



Weatherford

ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG

| | | | | |
|---|------------------------------|---------|----------------|------------------|
| COMPANY | GRAND MESA OPERATING COMPANY | | | |
| WELL | BUZZ'S BOAT #14 | | | |
| FIELD | WILDCAT | | | |
| PROVINCE/COUNTY | WASHINGTON | | | |
| COUNTRY/STATE | U.S.A. / COLORADO | | | |
| LOCATION | 620' FSL & 2262' FWL | | | |
| SEC 24 | TWP 5S | RGE 54W | Other Services | |
| Latitude | | | MDN/MPD | MML |
| Longitude | | | MSS | |
| API Number | 05-121-11053 | | | |
| Permanent Datum GL, Elevation 5152 feet | | | | Elevations: feet |
| Log Measured From KB | | | | KB 5171.00 |
| Drilling Measured From KB @ 19 FEET | | | | DF 5169.00 |
| Date | 09-NOV-2016 | | | GL 5152.00 |
| Run Number | ONE | | | |
| Service Order | 4558-165852107 | | | |
| Depth Driller | 8254.00 | | | feet |
| Depth Logger | 8260.00 | | | feet |
| First Reading | 8257.00 | | | feet |
| Last Reading | 327.00 | | | feet |
| Casing Driller | 330.00 | | | feet |
| Casing Logger | 327.00 | | | feet |
| Bit Size | 7.875 | | | inches |
| Hole Fluid Type | CHEMICAL | | | |
| Density / Viscosity | 9.30 lb/USg | | 74.00 CP | |
| PH / Fluid Loss | 10.00 | | 7.20 ml/30Min | |
| Sample Source | FLOWLINE | | | |
| Rm @ Measured Temp | 1.19 @ 75.0 | | | ohm-m |
| Rmf @ Measured Temp | 0.95 @ 75.0 | | | ohm-m |
| Rmc @ Measured Temp | 1.43 @ 75.0 | | | ohm-m |
| Source Rmf / Rmc | CALC | CALC | | |
| Rm @ BHT | 0.47 @191.0 | | | ohm-m |
| Time Since Circulation | 5 HOURS | | | |
| Max Recorded Temp | 191.00 | | deg F | |
| Equipment / Base | 13096 | | OKC | |
| Recorded By | ADAM SILL | | | |
| Witnessed By | KENT MATSON | | | |

| BOREHOLE RECORD | | | | | Last Edited: 09-NOV-2016 05:42 |
|--------------------|----------------|--------------------|--------------------|---------------------|--------------------------------|
| Bit Size inches | | Depth From feet | | Depth To feet | |
| 7.875 | | 330.00 | | 8254.00 | |
| CASING RECORD | | | | | |
| Type | Size inches | Depth From feet | Shoe Depth feet | Weight pounds/ft | |
| SURFACE | 8.625 | 0.00 | 330.00 | 24.00 | |

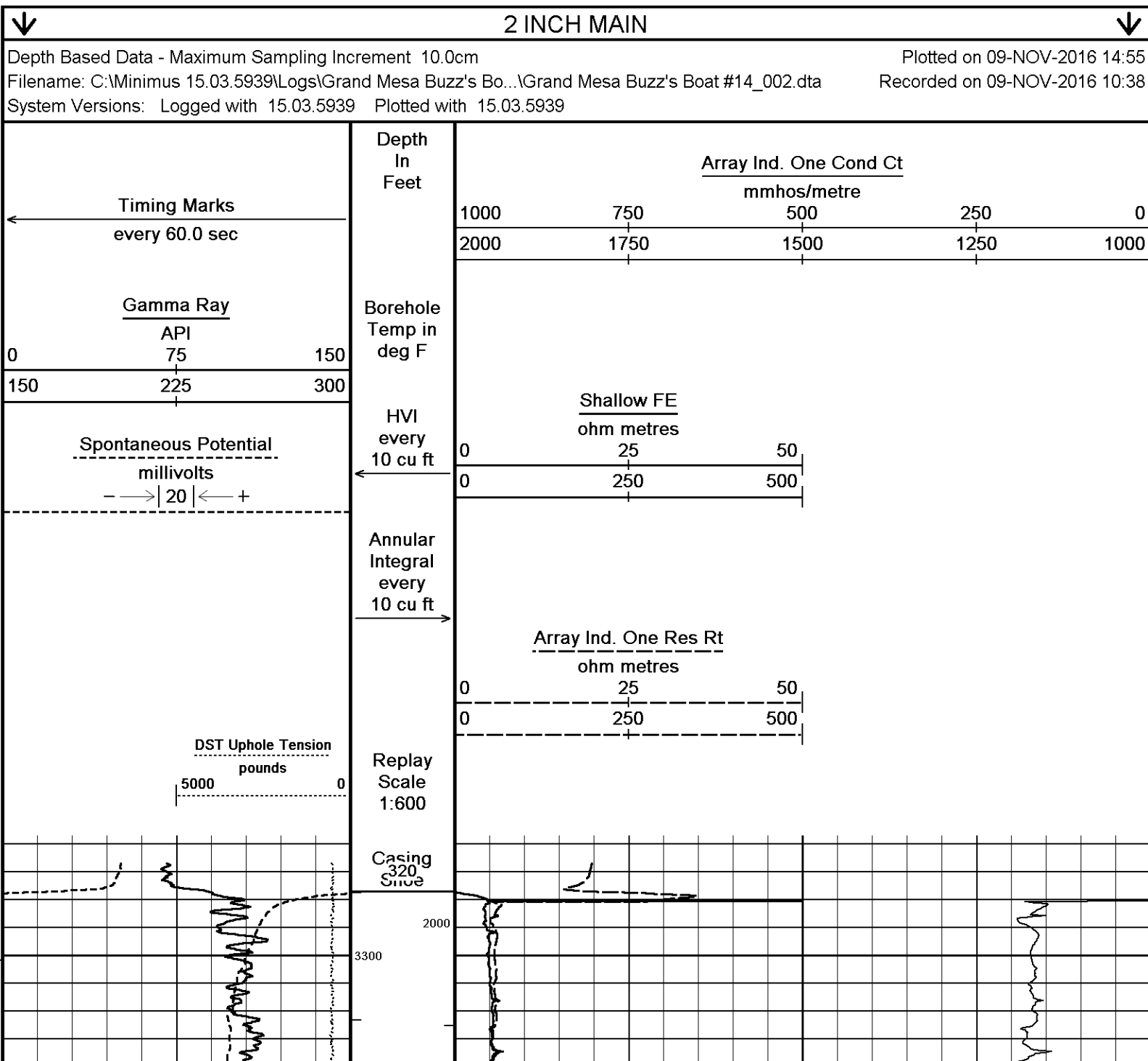
| REMARKS |
|--|
| - SOFTWARE ISSUE: WLS 15.03.5939. |
| - RUN ONE: MCG, MML, MDN, MPD, MFE, MSS, MAI RUN IN COMBINATION. - HARDWARE: DUAL BOWSPRING USED ON MDN. 0.5 INCH STANDOFF USED ON MFE. TWO 0.5 INCH STANDOFFS USED ON MSS. 0.5 INCH STANDOFF USED ON MAI. |
| - 2.71 G/CC LIMESTONE DENSITY MATRIX 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: 3310 CU.FT. |
| - ANNULAR HOLE VOLUME WITH 5.5 INCH PRODUCTION CASING FROM TD TO SURFACE CASING: 2003 CU.FT. |

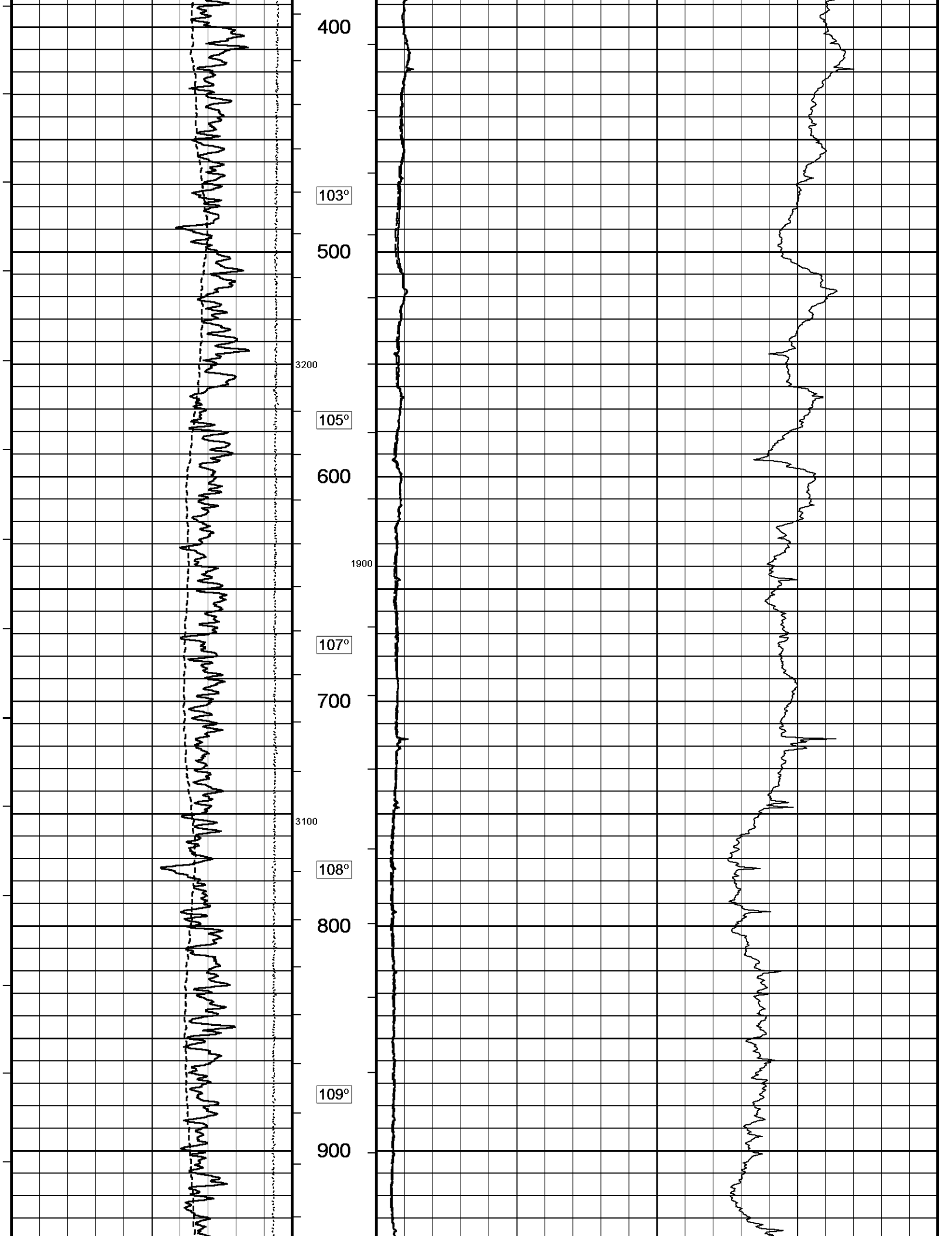
- RIG: WW DRILLING #20.

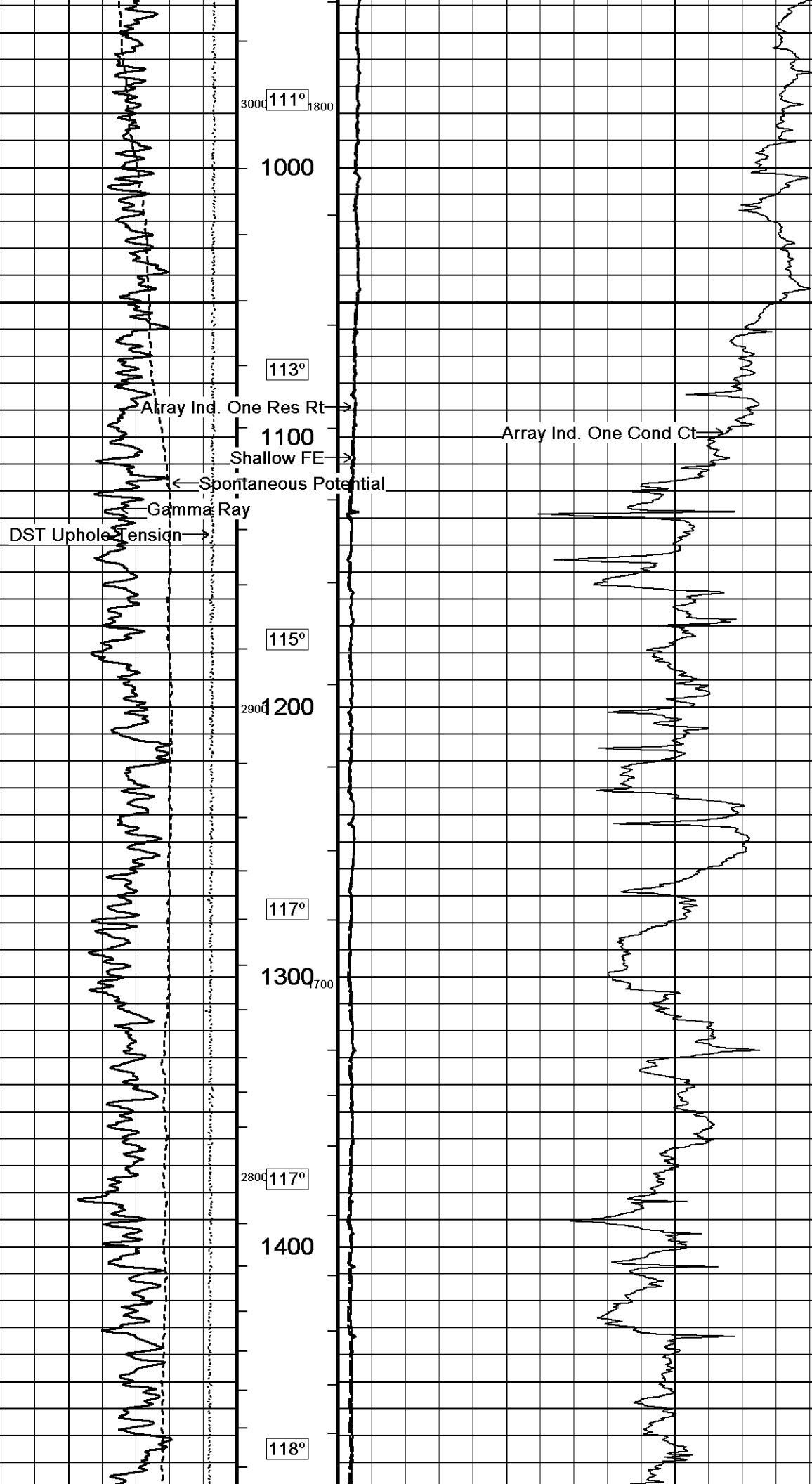
- ENGINEER: A. SILL.

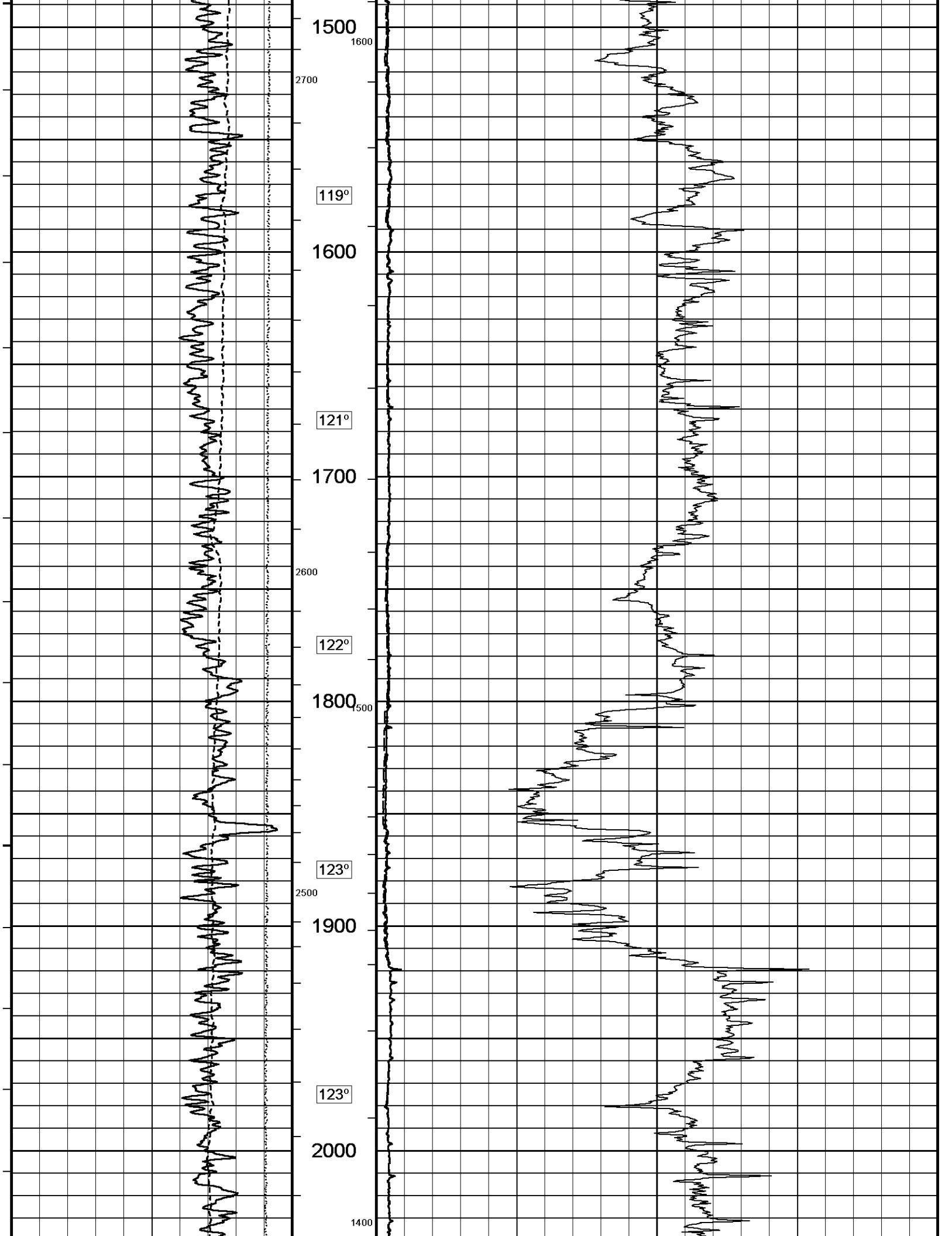
- OPERATOR: B. TOVAR.

In interpreting, communicating or providing information and/or making recommendations, either written or oral, as to logs or test or other data, type or amount of material, or Work or other service to be furnished, or manner of performance, or in predicting results to be obtained, the Contractor will give the Company the benefit of the Contractor's best judgment based on its experience and will perform all such Work in a good and workmanlike manner. Any interpretation of test or other data, and any recommendation or reservoir description based upon such interpretations, are opinions based upon inferences from measurements and empirical relationships and assumptions, which inferences and assumptions are not infallible, and with respect to which professional engineers and analysts may differ. ACCORDINGLY ANY INTERPRETATION OR RECOMMENDATION RESULTING FROM THE SERVICES WILL BE AT THE SOLE RISK OF THE COMPANY, AND THE CONTRACTOR CANNOT AND DOES NOT WARRANT THE ACCURACY, CORRECTNESS OR COMPLETENESS OF ANY SUCH INTERPRETATION OR RECOMMENDATION, WHICH INTERPRETATIONS AND RECOMMENDATIONS SHOULD NOT, THEREFORE, UNDER ANY CIRCUMSTANCES BE RELIED UPON AS THE SOLE OR MAIN BASIS FOR ANY DRILLING, COMPLETION, WELL TREATMENT, PRODUCTION OR FINANCIAL DECISION, OR ANY PROCEDURE INVOLVING ANY RISK TO THE SAFETY OF ANY DRILLING ACTIVITY, DRILLING RIG OR ITS CREW OR ANY OTHER INDIVIDUAL. THE COMPANY HAS FULL RESPONSIBILITY FOR ALL DECISIONS CONCERNING THE SERVICES.



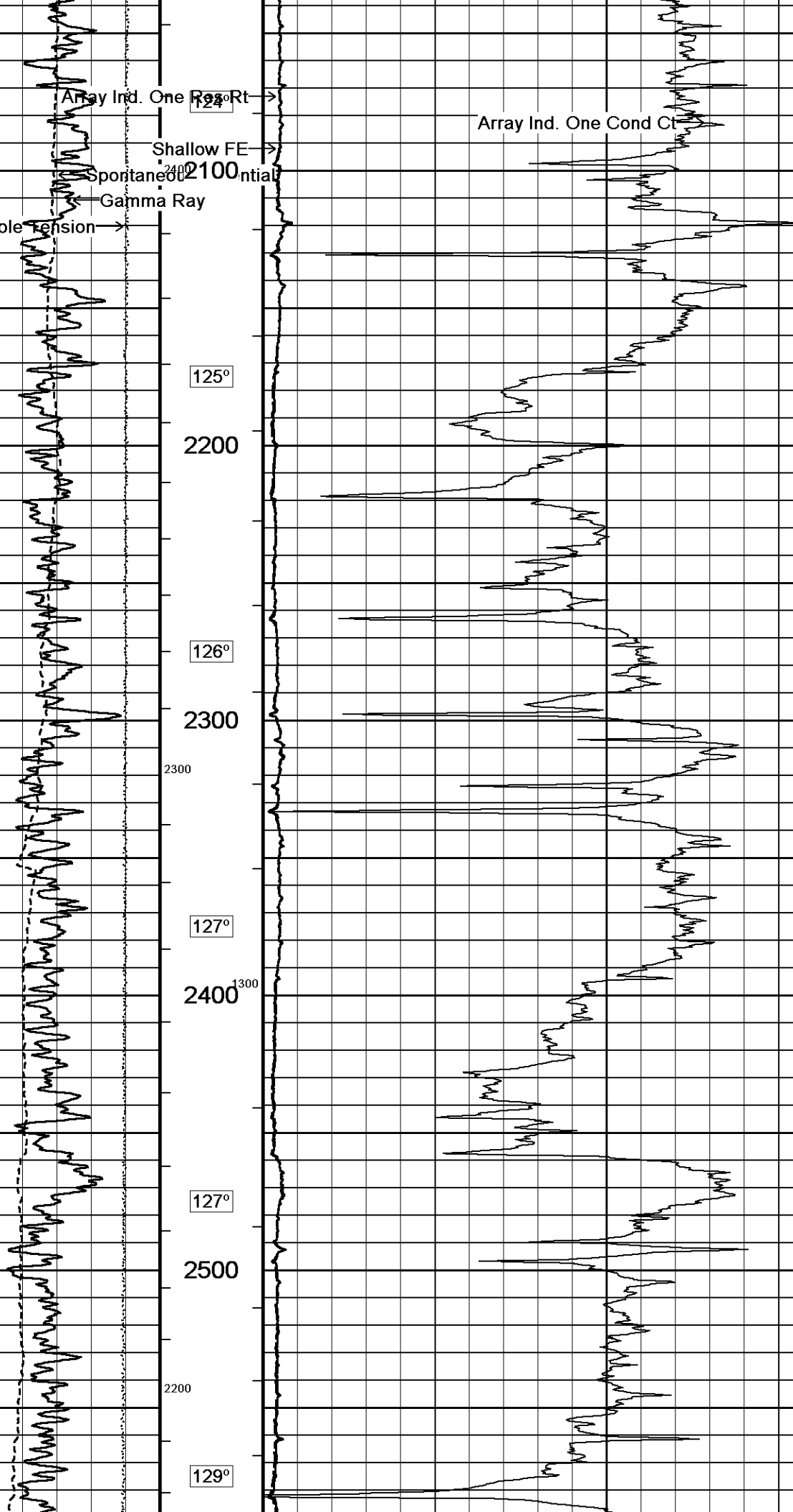


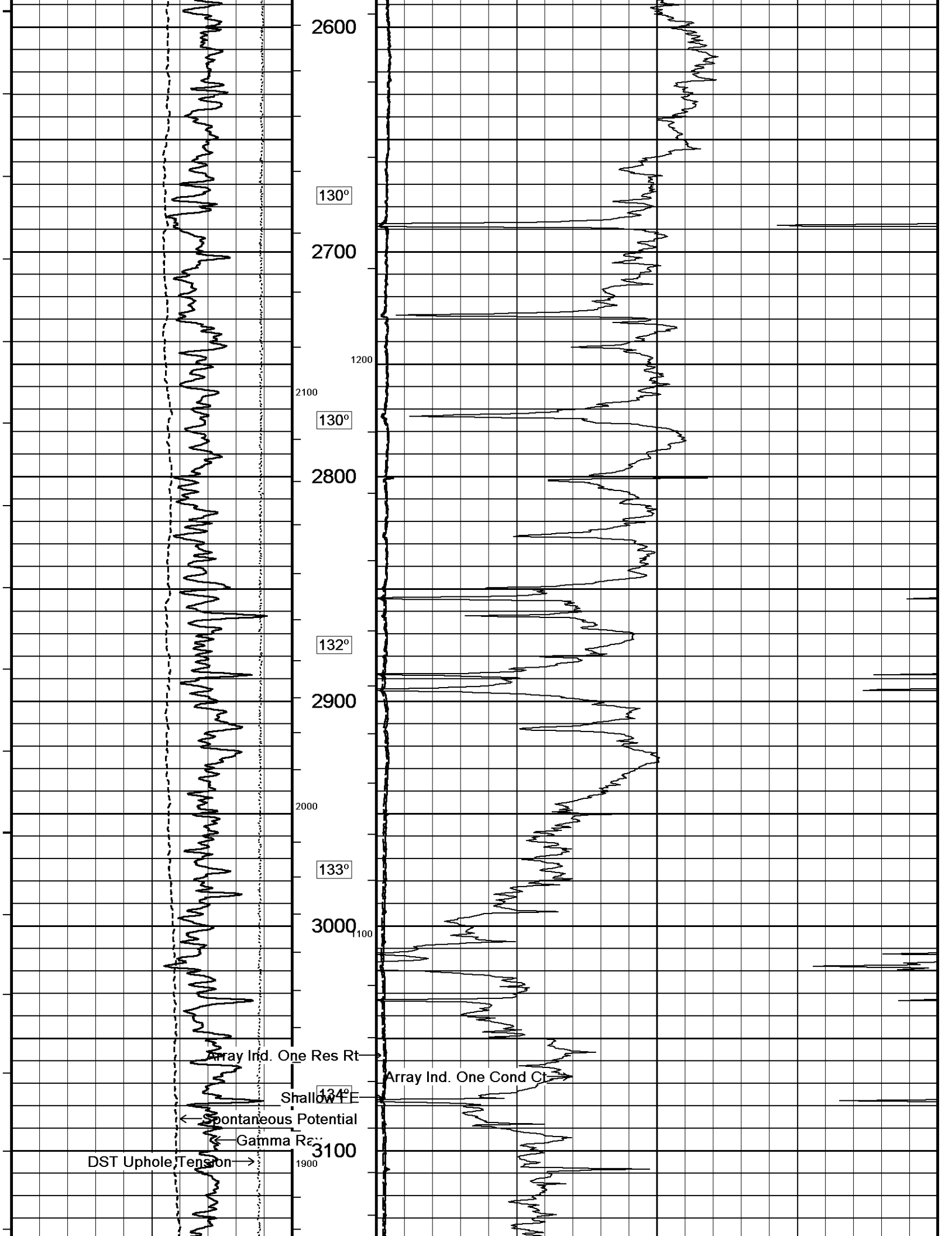


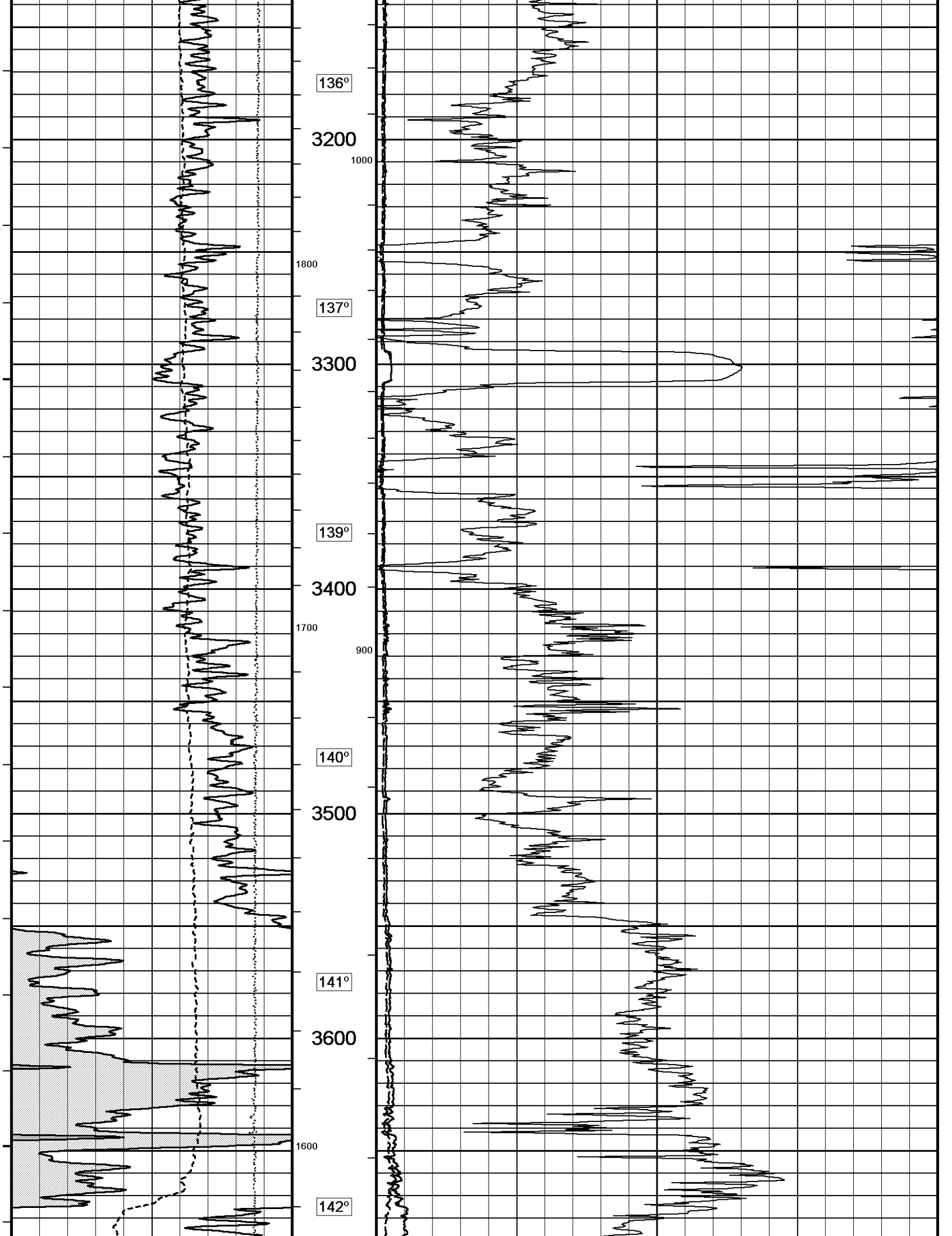


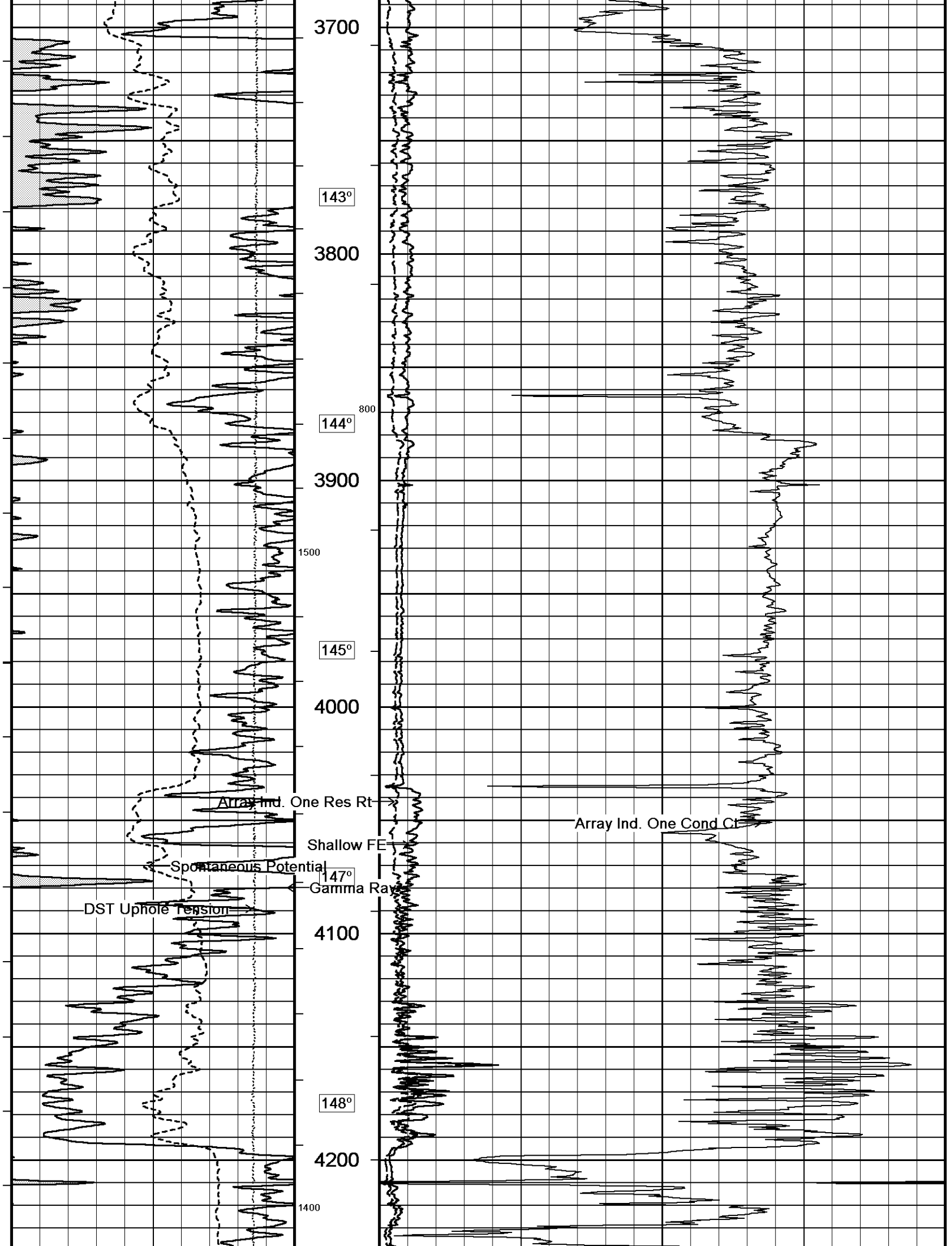
Array Ind. One Res Rt →
Shallow FE →
Spontaneous Potential →
Gamma Ray →
DST Uphole Pressure →

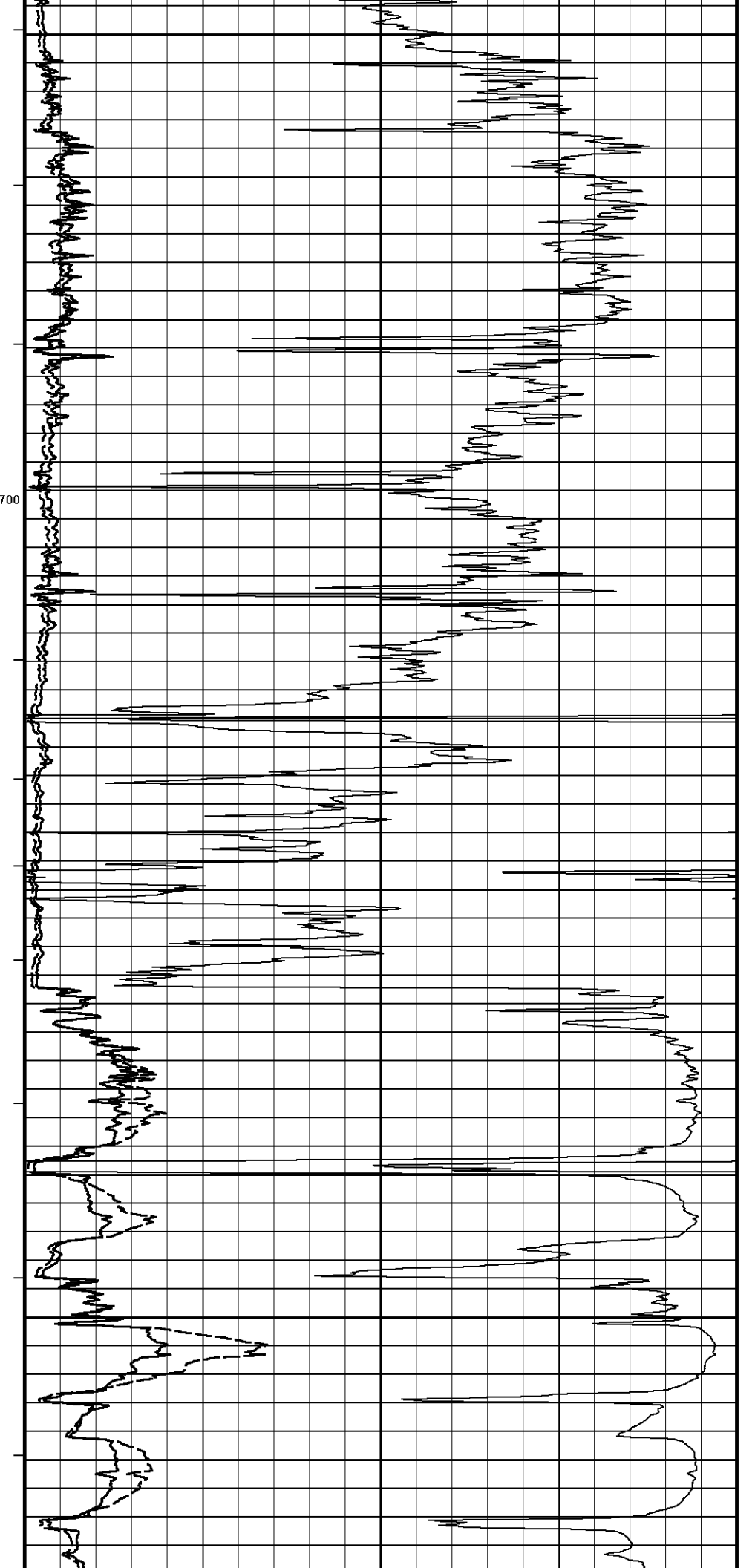
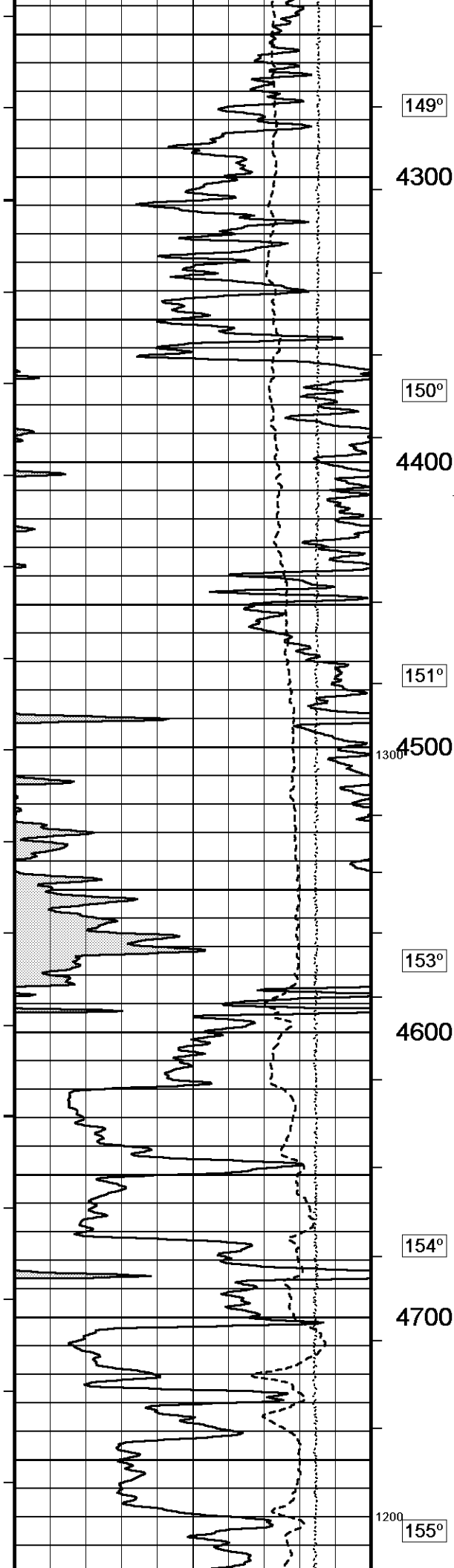
Array Ind. One Cond Ct

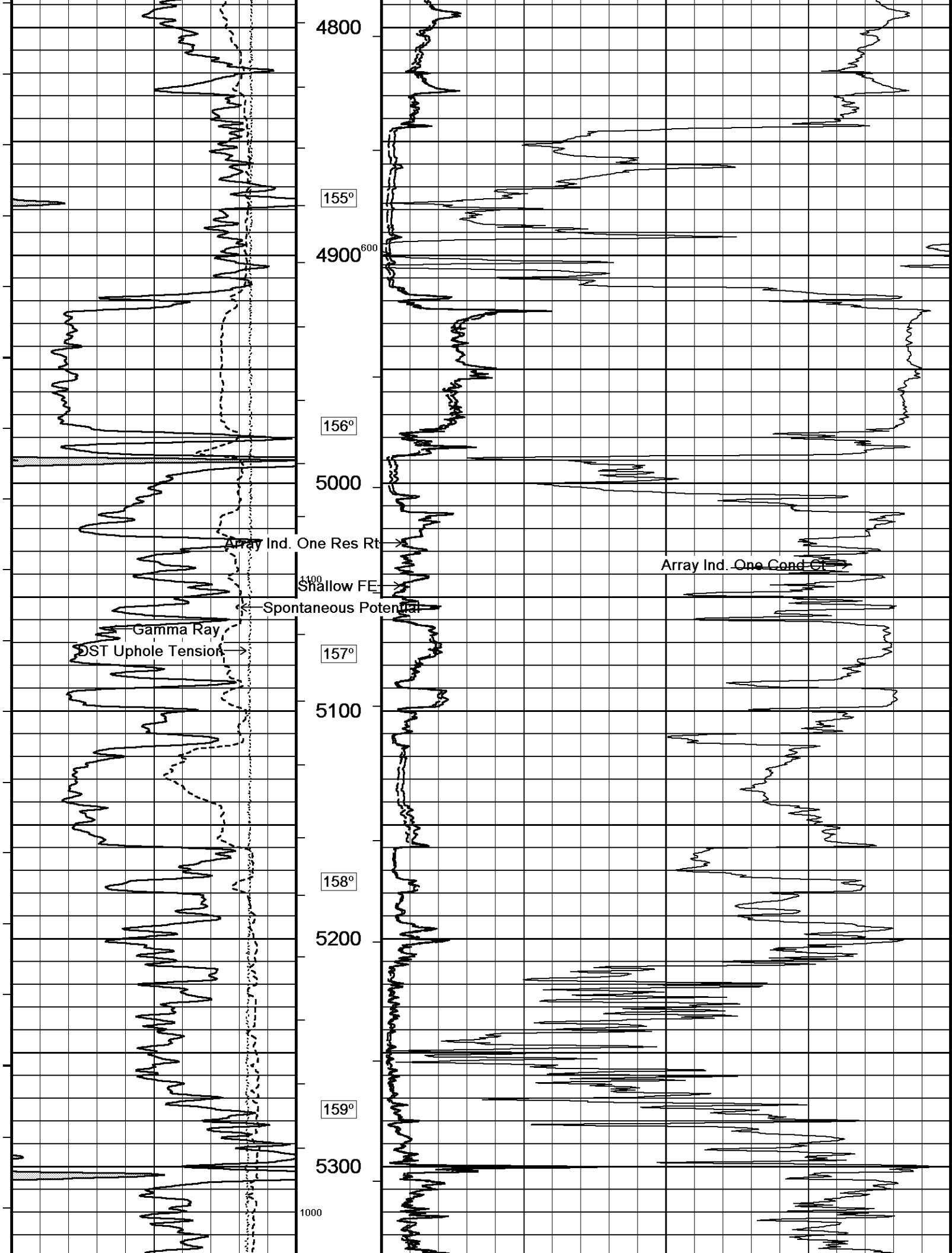


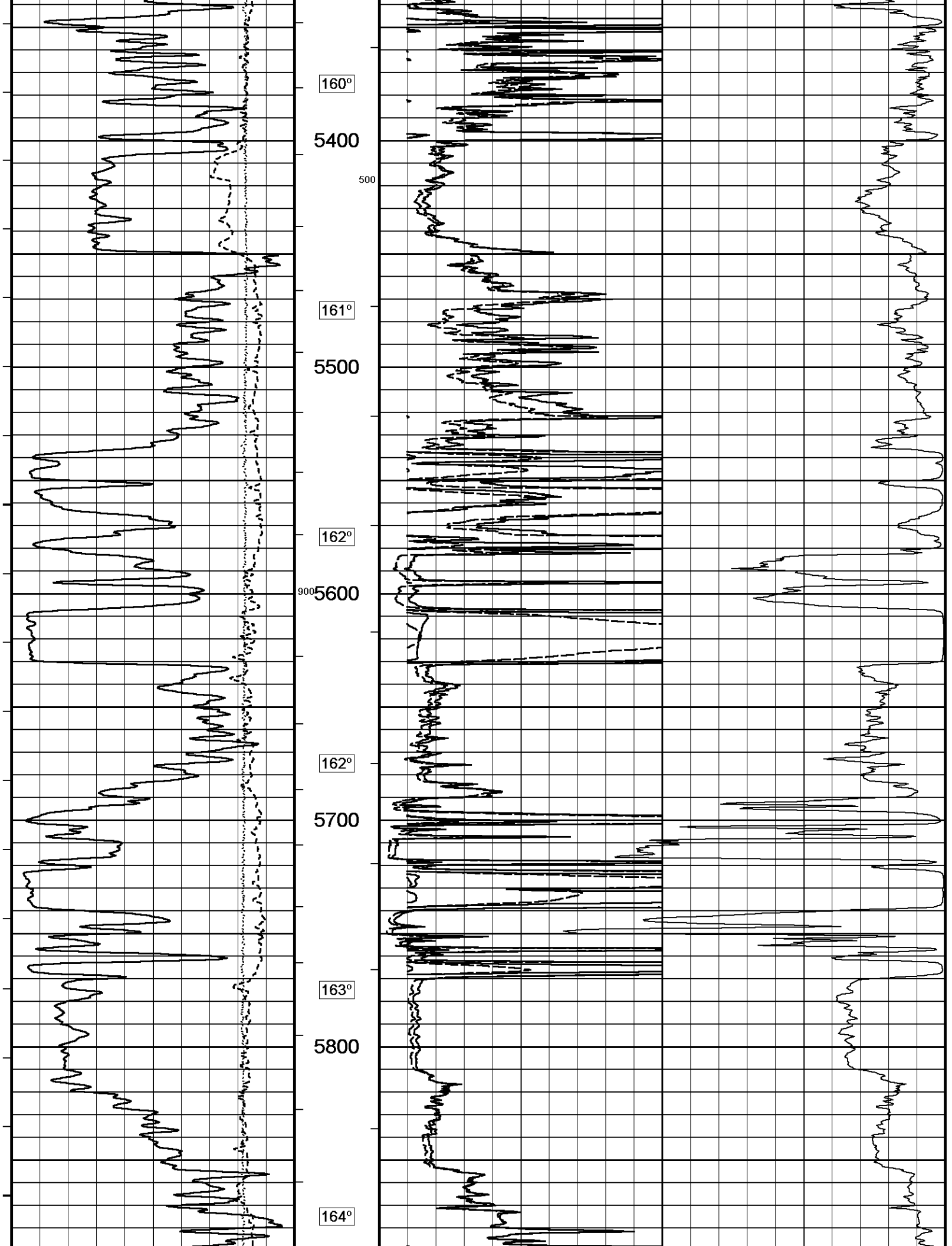


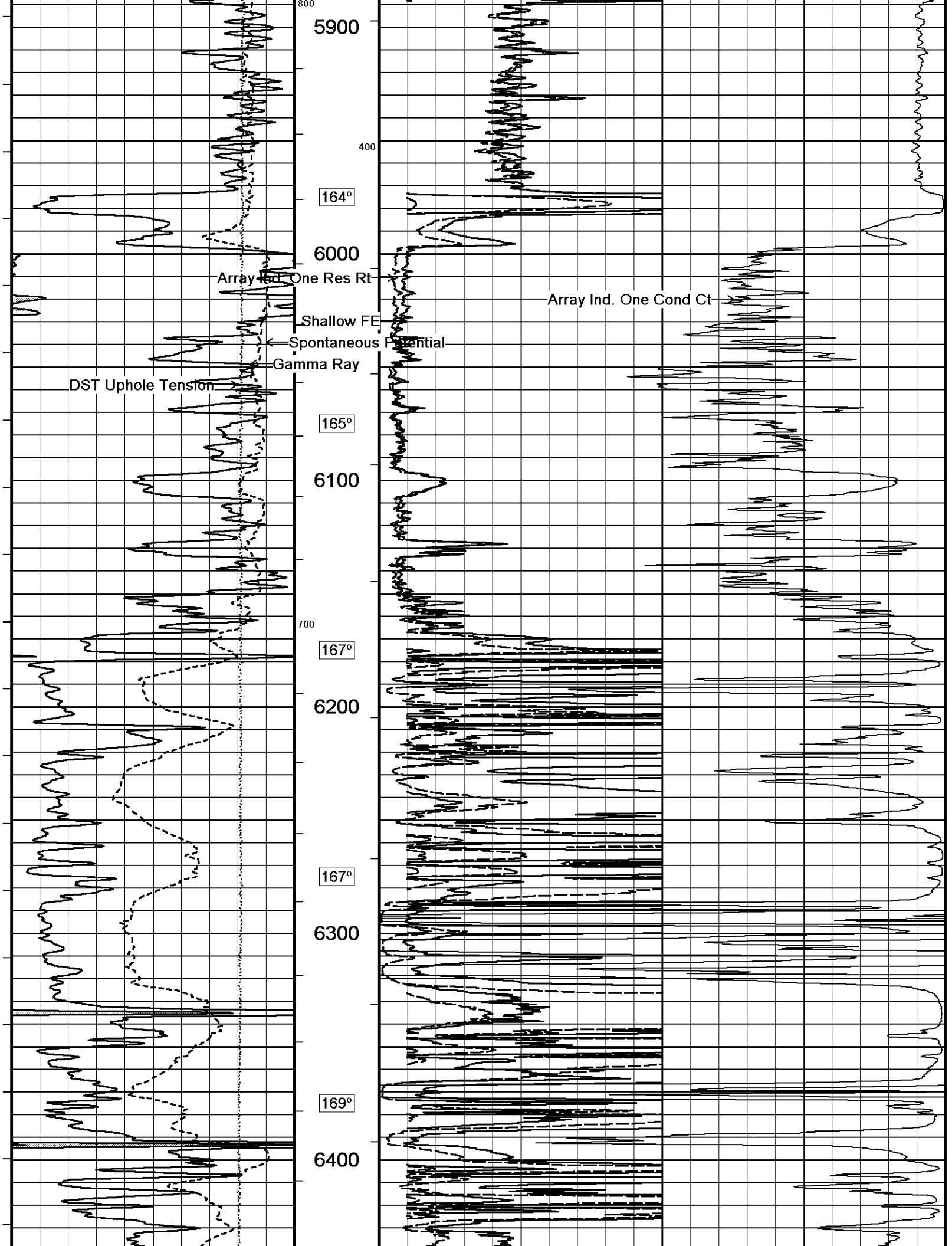


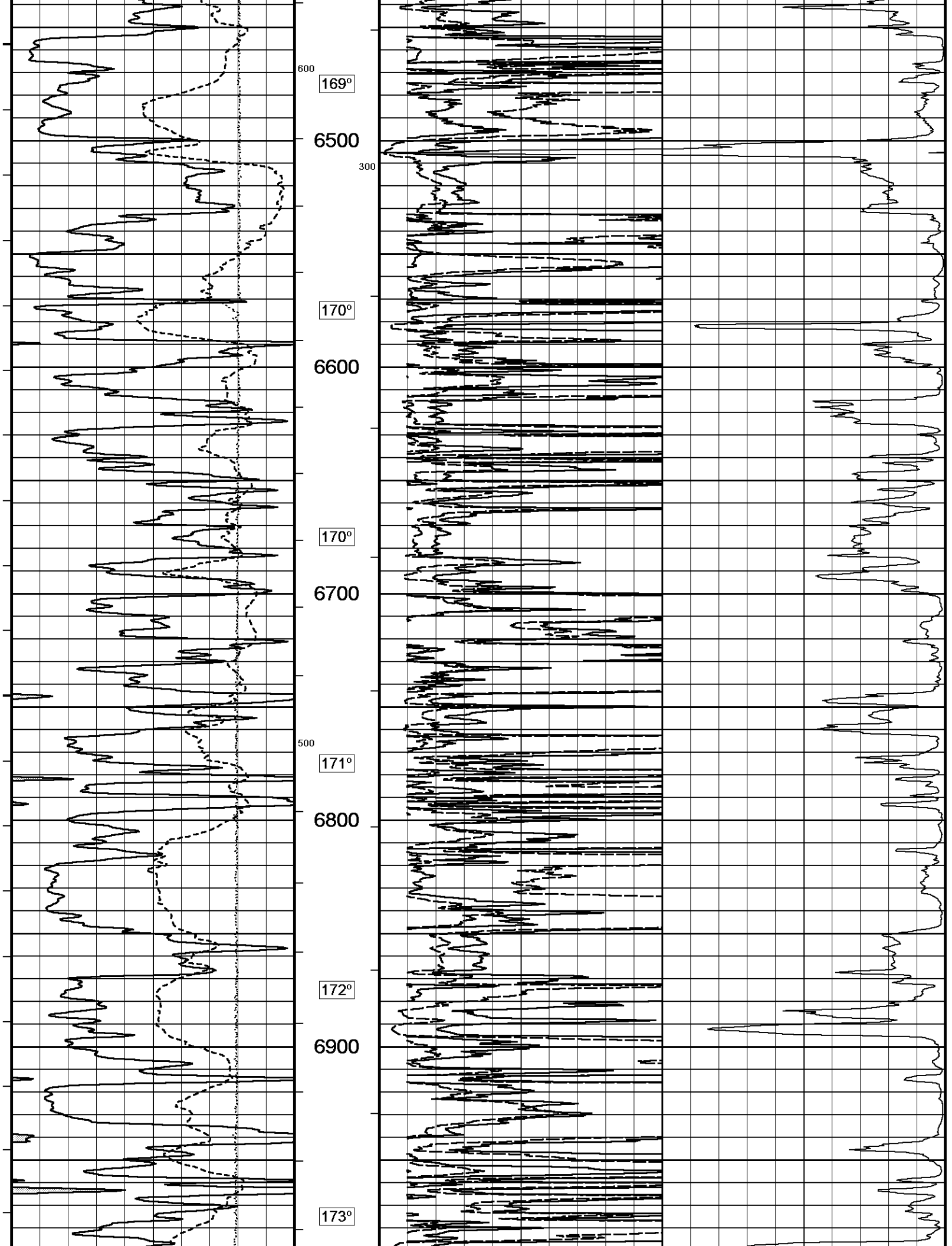


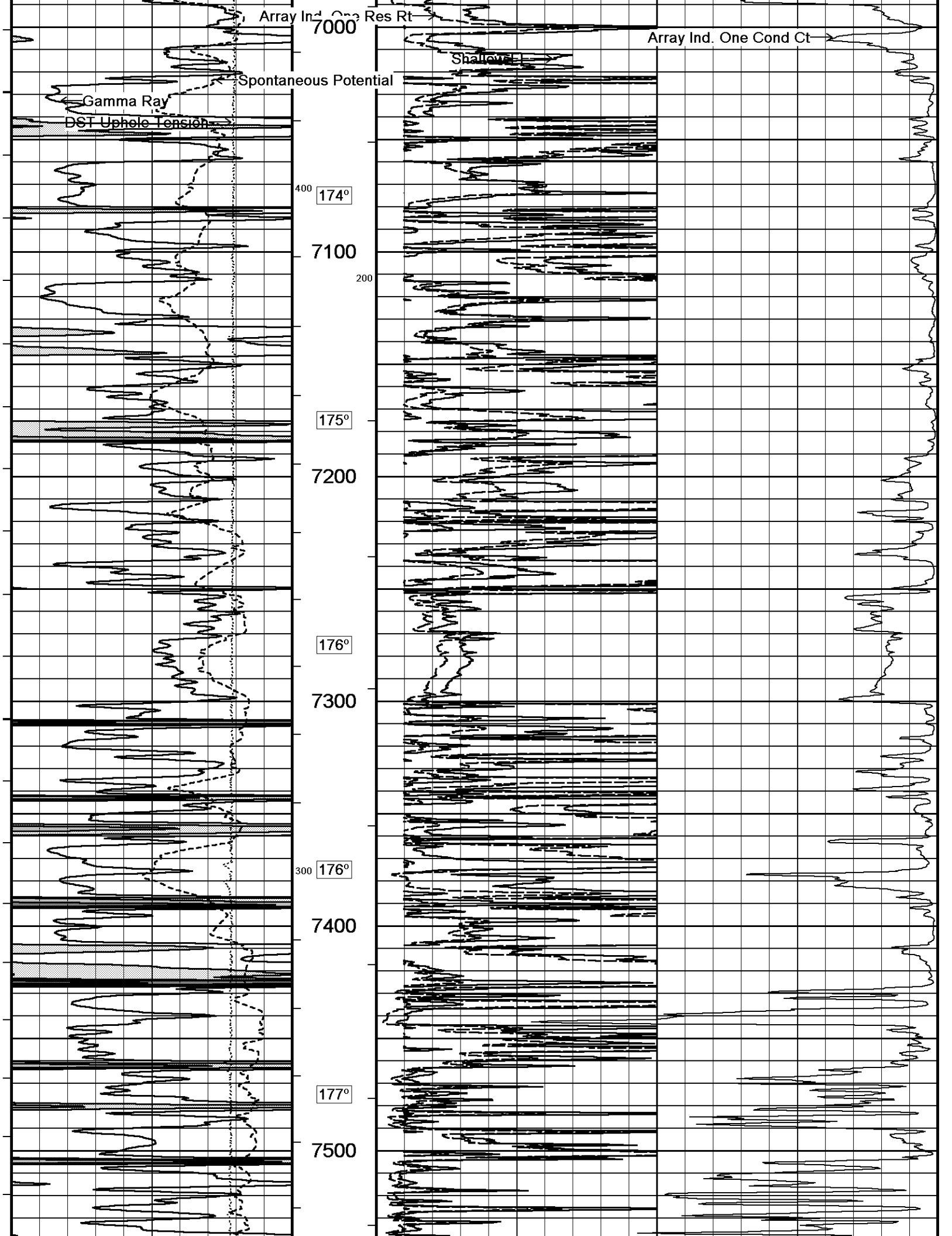


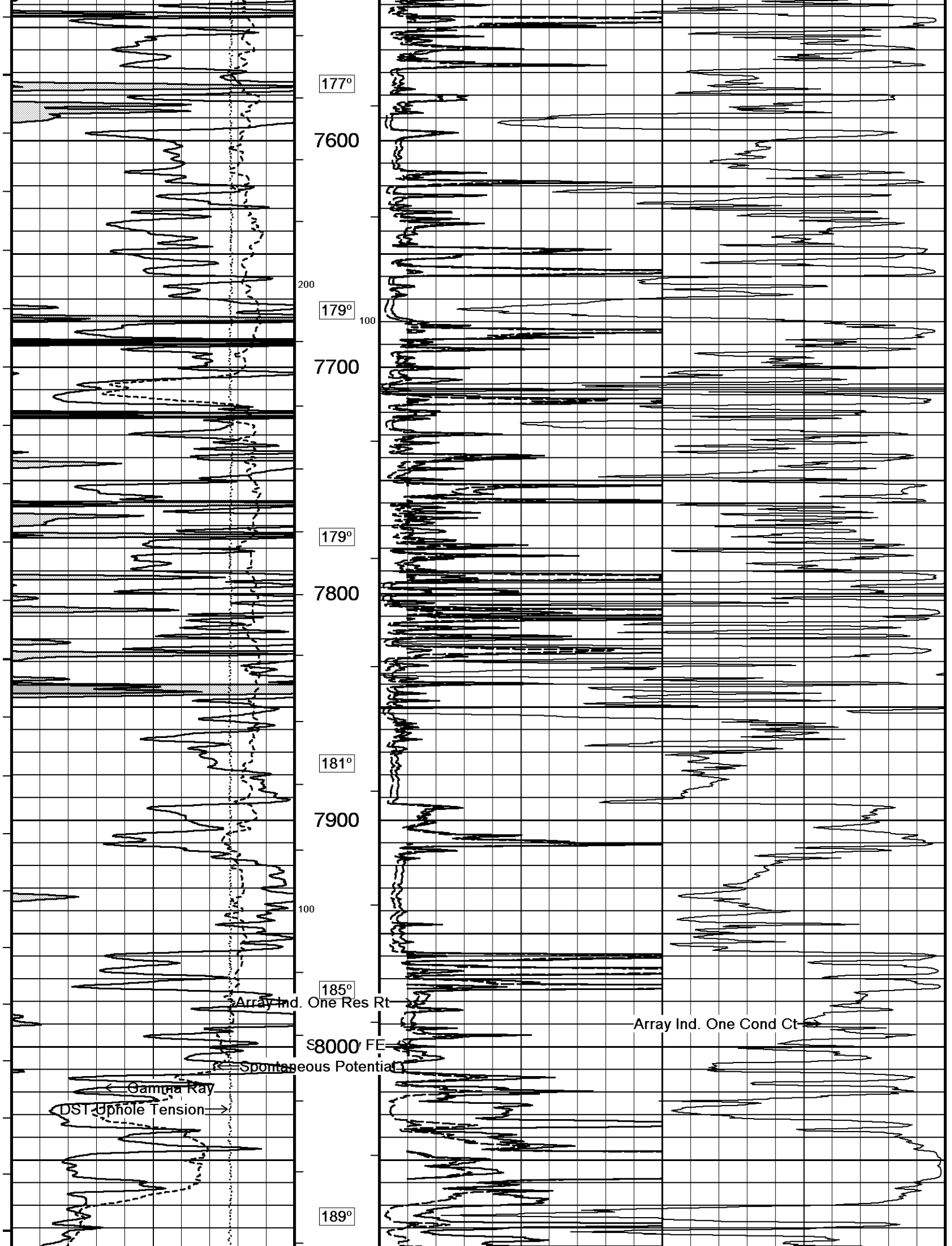


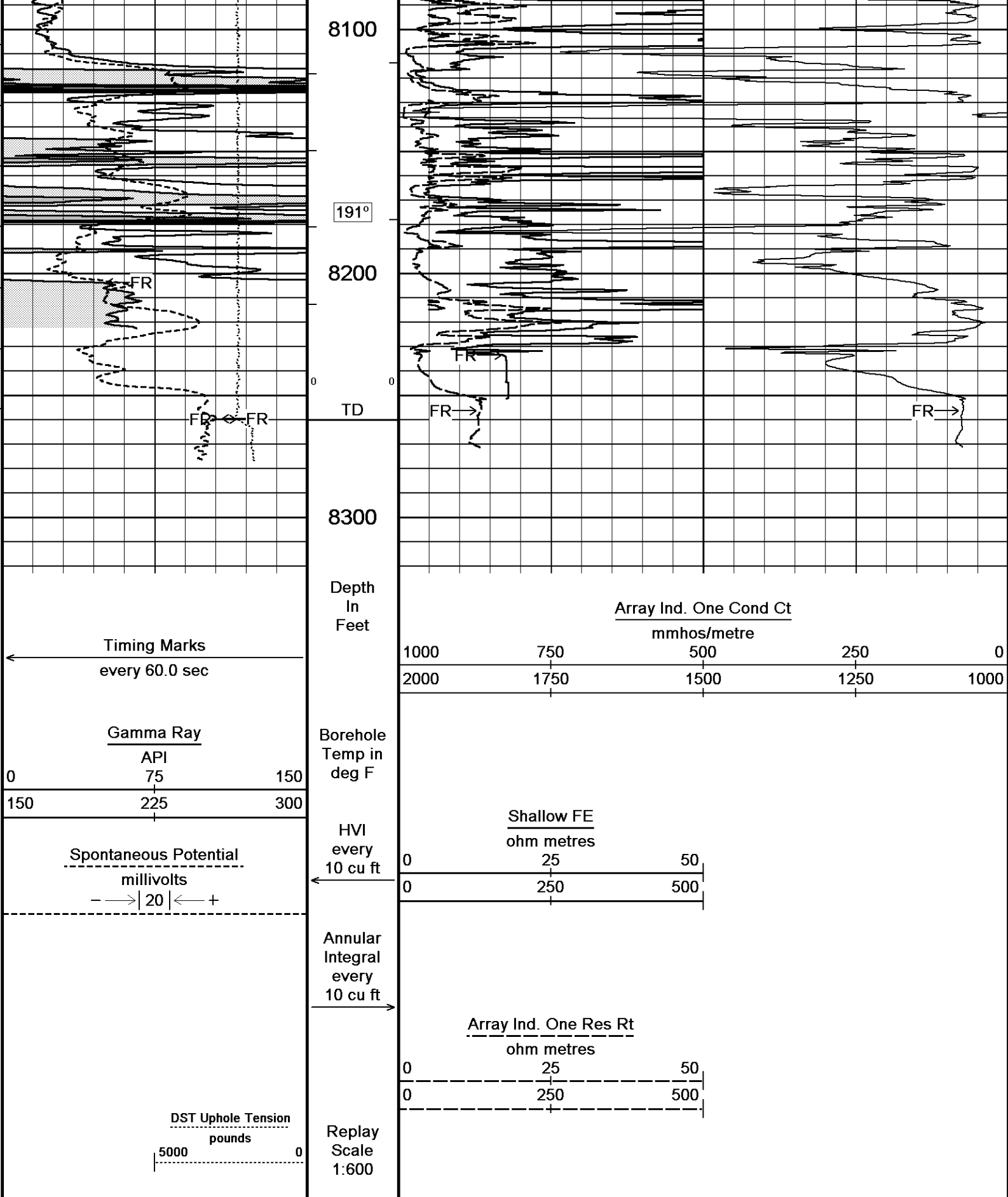












Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 09-NOV-2016 14:55

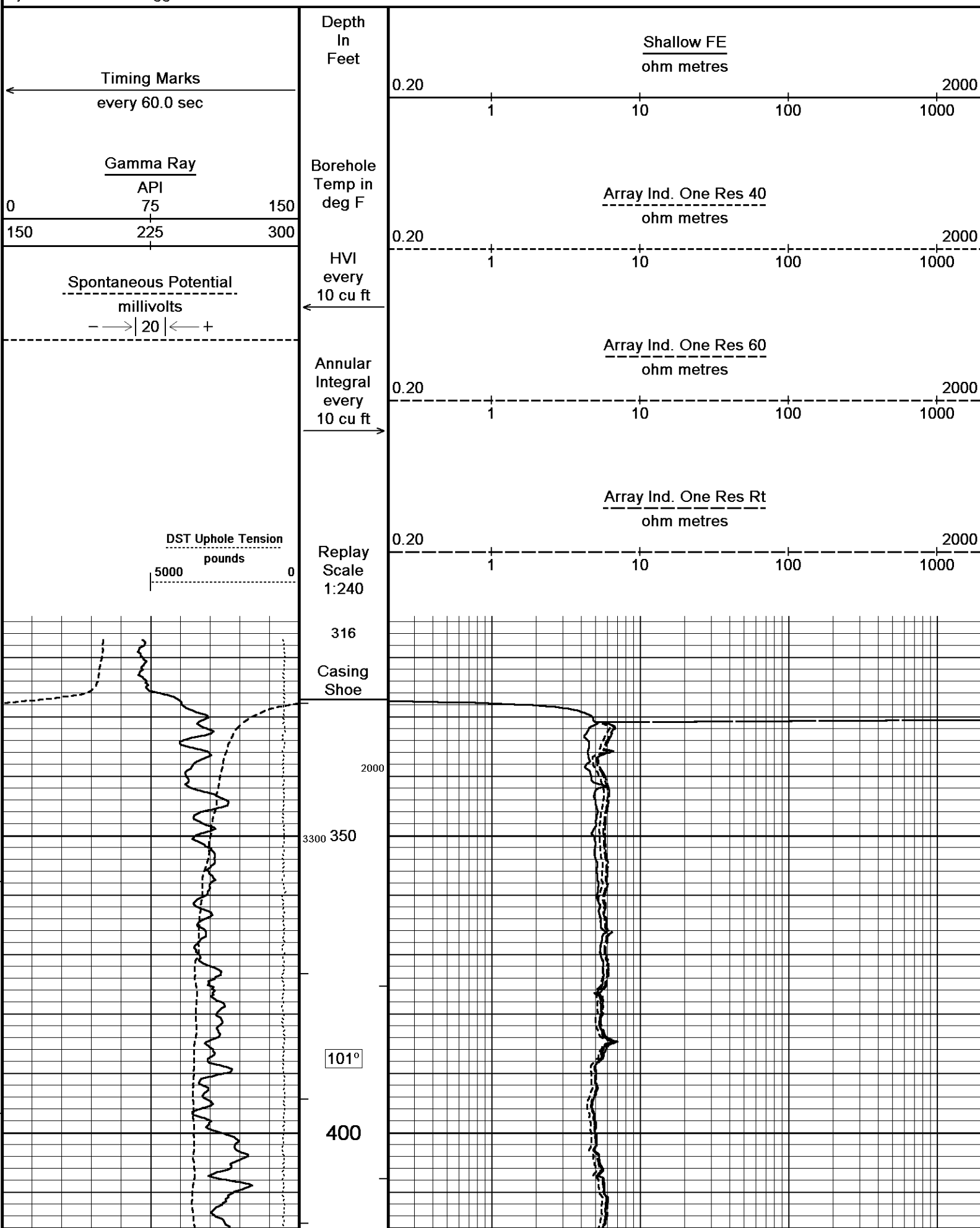
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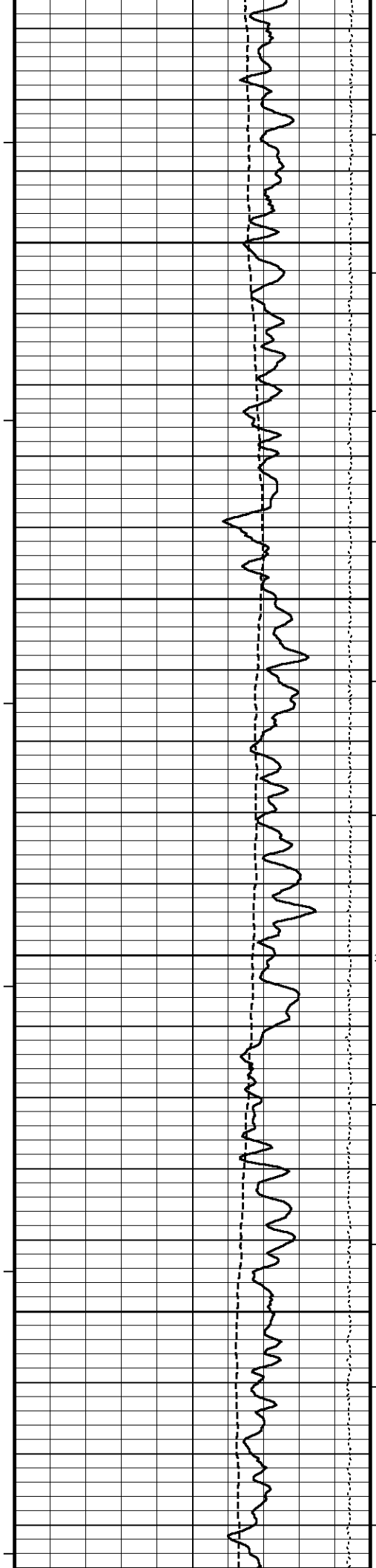
Recorded on 09-NOV-2016 10:38

System Versions: Logged with 15.03.5939 Plotted with 15.03.5939

2 INCH MAIN

5 INCH MAIN





102°

450

103°

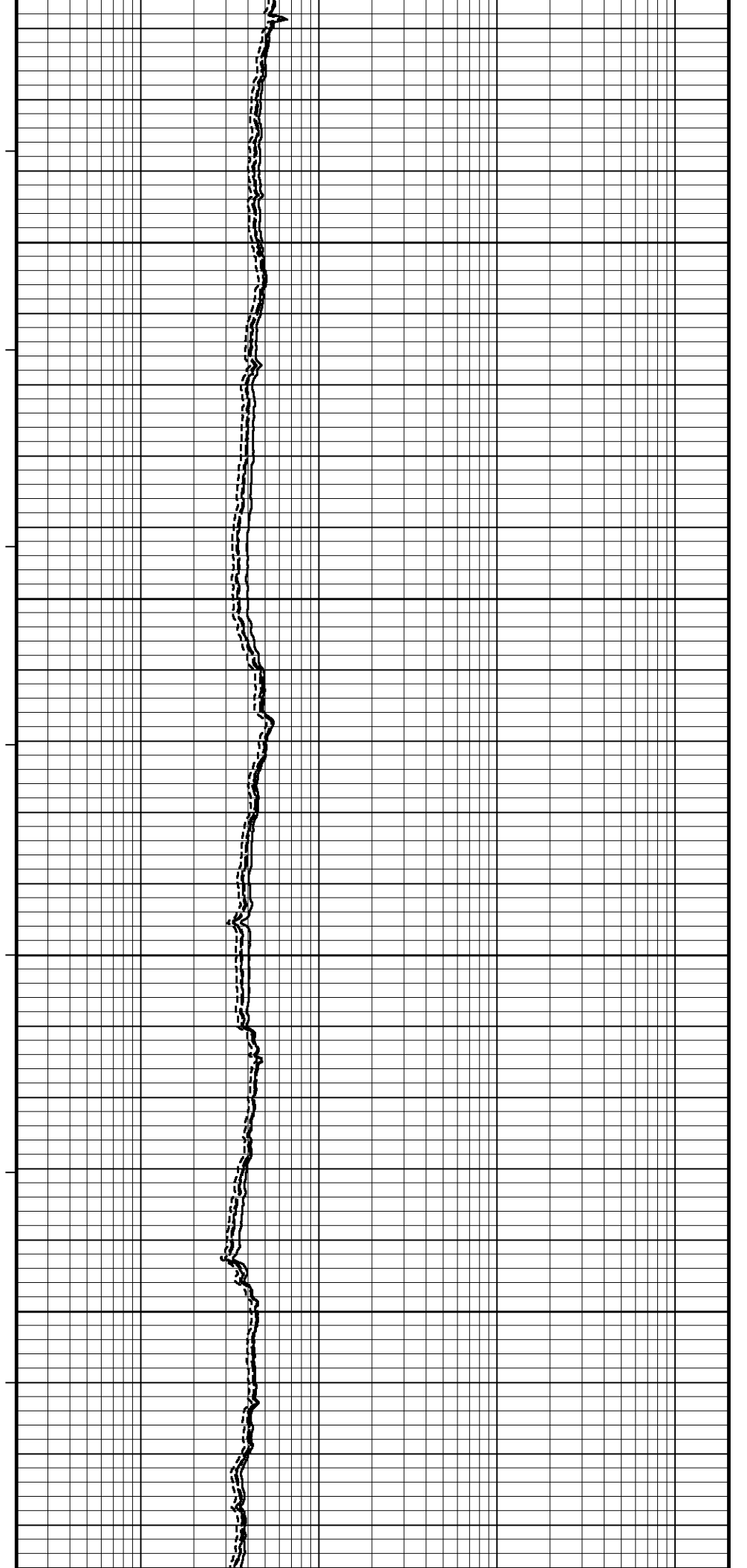
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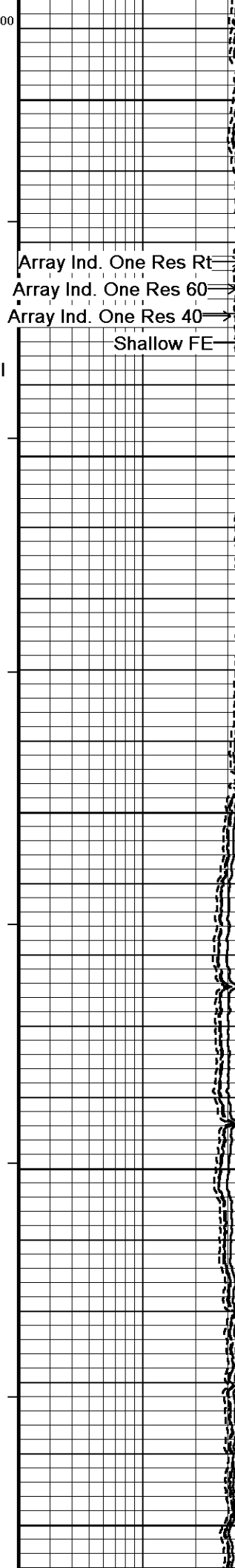
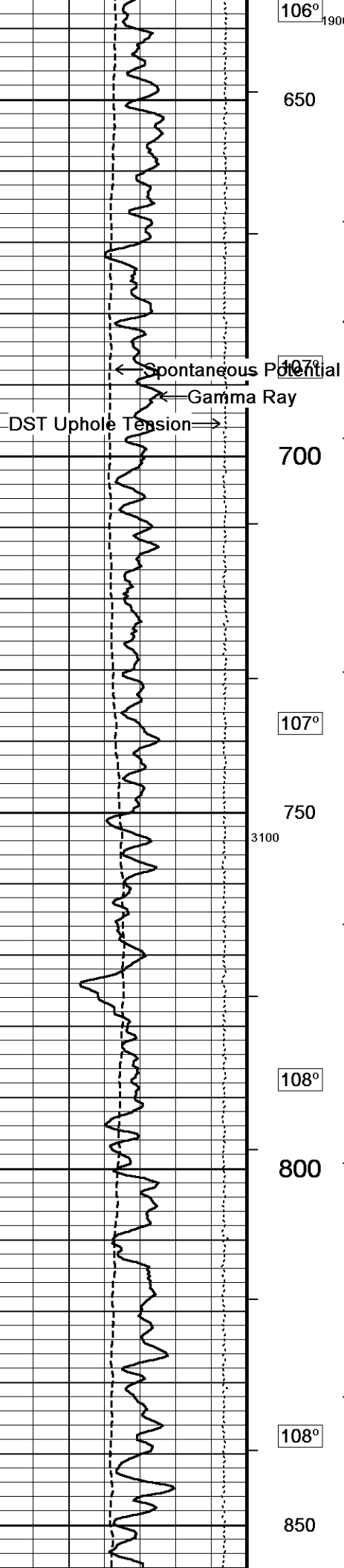
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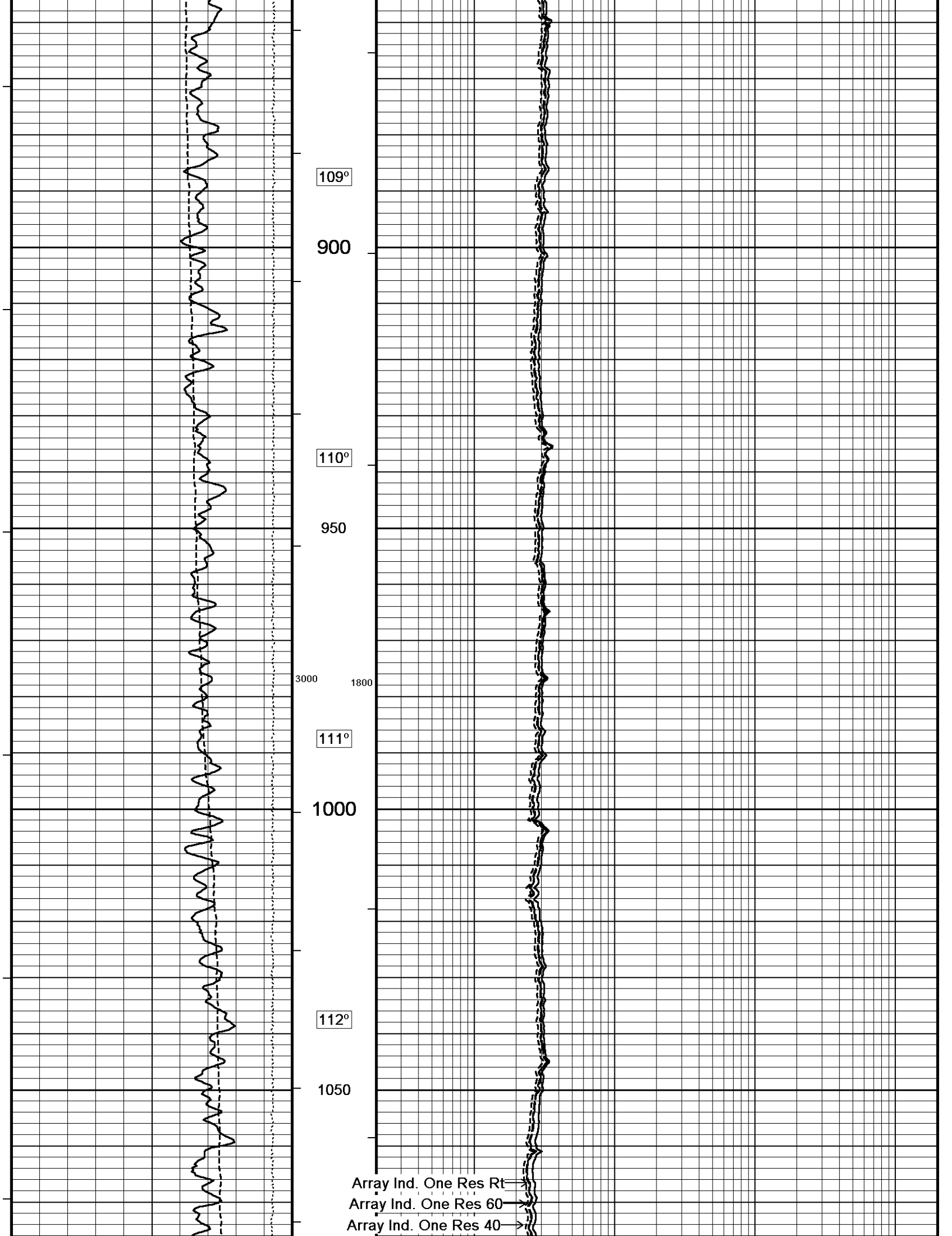
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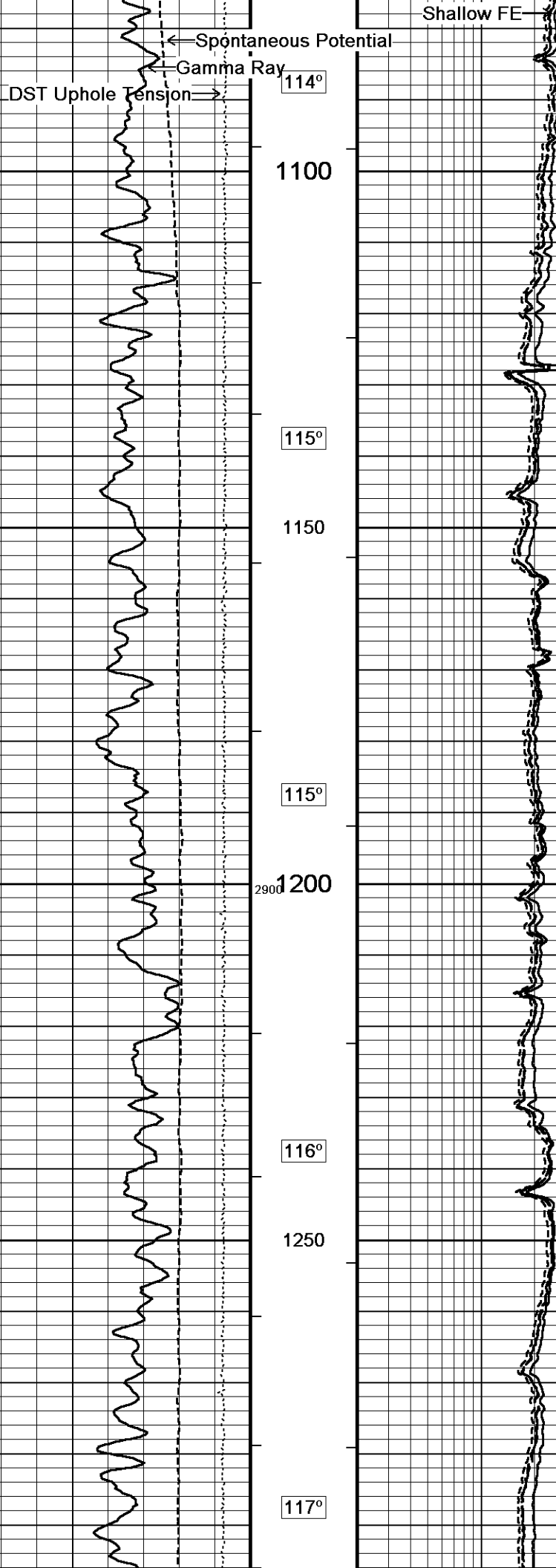
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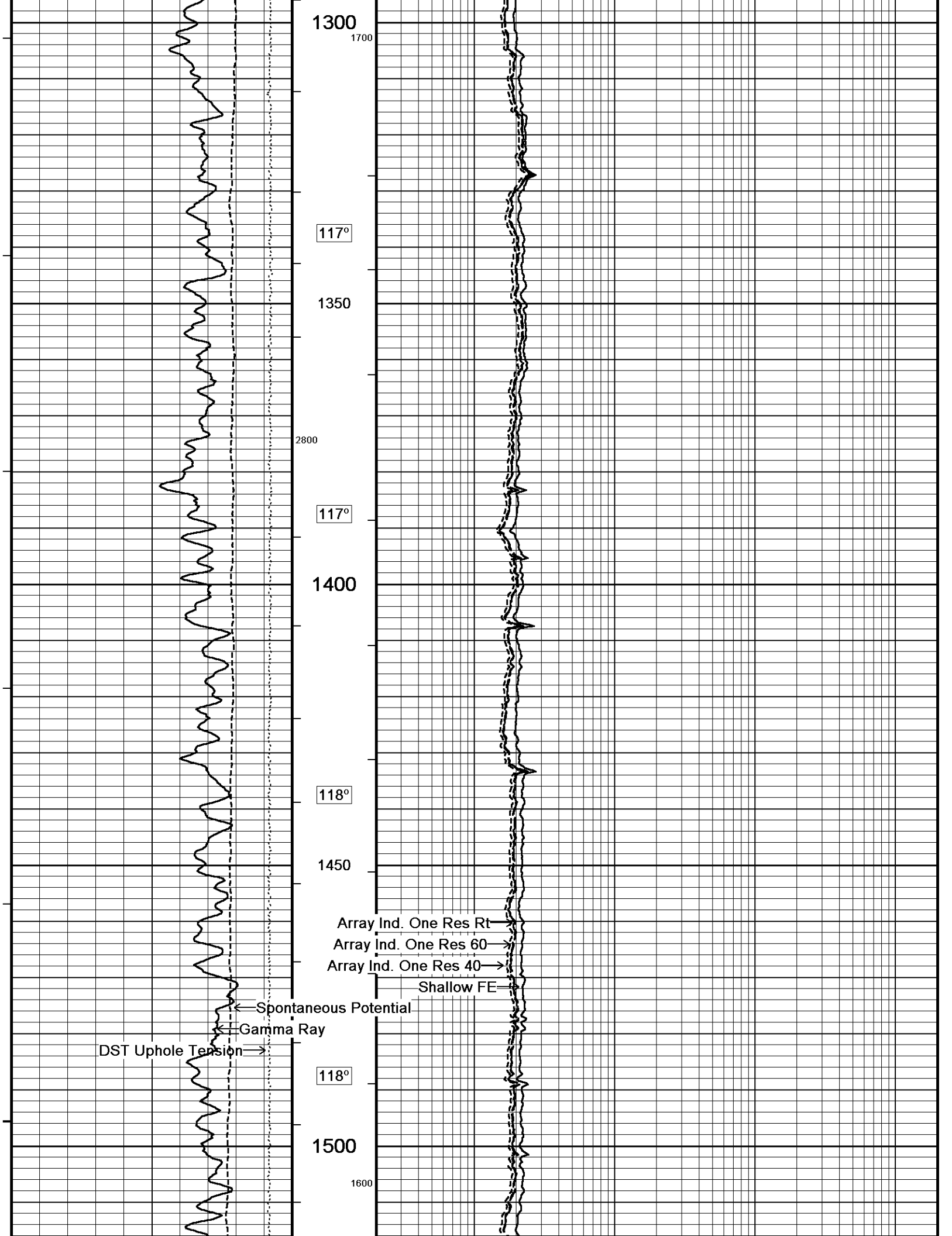
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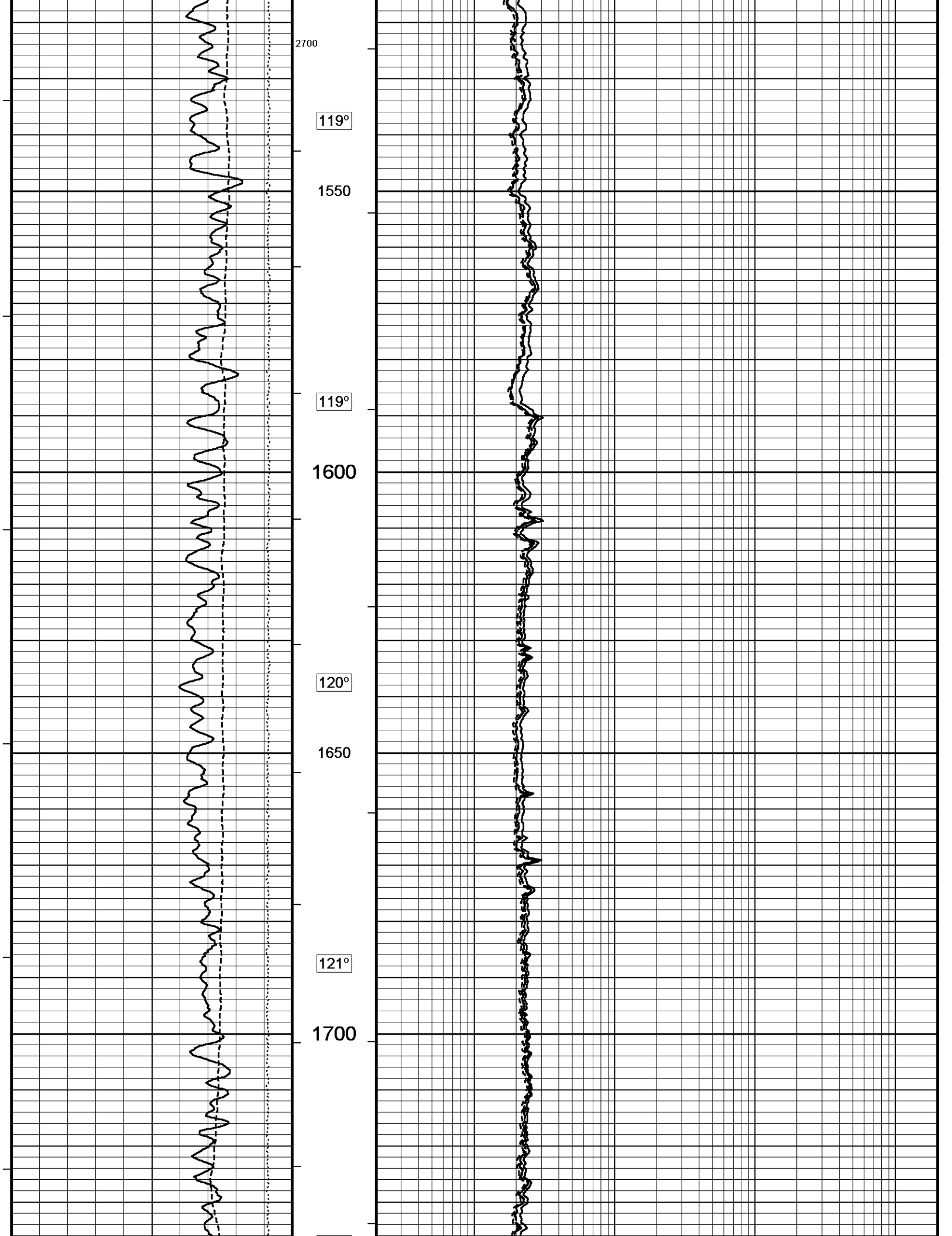


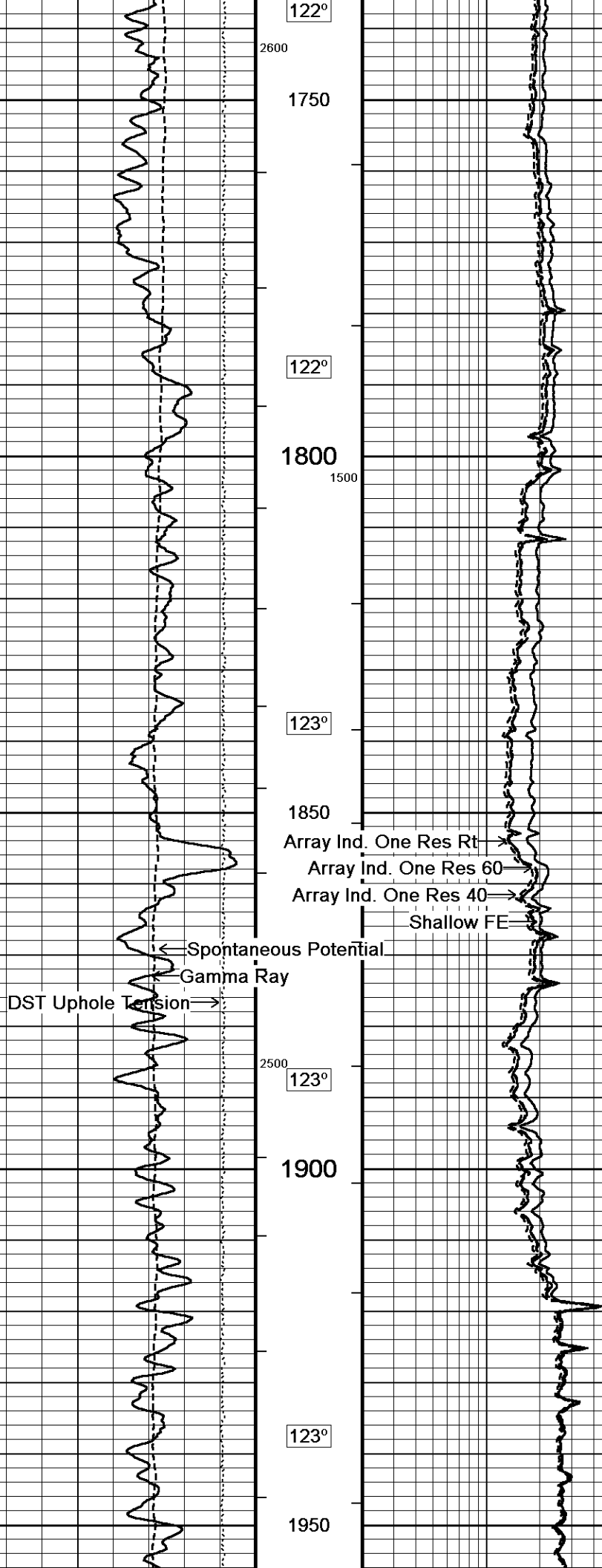


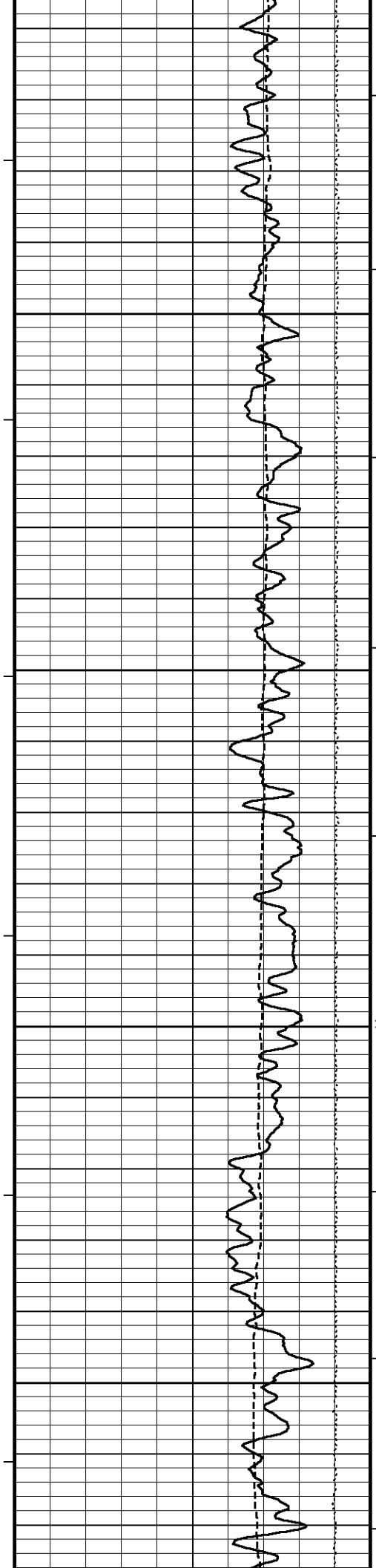












123°

2000

1400

123°

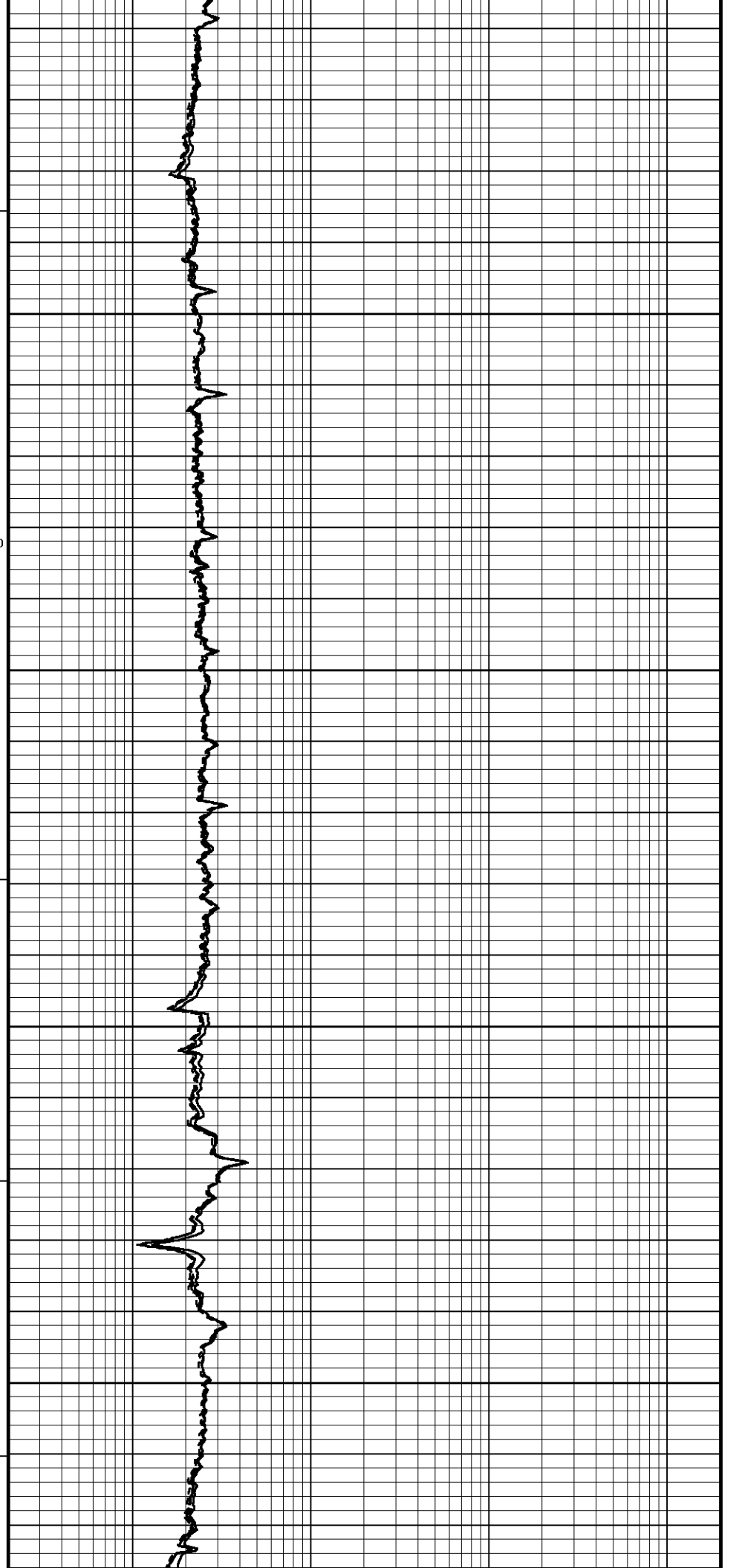
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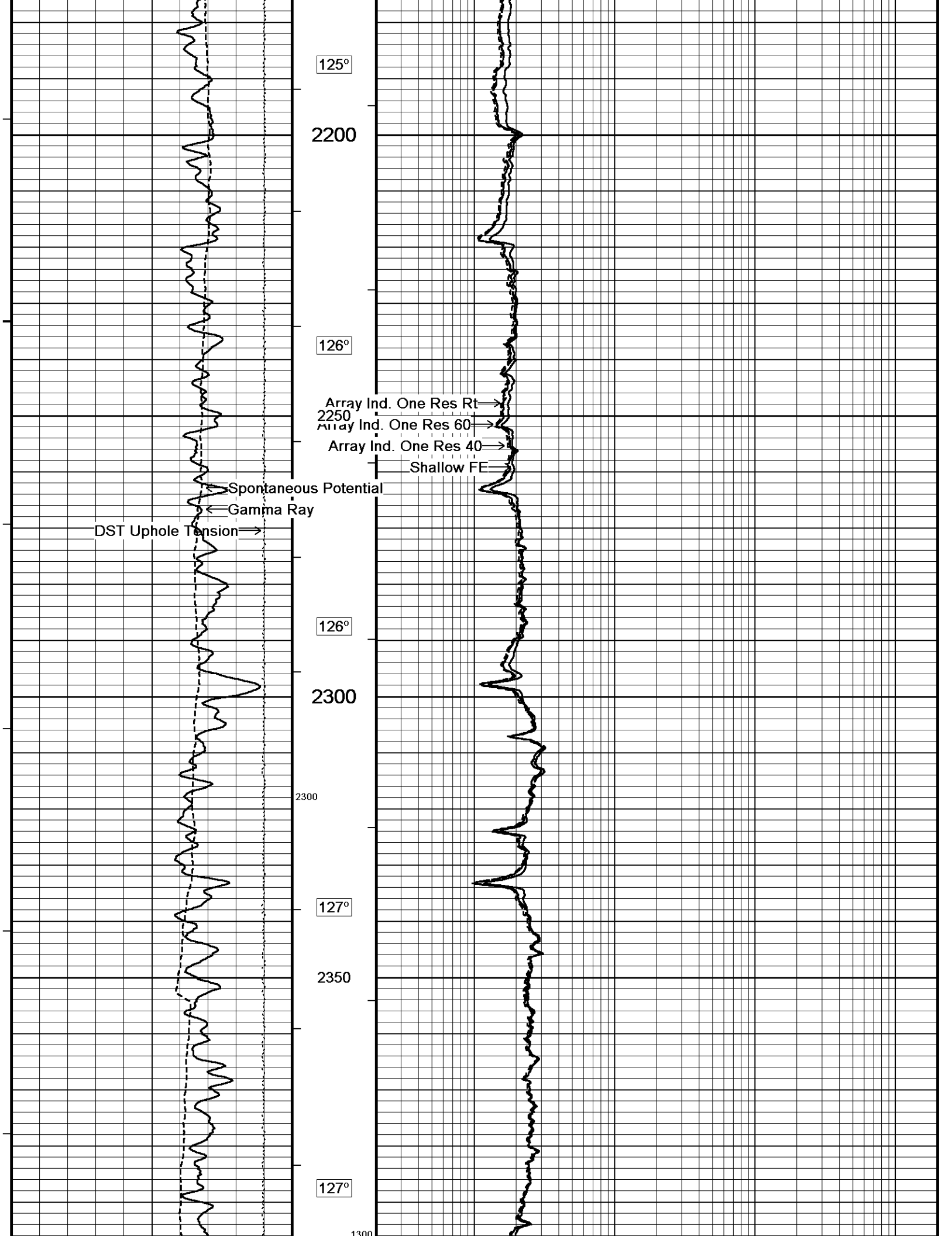
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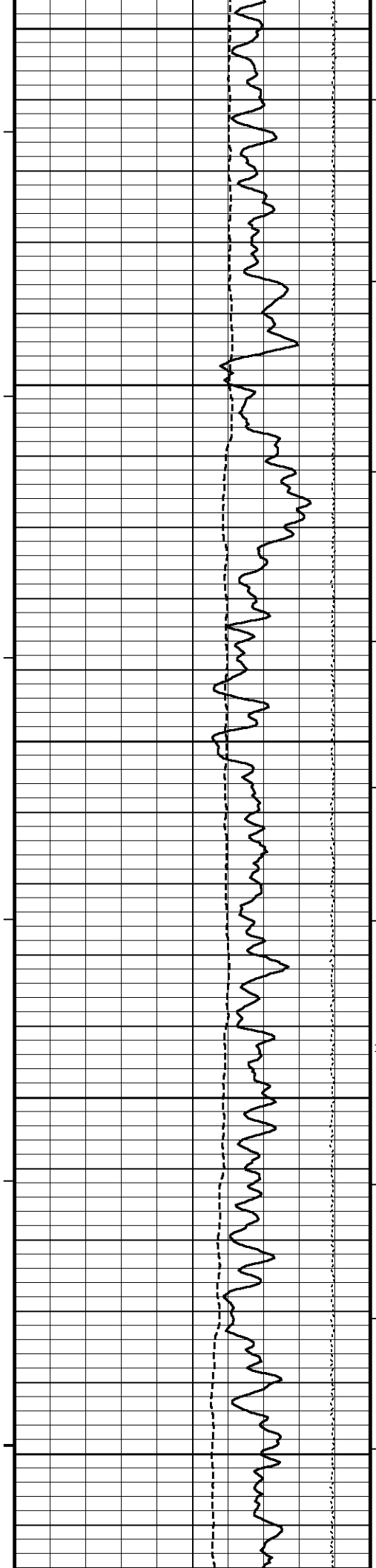
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124°

2150







2400

127°

2450

128°

2500

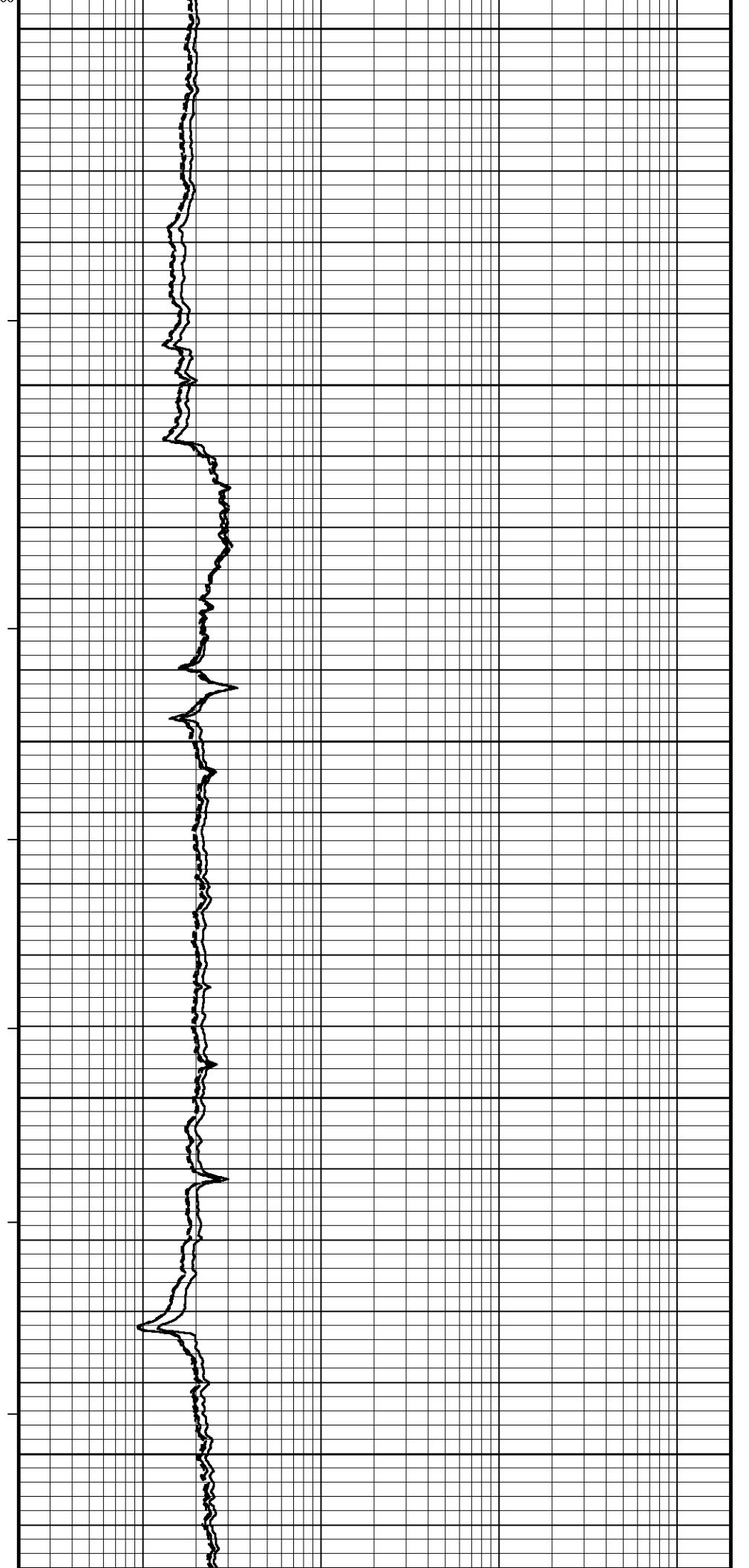
128°

2200

2550

129°

2600



← Spontaneous Potential
← Gamma Ray
DST Uphole Tension →

130°

Array Ind. One Res Rt →
Array Ind. One Res 60 →
2650 Array Ind. One Res 40 →
Shallow FE →

130°

2700

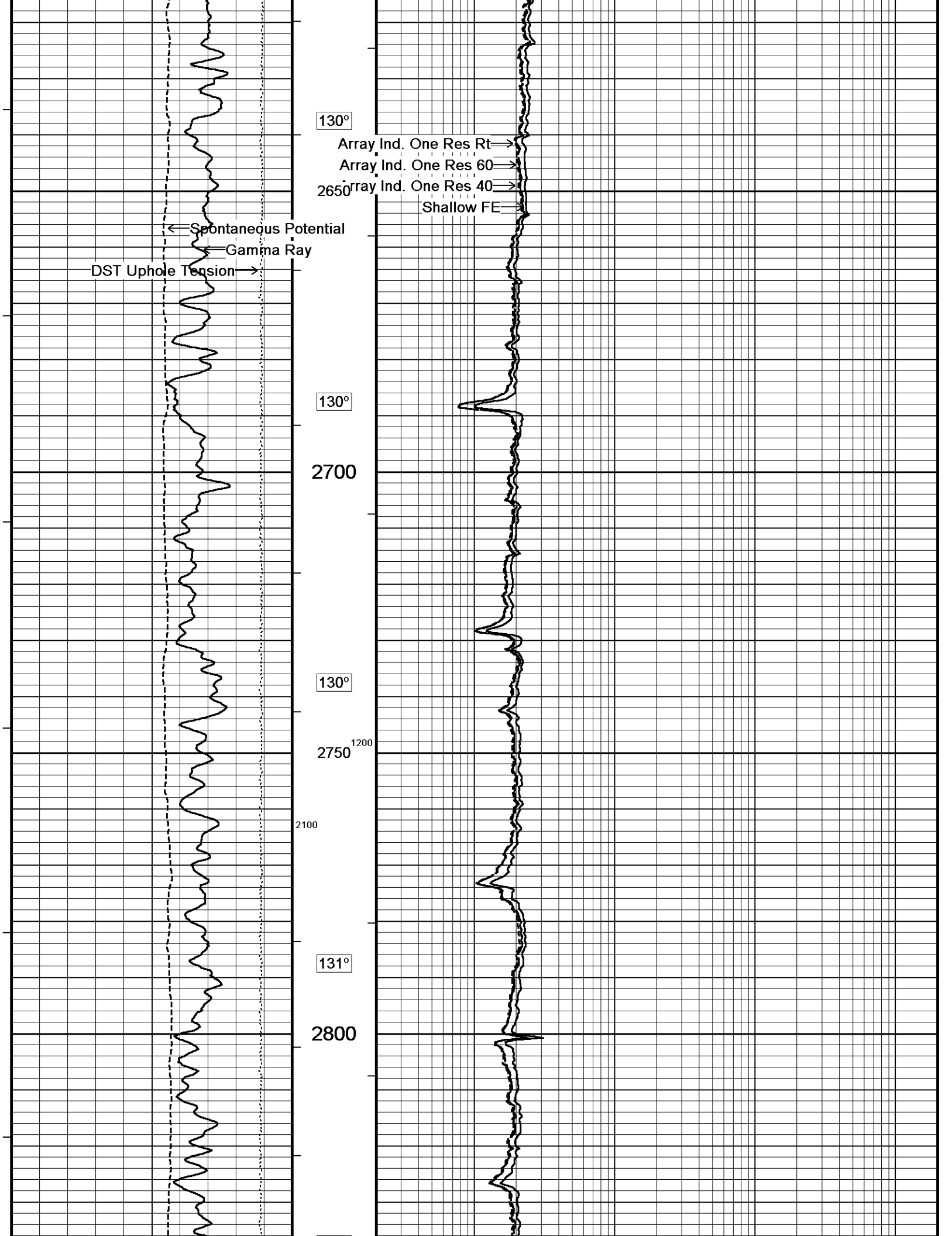
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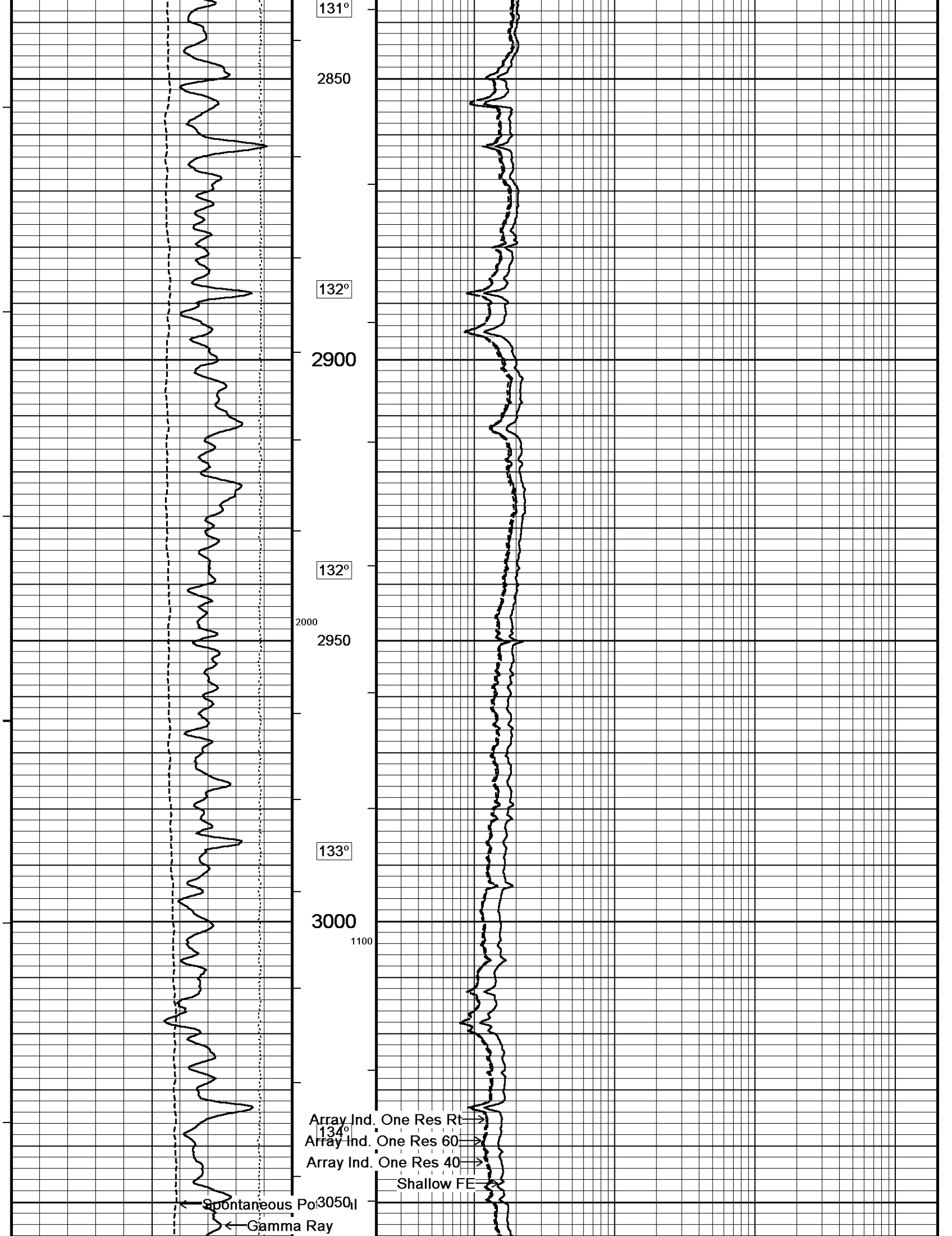
2750¹²⁰⁰

2100

131°

2800





DST Uphole Tension →

134°

3100

1900

135°

3150

136°

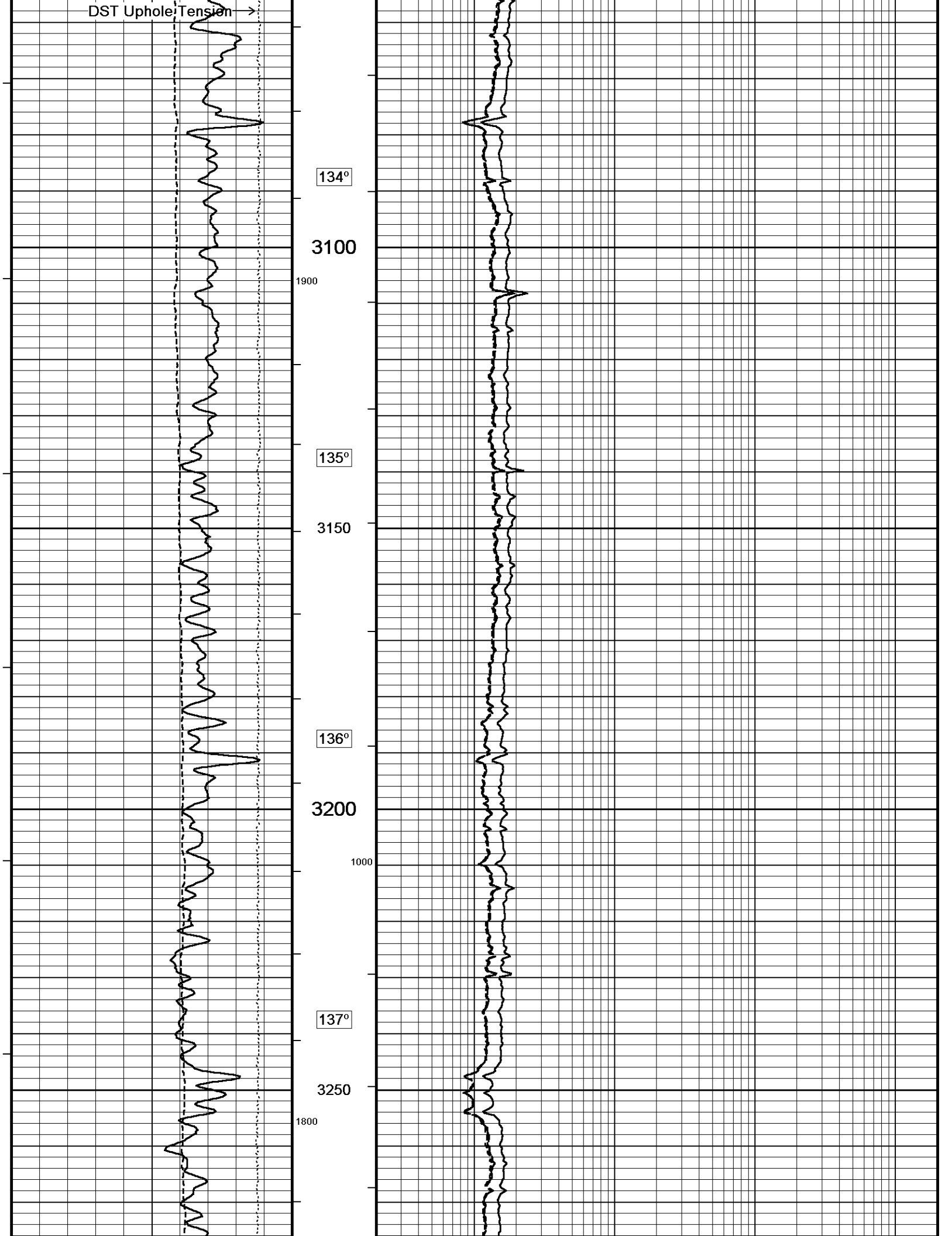
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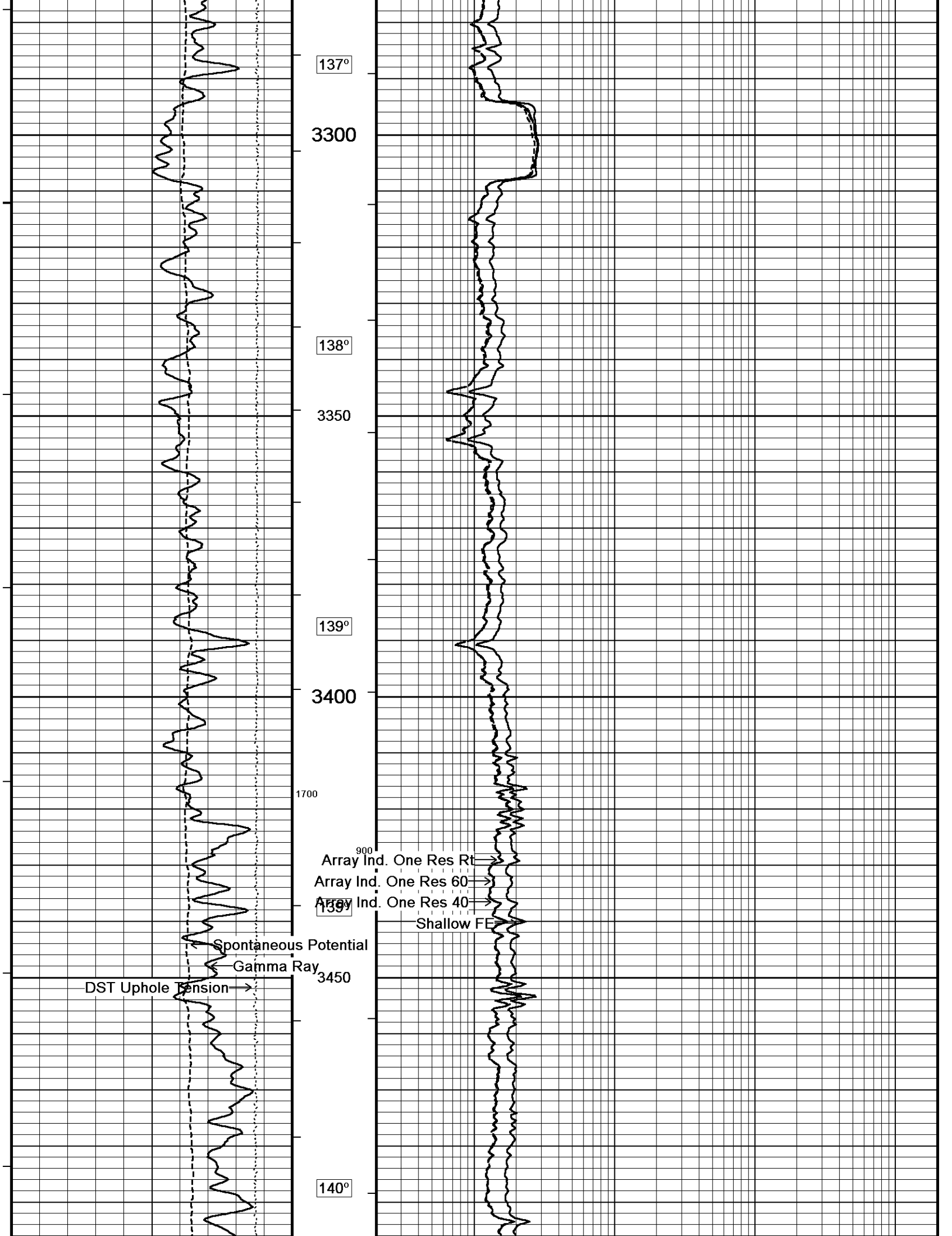
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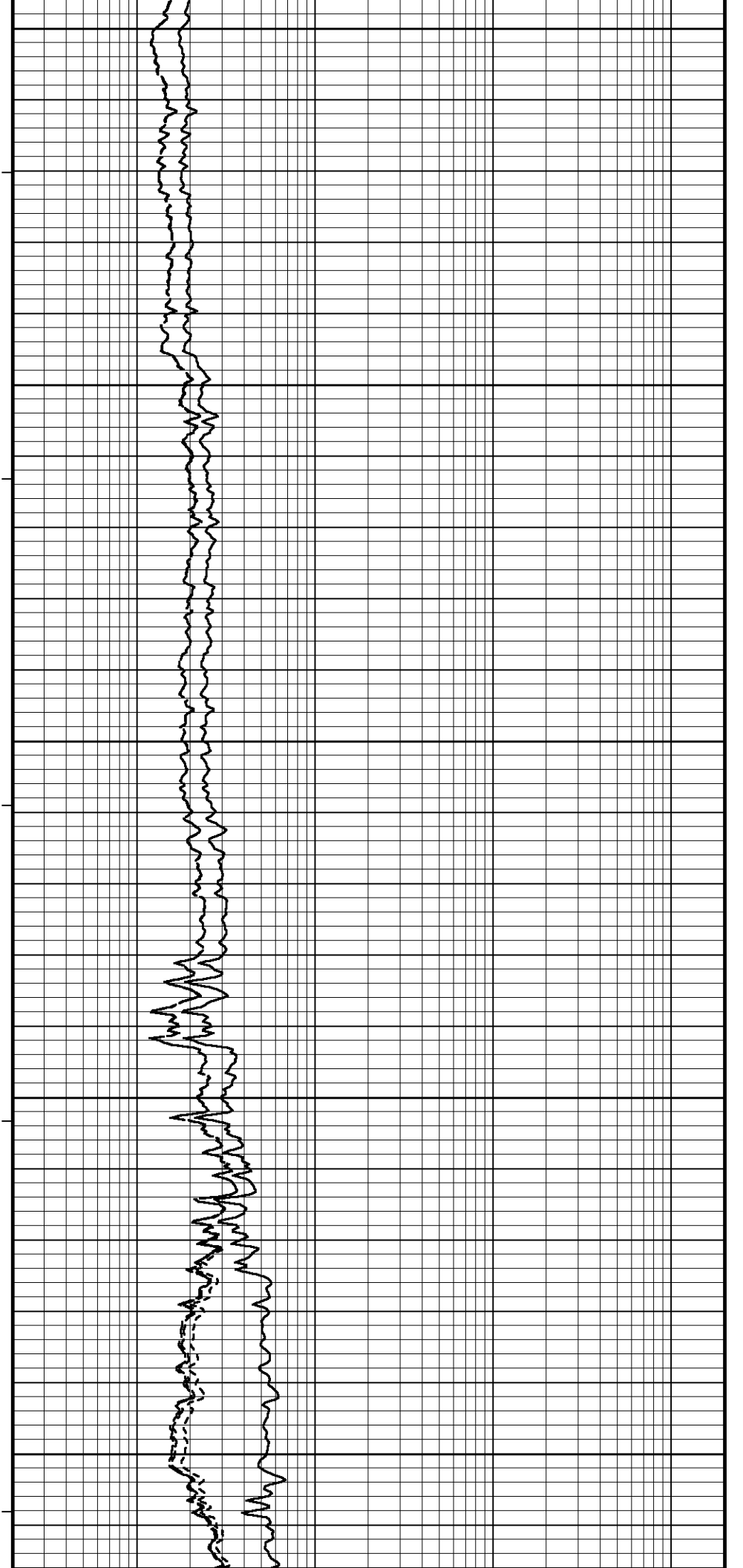
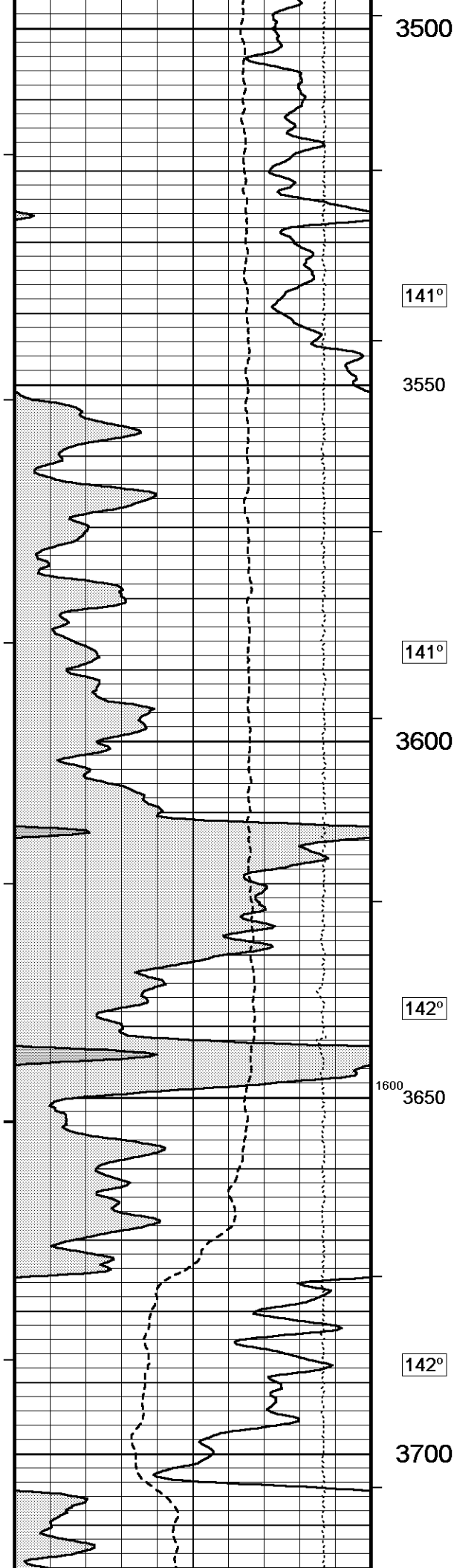
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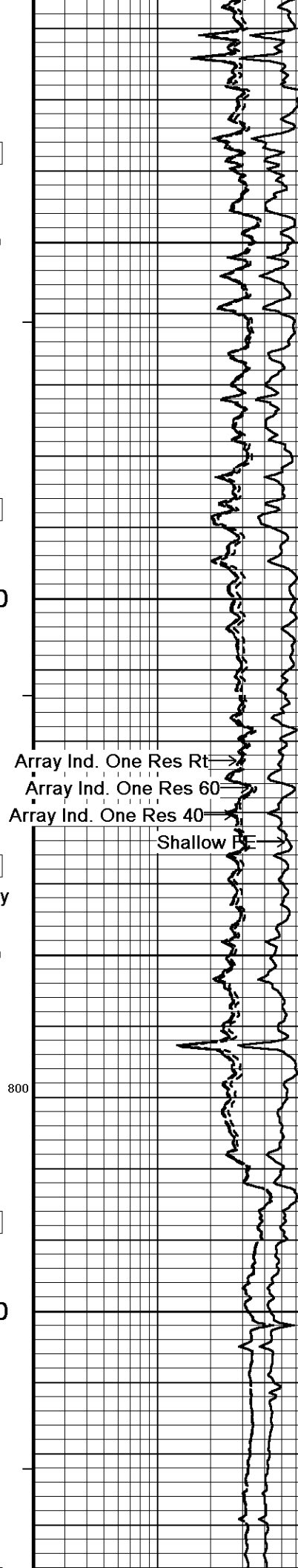
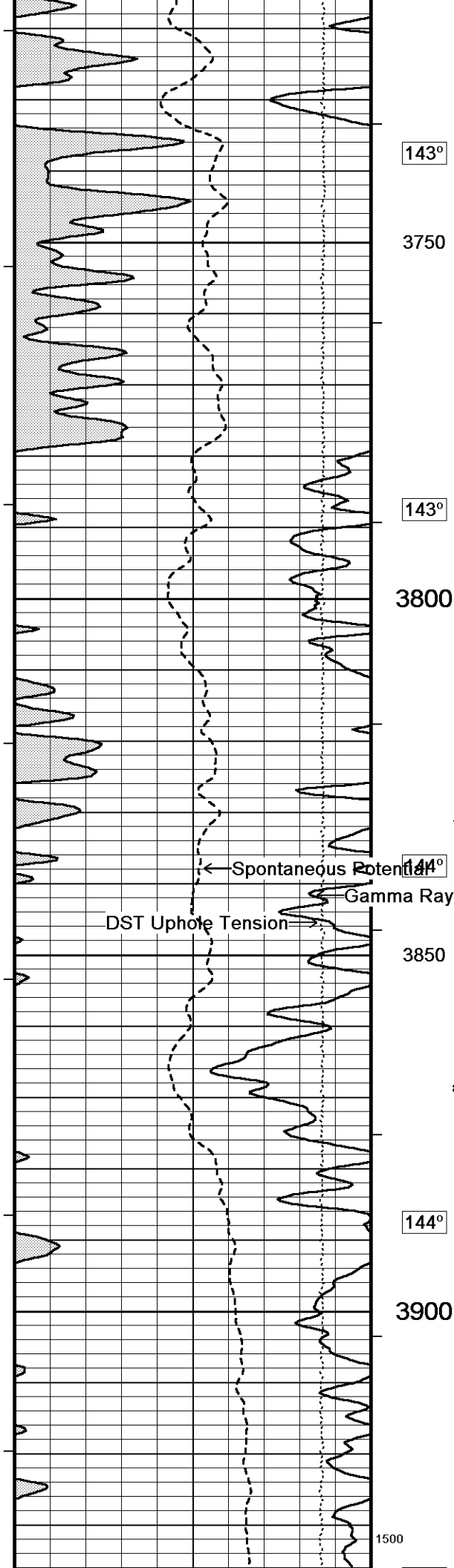
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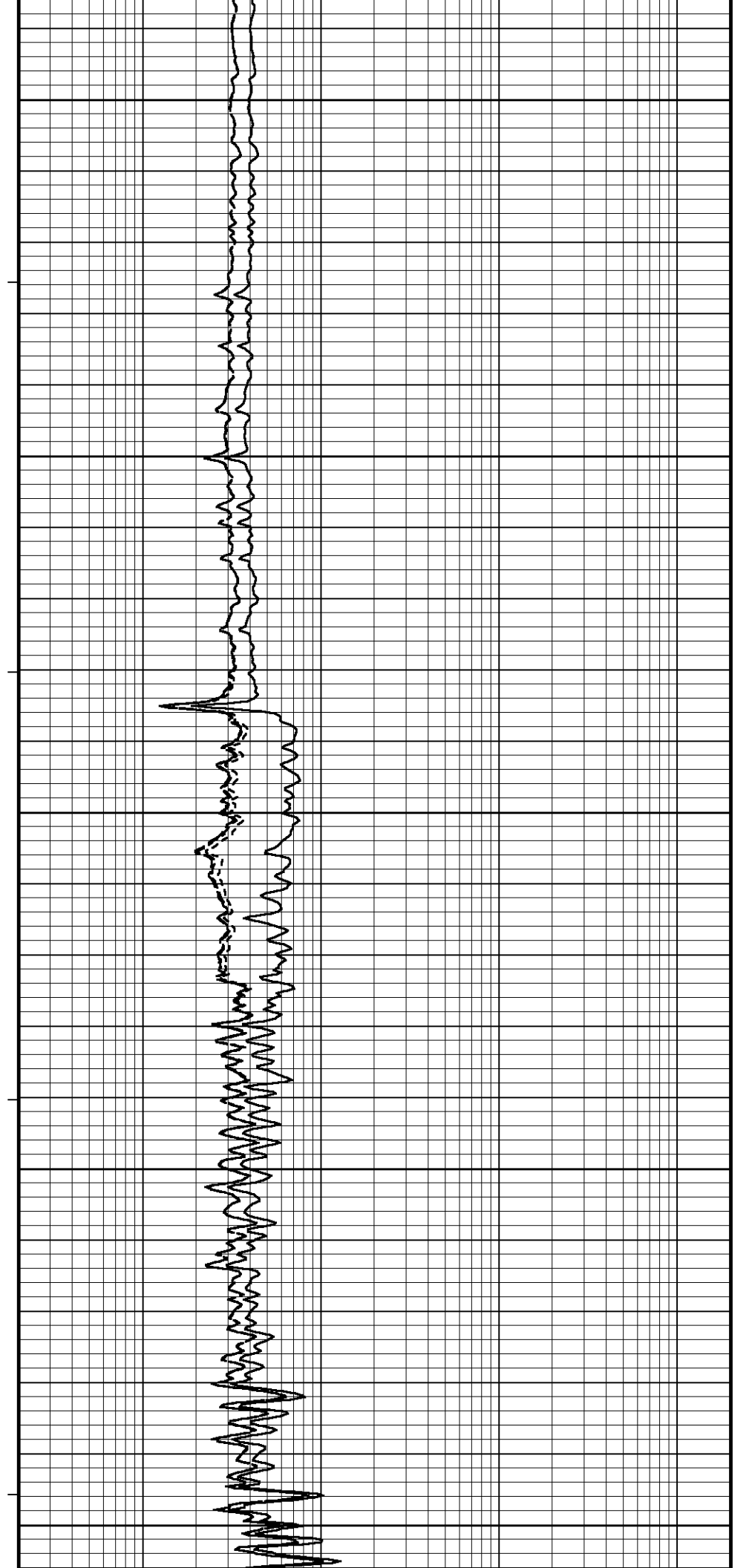
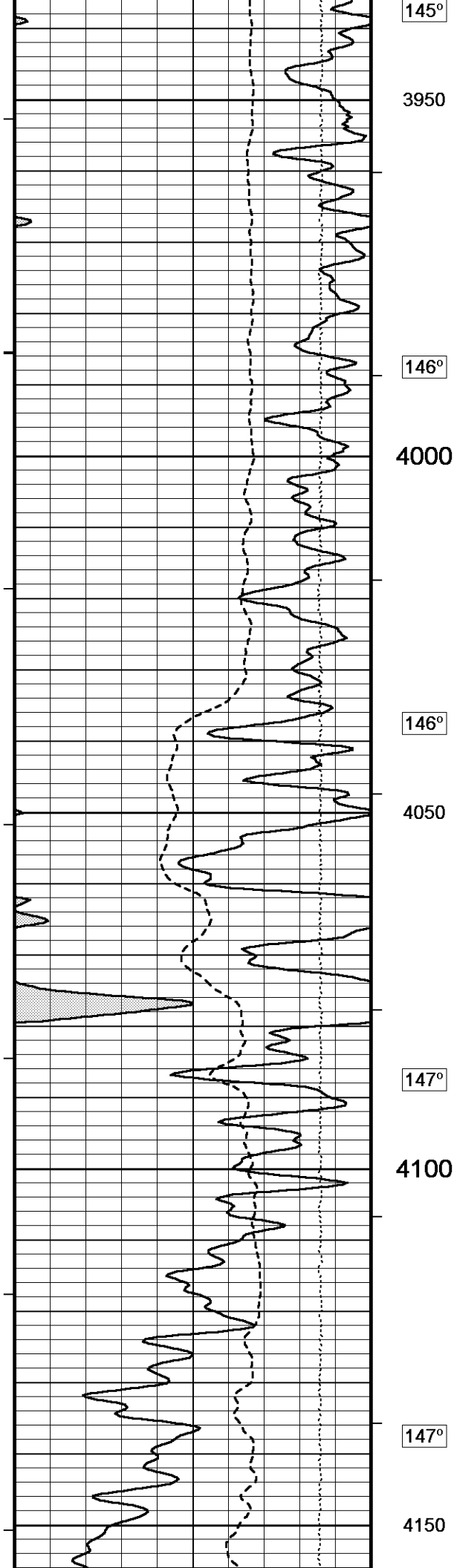
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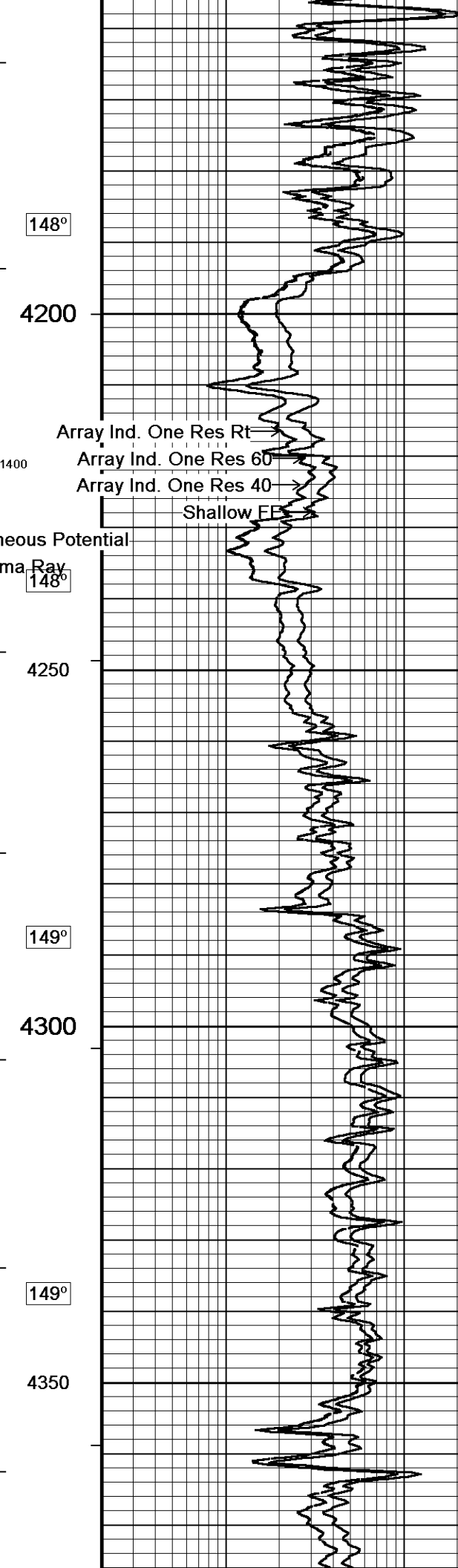
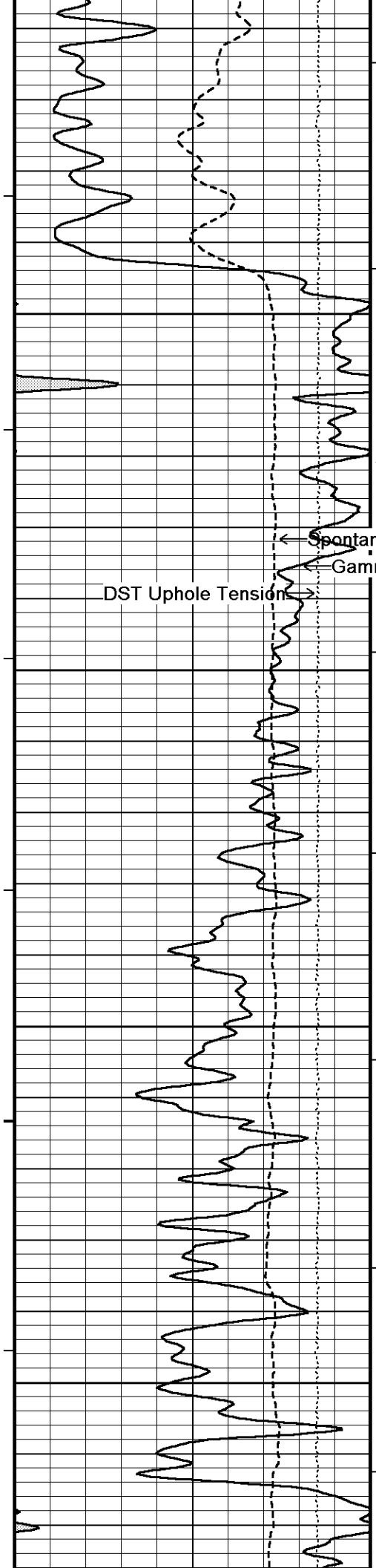












148°

4200

Array Ind. One Res Rt

Array Ind. One Res 60

Array Ind. One Res 40

Shallow FF

Spontaneous Potential

Gamma Ray

148°

DST Uphole Tension

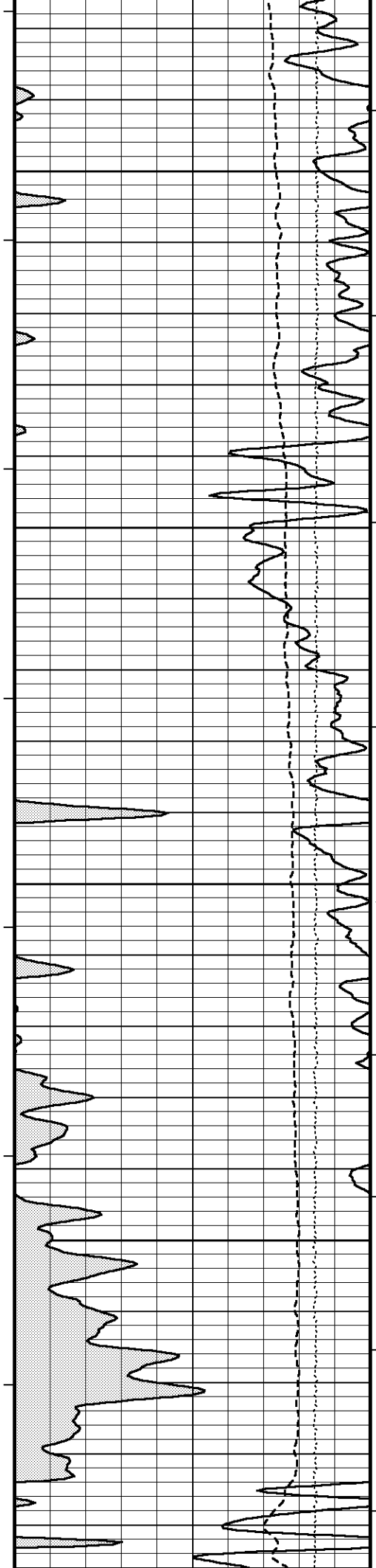
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149°

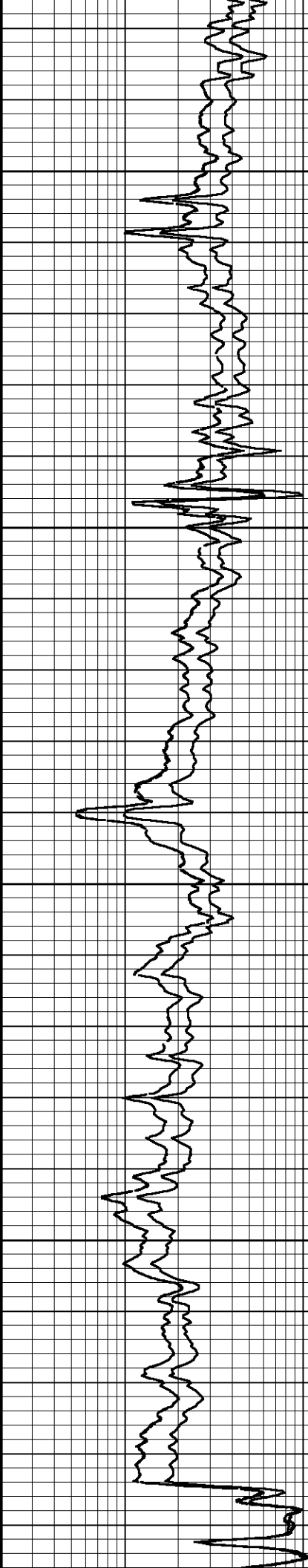
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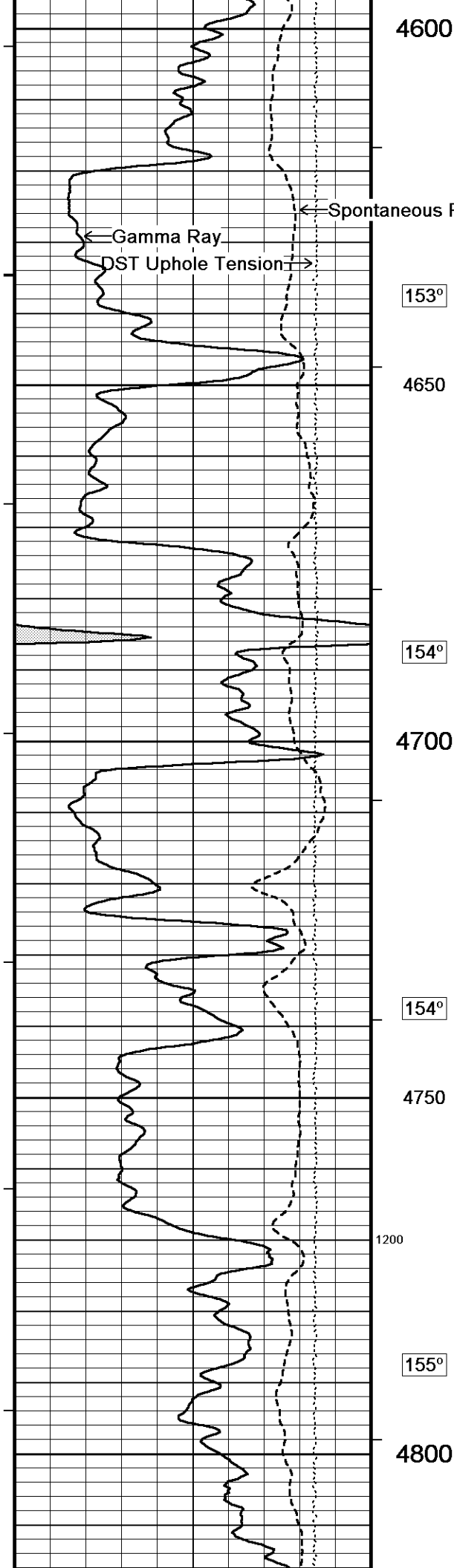
149°

4350



150°
4400
700
151°
4450
152°
4500
1300
153°
4550
153°





4600

Spontaneous Potential

Gamma Ray

DST Uphole Tension

153°

4650

154°

4700

154°

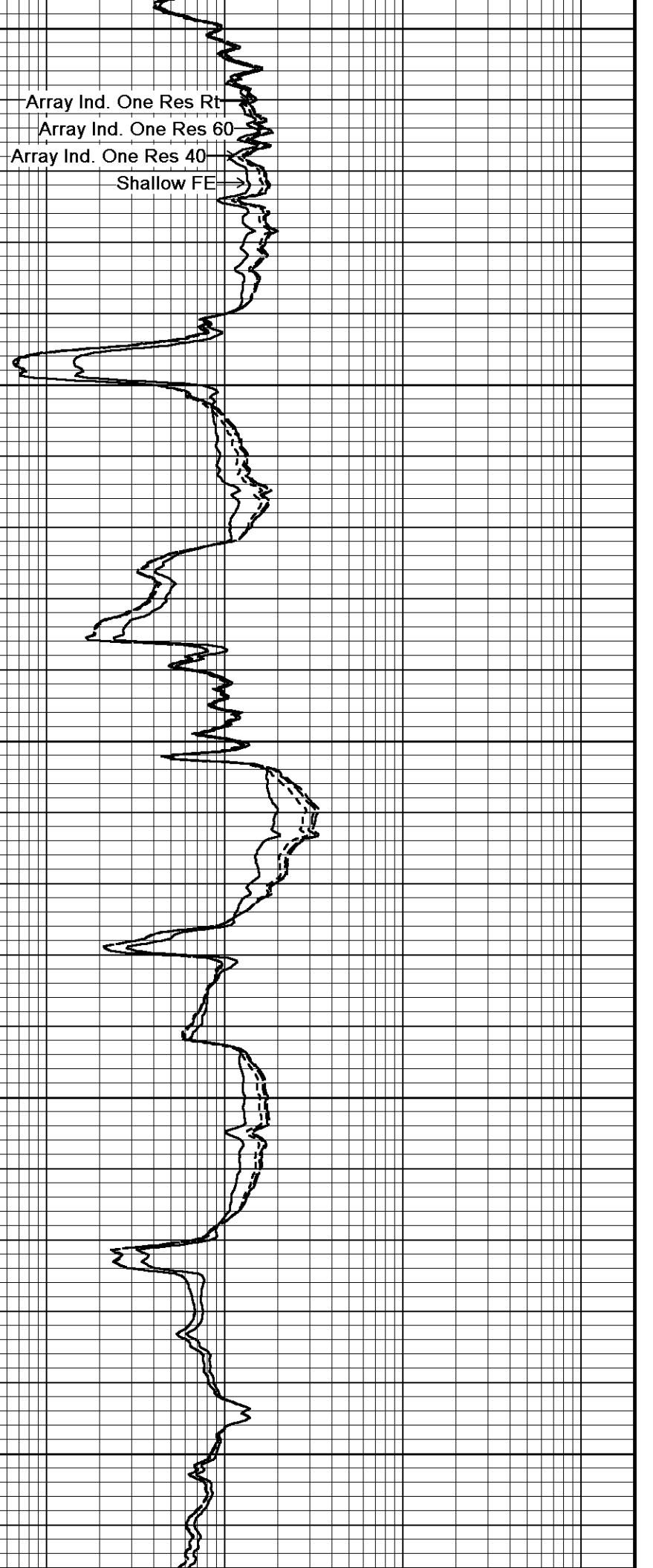
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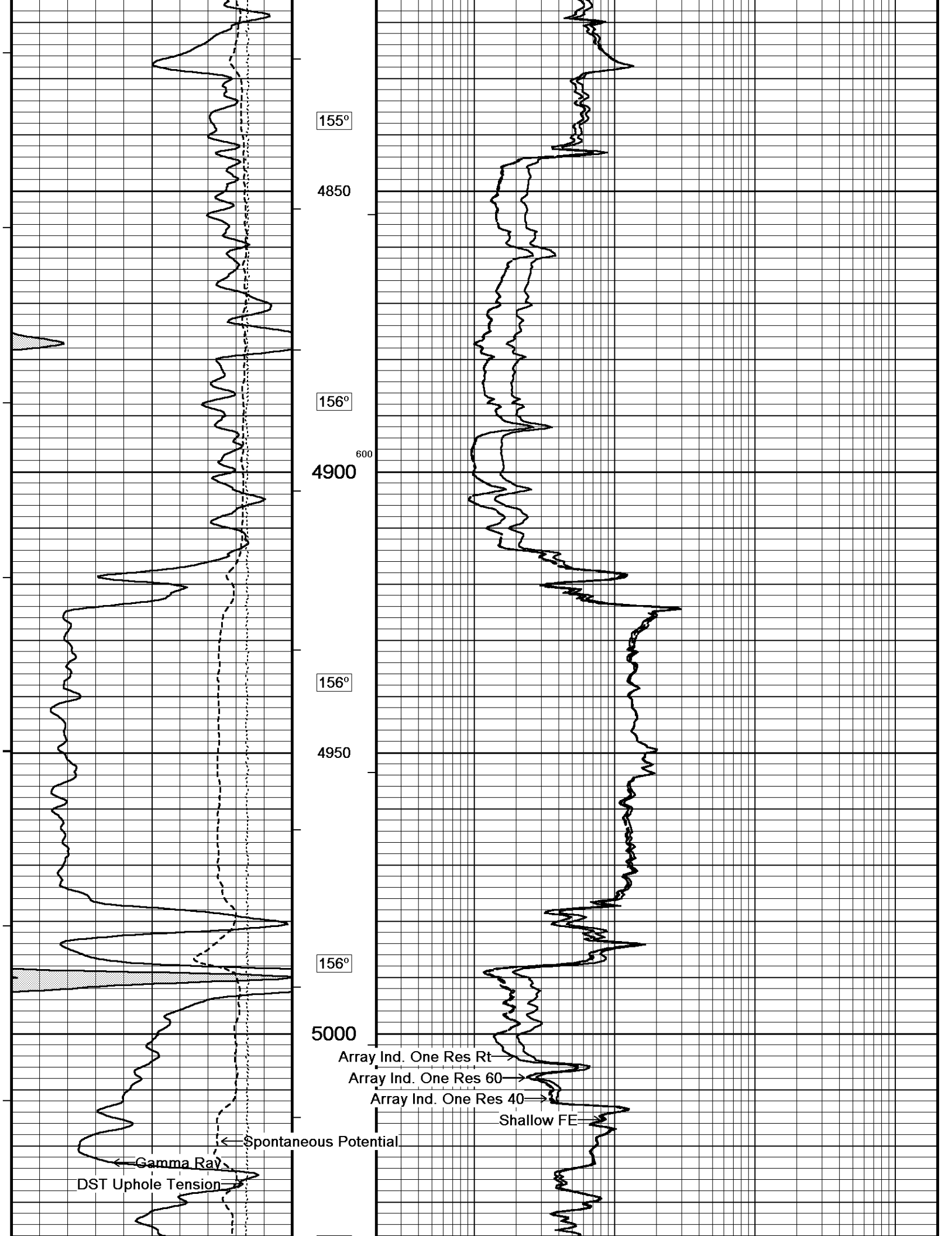
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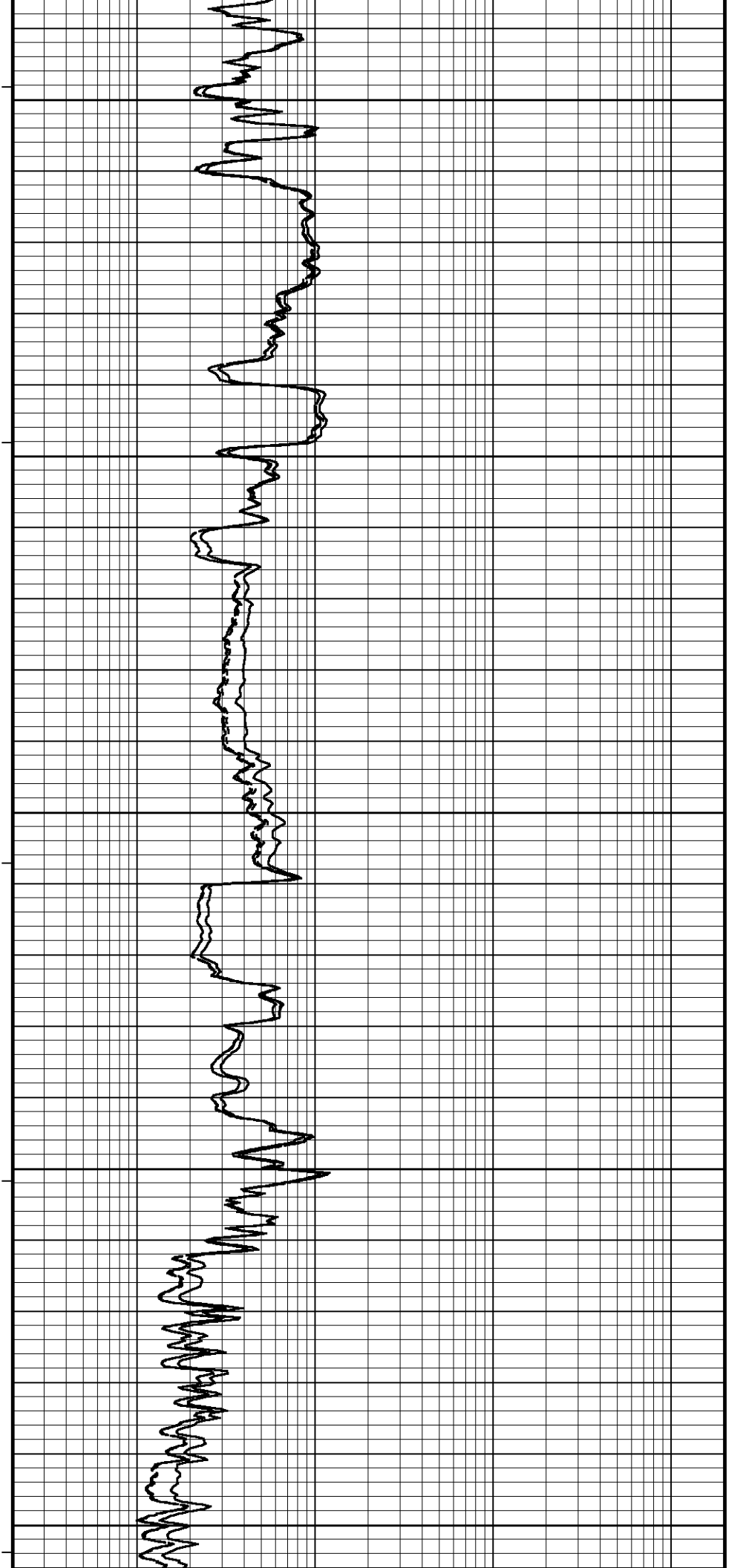
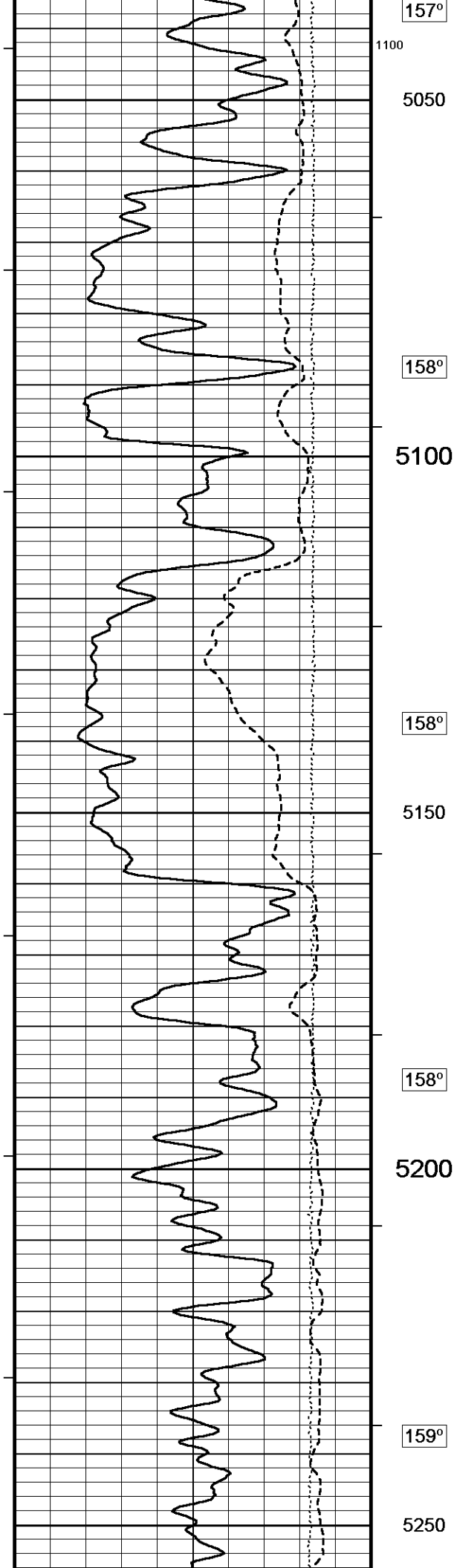
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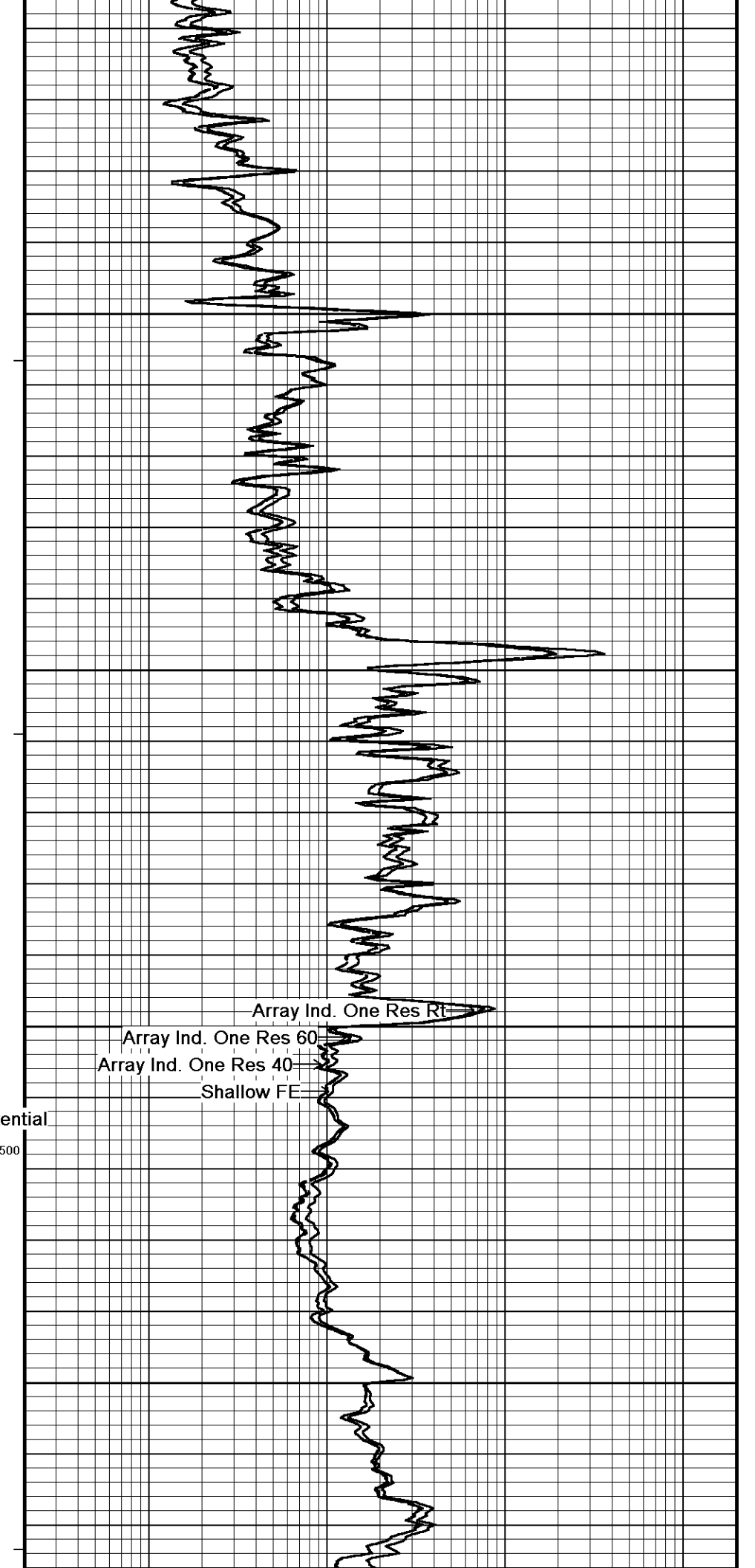
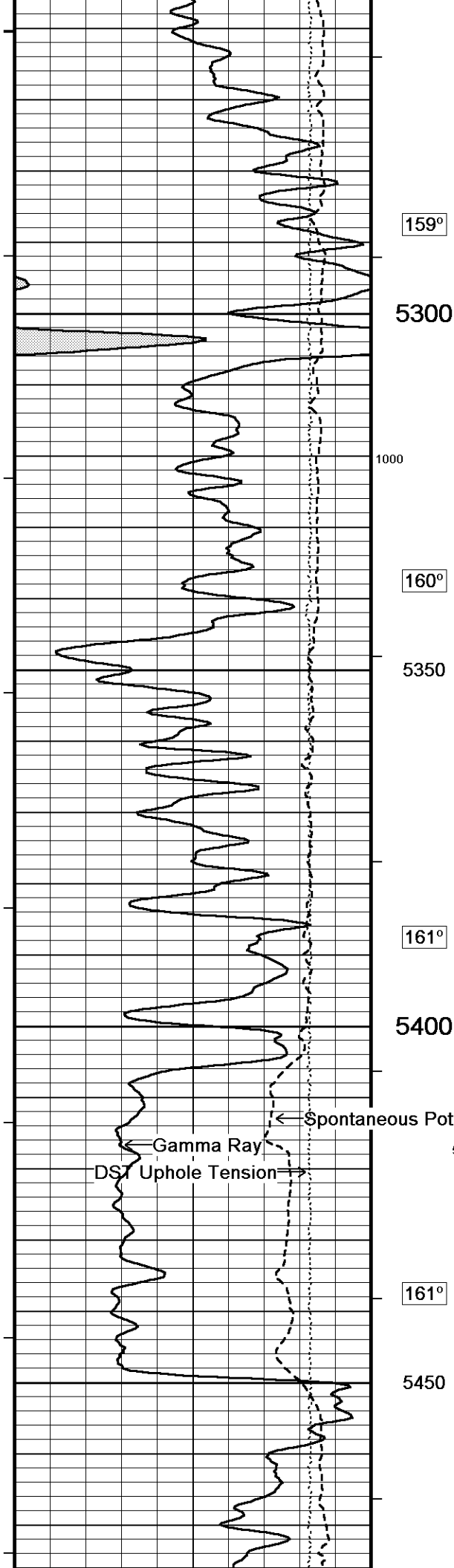
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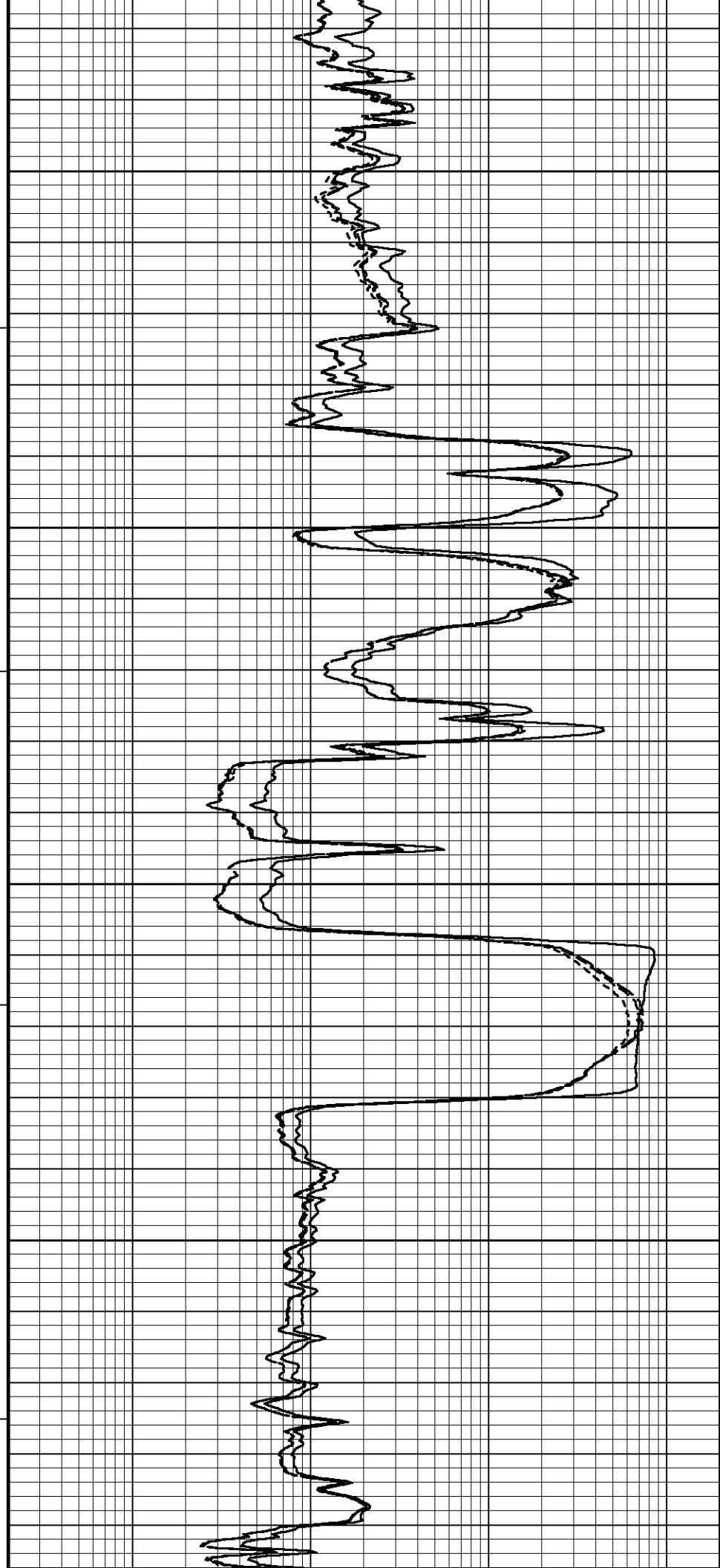
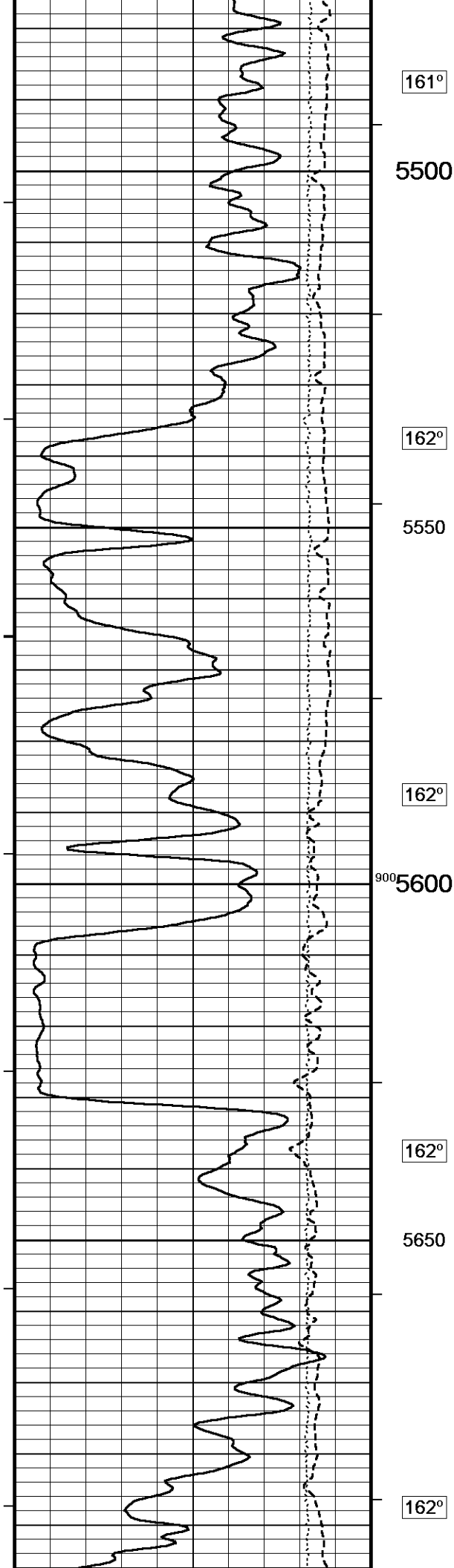
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE

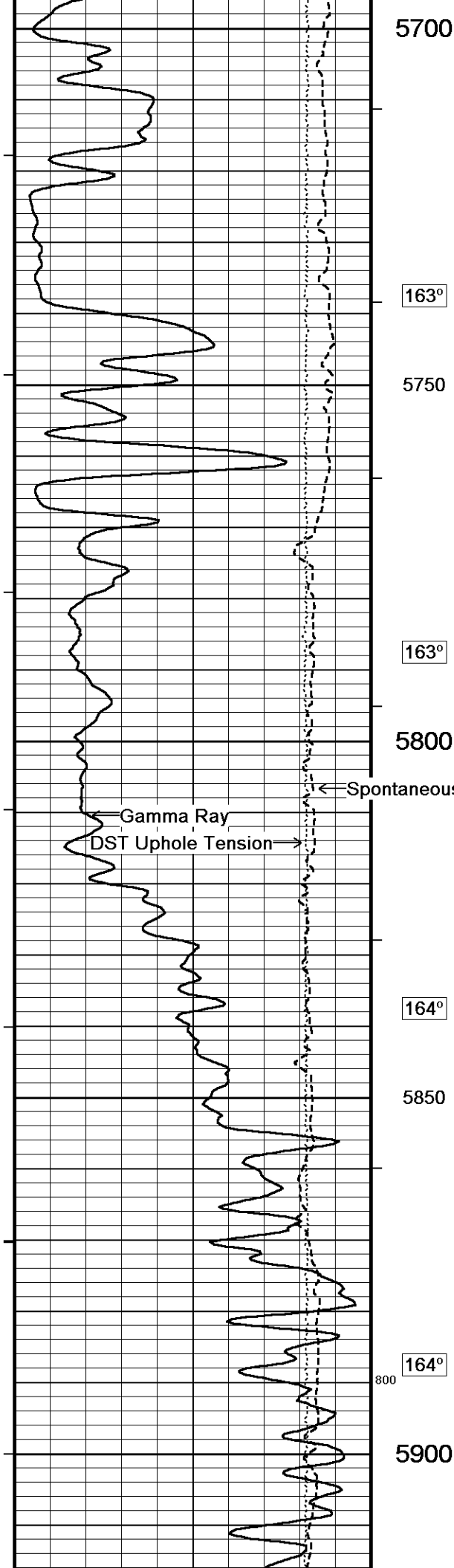












5700

163°

5750

163°

5800

← Spontaneous Potential

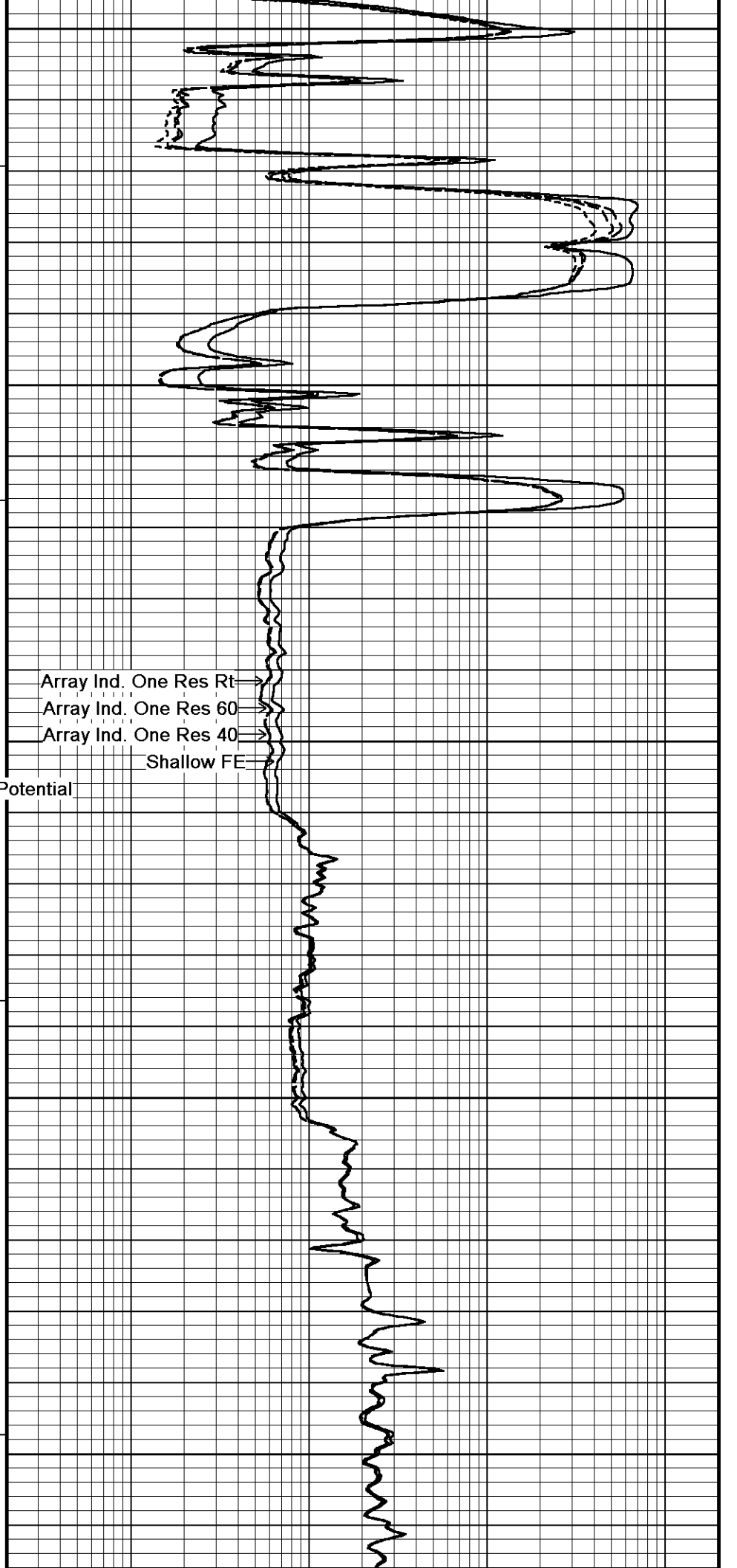
164°

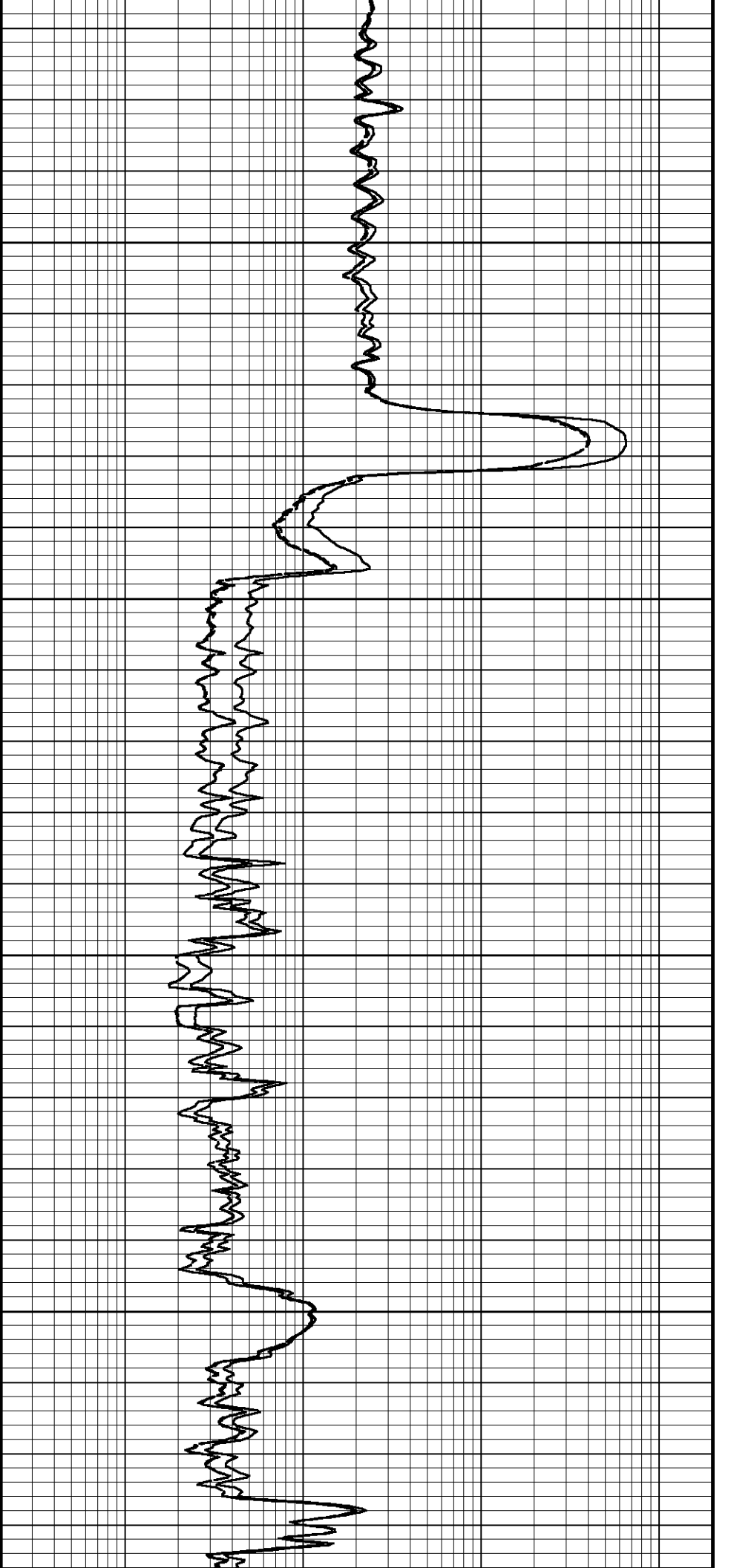
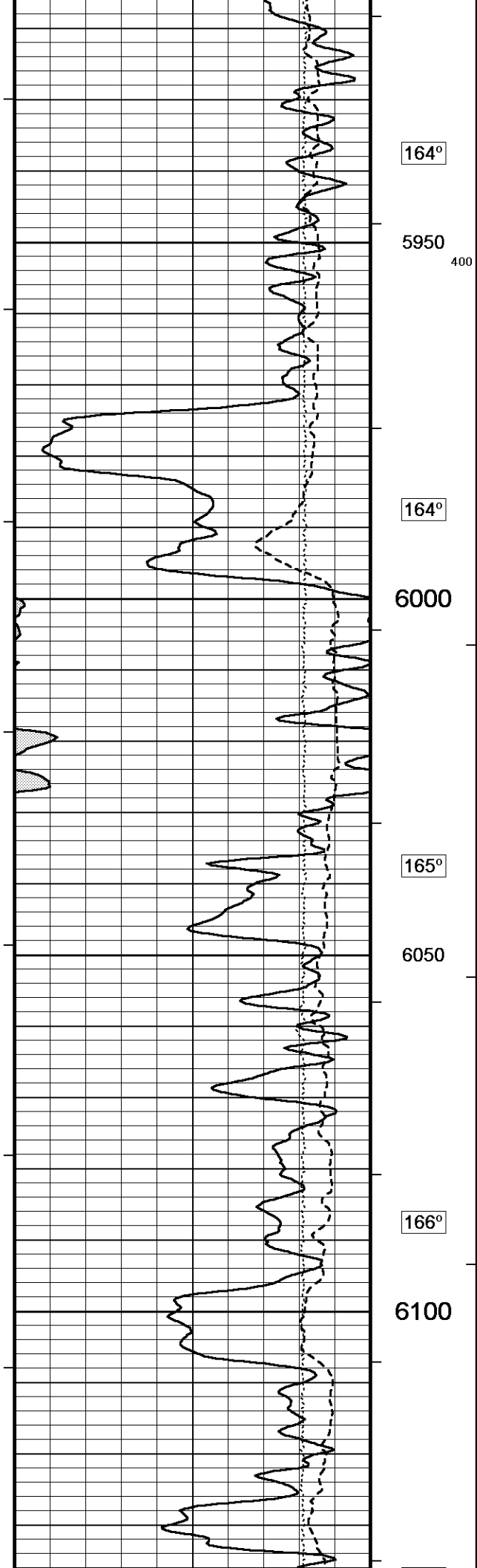
5850

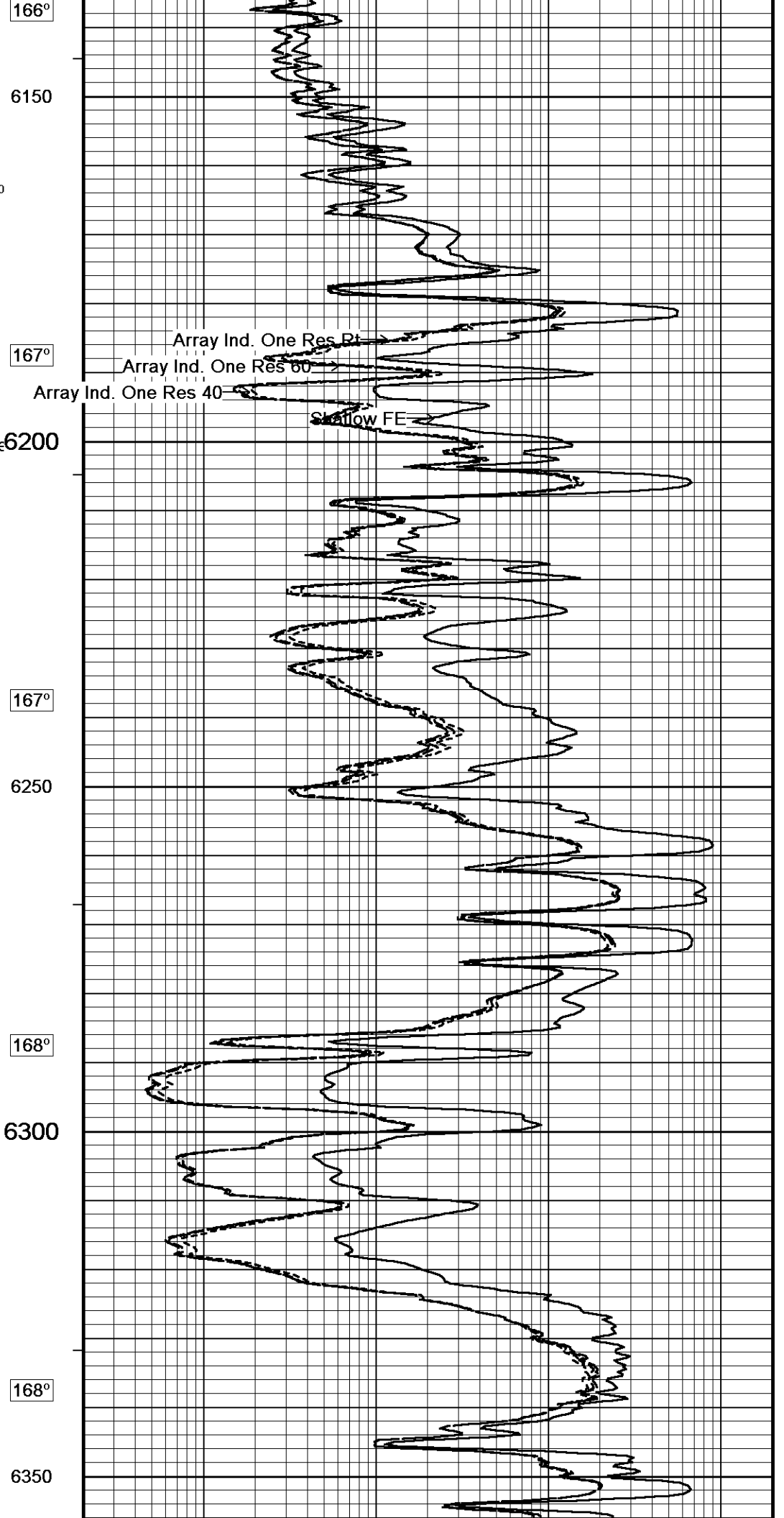
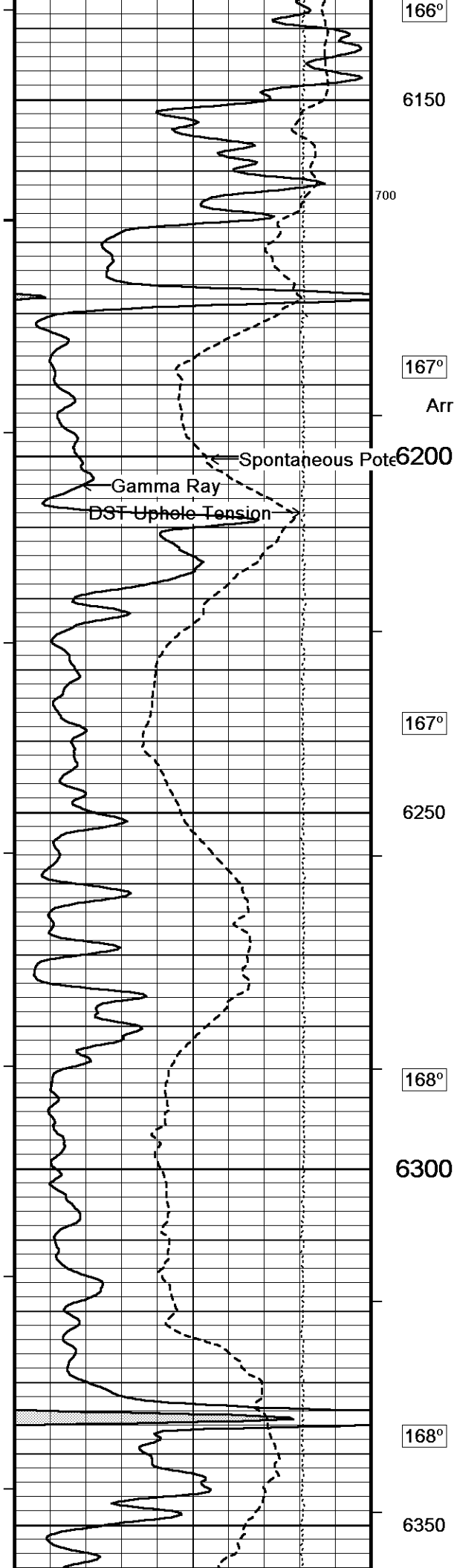
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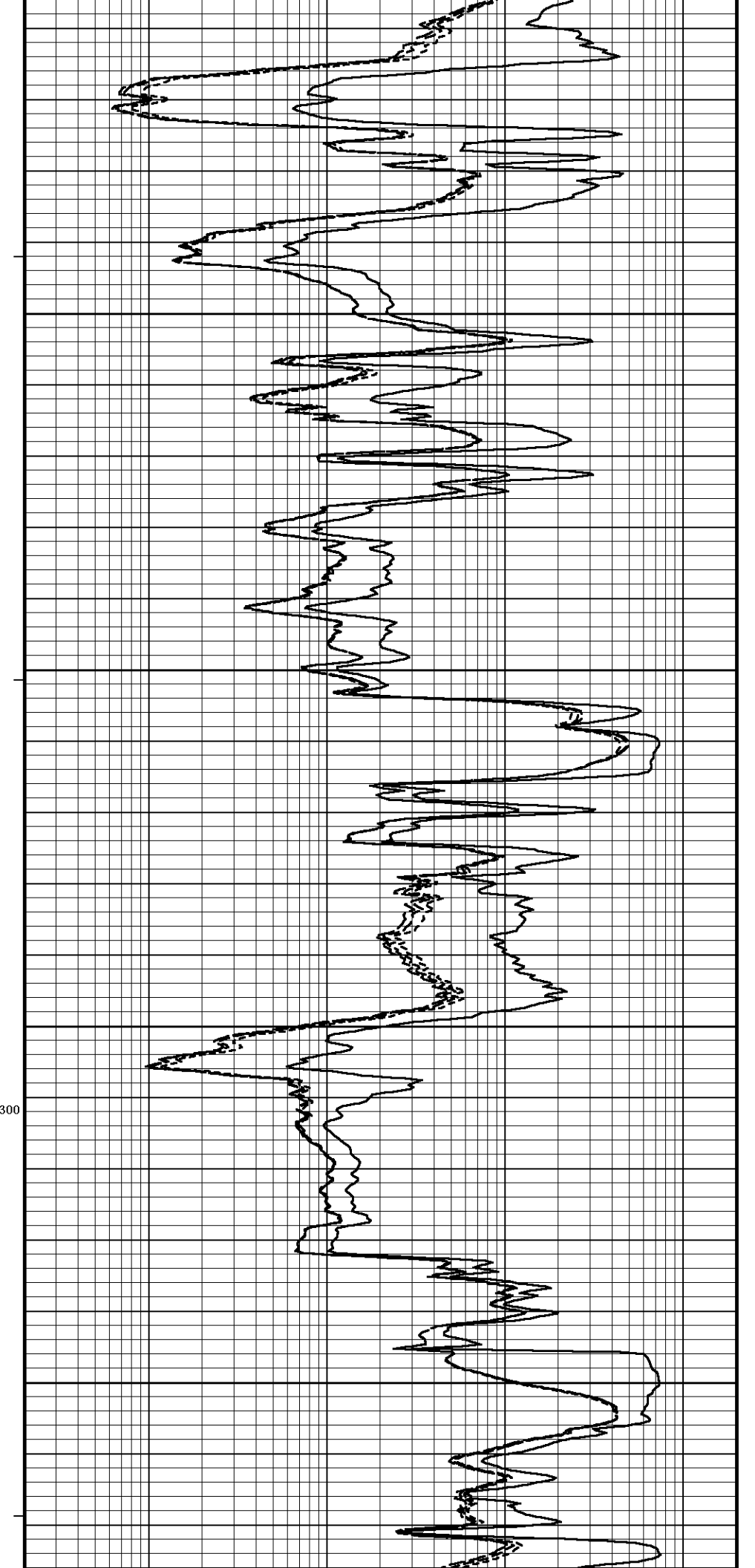
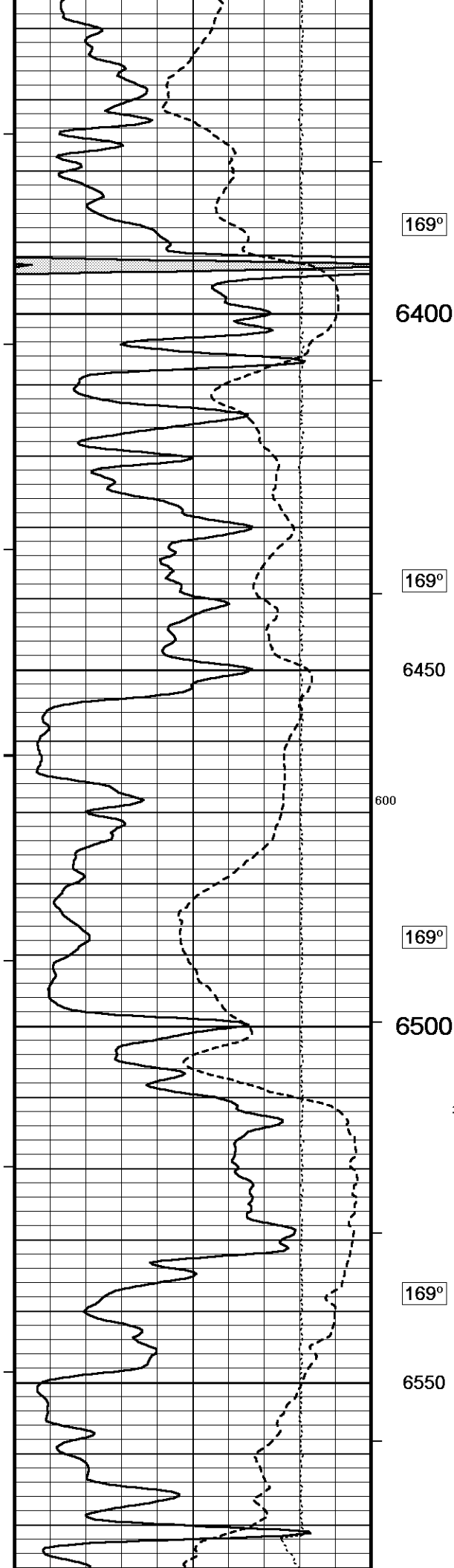
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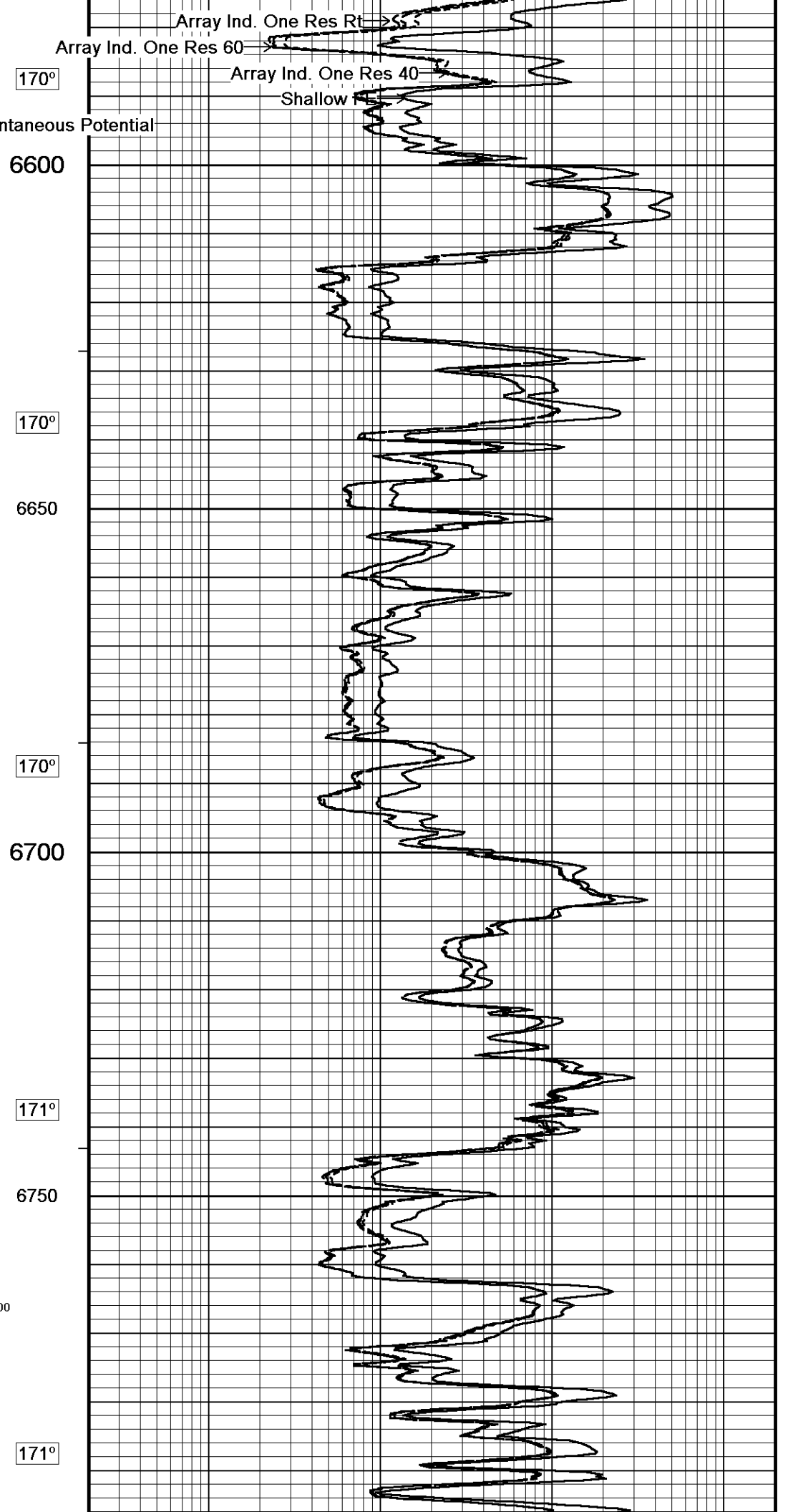
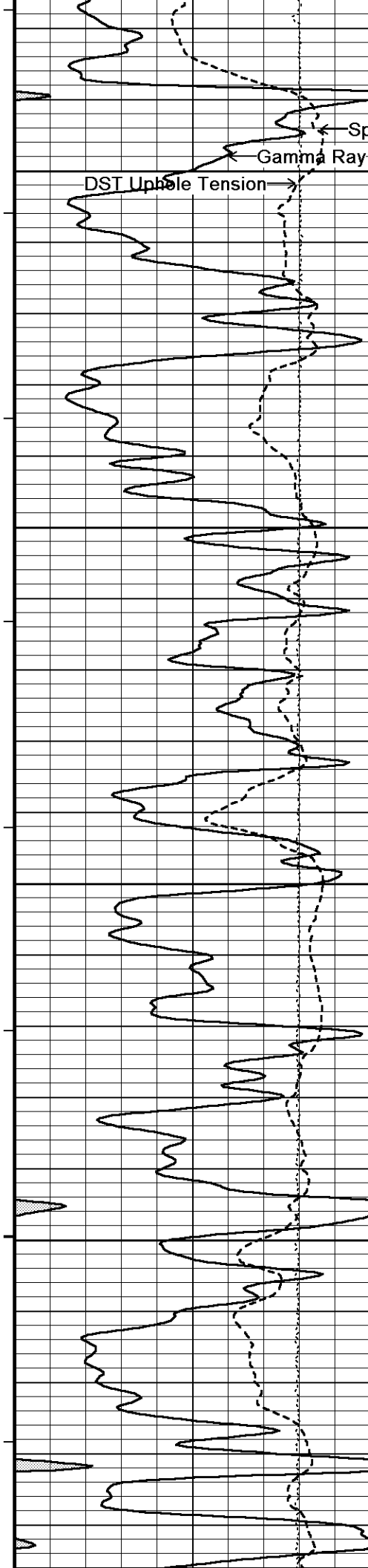
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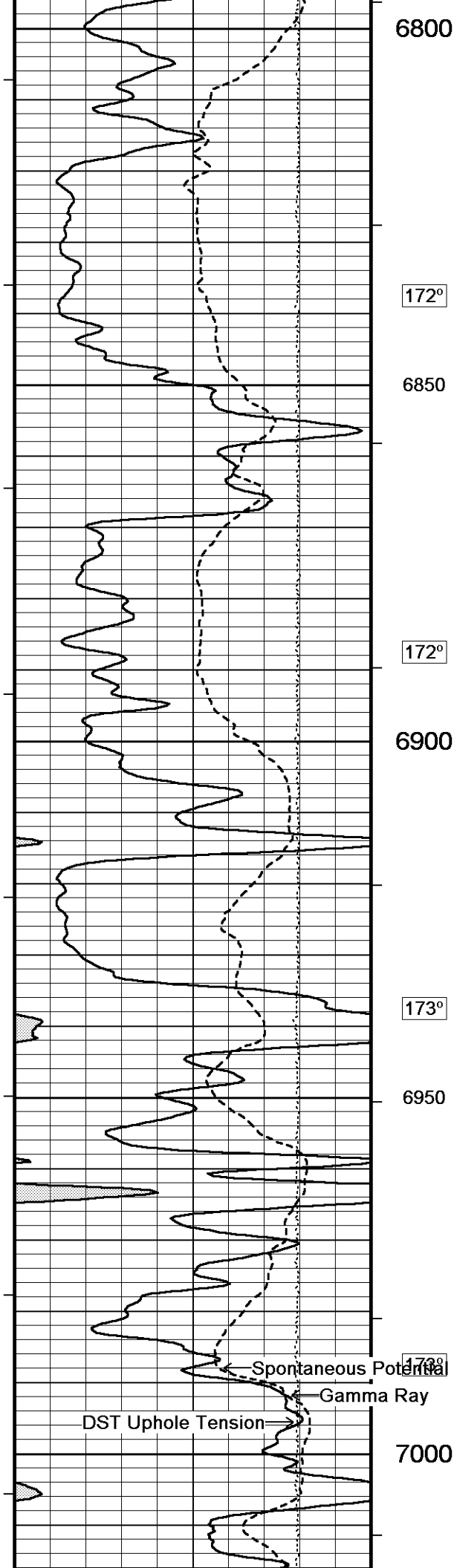












6800

172°

6850

172°

6900

173°

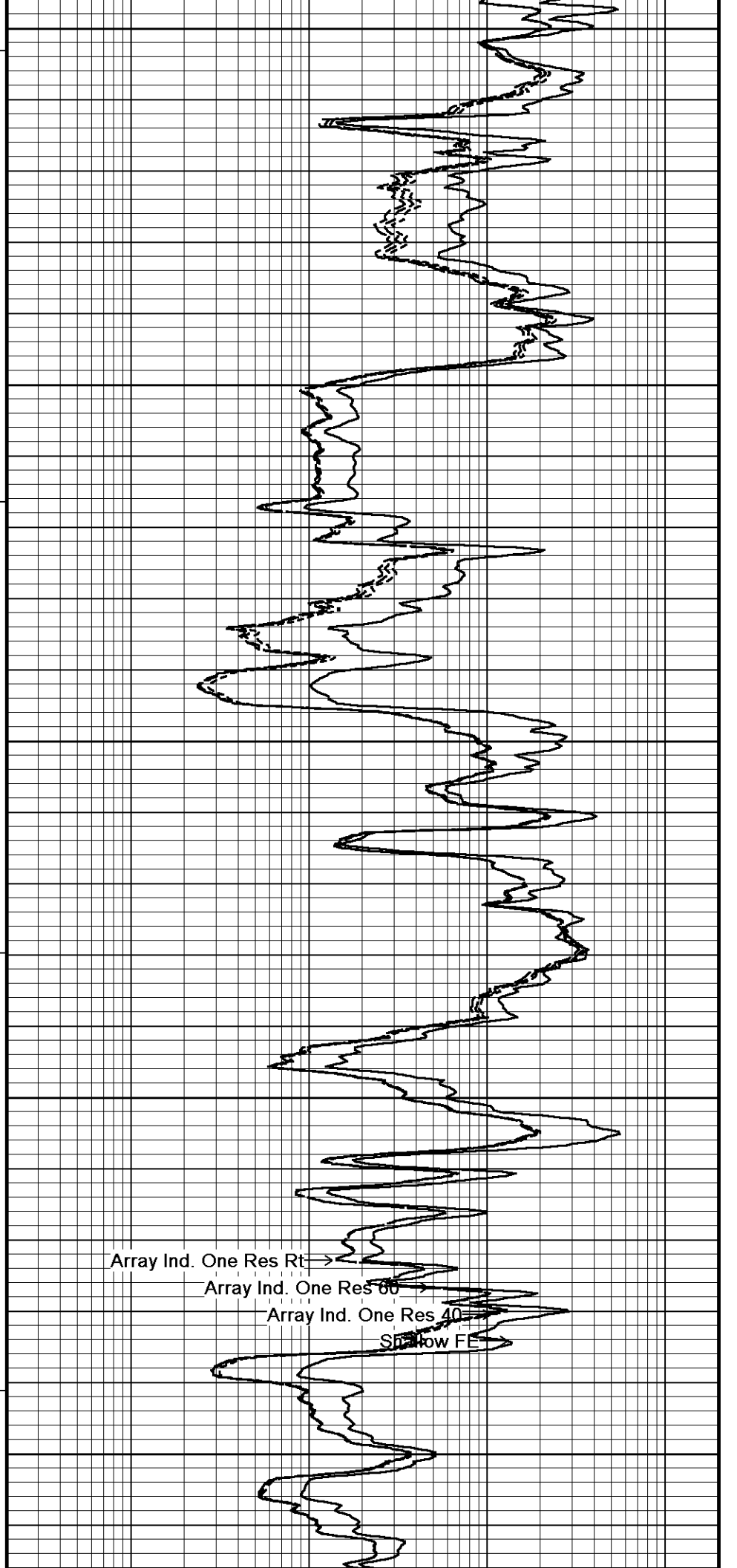
6950

Spontaneous Potential

Gamma Ray

DST Uphole Tension

7000

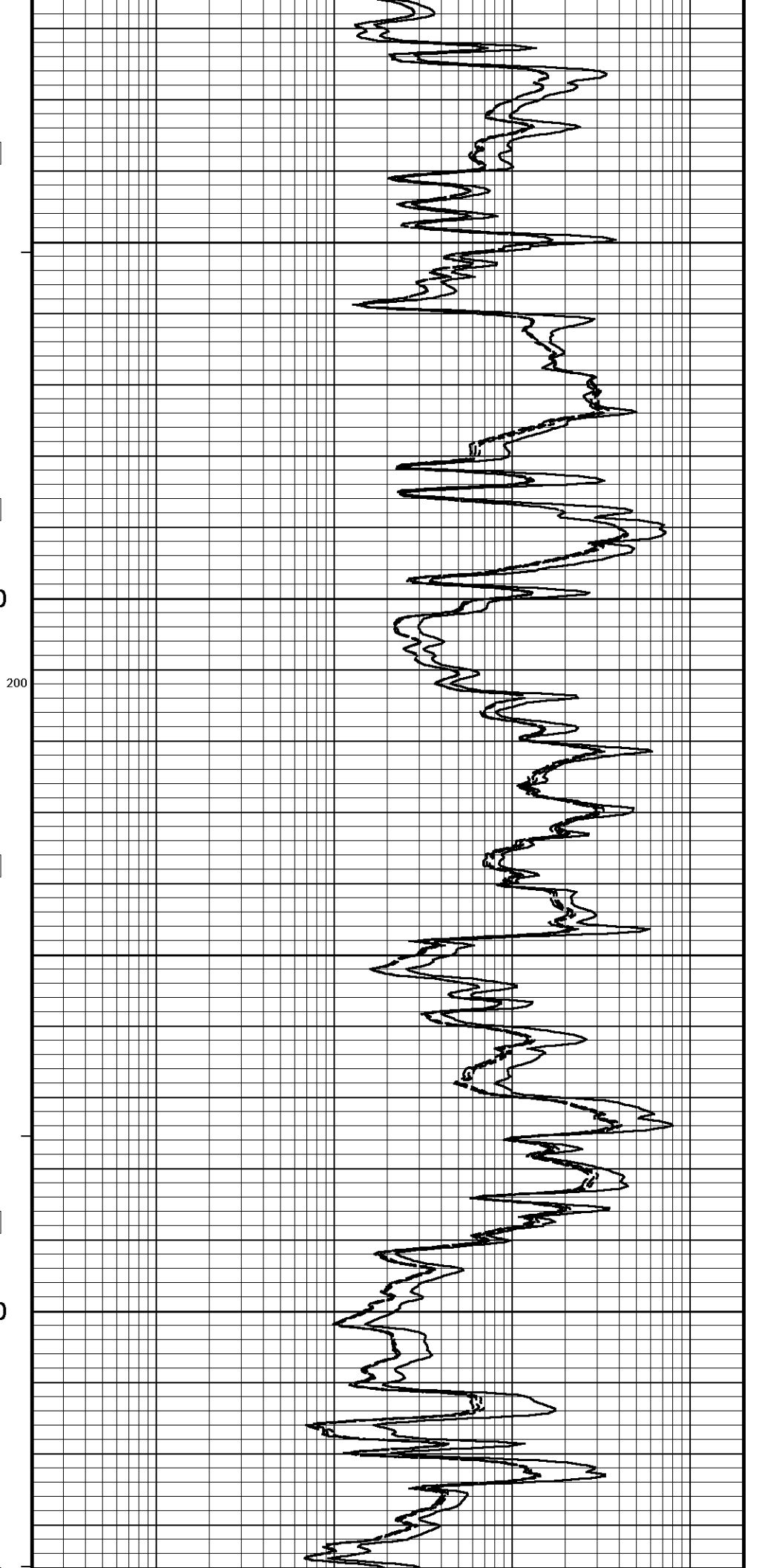
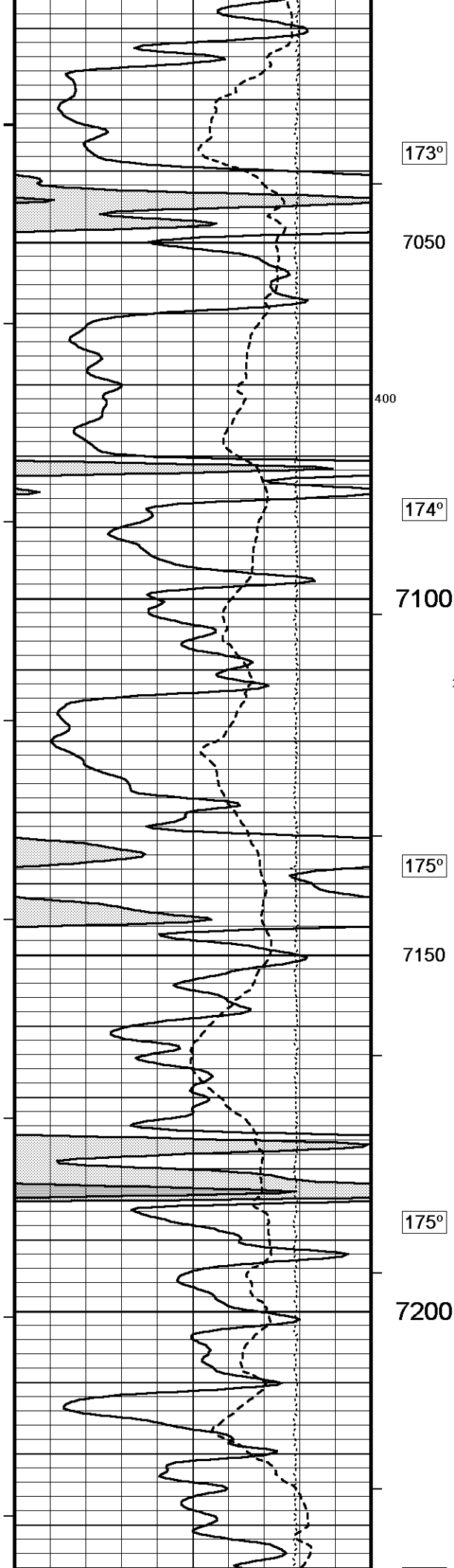


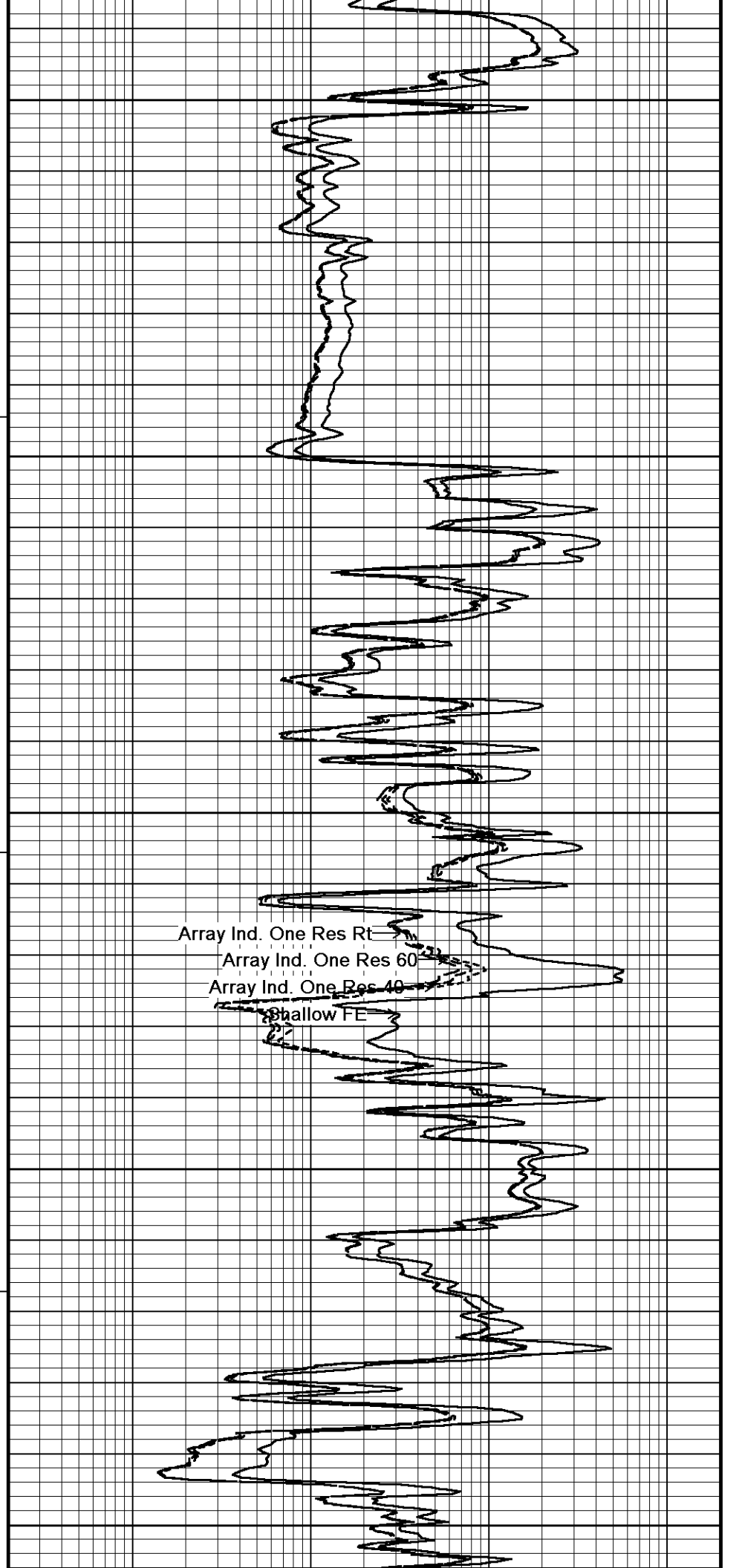
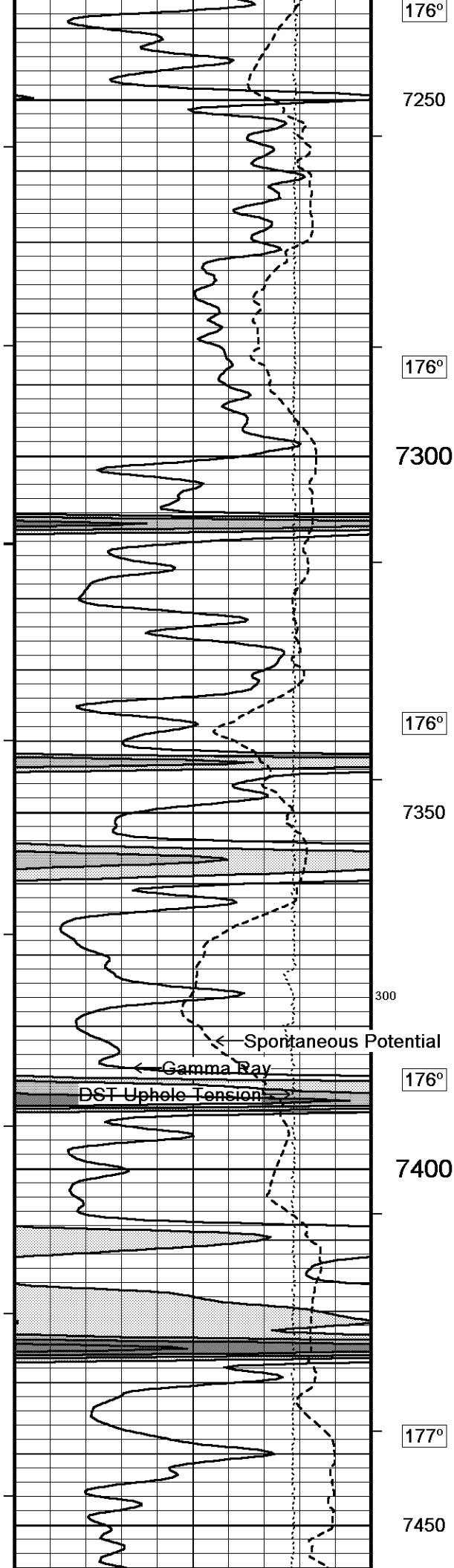
Array Ind. One Res Rt

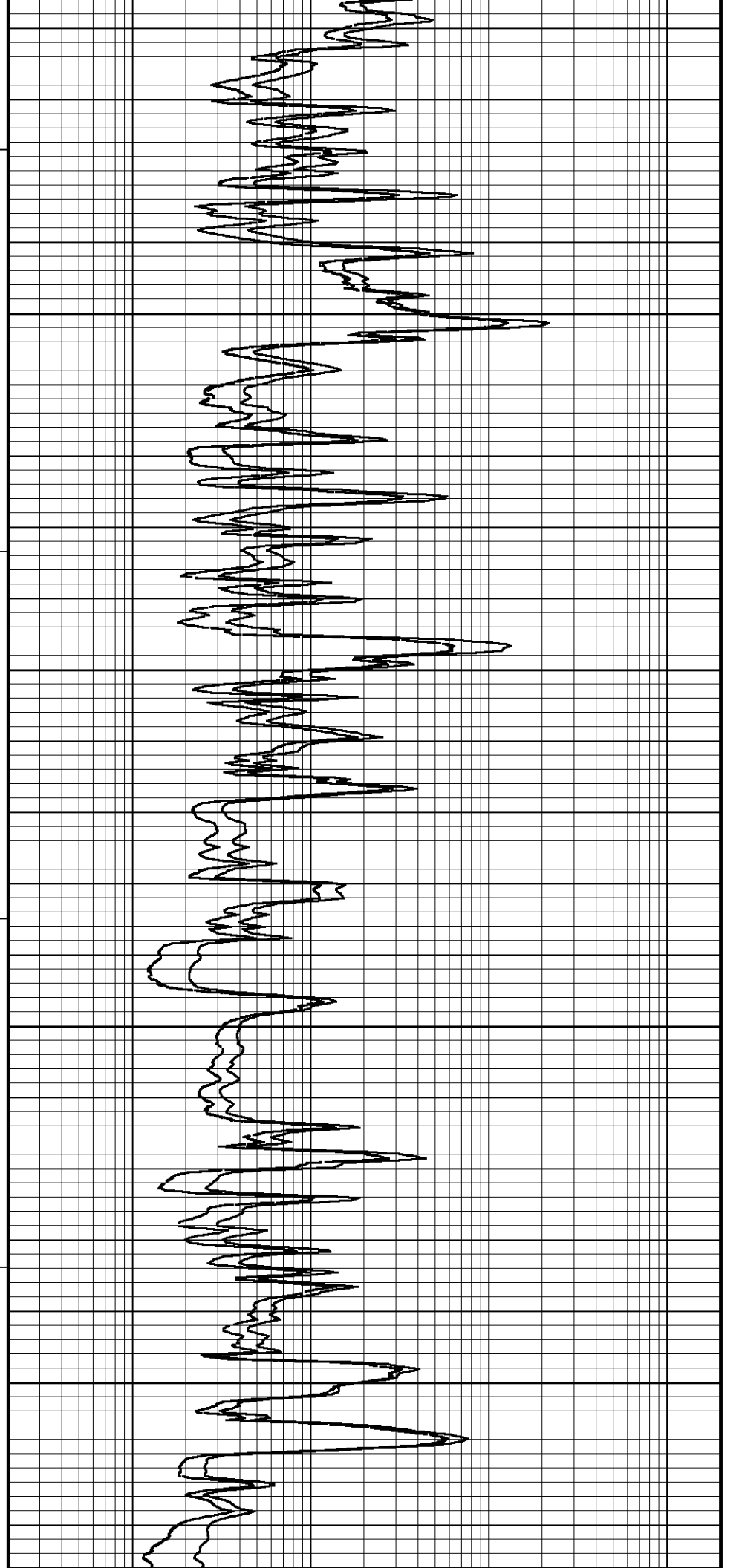
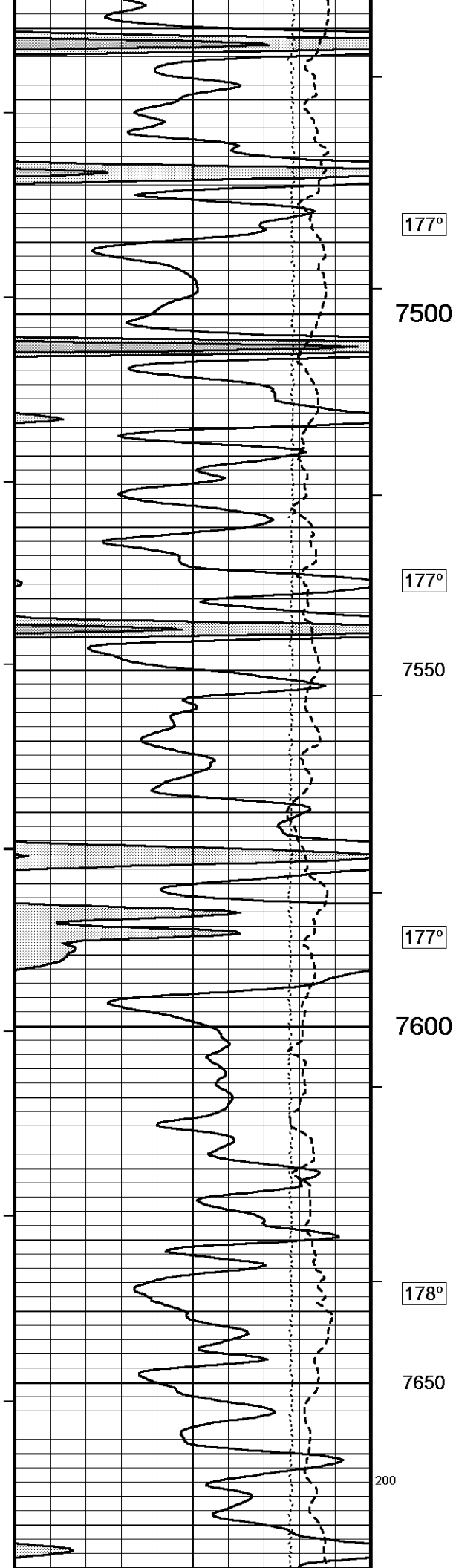
Array Ind. One Res 60

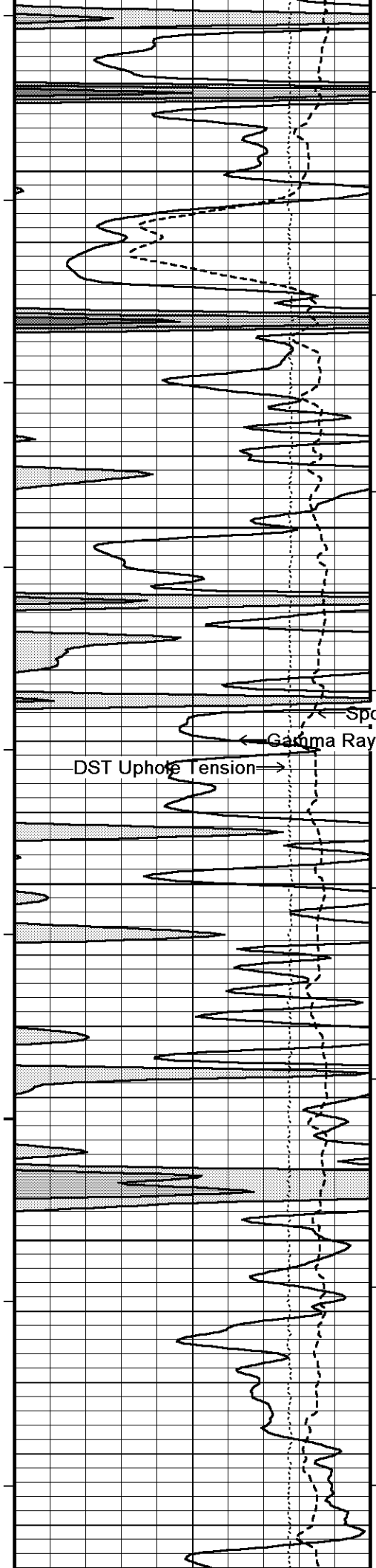
Array Ind. One Res 40

Shallow FE









179°
7700
179°
7750
179°
7800
180°
7850
182°

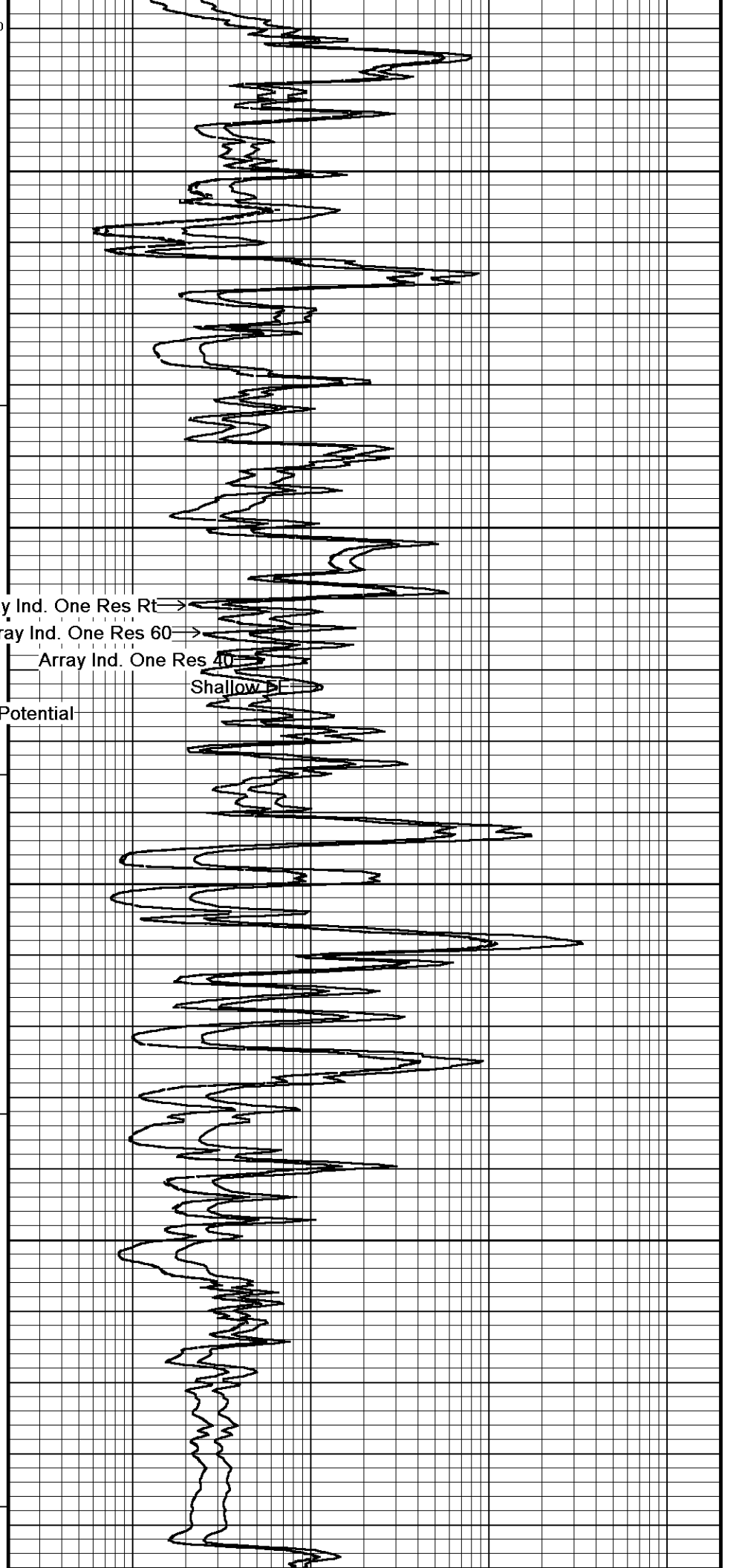
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40

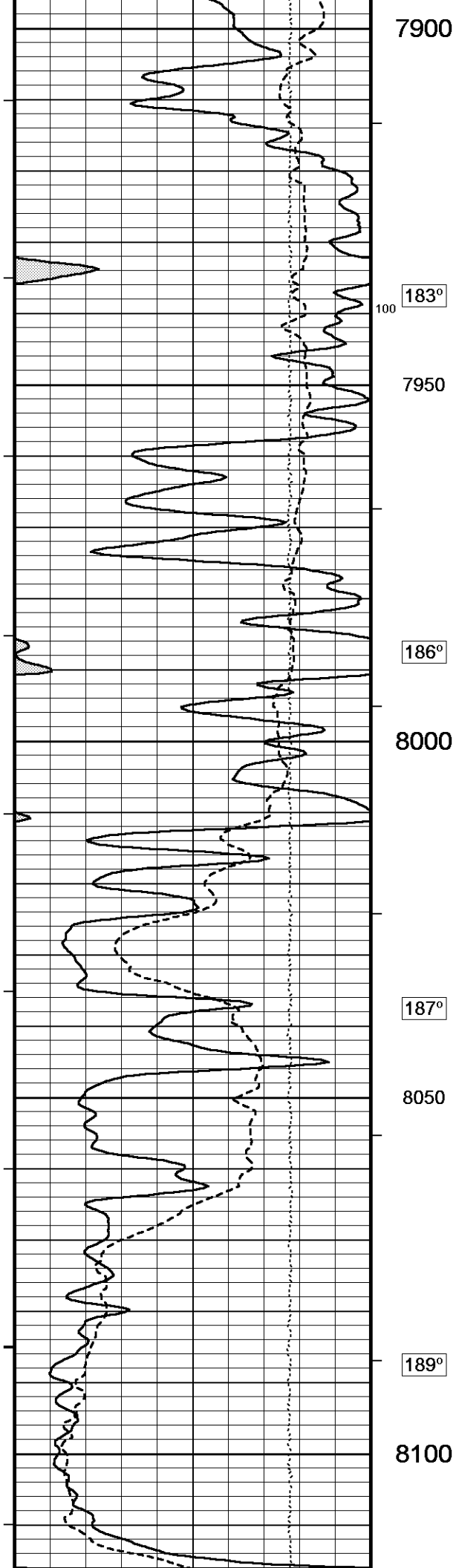
Shallow PI

Spontaneous Potential

Gamma Ray

DST Uphole Tension



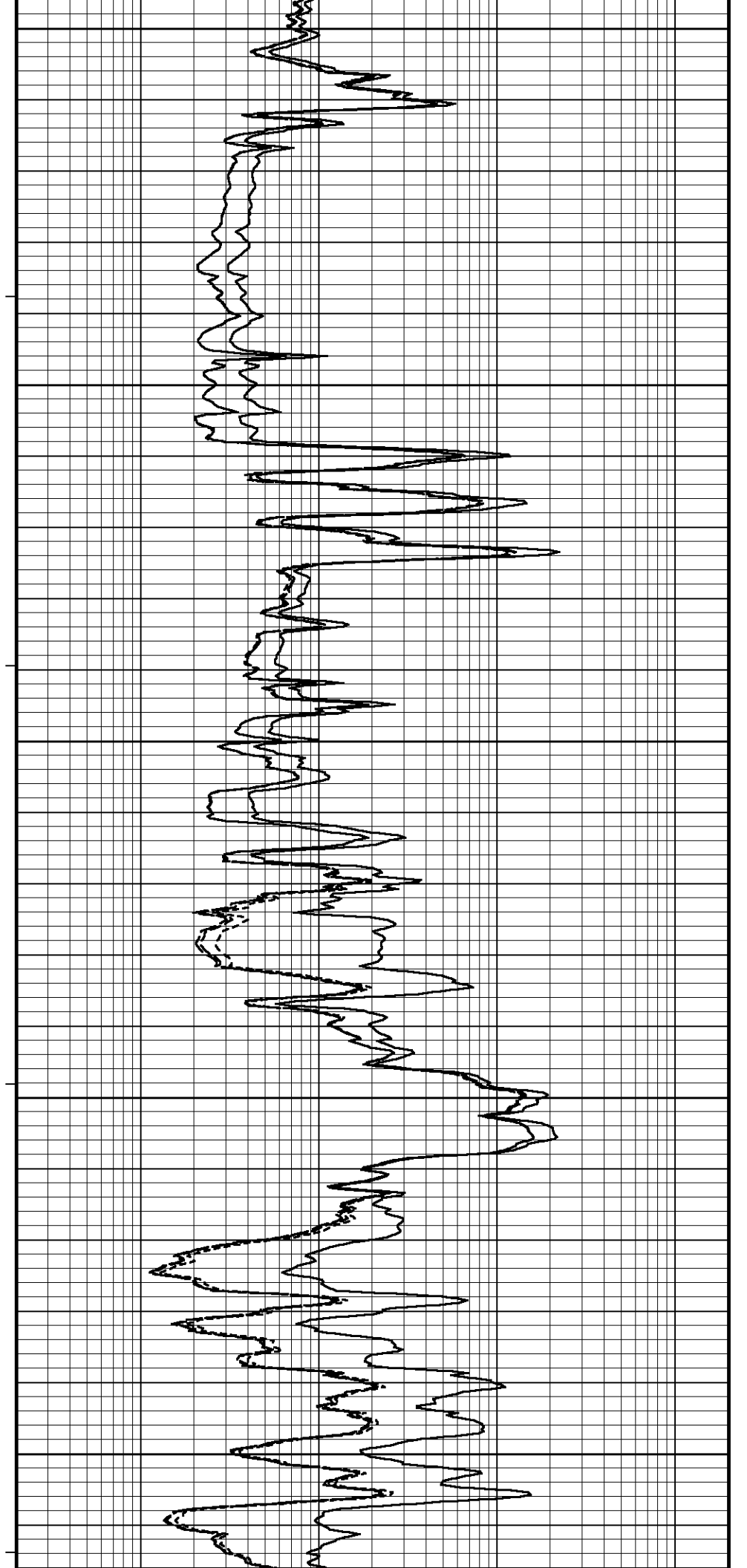


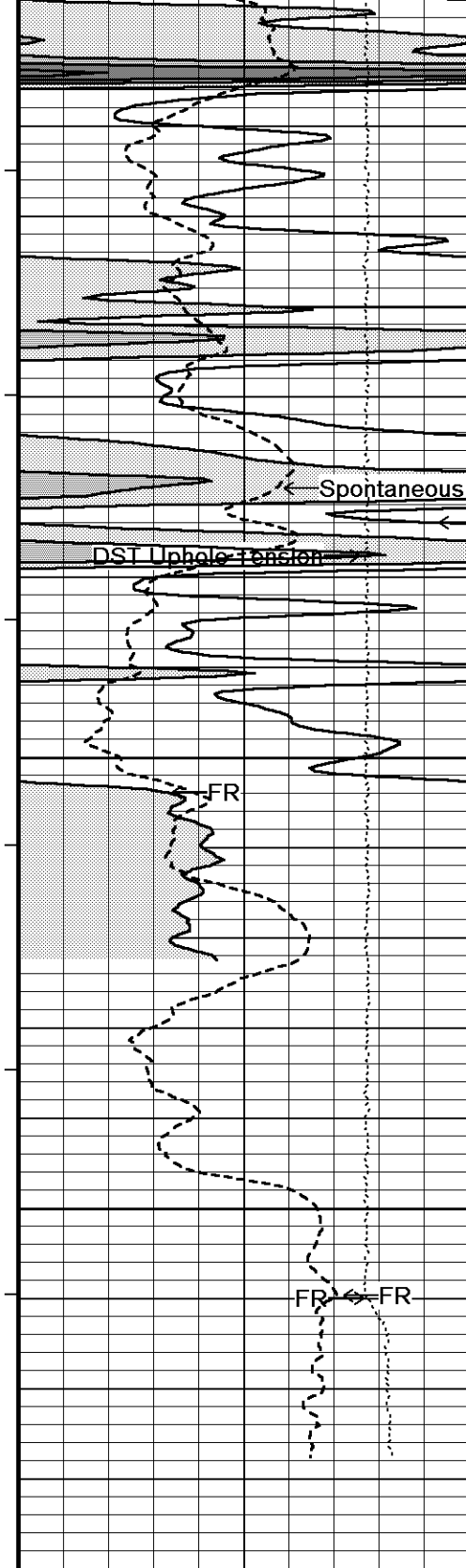
183°

186°

187°

189°





191°

8150

191°

8200

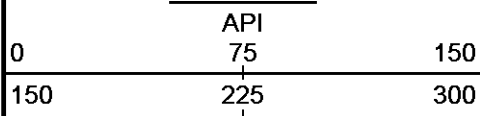
8250

TD

Depth
In
Feet

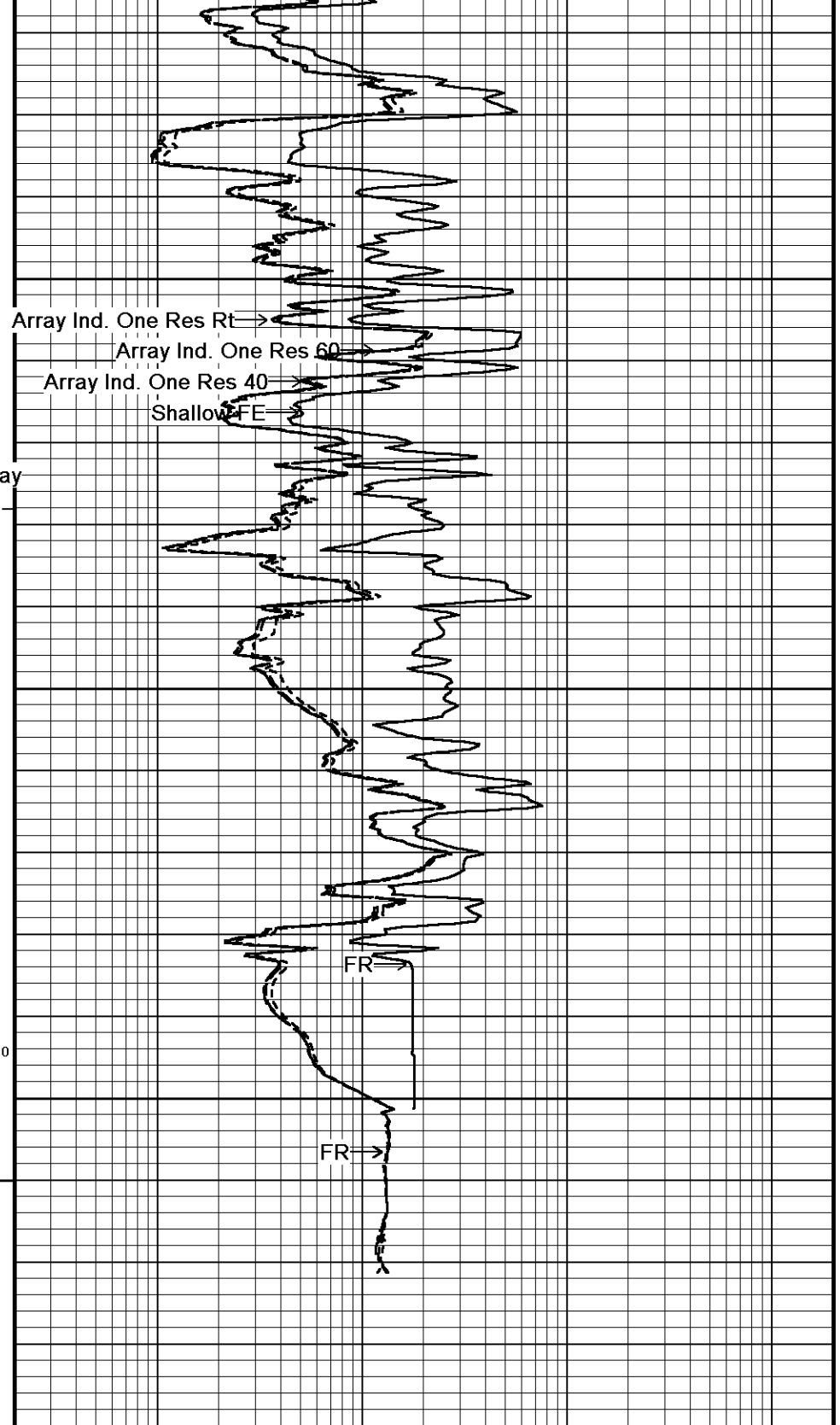
Timing Marks
every 60.0 sec

Gamma Ray



Borehole
Temp in
deg F

HVI
every

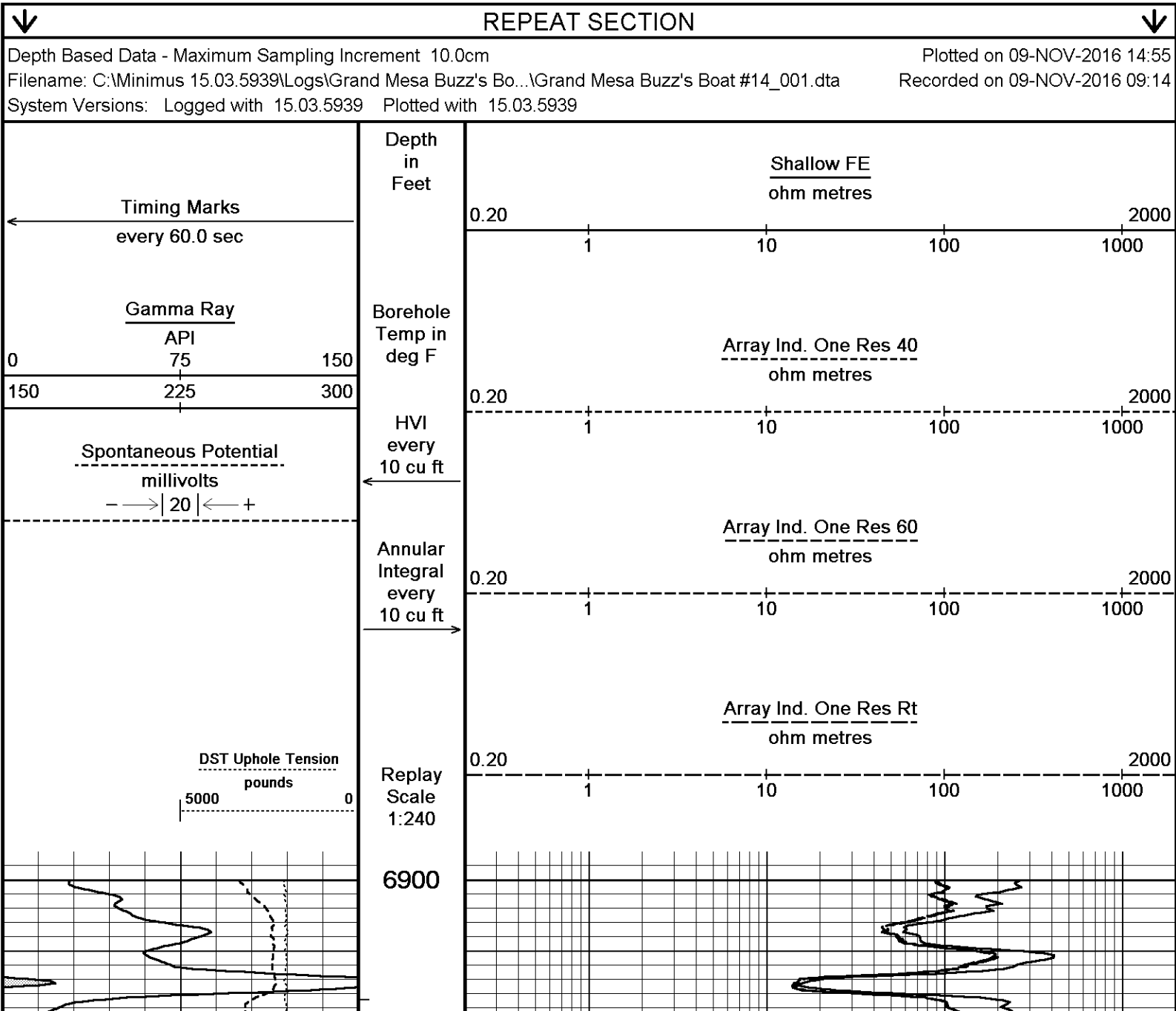
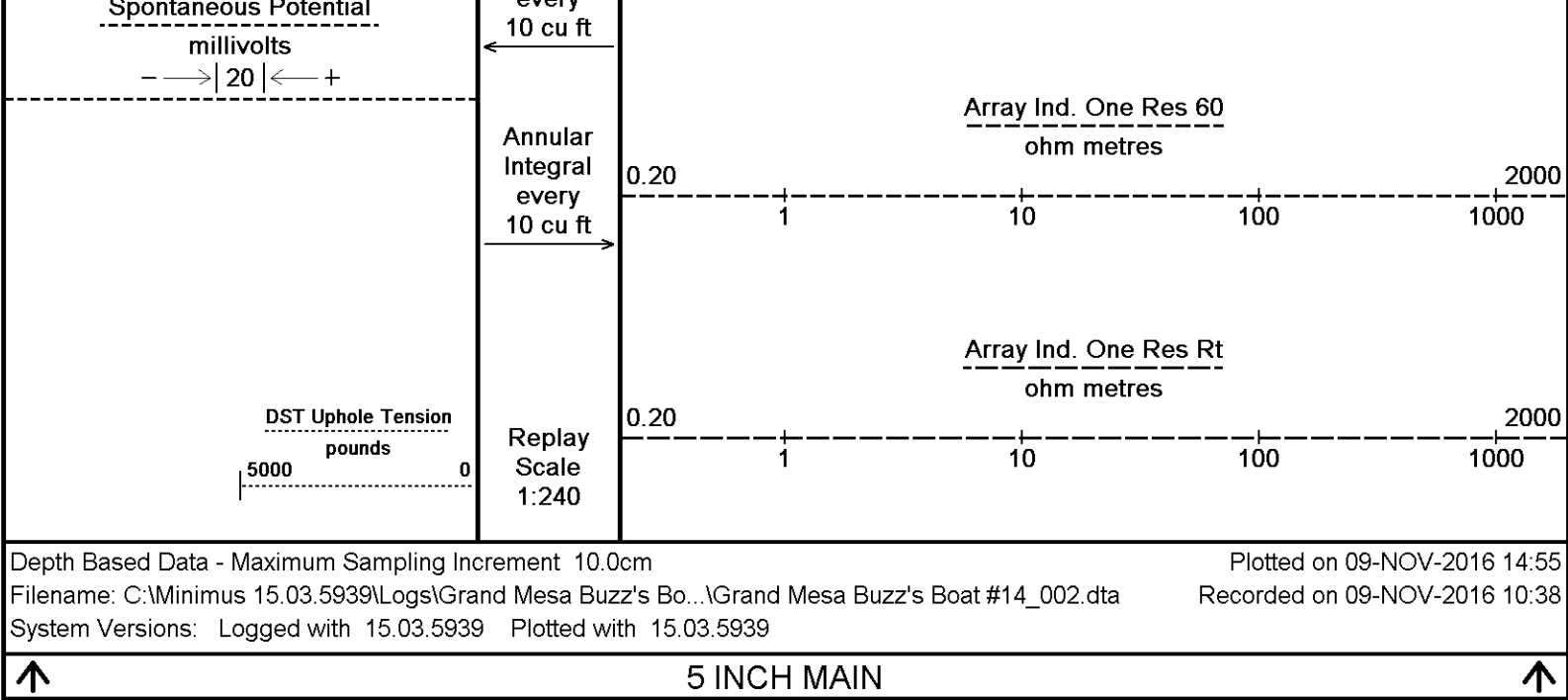


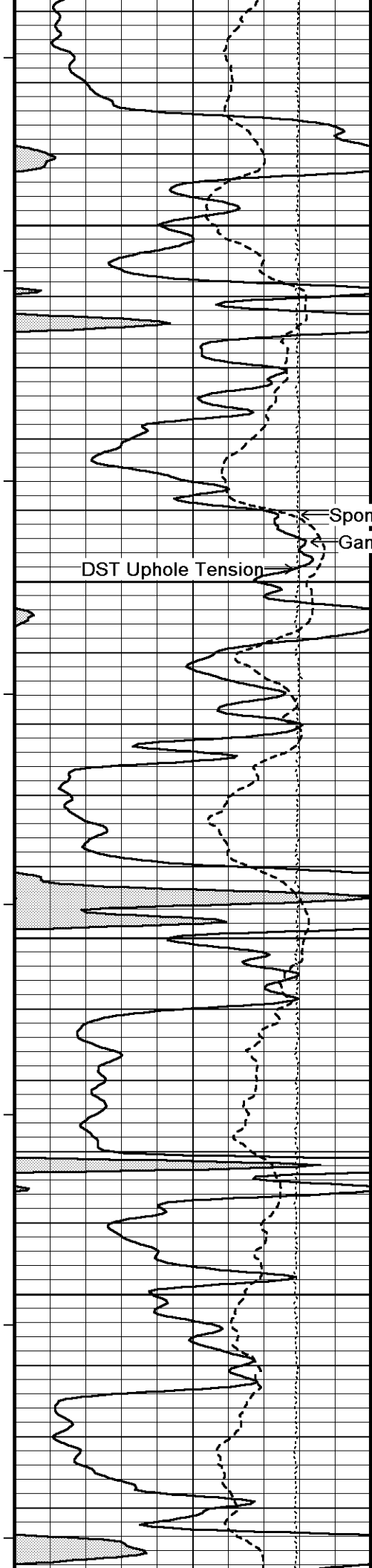
0.20 Shallow FE ohm metres 2000

1 10 100 1000

0.20 Array Ind. One Res 40 ohm metres 2000

1 10 100 1000





171°

6950

172°

Spontaneous Potential

Gamma Ray

DST Uphole Tension

7000

172°

7050

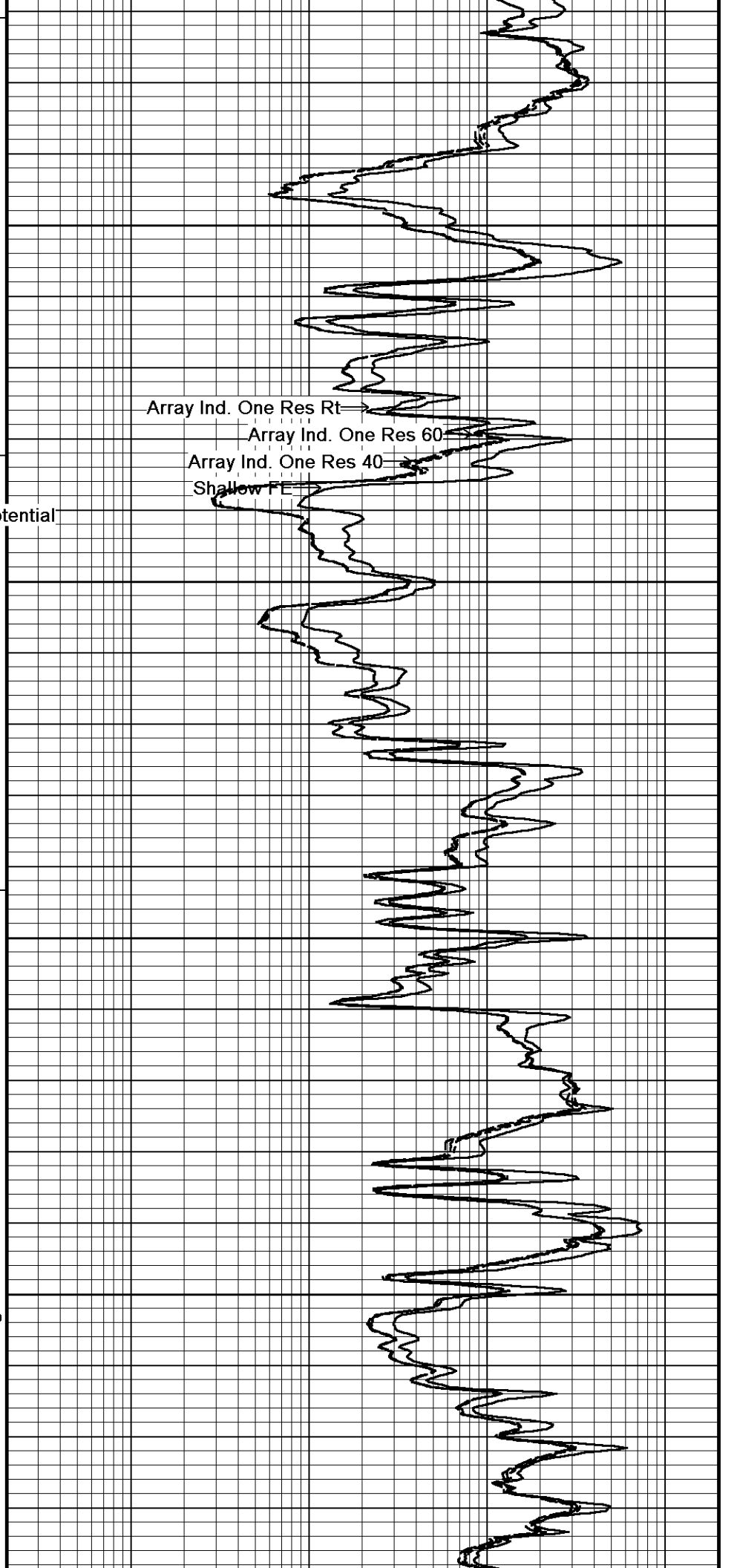
400

173°

7100

200

173°

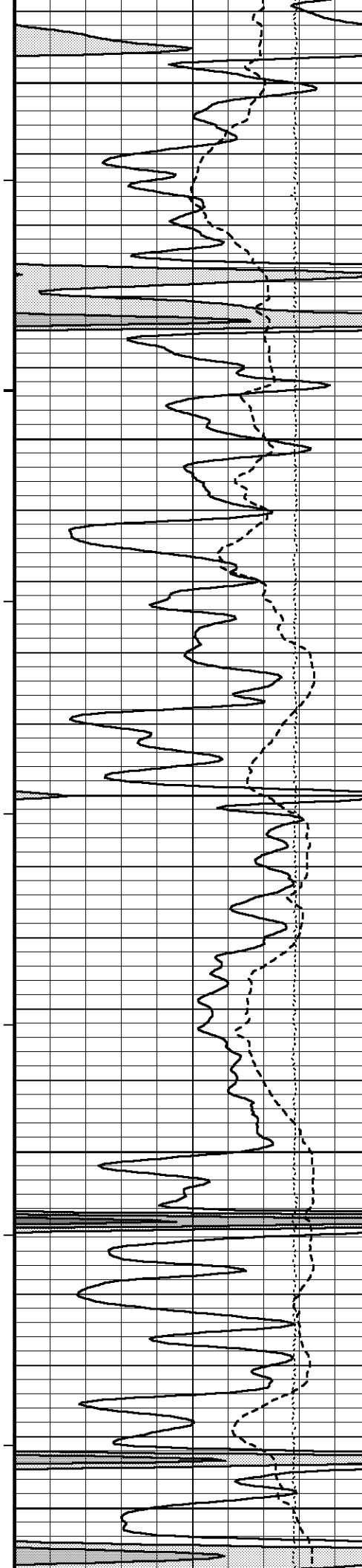


Array Ind. One Res Rt

Array Ind. One Res 60

Array Ind. One Res 40

Shallow FE



7150

174°

7200

174°

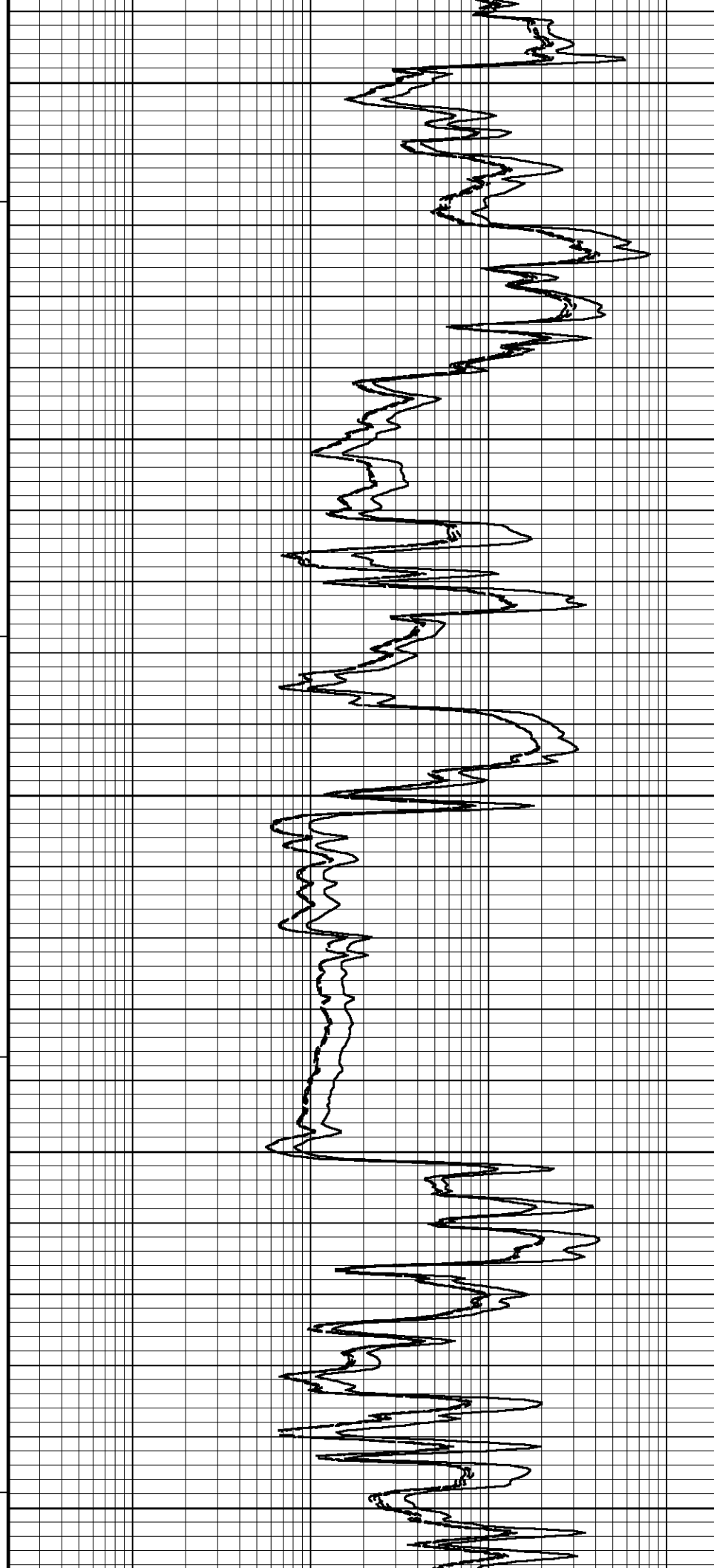
7250

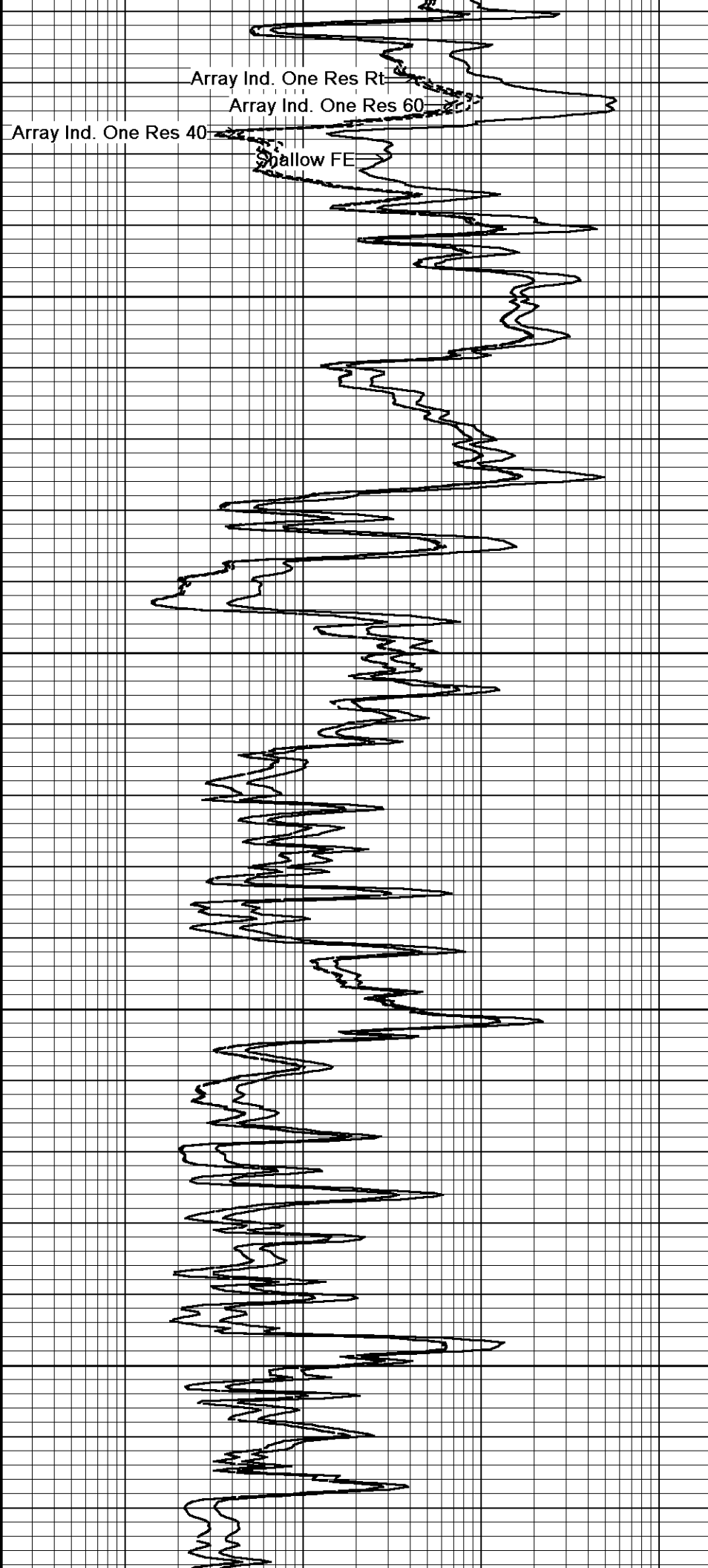
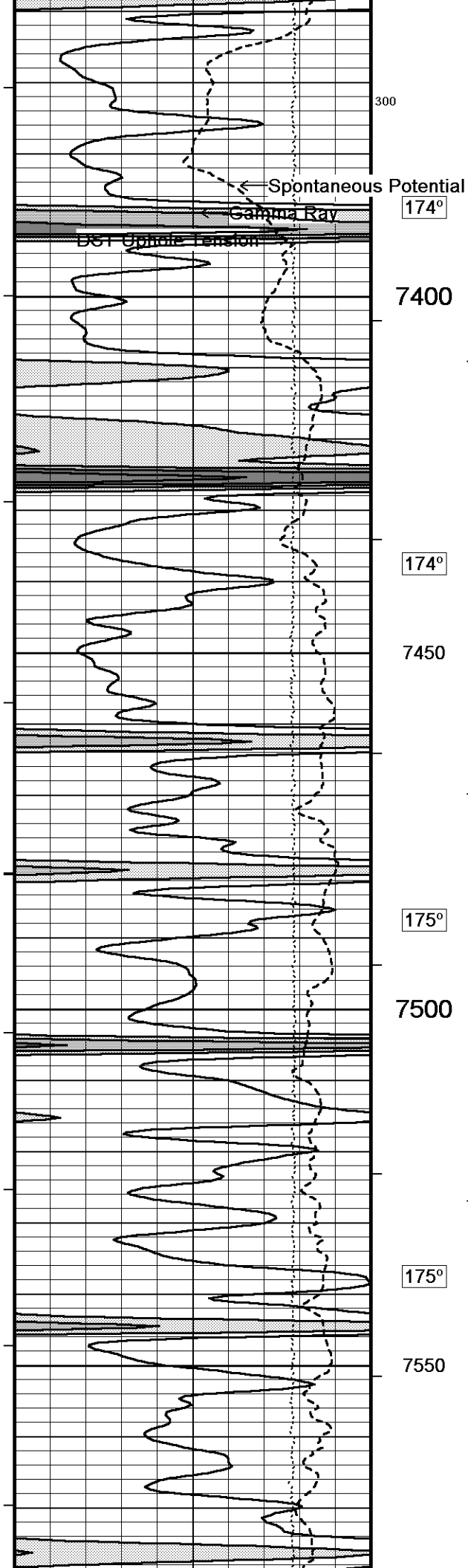
174°

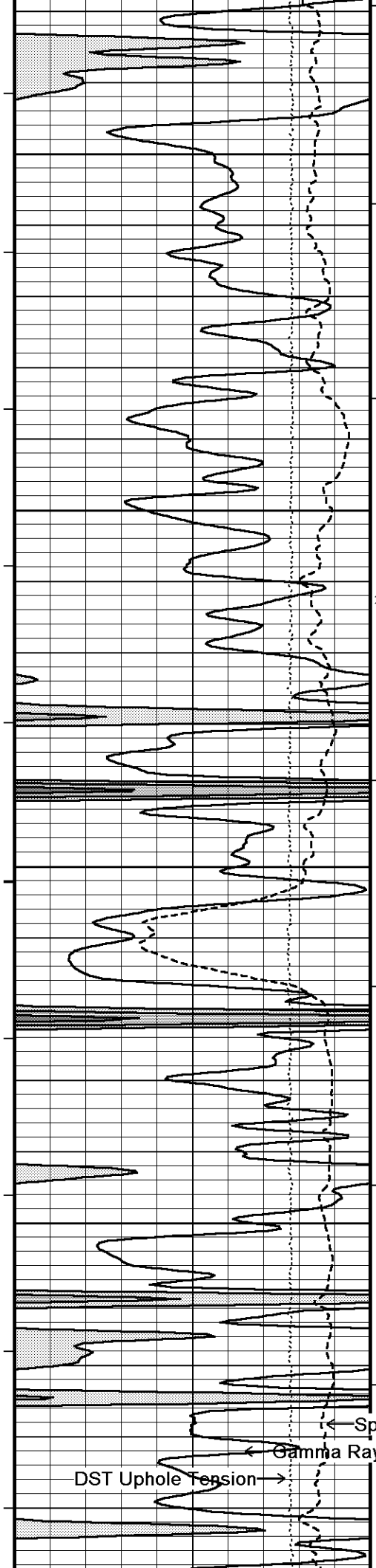
7300

174°

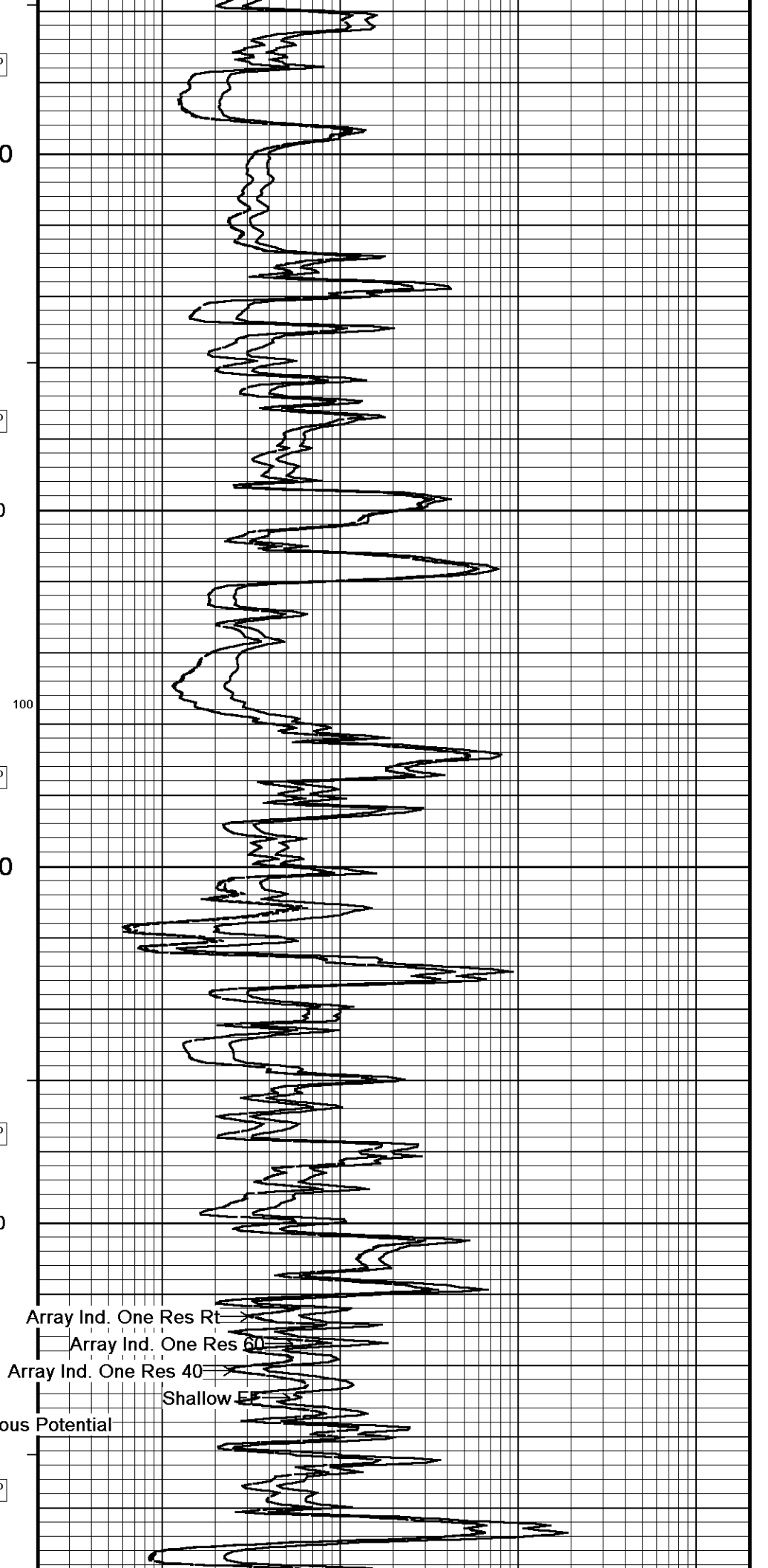
7350







175°
7600
176°
7650
200
100
177°
7700
176°
7750
177°

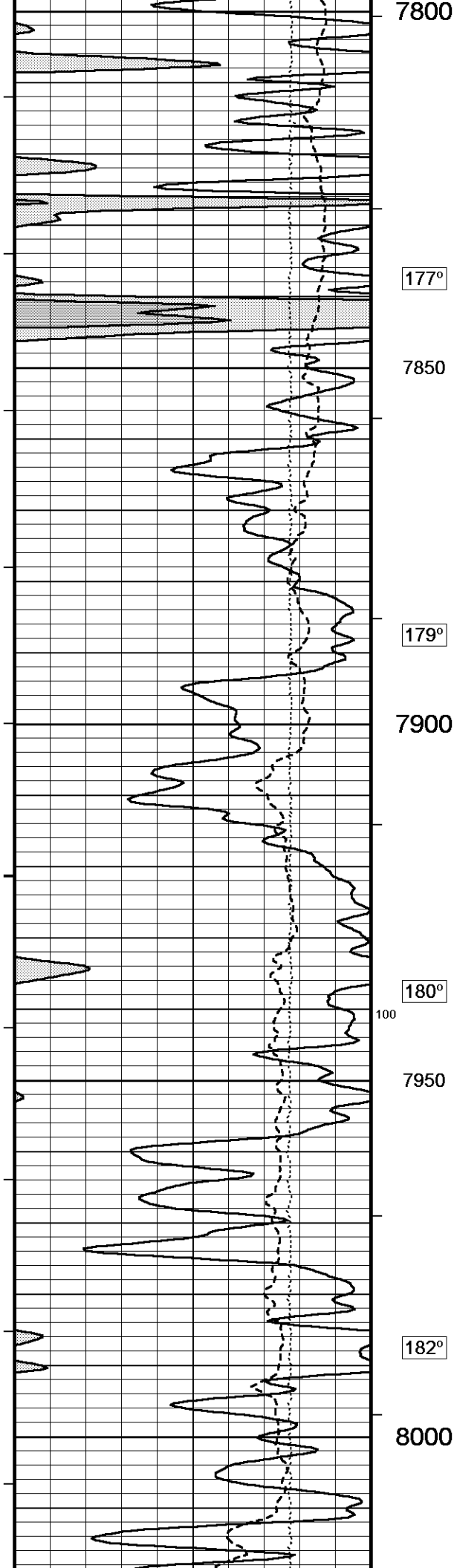


Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FF

← Spontaneous Potential

← Gamma Ray

DST Uphole Tension →



7800

177°

7850

179°

7900

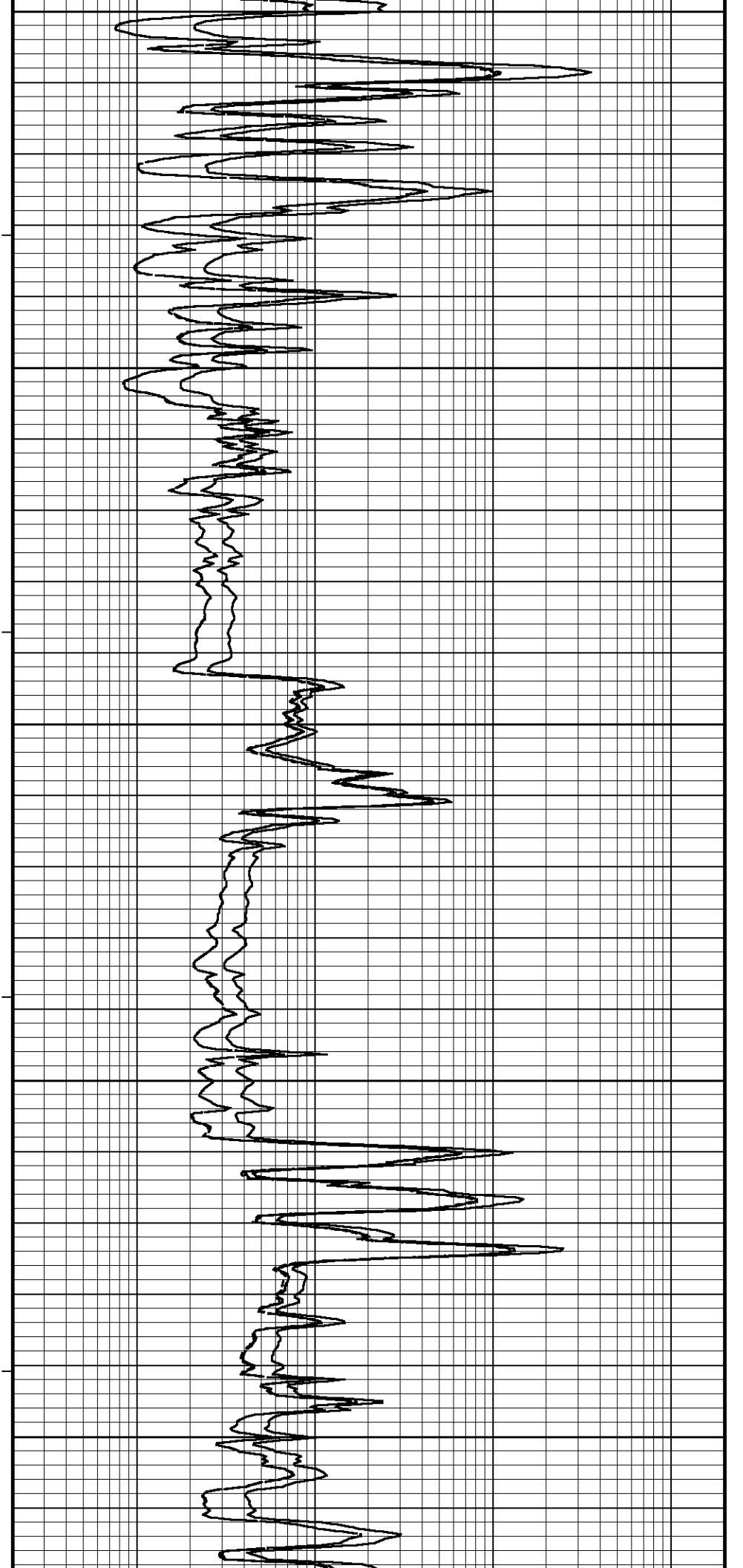
180°

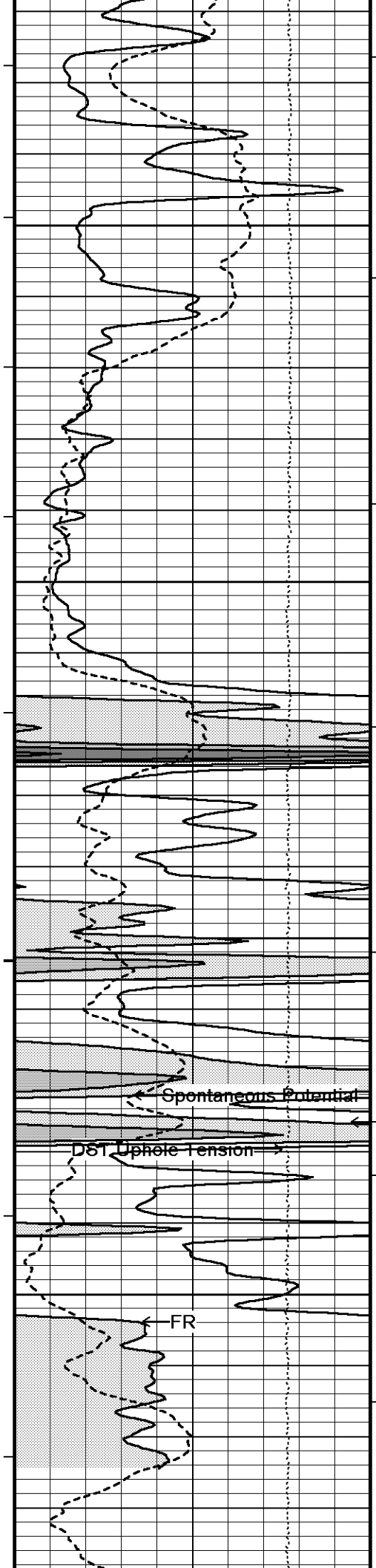
100

7950

182°

8000





Gamma Ray

184°

8050

187°

8100

188°

8150

188°

8200

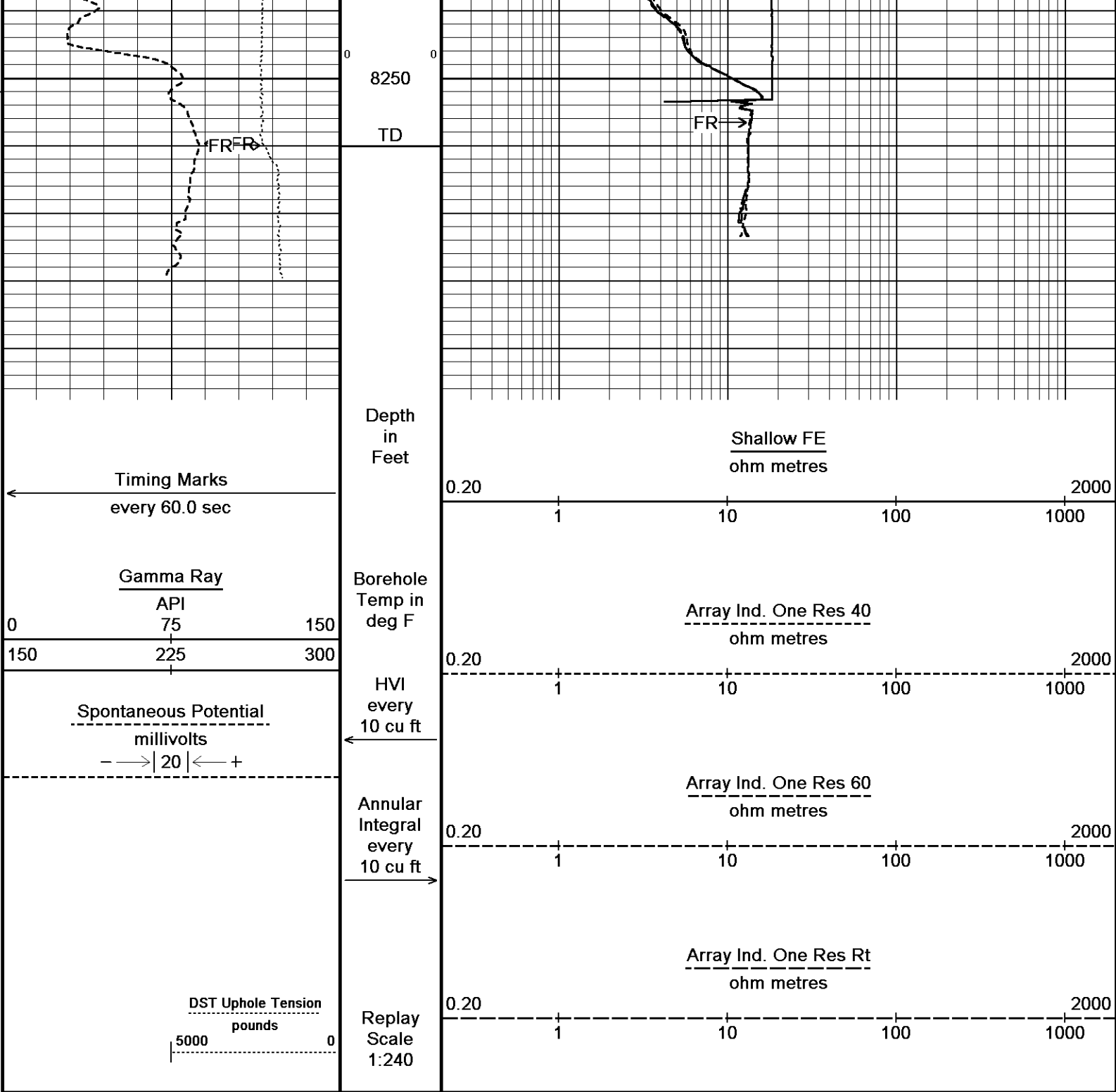
Array Ind. One Res 40

Array Ind. One Res 60

Array Ind. One Res RT

Shallow FLS

FR



Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 09-NOV-2016 14:55

Filename: C:\Minimus 15.03.5939\Logs\Grand Mesa Buzz's Boat #14\Grand Mesa Buzz's Boat #14_001.dta

Recorded on 09-NOV-2016 09:14

System Versions: Logged with 15.03.5939 Plotted with 15.03.5939

↑

REPEAT SECTION

↑

| BEFORE SURVEY CALIBRATION | | |
|--|----------|----------------------------------|
| C:\Minimus 15.03.5939\Logs\Grand Mesa Buzz's Boat #14\Grand Mesa Buzz's Boat #14_001.dta | | |
| General Constants All 000 | | Last Edited on 09-NOV-2016,08:22 |
| General Parameters | | |
| Mud Resistivity | 1.190 | ohm-metres |
| Mud Resistivity Temperature | 75.000 | 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 | None | |

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

Down-hole Tension Calibration SMS 0

Field Calibration on 24-JUL-2016 15:20


| Reading No | Measured | Calibrated (lbs) |
|------------|----------|------------------|
| 1 | 15235.81 | 0.00 |
| 2 | 16026.61 | 481.00 |

Gamma Calibration MCG-C 123

Field Calibration on 08-NOV-2016 22:41

| | Measured | Calibrated (API) |
|--------------------|----------|------------------|
| Background | 73 | 51 |
| Calibrator (Gross) | 728 | 507 |
| Calibrator (Net) | 656 | 456 |

Gamma Calibration Tolerances MCG-C 123

Ratio 1.438  Counts/API

The bar chart shows a scale from 1.40 to 1.55. The value 1.438 is indicated by a black bar.

Gamma Constants MCG-C 123

Last Edited on 09-NOV-2016,05:46

| | | |
|---------------------------------|-----------------|-------|
| Gamma Calibrator Number | MCGGRCC141 | |
| GRC-M Calibrator Jig in Use? | NO | |
| Inactive Background Jig in Use? | NO | |
| Mud Density | 1.12 | gm/cc |
| Caliper Source for Processing | Density Caliper | |
| Tool Position | Eccentred | |
| Potassium Equivalence | Chloride | |
| K Mud Concentration | 0.00 | % |

High Resolution Temperature Calibration MCG-C 123

Field Calibration on 31-OCT-2015,17:05

| | Measured | Calibrated(Deg F) |
|-------|----------|-------------------|
| Lower | 50.00 | 50.00 |
| Upper | 100.00 | 100.00 |

High Resolution Temperature Constants MCG-C 123

Last Edited on 22-SEP-2015,11:43

Pre-filter Length 11

SP Calibration MCG-C 123

Field Calibration on 14-JUL-2016 12:06

| | Measured | Calibrated (mV) |
|-------------|----------|-----------------|
| Reference 1 | 101.2 | 100.6 |
| Reference 2 | -99.1 | -99.9 |

Micro Normal and Micro Inverse Calibration MMR-C.A 247

Base Calibration on 28-AUG-2016 19:13

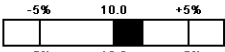
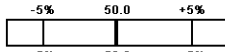
Field Check on 08-NOV-2016 22:26

Base Calibration

| Channel | Resistor 1 | Measured Resistor 2 | Calibrated (ohm-m) Resistor 1 | Calibrated (ohm-m) Resistor 2 |
|---------------|------------|---------------------|-------------------------------|-------------------------------|
| Micro Normal | 10.2 | 49.9 | 5.1 | 25.6 |
| Micro Inverse | 10.0 | 49.5 | 3.4 | 16.9 |

| Channel | Base Check (ohm-m) | Field Check (ohm-m) |
|---------------|--------------------|---------------------|
| Micro Normal | 93.6 | 93.6 |
| Micro Inverse | 62.2 | 62.2 |

Micro Normal & Micro Inverse Calibration Tolerance MMR-C.A 247

Micro Normal Res. 1 10.2  ohm Micro Normal Res. 2 49.9  ohm

The bar charts show tolerance ranges from -5% to +5% for both resistors. The measured values are within the tolerance ranges.

| | | | | | | | |
|---------------------------|------|--|-------|----------------------|------|--|-----|
| Micro Inverse Res. 1 | 10.0 | <div><div></div><div></div><div></div><div></div><div></div></div> | ohm | Micro Inverse Res. 2 | 49.5 | <div><div></div><div></div><div></div><div></div><div></div></div> | ohm |
| Micro Normal Base Check | 93.6 | <div><div>-2%</div><div>93.19</div><div>+2%</div></div> | ohm-m | | | | |
| Micro Inverse Base Check | 62.2 | <div><div>-2%</div><div>62.11</div><div>+2%</div></div> | ohm-m | | | | |
| Micro Normal Field Check | 93.6 | <div><div>-2%</div><div>93.6</div><div>+2%</div></div> | ohm-m | | | | |
| Micro Inverse Field Check | 62.2 | <div><div>-2%</div><div>62.2</div><div>+2%</div></div> | ohm-m | | | | |

Micro Normal and Micro Inverse Constants MMR-C.A 247

Last Edited on 26-JUN-2016,15:44

Pad Type 8-12 in Soft Rubber Inflatable 006-9011-159
 Micro Normal K Factor 0.5110
 Micro Inverse K Factor 0.3380
 Standoff Offset 0.0000 inches

Caliper Calibration MMR-C.A 247

Base Calibration on 28-AUG-2016 19:08
 Field Calibration on 08-NOV-2016 22:25

| | | |
|-------------------|-----------------------|----------------------|
| Base Calibration | | |
| Reading No | Measured | Calibrator Size (in) |
| 1 | 14869 | 5.98 |
| 2 | 18207 | 7.97 |
| 3 | 21411 | 9.86 |
| 4 | 25389 | 11.92 |
| 5 | 0 | 0.00 |
| 6 | N/A | N/A |
| Field Calibration | | |
| | Measured Caliper (in) | Actual Caliper (in) |
| | 8.04 | 7.97 |

Caliper Calibration Tolerances MMR-C.A 247

Short Arm Field Cal. 8.04

7.77

7.97

8.17

 in

Micro-Resistivity Caliper Constants MMR-C.A 247

Last Edited on

Sonde Configuration Resistivity Mode

Neutron Calibration MDN-A.B 66

Base Calibration on 22-MAY-2016,18:15
 Field Check on 08-NOV-2016 22:46

| | |
|--------------------------|---------------------------|
| Base Calibration | |
| | Measured Calibrated (cps) |
| | Near Far Near Far |
| | 3116 97 3714 110 |
| Ratio | 32.277 33.764 |
| Field Calibrator at Base | |
| | Calibrated (cps) |
| | 2061 3028 |
| Ratio | 0.681 |
| Field Check | |
| | Calibrated (cps) |
| | 2161 3088 |
| Ratio | 0.700 |

Neutron Calibration Tolerances MDN-A.B 66

Ratio 32.277

-5%

33

+5%

Base Check 0.681

0.65

0.7

0.75

Field Check 0.700

0.661

0.681

0.701

Neutron Constants MDN-A.B 66

Last Edited on 09-NOV-2016,05:46

Neutron Source Id P0204NN
 Neutron Jig Number NJ5736
 Air Hole Processing Legacy
 Caliper Source for Processing Density Caliper
 Stand-off 0.00 inches

| | | |
|---------------------------------|----------------|-----------|
| Mud Density | 1.00 | gm/cc |
| Limestone Sigma | 7.10 | cu |
| Sandstone Sigma | 4.26 | cu |
| Dolomite Sigma | 4.70 | cu |
| Formation Pressure Source | None | |
| Formation Pressure | N/A | kpsi |
| Temperature Source | Constant Value | |
| Temperature | 68.00 | degrees F |
| Mud Salinity | 0.00 | kppm |
| Salinity Correction | Not Applied | |
| Formation Fluid Salinity Source | None | |
| Formation Fluid Salinity | N/A | kppm |
| Barite Mud Correction | Not Applied | |

| | | | |
|----------------------------|----------|---|--|
| FE Calibration MFE-B.J 352 | | Base Calibration on 28-AUG-2016 18:58 Field Check on 08-NOV-2016 22:14 | |
| Base Calibration | | | |
| | Measured | Calibrated (ohm-m) | |
| Reference 1 | 0.0 | 0.0 | |
| Reference 2 | 963.3 | 126.8 | |
| Base Check | | 281.3 | |
| Field Check | | 281.6 | |

| | | | |
|---------------------------------------|-------|---|-------|
| FE Calibration Tolerances MFE-B.J 352 | | | |
| Reference 2 | 963.3 | <div> <div>-3%</div> <div>960.0</div> <div>+3%</div> </div> | ohm |
| Base Check | 281.3 | <div> <div>-2%</div> <div>277.0</div> <div>+2%</div> </div> | ohm-m |
| Field Check | 281.6 | <div> <div>-2%</div> <div>281.3</div> <div>+2%</div> </div> | ohm-m |

| | | | | | |
|-------------------------------|--|-------------------------------------|----------------------------------|--------|--|
| FE Constants MFE-B.J 352 | | | Last Edited on 09-NOV-2016,05:46 | | |
| Running Mode | | No Sleeve | | | |
| MFE K Factor | | 0.1268 | | | |
| Borehole Correction Constants | | | | | |
| Sonde Position | | 0.5 | | inches | |
| Hole Size Source | | Density Caliper | | | |
| Hole Size Constant Value | | N/A | | inches | |
| Rm Source | | Global Value: Temperature Corrected | | | |
| Temp. for Rm Corr. | | MCG External Temperature | | | |

| | | | | | |
|----------------------------|------------------------|-------------------|----------------------------------|------------|--------------------|
| Sonic Constants MSS-A.A 55 | | | Last Edited on 09-NOV-2016,05:46 | | |
| Maximum Boundary Contrast | 100.00 | micro-sec/ft | | | |
| Fluid Transit Time | 189.00 | micro-sec/ft | | | |
| Limestone Transit Time | 47.50 | micro-sec/ft | | | |
| Sandstone Transit Time | 55.50 | micro-sec/ft | | | |
| Dolomite Transit Time | 43.50 | micro-sec/ft | | | |
| Sonic used for Porosities | 3-5' Compensated Sonic | | | | |
| Correction for Sonde Skew | Applied | | | | |
| Cycle Stretch Algorithm | Applied | | | | |
| MN3FT | N/A | micro-sec | | | |
| MX3FT | N/A | micro-sec | | | |
| Hunt-Raymer Constant | 83.13 | micro-sec/ft | | | |
| Sonde Mode | Compensated | | | | |
| Hole Type | Open Hole | | | | |
| Sonde Parameters | | | | | |
| | Measured | Calibrated | | | |
| Offset | N/A | 0.0000 | | | |
| Free Pipe | N/A | N/A | | | |
| Peak Amplitude Source | N/A | | | | |
| Waveform | Start Time (micro-sec) | Width (micro-sec) | Pre Gain | Start Gain | Discriminator (mV) |
| 3' | N/A | N/A | N/A | N/A | N/A |

| | | | | | |
|----|-----|-----|-----|-----|-----|
| 4' | N/A | N/A | N/A | N/A | N/A |
| 5' | N/A | N/A | N/A | N/A | N/A |
| 6' | N/A | N/A | N/A | N/A | N/A |

Processed Fixed Gate Parameters

| | | | | |
|------------------------------|----------------------|--------------------|-----|--|
| Waveform Used For Processing | N/A | | | |
| Start Time (micro-sec) | End Time (micro-sec) | Discriminator (mV) | N/A | |
| N/A | N/A | N/A | | |
| N/A | N/A | N/A | N/A | |
| N/A | N/A | N/A | N/A | |
| N/A | N/A | N/A | N/A | |
| N/A | N/A | N/A | N/A | |

Full Waveform Parameters

| | | | |
|---------------------------------|-----|-----------|--|
| Use 3' Waveform to derive TR | N/A | | |
| Use 4' Waveform to derive TR | N/A | | |
| Use 5' Waveform to derive TR | N/A | | |
| Use 6' Waveform to derive TR | N/A | | |
| 3' Waveform Discriminator Level | N/A | mV | |
| 4' Waveform Discriminator Level | N/A | mV | |
| 5' Waveform Discriminator Level | N/A | mV | |
| 6' Waveform Discriminator Level | N/A | mV | |
| 3' Waveform Filter | N/A | | |
| 4' Waveform Filter | N/A | | |
| 5' Waveform Filter | N/A | | |
| 6' Waveform Filter | N/A | | |
| Semblance Level | N/A | | |
| Semblance Window Width | N/A | micro-sec | |
| Sonic 1 Despiker | N/A | N/A | |
| Sonic 2 Despiker | N/A | N/A | |

Induction Calibration MAI-A.A 111

Base Calibration on 05-AUG-2014,09:34
Field Check on 08-NOV-2016 22:13

Base Calibration

| Test Loop Calibration | Measured | | Calibrated (mmho/m) | |
|-----------------------|----------|-------|---------------------|-------|
| Channel | Low | High | Low | High |
| 1 | 17.6 | 473.6 | 9.3 | 966.2 |
| 2 | 6.4 | 385.9 | 7.6 | 821.4 |
| 3 | 3.2 | 264.0 | 5.2 | 566.0 |
| 4 | 2.1 | 135.5 | 2.6 | 279.2 |

Array Temperature 23.0 Deg F

Test Loop Calibration Verified 22-MAY-2016,17:59

| Channel | Base Check (mmho/m) | | Field Check (mmho/m) | |
|---------|---------------------|--------|----------------------|--------|
| | Low | High | Low | High |
| 1 | 12.1 | 3873.0 | 10.7 | 3868.1 |
| 2 | 29.8 | 3528.1 | 28.6 | 3523.9 |
| 3 | 29.1 | 3021.3 | 28.1 | 3017.8 |
| 4 | 19.1 | 2058.5 | 18.5 | 2056.2 |
| Deep | 17.7 | 1962.1 | 17.1 | 1959.8 |
| Medium | 43.1 | 3976.4 | 41.8 | 3971.7 |
| Shallow | 44.4 | 5232.7 | 42.6 | 5226.4 |

Array Temperature 65.8 62.1 Deg F

Induction Calibration Tolerances MAI-A.A 111

| | | | | | | |
|--------------------|------|--|----------------------------|-------|--|--------|
| Low Conductivity 1 | 17.6 | | mmho/m High Conductivity 1 | 473.6 | | mmho/m |
| Low Conductivity 2 | 6.4 | | mmho/m High Conductivity 2 | 385.9 | | mmho/m |
| Low Conductivity 3 | 3.2 | | mmho/m High Conductivity 3 | 264.0 | | mmho/m |
| Low Conductivity 4 | 2.1 | | mmho/m High Conductivity 4 | 135.5 | | mmho/m |
| Background Vx 1 | 0.0 | | mmho/m Phase Check Loop 1 | 0.0 | | % |
| Background Vx 2 | 0.0 | | mmho/m Phase Check Loop 2 | 0.0 | | % |
| Background Vx 3 | 0.0 | | mmho/m Phase Check Loop 3 | 0.0 | | % |

| | | | |
|--|--------|-------------------------------------|-------------|
| Induction Constants MAI-A.A 111 | | Last Edited on 09-NOV-2016,05:45 | |
| Induction Model | | RtAP-WBM | |
| Borehole Correction Constants | | | |
| Tool Centred | | No | |
| Hole Size Source | | Density Caliper | |
| Hole Size Constant Value | | N/A | inches |
| 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 |
| Rm Source | | Global Value: Temperature Corrected | |
| 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 |
| Symmetrised Receiver Gains | | | |
| Receiver 1 | | 1.00 | |
| Receiver 2 | | 1.00 | |
| Receiver 3 | | 1.00 | |
| Receiver 4 | | 1.00 | |
| 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 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 | |

| | | | |
|---|----------|--|--|
| High Resolution Temperature Calibration MAI-A.A 111 | | Field Calibration on 24-NOV-2014,10:23 | |
| | Measured | Calibrated(Deg F) | |
| Lower | 10.00 | 10.00 | |
| Upper | 100.00 | 100.00 | |

| | | | |
|---|----|----------------------------------|--|
| High Resolution Temperature Constants MAI-A.A 111 | | Last Edited on 26-JUN-2014,15:06 | |
| Pre-filter Length | 11 | | |

| | | | | |
|-------------------------------------|-------|----------|---------------------------------------|-------|
| Photo Density Calibration MPD-B 104 | | | Base Calibration on 28-AUG-2016 20:24 | |
| | | | Field Check on 08-NOV-2016 22:23 | |
| Density Calibration | | | | |
| Base Calibration | | Measured | Calibrated (sdu) | |
| | Near | Far | Near | Far |
| Background | 1145 | 1339 | | |
| Reference 1 | 49665 | 24007 | 59556 | 30836 |
| Reference 2 | 20032 | 2442 | 24941 | 2541 |
| Field Check at Base | | | | |

1144.9 1338.6

Field Check

1139.6 1323.0

PE Calibration

Base Calibration

Measured

Calibrated

| | WS | WH | Ratio |
|-------------|-------|-------|-------|
| Background | 211 | 1021 | |
| Reference 1 | 20773 | 49486 | 0.424 |
| Reference 2 | 5807 | 19899 | 0.296 |

Ratio

0.371
0.272

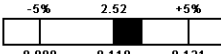
Field Check at Base


211.3 1021.2

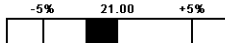
Field Check

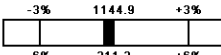
207.9 1017.4

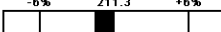
Photo Density Calibration Tolerances MPD-B 104

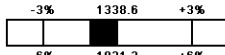
Near Density Ratio 2.57 

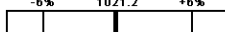
PE Calibration 0.119 

Far Density Ratio 20.54 

Near Den. Field Check 1139.6 

PE WS Field Check 207.9 

Far Den. Field Check 1323.0 

PE WH Field Check 1017.4 

Density Constants MPD-B 104

Last Edited on 09-NOV-2016,05:46

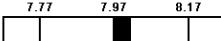
| | | |
|-------------------------------|-----------------|-------|
| Density Source Id | P50557B | |
| Nylon Calibrator Number | DNCE695 | |
| Aluminium Calibrator Number | DACD698 | |
| Density Shoe Profile | 8 inch | |
| Caliper Source for Processing | Density Caliper | |
| PE Correction to Density | Not Applied | |
| Mud Density | 1.12 | gm/cc |
| Mud Density Z/A Multiplier | 1.11 | |
| Mud Filtrate Density | 1.00 | gm/cc |
| Dry Hole Mud Filtrate Density | 1.00 | gm/cc |
| DNCT | 0.00 | gm/cc |
| CRCT | 0.00 | gm/cc |
| Density Z/A Correction | Hybrid | |
| Matrix Density (gm/cc) | Depth (ft) | |
| 2.71 | 0.00 | |
| 0.00 | 0.00 | |
| 0.00 | 0.00 | |
| 0.00 | 0.00 | |
| 0.00 | 0.00 | |
| 0.00 | 0.00 | |
| 0.00 | 0.00 | |
| 0.00 | 0.00 | |
| 0.00 | 0.00 | |

Caliper Calibration MPD-B 104

Base Calibration on 28-AUG-2016 19:51
Field Calibration on 08-NOV-2016 22:17

| | | |
|-------------------|-----------------------|----------------------|
| Base Calibration | | |
| Reading No | Measured | Calibrator Size (in) |
| 1 | 13646 | 3.99 |
| 2 | 22688 | 5.98 |
| 3 | 31297 | 7.97 |
| 4 | 39521 | 9.86 |
| 5 | 48608 | 11.92 |
| 6 | N/A | N/A |
| Field Calibration | | |
| | Measured Caliper (in) | Actual Caliper (in) |
| | 8.01 | 7.97 |

Caliper Calibration Tolerances MPD-B 104

Short Arm Field Cal. 8.01  in

DOWNHOLE EQUIPMENT

C:\Minimus 15.03.5939\Logs\Grand Mesa Buzz's Boat #14\Grand Mesa Buzz's Boat #14_001.dta

Cablehead, 11 pin
CBH-CA 176 LG: 2.40 ft WT: 24.3 lb OD: 2.244 in

Compact Comms Gamma
MCG-C 123 LG: 8.70 ft WT: 63.9 lb OD: 2.244 in

Compact Micro-Resistivity
MMR-C.A 247 LG: 8.59 ft WT: 81.6 lb OD: 4.882 in

Compact Neutron
MDN-A.B 66 LG: 5.04 ft WT: 50.7 lb OD: 2.244 in

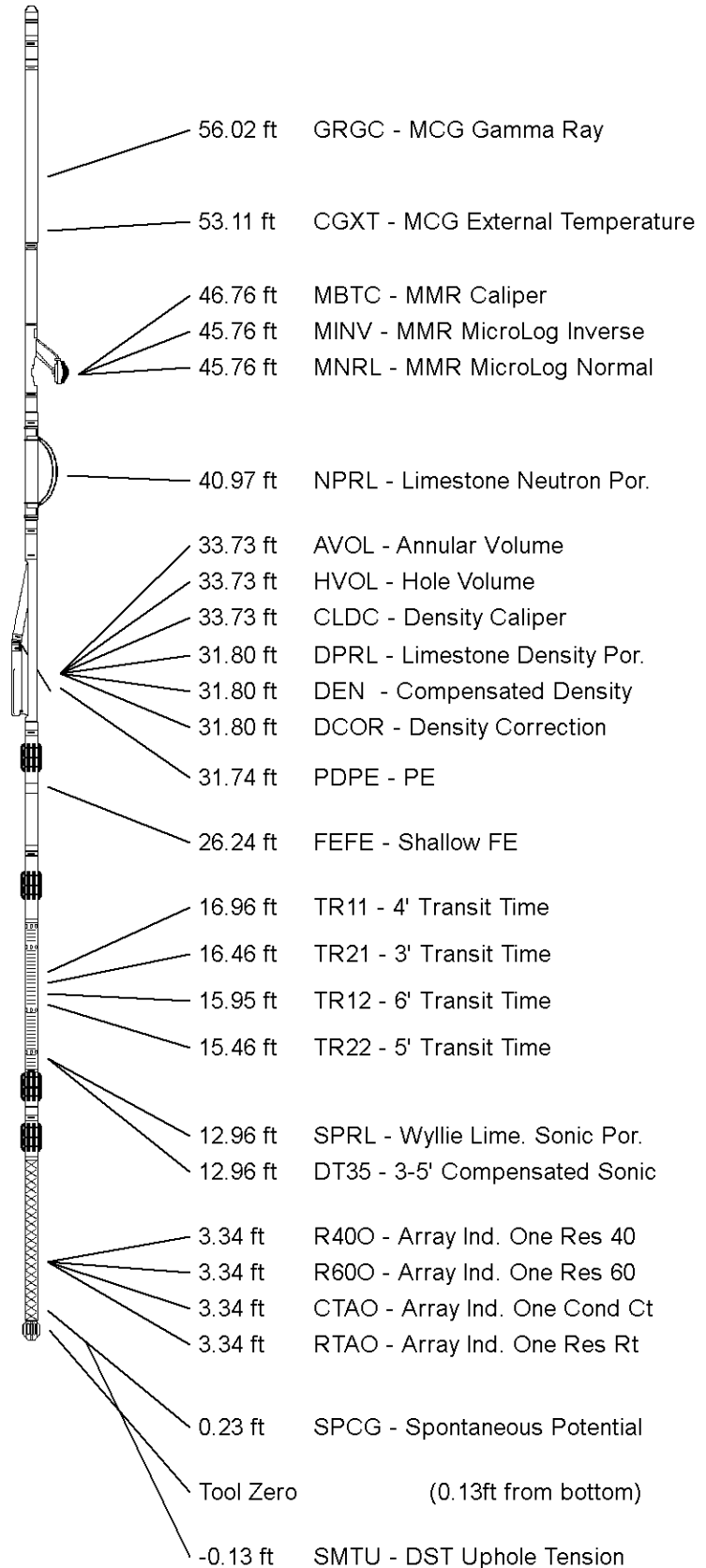
Compact Density/Caliper
MPD-B 104 LG: 9.59 ft WT: 90.4 lb OD: 2.449 in

Compact Focussed Electric
MFE-B.J 352 LG: 6.05 ft WT: 48.5 lb OD: 2.244 in

Compact Sonic
MSS-A.A 55 LG: 12.52 ft WT: 72.8 lb OD: 2.244 in

Compact Induction
MAI-A.A 111 LG: 10.81 ft WT: 48.5 lb OD: 2.244 in

Total Length: 63.70 ft Weight: 480.6 lb



All measurements relative to tool zero.

COMPANY

WELL

FIELD

GRAND MESA OPERATING COMPANY

BUZZ'S BOAT #14

WILDCAT

FIELD WILDCAT
PROVINCE/COUNTY WASHINGTON
COUNTRY/STATE U.S.A. / COLORADO

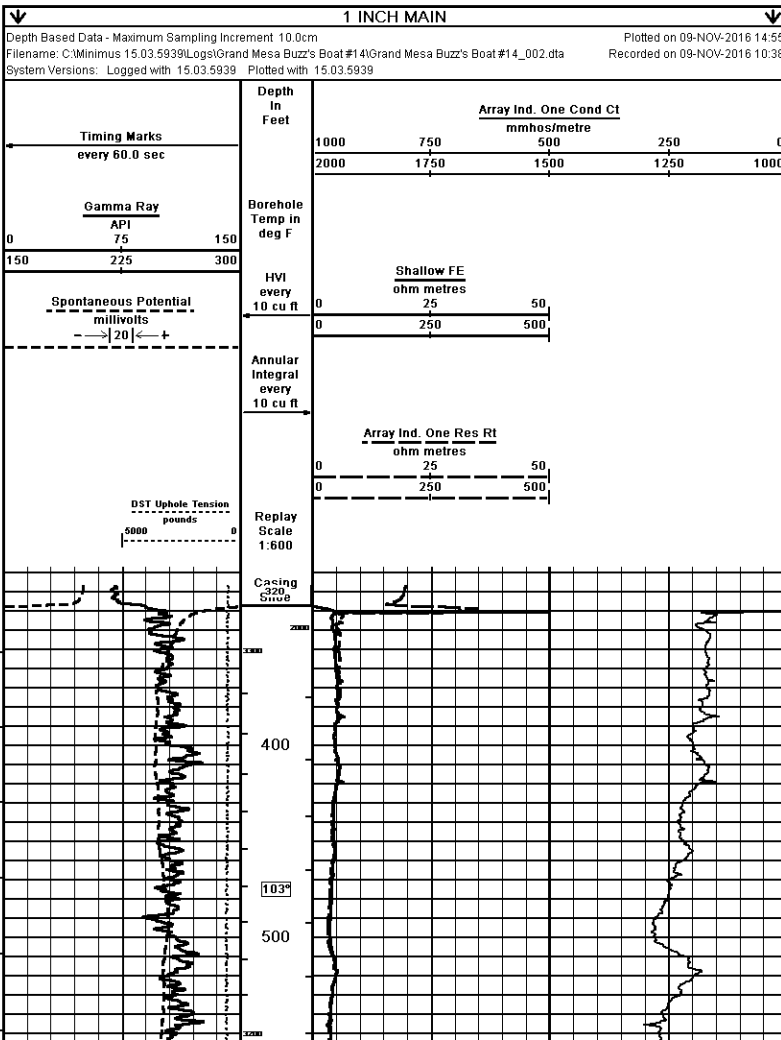
| | | | | | |
|-------------------------|---------|------|---------------|---------|------|
| Elevation Kelly Bushing | 5171.00 | feet | First Reading | 8257.00 | feet |
| Elevation Drill Floor | 5169.00 | feet | Depth Driller | 8254.00 | feet |
| Elevation Ground Level | 5152.00 | feet | Depth Logger | 8260.00 | feet |

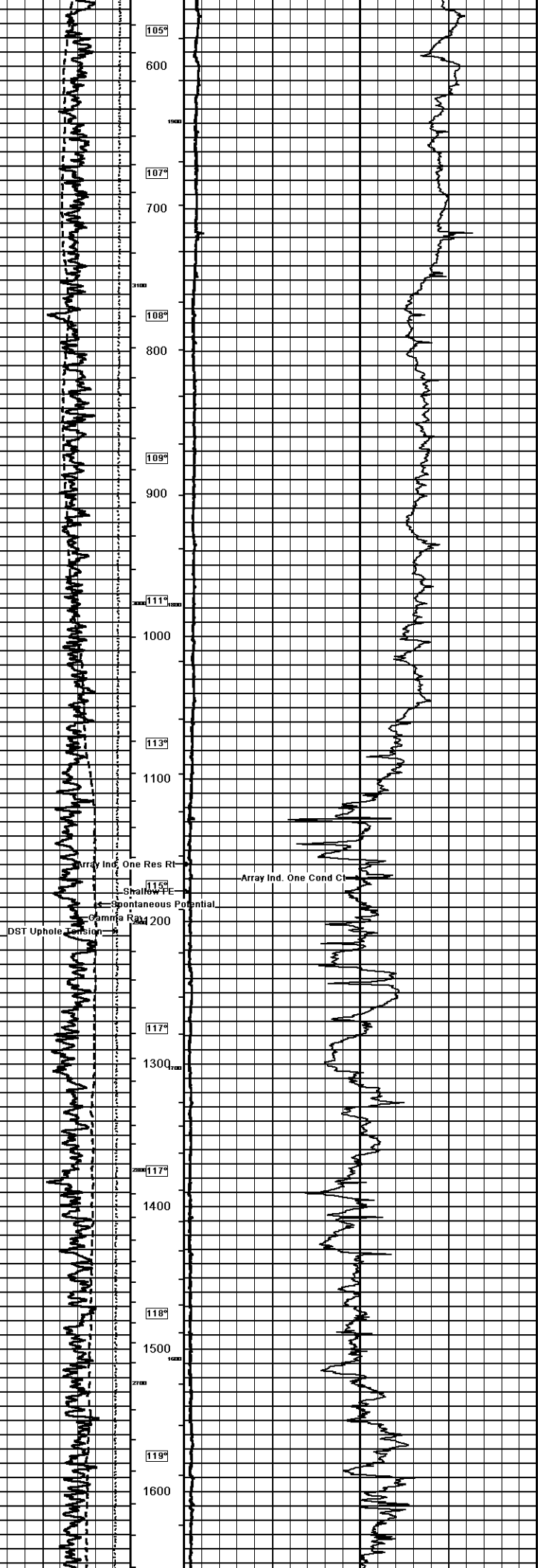


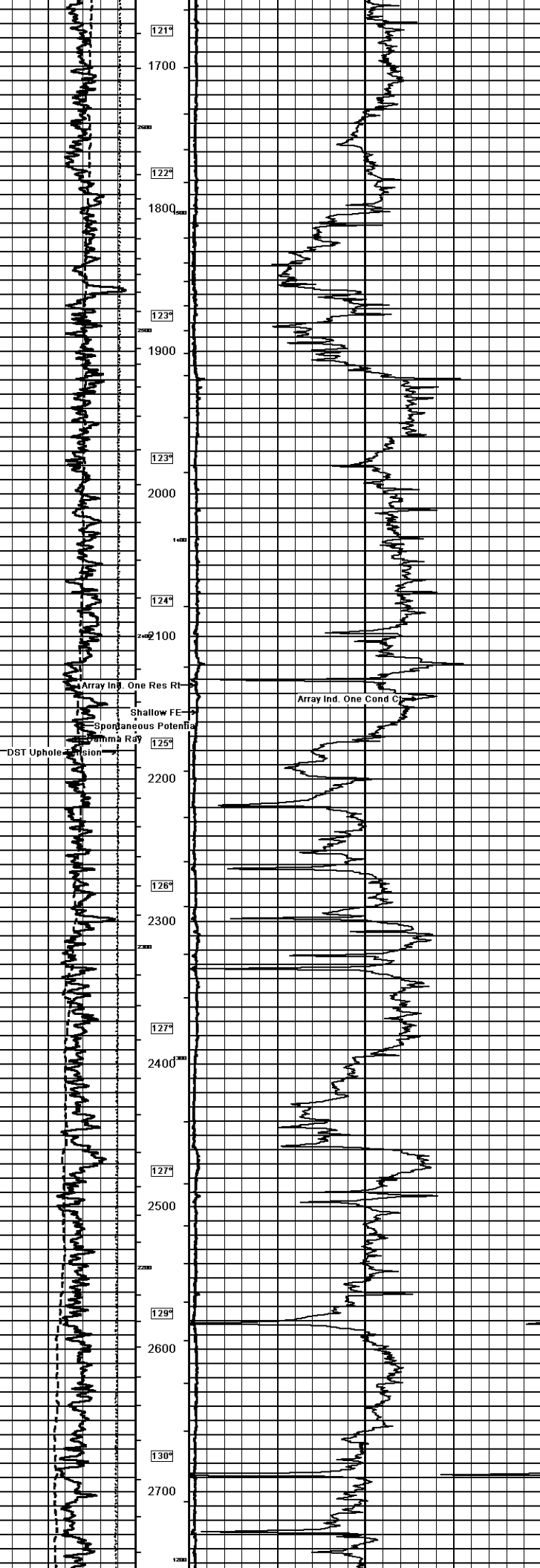
ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG

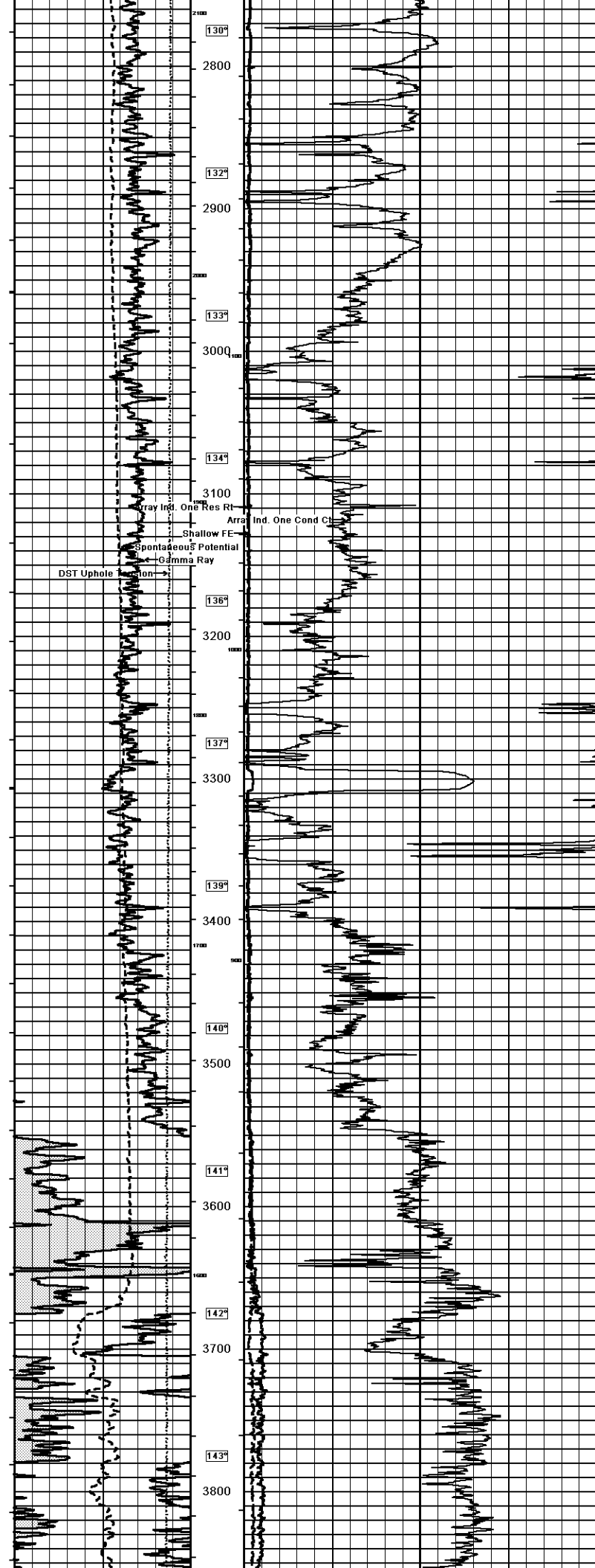
Weatherford[®]

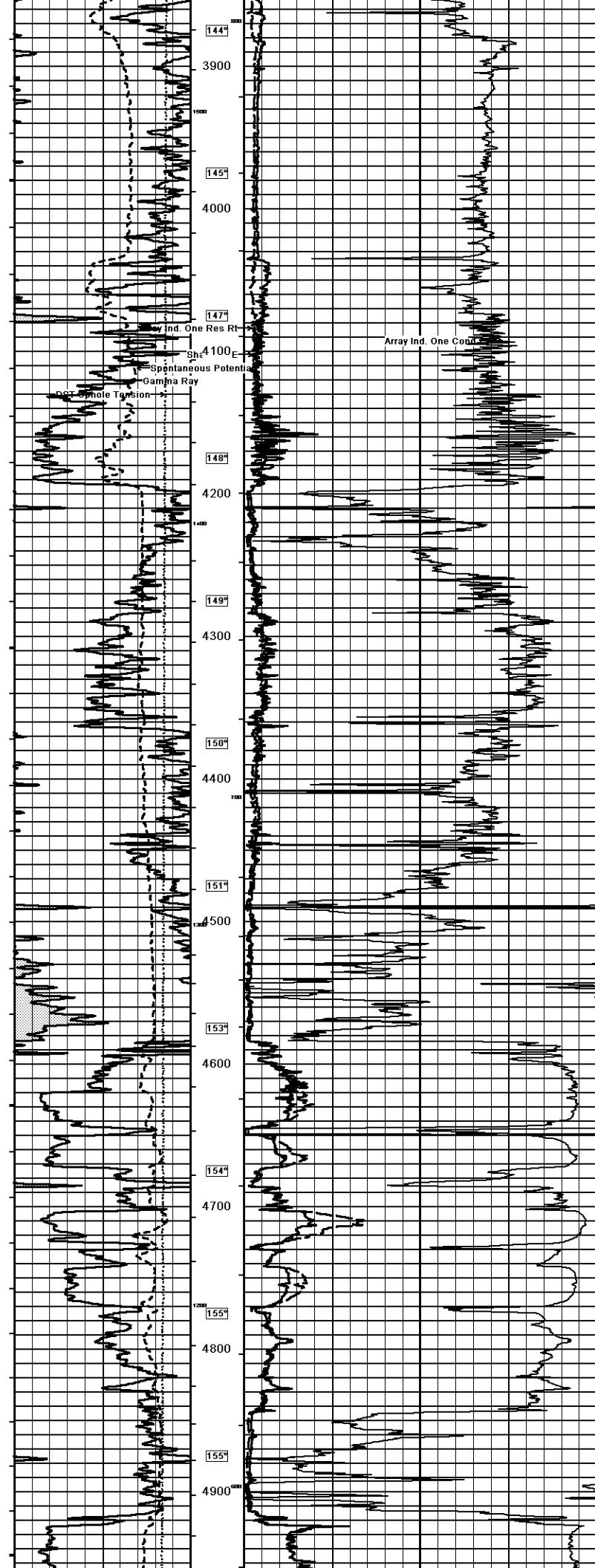
| Weatherford | | ARRAY INDUCTION SHALLOW FOCUSED ELECTRIC LOG | |
|--------------------------------|------------------------------|--|------------------|
| COMPANY | GRAND MESA OPERATING COMPANY | | |
| WELL | BUZZ'S BOAT #14 | | |
| FIELD | WILDCAT | | |
| PROVINCE/COUNTY | WASHINGTON | | |
| COUNTRY/STATE | U.S.A. / COLORADO | | |
| LOCATION | 6201 ESL & 22621 EWL | | |
| SEC. 24 | TWP. 5S | RGE. 54W | TOWNSHIP/SECTION |
| Latitude | 46.12111053 | Longitude | 120.00000000 |
| Log Number | 05-121-11053 | | |
| Permanent Datum G.L. Elevation | 5152 feet | | |
| Log Measured From | KB @ 19 FEET | | |
| Drilling Measured From | KB @ 19 FEET | | |
| Date | 09-NOV-2016 | | |
| Run Number | ONE | | |
| Service Order | 4559-16592107 | | |
| Depth Driller | 8254.00 | feet | |
| Depth Logger | 8360.00 | feet | |
| First Reading | 8257.00 | feet | |
| Last Reading | 327.00 | feet | |
| Casing Driller | 330.00 | feet | |
| Casing Logger | 327.00 | feet | |
| Bit Size | 7.875 | inches | |
| Hole Fluid Type | CHEMICAL | | |
| Density/Viscosity | 9.30 lb/50 | 74.00 CP | |
| PH/Fluid Loss | 10.00 | 7.20 m3/30min | |
| Sample Source | FLOWLINE | | |
| Rm @ Measured Temp | 1.19 @ 75.0 | ohm-m | |
| Rm @ Measured Temp | 0.95 @ 75.0 | ohm-m | |
| Rm @ Measured Temp | 1.43 @ 75.0 | ohm-m | |
| Source Rm / Rmc | CALC | CALC | |
| Rm @ BHT | 0.47 @ 91.0 | ohm-m | |
| Time Since Circulation | 5 HOURS | | |
| Max Recorded Temp | 191.00 | deg F | |
| Equipment / Base | 13006 | OKC | |
| Recorded By | ADAM SILL | | |
| Witnessed By | KENT MATSON | | |

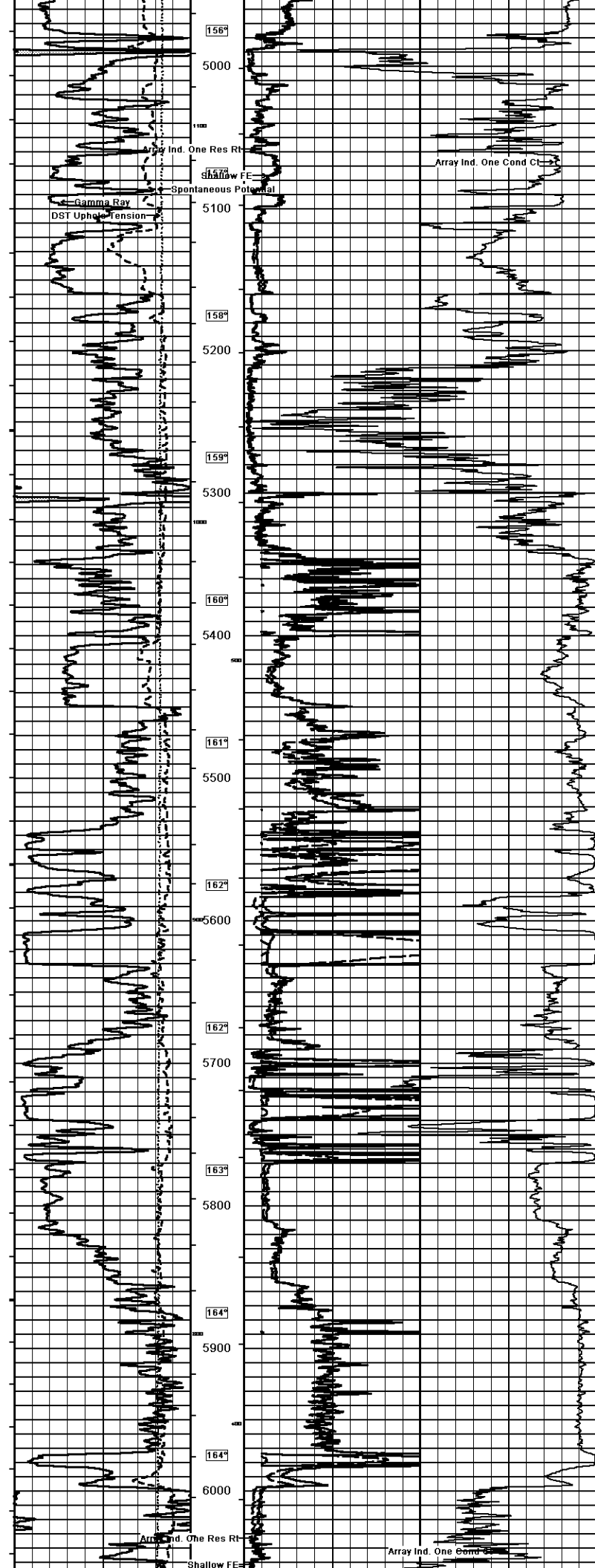


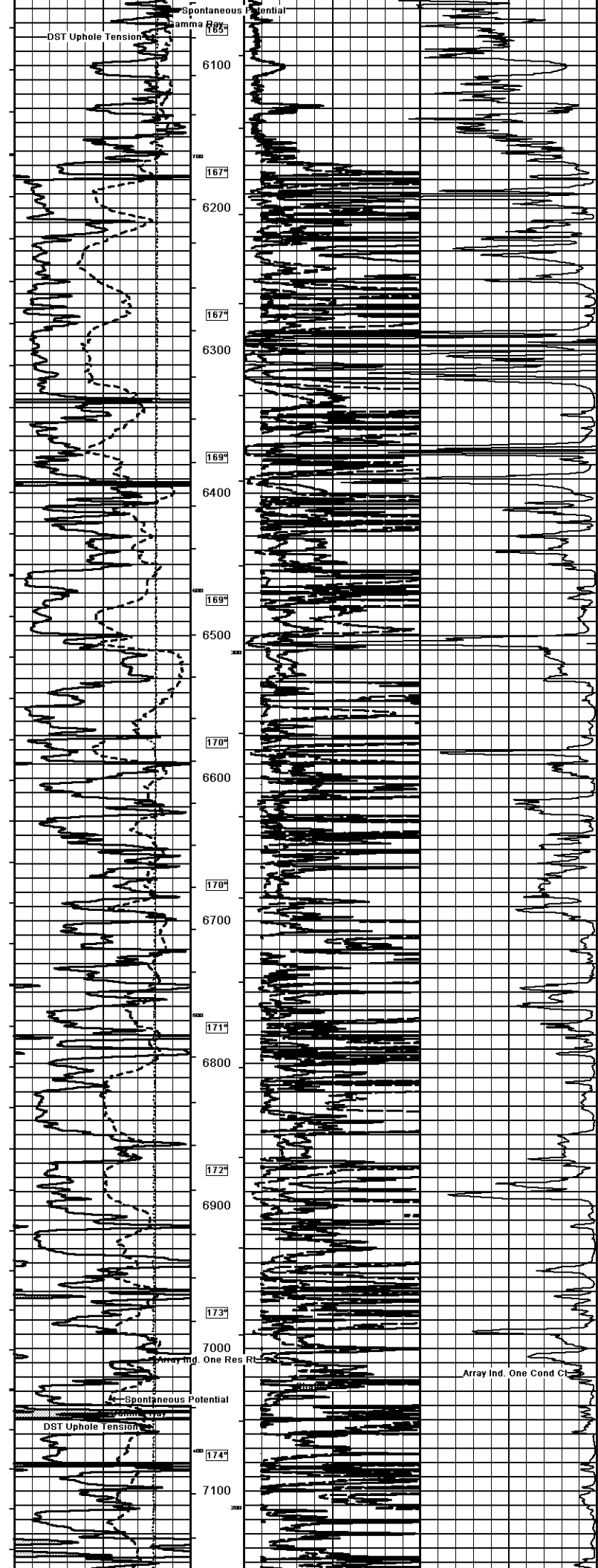


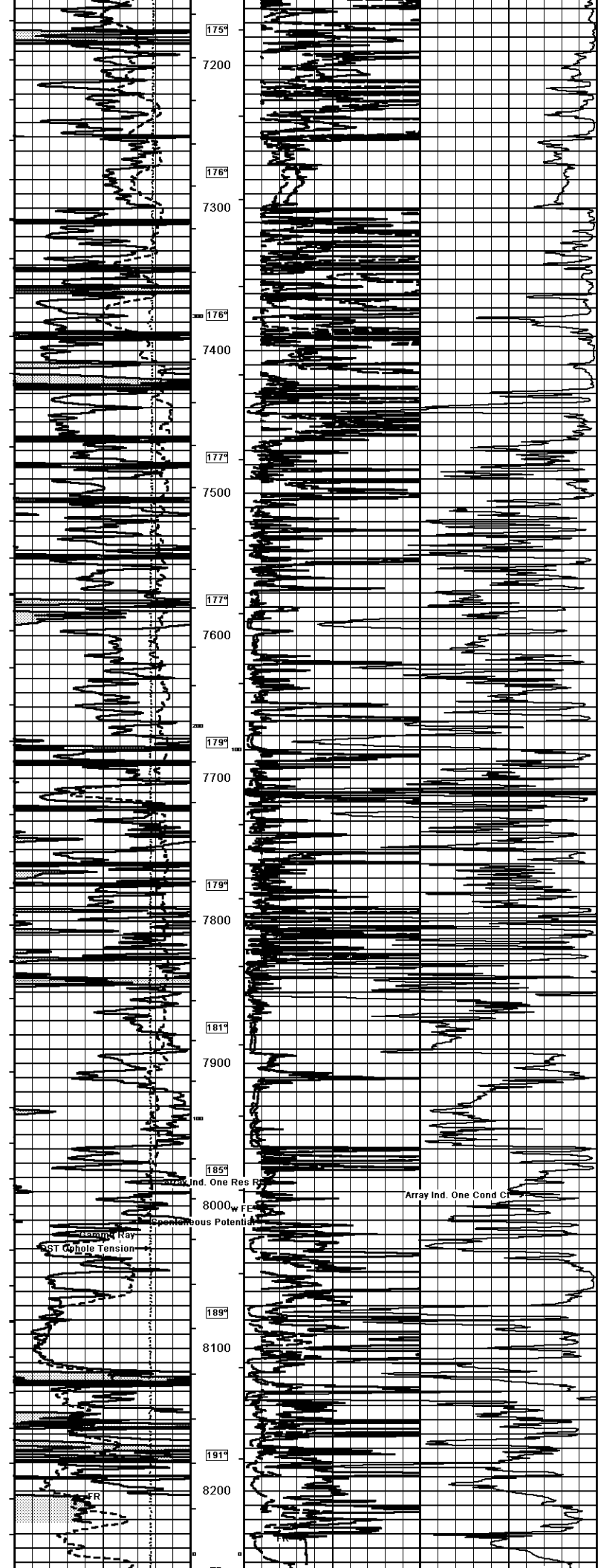


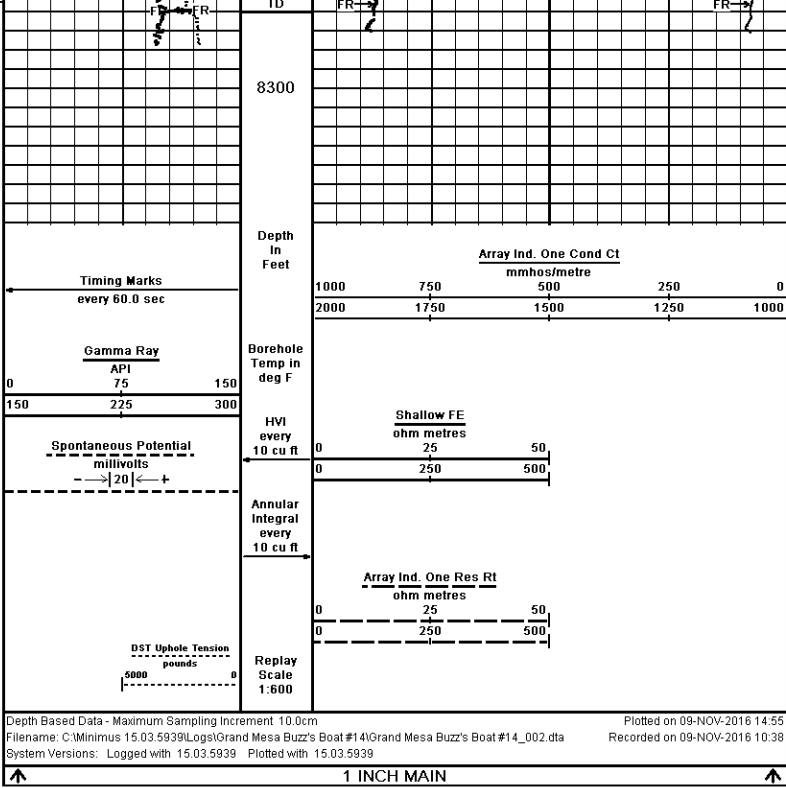













| | | | | | |
|--|---------|------------------------------|---------------|---------|------|
| COMPANY | | GRAND MESA OPERATING COMPANY | | | |
| WELL | | BUZZ'S BOAT #14 | | | |
| FIELD | | WILDCAT | | | |
| PROVINCE/COUNTY | | WASHINGTON | | | |
| COUNTRY/STATE | | U.S.A. / COLORADO | | | |
| Elevation Kelly Bushing | 5171.00 | feet | First Reading | 8257.00 | feet |
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| Elevation Ground Level | 5152.00 | feet | Depth Logger | 8260.00 | feet |
|  | | ARRAY INDUCTION | | | |
| Weatherford | | SHALLOW FOCUSED | | | |
| | | ELECTRIC LOG | | | |