



**Weatherford**<sup>®</sup>

**ARRAY INDUCTION  
SHALLOW FOCUSED  
ELECTRIC LOG**

COMPANY **SHAKESPEARE OIL CO., INC.**  
 WELL **JANZEN 1-34**  
 FIELD **WILDCAT**  
 PROVINCE/COUNTY **SCOTT**  
 COUNTRY/STATE **U.S.A. / KANSAS**  
 LOCATION **1363' FNL & 339' FEL  
NW NE SE NE**

SEC **34** TWP **16S** RGE **34W** Other Services **MML**  
 API Number **15-171-20956** MPD/MDN **MSS**  
 Permit Number **Permanent Datum GL, Elevation 3119 feet**  
 Log Measured From **KB**  
 Drilling Measured From **KB @ 7 FEET**

|                        |              |                |  |
|------------------------|--------------|----------------|--|
| Date                   | 14-JUL-2013  | Elevations:    | KB 3126.00<br>DF 3124.00<br>GL 3119.00 |
| Run Number             | ONE          |                |  |
| Service Order          | 3541023      |                |  |
| Depth Driller          | 4895.00      | feet           |  |
| Depth Logger           | 4892.00      | feet           |  |
| First Reading          | 4889.00      | feet           |  |
| Last Reading           | 263.00       | feet           |  |
| Casing Driller         | 267.00       | feet           |  |
| Casing Logger          | 263.00       | feet           |  |
| Bit Size               | 7.875        | inches         |  |
| Hole Fluid Type        | CHEM         |                |  |
| Density / Viscosity    | 9.30 lb/USg  | 49.00 CP       |  |
| PH / Fluid Loss        | 10.50        | 12.00 ml/30Min |  |
| Sample Source          | FLOW LINE    |                |  |
| Rm @ Measured Temp     | 0.53 @ 85.0  | ohm-m          |  |
| Rmf @ Measured Temp    | 0.42 @ 85.0  | ohm-m          |  |
| Rmc @ Measured Temp    | 0.62 @ 85.0  | ohm-m          |  |
| Source Rmf / Rmc       | CALC         | CALC           |  |
| Rm @ BHT               | 0.38 @ 116.0 | ohm-m          |  |
| Time Since Circulation | 5 HRS        |                |  |
| Max Recorded Temp      | 116.00       | deg F          |  |
| Equipment / Base       | 13057        | LB             |  |
| Recorded By            | D. COLE      |                |  |
| Witnessed By           | S. DAVIS     |                |  |
| JOB #                  | LB 13-202    |                |  |

**BOREHOLE RECORD**

Last Edited: 13-JUL-2013 23:32

|                    |                    |                  |
|--------------------|--------------------|------------------|
| Bit Size<br>inches | Depth From<br>feet | Depth To<br>feet |
| 7.875              | 267.00             | 4895.00          |

**CASING RECORD**

|         |                |                    |                    |                     |
|---------|----------------|--------------------|--------------------|---------------------|
| Type    | Size<br>inches | Depth From<br>feet | Shoe Depth<br>feet | Weight<br>pounds/ft |
| SURFACE | 8.625          | 0.00               | 267.00             | 24.00               |

**REMARKS**

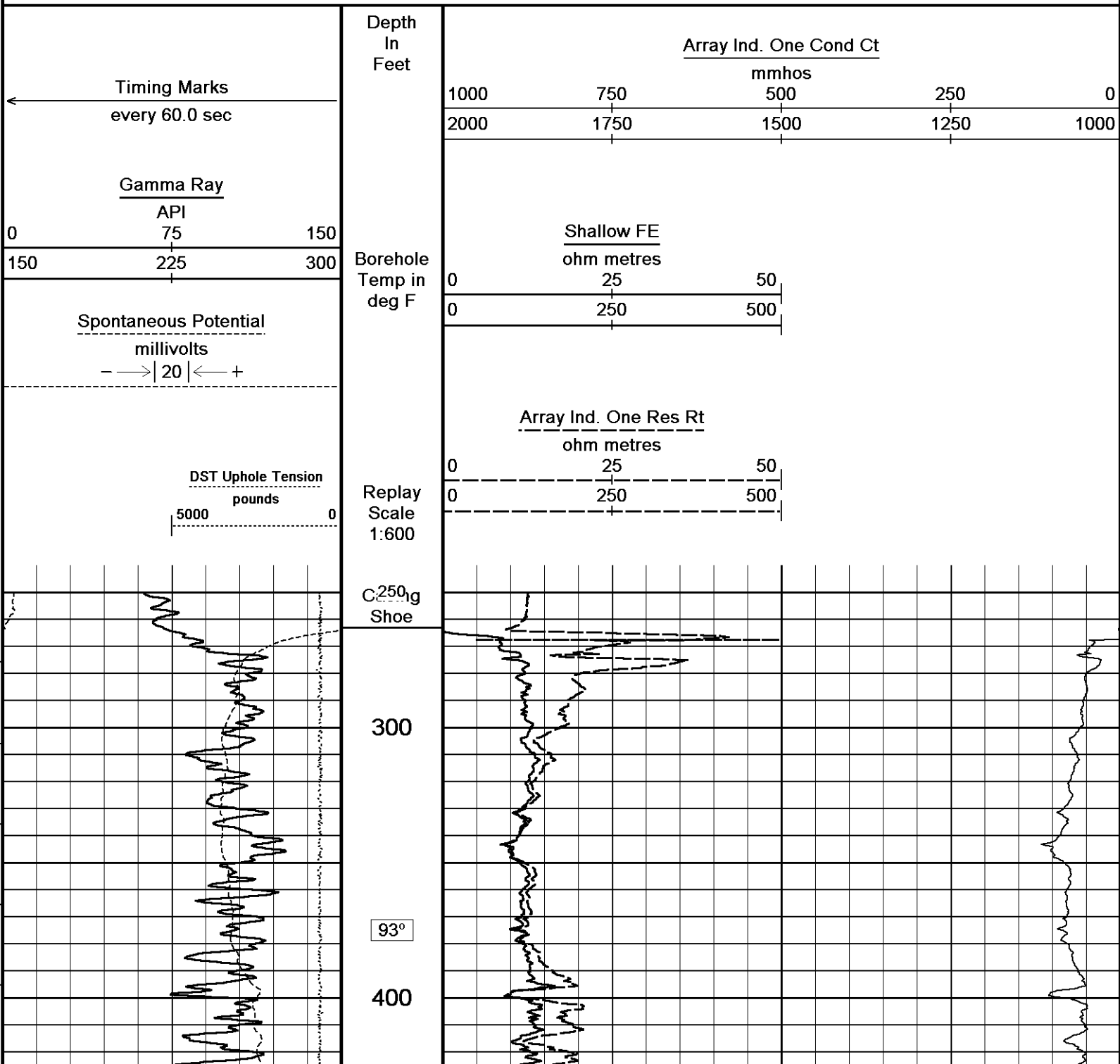
- SOFTWARE ISSUE: WLS 13.05.9583.
- MCG, MML, MDN, MPD, MFE, MSS, MAI RUN IN COMBINATION.
  - HARDWARE: DUAL BOWSPRING USED ON MDN.
  - 0.5 INCH STANDOFF USED ON MFE.
  - TWO 0.5 INCH STANDOFFS USED ON MSS.
  - 0.5 INCH STANDOFF USED ON MAI.
- 2.71 G/CC LIMESTONE DENSITY MATRIX USED TO CALCULATE POROSITY.
- BOREHOLE RUGOSITY, TIGHT PULLS, AND WASHOUTS WILL AFFECT DATA QUALITY.
- ALL INTERVALS LOGGED AND SCALED PER CUSTOMER'S REQUEST.
- TOTAL HOLE VOLUME FROM TD TO SURFACE CASING: 2320 CU. FT.
- ANNULAR HOLE VOLUME WITH 5.5 INCH CASING FROM TD TO SURFACE CASING: 1570 CU. FT.

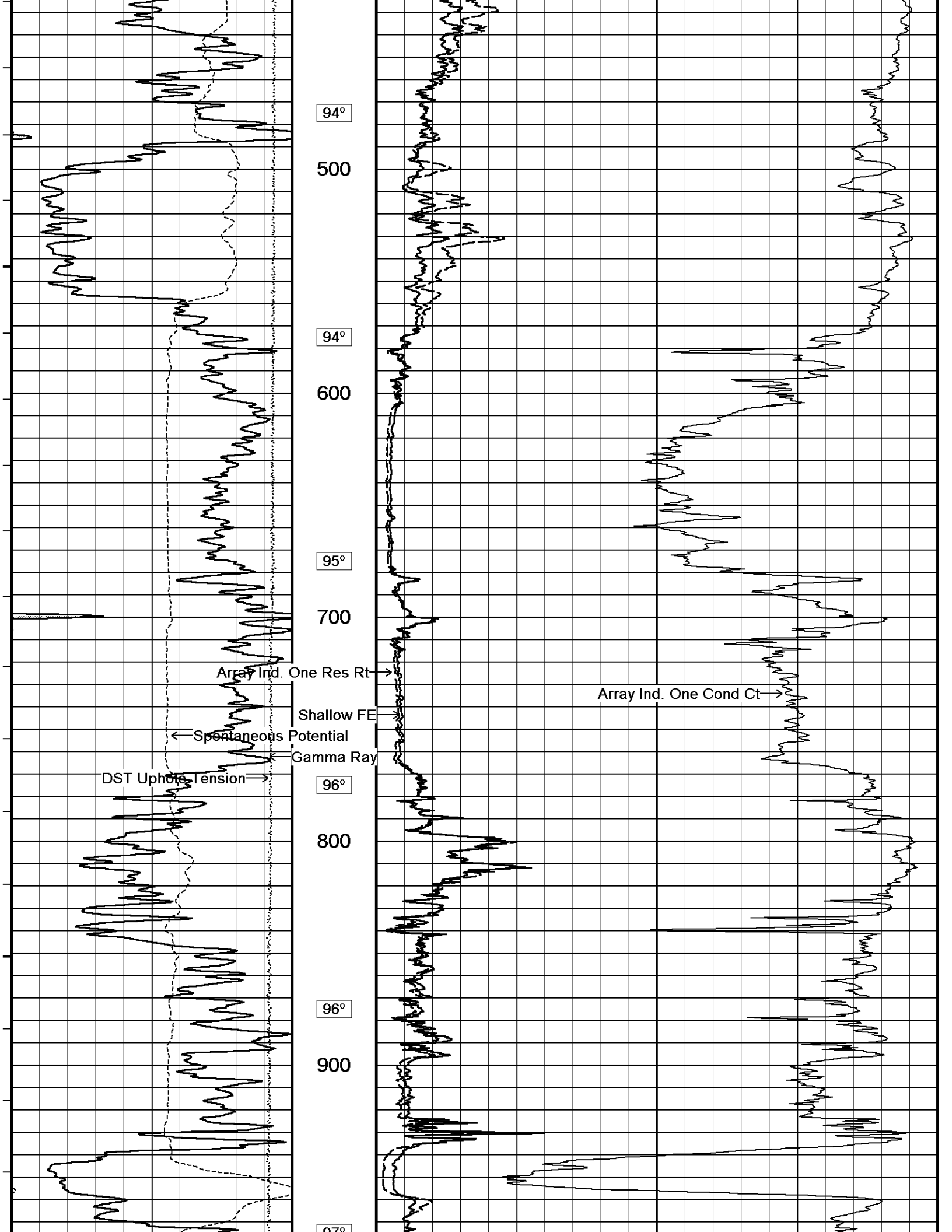
- RIG: HD DRILLING #3  
 - ENGINEER: D. COLE  
 - OPERATOR(S): J. LAPOINT ,C. REMIREZ

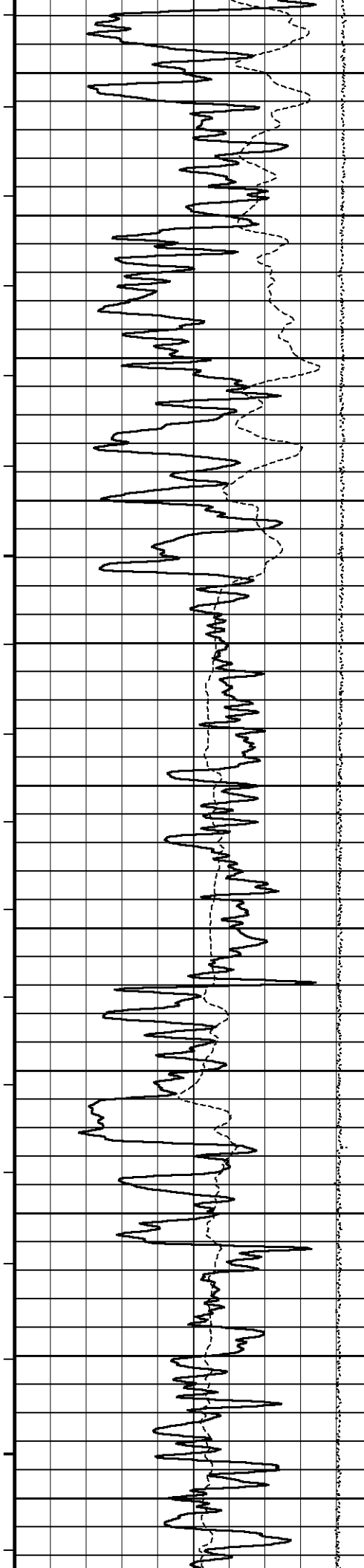
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not, guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, costs, 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 our general terms and conditions in our price schedule.

**2 INCH MAIN**

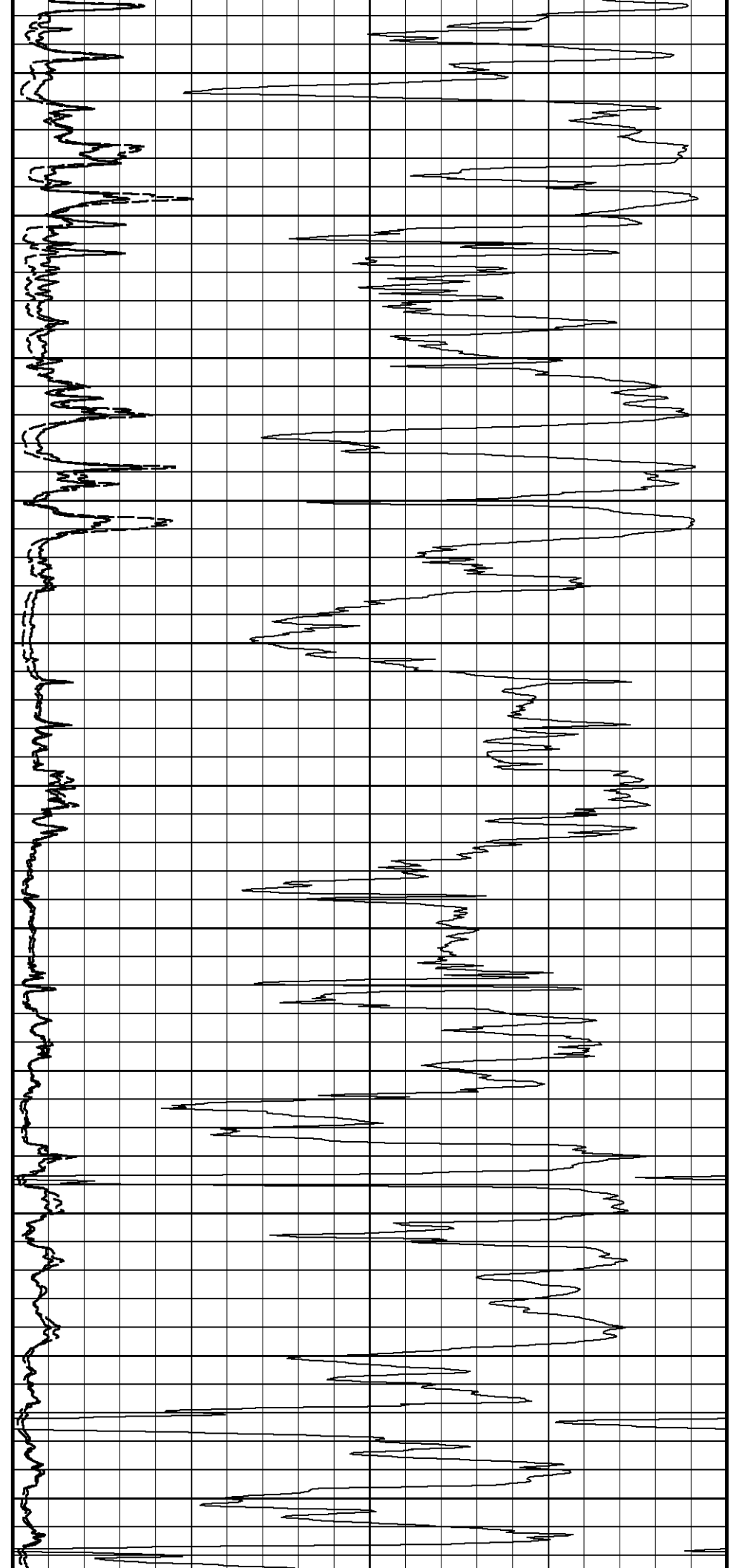
Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 14-JUL-2013 06:02  
 Filename: C:\Minimus 13.05.9583\Logs\Shakespeare Janzen 1-34\COPY of Janzen 1-34 MAIN5.dta Recorded on 14-JUL-2013 04:37  
 System Versions: Plotted with 13.05.9583

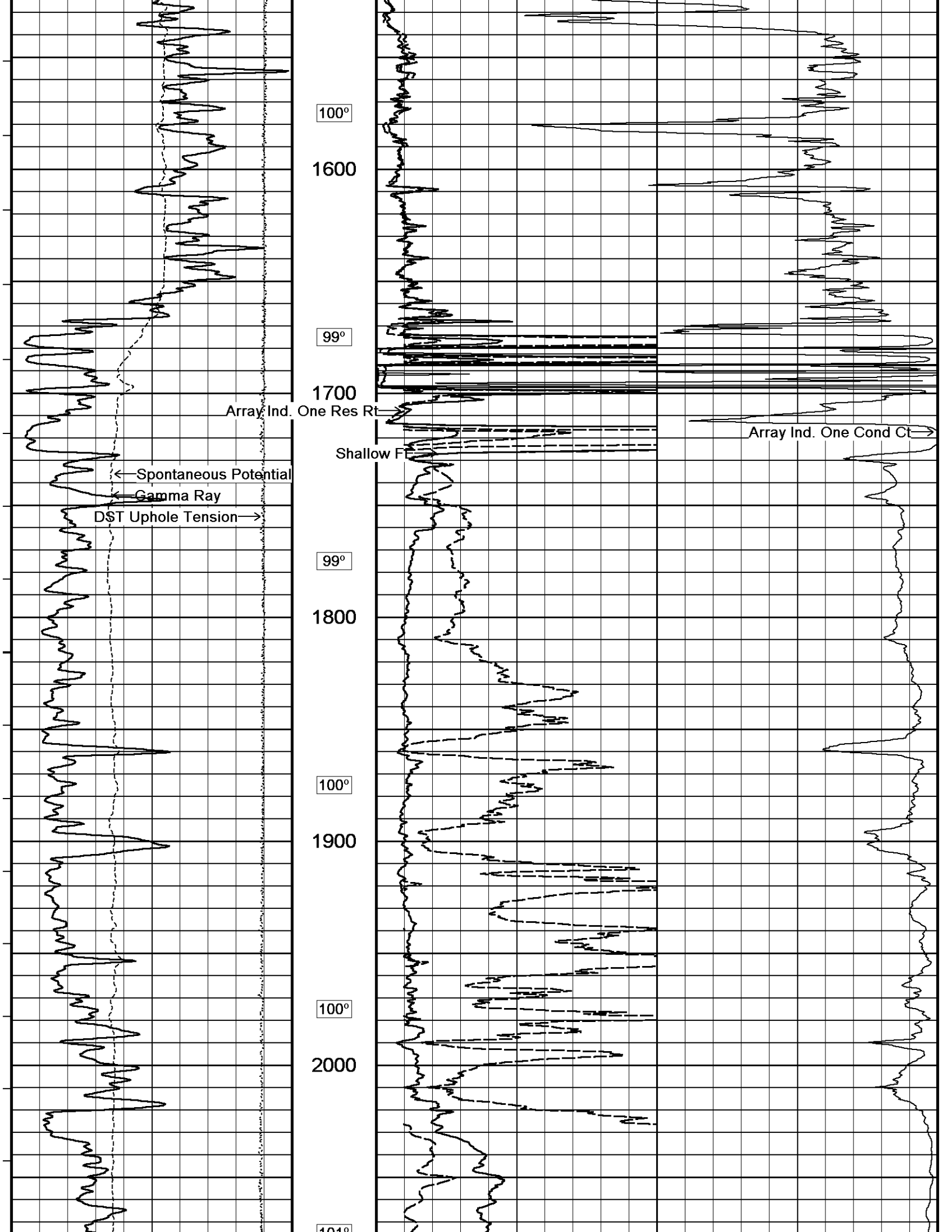


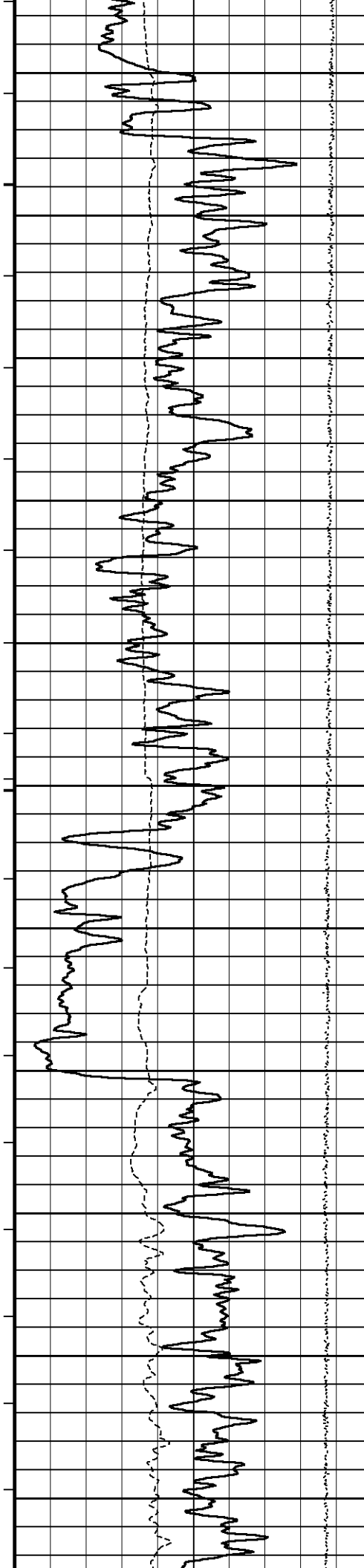




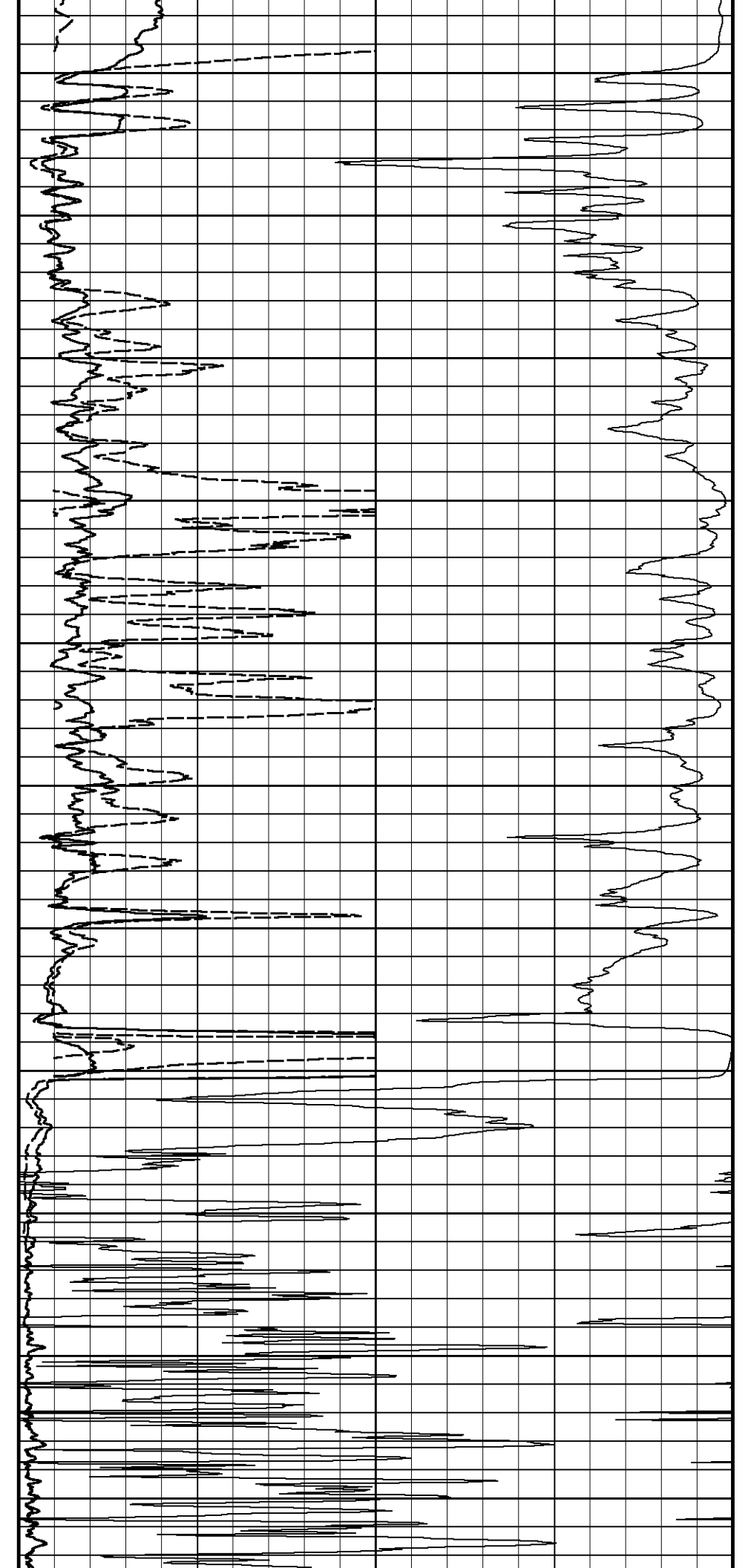
97°  
1000  
97°  
1100  
98°  
1200  
99°  
1300  
99°  
1400  
100°  
1500

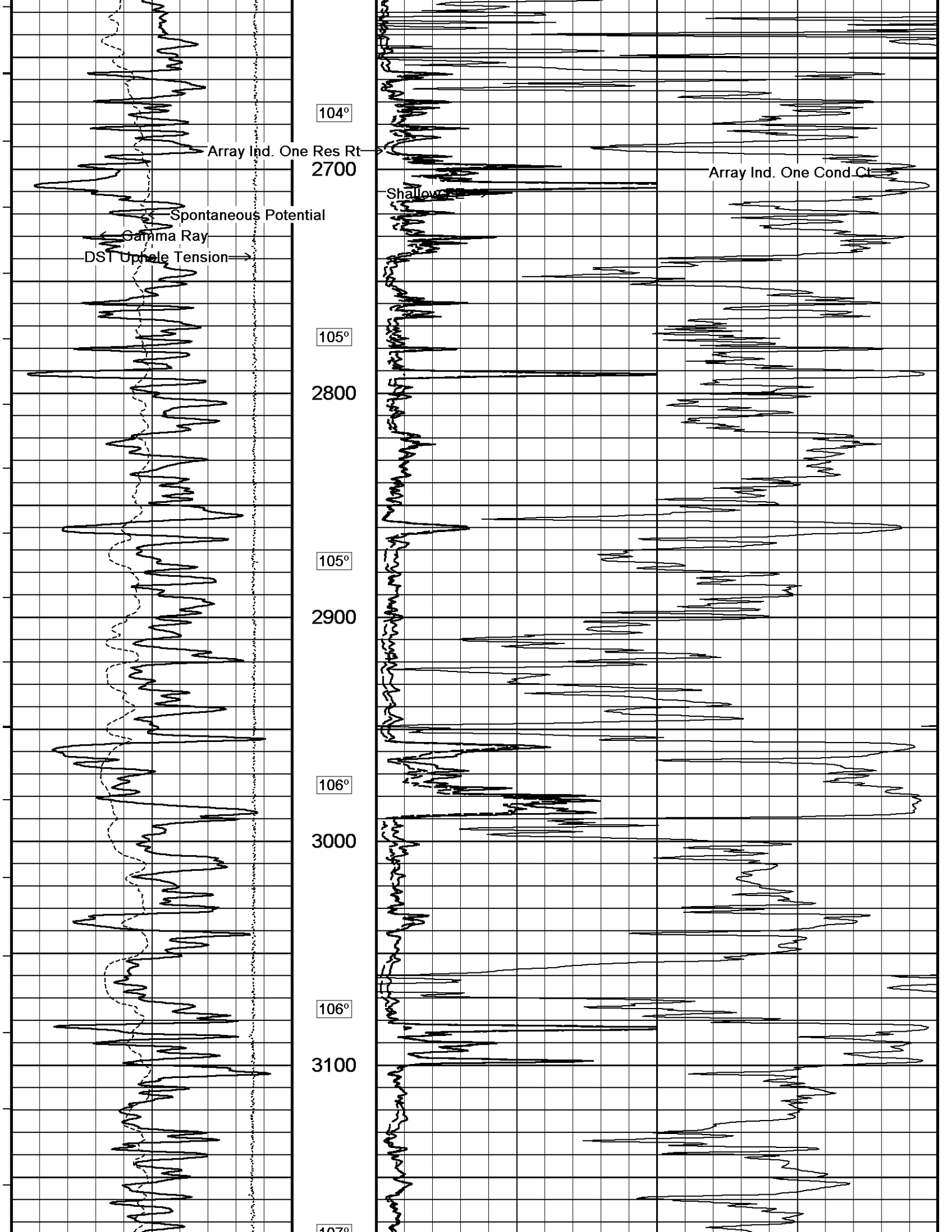


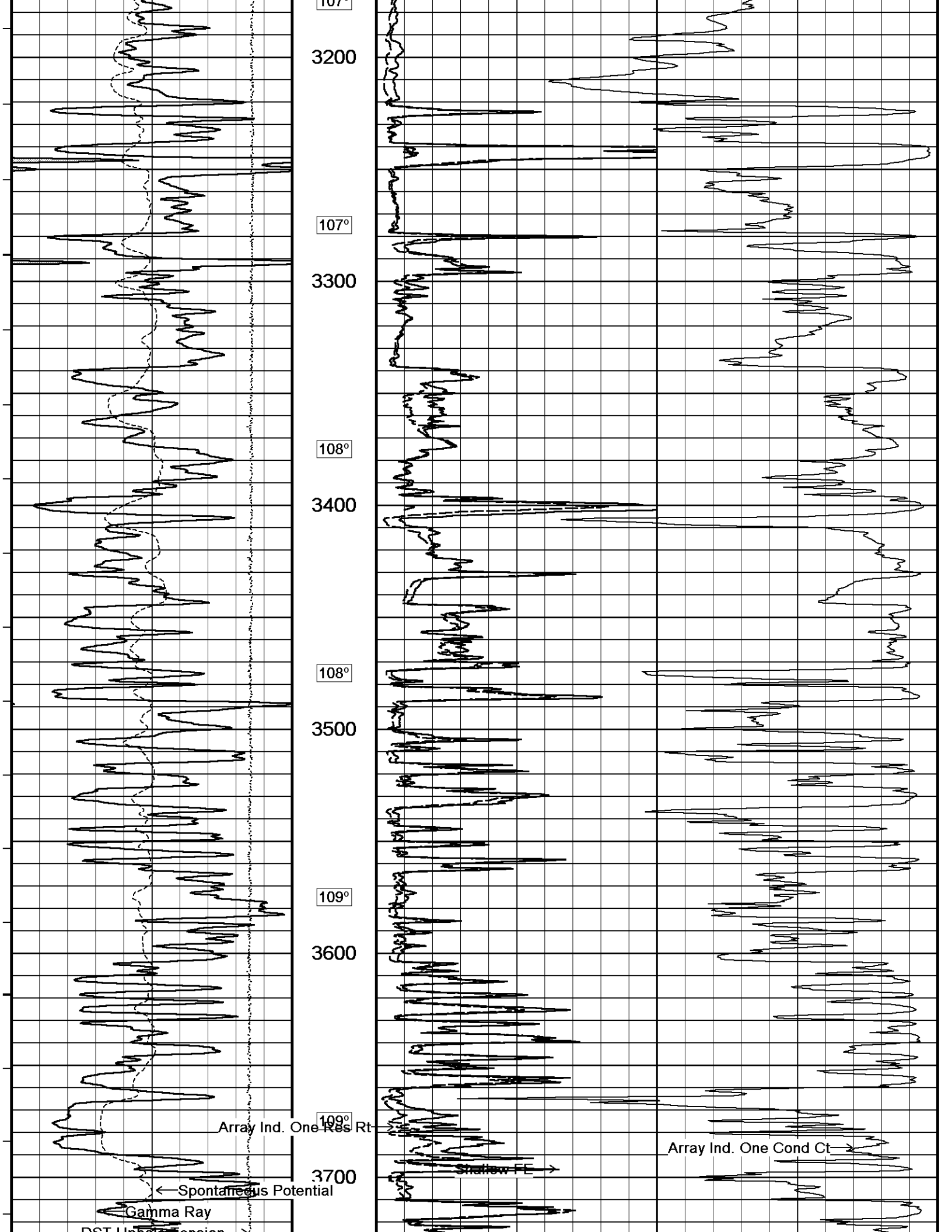




101°  
2100  
101°  
2200  
102°  
2300  
104°  
2400  
104°  
2500  
104°  
2600

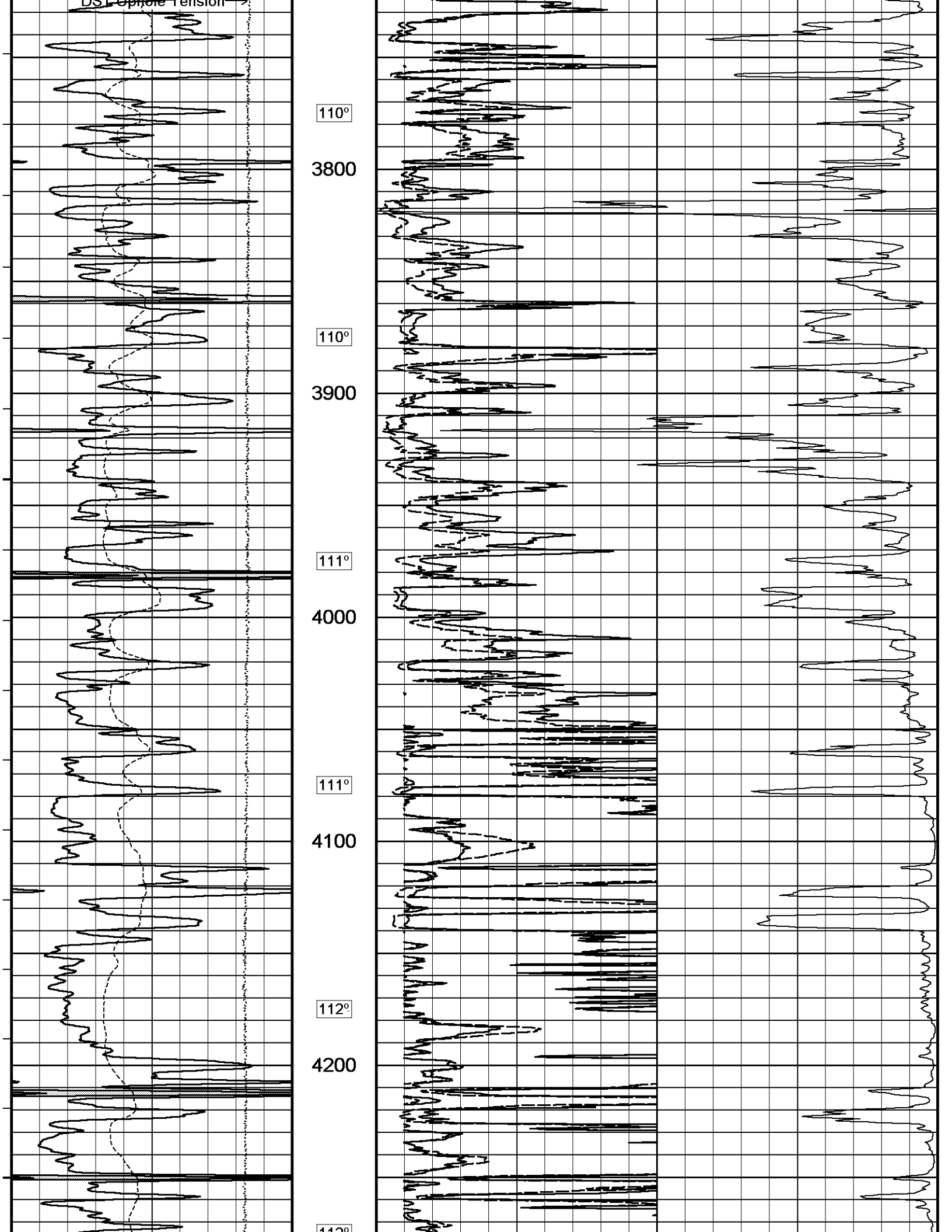


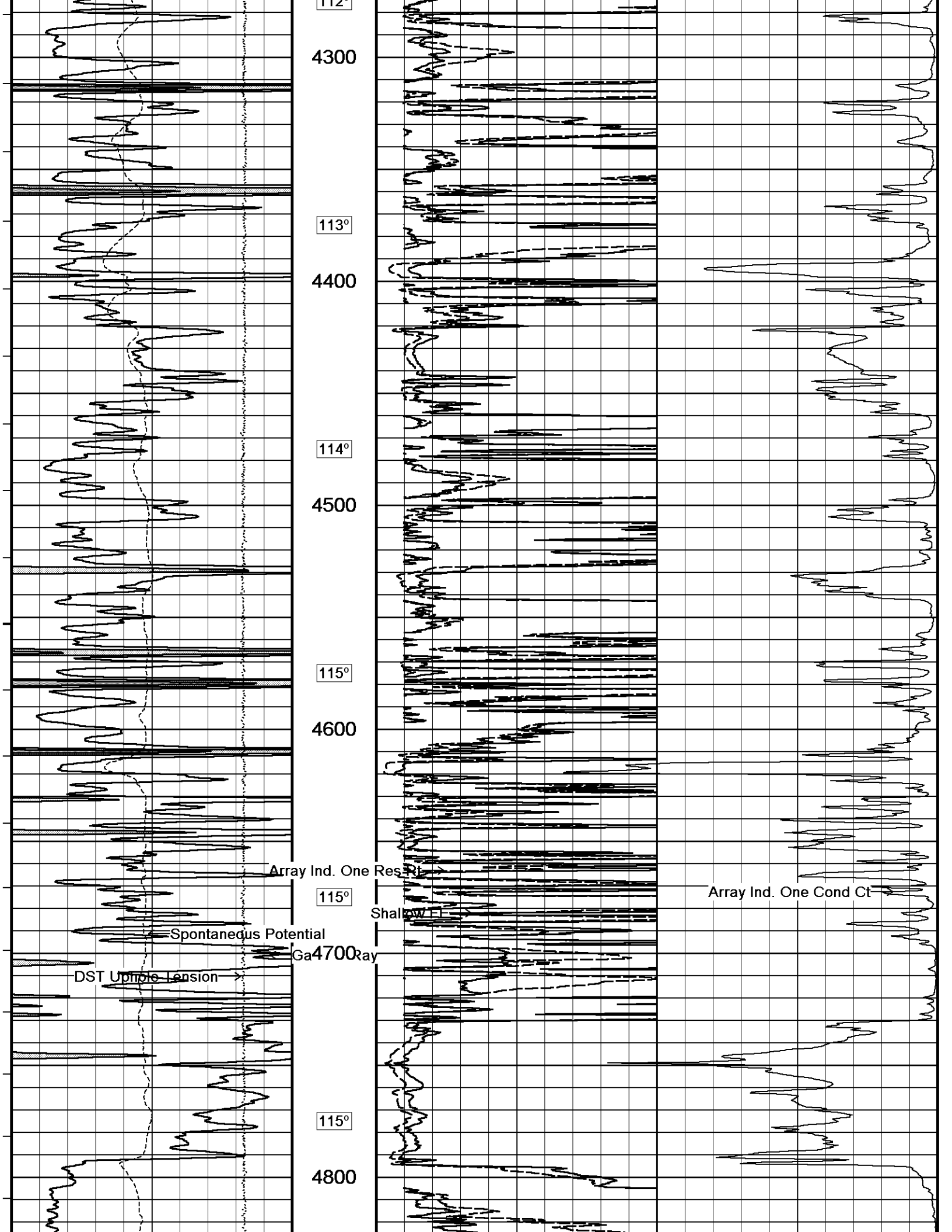


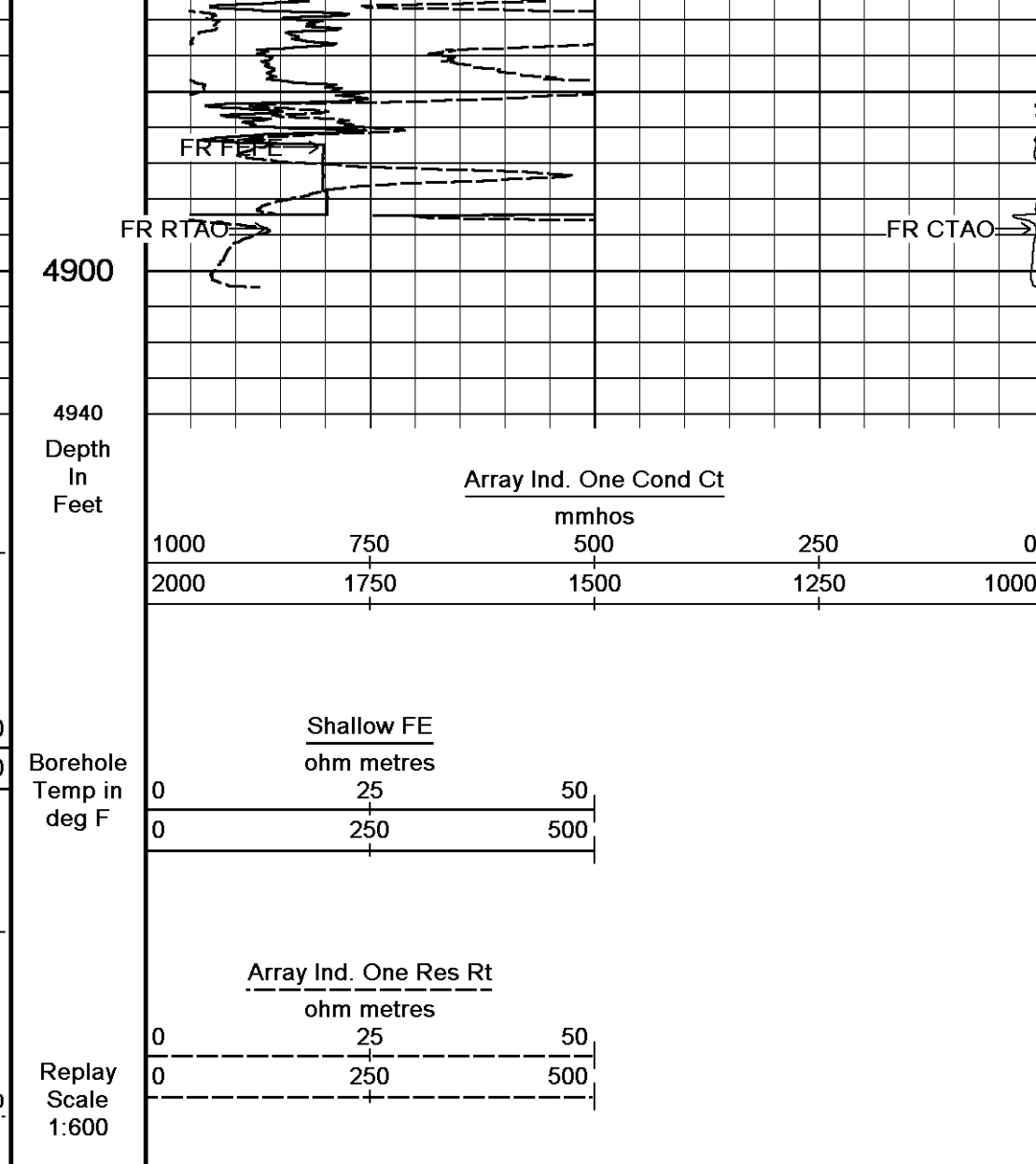
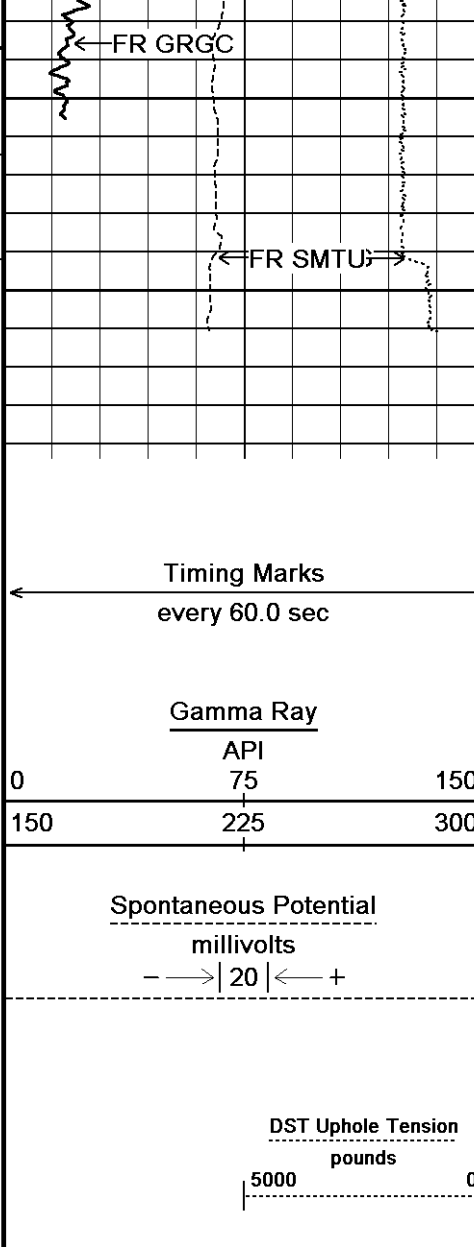




DSL Upflow Tension





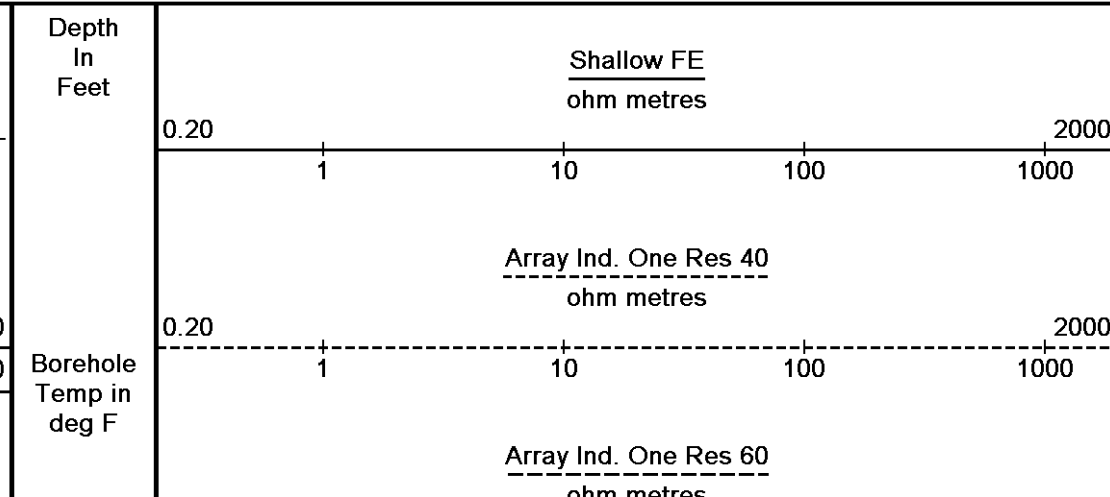
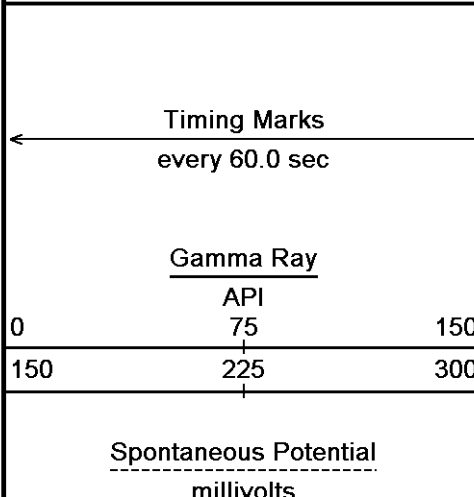


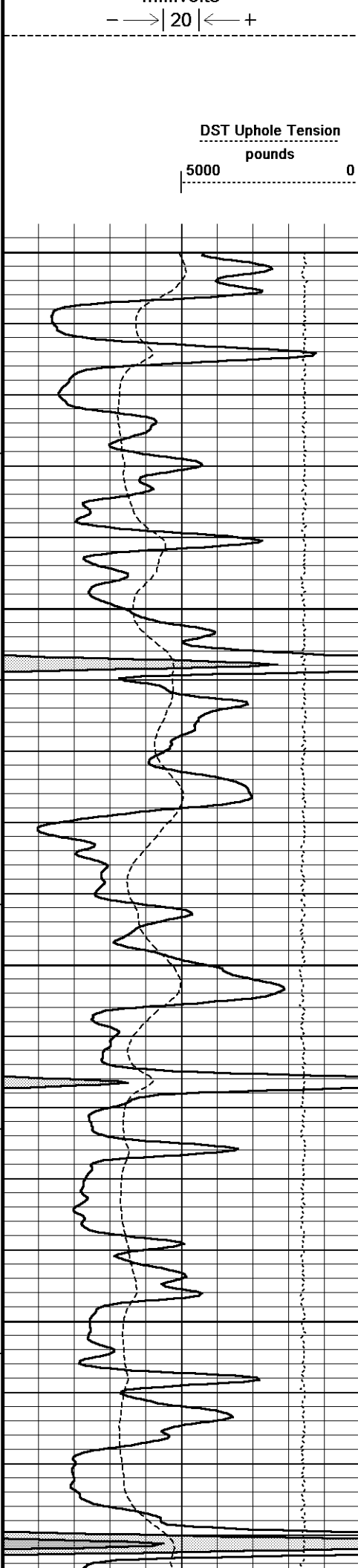
Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 14-JUL-2013 06:02  
 Filename: C:\Minimus 13.05.9583\Logs\Shakespeare Janzen 1-34\Copy of Janzen 1-34 MAIN5.dta Recorded on 14-JUL-2013 04:37  
 System Versions: Plotted with 13.05.9583

↑ 2 INCH MAIN ↑

↓ 5 INCH MAIN ↓

Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 14-JUL-2013 06:02  
 Filename: C:\Minimus 13.05.9583\Logs\Shakespeare Janzen 1-34\Copy of Janzen 1-34 MAIN5.dta Recorded on 14-JUL-2013 04:37  
 System Versions: Plotted with 13.05.9583





Replay  
 Scale  
 1:240

3800

110°

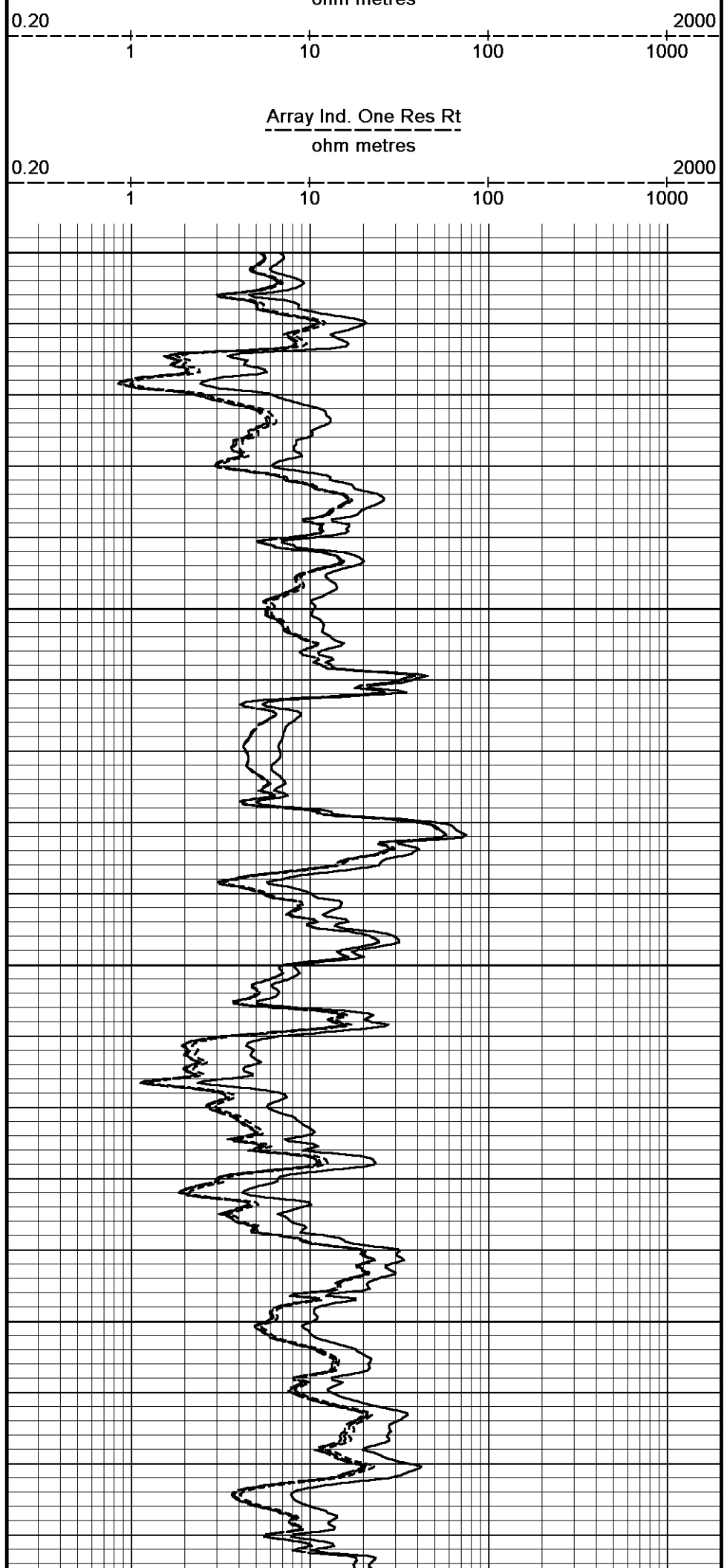
3850

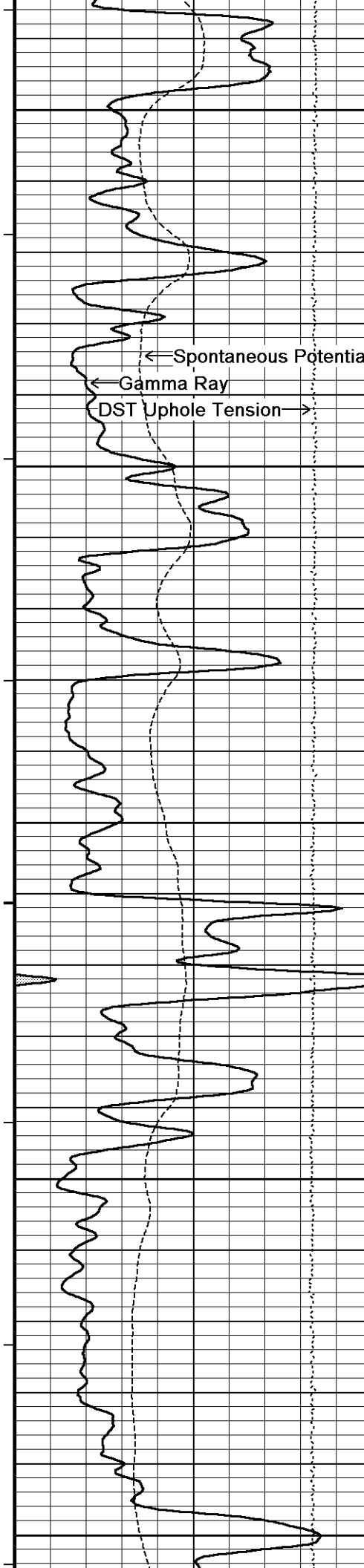
111°

3900

110°

3950





111°

4000

111°

4050

111°

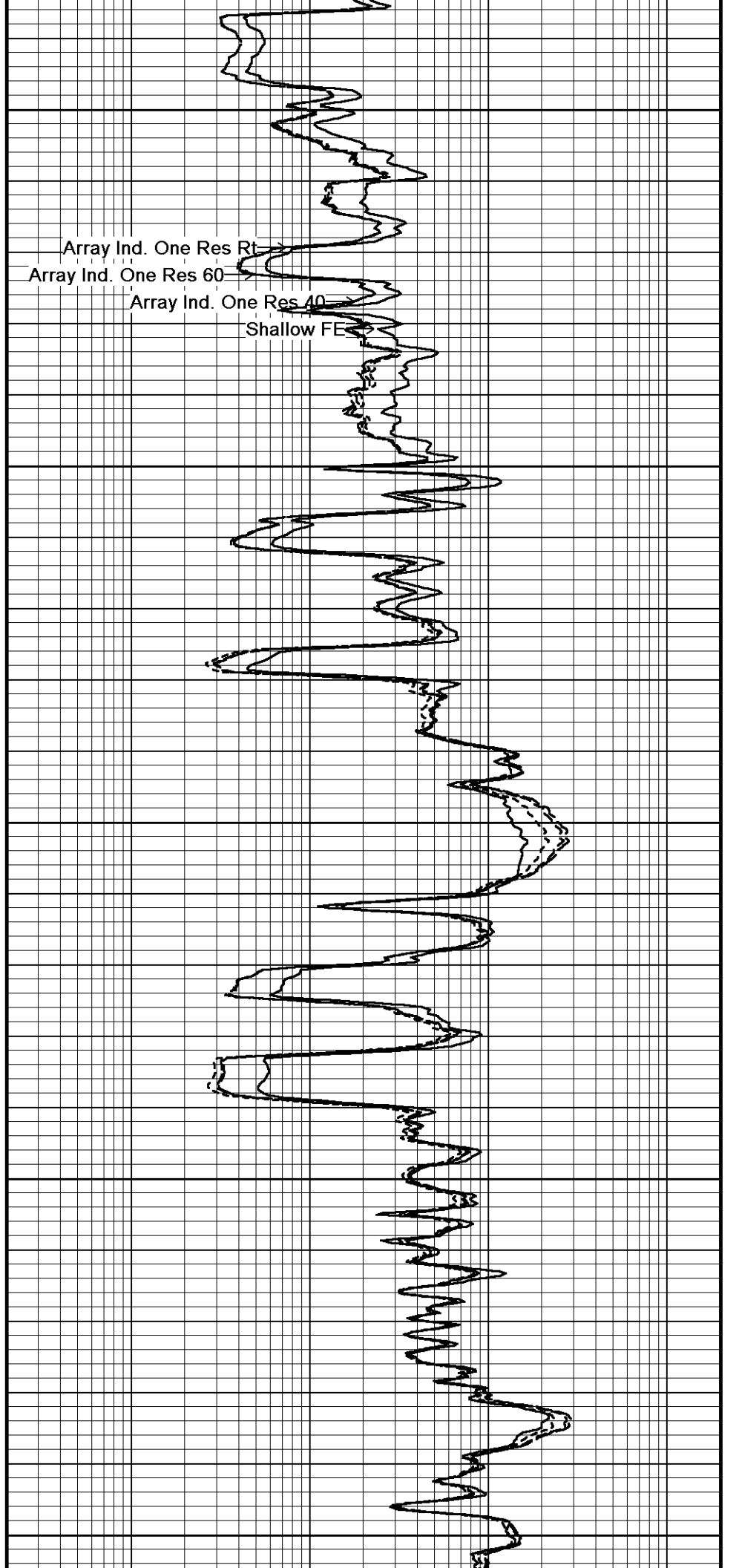
4100

112°

4150

112°

4200

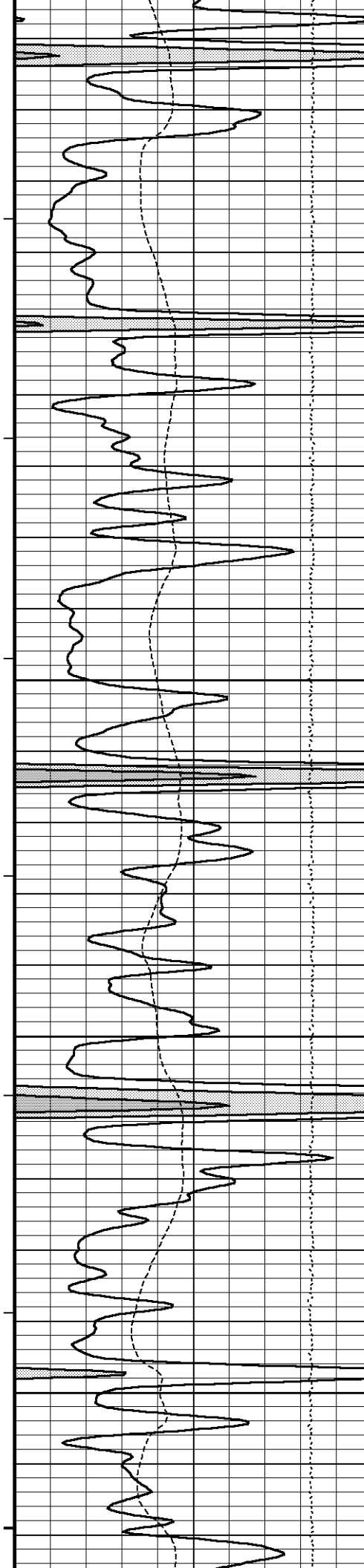


Array Ind. One Res Rt

Array Ind. One Res 60

Array Ind. One Res 40

Shallow FE



112°

4250

112°

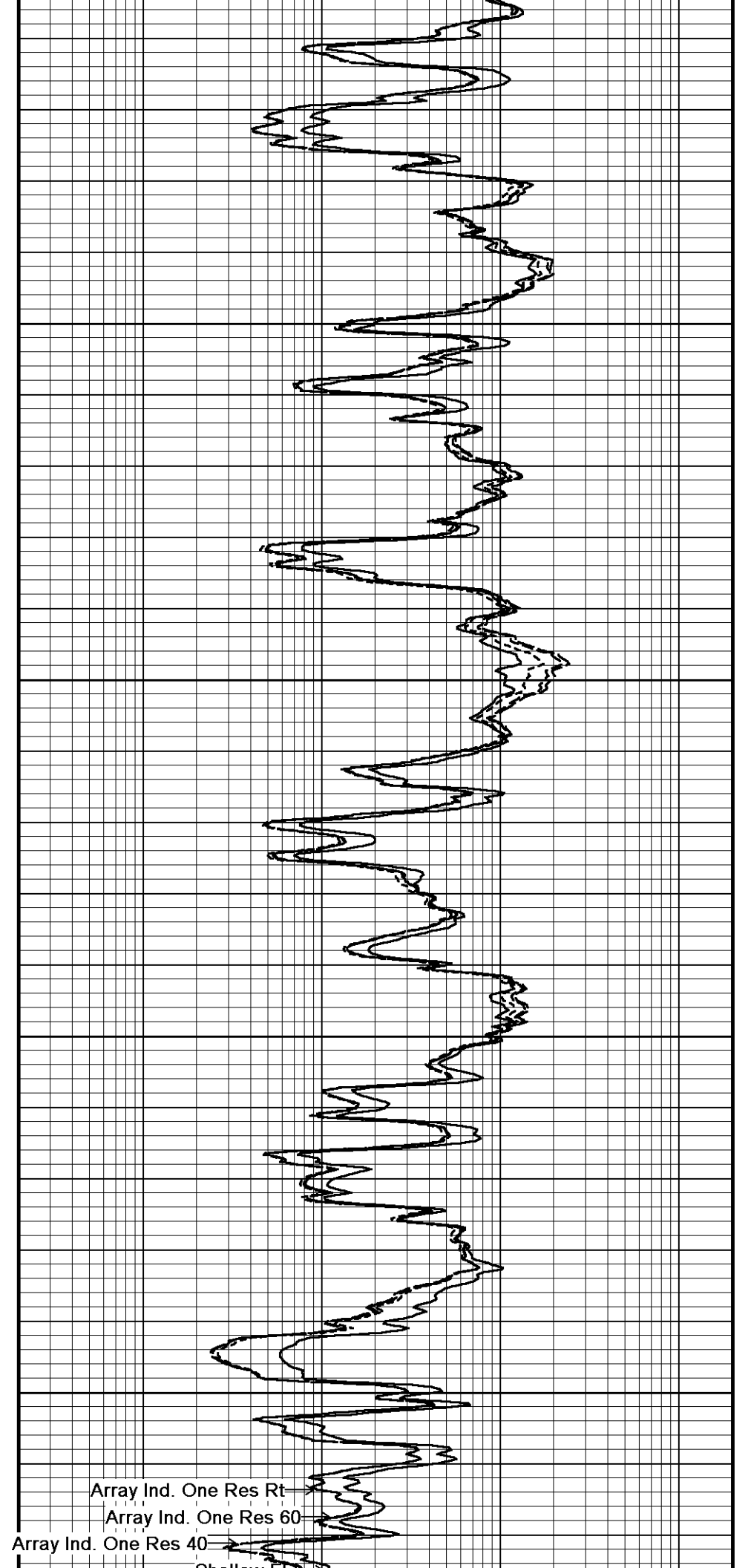
4300

113°

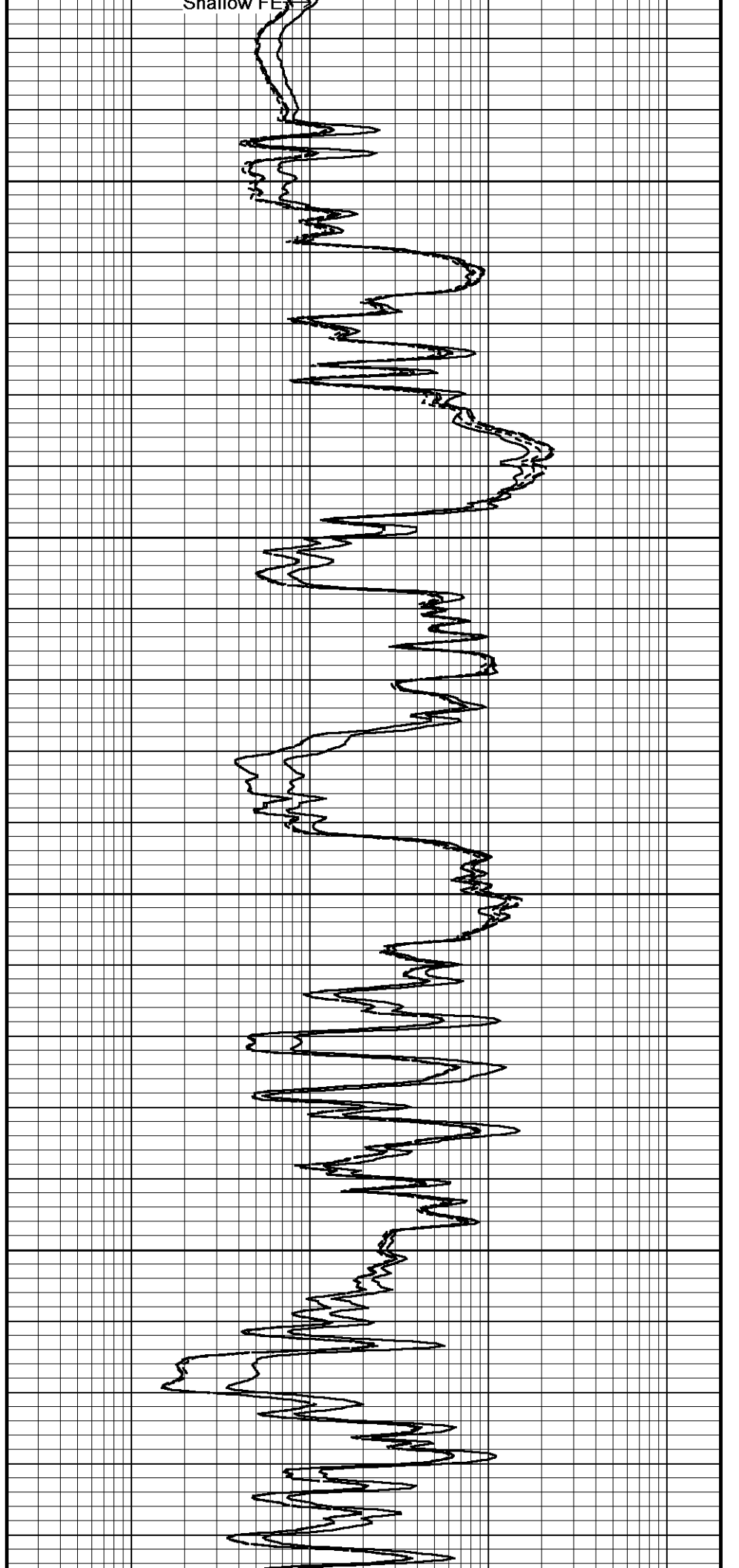
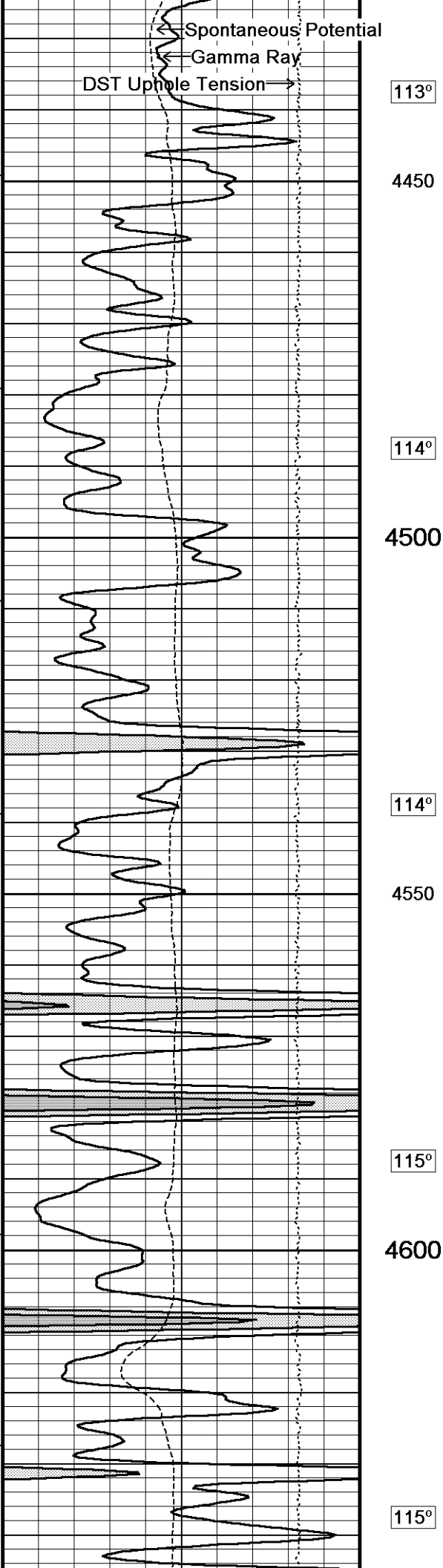
4350

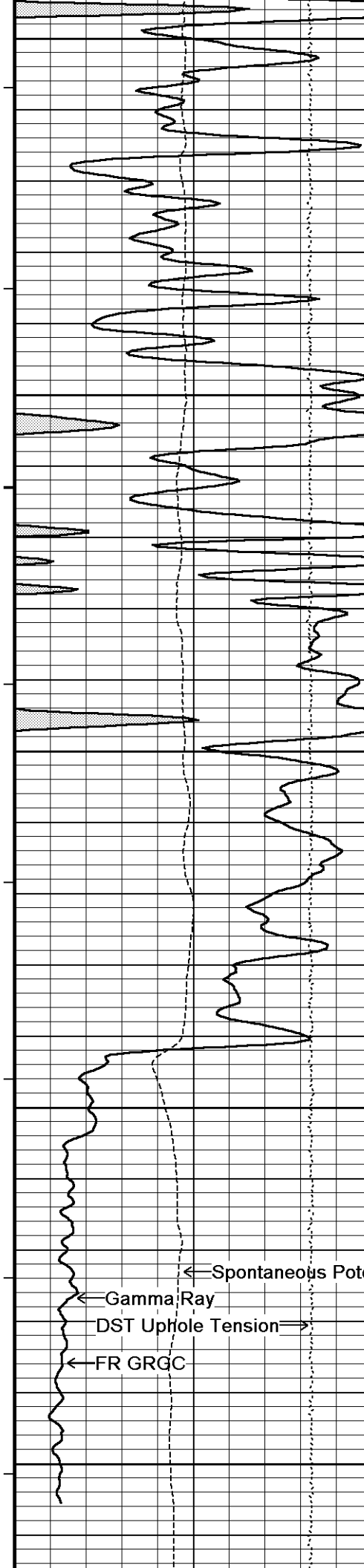
113°

4400



Array Ind. One Res Rt →  
Array Ind. One Res 60 →  
Array Ind. One Res 40 →  
Challenger →





4650

115°

4700

116°

4750

115°

4800

114°

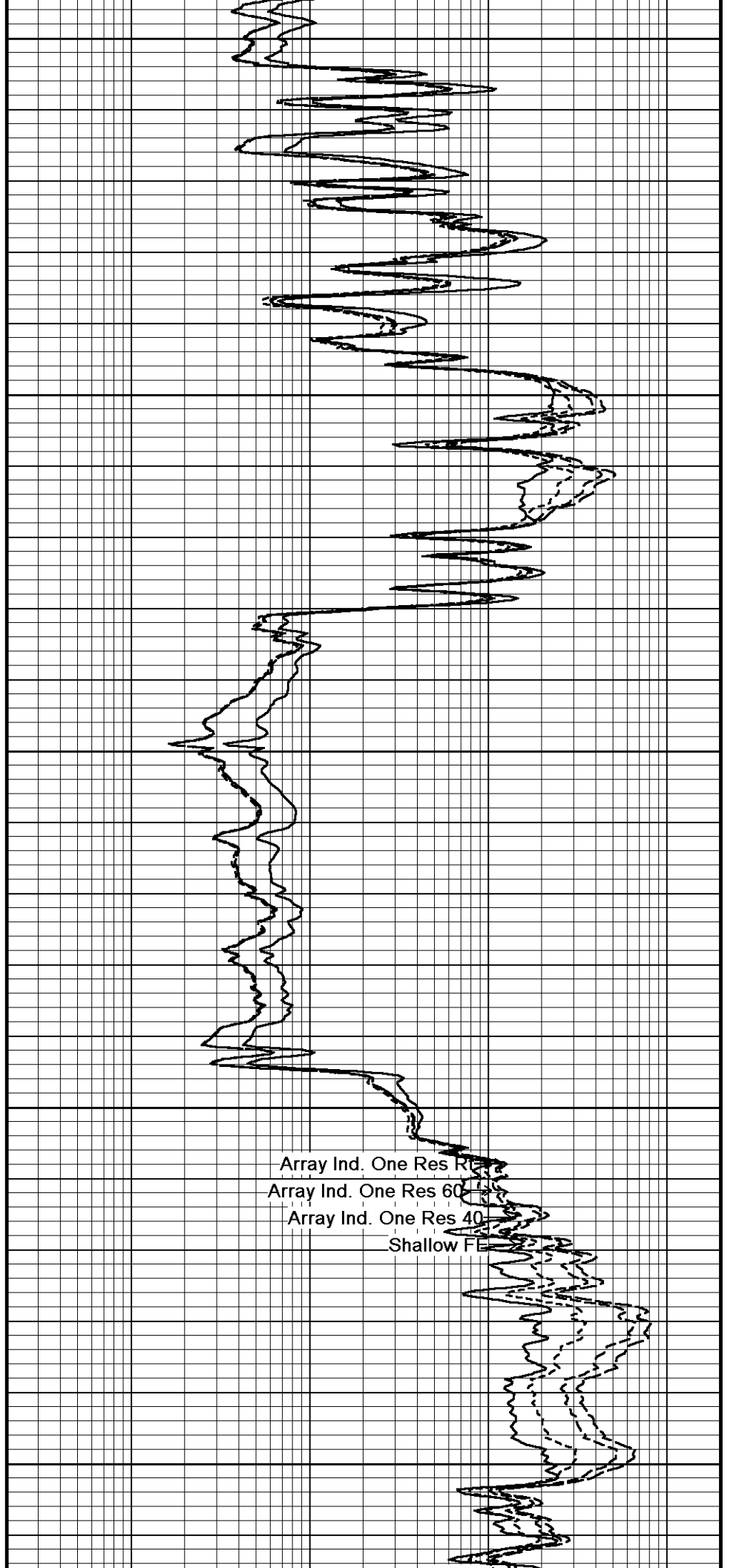
4850

← Spontaneous Potential

← Gamma Ray

DST Uphole Tension →

← FR GRGC



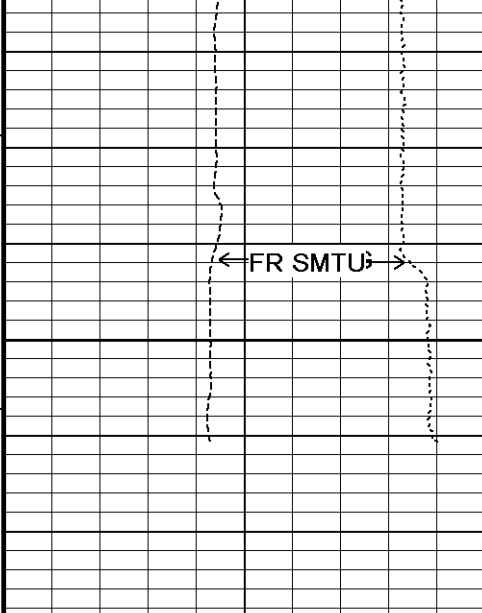
Array Ind. One Res R

Array Ind. One Res 60

Array Ind. One Res 40

Shallow FE





4900

4926

Depth  
In  
Feet

Timing Marks  
every 60.0 sec

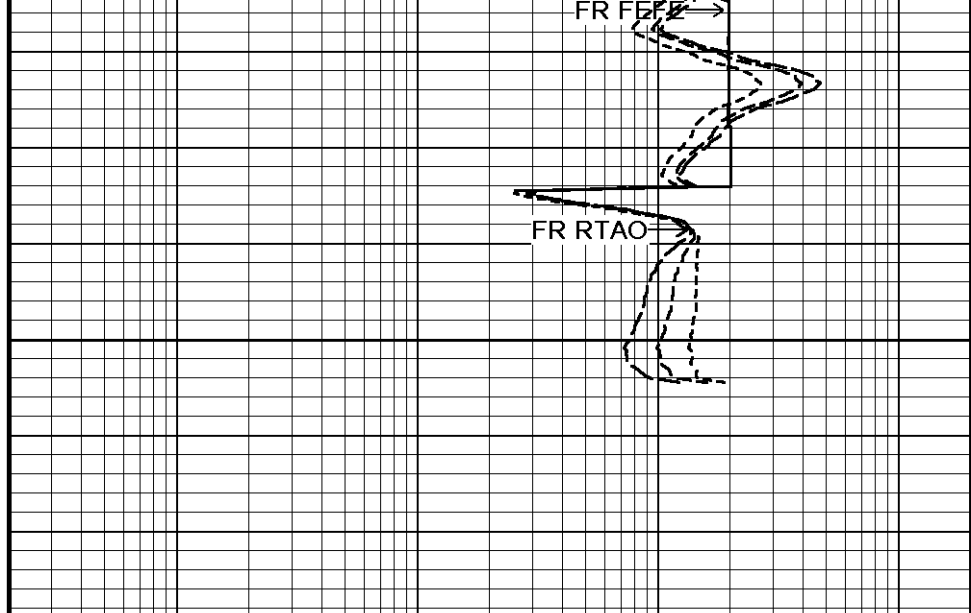
Gamma Ray  
API  
0 75 150  
150 225 300

Spontaneous Potential  
millivolts  
- -> | 20 | <- +

DST Uphole Tension  
pounds  
5000 0

Borehole  
Temp in  
deg F

Replay  
Scale  
1:240



Shallow FE  
ohm metres  
0.20 1 10 100 1000 2000

Array Ind. One Res 40  
ohm metres  
0.20 1 10 100 1000 2000

Array Ind. One Res 60  
ohm metres  
0.20 1 10 100 1000 2000

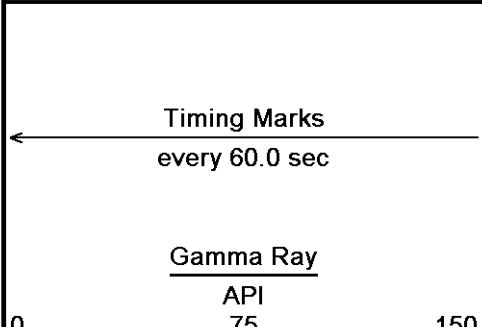
Array Ind. One Res Rt  
ohm metres  
0.20 1 10 100 1000 2000

Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 14-JUL-2013 06:02  
 Filename: C:\Minimus 13.05.9583\Log\Shakespeare Janzen 1-34\Cop\Janzen 1-34 MAIN5.dta Recorded on 14-JUL-2013 04:37  
 System Versions: Plotted with 13.05.9583

↑ 5 INCH MAIN ↑

↓ REPEAT SECTION ↓

Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 14-JUL-2013 06:02  
 Filename: C:\Minimus 13.05.9583\Log\Shakespeare Janzen 1-34\Janzen 1-34 REPEAT.dta Recorded on 14-JUL-2013 01:17  
 System Versions: Logged with 13.05.9583 Plotted with 13.05.9583



Depth  
in  
Feet

Timing Marks  
every 60.0 sec

Gamma Ray  
API  
0 75 150

Shallow FE  
ohm metres  
0.20 1 10 100 1000 2000

Array Ind. One Res 40  
ohm metres  
0.20 1 10 100 1000 2000

150 225 300

Borehole Temp in deg F

Spontaneous Potential

millivolts

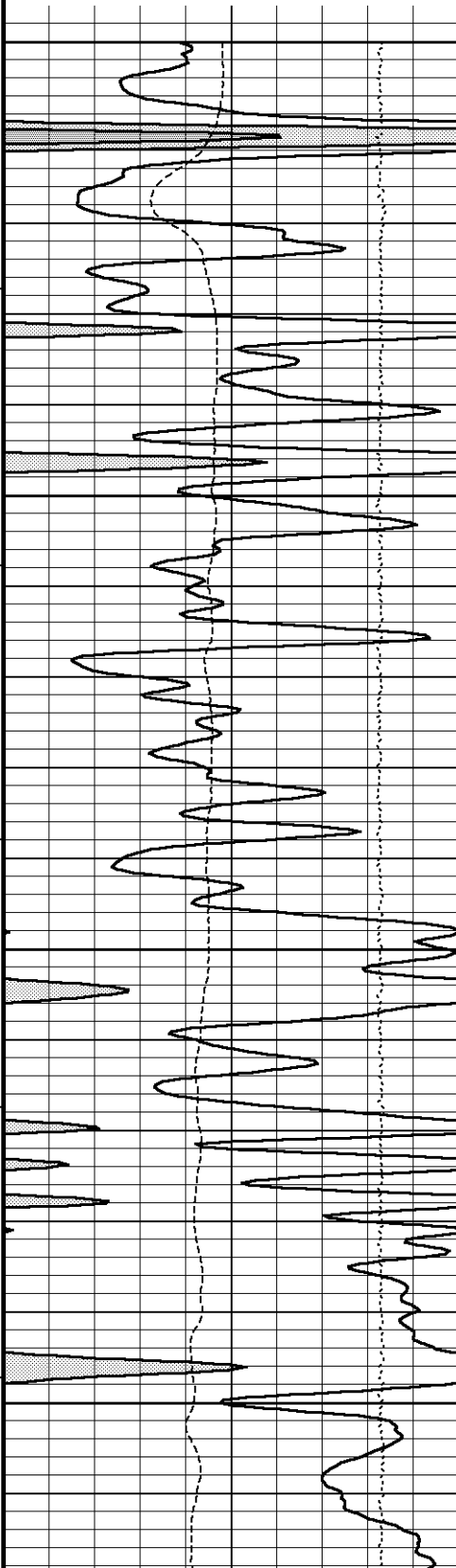
--> | 20 | <-- +

DST Uphole Tension

pounds

5000 0

Replay Scale 1:240



4600

114°

4650

115°

4700

115°

4750

1 10 100 1000

Array Ind. One Res 60

ohm metres

0.20 2000

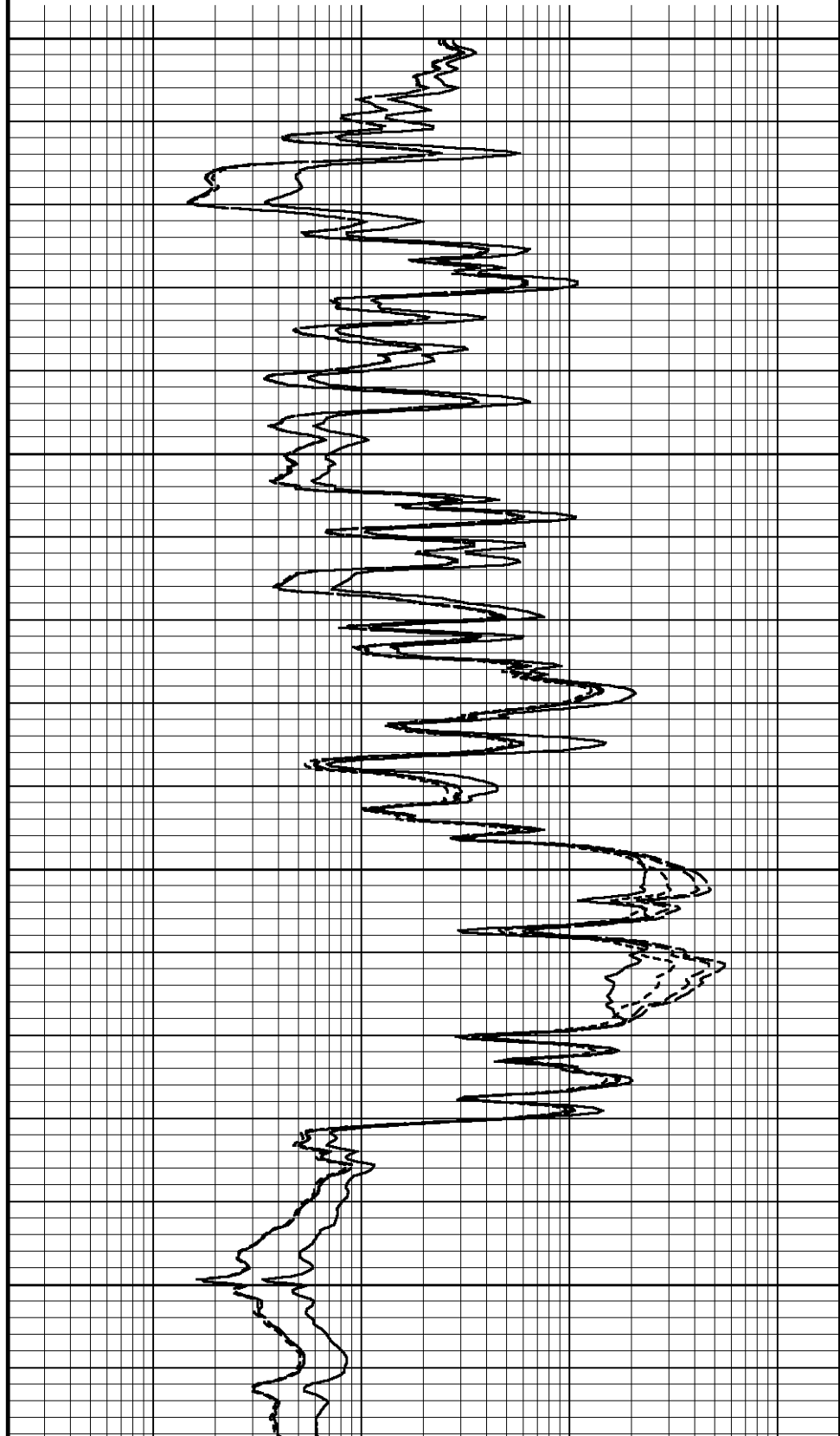
1 10 100 1000

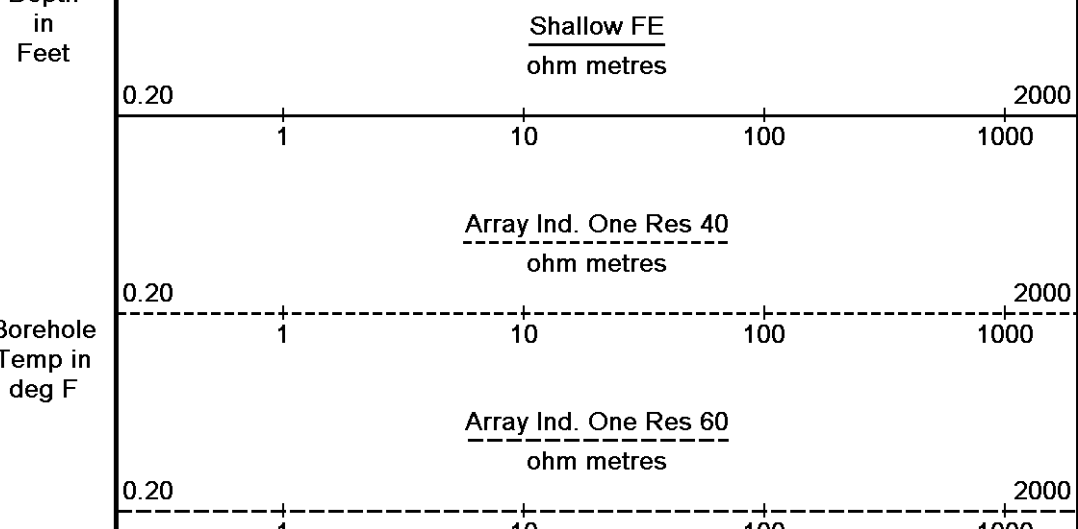
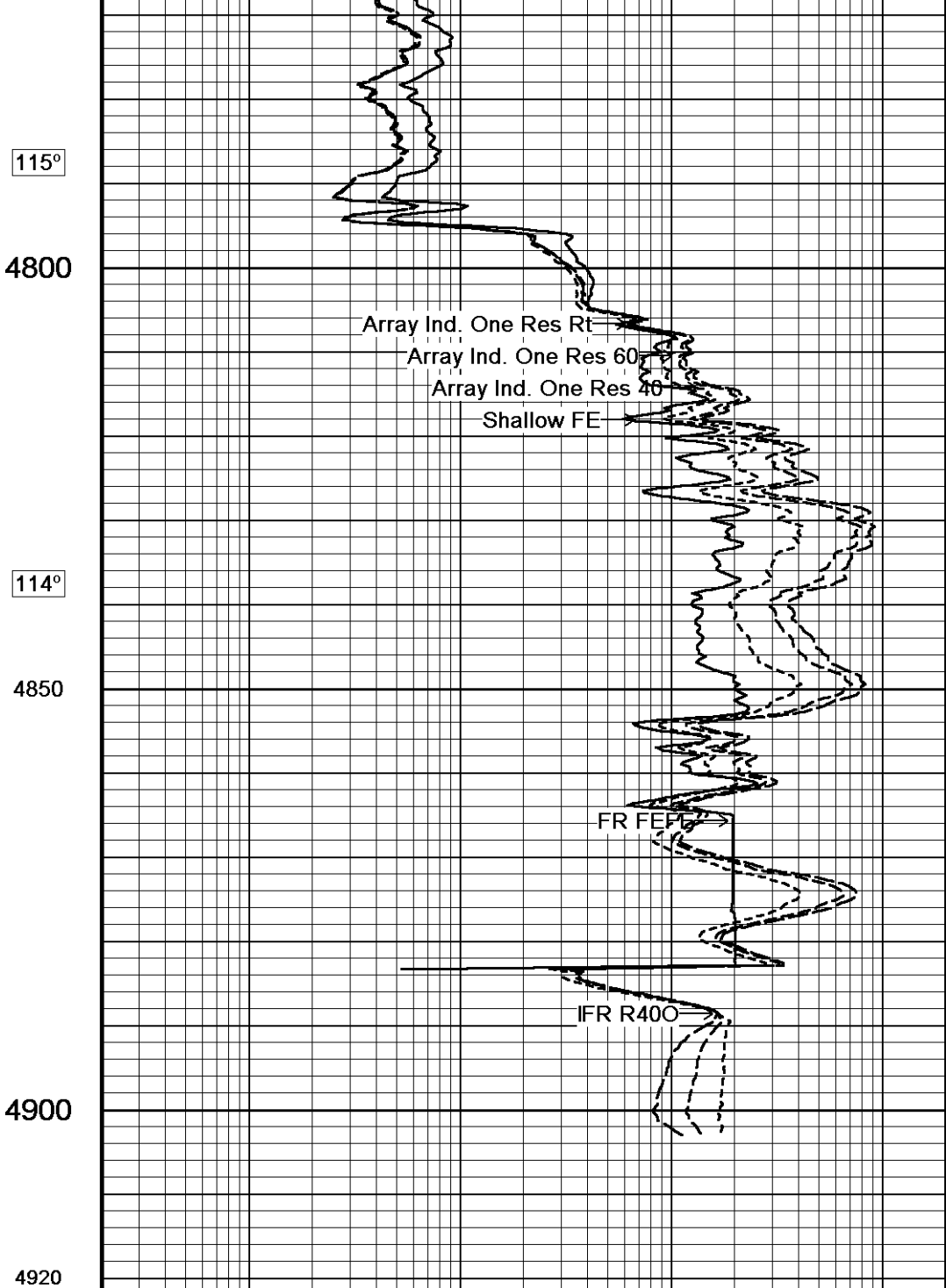
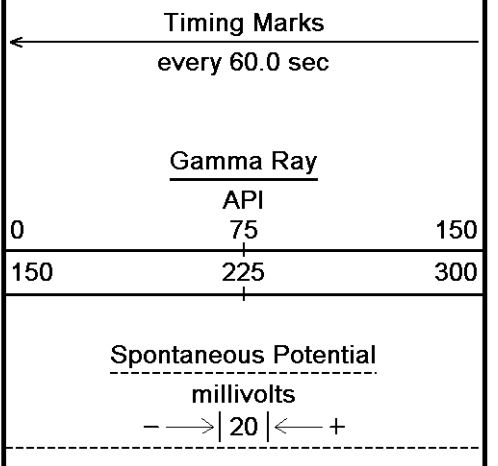
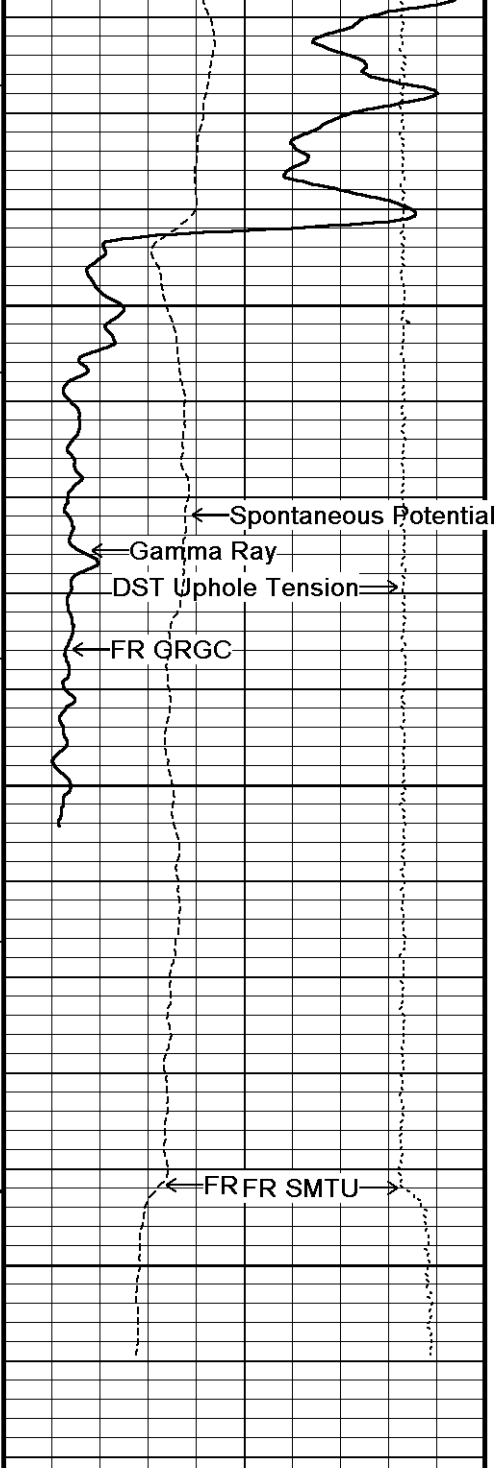
Array Ind. One Res Rt

ohm metres

0.20 2000

1 10 100 1000





DST Uphole Tension  
pounds

Replay  
Scale  
1:240

Array Ind. One Res Rt  
ohm metres

0.20

1

10

100

1000

2000

Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 14-JUL-2013 06:02

Filename: C:\Minimus 13.05.9583\Logs\Shakespeare Janzen 1-34\Janzen 1-34 REPEAT.dta

Recorded on 14-JUL-2013 01:17

System Versions: Logged with 13.05.9583 Plotted with 13.05.9583



## REPEAT SECTION



### BEFORE SURVEY CALIBRATION

C:\Minimus 13.05.9583\Logs\Shakespeare Janzen 1-34\Janzen 1-34 REPEAT.dta

General Constants All 000

Last Edited on 13-JUL-2013,23:32

#### General Parameters

|                             |          |            |
|-----------------------------|----------|------------|
| Mud Resistivity             | 0.520    | ohm-metres |
| Mud Resistivity Temperature | 85.000   | degrees F  |
| Water Level                 | 0.000    | feet       |
| Borehole Fluid Processing   | Wet Hole |            |

#### Hole/Annular Volume and Differential Caliper Parameters

|                                  |                 |        |
|----------------------------------|-----------------|--------|
| HVOL Method                      | Single Caliper  |        |
| HVOL Caliper 1                   | Density Caliper |        |
| HVOL Caliper 2                   | N/A             |        |
| Annular Volume Diameter          | 5.500           | inches |
| Caliper for Differential Caliper | MMR Caliper     |        |

#### Rwa Parameters

|                     |                       |
|---------------------|-----------------------|
| Porosity used       | Base Density Porosity |
| Resistivity used    | Array Ind. One Res Rt |
| RWA Constant A      | 0.610                 |
| RWA Constant M      | 2.150                 |
| SW/APOR Tool Source | 0.000                 |

High Resolution Temperature Calibration MCG-D.K 442

Field Calibration on 24-APR-2013,09:31

|       | Measured | Calibrated(Deg F) |
|-------|----------|-------------------|
| Lower | 50.00    | 50.00             |
| Upper | 75.00    | 75.00             |

High Resolution Temperature Constants MCG-D.K 442

Last Edited on 07-JUL-2013,12:48

Pre-filter Length 11

Gamma Calibration MCG-D.K 442

Field Calibration on 13-JUL-2013 19:43

|                    | Measured | Calibrated (API) |
|--------------------|----------|------------------|
| Background         | 73       | 49               |
| Calibrator (Gross) | 1157     | 774              |
| Calibrator (Net)   | 1084     | 725              |

Gamma Constants MCG-D.K 442

Last Edited on 13-JUL-2013,23:28

|                               |                 |       |
|-------------------------------|-----------------|-------|
| Gamma Calibrator Number       | GRC38           |       |
| Mud Density                   | 1.11            | gm/cc |
| Caliper Source for Processing | Density Caliper |       |
| Tool Position                 | Eccentred       |       |
| Concentration of KCl          |                 | kppm  |
| K Mud Type                    | Chloride        |       |
| K Mud Concentration           | 0.00            | %     |

FE Calibration MFE-B.J 352

Base Calibration on 07-JUL-2013 11:12

Field Check on 13-JUL-2013 19:13

#### Base Calibration

|             | Measured | Calibrated (ohm-m) |
|-------------|----------|--------------------|
| Reference 1 | 0.0      | 0.0                |
| Reference 2 | 962.8    | 126.8              |
| Base Check  |          | 281.6              |

Field Check

281.5

FE Constants MFE-B.J 352

Last Edited on 13-JUL-2013,23:29

|                                  |                          |        |
|----------------------------------|--------------------------|--------|
| Running Mode                     | No Sleeve                |        |
| MFE K Factor                     | 0.1268                   |        |
| Caliper Source for FE correction | Density Caliper          |        |
| Caliper Value for FE correction  | N/A                      | inches |
| Rm Source for FE correction      | Temperature Corr         |        |
| Temp. for Rm Corr.               | MCG External Temperature |        |
| Stand-off                        | 0.5                      | inches |

Induction Calibration MAI-A.A 45

Base Calibration on 07-JUL-2013,13:00  
Field Check on 13-JUL-2013 19:09

Base Calibration

| Test Loop Calibration |      | Measured |     | Calibrated (mmho/m) |  |
|-----------------------|------|----------|-----|---------------------|--|
| Channel               | Low  | High     | Low | High                |  |
| 1                     | 14.4 | 472.6    | 9.3 | 966.2               |  |
| 2                     | 5.7  | 374.0    | 7.6 | 821.4               |  |
| 3                     | 3.4  | 261.2    | 5.2 | 566.0               |  |
| 4                     | 2.5  | 133.9    | 2.6 | 279.2               |  |

Array Temperature 0.0 Deg F

| Channel | Base Check (mmho/m) |      | Field Check (mmho/m) |        |
|---------|---------------------|------|----------------------|--------|
|         | Low                 | High | Low                  | High   |
| 1       |                     |      | 20.7                 | 3853.4 |
| 2       |                     |      | 32.4                 | 3629.9 |
| 3       |                     |      | 29.0                 | 3049.7 |
| 4       |                     |      | 18.5                 | 2079.3 |
| Deep    |                     |      | 16.3                 | 1911.4 |
| Medium  |                     |      | 42.8                 | 4060.8 |
| Shallow |                     |      | 50.6                 | 5483.9 |

Array Temperature 97.0 Deg F

Induction Constants MAI-A.A 45

Last Edited on 13-JUL-2013,23:30

|                                   |                          |            |
|-----------------------------------|--------------------------|------------|
| Induction Model                   | RtAP-WBM                 |            |
| Caliper for Borehole Corr.        | Density Caliper          |            |
| Hole Size for Borehole Correction | N/A                      | inches     |
| Tool Centred                      | No                       |            |
| Stand-off Type                    | Fins                     |            |
| Stand-off                         | 0.50                     | inches     |
| Number of Fins on Stand-off       | 8.0000                   |            |
| Stand-off Fin Angle               | 45.00                    | degrees    |
| Stand-off Fin Width               | 0.5000                   | inches     |
| Borehole Corr. Rm Source          | Temperature Corr         |            |
| Temp. for Rm Corr.                | MCG External Temperature |            |
| Squasher Start                    | 0.0020                   | mhos/metre |
| Squasher Offset                   | N/A                      | mhos/metre |

Borehole Normalisation

|      |        |      |        |
|------|--------|------|--------|
| DRM1 | 0.0000 | DRC1 | 0.0000 |
| DRM2 | 0.0000 | DRC2 | 0.0000 |
| MRM1 | 0.0000 | MRC1 | 0.0000 |
| MRM2 | 0.0000 | MRC2 | 0.0000 |
| SRM1 | 0.0000 | SRC1 | 0.0000 |
| SRM2 | 0.0000 | SRC2 | 0.0000 |

Calibration Site Corrections

|           |      |             |
|-----------|------|-------------|
| Channel 1 | 0.00 | mmhos/metre |
| Channel 2 | 0.00 | mmhos/metre |
| Channel 3 | 0.00 | mmhos/metre |
| Channel 4 | 0.00 | mmhos/metre |

Apparent Porosity and Water Saturation Constants

|                             |        |
|-----------------------------|--------|
| Archie Constant (A)         | 1.00   |
| Cementation Exponent (M)    | 2.00   |
| Saturation Exponent (N)     | 2.00   |
| Saturation of Water for App | 100.00 |

|                                      |        |         |
|--------------------------------------|--------|---------|
| Saturation of water for Apor         | 100.00 | percent |
| Resistivity of Water for Apor and Sw | 0.05   | ohm-m   |
| Resistivity of Mud Filtrate for Sw   | 0.00   | ohm-m   |
| Source for Rt                        | 0.00   |         |
| Source for Rxo                       | 0.00   |         |

## DOWNHOLE EQUIPMENT

C:\Minimus 13.05.9583\Log\Shakespeare Janzen 1-34\Janzen 1-34 REPEAT.dta

CBH-C, Cablehead, 11 pin  
 CBH-CA 233 LG: 2.40 ft WT: 24.3 lb OD: 2.24 in

Compact Comms Gamma  
 MCG-D.K 442 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

Compact Micro-Resistivity  
 MMR-A 11 LG: 8.59 ft WT: 81.6 lb OD: 4.88 in

Compact Neutron  
 MDN-A.B 65 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

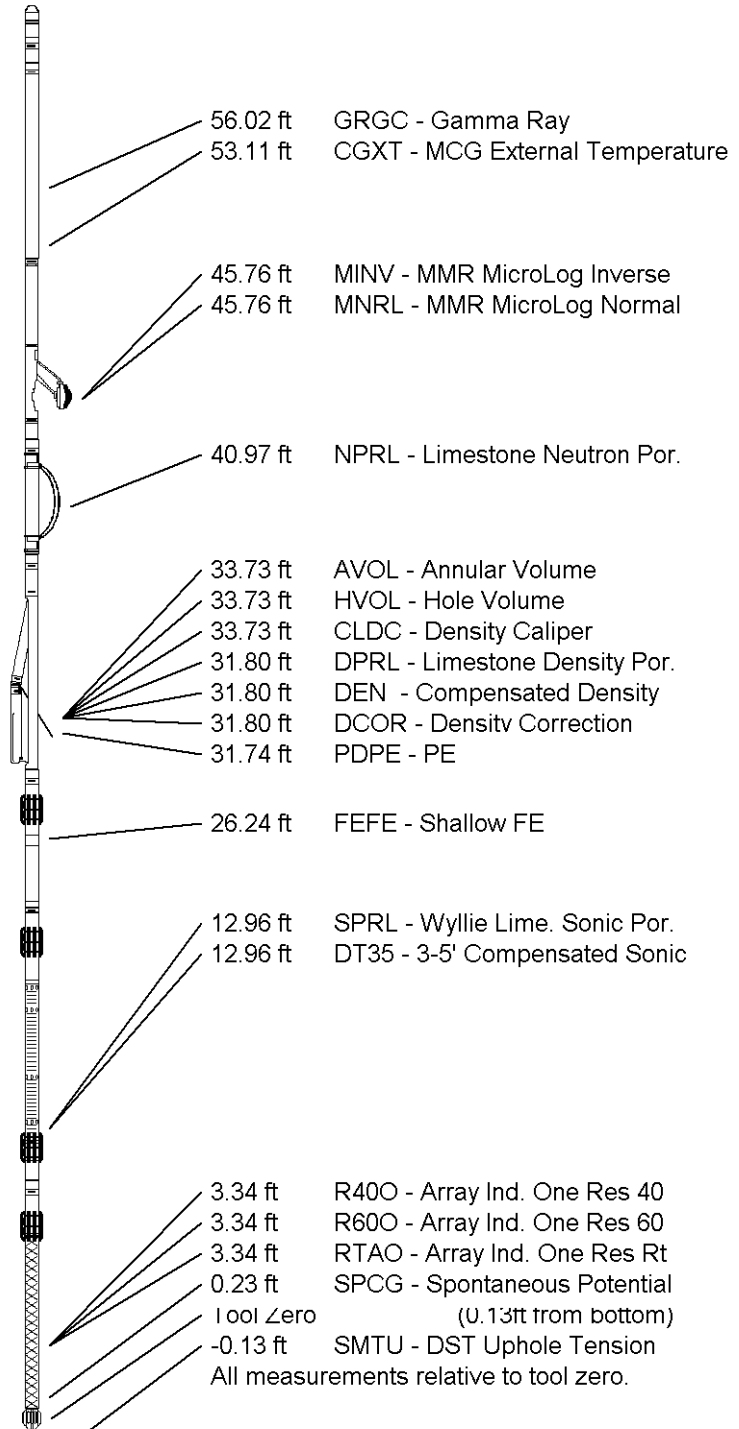
Compact Density/Caliper  
 MPD-B 31 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

Compact Focussed Electric  
 MFE-B.J 352 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

Compact Sonic  
 MSS-A.A 126 LG: 12.52 ft WT: 72.8 lb OD: 2.24 in

Compact Induction  
 MAI-A.A 45 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 63.70 ft Weight: 480.6 lb



|                 |                           |
|-----------------|---------------------------|
| COMPANY         | SHAKESPEARE OIL CO., INC. |
| WELL            | JANZEN 1-34               |
| FIELD           | WILDCAT                   |
| PROVINCE/COUNTY | SCOTT                     |
| COUNTRY/STATE   | U.S.A. / KANSAS           |

Elevation Kelly Bushing 3126.00 feet  
 Elevation Drill Floor 3124.00 feet  
 Elevation Ground Level 3119.00 feet

First Reading 4889.00 feet  
 Depth Driller 4895.00 feet  
 Depth Logger 4892.00 feet

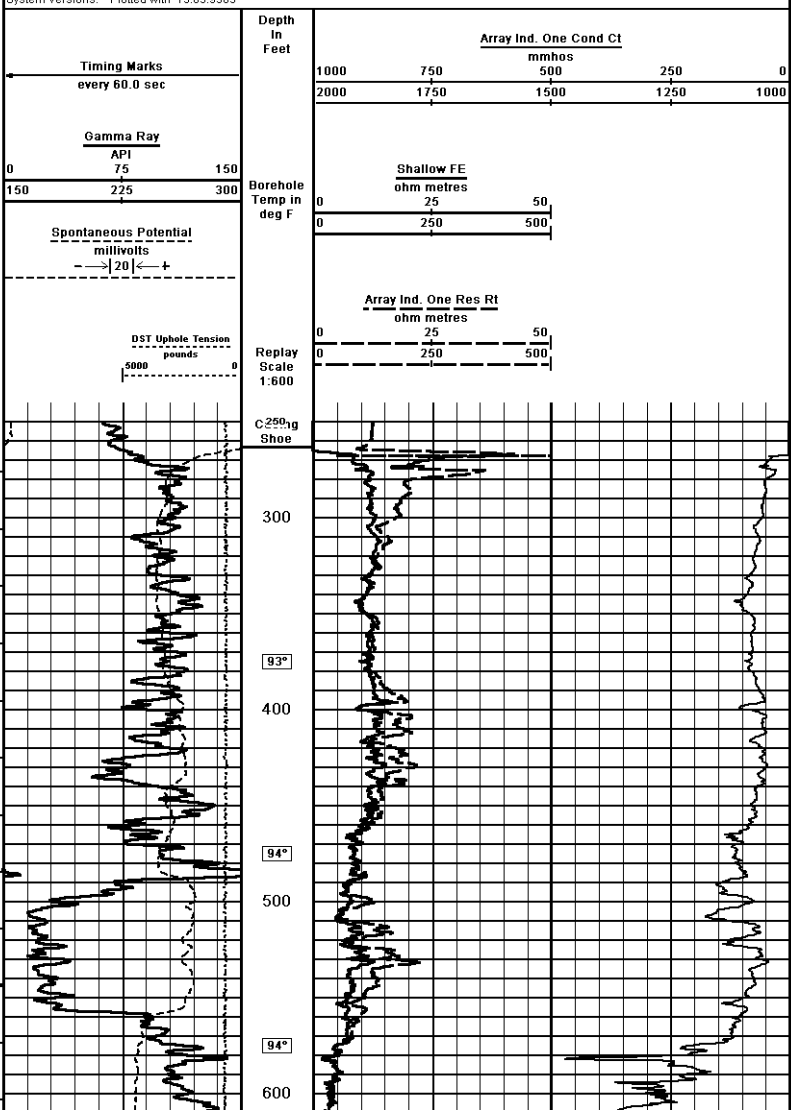


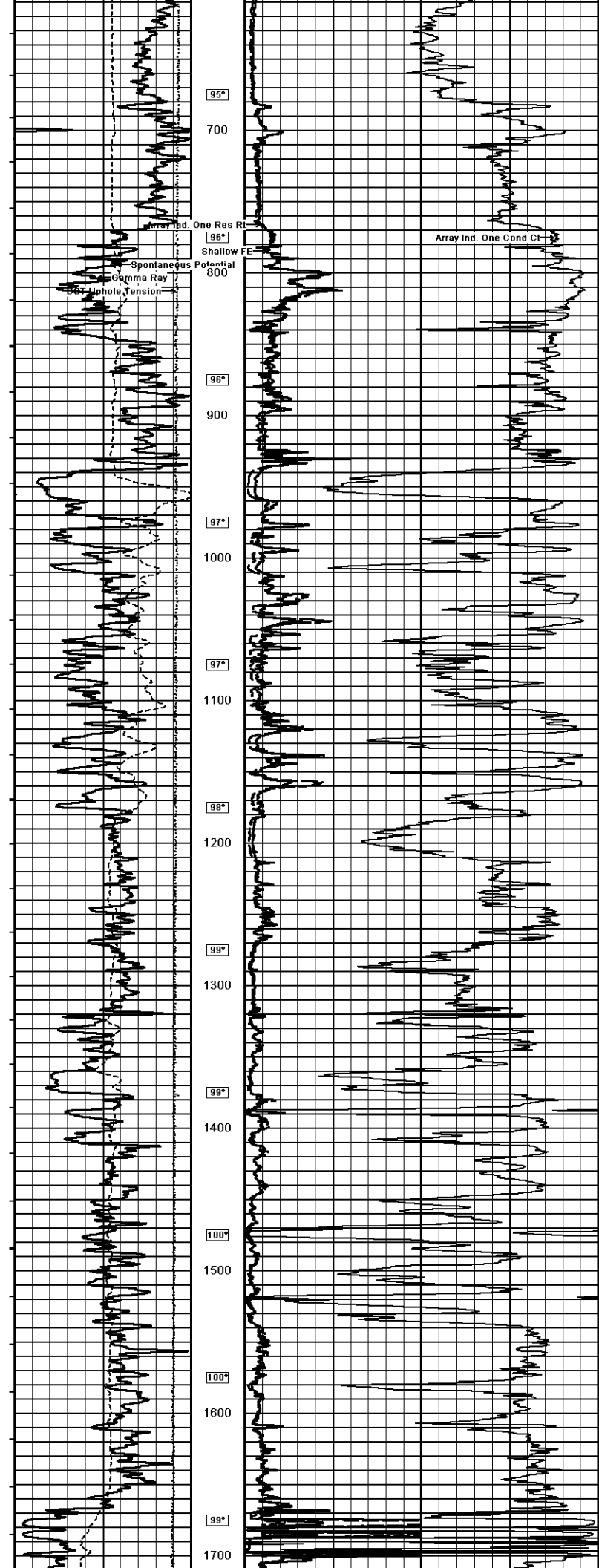
**Weatherford**<sup>®</sup>

ARRAY INDUCTION  
 SHALLOW FOCUSED  
 ELECTRIC LOG

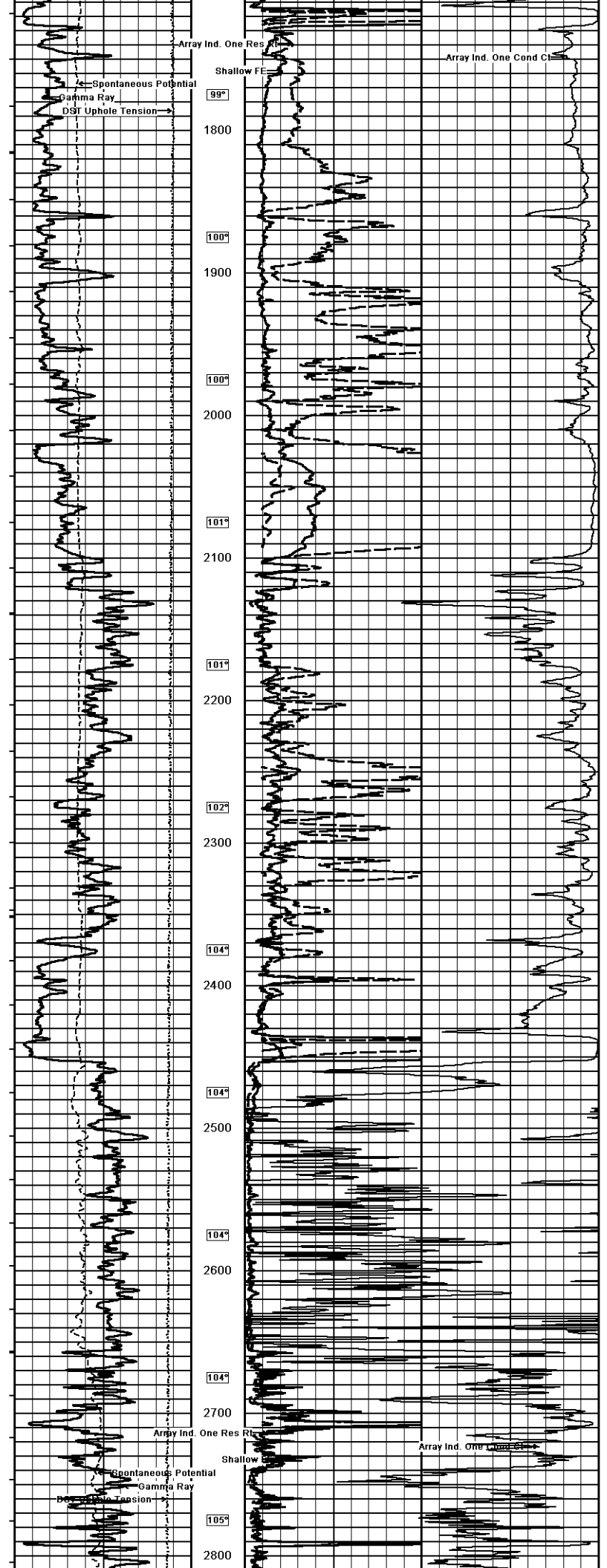
|                                 |                          |   |                                     |
|---------------------------------|--------------------------|---|-------------------------------------|
| <b>Weatherford</b>              |                          | <b>ARRAY INDUCTION<br/>SHALLOW FOCUSED<br/>ELECTRIC LOG</b> |                                     |
| COMPANY:                        | SHAKEPEARE OIL CO., INC. | WELL:   | JANZEN 1-34                         |
| FIELD:                          | WILDCAT                  | PROVINCE/COUNTY:  | SCOTT                               |
| COUNTRY/STATE:                  | U.S.A. / KANSAS          | LOCATION:   | 1363' FNL & 339' FEL<br>NW NE SE NE |
| SEC 34                          | Type 188                 | Other Services:   | MML                                 |
| API Number:                     | 15-171-28998             | WMS   |                                     |
| Permanant Datum Q.L. Elevation: | 3119 feet                | Log Measured From KB:                                       |                                     |
| Drilling Measured From KB @:    | 7 FEET                   | Date:   | 14-JUL-2013                         |
| Run Number:                     | ONE                      | Service Order:  | 3541023                             |
| Depth Driller:                  | 4895.00                  | Depth Logger:   | 4892.00                             |
| First Reading:                  | 4889.00                  | Casing Driller:   | 287.00                              |
| Casing Logger:                  | 283.00                   | BIT Size:   | 7.875 inches                        |
| Hole Fluid Type:                | CHEM                     | Density/Viscosity:  | 9.30 lbm/sg 49.00 CP                |
| PH/Fluid Loss:                  | 10.50                    | Flow Line:  | 12.00 ml/30min                      |
| Sample Source:                  | FLOW LINE                | Rm @ Measured Temp:   | 0.53 @ 85.0 ohm-m                   |
| Rm @ Measured Temp:             | 0.42 @ 85.0 ohm-m        | Rm @ Measured Temp:   | 0.62 @ 85.0 ohm-m                   |
| Source Rm/Fr/Rmc:               | CALC                     | Rm @ BHT:   | 0.38 @ 115.0 ohm-m                  |
| Time Since Circulation:         | 5 HRS                    | Max Recorded Temp:  | 116.00 deg F                        |
| Equipment/Base:                 | 13067                    | Equipped By:  | S. DAVIS                            |
| Witnessed By:                   |                          | Log #:  | LB13-202                            |

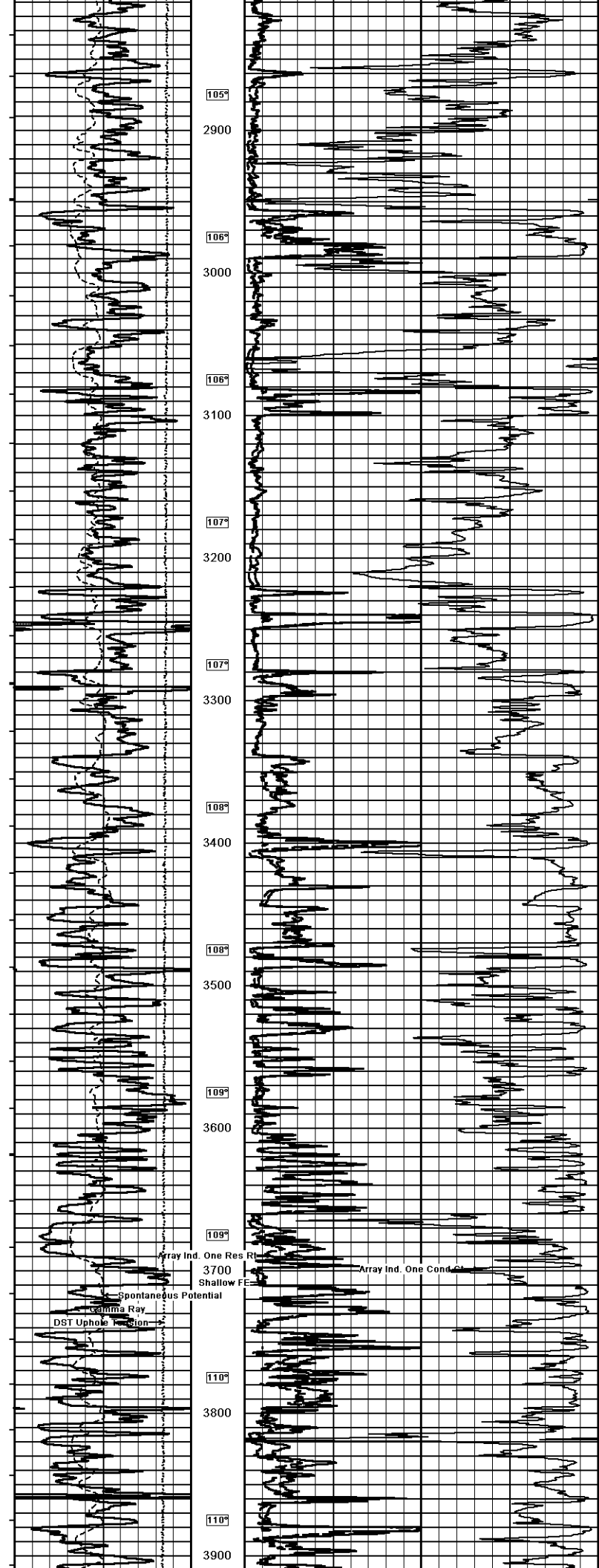
1 INCH MAIN  
 Depth Based Data - Maximum Sampling Increment 10.0cm  
 Plotted on 14-JUL-2013 06:02  
 Filename: C:\Minimus 13.05.9583\Logs\Shakespeare Janzen 1-34\Copy of Janzen 1-34 MAIN5.dta  
 Recorded on 14-JUL-2013 04:37  
 System Versions: Plotted with 13.05.9583

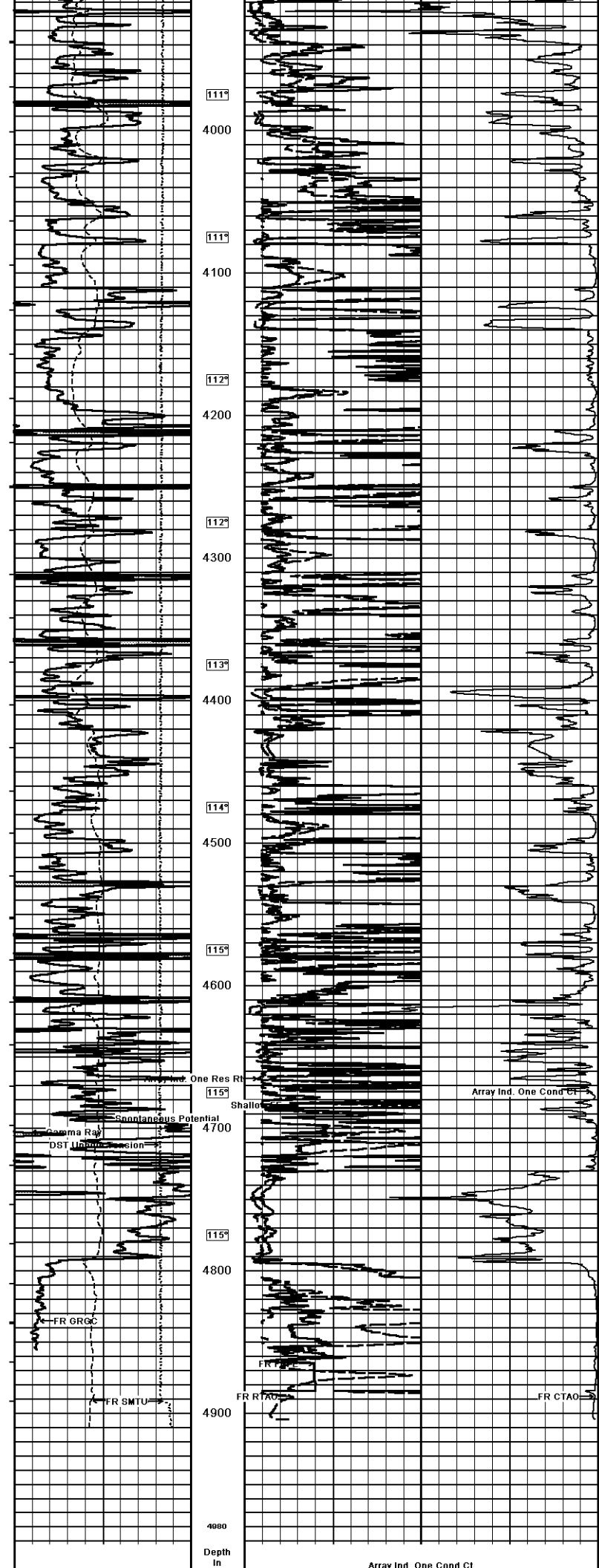


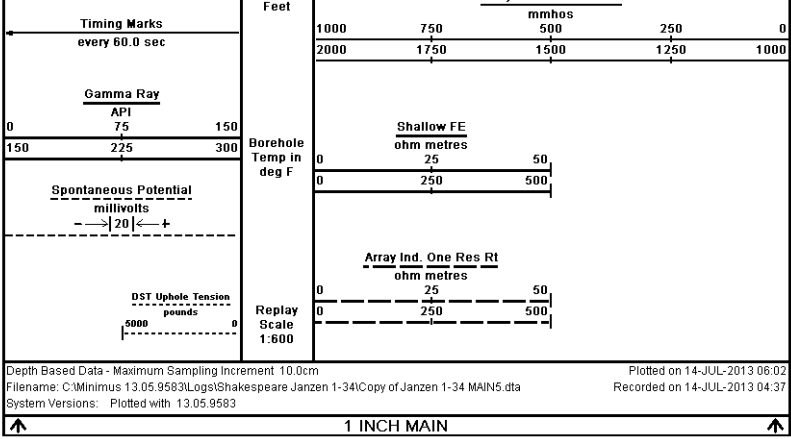













|                         |                           |      |               |         |      |
|-------------------------|---------------------------|------|---------------|---------|------|
| <b>COMPANY</b>          | SHAKESPEARE OIL CO., INC. |      |               |         |      |
| <b>WELL</b>             | JANZEN 1-34               |      |               |         |      |
| <b>FIELD</b>            | WILDCAT                   |      |               |         |      |
| <b>PROVINCE/COUNTY</b>  | SCOTT                     |      |               |         |      |
| <b>COUNTRY/STATE</b>    | U.S.A. / KANSAS           |      |               |         |      |
| Elevation Kelly Busting | 3126.00                   | feet | First Reading | 4889.00 | feet |
| Elevation Drill Floor   | 3124.00                   | feet | Depth Driller | 4895.00 | feet |
| Elevation Ground Level  | 3119.00                   | feet | Depth Logger  | 4892.00 | feet |


**ARRAY INDUCTION**  
**SHALLOW FOCUSED**  
**ELECTRIC LOG**