 0 — +.25 |

COMPANY [redacted]

WELL P.A. [redacted] # 57

FIELD [redacted] STATE W.VA.

SEQ: COUNTY [redacted]

6-2-78

Log FR 2200'
Log TD 2201'
DRLR TD 2205'
Elev.
DF 1124.11'
KB 1125.11'
GL 1115.11'

2407

ROA 2407

# Basin Surveys, Inc

PERFORATION DEPTH CONTROL

FILING NO.

PERMIT# ROA-2407

COMPANY PENNZOIL COMPANY

WELL P.A. TALLMAN #57

FIELD SMITHFIELD

COUNTY ROANE STATE W. VA.

LOCATION:

TRACE FORK QUAD: TARIFF ROAD 7½'

SEC. _____ TWP. _____ RGE. _____

OTHER LOGS:

PERMANENT DATUM GROUND LEVEL ELEV. 1115.11

LOG MEASURED FROM KB 10' APD

DRILLING MEASURED FROM KB

ELEVATIONS:

KB. 1125.11'

DF. 1124.11'

GL. 1115.11'

| | | | |
|---|---|---|---|
| DATE | 10-20-78 | | |
| RUN NO. | ONE | | |
| TYPE LOG | GR-CCL | | |
| DEPTH - DRILLER | 2205' | | |
| DEPTH - LOGGER | 2165' | | |
| BOTTOM LOGGED INTERVAL | 2161' | | |
| TOP LOGGED INTERVAL | 1200' | | |
| TYPE FLUID IN HOLE | NONE | | |
| SALINITY PPM CL. | | | |
| DENSITY LB./GAL. | | | |
| LEVEL | ------ | | |
| MAX. REC. TEMP. - DEG. F | | | |
| OPR. RIG TIME | R. HAVERTY | | |
| RECORDED BY | MR. GEORGE | | |
| WITNESSED BY | | | |

| RUN NO. | BORE HOLE RECORD | | | CASING RECORD | | | |
|---|---|---|---|---|---|---|---|
| | BIT | FROM | TO | SIZE | WGT. | FROM | TO |
| ONE | 7 7/8" | 342' | 1780' | 8 5/8" | | SURFACE | 342' |
| | 6 3/4" | 1780' | TD | 4½" | | SURFACE | TD |

THIS HEADING AND LOG CONFORM TO API STANDARD PRACTICE RP-33 ®

## EQUIPMENT DATA

| GAMMA RAY | | | |
|---|---|---|---|
| RUN NO. | ONE | | |
| TOOL MODEL NO. | GRC#7 | | |
| DIAM. | 1.75" | | |
| DETECT. MODEL NO. | AD4 | | |
| TYPE | SCINT. | | |
| LENGTH | 3" | | |
| | | | |
| | | | |
| **GENERAL** | | | |
| HOIST TRUCK NO. | 207 | | |
| INST. TRUCK NO. | 207 | | |
| TOOL SERIAL NO. | | | |
| | | | |

| PERFORATIONS | | | |
|---|---|---|---|
| Type | To | From | No. Shots |
| CASE GUN | 2152' | 2142' | 20 |

## LOGGING DATA

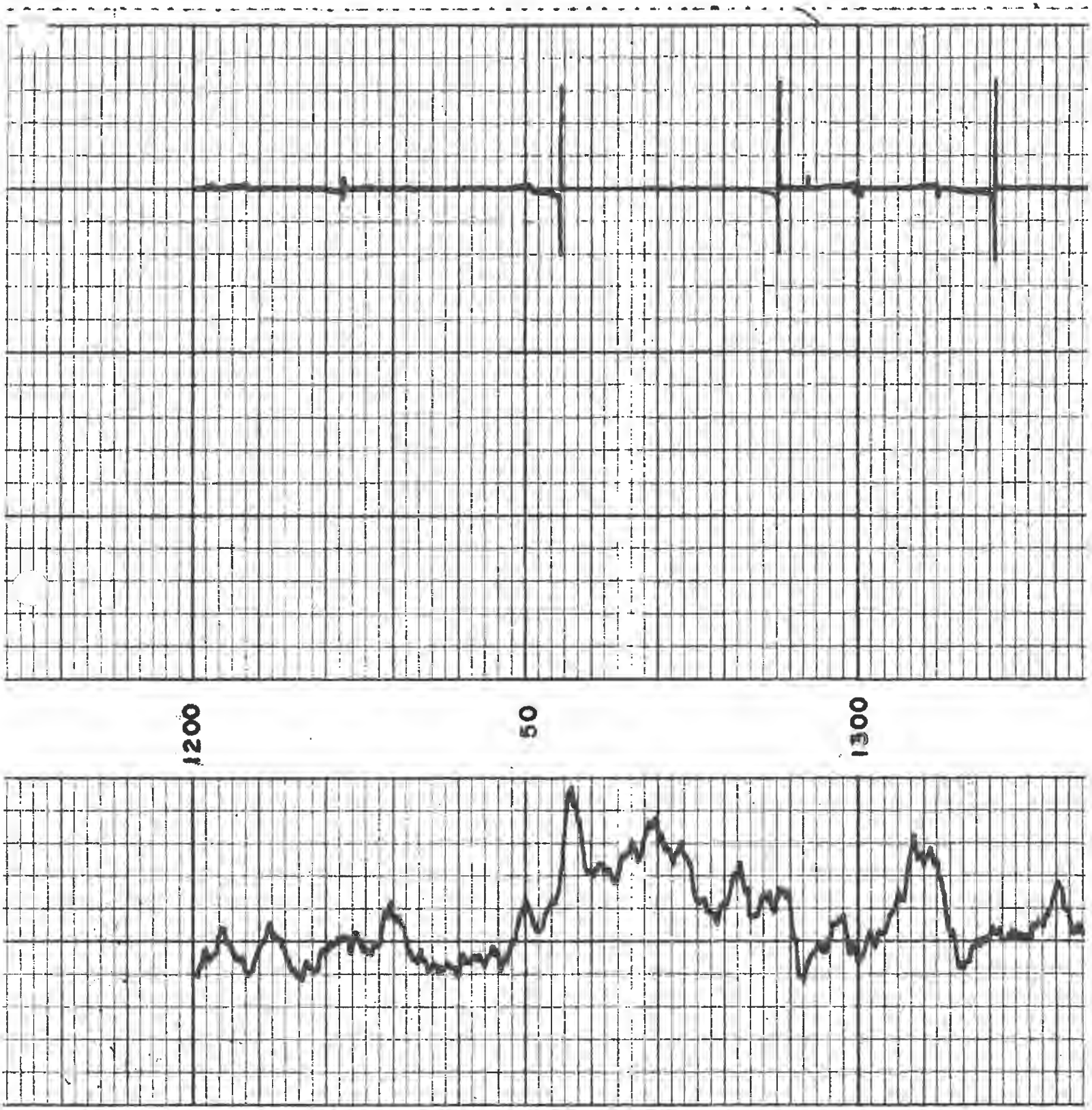
| GENERAL | | | | GAMMA RAY | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| RUN NO. | DEPTHS FROM | DEPTHS TO | SPEED FT/MIN | T.C. SEC. | SENS. SETTINGS | ZERO LOG DIV. | SCALE API G.R. UNITS | | | | |
| ONE | 2161' | 1200' | 30 | 3 | 90 | 0-T. | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

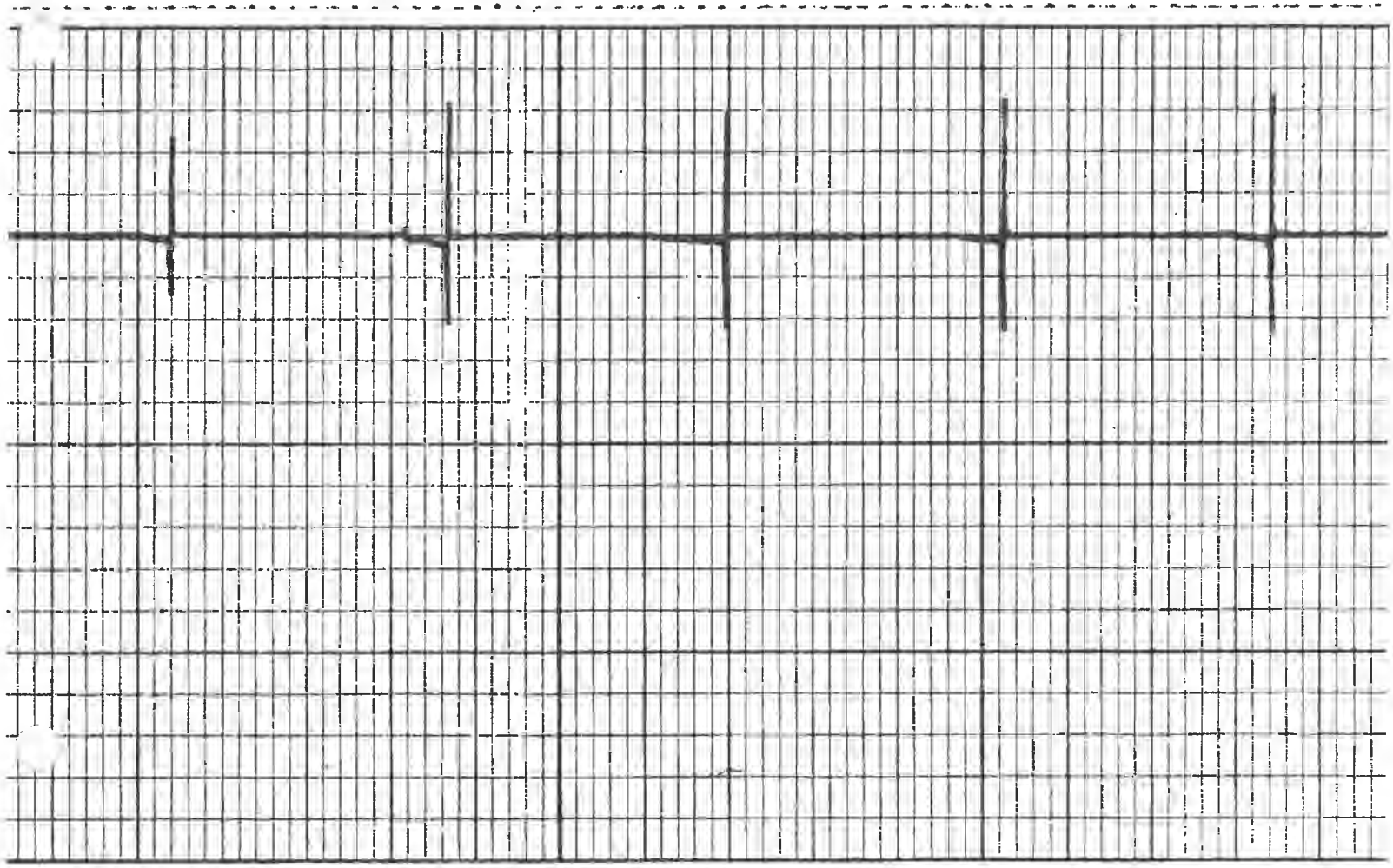
REFERENCE LITERATURE:

REMARKS:

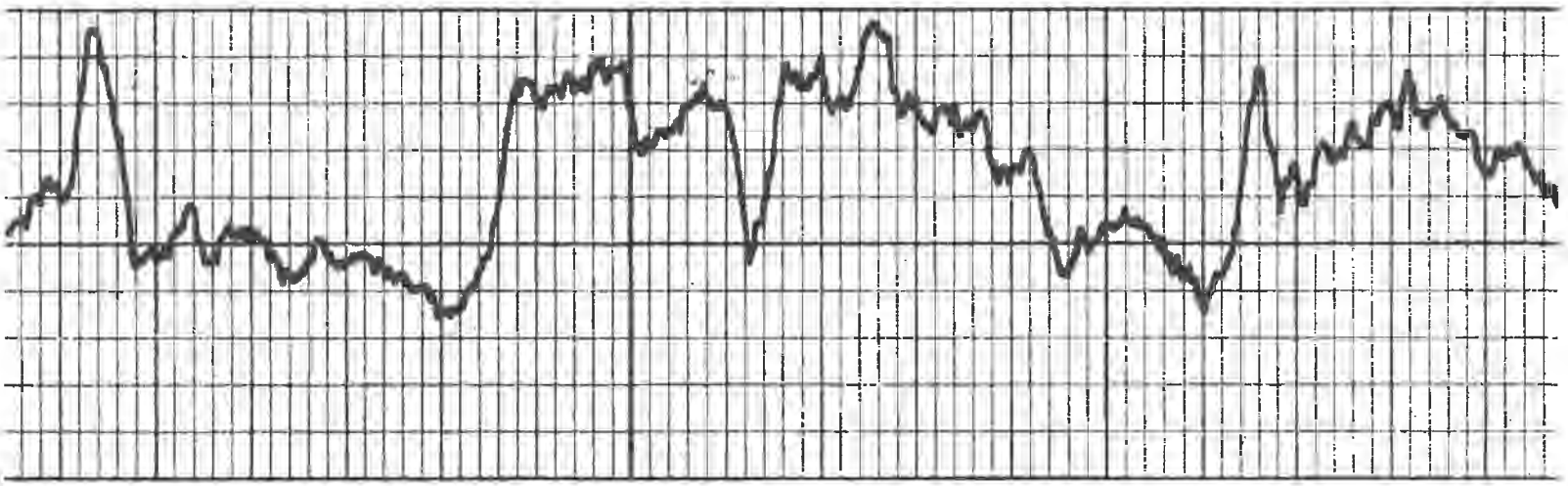
## GAMMA RAY

API GAMMA RAY UNITS

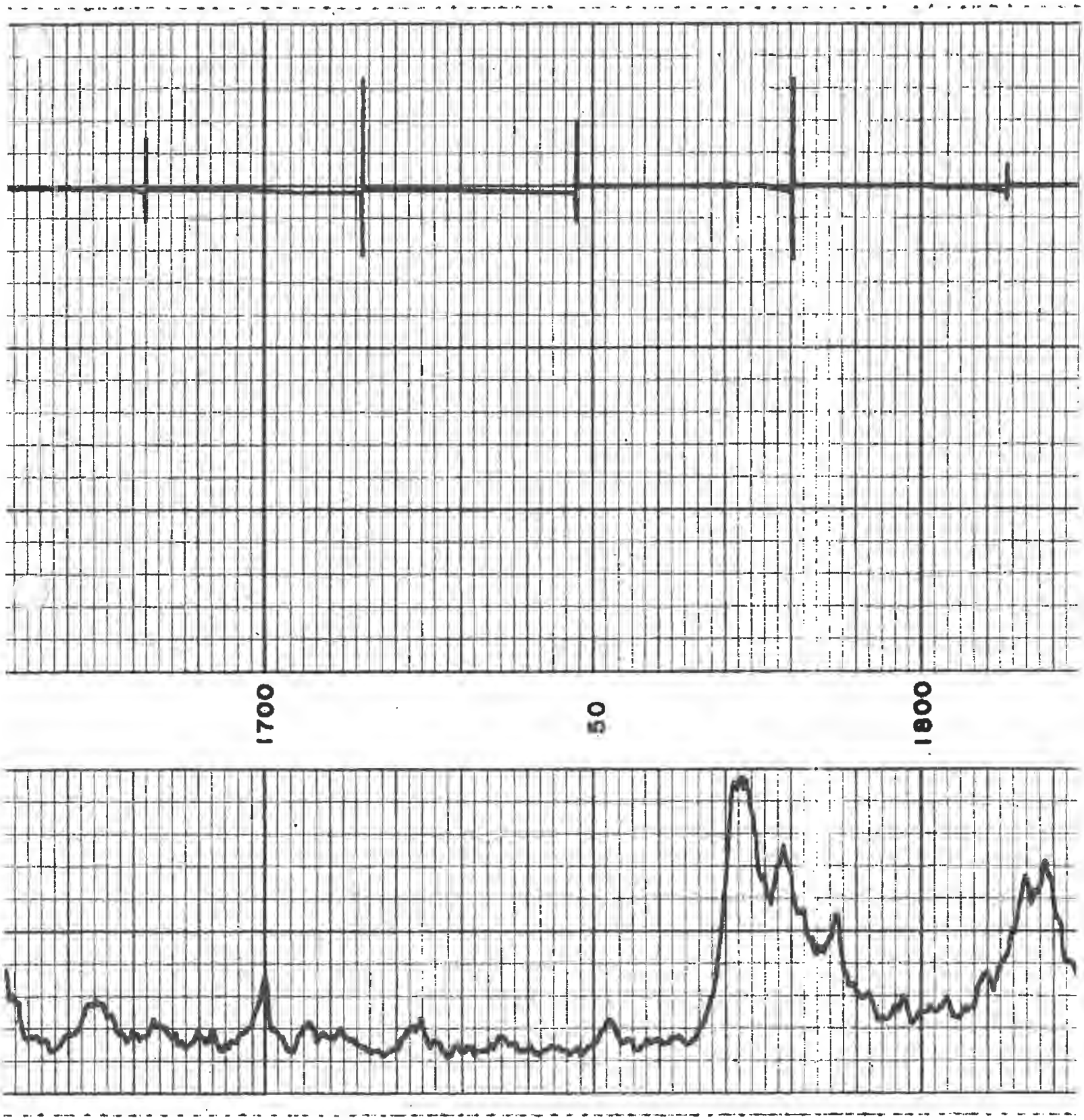

1200
50
1300

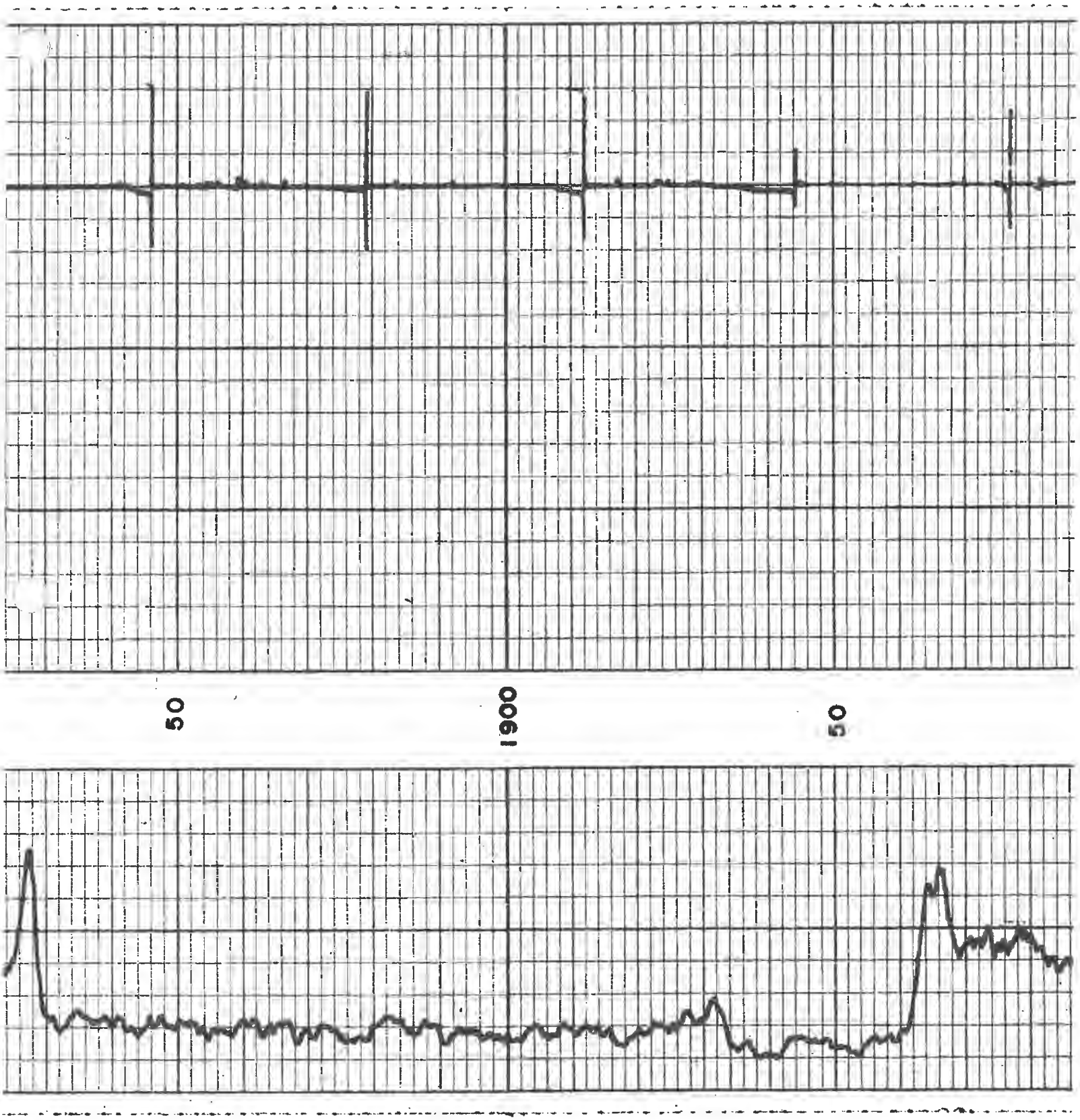


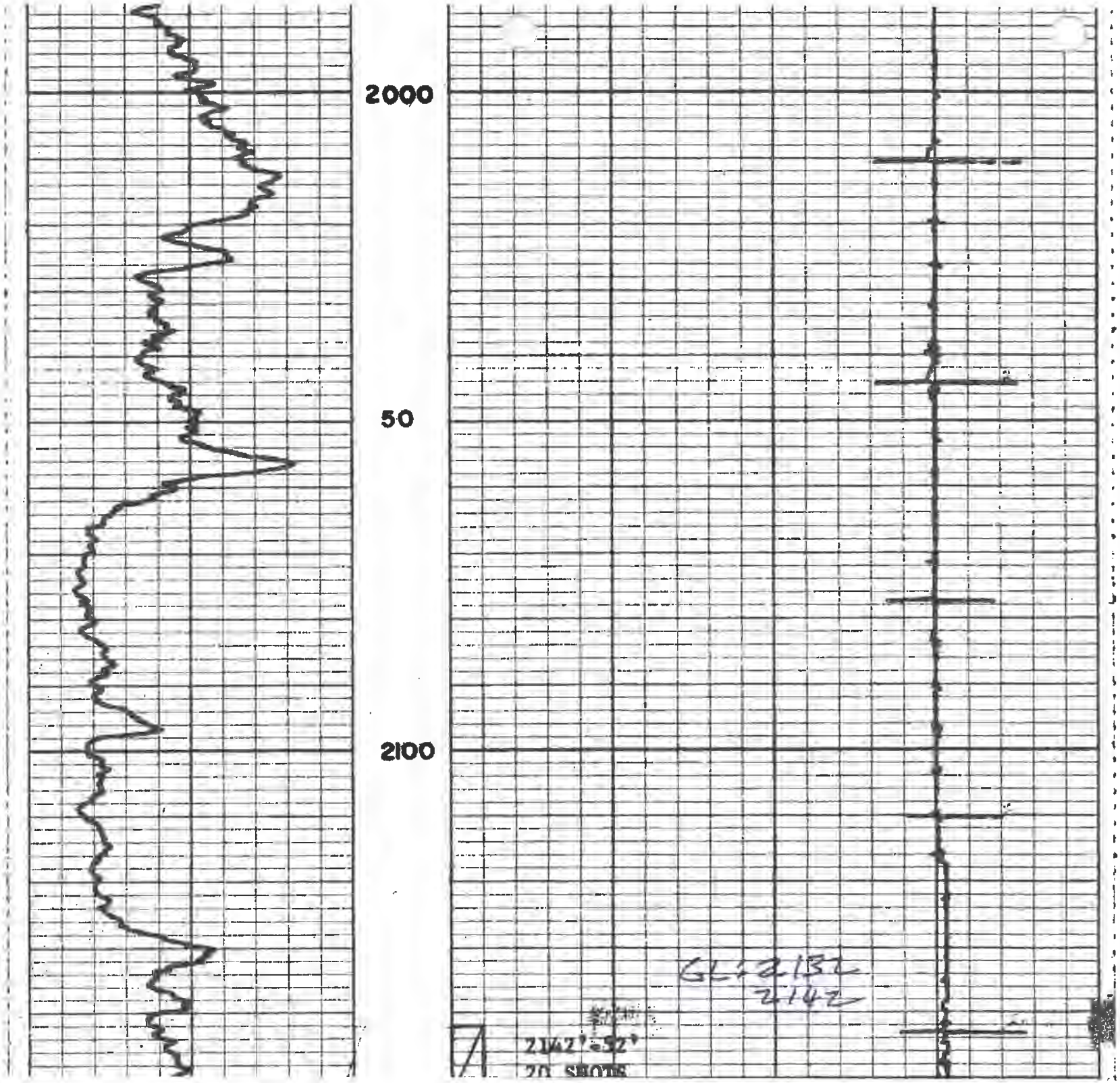
50 1400 50



1500
50
1600
50


1700
50
1800


50
1900
50


2000
50
2100
GL: 2137
2142
2142'-52'
20 SHOTS

GAMMA RAY

FIRST READING [illegible]
TOTAL DEPTH [illegible]

COL

PENNZOIL COMPANY
P.A. TALLMAN # 57
ROANE, W.VA.
GR/FDC 10-20-78
GR/C DEN/CAL 8-2-78

WVGES GEOLOGY UNDERLIES IT ALL
"Pipeline"

Select County: (087) Roane
Enter Permit #: 2408
Get Data | Reset

Select datatypes: (Check All)
Location | Production | Plugging
Owner/Completion | Stratigraphy | Sample
Pay/Show/Water | Logs | Btm Hole Loc

Table Descriptions
County Code Translations
Permit-Numbering Series
Usage Notes
Contact Information
Disclaimer
WVGES Main
"Pipeline-Plus" New

WV Geological & Economic Survey:

**Well: County = 87 Permit = 2408**

Report Time: Thursday, April 30, 2020 8:34:31 PM

Location Information: View Map

| API | COUNTY | PERMIT | TAX_DISTRICT | QUAD_75 | QUAD_15 | LAT_DD | LON_DD | UTME | UTMN |
|---|---|---|---|---|---|---|---|---|---|
| 4708702408 | Roane | 2408 | Smithfield | Tariff | Otter | 38.645915 | -81.214086 | 481369.9 | 4277506.4 |

There is no Bottom Hole Location data for this well

Owner Information:

| API | CMP_DT | SUFFIX | STATUS | SURFACE_OWNER | WELL_NUM | CO_NUM | LEASE | LEASE_NUM | MINERAL_OWN | OPERATOR_AT_COMPLETION | PROP_VD | PROP_TRGT_FM | TFM_EST_PR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702408 | 7/-/1978 | Original Loc | Completed | P A Tallman | | 58 | | | | Pennzoil Company | | | |

Completion Information:

| API | CMP_DT | SPUD_DT | ELEV | DATUM | FIELD | DEEPEST_FM | DEEPEST_FMT | INITIAL_CLASS | FINAL_CLASS | TYPE | RIG | CMP_MTHD | TVD | TMD | NEW_FTG | KOD | G_BEF | G_AFT | O_BEF | O_AFT | NGL_BEF | NGL_AFT | P_BEF | TI_BEF | P_AFT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702408 | 7/-/1978 | -/-/- | 1054 | Ground Level | Tariff Tlmn | Big Injun (Price&eq) | Big Injun (Price&eq) | Service Well | Unsuccessful | Water Injection | Rotary | Acid+Frac | 2195 | | 2195 | | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 |

Pay/Show/Water Information:

| API | CMP_DT | ACTIVITY | PRODUCT | SECTION | DEPTH_TOP | FM_TOP | DEPTH_BOT | FM_BOT | | G_BEF | G_AFT | O_BEF | O_AFT | WATER_QNTY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702408 | 7/-/1978 | Horizon | Injection | Vertical | | | 2195 | Big Injun | (Price&eq) | 0 | 0 | | | |

Production Gas Information: (Volumes in Mcf) * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_GAS | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702408 | Pennzoil Company | 1981 | 1,118 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702408 | Pennzoil Company | 1982 | 1,385 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702408 | Pennzoil Company | 1983 | 520 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702408 | Pennzoil Company | 1984 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702408 | Riddle, William Dye | 1985 | 971 | 101 | 171 | 92 | 54 | 84 | 42 | | 82 | 24 | 112 | 97 | 112 |
| 4708702408 | Starr, Paul F. | 1986 | 923 | 35 | 7 | 0 | 72 | 79 | 73 | 61 | 37 | 215 | 114 | 108 | 122 |
| 4708702408 | Starr, Paul F. | 1987 | 546 | 58 | 118 | 20 | 22 | 37 | 58 | 61 | 53 | 20 | 0 | 0 | 99 |
| 4708702408 | Riddle, William Dye | 1988 | 920 | 92 | 76 | 71 | 12 | 80 | 82 | 76 | 81 | 80 | 84 | 94 | 92 |
| 4708702408 | Starr, Paul F. | 1989 | 737 | 101 | 91 | 81 | 72 | 76 | 53 | 19 | 35 | 41 | 50 | 55 | 63 |
| 4708702408 | Pennzoil Products Company | 1989 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702408 | Riddle, William Dye | 1990 | 250 | 71 | 88 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 47 | 44 |
| 4708702408 | Pennzoil Products Company | 1990 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702408 | Riddle, William Dye | 1991 | 578 | 43 | 44 | 46 | 48 | 70 | 58 | 55 | 32 | 52 | 7 | 52 | 71 |
| 4708702408 | Pennzoil Products Company | 1991 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702408 | Pennzoil Products Company | 1992 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702408 | Riddle, William Dye | 1993 | 289 | 15 | 21 | 39 | 40 | 48 | 25 | 48 | 29 | 7 | 7 | 10 | |
| 4708702408 | Pennzoil Products Company | 1993 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702408 | Pennzoil Products Company | 1994 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702408 | Pennzoil Products Company | 1995 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702408 | Triad Resources, Inc. | 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702408 | Ground Resources, LLC | 2017 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702408 | Ground Resources LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Production Oil Information: (Volumes in Bbl) ** some operators may have reported NGL under Oil * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_OIL | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702408 | Pennzoil Company | 1981 | 509 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702408 | Pennzoil Company | 1982 | 665 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702408 | Pennzoil Company | 1983 | 629 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702408 | Pennzoil Company | 1984 | 1,030 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702408 | Riddle, William Dye | 1985 | 203 | | 68 | | | | 67 | | | | | 68 | |
| 4708702408 | Starr, Paul F. | 1986 | 141 | 0 | 0 | 0 | 69 | 0 | 0 | 0 | 0 | 0 | 72 | 0 | 0 |
| 4708702408 | Starr, Paul F. | 1987 | 141 | 0 | 0 | 71 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 70 |
| 4708702408 | Riddle, William Dye | 1988 | 140 | 0 | 0 | 0 | 0 | 0 | 72 | 0 | 0 | 0 | 68 | 0 | 0 |
| 4708702408 | Starr, Paul F. | 1989 | 143 | 0 | 0 | 0 | 71 | 0 | 0 | 0 | 0 | 0 | 0 | 72 | 0 |
| 4708702408 | Pennzoil Products Company | 1989 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702408 | Riddle, William Dye | 1990 | 136 | 0 | 0 | 0 | 0 | 0 | 68 | 0 | 0 | 0 | 0 | 68 | 0 |
| 4708702408 | Pennzoil Products Company | 1990 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702408 | Riddle, William Dye | 1991 | 68 | | | | | | | 68 | | | | | |
| 4708702408 | Pennzoil Products Company | 1991 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702408 | Pennzoil Products Company | 1992 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702408 | Riddle, William Dye | 1993 | 147 | 69 | | | | | | | | | | | 78 |
| 4708702408 | Pennzoil Products Company | 1993 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702408 | Pennzoil Products Company | 1994 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702408 | Pennzoil Products Company | 1995 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702408 | Triad Resources, Inc. | 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702408 | Ground Resources, LLC | 2017 | 0 | | | | | | | | | | | | |
| 4708702408 | Ground Resources LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Production NGL Information: (Volumes in Bbl) ** some operators may have reported NGL under Oil * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_NGL | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702408 | Ground Resources LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Production Water Information: (Volumes in Gallons) * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_WTR | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702408 | Ground Resources LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Injector 2408

Injector 2408

Stratigraphy Information:

| API | SUFFIX | FM | FM_QUALITY | DEPTH_TOP | DEPTH_QUALITY | THICKNESS | THICKNESS_QUALITY | ELEV | DATUM |
|---|---|---|---|---|---|---|---|---|---|
| 4708702408 | Original Loc | Little Lime | Well Record | 1890 | Reasonable | 30 | Reasonable | 1054 | Ground Level |
| 4708702408 | Original Loc | Blue Monday | Well Record | 1920 | Reasonable | 6 | Reasonable | 1054 | Ground Level |
| 4708702408 | Original Loc | Greenbrier Group | Well Record | 1944 | Reasonable | 108 | Reasonable | 1054 | Ground Level |
| 4708702408 | Original Loc | Big Lime | Well Record | 1944 | Reasonable | 108 | Reasonable | 1054 | Ground Level |
| 4708702408 | Original Loc | Big Injun (Price&eq) | Well Record | 2052 | Reasonable | 32 | Reasonable | 1054 | Ground Level |
| 4708702408 | Original Loc | Undf PRICE blw INJN | Well Record | 2084 | Reasonable | 111 | Reasonable | 1054 | Ground Level |

Wireline (E-Log) Information:

| API | LOG_TOP | LOG_BOT | DEEPEST_FML | LOGS_AVAIL | SCAN | DIGITIZED | GR_TOP | GR_BOT | D_TOP | D_BOT | N_TOP | N_BOT | I_TOP | I_BOT | T_TOP | T_BOT | S_TOP | S_BOT | O_TOP | O_BOT | INCH2 | INCH5 | REDUCED | KOP | LOGMD | ELEV_KB | ELEV_GL | ELEV_DF | LOG_I |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702408 | 100 | 2174 | | G D C S I * | Y | N | 100 | 2156 | 298 | 2174 | | | 470 | 2170 | | | 370 | 2170 | 288 | 2174 | Y | Y | N | | | | | | |

Comment: *logs: caliper, CCL, perf, azimuth, fracture ID, sp, laterolog; 25 inch scale, log analysis

Downloadable Log Images: We advise you to save the log image file to your PC for viewing. To do so, right-click the .tif image of interest and select the save option. Then you can direct the file to a location of your choice. Please note these Images vary in size and some may take several minutes to download, especially if using a 56k or slower dialup connection.

| FILENAME |
|---|
| 4708702408co.tif |
| 4708702408gdc_a.tif |
| 4708702408gpo.tif |
| 4708702408gsc.tif |
| 4708702408il_.tif |

**Quick Reference Guide for Log File Names** For more info about WVGES scanned logs click here

**geologic log types:**
- d density (includes bulk density, compensated density, density, density porosity, grain density, matrix density, etc.)
- e photoelectric adsorption (PE or Pe, etc.)
- g gamma ray
- i induction (includes dual induction, medium induction, deep induction, etc.)
- l laterolog
- m dipmeter
- n neutron (includes neutron porosity, sidewall neutron--SWN, etc.)
- o other[1]
- s sonic or velocity
- t temperature (includes borehole temperature, BHT, differential temperature, etc.)
- z spontaneous potential or potential

**mechanical log types:**
- b cement bond
- c caliper
- o other[1]
- p perforation depth control or perforate

[1]other logs may include, but are not limited to, such curves as audio, bit size, CCL--casing collar locator, continuous meter, directional survey, gas detector, guard, NCTL--Nuclear Cement Top Locator, radioactive tracer, tension

There is no Plugging data for this well

There is no Sample data for this well

2408

# APPENDIX A
## Injection Well Form

1) GEOLOGIC TARGET FORMATION BIG INJUN

Depth 2052 Feet (top) 2084 Feet (bottom)

2) Estimated Depth of Completed Well, (or actual depth of existing well): 2195 Feet

3) Approximate water strata depths: Fresh N/A Feet Salt N/A Feet

4) Approximate coal seam depths:

5) Is coal being mined in the area? Yes ☐ No ☑

6) Virgin reservoir pressure in target formation 800 psig Source HISTORICAL/ESTIMATED

7) Estimated reservoir fracture pressure _____ psig (BHFP)

8) MAXIMUM PROPOSED INJECTION OPERATIONS:

Injection rate (bbl/hour) 25

Injection volume (bbl/day) 200

Injection pressure (psig) 1000

Bottom hole pressure (psig) 2000

9) DETAILED IDENTIFICATION OF MATERIALS TO BE INJECTED, INCLUDING ADDITIVES:

Fresh water and/or produced water from the area and possible bactericides necessary to maintain water quality to improve oil recovery. Not using bactericides at this time, but will submit a MSDS for approval for any used in the future. Additives include Scale inhibitor and THDS (Cleaner).

Temperature of injected fluid: (°F) AMBIENT

10) FILTERS (IF ANY)

ANTHRACITE COAL FILTERS

11) SPECIFICATIONS FOR CATHODIC PROTECTION AND OTHER CORROSION CONTROL

NONE

# APPENDIX A (cont.)

2408

12. Casing and Tubing Program

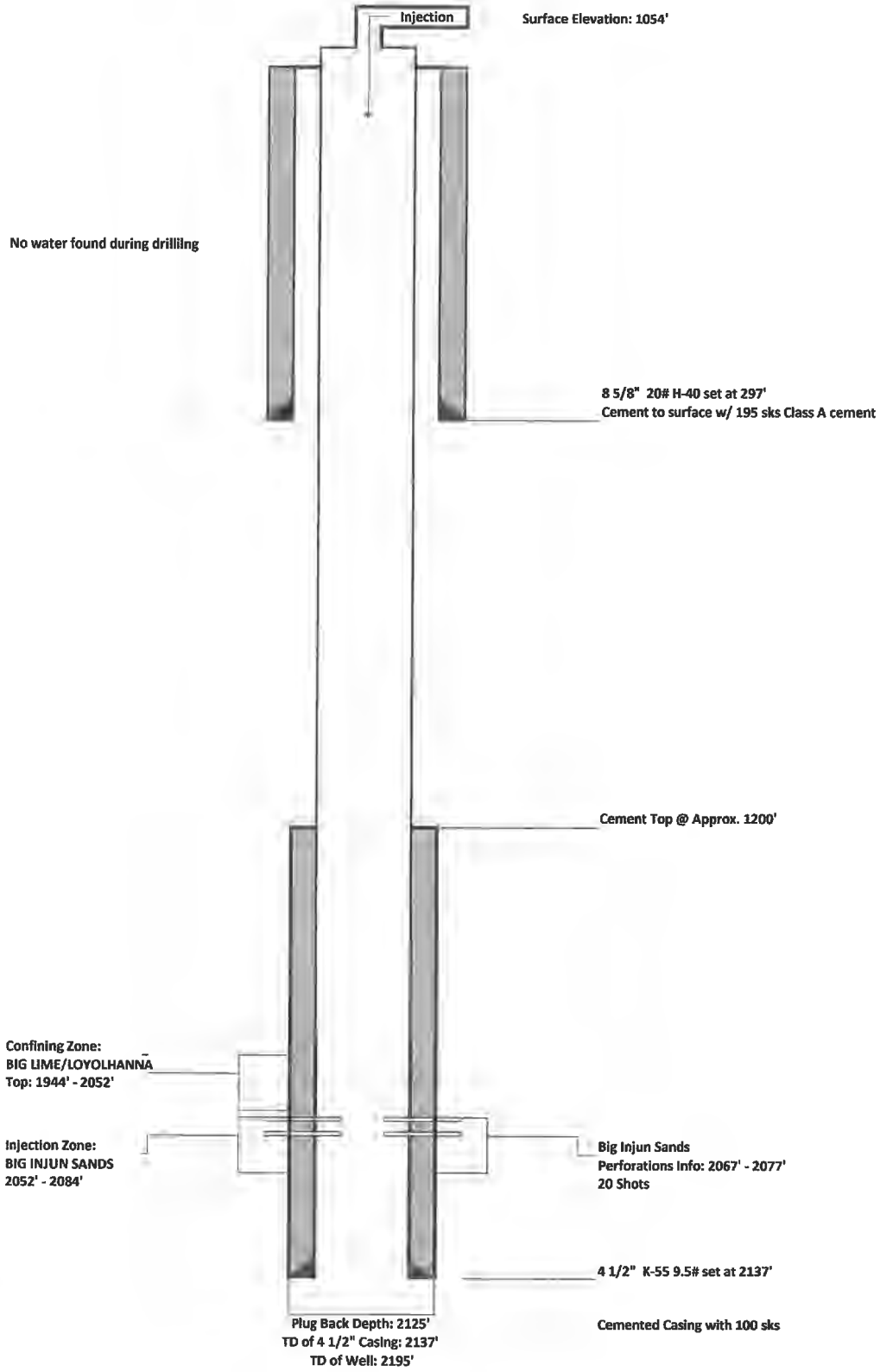
| TYPE | Size | New or Used | Grade | Weight per ft. (lb/ft) | FOOTAGE: For Drilling | INTERVALS: Left in Well | CEMENT: Fill-up (Cu. Ft.) |
|---|---|---|---|---|---|---|---|
| Conductor | | | | | | | |
| Fresh Water | 8 5/8" | | H-40 | 20# | 297' | 297' | 195sks CTS |
| Coal | | | | | | | |
| Intermediate 1 | | | | | | | |
| Intermediate 2 | | | | | | | |
| Production | 4 1/2" | | K-55 | 9.5# | 2137' | 2137' | |
| Tubing | NONE | | | | | | |
| Liners | | | | | | | |

| TYPE | Wellbore Diameter | Casing Size | Wall Thickness | Burst Pressure | Cement Type | Cement Yield (cu. ft./sk) | Cement to Surface ? (Y or N) |
|---|---|---|---|---|---|---|---|
| Conductor | | | | | | | |
| Fresh Water | | | | | | | |
| Coal | | | | | | | |
| Intermediate 1 | | | | | | | |
| Intermediate 2 | | | | | | | |
| Production | | | | | | | |
| Tubing | | | | | | | |
| Liners | | | | | | | |

| PACKERS | Packer #1 | Packer #2 | Packer #3 | Packer #4 |
|---|---|---|---|---|
| Kind: | NONE | | | |
| Sizes: | | | | |
| Depths Set: | | | | |

# WELL SCHEMATIC

**Tallman 58**
**API 47-087-2408**



INJECTOR 2408

OG-10
Rev. - 9-71

RECEIVED
FEB 27 1979
OIL & GAS DIVISION
DEPT. OF MINES

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES
# Oil and Gas Division
# WELL RECORD

Quadrangle Tariff 7.5' 634 7800 5
Permit No. Roa-2408 1900 4

Rotary X Oil ____
Cable ____ Gas ____
Recycling ____ Comb. ____
Water Flood X Storage ____
Disposal ____ (Kind)

Company Pennzoil Company 64
Address P. O. Box 1588, Parkersburg, WV 26101
Farm P. A. Tallman Acres 2350
Location (waters) Trace Fork
Well No. 58 Elev. 1054.40
District Smithfield 5 County Roane
The surface of tract is owned in fee by
Roscoe Jarvis
Address Left Hand, WV 25251
Mineral rights are owned by Anna Lee Collins
Address 1009 Main Street Point Pleasant WV
Drilling Commenced July 18, 1978
Drilling Completed July 24, 1978
Initial open flow ____ cu. ft. ____ bbls.
Final production ____ cu. ft. per day ____ bbls.
Well open ____ hrs. before test ____ RP.

| Casing and Tubing | Used in Drilling | Left in Well | Cement fill up Cu. ft. (Sks.) |
|---|---|---|---|
| Size | | | |
| 20-16 | | | |
| Cond. | | | |
| 13-10" | | | |
| 9 5/8 | | | |
| 8 5/8 | 297 | 297 | 195 sks. |
| 7 | | | |
| 4 1/2 | 2137 | 2137 | 100 sks. |
| 3 | | | |
| 2 | | | |
| Liners Used | | | |

Attach copy of cementing record.

Well treatment details:
Fractured 10-23-78 w/160BW, 1200# 20/40 sd., 250 Gal. 15% HCL
Water Injection Well

Coal was encountered at ____ Feet ____ Inches
Fresh water ____ Feet ____ Salt Water ____ Feet ____
Producing Sand Big Injun Depth ____

| Formation | Color | Hard or Soft | Top Feet | Bottom Feet | Oil, Gas or Water | *Remarks |
|---|---|---|---|---|---|---|
| Shale | | | 0 | 108 | | |
| Sand | | | 108 | 148 | | |
| Siltstone | | | 148 | 262 | | |
| Sand | | | 262 | 272 | | |
| Siltstone | | | 272 | 304 | | |
| Shale | | | 304 | 382 | | |
| Sand | | | 382 | 396 | | |
| Shale | | | 396 | 420 | | |
| Sand | | | 420 | 450 | | |
| Shale | | | 450 | 48[illegible] | | |
| Sand | | | 482 | 5[illegible] | | |
| Sandstone | | | 514 | 702 | | |
| Sand | | | 702 | 826 | | |
| Siltstone | | | 826 | 886 | | |
| Shale | | | 886 | 920 | | |
| Sand | | | 920 | 936 | | |
| Shale | | | 936 | 964 | | |
| Sand | | | 964 | 982 | | |
| Siltstone | | | 982 | 1040 | | |
| Shale & Silt | | | 1040 | 1078 | | |
| Sand | | | 1078 | 1096 | | |
| Shale | | | 1096 | 1104 | | |
| Silt & Sand | | | 1104 | 1150 | | |

(over)

* Indicates Electric Log tops in the remarks section.

2408

| Formation | Color | Hard or Soft | Top Feet | Bottom Feet | Oil, Gas or Water | Remarks |
|---|---|---|---|---|---|---|
| Shale | | | 1150 | 1162 | | |
| Siltstone | | | 1162 | 1194 | | |
| Shale | | | 1194 | 1200 | | |
| Siltstone | | | 1200 | 1232 | | |
| Sand | | | 1232 | 1250 | | |
| Shale | | | 1250 | 1276 | | |
| Sand | | | 1276 | 1322 | | |
| Shale | | | 1322 | 1336 | | |
| Sand | | | 1336 | 1350 | | |
| Shale & Silt | | | 1350 | 1372 | | |
| Sand | | | 1372 | 1440 | | |
| Shale & Silt | | | 1440 | 1552 | | |
| Sand | | | 1552 | 1698 | | |
| Shale | | | 1698 | 1710 | | |
| Sand | | | 1710 | 1890 | | |
| Little Lime | | | 1890 | 1920 | | |
| Blue Monday | | | 1920 | 1926 | | |
| Pencil Cave | | | 1926 | 1944 | | |
| Big Lime | | | 1944 | 1988 | | |
| Loyalhanna | | | 1988 | 2052 | | |
| Big Injun | | | 2052 | 2084 | | |
| Shale | | | 2084 | 2195 | | |
| Total Depth | | | | 2195 | | |
| Plug Back Depth | | | | 2125 | | |

Date February 26, 19 79

APPROVED PENNZOIL COMPANY Owner

By [signature]

(Title)

2408
Compensated
Formation Density
Log
Gamma-Gamma

Schlumberger

# COMPENSATED FORMATION DENSITY LOG

Gamma Gamma

COUNTY ROANE
FIELD SMITHFIELD DISTRICT
LOCATION
WELL P. A. TALLMAN #58
COMPANY PENNZOIL COMPANY

COMPANY PENNZOIL COMPANY

WELL P. A. TALLMAN #58

FIELD SMITHFIELD DISTRICT

COUNTY ROANE STATE WEST VIRGINIA

LOCATION: TRACE FORK (WATERS)
DISTRICT - SMITHFIELD
QUAD: TARIFF 7.5'

API SERIAL NO. P-ROA-2408 | SEC. | TWP | RANGE

Other Services:
DIL
BHC/GR
FIL

Permanent Datum: GL ; Elev.: 1054.40
Log Measured From KB 10 Ft. Above Perm. Datum
Drilling Measured From KB

Elev.: K.B. 1064.40
D.F.
G.L. 1054.40

| | | | | |
|---|---|---|---|---|
| Date | 7/24/78 | | | |
| Run No. | ONE | | | |
| Depth—Driller | 2195 | | | |
| Depth—Logger | 2176 | | | |
| Btm. Log Interval | 2174 | | | |
| Top Log Interval | TOD'GR | | | |
| Casing—Driller | 8 5/8 @ 257 | @ | @ | @ |
| Casing—Logger | 304 | | | |
| Bit Size | 6 3/4 | | | |
| Type Fluid in Hole | FRESH MUD | | | |
| Dens. / Visc. | NA / NA | | | |
| pH / Fluid Loss | NA / NA ml | ml | ml | ml |
| Source of Sample | PIT | | | |
| Rm @ Meas. Temp. | 1.1 @ 70°F | @ °F | @ °F | @ °F |
| Rmf @ Meas. Temp. | @ °F | @ °F | @ °F | @ °F |
| Rmc @ Meas. Temp. | @ °F | @ °F | @ °F | @ °F |
| Source: Rmf / Rmc | | | | |
| Rm @ BHT | @ °F | @ °F | @ °F | @ °F |
| TIME Circulation Stopped | | | | |
| Logger on Bottom | | | | |
| Max. Rec. Temp. | 82 EST °F | °F | °F | °F |
| Equip. / Location | 7699 / PAINTSVILLE | | | |
| Recorded By | BOGDANSKI | | | |
| Witnessed By Mr. | TOOHEY & MR. LUMEN | | | |

FOLD HERE

The well name, location and borehole reference data were furnished by the customer.

SCALE CHANGE
Type Log | Depth | Up Hole | Down Hole

RUN NO. ONE
Service Order No. 43108
Fluid Level FULL
Salinity, PPM Cl.
Gravity - F.P.M.
F.S. INSTRUMENT SERIAL NO.

| | | | | | | |
|---|---|---|---|---|---|---|
| Dens. Panel | 370 | | | | | |
| Dens. Cart. | 265 | | | | | |
| Dens. Skid. | 1080 | | | | | |
| Dens. Sonde | 120 | | | | | REMARKS |
| Dens. Source | 5058 | | | | | |
| Dens. Calibrator | SCALER | | | | | |
| GR Cart. | 1075 | | | | | |
| Memorizer Panel | 318 | | | | | |
| Tape Recorder (TTR) | | | | | | |
| Depth Encoder (DAE) | | | | | | |
| Frequency Wheel (CWW) | | | | | | |
| CALIBRATION DATA | | | | | | |
| GR — BKG. CPS | 100 | | | | | |
| GR — Source CPS | | | | | | |
| GR — Sens. - Cal | | | | | | |
| GR — T. C. - Cal | | | | | | |
| FDC — P¹ — Before Log | 742 | | | | | |
| FDC — P² — Before Log | 1124 | | | | | |
| FDC — P¹ — After Log | 742 | | | | | |
| FDC — P² — After Log | 1124 | | | | | |
| LOGGING DATA | FR 2045 | 1045 LR | FR 2050 | 2050-1945 | 1945 CSG | |
| Grain Density | 2.68 | 2.87 | 2.68 | 2.71 | 2.68 | |
| Liquid Density | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | |
| Hole Fluid | LIQUID | LIQUID | LIQUID | LIQUID | LIQUID | |
| Porosity Scale | 30, -10 | 30,-10 | 30,-10 | 30,-10 | 30,-10 | |
| G.R. T.C. Logged | | | | | | |
| G.R. Sens. Logged | | | | | | |
| Zero Div. Left | | | | | | |
| Scale Per 100 Div. | | | | | | |

All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to Clause 4 of our General Terms and Conditions as set out in our current price schedule.

**CALIPER** DIAM. IN INCHES

5 — 15

**GAMMA RAY** API UNITS

0 — 200

200 — 400

**CORRECTION** GRAMS/CC

Use this scale when correction curve is presented in Track 2: 0 — +.25

OR

Use this scale when correction curve is presented in Track 3: -.25 — 0 — +.25

**BULK DENSITY** GRAMS/CC

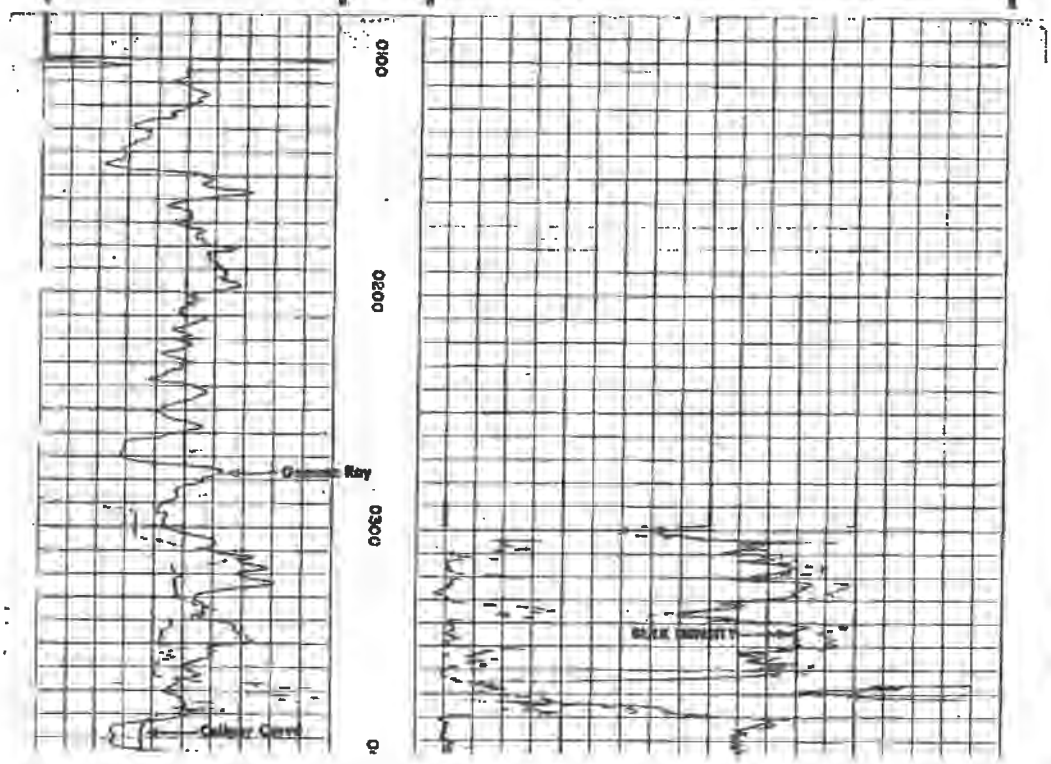
2.0 — 2.5 — 3.0

1.0 — 1.5 — 2.0

MATRIX

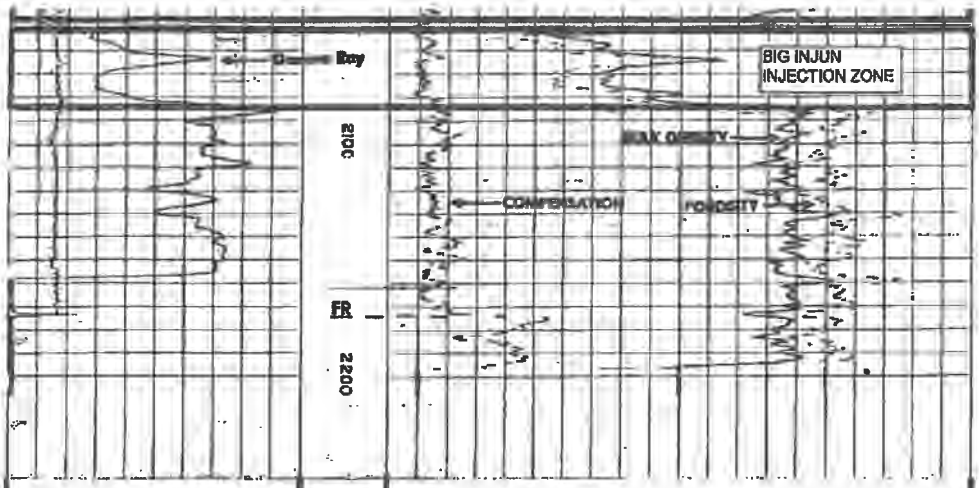
**DENSITY POROSITY INDEX %** _____ MATRIX

30 — 20 — 10 — 0 — -10



COMPENSATION
POROSITY
0800
0900
1000
1100
1200

1500
1400
1300
1600
1700
1800
1900
2000
BIG LIME/
LOYALHANNA
CONFINING ZONE




| | | |
|---|---|---|
| 0 — 200 | | 2.0 — 2.5 — 3.0 |
| 200 — 400 | | 1.0 — 1.5 — 2.0 |
| **GAMMA RAY** API UNITS | | **BULK DENSITY** GRAMS/CC. |
| 5 — 15 | | 0 — +.25 **CORRECTION** GRAMS/CC. |
| **CALIPER** HOLE DIAM. IN INCHES | DEPTHS | |

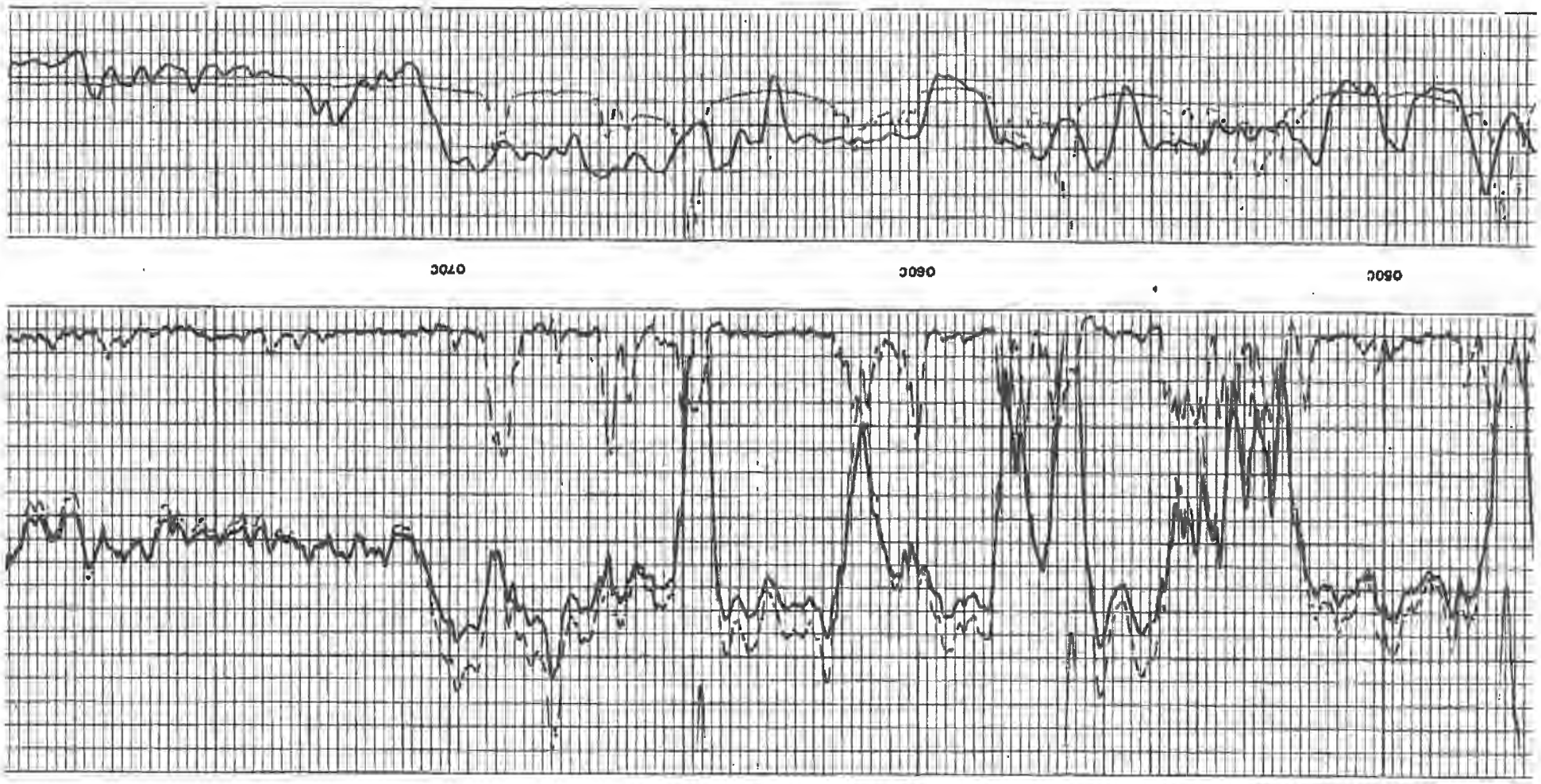
COMPANY PENNZOIL COMPANY
WELL P. A. TALLMAN #58
FIELD SMITHFIELD DISTRICT
COUNTY ROANE STATE W. VA.

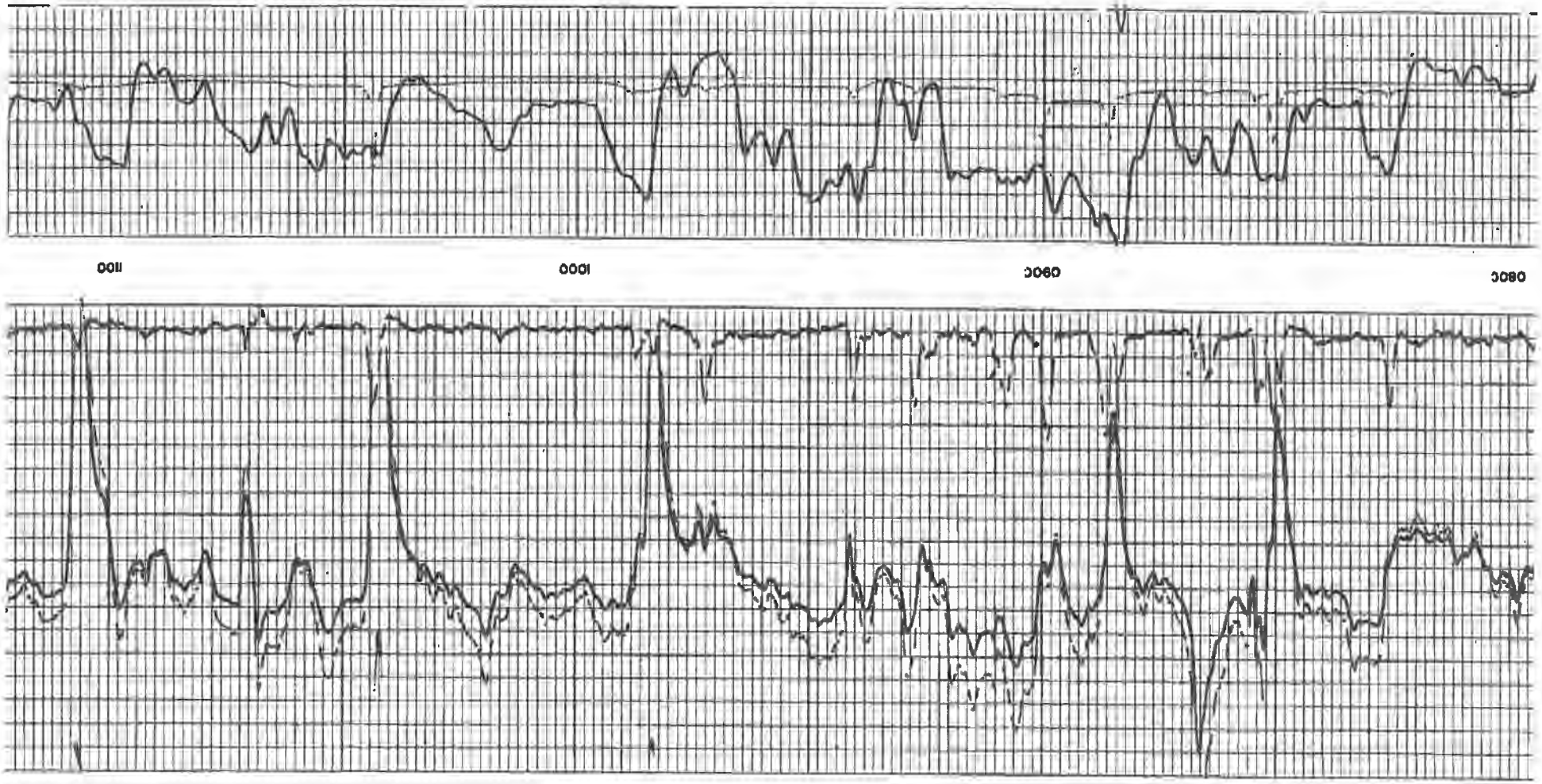
SCHL. FR 2174
SCHL. TD 2176
DRLR TD 2195
Elev:
KB 1064.40
DF
GL 1054.40

## DETAIL LOG
5" = 100'

| | | |
|---|---|---|
| **CALIPER** HOLE DIAM. IN INCHES | DEPTHS | |
| 5 — 15 | | 0 — +.25 **CORRECTION** GRAMS/CC. |
| **GAMMA RAY** API UNITS | | **BULK DENSITY** GRAMS/CC. |
| 0 — 200 | | 2.0 — 2.5 — 3.0 |
| 200 — 400 | | 1.0 — 1.5 — 2.0 |
| | 2100 | DETAIL LOG 5" = 100' |

0200
0
Ceiling
Gamma Ray
Caliper Curve
0400
COMPENSATION
BULK DENSITY
POISSON

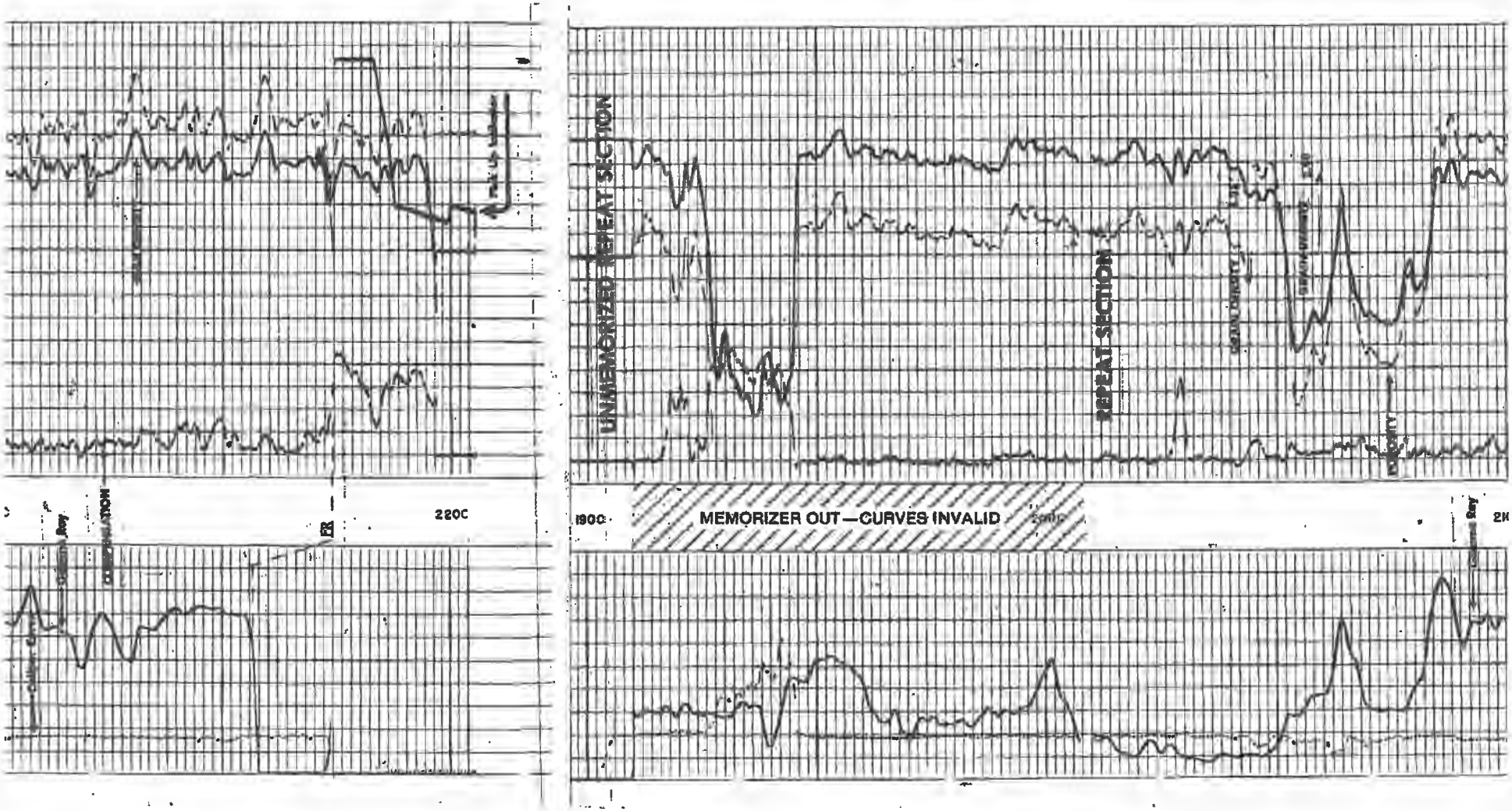

0700
0800
0900

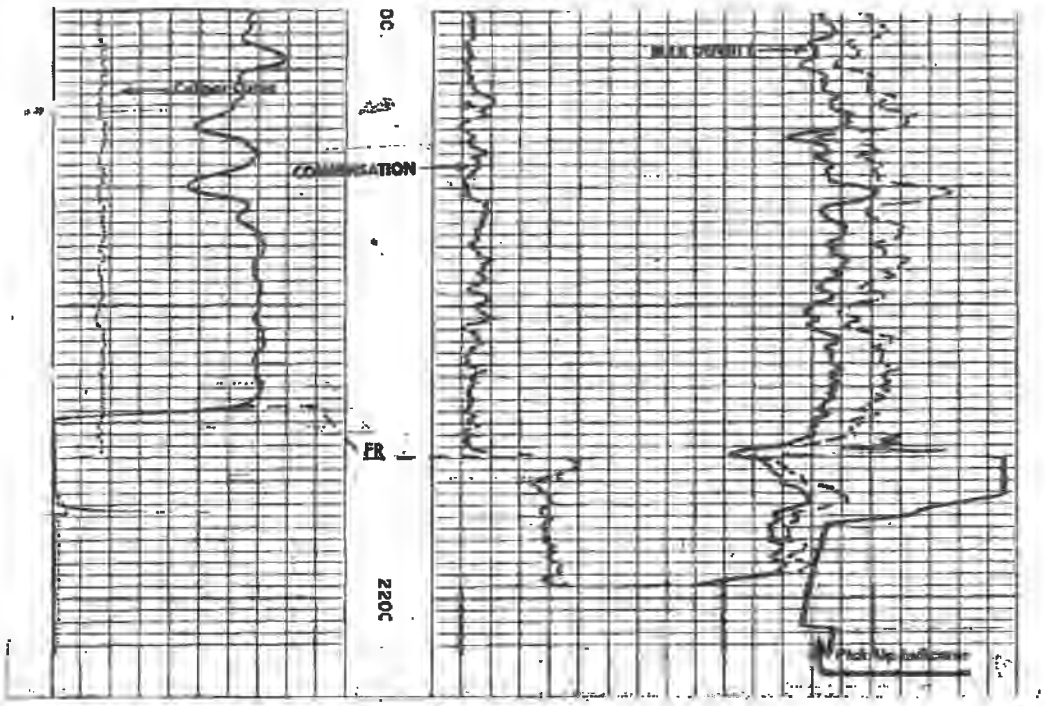

1100
1000
0960
0980

1200
1300
1400

1700
1600
1500

GRAIN DENSITY
GRAIN DENSITY
GRAIN DENSITY
GRAIN DENSITY
POROSITY
1800
1900
2000
2100


UNMEMORIZED REPEAT SECTION
REPEAT SECTION
MEMORIZER OUT—CURVES INVALID
1900
2K
220C
MOON




| | | |
|---|---|---|
| 0 — 200 | | 2.0 — 2.5 — 3.0 |
| 200 — 400 | | 1.0 — 1.5 — 2.0 |
| **GAMMA RAY** API UNITS | | **BULK DENSITY** GRAMS/CC. |
| 5 — 15 | | 0 — +.25 **CORRECTION** GRAMS/CC. |
| **CALIPER** HOLE DIAM. IN INCHES | DEPTHS | |

COMPANY PENNZOIL COMPANY

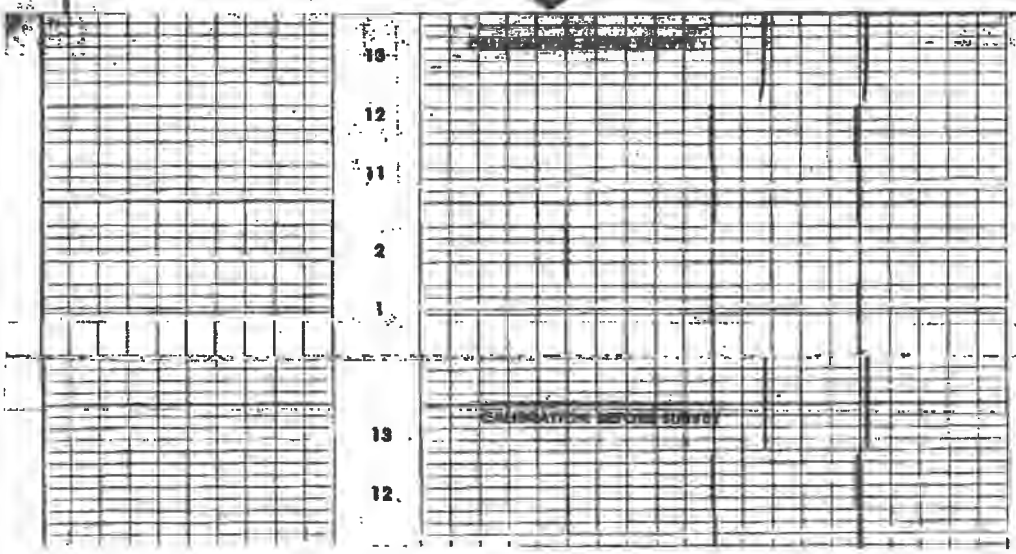
WELL P. A. TALLMAN #58

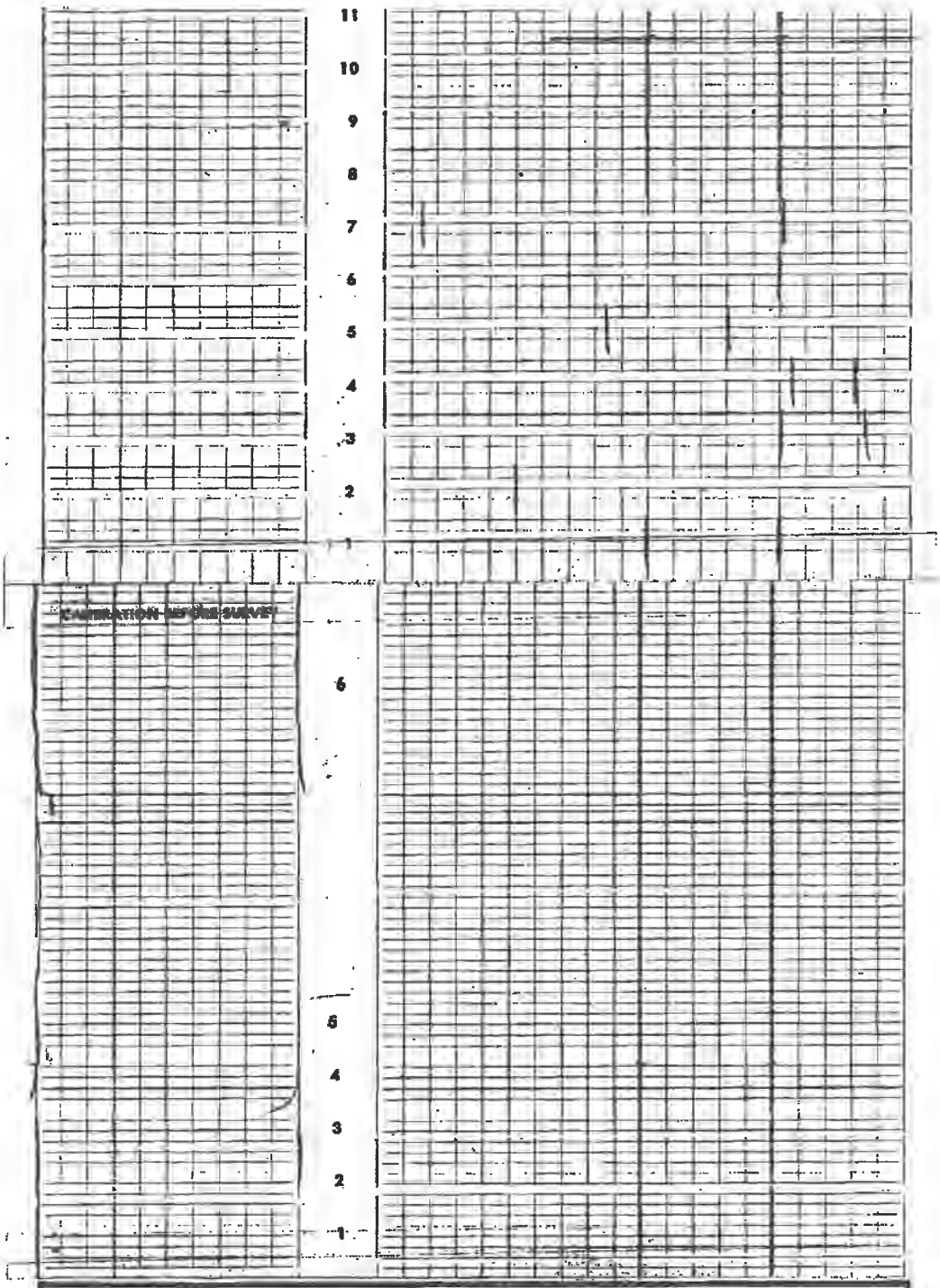
FIELD SMITHFIELD DISTRICT

COUNTY ROANE STATE W.VA.

SCHL. FR 2174
SCHL. TD 2176
DRLR TD 2195
Elev:
KB 1064.40
DF
GL 1054.40

CALIBRATION RECORD






## FORMATION DENSITY COMPENSATED CALIBRATION CODING

1. MECHANICAL ZERO
2. RECORDER SENSITIVITY

PANEL TEST

| | POS | FDC LIQUID ρ | Δρ |
|---|---|---|---|
| 3. | # 1 | 2.92 | .00 |
| 4. | # 2 | 2.78 | +.14 |
| 6. | # 3 | 2.42 | −.10 |
| 6. | # 4 | 2.35 | .00 |
| 7. | # 5 | 2.08 | .01 |

8. MECHANICAL ZERO CALIPER
9. 8" RING
10. 12" RING
11. TOOL CALIBRATE #1 SET $\rho = 2.50$
12. TOOL CALIBRATE #2 SET $\Delta\rho = .00$
13. LOG POSITION $\rho = 2.59$, $\Delta\rho = .015$

## GAMMA RAY CALIBRATION CODING

1. MECHANICAL ZERO
2. ELECTRICAL ZERO
3. RECORDER SENSITIVITY
4. MEMORIZER ADJUSTMENT
5. BACKGROUND
6. CALIBRATE - SOURCE IN PLACE

# CALIBRATION RECORD

COMPANY PENNZOIL COMPANY

WELL P. A. TALLMAN #85

SCHL. FR 2174
SCHL. TD 2176
DRLR TD 2195

FIELD SMITHFIELD DISTRICT

COUNTY ROANE STATE W. VA.

Elev: KB 1064.40 DF ____ GL 1054.40

# Log Analysis

COMPANY: PENNZOIL COMPANY

WELL: P. A. TALLMAN #58

FIELD: SMITHFIELD DISTRICT

COUNTY: ROANE

STATE: WEST VIRGINIA

| DEPTH | Ø F | | Rt | Assume Rw=.05 | | Rma=2.68 F=1.0 | | | | % POROSITY | % WATER | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2052-54 | 22 | | 14 | | | | | | | | 24 | |
| 2054-56 | 21 | | 10 | | | | | | | | 29 | |
| 2056-58 | 18 | | 10 | | | | | | | | 32 | |
| 2058-60 | 19 | | 12 | | | | | | | | 29 | |
| 2060-62 | 17 | | 12 | | | | | | | | 35 | SHALEY |
| 2062-64 | 11 | | 14 | | | | | | | | 51 | |
| 2064-66 | 9 | | 15 | | | | | | | | 60 | SHALEY |
| 2066-68 | 16 | | 11 | | | | | | | | 39 | SHALEY |
| 2068-70 | 18 | | 9 | | | | | | | | 37 | SHALEY |
| 2070-72 | 18 | | 10 | | | | | | | | 35 | |
| 2072-74 | 18 | | 11 | | | | | | | | 34 | |
| 2074-76 | 18 | | 12 | | | | | | | | 32 | |
| 2076-78 | 15 | | 11 | | | | | | | | 41 | |
| 2078-80 | 11 | | 8 | | | | | | | | 67 | |
| 2080-82 | 14 | | 7 | | | | | | | | 54 | SHALEY |
| 2082-84 | 8 | | 7 | | | | | | | | 100 | SHALEY |

All interpretations are opinions based on inferences from electrical and other measurements and we cannot, and do not, guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to Clause 4 of our General Terms and Conditions as set out in our current Price Schedule.

DATE: 7/24/78

LOCATION: PAINTSVILLE

ENGINEER: ED BOGDANSKI

SWB-1325-2

2408

# Basin

PERFORATIC

| | |
|---|---|
| FILING NO. | |
| PERMIT # ROA-2408 | COMPANY PERM |
| | WELL P.A. |
| | FIELD SMIT |
| | COUNTY ROAN |
| | LOCATION: TRACE QUAD: TAR |
| | SEC. TWP. |

PERMANENT DATUM GROUND LEVEL
LOG MEASURED FROM K.B. 10' ABOVE P
DRILLING MEASURED FROM K.B. 10' ABOVE

| | |
|---|---|
| DATE | 10-20-78 |
| RUN NO. | ONE |
| TYPE LOG | GR/FDC |
| DEPTH – DRILLER | 2195' |
| DEPTH – LOGGER | 2101' |
| BOTTOM LOGGED INTERVAL | 2100' |
| TOP LOGGED INTERVAL | 1200' |
| TYPE FLUID IN HOLE | |
| SALINITY PPM CL | |
| DENSITY LB./GAL | |
| LEVEL | EMPTY |
| MAX. REC. TEMP. – DEG. F | |
| OPR. RIG TIME | [redacted] |
| RECORDED BY | [redacted] |
| WITNESSED BY | [redacted] |

| RUN NO. | BORE HOLE RECORD BIT | FROM | TO | SIZE |
|---|---|---|---|---|
| | | | | 8 5 |
| | 6 3/4" | 304' | T.D. | |
| | | | | |
| | | | | 4 1 |

THIS HEADING AND LOG CONFORM TO API

Surveys, Inc

N DEPTH CONTROL

IL COMPANY

ALLMAN # 58

IELD DISTRICT

STATE W.VA.

RK
F 7 1/2'

OTHER LOGS:

ROM.

1054.40'

D.

ELEVATIONS:
KB. 1064.40'
DF. 1063.40'
GL. 1054.40'

PO & MR. JONES

CASING RECORD

| WGT. | FROM | TO |
|---|---|---|
| | 0' | 297' |
| | | |
| | 0' | T.D. |
| | | |

ARD PRACTICE RP-33 (P)

EQUIPMENT DATA

| | GAMMA RAY | | |
|---|---|---|---|
| RUN NO. | | | |
| TOOL MODEL NO. | ONE | | |
| DIAM. | GC-56 | | |
| DETECT. MODEL NO. | 3.5" | | |
| TYPE | A.P.A. | | |
| LENGTH | SCINT | | |

PERFORATIONS

| Type | To | From | No. Shots |
|---|---|---|---|
| 3 1/8" HOLLOW STEEL CARRIERS | 2067' | 2077' | 20 |

GENERAL

| | |
|---|---|
| HOIST TRUCK NO. | 161 |
| INST. TRUCK NO. | 161 |
| TOOL SERIAL NO. | |

LOGGING DATA

GENERAL

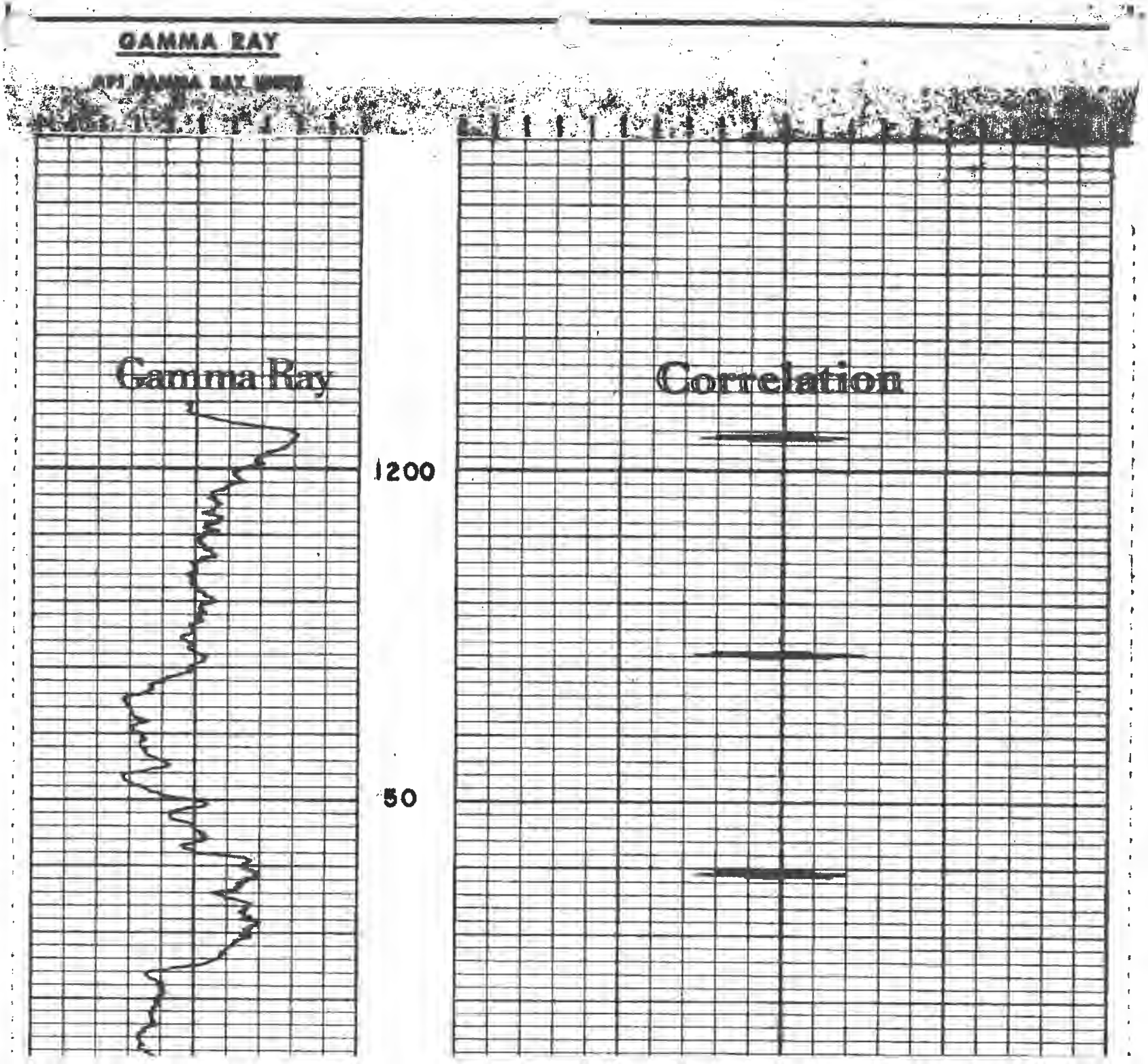
| RUN NO. | DEPTHS FROM | DEPTHS TO | SPEED FT/MIN | T.C. SEC. |
|---|---|---|---|---|
| 1 | 2101' | 1200' | 30 | 3 |

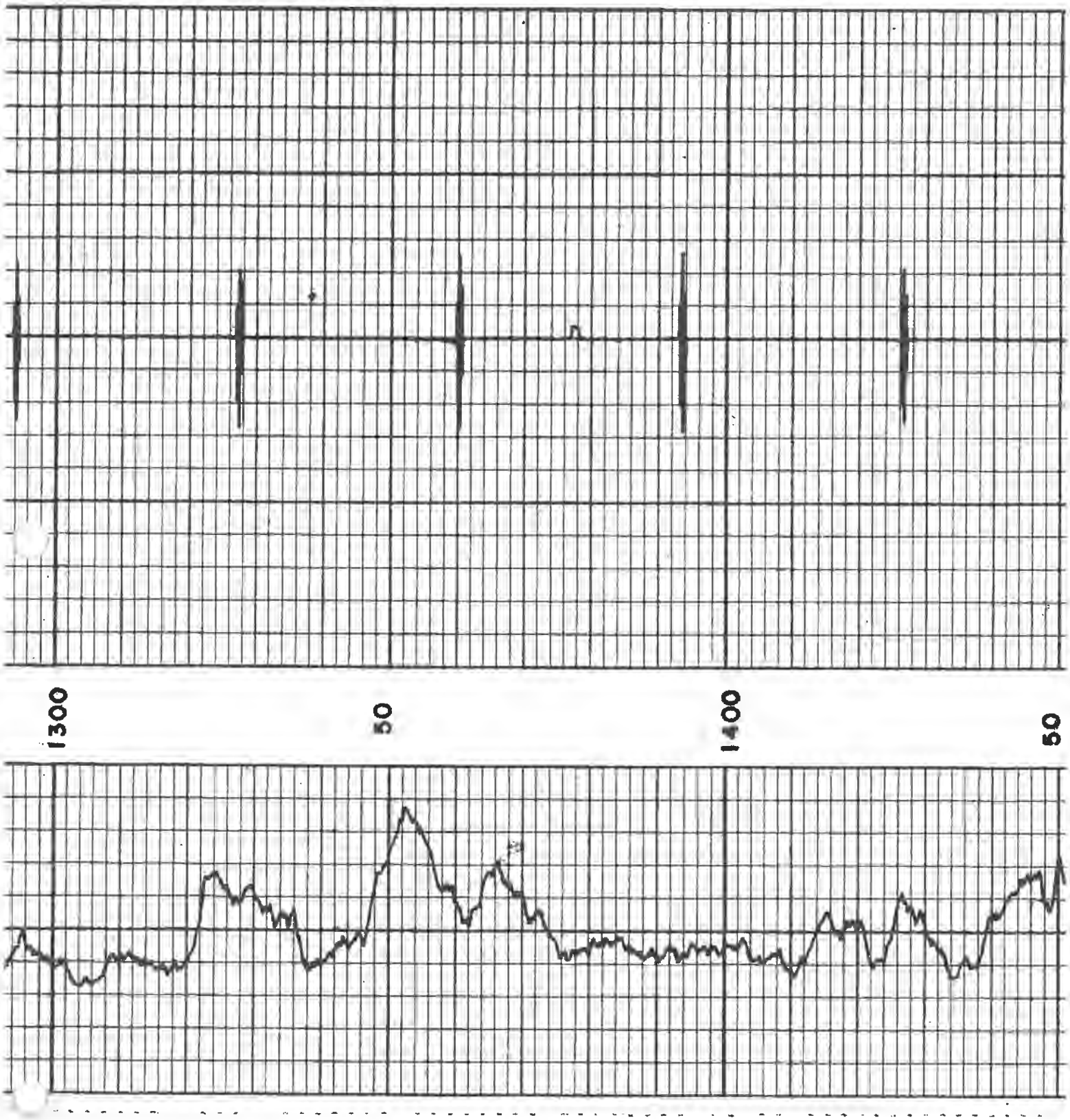
GAMMA RAY

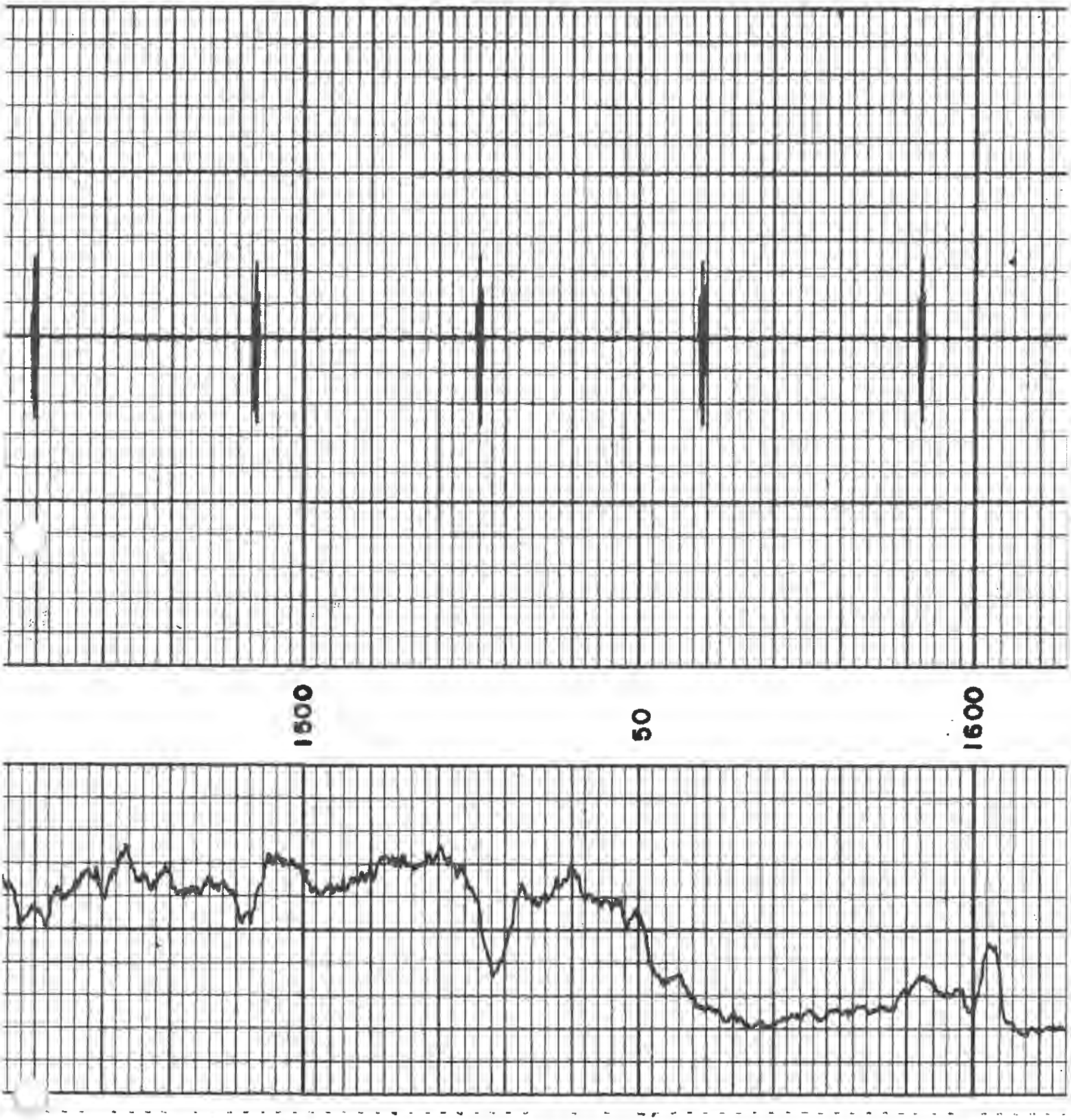
| SENS. SETTINGS | ZERO LOG DIV. | SCALE API G.R. UNITS |
|---|---|---|
| 90 | 0-1 | 20 |

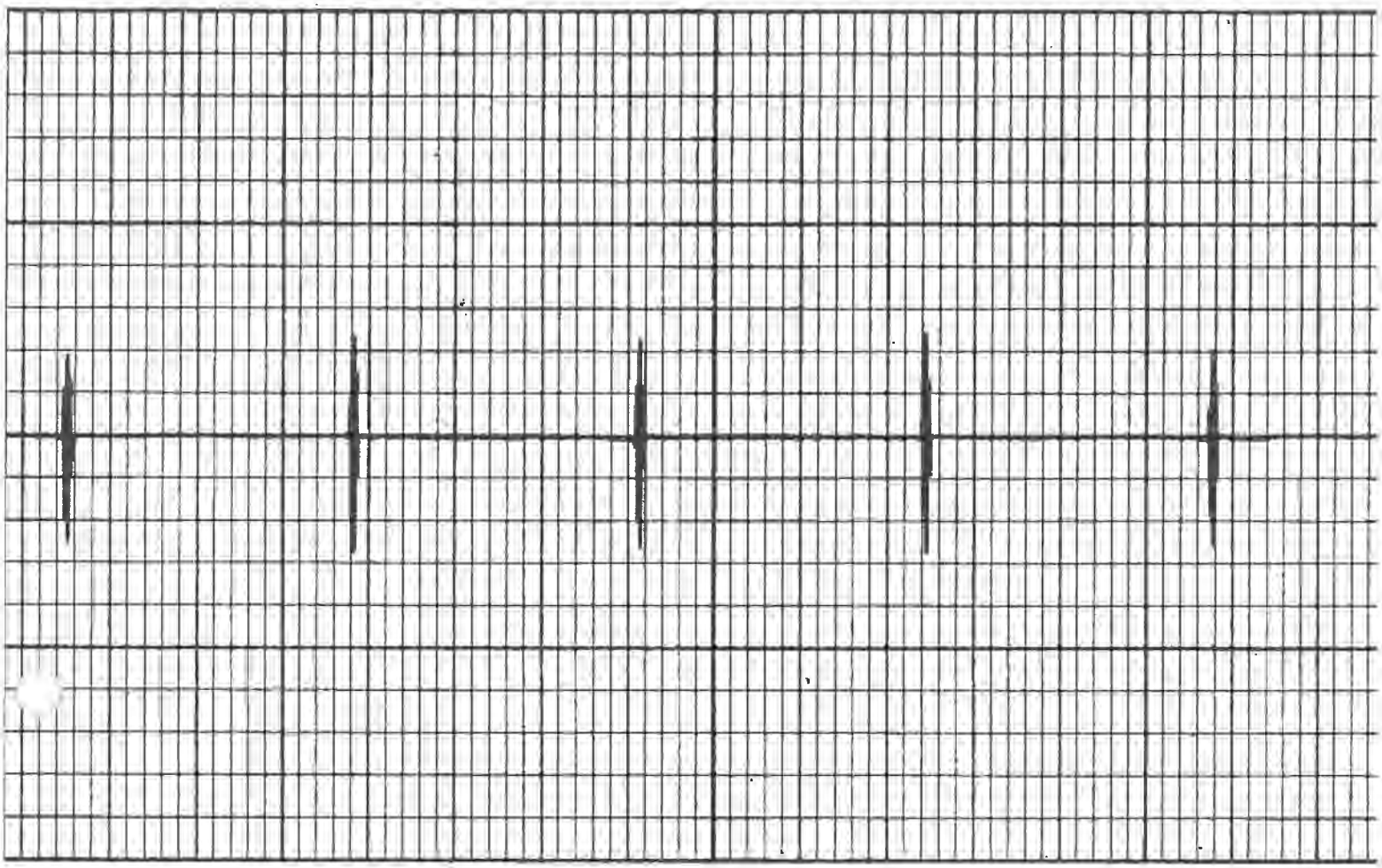
REFERENCE LITERATURE:

REMARKS:

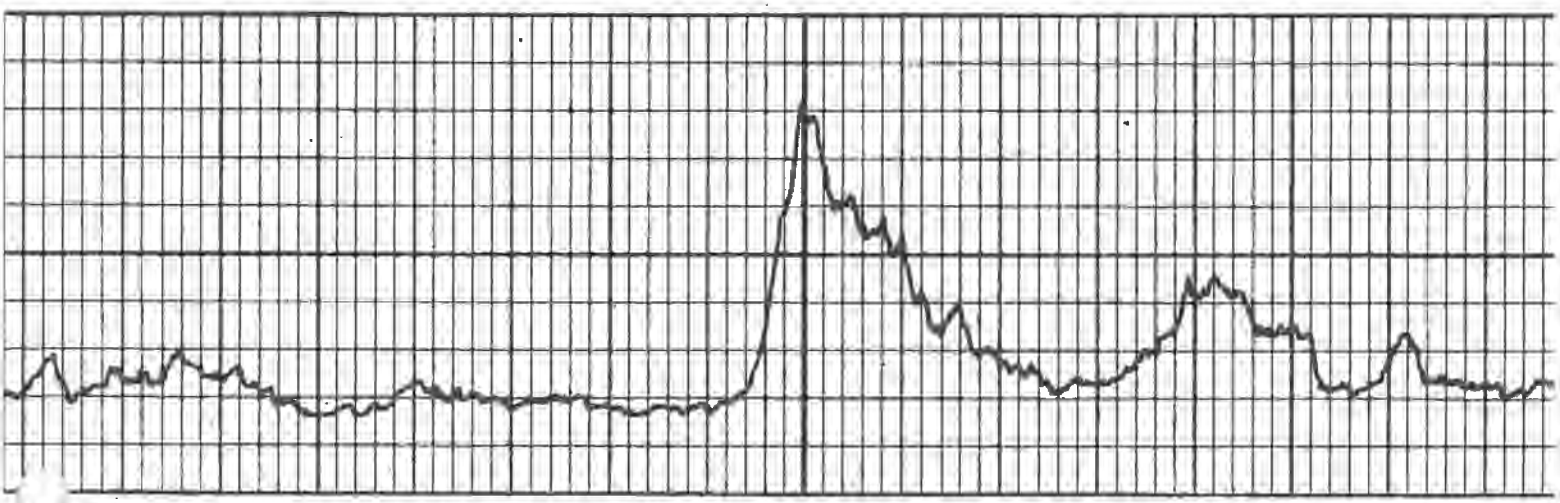

GAMMA RAY
Gamma Ray
1200
50
Correlation

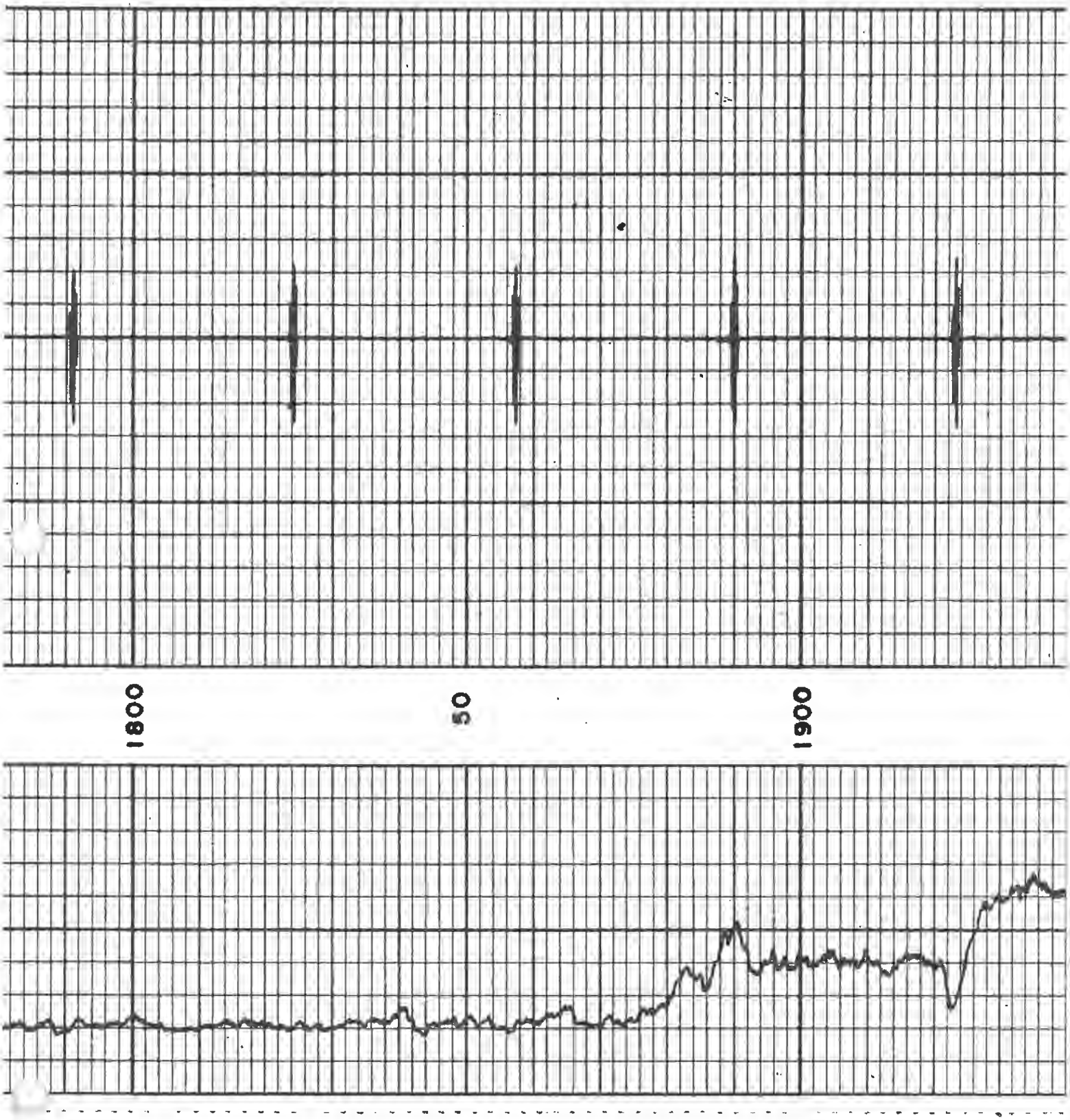

1300
50
1400
50

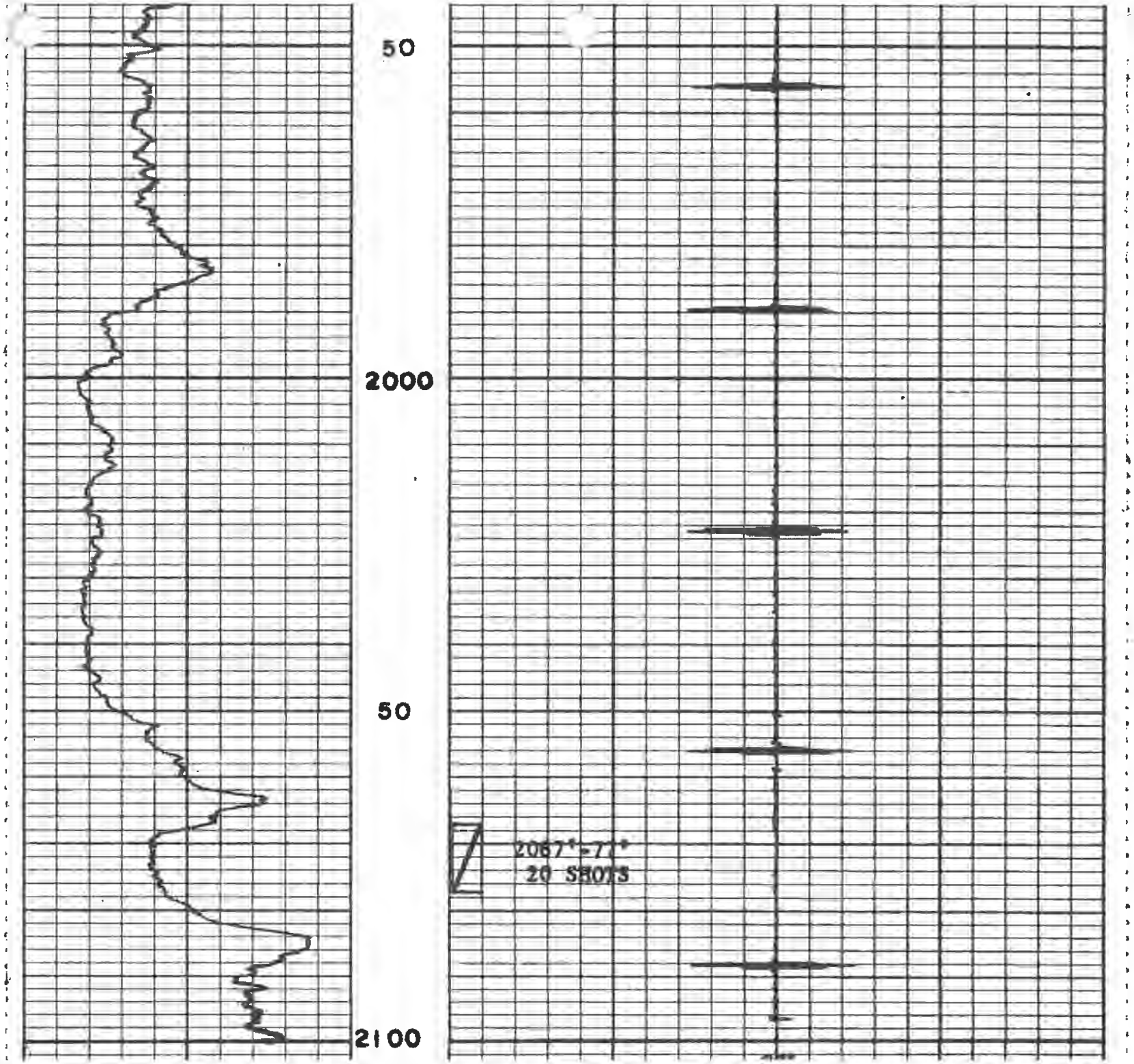

1500
50
1600



50 1700 50




1800
50
1900


50
2000
50
2100
2067'-77'
20 SHOTS

FIRST READING

TOTAL DEPTH 2100'

PENNZOIL COMPANY
P.A. TALIMAN # 52
ROANE, W.VA.
GR/FDC 10-20-78

"Pipeline"

Select County: (087) Roane
Enter Permit #: 2409
Get Data | Reset

Select datatypes: (Check All)
Location | Production | Plugging
Owner/Completion | Stratigraphy | Sample
Pay/Show/Water | Logs | Btm Hole Loc

Table Descriptions
County Code Translations
Permit-Numbering Series
Usage Notes
Contact Information
Disclaimer
WVGES Main
"Pipeline-Plus" New

WV Geological & Economic Survey:

**Well: County = 87 Permit = 2409**

Report Time: Thursday, April 30, 2020 8:50:05 PM

Location Information: View Map

| API | COUNTY | PERMIT | TAX_DISTRICT | QUAD_75 | QUAD_15 | LAT_DD | LON_DD | UTME | UTMN |
|---|---|---|---|---|---|---|---|---|---|
| 4708702409 | Roane | 2409 | Smithfield | Tariff | Otter | 38.646746 | -81.214459 | 481337.6 | 4277598.6 |

There is no Bottom Hole Location data for this well

Owner Information:

| API | CMP_DT | SUFFIX | STATUS | SURFACE_OWNER | WELL_NUM | CO_NUM | LEASE | LEASE_NUM | MINERAL_OWN | OPERATOR_AT_COMPLETION | PROP_VD | PROP_TRGT_FM | TFM_EST_PR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702409 | 7/-/1978 | Original Loc | Completed | P A Tallman | 59 | | | | | Pennzoil Company | | | |
| 4708702409 | 12/8/1994 | Worked Over | Completed | P A Tallman | 59 | | | | | Pennzoil Products Company | | | |

Completion Information:

| API | CMP_DT | SPUD_DT | ELEV | DATUM | FIELD | DEEPEST_FM | DEEPEST_FMT | INITIAL_CLASS | FINAL_CLASS | TYPE | RIG | CMP_MTHD | TVD | TMD | NEW_FTG | KOD | G_BEF | G_AFT | O_BEF | O_AFT | NGL_BEF | NGL_AFT | P_BEF | TI_BEF | P_A |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702409 | 7/-/1978 | -/-/- | 1055 | Ground Level | Tariff(Tlmn) | Big Injun (Price&eq) | Big Injun (Price&eq) | Service Well | Unsuccessful | Water Injection | Rotary | Acid+Frac | 2141 | | 2141 | | 0 | 0 | 0 | 0 | | | 0 | 0 | |
| 4708702409 | 12/8/1994 | 12/8/1994 | 1064 | Ground Level | Tariff(Tlmn) | Price Fm & equiv | Big Injun (Price&eq) | Service Well | Unsuccessful | Water Injection | Cable Tool | Acid+Frac | 2140 | | 0 | | 0 | 0 | 0 | 0 | | | 0 | 0 | |

Pay/Show/Water Information:

| API | CMP_DT | ACTIVITY | PRODUCT | SECTION | DEPTH_TOP | FM_TOP | DEPTH_BOT | FM_BOT | G_BEF | G_AFT | O_BEF | O_AFT | WATER_QNTY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702409 | 12/8/1994 | Horizon | Injection | Vertical | 2062 | Big Injun (Price&eq) | 2092 | Big Injun (Price&eq) | 0 | 0 | | | |
| 4708702409 | 7/-/1978 | Horizon | Injection | Vertical | | | 2092 | Big Injun (Price&eq) | 0 | 0 | | | |

Production Gas Information: (Volumes in Mcf) * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_GAS | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702409 | Pennzoil Company | 1981 | 1,118 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702409 | Pennzoil Company | 1982 | 1,385 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702409 | Pennzoil Company | 1983 | 520 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702409 | Pennzoil Company | 1984 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702409 | Pennzoil Products Company | 1989 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702409 | Pennzoil Products Company | 1990 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702409 | Pennzoil Products Company | 1991 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702409 | Pennzoil Products Company | 1992 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702409 | Pennzoil Products Company | 1993 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702409 | Pennzoil Products Company | 1994 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702409 | Pennzoil Products Company | 1995 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702409 | Triad Resources, Inc. | 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702409 | Ground Resources, LLC | 2017 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702409 | Ground Resources LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Production Oil Information: (Volumes in Bbl) ** some operators may have reported NGL under Oil * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_OIL | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702409 | Pennzoil Company | 1981 | 509 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702409 | Pennzoil Company | 1982 | 665 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702409 | Pennzoil Company | 1983 | 629 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702409 | Pennzoil Company | 1984 | 1,030 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702409 | Pennzoil Products Company | 1989 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702409 | Pennzoil Products Company | 1990 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702409 | Pennzoil Products Company | 1991 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702409 | Pennzoil Products Company | 1992 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702409 | Pennzoil Products Company | 1993 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702409 | Pennzoil Products Company | 1994 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702409 | Pennzoil Products Company | 1995 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702409 | Triad Resources, Inc. | 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702409 | Ground Resources, LLC | 2017 | 0 | | | | | | | | | | | | |
| 4708702409 | Ground Resources LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Production NGL Information: (Volumes in Bbl) ** some operators may have reported NGL under Oil * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_NGL | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702409 | Ground Resources LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Production Water Information: (Volumes in Gallons) * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_WTR | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702409 | Ground Resources LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Stratigraphy Information:

| API | SUFFIX | FM | FM_QUALITY | DEPTH_TOP | DEPTH_QUALITY | THICKNESS | THICKNESS_QUALITY | ELEV | DATUM |
|---|---|---|---|---|---|---|---|---|---|
| 4708702409 | Original Loc | Little Lime | Well Record | 1904 | Reasonable | 28 | Reasonable | 1055 | Ground Level |
| 4708702409 | Original Loc | Blue Monday | Well Record | 1932 | Reasonable | 4 | Reasonable | 1055 | Ground Level |
| 4708702409 | Original Loc | Greenbrier Group | Well Record | 1956 | Reasonable | 106 | Reasonable | 1055 | Ground Level |
| 4708702409 | Original Loc | Big Lime | Well Record | 1956 | Reasonable | 106 | Reasonable | 1055 | Ground Level |
| 4708702409 | Original Loc | Big Injun (Price&eq) | Well Record | 2062 | Reasonable | 30 | Reasonable | 1055 | Ground Level |
| 4708702409 | Original Loc | Undf PRICE blw INJN | Well Record | 2092 | Reasonable | 49 | Reasonable | 1055 | Ground Level |

Wireline (E-Log) Information:

| API | LOG_TOP | LOG_BOT | DEEPEST_FML | LOGS_AVAIL | SCAN | DIGITIZED | GR_TOP | GR_BOT | D_TOP | D_BOT | N_TOP | N_BOT | I_TOP | I_BOT | T_TOP | T_BOT | S_TOP | S_BOT | O_TOP | O_BOT | INCH2 | INCH5 | REDUCED | KOP | LOGMD | ELEV_KB | ELEV_GL | ELEV_DF | LOG_I |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

Inspector 2409

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702409 | 2 | 2140 | G.D.C.* | Y | N | 2 | 2134 | 630 | 2140 | | | | | 630 | 2140 | Y | Y | N |

Comment: *logs: caliper, perforation, depth

Injector 2409

Downloadable Log Images: We advise you to save the log image file to your PC for viewing. To do so, right-click the .tif image of interest and select the save option. Then you can direct the file to a location of your choice. Please note these images vary in size and some may take several minutes to download, especially if using a 56k or slower dialup connection.

| FILENAME |
|---|
| 4708702409gdc.tif |
| 4708702409gpo.tif |

**Quick Reference Guide for Log File Names** For more info about WVGES scanned logs click here

**geologic log types:**
- d density (includes bulk density, compensated density, density, density porosity, grain density, matrix density, etc.)
- e photoelectric adsorption (PE or Pe, etc.)
- g gamma ray
- i induction (includes dual induction, medium induction, deep induction, etc.)
- l laterolog
- m dipmeter
- n neutron (includes neutron porosity, sidewall neutron--SWN, etc.)
- o other[1]
- s sonic or velocity
- t temperature (includes borehole temperature, BHT, differential temperature, etc.)
- z spontaneous potential or potential

**mechanical log types:**
- b cement bond
- c caliper
- o other[1]
- p perforation depth control or perforate

[1]other logs may include, but are not limited to, such curves as audio, bit size, CCL--casing collar locator, continuous meter, directional survey, gas detector, guard, NCTL--Nuclear Cement Top Locator, radioactive tracer, tension

There is no Plugging data for this well

There is no Sample data for this well

2409

# APPENDIX A
## Injection Well Form

1) GEOLOGIC TARGET FORMATION BIG INJUN

Depth 2062 Feet (top) 2092 Feet (bottom)

2) Estimated Depth of Completed Well, (or actual depth of existing well): 2141 Feet

3) Approximate water strata depths: Fresh N/A Feet Salt N/A Feet

4) Approximate coal seam depths:

5) Is coal being mined in the area? Yes ☐ No ☑

6) Virgin reservoir pressure in target formation 800 psig Source HISTORICAL/ESTIMATED

7) Estimated reservoir fracture pressure _____ psig (BHFP)

8) MAXIMUM PROPOSED INJECTION OPERATIONS:

Injection rate (bbl/hour) 25

Injection volume (bbl/day) 200

Injection pressure (psig) 1000

Bottom hole pressure (psig) 2000

9) DETAILED IDENTIFICATION OF MATERIALS TO BE INJECTED, INCLUDING ADDITIVES:

Fresh water and/or produced water from the area and possible bactericides necessary to maintain water quality to improve oil recovery. Not using bactericides at this time, but will submit a MSDS for approval for any used in the future. Additives include Scale inhibitor and THDS (Cleaner).

Temperature of injected fluid: (°F) AMBIENT

10) FILTERS (IF ANY)

ANTHRACITE COAL FILTERS

11) SPECIFICATIONS FOR CATHODIC PROTECTION AND OTHER CORROSION CONTROL

NONE

# APPENDIX A (cont.)

2409

12. Casing and Tubing Program

| TYPE | Size | New or Used | Grade | Weight per ft. (lb/ft) | FOOTAGE: For Drilling | INTERVALS: Left in Well | CEMENT: Fill-up (Cu. Ft.) |
|---|---|---|---|---|---|---|---|
| Conductor | | | | | | | |
| Fresh Water | 8 5/8" | | H-40 | 20# | 299' | 299' | 195sks CTS |
| Coal | | | | | | | |
| Intermediate 1 | | | | | | | |
| Intermediate 2 | | | | | | | |
| Production | 4 1/2" | | K-55 | 9.5# | 2131' | 2131' | 100sks |
| Tubing | NONE | | | | | | |
| Liners | | | | | | | |

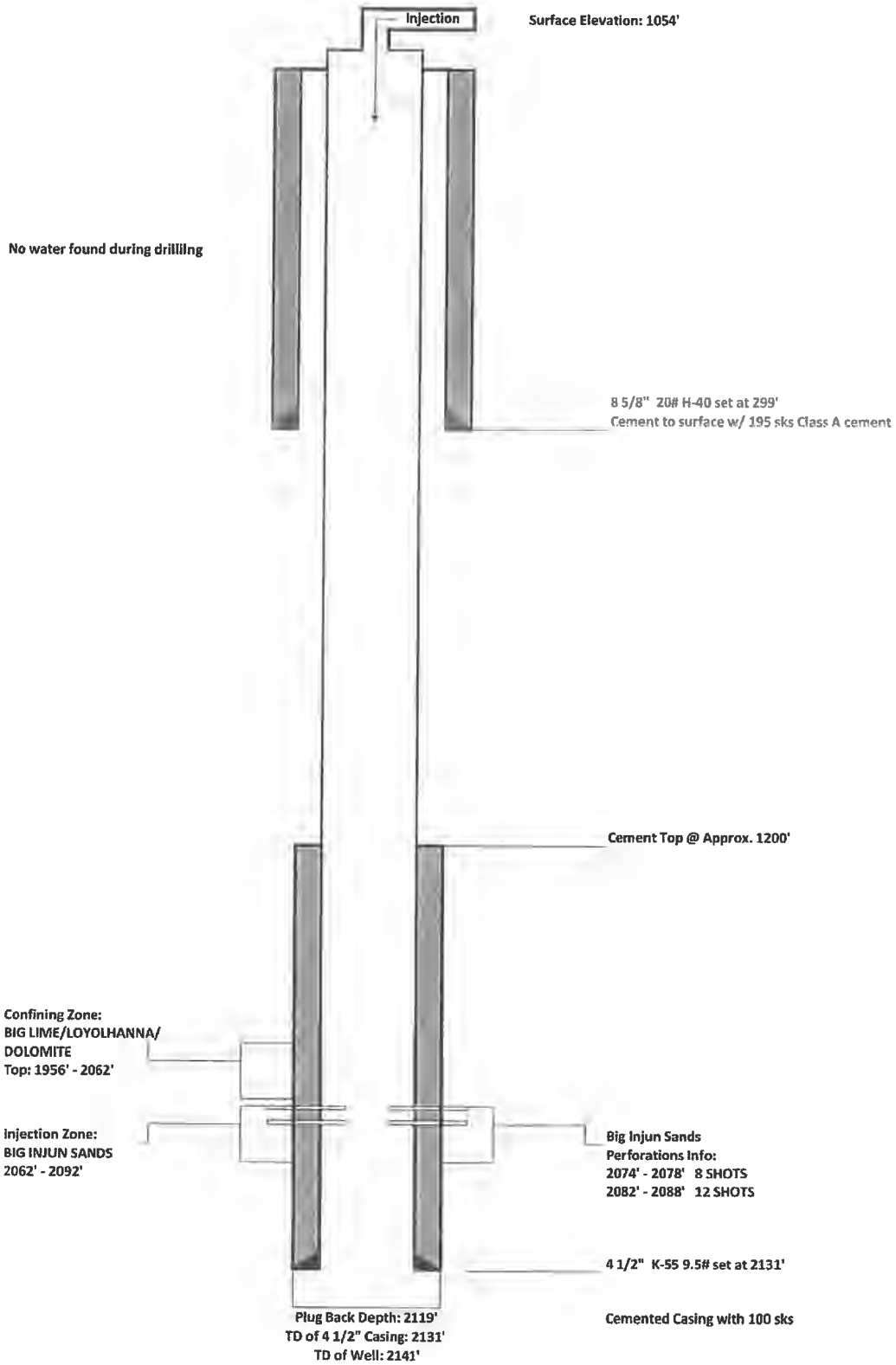
| TYPE | Wellbore Diameter | Casing Size | Wall Thickness | Burst Pressure | Cement Type | Cement Yield (cu. ft./sk) | Cement to Surface ? (Y or N) |
|---|---|---|---|---|---|---|---|
| Conductor | | | | | | | |
| Fresh Water | | | | | | | |
| Coal | | | | | | | |
| Intermediate 1 | | | | | | | |
| Intermediate 2 | | | | | | | |
| Production | | | | | | | |
| Tubing | | | | | | | |
| Liners | | | | | | | |

| PACKERS | Packer #1 | Packer #2 | Packer #3 | Packer #4 |
|---|---|---|---|---|
| Kind: | NONE | | | |
| Sizes: | | | | |
| Depths Set: | | | | |

2409

# WELL SCHEMATIC

**Tallman 59**
**API 47-087-2409**



INJECTOR 2409

OG-10
Rev. - 9-71

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES
# Oil and Gas Division
# WELL RECORD

RECEIVED
Office of Oil & Gas
UIC Section
NOV 1 4 1994
WV Division of
Environmental Protection

Quadrangle Tariff 7.5'

Permit No. Roa-2049 2409
ORIGINAL TYPO

Oil ____ Gas ____
Cable ____ Comb. ____
Recycling ____ Storage ____
Water Flood X
Disposal ____ ____ (Kind)

Company Pc uzoil Company
Address P. O. Box 1588, Parkersburg, WV 26101
Farm P. A. Tallman Acres 2350
Location (waters) Trace Fork
Well No. 59 Elev. 1054.68'
District Smithfield County Roane
The surface of tract is owned in fee by
Roscoe Jervis
Address Left Hand, WV 25251
Mineral rights are owned by Anna Lee Collins
Address 1009 Main St., Point Pleasant WV
Drilling Commenced July 25, 1978
Drilling Completed July 29, 1978
Initial open flow ____ cu. ft. ____ bbls.
Final production ____ cu. ft. per day ____ bbls.
Well open ____ hrs. before test ____ RP.

| Casing and Tubing | Used in Drilling | Left in Well | Cement fill up Cu. ft. (Sks.) |
|---|---|---|---|
| Size 20-16 Cond. | | | |
| 13-10" | | | |
| 9 5/8 | | | |
| 8 5/8 | 299 | 299 | 195 sks. |
| 7 | | | |
| 5 1/2 | | | |
| 4 1/2 | 2131 | 2131 | |
| 3 | | | |
| 2 | | | |
| Liners Used | | | |

Well treatment details:
Fractured 10-23-78 w/148BW, 1800# 20/40 sd., 200 Gal. 15% HCL
Water Injection Well

Attach copy of cementing record.

Coal was encountered at ____ Feet ____ Inches
Fresh water ____ Feet ____ Salt Water ____ Feet ____
Producing Sand Big Injun Depth ____

| Formation | Color | Hard or Soft | Top Feet | Bottom Feet | Oil, Gas or Water | * Remarks |
|---|---|---|---|---|---|---|
| Sand | | | 0 | 32 | | |
| Silt & Shale | | | 32 | 58 | | |
| Sand & Silt | | | 58 | 150 | | |
| Shale & Silt | | | 150 | 390 | | |
| Sand | | | 390 | 402 | | |
| Shale | | | 402 | 434 | | |
| Sand | | | 434 | 458 | | |
| Shale & Silt | | | 458 | 604 | | |
| Sand & Silt | | | 604 | 648 | | |
| Shale | | | 648 | 714 | | |
| Sand & Silt | | | 714 | 854 | | |
| Shale & Silt | | | 854 | 924 | | |
| Sand | | | 924 | 938 | | |
| Shale | | | 938 | 960 | | |
| Sand & Silt | | | 960 | 988 | | |
| Shale & Silt | | | 988 | 1008 | | |
| Sand & Silt | | | 1008 | 1046 | | |
| Silty Shale | | | 1046 | 1080 | | |
| Sand | | | 1080 | 1100 | | |
| Shale & Silt | | | 1100 | 1112 | | |
| Sand | | | 1112 | 1142 | | |
| Shale | | | 1142 | 1158 | | |
| Silt & Sand | | | 1158 | 1204 | | |
| Shale | | | 1204 | 1232 | | |

(over)

* Indicates Electric Log tops in the remarks section.

INJECTOR 2409

| Formation | Color | Hard or Soft | Top Feet | Bottom Feet | Oil, Gas or Water | Remarks |
|---|---|---|---|---|---|---|
| Sand | | | 1232 | 1244 | | |
| Shale | | | 1244 | 1252 | | |
| Silty Sand | | | 1252 | 1276 | | |
| Shale | | | 1276 | 1300 | | |
| Sand | | | 1300 | 1330 | | |
| Silty Shale | | | 1330 | 1388 | | |
| Silty Sand | | | 1388 | 1442 | | |
| Silty Shale | | | 1442 | 1544 | | |
| Sand | | | 1544 | 1584 | | |
| Silty Shale | | | 1584 | 1600 | | |
| Sand | | | 1600 | 1716 | | |
| Shale | | | 1716 | 1738 | | |
| Silty Sand | | | 1738 | 1782 | | |
| Sand | | | 1782 | 1904 | | |
| Little Lime | | | 1904 | 1932 | | |
| Blue Monday | | | 1932 | 1936 | | |
| Pencil Cave | | | 1936 | 1956 | | |
| Big Lime | | | 1956 | 1996 | | |
| Loyalhanna | | | 1996 | 2050 | | |
| Dolomite | | | 2050 | 2062 | | |
| Big Injun | | | 2062 | 2092 | | |
| Shale | | | 2092 | 2141 | | |
| Total Depth | | | | 2141 | | |
| Plug Back Depth | | | | 2119 | | |

Date February 26, 19 79

APPROVED PENNZOIL COMPANY Owner

By [illegible]
(Title)

FORM IV-37
(Obverse)
[08-78]

Date: March 17 19 81
Operator's Well No. P. A. Tallman 59
API Well No. 47 - 087 - 2409
State County Permit

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES, OIL AND GAS DIVISION

PRE-OPERATION CERTIFICATE
FOR LIQUID-INJECTION OR WASTE DISPOSAL WELL

WELL OPERATOR Pennzoil Company
Address P. O. Box 1588
Parkersburg, WV 26101

DESIGNATED AGENT James A. Crews
Address P. O. Box 1588
Parkersburg, WV 26101

GEOLOGICAL TARGET FORMATION Big Injun Depth 2062 feet(top) to 2092 feet(bottom)

Virgin reservoir pressure in target formation 80 psig

Source of information on virgin-reservoir pressure Data taken in comparable fields

Perforation intervals 2074-78 & 2082-88 Open-hole intervals

MAXIMUM PROPOSED INJECTION OPERATIONS

Volume per hour: 10 BBl/Hr. Bottom hole pressure: 1900 psig

DETAILED IDENTIFICATION OF MATERIALS TO BE INJECTED:

Liquids to be injected for oil recovery under Code § 22-6-10a: Fresh Water

Wastes to be disposed of: Produced water from waterflood operations to be re-injected

Additives (slurry mediums, inhibitors, solvents, oxidizers, deoxidizers, etc.) Bactericide

RECEIVED
MAR 20 1981
OIL & GAS DIVISION
DEPT. OF MINES

SPECIFICATIONS FOR CATHODIC PROTECTION AND OTHER CORROSION CONTROL

FILTERS (IF ANY) In-line cartridge filter at injection plant and strainer on wellhead

ADDITIONAL DRILLING AS PART OF THE CONVERSION

*(Complete and submit Form IV-35, "Well Operator's Report of Drilling, Fracturing and/or Stimulating or Physical Change".)*

DETAILS ON NEW CASING AND TUBING PROGRAM AS PART OF THE CONVERSION:

*(To be completed below unless the new casing and tubing program is described on a Form IV-35, "Well Operator's Report of Drilling, Fracturing and/or Stimulating or Physical Change", submitted in connection with the permit to which this Form IV-37 pre-operation certificate relates.)*

| CASING OR TUBING TYPE | SPECIFICATIONS Size | Grade | Weight per ft | New | Used | FOOTAGE INTERVALS For drilling | Left in well | CEMENT FILL-UP OR SACKS (Cu. ft.) | PACKERS |
|---|---|---|---|---|---|---|---|---|---|
| Conductor | | | | | | | | | Kinds |
| Fresh water | | | | | | | | | |
| Coal | | | | | | | | | Sizes |
| Intermediate | | | | | | | | | |
| Production | | | | | | | | | Depths set |
| Tubing | | | | | | | | | |
| Liners | | | | | | | | | Perforations: |
| | | | | | | | | | Top Bottom |
| | | | | | | | | | |
| | | | | | | | | | |

(Continue on reverse side)

FORM IV-37
(Reverse)

[08-78]

MECHANICAL INTEGRITY TEST

Test method: Casing held 3100 psig during fracture treatment

The undersigned certifies that the test described above was made on 10/13, 19 78, and demonstrated the mechanical integrity of the well.

FACILITIES OR SYSTEMS TO PROTECT THE INTEGRITY OF THE GEOLOGICAL TARGET FORMATION OR TO PREVENT FRACTURING THE CONFINING STRATA

APPLICATION FOR VARIANCE (IF ANY), FROM REGULATION 9.01(a)
[Specify purpose, necessity, and justification]

MAY 15, 1981

David W. Robinson, Chief, Water Resources Division has filed No Objections to the issuance of the application and the Office of Oil and Gas therefore approves as described in 22-4-2g of the Statute.

Thomas E. Huzzey

Thomas E. Huzzey, Administrator

Pennzoil Company
Well Operator

By Gustav A. Lucas

Its Supervisor, Surveying & Mapping

2409
CDL

Row
2409

Basin Sur

COMPENSATED DENSITY LOG

PERMIT # ROA-2409 47-087

COMPANY PENNZOIL COMPANY
WELL P.A. TALIMAN # 59
FIELD SMITHFIELD
COUNTY ROANE STATE W.VA.

LOCATION TRACE FORK TARIFF 7 1/2'

OTHER SERVICES

Permanent Datum: GROUND LEVEL Elev.: 1054'
Log Measured from K.B. 8 Ft. Above Perm. Datum
Drilling Measured from K.B. 8' ABOVE G.L.

Elev.: K.B. 1062' D.F. 1061' G.L. 1054'

| | |
|---|---|
| Date | 10-11-78 |
| Run No. | ONE |
| Type Log | DENSITY/CAL |
| Depth-Driller | 1481' |
| Depth-Logger | 1481' |
| Bottom logged interval | 1481' |
| Top logged interval | SF |
| Type fluid in hole | MUD |
| Salinity, PPM Cl | |
| Density | |
| Level | |
| Max. rec. temp. deg. F. | |
| Operating rig time | 2 HRS. |
| Recorded by | [illegible] |
| Witnessed by | MR. GOODWIN |

Bore-Hole Record

| No. | Bit | From | To | Size | Wgt. | From | To |
|---|---|---|---|---|---|---|---|
| | 7 7/8" | SURF' | 1481' | 7 7/8" | | | |
| | 5 7/8" | 1481' | 2113' | 5 7/8" | | | |

Casing Record

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |

Equipment Data

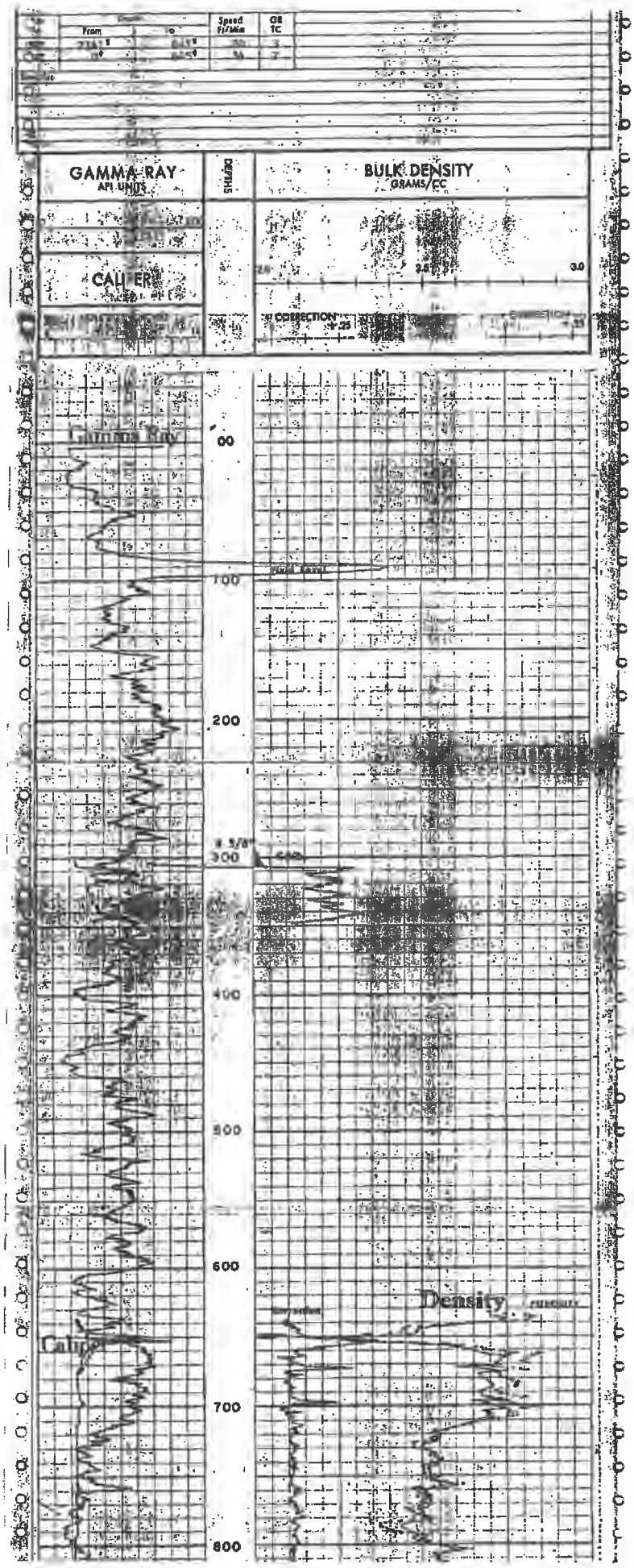
| | | | |
|---|---|---|---|
| Tool No. | | Source No. | |
| Det. No. | | Det. No. | |
| Det. No. | | Det. No. | |
| Det. No. | | Det. No. | |

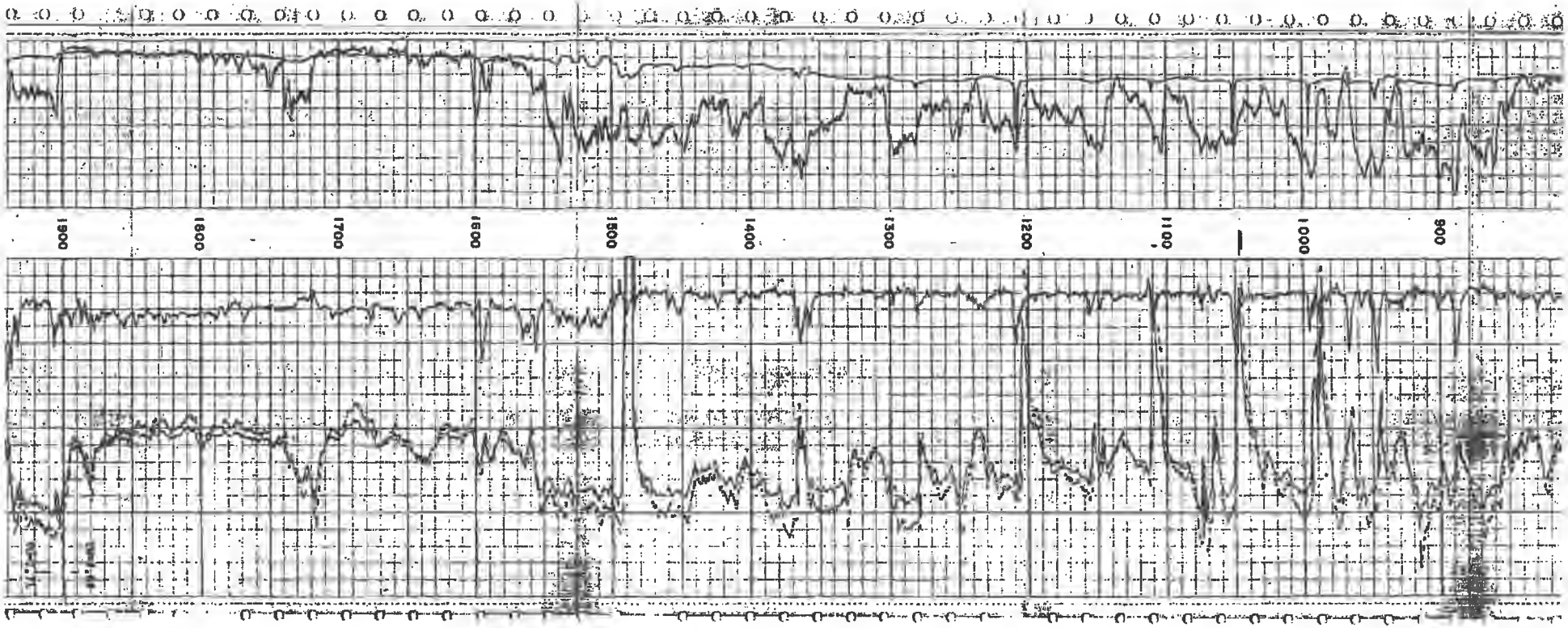
Calibration Log

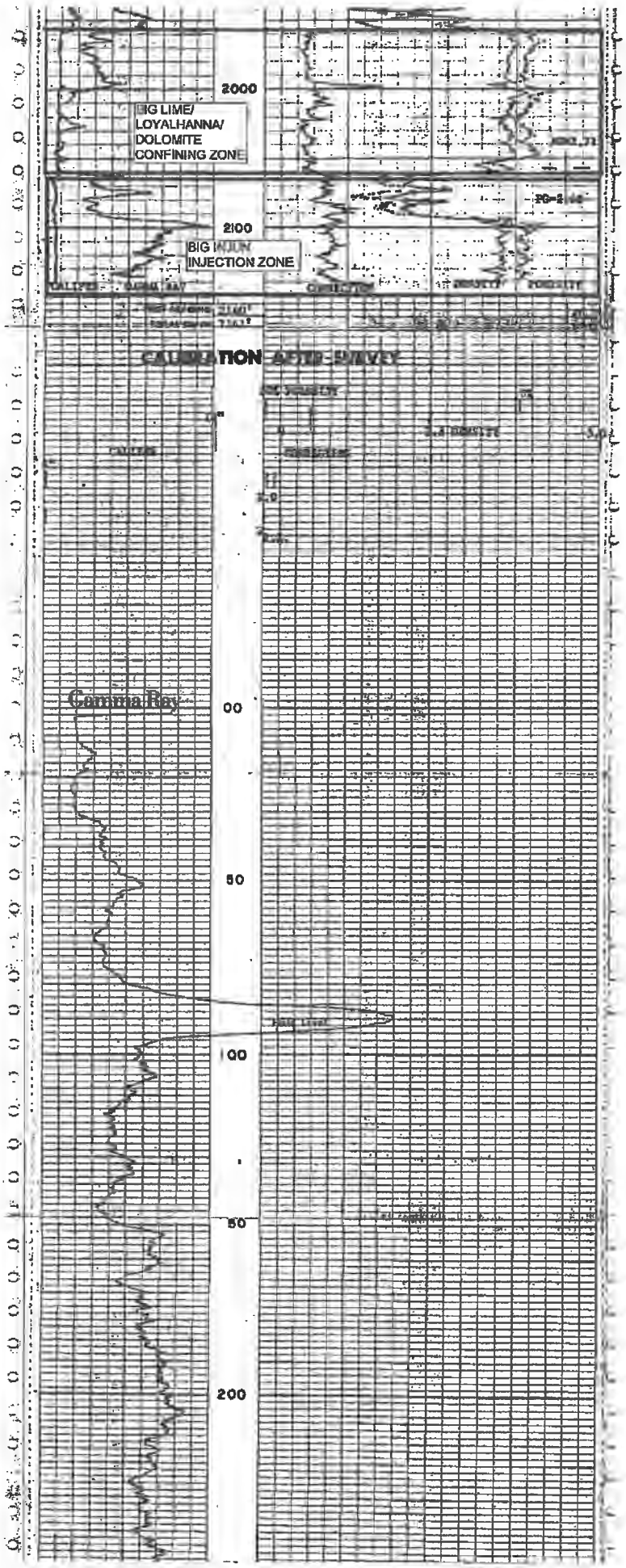
| | | | |
|---|---|---|---|
| Det. No. | | Det. No. | |
| Det. No. | | Det. No. | |
| Det. No. | | Det. No. | |
| Det. No. | | Det. No. | |

Logging Times

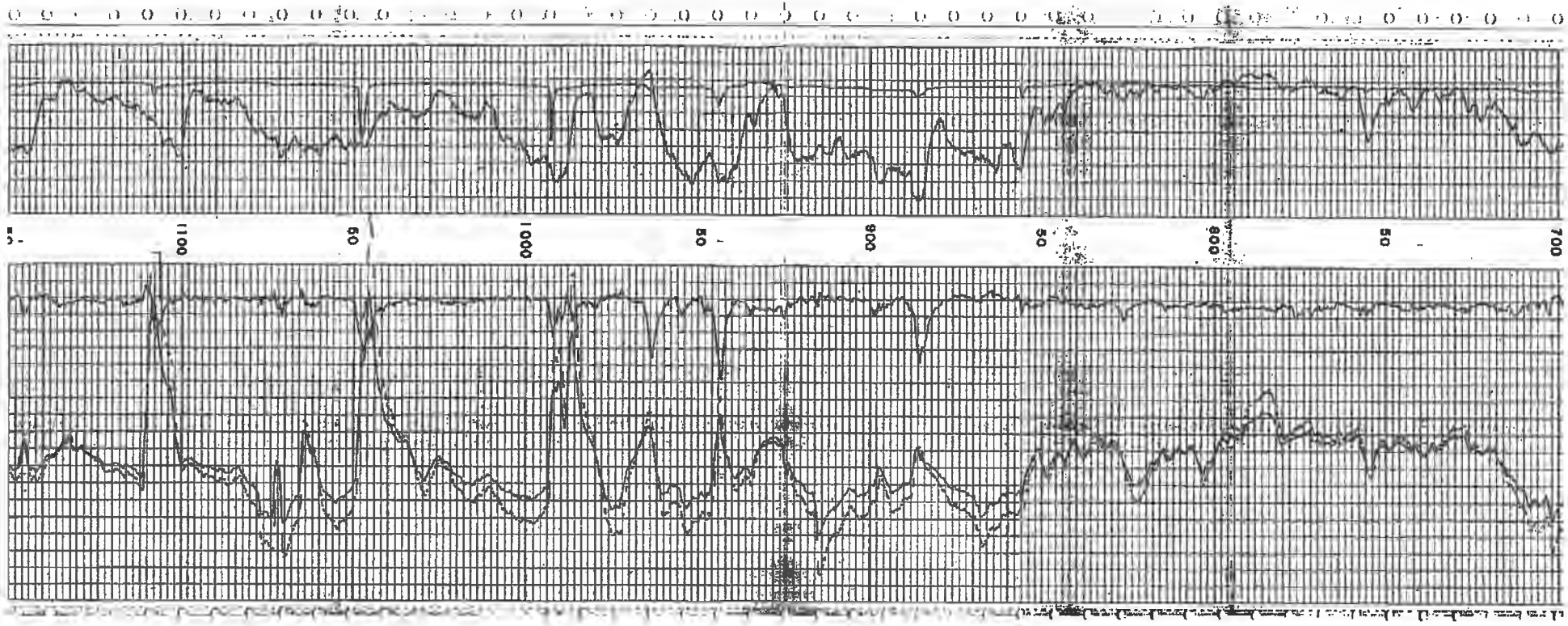
| | |
|---|---|
| | |
| | |
| | |
| | |

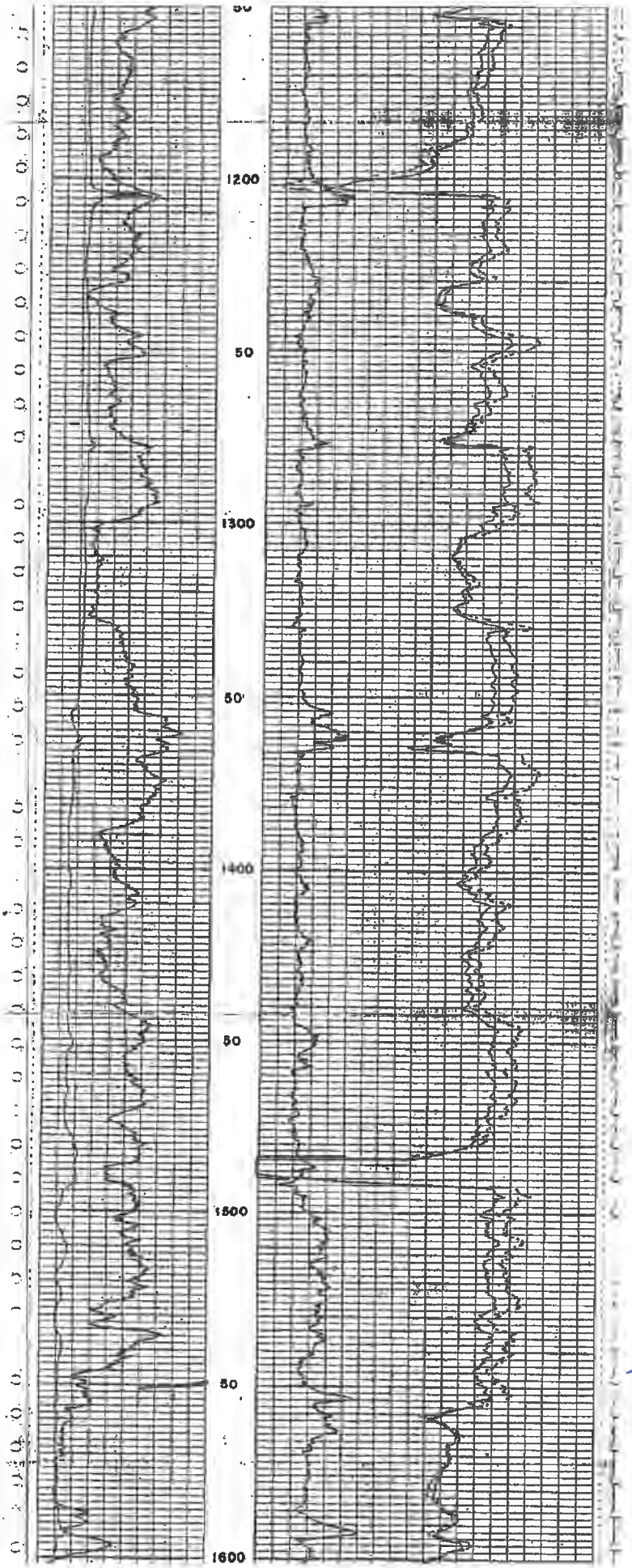

From
Speed Ft/Min
GR TC
GAMMA RAY
API UNITS
DEPTHS
BULK DENSITY
GRAMS/CC
CALIPER
CORRECTION
Gamma Ray
Density
Caliper
100
200
300
400
500
600
700
800


1900
1800
1700
1600
1500
1400
1300
1200
1100
1000
900


BIG LIME/
LOYALHANNA/
DOLOMITE
CONFINING ZONE
BIG INJUN
INJECTION ZONE
2000
2100
CALIBRATION AFTER SURVEY
Gamma Ray
00
50
100
50
200

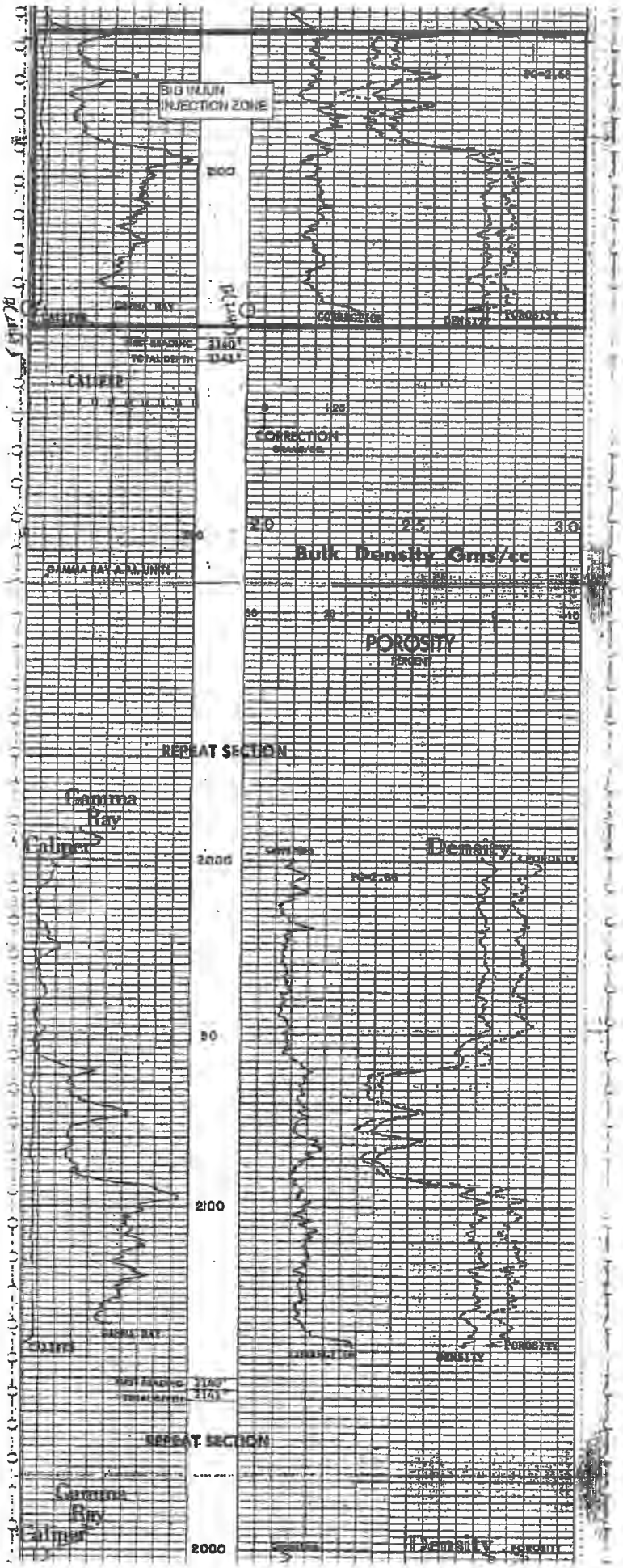
50
300
50
400
50
500
50
600
50
Caliper
Density
POROSITY

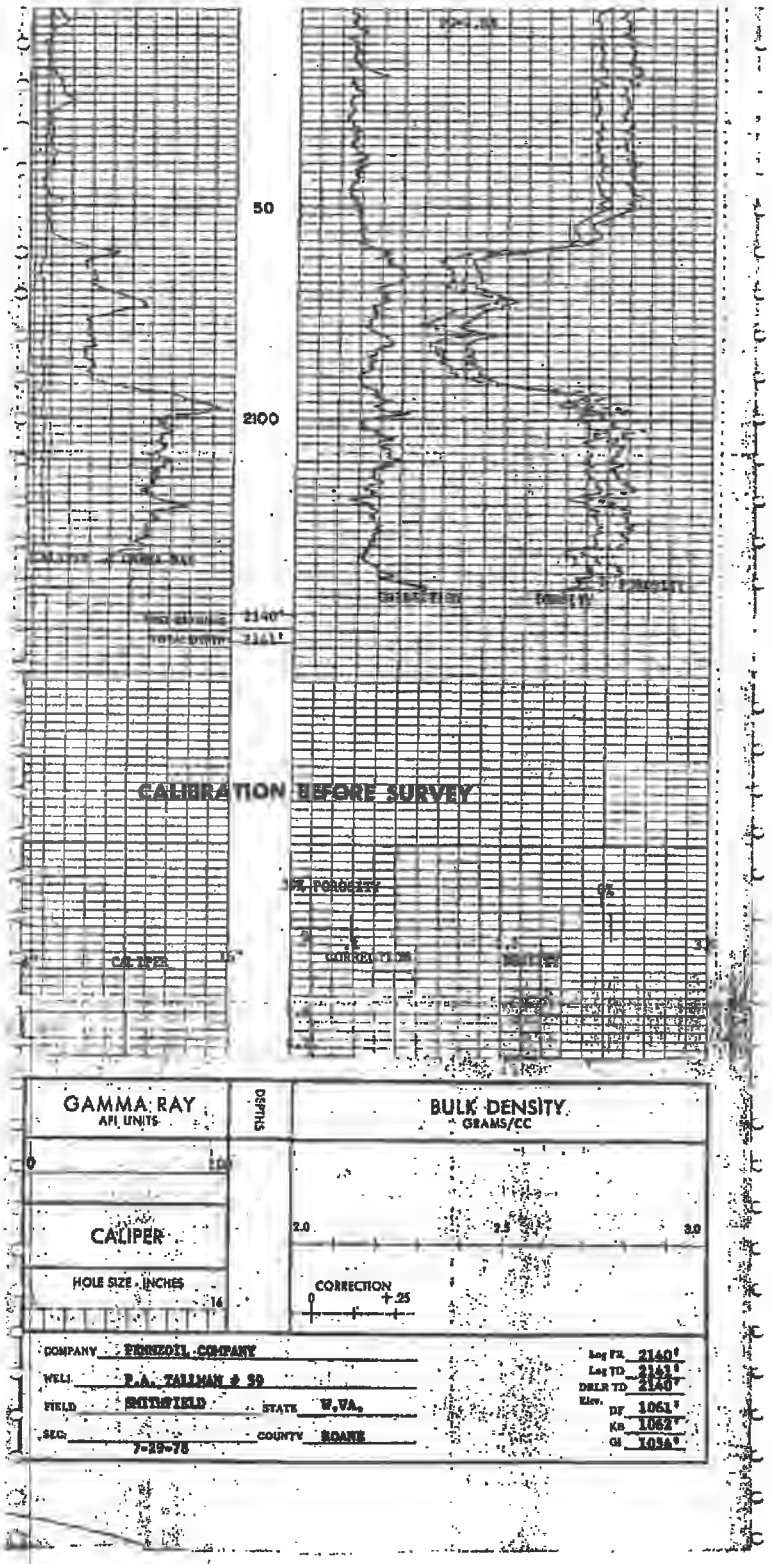

1100
50
1000
50
900
50
800
50
700




TOP OF BIG LIME
1556

50
1700
50
1800
50
1900
50
2000
BIG LIME/
LOYALHANNA/
DOLOMITE
CONFINING ZONE
50


BIG WUN
INJECTION ZONE
2100
CALIPER
CORRECTION
2.0
2.5
3.0
Bulk Density Gms/cc
GAMMA RAY & CL UNITS
POROSITY
PERCENT
REPEAT SECTION
Gamma
Ray
Caliper
2000
Density
2100
REPEAT SECTION
Gamma
Ray
Caliper
2000
Density


50
2100
2140'
2141'
CALIBRATION BEFORE SURVEY
GAMMA RAY
API UNITS
DEPTHS
BULK DENSITY
GRAMS/CC
0
100
CALIPER
HOLE SIZE - INCHES
14
2.0
2.5
3.0
CORRECTION
0
+.25
COMPANY PENNZOIL COMPANY
WELL P.A. TALLMAN # 39
FIELD SHUMFIELD
STATE W.VA.
SEC.
COUNTY ROANE
7-29-78
Log TD 2140'
Log TD 2141'
DRLR TD 2140'
Elev.
DF 1061'
KB 1062'
GL 1054'

2409
PERFORATION
DEPTH CONTROL

# Basin Surveys, Inc.

PERFORATION DEPTH CONTROL

FILING NO.
PERMIT # RDA-2409
47-087

COMPANY: PENNZOIL COMPANY

WELL: P.A. TALLMAN # 59

FIELD: SMITHFIELD DISTRICT

COUNTY: [illegible] STATE: [illegible]

LOCATION: TRACE FORK
QUAD: TARIFF 7 1/2'

SEC. TWP. RGE.

OTHER LOGS: [illegible]/C DEN/CAL

PERMANENT DATUM: GROUND LEVEL ELEV. 1054'
LOG MEASURED FROM: K.B. 8 ABOVE P.D.
DRILLING MEASURED FROM: K.B. 8 ABOVE P.D.

ELEVATIONS:
KB. 1062'
DF. 1061'
GL. 1054'

| | | | |
|---|---|---|---|
| DATE | 10-10-78 | | |
| RUN NO. | ONE | | |
| TYPE LOG | CB/FDC | | |
| DEPTH - DRILLER | [illegible] | | |
| DEPTH - LOGGER | [illegible] | | |
| BOTTOM LOGGED INTERVAL | [illegible] | | |
| TOP LOGGED INTERVAL | [illegible] | | |
| TYPE FLUID IN HOLE | | | |
| SALINITY PPM Cl. | | | |
| DENSITY LB./GAL. | | | |
| LEVEL | FULL | | |
| MAX. REC. TEMP. - DEG. F | | | |
| EQUIP. NO. TYPE | [illegible] | | |
| RECORDED BY | [illegible] | | |
| WITNESSED BY | MR. [illegible] & MR. JONES | | |

| RUN NO. | BORE HOLE RECORD BIT | FROM | TO | CASING RECORD SIZE | WGT. | FROM | TO |
|---|---|---|---|---|---|---|---|
| | 7 7/8" | 207' | [illegible] | | | | |
| | | | | 5 5/8" | | 0' | 207' |
| | 4 3/4" | [illegible] | T.D. | | | | |
| | | | | 3 1/2" | | 0' | T.D. |

THIS MEASURING AND D-LOG CONFORM TO API STANDARD PRACTICE RP-33

EQUIPMENT DATA

GAMMA RAY

| RUN NO. | TOOL MODEL NO. | DETECT. MODEL NO. | TYPE UNIT |
|---|---|---|---|
| 1 | GC-5A | [illegible] | [illegible] |

PERFORATIONS

| RUN NO. | TYPE | Tr. | TYPE | Tr. |
|---|---|---|---|---|
| 1 | 3 1/2" [illegible] | [illegible] | [illegible] | [illegible] |

GENERAL

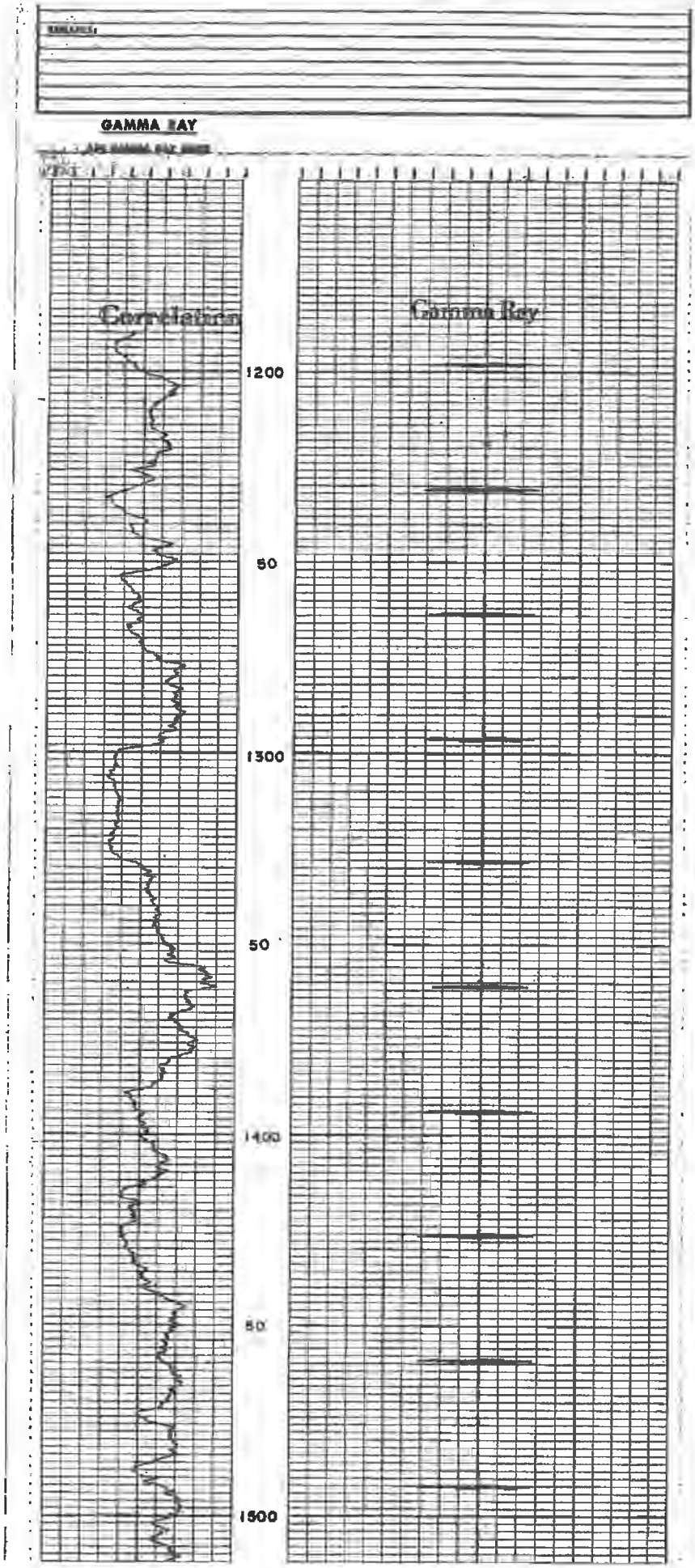
| | |
|---|---|
| INSTR. TRUCK NO. | 161 |
| TOOL SERIAL NO. | 161 |

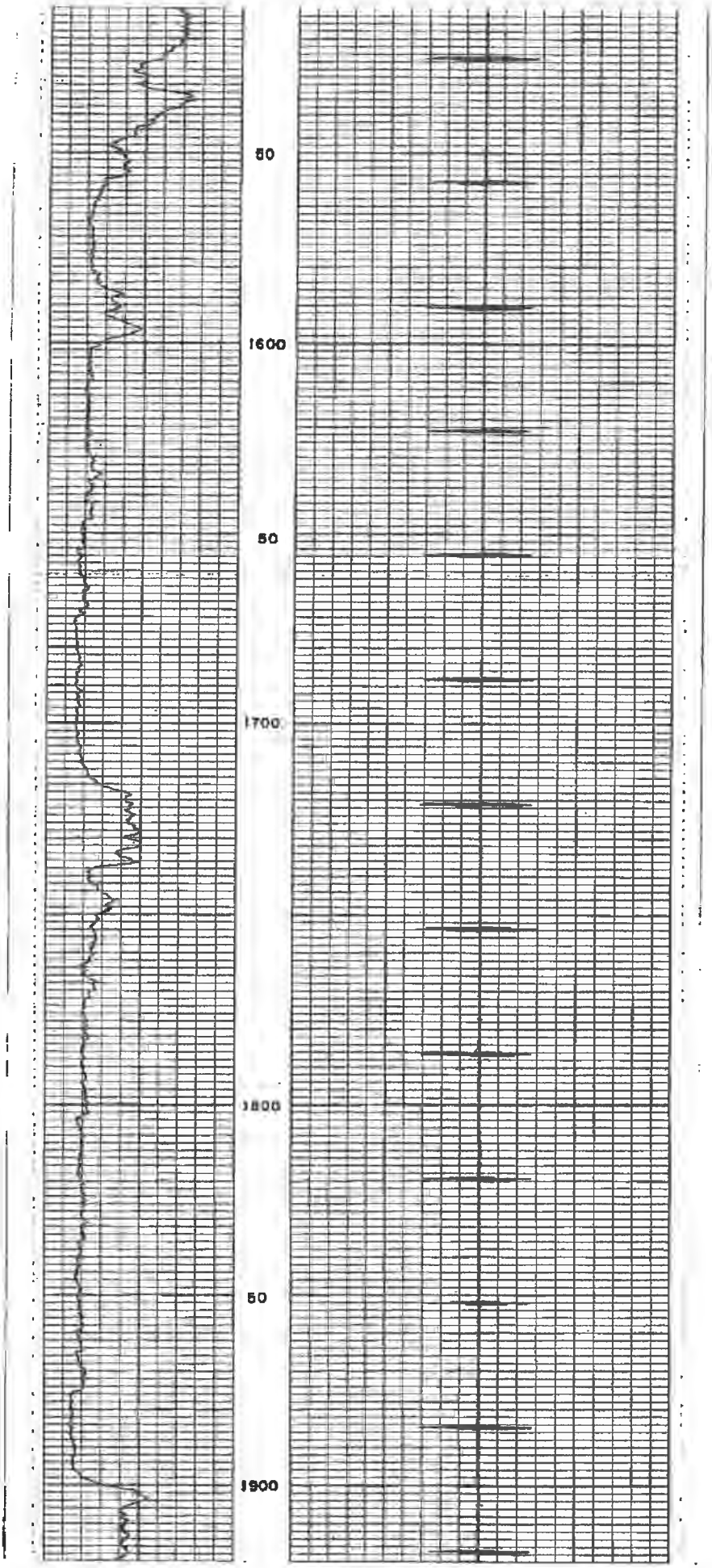
LOGGING DATA

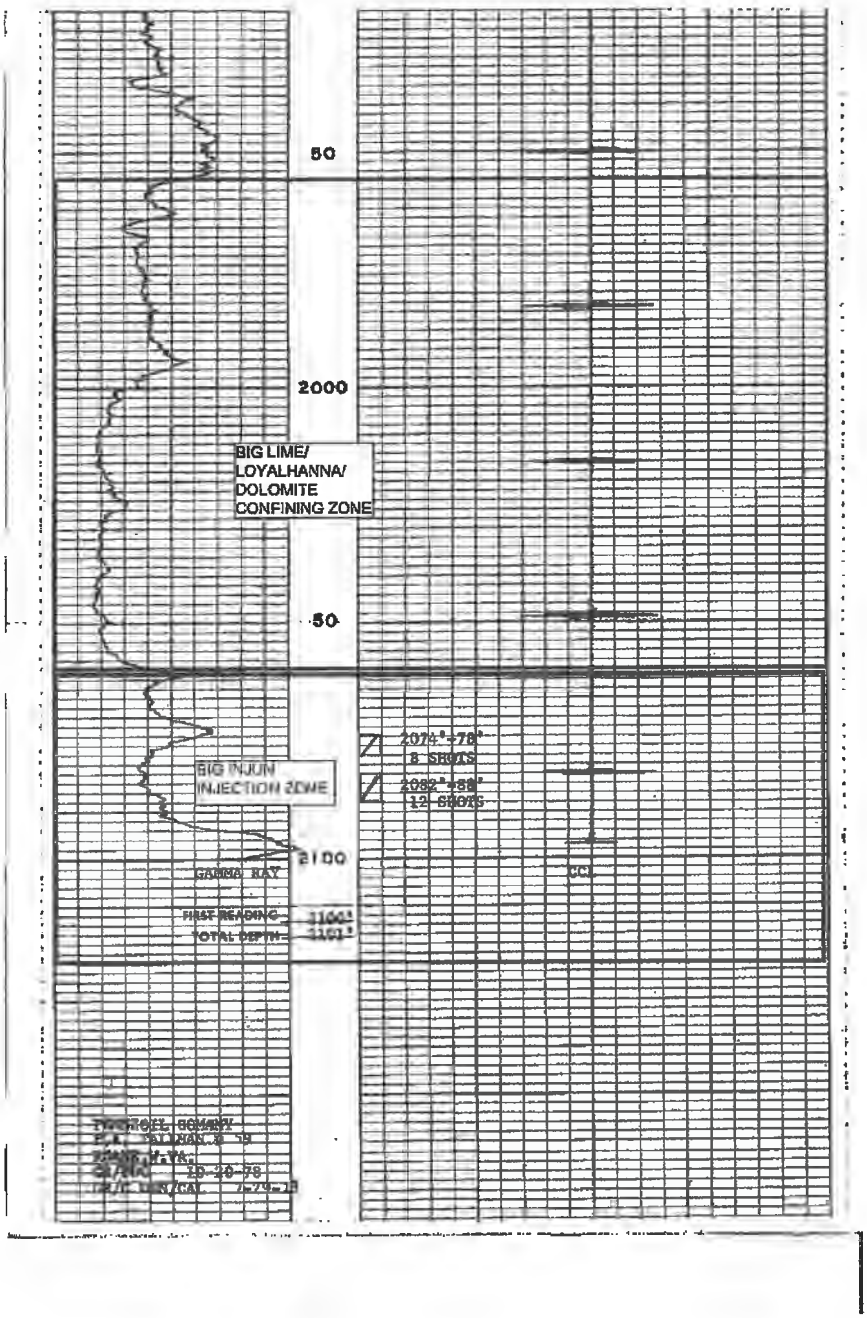
GAMMA RAY

| RUN NO. | DEPTH FROM | DEPTH TO | SPEED FT/MIN | T.C. SEC. | SENS. SETTINGS | ZERO LOG DIV. | SCALE API G.R. UNITS |
|---|---|---|---|---|---|---|---|
| 1 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 30 |

REMARKS LITERATURE:


GAMMA RAY
Correlation
Gamma Ray
1200
50
1300
50
1400
50
1500


50
1600
50
1700
1800
50
1900




PERF GL

2066
2070

2074
2080

WVGES GEOLOGY UNDERLIES IT ALL
"Pipeline"

Select County: (087) Roane
Enter Permit #: 2638
Get Data | Reset

Select datatypes: (Check All)
Location | Production | Plugging
Owner/Completion | Stratigraphy | Sample
Pay/Show/Water | Logs | Btm Hole Loc

Table Descriptions
County Code Translations
Permit-Numbering Series
Usage Notes
Contact Information
Disclaimer
WVGES Main
"Pipeline-Plus" New

WV Geological & Economic Survey:

## Well: County = 87 Permit = 2638

Report Time: Thursday, April 30, 2020 10:01:20 AM

### Location Information: View Map

| API | COUNTY | PERMIT | TAX_DISTRICT | QUAD_75 | QUAD_15 | LAT_DD | LON_DD | UTME | UTMN |
|---|---|---|---|---|---|---|---|---|---|
| 4708702638 | Roane | 2638 | Smithfield | Tariff | Otter | 38.653997 | -81.209836 | 481741.8 | 4278402.3 |

There is no Bottom Hole Location data for this well

### Owner Information:

| API | CMP_DT | SUFFIX | STATUS | SURFACE_OWNER | WELL_NUM | CO_NUM | LEASE | LEASE_NUM | MINERAL_OWN | OPERATOR_AT_COMPLETION | PROP_VD | PROP_TRGT_FM | TFM_EST_PR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702638 | 5/1/1911 | Original Loc | Completed | W M Looney | 7 | | | | | Pennzoil Company | | | |
| 4708702638 | 7/11/1985 | Worked Over | Completed | Pennzoil Products | 7 | | | | | Pennzoil Company | | | |
| 4708702638 | 6/21/1988 | Worked Over | Completed | Pennzoil | 7 | | | | | Pennzoil Company | | | |

### Completion Information:

| API | CMP_DT | SPUD_DT | ELEV | DATUM | FIELD | DEEPEST_FM | DEEPEST_FMT | INITIAL_CLASS | FINAL_CLASS | TYPE | RIG | COMP_MTHD | TVD | TMD | NEW_FTG | KOD | G_BEF | G_AFT | O_BEF | O_AFT | NGL_BEF | NGL_AFT | P_BEF | TI_BEF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702638 | 5/1/1911 | 3/23/1911 | 1072 | Ground Level | Tariff(Timn) | Big Injun (Price&eq) | Big Injun (Price&eq) | unclassified | unclassified | Oil | unknown | Shot | 2103 | | 2103 | | 0 | 0 | 0 | 20 | | | 0 | 0 |
| 4708702638 | 7/11/1985 | -/-/1985 | 1072 | Ground Level | Tariff(Timn) | Big Injun (Price&eq) | Big Injun (Price&eq) | Development Well | Development Well | Oil | unknown | Fractured | 2103 | | 0 | | 0 | 0 | 0 | 2 | | | 0 | 0 |
| 4708702638 | 6/21/1988 | 6/17/1988 | 1078 | Ground Level | Tariff(Timn) | Price Fm & equivs | Big Injun (Price&eq) | Service Well | Unsuccessful | Water Injection | Cable Tool | unknown | 2103 | | 0 | | 0 | 0 | 0 | 0 | | | 0 | 0 |

### Pay/Show/Water Information:

| API | CMP_DT | ACTIVITY | PRODUCT | SECTION | DEPTH_TOP | FM_TOP | DEPTH_BOT | FM_BOT | G_BEF | G_AFT | O_BEF | O_AFT | WATER_QNTY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702638 | 5/1/1911 | Water | Salt Water | Vertical | | | 1635 | | | | | | 0 |
| 4708702638 | 5/1/1911 | Pay | Oil | Vertical | 2070 | Big Injun (Price&eq) | 2082 | Big Injun (Price&eq) | 0 | 20 | | | |
| 4708702638 | 7/11/1985 | Pay | Oil | Vertical | 2070 | Big Injun (Price&eq) | 2082 | Big Injun (Price&eq) | 0 | 2 | | | |
| 4708702638 | 6/21/1988 | Horizon | Injection | Vertical | 2067 | Big Injun (Price&eq) | 2103 | Big Injun (Price&eq) | 0 | 0 | | | |

### Production Gas Information: (Volumes in Mcf) * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_GAS | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702638 | Pennzoil Company | 1981 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702638 | Pennzoil Company | 1982 | 1,385 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702638 | Pennzoil Company | 1983 | 521 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702638 | Pennzoil Company | 1984 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702638 | Pennzoil Products Company | 1989 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702638 | Pennzoil Products Company | 1990 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702638 | Pennzoil Products Company | 1991 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702638 | Pennzoil Products Company | 1992 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702638 | Pennzoil Products Company | 1993 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702638 | Pennzoil Products Company | 1994 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702638 | Pennzoil Products Company | 1995 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702638 | Triad Resources, Inc. | 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702638 | Ground Resources, LLC | 2017 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702638 | Ground Resources LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

### Production Oil Information: (Volumes in Bbl) ** some operators may have reported NGL under Oil * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_OIL | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702638 | Pennzoil Company | 1981 | 101 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702638 | Pennzoil Company | 1982 | 248 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702638 | Pennzoil Company | 1983 | 438 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702638 | Pennzoil Company | 1984 | 1,012 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702638 | Pennzoil Products Company | 1989 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702638 | Pennzoil Products Company | 1990 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702638 | Pennzoil Products Company | 1991 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702638 | Pennzoil Products Company | 1992 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702638 | Pennzoil Products Company | 1993 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702638 | Pennzoil Products Company | 1994 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702638 | Pennzoil Products Company | 1995 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702638 | Triad Resources, Inc. | 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702638 | Ground Resources, LLC | 2017 | 0 | | | | | | | | | | | | |
| 4708702638 | Ground Resources LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

### Production NGL Information: (Volumes in Bbl) ** some operators may have reported NGL under Oil * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_NGL | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702638 | Ground Resources LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

### Production Water Information: (Volumes in Gallons) * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_WTR | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702638 | Ground Resources LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | .0 | 0 | 0 | 0 | 0 | 0 | 0 |

### Stratigraphy Information:

| API | SUFFIX | FM | FM_QUALITY | DEPTH_TOP | DEPTH_QUALITY | THICKNESS | THICKNESS_QUALITY | ELEV | DATUM |
|---|---|---|---|---|---|---|---|---|---|
| 4708702638 | Original Loc | Mahonig Ss/Big Dunk | Well Record | 700 | Reasonable | 220 | Reasonable | 1072 | Ground Level |
| 4708702638 | Original Loc | Salt Sands (undiff) | Well Record | 1600 | Reasonable | 290 | Reasonable | 1072 | Ground Level |
| 4708702638 | Original Loc | Maxton | Well Record | 1892 | Reasonable | 33 | Reasonable | 1072 | Ground Level |
| 4708702638 | Original Loc | Little Lime | Well Record | 1930 | Reasonable | 30 | Reasonable | 1072 | Ground Level |
| 4708702638 | Original Loc | Pencil Cave | Well Record | 1970 | Reasonable | 10 | Reasonable | 1072 | Ground Level |
| 4708702638 | Original Loc | Big Lime | Well Record | 1980 | Reasonable | 87 | Reasonable | 1072 | Ground Level |

INJECTOR 2638

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 4708702638 | Original Loc | Big Injun (Price&eq) | Well Record | 2067 | Reasonable | | 0 | Reasonable | 1072 | Ground Level |

2636

Wireline (E-Log) Information:

| API | LOG_TOP | LOG_BOT | DEEPEST_FML | LOGS_AVAIL | SCAN | DIGITIZED | GR_TOP | GR_BOT | D_TOP | D_BOT | N_TOP | N_BOT | I_TOP | I_BOT | T_TOP | T_BOT | S_TOP | S_BOT | O_TOP | O_BOT | INCH2 | INCH5 | REDUCED | KOP | LOGMD | ELEV_KB | ELEV_GL | ELEV_DF | LOG_ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702638 | 0 | 2414 | | G C * | Y | N | 0 | 2414 | | | | | | | | | | | 0 | 2408 | N | Y | N | | | | | | |

Comment: *logs: caliper, CCL

Downloadable Log Images: We advise you to save the log image file to your PC for viewing. To do so, right-click the .tif image of interest and select the save option. Then you can direct the file to a location of your choice. Please note these images vary in size and some may take several minutes to download, especially if using a 56k or slower dialup connection.

| FILENAME |
|---|
| 4708702638gco.tif |

**Quick Reference Guide for Log File Names** For more info about WVGES scanned logs click here

**geologic log types:**
- d density (includes bulk density, compensated density, density, density porosity, grain density, matrix density, etc.)
- e photoelectric adsorption (PE or Pe, etc.)
- g gamma ray
- i induction (includes dual induction, medium induction, deep induction, etc.)
- l laterolog
- m dipmeter
- n neutron (includes neutron porosity, sidewall neutron--SWN, etc.)
- o other[1]
- s sonic or velocity
- t temperature (includes borehole temperature, BHT, differential temperature, etc.)
- z spontaneous potential or potential

**mechanical log types:**
- b cement bond
- c caliper
- o other[1]
- p perforation depth control or perforate

[1]other logs may include, but are not limited to, such curves as audio, bit size, CCL--casing collar locator, continuous meter, directional survey, gas detector, guard, NCTL--Nuclear Cement Top Locator, radioactive tracer, tension

There is no Plugging data for this well

There is no Sample data for this well

2638

# APPENDIX A
## Injection Well Form

1) GEOLOGIC TARGET FORMATION Big Injun Sandstone

Depth 2067 Feet (top) 2103 Feet (bottom)

2) Estimated Depth of Completed Well, (or actual depth of existing well): 2103 Feet

3) Approximate water strata depths: Fresh _____ Feet Salt 1635, 1700 Feet

4) Approximate coal seam depths: None

5) Is coal being mined in the area? Yes ☐ No ☑

6) Virgin reservoir pressure in target formation 880 psig Source Estimated/Historical

7) Estimated reservoir fracture pressure _____ psig (BHFP)

8) MAXIMUM PROPOSED INJECTION OPERATIONS:

Injection rate (bbl/hour) 25

Injection volume (bbl/day) 200

Injection pressure (psig) 1000

Bottom hole pressure (psig) 2000

9) DETAILED IDENTIFICATION OF MATERIALS TO BE INJECTED, INCLUDING ADDITIVES:
Fresh water and/or produced water from the field and possible biocides as necessary.

Temperature of injected fluid: (°F) Ambient

10) FILTERS (IF ANY)
Anthracite Coal Filters

11) SPECIFICATIONS FOR CATHODIC PROTECTION AND OTHER CORROSION CONTROL
None

# APPENDIX A (cont.)

12. Casing and Tubing Program

| TYPE | Size | New or Used | Grade | Weight per ft. (lb/ft) | FOOTAGE: For Drilling | INTERVALS: Left in Well | CEMENT: Fill-up (Cu. Ft.) |
|---|---|---|---|---|---|---|---|
| Conductor | | | | | | | |
| Fresh Water | 6 5/8" | | | | 1987 | 1987 | No Record |
| Coal | | | | | | | |
| Intermediate 1 | | | | | | | |
| Intermediate 2 | | | | | | | |
| Production | 4 1/2" | | | | 2046 | 2046 | 40 sks |
| Tubing | None | | | | | | |
| Liners | | | | | | | |

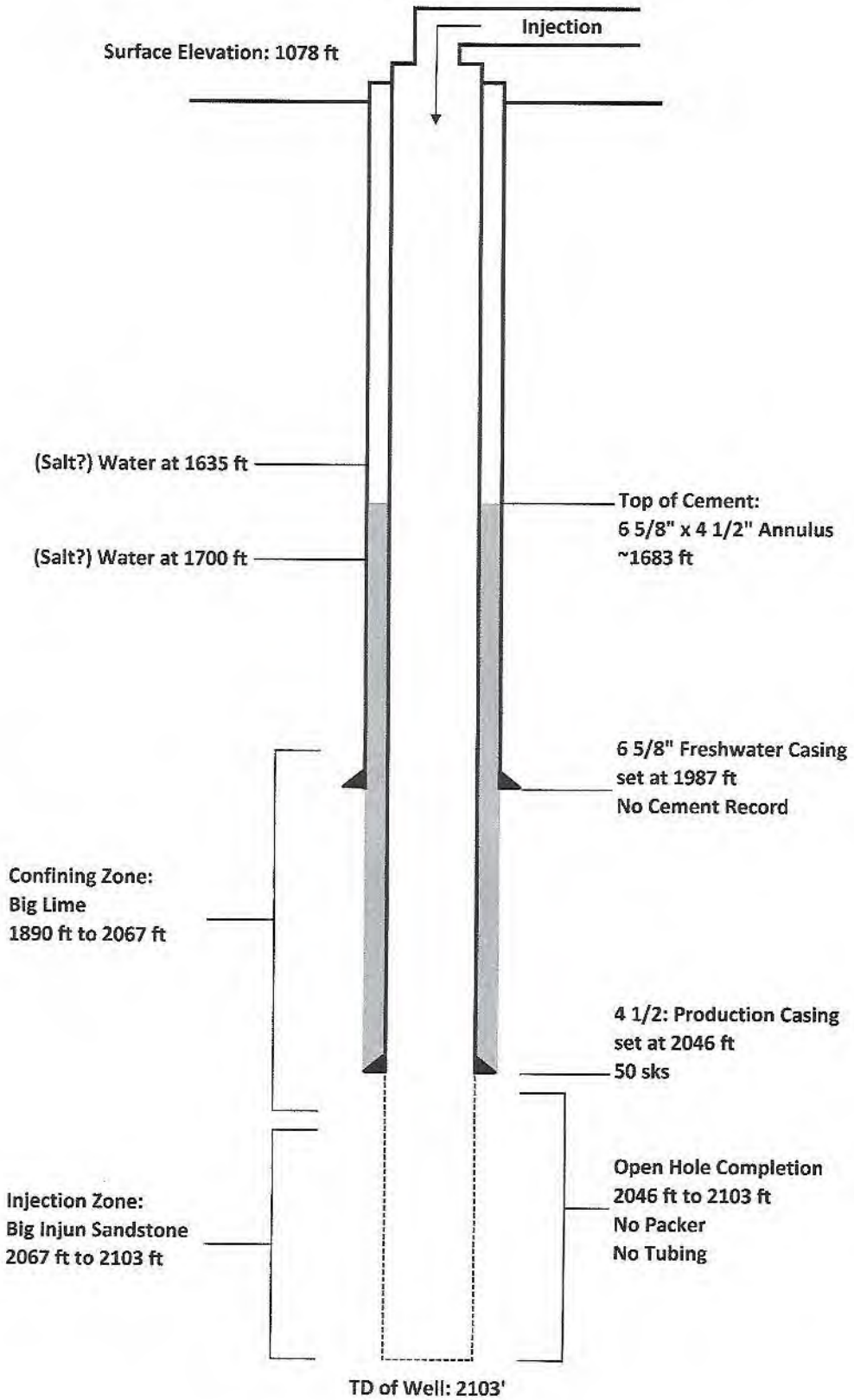
| TYPE | Wellbore Diameter | Casing Size | Wall Thickness | Burst Pressure | Cement Type | Cement Yield (cu. ft./sk) | Cement to Surface ? (Y or N) |
|---|---|---|---|---|---|---|---|
| Conductor | | | | | | | |
| Fresh Water | | 6 5/8" | | | | | No record |
| Coal | | | | | | | |
| Intermediate 1 | | | | | | | |
| Intermediate 2 | | | | | | | |
| Production | | 4 1/2" | | | | 40 sks | No |
| Tubing | | | | | | | |
| Liners | | | | | | | |

| PACKERS | Packer #1 | Packer #2 | Packer #3 | Packer #4 |
|---|---|---|---|---|
| Kind: | None | | | |
| Sizes: | | | | |
| Depths Set: | | | | |

# Well Schematic

## W.M. LOONEY 7

## API 47-087-02638



INJECTOR 2638

WR-35

RECEIVED
NOV 12 1987
DIVISION OF OIL & GAS
DEPARTMENT OF ENERGY

State of West Virginia
DEPARTMENT OF ENERGY
Oil and Gas Division

Date November 10, 1987
Operator's
Well No. 7
Farm W. M. Looney
API No. 47 - 087 - 2638-F

WELL OPERATOR'S REPORT
OF
DRILLING, FRACTURING AND/OR STIMULATING, OR PHYSICAL CHANGE

WELL TYPE: Oil X / Gas ___ / Liquid Injection ___ / Waste Disposal ___ /
(If "Gas," Production ___ / Underground Storage ___ / Deep ___ / Shallow ___ /)

LOCATION: Elevation: 1072' Watershed Trace Fork
District: Smithfield County Roane Quadrangle Tariff 7.5'

COMPANY Pennzoil Products Company
ADDRESS P.O. Box 5519, Vienna, WV 26105
DESIGNATED AGENT James A. Crews
ADDRESS PO Box 5519, Vienna, WV 26105
SURFACE OWNER Pennzoil Products Co.
ADDRESS P.O. Box 5519, Vienna, WV 26105
MINERAL RIGHTS OWNER Keith Crihfield
ADDRESS Spencer, WV 25276
OIL AND GAS INSPECTOR FOR THIS WORK Homer Dougherty ADDRESS Looneyville, WV 25259
PERMIT ISSUED 6-26-85
DRILLING COMMENCED
~~DRILLING~~ Fracture COMPLETED 7-11-85
IF APPLICABLE: PLUGGING OF DRY HOLE ON CONTINUOUS PROGRESSION FROM DRILLING OR REWORKING. VERBAL PERMISSION OBTAINED ON

| Casing & Tubing | Used in Drilling | Left in Well | Cement fill up Cu. ft. |
|---|---|---|---|
| Size 20-16 Cond. | | | |
| 13-10" | | | |
| 9 5/8 | | | |
| 8 5/8 | | | |
| 7 | See original well record. | | |
| 5 1/2 | | | |
| 4 1/2 | | | |
| 3 | | | |
| 2 | | | |
| Liners used | | | |
| | | | |

GEOLOGICAL TARGET FORMATION Big Injun Depth 2067-2103 feet
Depth of completed well 403 feet Rotary ___ / Cable Tools ___
Water strata depth: Fresh ___ feet; Salt ___ feet
Coal seam depths: ___ Is coal being mined in the area? ___

OPEN FLOW DATA
Producing formation Big Injun Pay zone depth ___ feet
Gas: Initial open flow ___ Mcf/d Oil: Initial open flow ___ Bbl/d
Final open flow ___ Mcf/d Final open flow 2 Bbl/d
Time of open flow between initial and final tests ___ hours
Static rock pressure ___ psig (surface measurement) after ___ hours shut in
(If applicable due to multiple completion--)
Second producing formation ___ Pay zone depth ___ feet
Gas: Initial open flow ___ Mcf/d Oil: Initial open flow ___ Bbl/d
Final open flow ___ Mcf/d Oil: Final open flow ___ Bbl/d
Time of open flow between initial and final tests ___ hours
Static rock pressure ___ psig (surface measurement) after ___ hours shut in

ROANE 2638-F

(Continue on reverse side)

2638

DETAILS OF PERFORATED INTERVALS, FRACTURING OR STIMULATING, PHYSICAL CHANGE, ETC.

Fractured 7-11-85 w/76 Bbls. $H_2O$ & 500# 20/40 sand.

WELL LOG

| FORMATION COLOR HARD OR SOFT | TOP FEET | BOTTOM FEET | REMARKS Including indication of all free and salt water, coal, oil and gas |
|---|---|---|---|
| See original well record. | | | |

RECEIVED
NOV 12 1987
DIVISION OF OIL & GAS
DEPARTMENT OF ENERGY

*(Attach separate sheets as necessary)*

PENNZOIL PRODUCTS COMPANY
Well Operator

By: Curtis A. Lucas
Curtis A. Lucas

Date: November 10, 1987

*Note: Regulation 2.02(i) provides as follows:*
*"The term 'log' or 'well log' shall mean a systematic detailed geological record of all formations, including coal, encountered in the drilling of a well."*

2634

2638
INJECTOR

Well No. 7 W M. Looney Farm.
Lease No. Smithers District Roane County.
Rig built by W. B. Wilson
Well drilled by J & B Gas Contractor.
Began drilling March 25 1971 Completed May 1 1971

| ROCK FORMATION | TOP | BOTTOM | REMARKS |
|---|---|---|---|
| Conductor | | 16 | 087-2638-F |
| Big Dunkard | 700 | 920 | |
| Gas Sand | 950 | 1000 | |
| Salt Sand | 1600 | 1890 | |
| Water | 1635 | | |
| Water | 1700 | | |
| Maxon Sand | 1892 | 1925 | |
| Little Lime | 1930 | 1960 | |
| Pencil Cave | 1970 | 1980 | |
| Big Lime | 1980 | 2067 | |
| Big Injun | 2067 | 2103 | |
| 1st Oil | 2070 | | |
| 2nd Oil | 2082 | | |
| Total Depth | | 2103 | |

CASING RECORD

| | CHARGED TO WELL | | PUT IN WELL | | PULLED OUT | | LEFT IN WELL | | Transferred before Completing | | Left at Well Not in Use | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Size | Feet | In. | Feet | In. | Feet | In. | Feet | In. | Feet | In. | Feet | In. | |
| 10 | | | 240. | | 240. | | | | Shot 7/10/73 - 40 qt. - D Dry | | | | |
| 8 5/8 | | | 835 | | 835. | | | | 5/3/11 - 20 " " | | | | |
| 6 5/8 | | | 1987. | | | | | | Shot 4/14/44 | 150 Qts. | 20 | | Wire |

Production First 24 Hours 20 Bbls. Signed John A. Ford Supt.

RECEIVED
JUN 06 1985
OIL & GAS DIVISION
DEPT. OF MINES

ROANE-2638-F

Form WR-37
(Obverse)

RECEIVED
Division of Energy
Oil and Gas
JUN 19 91
UIC Section

Date: June 18 19 91
Operator's
Well No. W. M. LOONEY NO. 7
API Well No. 47 - 087 - 2638
State County Permit

STATE OF WEST VIRGINIA
DEPARTMENT OF ENERGY, OIL AND GAS DIVISION

W/PMIT ✓
UIC ✓

PRE-OPERATION CERTIFICATE
FOR LIQUID INJECTION OR WASTE DISPOSAL WELL

WELL OPERATOR Pennzoil Products Company
Address P.O. Box 5519
Vienna, W. Va. 26105-5519

DESIGNATED AGENT James A. Crews
Address P.O. Box 5519
Vienna, W. Va. 26105-5519

GEOLOGICAL TARGET FORMATION Big Injun Depth 2067 feet (top) to 2113 feet (bottom)

Virgin reservoir pressure in target formation 80 psig

Source of information on virgin reservoir pressure Estimated

Perforation intervals _____ Open-hole intervals 2082-2113

MAXIMUM PERMITTED INJECTION OPERATIONS

Volume per hour: 12 Bbls/Hr.

Well head injection pressure: 1080 psig
Bottom hole pressure: 2000 psig

DETAILED IDENTIFICATION OF MATERIALS TO BE INJECTED

Liquids to be injected for oil recovery under Code § 22-4-10a:
Fresh and/or produced water from waterflood operations.

Wastes to be disposed of: _____

Additives (Slurry mediums, inhibitors, solvents, oxidizers, deoxidizers, etc.):
Bactericides and other chemicals as necessary to maintain water quality or improve oil recovery.

Specific Gravity: _____

SPECIFICATIONS FOR CATHODIC PROTECTION AND OTHER CORROSION CONTROL _____

ADDITIONAL DRILLING AS PART OF THE CONVERSION

Complete and submit Form WR-35, "Well Operator's Report of Drilling, Fracturing and/or Stimulating or Physical Change".

DETAILS ON NEW CASING AND TUBING PROGRAM AS PART OF THE CONVERSION:

(To be completed below unless the new casing and tubing program is described on a Form WR-35, "Well Operator's Report of Drilling, Fracturing and/or Stimulating or Physical Change", submitted in connection with the permit to which this Form WR-37 preoperation certificate relates.)

| CASING OR TUBING TYPE | SPECIFICATIONS | | | | | FOOTAGE INTERVALS | | CEMEMT FILL-UP OR SACKS | PACKERS |
|---|---|---|---|---|---|---|---|---|---|
| | Size | Grade | Weight per ft. | New | Used | For drilling | Left in Well | (Cubic feet) | |
| Conductor | | | | | | | | | Kinds |
| Fresh water | 10 | | | | | 740 | | | |
| ~~XXXX~~ Interm | 8-1 | 4 | | | | 835 | | | Sizes |
| Intermediate | 6-5 | 8 | | | | | 1987 | Existing | |
| Production | 4-1 | 2 K55 | 9.5 | x | | | 2046 | 50 Sks. | Depths s |
| Tubing | | | | | | | | | |
| Liners | | | | | | | | | Perforati |
| | | | | | | | | | |

FORM WR-37
(Reverse)

MECHANICAL INTEGRITY TEST

Test method: Monitoring of 4-1/2"x6-5/8" annulus - see attached pressure chart.

The undersigned certifies that the test was performed on 6/29 - 7/5, 1988 and demonstrated the mechanical integrity of the well. The test was witnessed by _____ representing the Division of Oil and Gas.

Pennzoil Products Co.
Well Operator

June 18, 1991
Date

THIS WELL IS AUTHORIZED FOR INJECTION.

Signed Michael L. Jones for Director, Division of Oil and Gas

Date 7/8/91

[NOTE: That the mechanical integrity of this well must be demonstrated again within ninety (90) days of five years from this date in order for injection to continue. Please notify the state inspector 24 hours in advance of the test].

FACILITIES OR SYSTEMS TO PROTECT THE INTEGRITY OF THE GEOLOGICAL TARGET FORMATION FRACTURING THE CONFINING STRATA _____

APPLICATION FOR VARIANCE (IF ANY) FROM REGULATION 9.01 (P)
[Specify purpose, necessity, and justification]

Pennzoil Products Company
Well Operator

By: Curtis A. Lucas

Curtis A. Lucas
Its Adv. Engr. Tech.

Lease No. 6216 Acres 480 Farm Name Loonoy, W. H. 87-2638 Well No. 7

N. 3.53-4 E. W. 35 Location Made Purchased From

Civil District Smithfield Rig Completed March 12, 1911 Date Purchased

County Roane Dr'g Commenced March 23, 1911 Sold to

St. W. Va. Dr'g Completed May 1, 1911 Date Sold

GAS OIL Rights Owned By Dr'g Contractor Drlg. Tools Acc't. Date Abandoned

## FORMATION

| Kind | Top | Bottom | Steel Line Meas. | Tests |
|---|---|---|---|---|
| Conductor | | 16 | | |
| Dunkard Sand | 700 | 920 | | |
| Salt Sand | 1600 | 1890 | 4167 | |
| Water | 1635 | 1700 | 4[illegible] | |
| Maxon Sand | 1892 | 1925 | | |
| Big Lime | 1980 | 2067 | 57 | |
| Pencil Cave | 1970 | 1980 | | |
| Big Injun | 2067 | 2103 | | |
| Gas & Oil | 2070 | | | |
| Oil & Gas | 2082 | | | |
| | | | | C.O. |
| T. D. | | ~~2103~~ 2114 | | |

RECEIVED
Division of Oil and Gas
JUN 19 91
UIC Section

## CASING RECORD

| Size | Bottom Casing Steel Line | Put in Well Tally Meas. | Pulled Tally Meas. | Cement |
|---|---|---|---|---|
| 10" | | 240' | 240' | Date |
| 8 1/4" | | 835' | 835' | Size Csg. |
| 6 5/8" | | 1967' | | Top Csg. |
| 5 3/16" | | 2005' | | Bot. Csg. |

## PACKERS AND SHOES

| Kind | Size | Depth Set | Date |
|---|---|---|---|
| | | | |

## TORPEDO RECORD

| Date | No. Qts. | Size Shell | Top Shot | Bottom | Re |
|---|---|---|---|---|---|
| May 3, '11 | 20 | 2-2x10 | | | 10' |
| Feb. 10, '13 | 40 | 4 1/2x20 | 2070 | 2090 | |
| June 16, '44 | 50 | 3 1/2x24 | 2090 | 2114 | Bomb |
| May 1, 1957 | 60 | 4 1/2x10 | 2080 | 2100 | Bom |

| Initial Prod. | Sand | At Completion | 30 Days After | |
|---|---|---|---|---|
| Oil | | | | |
| Gas | | | | |

APPROVED

WR-35

RECEIVED
Division of Energy
Oil and Gas
JUN 1 9 91
UIC Section

19-May-88
API # 47- 87-02638 S

State of West Virginia
DEPARTMENT OF ENERGY
Division of Oil and Gas

Well Operator's Report of Well Work

Farm name: PENNZOIL PRODUCTS, INC. Operator Well No.: W.M. LOONEY 7 WIW,

LOCATION: Elevation: 1078.00 Quadrangle: TARIFF

District: SMITHFIELD County: ROANE
Latitude: 4800 Feet South of 38 Deg. 40Min. 0 Sec.
Longitude 12300 Feet West of 81 Deg. 10 Min. 0 Sec.

Company: PENNZOIL PRODUCTS COMPANY
P. O. BOX 5519
VIENNA, WV

Agent: JAMES A. CREWS

Inspector: HOMER DOUGHERTY
Permit Issued: 05/20/88
Well work Commenced: 6-17-88
Well work Completed: 6-21-88
Verbal Plugging
Permission granted on:
Rotary_____ Cable ____X_ Rig
Total Depth (feet) 2114
Fresh water depths (ft) N/A
Salt water depths (ft) 1635
Is coal being mined in area (Y/N)?
Coal Depths (ft): N/A

| Casing & Tubing Size | Used in Drilling | Left in Well | Cement Fill Up Cu. Ft. |
|---|---|---|---|
| 10 | 240 | 240 | Pulled |
| 8-1/4 | 835 | 835 | Pulled |
| 6-5/8 | 1987 | 1987 | |
| 4-1/2 | 2046 | 2046 | 50:50 Poz |

NOTE: Well was converted to LI as permited.

OPEN FLOW DATA

Producing formation Big Injun LI Pay zone depth (ft)_____
Gas: Initial open flow_____MCF/d Oil: Initial open flow_____Bbl/d
Final open flow_____MCF/d Final open flow _____Bbl/d
Time of open flow between initial and final tests_____Hours
Static rock Pressure_____psig (surface pressure) after _____Hours

Second producing formation_____ Pay zone depth (ft)_____
Gas: Initial open flow_____MCF/d Oil: Initial open flow_____Bbl/d
Final open flow_____MCF/d Final open flow _____Bbl/d
Time of open flow between initial and final tests_____Hours
Static rock Pressure_____psig (surface pressure) after _____Hours

NOTE: ON BACK OF THIS FORM PUT THE FOLLOWING: 1). DETAILS OF PERFORATED INTERVALS, FRACTURING OR STIMULATING, PHYSICAL CHANGE, ETC. 2). THE WELL LOG WHICH IS A SYSTEMATIC DETAILED GEOLOGICAL RECORD OF ALL FORMATIONS, INCLUDING COAL ENCOUNTERED BY THE WELLBORE.

For: PENNZOIL PRODUCTS COMPANY
By: Timothy P. Roush
Date: November 19, 1990

# NL McCullough

GAMMA RAY LOG

FILING NO. 87-2638

COMPANY PENNZOIL COMPANY

WELL W. M. LOONEY #7

FIELD TARIFF FIELD

COUNTY ROANE STATE WV

LOCATION SMITHFIELD DISTRICT

OTHER SERVICES

SEC. TWP. RGE.

PERMANENT DATUM GROUND LEVEL ELEV. -

LOG MEASURED FROM 2' ABOVE P.D.

DRILLING MEASURED FROM D.F.

ELEVATIONS: KB - DF - GL -

| | | |
|---|---|---|
| DATE | 1-23-84 | |
| RUN NO | ONE | ONE |
| TYPE LOG | GAMMA RAY | MECH. CALIPER |
| DEPTH DRILLER | 2114' | |
| DEPTH LOGGER | 2117' | |
| BOTTOM LOGGED INTERVAL | 2114' | 2115' |
| TOP LOGGED INTERVAL | SURF. | 1900' |
| TYPE FLUID IN HOLE | OIL & WATER | |
| SALINITY PPM CL | - | |
| DENSITY LB/GAL | - | |
| LEVEL | - | |
| MAX. REC. TEMP. DEG. F | - | |
| OPR. RIG TIME | 3 HOURS | |
| RECORDED BY | SMITH | |
| WITNESSED BY | MR. PUTSCHER | |
| DISTRICT: | CHARLESTON | |

BORE HOLE RECORD

| RUN NO. | BIT | FROM | TO | SIZE | WGT. |
|---|---|---|---|---|---|
| ONE | | | | 6 5/8" | |

CASING RECORD

| FROM | TO |
|---|---|
| SURF. | 1982' |

FOLD HERE

EQUIPMENT DATA

GAMMA RAY / MECH. CALIPER

| | | |
|---|---|---|
| RUN NO. | ONE | |
| TOOL MODEL NO. | 5547-0-0 | |
| DIAM. | 3.5" | 1.75" |
| DETECT. MODEL NO. | SCINT. | PULSE |
| TYPE | 3" | 6" ARMS |
| LENGTH | | |
| DIST. TO N. SOURCE | | |

NEUTRON

| | |
|---|---|
| RUN NO | |
| LOG TYPE | |
| TOOL MODEL NO. | |
| DIAM. | |
| DETECT. MODEL NO. | |
| TYPE | |
| LENGTH | |
| SOURCE MODEL NO. | |
| SERIAL NO. | |
| SPACING | |
| TYPE | |
| STRENGTH | |

GENERAL

| | |
|---|---|
| HOIST TRUCK NO. | 1644 |
| INST. TRUCK NO. | 1644 |
| TOOL SERIAL NO. | |
| LOG TICKET NO. | 180238 |

LOGGING DATA

GENERAL

| RUN NO. | DEPTHS FROM | DEPTHS TO | SPEED FT. MIN. | T.C. SEC |
|---|---|---|---|---|
| ONE | 2114' | SURF. | 28' | 2 |
| ONE | 2115' | 1990' | 30' | 2 |

GAMMA RAY

| RUN NO. | GAIN SETTINGS | ZERO DIV. | AR IN UNITS PER LOG DIV. | T.C. SEC |
|---|---|---|---|---|
| ONE | R-6(X1) D-400 G-500 | 0 | | |
| ONE | R-3(X1) D-200 G-25 | | | |

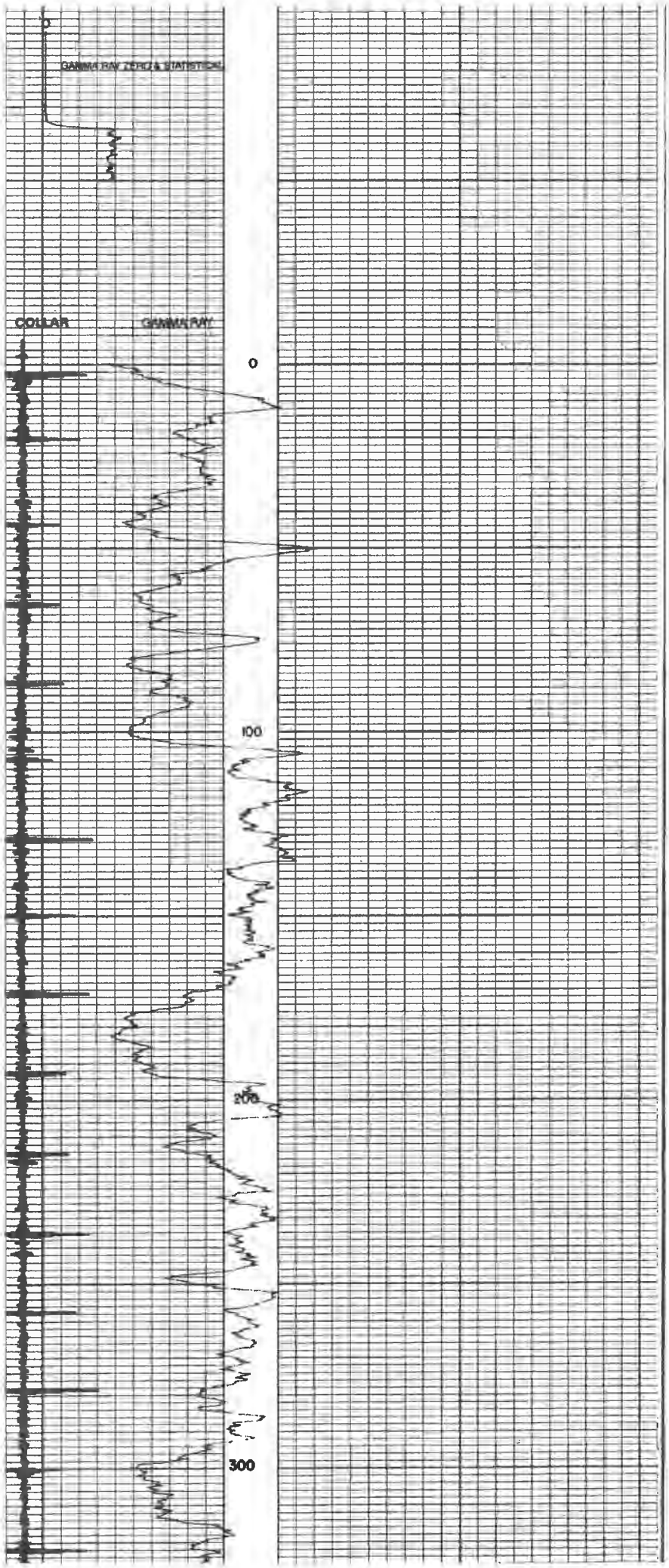
NEUTRON

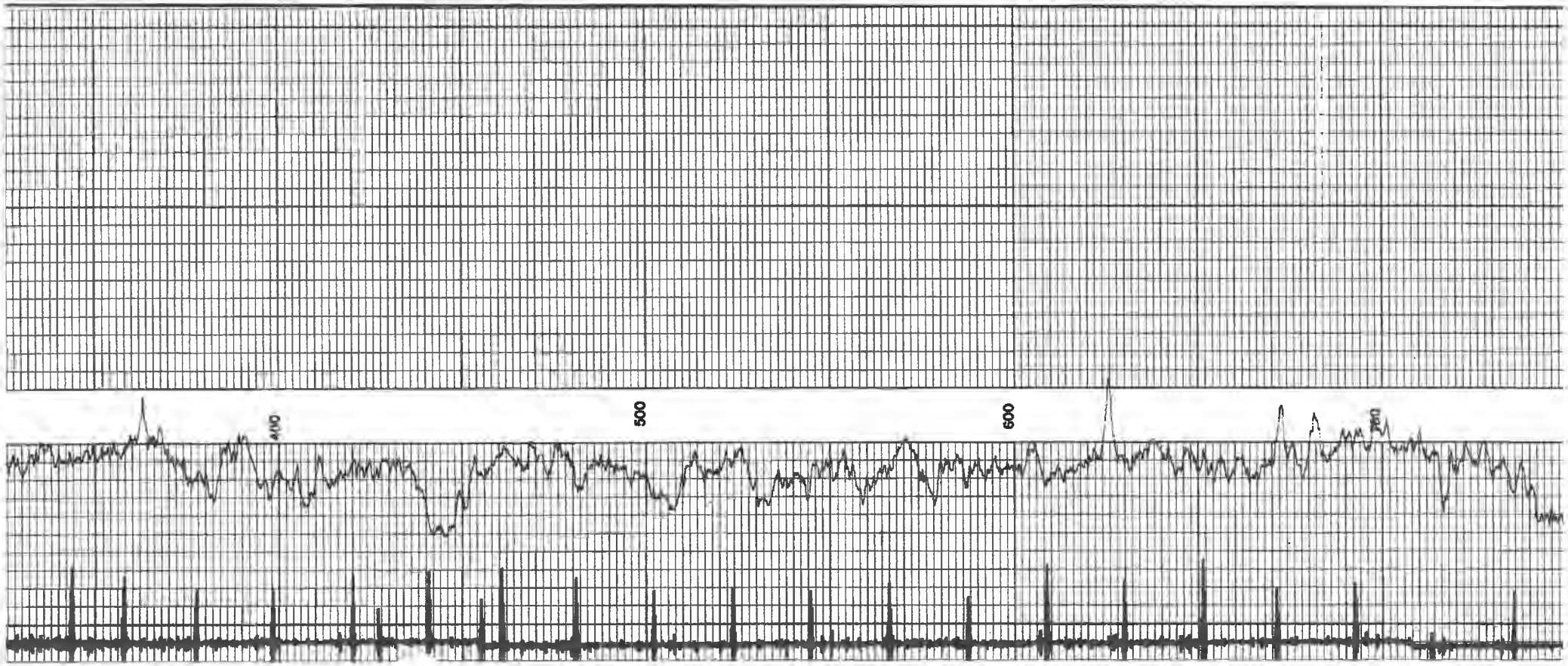
| RUN NO. | GAIN SETTINGS | ZERO DIV. | AR IN UNITS PER LOG DIV. |
|---|---|---|---|

REFERENCE LITERATURE

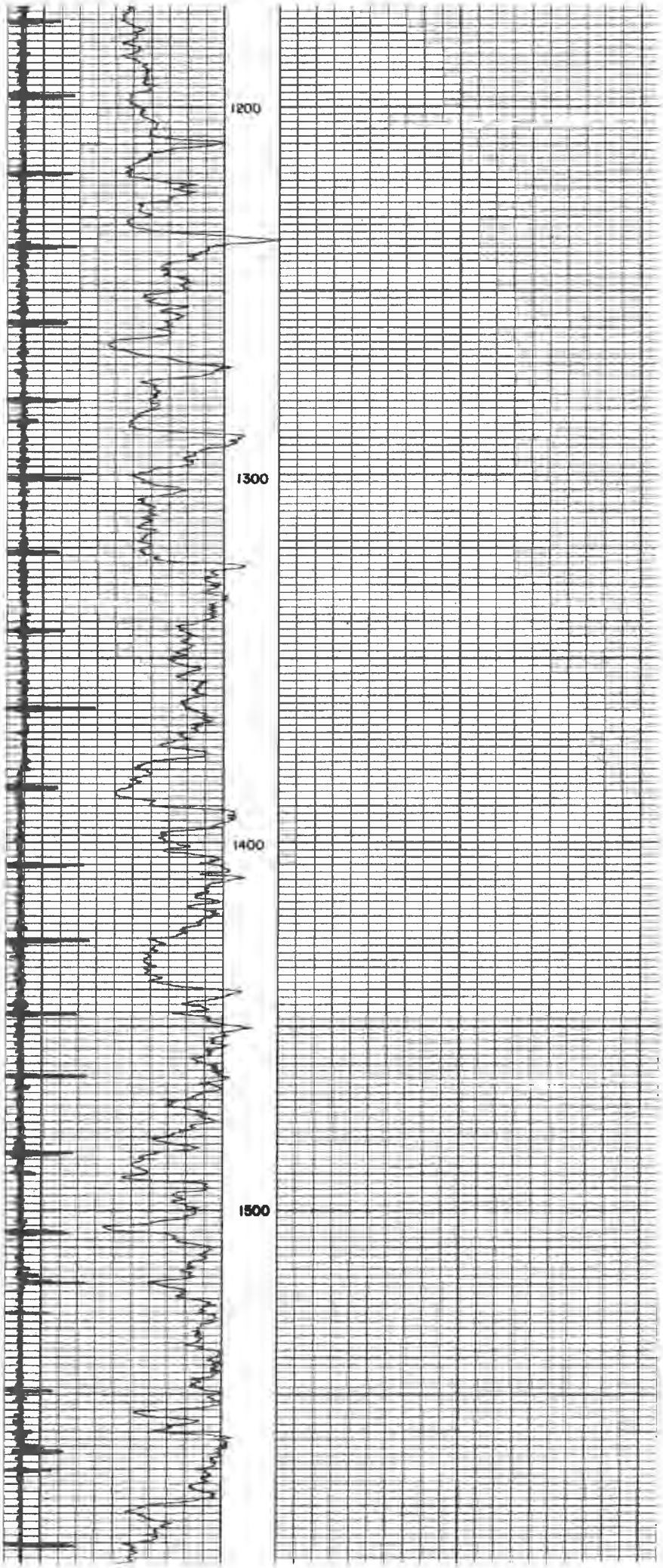
REMARKS:

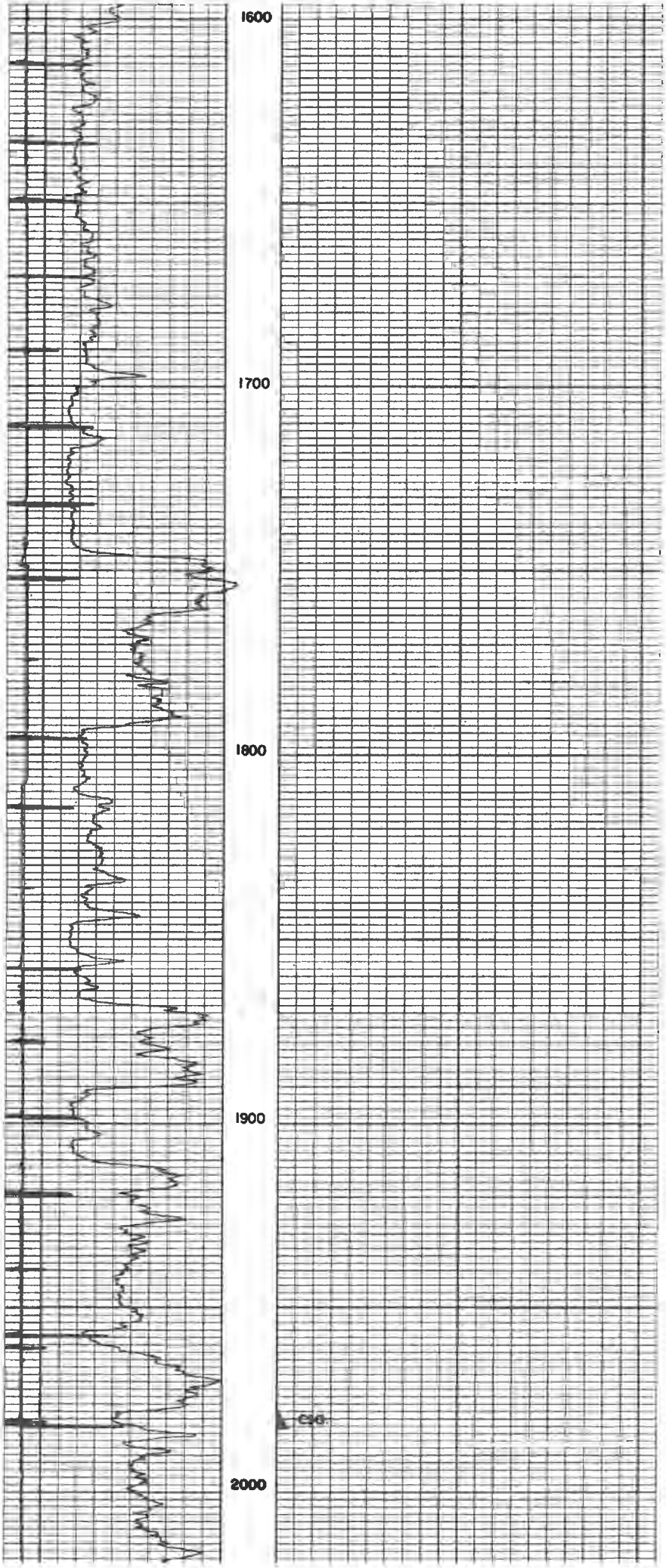
FOLD HERE

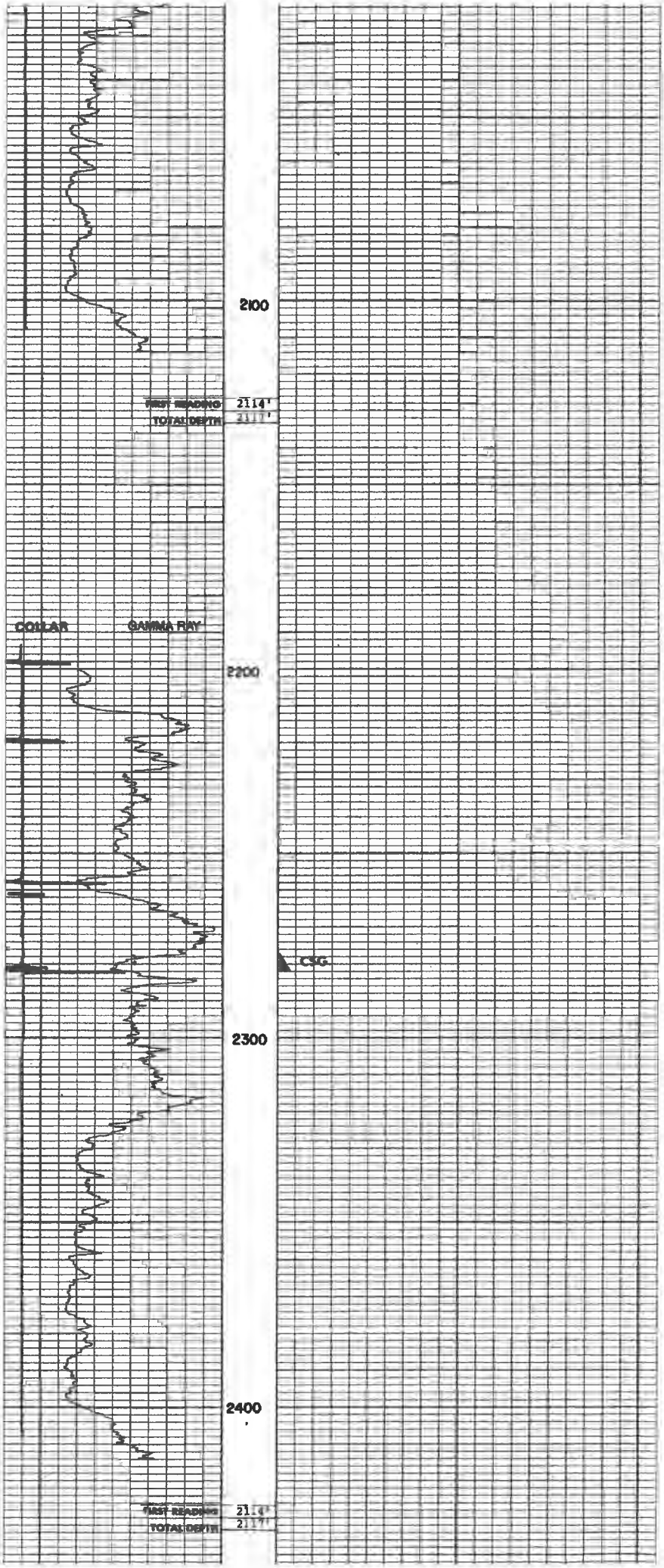

0
GAMMA RAY ZERO & STATISTICAL
COLLAR
GAMMA RAY
0
100
200
300

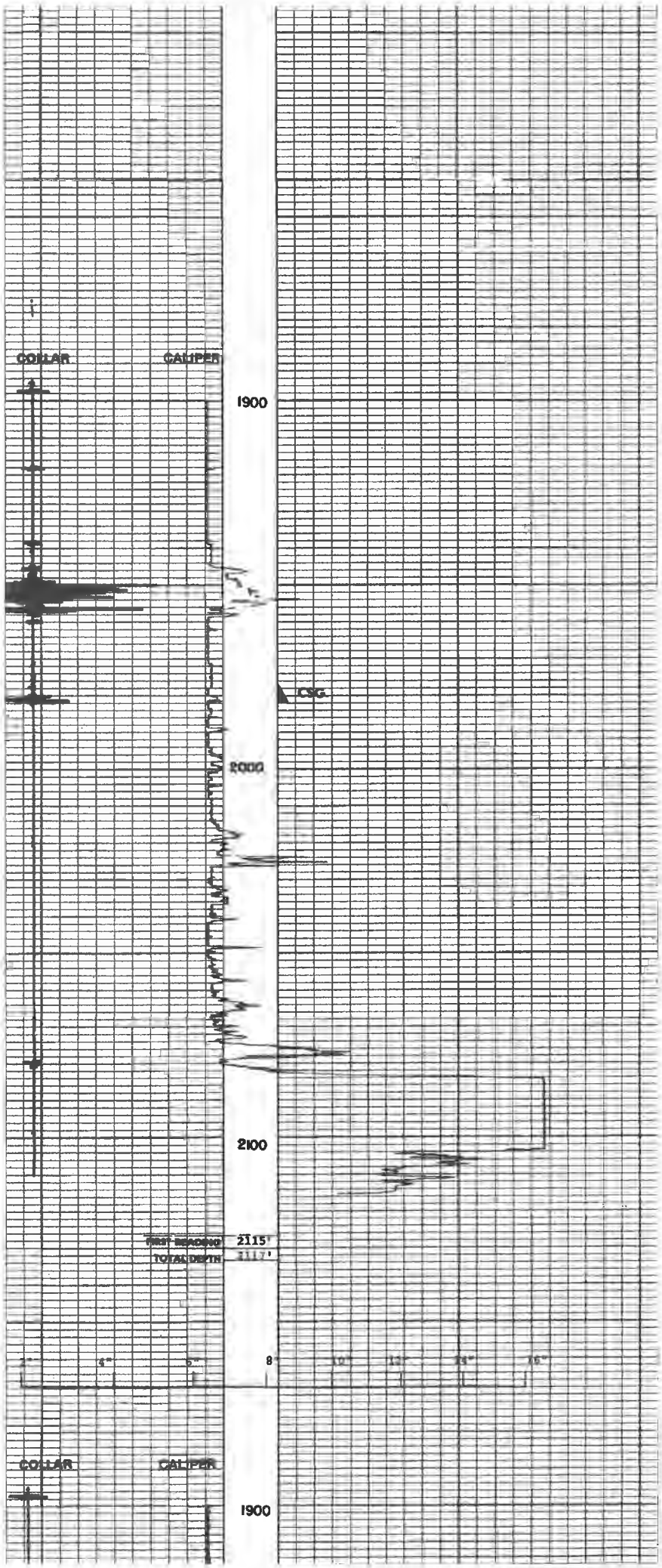

400
500
600
700

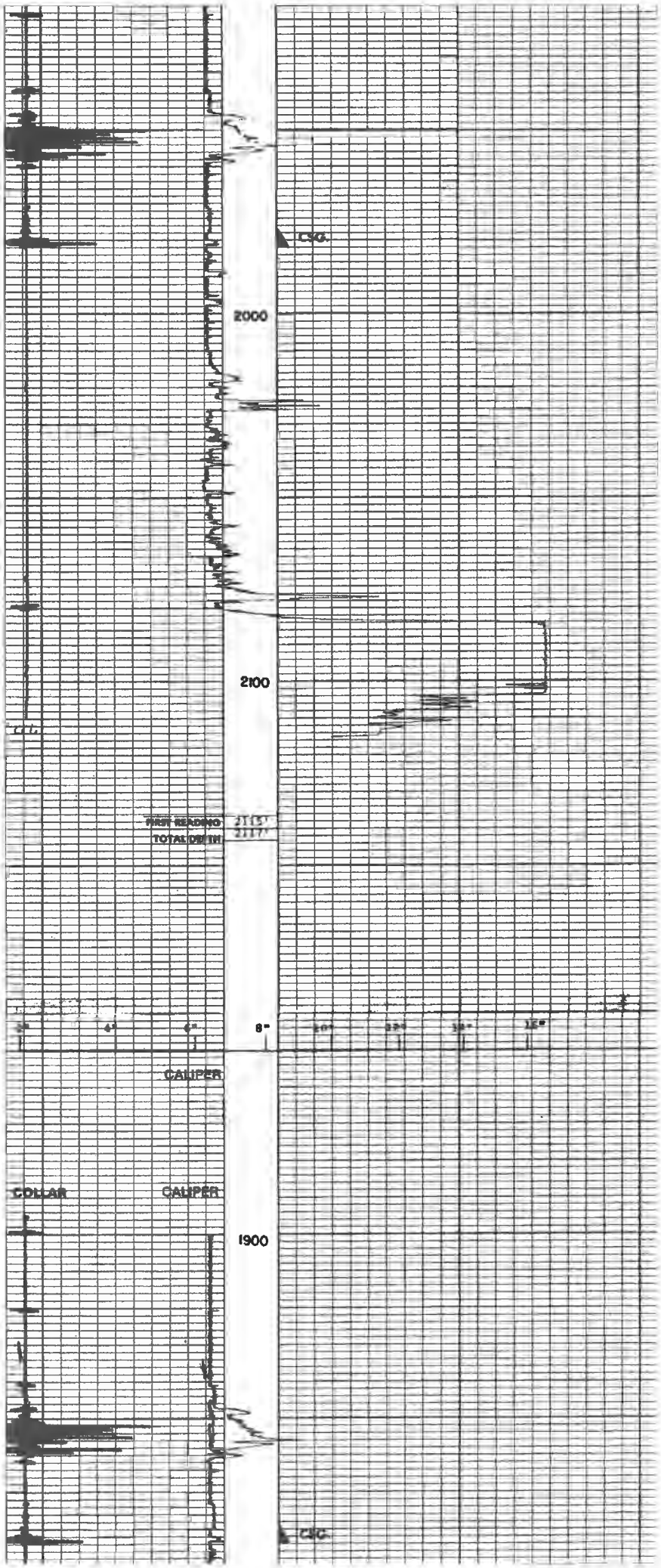
1100
1000
900
800

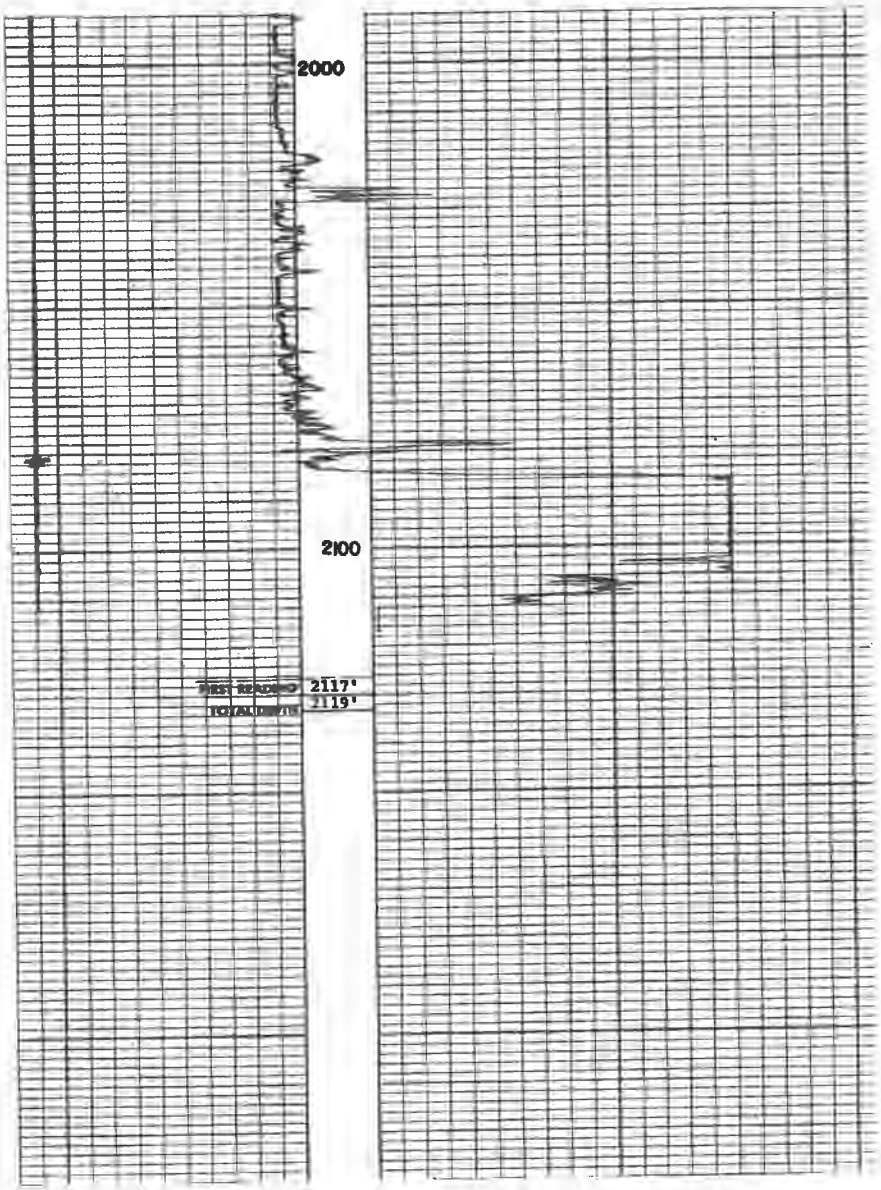

1200
1300
1400
1500


1600
1700
1800
1900
2000
C26


2100
FIRST READING 2114'
TOTAL DEPTH 2117'
COLLAR
GAMMA RAY
2200
CSG
2300
2400
FIRST READING 2114'
TOTAL DEPTH 2117'


COLLAR
CALIPER
1900
CSG.
2000
2100
FIRST READING 2115'
TOTAL DEPTH 2117'
4"
6"
8"
10"
12"
14"
16"
COLLAR
CALIPER
1900


CSG.
2000
2100
C.C.L.
FIRST READING
TOTAL DEPTH
4"
6"
8"
CALIPER
COLLAR
CALIPER
1900
CSG.


2000
2100
2117'
2119'

"Pipeline"

Select County: (087) Roane
Enter Permit #: 2778
Get Data | Reset

Select datatypes: (Check All)
Location | Production | Plugging
Owner/Completion | Stratigraphy | Sample
Pay/Show/Water | Logs | Btm Hole Loc

Table Descriptions
County Code Translations
Permit-Numbering Series
Usage Notes
Contact Information
Disclaimer
WVGES Main
"Pipeline-Plus" New

WV Geological & Economic Survey:

# Well: County = 87 Permit = 2778

Report Time: Thursday, April 30, 2020 8:55:42 PM

## Location Information: View Map

| API | COUNTY | PERMIT | TAX_DISTRICT | QUAD_75 | QUAD_15 | LAT_DD | LON_DD | UTME | UTMN |
|---|---|---|---|---|---|---|---|---|---|
| 4708702778 | Roane | 2778 | Smithfield | Tariff | Otter | 38.662989 | -81.19721 | 482842.5 | 4279397.7 |

There is no Bottom Hole Location data for this well

## Owner Information:

| API | CMP_DT | SUFFIX | STATUS | SURFACE_OWNER | WELL_NUM | CO_NUM | LEASE | LEASE_NUM | MINERAL_OWN | OPERATOR_AT_COMPLETION | PROP_VD | PROP_TRGT_FM | TFM_EST_PR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702778 | 5/7/1913 | Original Loc | Completed | M J Snodgrass | 12 | | | | | South Penn Oil (S. Penn Nat. Gas) | | | |
| 4708702778 | 5/15/1913 | Worked Over | Completed | M J Snodgrass | 12 | | | | | South Penn Oil (S. Penn Nat. Gas) | | | |
| 4708702778 | 11/8/1988 | Worked Over | Completed | David Vineyard | 12 | | | | | Pennzoil Company | | | |

## Completion Information:

| API | CMP_DT | SPUD_DT | ELEV | DATUM | FIELD | DEEPEST_FM | DEEPEST_FMT | INITIAL_CLASS | FINAL_CLASS | TYPE | RIG | CMP_MTHD | TVD | TMD | NEW_FTG | KOD | G_BEF | G_AFT | O_BEF | O_AFT | NGL_BEF | NGL_AFT | P_BEF | TI_BE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702778 | 5/7/1913 | 3/20/1913 | 1149 | Ground Level | Tariff(Tlmn) | Undf PRICE blw INJN | Big Injun (Price&eq) | Development Well | Development Well | Oil w/ Gas Show | Cable Tool | Shot | 2206 | | 2206 | | 0 | 0 | 0 | 2 | | | 0 | |
| 4708702778 | 5/15/1913 | -/-/- | 1149 | Ground Level | Tariff(Tlmn) | Undf PRICE blw INJN | Big Injun (Price&eq) | Development Well | Development Well | Oil w/ Gas Show | unknown | Shot | 2206 | | 0 | | 0 | 0 | 0 | 0 | | | 0 | |
| 4708702778 | 11/8/1988 | -/-/- | 1149 | Ground Level | | | | unclassified | unclassified | not available | unknown | unknown | | | | | | | | | | | | |

## Pay/Show/Water Information:

| API | CMP_DT | ACTIVITY | PRODUCT | SECTION | DEPTH_TOP | FM_TOP | DEPTH_BOT | FM_BOT | G_BEF | G_AFT | O_BEF | O_AFT | WATER_QNTY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702778 | 5/15/1913 | Pay | Oil & Gas | Vertical | | | 2180 | Big Injun (Price&eq) | 0 | 0 | | | |
| 4708702778 | 5/15/1913 | Show | Gas | Vertical | | | 2180 | Big Injun (Price&eq) | 0 | 0 | | | |
| 4708702778 | 5/15/1913 | Pay | Oil | Vertical | | | 2180 | Big Injun (Price&eq) | 0 | 2 | | | |

## Production Gas Information: (Volumes in Mcf) * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_GAS | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702778 | Pennzoil Company | 1981 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702778 | Pennzoil Company | 1982 | 1,385 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702778 | Pennzoil Company | 1983 | 521 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702778 | Pennzoil Company | 1984 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702778 | Pennzoil Products Company | 1989 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702778 | Pennzoil Products Company | 1991 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702778 | Pennzoil Products Company | 1993 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702778 | Triad Resources, Inc. | 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702778 | Ground Resources, LLC | 2017 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702778 | Ground Resources, LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## Production Oil Information: (Volumes in Bbl) ** some operators may have reported NGL under Oil * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_OIL | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702778 | Pennzoil Company | 1981 | 368 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702778 | Pennzoil Company | 1982 | 236 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702778 | Pennzoil Company | 1983 | 309 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702778 | Pennzoil Company | 1984 | 220 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702778 | Pennzoil Products Company | 1989 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702778 | Pennzoil Products Company | 1991 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702778 | Pennzoil Products Company | 1993 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702778 | Triad Resources, Inc. | 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702778 | Ground Resources, LLC | 2017 | 0 | | | | | | | | | | | | |
| 4708702778 | Ground Resources, LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## Production NGL Information: (Volumes in Bbl) ** some operators may have reported NGL under Oil * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_NGL | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702778 | Ground Resources, LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## Production Water Information: (Volumes in Gallons) * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_WTR | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702778 | Ground Resources, LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## Stratigraphy Information:

| API | SUFFIX | FM | FM_QUALITY | DEPTH_TOP | DEPTH_QUALITY | THICKNESS | THICKNESS_QUALITY | ELEV | DATUM |
|---|---|---|---|---|---|---|---|---|---|
| 4708702778 | Original Loc | Buffio Ss/1st Cow Rn | Well Record | 730 | Reasonable | 20 | Reasonable | 1149 | Ground Level |
| 4708702778 | Original Loc | Mahonig Ss/Big Dunk | Well Record | 790 | Reasonable | 90 | Reasonable | 1149 | Ground Level |
| 4708702778 | Original Loc | Salt Sands (undiff) | Well Record | 1670 | Reasonable | 210 | Reasonable | 1149 | Ground Level |
| 4708702778 | Original Loc | Maxton | Well Record | 1880 | Reasonable | 125 | Reasonable | 1149 | Ground Level |
| 4708702778 | Original Loc | Little Lime | Well Record | 2005 | Reasonable | 55 | Reasonable | 1149 | Ground Level |
| 4708702778 | Original Loc | Pencil Cave | Well Record | 2060 | Reasonable | 5 | Reasonable | 1149 | Ground Level |
| 4708702778 | Original Loc | Big Lime | Well Record | 2065 | Reasonable | 110 | Reasonable | 1149 | Ground Level |
| 4708702778 | Original Loc | Big Injun (Price&eq) | Well Record | 2175 | Reasonable | 0 | Reasonable | 1149 | Ground Level |

There is no Wireline (E-Log) data for this well

There is no Plugging data for this well

There is no Sample data for this well

INJECTOR 2778

# APPENDIX A
## Injection Well Form

2778

1) GEOLOGIC TARGET FORMATION Big Injun Sandstone

Depth 2175 Feet (top) 2200 Feet (bottom)

2) Estimated Depth of Completed Well, (or actual depth of existing well): 2206 Feet

3) Approximate water strata depths: Fresh _____ Feet Salt 1700, 1900 Feet

4) Approximate coal seam depths: None

5) Is coal being mined in the area? Yes ☐ No ☑

6) Virgin reservoir pressure in target formation 880 psig Source Estimated/Historical

7) Estimated reservoir fracture pressure _____ psig (BHFP)

8) MAXIMUM PROPOSED INJECTION OPERATIONS:

Injection rate (bbl/hour) 25

Injection volume (bbl/day) 200

Injection pressure (psig) 1000

Bottom hole pressure (psig) 2000

9) DETAILED IDENTIFICATION OF MATERIALS TO BE INJECTED, INCLUDING ADDITIVES:
Fresh water and/or produced water from the field and possible biocides as necessary.

Temperature of injected fluid: (°F) Ambient

10) FILTERS (IF ANY)
Anthracite Coal Filters

11) SPECIFICATIONS FOR CATHODIC PROTECTION AND OTHER CORROSION CONTROL
None

# APPENDIX A (cont.)

12. Casing and Tubing Program

| TYPE | Size | New or Used | Grade | Weight per ft. (lb/ft) | FOOTAGE: For Drilling | INTERVALS: Left in Well | CEMENT: Fill-up (Cu. Ft.) |
|---|---|---|---|---|---|---|---|
| Conductor | 10 | | | | 10 | 10 | No Record |
| Fresh Water | 8 1/4" | | | | 805 | 805 | No Record |
| Coal | | | | | | | |
| Intermediate 1 | | | | | | | |
| Intermediate 2 | | | | | | | |
| Production | 6 5/8 | | | | 2118 | 2118 | No Record |
| Tubing | None | | | | | | |
| Liners | | | | | | | |

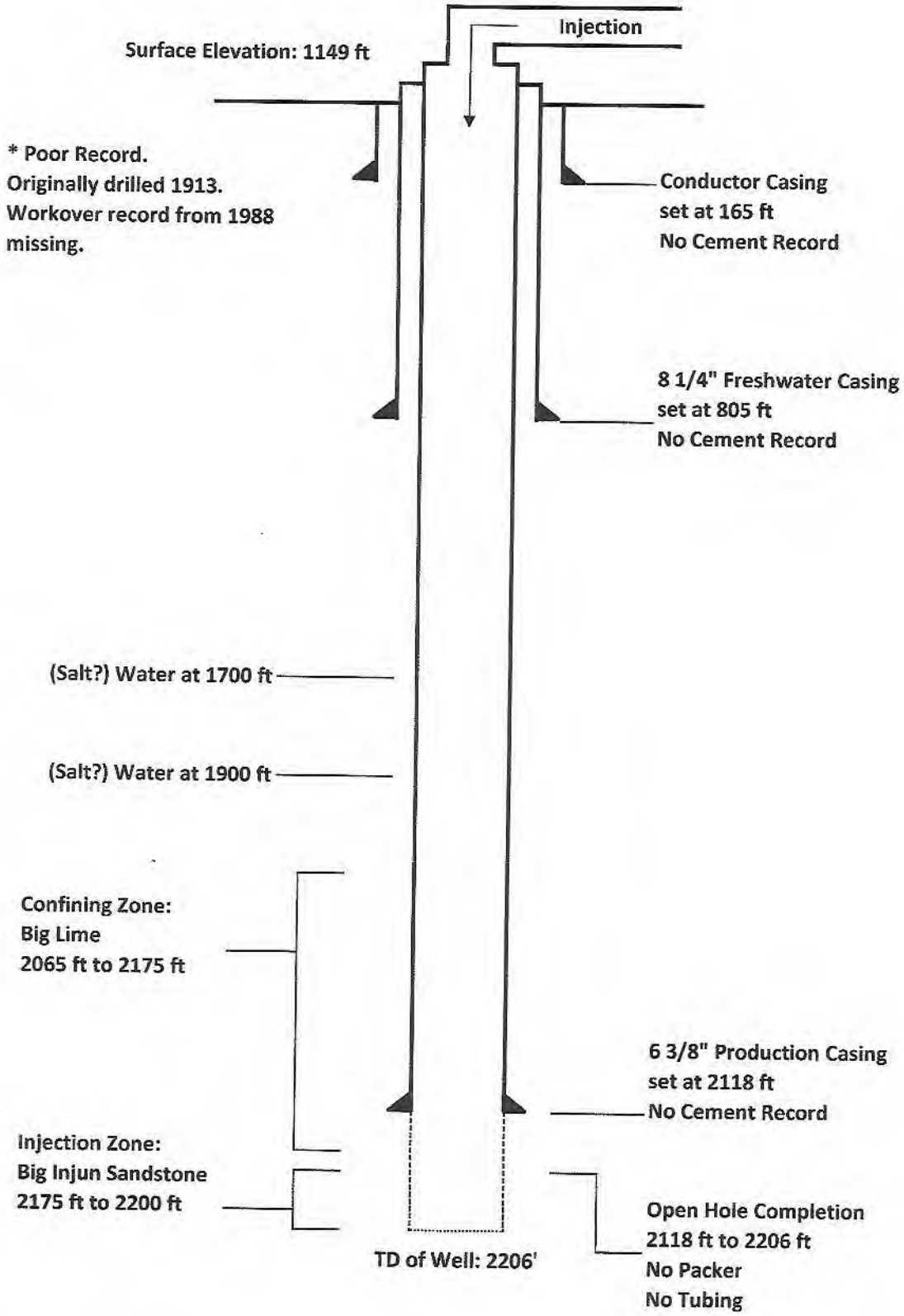
| TYPE | Wellbore Diameter | Casing Size | Wall Thickness | Burst Pressure | Cement Type | Cement Yield (cu. ft./sk) | Cement to Surface ? (Y or N) |
|---|---|---|---|---|---|---|---|
| Conductor | | 10 | | | | | No Record |
| Fresh Water | | 8 1/4 | | | | | No record |
| Coal | | | | | | | |
| Intermediate 1 | | | | | | | |
| Intermediate 2 | | | | | | | |
| Production | | 6 5/8" | | | | | No Record |
| Tubing | | | | | | | |
| Liners | | | | | | | |

| PACKERS | Packer #1 | Packer #2 | Packer #3 | Packer #4 |
|---|---|---|---|---|
| Kind: | None | | | |
| Sizes: | | | | |
| Depths Set: | | | | |

# Well Schematic

## M.J. SNODGRASS 12

## API 47-087-02778



2778
INJECTOR

Crooked

Well No. 12 M. J. Rudgiaus Farm.
Lease No. Smallfield District Roane County.
Rig built by S. O. Co.
Well drilled by S. O. Co. Contractor.
Began drilling March 20 1923 Completed May 7 1923

| ROCK FORMATION | TOP | BOTTOM | REMARKS |
|---|---|---|---|
| Conductor | | 16 | |
| Little Berea | 750 | 750 | |
| Big " | 790 | 850 | |
| Salt Sand | 1670 | 1880 | |
| Water | 1700 | | |
| Maxon Sand | 1880 | 2005 | |
| Water | 1900 | | |
| Little Lime | 2005 | 2060 | |
| Pencil Cave | 2060 | 2065 | |
| Big Lime | 2065 | 2175 | 217-215 |
| Big Injun | 2175 | 2200 | |
| Oil & Gas | 2180 | | |
| Total Depth | | 2206 | |

CASING RECORD

| Size | CHANGED TO WELL Feet | In. | PUT IN WELL Feet | In. | PULLED OUT Feet | In. | LEFT IN WELL Feet | In. | Transferred before Completion Feet | In. | Left in Well Not in Use Feet | In. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | | | 16 | | | | | | Shot 5/15 | | 40 of 8 | |
| 8 5/8 | | | 805 | | | | | | " 5/7/13 | | 20 " | |
| 6 5/8 | | | 2118 | | | | | | | | | |
| | | | 2195 | | | | | | | | | |

Production First 24 Hours 2 Bbls. Signed W. H. Graham Supt.

47-087-2778

**47-087-02778**

**No E-Log Available**

WVGES GEOLOGY UNDERLIES IT ALL "Pipeline"

Select County: (087) Roane
Enter Permit #: 2844
Get Data | Reset

Select datatypes: (Check All)
Location, Production, Plugging, Owner/Completion, Stratigraphy, Sample, Pay/Show/Water, Logs, Btm Hole Loc

Table Descriptions
County Code Transl ations
Permit-Numbering Series
Usage Notes
Contact Info ation
Disclaimer
WVGES Main
"Pipeline-Plus" New

WV Geological & Economic Survey:

**Well: County = 87 Permit = 2844**

Report Time: Wednesday, May 13, 2020 10:39:11 AM

Well Reassignment Information: Reassigned From

| OLD_COUNTY | OLD_PERMIT | NEW_COUNTY | NEW_PERMIT |
|---|---|---|---|
| 87 | 3276 | 87 | 2844 |

Location Information: View Ma

| API | COUNTY | PERMIT | TAX_DISTRICT | QUAD_75 | QUAD_15 | LAT_DD | LON_DD | UTME | UTMN |
|---|---|---|---|---|---|---|---|---|---|
| 4708702844 | Roane | 2844 | Smithfield | Tariff | Otter | 38.662699 | -81.200355 | 482568.9 | 4279366.1 |

There is no Bottom Hole Location data for this well

Owner Information:

| API | CMP_DT | SUFFIX | STATUS | SURFACE_OWNER | WELL_NUM | CO_NUM | LEASE | LEASE_NUM | MINERAL_OWN | OPERATOR_AT_COMPLETION | PROP_VD | PROP_TRGT_FM | TFM_EST_PR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702844 | 1/10/1913 | Original Loc | Completed | P A Tallman | 40 | | | | | Carter Oil | | | |
| 4708702844 | 5/22/1936 | Worked Over | Completed | P A Tallman | 40 | | | | | Pennzoil Company | | | |
| 4708702844 | 11/8/1988 | Worked Over | Completed | Kenneth Yufer | 40 | | | | | Pennzoil Com an | | | |

Completion Information:

| API | CMP_DT | SPUD_DT | ELEV | DATUM | FIELD | DEEPEST_FM | DEEPEST_FMT | INITIAL_CLASS | FINAL_CLASS | TYPE | RIG | CMP_MTHD | TVD | TMD | NEW_FTG | KOD | G_BEF | G_AFT | O_BEF | O_AFT | NGL_BEF | NGL_AFT | P_BEF | TI_BEF | P_AFT | TI_ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702844 | 1/10/1913 | 10/29/1912 | 1109 | Ground Level | Tariff(Timn) | Undf PRICE blw INJN | Big Injun (Price&eq) | Development Well | Development Well | Oil | Cable Tool | Shot | 2176 | | 2176 | | 0 | 0 | 0 | 10 | | | 0 | 0 | 0 | |
| 4708702844 | 5/22/1936 | -/-/- | 1109 | Ground Level | Tariff(Timn) | Undf PRICE blw INJN. | Big Injun (Price&eq) | Development Well | Development Well | Oil | unknown | Shot | 2176 | | 0 | | 0 | 0 | 0 | 9 | | | 0 | 0 | 0 | |
| 4708702844 | 11/8/1988 | -/-/- | 1109 | Ground Level | | | | unclassified | unclassified | not available | unknown | unknown | | | | | | | | | | | | | | |

Pay/Show/Water Information:

| API | CMP_DT | ACTIVITY | PRODUCT | SECTION | DEPTH_TOP | FM_TOP | DEPTH_BOT | FM_BOT | G_BEF | G_AFT | O_BEF | O_AFT | WATER_QNTY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702844 | 1/10/1913 | Show | Gas | Vertical | | | 2151 | Big Injun (Price&eq) | 0 | 0 | | | |
| 4708702844 | 1/10/1913 | Pay | Oil | Vertical | 2151 | Big Injun (Price&eq) | 2169 | Big Injun (Price&eq) | 0 | 10 | | | |
| 4708702844 | 5/22/1936 | Pay | Oil | Vertical | 2151 | Big Injun (Price&eq) | 2169 | Big Injun (Price&eq) | 0 | 9 | | | |

Production Gas Information: (Volumes in Mcf) * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_GAS | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702844 | Pennzoil Company | 1981 | 1,118 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702844 | Pennzoil Company | 1982 | 1,385 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702844 | Pennzoil Company | 1983 | 521 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702844 | Pennzoil Company | 1984 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702844 | Pennzoil Products Company | 1989 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702844 | Pennzoil Products Company | 1990 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702844 | Pennzoil Products Company | 1991 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702844 | Pennzoil Products Company | 1992 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702844 | Triad Resources, Inc. | 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702844 | Ground Resources, LLC | 2017 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702844 | Ground Resources LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Production Oil Information: (Volumes in Bbl) ** some operators may have reported NGL under Oil * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_OIL | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702844 | Pennzoil Company | 1981 | 509 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702844 | Pennzoil Company | 1982 | 665 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702844 | Pennzoil Company | 1983 | 629 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702844 | Pennzoil Company | 1984 | 1,030 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702844 | Pennzoil Products Company | 1989 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702844 | Pennzoil Products Company | 1990 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702844 | Pennzoil Products Company | 1991 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702844 | Pennzoil Products Company | 1992 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702844 | Triad Resources, Inc. | 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708702844 | Ground Resources, LLC | 2017 | 0 | | | | | | | | | | | | |
| 4708702844 | Ground Resources LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Production NGL Information: (Volumes in Bbl) ** some operators may have reported NGL under Oil * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_NGL | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702844 | Ground Resources LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Production Water Information: (Volumes in Gallons) * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_WTR | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708702844 | Ground Resources LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Stratigraphy Information:

| API | SUFFIX | FM | FM_QUALITY | DEPTH_TOP | DEPTH_QUALITY | THICKNESS | THICKNESS_QUALITY | ELEV | DATUM |
|---|---|---|---|---|---|---|---|---|---|
| 4708702844 | Original Loc | Cow Run (undiff) | Well Record | 725 | Reasonable | 10 | Reasonable | 1109 | Ground Level |
| 4708702844 | Original Loc | Homewd Ss/2n Cow Run | Well Record | 762 | Reasonable | 198 | Reasonable | 1109 | Ground Level |
| 4708702844 | Original Loc | 1st Salt Sand | Well Record | 1360 | Reasonable | 34 | Reasonable | 1109 | Ground Level |
| 4708702844 | Original Loc | 2nd Salt Sand | Well Record | 1442 | Reasonable | 58 | Reasonable | 1109 | Ground Level |
| 4708702844 | Original Loc | 3rd Salt Sand | Well Record | 1620 | Reasonable | 190 | Reasonable | 1109 | Ground Level |
| 4708702844 | Original Loc | Maxton | Well Record | 1934 | Reasonable | 32 | Reasonable | 1109 | Ground Level |
| 4708702844 | Original Loc | Little Lime | Well Record | 1970 | Reasonable | 38 | Reasonable | 1109 | Ground Level |

2844

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 4708702844 | Original Loc | Pencil Cave | Well Record | 2008 | Reasonable | 28 | Reasonable | 1109 | Ground Level |
| 4708702844 | Original Loc | Big Lime | Well Record | 2036 | Reasonable | 105 | Reasonable | 1109 | Ground Level |
| 4708702844 | Original Loc | Big Injun (Price&eq) | Well Record | 2141 | Reasonable | 30 | Reasonable | 1109 | Ground Level |
| 4708702844 | Original Loc | Undf PRICE blw INJN | Well Record | 2171 | Reasonable | 0 | Reasonable | 1109 | Ground Level |

There is no Wireline (E-Log) data for this well

There is no Plugging data for this well

There is no Sample data for this well

# APPENDIX A
## Injection Well Form

2844

1) GEOLOGIC TARGET FORMATION Big Injun Sandstone

Depth 2141 Feet (top) 2171 Feet (bottom)

2) Estimated Depth of Completed Well, (or actual depth of existing well): 2176 Feet

3) Approximate water strata depths: Fresh _____ Feet Salt _____ Feet

4) Approximate coal seam depths: None

5) Is coal being mined in the area? Yes ☐ No ☑

6) Virgin reservoir pressure in target formation 880 psig Source Estimated/Historical

7) Estimated reservoir fracture pressure _____ psig (BHFP)

8) MAXIMUM PROPOSED INJECTION OPERATIONS:

Injection rate (bbl/hour) 25

Injection volume (bbl/day) 200

Injection pressure (psig) 1000

Bottom hole pressure (psig) 2000

9) DETAILED IDENTIFICATION OF MATERIALS TO BE INJECTED, INCLUDING ADDITIVES:
Fresh water and/or produced water from the field and possible biocides as necessary.

Temperature of injected fluid: (°F) Ambient

10) FILTERS (IF ANY)
Anthracite Coal Filters

11) SPECIFICATIONS FOR CATHODIC PROTECTION AND OTHER CORROSION CONTROL
None

# APPENDIX A (cont.)

12. Casing and Tubing Program

| TYPE | Size | New or Used | Grade | Weight per ft. (lb/ft) | FOOTAGE: For Drilling | INTERVALS: Left in Well | CEMENT: Fill-up (Cu. Ft.) |
|---|---|---|---|---|---|---|---|
| Conductor | 10 | | | | 87 | 87 | No Record |
| Fresh Water | 6 1/2" | | | | 2039 | 2039 | No Record |
| Coal | | | | | | | |
| Intermediate 1 | | | | | | | |
| Intermediate 2 | | | | | | | |
| Production | 5 1/2" | | | | 2078 | 2078 | No Record |
| Tubing | 2" | | | | 2171 | 2171 | |
| Liners | | | | | | | |

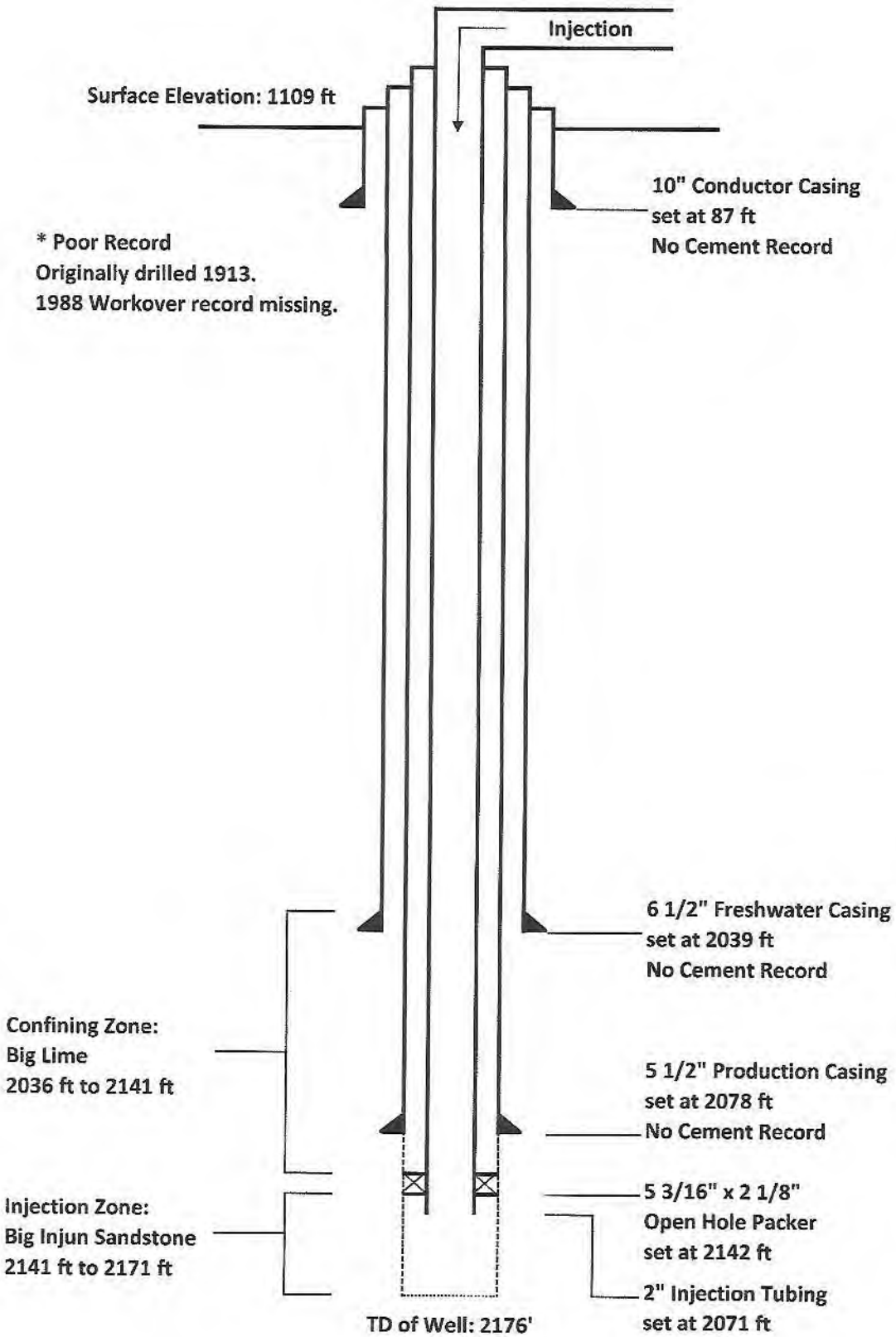
| TYPE | Wellbore Diameter | Casing Size | Wall Thickness | Burst Pressure | Cement Type | Cement Yield (cu. ft./sk) | Cement to Surface ? (Y or N) |
|---|---|---|---|---|---|---|---|
| Conductor | | 10 | | | | | No Record |
| Fresh Water | | 8 1/4 | | | | | No record |
| Coal | | | | | | | |
| Intermediate 1 | | | | | | | |
| Intermediate 2 | | | | | | | |
| Production | | 6 5/8" | | | | | No Record |
| Tubing | | 2" | | | | | |
| Liners | | | | | | | |

| PACKERS | Packer #1 | Packer #2 | Packer #3 | Packer #4 |
|---|---|---|---|---|
| Kind: | Open Hole Packer | | | |
| Sizes: | 5 3/16 x 2 1/8 | | | |
| Depths Set: | | | | |

# Well Schematic

## TALLMAN 40

## API 47-087-02844



Crawford

087-3376

Lease No. 3707 Acres 2350 N. 54 E. W. 34 District Spencer

| | |
|---|---|
| District or Town | Smithfield |
| County | Gilmer |
| State | W. Va. |
| Commenced | 10/29/12 |
| Completed | 1/10/13 |
| Contractor | Cody T. Miller |
| Purchased From | Carter Oil Co. |
| Date Purchased | 1-1-26 |
| Date Connected | |
| Sold To | |
| Date Sold | |
| Date Plugged | |
| Date Abandoned | |

1.05 Per Foot

## CASING AND TUBING

| Size | Put in Well | Left in Well | Pulled |
|---|---|---|---|
| 13 in. Casing | | | |
| 10 in. Casing | 290 | 86 1/2 | 203 1/2 |
| 8 5/8 in. Casing | 775 | | 775 |
| 6 5/8 in. Casing | 2039 | 2039 | |
| 5 3/16 in. Casing | | | |
| 5 in. Casing | 2078 | 2078 | 2078 |
| 4 1/2 in. Casing | | | |
| 2 in. Tubing | 2166 | 2166 | 2167 |
| 2 1/2 in. Tubing | 2171 | | |
| in. Tubing | | | |

## SHOOTING

| Date | Qts. | Sand | Depth | Top Bottom | Top After |
|---|---|---|---|---|---|
| 7-13 | 20 | Dia | | | |
| 5-22-26 | 40 | Lime | | | |

Initial Oil Production 10 bbl.

Initial Open Flow

Initial Rock Pressure

## RECORD

Elevation at Mouth of Well

| Formation | Top | Bottom | Thickness | Oil at | Gas at | Water at | Th |
|---|---|---|---|---|---|---|---|
| Pittsburgh Coal | | | | | | | |
| Red Rock Cave | 475 | 535 | 60 | | | | |
| Cow Run (First) | 725 | 735 | 10 | | | | |
| Cow Run (Second) | 762 | 960 | 198 | | | | |
| Salt Sand (Upper) | 1360 | 1394 | 34 | | | | |
| Salt Sand (Middle) | 1442 | 1500 | 58 | | | | |
| Salt Sand (Lower) | 1670 | 1810 | 190 | | | 1745 | |
| Maxon | 1934 | 1966 | 32 | | | | |
| Little Lime | 1970 | 2008 | 38 | | | | |
| Pencil Cave | 2008 | 2036 | 28 | | | | |
| Big Lime | 2036 | 2141 | 105 | | | | |
| Keener Sand | | | | | | | |
| Injun Sand | 2141 | 2171 | 30 | 2151 | 2151 | | 18 |
| Squaw Sand | | | | | | | |
| Weir Sand | | | | | | | |
| Berea Sand | | | | | | | |
| Gantz Sand | | | | | | | |
| Fifty Foot Sand | | | | | | | |
| Thirty Foot Sand | | | | | | | |
| Gordon Stray | | | | | | | |
| Gordon Sand | | | | | | | |
| Fourth Sand | | | | | | | |
| Fifth Sand | | | | | | | |
| Corniferous Lime | | | | | | | |
| Niagara Lime | | | | | | | |
| Cave | | | | | | | |
| Clinton | | | | | | | |
| Medina Shale | | | | | | | |
| Trenton | | | | | | | |
| Total Depth | 2176 | | | | | | |

Remarks While running the 6 5/8" casing it parted 27 jts. from the top, pulling 37 jts. drop to the bottom. 42 jts. 858' being dri[illegible] 38 jts. of which was new 20# casing & 4 jts. old 20# casing. [illegible] on one of the old jts. pulled out the collar [illegible]

## PACKERS

| Size | Make | Set at |
|---|---|---|
| 5 3/16 x 6 5/8 | | |
| 2 1/2 | WB | |

2844

**47-0877-02844**

**Tallman 40**

**No E-Log Available**

WVGES GEOLOGY UNDERLIES IT ALL "Pipeline"

Select County: (087) Roane
Enter Permit #: 3096
Get Data | Reset

Select datatypes: (Check All)
Location, Production, Plugging, Owner/Completion, Stratigraphy, Sample, Pay/Show/Water, Logs, Btm Hole Loc

Table Descriptions
County Code Translations
Permit-Numbering Series
Usage Notes
Contact Information
Disclaimer
WVGES Main
"Pipeline-Plus" New

WV Geological & Economic Survey:

## Well: County = 87 Permit = 3096

Report Time: Thursday, April 30, 2020 9:01:46 PM

### Well Reassignment Information: Reassigned From

| OLD_COUNTY | OLD_PERMIT | NEW_COUNTY | NEW_PERMIT |
|---|---|---|---|
| 87 | 50126 | 87 | 3096 |

### Location Information: View Map

| API | COUNTY | PERMIT | TAX_DISTRICT | QUAD_75 | QUAD_15 | LAT_DD | LON_DD | UTME | UTMN |
|---|---|---|---|---|---|---|---|---|---|
| 4708703096 | Roane | 3096 | Smithfield | Tariff | Otter | 38.664149 | -81.212796 | 481486.8 | 4279529.4 |

There is no Bottom Hole Location data for this well

### Owner Information:

| API | CMP_DT | SUFFIX | STATUS | SURFACE_OWNER | WELL_NUM | CO_NUM | LEASE | LEASE_NUM | MINERAL_OWN | OPERATOR_AT_COMPLETION | PROP_VD | PROP_TRGT_FM | TFM_EST_PR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708703096 | 7/23/1913 | Original Loc | Completed | W M Looney | 18 | | | | | South Penn Oil (S. Penn Nat. Gas) | | | |
| 4708703096 | 1/22/1934 | Worked Over | Completed | W M Looney | 18 | | | | | South Penn Oil (S. Penn Nat. Gas) | | | |
| 4708703096 | 4/1/1942 | Worked Over | Completed | W M Looney | 18 | | | | | Pennzoil Company | | | |
| 4708703096 | 5/25/1972 | Worked Over | Completed | W M Looney, F Boothe | 18 | | | | Charles E Looney, et al | Pennzoil Company | | | |
| 4708703096 | 12/7/1988 | Worked Over | Completed | W M Looney, F Boothe | 18 | | | | | Pennzoil Company | | | |
| 4708703096 | -/-/- | Plugging | Cancelled | Triad Hunter | 18 | | W M Looney | | | Triad Hunter LLC | | | |

### Completion Information:

| API | CMP_DT | SPUD_DT | ELEV | DATUM | FIELD | DEEPEST_FM | DEEPEST_FMT | INITIAL_CLASS | FINAL_CLASS | TYPE | RIG | CMP_MTHD | TVD | TMD | NEW_FTG | KOD | G_BEF | G_AFT | O_BEF | O_AFT | NGL_BEF | NGL_AFT | P_BEF | TI_BI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708703096 | 7/23/1913 | 6/5/1913 | 984 | Ground Level | Tariff(Tlmn) | Undf PRICE blw INJN | Big Injun (Price&eq) | Development Well | Development Well | Oil w/ Gas Show | Cable Tool | Shot | 2032 | | 2032 | | 0 | 0 | 0 | 15 | | | 0 | |
| 4708703096 | 1/22/1934 | -/-/- | 984 | Ground Level | Tariff(Tlmn) | Undf PRICE blw INJN | Big Injun (Price&eq) | Development Well | Development Well | Oil w/ Gas Show | Cable Tool | Shot | 2032 | | 0 | | 0 | 0 | 0 | 0 | | | 0 | |
| 4708703096 | 4/1/1942 | -/-/- | 984 | Ground Level | Tariff(Tlmn) | Undf PRICE blw INJN | Big Injun (Price&eq) | Development Well | Development Well | Oil w/ Gas Show | Cable Tool | Shot | 2032 | | 0 | | 0 | 0 | 0 | 0 | | | 0 | |
| 4708703096 | 5/25/1972 | -/-/- | 984 | Ground Level | Tariff(Tlmn) | Undf PRICE blw INJN | Big Injun (Price&eq) | Development Well | Development Well | Oil w/ Gas Show | Cable Tool | Fractured | 2032 | | 0 | | 0 | 23 | 0 | 25 | | | 0 | |
| 4708703096 | 12/7/1988 | -/-/- | 984 | Ground Level | Tariff(Tlmn) | Undf PRICE blw INJN | Big Injun (Price&eq) | Service Well | Unsuccessful | Water Injection | unknown | unknown | 2032 | | 0 | | 0 | 0 | 0 | 0 | | | 0 | |
| 4708703096 | -/-/- | -/-/- | 984 | Ground Level | | | | | | | | | | | | | | | | | | | | |

### Pay/Show/Water Information:

| API | CMP_DT | ACTIVITY | PRODUCT | SECTION | DEPTH_TOP | FM_TOP | DEPTH_BOT | FM_BOT | G_BEF | G_AFT | O_BEF | O_AFT | WATER_QNTY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708703096 | 7/23/1913 | Show | Oil & Gas | Vertical | | | 1938 | Big Lime | 0 | 0 | | | |
| 4708703096 | 4/1/1942 | Pay | Oil & Gas | Vertical | 2000 | Big Injun (Price&eq) | 2030 | Big Injun (Price&eq) | 0 | 0 | | | |
| 4708703096 | 7/23/1913 | Pay | Oil | Vertical | 2000 | Big Injun (Price&eq) | 2030 | Big Injun (Price&eq) | 0 | 15 | | | |
| 4708703096 | 12/7/1988 | Horizon | Injection | Vertical | 1996 | Big Injun (Price&eq) | 2030 | Big Injun (Price&eq) | 0 | 0 | | | |
| 4708703096 | 7/23/1913 | Show | Gas | Vertical | 2000 | Big Injun (Price&eq) | 2030 | Big Injun (Price&eq) | 0 | 0 | | | |
| 4708703096 | 5/25/1972 | Show | Gas | Vertical | 1996 | Big Injun (Price&eq) | 2030 | Big Injun (Price&eq) | 0 | 23 | | | |
| 4708703096 | 1/22/1934 | Pay | Oil & Gas | Vertical | 2000 | Big Injun (Price&eq) | 2030 | Big Injun (Price&eq) | 0 | 0 | | | |
| 4708703096 | 5/25/1972 | Pay | Oil | Vertical | 1996 | Big Injun (Price&eq) | 2030 | Big Injun (Price&eq) | 0 | 25 | | | |

### Production Gas Information: (Volumes in Mcf) * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_GAS | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708703096 | Pennzoil Company | 1981 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703096 | Pennzoil Company | 1982 | 1,385 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703096 | Pennzoil Company | 1983 | 521 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703096 | Pennzoil Company | 1984 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703096 | Pennzoil Products Company | 1989 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703096 | Pennzoil Products Company | 1990 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703096 | Pennzoil Products Company | 1991 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703096 | Pennzoil Products Company | 1992 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703096 | Pennzoil Products Company | 1993 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703096 | Pennzoil Products Company | 1994 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703096 | Pennzoil Products Company | 1995 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703096 | Triad Resources, Inc. | 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703096 | Ground Resources, LLC | 2017 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703096 | Ground Resources, LLC | 2018 | 44 | 0 | 0 | 44 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

### Production Oil Information: (Volumes in Bbl) ** some operators may have reported NGL under Oil * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_OIL | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708703096 | Pennzoil Company | 1981 | 101 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703096 | Pennzoil Company | 1982 | 248 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703096 | Pennzoil Company | 1983 | 438 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703096 | Pennzoil Company | 1984 | 1,012 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703096 | Pennzoil Products Company | 1989 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703096 | Pennzoil Products Company | 1990 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703096 | Pennzoil Products Company | 1991 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703096 | Pennzoil Products Company | 1992 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703096 | Pennzoil Products Company | 1993 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703096 | Pennzoil Products Company | 1994 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703096 | Pennzoil Products Company | 1995 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703096 | Triad Resources, Inc. | 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703096 | Ground Resources, LLC | 2017 | 0 | | | | | | | | | | | | |
| 4708703096 | Ground Resources, LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

### Production NGL Information: (Volumes in Bbl) ** some operators may have reported NGL under Oil * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_NGL | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

INJECTION 3096

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708703096 | Ground Resources LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Production Water Information: (Volumes in Gallons) * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_WTR | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708703096 | Ground Resources, LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Stratigraphy Information:

| API | SUFFIX | FM | FM_QUALITY | DEPTH_TOP | DEPTH_QUALITY | THICKNESS | THICKNESS_QUALITY | ELEV | DATUM |
|---|---|---|---|---|---|---|---|---|---|
| 4708703096 | Original Loc | Buffio Ss/1st Cow Rn | Well Record | 600 | Reasonable | 25 | Reasonable | 984 | Ground Level |
| 4708703096 | Original Loc | Mahonig Ss/Big Dunk | Well Record | 630 | Reasonable | 180 | Reasonable | 984 | Ground Level |
| 4708703096 | Original Loc | Lo Frprt Ss/Frprt Ss | Well Record | 1347 | Reasonable | 40 | Reasonable | 984 | Ground Level |
| 4708703096 | Original Loc | Salt Sands (undiff) | Well Record | 1498 | Reasonable | 192 | Reasonable | 984 | Ground Level |
| 4708703096 | Original Loc | Maxton | Well Record | 1720 | Reasonable | 30 | Reasonable | 984 | Ground Level |
| 4708703096 | Original Loc | Little Lime | Well Record | 1825 | Reasonable | 50 | Reasonable | 984 | Ground Level |
| 4708703096 | Original Loc | Pencil Cave | Well Record | 1883 | Reasonable | 5 | Reasonable | 984 | Ground Level |
| 4708703096 | Original Loc | Big Lime | Well Record | 1888 | Reasonable | 70 | Qstnble Pick | 984 | Ground Level |
| 4708703096 | Original Loc | Keener | Well Record | 1958 | Qstnble Pick | 38 | Qstnble Pick | 984 | Ground Level |
| 4708703096 | Original Loc | Big Injun (Price&eq) | Well Record | 1996 | Reasonable | 34 | Reasonable | 984 | Ground Level |
| 4708703096 | Original Loc | Undf PRICE blw INJN | Well Record | 2030 | Reasonable | 0 | Reasonable | 984 | Ground Level |

Wireline (E-Log) Information:

| API | LOG_TOP | LOG_BOT | DEEPEST_FML | LOGS_AVAIL | SCAN | DIGITIZED | GR_TOP | GR_BOT | D_TOP | D_BOT | N_TOP | N_BOT | I_TOP | I_BOT | T_TOP | T_BOT | S_TOP | S_BOT | O_TOP | O_BOT | INCH2 | INCH5 | REDUCED | KOP | LOGMD | ELEV_KB | ELEV_GL | ELEV_DF | LOG_I |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708703096 | 1450 | 2033 | | G C * | Y | N | 1450 | 2033 | | | | | | | | | | | 1450 | 2032 | N | Y | N | | | | | | |

Comment: *logs: caliper, CCL

Downloadable Log Images: We advise you to save the log image file to your PC for viewing. To do so, right-click the .tif image of interest and select the save option. Then you can direct the file to a location of your choice. Please note these images vary in size and some may take several minutes to download, especially if using a 56k or slower dialup connection.

| FILENAME |
|---|
| 4708703096gco.tif |

**Quick Reference Guide for Log File Names** For more info about WVGES scanned logs click here

**geologic log types:**
- d density (includes bulk density, compensated density, density, density porosity, grain density, matrix density, etc.)
- e photoelectric adsorption (PE or Pe, etc.)
- g gamma ray
- i induction (includes dual induction, medium induction, deep induction, etc.)
- l laterolog
- m dipmeter
- n neutron (includes neutron porosity, sidewall neutron--SWN, etc.)
- o other[1]
- s sonic or velocity
- t temperature (includes borehole temperature, BHT, differential temperature, etc.)
- z spontaneous potential or potential

**mechanical log types:**
- b cement bond
- c caliper
- o other[1]
- p perforation depth control or perforate

[1]other logs may include, but are not limited to, such curves as audio, bit size, CCL--casing collar locator, continuous meter, directional survey, gas detector, guard, NCTL--Nuclear Cement Top Locator, radioactive tracer, tension

There is no Plugging data for this well

There is no Sample data for this well

# APPENDIX A
## Injection Well Form

3096

1) GEOLOGIC TARGET FORMATION Big Injun Sandstone

Depth 1996 Feet (top) 2030 Feet (bottom)

2) Estimated Depth of Completed Well, (or actual depth of existing well): 2032 Feet

3) Approximate water strata depths: Fresh _____ Feet Salt _____ Feet

4) Approximate coal seam depths: None

5) Is coal being mined in the area? Yes ☐ No ☑

6) Virgin reservoir pressure in target formation 880 psig Source Estimated/Historical

7) Estimated reservoir fracture pressure _____ psig (BHFP)

8) MAXIMUM PROPOSED INJECTION OPERATIONS:

Injection rate (bbl/hour) 25

Injection volume (bbl/day) 200

Injection pressure (psig) 1000

Bottom hole pressure (psig) 2000

9) DETAILED IDENTIFICATION OF MATERIALS TO BE INJECTED, INCLUDING ADDITIVES:
Fresh water and/or produced water from the field and possible biocides as necessary.

Temperature of injected fluid: (°F) Ambient

10) FILTERS (IF ANY)
Anthracite Coal Filters

11) SPECIFICATIONS FOR CATHODIC PROTECTION AND OTHER CORROSION CONTROL
None

# APPENDIX A (cont.)

12. Casing and Tubing Program

| TYPE | Size | New or Used | Grade | Weight per ft. (lb/ft) | FOOTAGE: For Drilling | INTERVALS: Left in Well | CEMENT: Fill-up (Cu. Ft.) |
|---|---|---|---|---|---|---|---|
| Conductor | | | | | | | |
| Fresh Water | | | | | | | |
| Coal | | | | | | | |
| Intermediate 1 | | | | | | | |
| Intermediate 2 | | | | | | | |
| Production | 4 1/2" | | | | 1992 | 1992 | 100 Sks |
| Tubing | | | | | | | |
| Liners | | | | | | | |

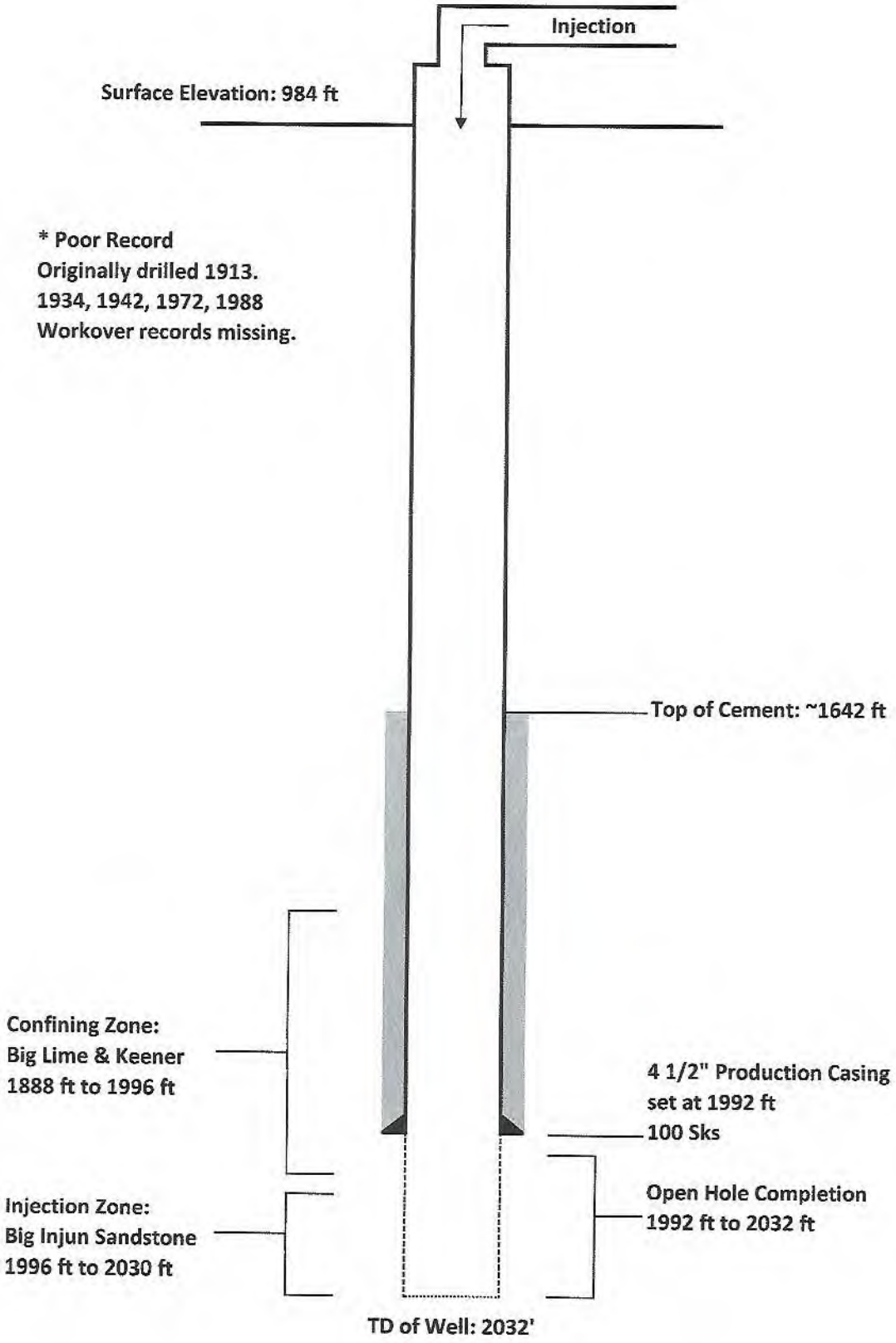
| TYPE | Wellbore Diameter | Casing Size | Wall Thickness | Burst Pressure | Cement Type | Cement Yield (cu. ft./sk) | Cement to Surface ? (Y or N) |
|---|---|---|---|---|---|---|---|
| Conductor | | | | | | | |
| Fresh Water | | | | | | | |
| Coal | | | | | | | |
| Intermediate 1 | | | | | | | |
| Intermediate 2 | | | | | | | |
| Production | | 4 1/2" | | | | | No |
| Tubing | | | | | | | |
| Liners | | | | | | | |

| PACKERS | Packer #1 | Packer #2 | Packer #3 | Packer #4 |
|---|---|---|---|---|
| Kind: | | | | |
| Sizes: | | | | |
| Depths Set: | | | | |

# Well Schematic

## LOONEY 18

## API 47-087-03096



Roa 3096 F

a. 18 W. M. Looney Farm.
No. Smithfield District Ritchie County.
built by S-O Co
ell drilled by S O Co Contractor.
egan drilling June 5 190 Completed July 23 1913

| ROCK FORMATION | TOP | BOTTOM | REMARKS |
|---|---|---|---|
| Conductor | | 16 | |
| Little Dunkard | 600 | 625 | |
| Big Dunkard | 630 | 810 | |
| Gas Sand | 1347 | 1357 | |
| Salt " | 1498 | 1690 | |
| Waterhole full | 1650 | | |
| Maxon Sand | 1720 | 1700 | |
| Little Lime | 1825 | 1875 | |
| Pencil Cave | 1883 | 1888 | |
| Big Lime | 1888 | 1958 | |
| Oil & Gas Light | 1938 | | |
| Keener Sand | 1956 | 1996 | Slight Lime meas 1888 |
| Big Injun " | 1996 | 2030 | " " " 1996 |
| Oil & Gas | 2000 | | " " " 2030 |
| Total Depth | | 2032 | " " " 2032 |

Shot 4-1-42 - 40 qts. @ 2005-2025 ft. Bomb Shot

CASING RECORD

| Size | CHARGED TO WELL Feet | In. | PUT IN WELL Feet | In. | PULLED OUT Feet | In. | LEFT IN WELL Feet | In. | Transferred before Completion Feet | In. | Left at Well Not in Use Feet | In. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | | | 190 | | 190 | | | | Shot 7/24/13 - 20 qts. B. Dug | | | | |
| 8 5/8 | | | 685 | | 685 | | | | Shot 1/27/34 - 36 qts. B. Dug | | | | |
| 6 5/8 | | | 1906 | | | | | | | | | | |

Production First 24 Hours 15 Bbls. Signed W H Graham Supt.

Approved by _____ Superintendent

RECEIVED
MAR 22 1972
OIL & GAS DIVISION
DEPT. OF MINES

WR-35

RECEIVED
Office of Environmental Protection
SEP 2 1 93
Permitting
Office of Oil & Gas

API # 47-087-03096 S

State of West Virginia
Division of Environmental Protection
Section of Oil and Gas

Well Operator's Report of Well Work

Farm name: BOOTHE, FERRELL  Operator Well No.: W. M. LOONEY 18

LOCATION: Elevation: 984.27  Quadrangle: Tariff

District: SMITHFIELD  County: ROANE
Latitude: 1010 Feet South of 38 Deg.40 Min. 0 Sec.
Longitude 1320 Feet West of 81 Deg.12 Min.30 Sec.

Company: PENNZOIL PRODUCTS COMPANY
P. O. BOX 5519
VIENNA, WV 26105-5519

Agent: JAMES A. CREWS

Inspector: Homer Dougherty
Permit Issued:
Well work Commenced: 9/18/92
Well work Completed: 9/24/92
Verbal Plugging
Permission granted on:
Rotary ____ Cable X Rig
Total Depth (feet) 2032
Fresh water depths (ft) N/A
Salt water depths (ft) N/A
Is coal being mined in area (Y/N)? N
Coal Depths (ft): N/A

| Casing & Tubing | Used in Drilling | Left in Well | Cement Fill Up Cu. Ft. |
|---|---|---|---|
| Size 2-3/8" | 1901.38 | 0 | Removed 2-3/8" |
| 5-1/2" | 2028 | 0 | Removed 5-1/2" |
| 4-1/2" | 1992.08 | 1992.08 | 100 sks |
| | | | |
| | | | |

OPEN FLOW DATA NOTE: Well work included only replacement of casing and pulling tubing.

Producing formation ____ Pay zone depth (ft) ____
Gas: Initial open flow ____ MCF/d Oil: Initial open flow ____ Bbl/d
Final open flow ____ MCF/d Final open flow ____ Bbl/d
Time of open flow between initial and final tests ____ Hours
Static rock Pressure ____ psig (surface pressure) after ____ Hours

Second producing formation ____ Pay zone depth (ft) ____
Gas: Initial open flow ____ MCF/d Oil: Initial open flow ____ Bbl/d
Final open flow ____ MCF/d Final open flow ____ Bbl/d
Time of open flow between initial and final tests ____ Hours
Static rock Pressure ____ psig (surface pressure) after ____ Hours

NOTE: ON BACK OF THIS FORM PUT THE FOLLOWING: 1). DETAILS OF PERFORATED INTERVALS, FRACTURING OR STIMULATING, PHYSICAL CHANGE, ETC. 2). THE WELL LOG WHICH IS A SYSTEMATIC DETAILED GEOLOGICAL RECORD OF ALL FORMATIONS, INCLUDING COAL ENCOUNTERED BY THE WELLBORE.

For: PENNZOIL PRODUCTS COMPANY

By: Timothy P. Roush, Supervisor - Surveying/Mapping
Date: September 20, 1993

3096

# Basin Surv

## GAMMA RAY-CALIP

| | |
|---|---|
| FILING NO. | 87-3096 |
| | WORK OVER |
| COMPANY | PENNZOIL UNITED INCOR |
| WELL | W. M. LOONEY # 18 |
| FIELD | SMITHFIELD DISTRICT |
| COUNTY | ROANE STATE |
| LOCATION: | |
| SEC. | TWP. RGE. |

PERMANENT DATUM GROUND LEVEL ELEV. NA
LOG MEASURED FROM DRILL FLOOR
DRILLING MEASURED FROM DRILL FLOOR

| | | |
|---|---|---|
| DATE | 5-23 72 | |
| RUN NO. | ONE | |
| TYPE LOG | GAMMA RAY/CAL | |
| DEPTH – DRILLER | 2033' | |
| DEPTH – LOGGER | 2033' | |
| BOTTOM LOGGED INTERVAL | 2032' | |
| TOP LOGGED INTERVAL | 1450' | |
| TYPE FLUID IN HOLE | EMPTY | |
| SALINITY PPM CL. | NA | |
| DENSITY LB./GAL. | NA | |
| LEVEL | SURF. | |
| MAX. REC. TEMP. – DEG. F | NA | |
| OPR. RIG TIME | 2 HOURS | |
| RECORDED BY | G. ENDICOTT | |
| WITNESSED BY | MR. KELLY | |

| RUN NO. | BORE HOLE RECORD | | | CASING R | | |
|---|---|---|---|---|---|---|
| | BIT | FROM | TO | SIZE | WGT. | FRO |
| | | | | 10" | | SU |
| | | | | 8 1/4" | | SU |
| | | | | 6 5/8" | | SU |
| | | | | 5 3/16" | | SU |

THIS HEADING AND LOG CONFORM TO API STANDARD PRACTI

ys, Inc.
R LOG

ST VIRGINIA

OTHER LOGS:

ELEVATIONS:
KB.
D. NA
G. NA

| ORD | |
|---|---|
| | 190' |
| | 685' |
| | 1906' |
| | 1928' |
| TO | |

SP 33

## EQUIPMENT DATA

| GAMMA RAY | | | | CALIPER | | | |
|---|---|---|---|---|---|---|---|
| RUN NO. | ONE | | | RUN NO. | ONE | | |
| TOOL MODEL NO. | GCD56XU | | | LOG TYPE | CALIPER | | |
| DIAM. | 3½" | | | TOOL MODEL NO. | CAL. BX | | |
| DETECT. MODEL NO. | A.P.A. | | | DIAM. | 3½" | | |
| TYPE | SCINT. | | | DETECT. MODEL NO. | | | |
| LENGTH | 3" | | | TYPE | 3 ARM | | |
| | | | | LENGTH | | | |
| | | | | SOURCE MODEL NO. | | | |
| GENERAL | | | | SERIAL NO. | | | |
| HOIST TRUCK NO. | 132 | | | SPACING | | | |
| INST. TRUCK NO. | 132 | | | TYPE | | | |
| TOOL SERIAL NO. | | | | STRENGTH | | | |

## LOGGING DATA

| GENERAL | | | | GAMMA RAY | | | | CALIPER | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| RUN NO. | DEPTHS FROM | DEPTHS TO | SPEED FT/MIN | T.C. SEC. | SENS. SETTINGS | ZERO LOG DIV. | SCALE API G.R. UNITS | T.C. SEC. | SENS. SETTINGS | ZERO LOG DIV. | SCALE |
| 1 | 2032' | 1450' | 28 | 3 | 50 | 0-L | 20 | 1 | 450 | 2 LOG DIV. | = 1" |

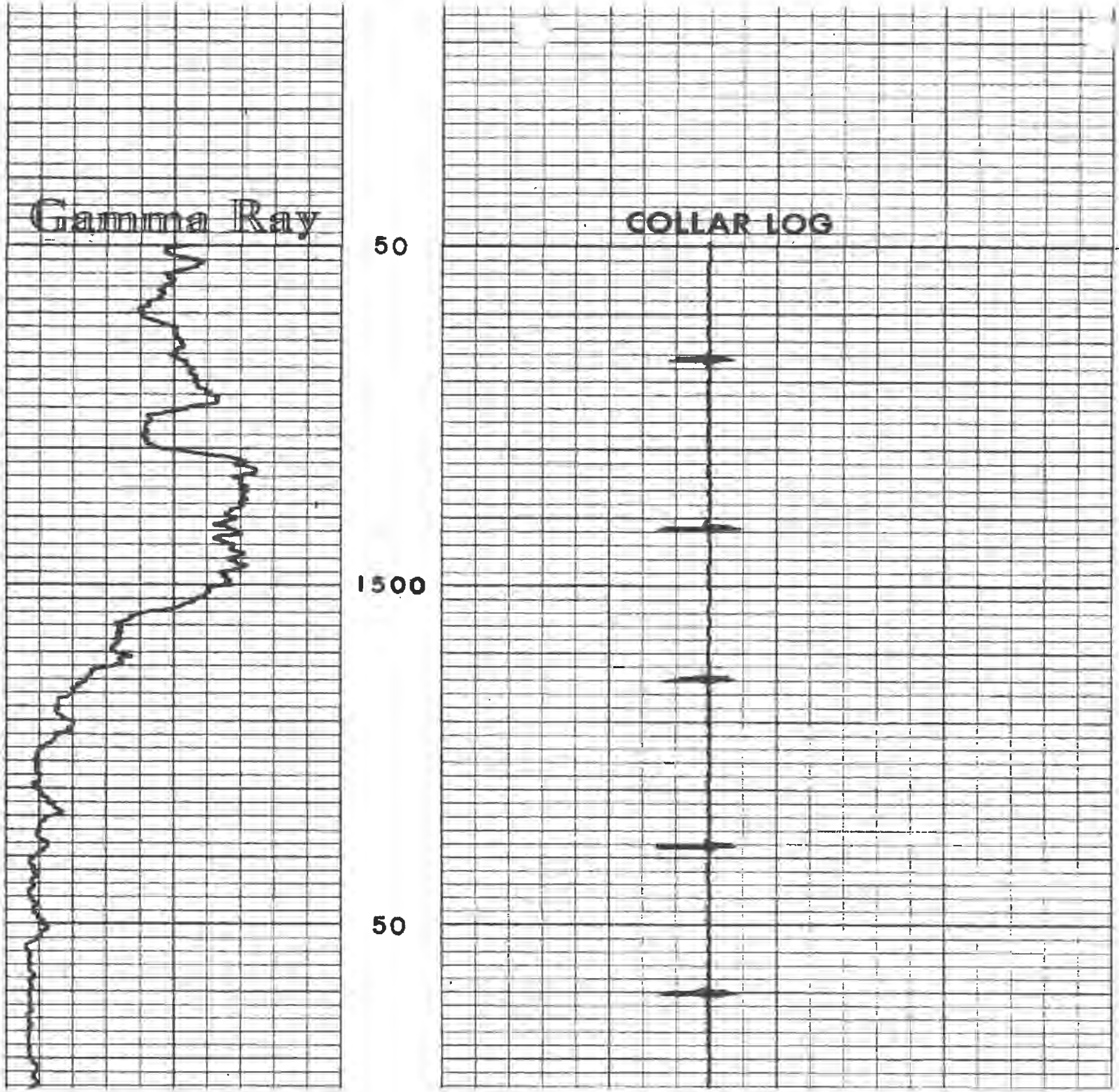
REFERENCE LITERATURE:

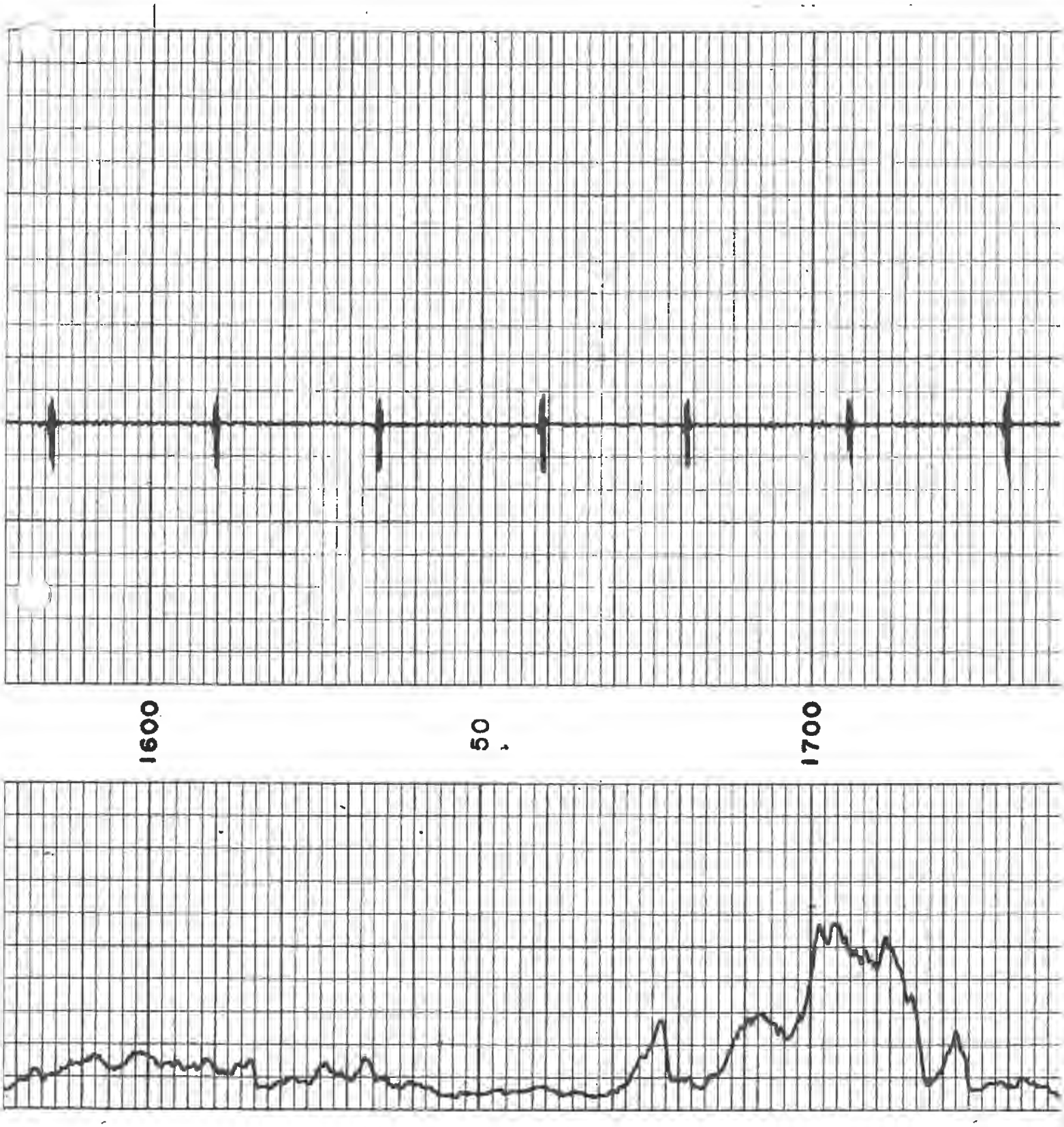
REMARKS:

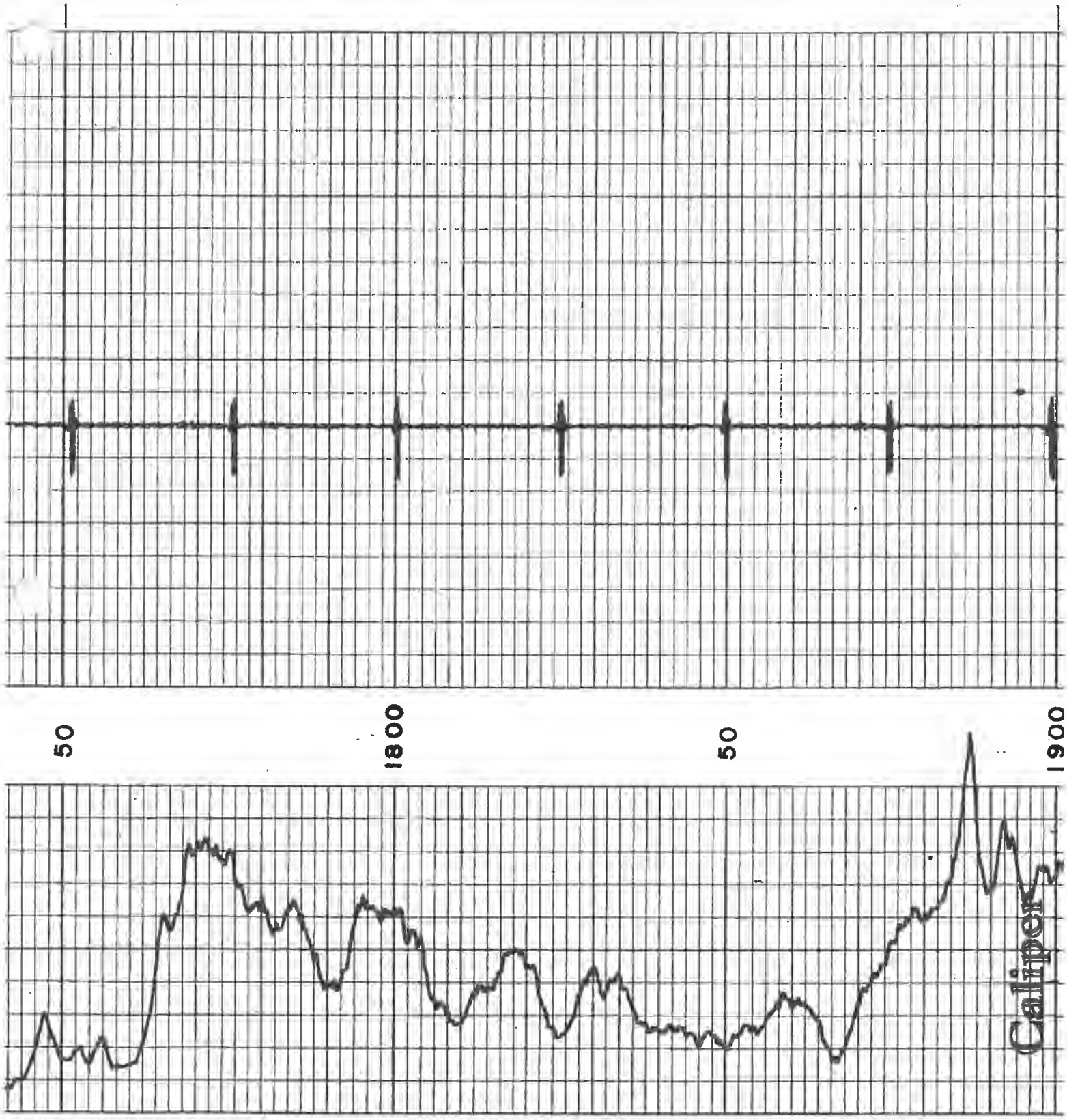
**GAMMA RAY**

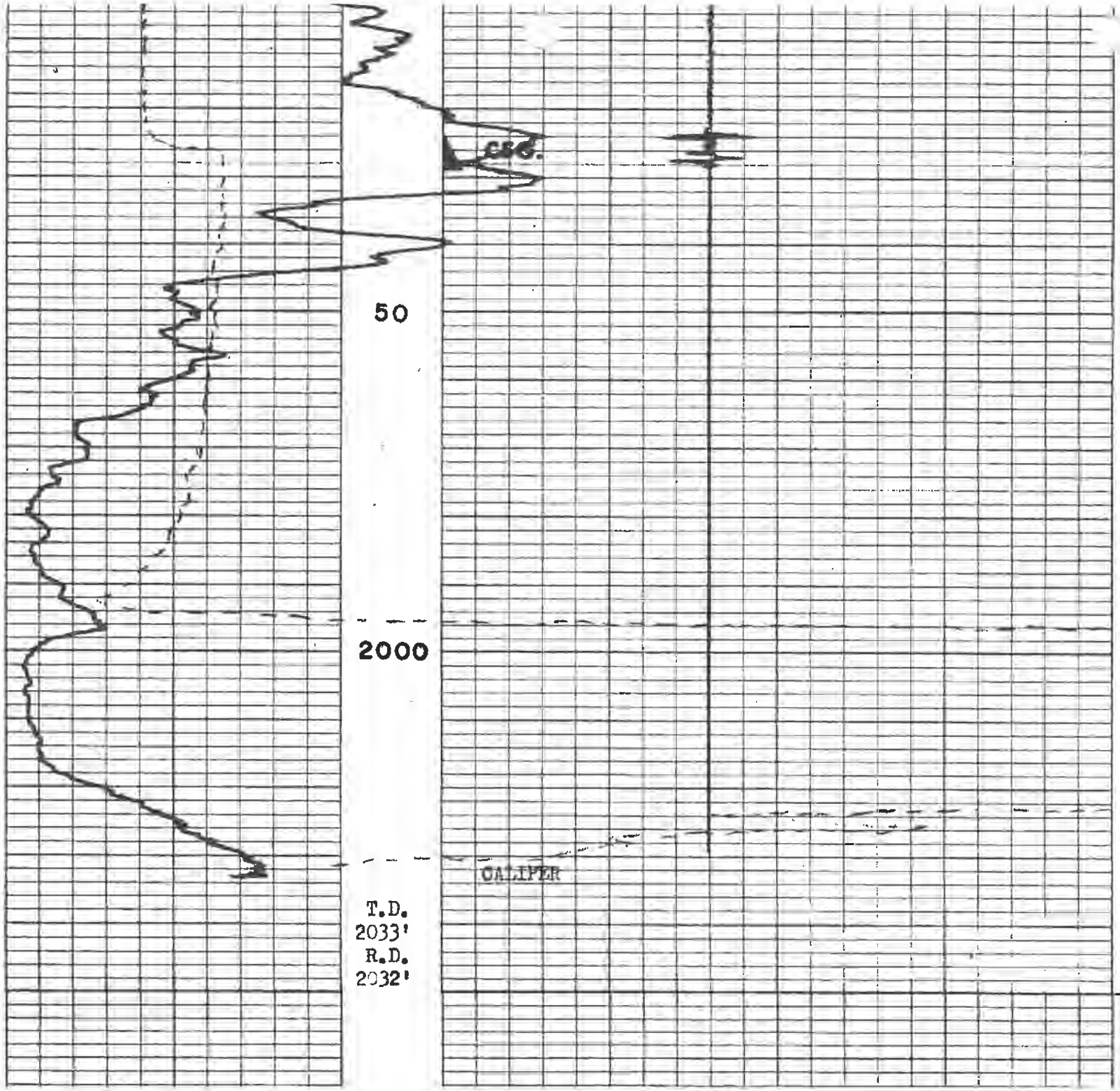
API GAMMA RAY UNITS

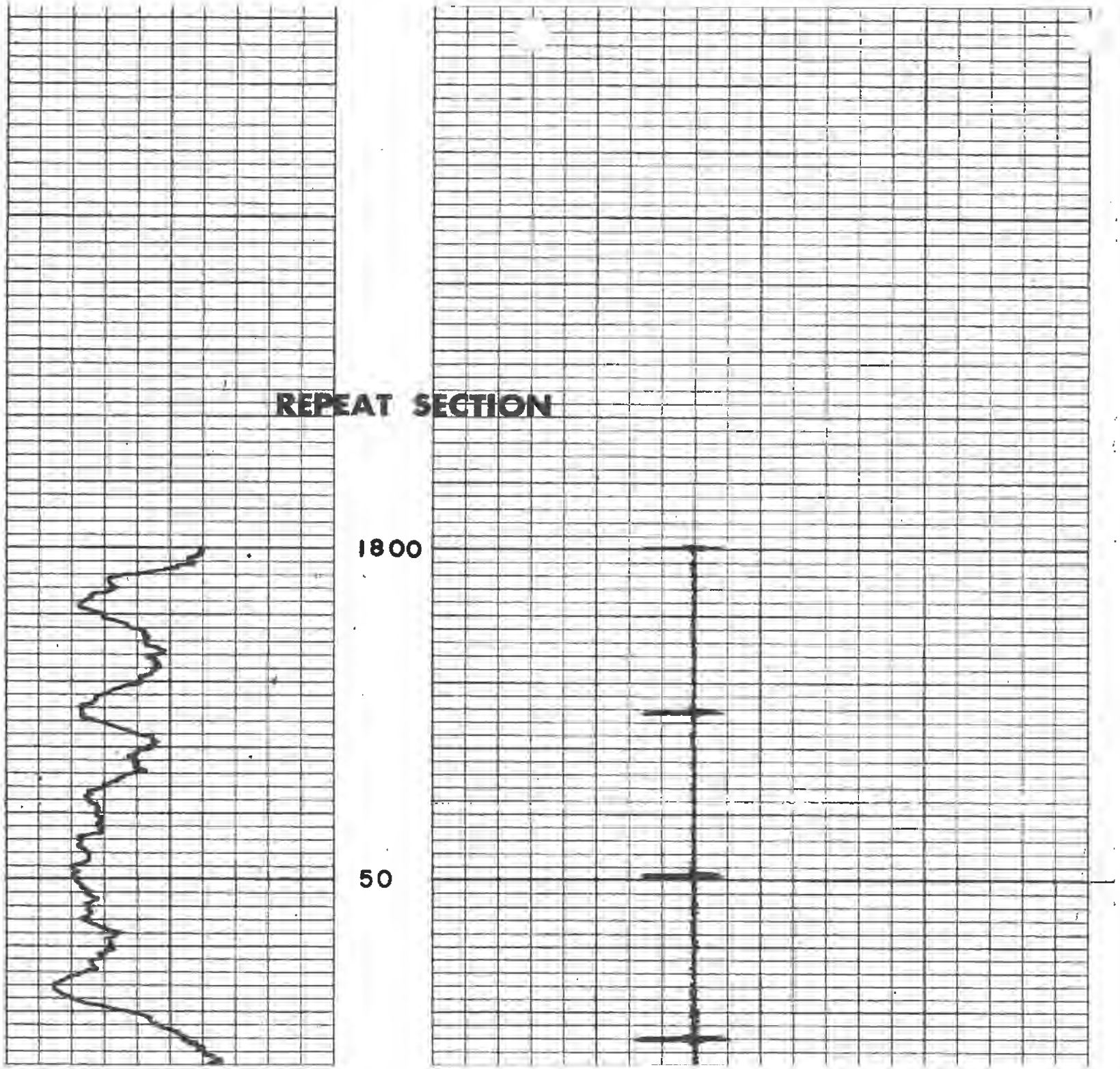
**CALIPER**

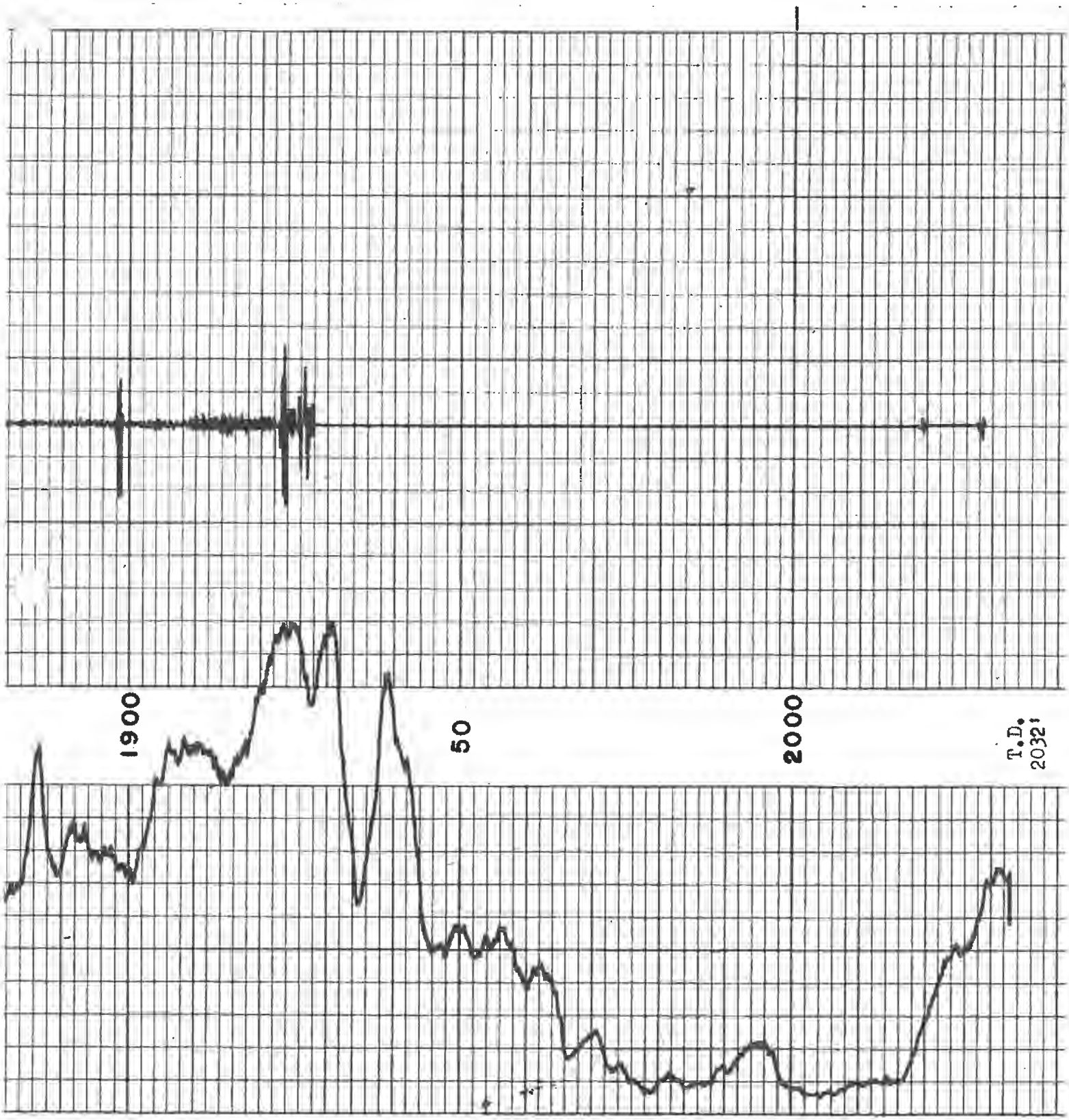

Gamma Ray
COLLAR LOG
50
1500
50

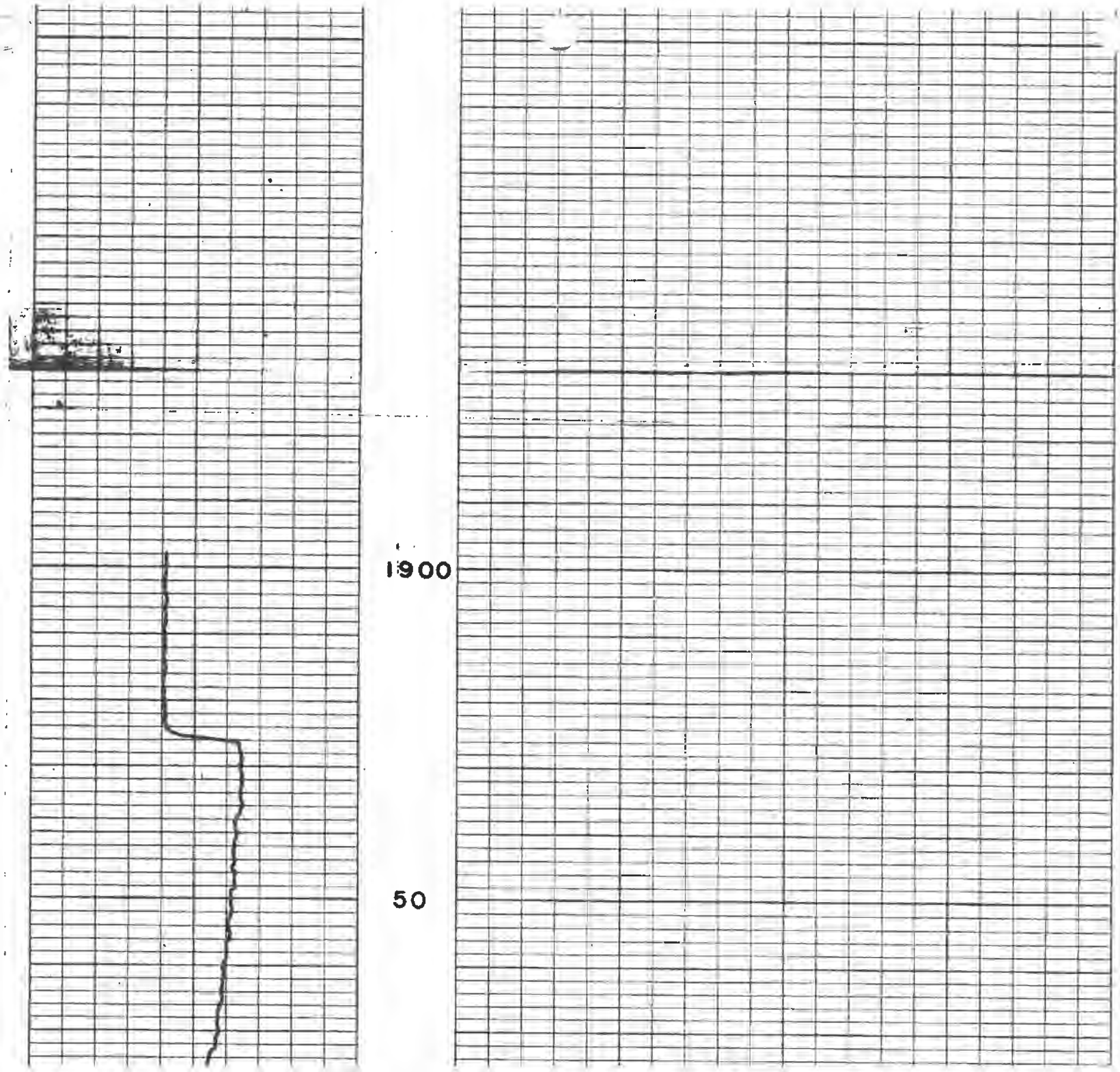

1600
50
1700

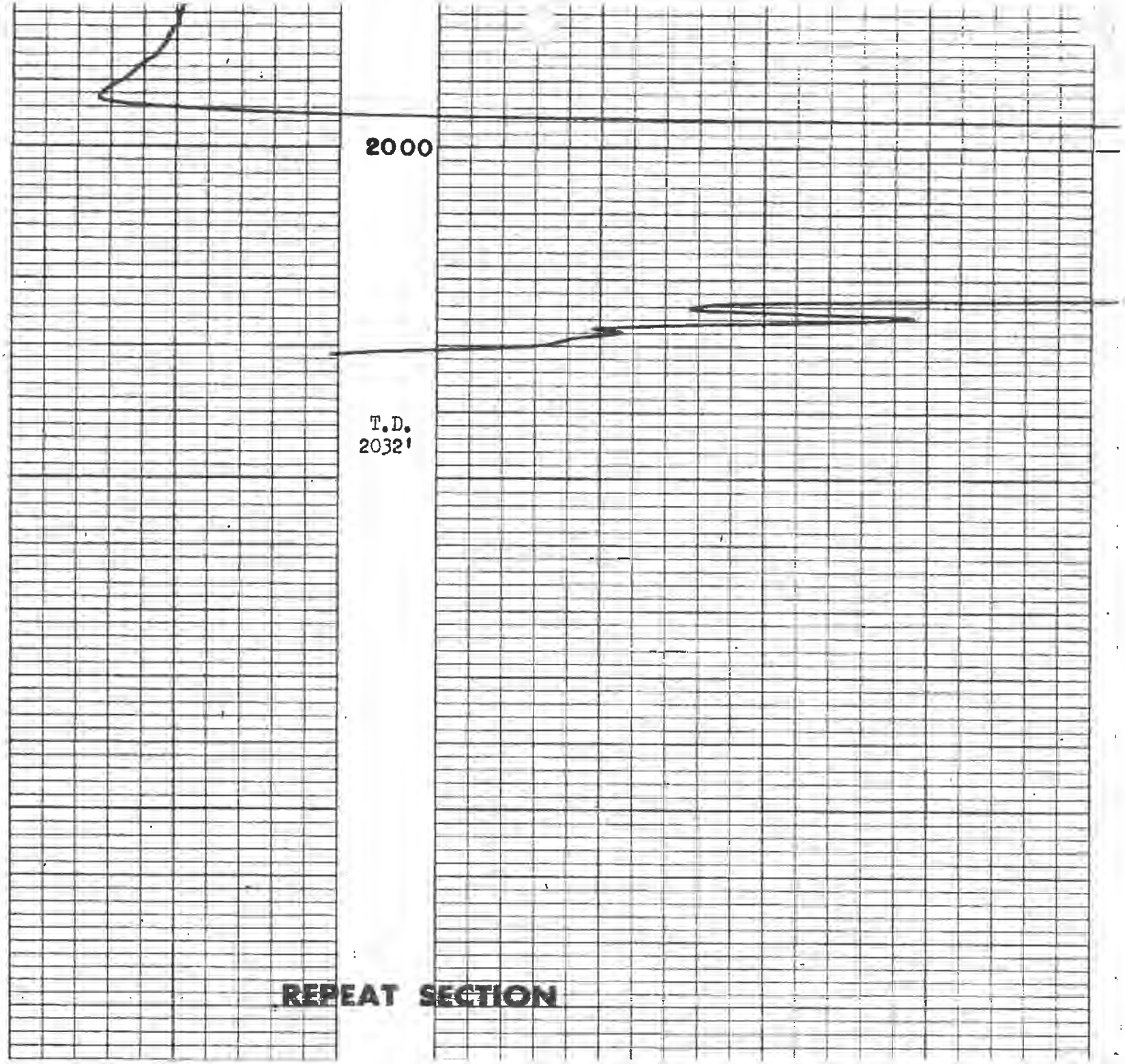

50
1800
50
1900
Caliper

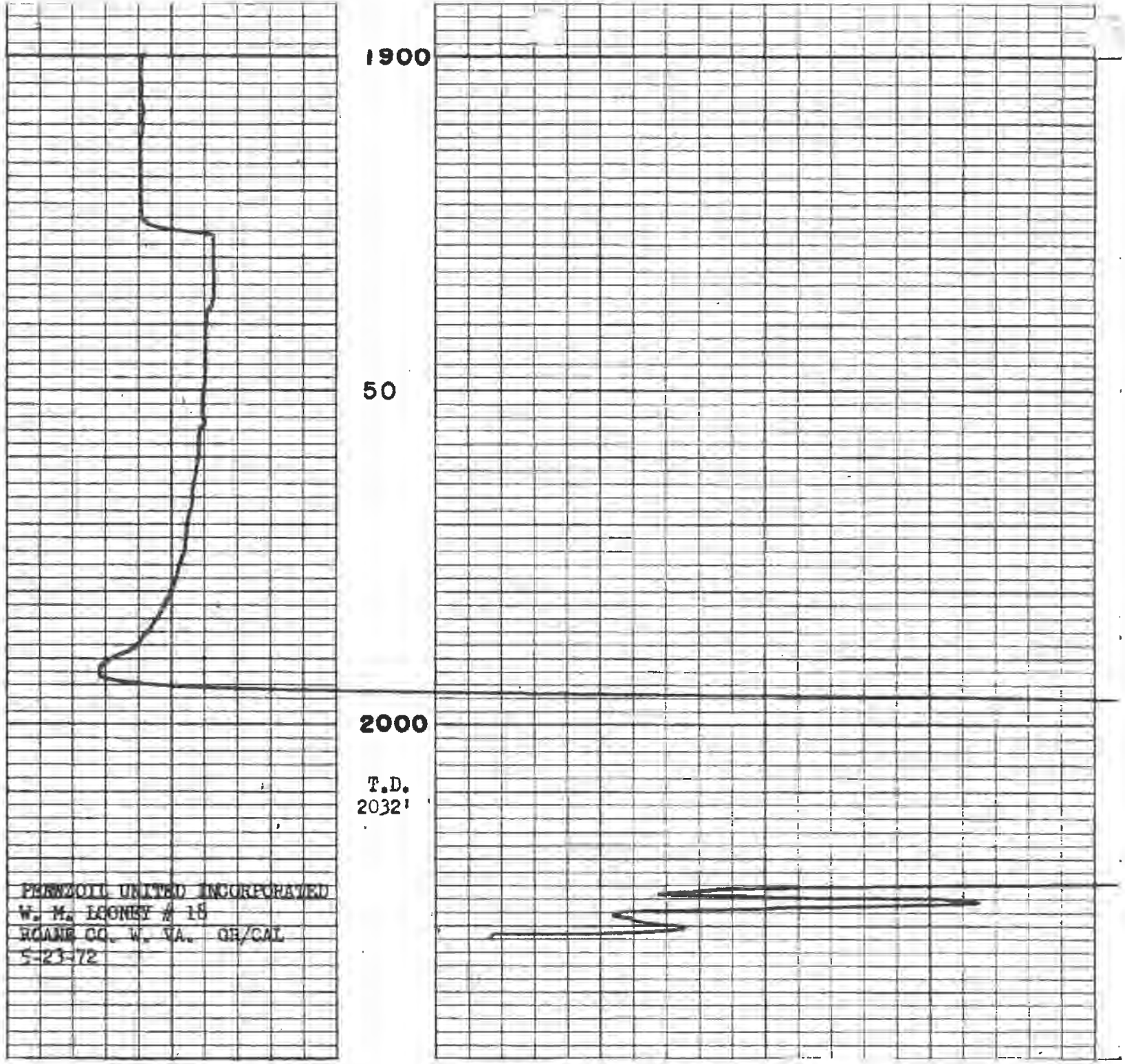

CSG.
50
2000
CALIPER
T.D.
2033'
R.D.
2032'


REPEAT SECTION
1800
50


1900
50
2000
T.D.
2032'


1900
50


2000
T.D.
2032'
REPEAT SECTION


1900
50
2000
T.D.
2032'
PENNZOIL UNITED INCORPORATED
W. M. LOONEY # 18
ROANE CO. W. VA. GR/CAL
5-23-72

WVGES GEOLOGY UNDERLIES IT ALL "Pipeline"

Select County: (087) Roane
Enter Permit #: 3604
Get Data | Reset

Select datatypes: (Check All)
Location | Production | Plugging
Owner/Completion | Stratigraphy | Sample
Pay/Show/Water | Logs | Btm Hole Loc

Table Descriptions
County Code Translations
Permit-Numbering Series
Usage Notes
Contact Information
Disclaimer
WVGES Main
"Pipeline-Plus" New

WV Geological & Economic Survey:

**Well: County = 87 Permit = 3604**

Report Time: Thursday, April 30, 2020 9:07:39 PM

Location Information: View Map

| API | COUNTY | PERMIT | TAX_DISTRICT | QUAD_75 | QUAD_15 | LAT_DD | LON_DD | UTME | UTMN |
|---|---|---|---|---|---|---|---|---|---|
| 4708703604 | Roane | 3604 | Smithfield | Tariff | Otter | 38.649325 | -81.20834 | 481670.8 | 4277883.6 |

There is no Bottom Hole Location data for this well

Owner Information:

| API | CMP_DT | SUFFIX | STATUS | SURFACE_OWNER | WELL_NUM | CO_NUM | LEASE | LEASE_NUM | MINERAL_OWN | OPERATOR_AT_COMPLETION | PROP_VD | PROP_TRGT_FM | TFM_EST_PR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708703604 | 8/-/1981 | Original Loc | Completed | D D Jones P A Tallman | 61 | | | | | Pennzoil Company | | | |

Completion Information:

| API | CMP_DT | SPUD_DT | ELEV | DATUM | FIELD | DEEPEST_FM | DEEPEST_FMT | INITIAL_CLASS | FINAL_CLASS | TYPE | RIG | CMP_MTHD | TVD | TMD | NEW_FTG | KOD | G_BEF | G_AFT | O_BEF | O_AFT | NGL_BEF | NGL_AFT | P_BEF | TI_BEF | P_AFT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708703604 | 8/-/1981 | -/-/- | 1058 | Ground Level | Tariff Tlmn | Big Injun (Price&eq) | Big Injun (Price&eq) | Service Well | Unsuccessful | Water Injection | Rotary | Acid+Frac | 2147 | | 2147 | | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 |

Pay/Show/Water Information:

| API | CMP_DT | ACTIVITY | PRODUCT | SECTION | DEPTH_TOP | FM_TOP | DEPTH_BOT | FM_BOT | G_BEF | G_AFT | O_BEF | O_AFT | WATER_QNTY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708703604 | 8/-/1981 | Horizon | Injection | Vertical | | | 2086 | Big Injun (Price&eq) | 0 | 0 | | | |

Production Gas Information: (Volumes in Mcf) * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_GAS | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708703604 | Pennzoil Company | 1984 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703604 | Pennzoil Products Company | 1989 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703604 | Pennzoil Products Company | 1990 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703604 | Pennzoil Products Company | 1991 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703604 | Pennzoil Products Company | 1992 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703604 | Pennzoil Products Company | 1993 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703604 | Pennzoil Products Company | 1994 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703604 | Pennzoil Products Company | 1995 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703604 | Triad Resources, Inc. | 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703604 | Ground Resources, LLC | 2017 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703604 | Ground Resources, LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Production Oil Information: (Volumes in Bbl) ** some operators may have reported NGL under Oil * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_OIL | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708703604 | Pennzoil Company | 1984 | 1,030 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703604 | Pennzoil Products Company | 1989 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703604 | Pennzoil Products Company | 1990 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703604 | Pennzoil Products Company | 1991 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703604 | Pennzoil Products Company | 1992 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703604 | Pennzoil Products Company | 1993 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703604 | Pennzoil Products Company | 1994 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703604 | Pennzoil Products Company | 1995 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703604 | Triad Resources, Inc. | 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703604 | Ground Resources, LLC | 2017 | 0 | | | | | | | | | | | | |
| 4708703604 | Ground Resources, LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Production NGL Information: (Volumes in Bbl) ** some operators may have reported NGL under Oil * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_NGL | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708703604 | Ground Resources, LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Production Water Information: (Volumes in Gallons) * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_WTR | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708703604 | Ground Resources, LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Stratigraphy Information:

| API | SUFFIX | FM | FM_QUALITY | DEPTH_TOP | DEPTH_QUALITY | THICKNESS | THICKNESS_QUALITY | ELEV | DATUM |
|---|---|---|---|---|---|---|---|---|---|
| 4708703604 | Original Loc | 3rd Salt Sand | Well Record | 1862 | Reasonable | 43 | Reasonable | 1058 | Ground Level |
| 4708703604 | Original Loc | Little Lime | Well Record | 1905 | Reasonable | 30 | Reasonable | 1058 | Ground Level |
| 4708703604 | Original Loc | Blue Monday | Well Record | 1935 | Reasonable | 5 | Reasonable | 1058 | Ground Level |
| 4708703604 | Original Loc | Big Lime | Well Record | 1957 | Reasonable | 111 | Reasonable | 1058 | Ground Level |
| 4708703604 | Original Loc | Greenbrier Group | Well Record | 1957 | Reasonable | 111 | Reasonable | 1058 | Ground Level |
| 4708703604 | Original Loc | Big Injun (Price&eq) | Well Record | 2068 | Reasonable | 18 | Reasonable | 1058 | Ground Level |

Wireline (E-Log) Information:

| API | LOG_TOP | LOG_BOT | DEEPEST_FML | LOGS_AVAIL | SCAN | DIGITIZED | GR_TOP | GR_BOT | D_TOP | D_BOT | N_TOP | N_BOT | I_TOP | I_BOT | T_TOP | T_BOT | S_TOP | S_BOT | O_TOP | O_BOT | INCH2 | INCH5 | REDUCED | KOP | LOGMD | ELEV_KB | ELEV_GL | ELEV_DF | LOG_ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708703604 | 2 | 2146 | | G D C* | Y | N | 2 | 2140 | 332 | 2146 | | | | | | | | | 332 | 2146 | Y | Y | N | | | | | | |

Comment: *logs: caliper, CCL, perforation

Downloadable Log Images: We advise you to save the log image file to your PC for viewing. To do so, right-click the .tif image of interest and select the save option. Then you can direct the file to a location of your choice. Please note these images vary in size and some may take several minutes to download, especially if using a 56k or slower dialup connection.

**Quick Reference Guide for Log File Names** For more info about WVGES scanned logs click here

INSPECTOR 3604

FILENAME
4708703604gdc.tif
4708703604gpo.tif

INJECTOR 3604

**geologic log types:**
d density (includes bulk density, compensated density, density porosity, grain density, matrix density, etc.)
e photoelectric adsorption (PE or Pe, etc.)
g gamma ray
i induction (includes dual induction, medium induction, deep induction, etc.)
l laterolog
m dipmeter
n neutron (includes neutron porosity, sidewall neutron--SWN, etc.)
o other[1]
s sonic or velocity
t temperature (includes borehole temperature, BHT, differential temperature, etc.)
z spontaneous potential or potential

**mechanical log types:**
b cement bond
c caliper
o other[1]
p perforation depth control or perforate

[1]other logs may include, but are not limited to, such curves as audio, bit size, CCL--casing collar locator, continuous meter, directional survey, gas detector, guard, NCTL--Nuclear Cement Top Locator, radioactive tracer, tension

There is no Plugging data for this well

There is no Sample data for this well

# APPENDIX A
## Injection Well Form

3604

1) GEOLOGIC TARGET FORMATION BIG INJUN

Depth 2068 Feet (top) 2086 Feet (bottom)

2) Estimated Depth of Completed Well, (or actual depth of existing well): ~~2157~~ 2147 Feet

3) Approximate water strata depths: Fresh NONE Feet Salt NONE Feet

4) Approximate coal seam depths:

5) Is coal being mined in the area? Yes ☐ No ☑

6) Virgin reservoir pressure in target formation 80 psig Source ESTIMATED

7) Estimated reservoir fracture pressure _____ psig (BHFP)

8) MAXIMUM PROPOSED INJECTION OPERATIONS:

Injection rate (bbl/hour) 6.25

Injection volume (bbl/day) 50

Injection pressure (psig)

Bottom hole pressure (psig) 1800

9) DETAILED IDENTIFICATION OF MATERIALS TO BE INJECTED, INCLUDING ADDITIVES:

Fresh water and/or produced water from the area and possible bactericides necessary to maintain water quality to improve oil recovery. Not using bactericides at this time but will submit a MSDS for approval for any used in the future.

Temperature of injected fluid: (°F) Ambient Temperature

10) FILTERS (IF ANY)

Anthracite Coal Filters

11) SPECIFICATIONS FOR CATHODIC PROTECTION AND OTHER CORROSION CONTROL

None

# APPENDIX A (cont.)

3604

12. Casing and Tubing Program

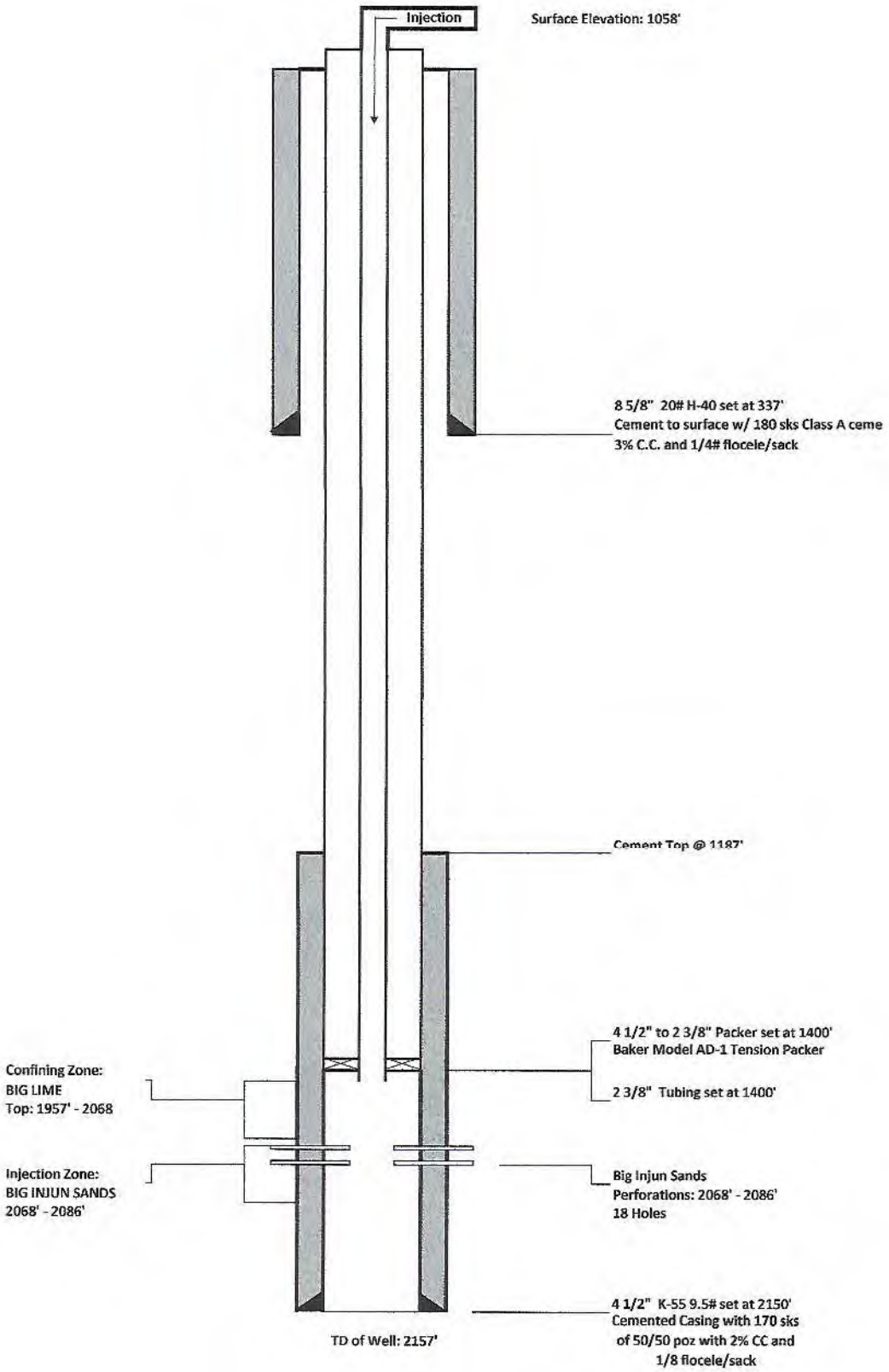
| TYPE | Size | New or Used | Grade | Weight per ft. (lb/ft) | FOOTAGE: For Drilling | INTERVALS: Left in Well | CEMENT: Fill-up (Cu. Ft.) |
|---|---|---|---|---|---|---|---|
| Conductor | | | | | | | |
| Fresh Water | 8 5/8" | NEW | H-40 | 20# | 337' | 337' | 180sks |
| Coal | | | | | | | |
| Intermediate 1 | | | | | | | |
| Intermediate 2 | | | | | | | |
| Production | 4 1/2" | NEW | K-55 | 9.5# | 2150' | 2150' | 170sks |
| Tubing | 2 3/8" | | | | 1400' | | |
| Liners | | | | | | | |

| TYPE | Wellbore Diameter | Casing Size | Wall Thickness | Burst Pressure | Cement Type | Cement Yield (cu. ft./sk) | Cement to Surface ? (Y or N) |
|---|---|---|---|---|---|---|---|
| Conductor | | | | | | | |
| Fresh Water | | | | | | | |
| Coal | | | | | | | |
| Intermediate 1 | | | | | | | |
| Intermediate 2 | | | | | | | |
| Production | | | | | | | |
| Tubing | | | | | | | |
| Liners | | | | | | | |

| PACKERS | Packer #1 | Packer #2 | Packer #3 | Packer #4 |
|---|---|---|---|---|
| Kind: | AD-1 Tension Packer | | | |
| Sizes: | 2 3/8" x 4 1/2" | | | |
| Depths Set: | 1400' | | | |

# Well Schematic

## Tallman 61
## API 47-087-3604



WR-37
REV. 5/01

Date: 1/2/2019

Operator's Well Number P A TALLMAN 61

API Well No.: 47- 087 - 03604 (State County Permit)

# STATE OF WEST VIRGINIA
# DEPARTMENT OF ENVIRONMENT-OFFICE OF OIL AND GAS
# PRE-OPERATION CERTIFICATE
# FOR LIQUID INJECTION OR WASTE DISPOSAL WELL

**WELL OPERATOR** Ground Resources, LLC
Address 513 Charleston Road
Spencer, WV 25276

**DESIGNATED AGENT** Steve Bowers
Address 230 Red Bud Road
Ovapa, WV 25164

**GEOLOGICAL TARGET FORMATION** Big Injun Depth 2057' feet(top) to 2087' feet(bottom)

Virgin reservoir pressure in target formation 880 psig

Source of information on virgin reservoir pressure: Historical/Estimated

Perforation intervals 2068'-2086' Open-hole intervals

**MAXIMUM PERMITTED INJECTION OPERATIONS**

Well head injection pressure: 1000 psig Bottom hole pressure: 1950 psig

Volume per hour: 25 bbls

**DETAILED IDENTIFICATION OF MATERIALS TO BE INJECTED**

Liquids to be injected for oil recovery: Fresh Water and Salt Water

Wastes to be disposed of:

Additives (Slurry mediums, inhibitors, solvents, oxidizers, deoxidizers, etc.)
Scale Inhibitor and THDS (Cleaner)

**SPECIFICATIONS FOR CATHODIC PROTECTION AND OTHER CORROSION CONTROL**

RECEIVED
Office of Oil and Gas
JAN - 4 2019
WV Department of
Environmental Protection

**ADDITIONAL DRILLING AS PART OF THE CONVERSION** (Complete form WR-35)

**DETAILS ON NEW CASING AND TUBING PROGRAM AS PART OF THE CONVERSION** ( To be completed below unless the new casing and tubing program is described on a form WR-35, submitted in connection with the permit to which this form WR-37 relates.)

| CASING OR TUBING TYPE | SIZE | GRADE | WEIGHT PER FT. | NEW | USED | FOOTAGE USED IN DRILLING | FOOTAGE LEFT IN WELL | CEMENT USED | PACKERS (KIND, SIZE, DEPTH SET) |
|---|---|---|---|---|---|---|---|---|---|
| CONDUCTOR | | | | | | | | | |
| FRESH WATER | 8 5/8" | H-40 | 20 | X | | 299' | 299' | To Surface | |
| COAL | | | | | | | | | |
| INTERMEDIATE | | | | | | | | | |
| PRODUCTION | 4 1/2" | J-55 | 9.5 | X | | 2148' | 2148' | | BAKER |
| TUBING | 2 3/8 | | 4.6 | | | 1382' | 1382' | | AD-1 |
| LINERS | | | | | | | | | 1382' |

JN

WR37

**MECHANICAL INTEGRITY TEST**

Test Method: Pressure well between 4 1/2 and 2 3/8 to 1,700 psi for 40 minutes.

The undersigned certifies that the test was performed on 1/2/2019, 20__ and demonstrated mechanical integrity of the well. The test was witnessed by Joe Taylor representing the Office of Oil and Gas.

Ground Resources, LLC.
Well Operator

1/2/2019
Date

**THIS WELL IS AUTHORIZED FOR INJECTION.**

Signed Charles T. Bree UIC PROGRAM ~~DIRECTOR~~ MANAGER

Date 4/9/19

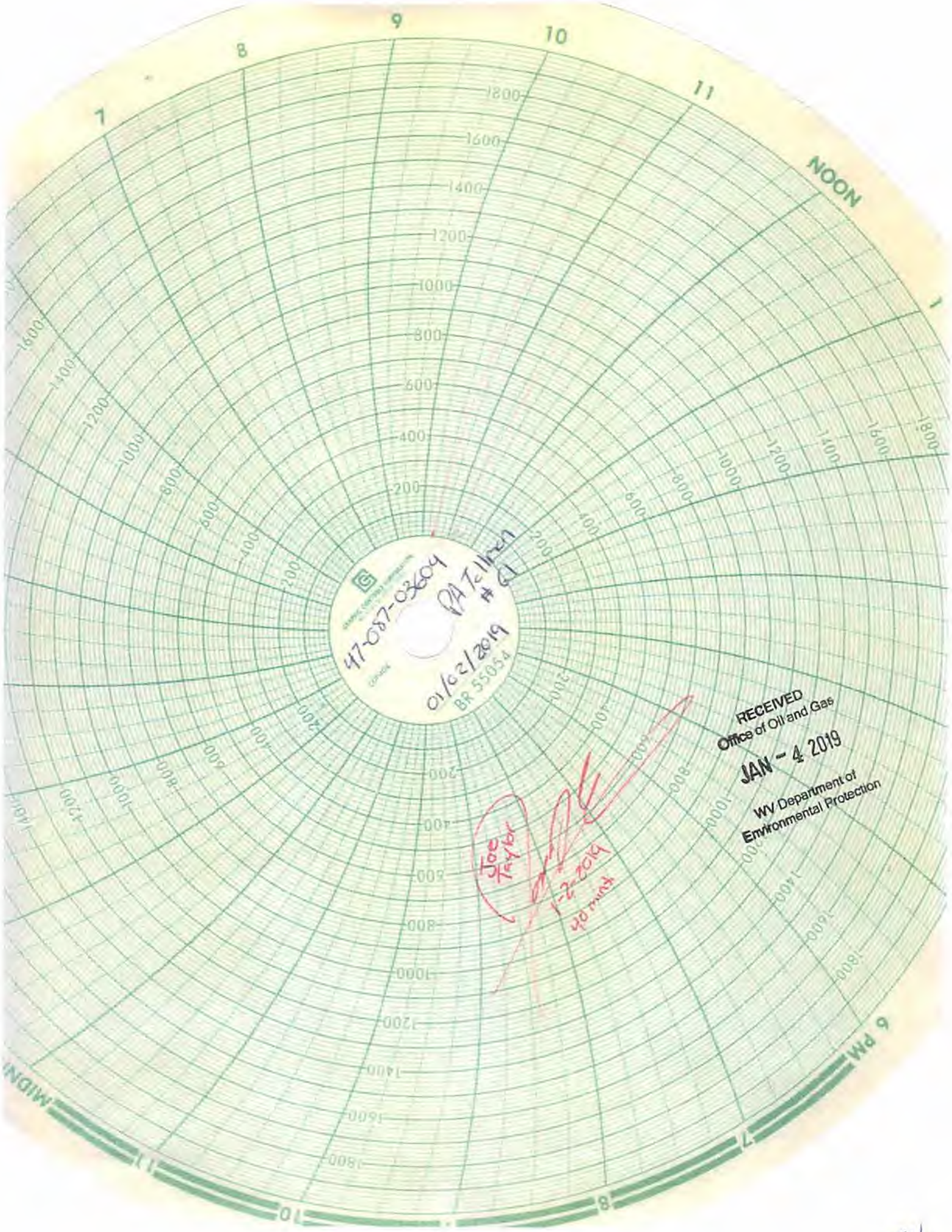
RECEIVED
Office of Oil and Gas
JAN - 4 2019
WV Department of
Environmental Protection

[NOTE: That the mechanical integrity of this well must be demonstrated again within ninety (90) days of five years from this date in order for injection to continue. Please notify the state inspector 24 hours in advance of the test].

Ground Resources, LLC.
Well Operator

By: [signature]
Its Agent

JN


47-087-03604
PA Tillman
# 61
01/02/2019
BR 55054
Joe Taylor
1-2-2019
40 mcf
RECEIVED
Office of Oil and Gas
JAN - 4 2019
WV Department of
Environmental Protection
NOON
6 PM
MIDN

JN

3604
INJECTOR

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES
Oil and Gas Division

# WELL RECORD

Rotary X Oil X
Cable ____ Gas ____
Recycling ____ Comb. ____
Water Flood X Storage ____
Disposal ____ (Kind)

Quadrangle Tariff 7.5'
Permit No. 087-3604-Li

Company Pennzoil Company
Address P.O.Box 1588, Parkersburg, WV 26101
Farm P. A. Tallman Acres 2350
Location (waters) Sycamore Fork
Well No. 61 Elev. 1058
District Smithfield County Roane
The surface of tract is owned in fee by
Doyle D. Jones
Address Left Hand, WV 25251
Mineral rights are owned by Ann[illegible] Collins
Address 1009 Main St., Point Pleasant WV
Drilling Commenced 8-13-82
Drilling Completed 8-18-82
Initial open flow W W cu. ft. ____ bbls.
Final production ____ cu. ft. per day ____ bbls.
Well open ____ hrs. before test ____ RP

| Casing and Tubing | Used in Drilling | Left in Well | Cement fill up Cu. ft. (Sks.) |
|---|---|---|---|
| Size 20-16 Cond. | | | |
| 13-10" | | | |
| 9 5/8 | | | |
| 8 5/8 | [illegible] | 117 | 180 sks. |
| 7 | | | |
| 5 1/2 | | | |
| 4 1/2 | 2 5[illegible] | 2 50 | 170 sks. |
| 3 | | | |
| 2 | | | |
| Liners Used | | | |

Attach copy of cementing record.

Well treatment details:
Water Injection Well
Fracture: 11-8-82 w/500 gls 15% HCL, 167 BGW, 1500# 20/40 sd
Perf: 2068-98/1 SH

Coal was encountered at ____ Feet ____ Inches
Fresh water ____ Feet ____ Salt Water ____ Feet ____
Producing Sand Big Injun Depth ____

| Formation | Color | Hard or Soft | Top Feet | Bottom Feet | Oil, Gas or Water | * Remarks |
|---|---|---|---|---|---|---|
| Sand,Silt,Shale | | | 0 | 1604 | | |
| Salt Sand | | | 1604 | 1712 | | |
| Silt, Shale, Sand | | | 1712 | 1776 | | |
| Salt Sand | | | 1776 | 1834 | | |
| Silt & Shale | | | 1834 | 1862 | | |
| Salt Sand | | | 1862 | 1905 | | |
| Little Lime | | | 1905 | 1935 | | |
| Blue Monday | | | 1935 | 1940 | | |
| Pencil Cave | | | 1940 | 1957 | | |
| Big Lime | | | 1957 | 2068 | | |
| Big Injun | | | 2068 | 2086 | | |
| Pocono Shale | | | 2086 | 2147 | | |
| Total Depth | | | | 2147 | | |

Injector 3604
SHUT-IN

OG-10
Rev. - 9-71

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES

# Oil and Gas Division

# WELL RECORD

Rotary X Oil X
Cable ____ Gas ____
Recycling ____ Comb. ____
Water Flood X Storage ____
Disposal ____ ____ (Kind)

Quadrangle Tariff 7.5'

Permit No. 087-3604-Li

Company Pennzoil Company
Address P.O.Box 1588, Parkersburg, WV 26101
Farm P. A. Tallman Acres 2350
Location (waters) Sycamore Fork
Well No. 61 Elev. 1058
District Smithfield County Roane
The surface of tract is owned in fee by
Doyle D. Jones
Address Left Hand, WV 25251
Mineral rights are owned by Anna Lee Collins
Address 1009 Main St., Point Pleasant WV
Drilling Commenced 8-13-82
Drilling Completed 8-18-82
Initial open flow WIW cu. ft. ____ bbls.
Final production ____ cu. ft. per day ____ bbls.
Well open ____ hrs. before test ____ RP.

| Casing and Tubing | Used in Drilling | Left in Well | Cement fill up Cu. ft. (Sks.) |
|---|---|---|---|
| Size 20-16 Cond. | | | |
| 13-10" | | | |
| 9 5/8 | | | |
| 8 5/8 | 337 | 337 | 180 sks. |
| 7 | | | |
| 5 1/2 | | | |
| 4 1/2 | 2150 | 2150 | 170 sks. |
| 3 | | | |
| 2 | | | |
| Liners Used | | | |

Attach copy of cementing record.

Well treatment details:

Water Injection Well

Fracture: 11-4-82 w/500 gls. 15% HCL, 167 BGW, 1500# 20/40 sd

Perf: 2068-86/18H

Coal was encountered at ____ Feet ____ Inches
Fresh water ____ Feet ____ Salt Water ____ Feet ____
Producing Sand Big Injun Depth ____

| Formation | Color | Hard or Soft | Top Feet | Bottom Feet | Oil, Gas or Water | * Remarks |
|---|---|---|---|---|---|---|
| Sand,Silt,Shale | | | 0 | 1604 | | |
| Salt Sand | | | 1604 | 1712 | | |
| Silt, Shale, Sand | | | 1712 | 1776 | | |
| Salt Sand | | | 1776 | 1834 | | |
| Silt & Shale | | | 1834 | 1862 | | |
| Salt Sand | | | 1862 | 1905 | | |
| Little Lime | | | 1905 | 1935 | | |
| Blue Monday | | | 1935 | 1940 | | |
| Pencil Cave | | | 1940 | 1957 | | |
| Big Lime | | | 1957 | 2068 | | |
| Big Injun | | | 2068 | 2086 | | |
| Pocono Shale | | | 2086 | 2147 | | |
| Total Depth | | | | 2147 | | |

Scanned with CamScanner

Date: Mar 11, 19 83

Operator's Well No. P.A. Tallman 61

API Well No. 47 - 087 - 36 3604
State County Per

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES, OIL AND GAS DIVISION

PRE-OPERATION CERTIFICATE
FOR LIQUID INJECTION OR WASTE DISPOSAL WELL

WELL OPERATOR Pennzoil Company DESIGNATED AGENT James A. Crews

Address P.O.Box 1588 Address P.O.Box 1588

Parkersburg, WV 26101 Parkersburg, WV 26101

GEOLOGICAL TARGET FORMATION Big Injun Depth 2057 feet(top) to 2087 feet(Bottom

Virgin reservoir pressure in target formation 80 psig

Source of information on virgin reservoir pressure Estimated

Perforation intervals 2068-2086 Open-hole intervals 18

MAXIMUM PROPOSED INJECTION OPERATIONS

Volume per hour: 6.25 BPH Bottom hole pressure: 1800 psig

DETAILED IDENTIFICATION OF MATERIALS TO BE INJECTED

Liquids to be injected for oil recovery under Code § 22-4-10a: Fresh Water

Wastes to be disposed of: Produced water from waterflood operations to be reinjected

Additives (slurry mediums, inhibitors, solvents, oxidizers, deoxidizers, etc.):

Bactericides

Specific Gravity:

SPECIFICATIONS FOR CATHODIC PROTECTION AND OTHER CORROSION CONTROL

FILTERS (IF ANY) Anthracite Coal Filters

ADDITIONAL DRILLING AS PART OF THE CONVERSION

(Complete and submit Form IV-35, "Well Operator's Report of Drilling, Fracturing and/or Stimulating or Physical Change".)

DETAILS ON NEW CASING AND TUBING PROGRAM AS PART OF THE CONVERSION:

(To be completed below unless the new casing and tubing program is described on a Form IV-35, "Well Operator's Report of Drilling, Fracturing and/or Stimulating or Physical Change", submitted in connection with the permit to which this Form IV-37 preoperation certificate relates.)

| NG, OR NG TYPE | SPECIFICATIONS Size | Grade | Weight per ft. | New | Used | FOOTAGE INTERVALS For drilling | Left in well | CEMENT FILL-UP OR SACKS (Cubic feet) | PACKERS |
|---|---|---|---|---|---|---|---|---|---|
| ector | | | | | | | | | Kinds |
| water | 8-5/8 | H40 | 20 | X | | 299 | 299 | Cement to surface | |
| | | | | | | | | | Sizes |
| mediate | | | | | | | | | |
| ction | 4-1/2 | J55 | 9.5 | X | | 2148 | 2148 | Thru Salt Sand | Depths se |
| | | | | | | | | | |
| | | | | | | | | | Perforati |

(continue on reverse

Scanned with CamScanner

(Reverse)
[01-83]

3604

MECHANICAL INTEGRITY TEST

Test method: Pumped down plug. Pressure tested 4-1/2" casing to 2000# for 20 minutes. Held OK

The undersigned certifies that the test was performed on Aug. 19, 1982 and demonstrated the mechanical integrity of the well. The test was witnessed by _____ representing the Office of Oil and Gas.

Well Operator _____ Date _____

THIS WELL IS AUTHORIZED FOR INJECTION.

Signed _____ Administrator, Office of Oil and Gas

Date _____

[NOTE: That the mechanical integrity of this well must be demonstrated again within ninety (90) days of five years from this date in order for injection to continue. Please notify the state inspector 24 hours in advance of the test].

FACILITIES OR SYSTEMS TO PROTECT THE INTEGRITY OF THE GEOLOGICAL TARGET FORMATION FRACTURING THE CONFINING STRATA _____

APPLICATION FOR VARIANCE (IF ANY) FROM REGULATION 9.01 (a)
[Specify purpose, necessity, and justification]

Pennzoil Company
Well Operator
By: Curtis A Lewis
Its Supervisor, Surveying & Mapping

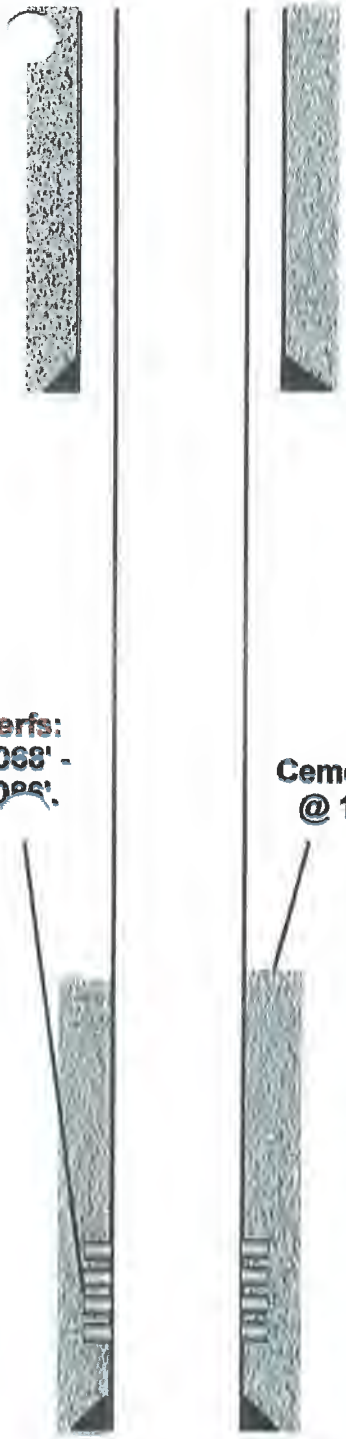
Scanned with CamScanner

☐ Proposed

☒ Original Schematic

# P.A.TALLMAN # 61- 47-087- 3604-LI
## SMITHFIELD DIST., ROANE CO., W.V.
## FIELD : TARIFF

| | Size | Wt. | Grde | Thrd | Depth | Sks/Cmt |
|---|---|---|---|---|---|---|
| CONDUCTOR | | | | | | |
| SURFACE | 8 5/8" | 20 # | H-40 | 8 RD | 337' | 180 sks |
| INTERMEDIATE | | | | | | |
| INTERMEDIATE | | | | | | |
| PRODUCTION | 4 1/2" | 9.5 # | K-55 | 8 RD | 2150' | 170 sks |
| TUBING | | | | | | |




| Perforation Information |
|---|
| BIG INJUN : 2068' - 2086' w / 18 Holes |
| |
| |
| |

| Casing and Tubing Information |
|---|
| 8 5/8" CSG set @ 337' cemented to surface w/ 180 sks Class A cement |
| having 3% C.C and 1/4 # flocele/sack. |
| 4 1/2" CSG cemented @ 2150' with 170 sks of 50/50 pozmix w / 2% C.C |
| and 1/8 # flocele/sack. |
| Cement Top @ 1187'. |
| |
| |

| Date | Work-Over Information |
|---|---|
| | |
| 8/16/82 | Ran 8 jts 8 5/8", 20 #, H-40, 8 RD thd CSG w/ S.T.& C. set @ 337' & |
| | cemented w/ 180 sks Class 'A' cement having 3% C.C and 1/4 # flocele/sk. |
| 8/19/82 | Ran 61 jts 4 1/2", 9.5 #, K-55, 8 RD thd CSG w/ S.T.& C. set @ 2150' & |
| | cemented w/ 500 gals mud flush & w/ 170 sks of 50/50 poz w / 2% Calcium |
| | Chloride and 1/8 # flocele/sack. |
| 11/04/82 | N.L.Mc Cullough treated perfs w/ 500 gals 15% HCl acid, 167 Bbls 20 # |
| | GW & 1500 lbs of 20/40 sand. B.D.P was 1250 psig, A.T.P was 860 psig, |
| | A.T.R was 9.6 B.P.M, I.S.I.P was 800 psig . |
| | |
| | |
| | |
| | |
| | |

WELL T.D. 2157'

PREPARED BY:Babaji Chitluri

DATE: 08/06/2002

ROA 3604

# GEARHART

## COMPENSATED DENSITY LOG

FILING NO. Roa 3604

COMPANY PENNZOIL COMPANY

WELL P. A. TALLMAN NO. 61

FIELD

COUNTY ROANE STATE WEST VIRGINIA

Location: PERMIT NO. 47-087-3604-LI
DISTRICT: SMITHFIELD
WATERSHED: SYCAMORE FORK
QUADRANGLE: TARIFF 7.5
Sec. Twp. Rge.

Other Services:

Permanent Datum: GL ; Elev.: 1058'
Log Measured from KB , 4 Ft. Above Perm. Datum
Drilling Measured From KB

Elev.: K.B. 1063'
D.F. 1063'
G.L. 1058'

| | | | |
|---|---|---|---|
| Date | 8-18-82 | | |
| Run No. | ONE | | |
| Depth-Driller | 2157' | | |
| Depth-Logger | 2147' | | |
| Bottom logged interval | 2140' | | |
| Top logged interval | SURFACE | | |
| Type fluid in hole | FORMATION | | |
| Density / Visc. | NA | | |
| pH / Fluid Loss | NA | | |
| Source of Samples | NA | | |
| Rm @ Meas. Temp. | NA @ °F | @ °F | @ °F |
| Rmf @ Meas. Temp. | NA @ °F | @ °F | @ °F |
| Rmc @ Meas. Temp. | NA @ °F | @ °F | @ °F |
| Source Rmf / Source Rmc | NA | | |
| Max rec. temp., deg F. | NA °F | °F | °F |
| Time: End Circulation | NA | | |
| Time: Logger on Bottom | 11:10 | | |
| Recorded By | D. SHARTZ | | |
| Witnessed By | MR. GREENHOUSE | | |

| Run No. | Bore-Hole Record Level | Bit | From | To | Casing Record Size | Wgt. | From | To |
|---|---|---|---|---|---|---|---|---|
| ONE | | 7-7/8 | 331' | 2157' | 8-5/8 | 24# | SURFACE | 331' |

FOLD HERE

EQUIPMENT DATA

| Run No. | Logging Unit | Location | Gamma Ray Tool No. | Tool No. | Compensated Density Source No. | Source Type | Source Strg. |
|---|---|---|---|---|---|---|---|
| ONE | 7037 | 21-092 | 2364 | 2364 | CSV-552 | CESIUM-137 | 2 C1 |

CALIBRATION DATA

| Run No. | Gamma Ray Bldg. cps | Gamma Ray Std. cps | Magnesium LS | Magnesium SS | Aluminum LS | Aluminum SS | Compensated Density Test Block LS | Compensated Density Test Block SS | Caliper L. Ring | Caliper S. Ring |
|---|---|---|---|---|---|---|---|---|---|---|
| ONE | | | 1045 | 605 | 210 | 418 | 210 | 418 | 14" | 7" |

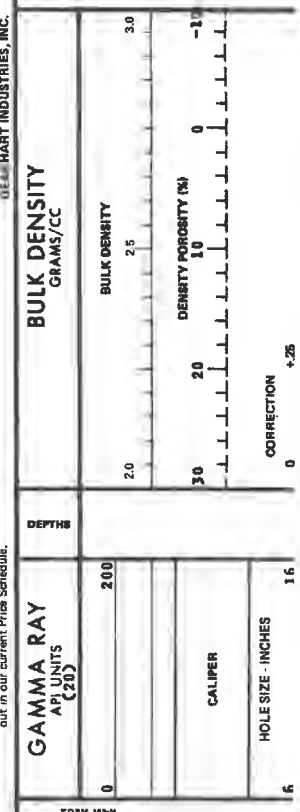
LOGGING DATA

| Run No. | General Depth From | General Depth To | Gamma Ray Speed FPM | Gamma Ray TC | Gamma Ray API PER LOG DIV. | Compensated Density TC | Compensated Density Matrix Density | Compensated Density Fluid Density | Salinity PPM NaCL |
|---|---|---|---|---|---|---|---|---|---|
| ONE | 2157' | SURFACE | 30 | 4 | 30 | 1 | 2 | 1.0 | |

REMARKS:

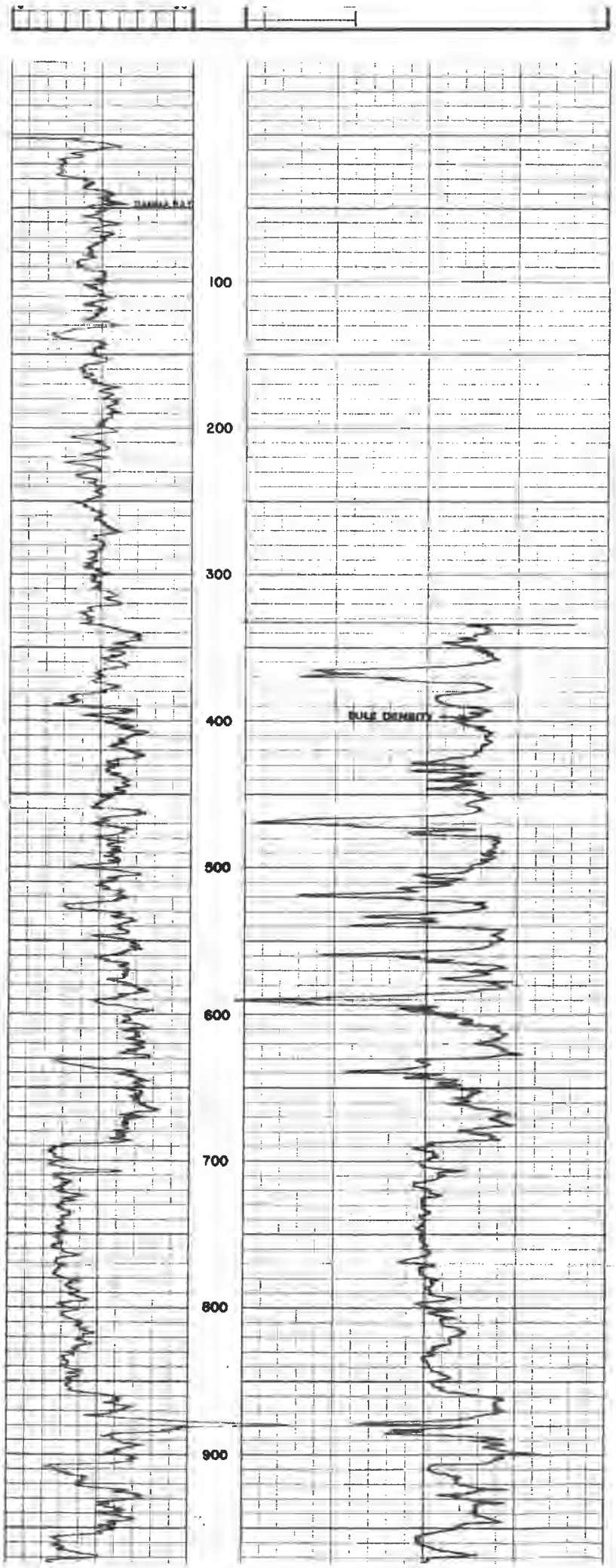
NOTICE: All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not, guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by one of our officers, agents or employees. These interpretations are also subject to our General Terms and Conditions as set out in our current Price Schedule.

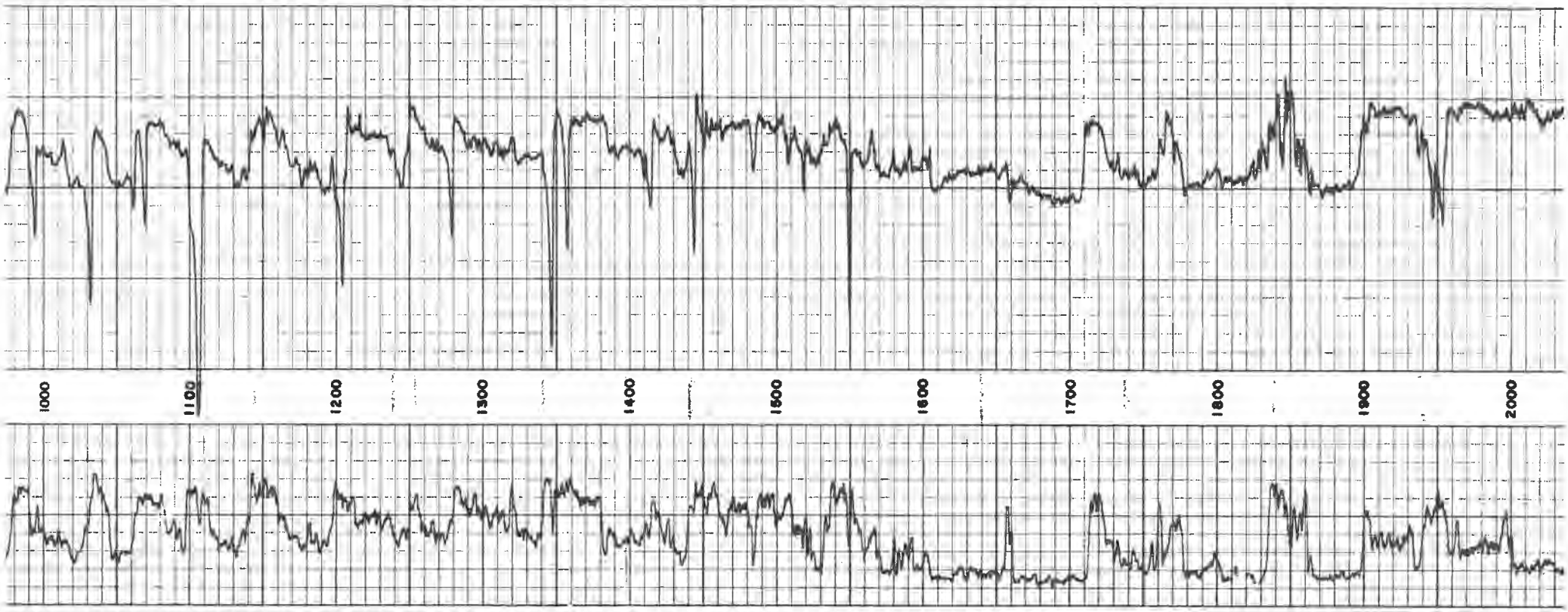
GEARHART INDUSTRIES, INC.

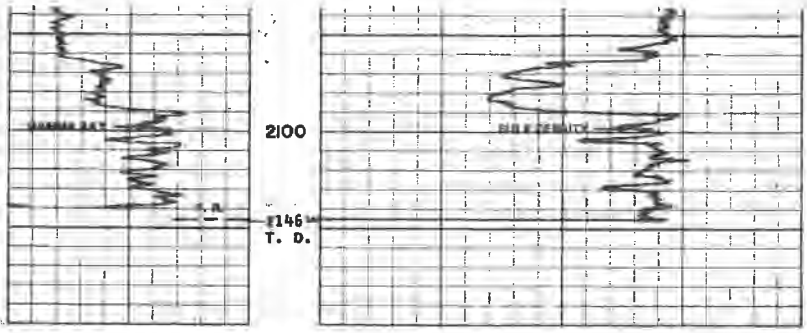


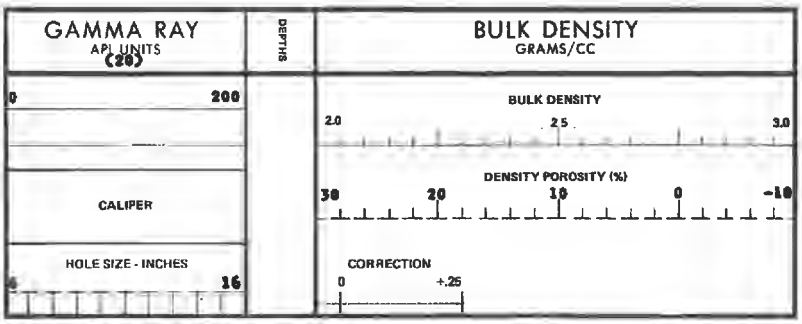

FORM 103-H

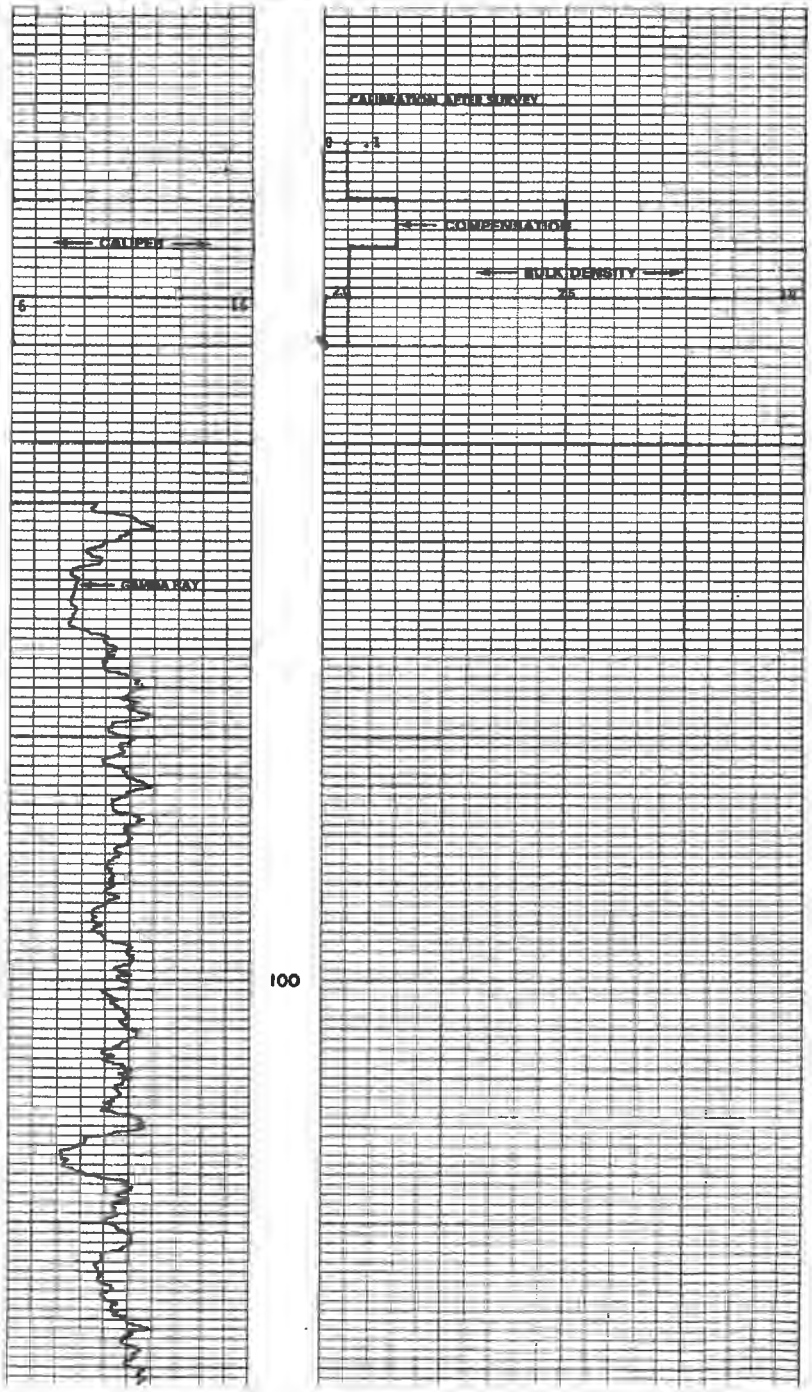
3604

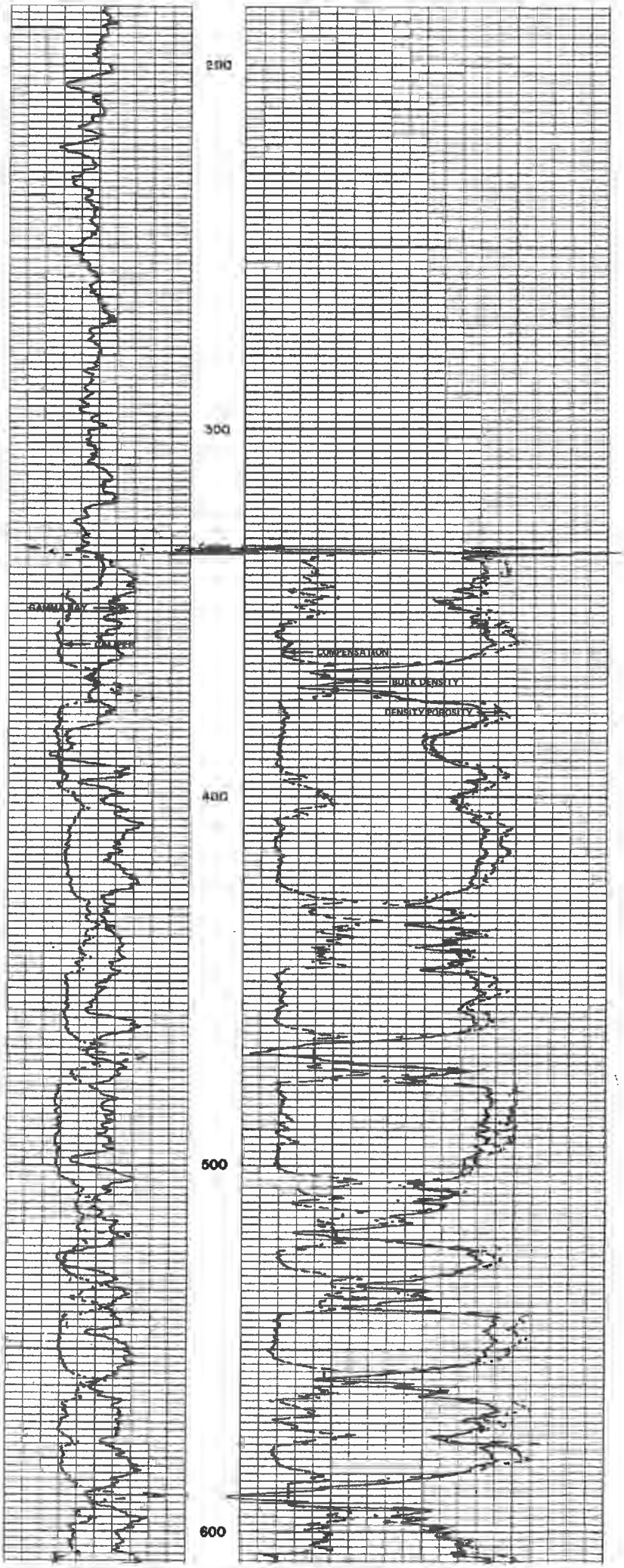

GAMMA RAY
RULE DENSITY
100
200
300
400
500
600
700
800
900


1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000

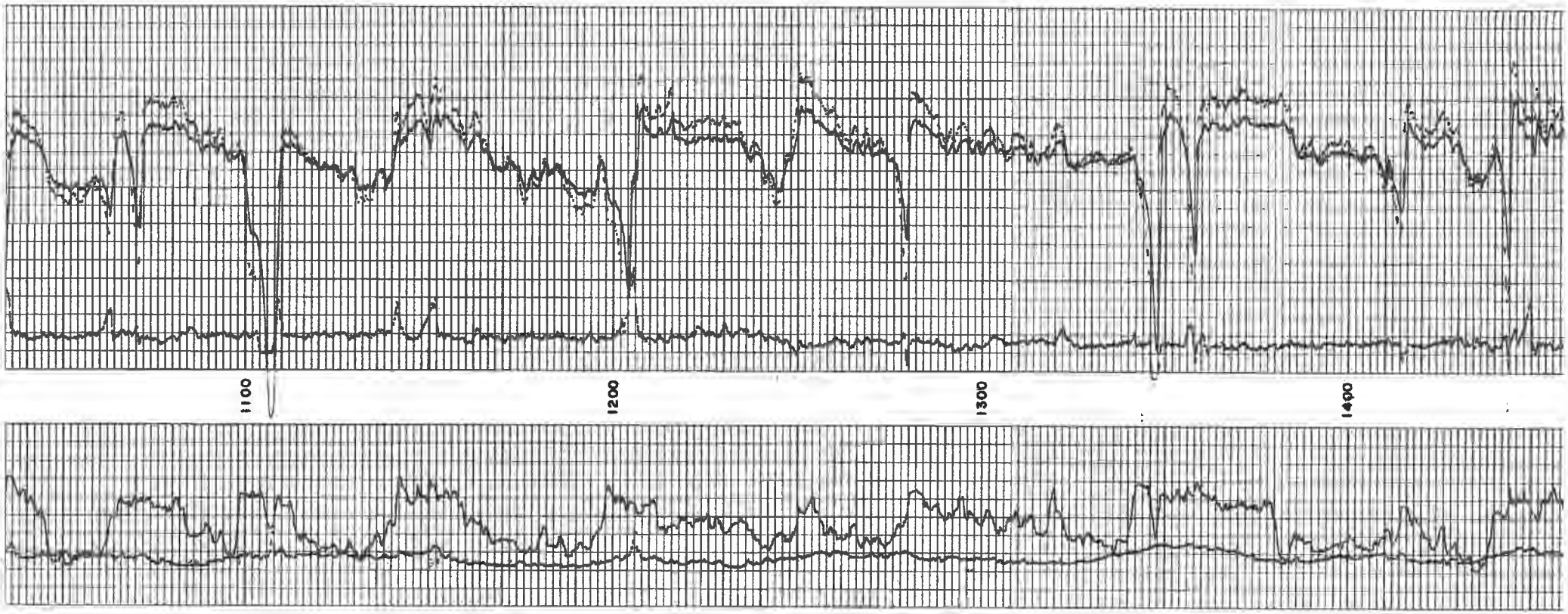

GAMMA RAY
2100
BULK DENSITY
146
T. D.

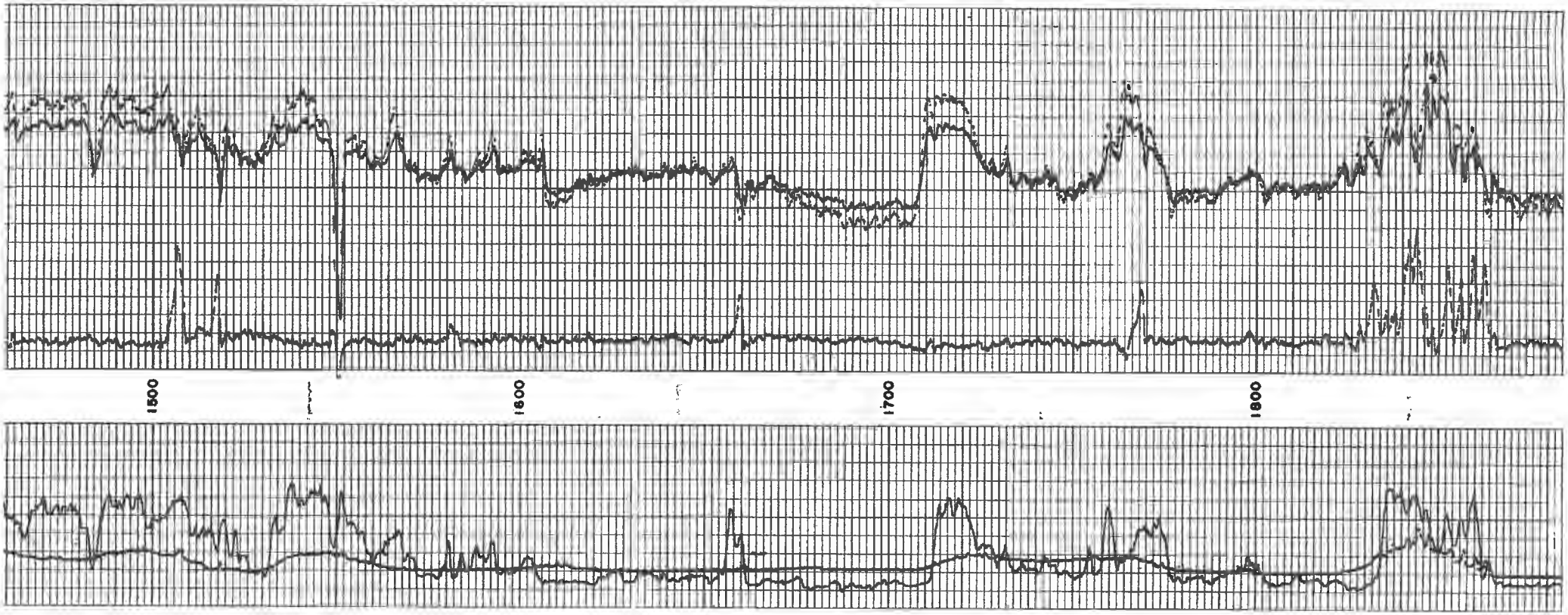

GAMMA RAY
API UNITS
(20)
DEPTHS
BULK DENSITY
GRAMS/CC
0
200
BULK DENSITY
2.0
2.5
3.0
CALIPER
DENSITY POROSITY (%)
30
20
10
0
-10
HOLE SIZE - INCHES
6
16
CORRECTION
0
+.25

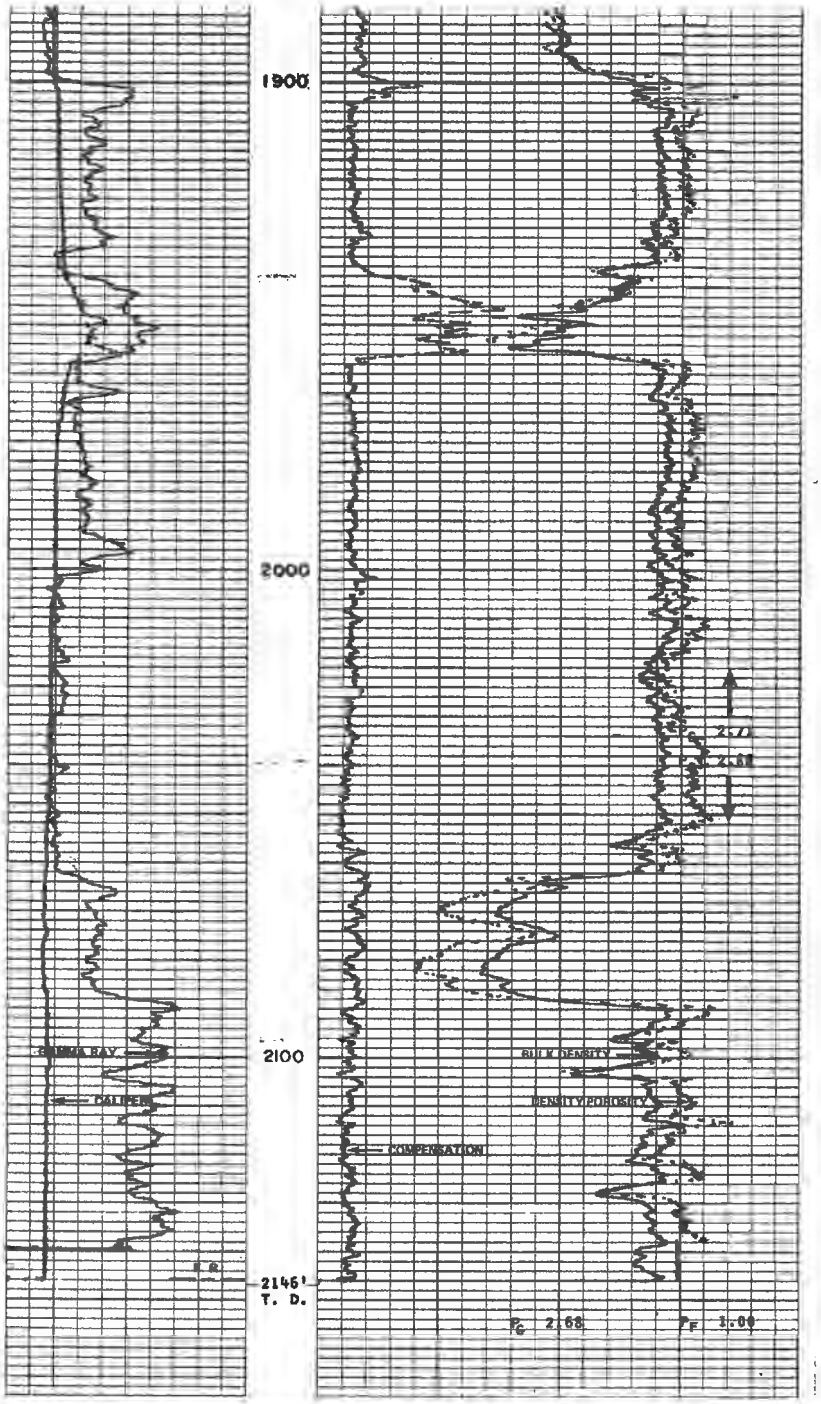

CALIBRATION AFTER SURVEY
0
+.1
COMPENSATION
BULK DENSITY
2.0
2.5
3.0
CALIPER
6
16
GAMMA RAY
100


200
300
400
500
600
GAMMA RAY
COMPENSATION
BULK DENSITY
DENSITY POROSITY

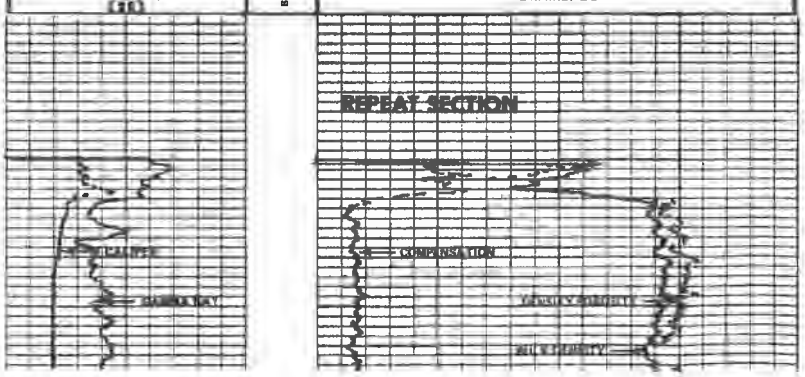
1000
900
800
700

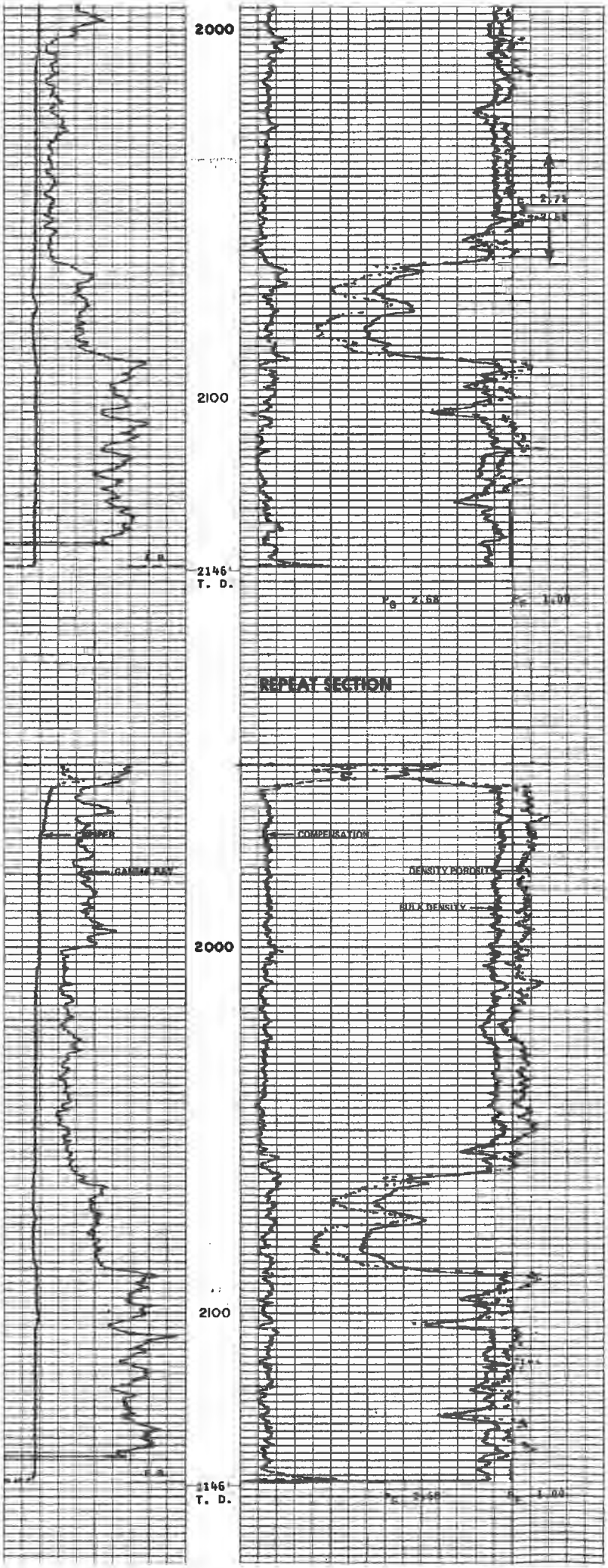

1100
1200
1300
1400

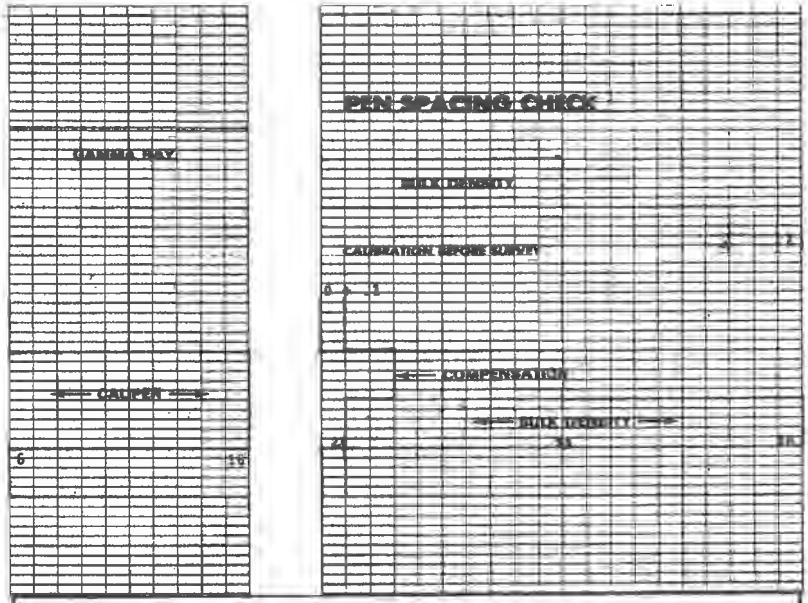

1500
1600
1700
1800




| | | |
|---|---|---|
| 6 — 16 HOLE SIZE - INCHES | | 0 — +.25 CORRECTION |
| CALIPER | | 10 20 10 0 -10 DENSITY POROSITY (%) |
| 0 — 200 | | 2.0 2.5 3.0 BULK DENSITY |
| GAMMA RAY API UNITS | DEPTHS | BULK DENSITY GRAMS/CC |




2000
2100
2146
T. D.
REPEAT SECTION
COMPENSATION
GAMMA RAY
DENSITY POROSITY
BULK DENSITY
2000
2100
2146
T. D.




Company PENZOIL COMPANY

Well P. A. TALLMAN NO. 61

Field

County ROANE State WEST VIRGINIA

GO FR 2146'
GO TD 2147'
DRLR TD 2157'
Elev:
KB 1063'
DF 1063'
GL 1058'

3604

# NL McC

## GAMMA RAY

| FILING NO. | |
|---|---|
| PERMIT # 47-087-3604 | COMPANY PENNZOIL |
| | WELL P. A. TA |
| | FIELD TARIFF |
| | COUNTY ROANE |
| | LOCATION |
| | DISTRICT: SMITHF |
| | WATERSHED: SYCAM |
| | TARIFF QUAD 7.5 |
| | SEC. TWP. |

| | |
|---|---|
| PERMANENT DATUM | GROUND LEVEL ELEV. |
| LOG MEASURED FROM | 6' ABOVE GROUND |
| DRILLING MEASURED FROM | K.B. |
| DATE | 11-4-82 |
| RUN NO. | ONE |
| TYPE LOG | GAMMA RAY |
| DEPTH—DRILLER | 2157' |
| DEPTH—LOGGER | 2119' |
| BOTTOM LOGGED INTERVAL | 2116' |
| TOP LOGGED INTERVAL | 1800' |
| TYPE FLUID IN HOLE | DRY |
| SALINITY PPM CL. | - |
| DENSITY LB./GAL. | - |
| LEVEL | - |
| MAX. REC. TEMP. DEG. F. | - |
| OPR. RIG TIME | 1 HOUR |
| RECORDED BY | SMITH |
| WITNESSED BY | MR. GREENLE |
| DISTRICT: | CHARLESTON |

| RUN | BORE HOLE RECORD | | | |
|---|---|---|---|---|
| NO. | BIT | FROM | TO | SIZE |
| ONE | | | | 8 5 |
| | | | | 4½" |
| | | | | |
| | | | | |
| | | | | |

illough
-OG

COMPANY
MAN #61

STATE WV

D
FORK

RGE.
'

OTHER SERVICES:
PERF.

ELEVATIONS:
KB 1063'
DF 1062'
GL 1058'

CASING RECORD

| WGT. | FROM | TO |
|---|---|---|
| " | SURF. | 331' |
| | SURF. | T.D. |

FOLD HERE

THIS HEADING AND LOG CONFORMS TO API RECOMMENDED STANDARD PRACTICE RP-33 (API)

## EQUIPMENT DATA

| GAMMA RAY | | | |
|---|---|---|---|
| RUN NO. | ONE | | |
| TOOL MODEL NO. | 5548-0-2 | | |
| DIAM. | 3.5" | | |
| DETECT. MODEL NO. | 5548-25 | | |
| TYPE | SCINT. | | |
| LENGTH | 3" | | |
| DIST. TO N. SOURCE | | | |
| | | | |
| **GENERAL** | | | |
| HOIST TRUCK NO. | 1353 | | |
| INST. TRUCK NO. | 1353 | | |
| TOOL SERIAL NO. | | | |
| LOG TICKET NO. | 203334 | | |

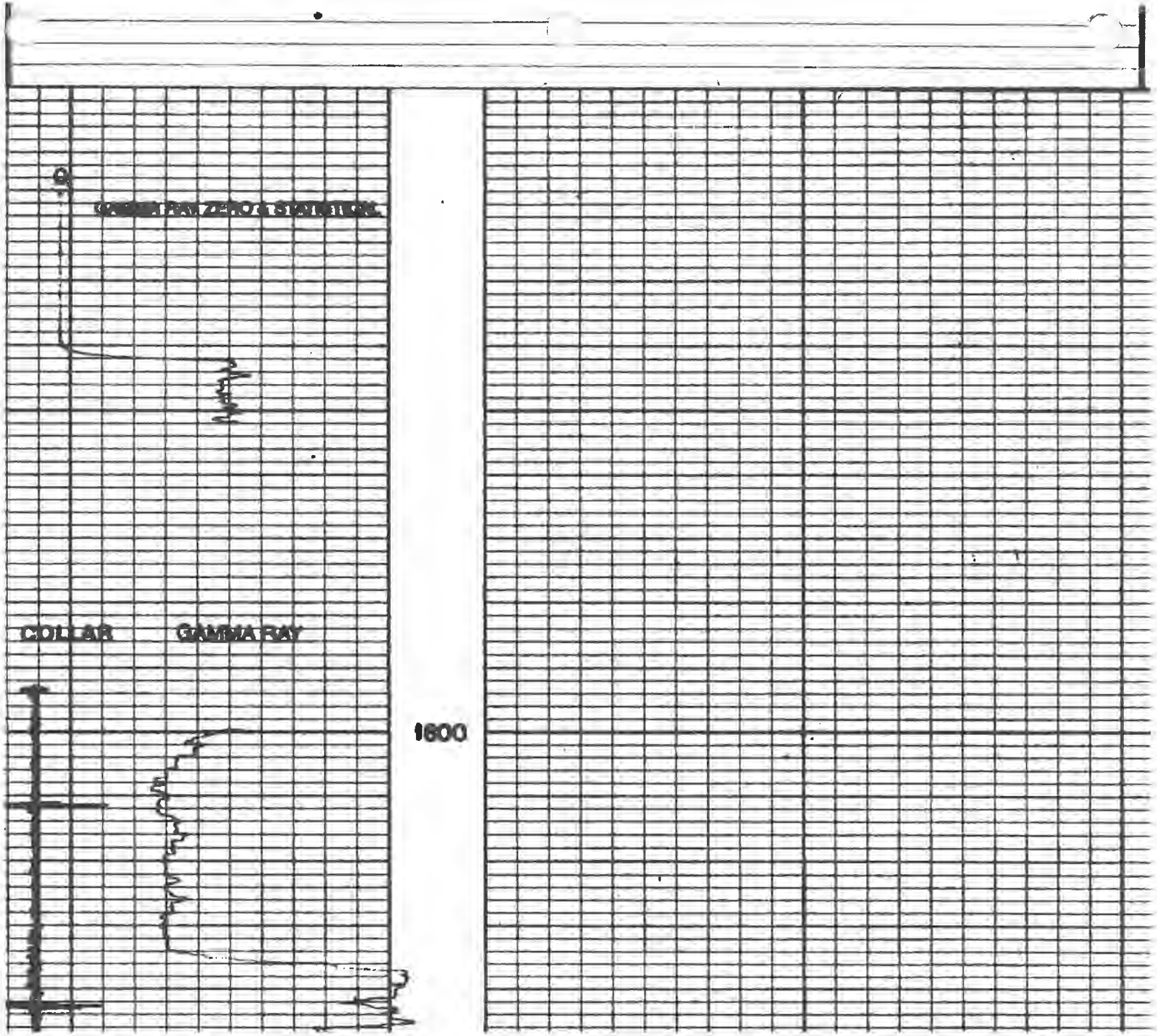
| NEUTRON | | | |
|---|---|---|---|
| RUN NO. | | | |
| LOG TYPE | | | |
| TOOL MODEL NO. | | | |
| DIAM. | | | |
| DETECT. MODEL NO. | | | |
| TYPE | | | |
| LENGTH | | | |
| SOURCE MODEL NO. | | | |
| SERIAL NO. | | | |
| SPACING | | | |
| TYPE | | | |
| STRENGTH | | | |

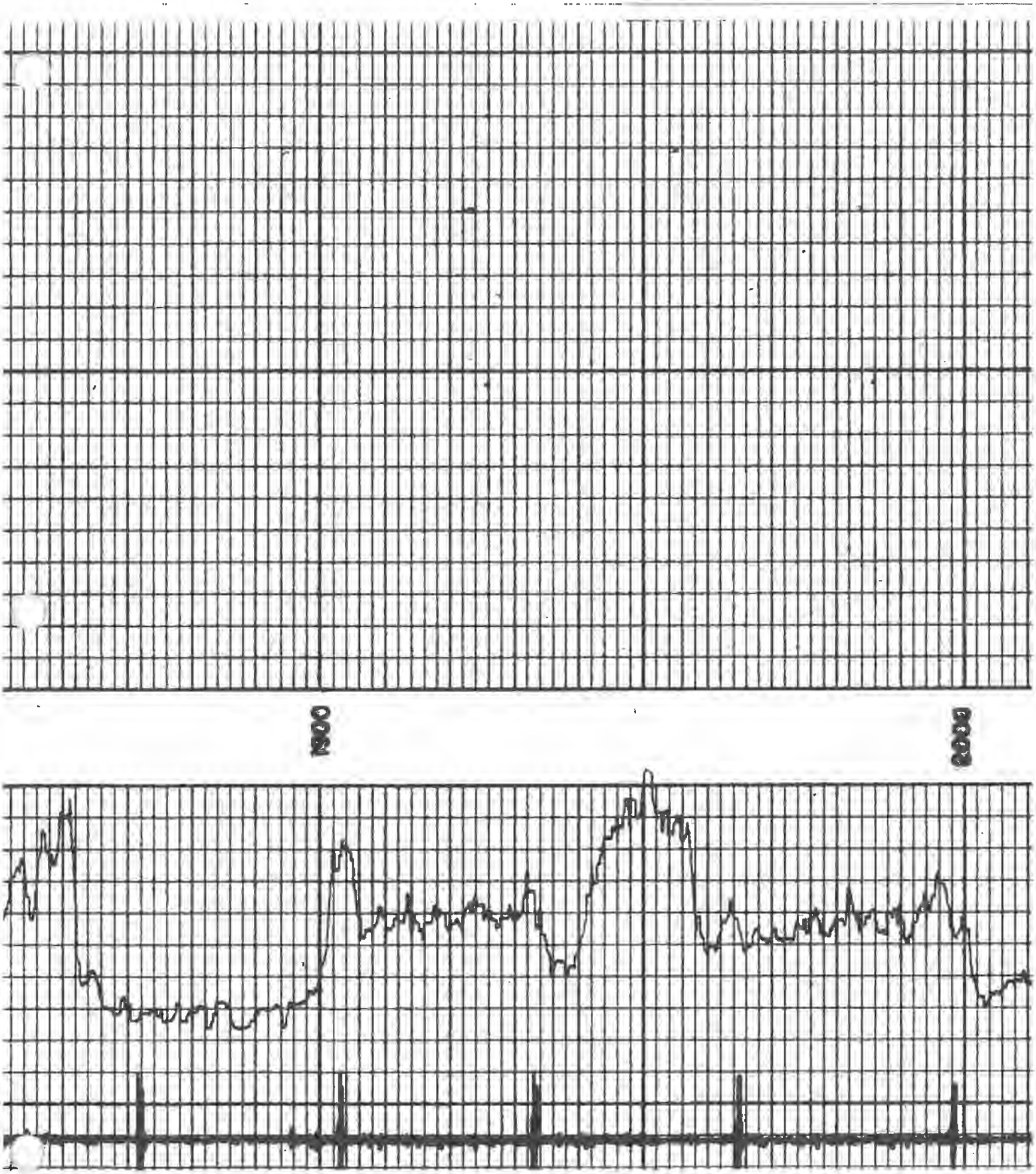
## LOGGING DATA

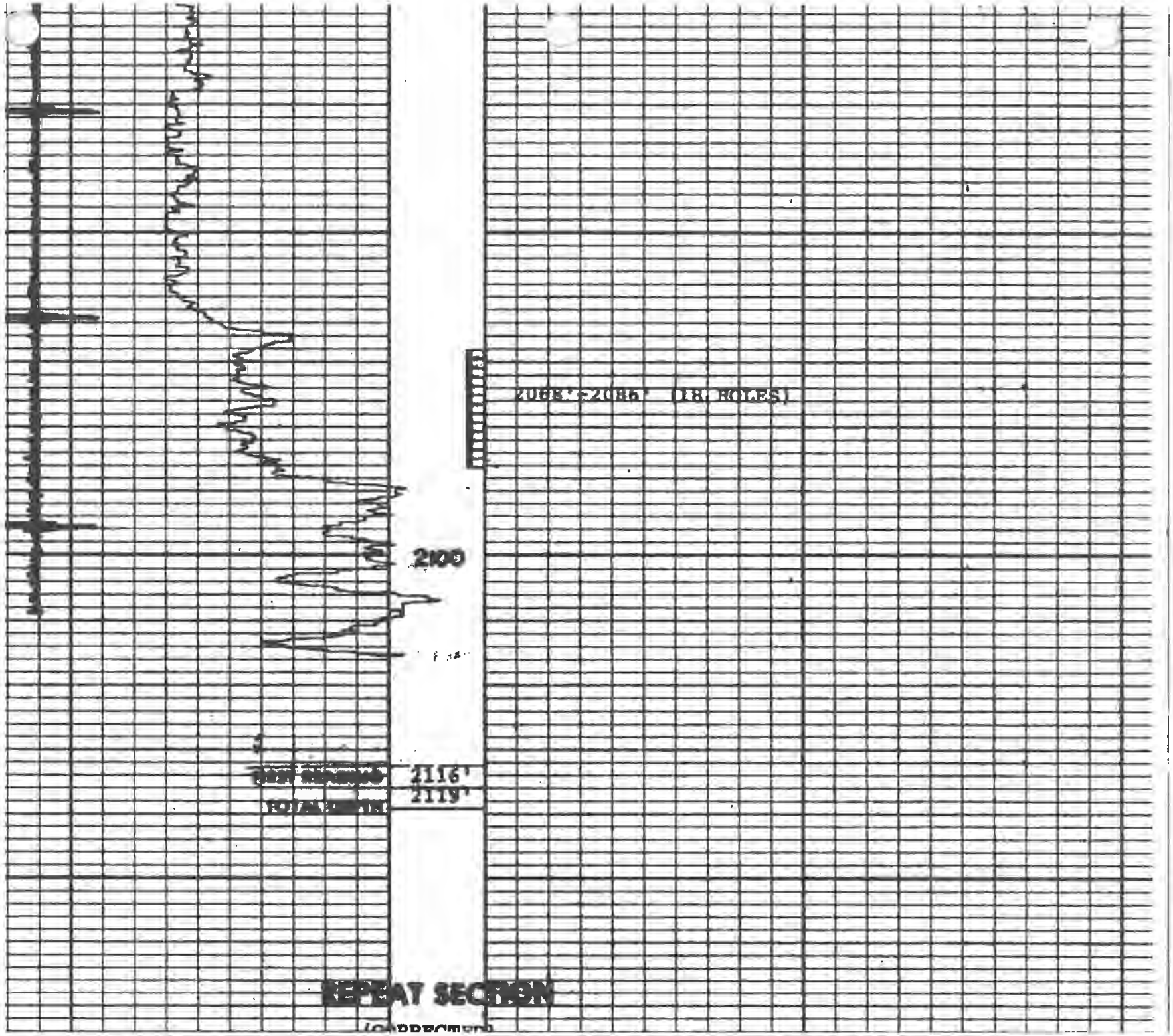
| GENERAL | | | | GAMMA RAY | | | | NEUTRON | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| RUN NO. | DEPTHS FROM | DEPTHS TO | SPEED FT./MIN. | T. C. SEC. | SENS. SETTINGS | ZERO DIV. L. OR R. | API GR. UNITS PER LOG DIV. | T. C. SEC. | SENS. SETTINGS | ZERO DIV. L. OR R. | API N. UNITS PER LOG DIV. |
| ONE | 2116' | 1800' | 28' | 2 | R-5 | | | | | | |
| | | | | | D-400 | | | | | | |
| | | | | | G-500 | | | | | | |

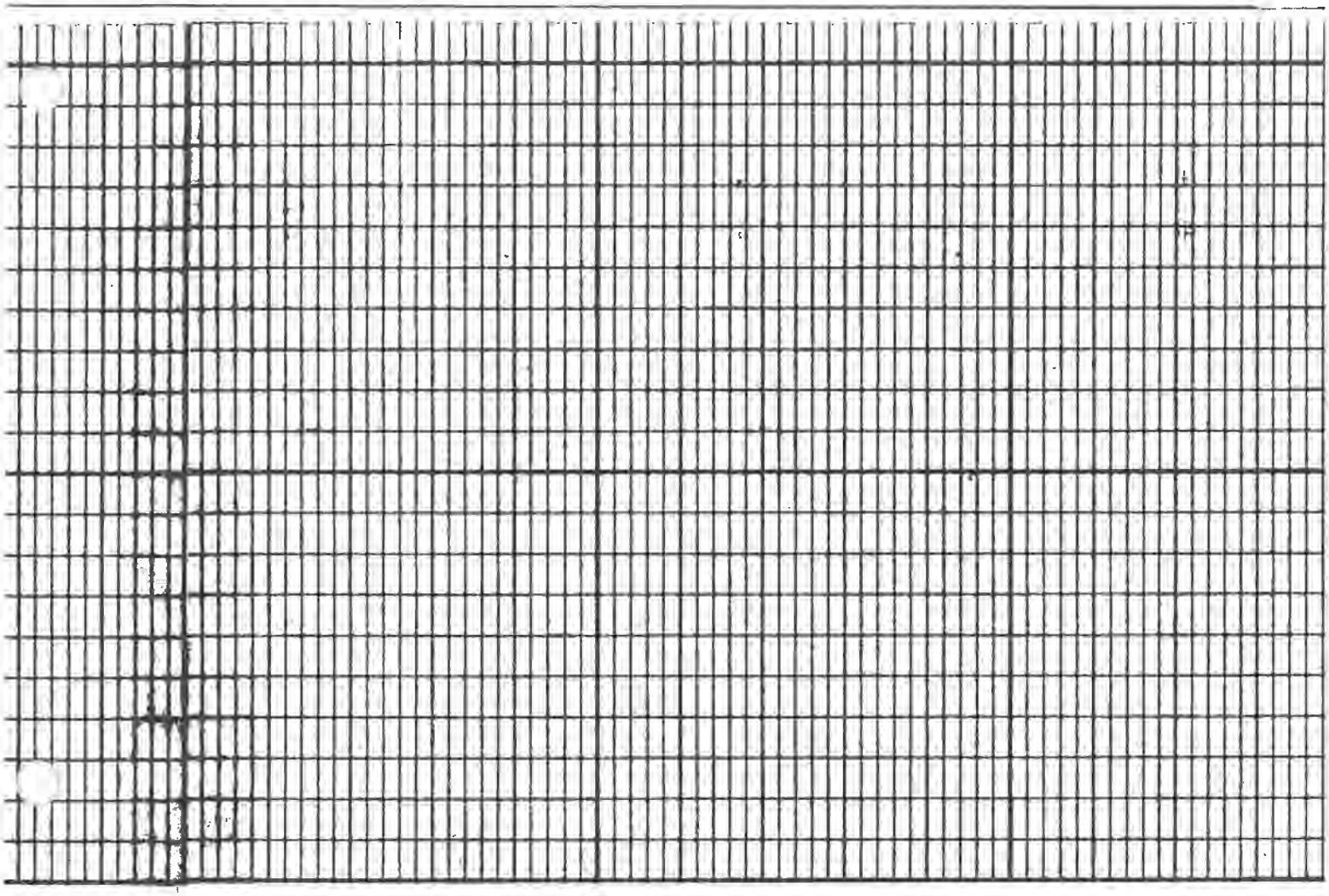
REFERENCE LITERATURE:

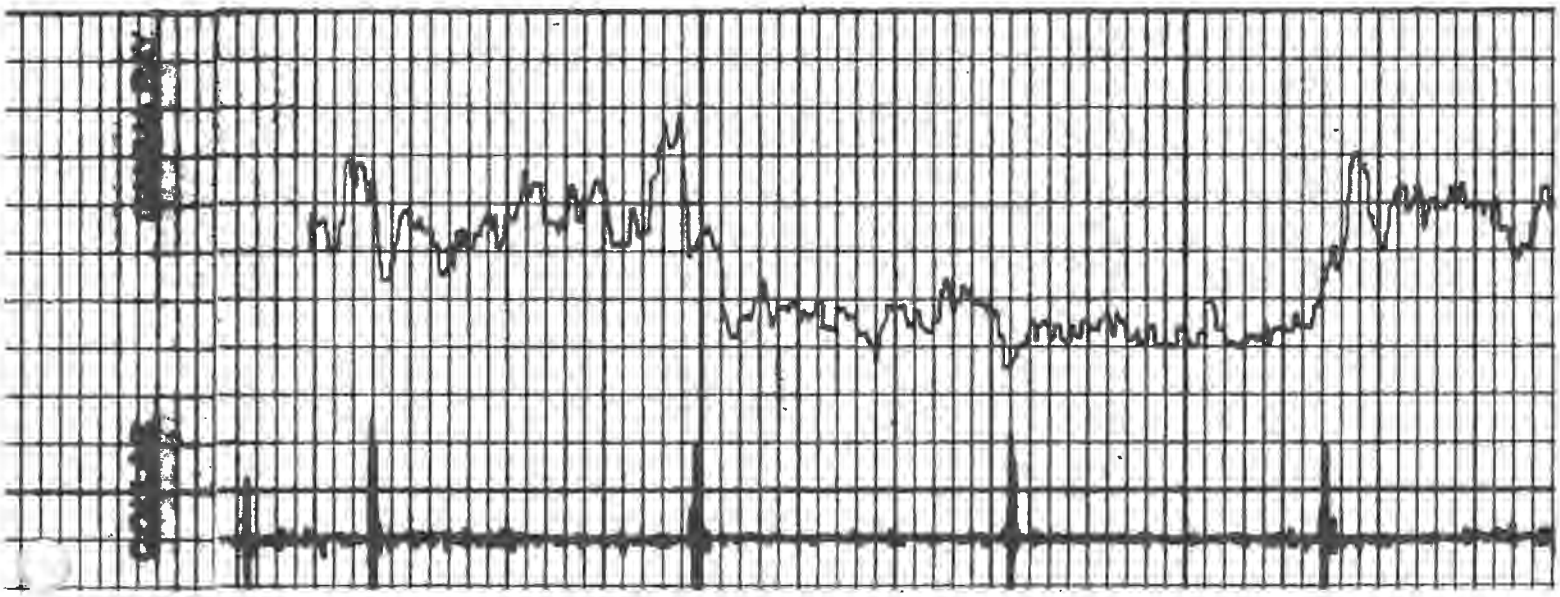
REMARKS: 3 1/8" OMEGA JETS - 18 HOLES - 2068'-2086'

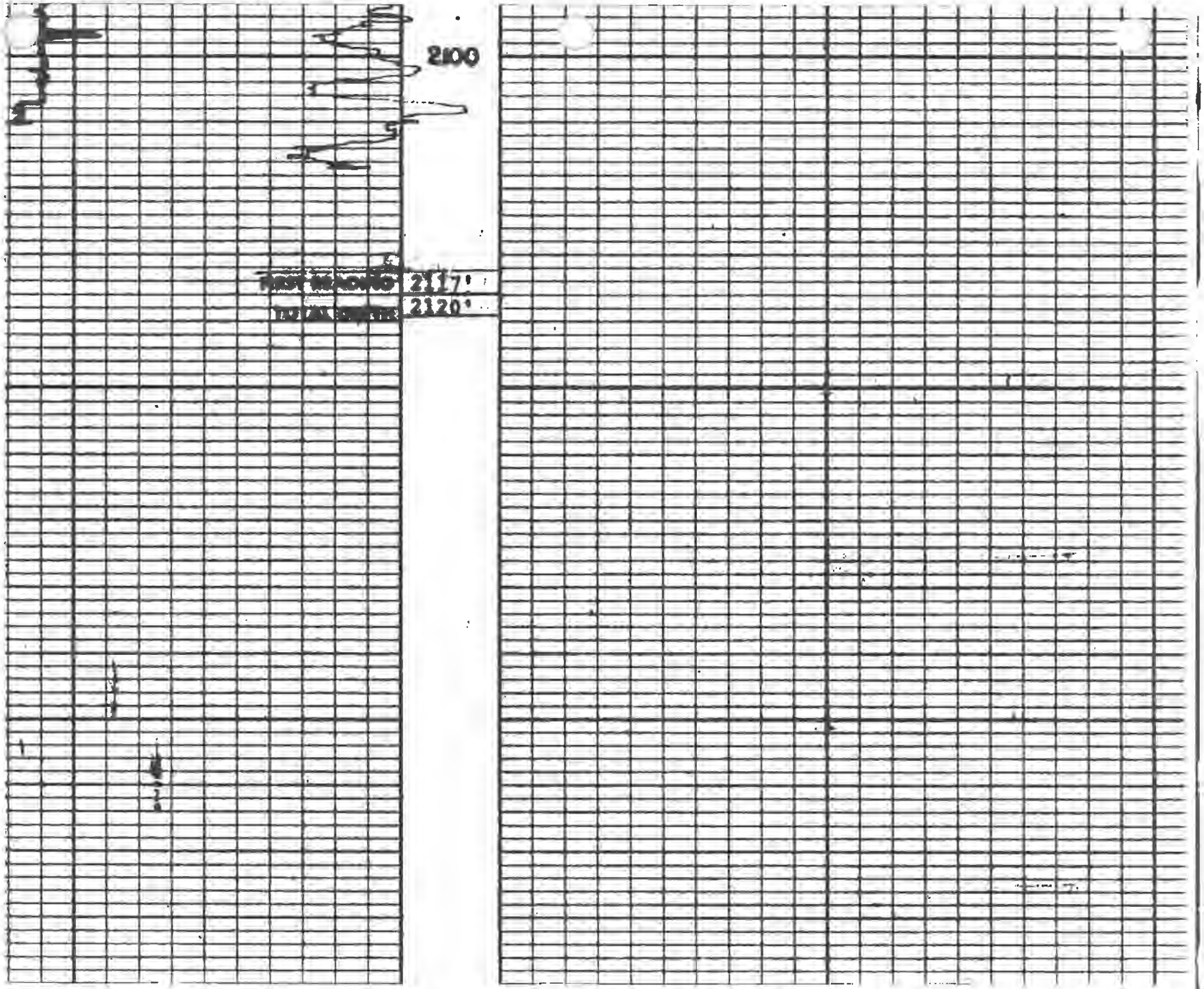

COLLAR
GAMMA RAY
1600


1500
2000


2068'-2086' (18 HOLES)
2100
2116'
2119'
REPEAT SECTION






2100
2117'
2120'

"Pipeline"

Select County: (087) Roane
Enter Permit #: 3605
Get Data | Reset

Select datatypes: (Check All)
Location, Production, Plugging, Owner/Completion, Stratigraphy, Sample, Pay/Show/Water, Logs, Btm Hole Loc

Table Descriptions
County Code Translations
Permit-Numbering Series
Usage Notes
Contact Information
Disclaimer
WVGES Main
"Pipeline-Plus" New

WV Geological & Economic Survey:

**Well: County = 87 Permit = 3605**

Report Time: Thursday, April 30, 2020 9:08:25 PM

Location Information: View Map

| API | COUNTY | PERMIT | TAX_DISTRICT | QUAD_75 | QUAD_15 | LAT_DD | LON_DD | UTME | UTMN |
|---|---|---|---|---|---|---|---|---|---|
| 4708703605 | Roane | 3605 | Spencer | Tariff | Otter | 38.643374 | -81.216216 | 481183.9 | 4277224.8 |

There is no Bottom Hole Location data for this well

Owner Information:

| API | CMP_DT | SUFFIX | STATUS | SURFACE_OWNER | WELL_NUM | CO_NUM | LEASE | LEASE_NUM | MINERAL_OWN | OPERATOR_AT_COMPLETION | PROP_VD | PROP_TRGT_FM | TFM_EST_PR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708703605 | 10/-/1982 | Original Loc | Completed | H Truman/P Tallman | 62 | | | | | Pennzoil Company | | | |

Completion Information:

| API | CMP_DT | SPUD_DT | ELEV | DATUM | FIELD | DEEPEST_FM | DEEPEST_FMT | INITIAL_CLASS | FINAL_CLASS | TYPE | RIG | CMP_MTHD | TVD | TMD | NEW_FTG | KOD | G_BEF | G_AFT | O_BEF | O_AFT | NGL_BEF | NGL_AFT | P_BEF | TI_BEF | P_AFT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708703605 | 10/-/1982 | -/-/- | 1155 | Ground Level | Tariff Timn | Big Injun (Price&eq) | Big Injun (Price&eq) | Service Well | Unsuccessful | Water Injection | Rotary | Acid+Frac | 2205 | | 2205 | | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 |

Pay/Show/Water Information:

| API | CMP_DT | ACTIVITY | PRODUCT | SECTION | DEPTH_TOP | FM_TOP | DEPTH_BOT | FM_BOT | G_BEF | G_AFT | O_BEF | O_AFT | WATER_QNTY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708703605 | 10/-/1982 | Horizon | Injection | Vertical | | | 2184 | Big Injun (Price&eq) | 0 | 0 | | | |

Production Gas Information: (Volumes in Mcf) * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_GAS | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708703605 | Pennzoil Company | 1984 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703605 | Pennzoil Products Company | 1989 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703605 | Pennzoil Products Company | 1990 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703605 | Pennzoil Products Company | 1991 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703605 | Pennzoil Products Company | 1992 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703605 | Pennzoil Products Company | 1993 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703605 | Pennzoil Products Company | 1994 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703605 | Pennzoil Products Company | 1995 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703605 | Triad Resources, Inc. | 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703605 | Ground Resources, LLC | 2017 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703605 | Ground Resources LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Production Oil Information: (Volumes in Bbl) ** some operators may have reported NGL under Oil * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_OIL | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708703605 | Pennzoil Company | 1984 | 1,030 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703605 | Pennzoil Products Company | 1989 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703605 | Pennzoil Products Company | 1990 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703605 | Pennzoil Products Company | 1991 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703605 | Pennzoil Products Company | 1992 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703605 | Pennzoil Products Company | 1993 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703605 | Pennzoil Products Company | 1994 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703605 | Pennzoil Products Company | 1995 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703605 | Triad Resources, Inc. | 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703605 | Ground Resources, LLC | 2017 | 0 | | | | | | | | | | | | |
| 4708703605 | Ground Resources LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Production NGL Information: (Volumes in Bbl) ** some operators may have reported NGL under Oil * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_NGL | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708703605 | Ground Resources LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Production Water Information: (Volumes in Gallons) * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_WTR | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708703605 | Ground Resources LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Stratigraphy Information:

| API | SUFFIX | FM | FM_QUALITY | DEPTH_TOP | DEPTH_QUALITY | THICKNESS | THICKNESS_QUALITY | ELEV | DATUM |
|---|---|---|---|---|---|---|---|---|---|
| 4708703605 | Original Loc | 3rd Salt Sand | Well Record | 1822 | Reasonable | 74 | Reasonable | 1155 | Ground Level |
| 4708703605 | Original Loc | Little Lime | Well Record | 1996 | Reasonable | 27 | Reasonable | 1155 | Ground Level |
| 4708703605 | Original Loc | Blue Monday | Well Record | 2023 | Reasonable | 3 | Reasonable | 1155 | Ground Level |
| 4708703605 | Original Loc | Greenbrier Group | Well Record | 2048 | Reasonable | 106 | Reasonable | 1155 | Ground Level |

Wireline (E-Log) Information:

| API | LOG_TOP | LOG_BOT | DEEPEST_FML | LOGS_AVAIL | SCAN | DIGITIZED | GR_TOP | GR_BOT | D_TOP | D_BOT | N_TOP | N_BOT | I_TOP | I_BOT | T_TOP | T_BOT | S_TOP | S_BOT | O_TOP | O_BOT | INCH2 | INCH5 | REDUCED | KOP | LOGMD | ELEV_KB | ELEV_GL | ELEV_DF | LOG_I |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708703605 | 1900 | 2200 | | G* | Y | N | 1900 | 2200 | | | | | | | | | | | 1900 | 1998 | N | Y | N | | | | | | |

Comment: *logs: CCL, perforation depth

Downloadable Log Images: We advise you to save the log image file to your PC for viewing. To do so, right-click the .tif image of interest and select the save option. Then you can direct the file to a location of your choice. Please note these images vary in size and some may take several minutes to download, especially if using a 56k or slower dialup connection.

**Quick Reference Guide for Log File Names** For more info about WVGES scanned logs click here
**geologic log types:**
d density (includes bulk density, compensated density, density, density porosity, grain density, matrix density, etc.)

| FILENAME |
|---|
| 4708703605gpo.tif |

Injector 3605

INJECTOR 3605

e photoelectric adsorption (PE or Pe, etc.)
g gamma ray
i induction (includes dual induction, medium induction, deep induction, etc.)
l laterolog
m dipmeter
n neutron (includes neutron porosity, sidewall neutron--SWN, etc.)
o other[1]
s sonic or velocity
t temperature (includes borehole temperature, BHT, differential temperature, etc.)
z spontaneous potential or potential

**mechanical log types:**

b cement bond
c caliper
o other[1]
p perforation depth control or perforate

[1]other logs may include, but are not limited to, such curves as audio, bit size, CCL--casing collar locator, continuous meter, directional survey, gas detector, guard, NCTL--Nuclear Cement Top Locator, radioactive tracer, tension

There is no Plugging data for this well

There is no Sample data for this well

(4/25)

3605

# APPENDIX A
## Injection Well Form

1) GEOLOGIC TARGET FORMATION BIG INJUN

Depth 2154 Feet (top) 2188 Feet (bottom)

2) Estimated Depth of Completed Well, (or actual depth of existing well): 2238 Feet

3) Approximate water strata depths: Fresh N/A Feet Salt N/A Feet

4) Approximate coal seam depths:

5) Is coal being mined in the area? Yes ☐ No ☑

6) Virgin reservoir pressure in target formation 800 psig Source HISTORICAL/ESTIMATED

7) Estimated reservoir fracture pressure _____ psig (BHFP)

8) MAXIMUM PROPOSED INJECTION OPERATIONS:

Injection rate (bbl/hour) 25

Injection volume (bbl/day) 200

Injection pressure (psig) 1000

Bottom hole pressure (psig) 2000

9) DETAILED IDENTIFICATION OF MATERIALS TO BE INJECTED, INCLUDING ADDITIVES:

Fresh water and/or produced water from the area and possible bactericides necessary to maintain water quality to improve oil recovery. Not using bactericides at this time, but will submit a MSDS for approval for any used in the future. Additives include Scale inhibitor and THDS (Cleaner).

Temperature of injected fluid: (°F) AMBIENT

10) FILTERS (IF ANY)

ANTHRACITE COAL FILTERS

11) SPECIFICATIONS FOR CATHODIC PROTECTION AND OTHER CORROSION CONTROL

NONE

# APPENDIX A (cont.)

3605

12. Casing and Tubing Program

| TYPE | Size | New or Used | Grade | Weight per ft. (lb/ft) | FOOTAGE: For Drilling | INTERVALS: Left in Well | CEMENT: Fill-up (Cu. Ft.) |
|---|---|---|---|---|---|---|---|
| Conductor | | | | | | | |
| Fresh Water | 8 5/8" | | H-40 | 20# | 419' | 419' | |
| Coal | | | | | | | |
| Intermediate 1 | | | | | | | |
| Intermediate 2 | | | | | | | |
| Production | 4 1/2" | | K-55 | 9.5# | 2236' | 2236' | |
| Tubing | NONE | | | | | | |
| Liners | | | | | | | |

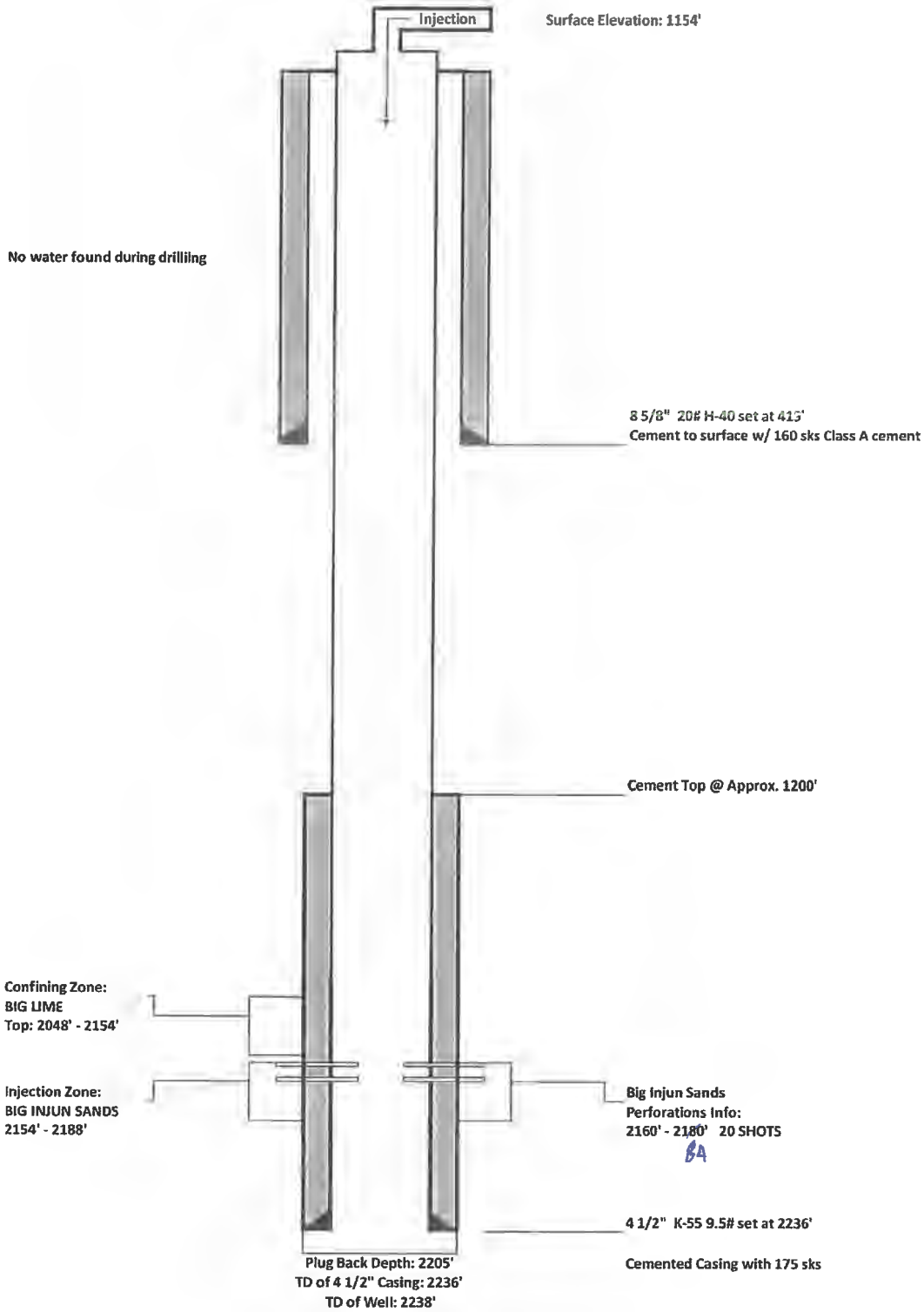
| TYPE | Wellbore Diameter | Casing Size | Wall Thickness | Burst Pressure | Cement Type | Cement Yield (cu. ft./sk) | Cement to Surface ? (Y or N) |
|---|---|---|---|---|---|---|---|
| Conductor | | | | | | | |
| Fresh Water | | | | | | | |
| Coal | | | | | | | |
| Intermediate 1 | | | | | | | |
| Intermediate 2 | | | | | | | |
| Production | | | | | | | |
| Tubing | | | | | | | |
| Liners | | | | | | | |

| PACKERS | Packer #1 | Packer #2 | Packer #3 | Packer #4 |
|---|---|---|---|---|
| Kind: | NONE | | | |
| Sizes: | | | | |
| Depths Set: | | | | |

3605

# WELL SCHEMATIC

**Tallman 62**
**API 47-087-03605**



INJECTOR 3605

OG-10
Rev. - 9-71

RECEIVED
MAR 07 1983
OIL AND GAS DIVISION
WV DEPARTMENT OF MINES

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES
Oil and Gas Division

# WELL RECORD

Rotary X Oil X
Cable ____ Gas ____
Recycling ____ Comb. ____
Water Flood X Storage ____
Disposal ____ ____ (Kind)

Quadrangle: Tariff 7.5'

Permit No. 087-3605-Li

Company Pennzoil Company
Address P. O. Box 1588, Parkersburg, WV 26101
Farm P. A. Tallman Acres 2350
Location (waters) Trace Fork
Well No. 62 Elev. 1154.56
District Smithfield County Roane
The surface of tract is owned in fee by
Harry S. Truman
Address Lefthand, WV 25251
Mineral rights are owned by Anna Lee Collins
Address 1009 Main St. Pt. Pleasant, WV
Drilling Commenced 10-12-82
Drilling Completed 10-16-82
Initial open flow WIW cu. ft. ____ bbls.
Final production ____ cu. ft. per day ____ bbls.
Well open ____ hrs. before test ____ RP.

| Casing and Tubing | Used in Drilling | Left in Well | Cement fill up Cu. ft. (Sks.) |
|---|---|---|---|
| Size 20-16 Cond. | | | |
| 13-10" | | | |
| 9 5/8 | | | |
| 8 5/8 | 419 | 419 | 160 sks |
| 7 | | | |
| 5 1/2 | | | |
| 4 1/2 | 2236 | 2236 | 175 sks |
| 3 | | | |
| 2 | | | |
| Liners Used | | | |

Attach copy of cementing record.

Well treatment details:
Water Injection Well

Fractured: 11-19-82 w/250 gls. 15% HCL, 145 Bbls. 20# Gel, 1500# 20/40 sd

Perf: 2160-2166; 2170-2184

Coal was encountered at ____ Feet ____ Inches
Fresh water ____ Feet ____ Salt Water ____ Feet ____
Producing Sand Big Injun Depth ____

| Formation | Color | Hard or Soft | Top Feet | Bottom Feet | Oil, Gas or Water | Remarks |
|---|---|---|---|---|---|---|
| Sand | | | 0 | 416 | | |
| Silt & Shale | | | 416 | 530 | | |
| Sand | | | 530 | 550 | | |
| Silt & Shale | | | 550 | 696 | | |
| Shale & Sand | | | 696 | 1822 | | |
| Salt Sand | | | 1822 | 1996 | | |
| Little Lime | | | 1996 | 2023 | | |
| Blue Monday | | | 2023 | 2026 | | |
| Pencil Cave | | | 2026 | 2048 | | |
| Big Lime | | | 2048 | 2154 | | |
| Big Injun | | | 2154 | 2188 | | |
| Pocono Shale | | | 2188 | 2238 | | |
| Total Depth | | | | 2238 | | |
| PBD | | | | 2205 | | |

ROANE 3605-Li

INJECTOR 3605

FORM IV-37
(Obverse)
01-83

Date: Mar 8, 19 83
Operator's Well No. P. A. Tallman 62
API Well No. 47 - 087 - 3605
State County Perm

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES, OIL AND GAS DIVISION

PRE-OPERATION CERTIFICATE
FOR LIQUID INJECTION OR WASTE DISPOSAL WELL

WELL OPERATOR Pennzoil Company DESIGNATED AGENT James A. Crews
Address P.O. Box 1588 Address P.O. Box 1588
Parkersburg, WV 26101 Parkersburg, WV 26101

GEOLOGICAL TARGET FORMATION Big Injun Depth 2140 feet (top) to 2174 feet (Bottom)

Virgin reservoir pressure in target formation 80 psig

Source of information on virgin reservoir pressure Estimated

Perforation intervals 2160-2166 2170-2184 Open-hole intervals 6 14

MAXIMUM PROPOSED INJECTION OPERATIONS

Volume per hour: 6.25 BPH Bottom hole pressure: 1800 psig

DETAILED IDENTIFICATION OF MATERIALS TO BE INJECTED

Liquids to be injected for oil recovery under Code § 22-4-10a: Fresh Water

Wastes to be disposed of: Produced water from waterflood operations to be reinjected

Additives (slurry mediums, inhibitors, solvents, oxidizers, deoxidizers, etc.): Bactericides

Specific Gravity:

SPECIFICATIONS FOR CATHODIC PROTECTION AND OTHER CORROSION CONTROL

FILTERS (IF ANY) Anthracite coal filters

ADDITIONAL DRILLING AS PART OF THE CONVERSION

(Complete and submit Form IV-35, "Well Operator's Report of Drilling, Fracturing and/or Stimulating or Physical Change".)

DETAILS ON NEW CASING AND TUBING PROGRAM AS PART OF THE CONVERSION:

(To be completed below unless the new casing and tubing program is described on a Form IV-35, "Well Operator's Report of Drilling, Fracturing and/or Stimulating or Physical Change", submitted in connection with the permit to which this Form IV-37 preoperation certificate relates.)

| ING OR ING TYPE | SPECIFICATIONS Size | Grade | Weight per ft. | New | Used | FOOTAGE INTERVALS For drilling | Left in well | CEMENT FILL-UP OR SACKS (Cubic feet) | PACKERS |
|---|---|---|---|---|---|---|---|---|---|
| ductor | | | | | | | | | Kinds |
| sh water | 8-5/8 | H40 | 20 | X | | 393 | 393 | Cement to surfac | |
| l | | | | " | | | | | Sizes |
| ermediate | | | | | | | | | |
| luction | 4-1/2 | J55 | 9.5 | X | | 2233 | 2233 | Thru Salt Sand | Depths set |
| ing | | | | | | | | | |
| ers | | | | | | | | | Perforations: |
| | | | | | | | | | |
| | | | | | | | | | |

(continue on reverse side)

FORM IV-37
(Reverse)
01-83

INJECTOR 3605

MECHANICAL INTEGRITY TEST

Test method: Pump plug down -- Pressured up to 2000 psi for 20 minutes. No bleed off. Casing held pressure. Released well.

The undersigned certifies that the test was performed on Oct. 16, 1982 and demonstrated the mechanical integrity of the well. The test was witnessed by N/A representing the Office of Oil and Gas.

Well Operator Date

THIS WELL IS AUTHORIZED FOR INJECTION.

Signed Administrator, Office of Oil and Gas

Date

[NOTE: That the mechanical integrity of this well must be demonstrated again within ninety (90) days of five years from this date in order for injection to continue. Please notify the state inspector 24 hours in advance of the test].

FACILITIES OR SYSTEMS TO PROTECT THE INTEGRITY OF THE GEOLOGICAL TARGET FORMATION FRACTURING THE CONFINING STRATA

APPLICATION FOR VARIANCE (IF ANY) FROM REGULATION 9.01 (a)
[Specify purpose, necessity, and justification]

Pennzoil Company
Well Operator
By: Curtis A. Lewis
Its Supervisor, Surveying & Mapping

3605 Perforating Collar Log

ROA 3605

# GEARHART — PERFORATING COLLAR LOG

ROA 3605

COMPANY:
WELL:
FIELD:
COUNTY: STATE:
LOCATION:
DATE: S. O. NO.

TOTAL DEPTH (CUST.) ZERO POINT
TOTAL DEPTH (GO) LOG CHECKED
PERM. DATUM

TYPE CASING SIZE WEIGHT
TYPE GUN SIZE LENGTH
WELL FLUID LEVEL

DEPTH REFERENCE—BENCH MARKS

TUBING SIZE N/A RESTRICTIONS (MIN. I.D.) 4
GAS LIFT VALVE MANDRELS N.A.
NO. 1 LANDING NIPPLE N.A. TOP OF PACKER
BOTTOM OF TUBING TOP OF LINER

| COLLARS ON RECORD | COLLARS LOCATED | RESET TO |
|---|---|---|
| 2066 | — | — |
| 2166 | — | — |
| 2192 | — | — |

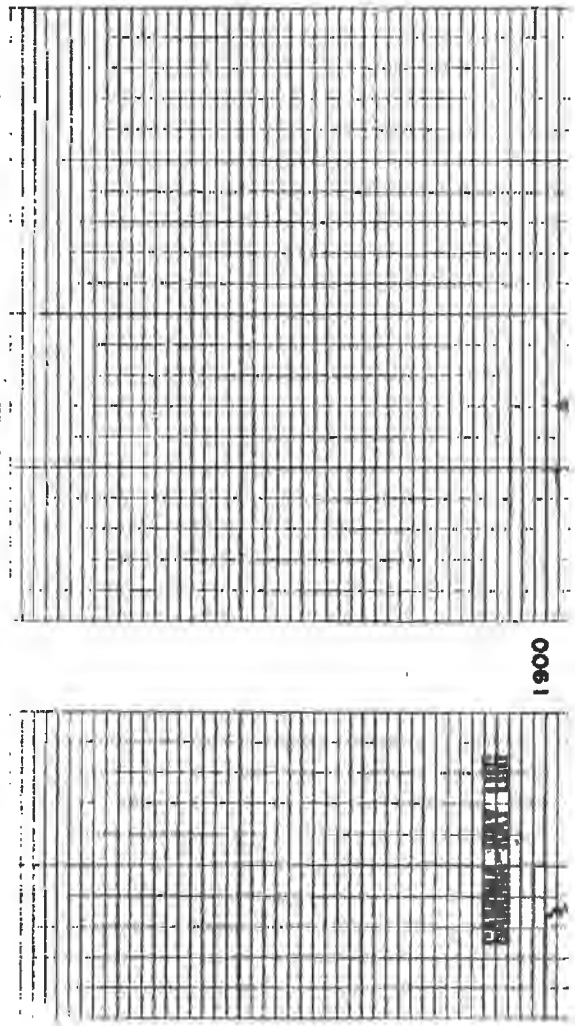
PERFORATED ZONES

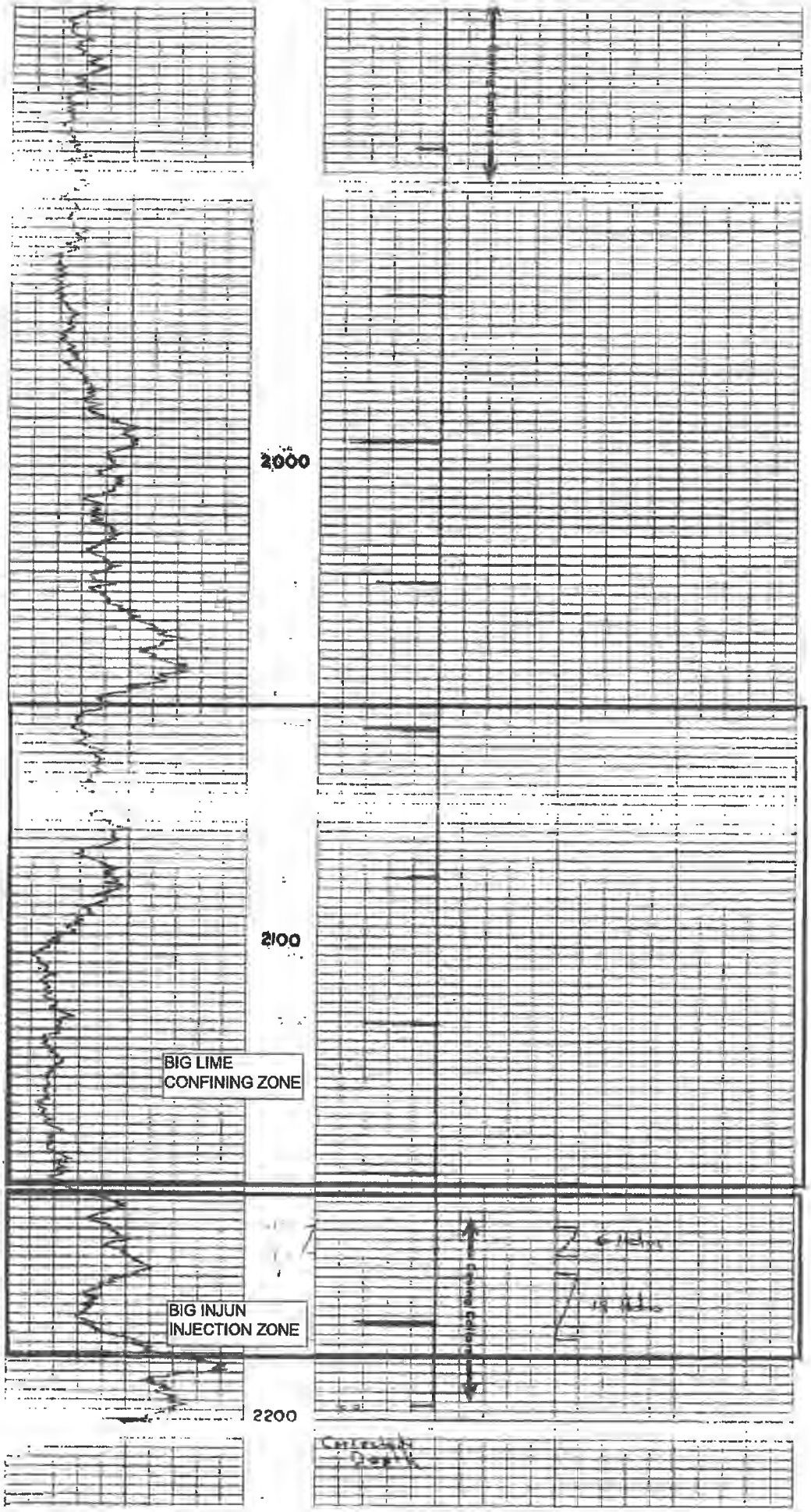
| DEPTH | | SHOTS |
|---|---|---|
| FROM 2152 | TO 2165 | 6 |
| FROM [illegible] | TO 2182 | 14 |
| FROM | TO | |
| FROM | TO | |
| FROM | TO | |
| FROM | TO | |
| FROM | TO | |
| FROM | TO | |
| FROM | TO | |

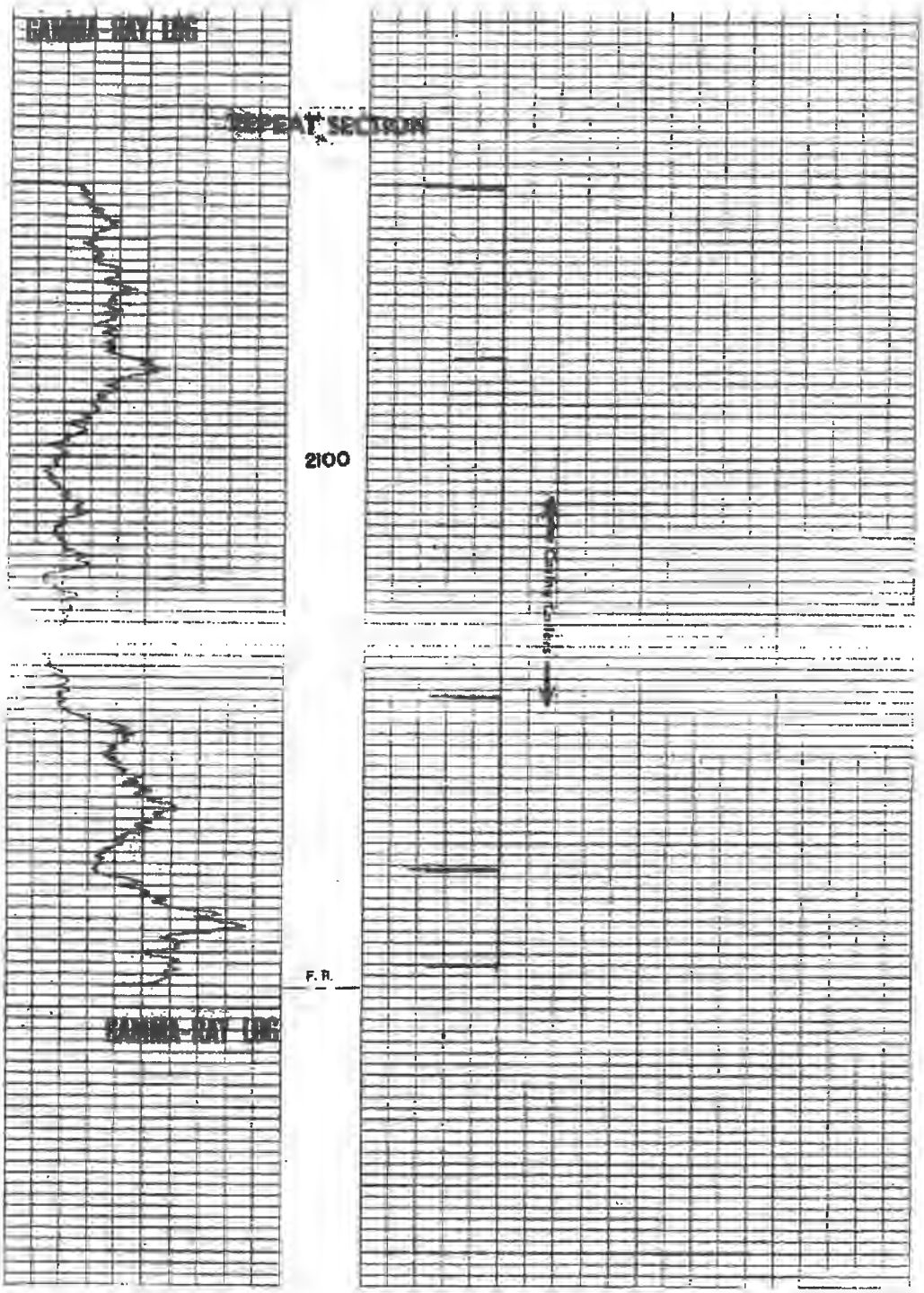
FIELD PRINT

REMARKS OR OTHER DATA

WITNESSED BY




2000
2100
BIG LIME
CONFINING ZONE
BIG INJUN
INJECTION ZONE
2200


GAMMA RAY LOG
REPEAT SECTION
2100
F.R.
GAMMA RAY LOG

"Pipeline"

Select County: (087) Roane
Enter Permit #: 3608
Get Data | Reset

Select datatypes: (Check All)
Location, Production, Plugging, Owner/Completion, Stratigraphy, Sample, Pay/Show/Water, Logs, Btm Hole Loc

Table Descriptions
County Code Translations
Permit-Numbering Series
Usage Notes
Contact Information
Disclaimer
WVGES Main
"Pipeline-Plus" New

WV Geological & Economic Survey:

## Well: County = 87 Permit = 3608

Report Time: Thursday, April 30, 2020 9:09:19 PM

### Location Information: View Map

| API | COUNTY | PERMIT | TAX_DISTRICT | QUAD_75 | QUAD_15 | LAT_DD | LON_DD | UTME | UTMN |
|---|---|---|---|---|---|---|---|---|---|
| 4708703608 | Roane | 3608 | Smithfield | Tariff | Otter | 38.64826 | -81.215729 | 481227.5 | 4277766.9 |

There is no Bottom Hole Location data for this well

### Owner Information:

| API | CMP_DT | SUFFIX | STATUS | SURFACE_OWNER | WELL_NUM | CO_NUM | LEASE | LEASE_NUM | MINERAL_OWN | OPERATOR_AT_COMPLETION | PROP_VD | PROP_TRGT_FM | TFM_EST_PR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708703608 | 10/-/1982 | Original Loc | Completed | O Young/P A Tallman | 85 | | | | | Pennzoil Company | | | |

### Completion Information:

| API | CMP_DT | SPUD_DT | ELEV | DATUM | FIELD | DEEPEST_FM | DEEPEST_FMT | INITIAL_CLASS | FINAL_CLASS | TYPE | RIG | CMP_MTHD | TVD | TMD | NEW_FTG | KOD | G_BEF | G_AFT | O_BEF | O_AFT | NGL_BEF | NGL_AFT | P_BEF | TI_BEF | P_AFT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708703608 | 10/-/1982 | -/-/- | 1083 | Ground Level | Tariff\Tlmn | Big Injun (Price&eq) | Big Injun (Price&eq) | Service Well | Unsuccessful | Water Injection | Rotary | Acid+Frac | 2201 | | 2201 | | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 |

### Pay/Show/Water Information:

| API | CMP_DT | ACTIVITY | PRODUCT | SECTION | DEPTH_TOP | FM_TOP | DEPTH_BOT | FM_BOT | G_BEF | G_AFT | O_BEF | O_AFT | WATER_QNTY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708703608 | 10/-/1982 | Horizon | Injection | Vertical | | | 2119 | Big Injun (Price&eq) | 0 | 0 | | | |

### Production Gas Information: (Volumes in Mcf) * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_GAS | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708703608 | Pennzoil Company | 1984 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703608 | Pennzoil Products Company | 1989 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703608 | Pennzoil Products Company | 1990 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703608 | Pennzoil Products Company | 1991 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703608 | Pennzoil Products Company | 1992 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703608 | Pennzoil Products Company | 1993 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703608 | Pennzoil Products Company | 1994 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703608 | Pennzoil Products Company | 1995 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703608 | Triad Resources, Inc. | 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703608 | Ground Resources, LLC | 2017 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703608 | Ground Resources, LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

### Production Oil Information: (Volumes in Bbl) ** some operators may have reported NGL under Oil * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_OIL | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708703608 | Pennzoil Company | 1984 | 1,030 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703608 | Pennzoil Products Company | 1989 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703608 | Pennzoil Products Company | 1990 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703608 | Pennzoil Products Company | 1991 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703608 | Pennzoil Products Company | 1992 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703608 | Pennzoil Products Company | 1993 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703608 | Pennzoil Products Company | 1994 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703608 | Pennzoil Products Company | 1995 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703608 | Triad Resources, Inc. | 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4708703608 | Ground Resources, LLC | 2017 | 0 | | | | | | | | | | | | |
| 4708703608 | Ground Resources, LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

### Production NGL Information: (Volumes in Bbl) ** some operators may have reported NGL under Oil * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_NGL | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708703608 | Ground Resources, LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

### Production Water Information: (Volumes in Gallons) * 2019 data for H6A wells only. Other wells are incomplete at this time.

| API | PRODUCING_OPERATOR | PRD_YEAR | ANN_WTR | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DCM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708703608 | Ground Resources, LLC | 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

### Stratigraphy Information:

| API | SUFFIX | FM | FM_QUALITY | DEPTH_TOP | DEPTH_QUALITY | THICKNESS | THICKNESS_QUALITY | ELEV | DATUM |
|---|---|---|---|---|---|---|---|---|---|
| 4708703608 | Original Loc | 1st Salt Sand | Well Record | 1577 | Reasonable | 119 | Reasonable | 1083 | Ground Level |
| 4708703608 | Original Loc | 2nd Salt Sand | Well Record | 1702 | Reasonable | 31 | Reasonable | 1083 | Ground Level |
| 4708703608 | Original Loc | 3rd Salt Sand | Well Record | 1790 | Reasonable | 136 | Reasonable | 1083 | Ground Level |
| 4708703608 | Original Loc | Little Lime | Well Record | 1926 | Reasonable | 32 | Reasonable | 1083 | Ground Level |
| 4708703608 | Original Loc | Blue Monday | Well Record | 1958 | Reasonable | 4 | Reasonable | 1083 | Ground Level |
| 4708703608 | Original Loc | Greenbrier Group | Well Record | 1980 | Reasonable | 106 | Reasonable | 1083 | Ground Level |
| 4708703608 | Original Loc | Big Lime | Well Record | 1980 | Reasonable | 106 | Reasonable | 1083 | Ground Level |
| 4708703608 | Original Loc | Big Lime | Well Record | 2048 | Reasonable | 106 | Reasonable | 1083 | Ground Level |
| 4708703608 | Original Loc | Big Injun (Price&eq) | Well Record | 2086 | Reasonable | 33 | Reasonable | 1083 | Ground Level |
| 4708703608 | Original Loc | Big Injun (Price&eq) | Well Record | 2154 | Reasonable | 34 | Reasonable | 1083 | Ground Level |

### Wireline (E-Log) Information:

| API | LOG_TOP | LOG_BOT | DEEPEST_FML | LOGS_AVAIL | SCAN | DIGITIZED | GR_TOP | GR_BOT | D_TOP | D_BOT | N_TOP | N_BOT | I_TOP | I_BOT | T_TOP | T_BOT | S_TOP | S_BOT | O_TOP | O_BOT | INCH2 | INCH5 | REDUCED | KOP | LOGMD | ELEV_KB | ELEV_GL | ELEV_DF | LOG_ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4708703608 | 320 | 2294 | | G N D I C * | Y | N | 320 | 2145 | 350 | 2130 | 350 | 2130 | 320 | 2194 | | | | | 320 | 2194 | Y | Y | N | | | | | | |

Comment: *logs: caliper, SP, PHIE, SW, Shale Index

Downloadable Log Images: We advise you to save the log image file to your PC for viewing. To do so, right-click the .tif image of interest and select the save

INJECTOR 3608

option. Then you can direct the file to a location of your choice. Please note these images vary in size and some may take several minutes to download, especially if using a 56k or slower dialup connection.

Injector 3608

| FILENAME |
| --- |
| 4708703608gdinczo.tif |
| 4708703608gicz.tif |

**Quick Reference Guide for Log File Names** For more info about WVGES scanned logs click here

**geologic log types:**

- d density (includes bulk density, compensated density, density, density porosity, grain density, matrix density, etc.)
- e photoelectric adsorption (PE or Pe, etc.)
- g gamma ray
- i induction (includes dual induction, medium induction, deep induction, etc.)
- l laterolog
- m dipmeter
- n neutron (includes neutron porosity, sidewall neutron--SWN, etc.)
- o other[1]
- s sonic or velocity
- t temperature (includes borehole temperature, BHT, differential temperature, etc.)
- z spontaneous potential or potential

**mechanical log types:**

- b cement bond
- c caliper
- o other[1]
- p perforation depth control or perforate

[1]other logs may include, but are not limited to, such curves as audio, bit size, CCL--casing collar locator, continuous meter, directional survey, gas detector, guard, NCTL--Nuclear Cement Top Locator, radioactive tracer, tension

There is no Plugging data for this well

There is no Sample data for this well

(4/25)

3608

# APPENDIX A
## Injection Well Form

1) GEOLOGIC TARGET FORMATION BIG INJUN

Depth 2086 Feet (top) 2119 Feet (bottom)

2) Estimated Depth of Completed Well, (or actual depth of existing well): 2201 Feet

3) Approximate water strata depths: Fresh N/A Feet Salt N/A Feet

4) Approximate coal seam depths:

5) Is coal being mined in the area? Yes ☐ No ☑

6) Virgin reservoir pressure in target formation 800 psig Source HISTORICAL/ESTIMATED

7) Estimated reservoir fracture pressure psig (BHFP)

8) MAXIMUM PROPOSED INJECTION OPERATIONS:

Injection rate (bbl/hour) 25

Injection volume (bbl/day) 200

Injection pressure (psig) 1000

Bottom hole pressure (psig) 2000

9) DETAILED IDENTIFICATION OF MATERIALS TO BE INJECTED, INCLUDING ADDITIVES:

Fresh water and/or produced water from the area and possible bactericides necessary to maintain water quality to improve oil recovery. Not using bactericides at this time, but will submit a MSDS for approval for any used in the future. Additives include Scale inhibitor and THDS (Cleaner).

Temperature of injected fluid: (°F) AMBIENT

10) FILTERS (IF ANY)

ANTHRACITE COAL FILTERS

11) SPECIFICATIONS FOR CATHODIC PROTECTION AND OTHER CORROSION CONTROL

NONE

# APPENDIX A (cont.)

3608

12. Casing and Tubing Program

| TYPE | Size | New or Used | Grade | Weight per ft. (lb/ft) | FOOTAGE: For Drilling | INTERVALS: Left in Well | CEMENT: Fill-up (Cu. Ft.) |
|---|---|---|---|---|---|---|---|
| Conductor | | | | | | | |
| Fresh Water | 8 5/8" | | H-40 | 20# | 344' | 344' | 130sks CTS |
| Coal | | | | | | | |
| Intermediate 1 | | | | | | | |
| Intermediate 2 | | | | | | | |
| Production | 4 1/2" | | K-55 | 9.5# | 2199' | 2199' | 190sks |
| Tubing | NONE | | | | | | |
| Liners | | | | | | | |

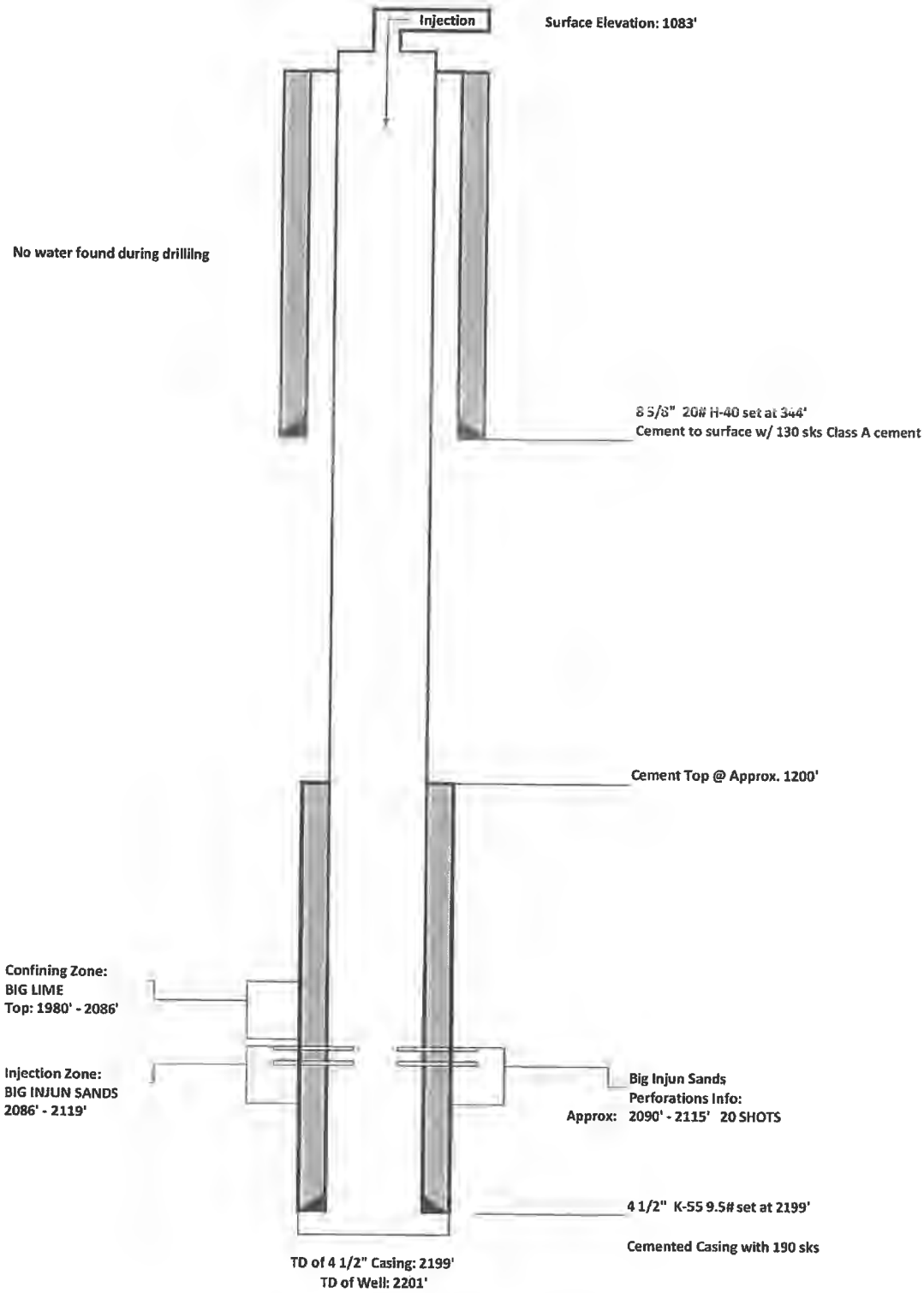
| TYPE | Wellbore Diameter | Casing Size | Wall Thickness | Burst Pressure | Cement Type | Cement Yield (cu. ft./sk) | Cement to Surface ? (Y or N) |
|---|---|---|---|---|---|---|---|
| Conductor | | | | | | | |
| Fresh Water | | | | | | | |
| Coal | | | | | | | |
| Intermediate 1 | | | | | | | |
| Intermediate 2 | | | | | | | |
| Production | | | | | | | |
| Tubing | | | | | | | |
| Liners | | | | | | | |

| PACKERS | Packer #1 | Packer #2 | Packer #3 | Packer #4 |
|---|---|---|---|---|
| Kind: | NONE | | | |
| Sizes: | | | | |
| Depths Set: | | | | |

3608

# WELL SCHEMATIC

**Tallman 65**
**API 47-087-03608**



OG-10
Rev. 9-71

RECEIVED
MAR 01 1983
OIL AND GAS DIVISION
WV DEPARTMENT OF MINES

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES
# Oil and Gas Division
# WELL RECORD

Rotary X Oil X
Cable ____ Gas ____
Recycling ____ Comb. ____
Water Flood X Storage ____
Disposal ____ (Kind)

Quadrangle Tariff 7.5'
Permit No. 087-3608-L1

Company Pennzoil Company
Address P. O. Box 1588, Parkersburg, WV 26101
Farm P. A. Tallman Acres 2350
Location (waters) Trace Fork
Well No. 65 Elev. 1082.98'
District Smithfield County Roane
The surface of tract is owned in fee by
Orville Young
Address Lonneyville, WV
Mineral rights are owned by Anna Lee Collins
Address 1009 Main St., Pt. Pleasant, WV
Drilling Commenced 10-7-82
Drilling Completed 10-12-82
Initial open flow WIW cu. ft. ____ bbls.
Final production ____ cu. ft. per day ____ bbls.
Well open ____ hrs. before test ____ RP.
Well treatment details:
Water Injection Well

| Casing and Tubing | Used in Drilling | Left in Well | Cement fill up Cu. ft. (Sks.) |
|---|---|---|---|
| Size 20-16 Cond. | | | |
| 13-10" | | | |
| 9 5/8 | | | |
| 8 5/8 | 344 | 344 | 130 sks |
| 7 | | | |
| 5 1/2 | | | |
| 4 1/2 | 2199 | 2199 | 190 sks |
| 3 | | | |
| 2 | | | |
| Liners Used | | | |

Attach copy of cementing record.

Fractured: 11-19-82 w/250-sks. 15% HCL, 145 BBls. 20# Gel, 1500# 20/40 sd.

Coal was encountered at ____ Feet ____ Inches
Fresh water ____ Feet ____ Salt Water ____ Feet ____
Producing Sand Big Injun Depth ____

| Formation | Color | Hard or Soft | Top Feet | Bottom Feet | Oil, Gas or Water | Remarks |
|---|---|---|---|---|---|---|
| Sand | | | 0 | 90 | | |
| Shale | | | 90 | 122 | | |
| Sand | | | 122 | 205 | | |
| Silt & Shale | | | 205 | 246 | | |
| Silt & Sand | | | 246 | 304 | | |
| Sand & Shale | | | 304 | 1577 | | |
| Salt Sand | | | 1577 | 1696 | | |
| Shale | | | 1696 | 1702 | | |
| Salt Sand | | | 1702 | 1733 | | |
| Silt & Sand | | | 1733 | 1764 | | |
| Sand | | | 1764 | 1776 | | |
| Silt & Shale | | | 1776 | 1790 | | |
| Salt Sand | | | 1790 | 1926 | | |
| Little Lime | | | 1926 | 1958 | | |
| Blue Monday | | | 1958 | 1962 | | |
| Pencil Cave | | | 1962 | 1980 | | |
| Big Lime | | | 1980 | 2086 | | |
| Big Injun | | | 2086 | 2119 | | |
| Pocono Shale | | | 2119 | 2201 | | |
| Total Depth | | | | 2201 | | |

ROANE 3608 L1

103-78

Operator's Well No. P.A. Tallman 65

API Well No. 47 - 087 - 3608-LI
State County Permit

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES, OIL AND GAS DIVISION

LIQUID INJECTION OR WASTE DISPOSAL WELL PERMIT APPLICATION

WELL TYPE: Liquid Injection X / Waste Disposal ___ /

LOCATION: Elevation: 1082.98' Watershed: Trace Fork

District: Smithfield County: Roane Quadrangle: Tariff 7.5'

GEOLOGICAL TARGET FORMATION: Big Injun Approximate depth 2157 feet

Virgin reservoir pressure in target formation 80 psig (surface measurement)

Source of information on virgin reservoir pressure Estimated

WELL OPERATOR Pennzoil Company
Address P.O.Box 1588
Parkersburg, WV 26101

DESIGNATED AGENT James A. Crews
Address P.O.Box 1588
Parkersburg, WV 26101

ROYALTY OWNER Anna Lee Collins
Address 1009 Main Street
Point Pleasant, WV
Acreage 2350

COAL OPERATOR NO COMMERCIAL COAL
Address

COAL OWNER(S) WITH DECLARATION ON RECORD:
Name
Address
Name
Address

SURFACE OWNER Orville Young
Address Looneyville, WV
Acreage

OIL & GAS INSPECTOR TO BE NOTIFIED
Name Richard Morris
Address Grantsville, WV

COAL LESSEE WITH DECLARATION ON RECORD:
Name
Address

RECEIVED
MAY - 6 1982
OIL AND GAS DIVISION
WV DEPARTMENT OF MINES

The undersigned well operator is entitled to operate for liquid injection or waste disposal purposes at the above location under a deed ___ / lease X / other contract ___ / dated May 21, 19 06, to the undersigned well operator from P. A. Tallman
(or a memorandum of said deed, lease, or other contract has been recorded:
Recorded on _____, 19___, in the office of the Clerk of the County Commission of Roane County, West Virginia, in Lease Book 12 at page 26. A permit is requested as follows:

PROPOSED WORK: Convert ___ / Drill X / Drill deeper ___ / Redrill ___ / Fracture or stimulate ___ /
Plug off old formation ___ / Perforate new formation ___ /
Other physical change in well (specify) _____

--planned as shown on the work order on the reverse side hereof.

Date of first liquid injection or waste disposal: _____, 19___

The above named coal operator, coal owner(s), and coal lessee are hereby notified that any objection they wish to make, or are required to make by Code § 22-4-1 must be filed with the Department of Mines within thirty (30) days after the receipt of this Application by the Department.

Copies of this Permit Application and the enclosed plat and reclamation plan have been mailed by registered mail or delivered by hand to the above named coal operator, coal owner(s) and coal lessee on or before the day of the mailing or delivery of this Permit Application to the Department of Mines at Charleston, West Virginia.

Please answer copies of all correspondence and directly to:
West Virginia Oil and Gas Conservation Commission
1615 Washington Street East
Charleston, WV 25311
Telephone: (304) 348-3092

Pennzoil Company
Well Operator

By Curtis A. Lucas
Its Supervisor, Surveying & Mapping

BLANKET BOND

FORM IV-3
(Reverse)
Rev. 9-81
11-8001

PROPOSED WORK ORDER

THIS IS AN ESTIMATE ONLY.
ACTUAL INFORMATION MUST BE SUBMITTED ON
FORM IV-35 AND/OR FORM IV-37 UPON COMPLETION

DRILLING CONTRACTOR (IF KNOWN): _____

Address _____

GEOLOGIC AND TARGET FORMATION: Big Injun

Estimated depth of completed well: 2157 feet; Rotary X; Cable tools ____

Approximate water strata depths: Fresh, ____ feet; salt, ____ feet

Approximate coal seam depths: _____ Is coal being mined in the area? Yes ____ No X

CASING AND TUBING PROGRAM

| CASING OR TUBING TYPE | SPECIFICATIONS Size | Grade | Weight per ft. | New | Used | FOOTAGE INTERVALS: For drilling | Left in well | CEMENT FILL-UP OR SACKS (Cubic Feet) | PACKERS: Kinds |
|---|---|---|---|---|---|---|---|---|---|
| Conductor | | | | | | | | | Kinds |
| Fresh water | 8-5/8 | H40 | 20 | X | | 325 | 325 | Cement to Surface | |
| Coal | | | | | | | | | Sizes |
| Intermediate | | | | | | | | | |
| Production | 4-1/2 | N55 | 9.5 | X | | 2157 | 2157 | Thru Salt Sand | Depths set |
| Tubing | | | | | | | | | |
| Liners | | | | | | | | | Perforations: |
| | | | | | | | | | Top Bottom |

NOTE 1: Regulation 7.02 of the Department of Mines provides that the original and four copies of Form IV-3 must be filed with the Department, accompanied by (i) a plat in the form prescribed by Regulation 11, (ii) a bond in one of the forms prescribed by Regulation 18, or in lieu thereof the other security allowed by Code § 22-4-2a, (iii) unless previously paid on the same well, the fee required by Code § 22-4-12b, (iv) Form IV-9, "Reclamation Plan", applicable to the reclamation required by Code § 22-4-12b and Regulation 23, and (v) if applicable, the consent required by Code § 22-4-2a from the owner of any water well or dwelling within 200 feet of the proposed well.

A separate Form IV-3 shall not be required for fracturing or stimulating a well where fracturing or stimulating is to be part of the work for which a permit is sought and is noted as such on the Form IV-3 filed in connection therewith.

NOTE 2: In addition to the permit required from the Department of Mines, the operator of a disposal well must obtain a separate permit from the Department of Natural Resources under the provisions of Code § 20-5A-5(b)(7).

THIS PERMIT MUST BE POSTED AT THE WELL SITE.
ALL PROVISIONS BEING IN ACCORDANCE WITH CHAPTER 22
ARTICLE 4 OF THE W. VA. CODE, THE LOCATION IS HEREBY
APPROVED FOR Liquid Injection THIS PERMIT SHALL EXPIRE
IF OPERATIONS HAVE NOT COMMENCED BY 2-14-83
BY _____

The following waiver must be completed by the coal operator and by any coal owner or coal lessee who has recorded a declaration under Code § 22-4-20, if the permit is to be issued within fifteen (15) days of receipt thereof.

W A I V E R

The undersigned coal operator ____ / owner ____ / lessee ____ / of the coal under this well location has examined this proposed well location. If a mine map exists which covers the area of the well location, the well location has been added to the mine map. The undersigned has no objection to the work proposed to be done at this location, provided, the well operator has complied with all applicable requirements of the West Virginia Code and the governing regulations.

Date: _____

By _____

Its _____

FORM IV-37
(Obverse)
(08-78)

Date: April 29, 19 82
Operator's Well No. P. A. Tallman 65
API Well No. 47 - 087 - 3608 - L1
State County Permit

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES, OIL AND GAS DIVISION

PRE-OPERATION CERTIFICATE
FOR LIQUID INJECTION OR WASTE DISPOSAL WELL

WELL OPERATOR Pennzoil Company
Address P. O. Box 1588
Parkersburg, WV 26101

DESIGNATED AGENT James A. Crews
Address P. O. Box 1588
Parkersburg, WV 26101

GEOLOGICAL TARGET FORMATION Big Injun Depth 2080 feet(top) to 2112 feet(bottom)

Virgin reservoir pressure in target formation 80 psig

Source of information on virgin reservoir pressure Est.

Perforation intervals Big Injun Interval* Open-hole intervals

* Will pick zones to perforate from the logs.

MAXIMUM PROPOSED INJECTION OPERATIONS

Volume per hour: 6.25 BPH Bottom hole pressure: 1800 psig

DETAILED IDENTIFICATION OF MATERIALS TO BE INJECTED

Liquids to be injected for oil recovery under Code § 22-6-10a: Fresh water

Wastes to be disposed of: Produced water from waterflood operations to be reinjected

Additives (slurry media, inhibitors, solvents, oxidizers, deoxidizers, etc.): Bactericides

RECEIVED
MAY - 6 1982
OIL AND GAS DIVISION
WV DEPARTMENT OF MINES

SPECIFICATIONS FOR CATHODIC PROTECTION AND OTHER CORROSION CONTROL

FILTERS (IF ANY) Cartridge filters

ADDITIONAL DRILLING AS PART OF THE CONVERSION

*(Complete and submit Form IV-36, "Well Operator's Report of Drilling, Fracturing and/or Stimulating or Physical Change".)*

DETAILS ON NEW CASING AND TUBING PROGRAM AS PART OF THE CONVERSION:

*(To be completed below unless the new casing and tubing program is described on a Form IV-36, "Well Operator's Report of Drilling, Fracturing and/or Stimulating or Physical Change", submitted in connection with the permit to which this Form IV-37 pre-operation certificate relates.)*

| CASING OR TUBING TYPE | SPECIFICATIONS Size | Grade | Weight per ft | New | Used | FOOTAGE INTERVALS For drilling | Left in well | CEMENT FILL-UP OR SACKS (Cubic Feet) | PACKERS |
|---|---|---|---|---|---|---|---|---|---|
| Conductor | | | | | | | | | Kinds |
| Fresh water | 8-5/8 | H40 | 20 | X | | 325 | 325 | Cement to | |
| Coal | | | | | | | | surface | Sizes |
| Intermediate | | | | | | | | | |
| Production | 4-1/2 | J55 | 9.5 | X | | 2157 | 2157 | Thru Sal | Depths set |
| Tubing | | | | | | | | Sand | |
| Liners | | | | | | | | | Perforations: |
| | | | | | | | | | Top Bottom |

(Continue on reverse side)

FORM IV-37
(Obverse)
(01-83)

Date: Mar. 8, 1983
Operator's Well No. P. A. Tallman 65
API Well No. 47 - 087 - 3608-
State County Permi

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES, OIL AND GAS DIVISION

PRE-OPERATION CERTIFICATE
FOR LIQUID INJECTION OR WASTE DISPOSAL WELL

WELL OPERATOR Pennzoil Company DESIGNATED AGENT James A. Crews
Address P.O.Box 1[illegible]8 Address P.O.Box 1588
Parkersburg, WV 26101 Parkersburg, WV 26101

GEOLOGICAL TARGET FORMATION Big Injun Depth 2080 feet(top) to 2112 feet(Bottom)
Virgin reservoir pressure in target formation 80 psig
Source of information on virgin reservoir pressure Estimated
Perforation intervals 2089-2097 2107-2117 Open-hole intervals 8 10

MAXIMUM PROPOSED INJECTION OPERATIONS
Volume per hour: 6.25 BPH Bottom hole pressure: 1800 psig

DETAILED IDENTIFICATION OF MATERIALS TO BE INJECTED
Liquids to be injected for oil recovery under Code § 22-4-10a: Fresh Water

Wastes to be disposed of: Produced water from waterflood operations to be reinjected

Additives (slurry mediums, inhibitors, solvents, oxidizers, deoxidizers, etc.):
Bactericides

Specific Gravity: [illegible]

SPECIFICATIONS FOR CATHODIC PROTECTION AND OTHER CORROSION CONTROL

FILTERS (IF ANY) Anthracite coal filters

ADDITIONAL DRILLING AS PART OF THE CONVERSION
(Complete and submit Form IV-35, "Well Operator's Report of Drilling, Fracturing and/or Stimulating or Physical Change".)

DETAILS ON NEW CASING AND TUBING PROGRAM AS PART OF THE CONVERSION:
(To be completed below unless the new casing and tubing program is described on a Form IV-35, "Well Operator's Report of Drilling, Fracturing and/or Stimulating or Physical Change", submitted in connection with the permit to which this Form IV-37 preoperation certificate relates.)

| SING OR BING TYPE | SPECIFICATIONS Size | Grade | Weight per ft. | New | Used | FOOTAGE INTERVALS For drilling | Left in well | CEMENT FILL-UP OR SACKS (Cubic feet) | PACKERS |
|---|---|---|---|---|---|---|---|---|---|
| nductor | | | | | | | | | Kinds |
| esh water | 9-5/8 | H40 | 20 | X | | 325 | 325 | Cement to surfac | |
| al | | | | | | | | | Sizes |
| termediate | | | | | | | | | |
| oduction | 4-1/2 | .055 | 9.5 | X | | 2157 | 2157 | Thru Salt Sand | Depths set |
| bing | | | | | | | | | |
| ers | | | | | | | | | Perforations: |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

(continue on reverse side

FORM IV-37
(Reverse)
01-83

MECHANICAL INTEGRITY TEST

Test method: Pumped plug down to Baffle. Pressured up to 2000 psi and held for 20 minutes. Plug and pressure held. Released well.

The undersigned certifies that the test was performed on Oct. 11, 1982 and demonstrated the mechanical integrity of the well. The test was witnessed by _____ representing the Office of Oil and Gas.

Well Operator _____ Date _____

THIS WELL IS AUTHORIZED FOR INJECTION.

Signed _____ Administrator, Office of Oil and Gas

Date _____

[NOTE: That the mechanical integrity of this well must be demonstrated again within ninety (90) days of five years from this date in order for injection to continue. Please notify the state inspector 24 hours in advance of the test].

FACILITIES OR SYSTEMS TO PROTECT THE INTEGRITY OF THE GEOLOGICAL TARGET FORMATION FRACTURING THE CONFINING STRATA _____

APPLICATION FOR VARIANCE (IF ANY) FROM REGULATION 9.01 (a)
[Specify purpose, necessity, and justification]

Pennzoil Company
Well Operator

By: Curtis A. Lewis

Its Supervisor, Surveying & Mapping

3608
Dual
Induction Log

Roa 3608

Schlumberger

DUAL INDUCTION-SFL

CSU

COMPANY: PENNZOIL CO.

WELL: P. A. TALLMAN #65

FIELD: TARIFF
COUNTY: ROANE
STATE: WEST VIRGINIA
NATION: USA
LOCATION: SMITHFIELD DISTRICT
TARIFF 7.5' QUAD.
SEC: TWP: RGE:

PERMANENT DATUM: GROUND LEVEL ELEVATIONS-
ELEV. OF PERM. DATUM: 1083.9' KB: 1089.9'
LOG MEASURED FROM: KELLY DF: 1088.9'
6.0' ABOVE PERM. DATUM GL: 1083.9'
DRLG. MEASURED FROM: KELLY

DATE: 12 OCT 82
RUN NO: 1

DEPTH-DRILLER: 2205.0'
DEPTH-LOGGER: 2201.0'
BTM. LOG INTERVAL: 2194.0'
TOP LOG INTERVAL: 344.0'

CASING-DRILLER: 338'
CASING-LOGGER: 344'
CASING: 8.625

BIT SIZE: 7.875
DEPTH: 2205'

'HER SERVICES-
FDC/CNL/GR

'I SERIAL NO:
47-087-360

ROGRAM
PE NO:
20.2
ERVICE
RDER NO:
208415

TYPE FLUID IN HOLE: SHALE CHECK-STARCH
DENSITY: 8.4 LB/G
VISCOSITY: 27.0 S
PH: 9.0
FLUID LOSS:
SOURCE OF SAMPLE: FLOW LINE
RM: 2.980 OHMM AT 53.0 DF
RMF: AT
RMC: AT
SOURCE RMF/RMC: /
RM AT BHT: 2.031 OHM AT 81.0 DF
RMF AT BHT: AT 81.0 DF
RMC AT BHT: AT 81.0 DF

TIME CIRC. STOPPED: 0200
TIME LOGGER ON BTM.: 0500

MAX. REC. TEMP: 81.0 DF

LOGGING UNIT NO: 101
LOGGING UNIT LOC: 3307
RECORDED BY: M. G. WEEKES
WITNESSED BY: MR. BILL GRENLEES

REMARKS: 1.5" STAND-OFFS

EQUIPMENT NUMBERS-

| | | | |
|---|---|---|---|
| DIS G-15 | DIC 1197 | CNC 2094 | CNB 3185 |
| PGS 229 | PDH 1106 | GSR 5355 | SFT 327 |
| SGT 3010 | | | |

ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENTS AND WE CANNOT, AND DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATIONS, AND WE SHALL NOT, EXCEPT IN THE CASE OF GROSS OR WILLFUL NEGLIGENCE ON OUR PART, BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COSTS, DAMAGES OR EXPENSES INCURRED OR SUSTAINED BY ANYONE RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR OFFICERS, AGENTS OR EMPLOYEES. THESE INTERPRETATIONS ARE ALSO SUBJECT TO OUR GENERAL TERMS AND CONDITIONS AS SET OUT IN OUR CURRENT PRICE SCHEDULE.

FILE

101

## AFTER SURVEY TOOL CHECK SUMMARY

PERFORMED: 82/10/12
PROGRAM FILE: ISN (VERSION 20.2 60/07/24)

DITD TOOL CHECK

| | ZERO BEFORE | ZERO AFTER | PLUS BEFORE | PLUS AFTER | UNITS |
|---|---|---|---|---|---|
| ILD | 0.0 | -0.0 | 503.7 | 504.4 | MMHO |
| ILM | 0.0 | -0.0 | 501.4 | 502.2 | MMHO |
| SFL | 0.0 | 0.0 | 500.0 | 497.5 | MMHO |

ILD SONDE ERROR CORRECTION : 5.5 MMHO
ILM SONDE ERROR CORRECTION : 7.7 MMHO

CNTA TOOL CHECK

| | JIG BEFORE | JIG AFTER |
|---|---|---|
| NRAT | 2.149 | 2.147 |

POROSITY CHANGE (LIME): 0.000

PGTK TOOL CHECK

| | JIG BEFORE | AFTER | UNITS |
|---|---|---|---|
| FFDC | 325 | 326 | CPS |
| NFDC | 478 | 472 | CPS |

FILE

11

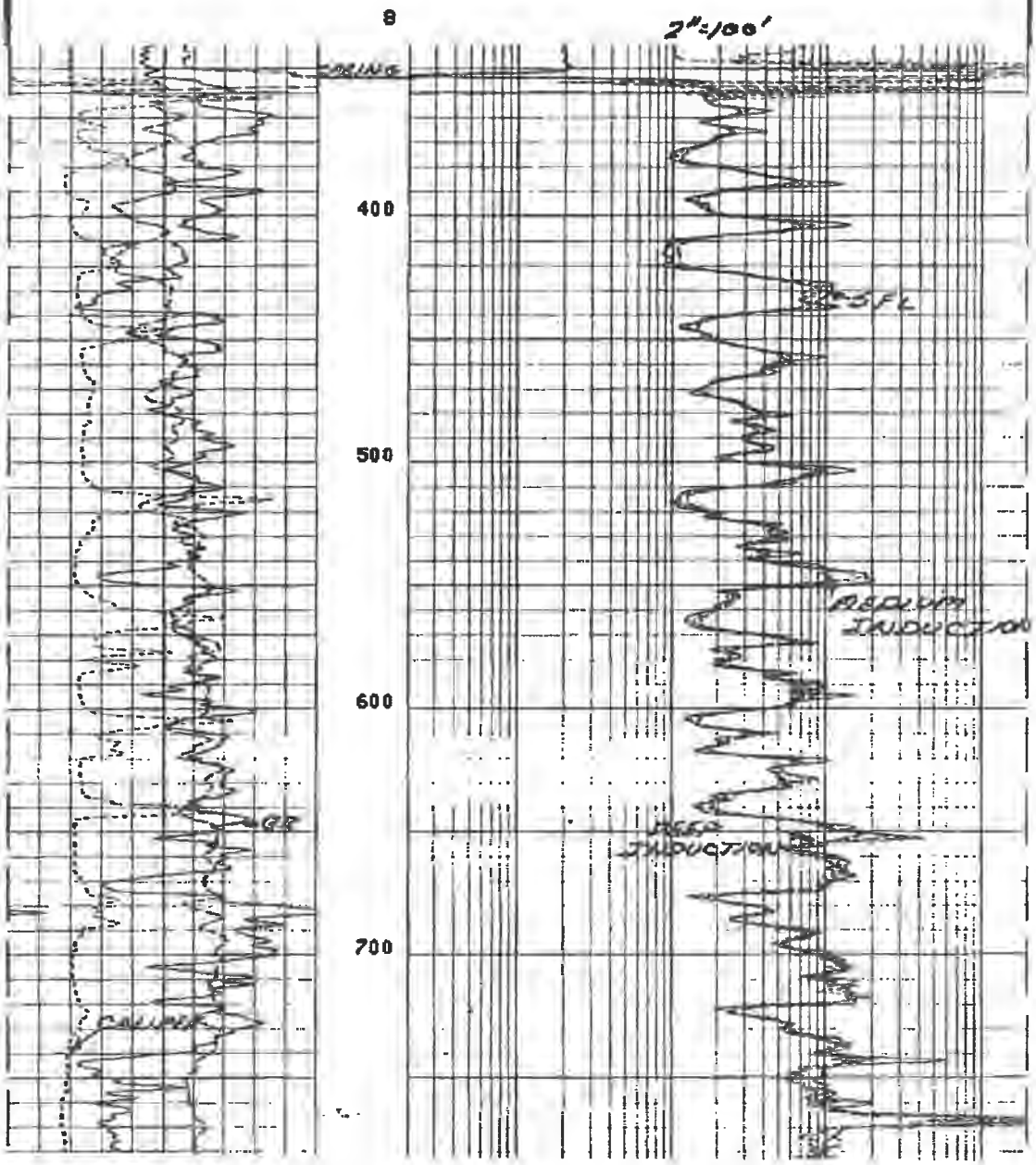
CHANGED PARAMETERS

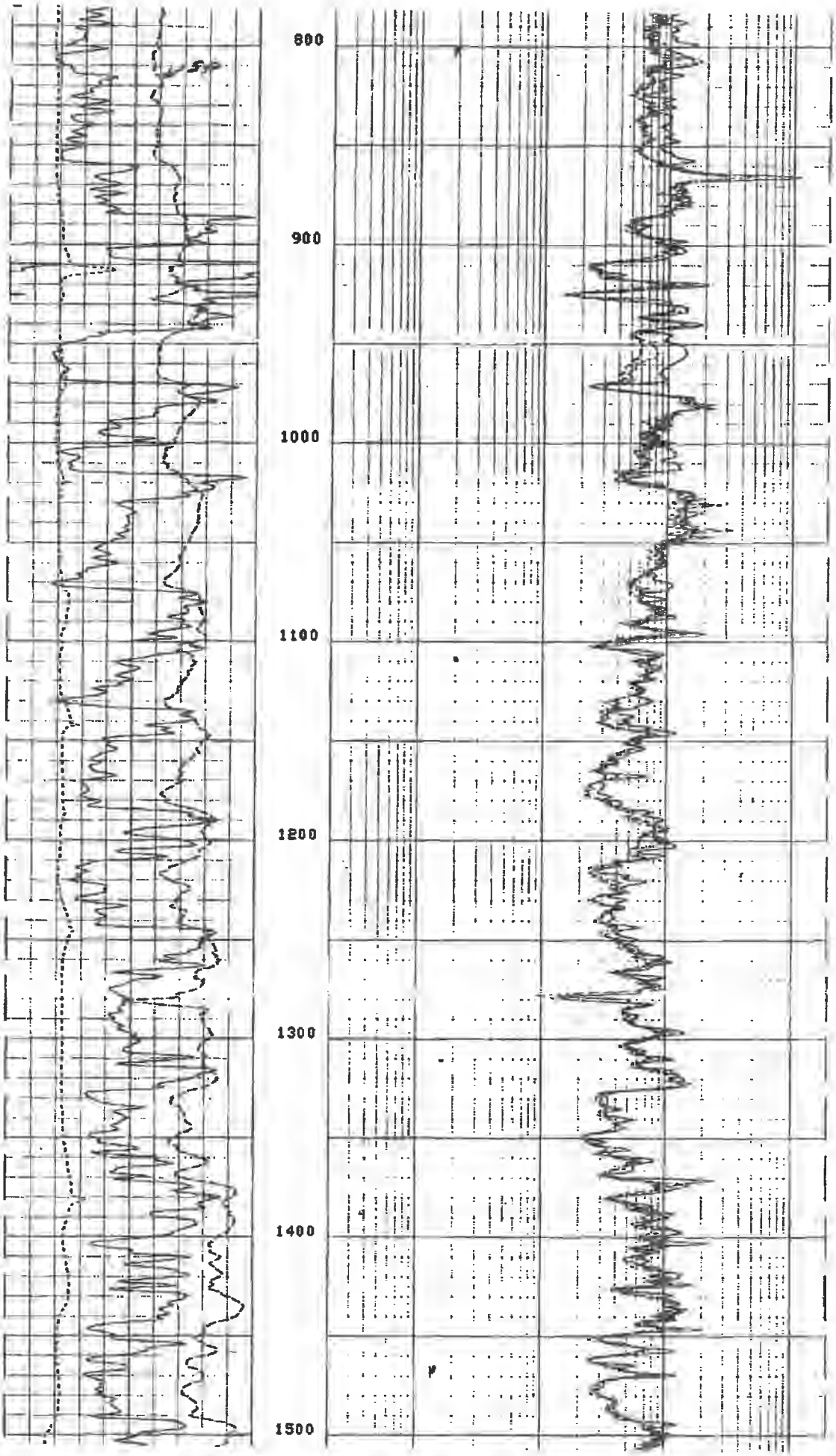
| NAME | VALUE | UNIT | NAME | VALUE | UNIT |
|---|---|---|---|---|---|
| MDEN | 2.680 | G/C3 | MATR | SAND | |

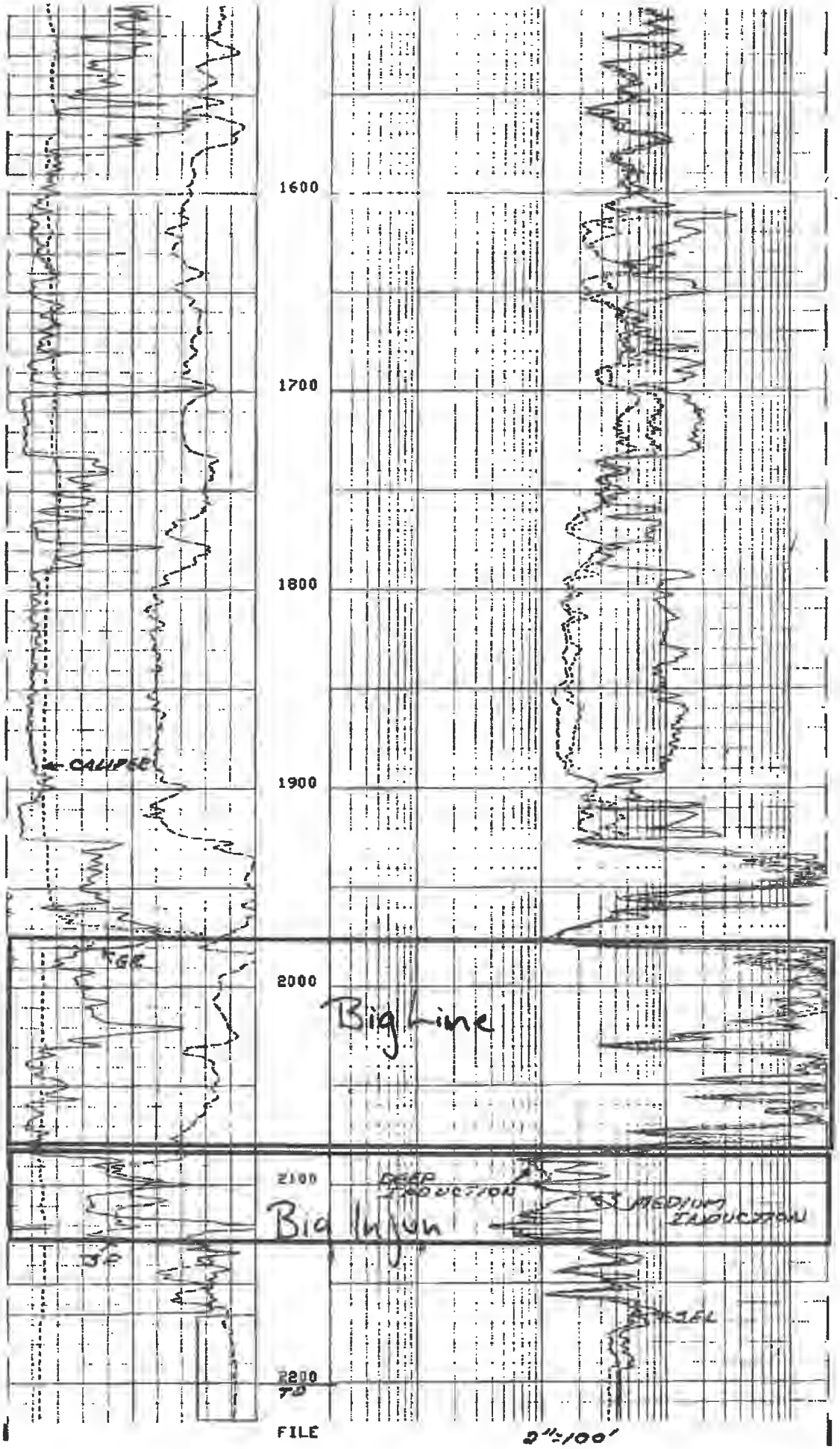
| CALI(IN ) | | ILD (OHMM) | |
|---|---|---|---|
| 6.000 | 16.00 | 0.2000 | 2000. |
| GR (GAPI) | | ILM (OHMM) | |
| 0.0 | 200.0 | 0.2000 | 2000. |
| SP (MV ) | | SFLU(OHMM) | |
| -160.0 | 40.00 | 0.2000 | 2000. |

FILE

8




800
900
1000
1100
1200
1300
1400
1500


1600
1700
1800
1900
2000
2100
2200
TD
CALIPER
GR
Big Lime
Big Injun
DEEP INDUCTION
MEDIUM INDUCTION
SFL
FILE
2"=100'

8

| CALI(IN ) | | ILD (OHMM) | |
|---|---|---|---|
| 6.000 | 16.00 | 0.2000 | 2000. |
| GR (GAPI) | | ILM (OHMM) | |
| 0.0 | 200.0 | 0.2000 | 2000. |
| SP (MV ) | | SFLU(OHMM) | |
| -160.0 | 40.00 | 0.2000 | 2000. |

SENSOR MEASURE POINT TO TENSION REFERENCE POINT

| | | | | | |
|---|---|---|---|---|---|
| NCNL | 44.4 | FEET | GR | 52.9 | FEET |
| FFDC | 29.1 | FEET | FCNL | 44.4 | FEET |
| CALI | 29.1 | FEET | NFDC | 29.1 | FEET |
| SFL | 3.9 | FEET | ILD | 6.9 | FEET |
| SP | .0 | FEET | ILM | 3.3 | FEET |
| TENS | .0 | FEET | SPAR | .0 | FEET |
| NRAT | 44.4 | FEET | | | |

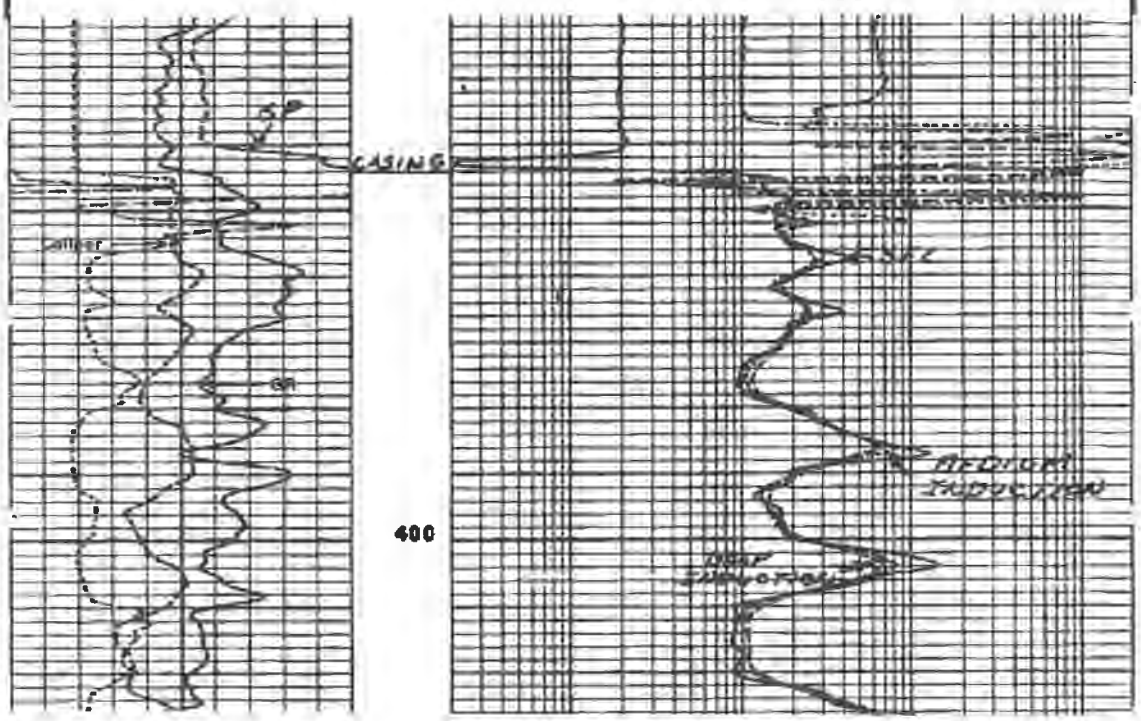
PARAMETERS

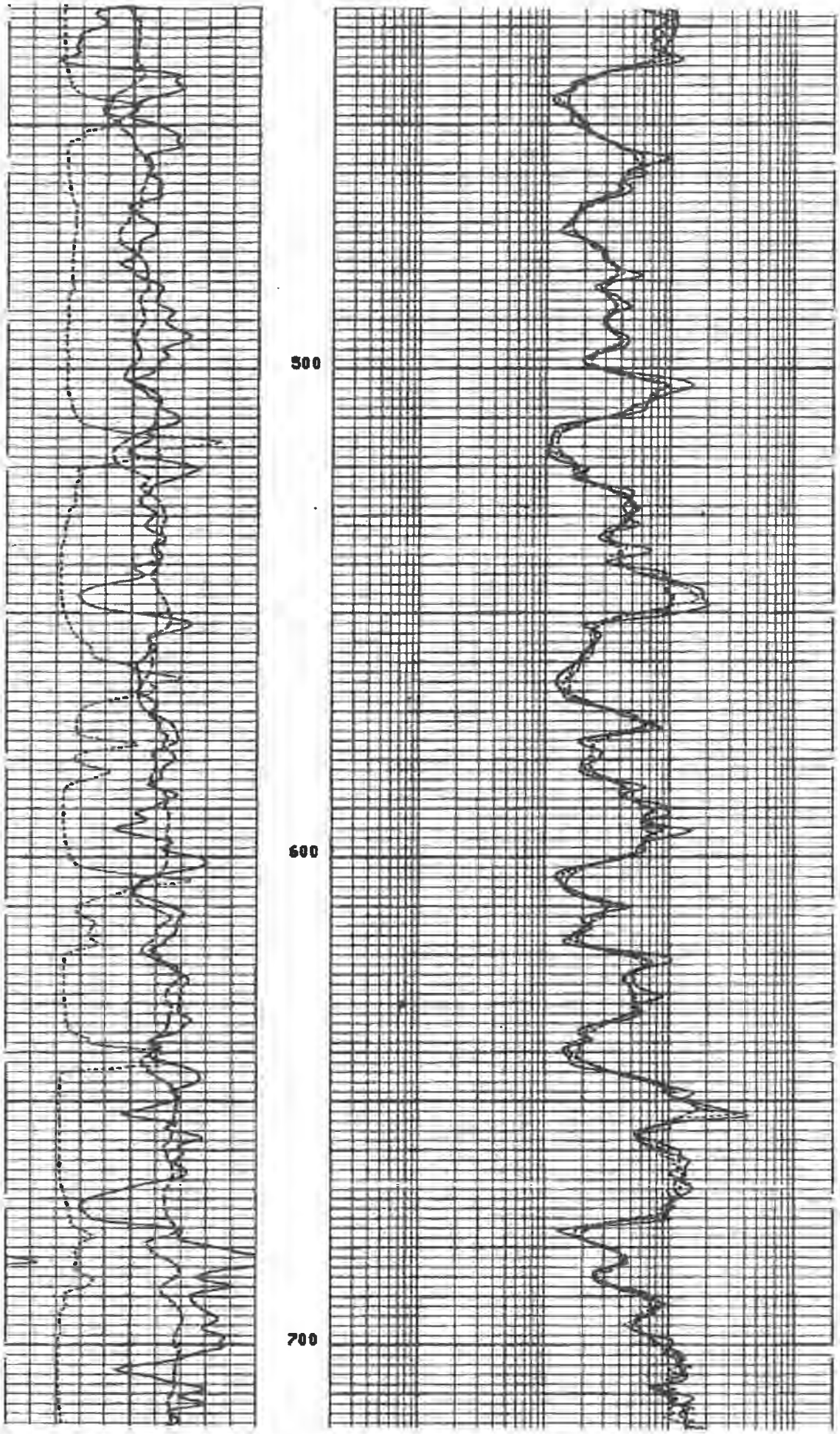
| NAME | VALUE | UNIT | NAME | VALUE | UNIT |
|---|---|---|---|---|---|
| PSNR | 2.220 | | BS | 7.875 | IN |
| MATR | SAND | | HC | CALI | |
| MDEN | 2.680 | G/C3 | FD | 1.000 | G/C3 |
| BHF | WATE | | FDCC | ALLD | |
| SBR | 1.000 | OHMM | DSEC | 5.500 | MMHO |
| FPHI | DPHI | | MSEC | 7.700 | MMHO |
| DO | 0.0 | | BHS | OPEN | |

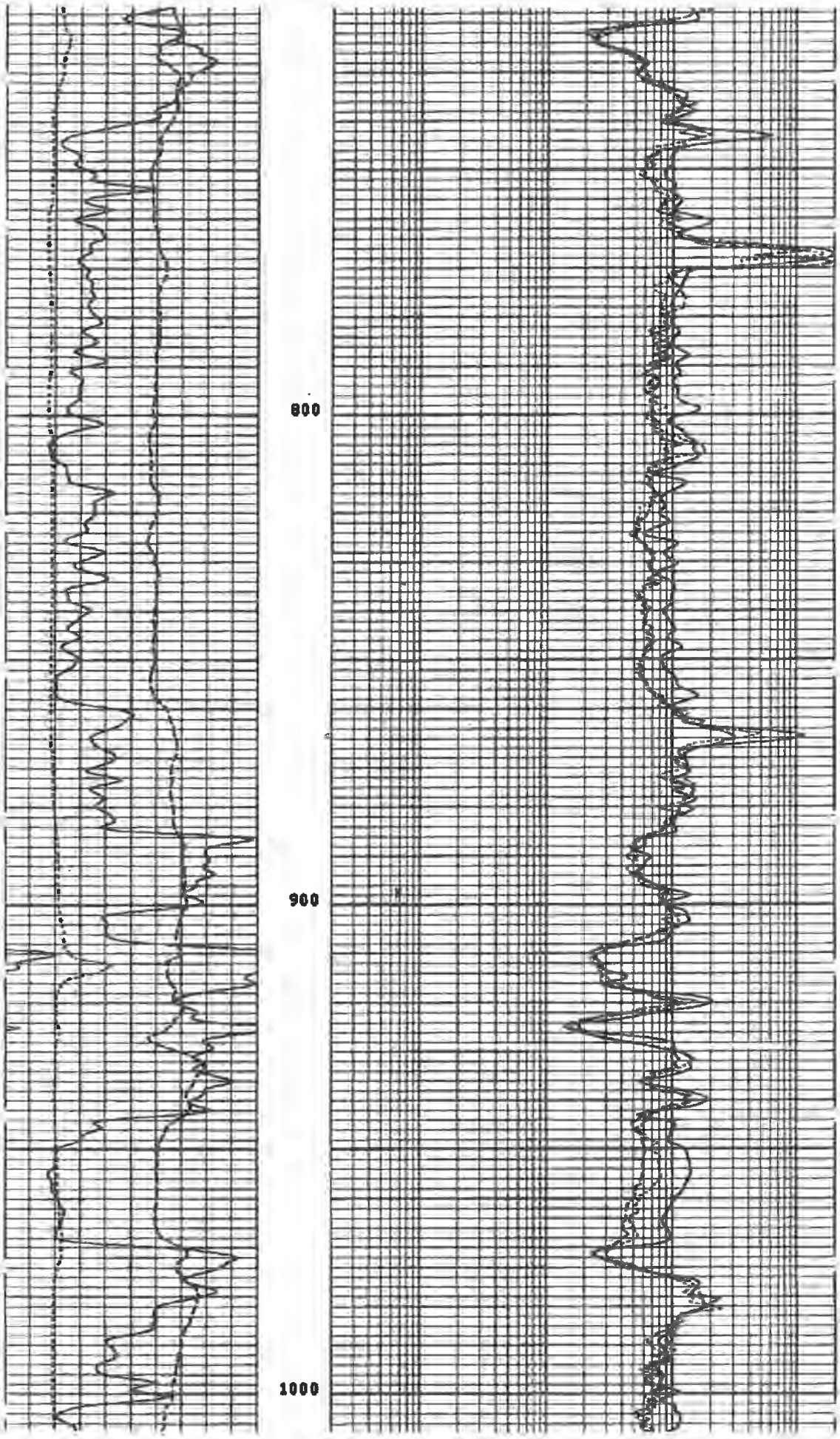

| CALI(IN ) | | ILD (OHMM) | |
|---|---|---|---|
| 6.000 | 16.00 | 0.2000 | 2000. |
| GR (GAPI) | | ILM (OHMM) | |
| 0.0 | 200.0 | 0.2000 | 2000. |
| SP (MV ) | | SFLU(OHMM) | |
| -160.0 | 40.00 | 0.2000 | 2000. |

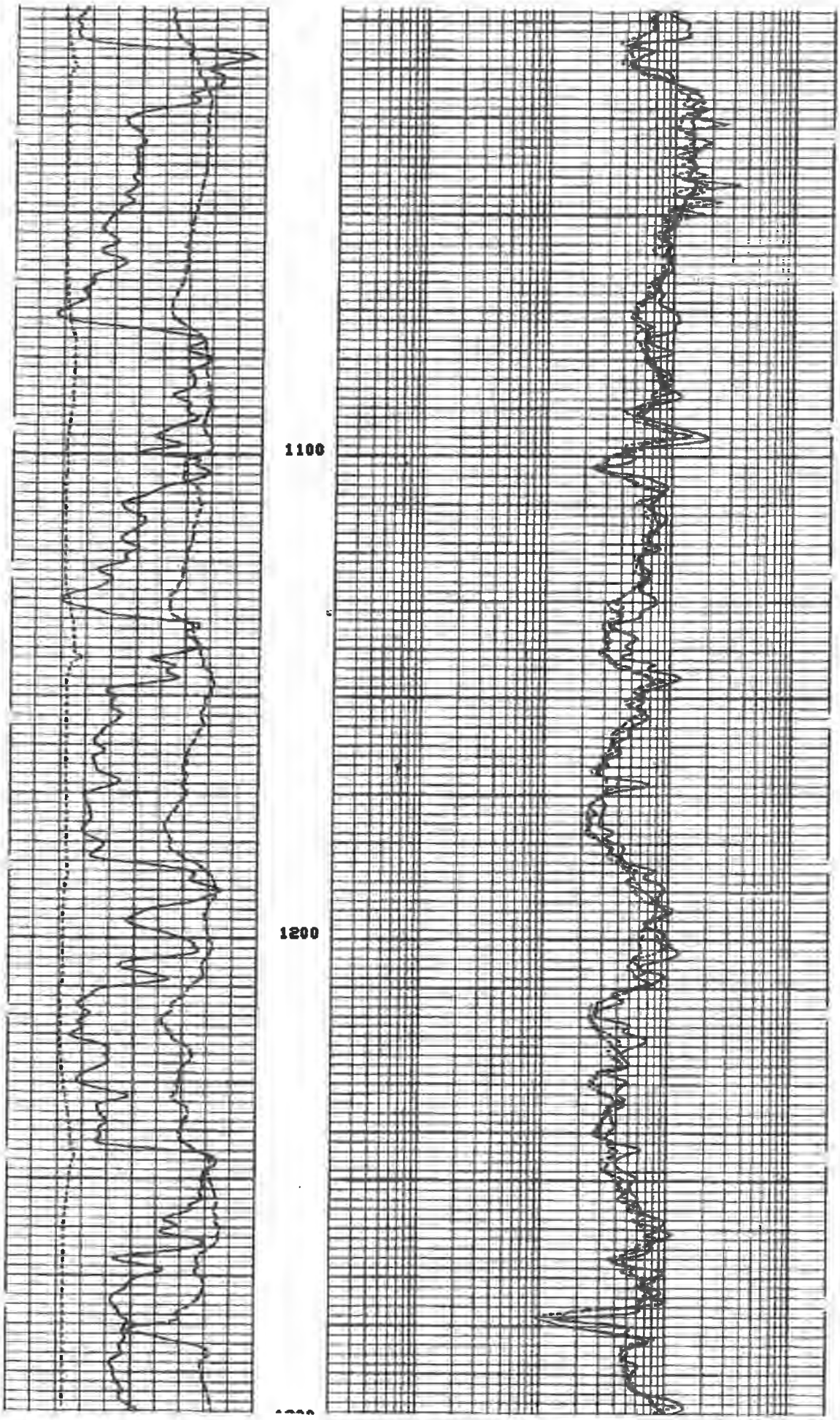

FILE 8

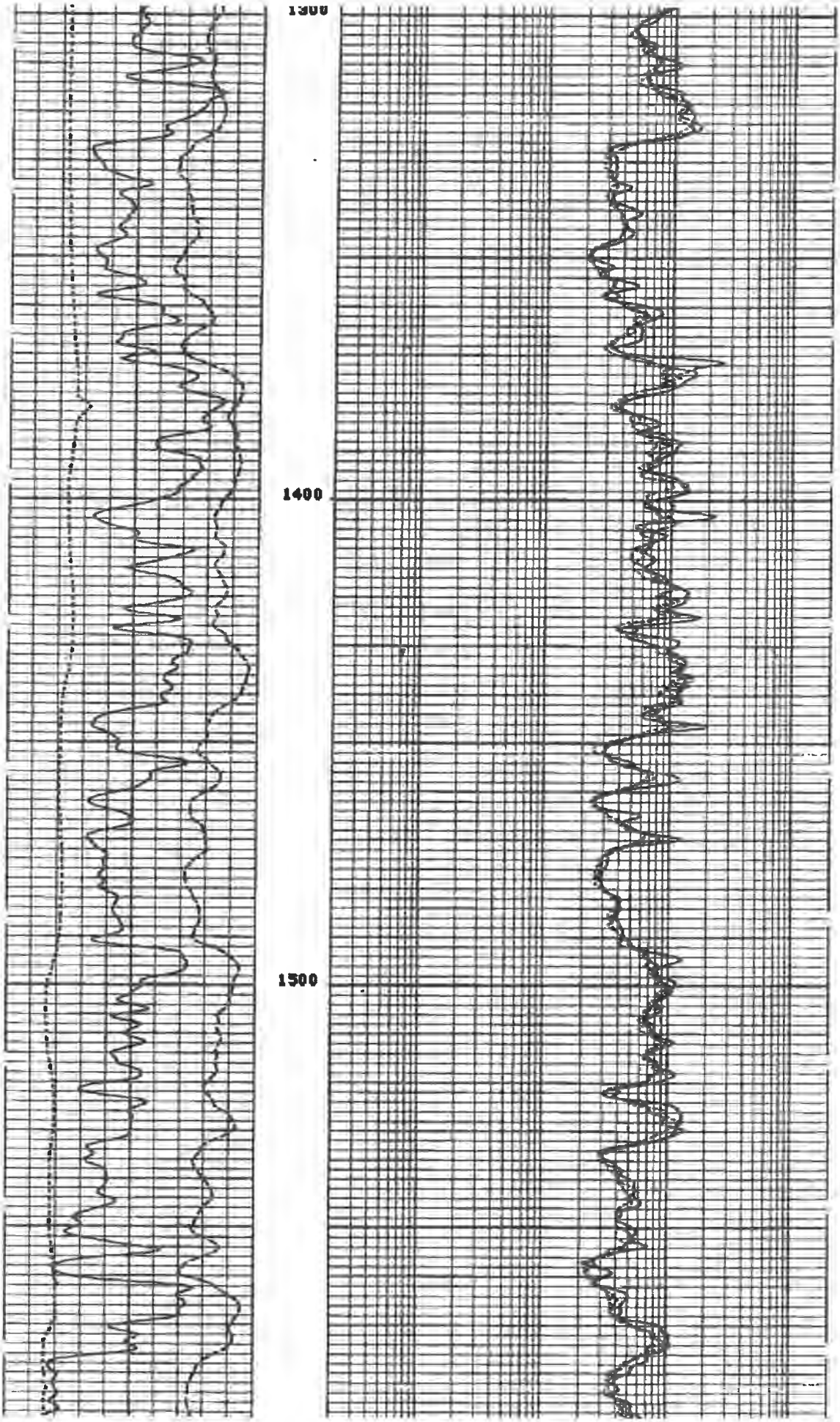
DETAIL LOG
5" = 100'

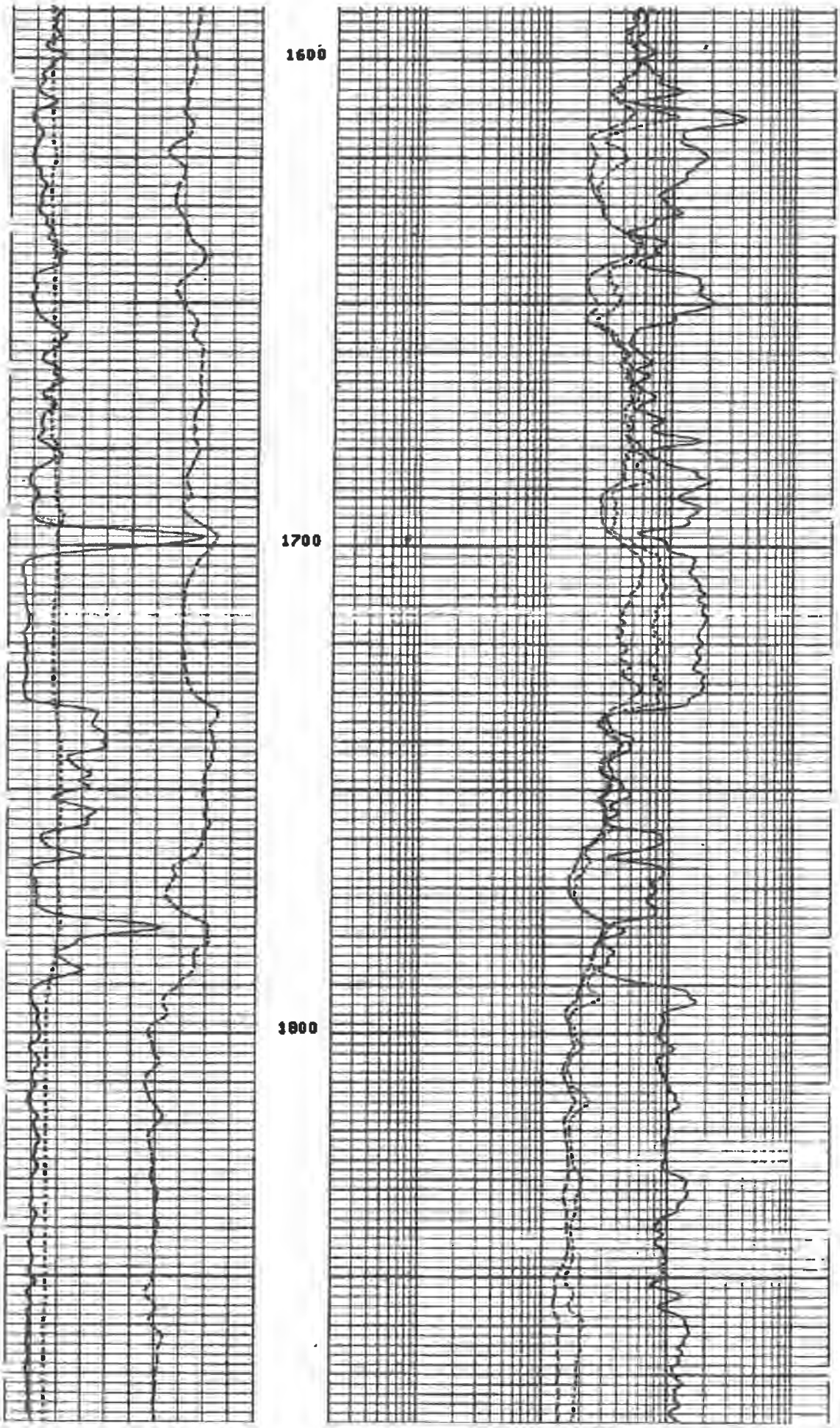


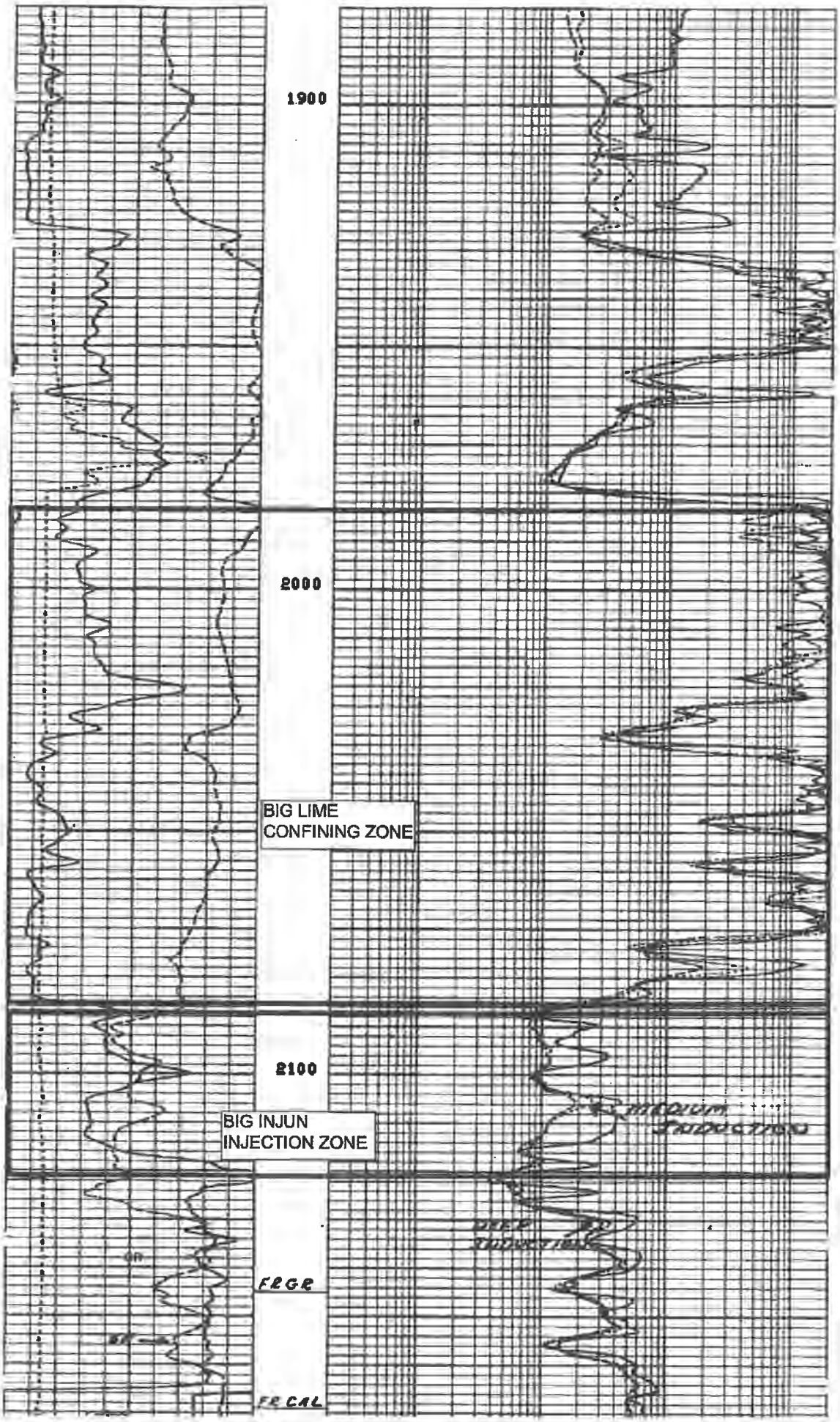

500
600
700

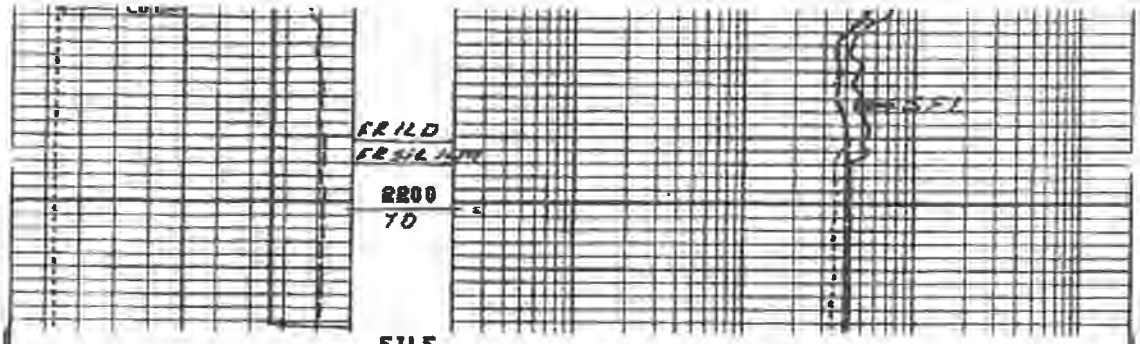

800
900
1000


1100
1200


1300
1400
1500


1600
1700
1800


1900
2000
BIG LIME
CONFINING ZONE
2100
BIG INJUN
INJECTION ZONE
FRGR
FRCAL




FILE

8

## DETAIL LOG
5" = 100'

| CALI(IN ) | | ILD (OHMM) | |
|---|---|---|---|
| 6.000 | 16.00 | 0.2000 | 2000. |
| GR (GAPI) | | ILM (OHMM) | |
| 0.0 | 200.0 | 0.2000 | 2000. |
| SP (MV ) | | SFLU(OHMM) | |
| -160.0 | 40.00 | 0.2000 | 2000. |

SENSOR MEASURE POINT TO TENSION REFERENCE POINT

| | | | | | |
|---|---|---|---|---|---|
| NCNL | 44.4 | FEET | GR | 52.9 | FEET |
| FFDC | 29.1 | FEET | FCNL | 44.4 | FEET |
| CALI | 29.1 | FEET | NFDC | 29.1 | FEET |
| SFL | 3.9 | FEET | ILD | 6.9 | FEET |
| SP | .0 | FEET | ILM | 3.3 | FEET |
| TENS | .0 | FEET | SPAR | .0 | FEET |
| NRAT | 44.4 | FEET | | | |

PARAMETERS

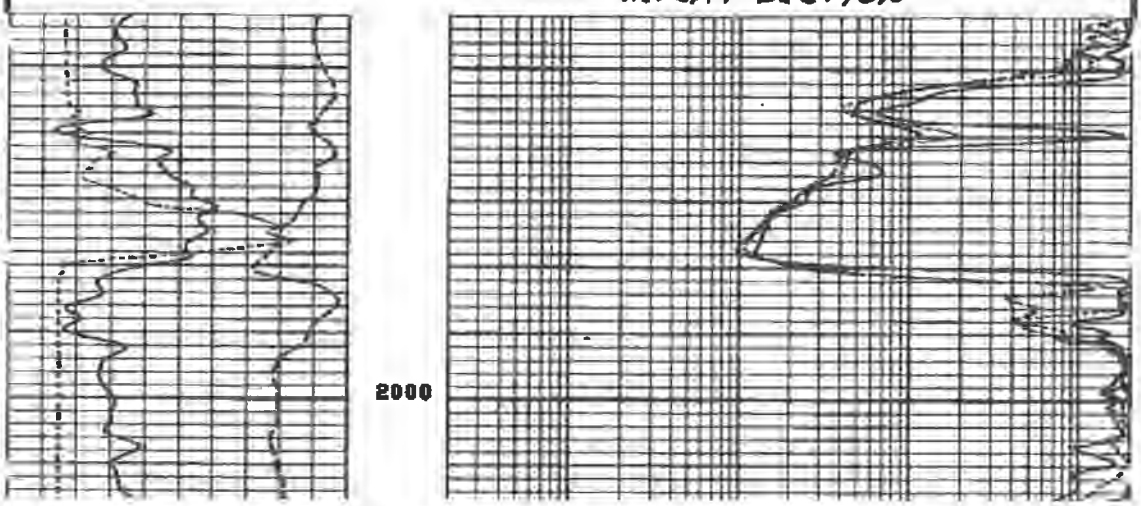
| NAME | VALUE | UNIT | NAME | VALUE | UNIT |
|---|---|---|---|---|---|
| PSNR | 2.220 | | BS | 7.875 | IN |
| MATR | SAND | | MC | CALI | |
| MDEN | 2.680 | G/C3 | FD | 1.000 | G/C3 |
| BHF | WATE | | FDCC | ALLO | |
| SBR | 1.000 | OHMM | DSEC | 5.500 | MMHO |
| FPHI | DPHI | | MSEC | 7.700 | MMHO |
| DO | 0.0 | | BHS | OPEN | |

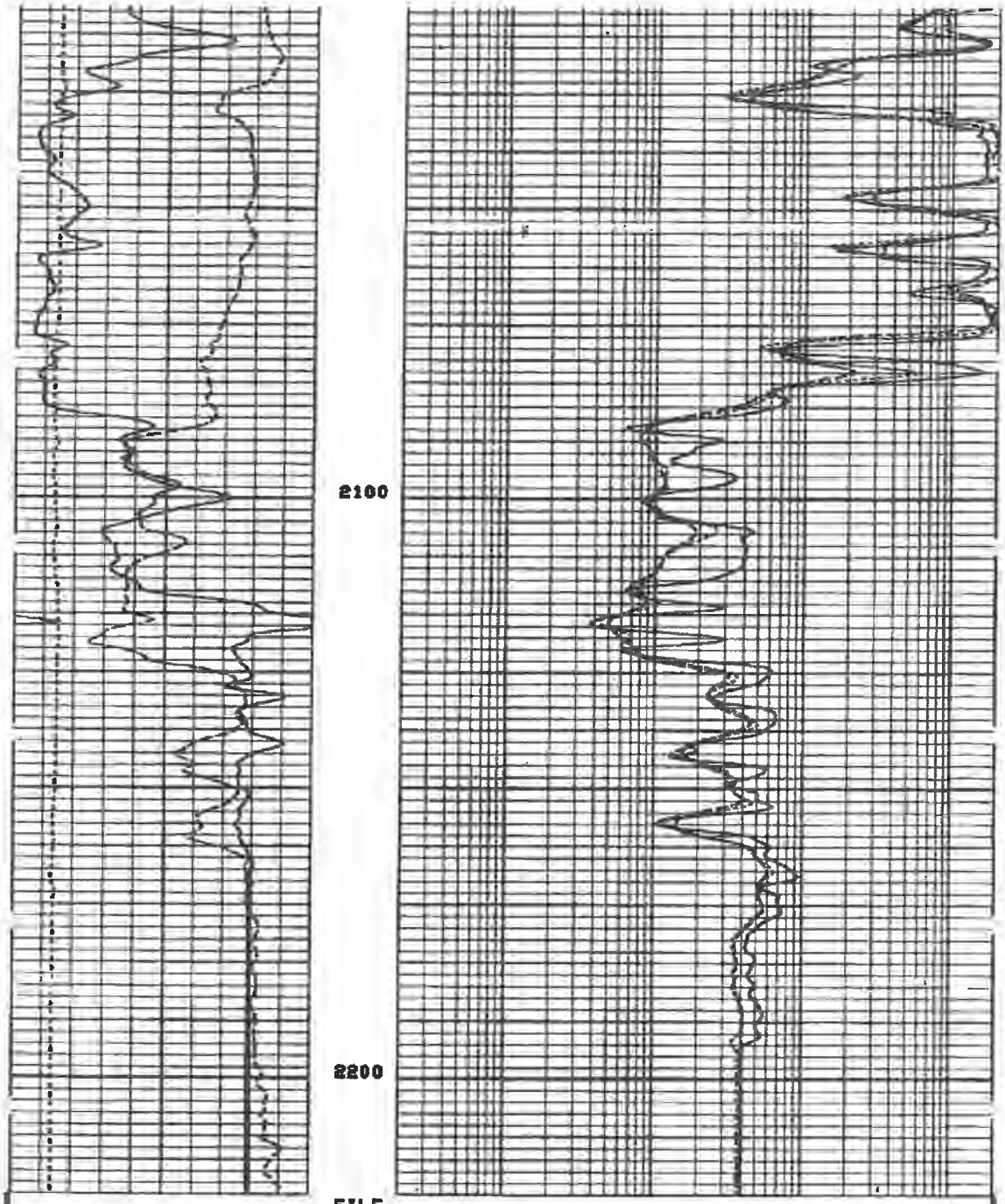
| CALI(IN ) | | ILD (OHMM) | |
|---|---|---|---|
| 6.000 | 16.00 | 0.2000 | 2000. |
| GR (GAPI) | | ILM (OHMM) | |
| 0.0 | 200.0 | 0.2000 | 2000. |
| SP (MV ) | | SFLU(OHMM) | |
| -160.0 | 40.00 | 0.2000 | 2000. |

FILE

5

REPEAT SECTION






| | |
|---|---|
| CALI(IN ) 6.000 — 16.00 | ILD (OHMM) 0.2000 — 2000. |
| GR (GAPI) 0.0 — 200.0 | ILM (OHMM) 0.2000 — 2000. |
| SP (MV ) -160.0 — 40.00 | SFLU(OHMM) 0.2000 — 2000. |

**SENSOR MEASURE POINT TO TENSION REFERENCE POINT**

| | | | | | |
|---|---|---|---|---|---|
| NCNL | 44.4 | FEET | GR | 52.9 | FEET |
| FFDC | 29.1 | FEET | FCNL | 44.4 | FEET |
| CALI | 29.1 | FEET | NFDC | 29.1 | FEET |
| SFL | 3.9 | FEET | ILD | 6.9 | FEET |
| SP | .0 | FEET | ILM | 3.3 | FEET |
| TENS | .0 | FEET | SPAR | .0 | FEET |
| NRAT | 44.4 | FEET | | | |

**PARAMETERS**

| NAME | VALUE | UNIT | NAME | VALUE | UNIT |
|---|---|---|---|---|---|
| PSHR | 2.220 | | BS | 7.875 | IN |
| MATR | SAND | | HC | CALI | |
| MDEN | 2.680 | G/C3 | FD | 1.000 | G/C3 |
| BMF | WATE | | FDCC | ALLO | |
| SBR | 1.000 | OHMM | DSEC | 5.500 | MMHO |
| FPHI | DPHI | | MSEC | 7.700 | MMHO |
| DO | 0.0 | | BHS | OPEN | |

BEFORE SURVEY CALIBRATION SUMMARY

PERFORMED: 82/10/12
PROGRAM FILE: ISN (VERSION 20.2 60/07/24)

DITD ELECTRONICS CALIBRATION SUMMARY

| | MEASURED ZERO | MEASURED PLUS | CALIBRATED ZERO | CALIBRATED PLUS | UNITS |
|---|---|---|---|---|---|
| ILD | 0.9 | 542.8 | 0.0 | 503.7 | MMHO |
| ILM | 0.8 | 484.3 | 0.0 | 501.4 | MMHO |
| SFL | 1.1 | 519.5 | 0.0 | 500.0 | MMHO |

ILD SONDE ERROR CORRECTION : 5.6 MMHO
ILM SONDE ERROR CORRECTION : 8.3 MMHO

SGTE DETECTOR CALIBRATION SUMMARY

| | MEASURED BKGD | MEASURED JIG | CALIBRATED | UNITS |
|---|---|---|---|---|
| GR | 55 | 197 | 165 | GAPI |

CNTA DETECTOR CALIBRATION SUMMARY

| | TANK INPUT | TANK CALIBRATED | JIG MEASURED | JIG CALIBRATED |
|---|---|---|---|---|
| NRAT | 2.220 | 2.158 | 2.210 | 2.149 |

PGTK DETECTOR CALIBRATION SUMMARY

| | BLOCK INPUT | BLOCK CALIBRATED | JIG MEASURED | JIG CALIBRATED | UNITS |
|---|---|---|---|---|---|
| FFDC | 719 | 337 | 693 | 325 | CPS |
| NFDC | 1148 | 528 | 1040 | 478 | CPS |

PGTK CALIPER CALIBRATION SUMMARY

| | MEASURED SMALL | MEASURED LARGE | CALIBRATED SMALL | CALIBRATED LARGE | UNITS |
|---|---|---|---|---|---|
| CALI | 12.4 | 16.2 | 8.0 | 12.0 | IN |

FILE

4

SHOP SUMMARY

PERFORMED: 82/10/09
PROGRAM FILE: SHOP (VERSION 22.2 82/06/08)

DITD ELECTRONICS CALIBRATION SUMMARY

| | TEST LOOP CALIBRATION MEASURED ZERO | MEASURED PLUS | CALIBRATED ZERO | CALIBRATED PLUS | TOOL CHECK CALIBRATED ZERO | TOOL CHECK CALIBRATED PLUS | UNITS |
|---|---|---|---|---|---|---|---|
| ILD | -5.4 | 525.9 | 0.0 | 500.0 | 0.0 | 504.0 | MMHO |
| ILM | -7.8 | 472.0 | 0.0 | 500.0 | 0.0 | 501.7 | MMHO |

ILD SONDE ERROR CORRECTION : 5.6 MMHO
ILM SONDE ERROR CORRECTION : 8.3 MMHO

(IS:GA15, IC:1197)

3608 CyberLook Field Log

ROA 3608 3608

Schlumberger

CYBERLOOK

CSU

COMPANY: PENNZOIL CO.

WELL: P. A. TALLMAN #65

FIELD: TARIFF
COUNTY: ROANE
STATE: WEST VIRGINIA
NATION: USA
LOCATION: SMITHFIELD DISTRICT
TARIFF 7.5' QUAD.
SEC: TWP: RGE:

PERMANENT DATUM: GROUND LEVEL ELEVATIONS-
ELEV. OF PERM. DATUM: 1083.9' KB: 1089.9'
LOG MEASURED FROM: KELLY DF: 1088.9'
6.0' ABOVE PERM. DATUM GL: 1083.9'
DRLG. MEASURED FROM: KELLY

DATE: 12 OCT 82
RUN NO: 1

DEPTH-DRILLER: 2205.0'
DEPTH-LOGGER: 2201.0'
BTM. LOG INTERVAL: 2130.0'
TOP LOG INTERVAL: 344.0'

CASING-DRILLER: 338'
CASING-LOGGER: 344'
CASING: 8.625

BIT SIZE: 7.875
DEPTH: 2205'

OTHER SERVI
FDC/CNL/G
DIL

API SERIAL
47-087-36

PROGRAM
TAPE NO:
20.2
SERVICE
ORDER NO:
208415

| | |
|---|---|
| TYPE FLUID IN HOLE: | SHALE CHECK/STARCH |
| DENSITY: | 8.4 LB/G |
| VISCOSITY: | 27.0 $ |
| PH: | 9.0 |
| FLUID LOSS: | |
| SOURCE OF SAMPLE: | FLOW LINE |
| RM: | 2.980 OHMM AT 53.0 DF |
| RMF: | AT |
| RMC: | AT |
| SOURCE RMF/RMC: | / |
| RM AT BHT: | 2.031 OHM AT 81.0 DF |
| RMF AT BHT: | AT 81.0 DF |
| RMC AT BHT: | AT 81.0 DF |
| TIME CIRC. STOPPED: | 0200 |
| TIME LOGGER ON BTM.: | 0500 |
| MAX. REC. TEMP: | 81.0 DF |
| LOGGING UNIT NO: | 101 |
| LOGGING UNIT LOC: | 3307 |
| RECORDED BY: | M. G. WEEKES |
| WITNESSED BY: | MR. BILL GRENLEES |

REMARKS:

EQUIPMENT NUMBERS-

| | | | |
|---|---|---|---|
| DIS G-15 | DIC 1197 | CNC 2094 | CNB 3185 |
| PGS 229 | PDH 1106 | GSR 5355 | SFT 327 |
| SGT 3010 | | | |

ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENTS AND WE CANNOT, AND DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATIONS, AND WE SHALL NOT, EXCEPT IN THE CASE OF GROSS OR WILLFUL NEGLIGENCE ON OUR PART, BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COSTS, DAMAGES OR EXPENSES INCURRED OR SUSTAINED BY ANYONE RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR OFFICERS, AGENTS OR EMPLOYEES. THESE INTERPRETATIONS ARE ALSO SUBJECT TO OUR GENERAL TERMS AND CONDITIONS AS SET OUT IN OUR CURRENT PRICE SCHEDULE.

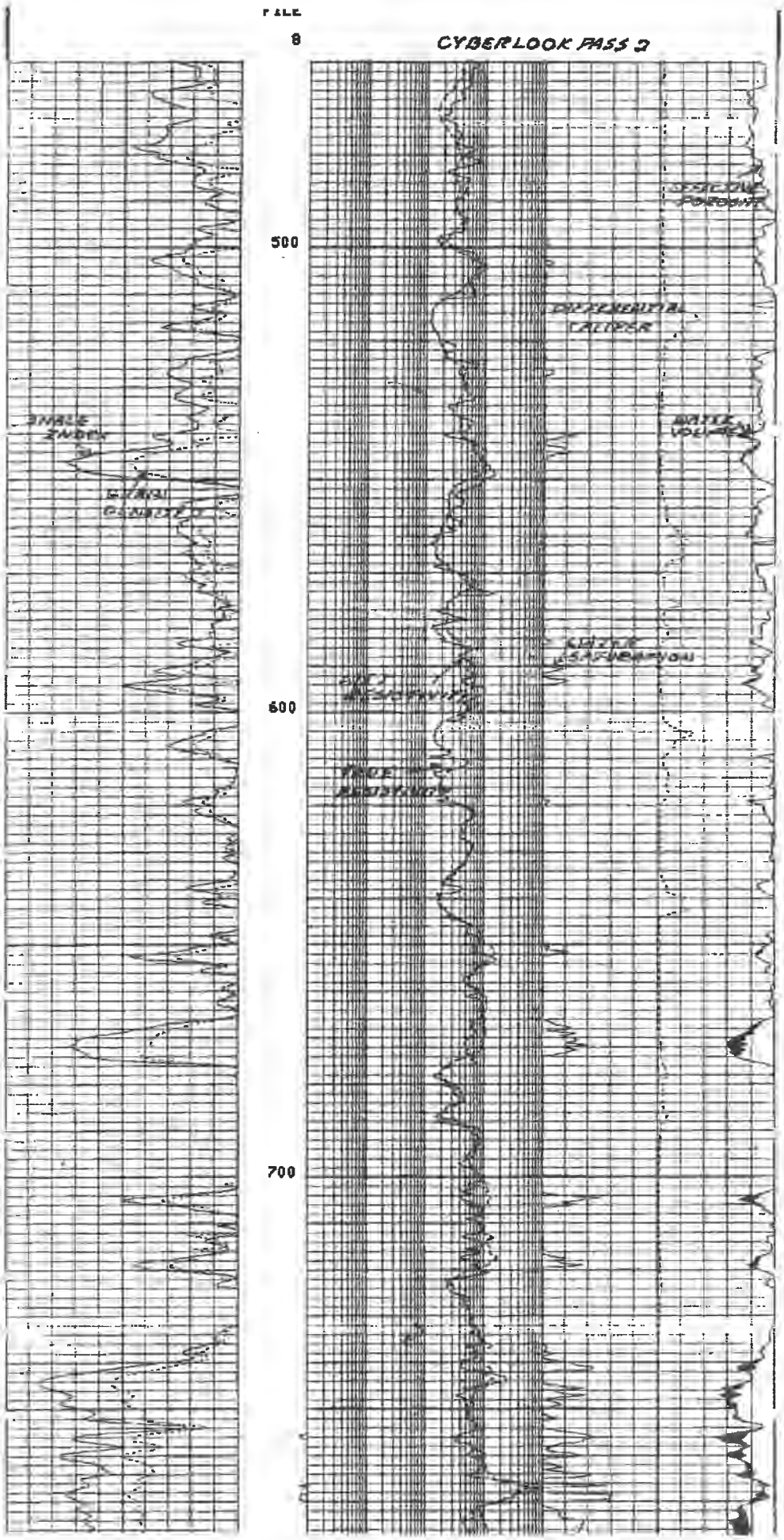
FILE

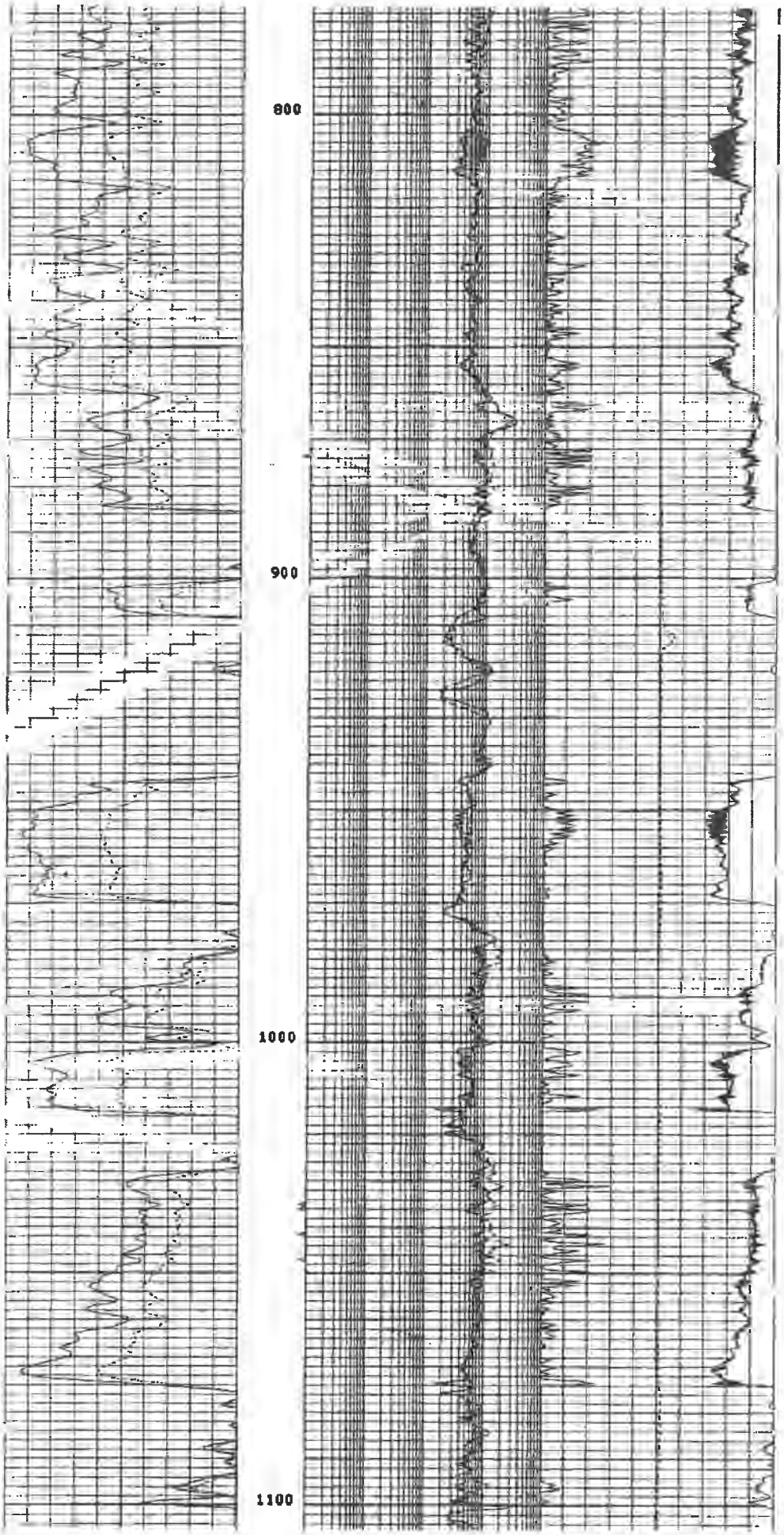
101

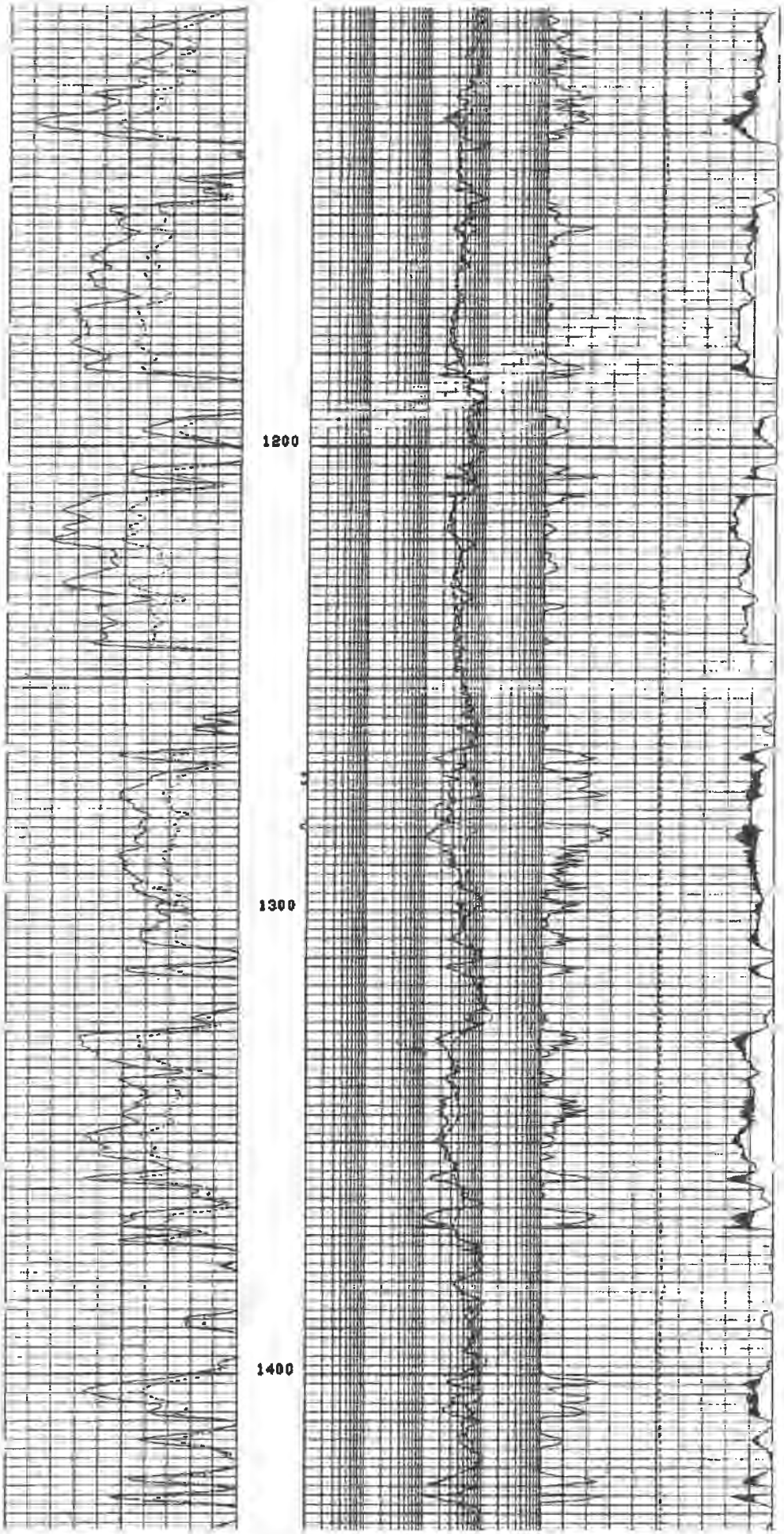
| DEPTH | $R_w$ | $R_{wa}$ | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | | | | % POROSITY | % WATER | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2130 | .05 | .20 | 18 | 160 | [illegible] | .26 | 268 | | | | | | |
| 2080 | | | | | [illegible] | .13 | 271 | | | | | | |
| 1976 | .18 | .60 | 8 | | | | | | | | | | |
| 1926 | | | 8 | 120 | 3440 | .20 | 268 | | | | | | |
| 1778 | .20 | 1.0 | | | | | | | | | | | |
| 1670 | | | 25 | 140 | | | | | | | | | |
| 1250 | .30 | | | | | | | | | | | | |
| 1050 | .30 | | | | | .30 | | | | | | | |
| 800 | | 1.2 | | | | | | | | | | | |

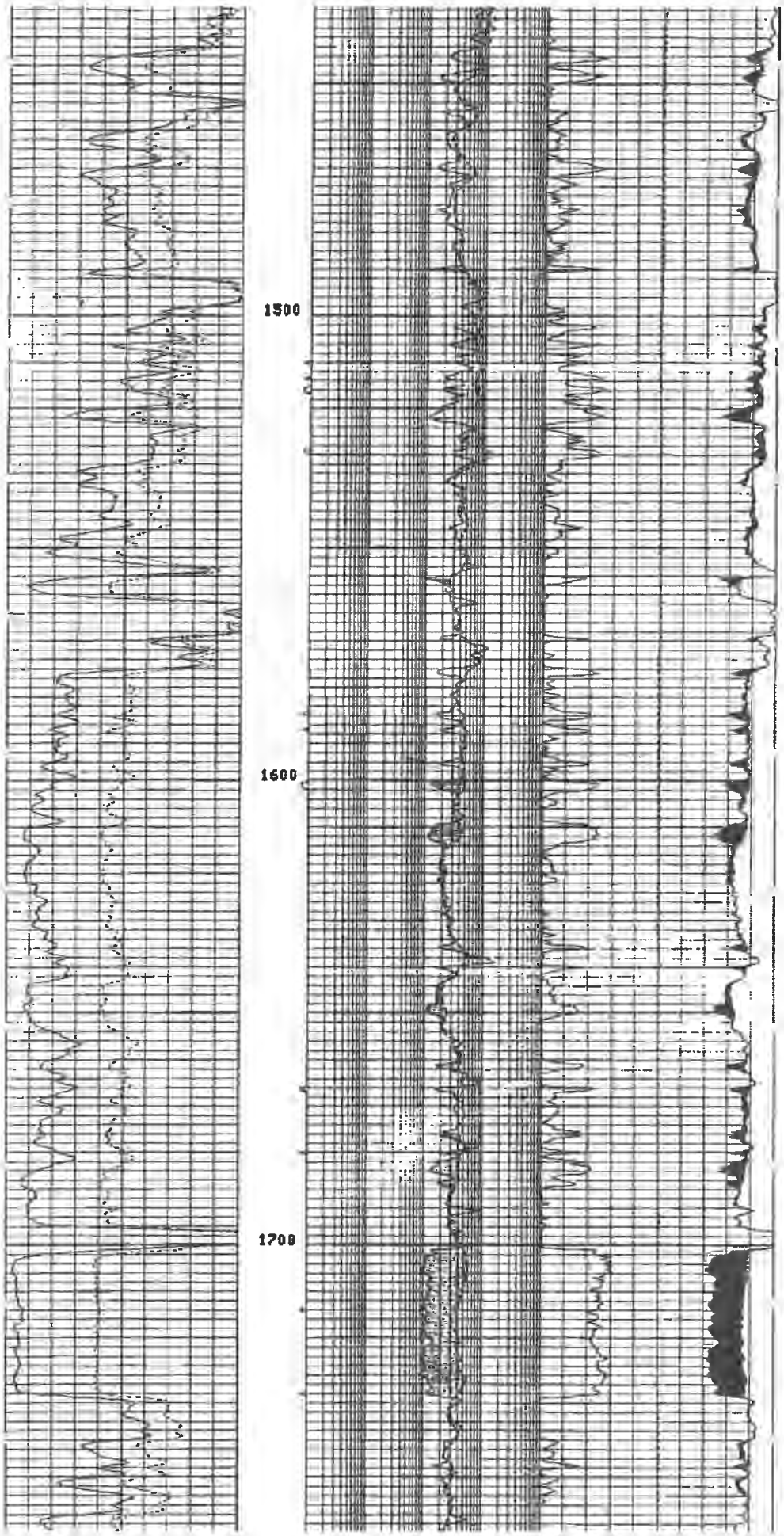
| | | |
|---|---|---|
| | | SW ( ) — 1.0000 -1.000 |
| | | DCAL(IN ) -20.00 20.000 |
| RHGF(G/C3) 2.5000 3.0000 | RO (OHMM) 0.1000 1000.0 | VW ( ) 0.5000 0.0 |
| MSI ( ) 0.1 1.0000 | RT (OHMM) 0.1000 1000.0 | PHIF( ) 0.5000 0.0 |

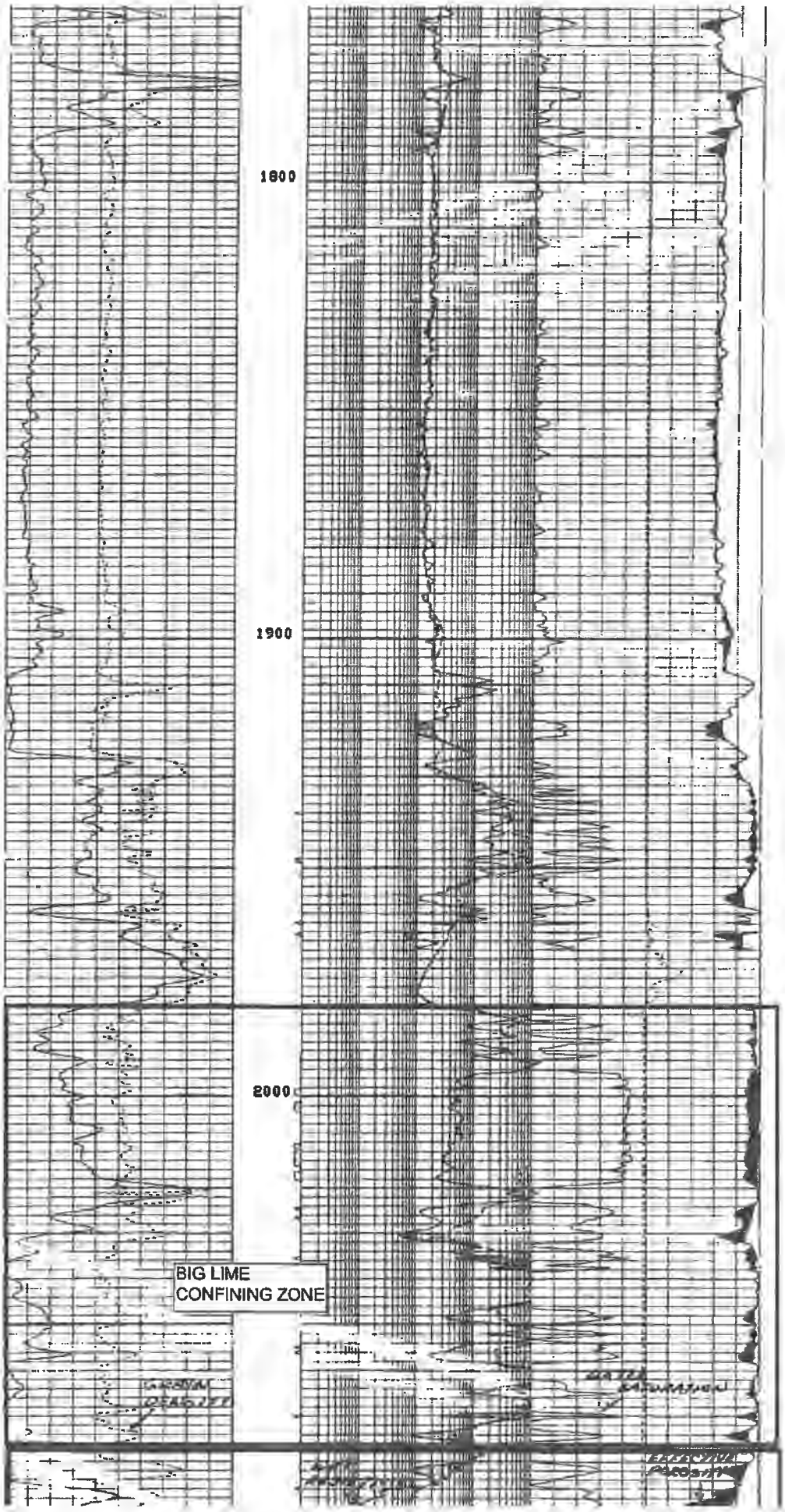
FILE

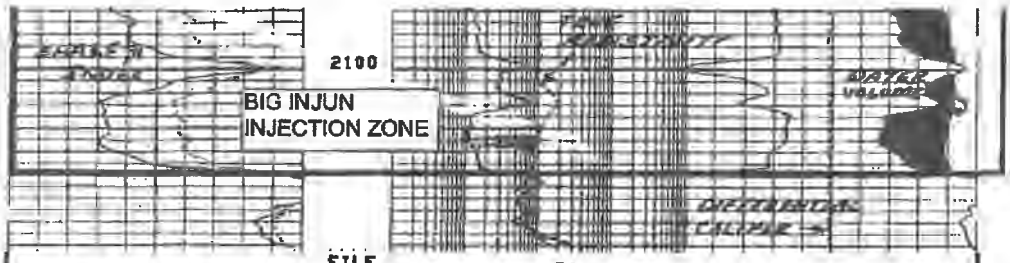

FILE
8
CYBERLOOK PASS 2
500
600
700
DIFFERENTIAL CALIPER


800
900
1000
1100


1200
1300
1400


1500
1600
1700


1800
1900
2000
BIG LIME
CONFINING ZONE




FILE 8

CYBERLOOK PASS 2

| | | | |
|---|---|---|---|
| RHGF(G/C3) 2.5000 – 3.0000 | | | SW ( ) 1.0000 – -1.000 |
| | | | DCAL(IN ) -20.00 – 20.000 |
| | | RO (OHMM) 0.1000 – 1000.0 | VW ( ) 0.5000 – 0.0 |
| MSI ( ) 0.0 – 1.0000 | | RI (OHMM) 0.1000 – 1000.0 | PHIE( ) 0.5000 – 0.0 |

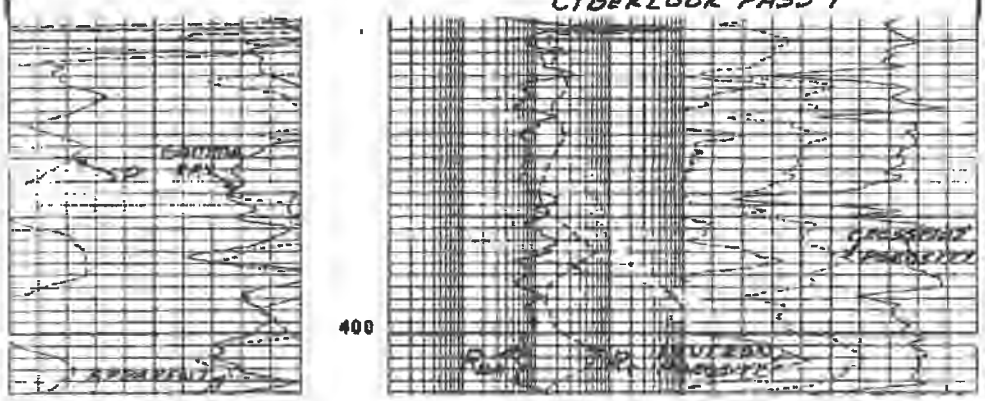
PARAMETERS

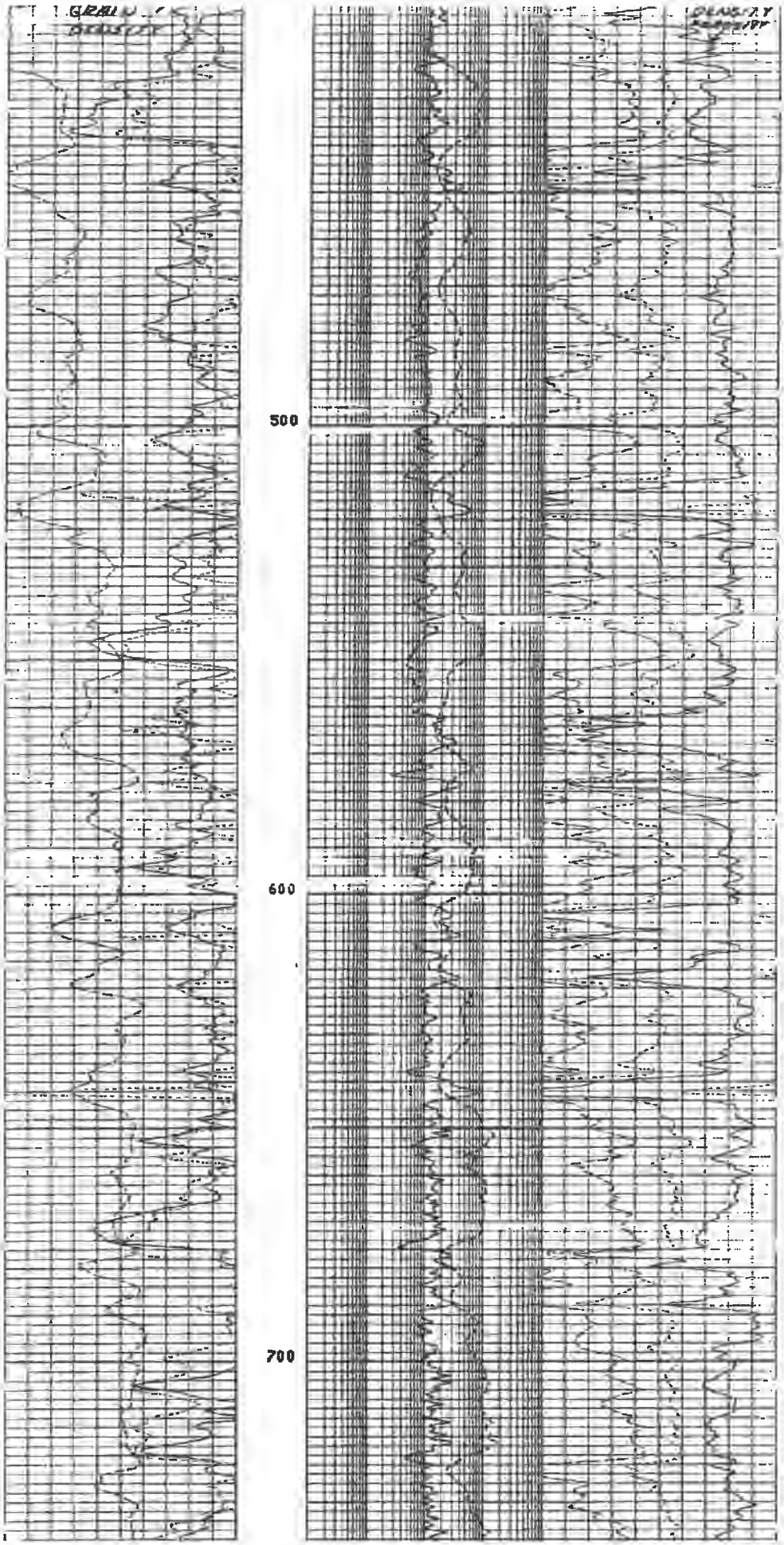
| NAME | VALUE | UNIT | NAME | VALUE | UNIT |
|---|---|---|---|---|---|
| KEXP | 1.00000 | | BS | 7.87500 | IN |
| KES | E4 | | KCON | 1.00000 | |
| GRSS | GR | | FRT | DISA | |
| UM32 | 4.77900 | | UM33 | 8.99700 | |
| UM23 | 8.99700 | | UM31 | 13.7700 | |
| UM21 | 13.7700 | | UM22 | 4.77900 | |
| RG33 | 2.87700 | | UF | 0.398000 | |
| RG31 | 2.71000 | | RG32 | 2.64400 | |
| RG22 | 2.64400 | | RG23 | 2.87700 | |
| LDTA | ABSE | | RG21 | 2.71000 | |
| SDGC | DGCN | | SIS | NONE | |
| TPML | 9.80000 | | NMLA | ABSE | |
| DLLM | 0.350000 | | GULM | 999.000 | GAPI |
| MDET | NEIT | | NLIM | 0.010000 | |
| FRTC | NONE | | LSWB | DISA | |
| GDCL | 0.0 | G/C3 | GDSH | 2.90000 | G/C3 |
| TPFM | 7.20000 | NS/M | DRUL | 0.350000 | G/C3 |
| TPSM | 7.20000 | NS/M | TPDM | 8.70000 | NS/M |
| FEPT | NONE | | FESX | DISA | |
| FCAL | PRES | | POUT | SAND | |
| RWF | 0.050000 | OHMM | RWB | 0.230000 | OHMM |
| NPCL | 0.0 | | NPSH | 0.500000 | |
| SPCL | -200.000 | MV | SPSH | 0.0 | MV |
| GRCL | 15.0000 | GAPI | GRSH | 160.000 | GAPI |
| NGSI | NEIT | | PMAX | 0.260000 | |
| WMUD | 8.40000 | LB/G | SINP | GR | |
| SONI | PRES | | RXOF | PRES | |
| HC | CALI | | RTLF | DISA | |
| PSNR | 9320. | CPS | MATR | SAND | |
| MDEN | 2.68000 | G/C3 | FD | 1.00000 | G/C3 |
| BHS | OPEN | | FPHI | PHIX | |
| DO | 0.0 | F | | | |

| | | | |
|---|---|---|---|
| RHGA(G/C3) 2.5000 – 3.0000 | | | PHIA( ) 0.4000 – -0.100 |
| SP (MV ) -80.00 – 20.000 | | RFA (OHMM) 0.0100 – 100.00 | DPHI( ) 0.4000 – -0.100 |
| GR (GAPI) 0.0 – 150.00 | | RI (OHMM) 0.1000 – 1000.0 | NPHI( ) 0.4000 – -0.100 |

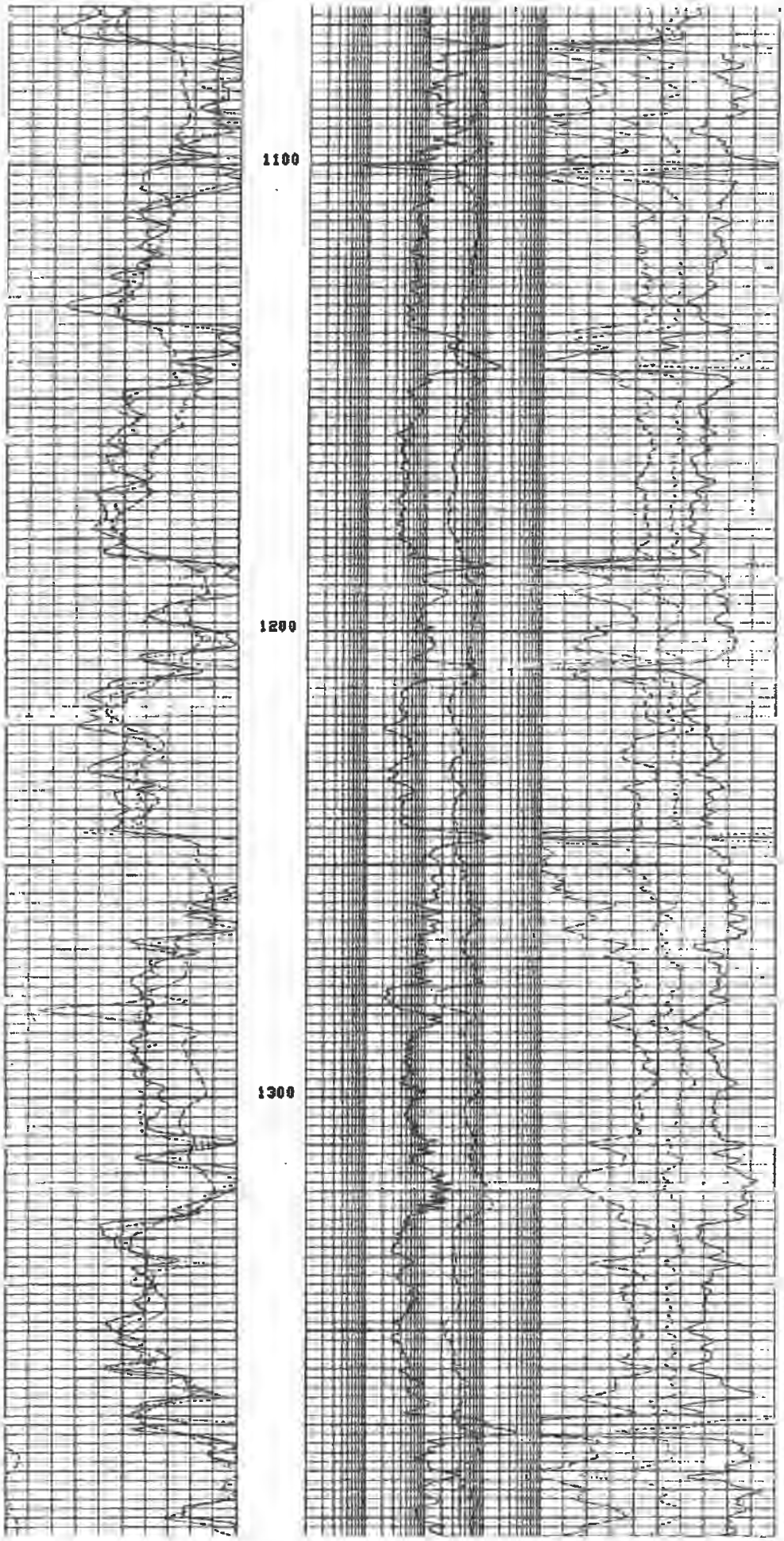
FILE 8

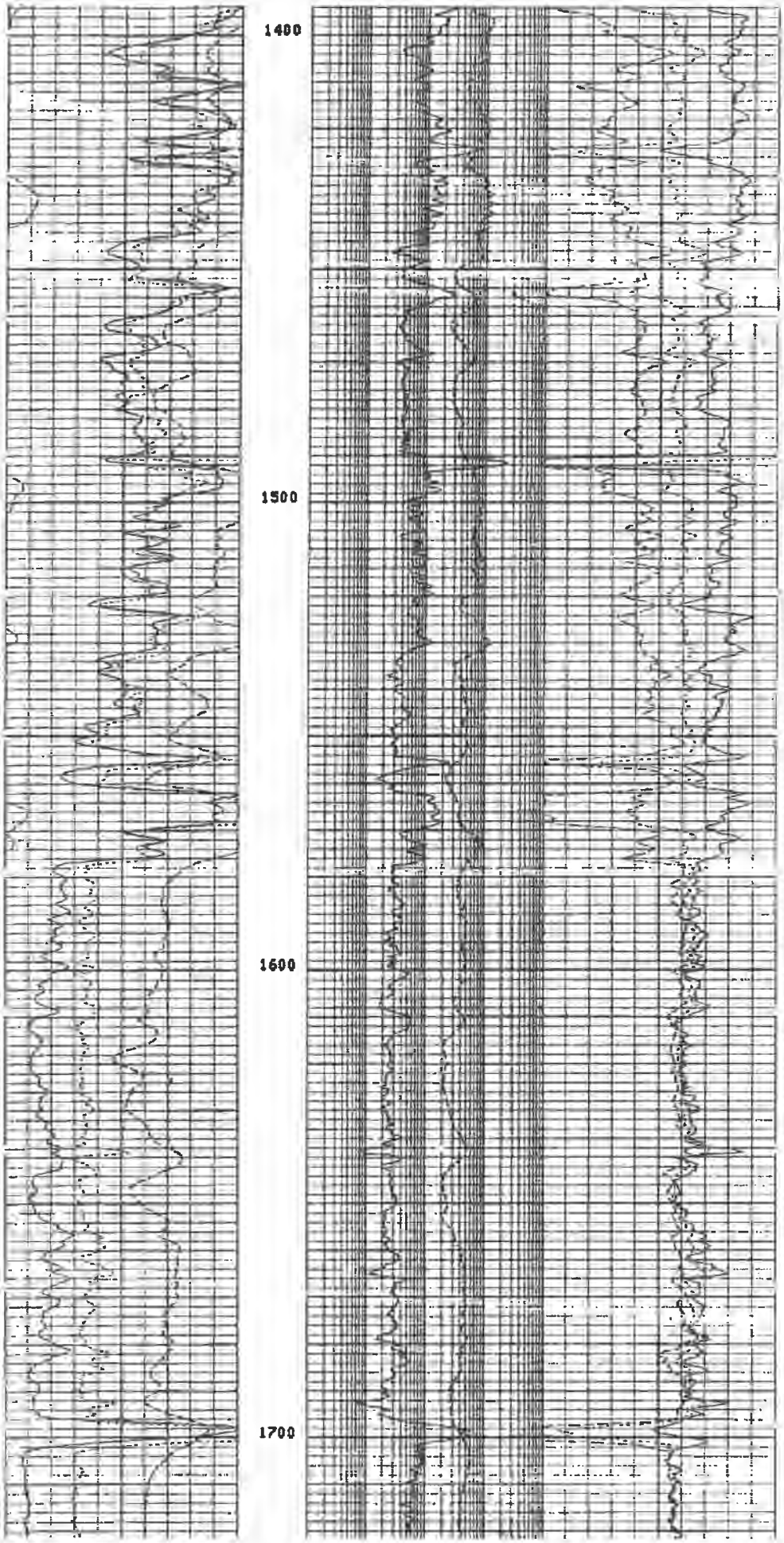
CYBERLOOK PASS 1

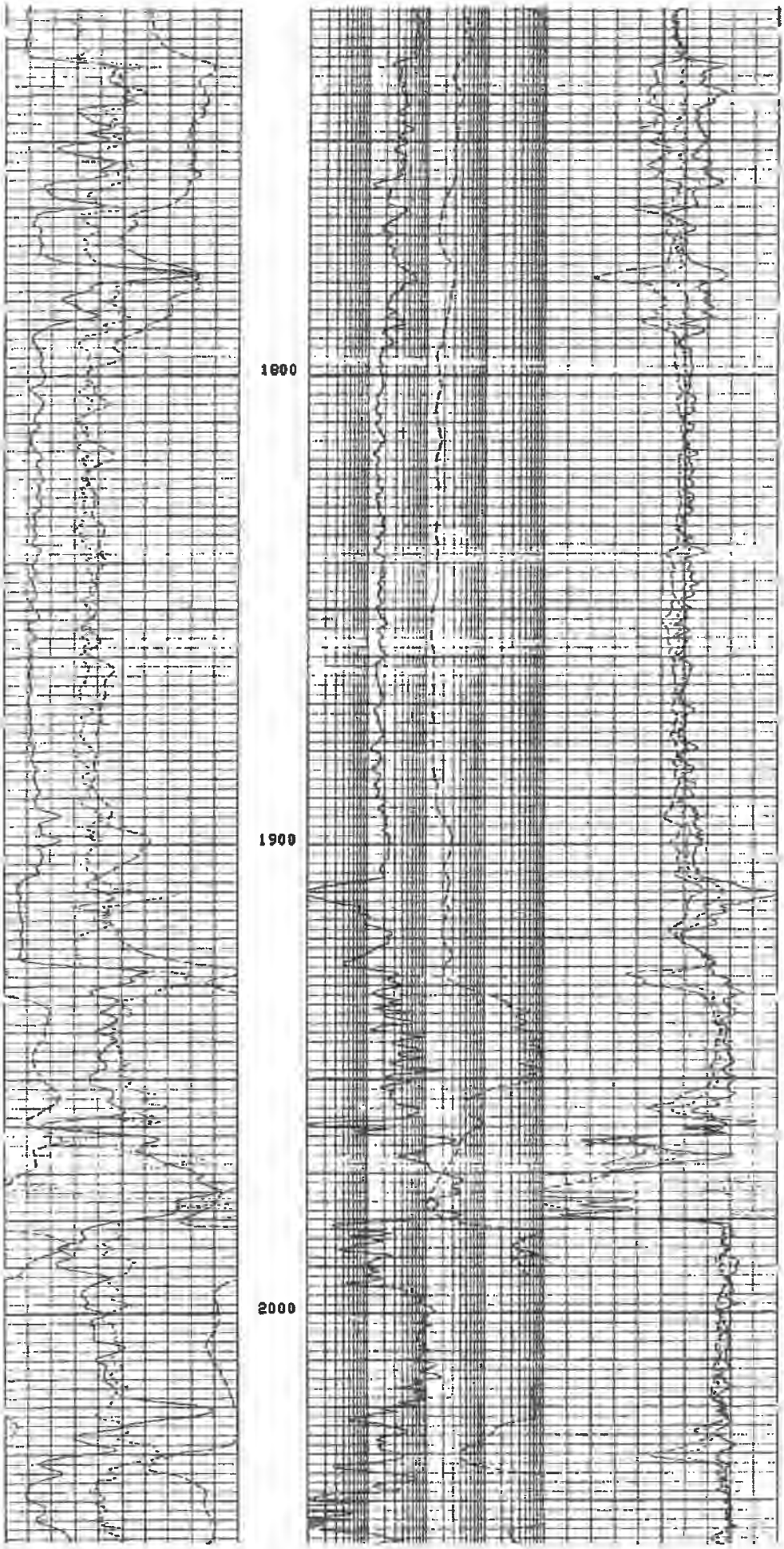


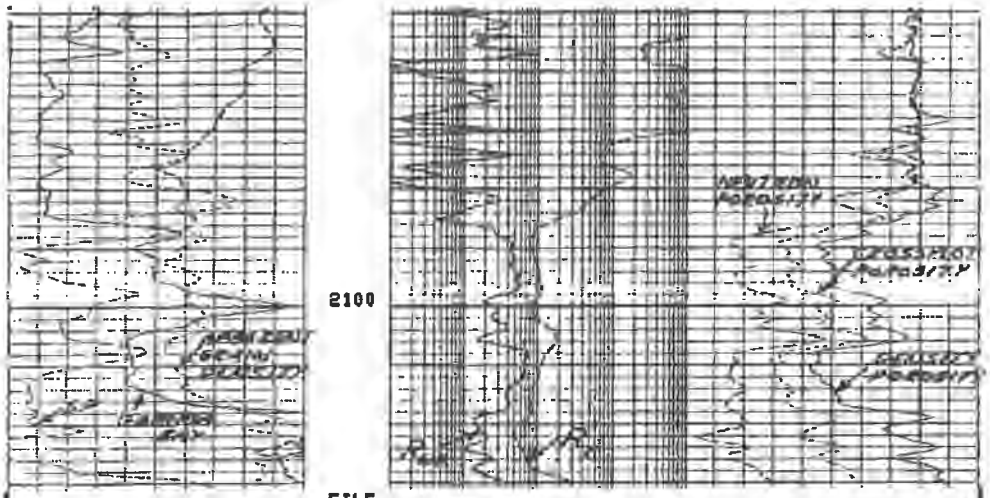

500
600
700

800
900
1000


1100
1200
1300


1400
1500
1600
1700


1800
1900
2000




| | | |
|---|---|---|
| RHGA(G/C3) 2.5000 3.0000 | | PHIA( ) 0.4000 -0.100 |
| SP (MV ) -80.00 20.000 | RFA (OHMM) 0.0100 100.00 | DPHI( ) 0.4000 -0.100 |
| GR (GAPI) 0.0 150.00 | RT (OHMM) 0.1000 1000.0 | NPHI( ) 0.4000 -0.100 |

PARAMETERS

| NAME | VALUE | UNIT | NAME | VALUE | UNIT |
|---|---|---|---|---|---|
| KEXP | 1.00000 | | BS | 7.87500 | IN |
| KES | E4 | | KCON | 1.00000 | |
| GRSS | GR | | FRT | DISA | |
| UM32 | 4.77900 | | UM33 | 8.99700 | |
| UM23 | 8.99700 | | UM31 | 13.7700 | |
| UM21 | 13.7700 | | UM22 | 4.77900 | |
| RG33 | 2.87700 | | UF | 0.398000 | |
| RG31 | 2.71000 | | RG32 | 2.64400 | |
| RG22 | 2.64400 | | RG23 | 2.87700 | |
| LDTA | ABSE | | RG21 | 2.71000 | |
| SDGC | DGCN | | SIS | NONE | |
| TPML | 9.80000 | | NMLA | ABSE | |
| DLLM | 0.350000 | | GULM | 999.000 | GAPI |
| MDET | NEIT | | NLIM | 0.010000 | |
| FRTC | NONE | | LSWB | DISA | |
| GDCL | 0.0 | G/C3 | GDSH | 2.90000 | G/C3 |
| TPFM | 7.20000 | NS/M | DRUL | 0.350000 | G/C3 |
| TPSM | 7.20000 | NS/M | TPDM | 8.70000 | NS/M |
| FEPT | NONE | | FESX | DISA | |
| FCAL | PRES | | POUT | SAND | |
| RWF | 0.050000 | OHMM | RWB | 0.230000 | OHMM |
| NPCL | 0.0 | | NPSH | 0.500000 | |
| SPCL | -200.000 | MV | SPSH | 0.0 | MV |
| GRCL | 15.0000 | GAPI | GRSH | 160.000 | GAPI |
| NGSI | NEIT | | PMAX | 0.260000 | |
| WMUD | 8.40000 | LB/G | SIMP | GR | |
| SONI | PRES | | RXOF | PRES | |
| HC | CALI | | RTLF | DISA | |
| PSNR | 8320. | CPS | MATR | SAND | |
| MDEN | 2.68000 | G/C3 | FD | 1.00000 | G/C3 |
| BHS | OPEN | | FPHI | PHIX | |
| DO | 0.0 | F | | | |