



Weatherford[®]

ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG

COMPANY			O'BRIEN ENERGY RESOURCES CORP.		
WELL			COLTON #1-33		
FIELD			NOVINGER		
PROVINCE/COUNTY			MEADE		
COUNTRY/STATE			U.S.A. / KANSAS		
LOCATION			1887' FSL & 1887' FEL		
SEC	TWP	RGE	Other Services		MML
33	33S	30W	MPD/MDN		
API Number			15-119-21345		
Permit Number					
Permanent Datum GL, Elevation 2701 feet					
Log Measured From KB					
Drilling Measured From KB					
Date	05-AUG-2013				
Run Number	ONE				
Service Order	3539956				
Depth Driller	6400.00		feet		
Depth Logger	6398.00		feet		
First Reading	6395.00		feet		
Last Reading	1499.00		feet		
Casing Driller	1500.00		feet		
Casing Logger	1499.00		feet		
Bit Size	7.875		inches		
Hole Fluid Type	CHEMICAL				
Density / Viscosity	9.15 lb/USg		52.00 CP		
PH / Fluid Loss	9.50		8.40 ml/30Min		
Sample Source	MUDPIT				
Rm @ Measured Temp	0.93 @103.0		ohm-m		
Rmf @ Measured Temp	0.74 @103.0		ohm-m		
Rmc @ Measured Temp	1.12 @103.0		ohm-m		
Source Rmf / Rmc	CALC	CALC			
Rm @ BHT	0.73 @132.0		ohm-m		
Time Since Circulation	5 HOURS				
Max Recorded Temp	132.00		deg F		
Equipment / Base	13096		LIB		
Recorded By	ADAM SILL				
Witnessed By	PETIER DEBENHAM		ROGER PEARSON		
JOB #	LB13-222				

BOREHOLE RECORD					Last Edited: 05-AUG-2013 09:03
Bit Size inches		Depth From feet		Depth To feet	
7.875		1500.00		6400.00	
CASING RECORD					
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft	
SURFACE	8.625	0.00	1500.00	24.00	

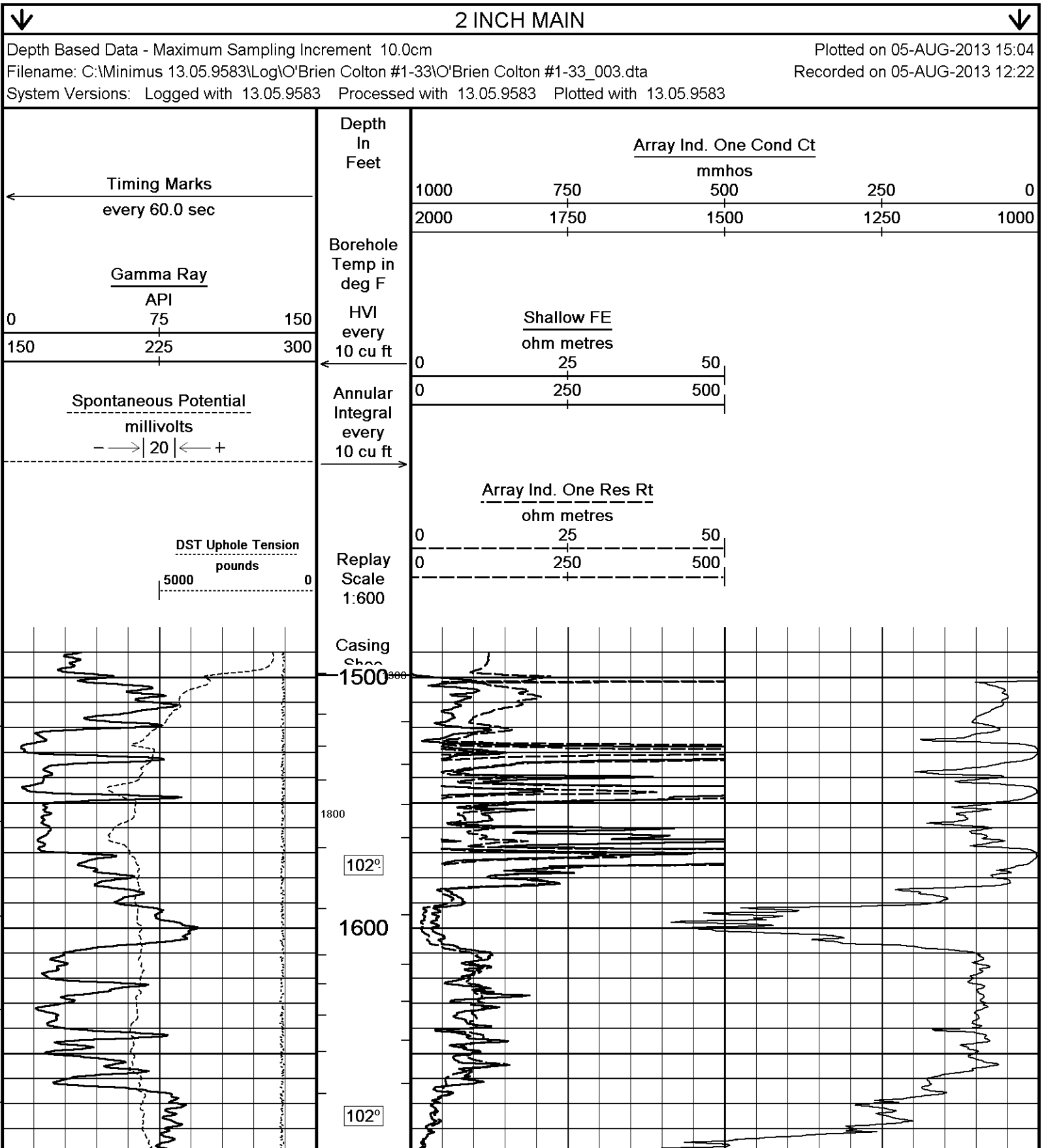
REMARKS
- SOFTWARE ISSUE: WLS 13.05.9583.
- MCG, MML, MDN, MPD, MFE, MAI RUN IN COMBINATION. - HARDWARE: DUAL BOWSPRING USED ON MDN. 0.5 INCH STANDOFF USED ON MFE. 0.5 INCH STANDOFF USED ON MAI.
- 2.71 G/CC LIMESTONE DENSITY MATRIX USED TO CALCULATE POROSITY.
- BOREHOLE RUGOSITY, TIGHT PULLS, AND WASHOUTS WILL AFFECT DATA QUALITY.
- ALL INTERVALS LOGGED AND SCALED PER CUSTOMER'S REQUEST.
- TOTAL HOLE VOLUME FROM TD TO SURFACE CASING: 1840 CU. FT.
- ANNULAR HOLE VOLUME WITH 4.5 INCH CASING FROM TD TO 4000 FEET: 560 CU. FT.
- RIG: DUKE #6

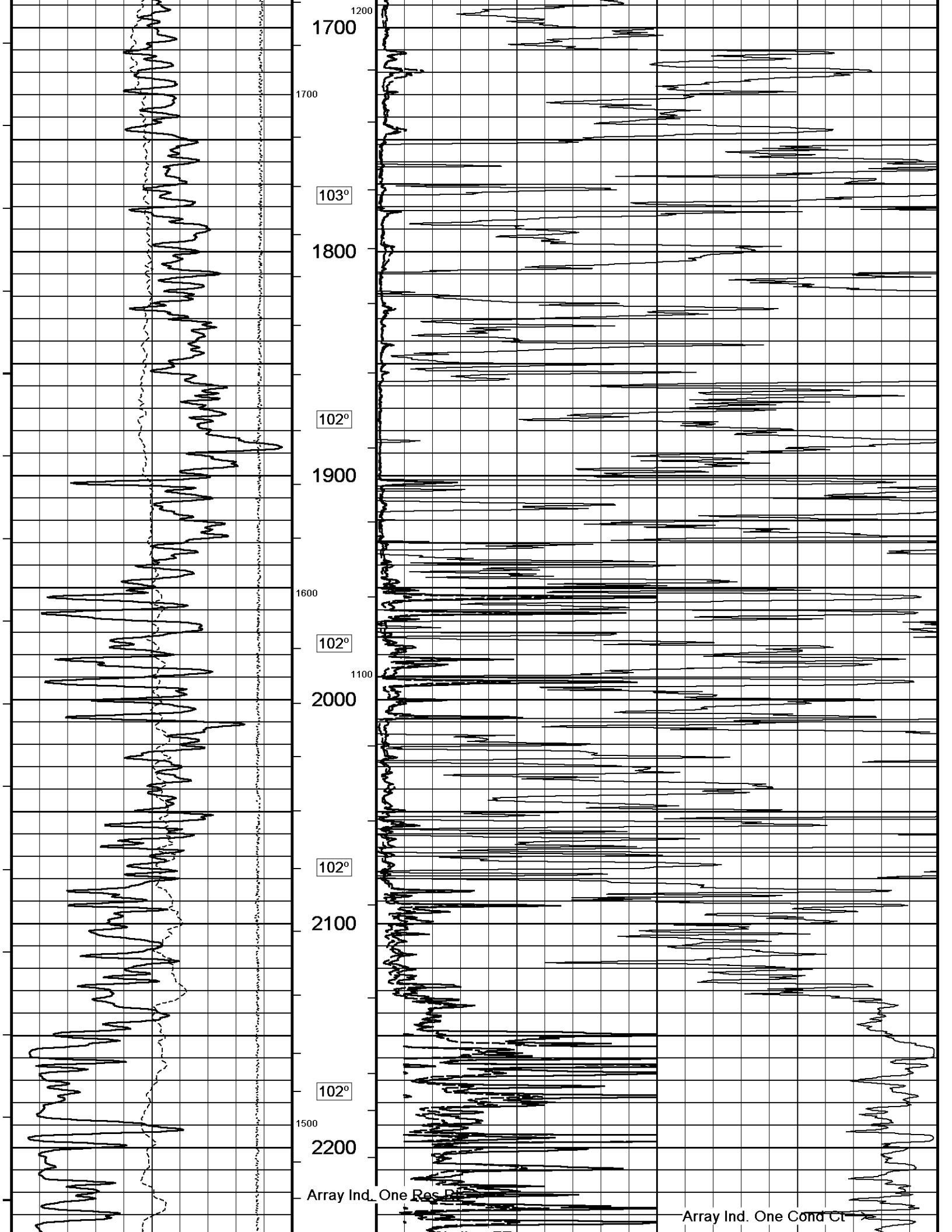
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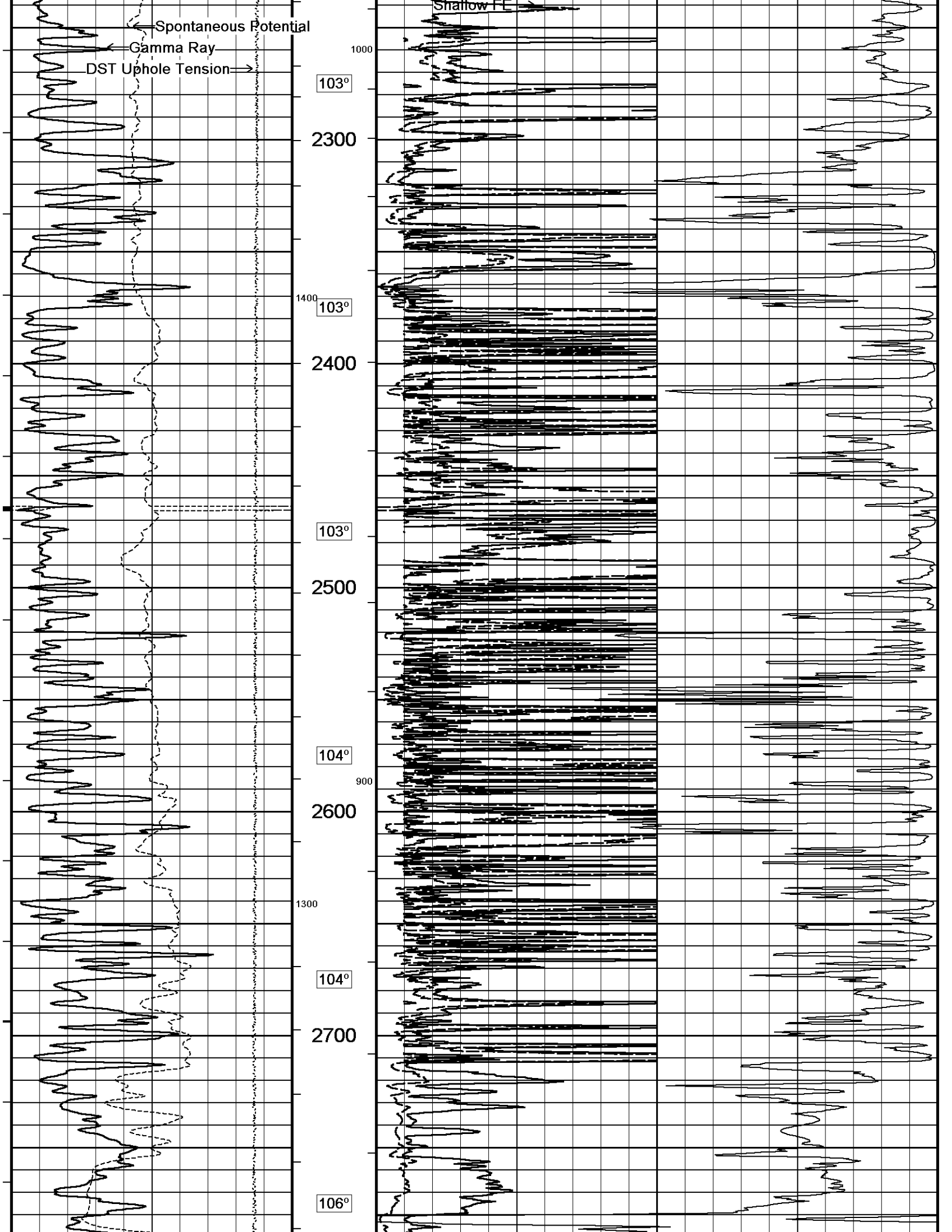
- ENGINEER: A. SILL.

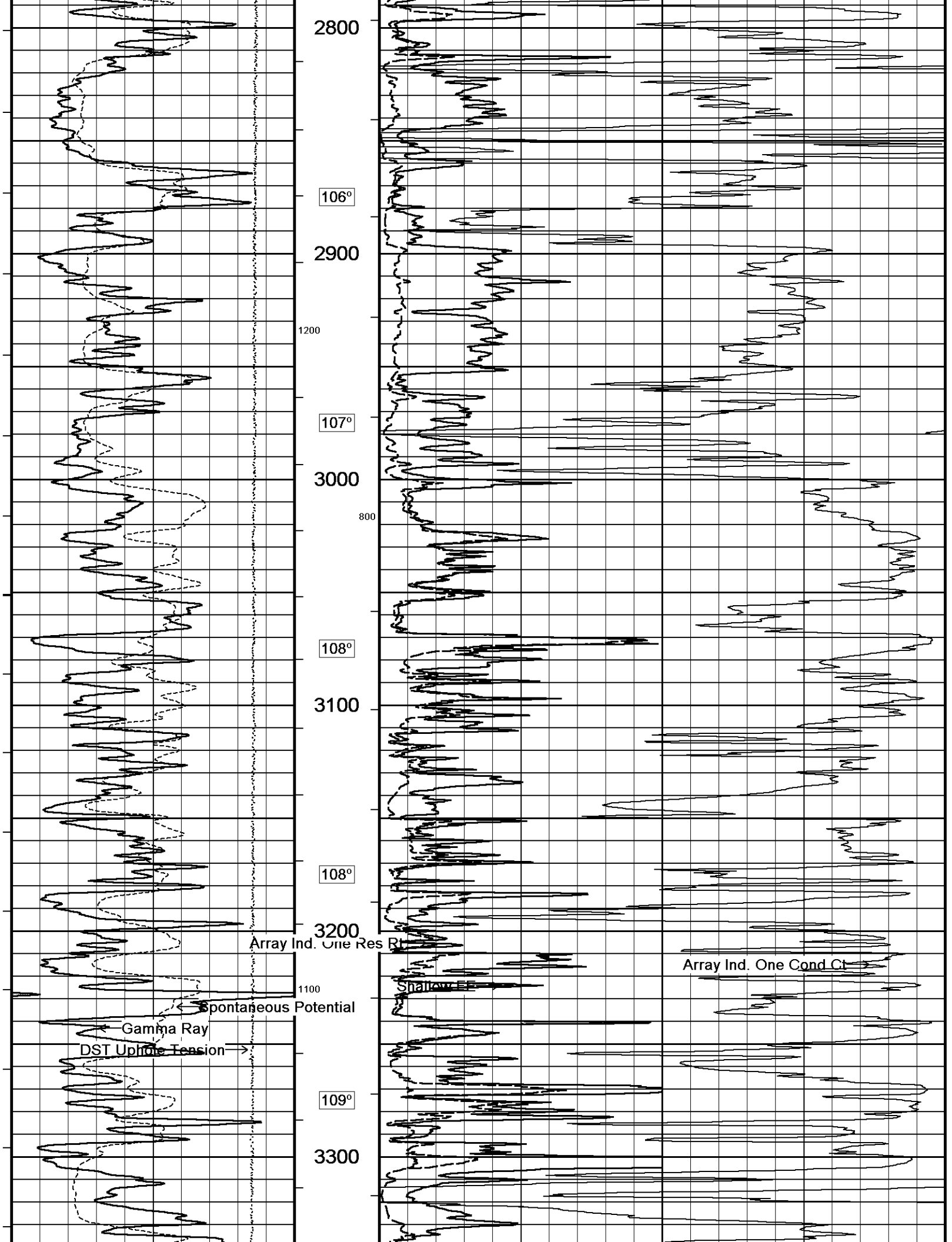
- OPERATOR(S): N. ADAME.

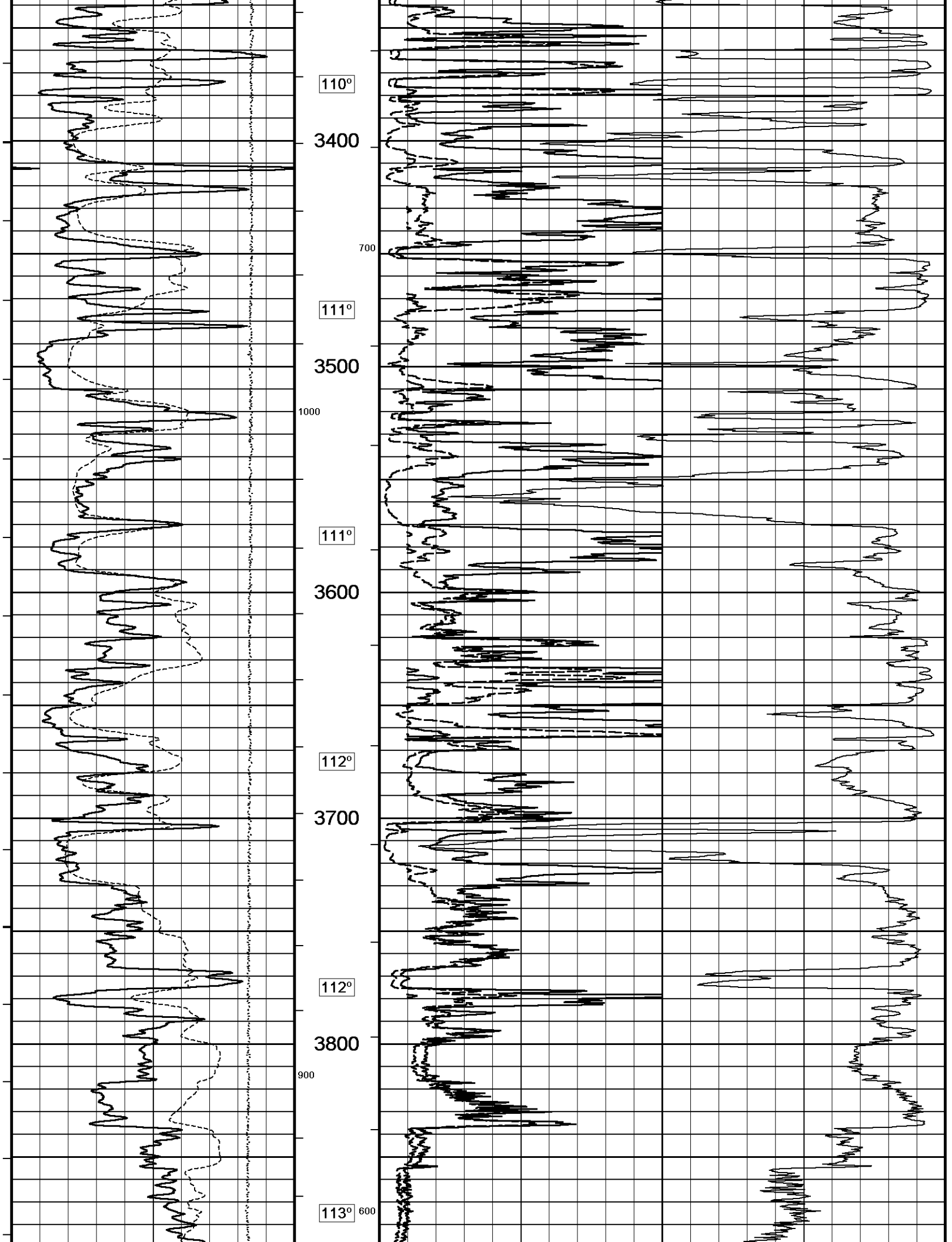
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not, guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, costs,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

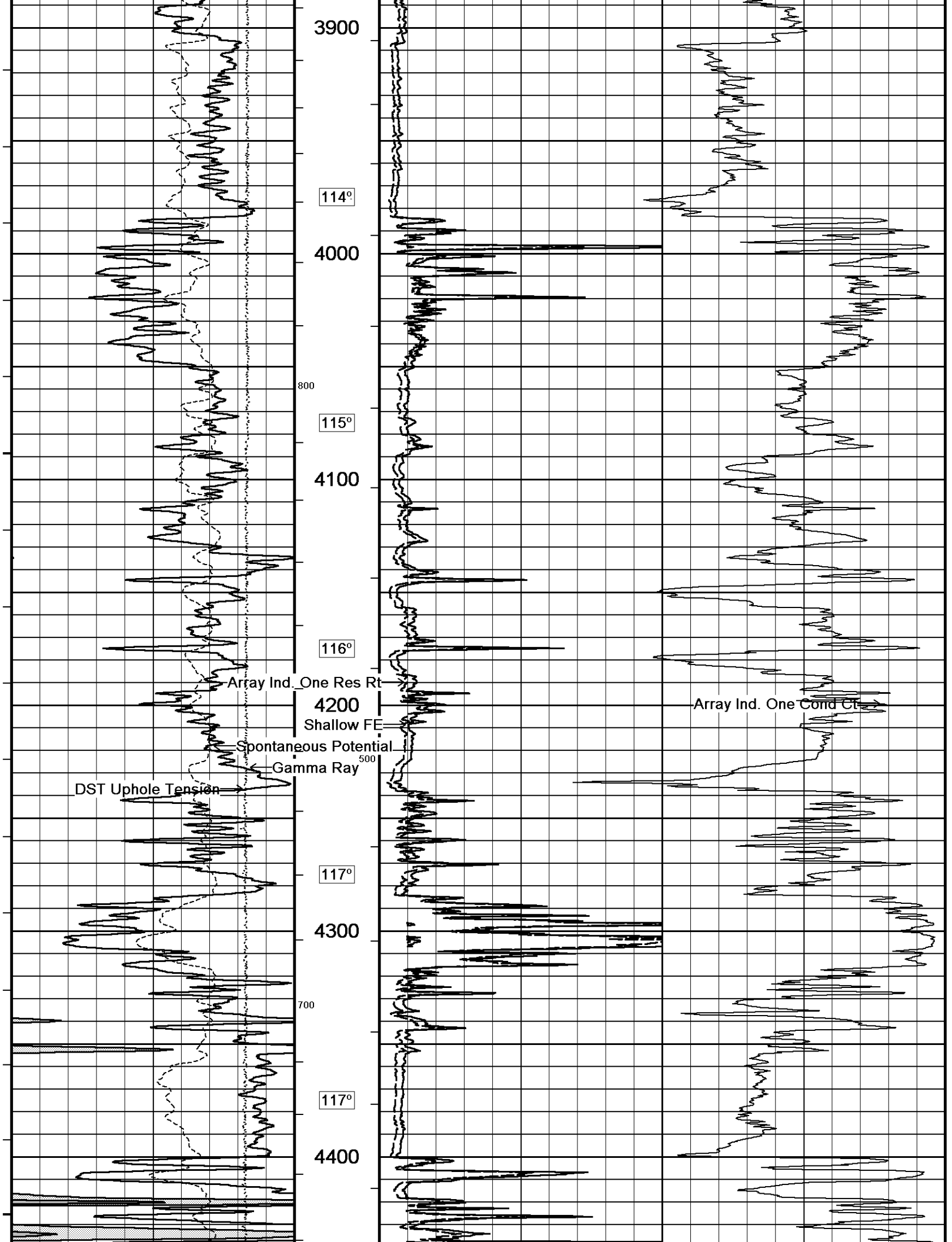


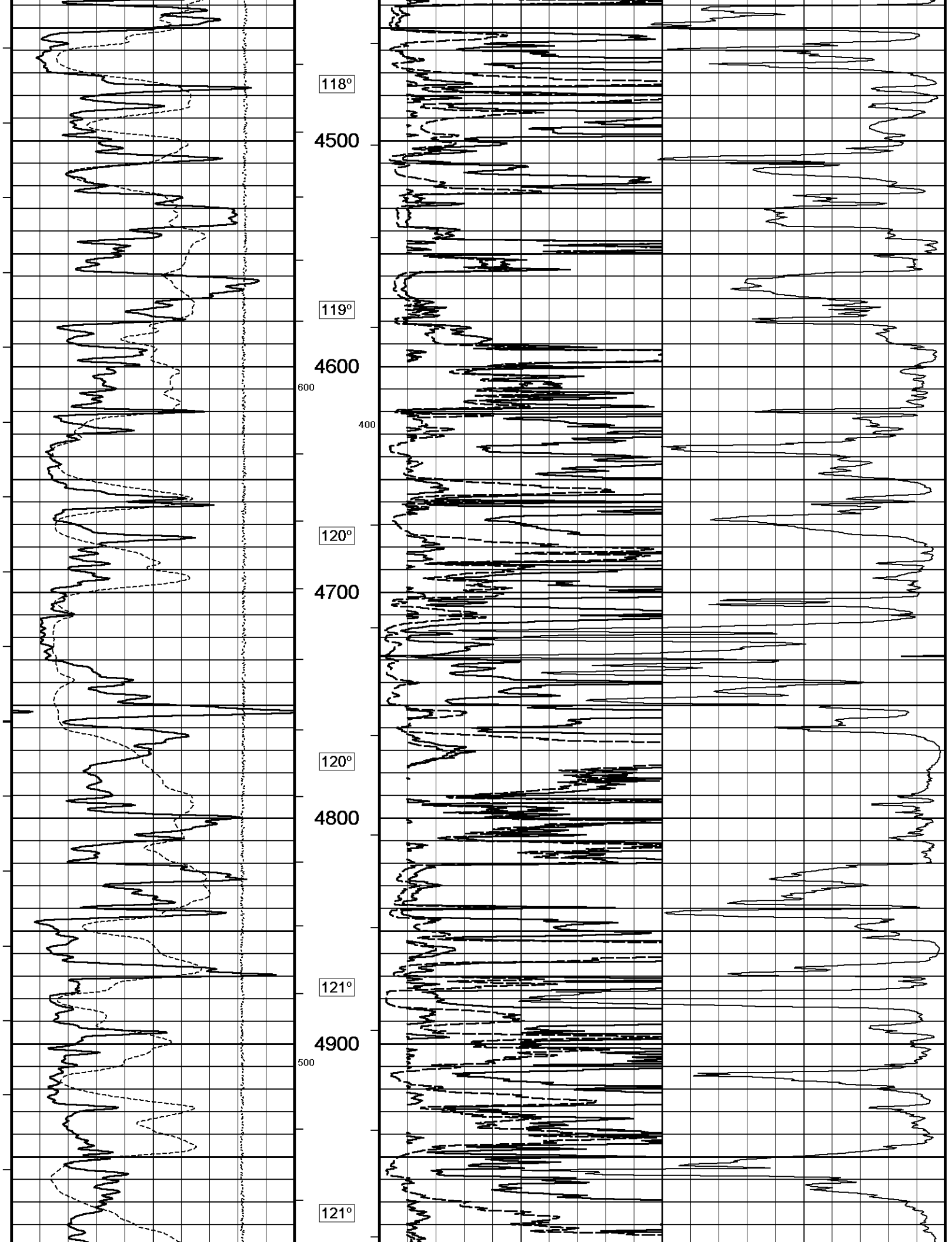


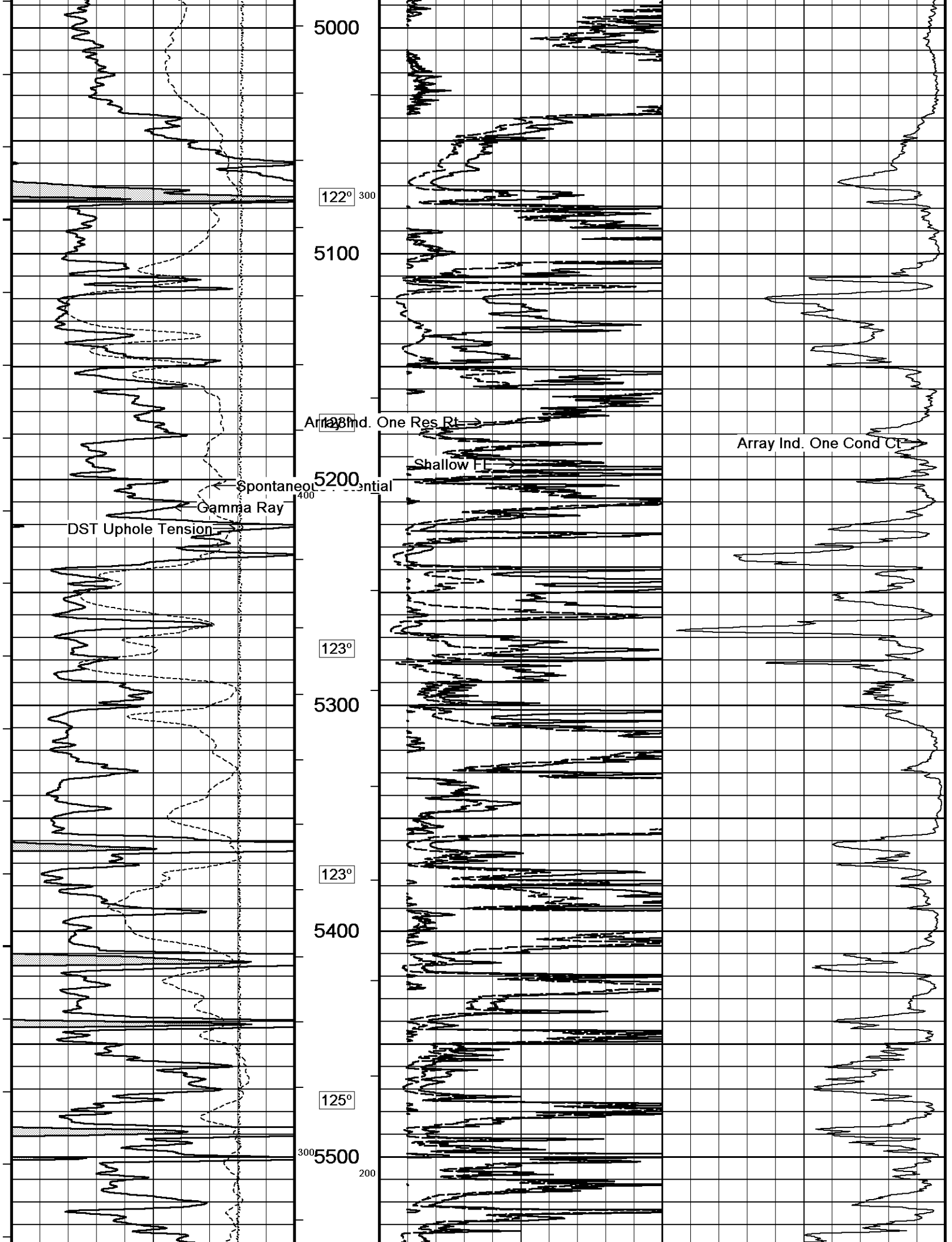


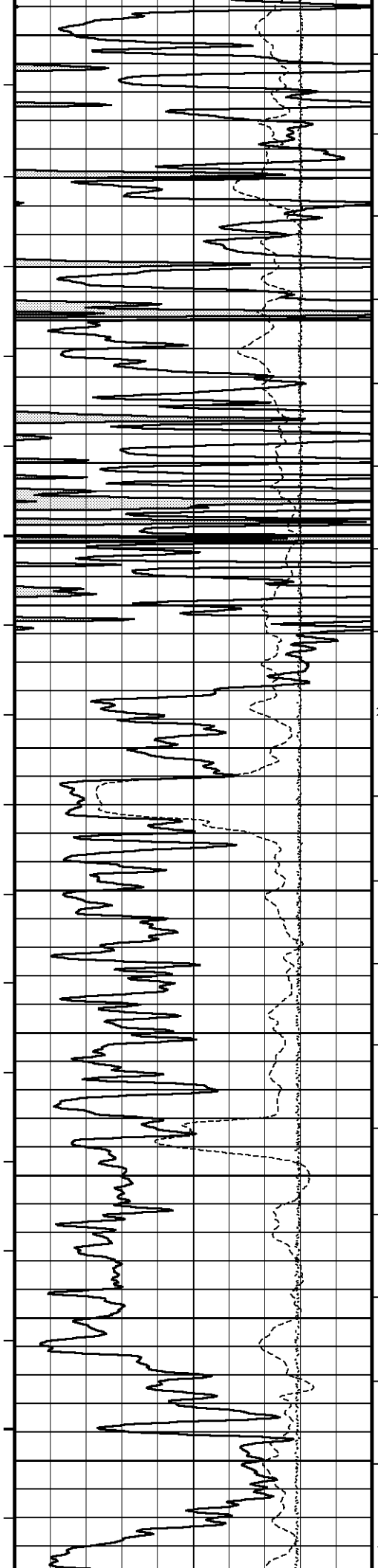




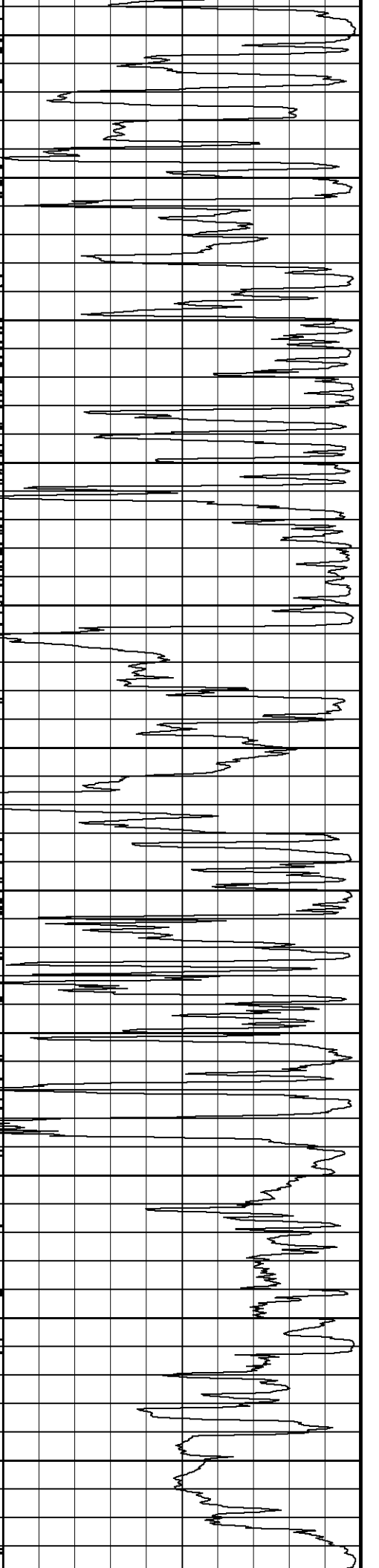
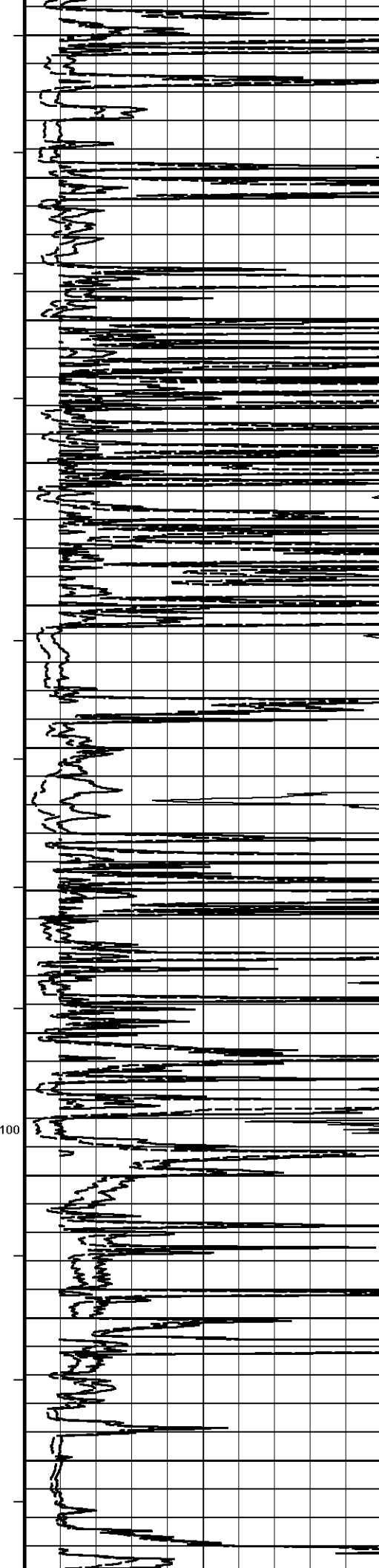


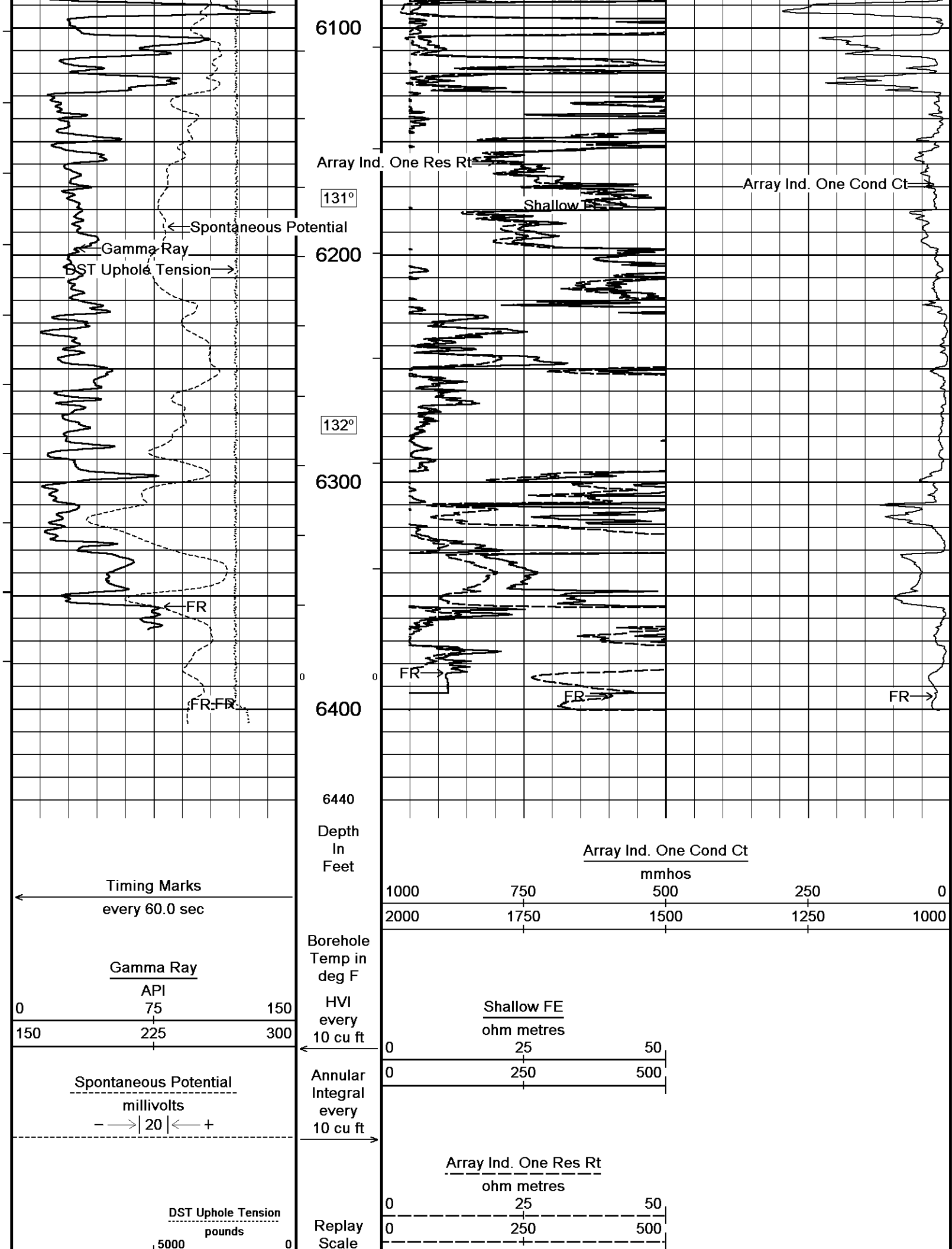






125°
5600
126°
5700
128°
200
5800
128°
5900
100
129°
6000
130°
100





1:600

Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 05-AUG-2013 15:04

Filename: C:\Minimus 13.05.9583\Log\O'Brien Colton #1-33\O'Brien Colton #1-33_003.dta

Recorded on 05-AUG-2013 12:22

System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583



2 INCH MAIN



5 INCH MAIN



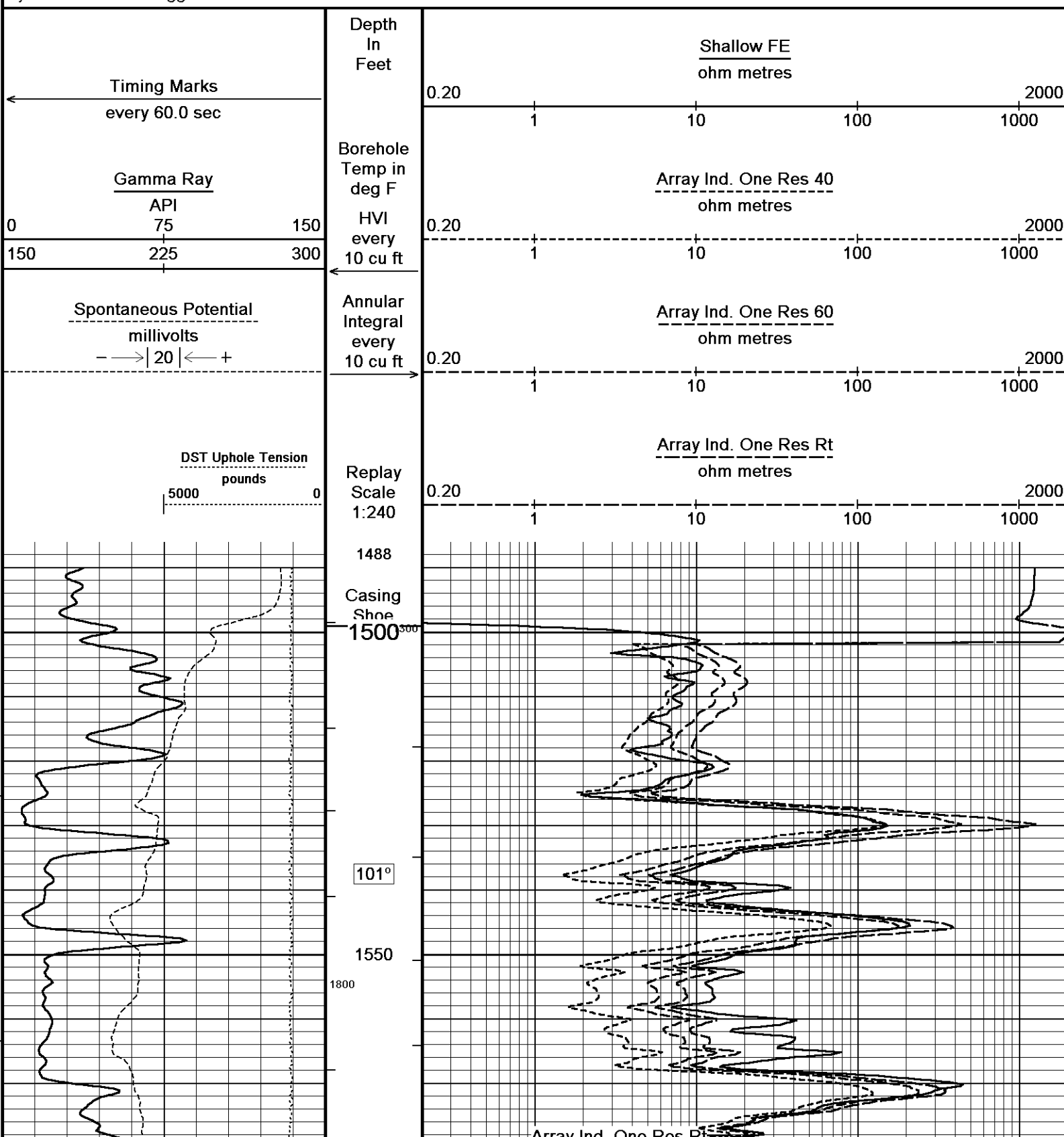
Depth Based Data - Maximum Sampling Increment 10.0cm

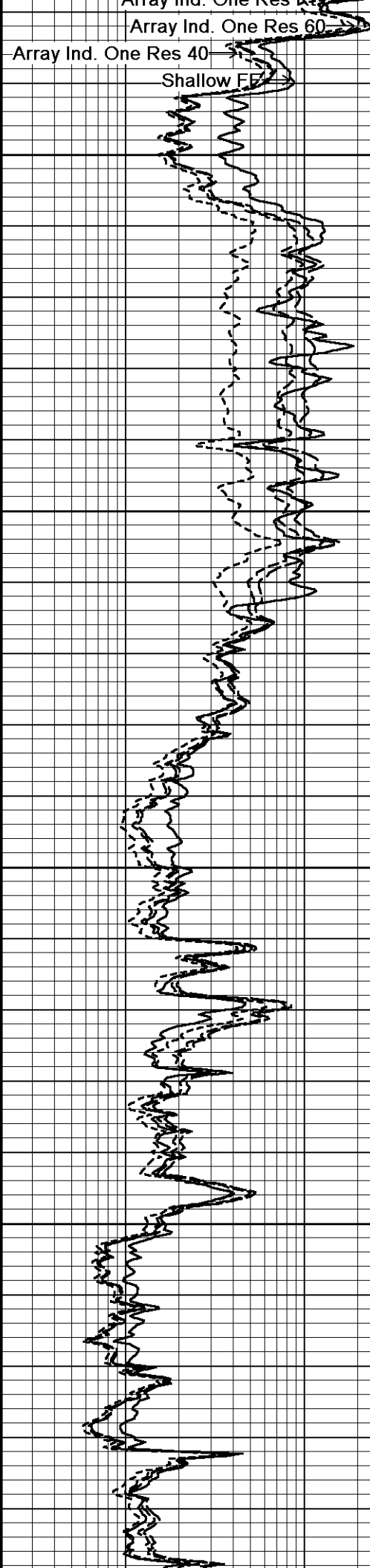
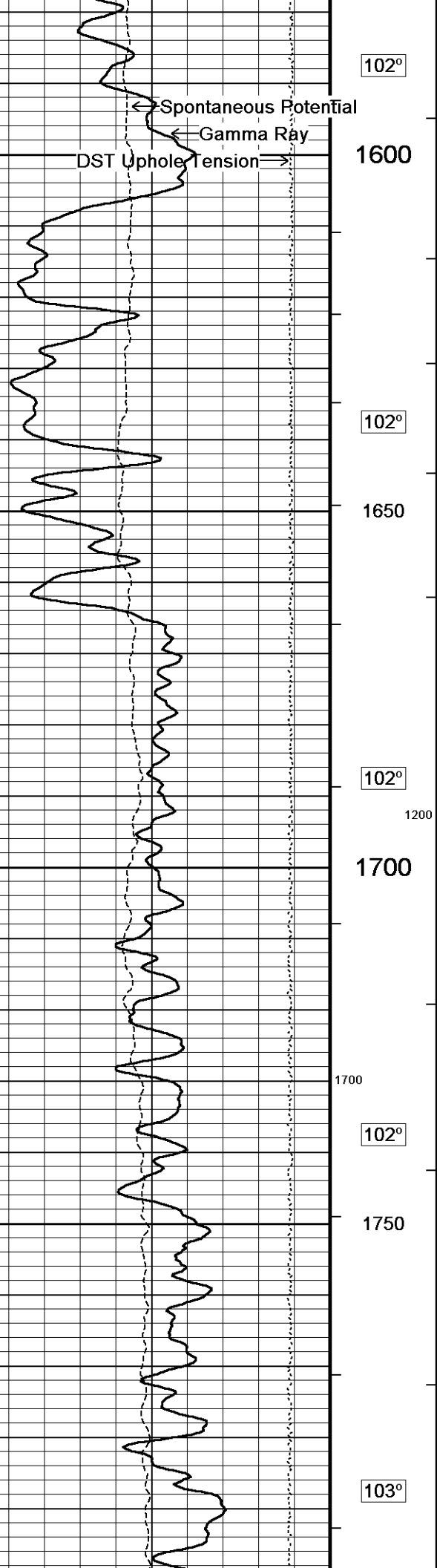
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Filename: C:\Minimus 13.05.9583\Log\O'Brien Colton #1-33\O'Brien Colton #1-33_003.dta

Recorded on 05-AUG-2013 12:22

System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583





1800

102°

1850

102°

1900

102°

1950

Array Ind. One Res Rt →

Array Ind. One Res 60 →

Array Ind. One Res 40 →

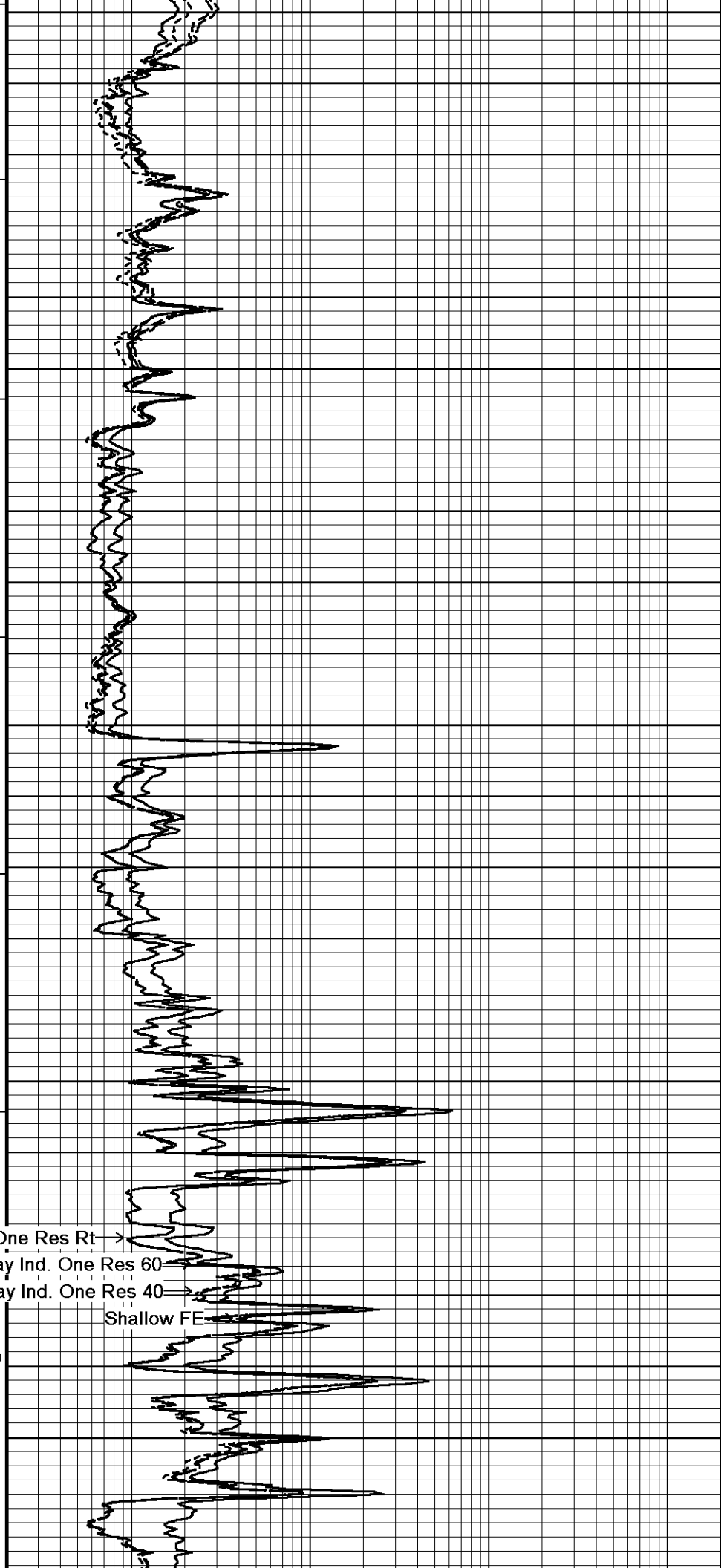
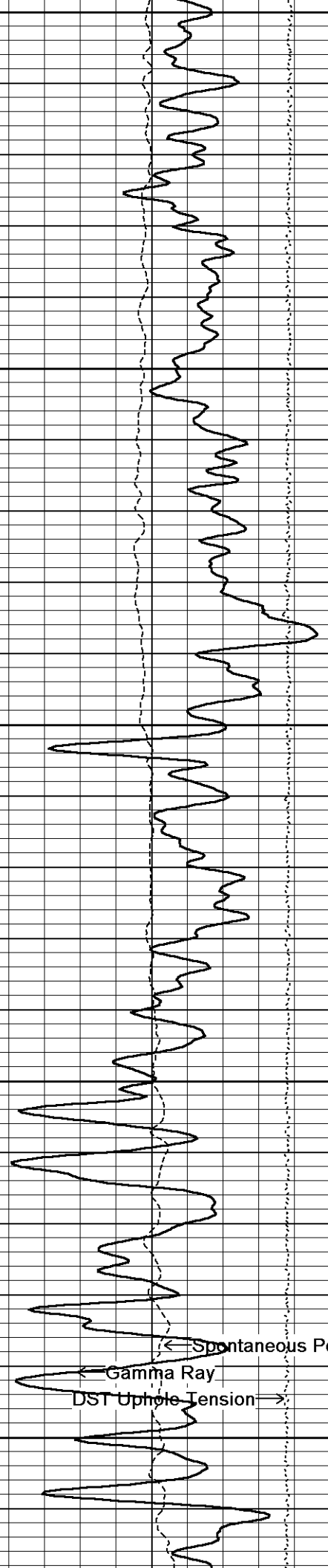
Shallow FE →

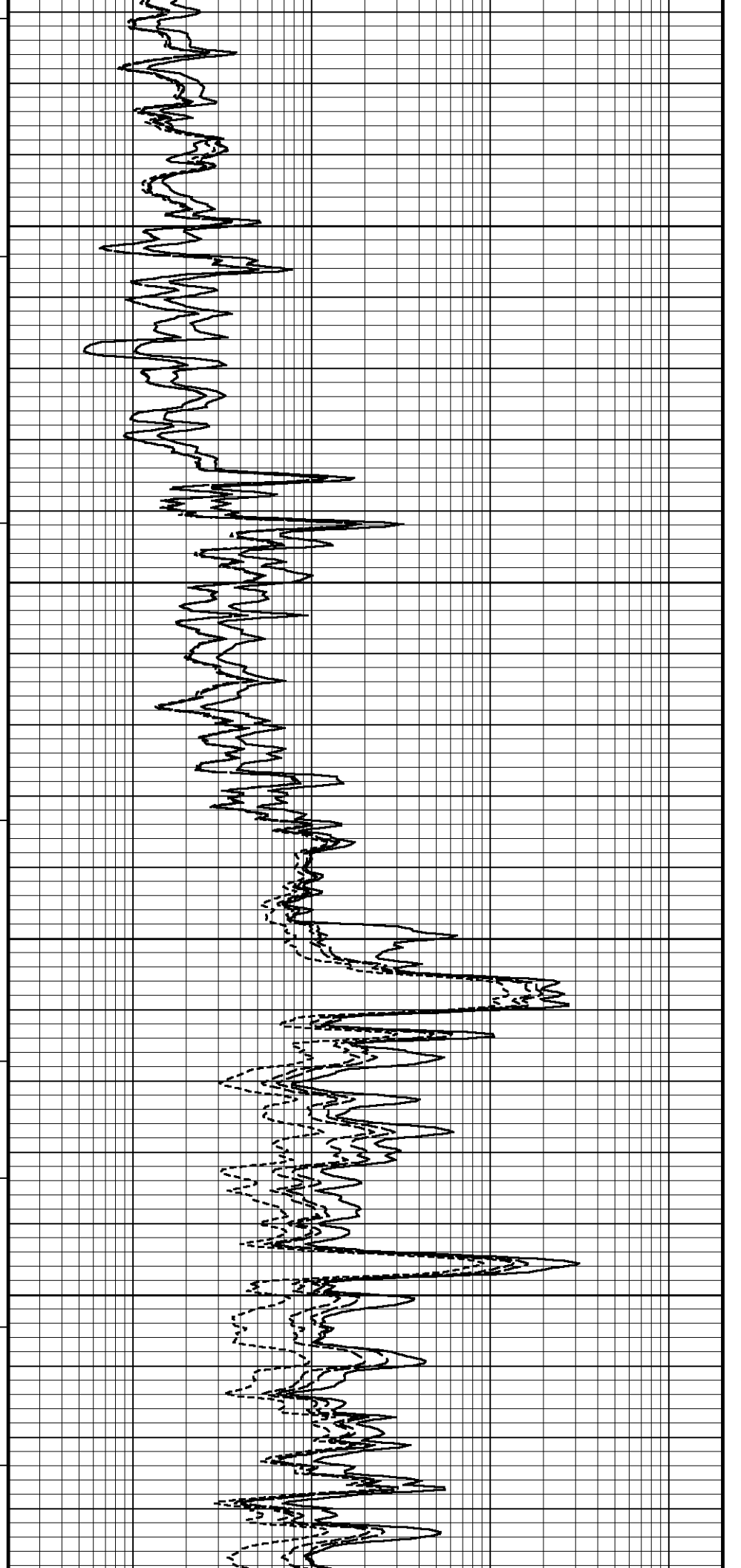
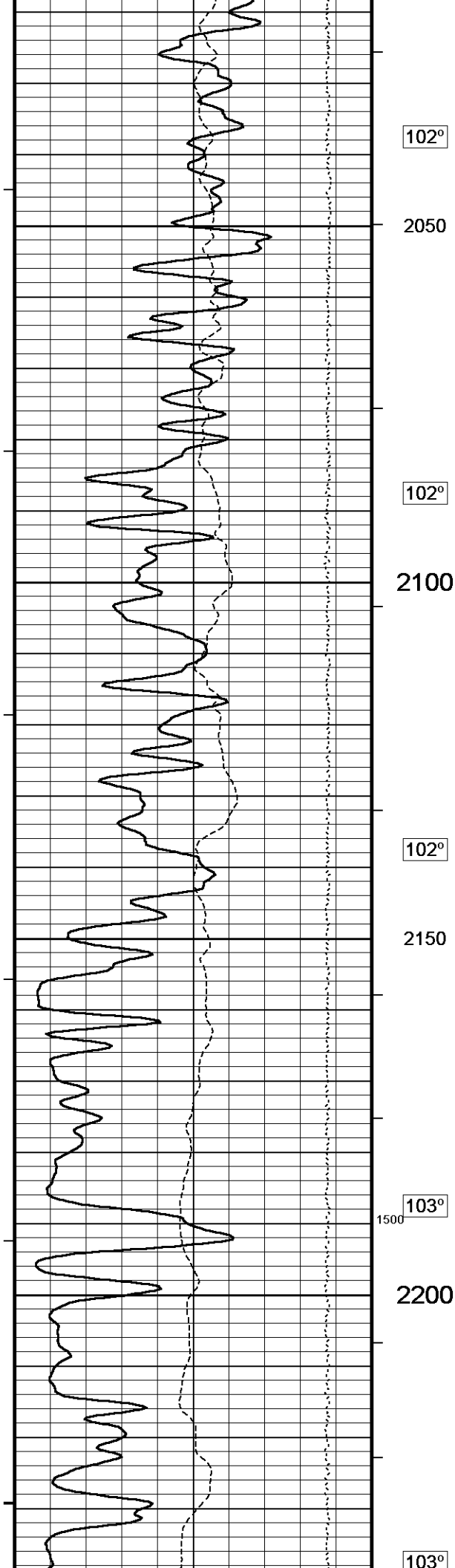
← Spontaneous Potential

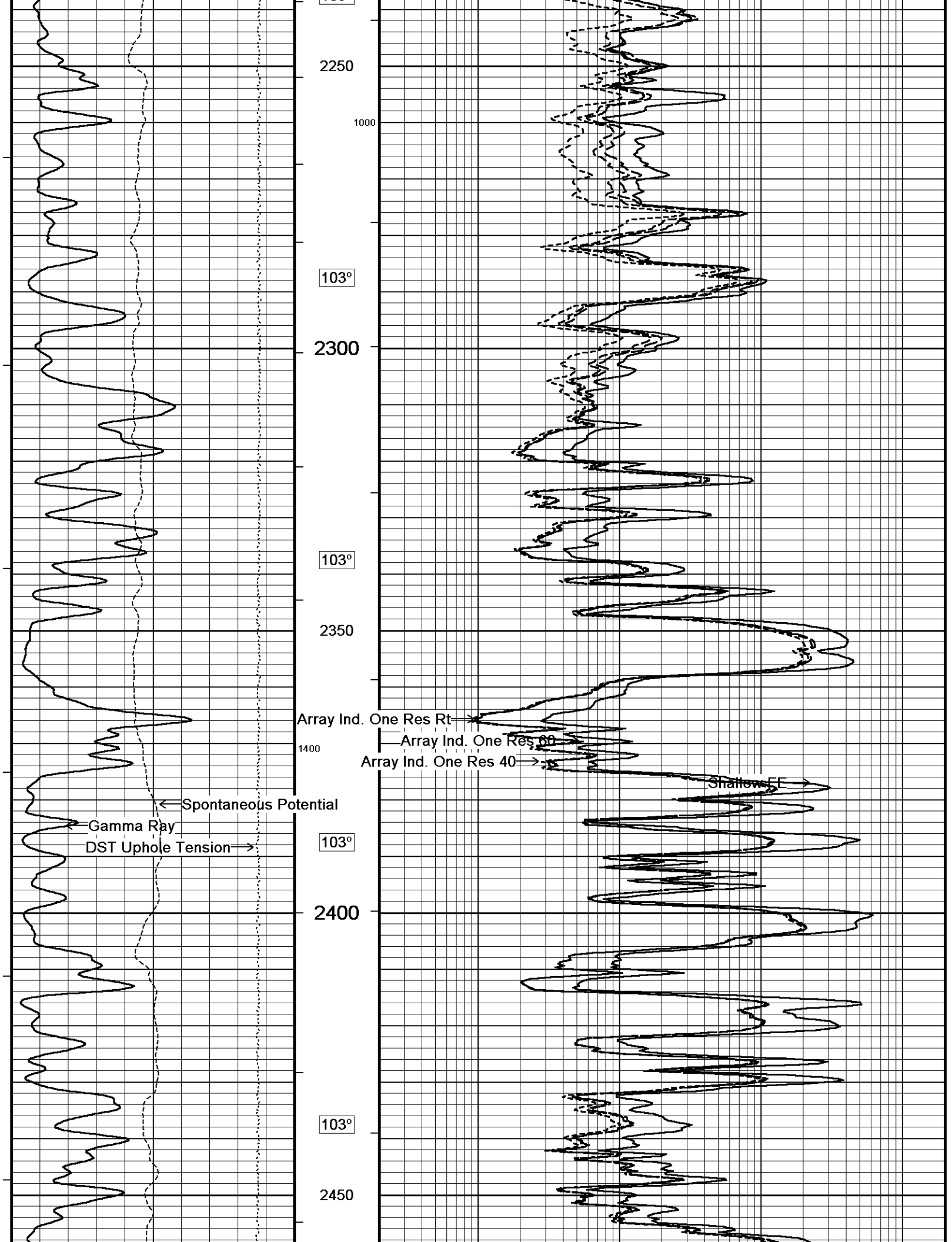
← Gamma Ray

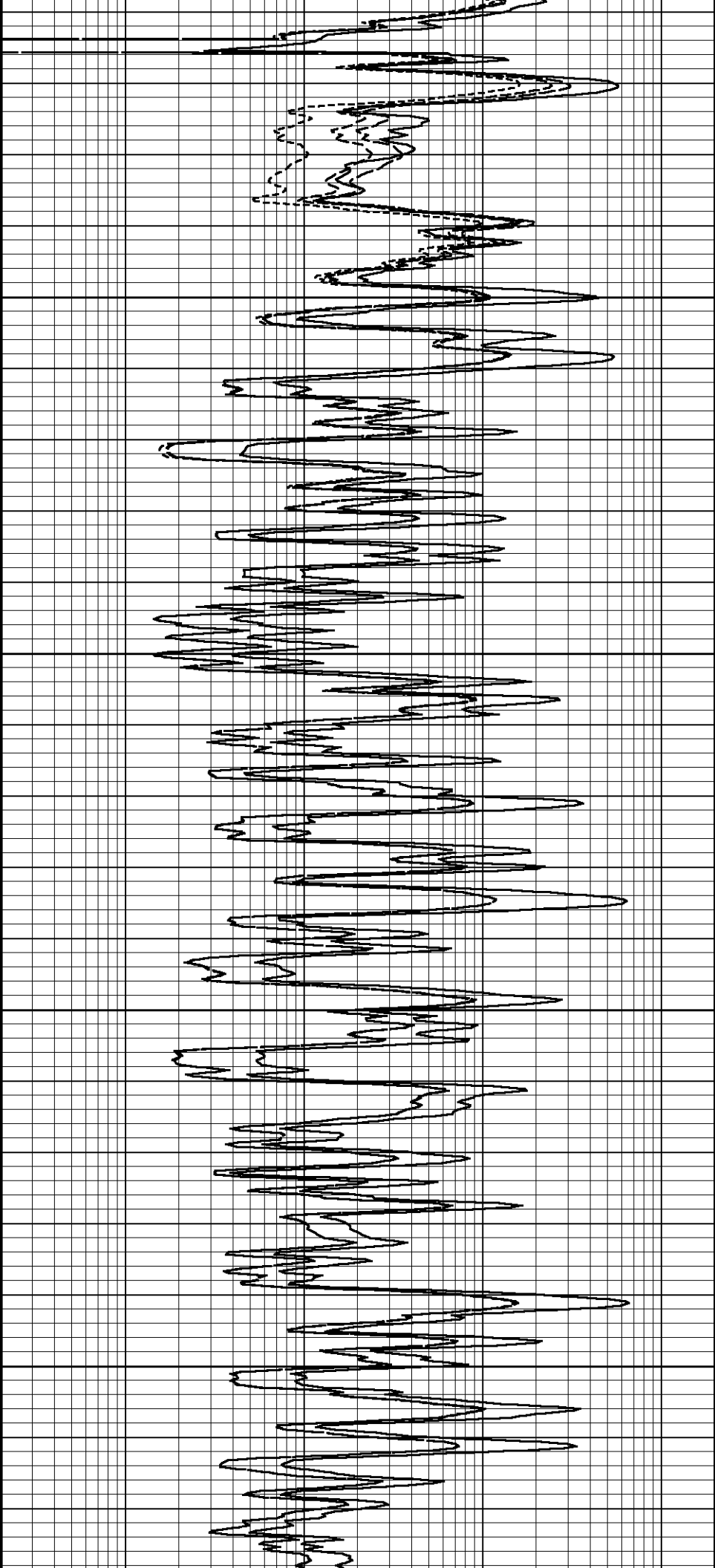
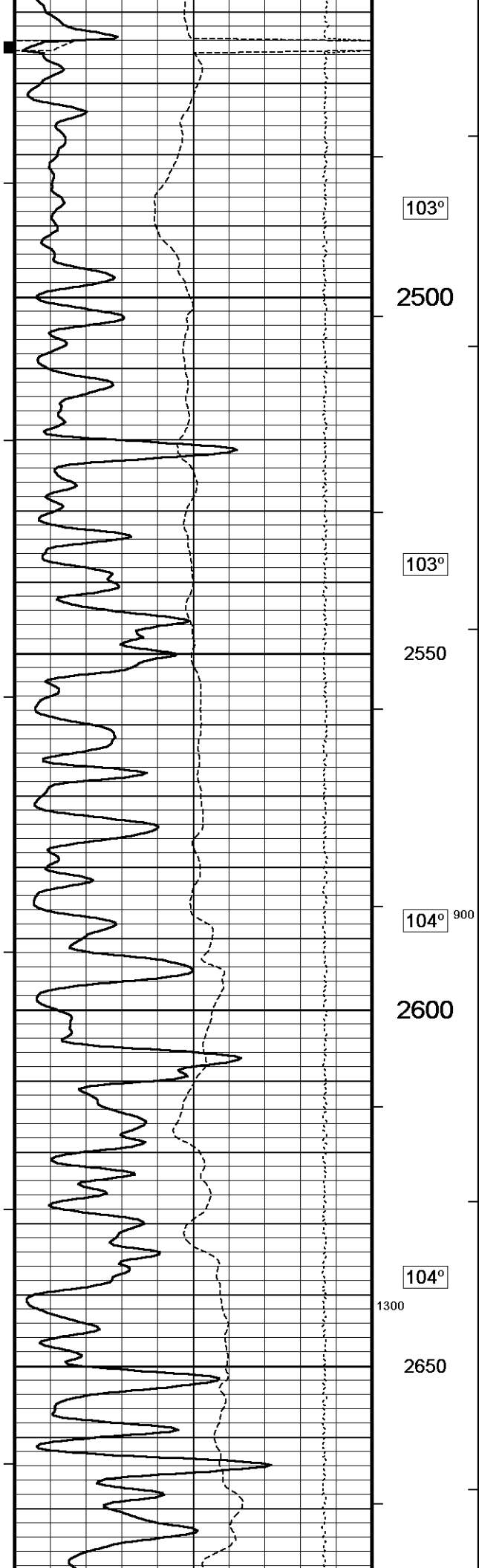
DST Uphole Tension →

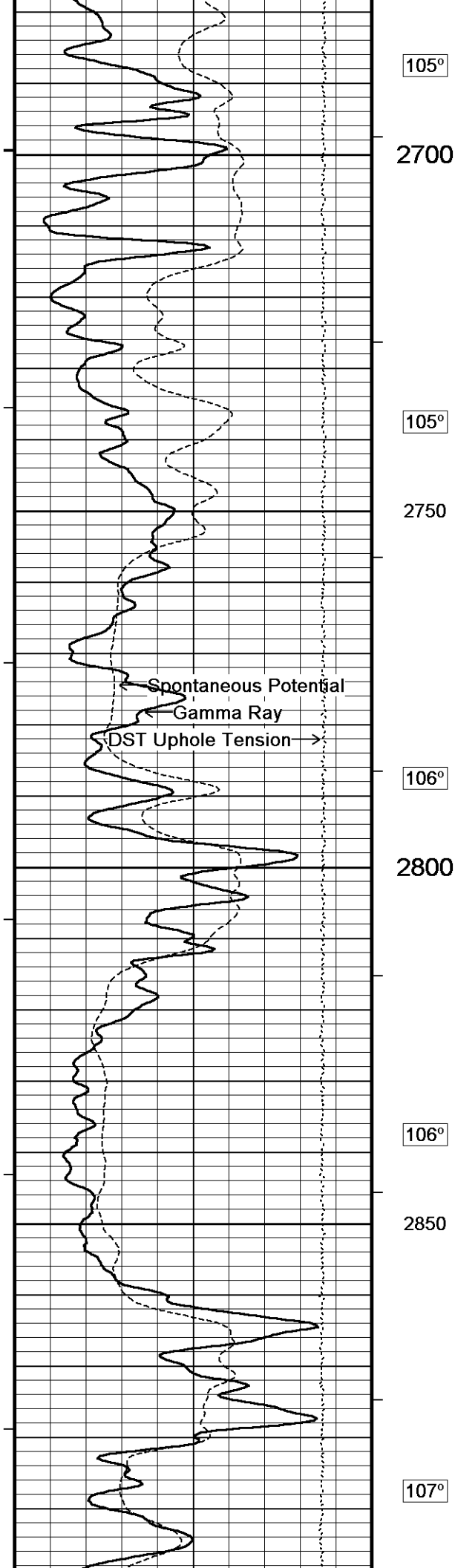
2000











105°

2700

105°

2750

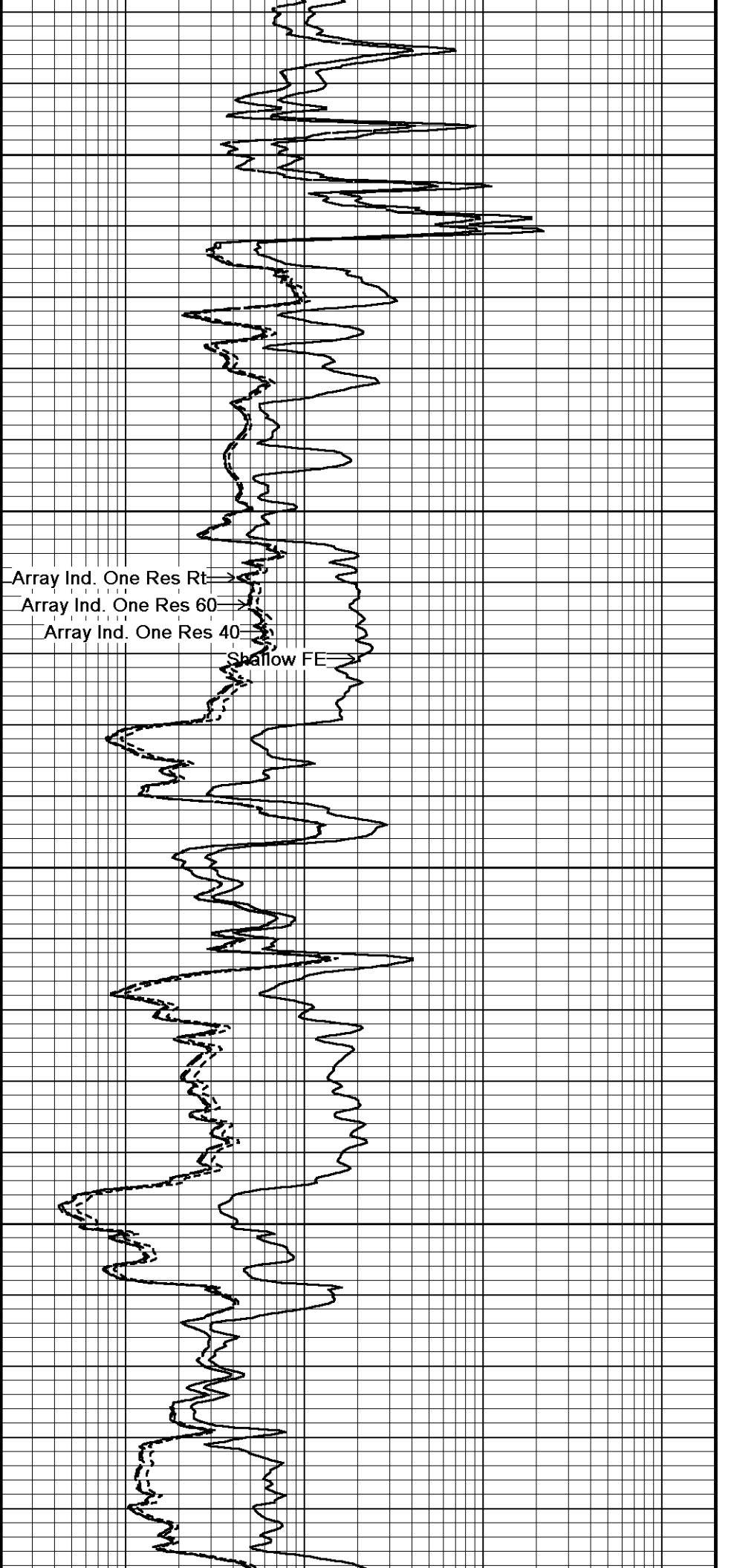
106°

2800

106°

2850

107°

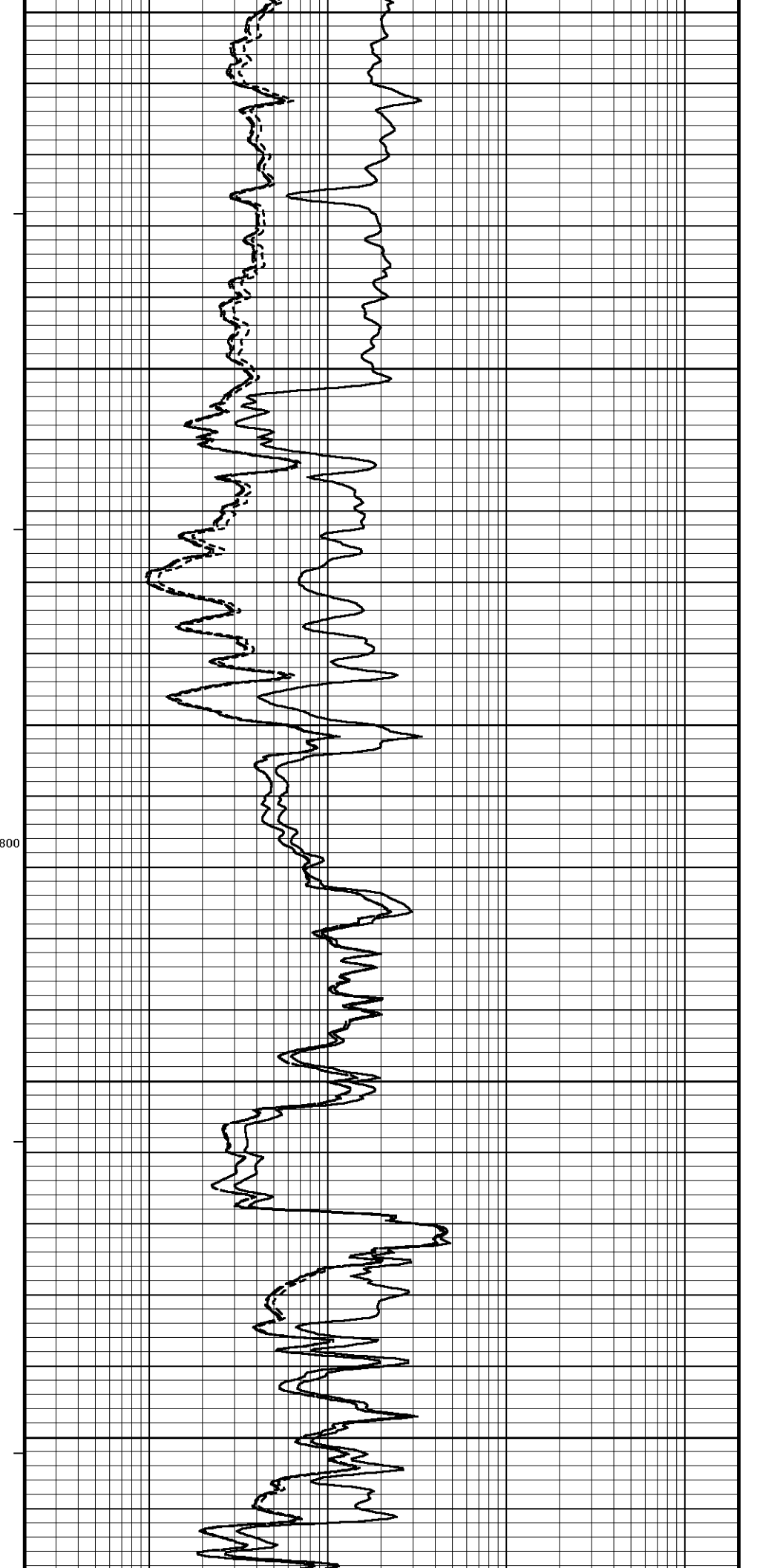
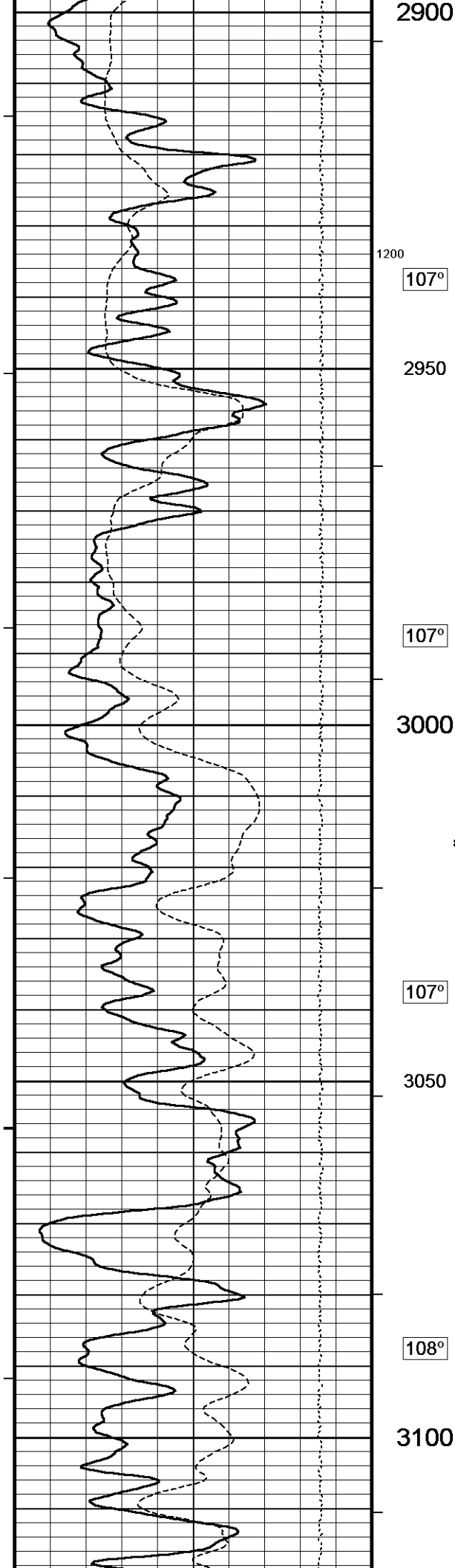


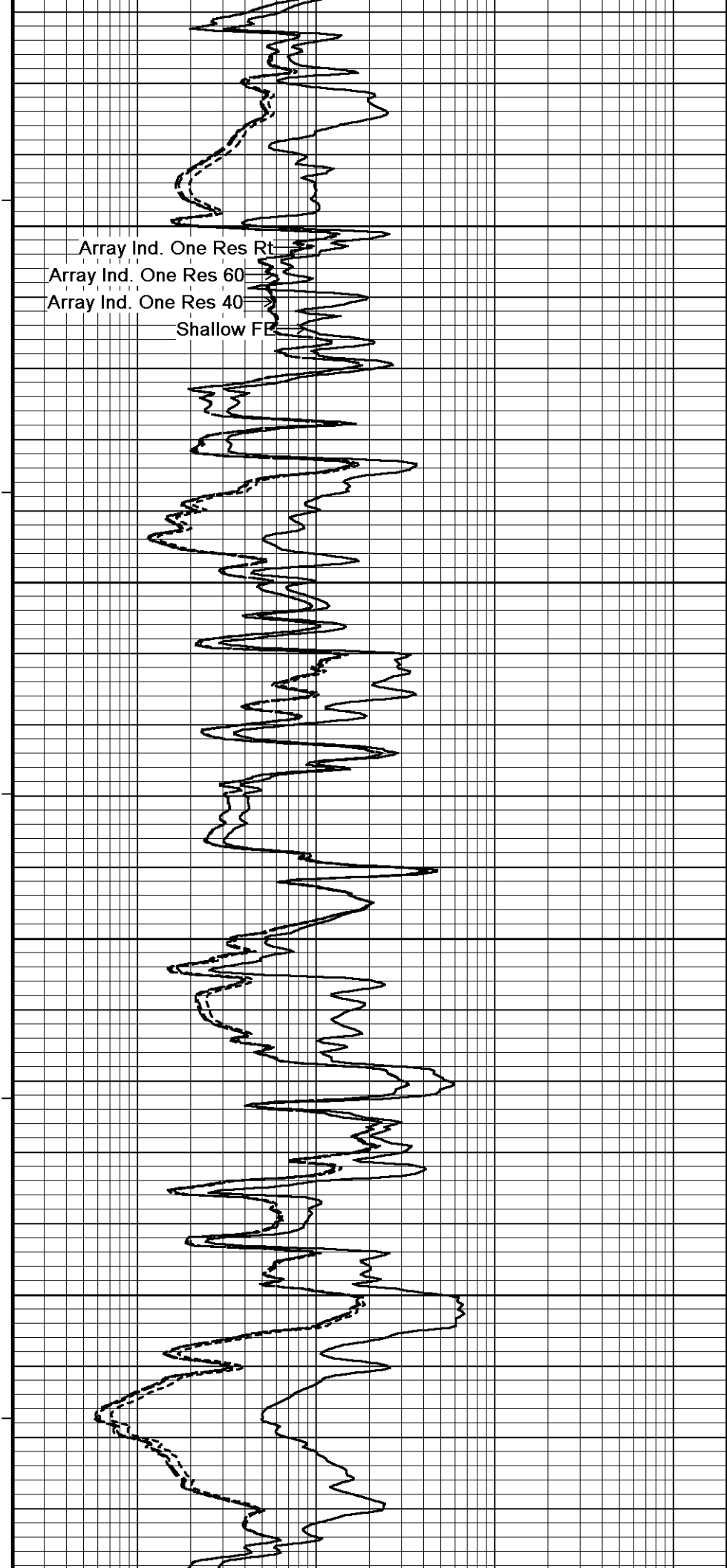
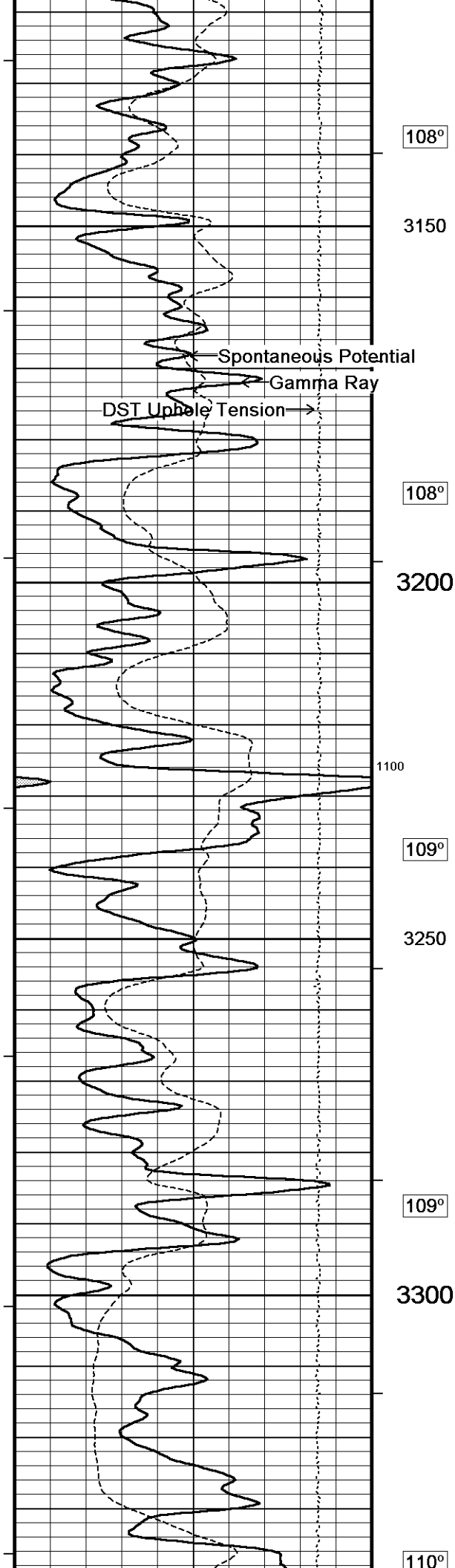
Array Ind. One Res Rt

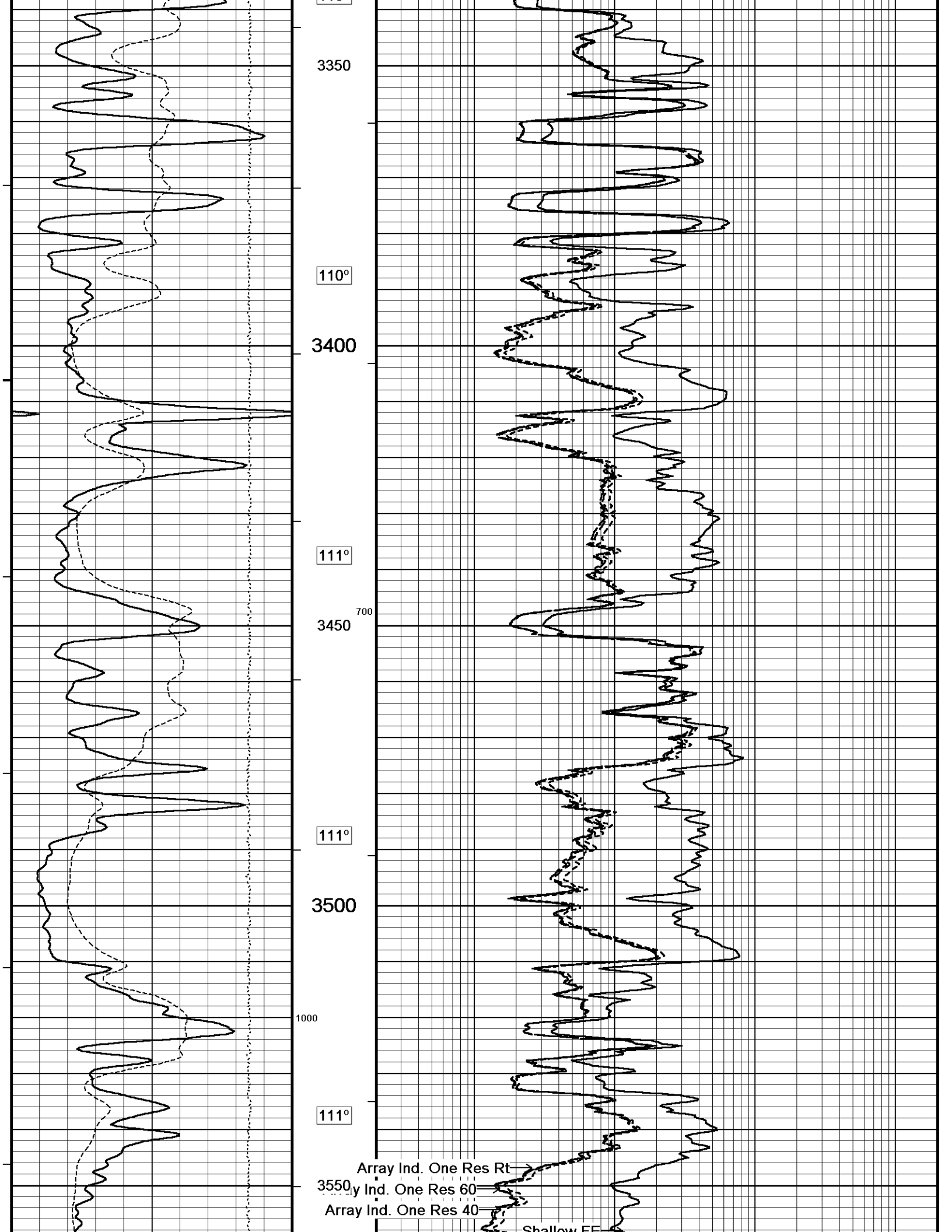
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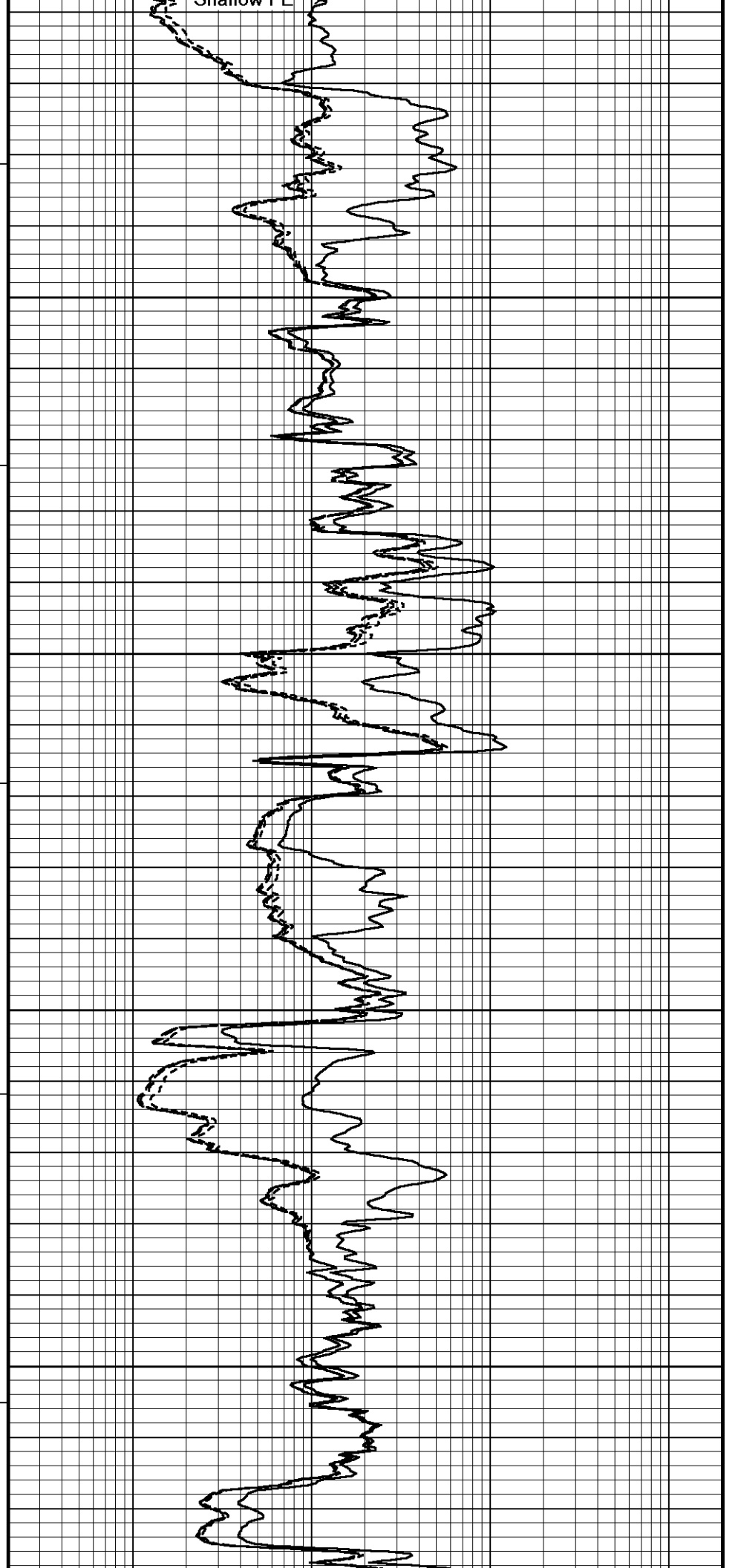
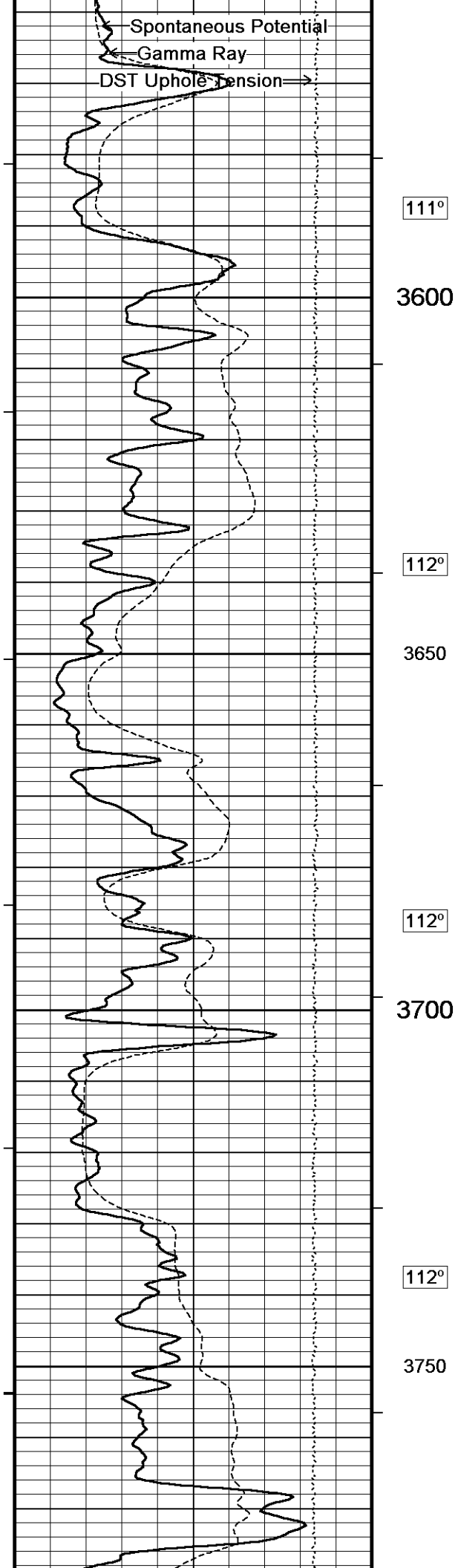
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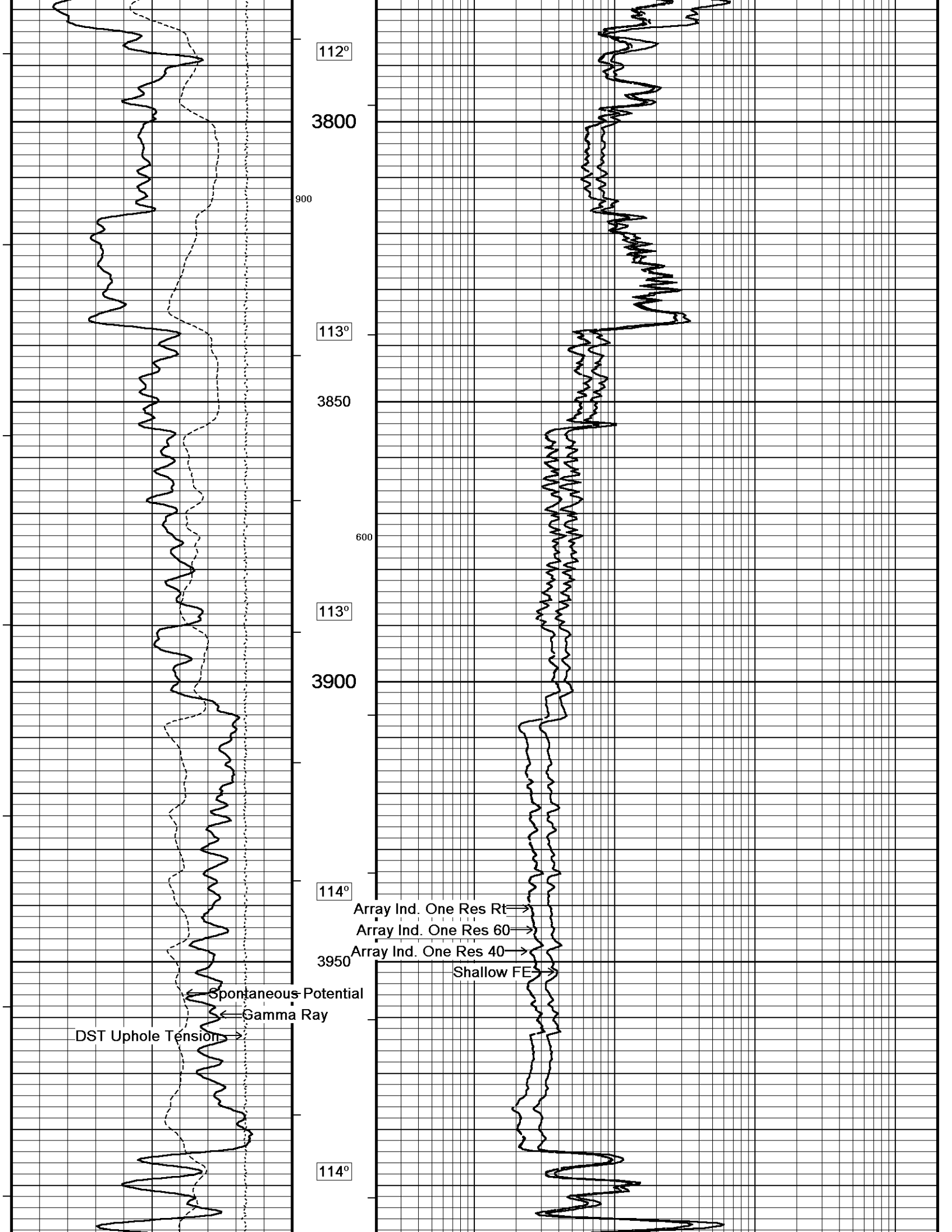
Shallow FE

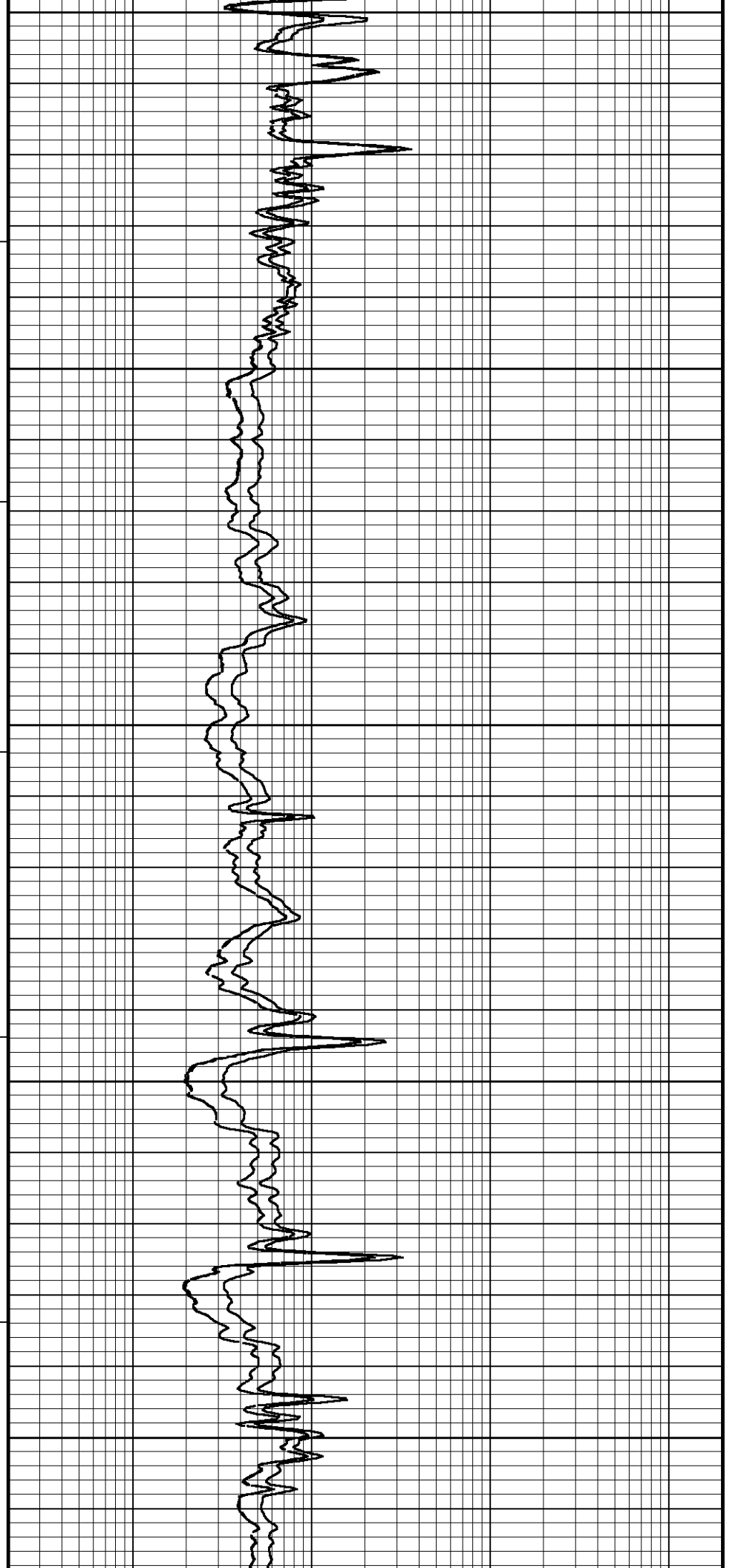
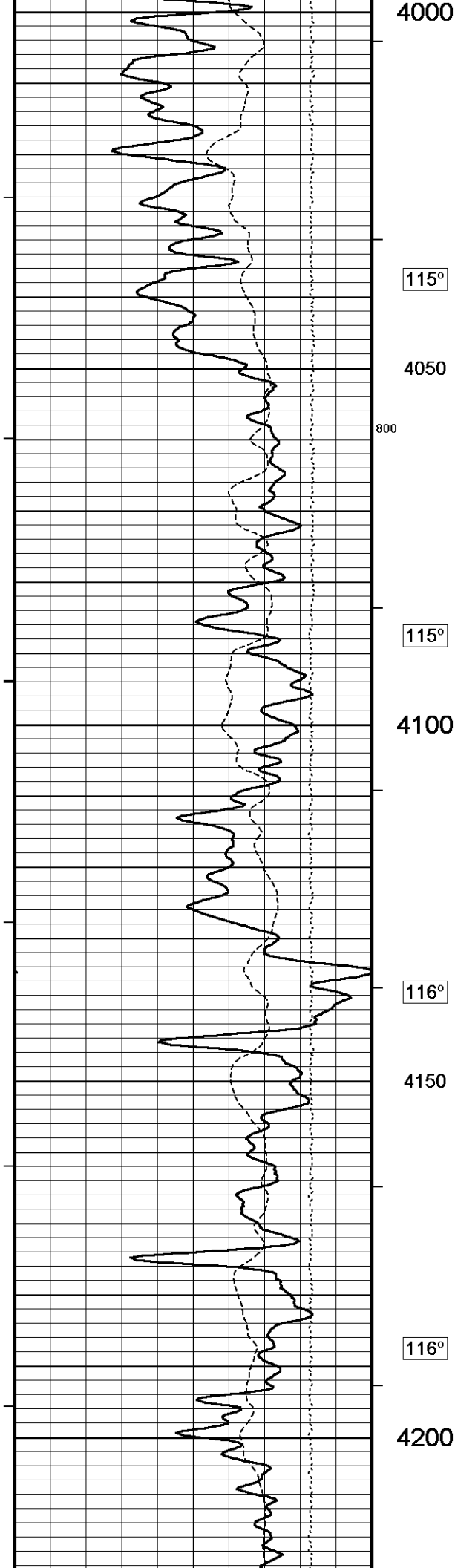


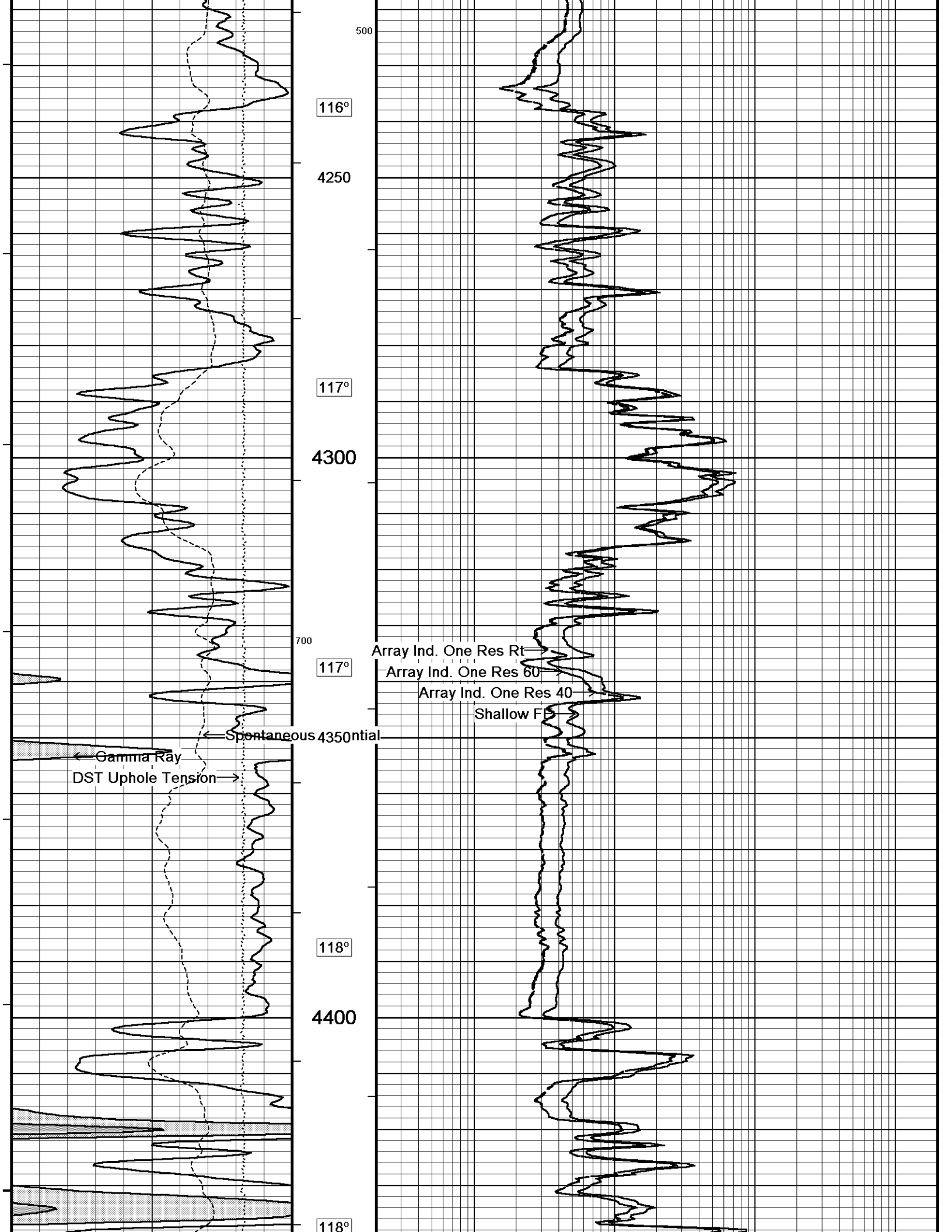


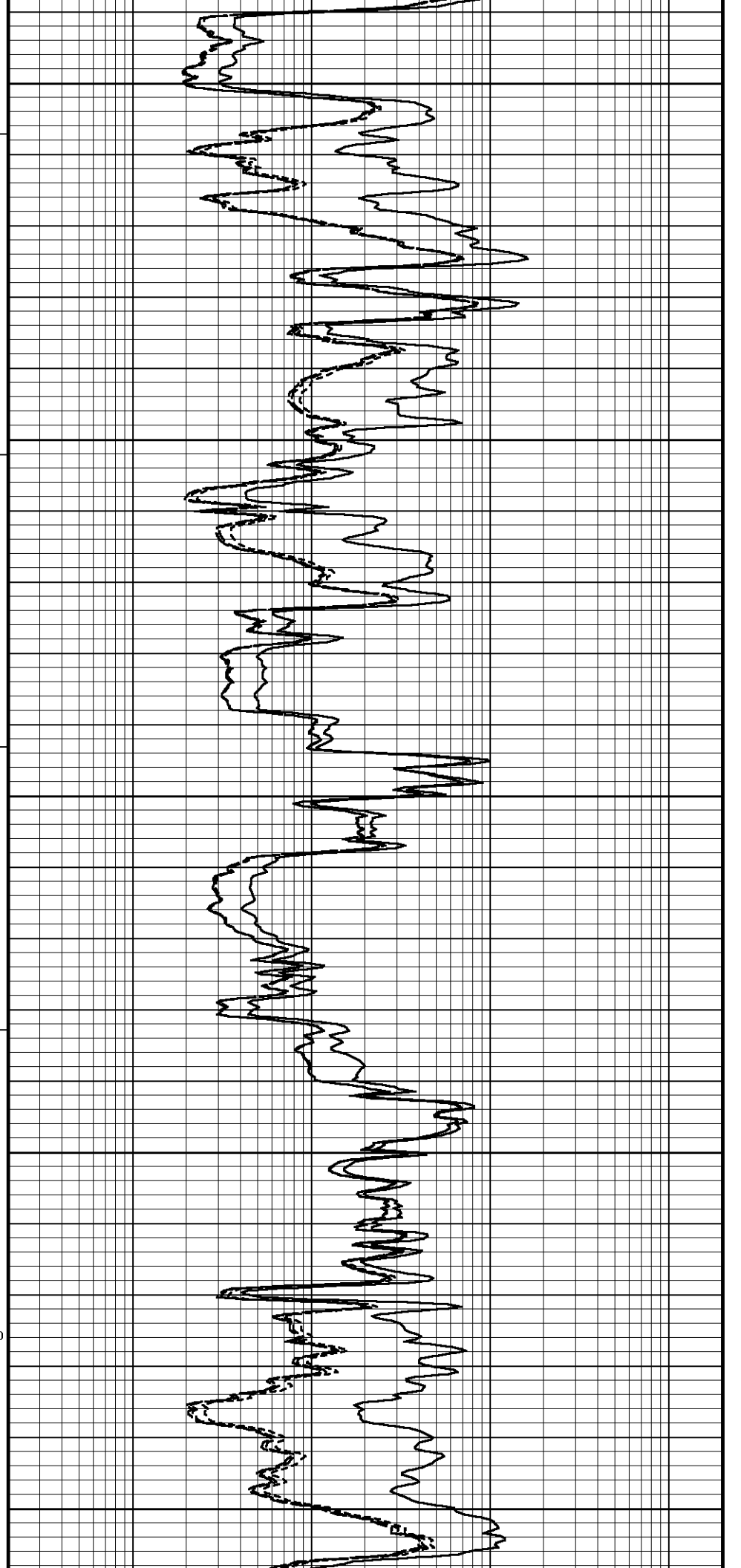
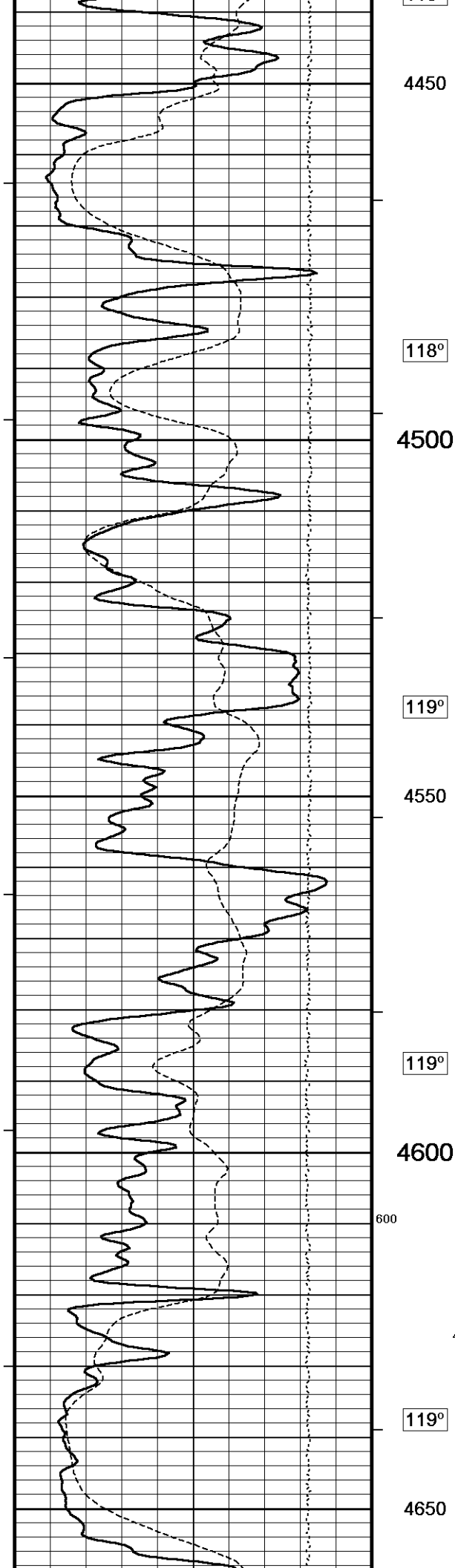


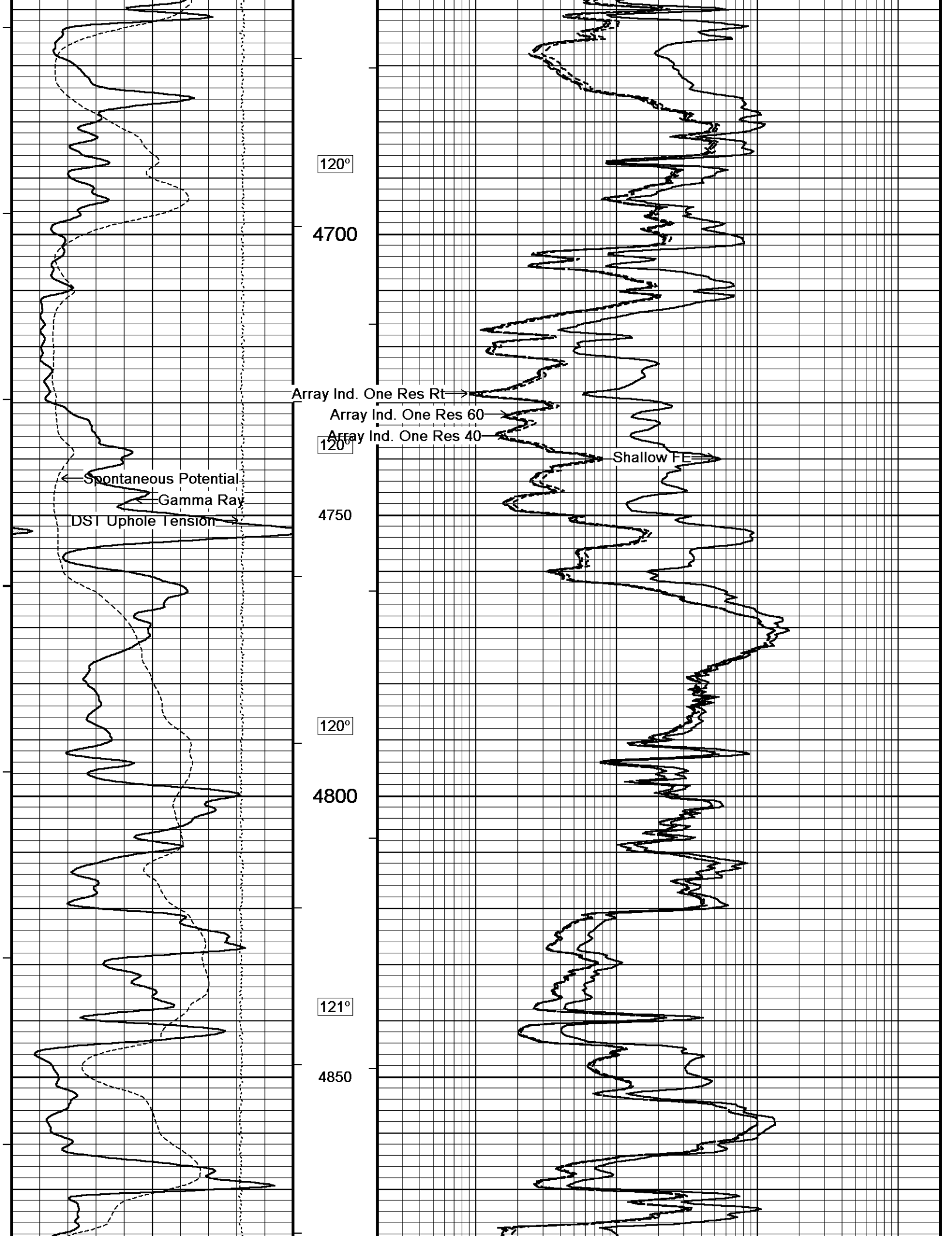


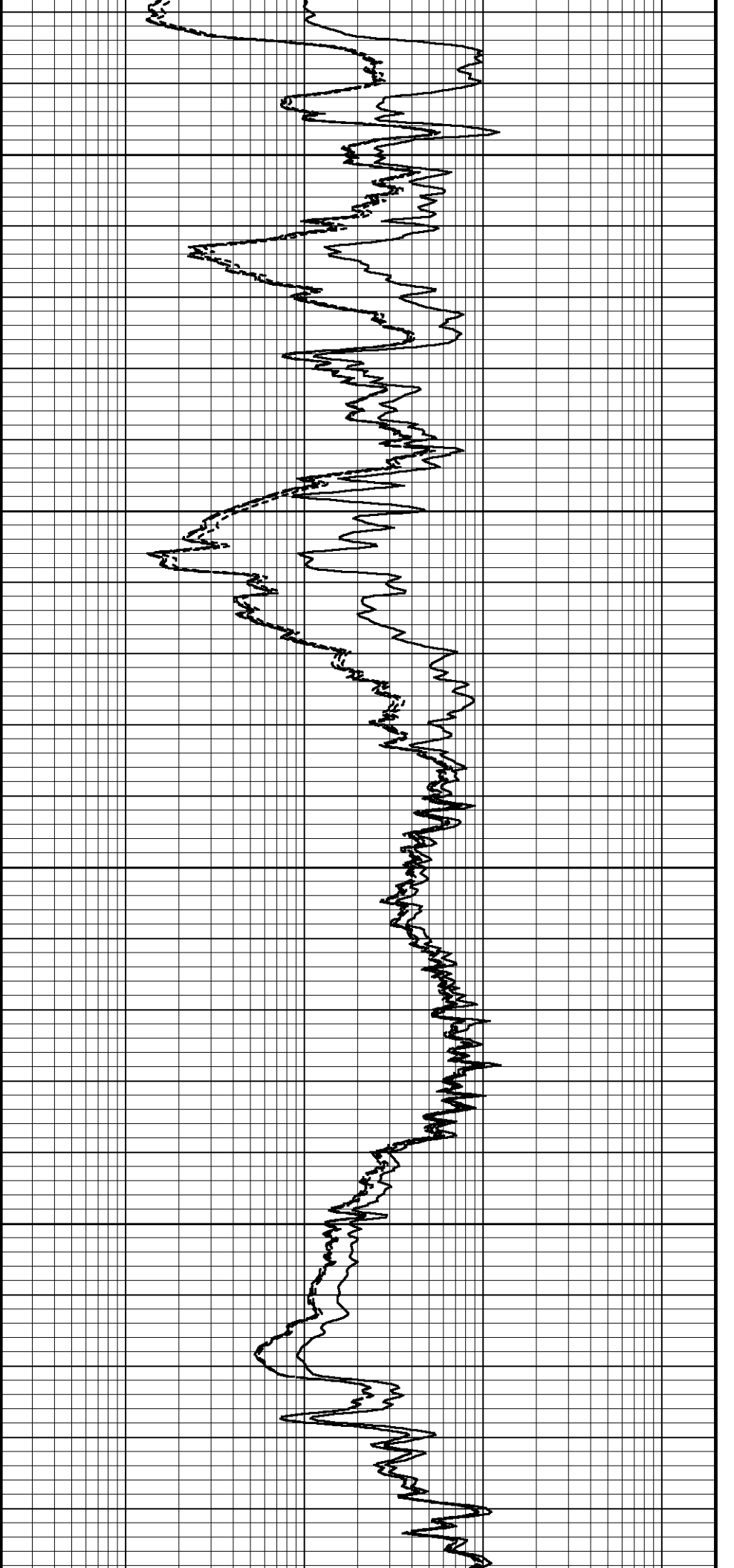
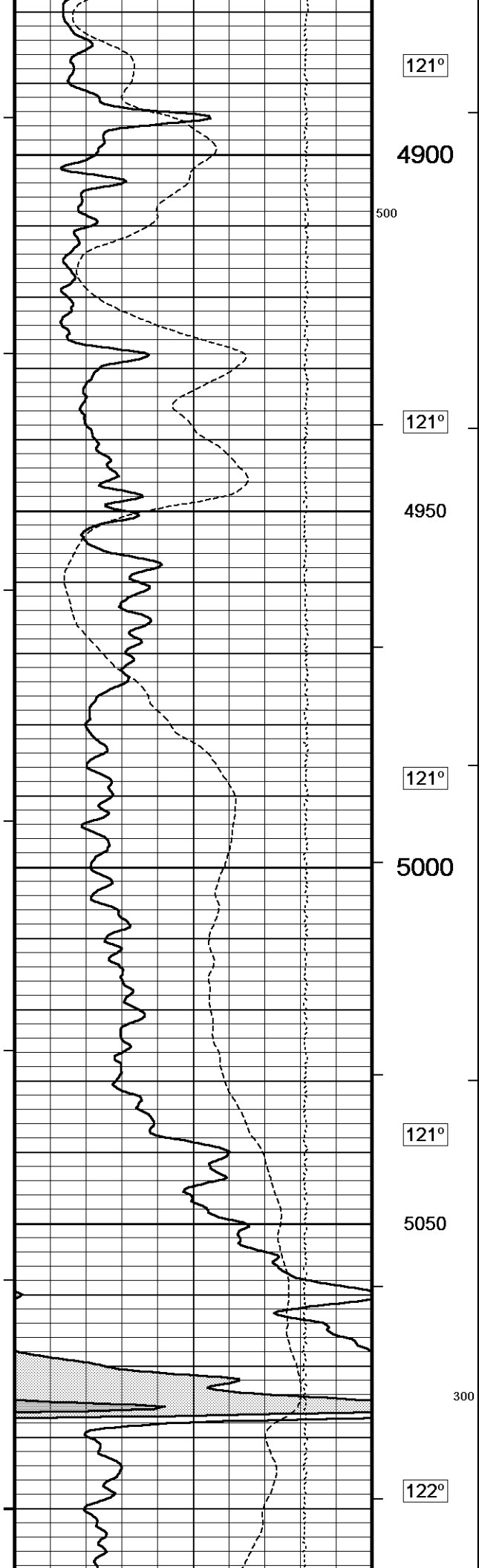


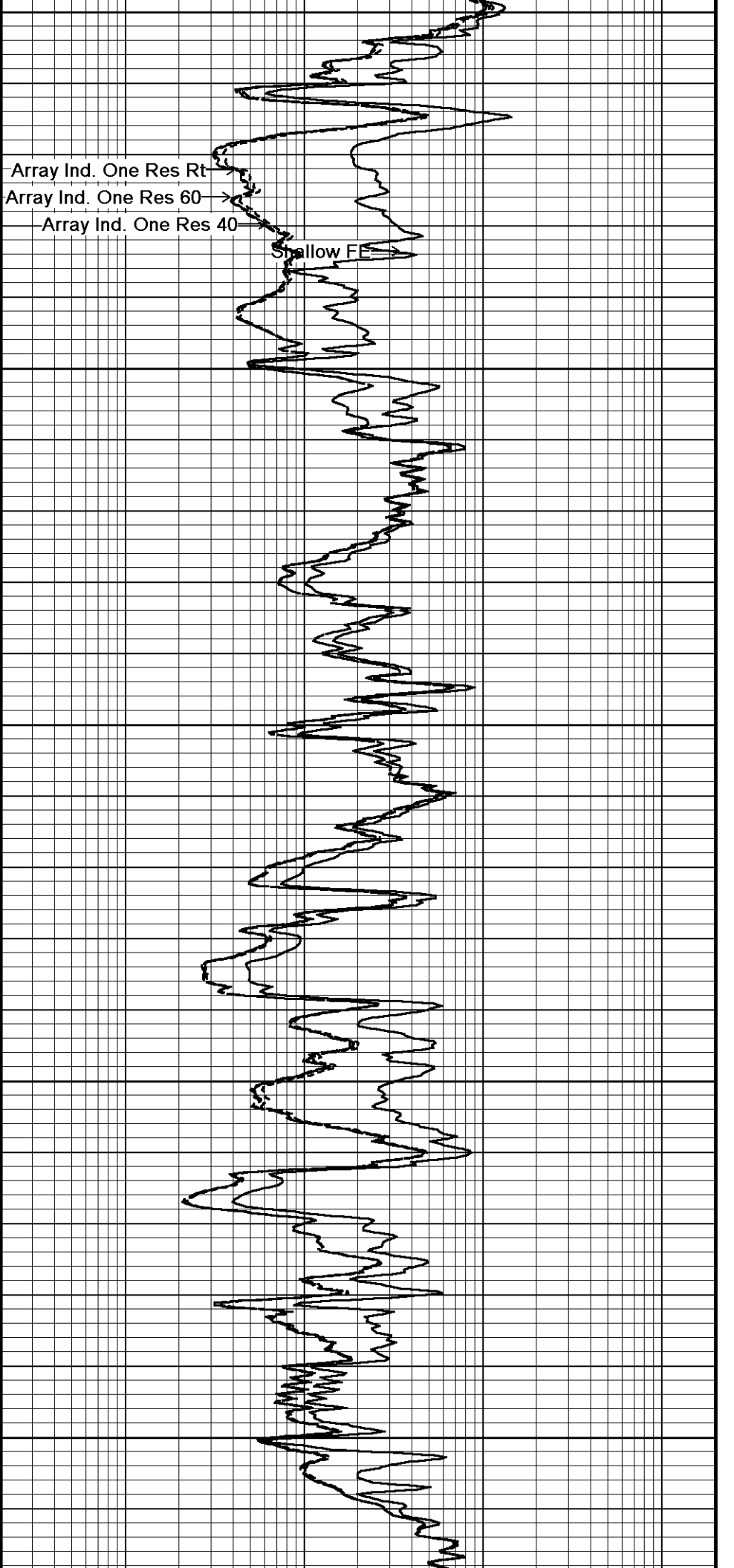
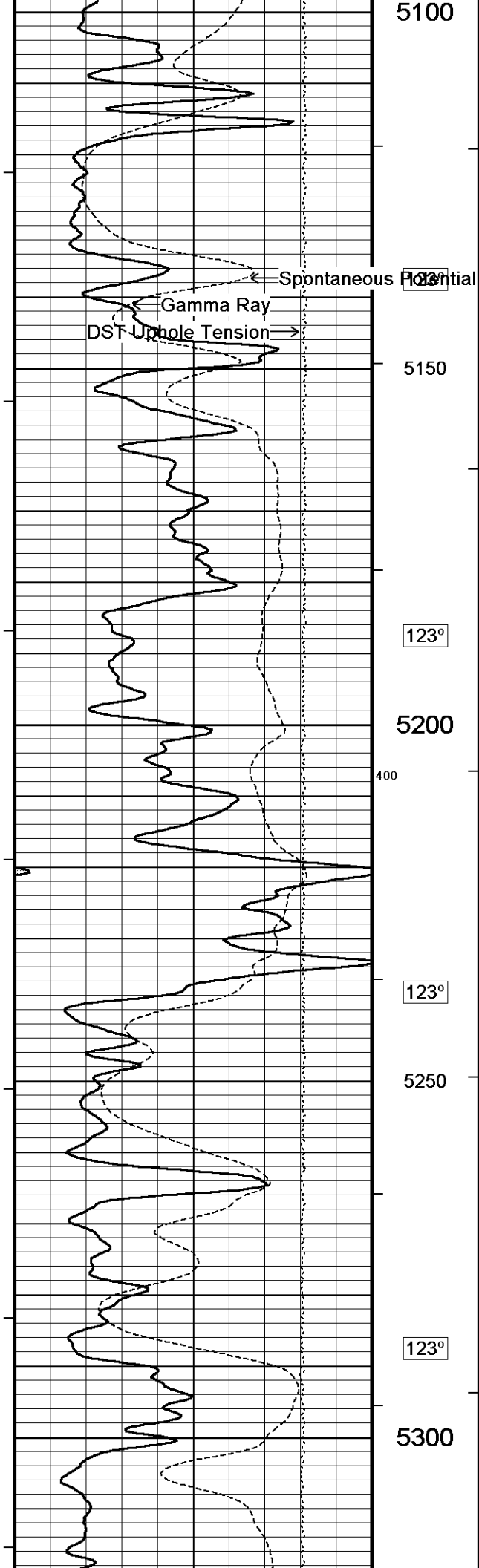


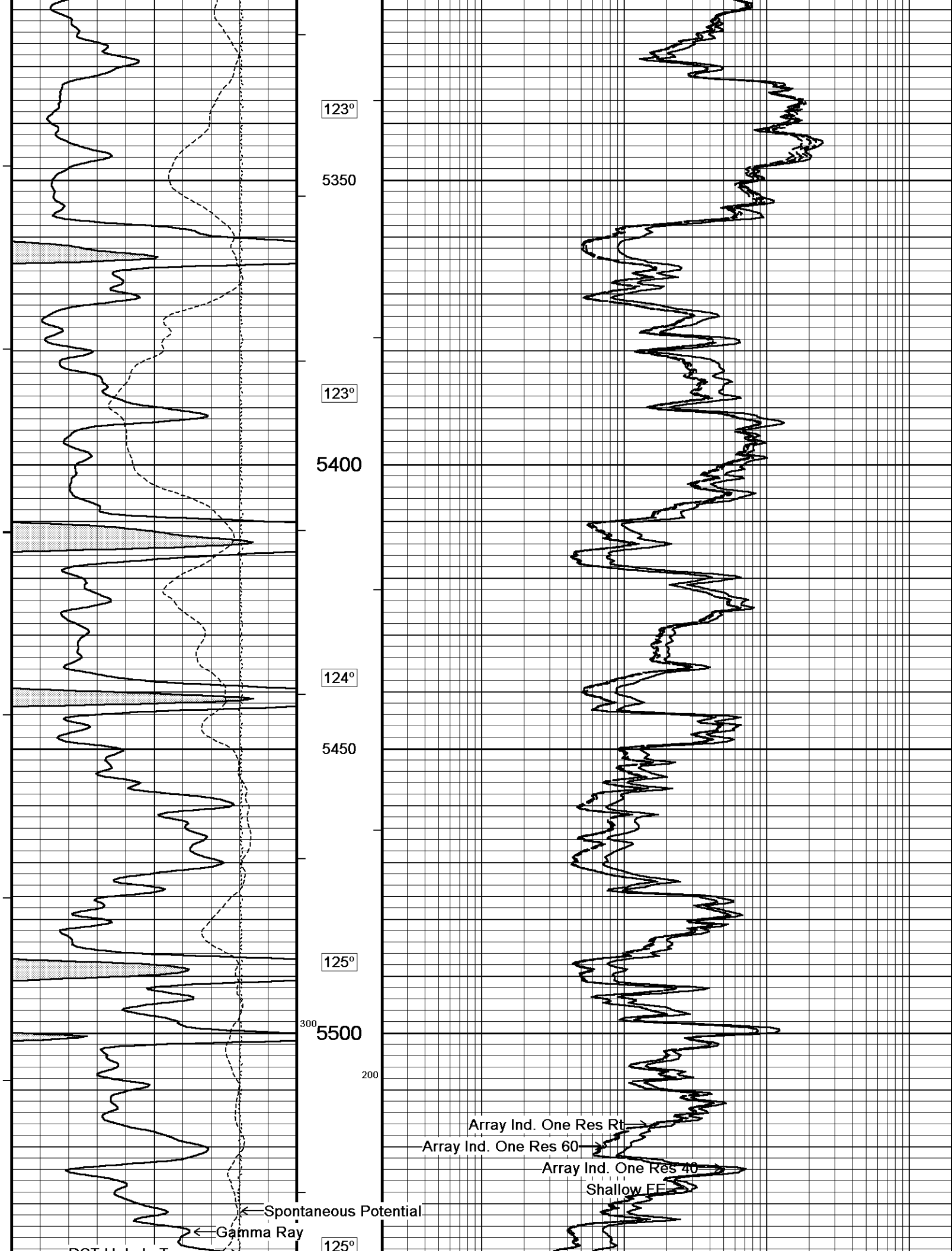


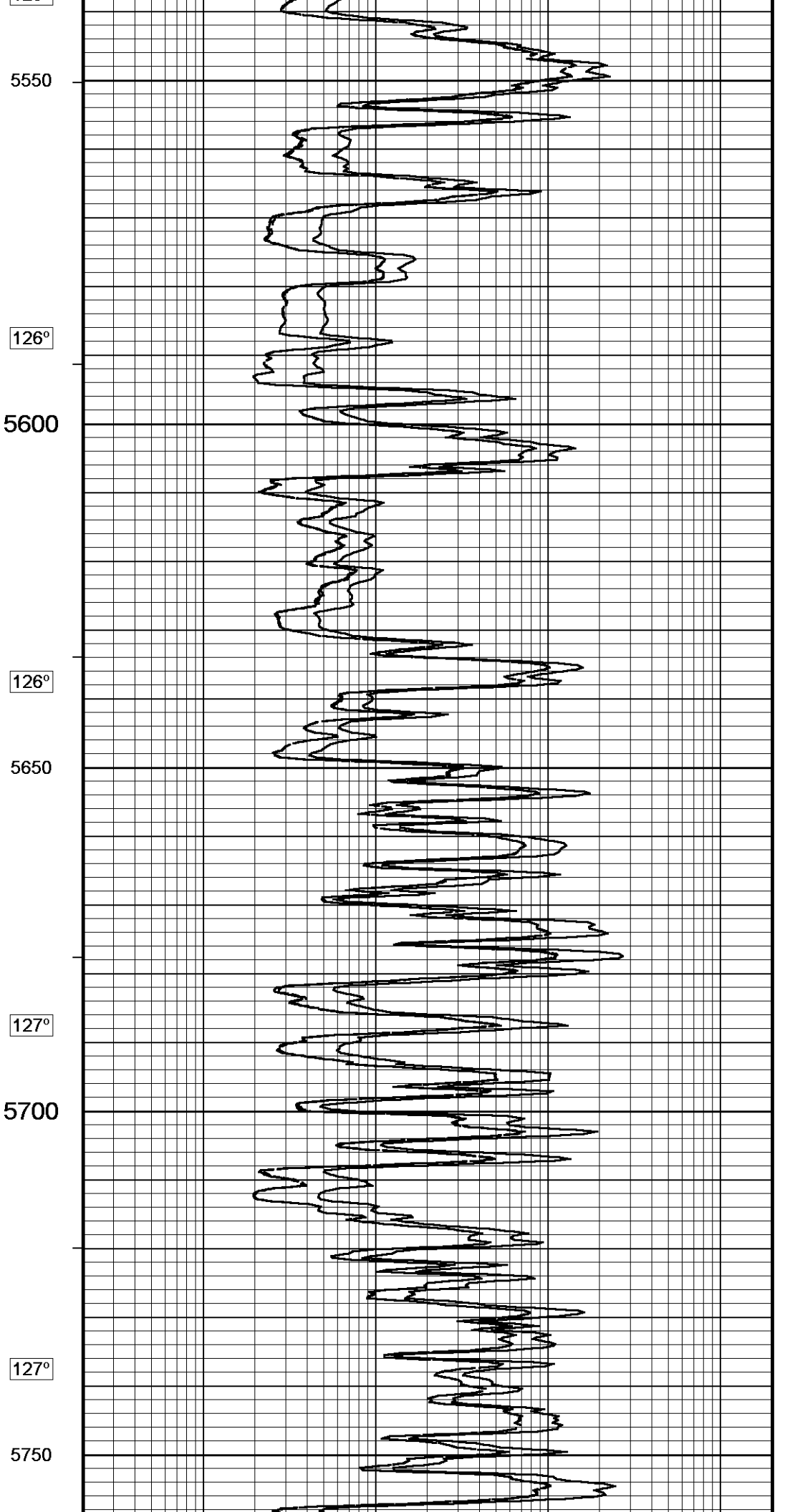
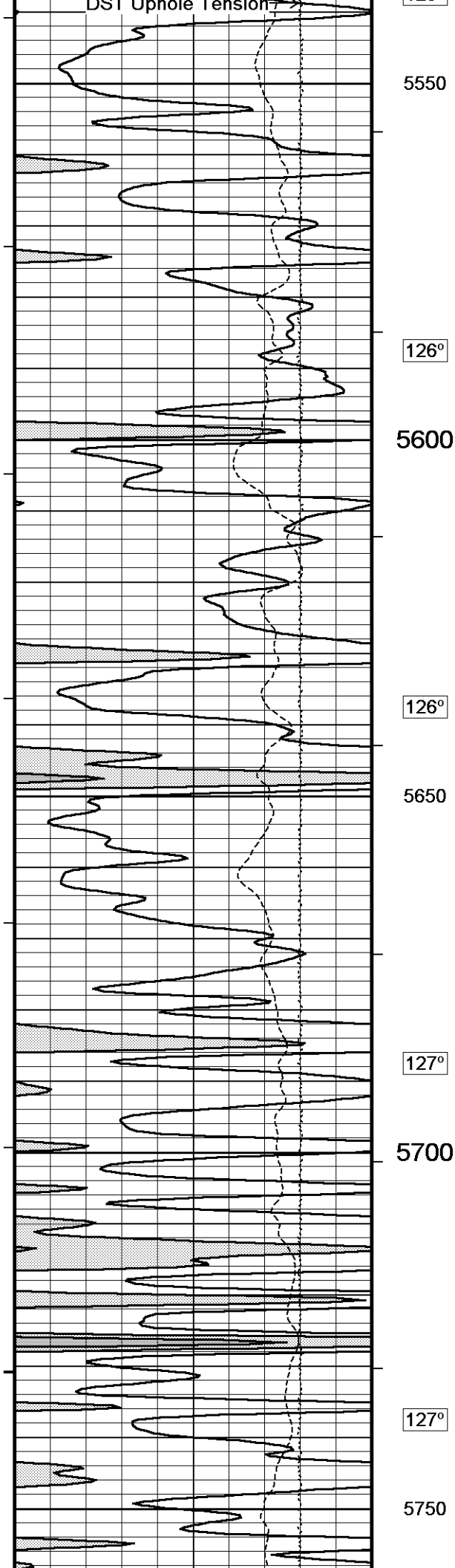


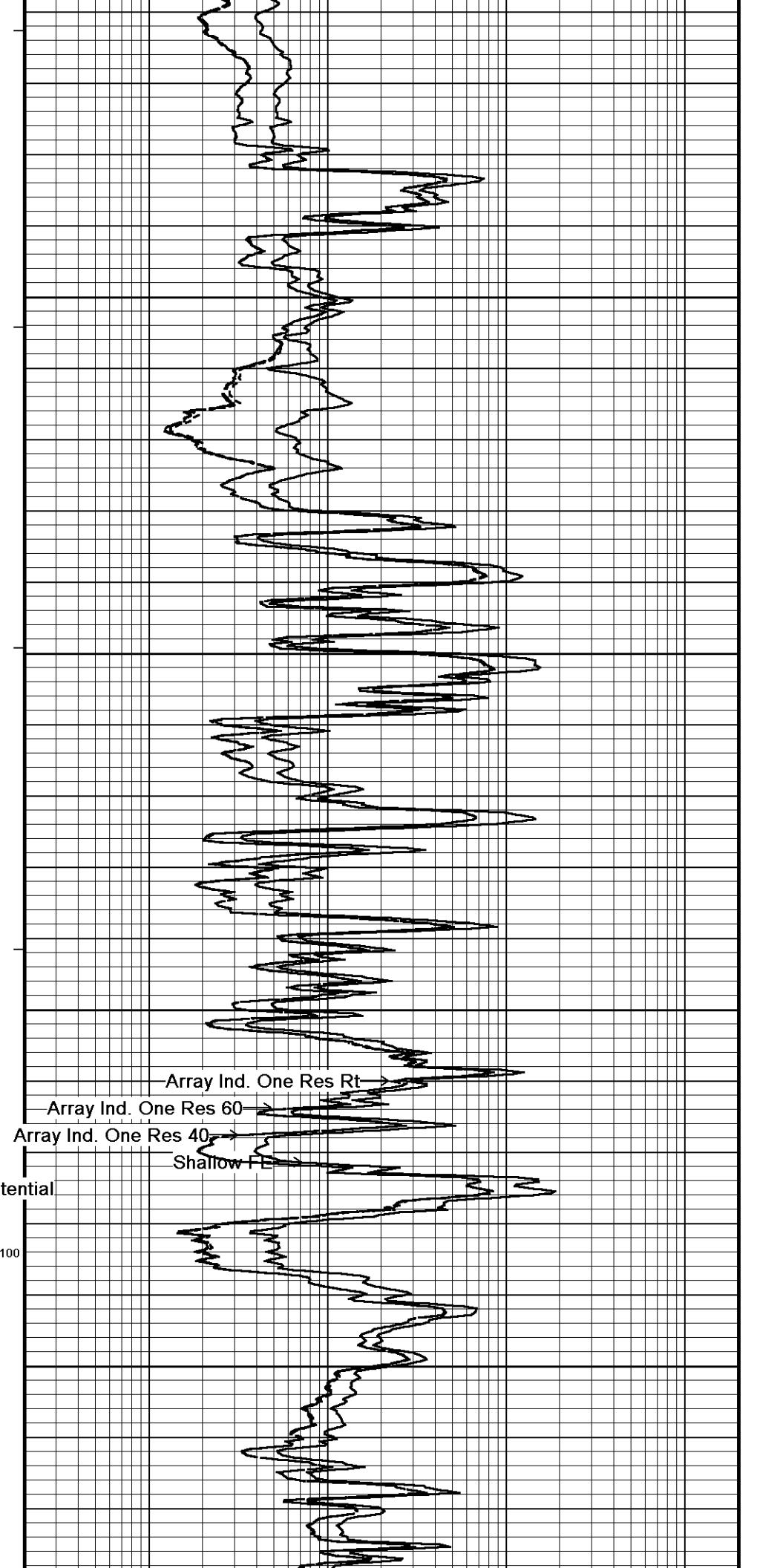
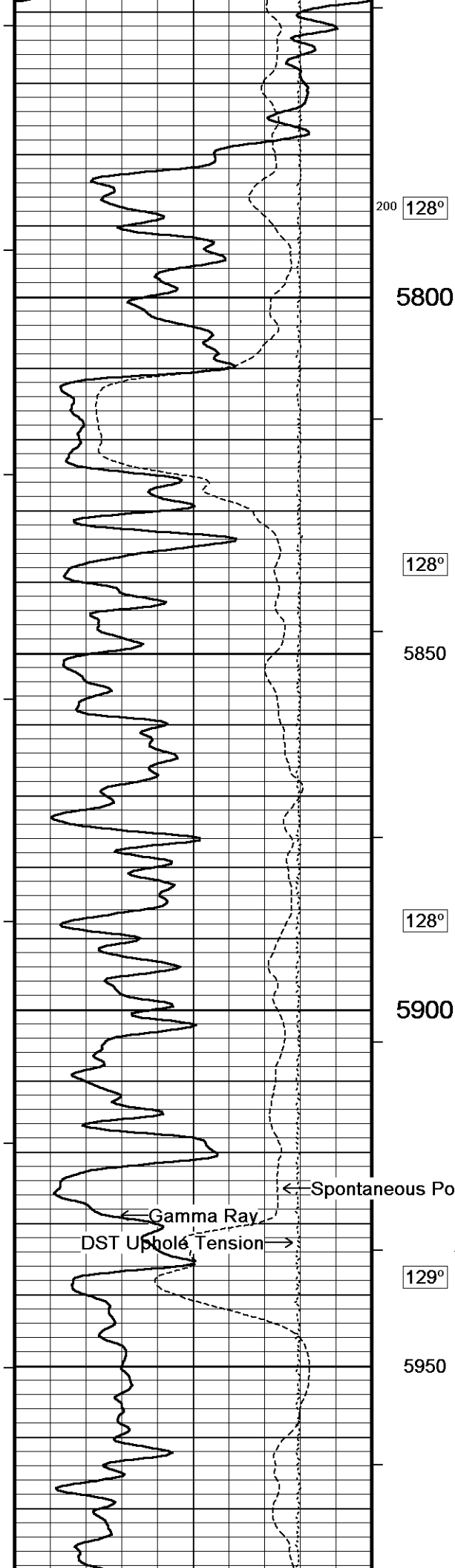


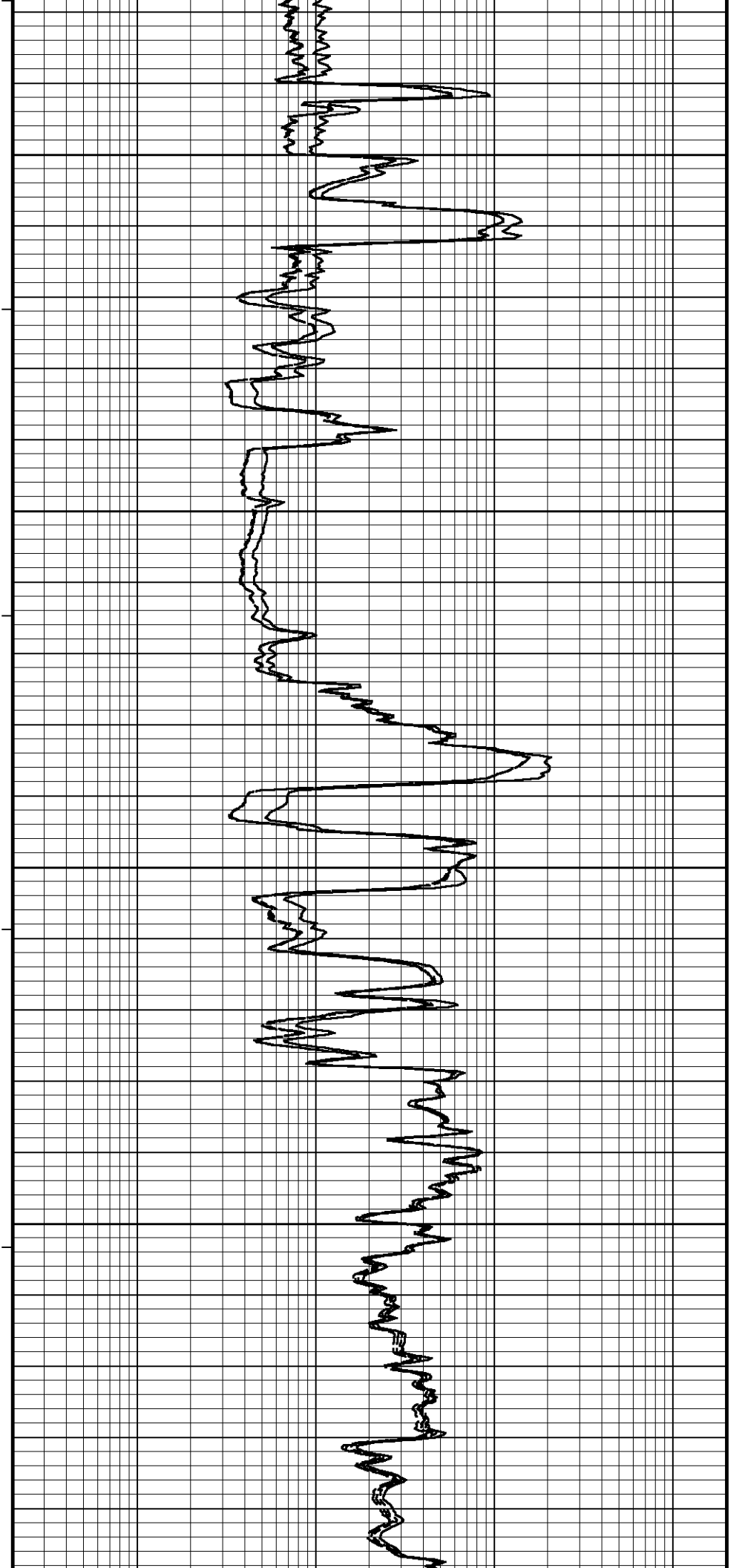
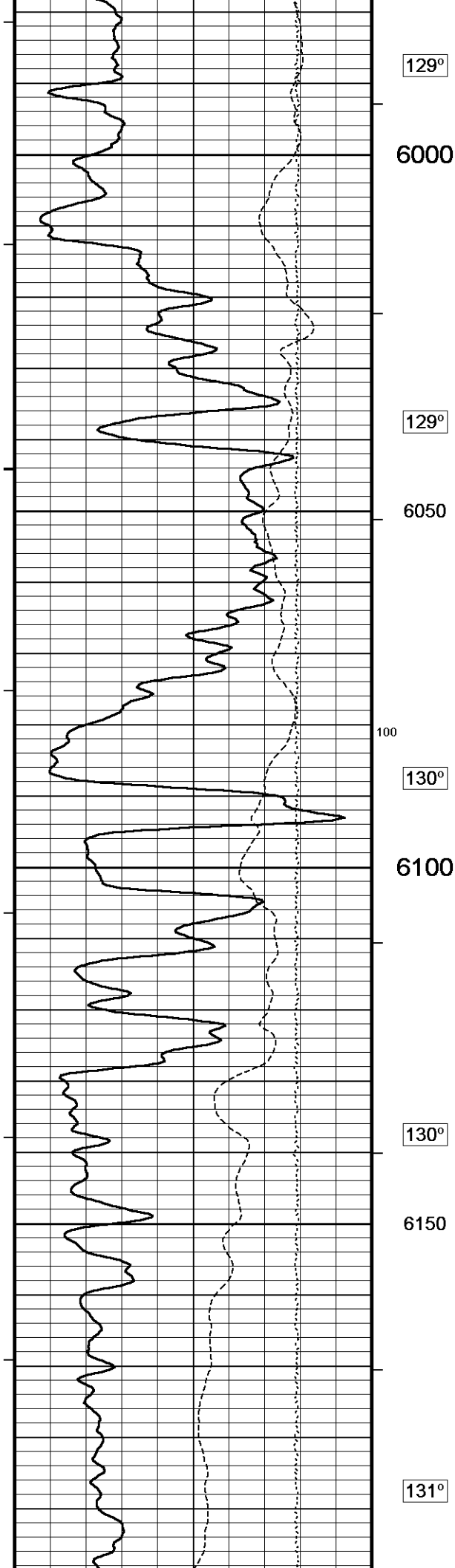


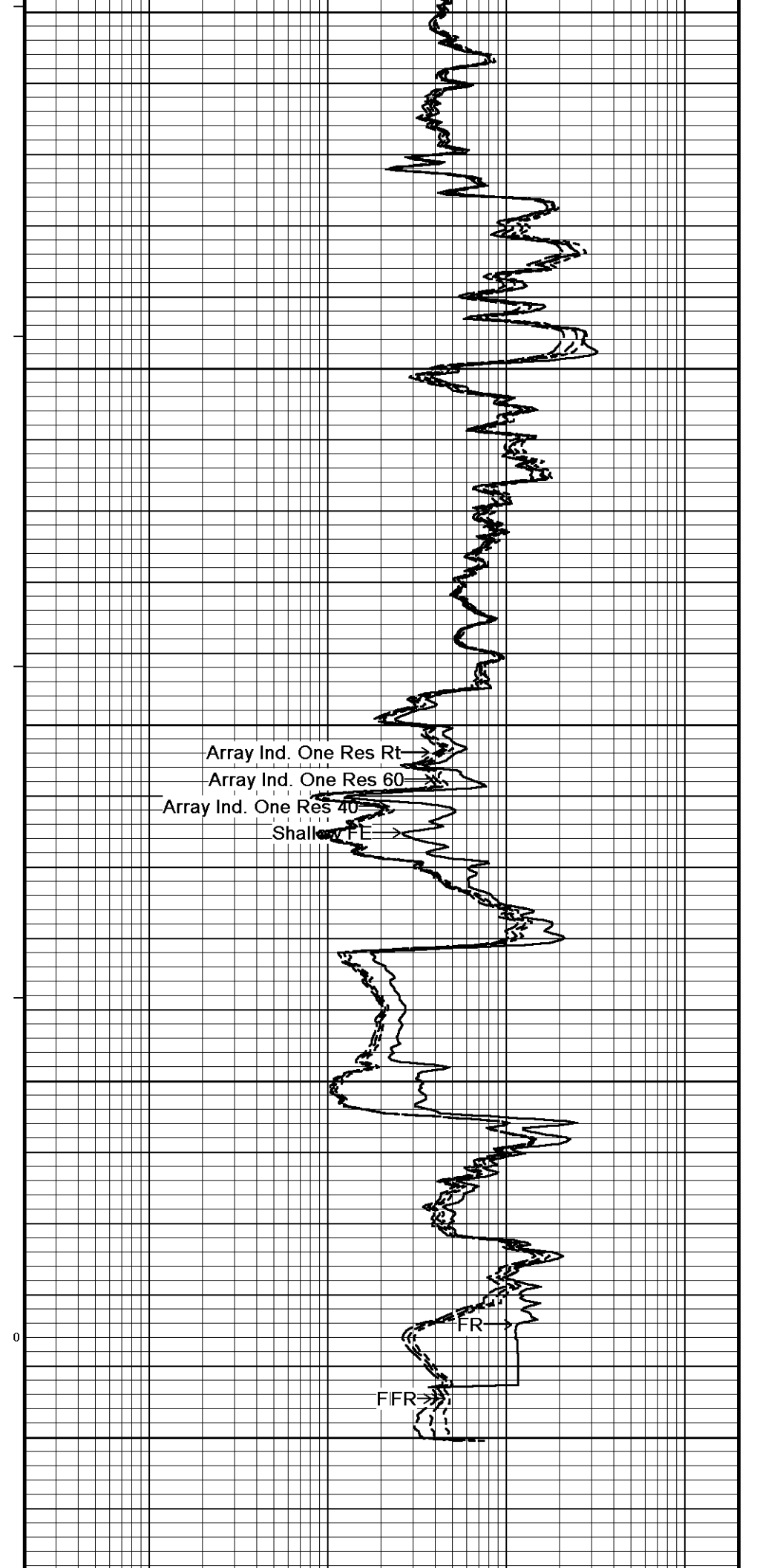
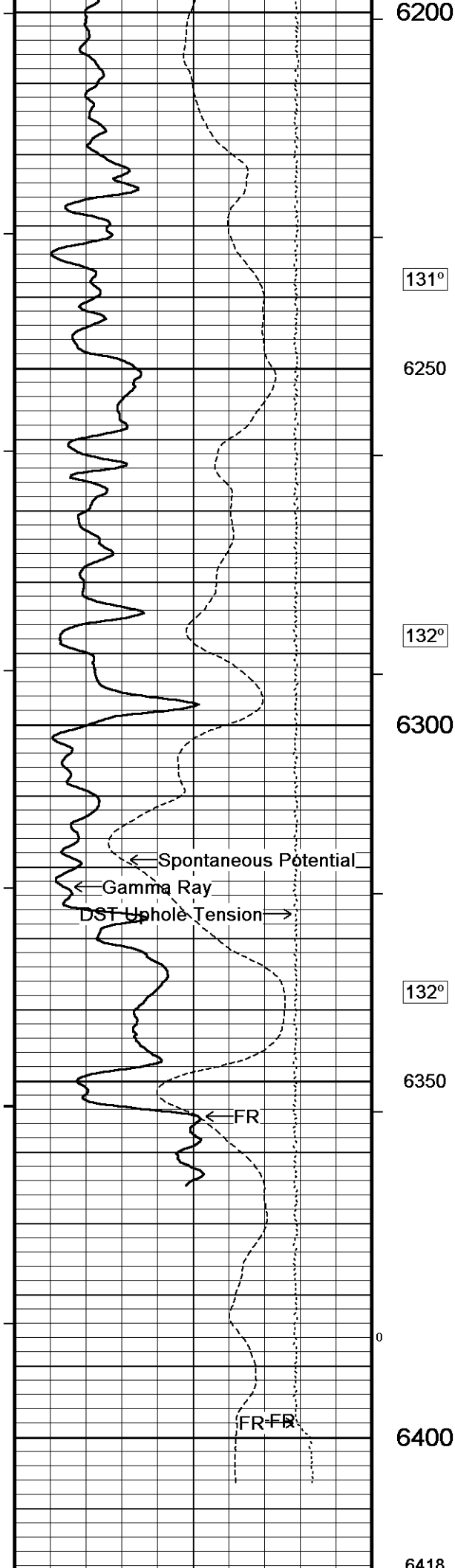


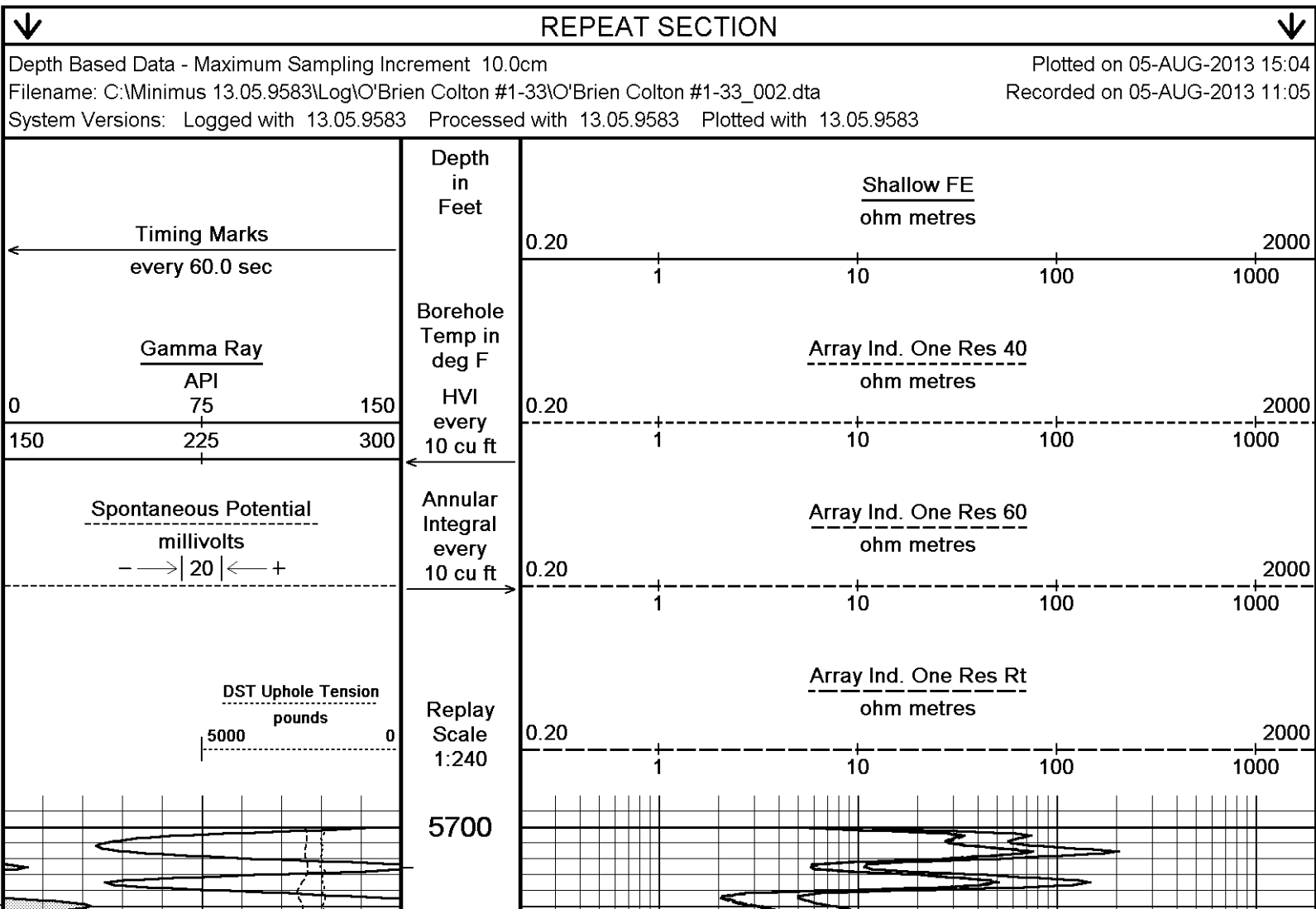
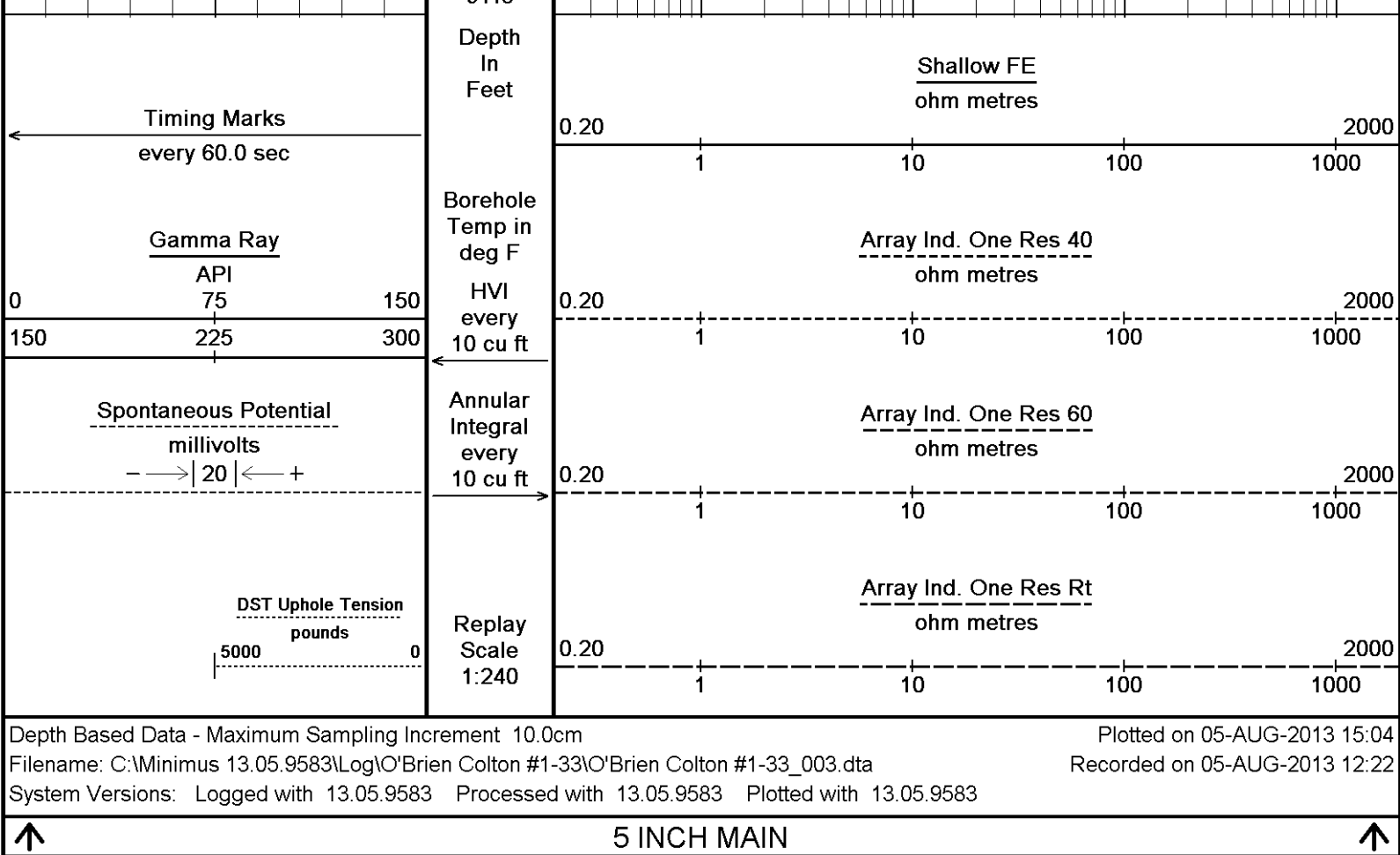


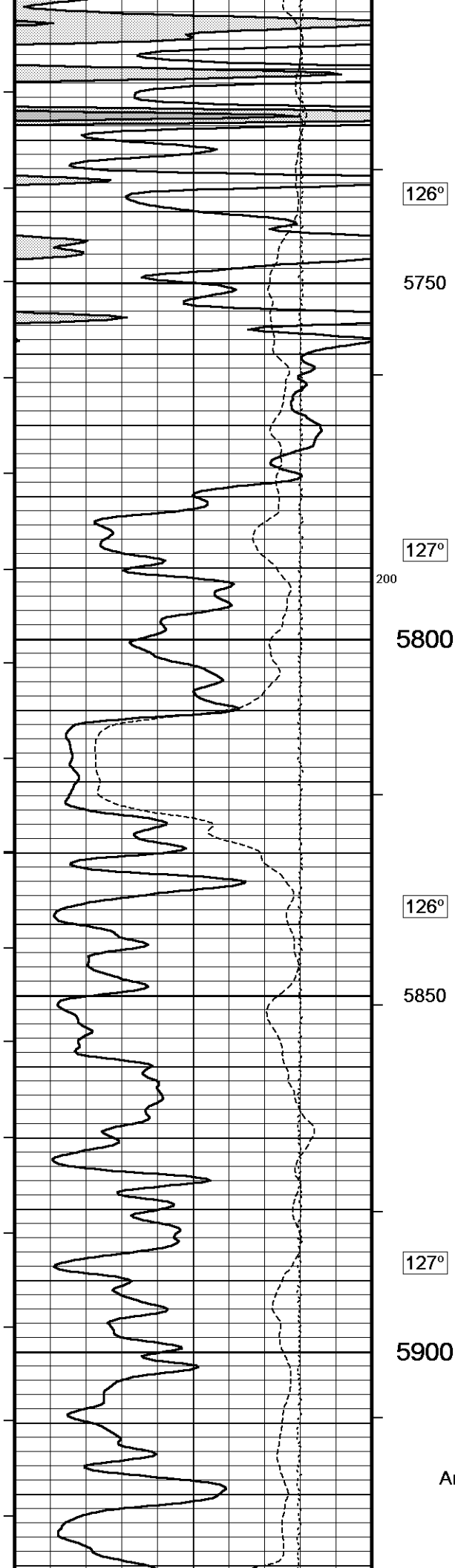












126°

5750

127°

200

5800

126°

5850

127°

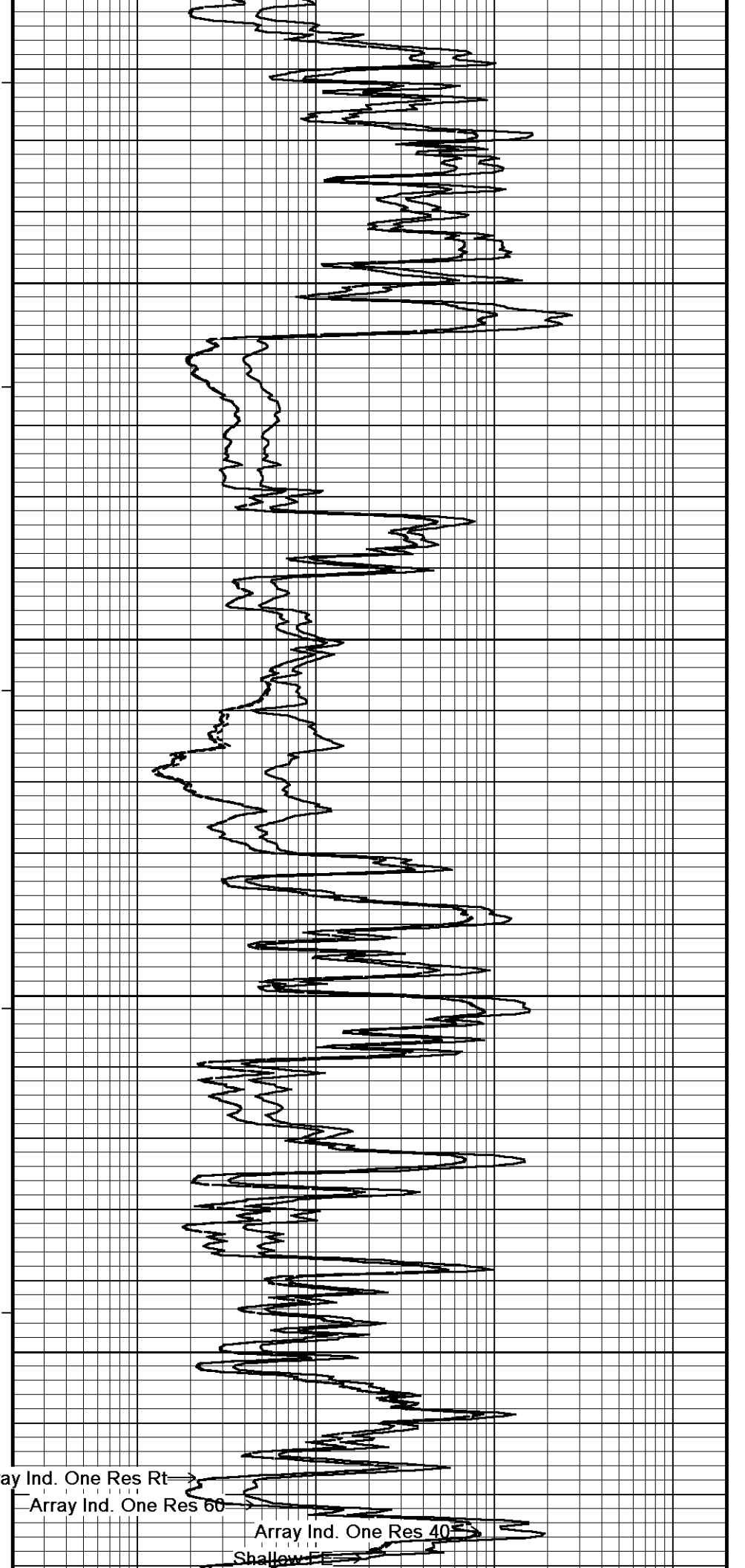
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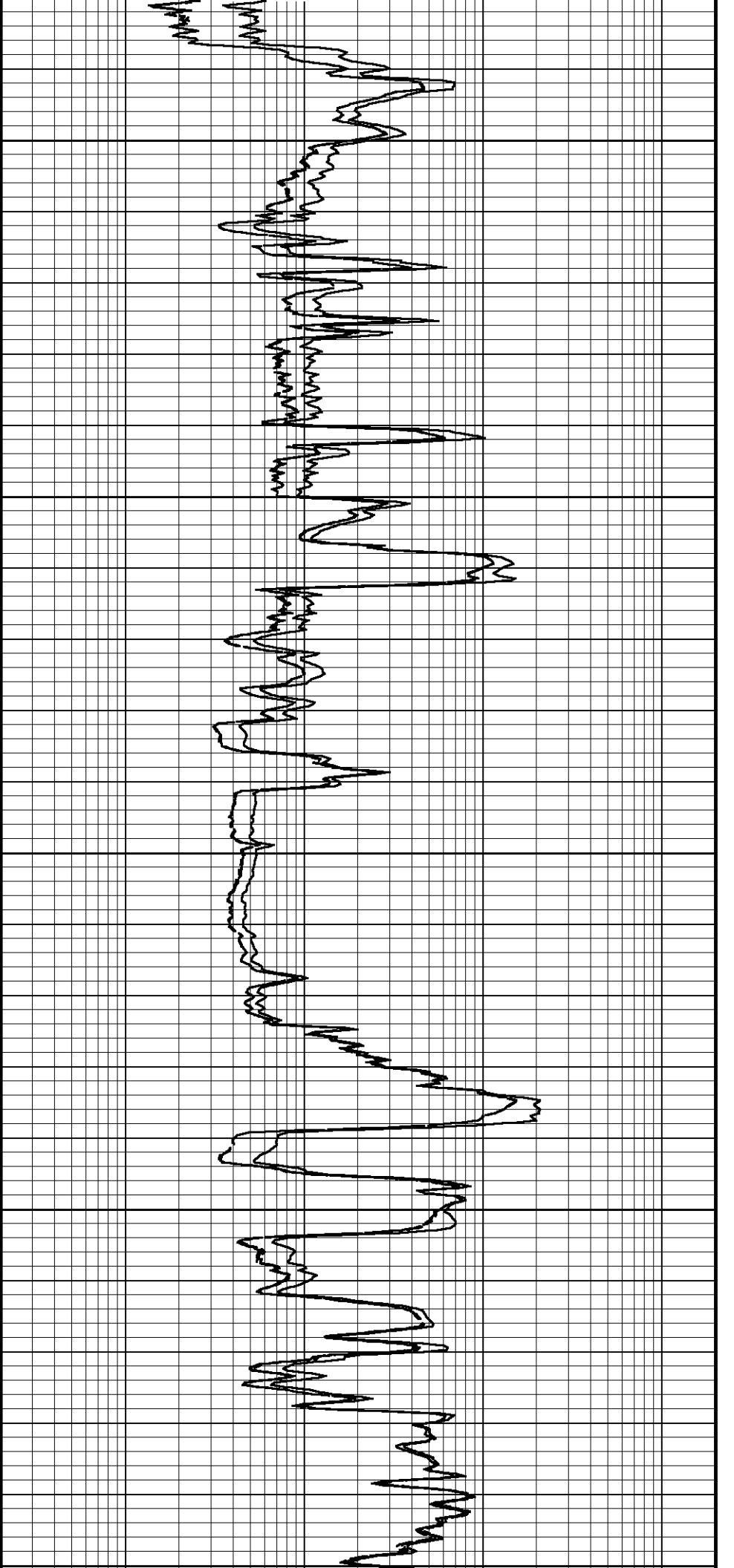
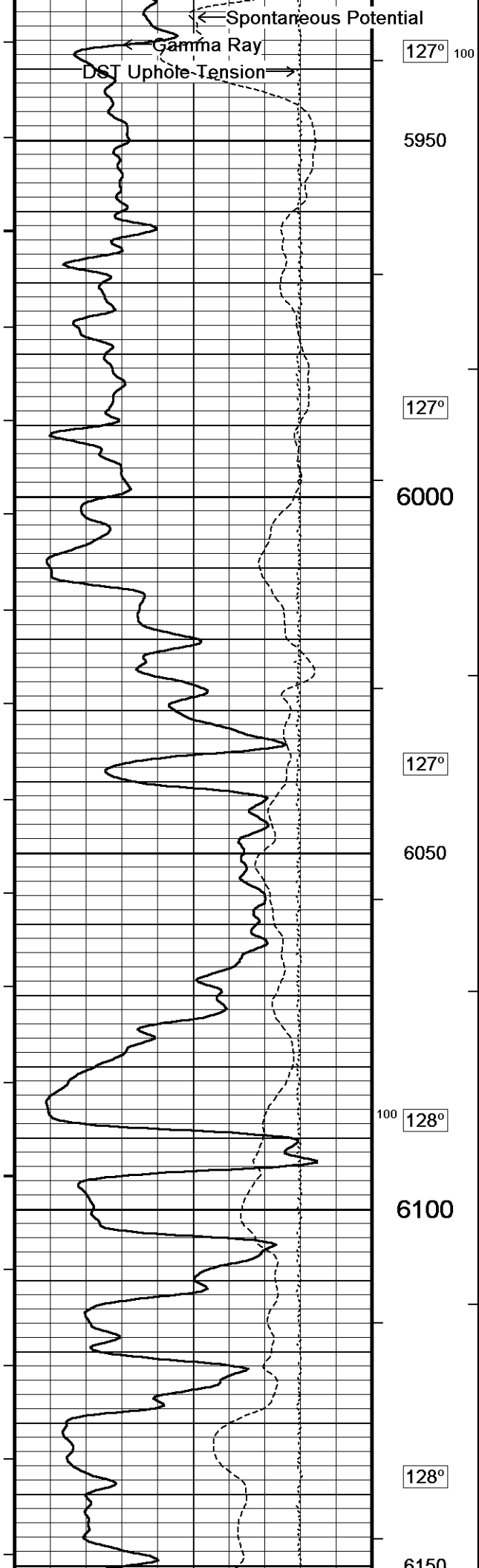
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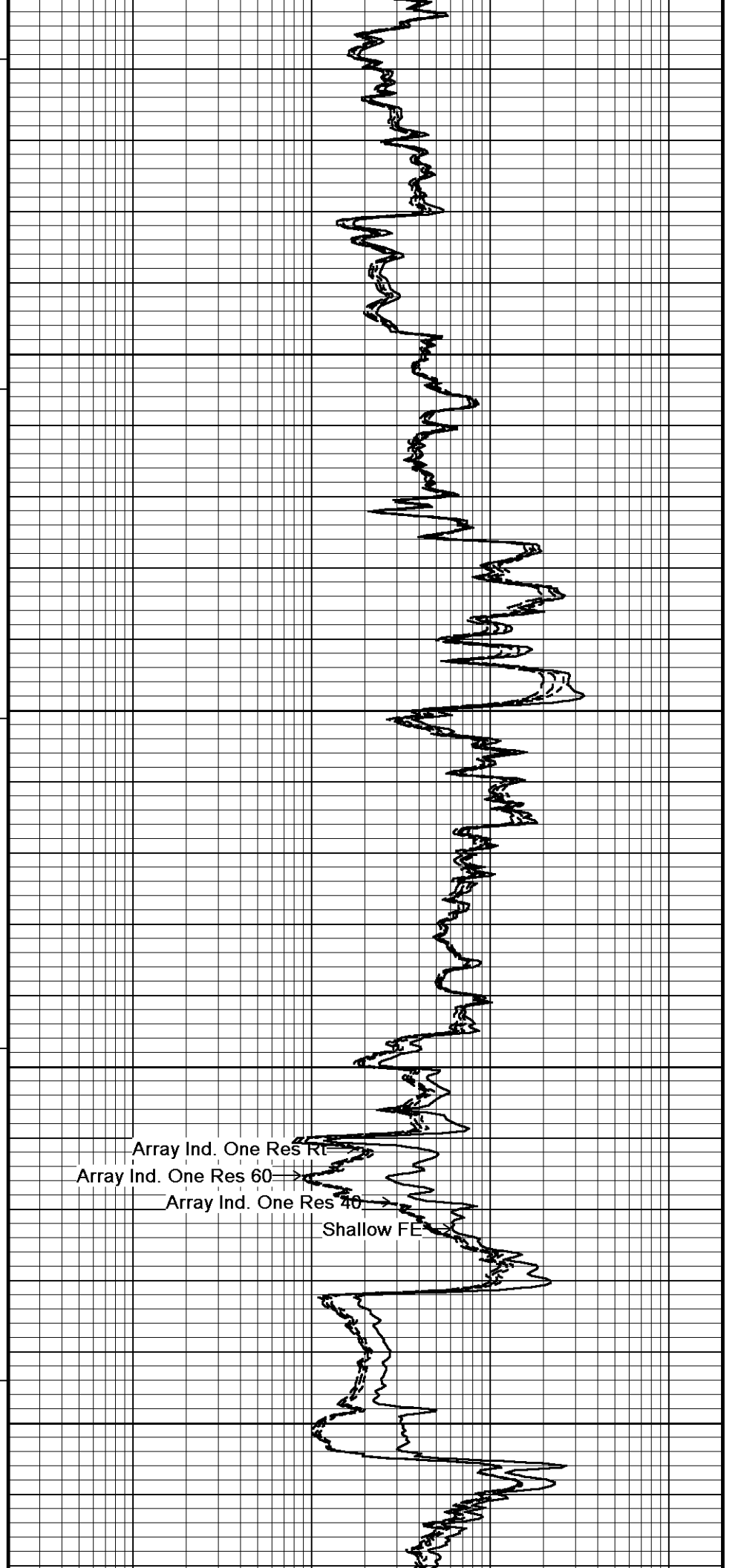
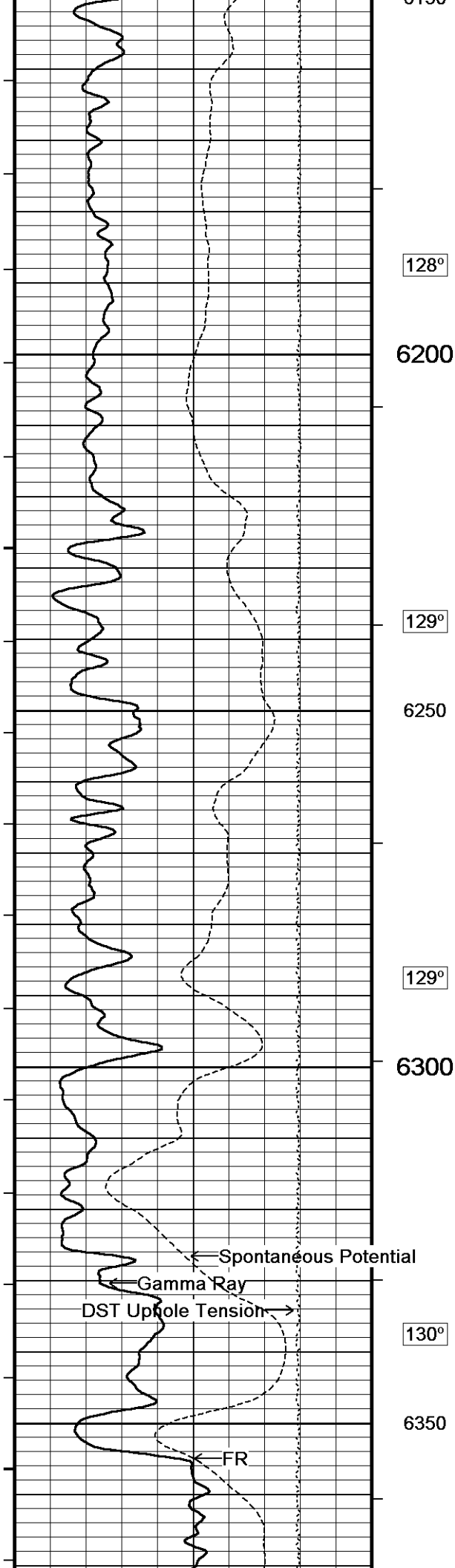
Array Ind. One Res 60

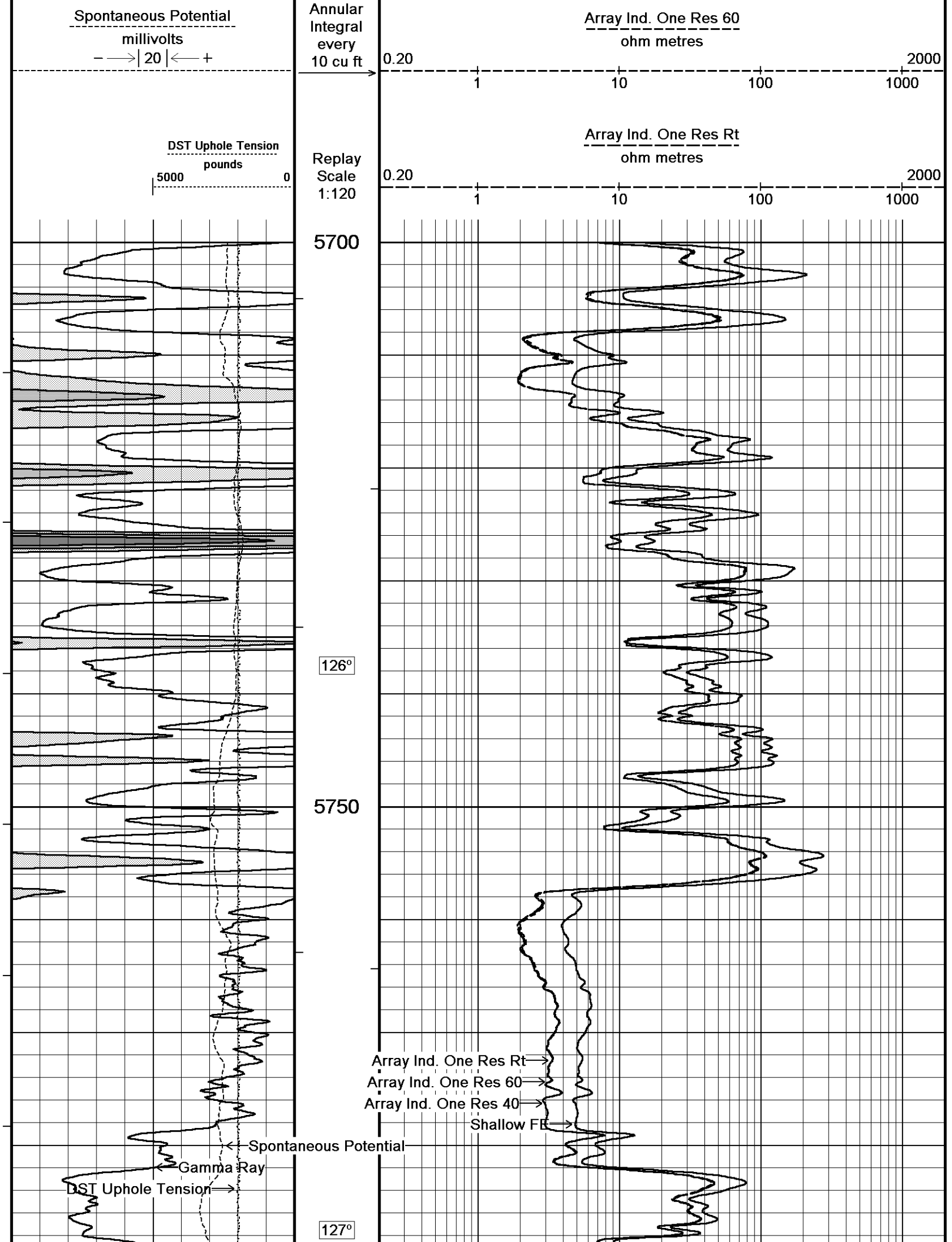
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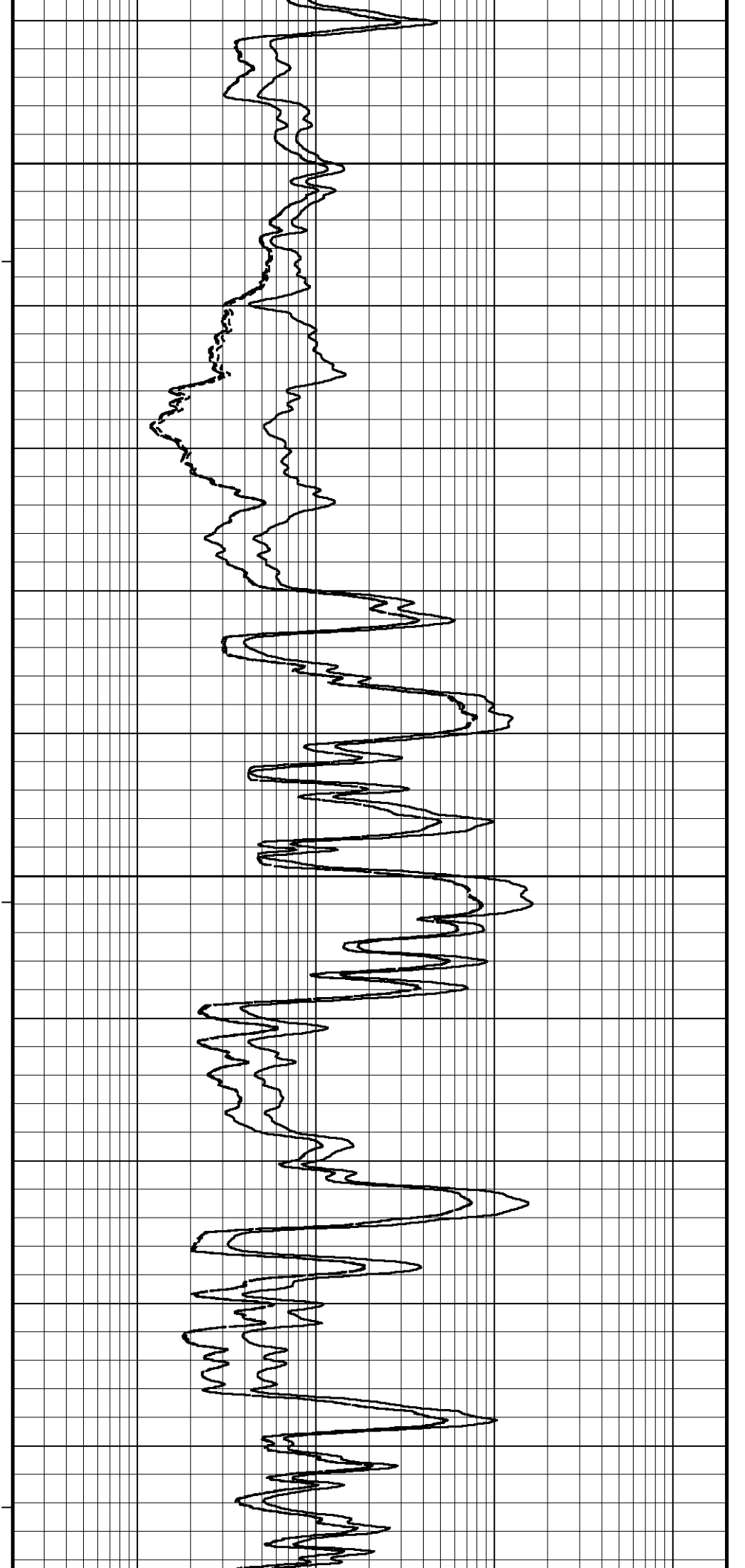
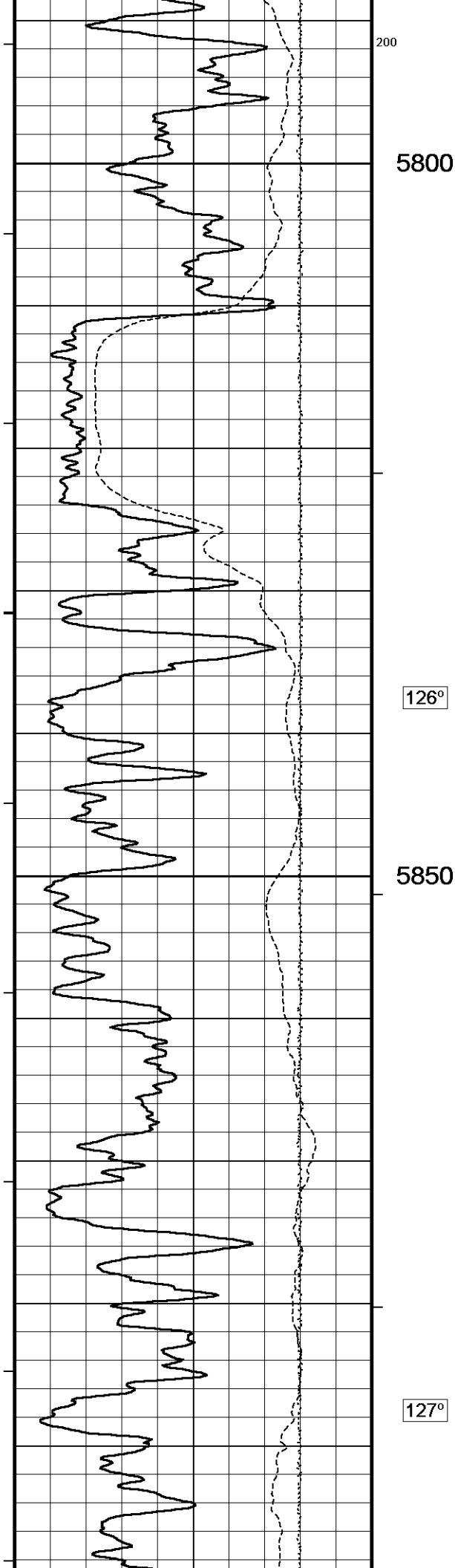
Shallow FE

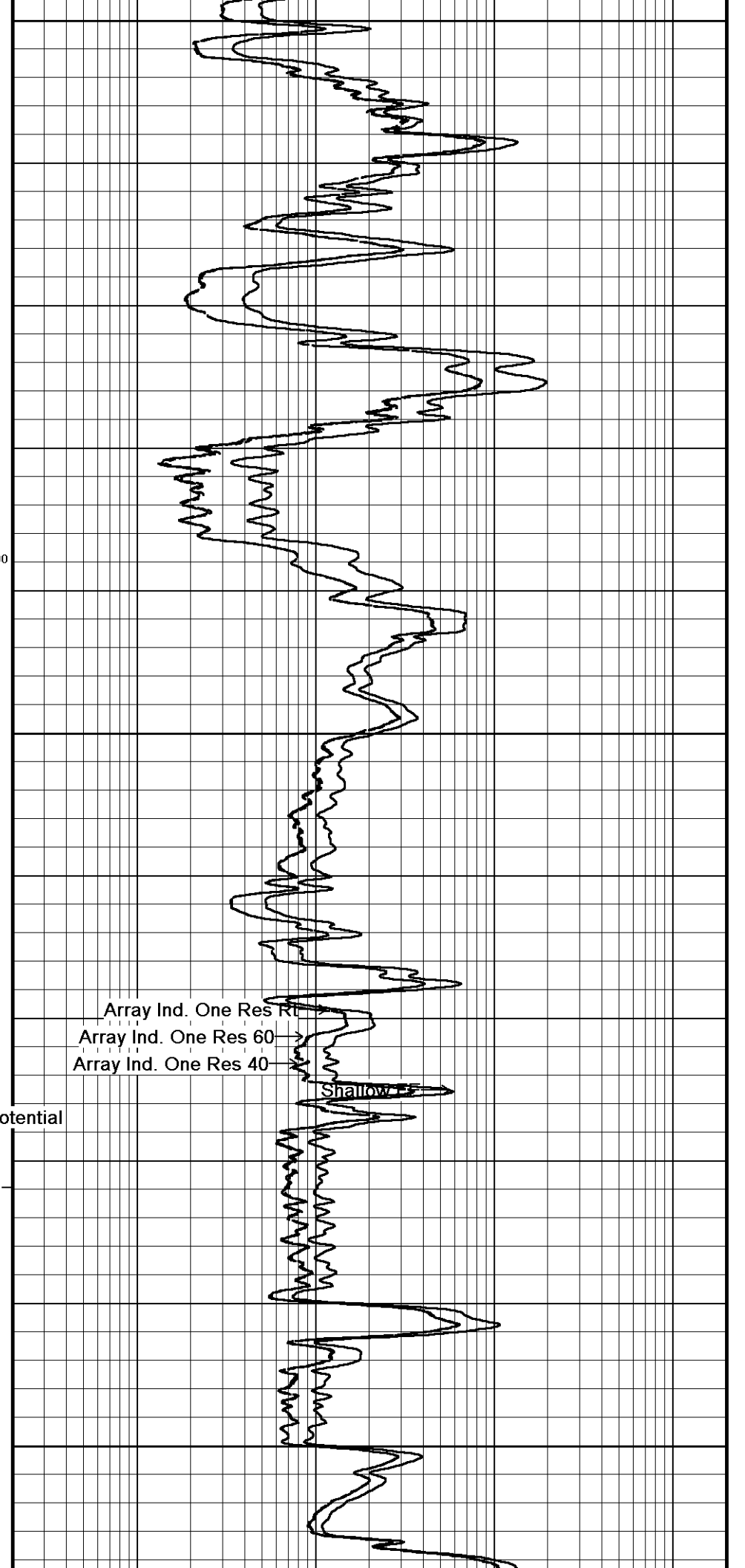
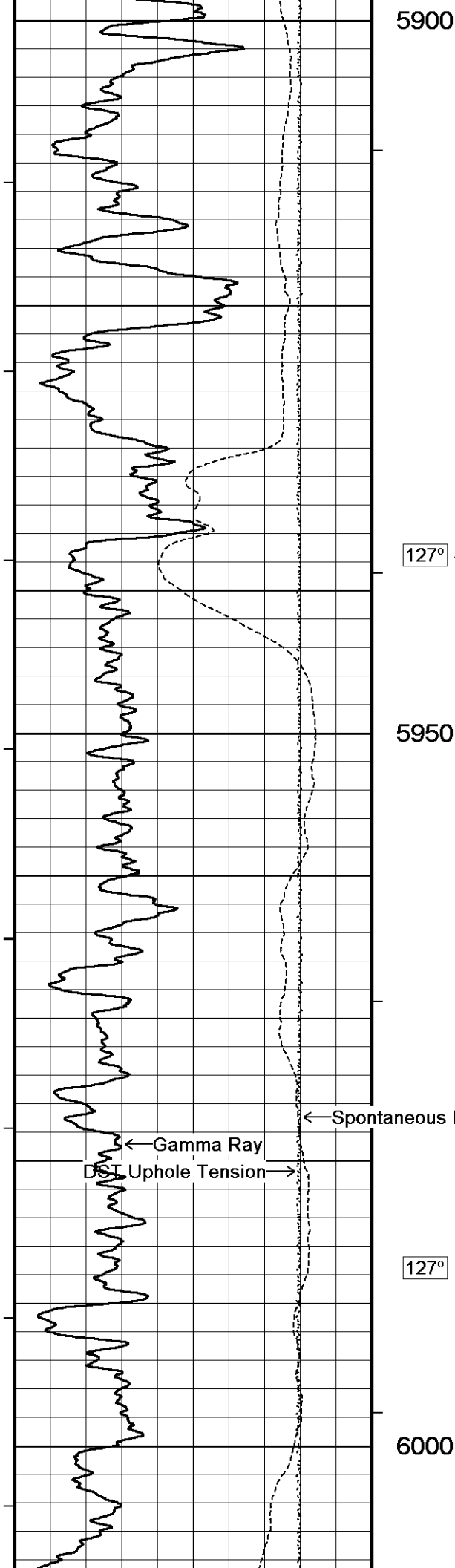


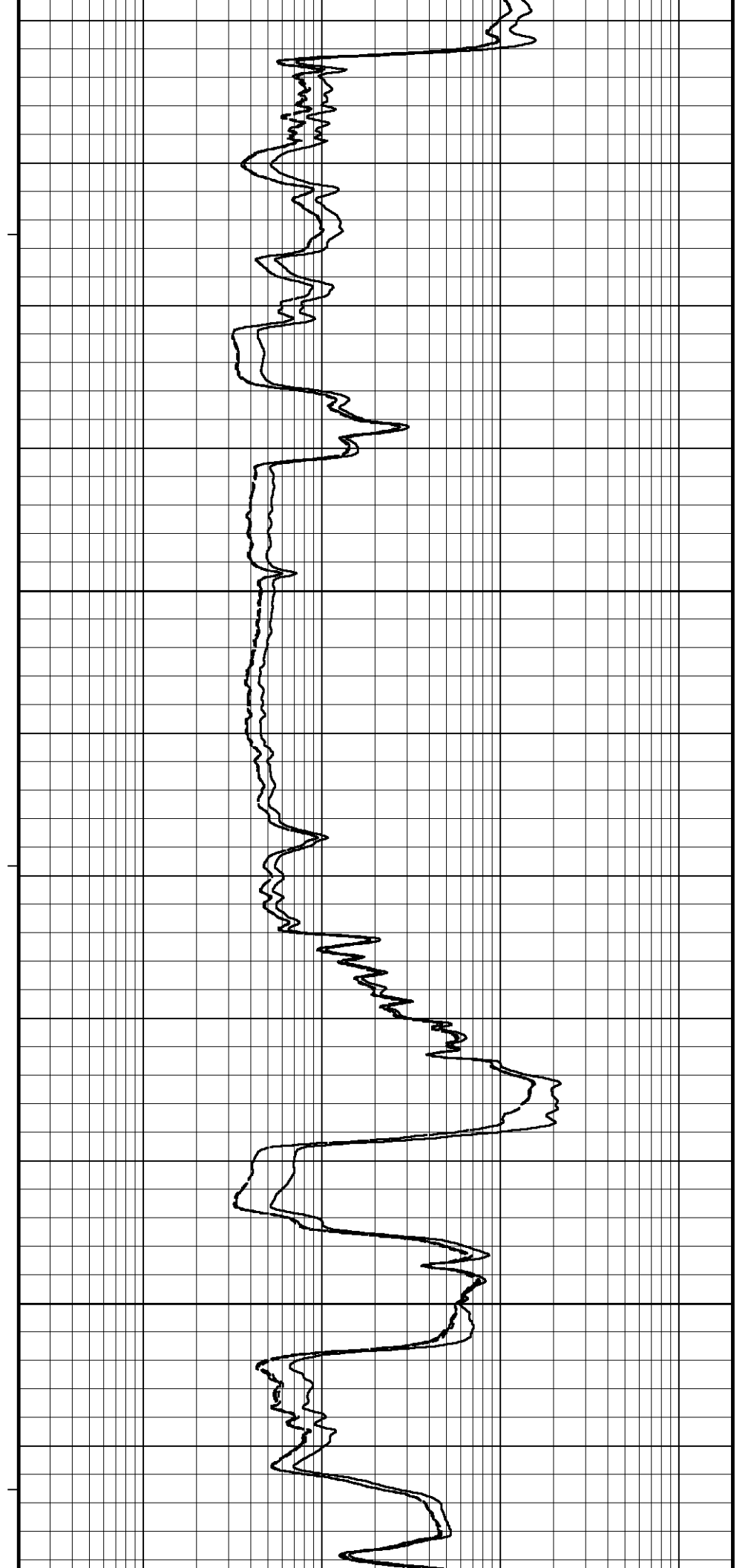
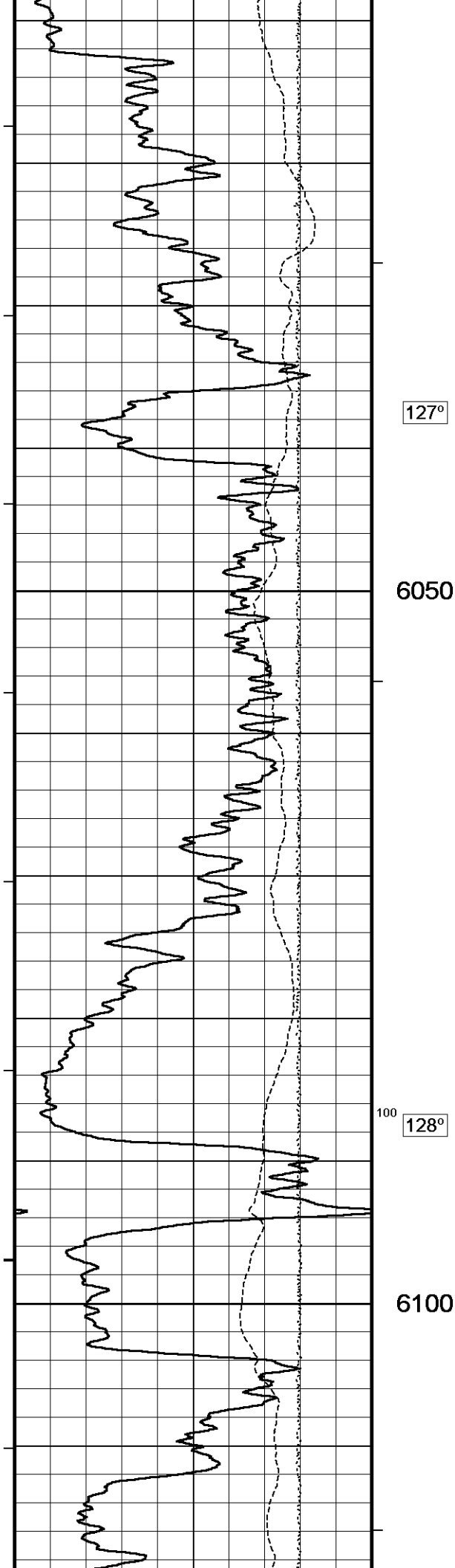


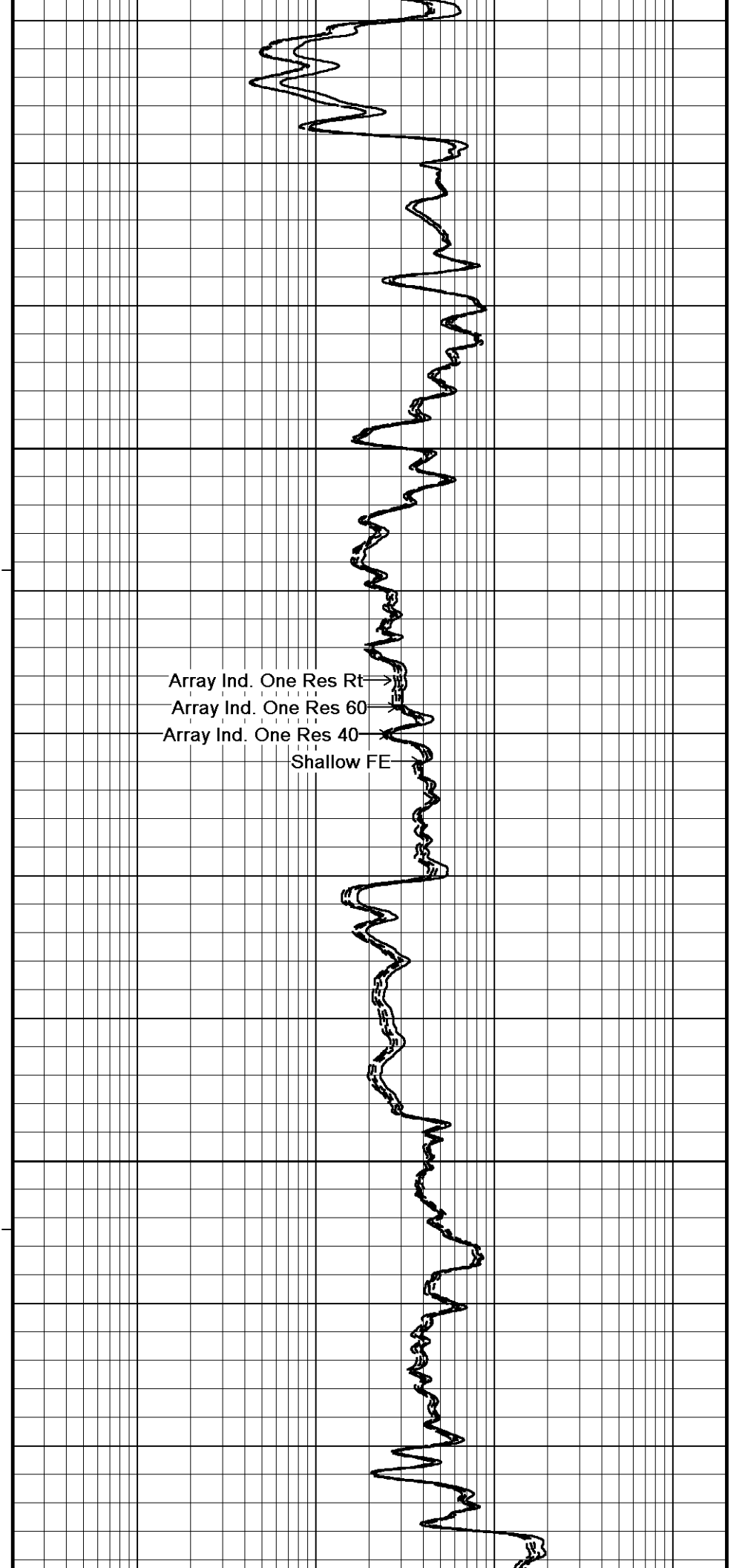
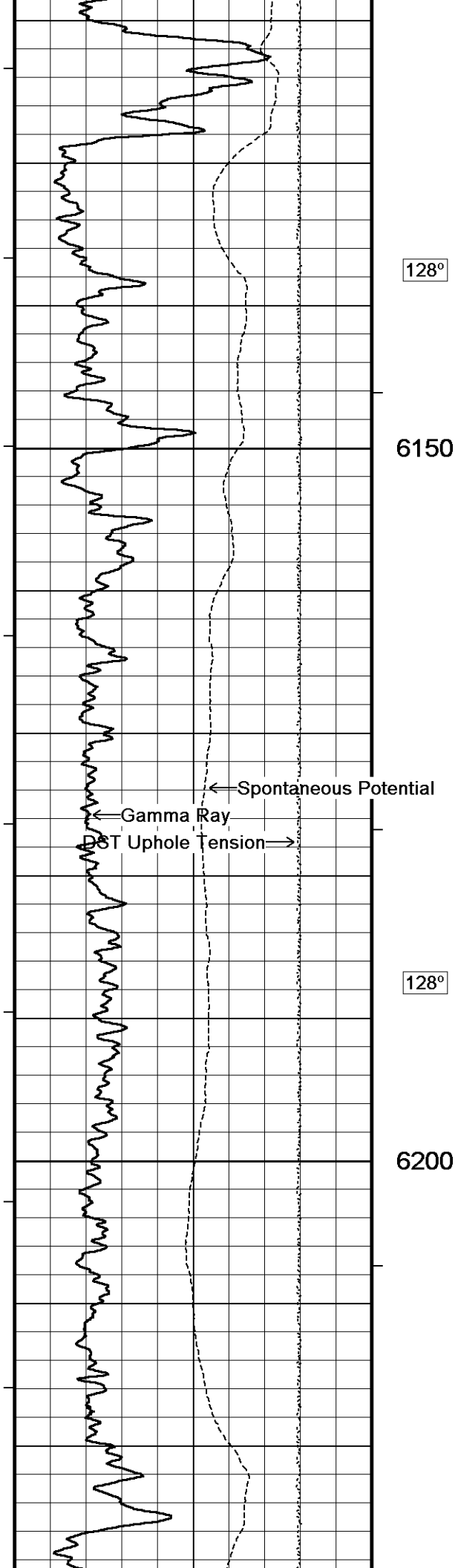


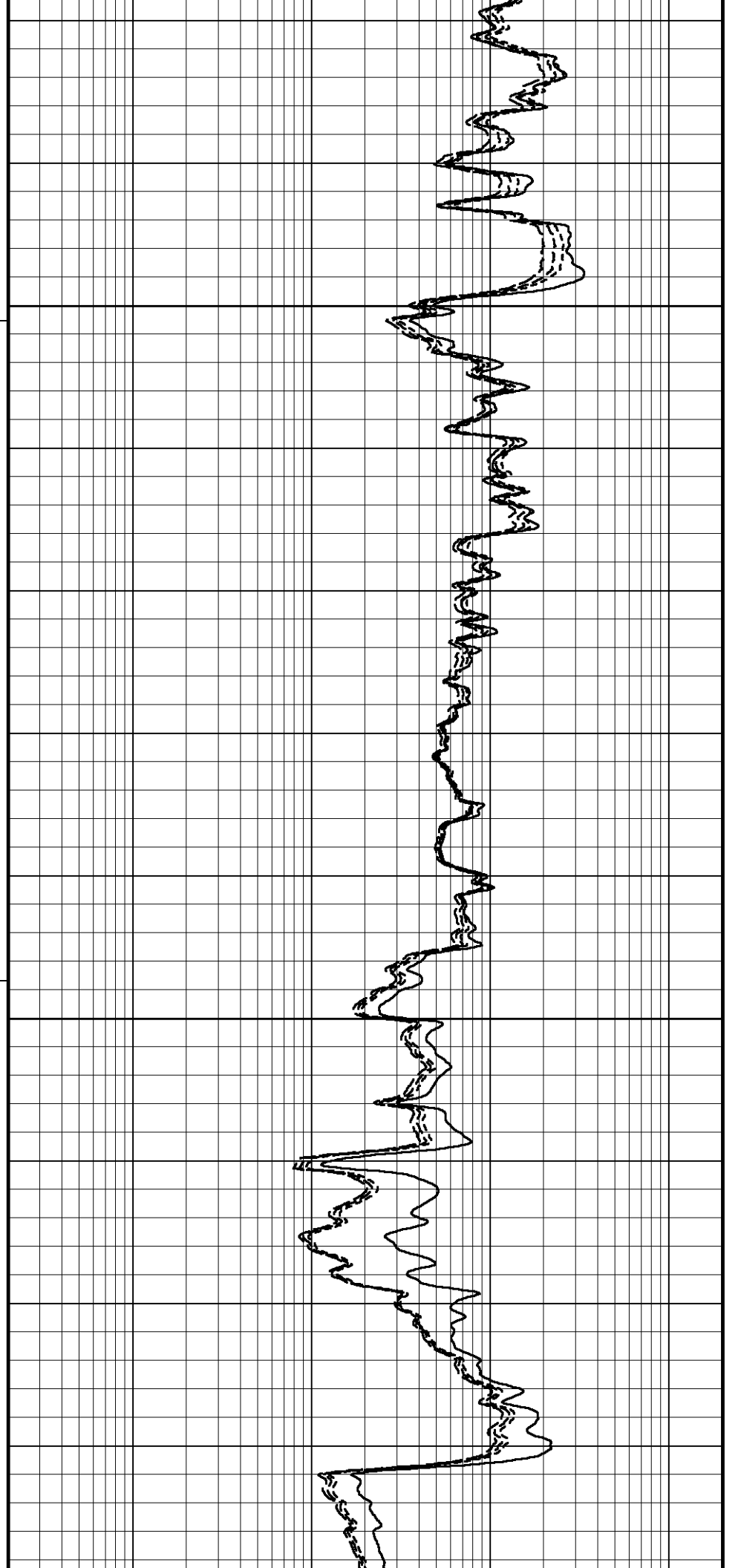
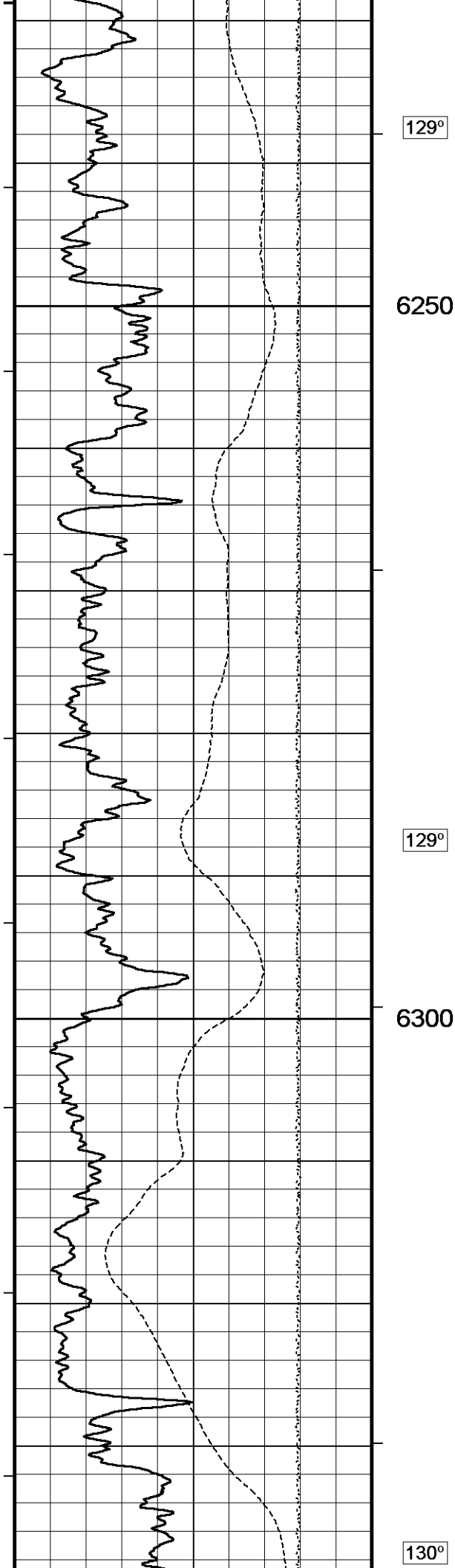


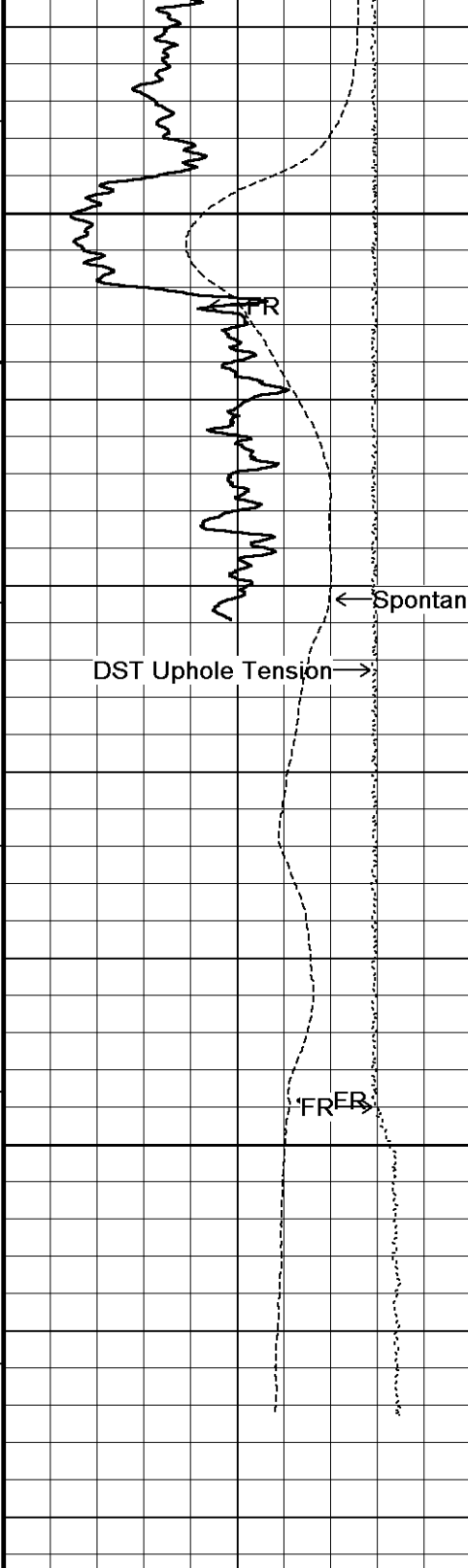












6350

Spontaneous Potential

DST Uphole Tension

FR

6400

6422
Depth in Feet

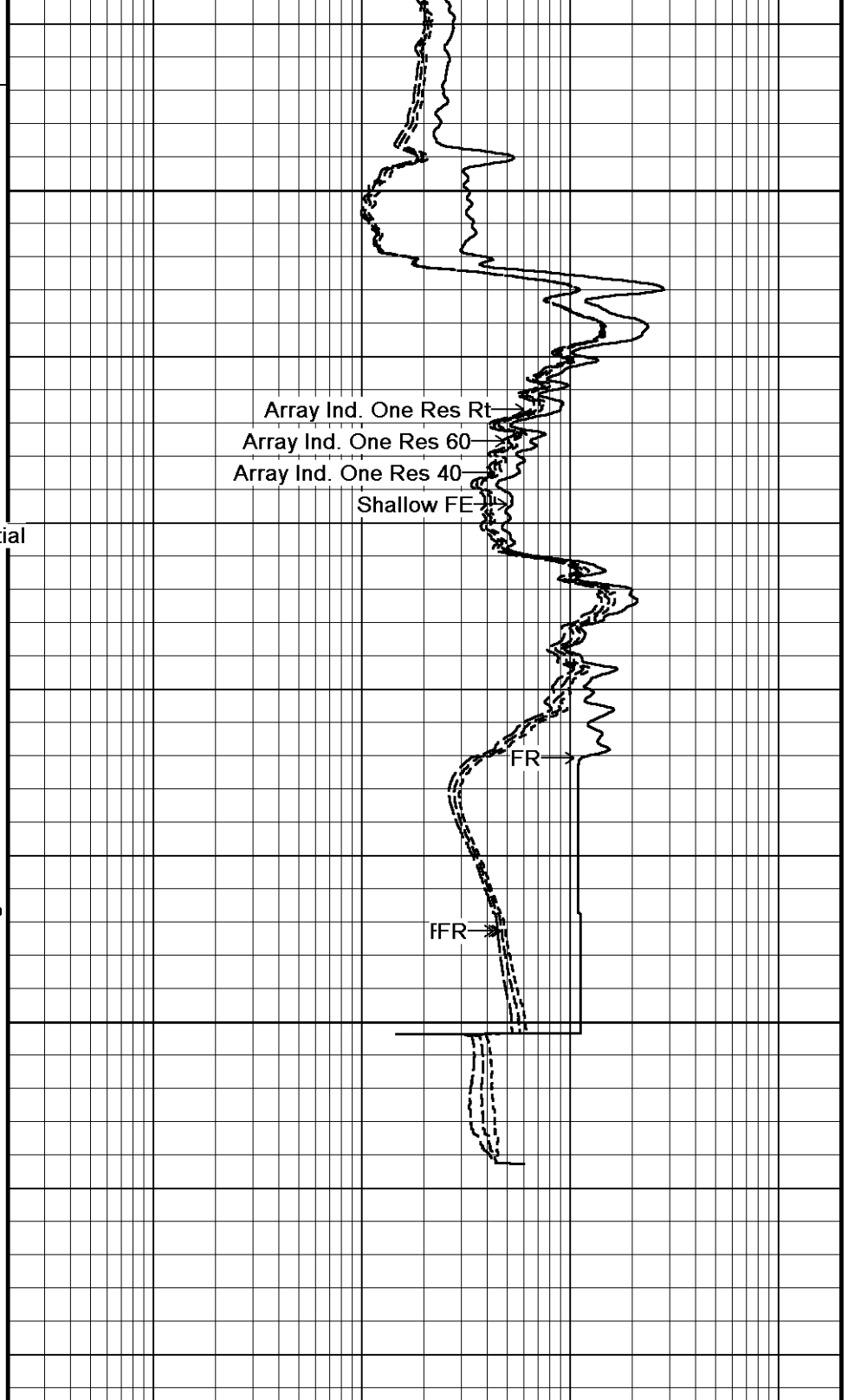
Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150
150 225 300

Spontaneous Potential
millivolts

Borehole Temp in deg F
HVI every 10 cu ft

Annular Integral



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

FR

IFR

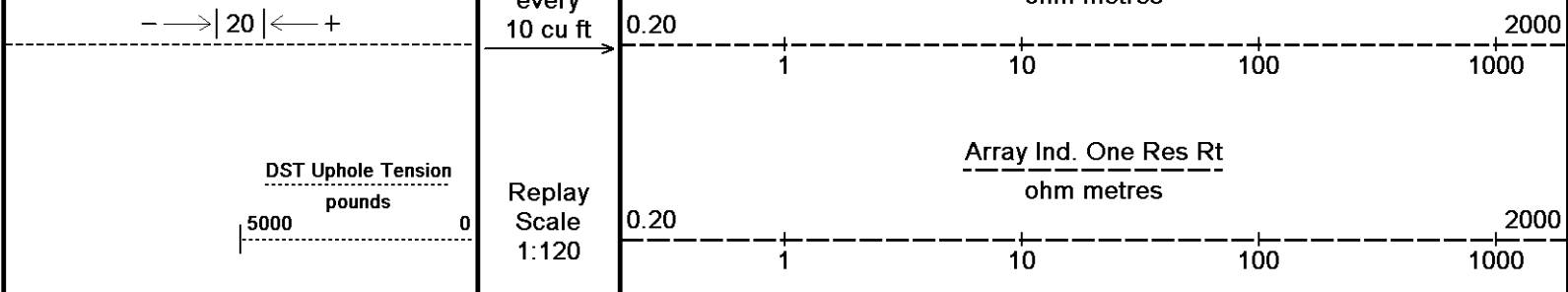
Shallow FE
ohm metres

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



Depth Based Data - Maximum Sampling Increment 2.5cm
 Plotted on 05-AUG-2013 15:04
 Filename: C:\Minimus 13.05.9583\Log\O'Brien Colton #1-33\O'Brien Colton #1-33_001.dta
 Recorded on 05-AUG-2013 11:05
 System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583

10 INCH HI-RES

BEFORE SURVEY CALIBRATION
 C:\Minimus 13.05.9583\Log\O'Brien Colton #1-33\O'Brien Colton #1-33_002.dta

General Constants All 000			Last Edited on 05-AUG-2013,10:30	
General Parameters				
Mud Resistivity	0.930	ohm-metres		
Mud Resistivity Temperature	103.000	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	4.500	inches		
Caliper for Differential Caliper	Density Caliper			
Rwa Parameters				
Porosity used	Base Density Porosity			
Resistivity used	Array Ind. Six Res Rt			
RWA Constant A	1.000			
RWA Constant M	2.000			
SW/APOR Tool Source	0.000			

Down-hole Tension Calibration SMS 0		Field Calibration on 04-AUG-2013 18:05	
Reading No	Measured	Calibrated (lbs)	
1	13735.13	0.00	
2	14289.75	471.00	

Gamma Calibration MCG-B 39		Field Calibration on 04-AUG-2013 10:53	
	Measured	Calibrated (API)	
Background	64	43	
Calibrator (Gross)	1141	768	
Calibrator (Net)	1077	725	

Gamma Constants MCG-B 39		Last Edited on 05-AUG-2013,09:22	
Gamma Calibrator Number	GRC38		
Mud Density	1.10	gm/cc	
Caliper Source for Processing	Density Caliper		
Tool Position	Eccentred		
Concentration of KCl		kppm	
K Mud Type	Chloride		
K Mud Concentration	0.00	%	

SP Calibration MCG-B 39		Field Calibration on 30-JUL-2013,09:41	
	Measured	Calibrated (mV)	
Reference 1	105.8	100.0	
Reference 2	-94.3	-100.0	

High Resolution Temperature Calibration MCG-B 39

		Measured	Calibrated(Deg F)	Field Calibration on 30-JUL-2013,09:41
Lower		50.00	50.00	
Upper		75.00	75.00	
High Resolution Temperature Constants MCG-B 39				Last Edited on 30-JUL-2013,09:41
Pre-filter Length		11		
Caliper Calibration MML-A 3				Base Calibration on 05-JUN-2013 15:43 Field Calibration on 04-AUG-2013 10:46
Base Calibration				
Reading No		Measured	Calibrator Size (in)	
1		14624	5.98	
2		17958	7.97	
3		21263	9.86	
4		25213	11.92	
5		0	0.00	
6		N/A	N/A	
Field Calibration				
		Measured Caliper (in)	Actual Caliper (in)	
		6.15	5.98	
Micro Normal and Micro Inverse Calibration MML-A 3				Base Calibration on 05-JUN-2013 15:36 Field Check on 04-AUG-2013 10:47
Base Calibration				
Channel	Resistor 1	Measured Resistor 2	Calibrated (ohm-m) Resistor 1 Resistor 2	
Micro Normal	12.2	60.2	5.0 25.0	
Micro Inverse	15.7	78.3	5.0 25.0	
Channel	Base Check (ohm-m)		Field Check (ohm-m)	
Micro Normal	63.0		63.0	
Micro Inverse	48.2		48.2	
Micro Normal and Micro Inverse Constants MML-A 3				Last Edited on 05-AUG-2013,09:22
Pad Type	8-12 in Soft Rubber Inflatable 006-9011-159			
Micro Normal K Factor	1.0000			
Micro Inverse K Factor	1.0000			
Standoff Offset	N/A inches			
Neutron Calibration MDN-A.B 66				Base Calibration on 31-JUL-2013 10:25 Field Check on 04-AUG-2013 10:58
Base Calibration				
		Measured	Calibrated (cps)	
	Near	Far	Near	Far
	3180	99	3714	110
Ratio	32.180		33.764	
Field Calibrator at Base			Calibrated (cps)	
			1617	2323
Ratio			0.696	
Field Check			Calibrated (cps)	
			1624	2337
Ratio			0.697	
Neutron Constants MDN-A.B 66				Last Edited on 05-AUG-2013,09:22
Neutron Source Id	P0204NN			
Neutron Jig Number	5824NE			
Epithermal Neutron	No			
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 353		Base Calibration on 22-MAY-2013 08:22 Field Check on 04-AUG-2013 10:23
Base Calibration		
	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	964.9	126.8
Base Check		280.9
Field Check		280.8
FE Constants MFE-B.J 353		Last Edited on 05-AUG-2013,09:22
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 167		Base Calibration on 19-APR-2013,13:41 Field Check on 04-AUG-2013 10:21
Base Calibration		
Test Loop Calibration		
Channel	Measured	Calibrated (mmho/m)
	Low High	Low High
1	17.3 474.2	9.3 966.2
2	6.3 388.4	7.6 821.4
3	3.3 259.4	5.2 566.0
4	1.9 133.0	2.6 279.2
Array Temperature	76.8	Deg F
Channel	Base Check (mmho/m)	Field Check (mmho/m)
	Low High	Low High
1		13.4 3838.7
2		29.7 3476.3
3		29.2 3052.4
4		19.8 2081.3
Deep		18.7 2048.6
Medium		42.3 3990.3
Shallow		43.1 5053.2
Array Temperature		78.6 Deg F
Induction Constants MAI-A.A 167		Last Edited on 05-AUG-2013,09:22
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	60.00	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 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 167

Field Calibration on 30-JUL-2013,09:41

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

High Resolution Temperature Constants MAI-A.A 167

Last Edited on 30-JUL-2013,09:41

Pre-filter Length	11
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Caliper Calibration MPD-B 64

Base Calibration on 04-AUG-2013 10:37
Field Calibration on 04-AUG-2013 10:38

Base Calibration			
Reading No	Measured	Calibrator Size (in)	
1	15388	3.99	
2	24325	5.98	
3	32740	7.97	
4	41178	9.86	
5	50491	11.92	
6	N/A	N/A	
Field Calibration			
	Measured Caliper (in)	Actual Caliper (in)	
	6.00	5.98	

Photo Density Calibration MPD-B 64

Base Calibration on 10-JUL-2013 10:09
Field Check on 04-AUG-2013 10:44

Density Calibration				
Base Calibration		Measured	Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	60252	33858	59556	30836
Reference 2	25108	2914	24941	2541
Field Check at Base				
	1163.0	1342.8		
Field Check				
	1165.2	1346.7		
PE Calibration				
Base Calibration		Measured	Calibrated	
	WS	WH	Ratio	Ratio
Background	211	1034		
Reference 1	22924	60048	0.385	0.371
Reference 2	6861	24971	0.278	0.272
Field Check at Base				
	210.7	1033.8		
Field Check				
	211.1	1036.7		

Density Source Id	18235B	
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	1.10	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 (m)
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

DOWNHOLE EQUIPMENT

C:\Minimus 13.05.9583\Log\O'Brien Colton #1-33\O'Brien Colton #1-33_002.dta

3/8" Triple Cone Cable Head (MCB C A)
MCB-C.A 5 LG: 1.58 ft WT: 15.4 lb OD: 2.24 in

Compact Comms Gamma
MCG-B 39 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

Compact Micro-log
MML-A 3 LG: 7.97 ft WT: 81.6 lb OD: 2.24 in

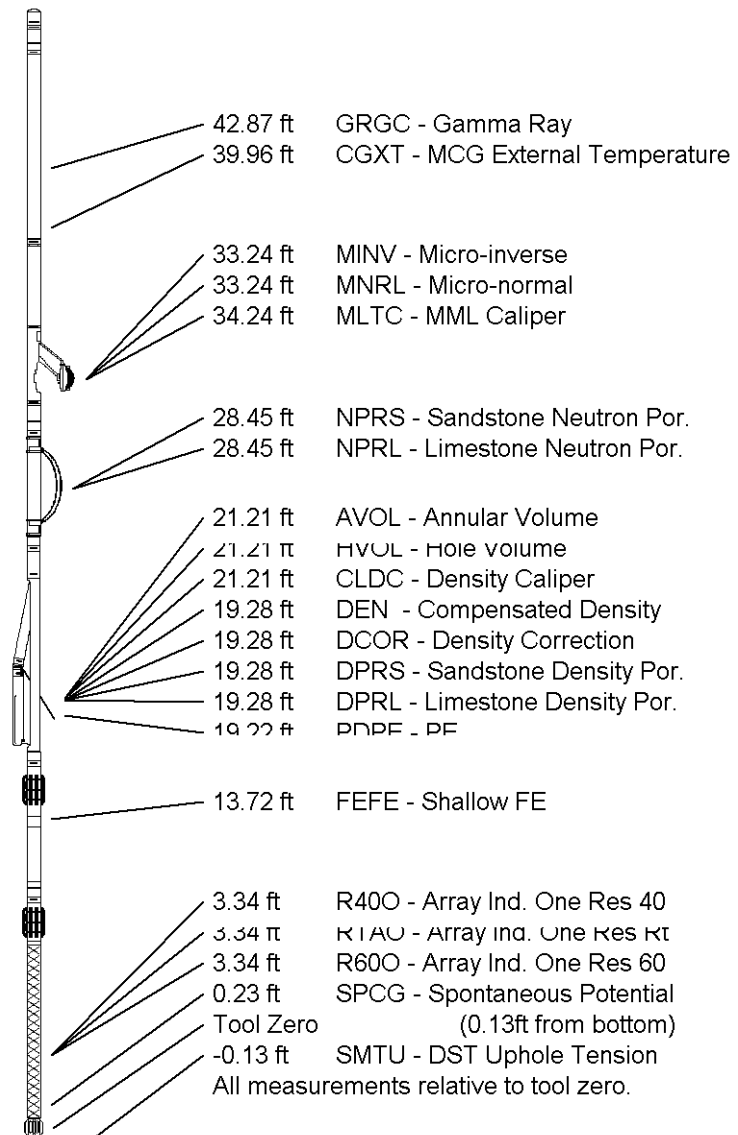
Compact Neutron
MDN-A.B 66 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Density/Caliper
MPD-B 64 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

Compact Focussed Electric
MFE-B.J 353 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

Compact Induction
MAI-A.A 167 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 49.73 ft Weight: 399.0 lb



COMPANY O'BRIEN ENERGY RESOURCES CORP.
WELL COLTON #1-33
FIELD NOVINGER
PROVINCE/COUNTY MEADE
COUNTRY/STATE U.S.A. / KANSAS

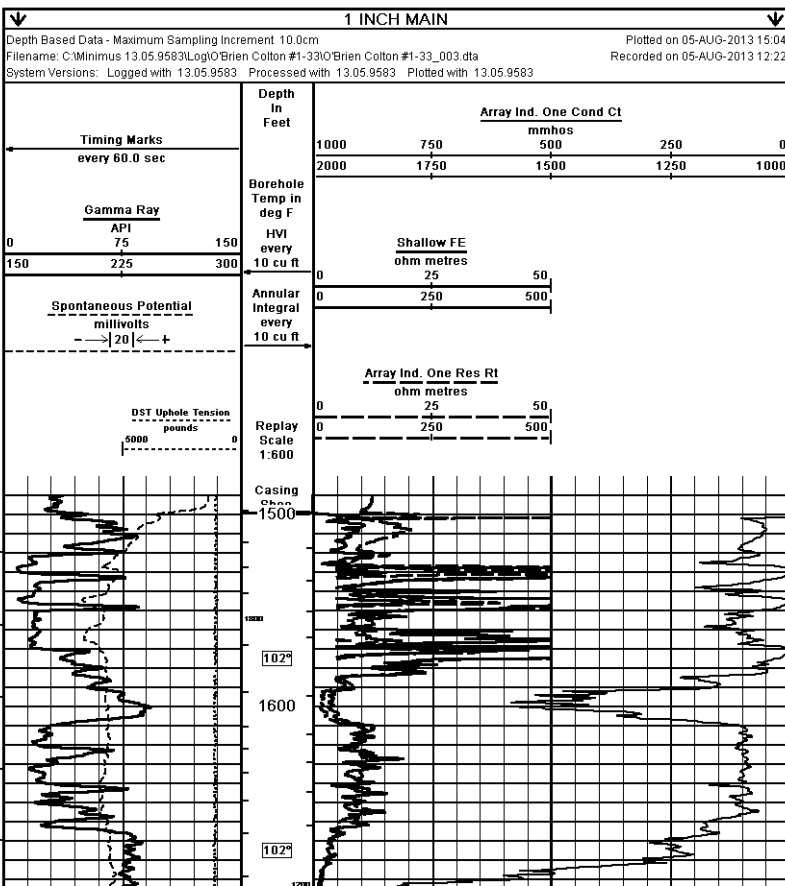
Elevation Kelly Bushing	2712.00	feet	First Reading	6395.00	feet
Elevation Drill Floor	2711.00	feet	Depth Driller	6400.00	feet
Elevation Ground Level	2701.00	feet	Depth Logger	6398.00	feet

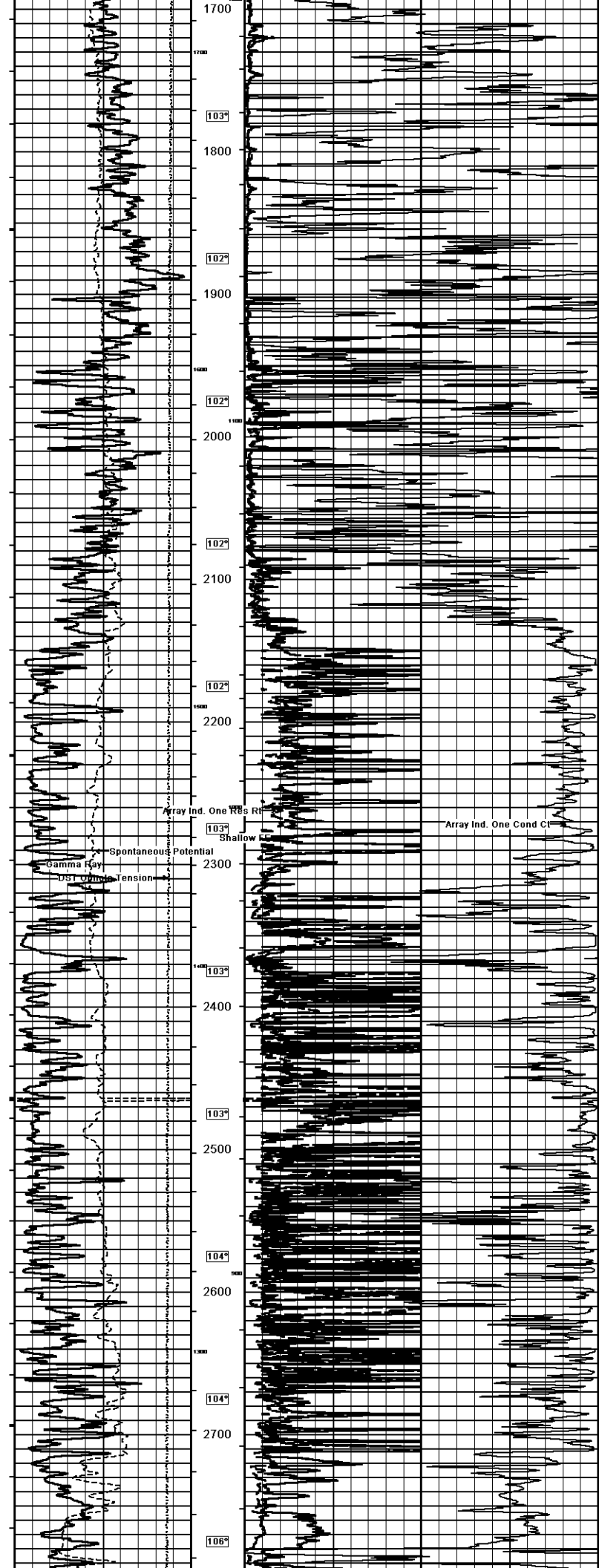


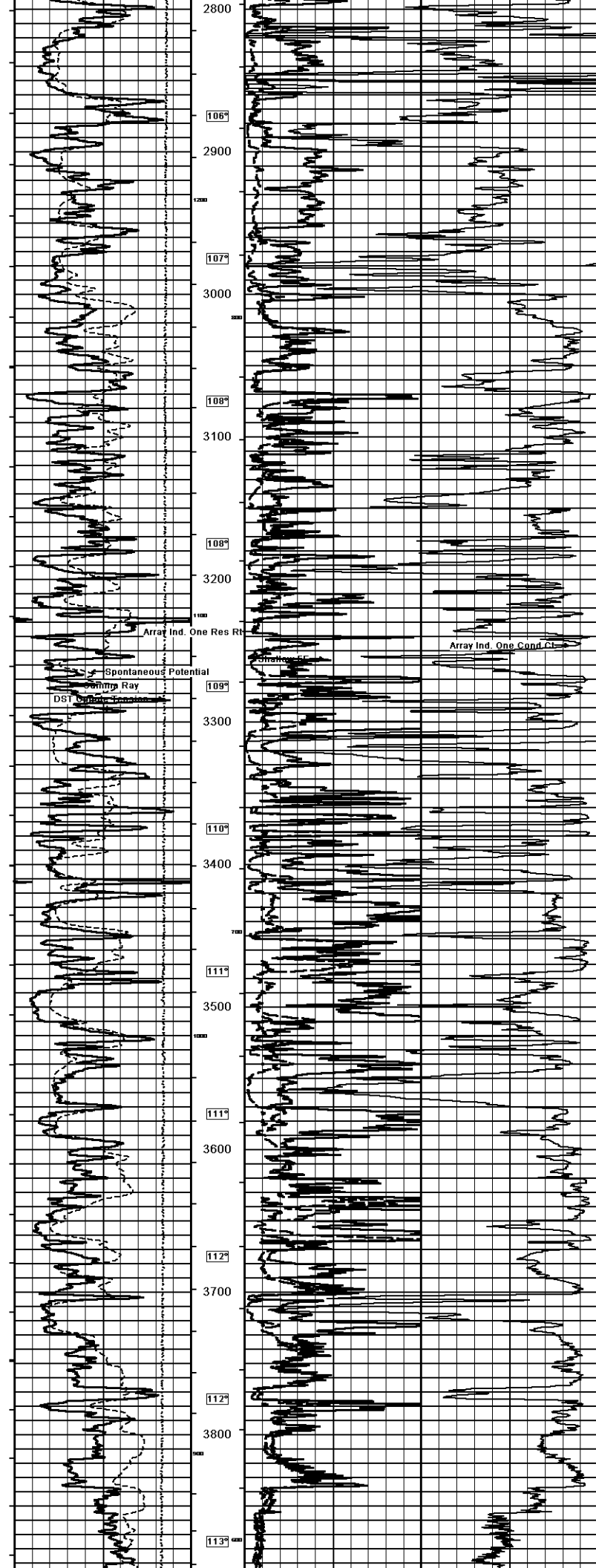
ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG

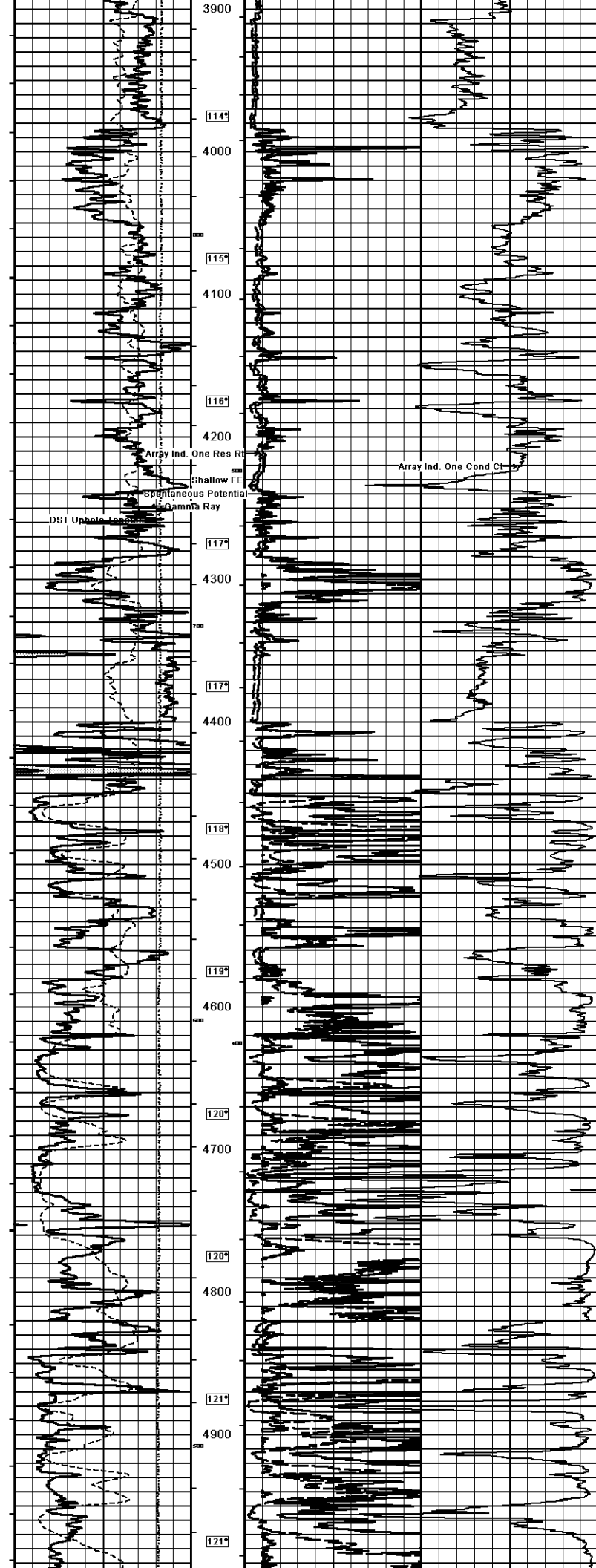
Weatherford®

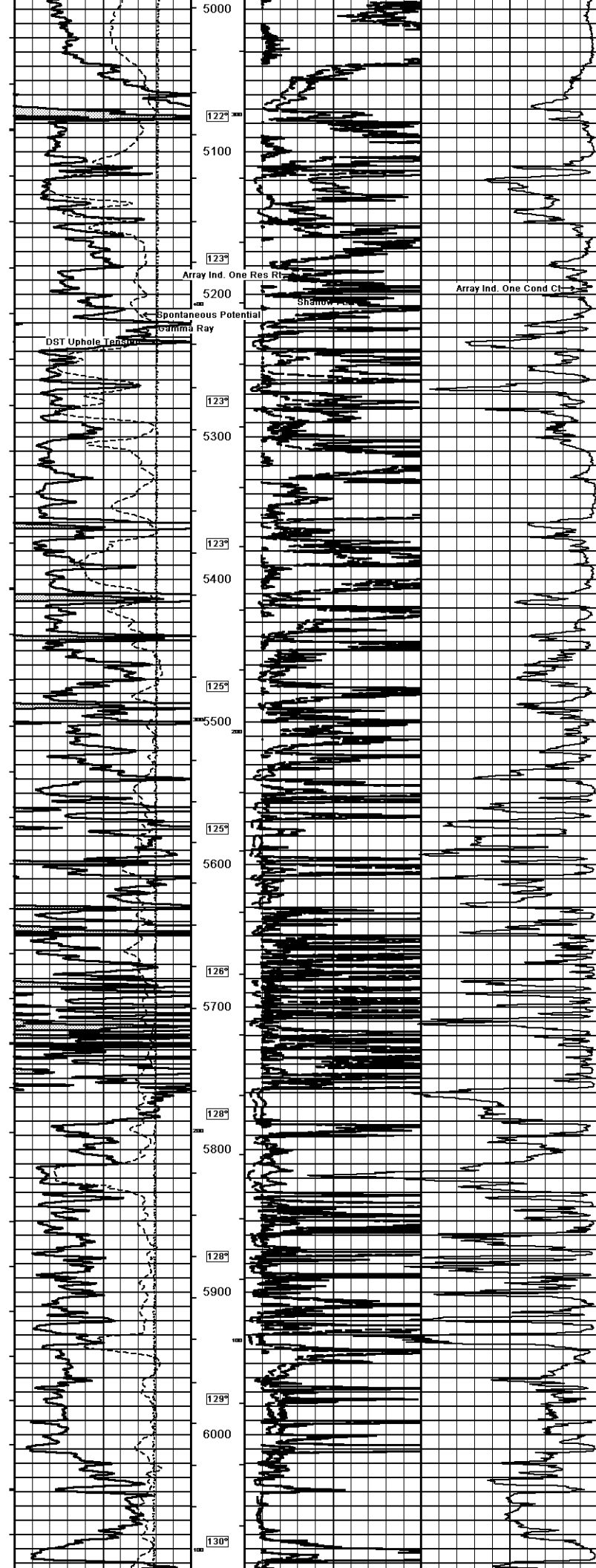
Weatherford		ARRAY INDUCTION SHALLOW FOCUSED ELECTRIC LOG	
COMPANY O'BRIEN ENERGY RESOURCES CORP.			
WELL COLTON #1-33			
FIELD NOVINGER			
PROVINCE/COUNTY MEADE			
COUNTRY/STATE U.S.A. / KANSAS			
LOCATION 1887' FSL & 1887' FEL			
SEC 33	TIME 3:35	DATE 15-11-2013	TIME 3:04
WELL NUMBER 15-119-21345	WELL NAME MFL		
Permanent Datum Q.L. Elevation 2701 feet			
Log Measured From RB			
Drilling Measured From RB			
Date 05-AUG-2013	Run Number ONE		
Service Order 3539956	Depth Driller 6400.00		
Depth Logger 6398.00	First Reading 6395.00		
Last Reading 1499.00	Casing Driller 1500.00		
Casing Logger 1499.00	Bit Size 7.875		
Hole Fluid Type CHEMICAL	Density/Viscosity 9.15 INDUSG 52.00 CP		
PH/FULL LOSS MUDPIT	Sample Source 8.40 ml/30min		
Run @ Measured Temp 0.93 @ 03.0	Run @ Measured Temp 0.74 @ 03.0		
Run @ Measured Temp 1.12 @ 03.0	Run @ Measured Temp 0.73 @ 32.0		
Source From R/m CALC	Source From R/m CALC		
Run @ BHT 0.73 @ 32.0	Time Since Circulation 5 HOURS		
Max Recorded Temp 132.00	deg F		
Equipment Base 13096	LIB		
Witnessed By ADAM SILL	ROGER PEARSON		
LOG # 1813-222			

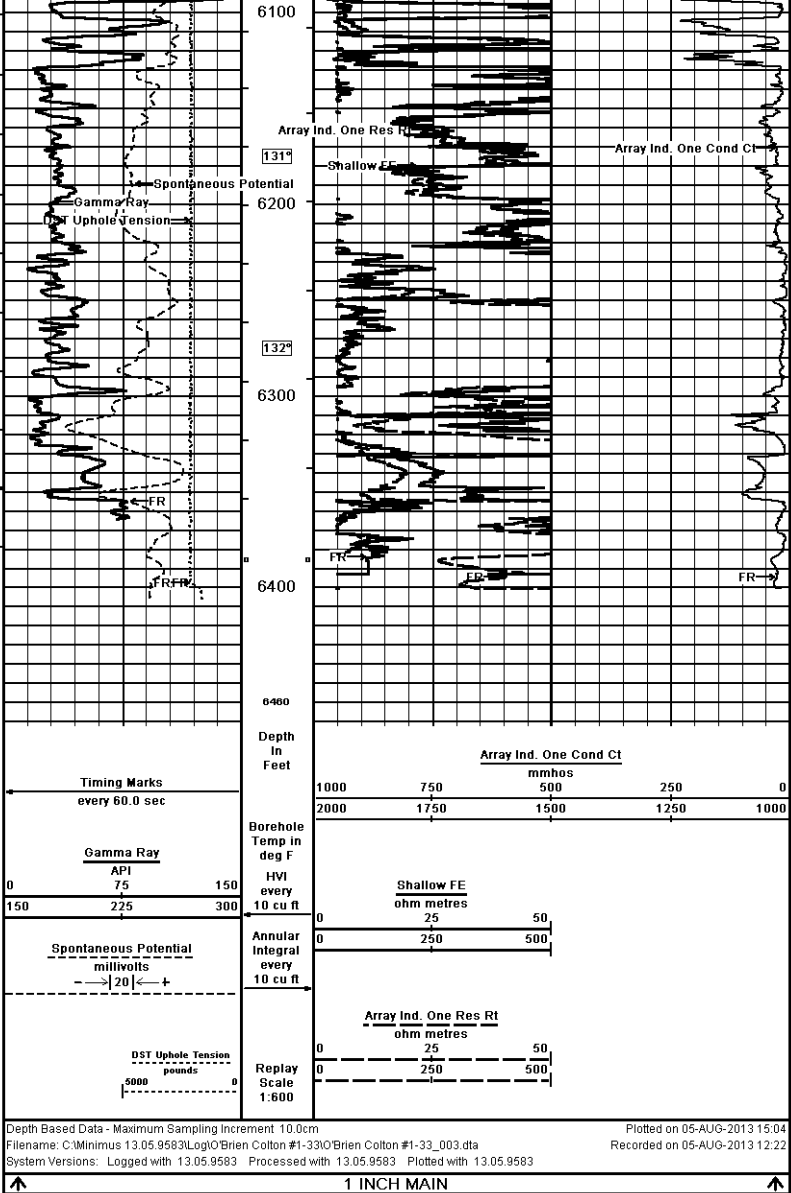












COMPANY		O'BRIEN ENERGY RESOURCES CORP.			
WELL		COLTON #1-33			
FIELD		NOVINGER			
PROVINCE/COUNTY		MEADE			
COUNTRY/STATE		U.S.A. / KANSAS			
Elevation Kelly Bushing	2712.00	feet	First Reading	6395.00	feet
Elevation Drill Floor	2711.00	feet	Depth Driller	6400.00	feet
Elevation Ground Level	2701.00	feet	Depth Logger	6398.00	feet
 Weatherford		ARRAY INDUCTION			
		SHALLOW FOCUSED			
		ELECTRIC LOG			