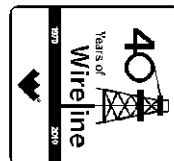




Weatherford

ARRAY INDUCTION SHALLOW FOCUSED ELECTRIC LOG



COMPANY	O'BRIEN ENERGY		
WELL	CROOKED CREEK #3-8		
FIELD	ANGELL SOUTH		
PROVINCE/COUNTY	MEADE		
COUNTRY/STATE	UNITED STATES / KANSAS		
LOCATION	660' FSL & 1650' FEL		
SEC	TWP	RGE	Other Services
8	33S	29W	MPD/MDN
API Number	15-119-21291		MML
Permit Number			
Permanent Datum G.L., Elevation 2687 feet			Elevations:
Log Measured From K.B. @ 12 FEET above Permanent Datum			KB
Drilling Measured From K.B.			DF
Date	12-MAY-2011		GL
Run Number	ONE		
Depth Driller	6330.00	feet	
Depth Logger	6330.00	feet	
First Reading	6327.00	feet	
Last Reading	1496.00	feet	
Casing Driller	1496.00	feet	
Casing Logger	1496.00	feet	
Bit Size	7.880	inches	
Hole Fluid Type	CHEMICAL		
Density / Viscosity	8.90 lb/USg	53.00 CP	
PH / Fluid Loss	10.50	7.80 ml/30Min	
Sample Source	FLOWLINE		
Rm @ Measured Temp	0.36 @ 91.0	ohm-m	
Rmf @ Measured Temp	0.29 @ 91.0	ohm-m	
Rmc @ Measured Temp	0.43 @ 91.0	ohm-m	
Source Rmf / Rmc	CALC	CALC	
Rm @ BHT	0.27 @120.0	ohm-m	
Time Since Circulation	4 HOURS		
Max Recorded Temp	120.00	deg F	
Equipment Name	COMPACT		
Equipment / Base	13025	LIB	
Recorded By	JUSTIN SCHEFFE		
Witnessed By	ROGER PEARSON		PETER DEBENHAM
S.O.	3529189		

BOREHOLE RECORD

Last Edited: 12-MAY-2011 10:30

Bit Size inches	Depth From feet	Depth To feet
7.880	1496.00	6330.00

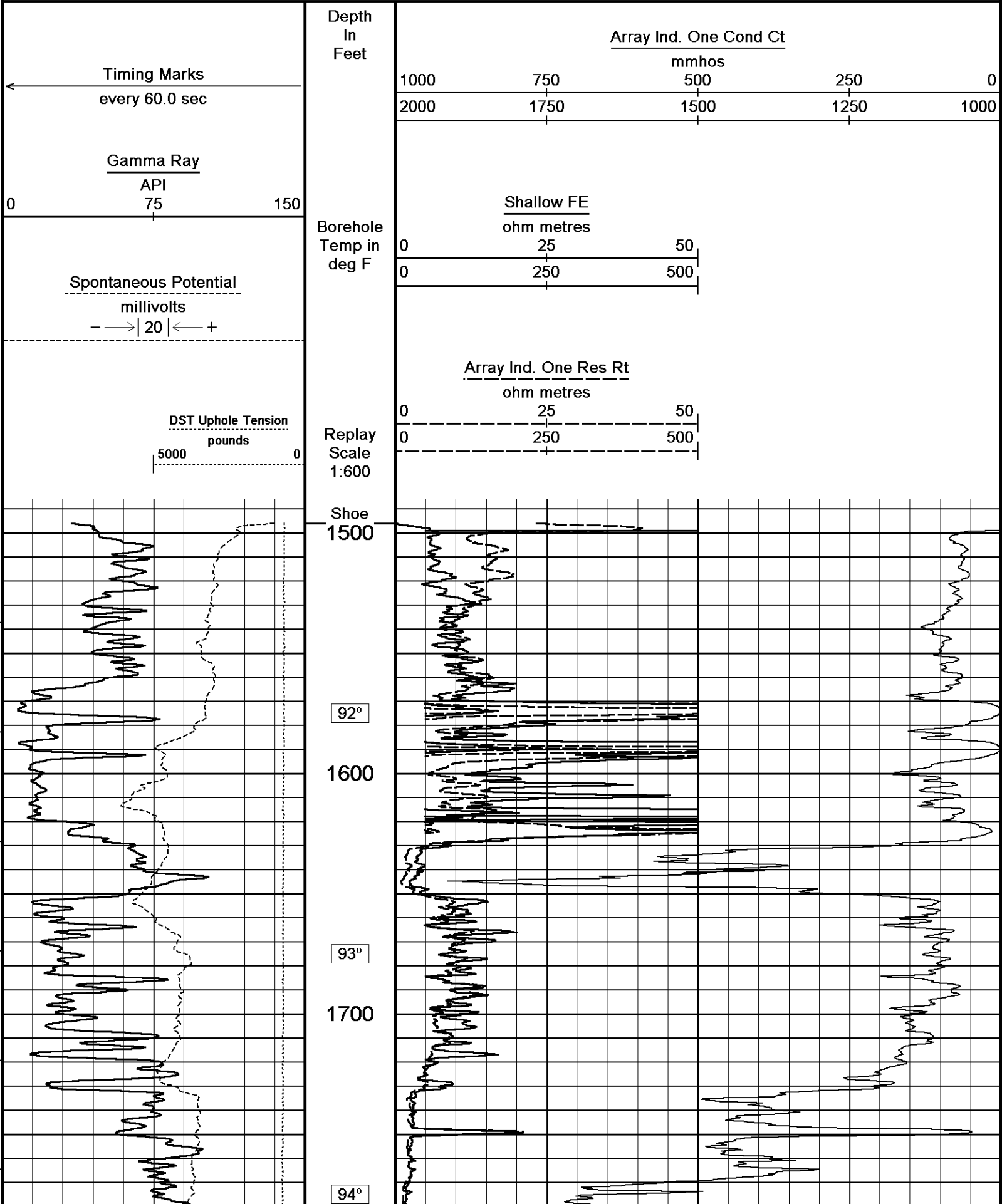
CASING RECORD

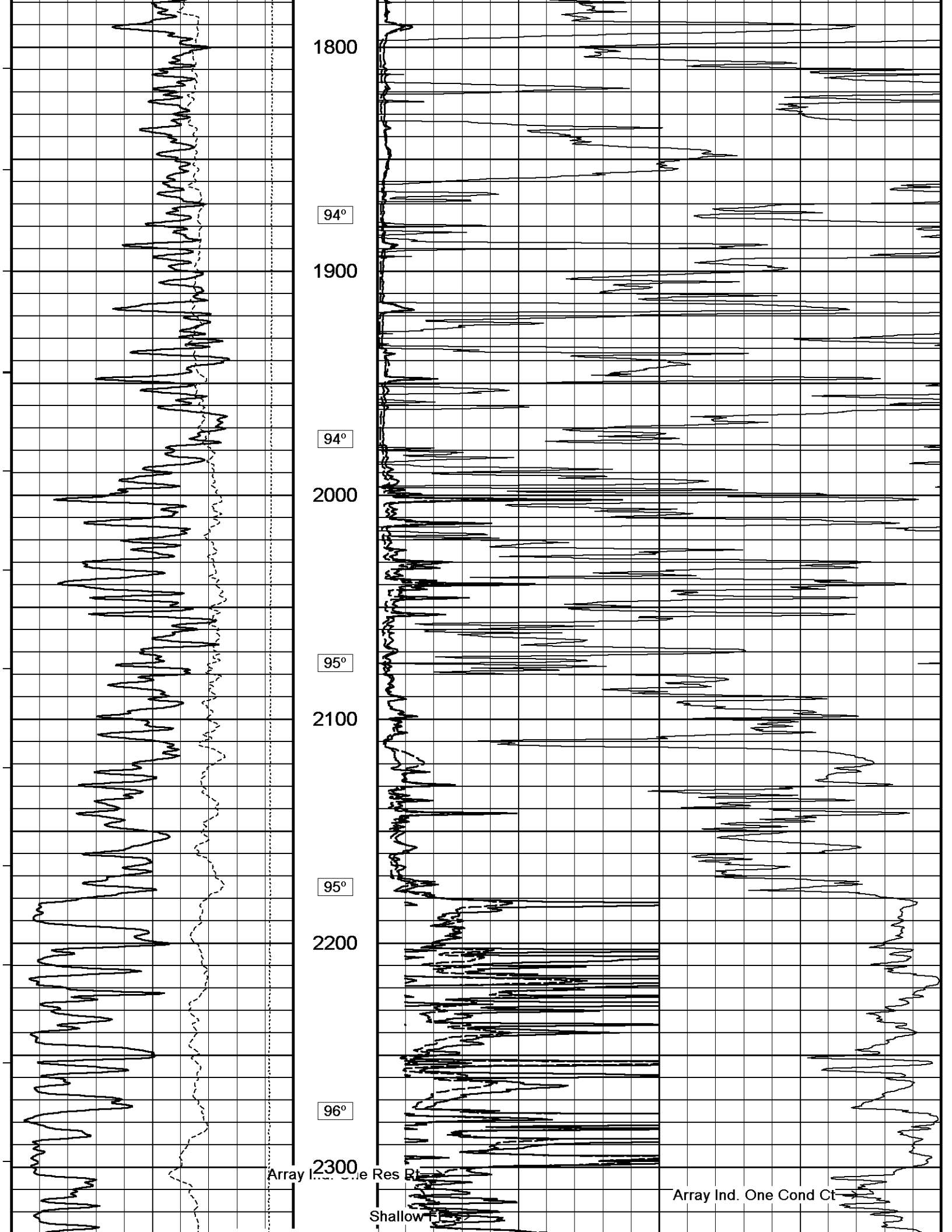
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	1496.00	24.00

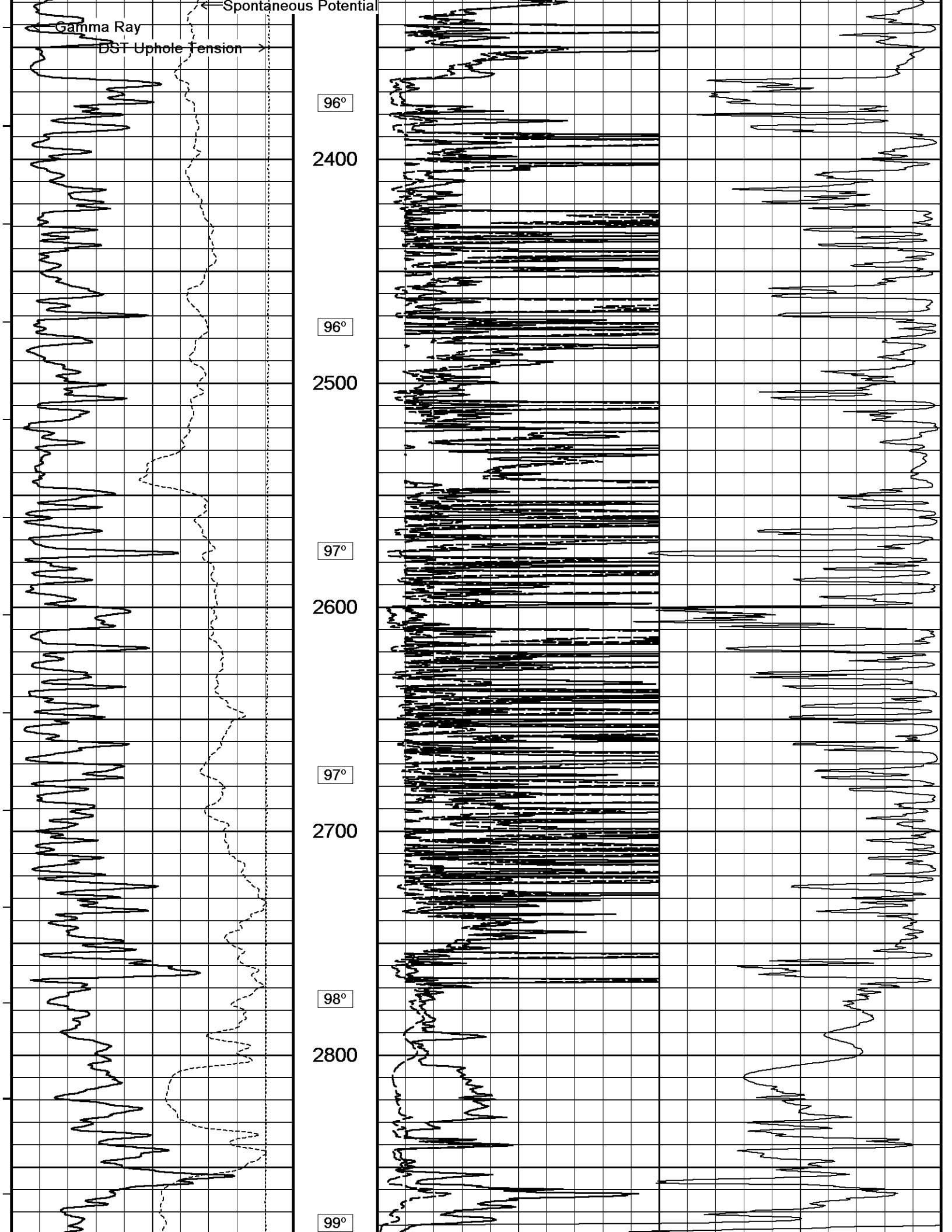
REMARKS

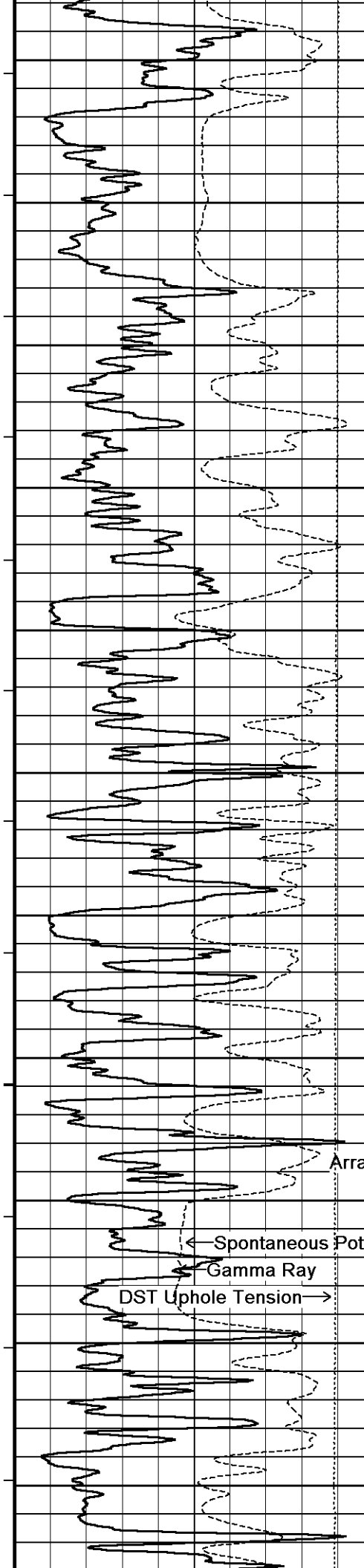
Tools Run: MAI, MPD, MCG, MDN, MFE, MML,
Hardware: MPD: 8 inch profile plate used. MAI and MFE: 0.5 inch standoffs used. MDN: Dual Eccentralizer used.
2.71 G/CC Limestone density matrix used to calculate porosity.
Borhole rugosity, tight pulls, and washouts will affect data quality.
All intervals logged and scaled per customer's request.
Annular volume with 4.5 inch production casing 560 Cubic Feet
Total hole volume to top of detail section 810 Cubic feet
Service order #3529189
Rig: Duke #6
Engineer: Justin Scheffe
Operator(s): Ken Rinehart

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.









2900

100°

3000

100°

3100

101°

3200

101°

3300

102°

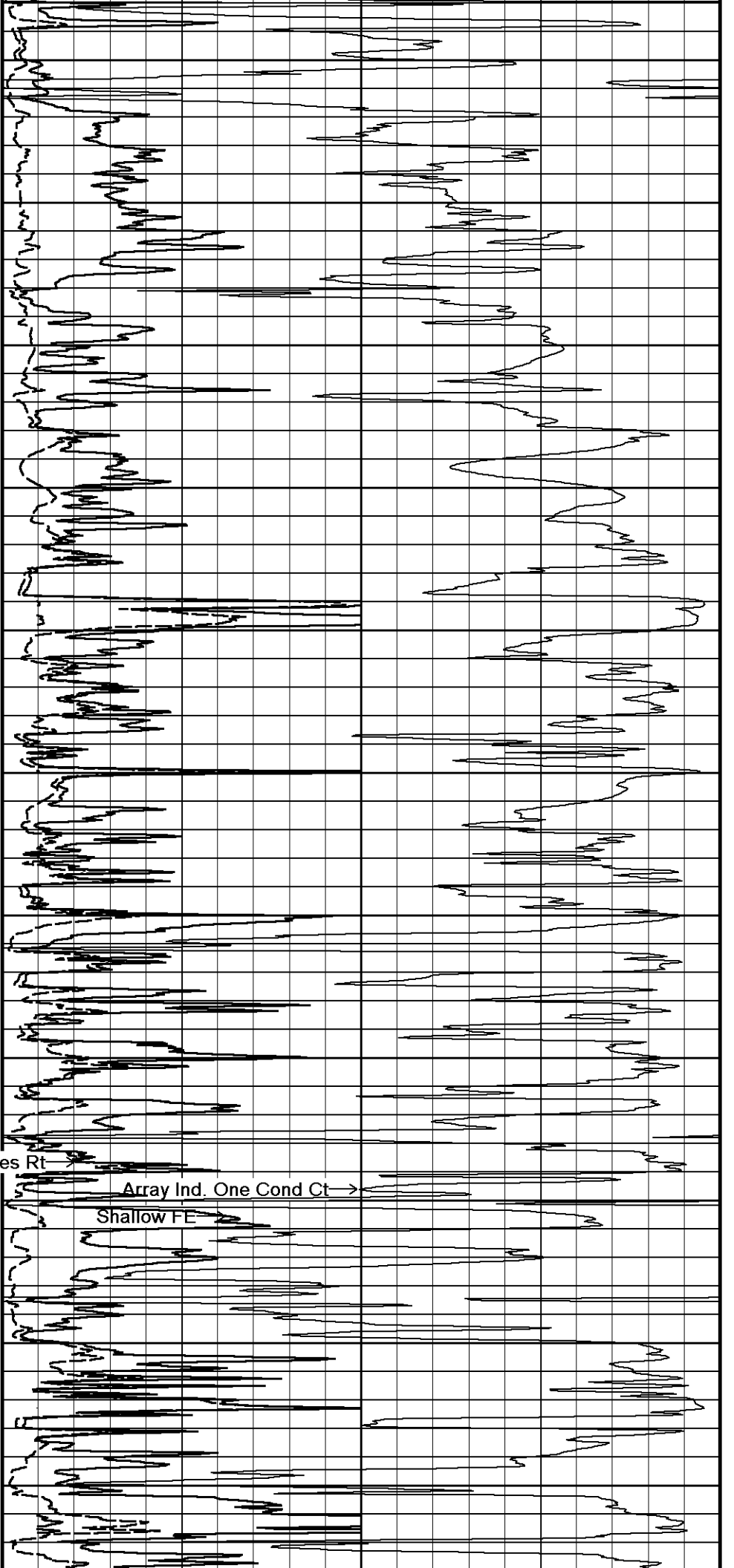
3400

Array Ind. One Res Rt

← Spontaneous Potential

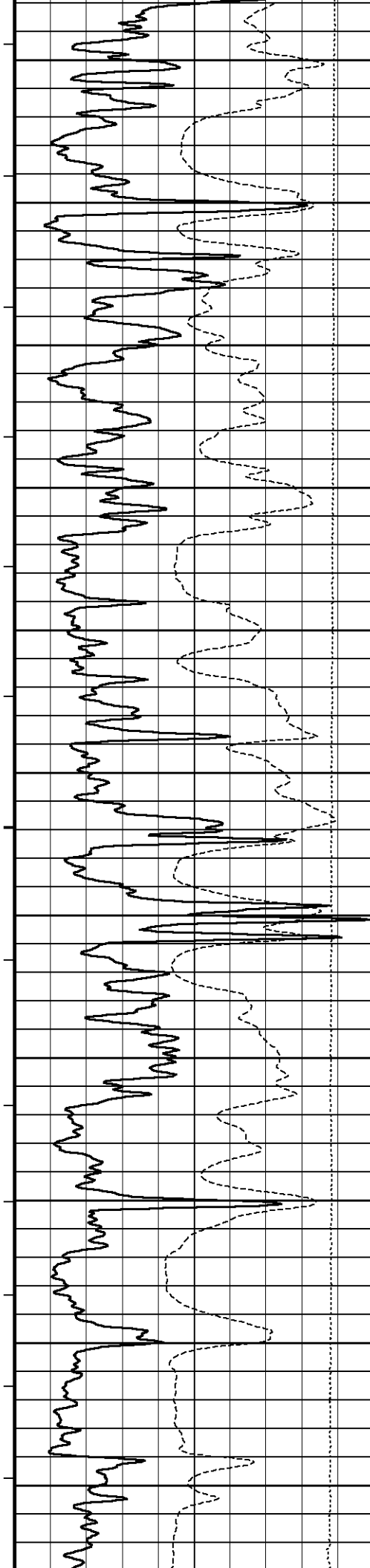
Gamma Ray

DST Uphole Tension →



Array Ind. One Cond Ct →

Shallow FE



102°

3500

103°

3600

104°

3700

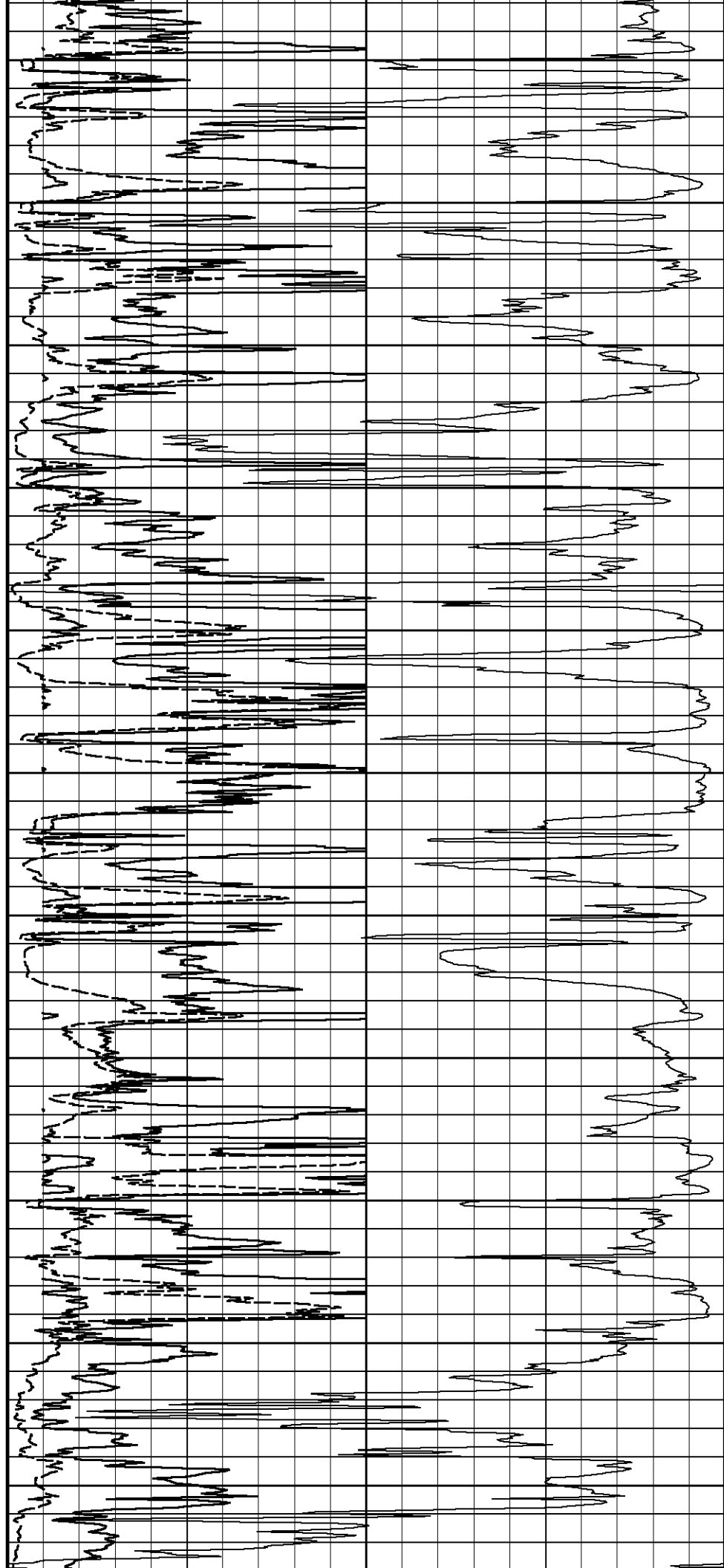
105°

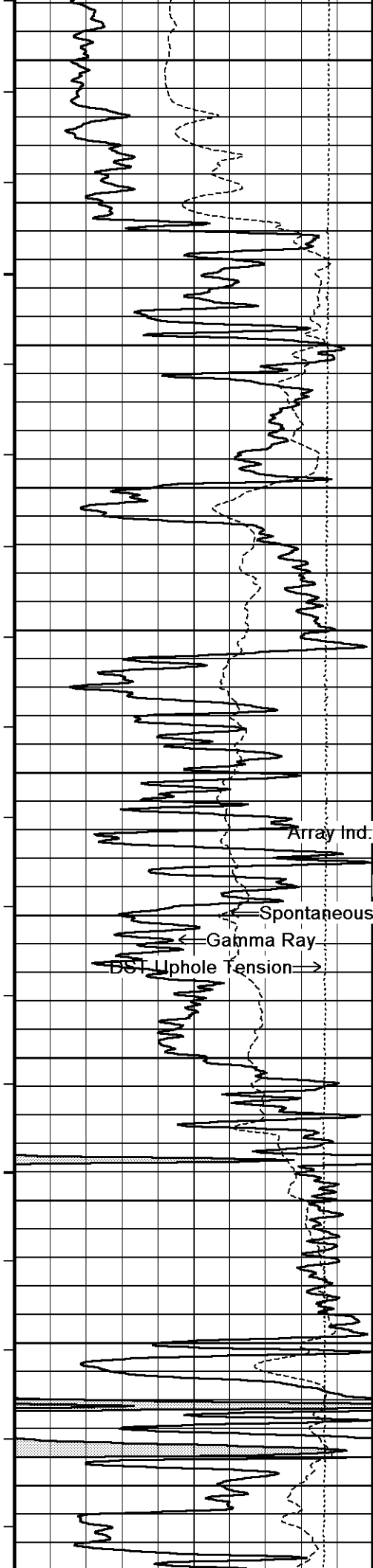
3800

105°

3900

106°





4000

107°

4100

108°

4200

108°

Shallow FE

4300

109°

4400

110°

4500

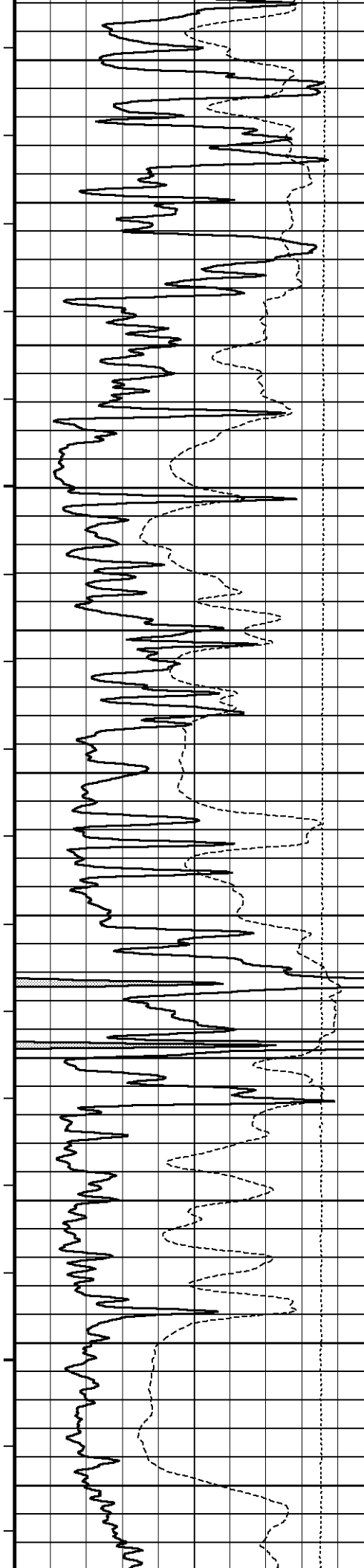
Array Ind. One Res Rt

Spontaneous Pot

Gamma Ray

DSI Uphole Tension

Array Ind. One Cond CT



110°

4600

111°

4700

112°

4800

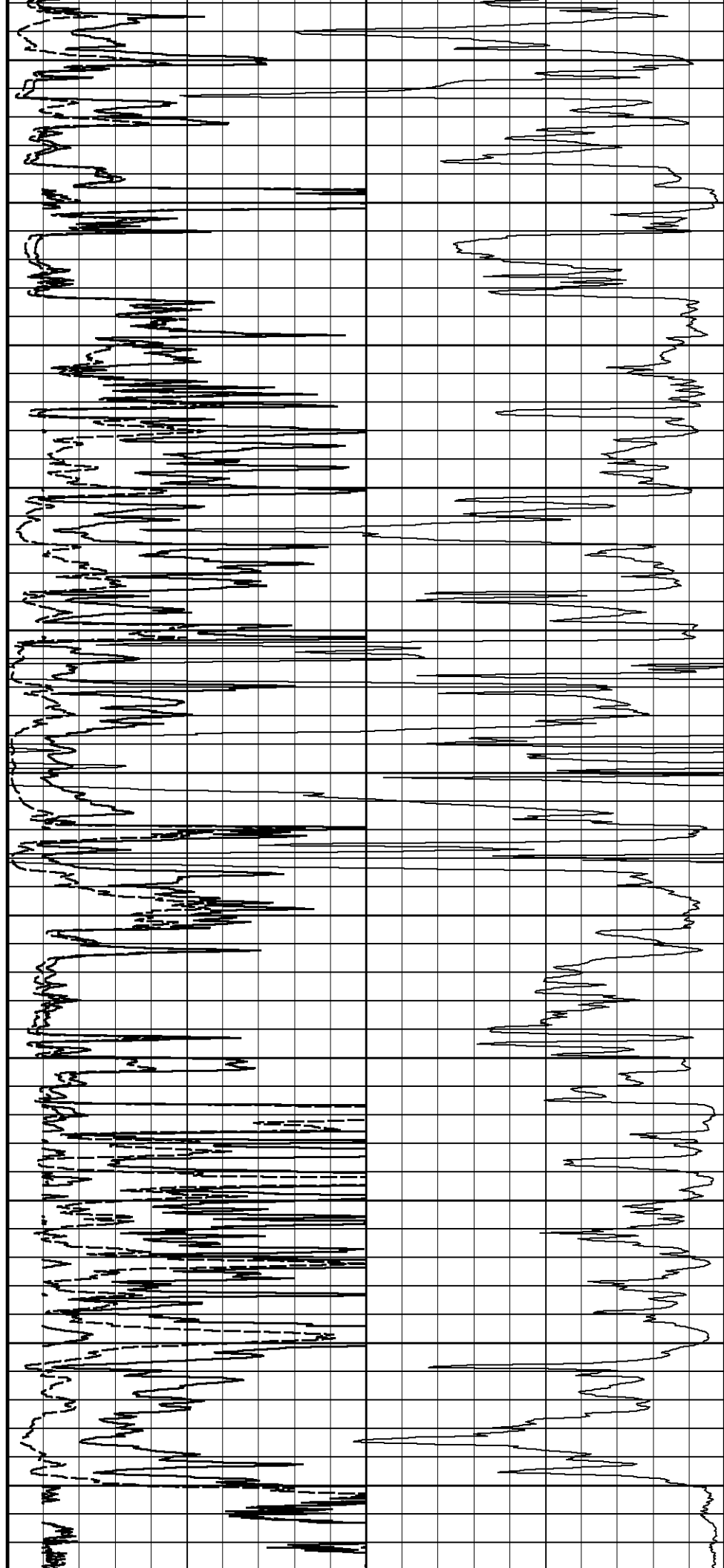
112°

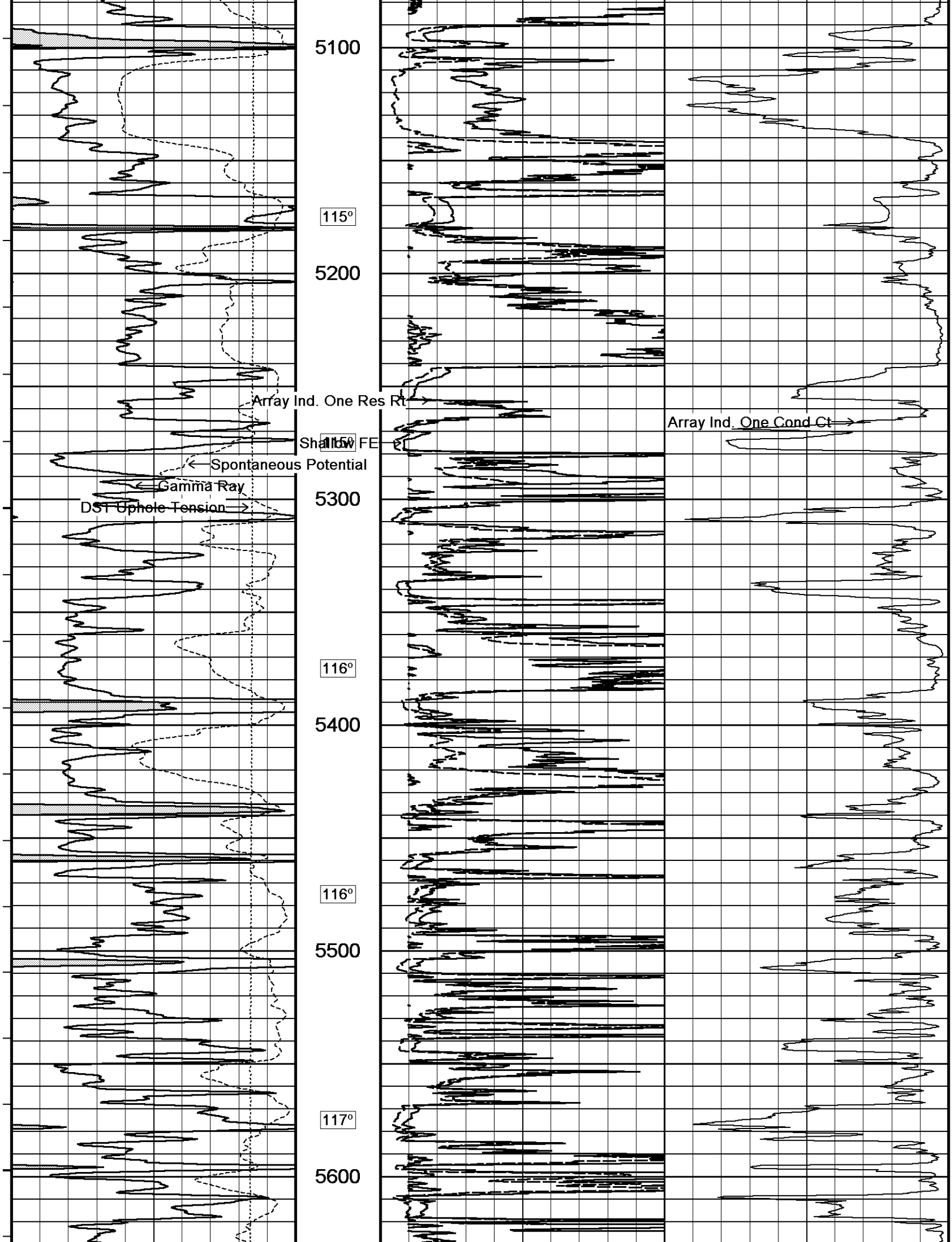
4900

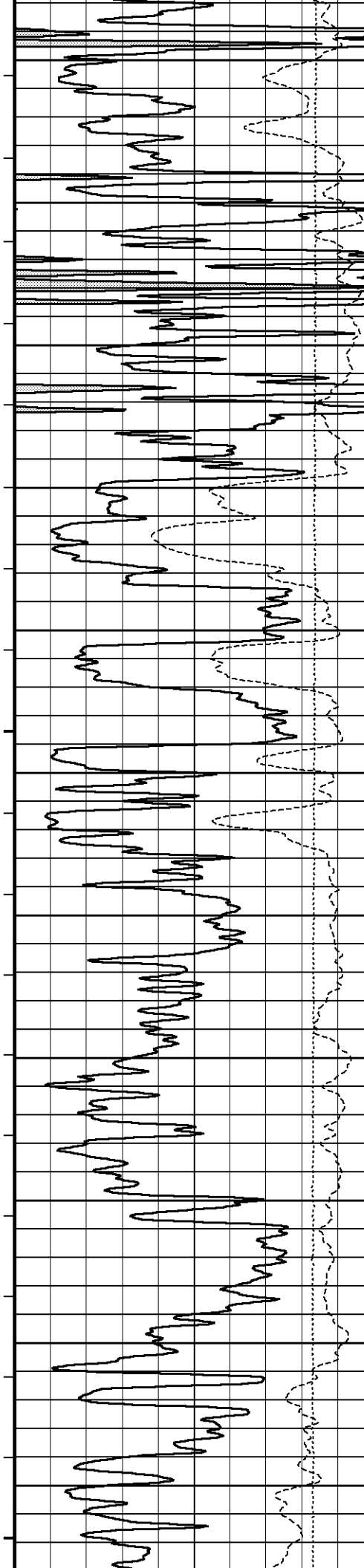
113°

5000

114°







118°

5700

120°

5800

119°

5900

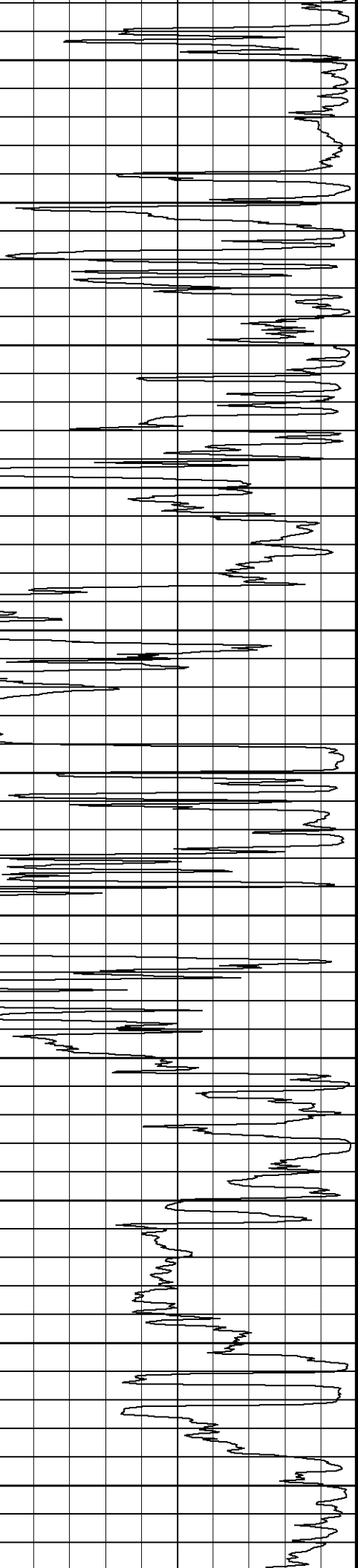
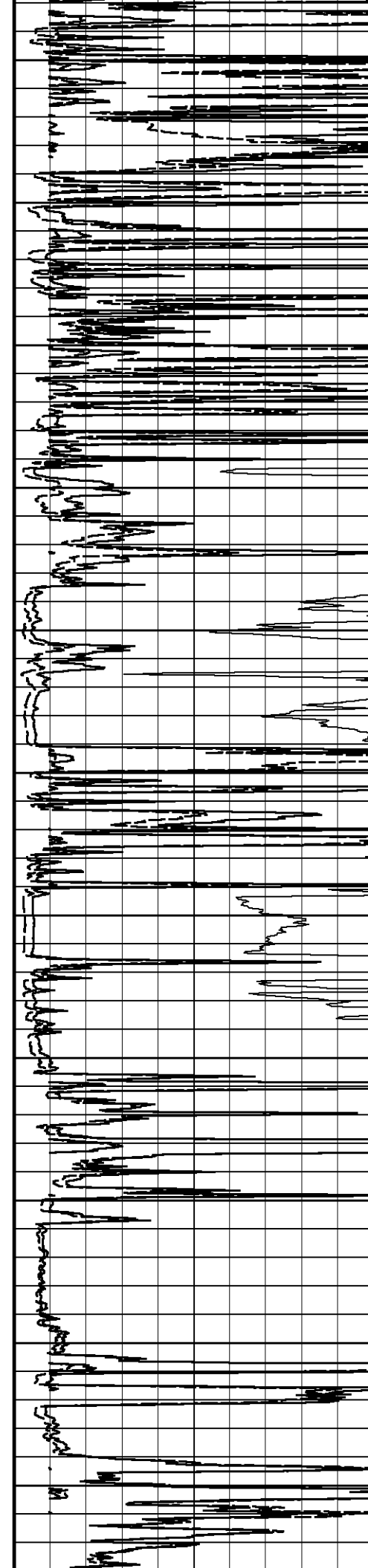
120°

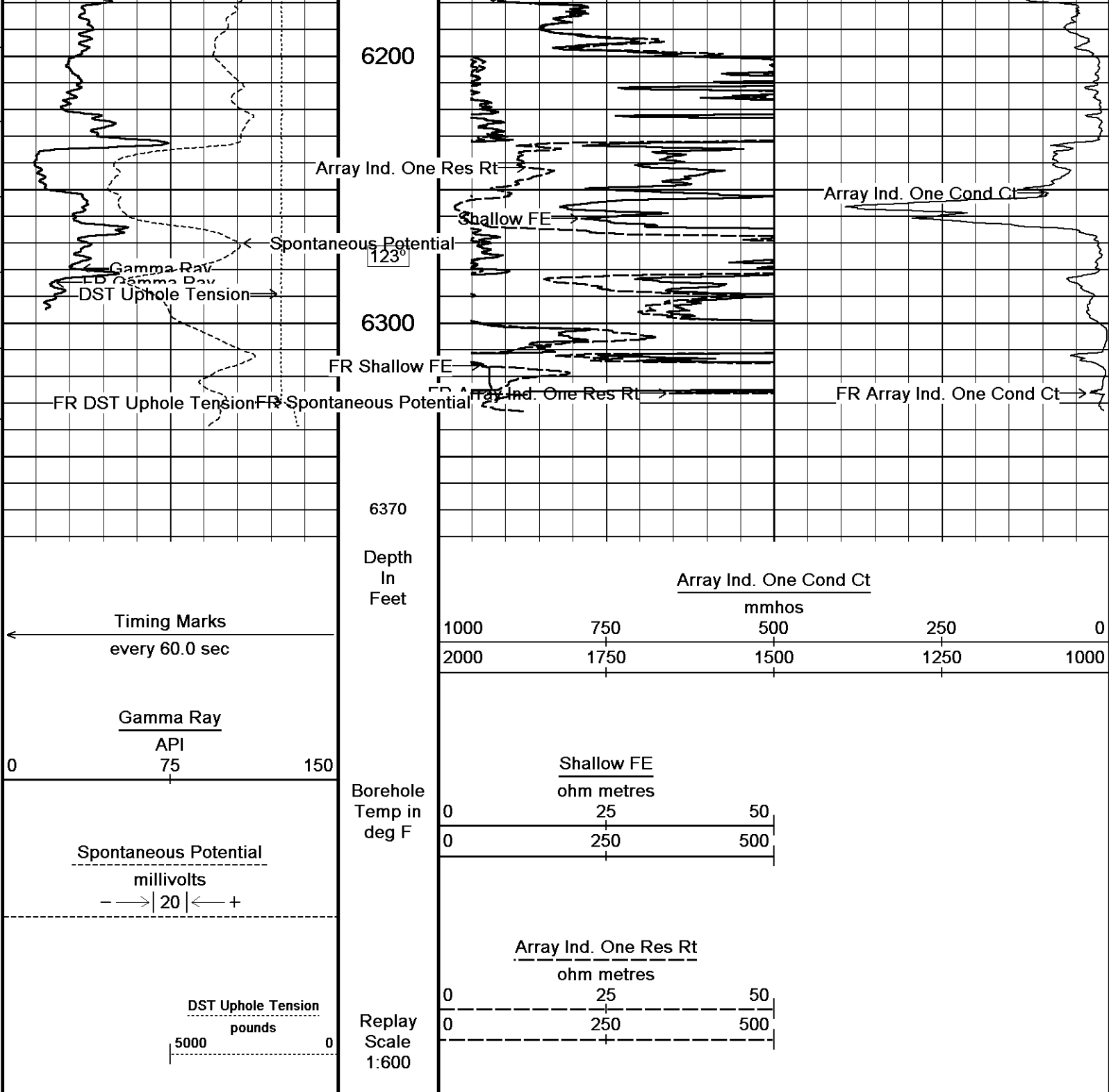
6000

121°

6100

122°

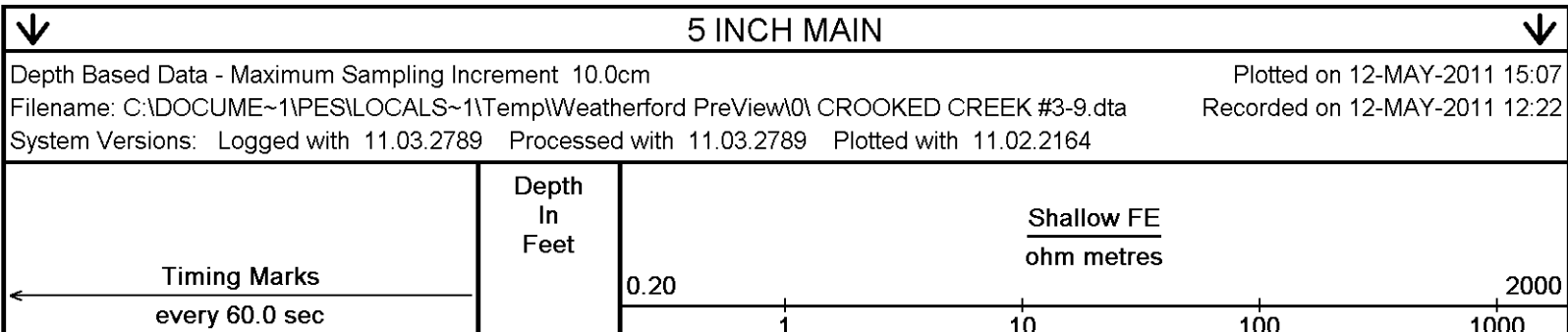


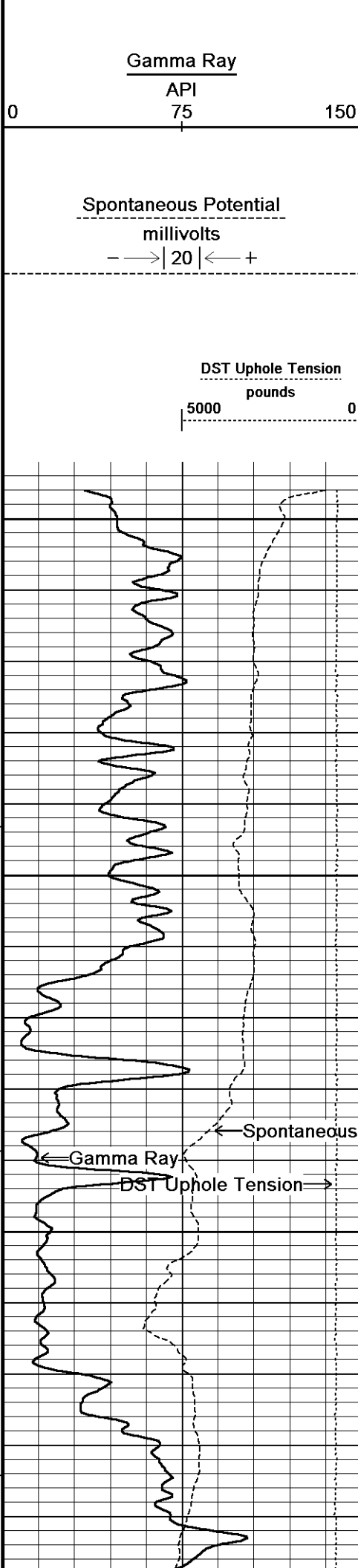


Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\DOCUME~1\PES\LOCALS~1\Temp\Weatherford PreView0\ CROOKED CREEK #3-9.dta
System Versions: Logged with 11.03.2789 Processed with 11.03.2789 Plotted with 11.02.2164

Plotted on 12-MAY-2011 15:07
Recorded on 12-MAY-2011 12:22

2 INCH MAIN





Borehole
Temp in
deg F

Replay
Scale
1:240

Shoe

1500

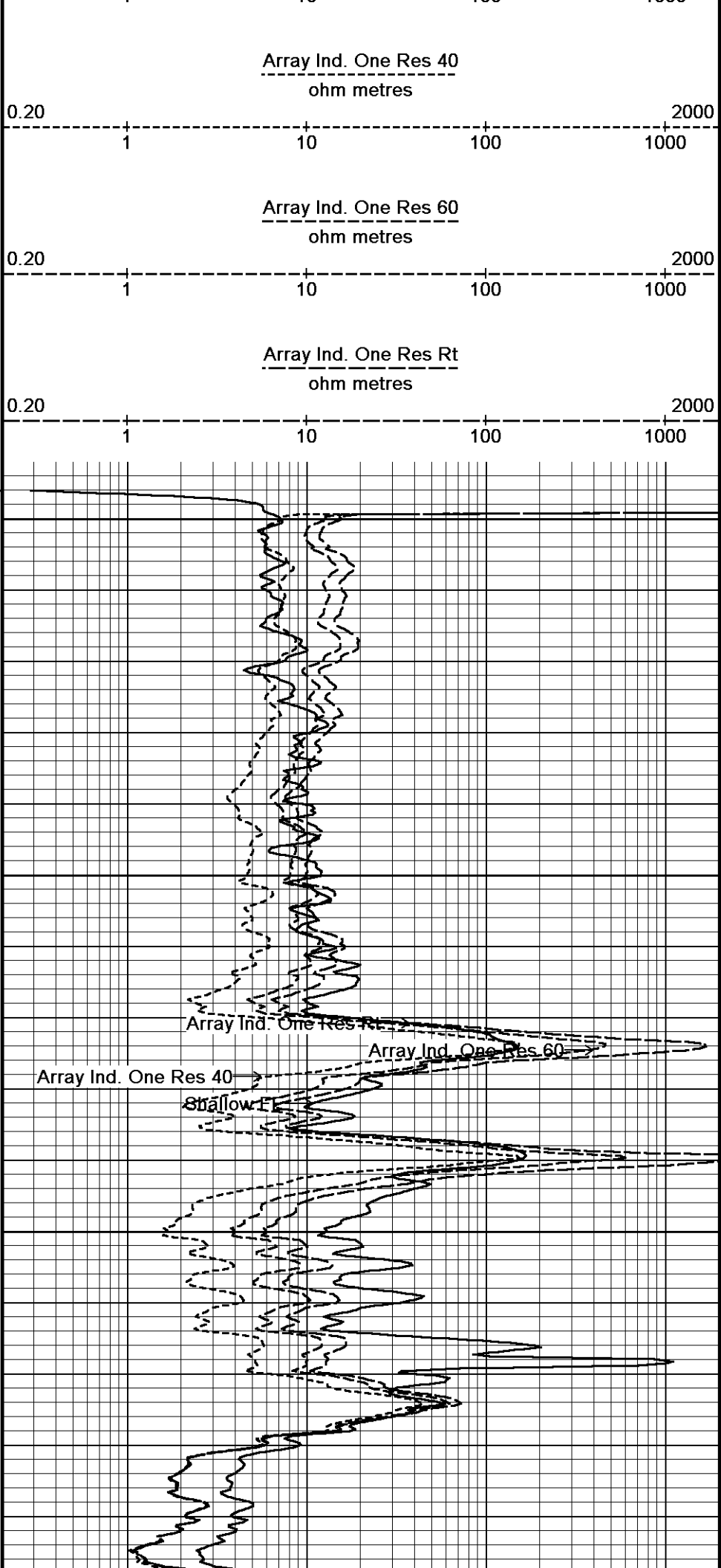
92°

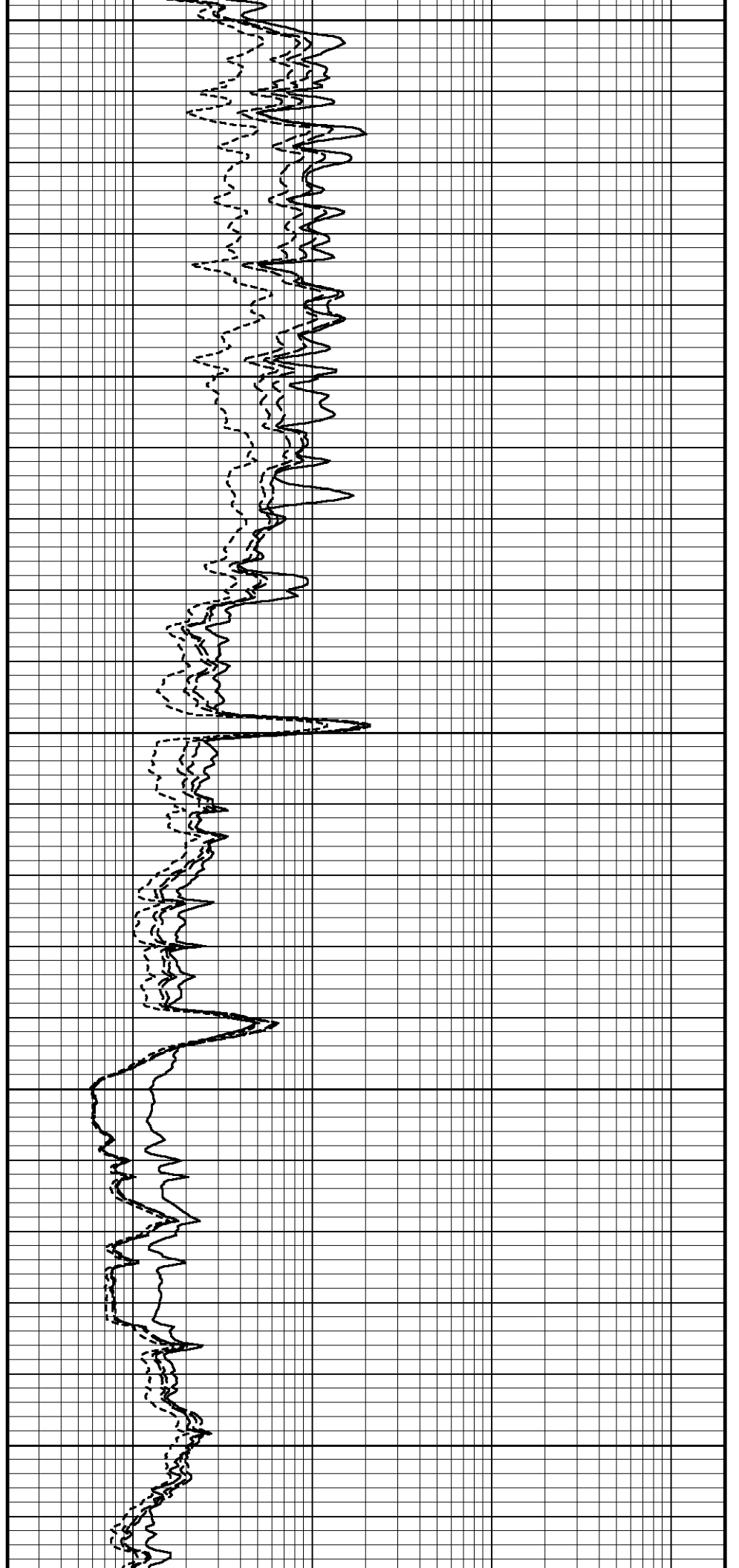
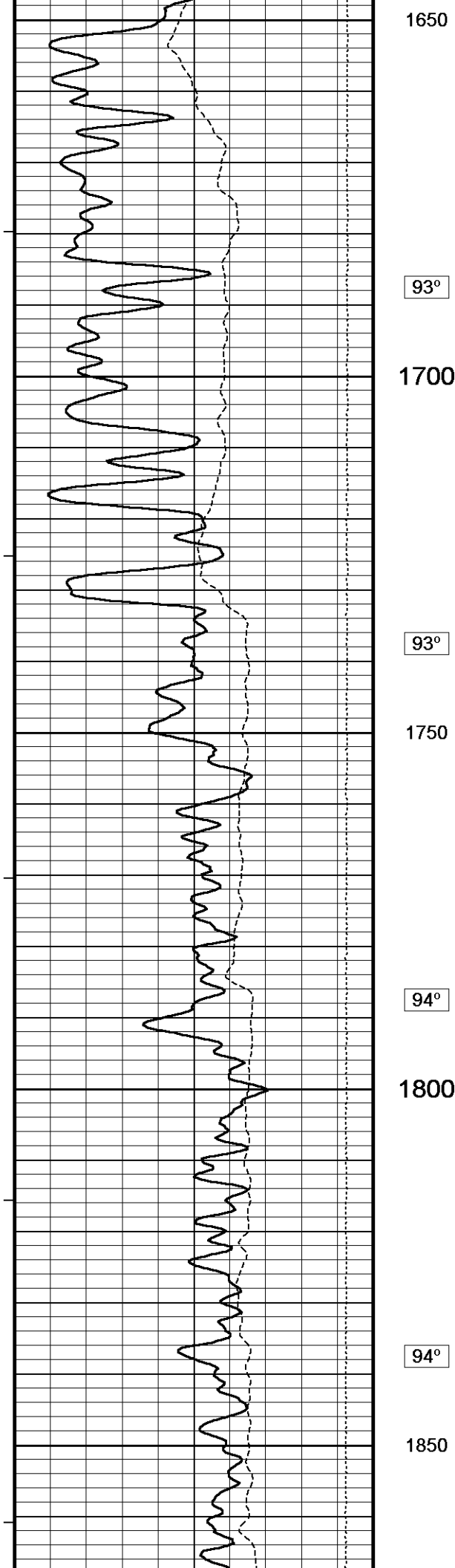
1550

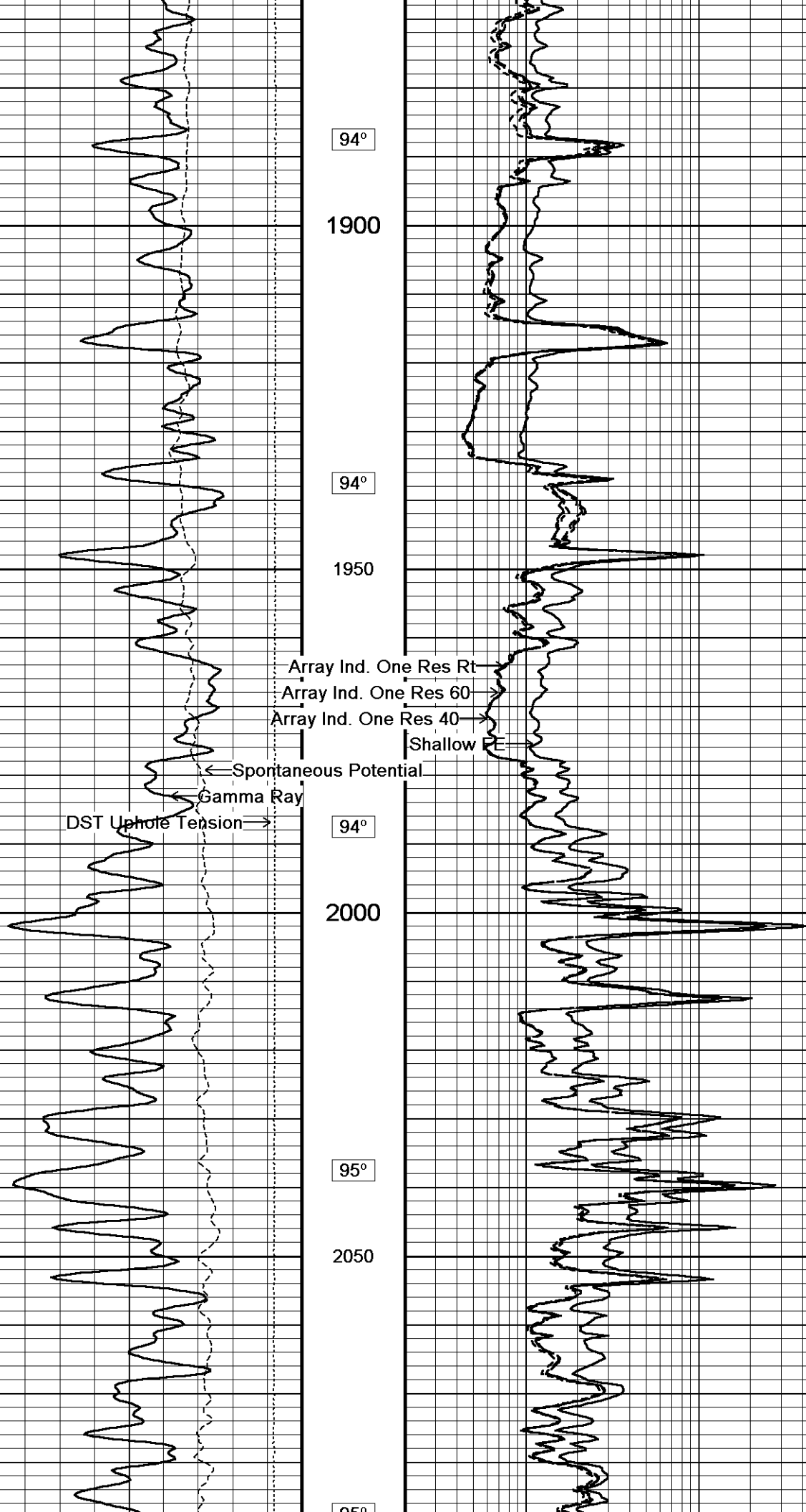
92°

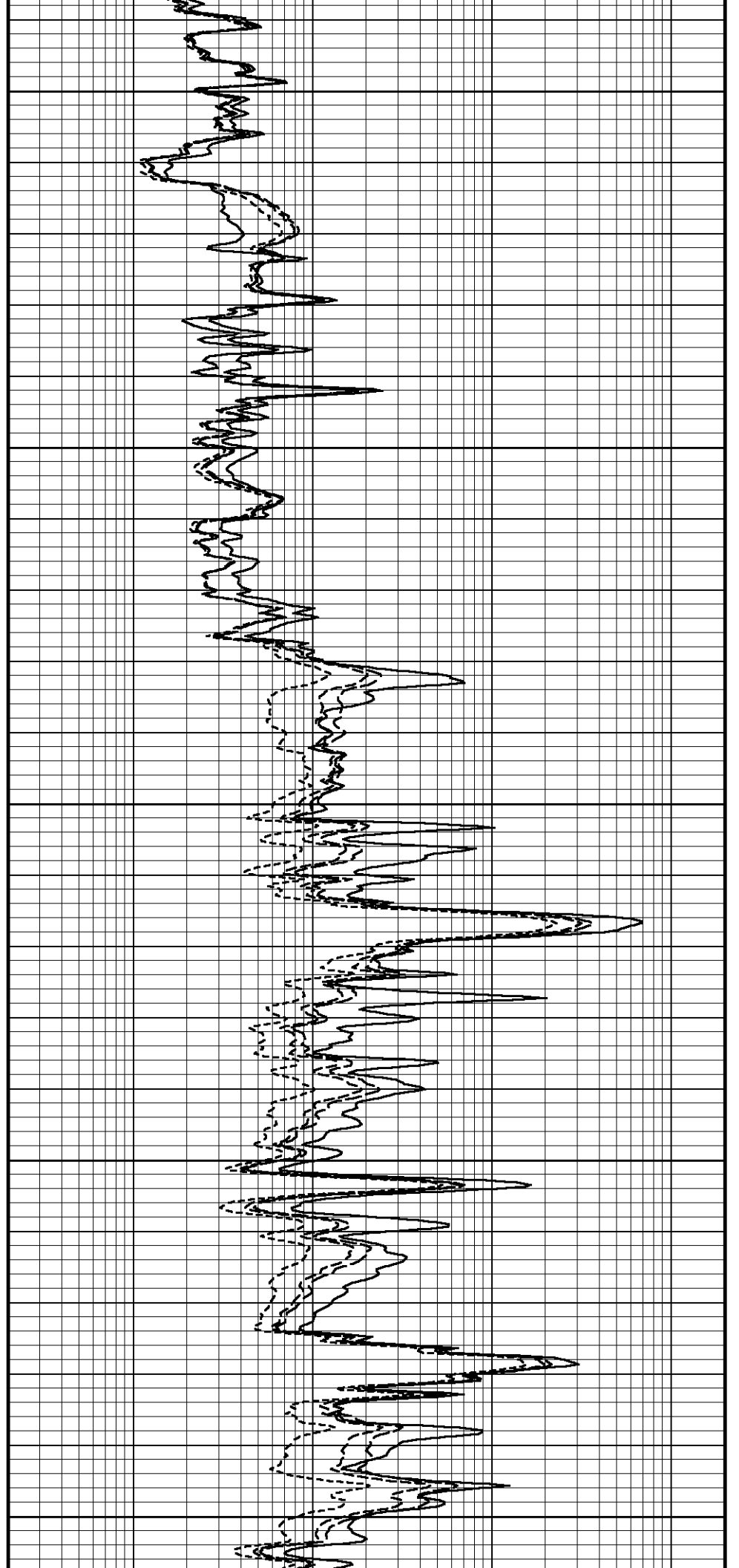
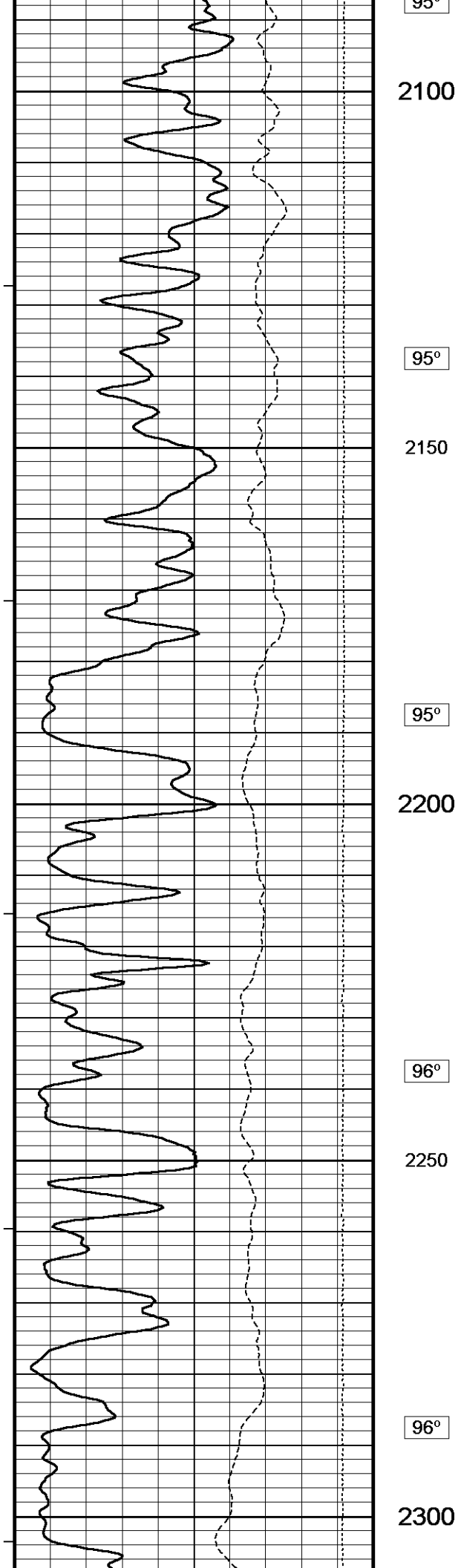
1600

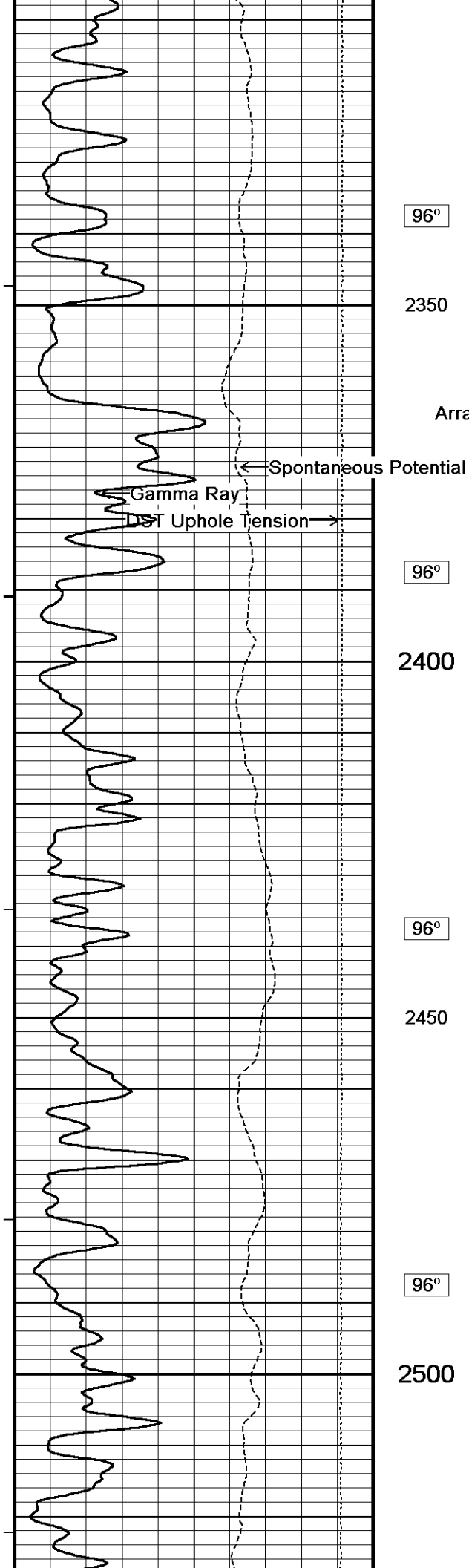
93°











96°

2350

Array Ind. One Res Rt

Array Ind. One Res 60

Array Ind. One Res 40

Shallow

← Spontaneous Potential

Gamma Ray

DST Uphole Tension →

96°

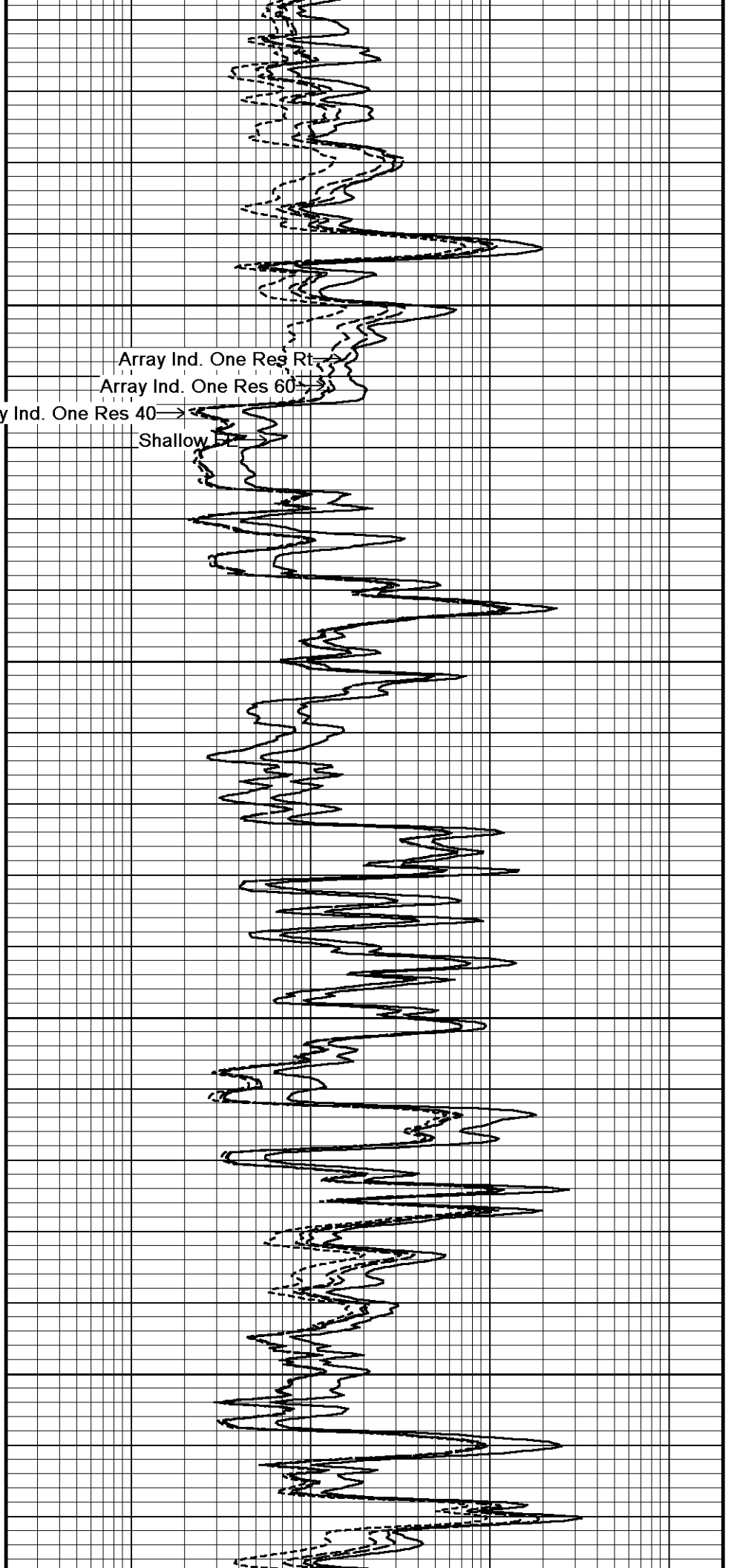
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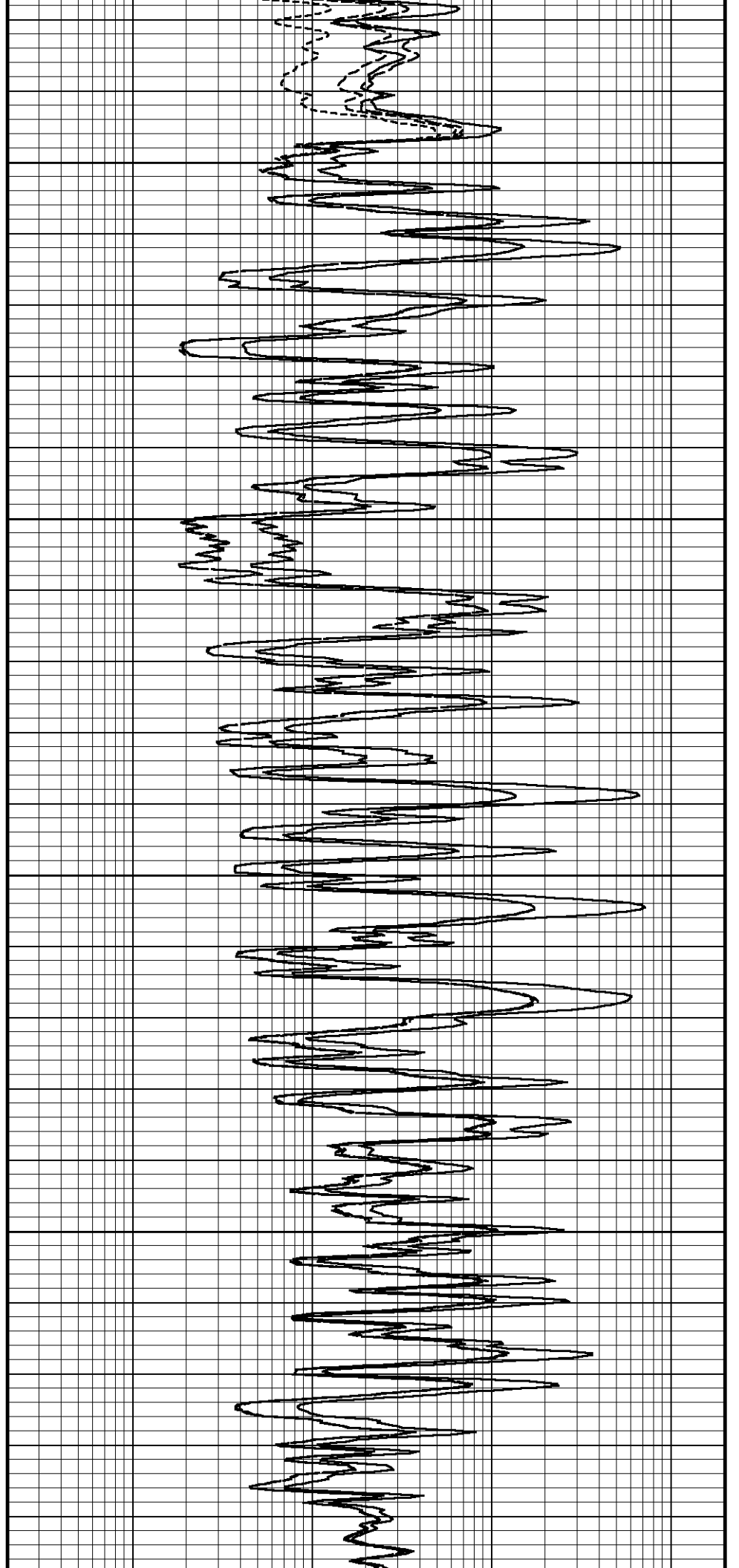
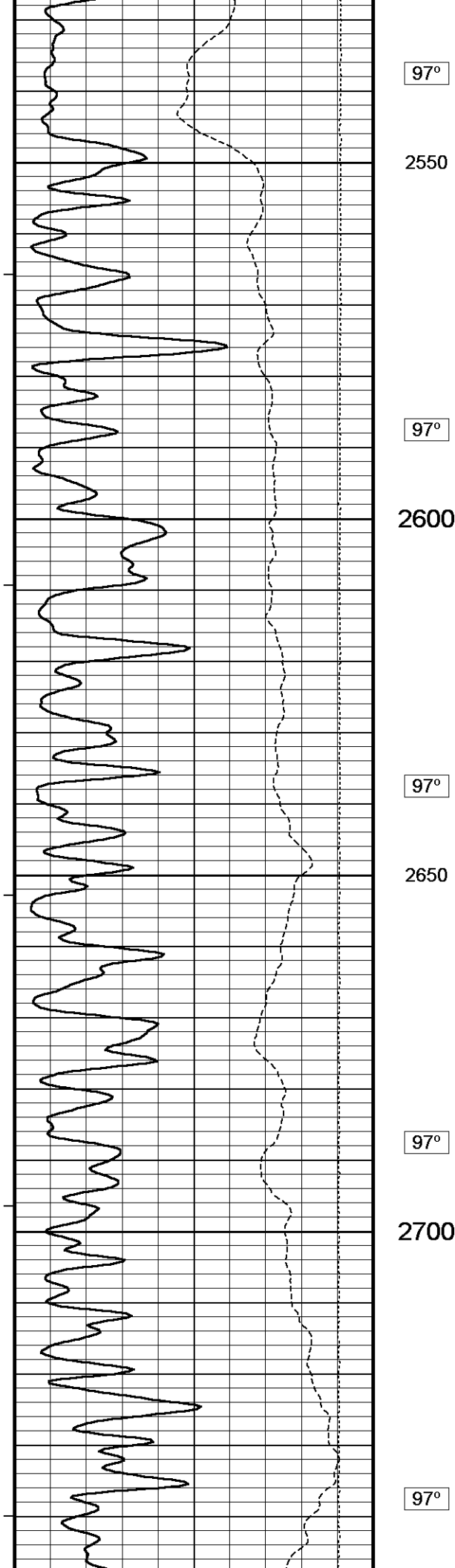
96°

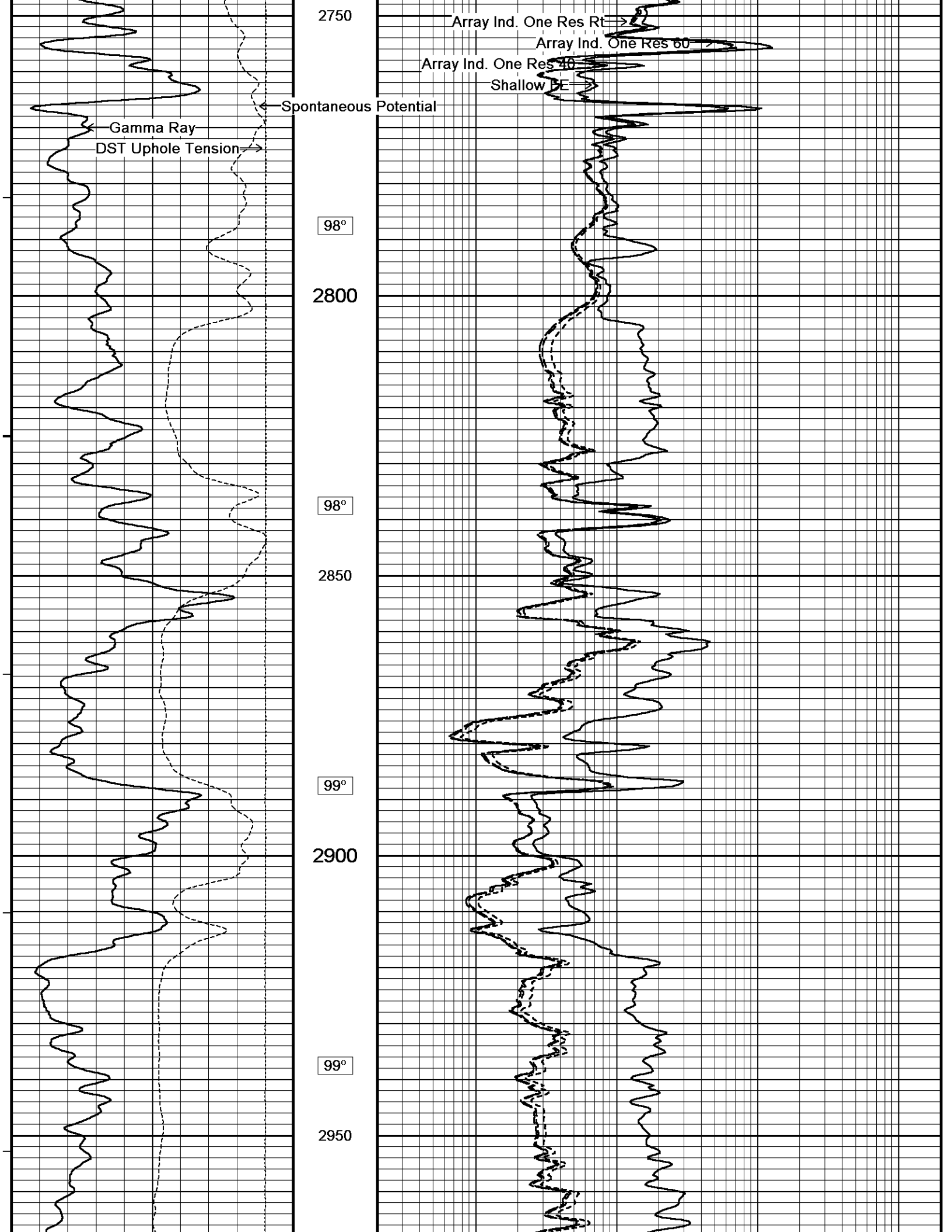
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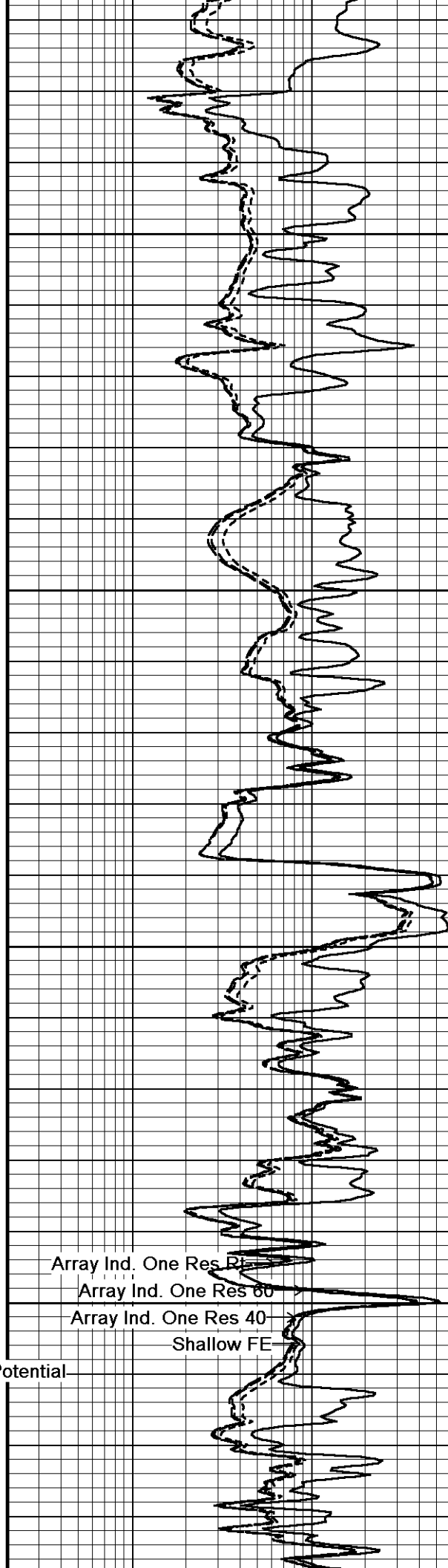
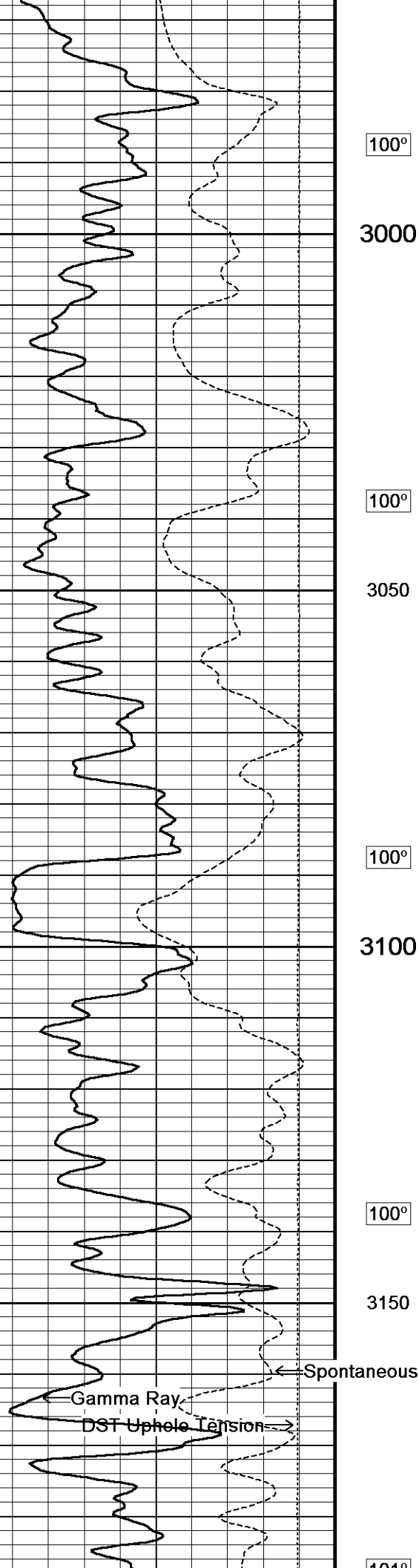
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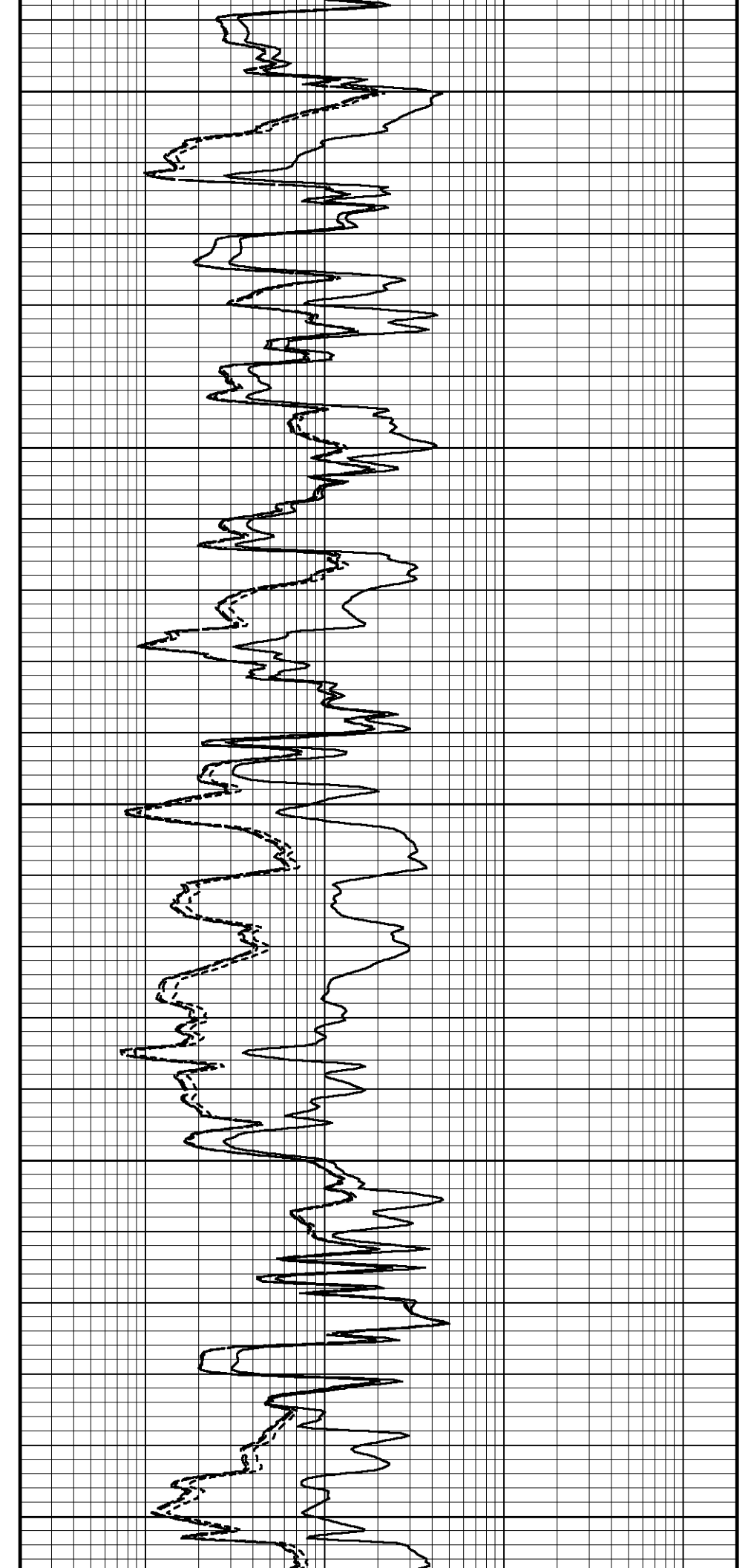
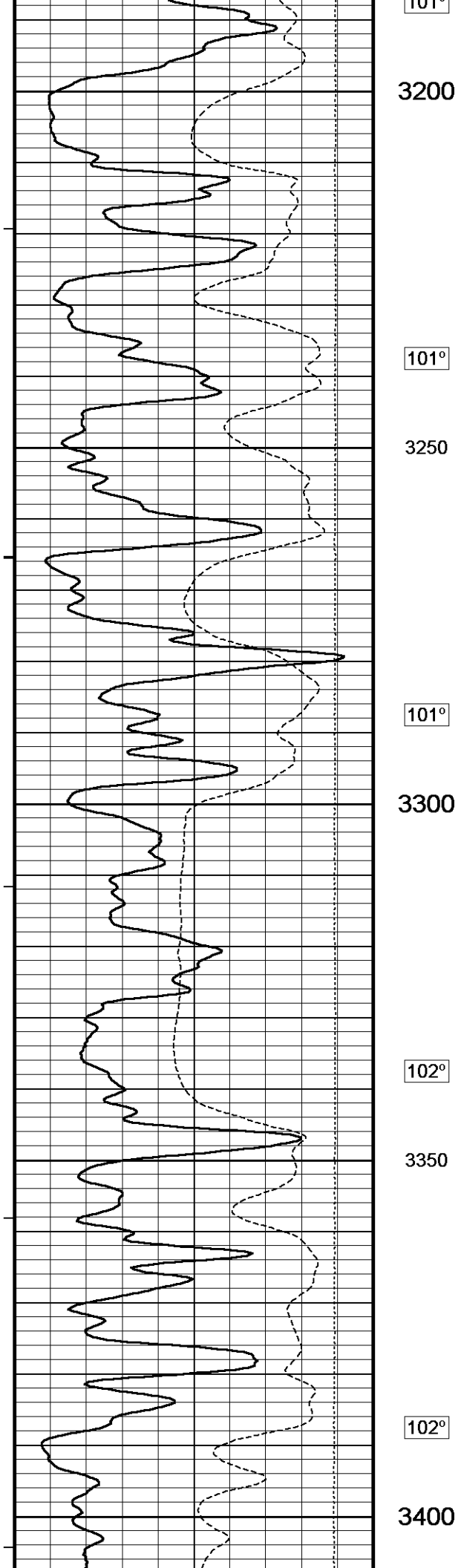
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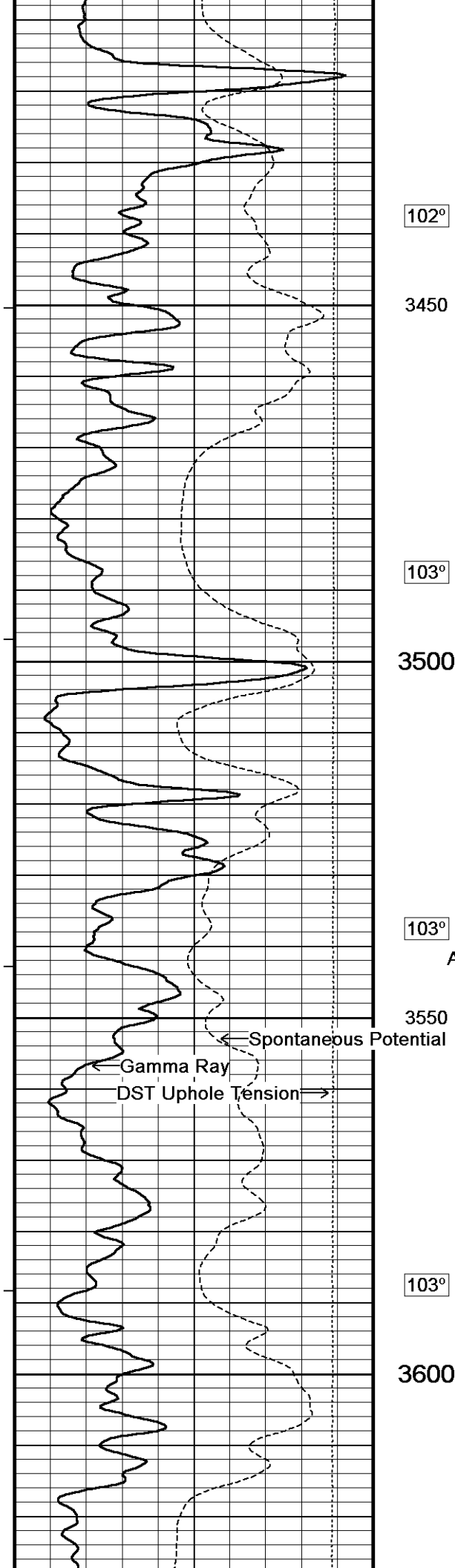












102°

3450

103°

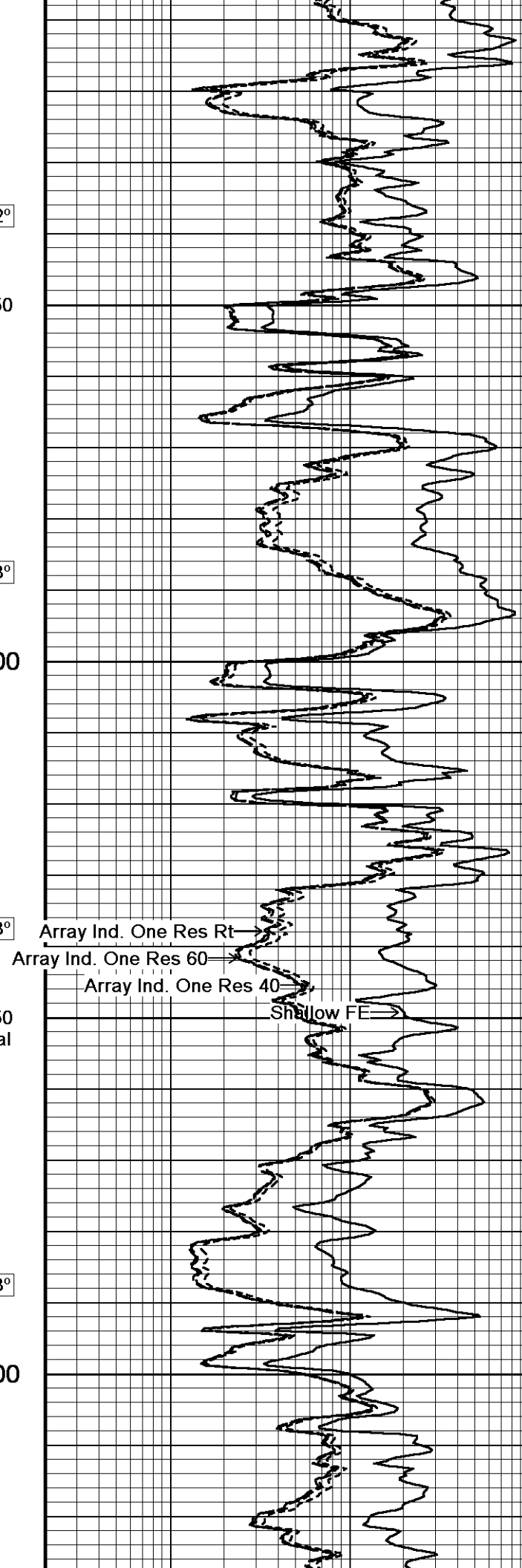
3500

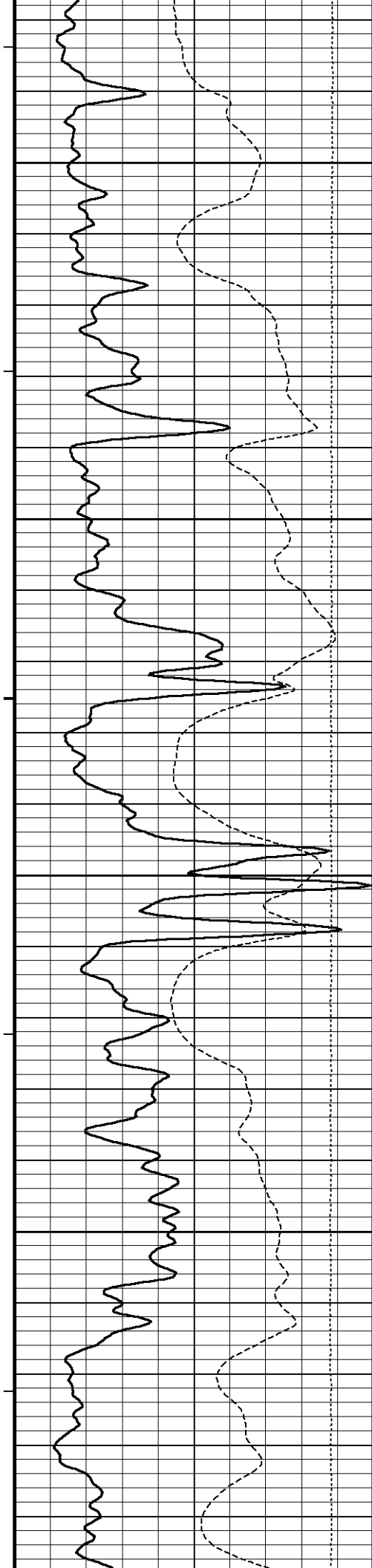
103°

3550

103°

3600





104°

3650

104°

3700

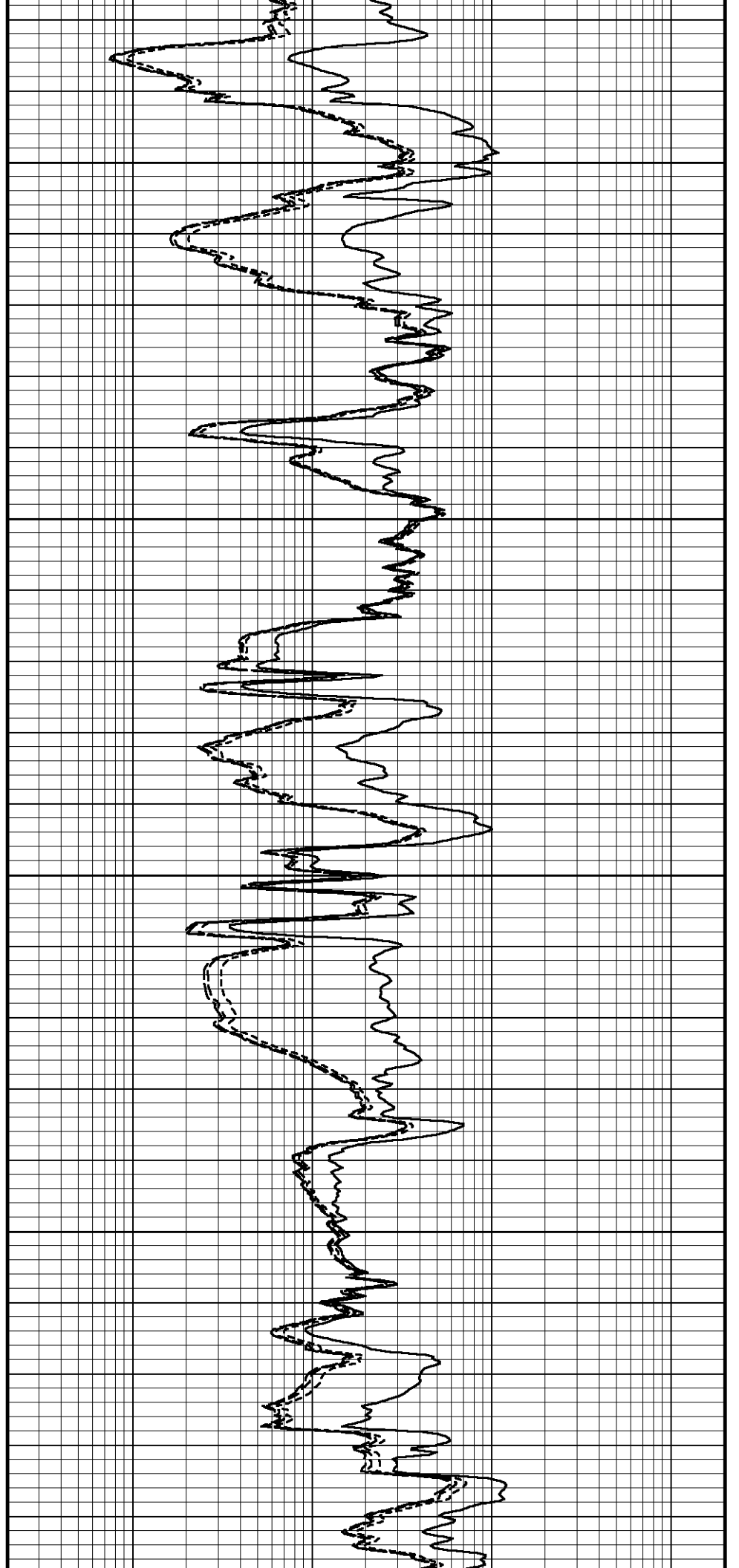
104°

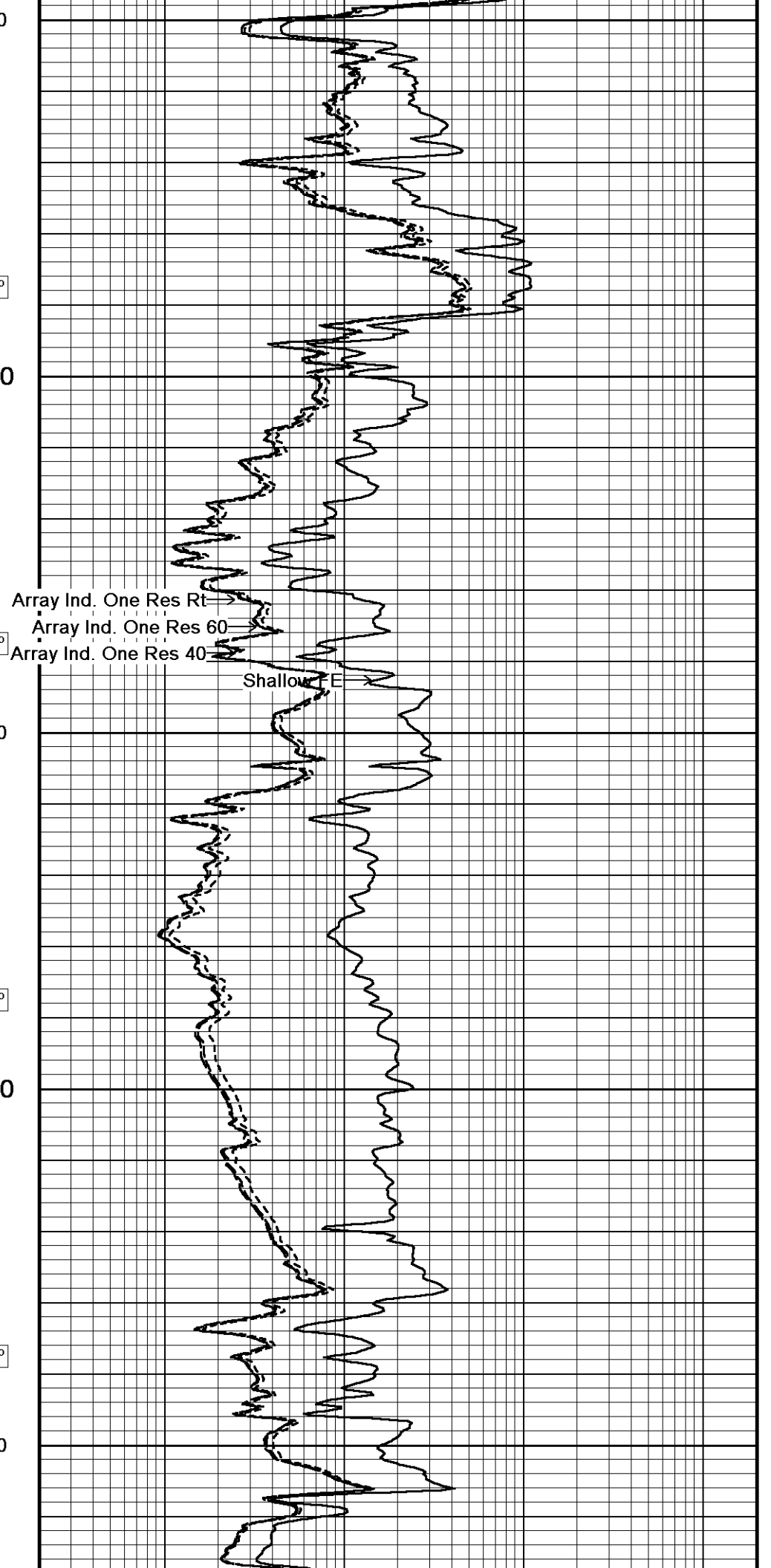
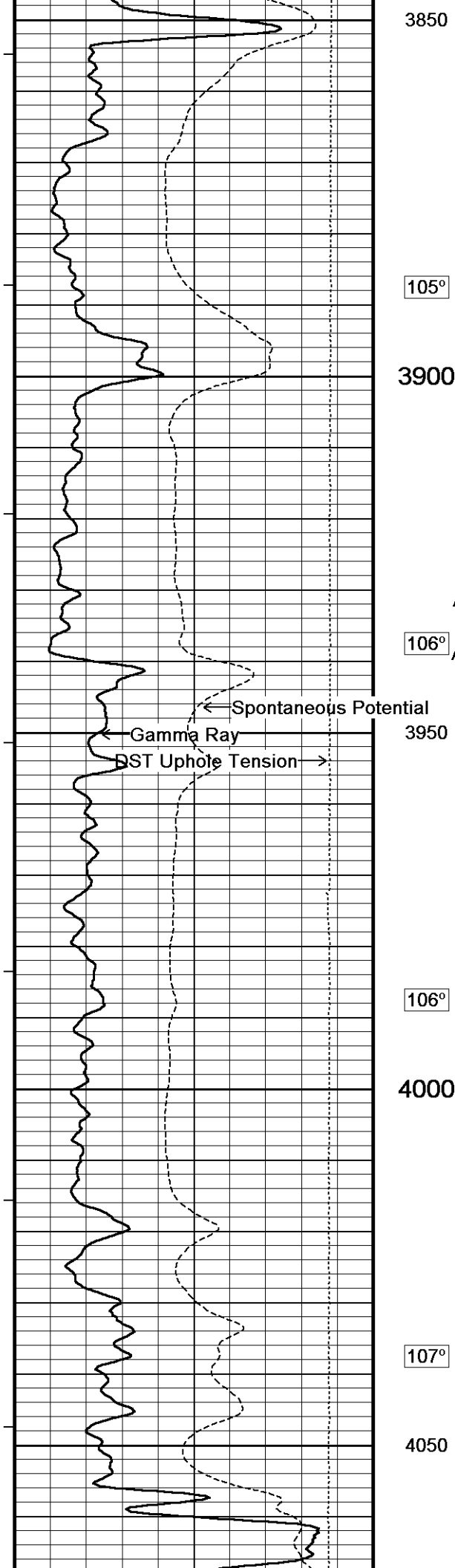
3750

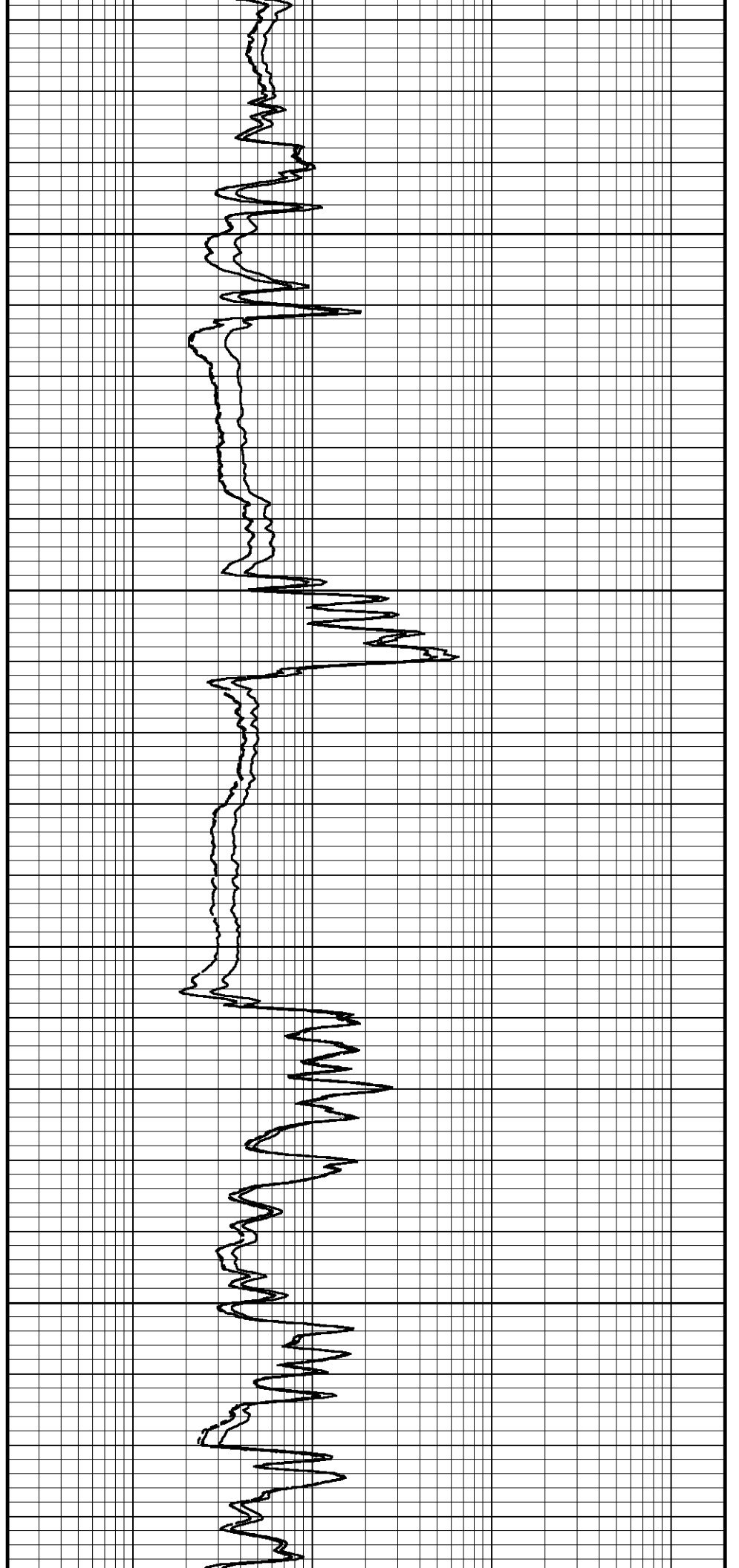
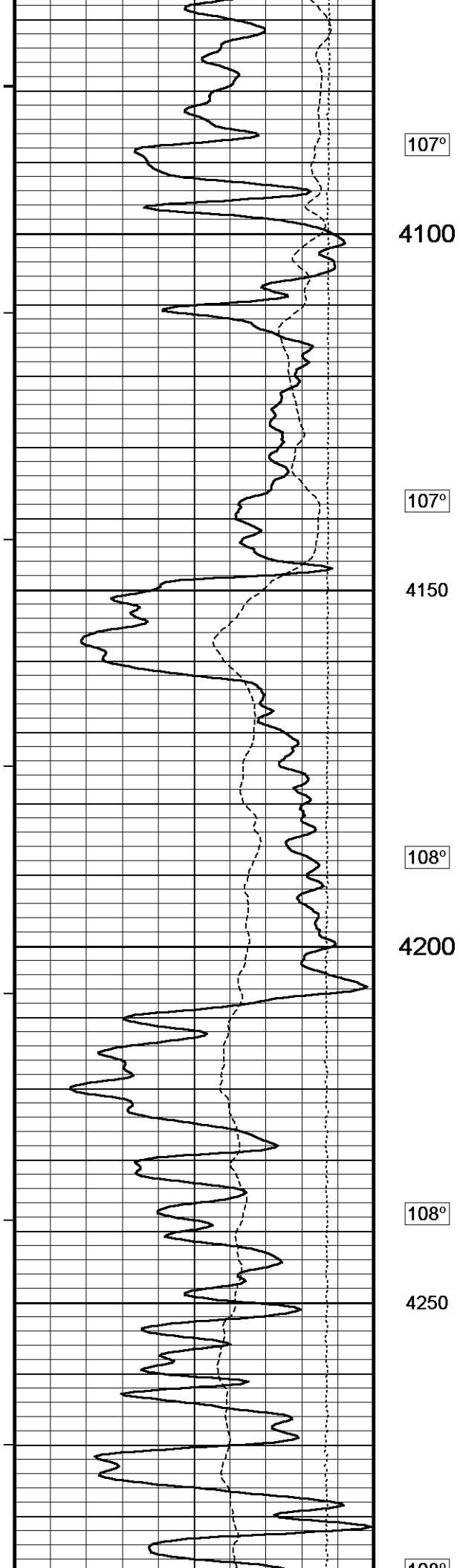
105°

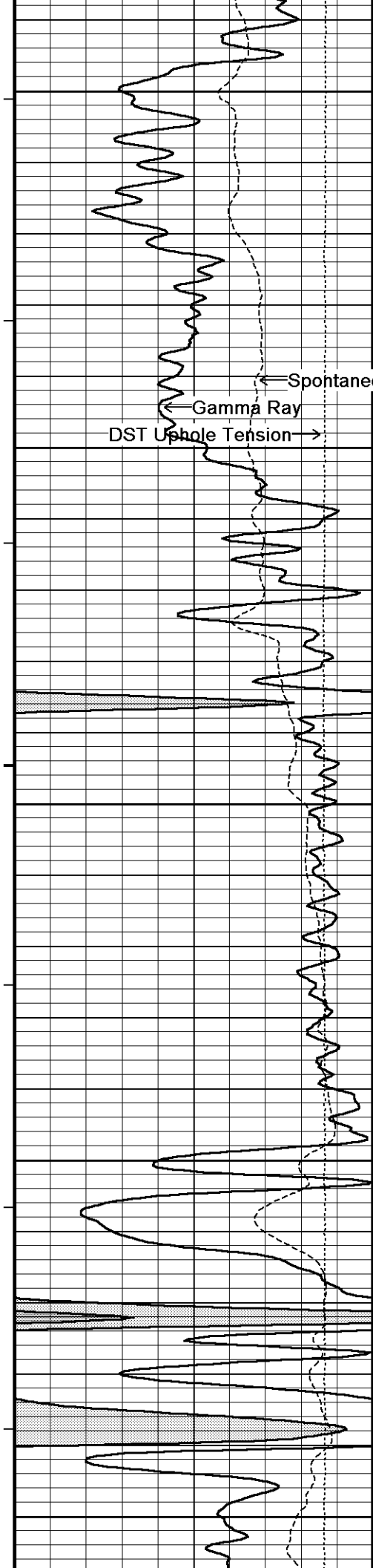
3800

105°









108°

4300

108°

4350

109°

4400

109°

4450

110°

4500

← Spontaneous Potential

← Gamma Ray

DST Uphole Tension →

Array Ind. One Res Rt

Array Ind. One Res 60 →

Array Ind. One Res 40 →

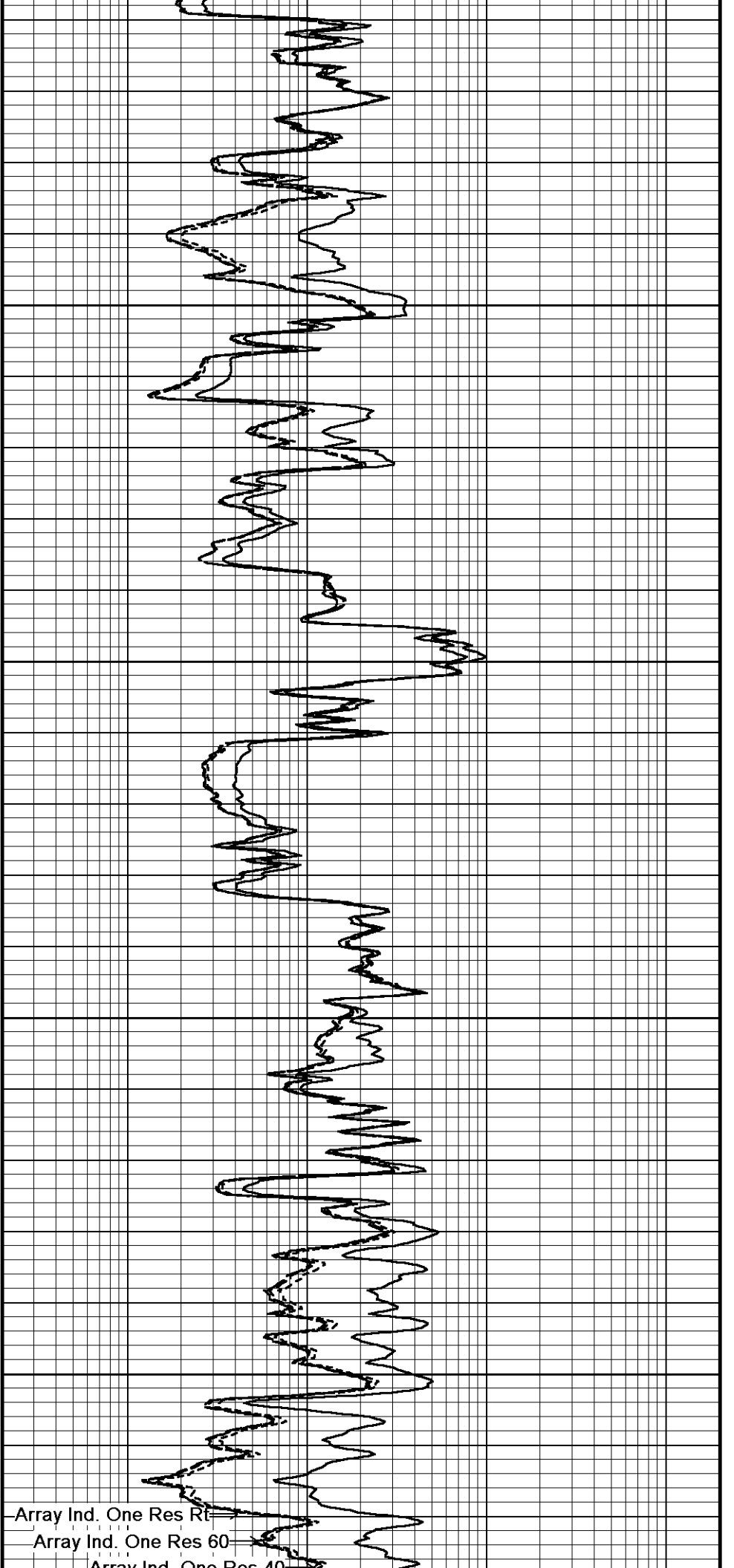
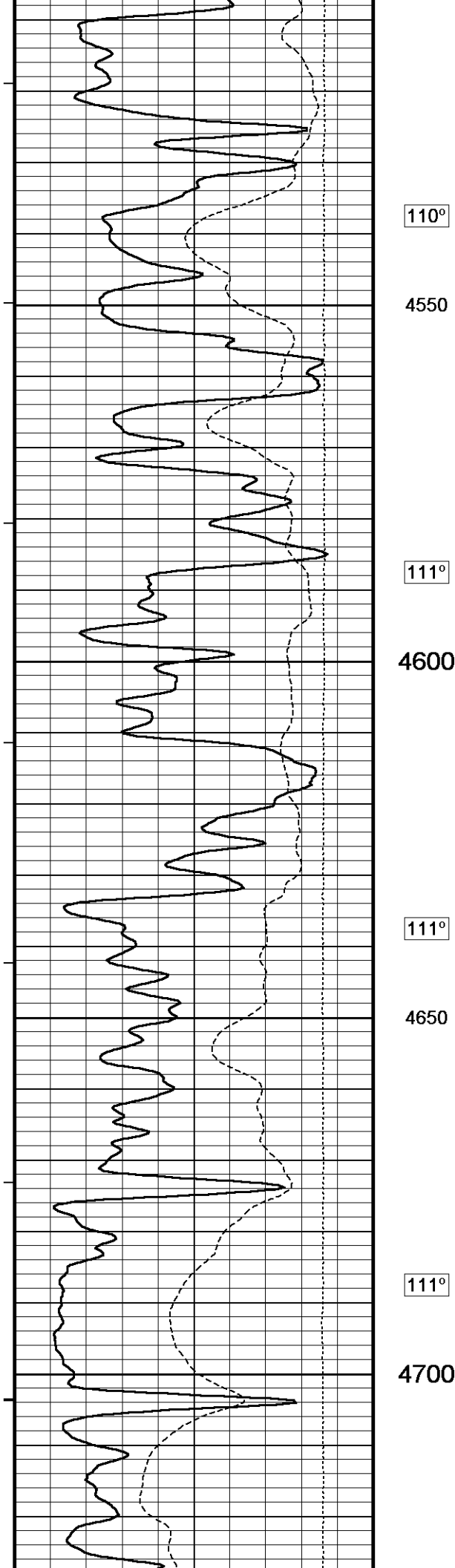
Shallow FE

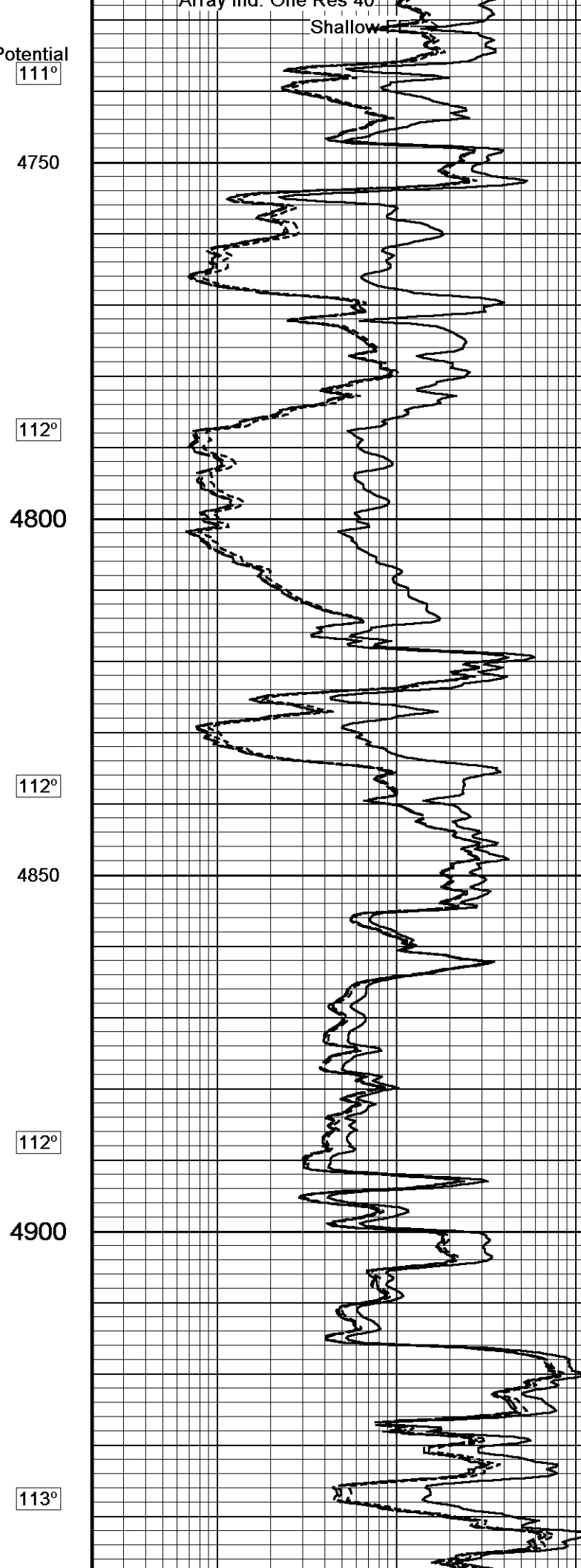
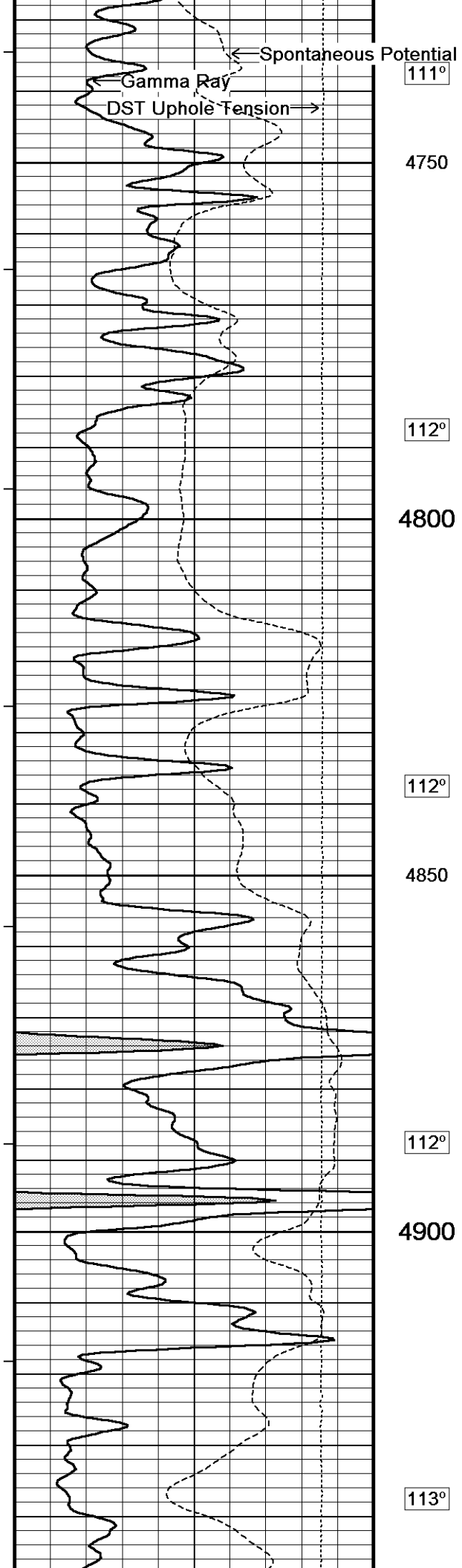
Array Ind. One Res Rt

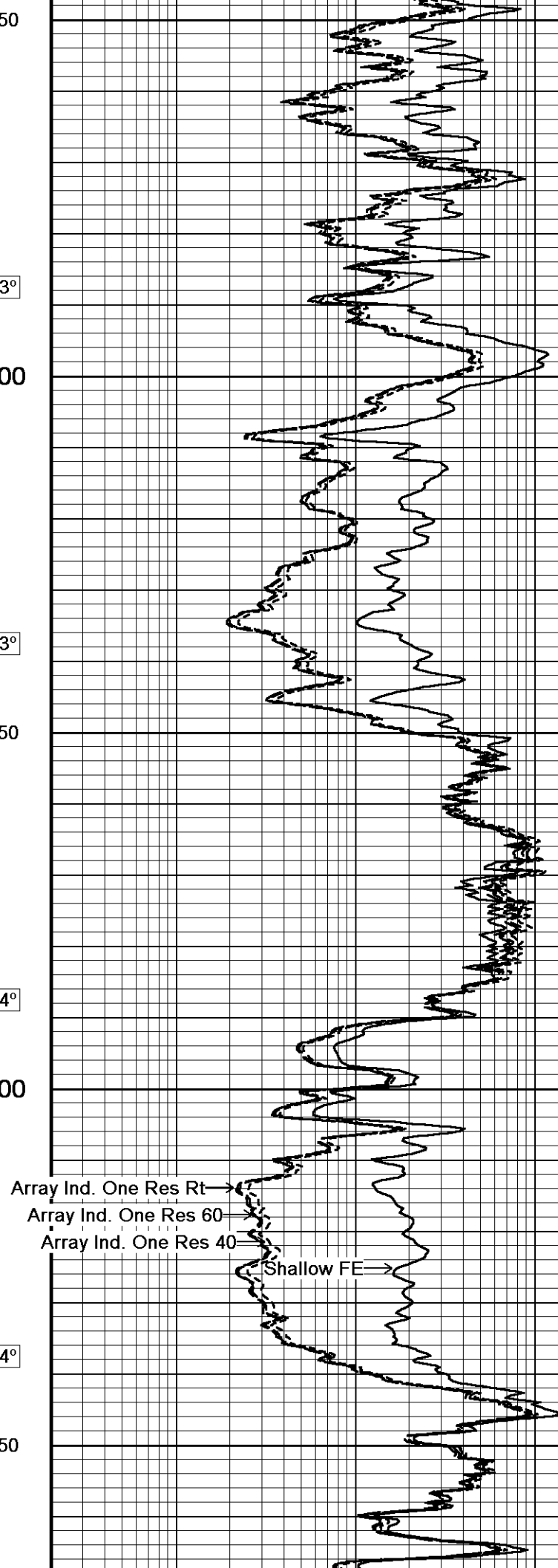
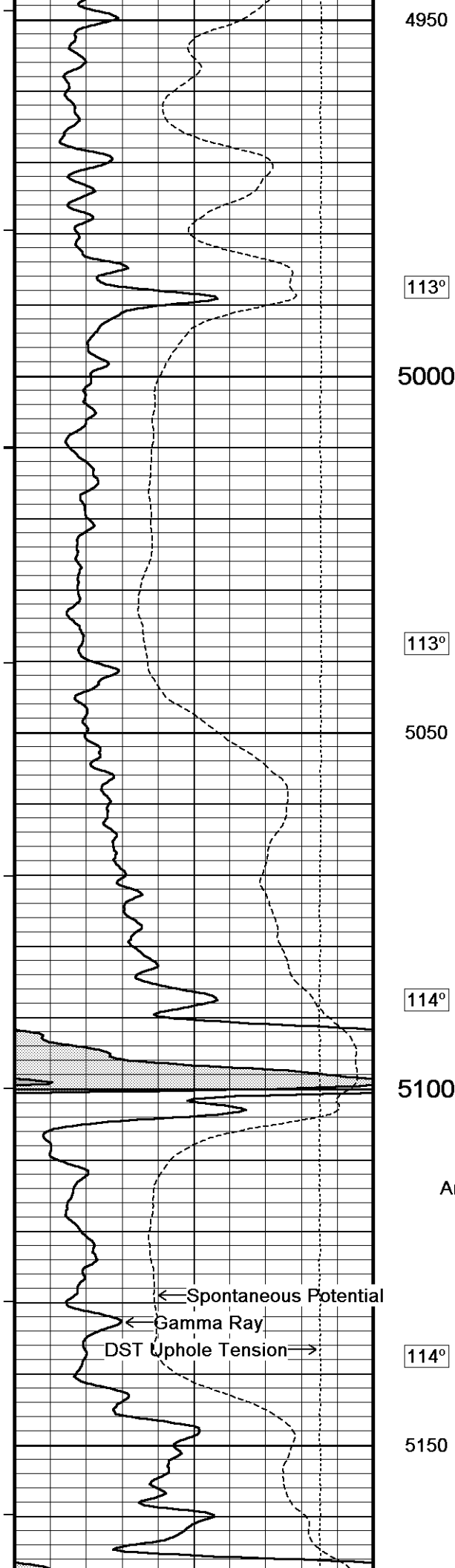
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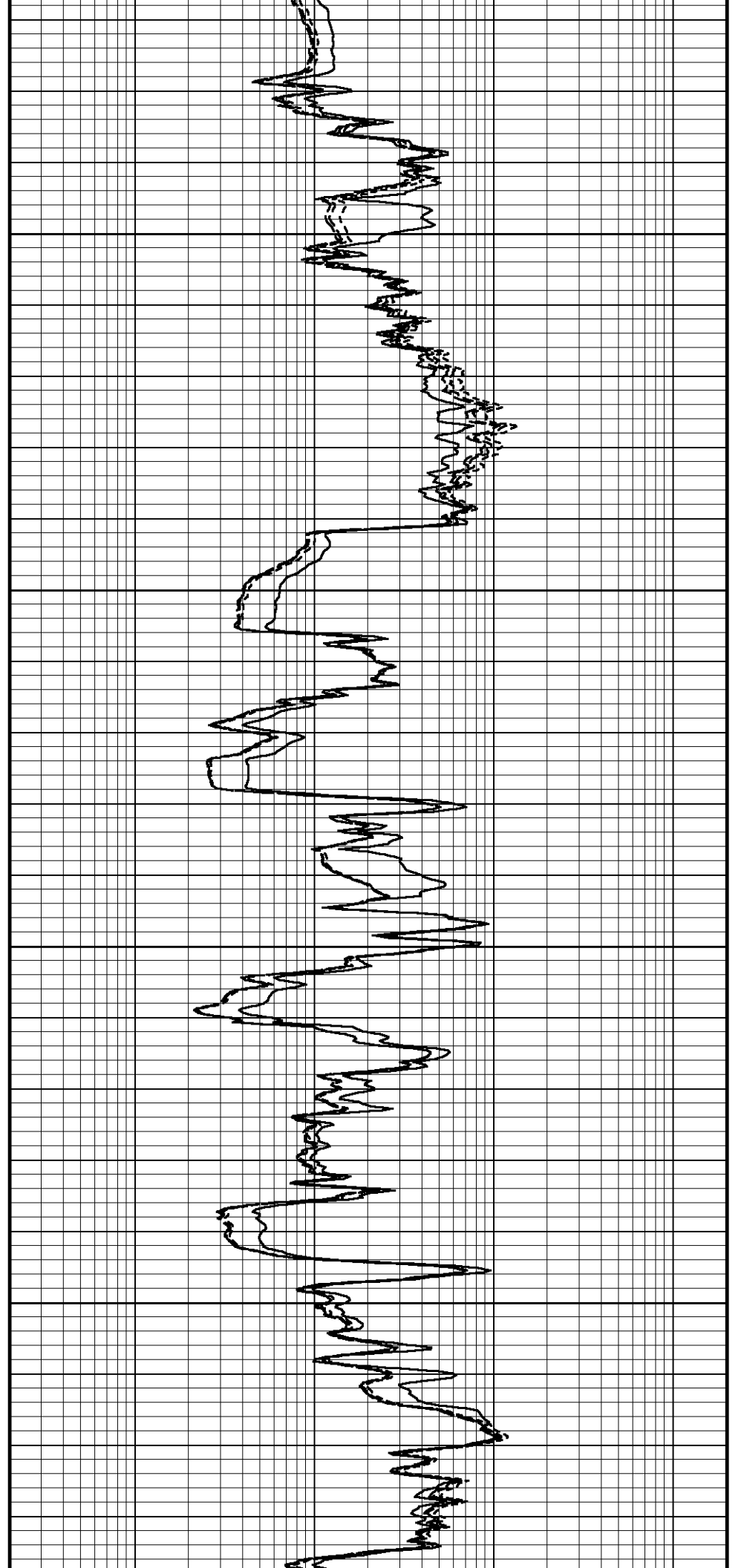
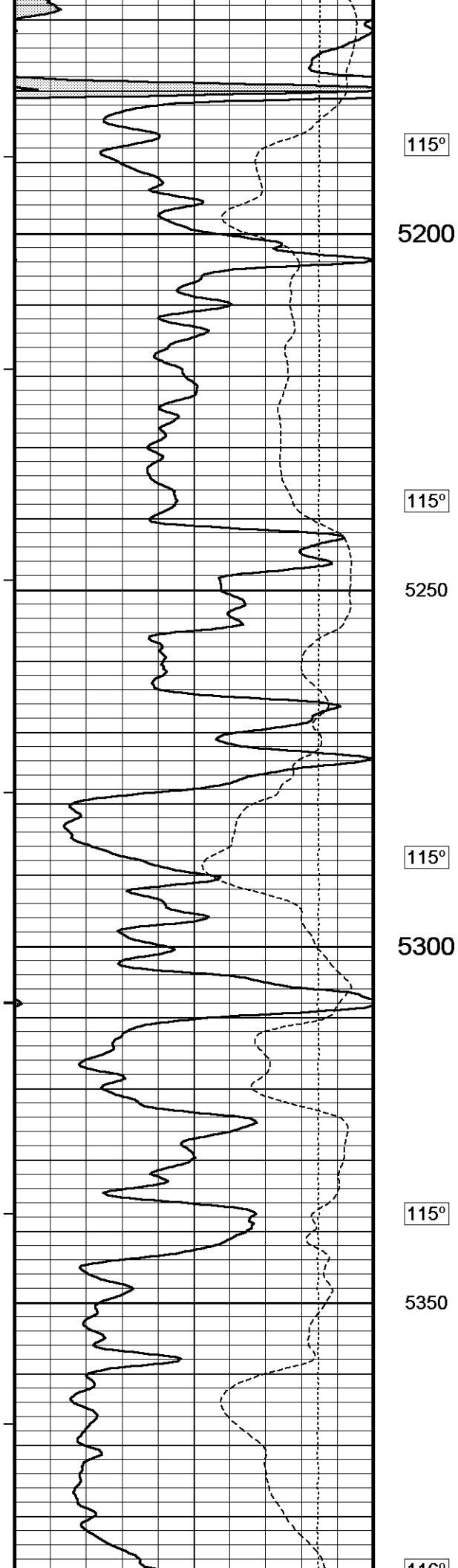
Array Ind. One Res 40 →

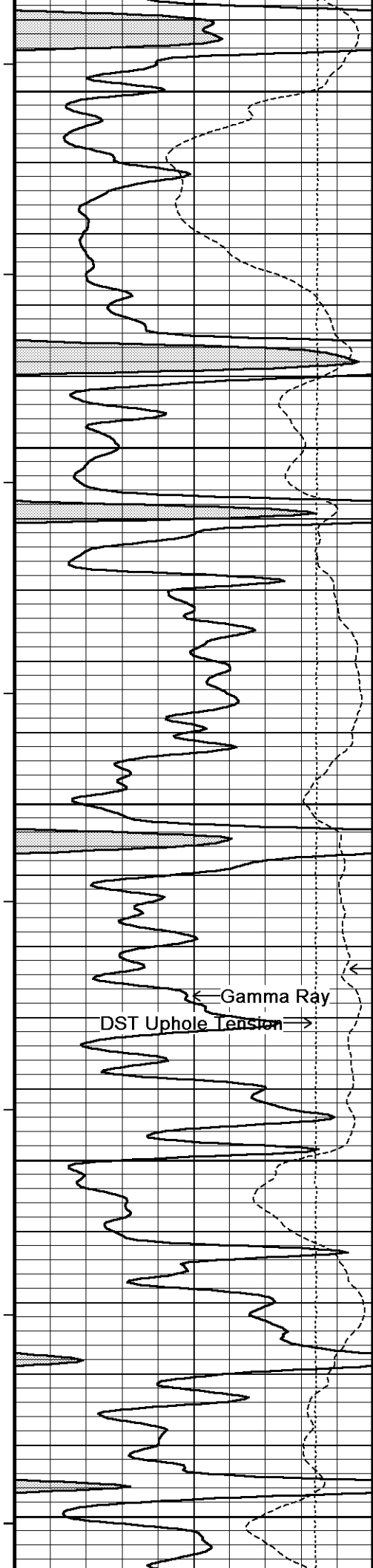
Shallow FE











116°

5400

116°

5450

116°

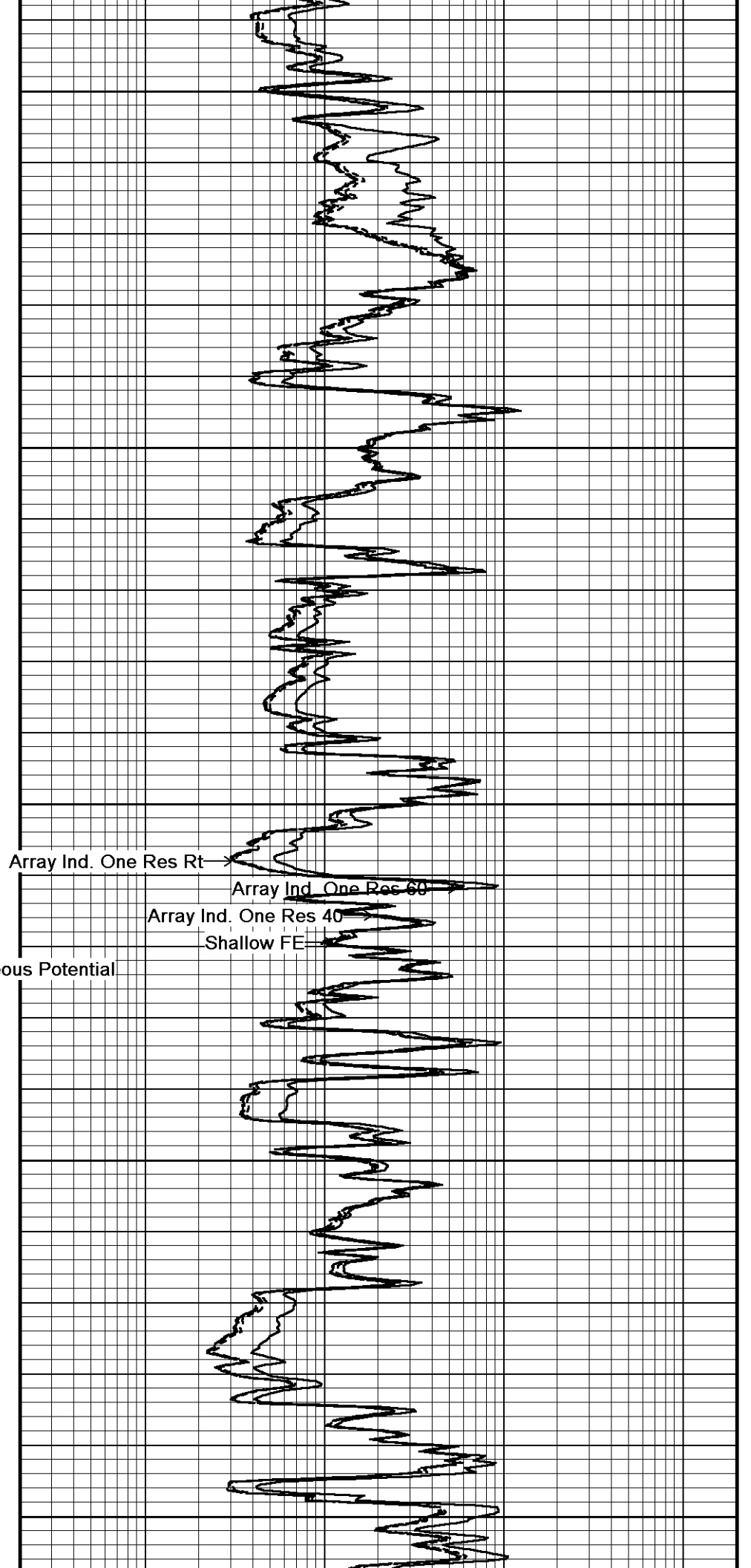
5500

117°

5550

117°

5600



Array Ind. One Res Rt

Array Ind. One Res 60

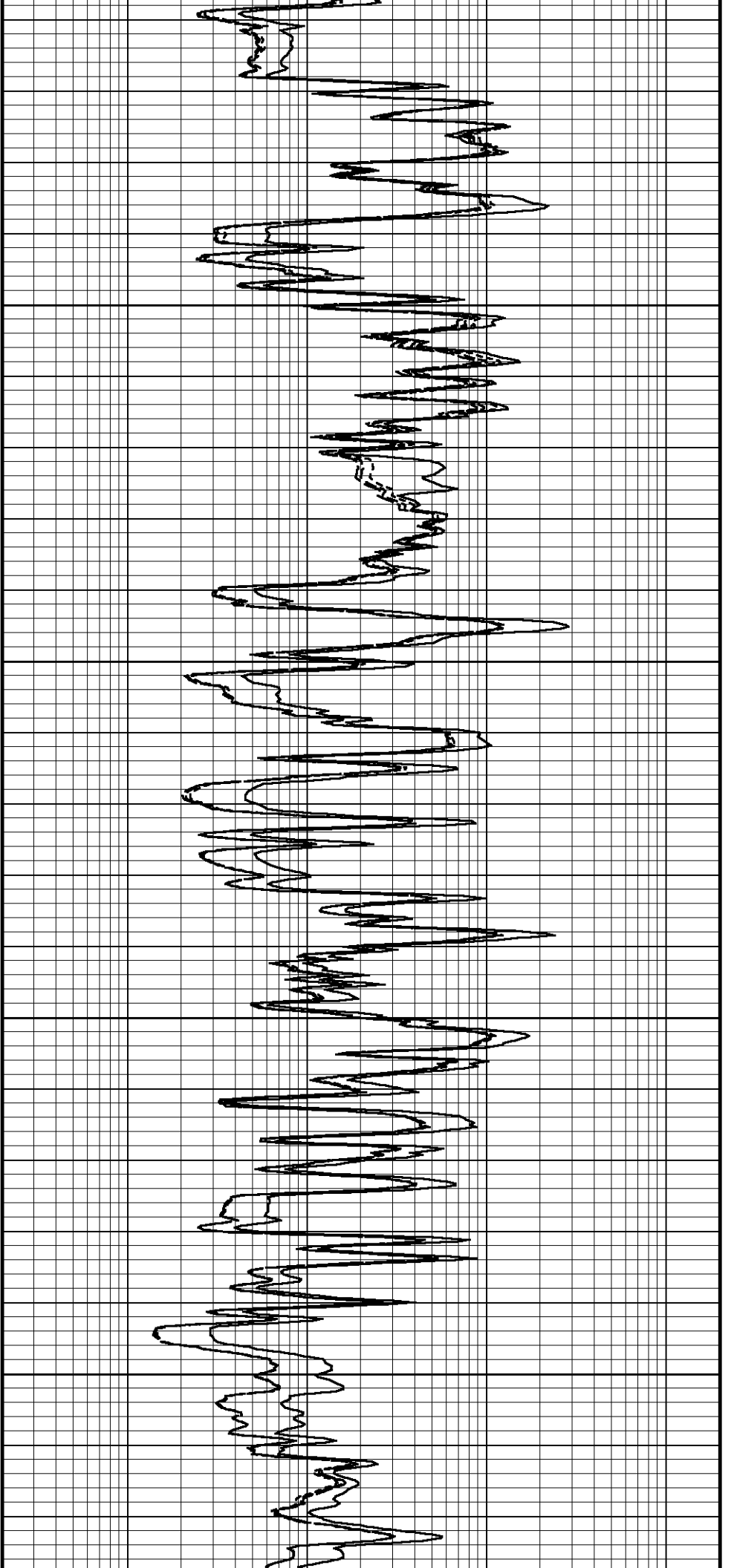
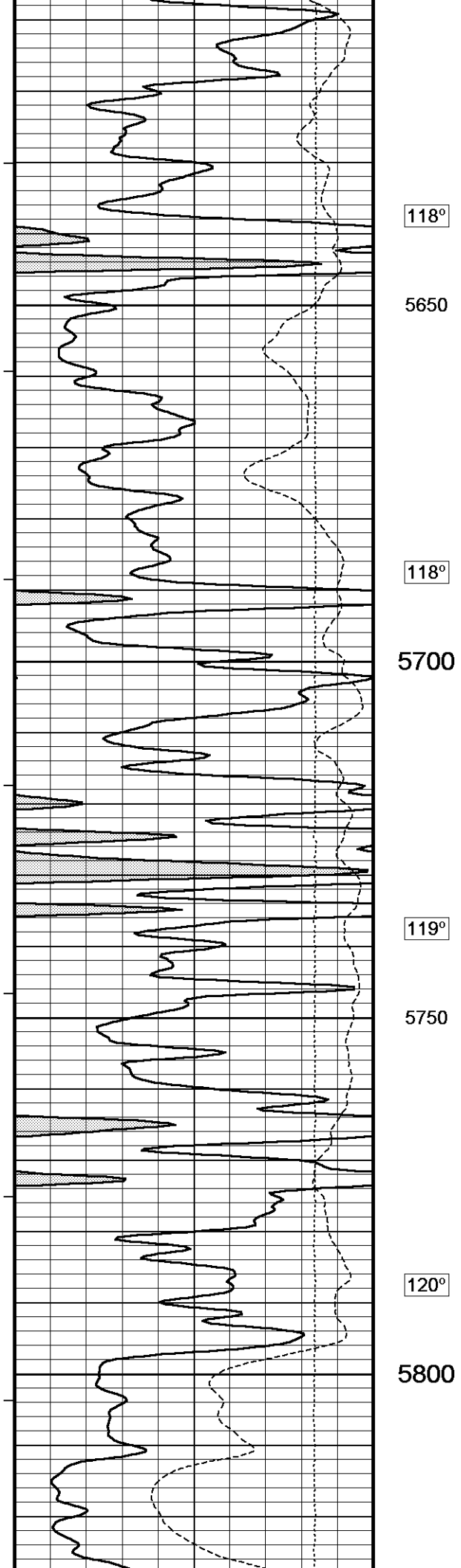
Array Ind. One Res 40

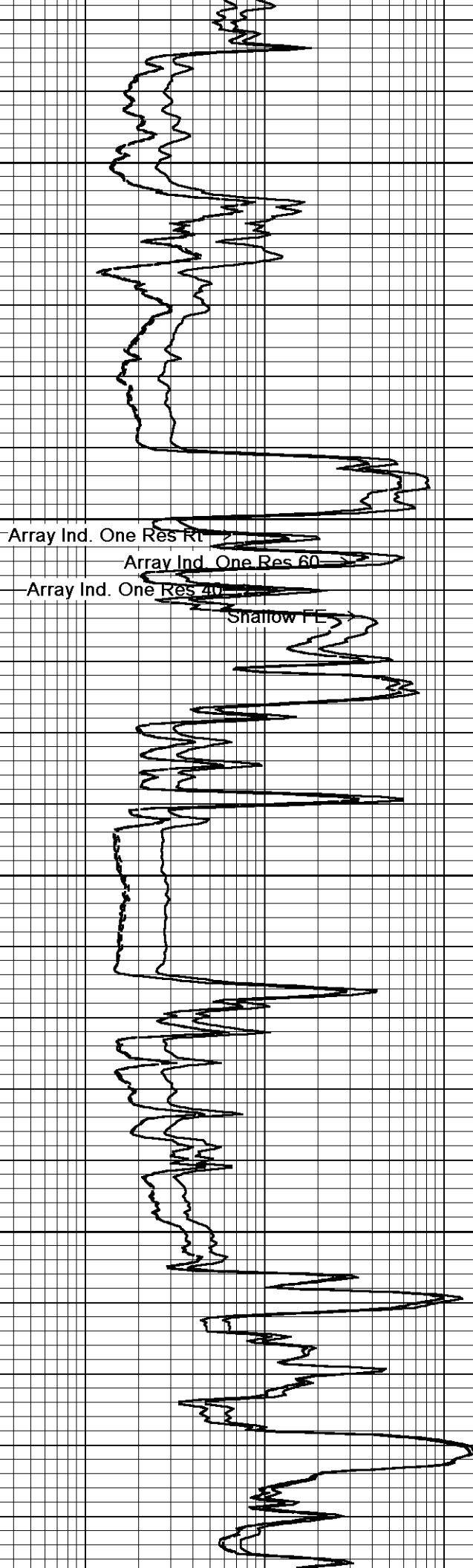
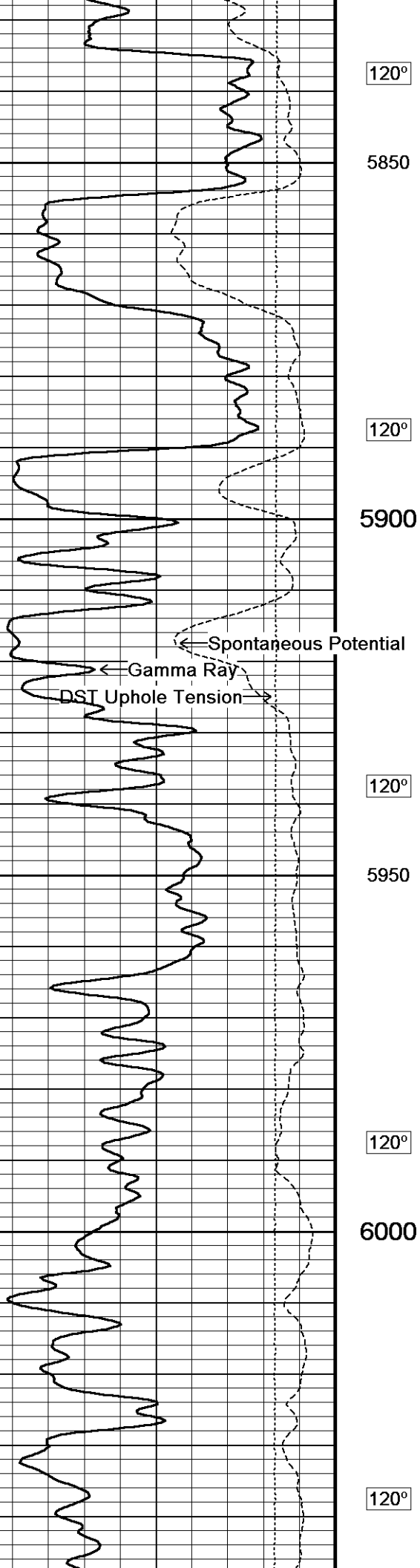
Shallow FE

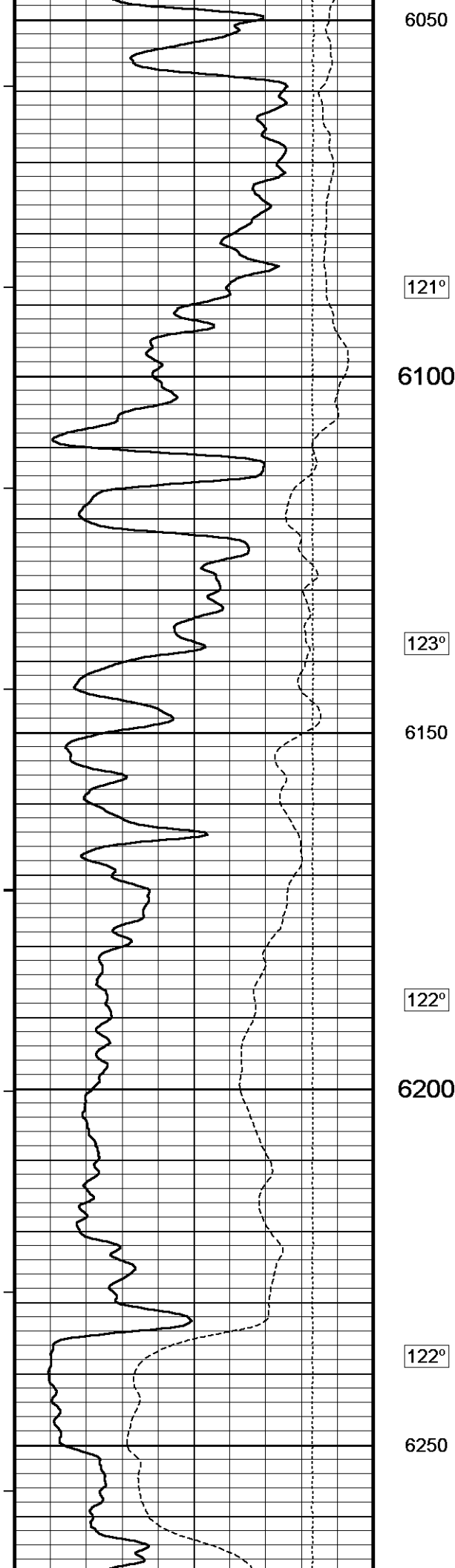
Spontaneous Potential

Gamma Ray

DST Uphole Tension







6050

121°

6100

123°

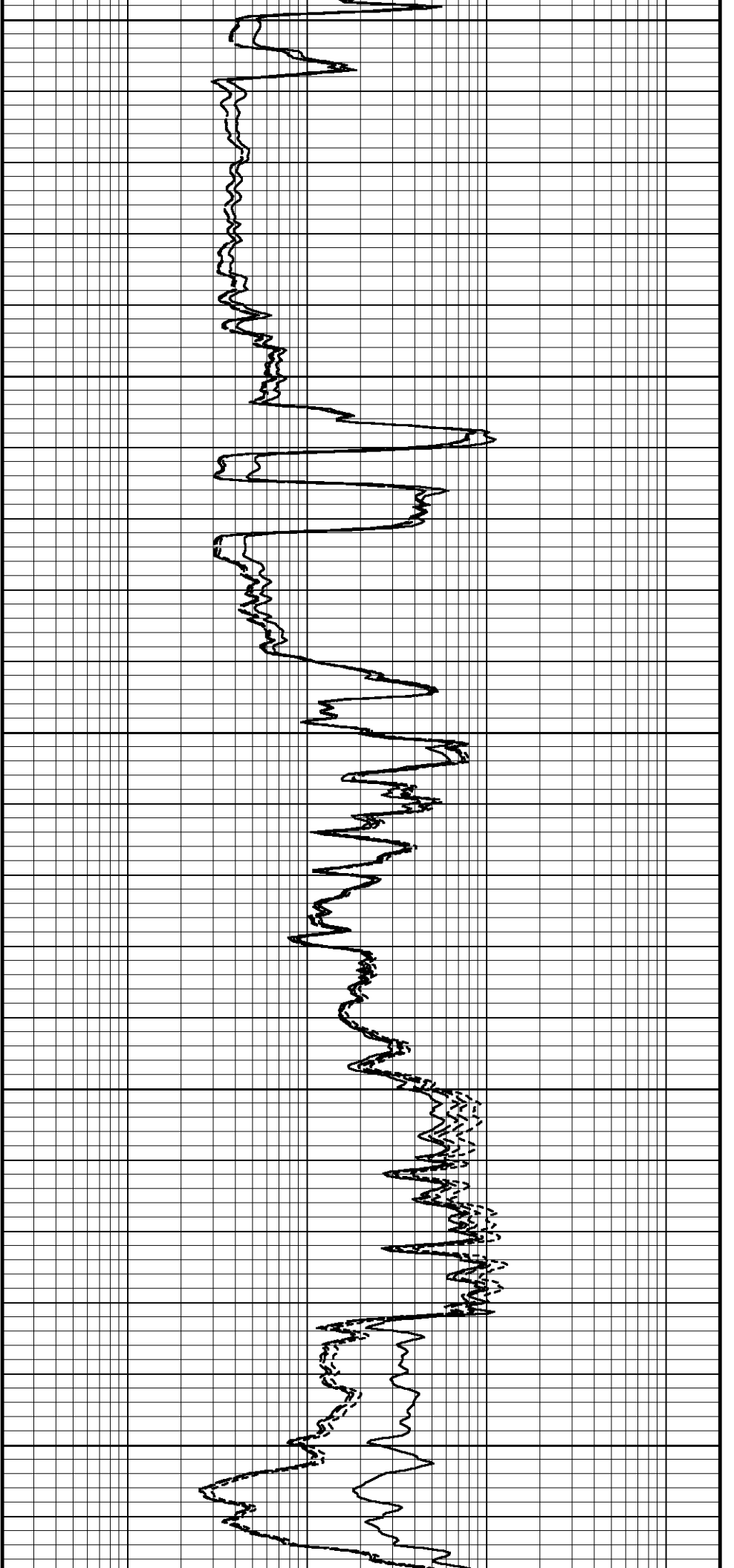
6150

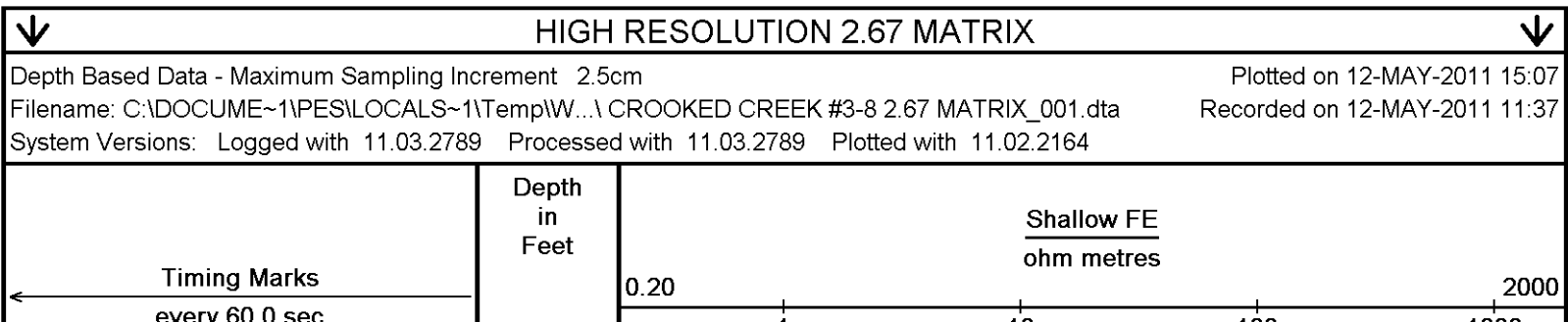
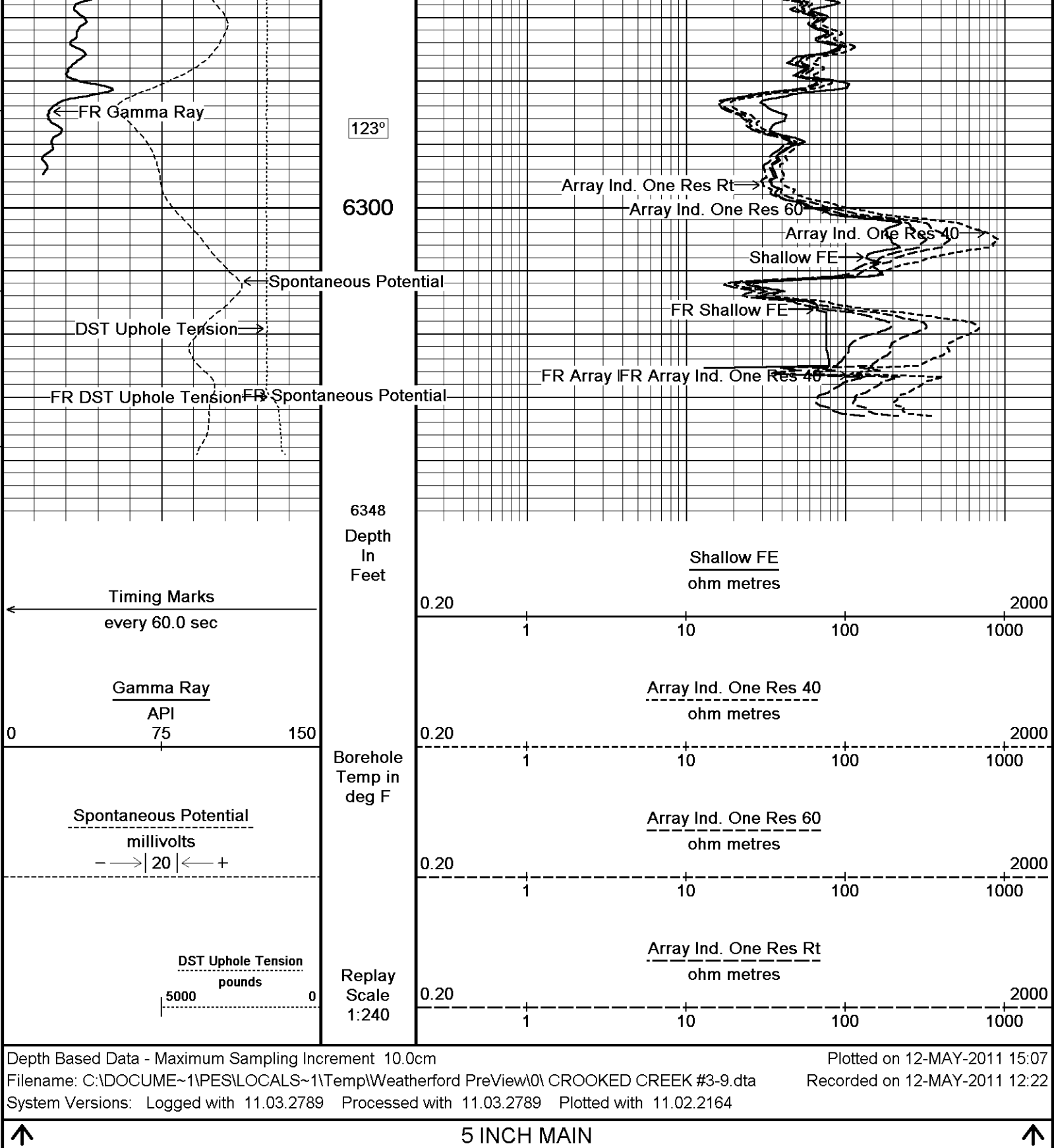
122°

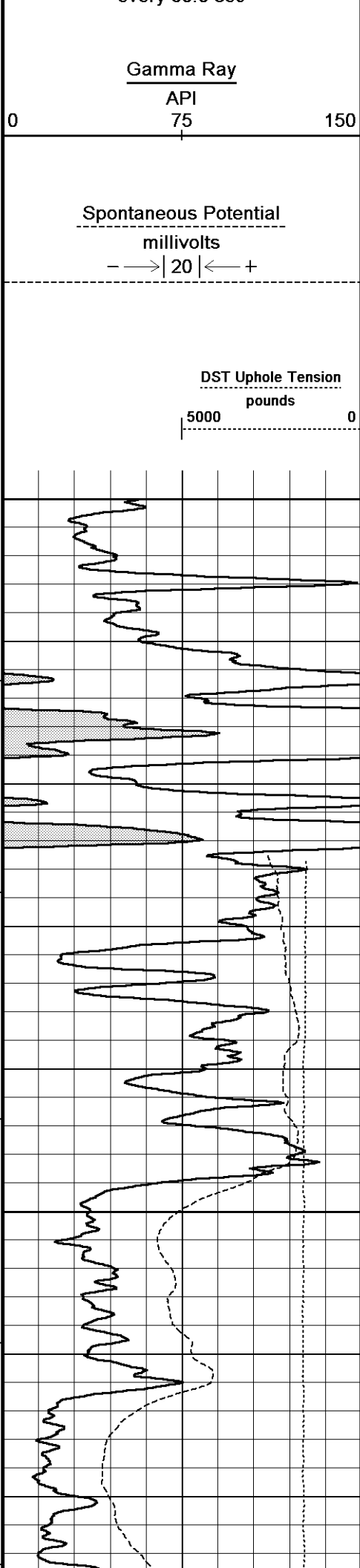
6200

122°

6250







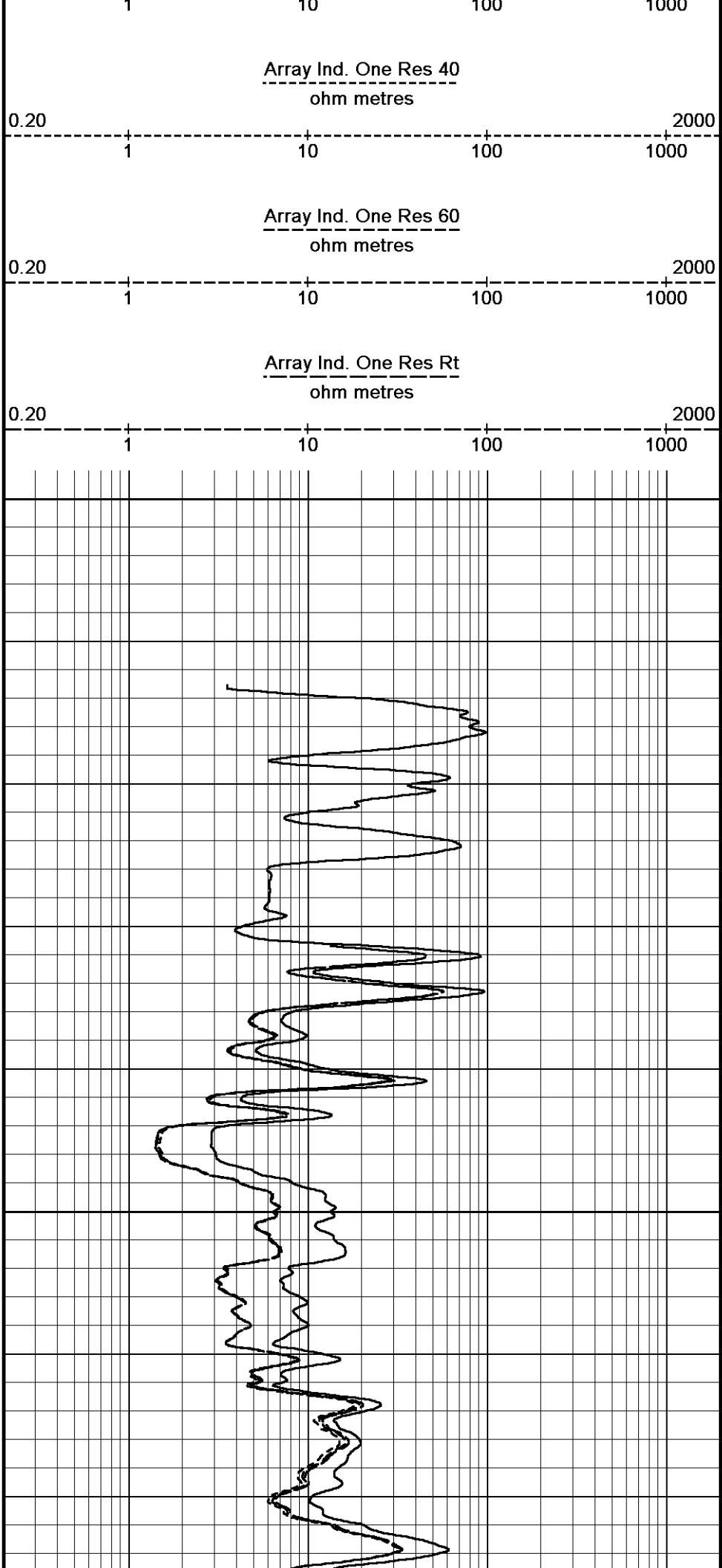
Borehole
Temp in
deg F

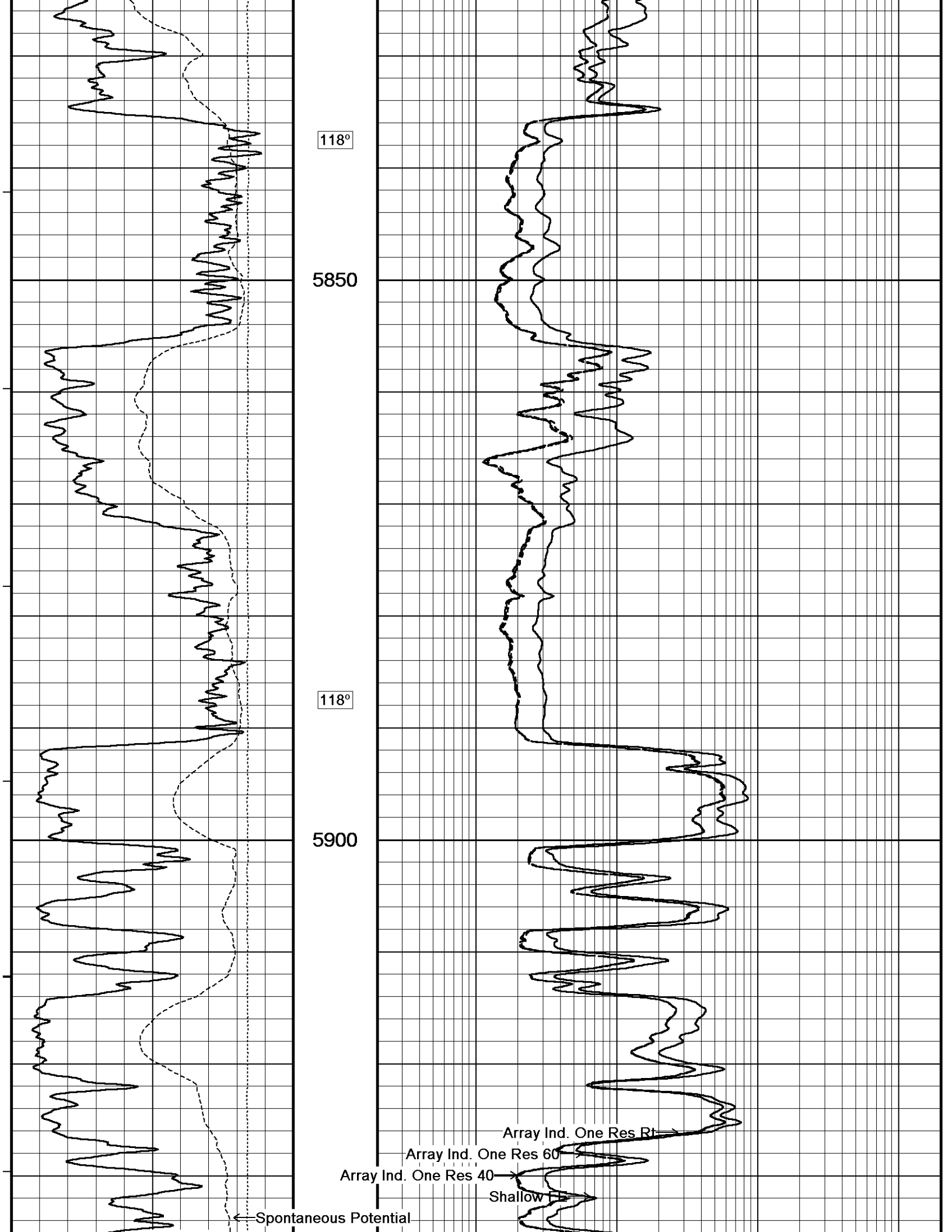
Replay
Scale
1:120

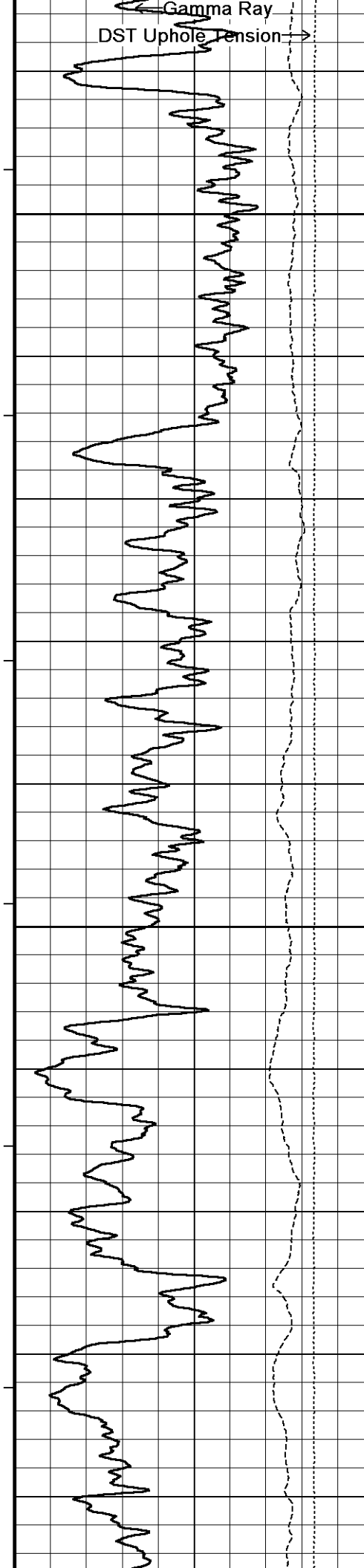
5750

119°

5800







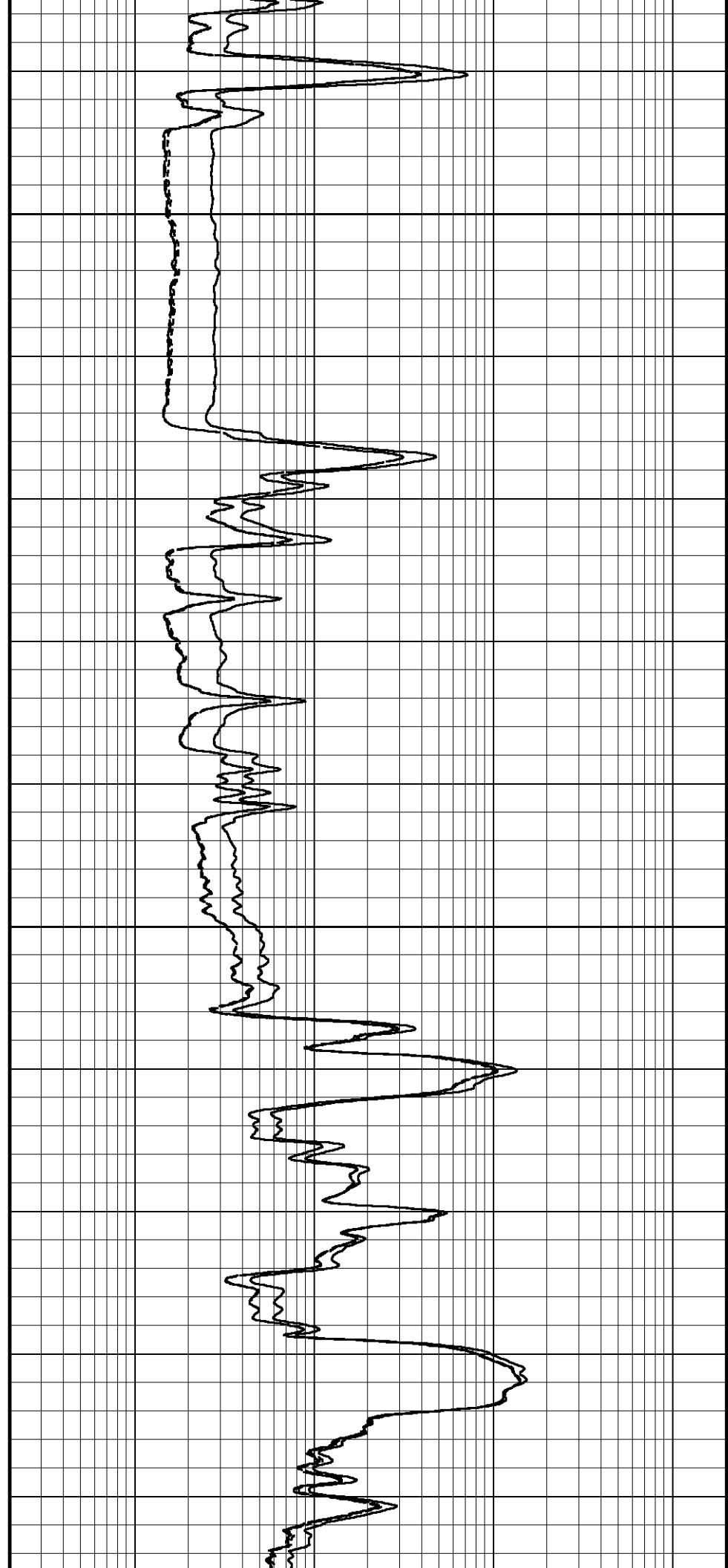
118°

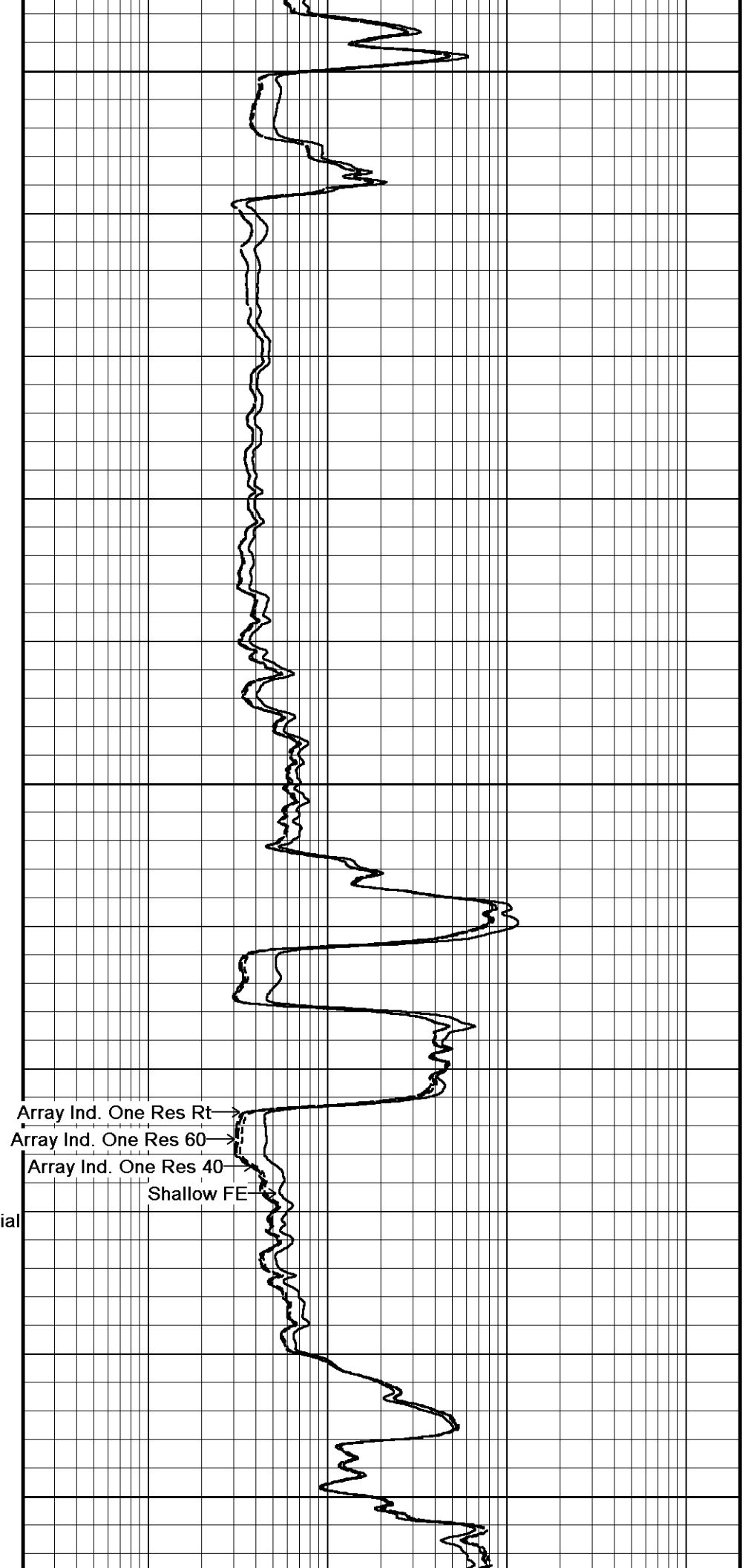
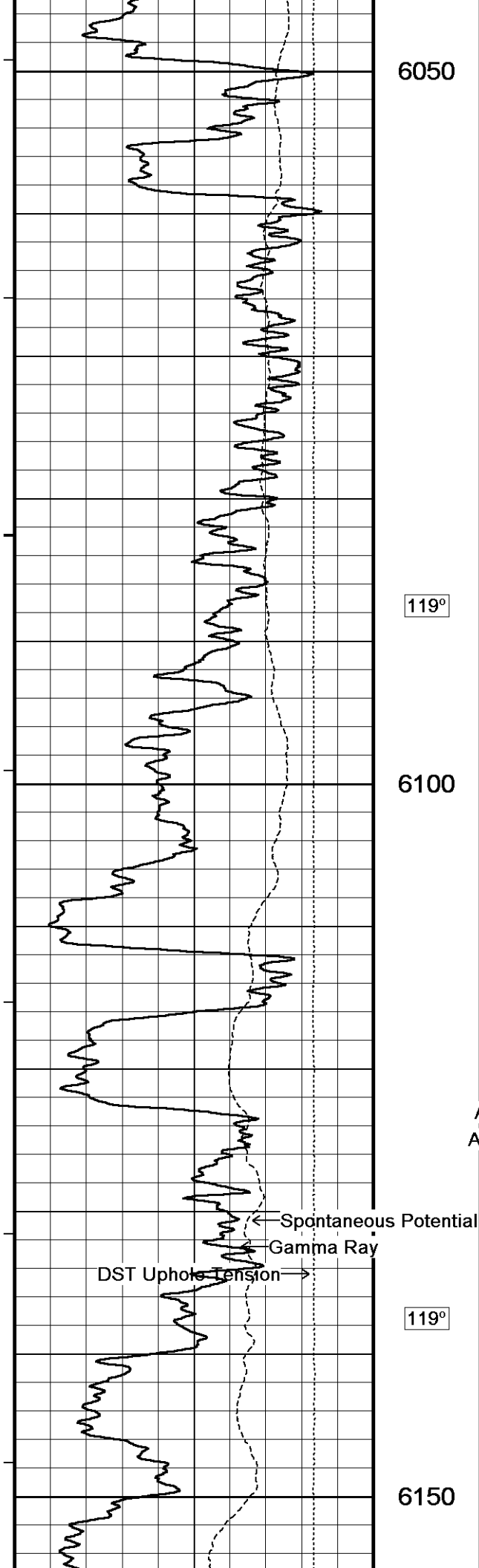
5950

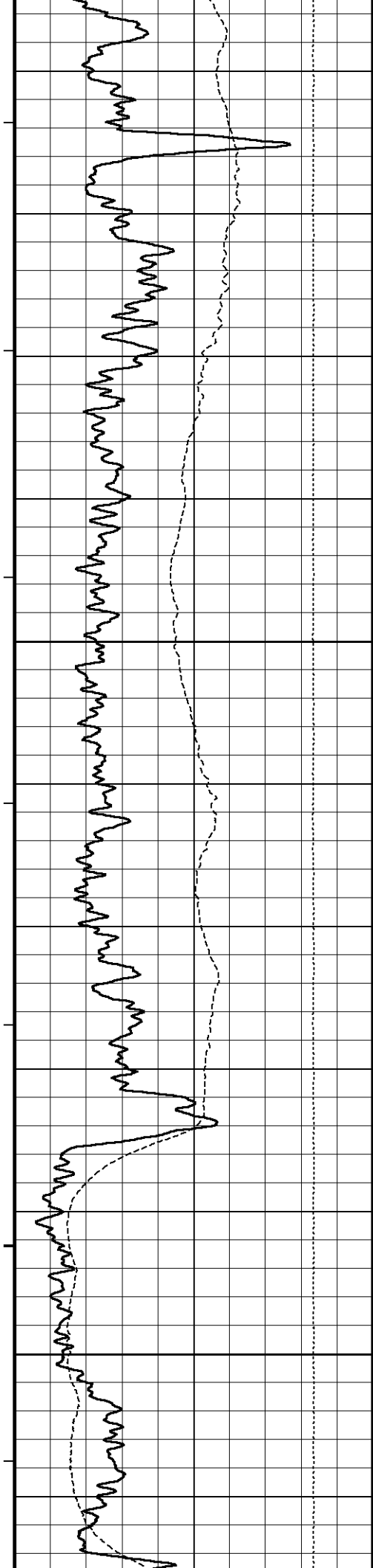
118°

6000

118°





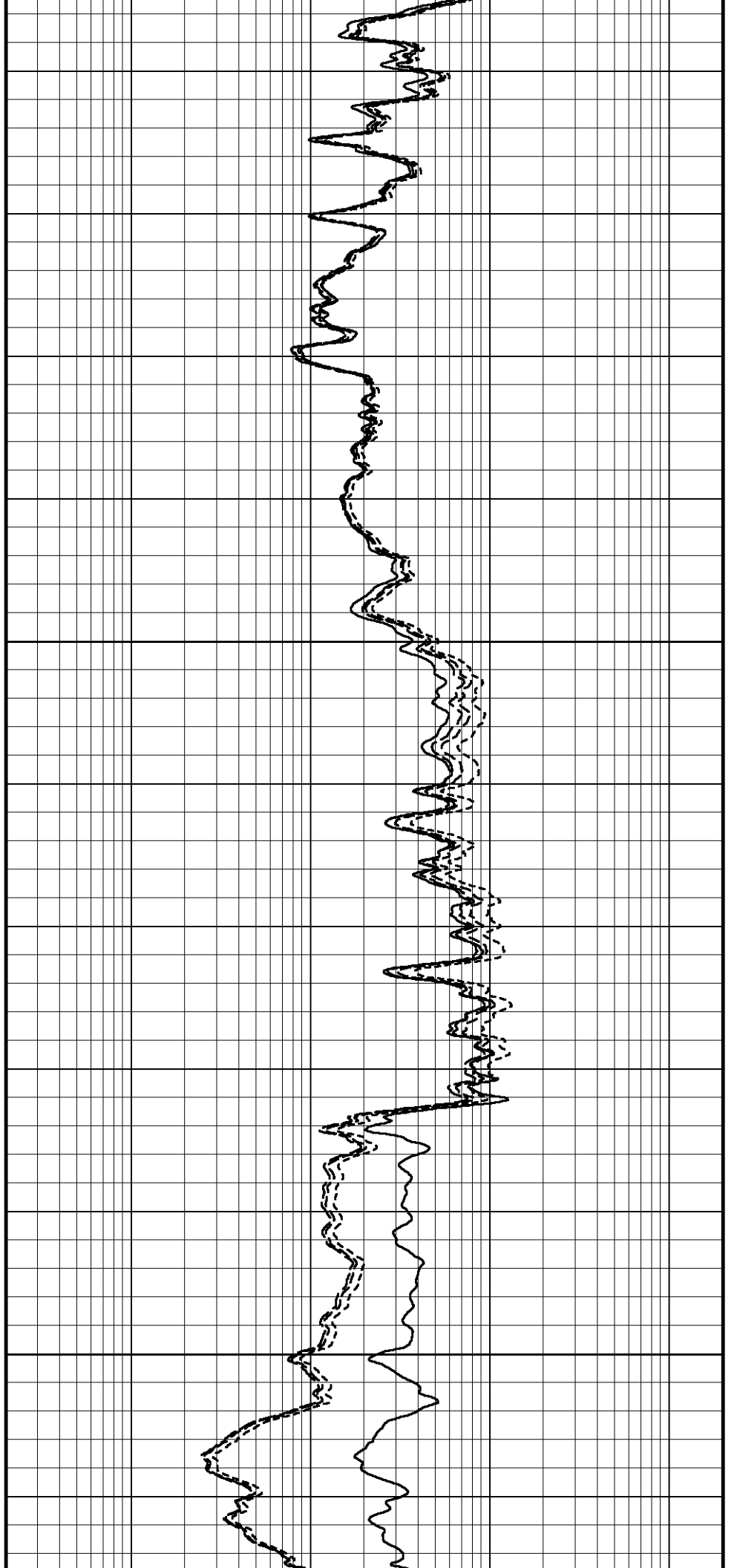


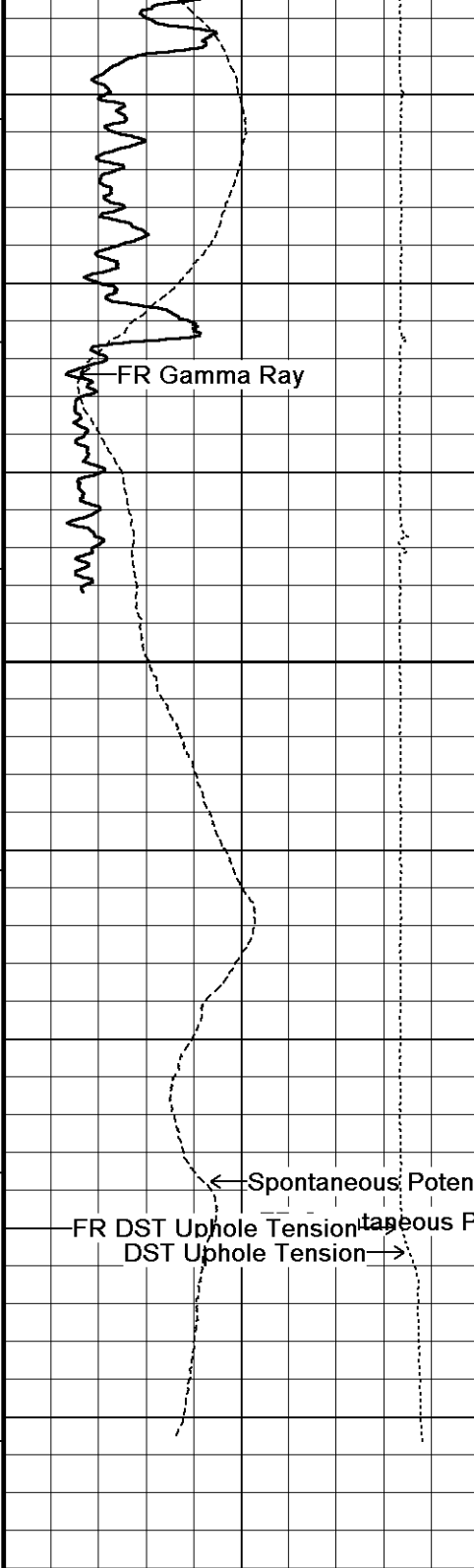
120°

6200

120°

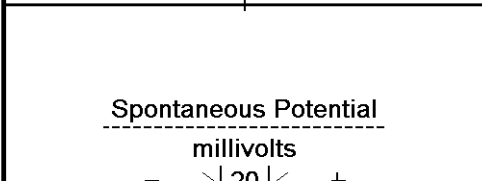
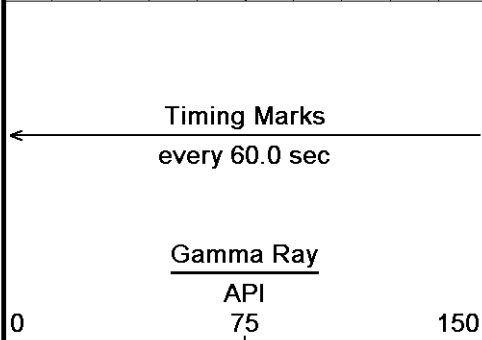
6250





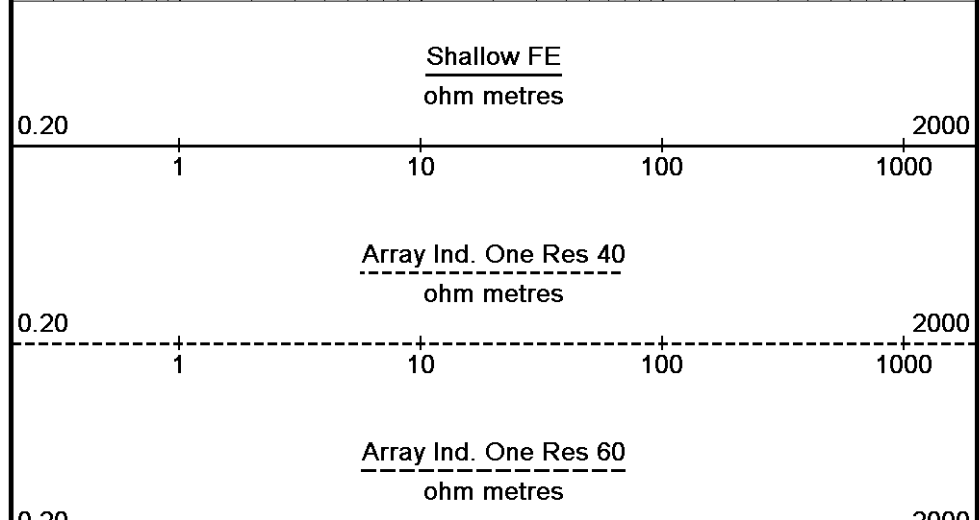
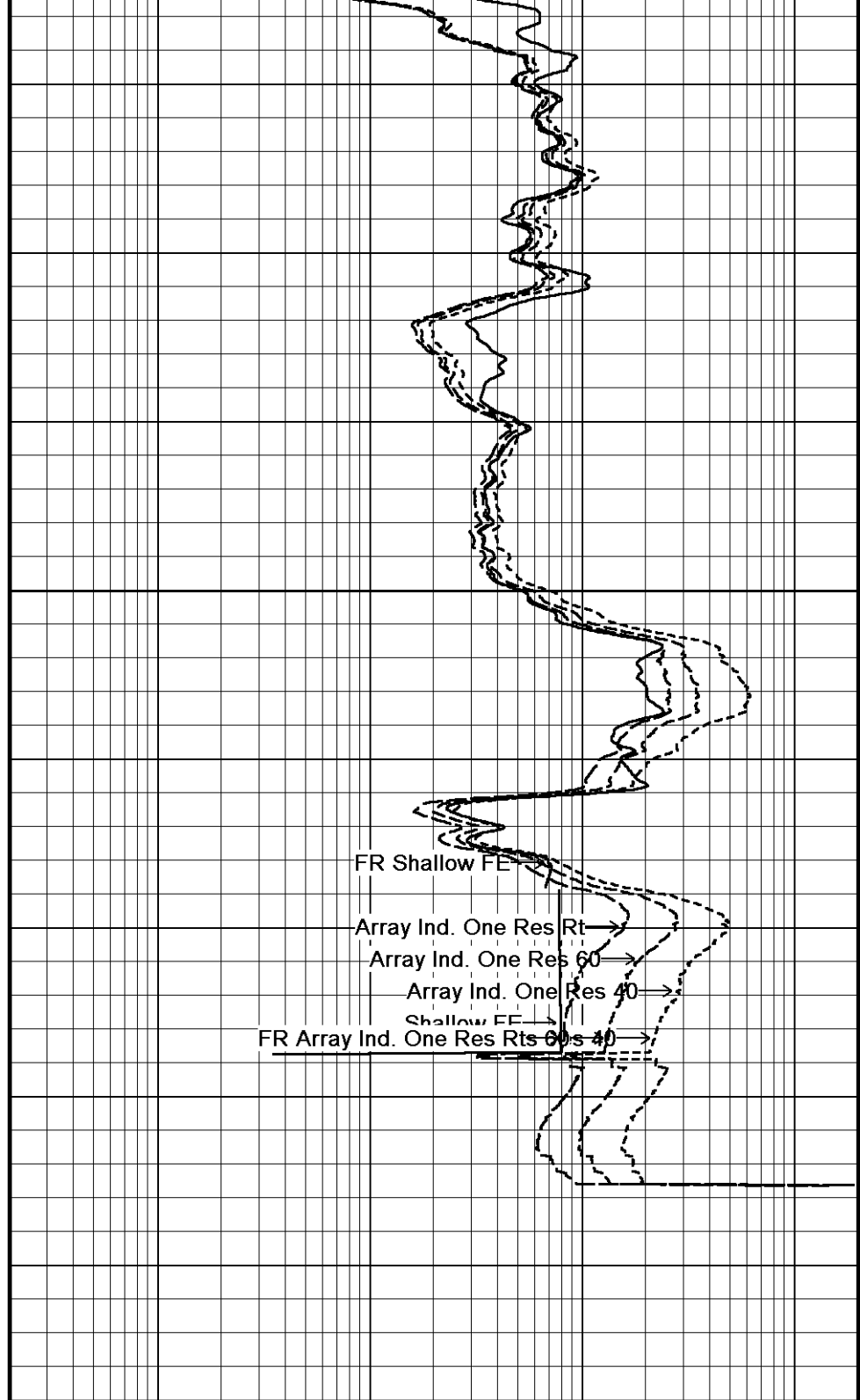
120°

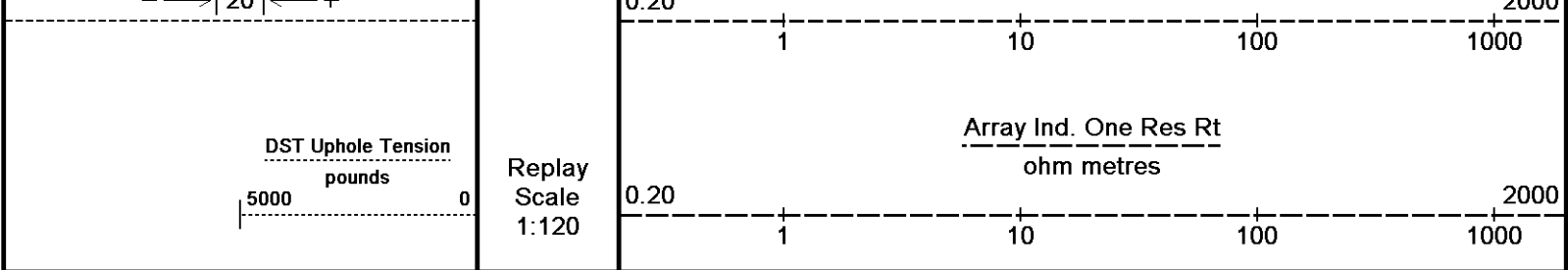
6300



6346
Depth
in
Feet

Borehole
Temp in
deg F



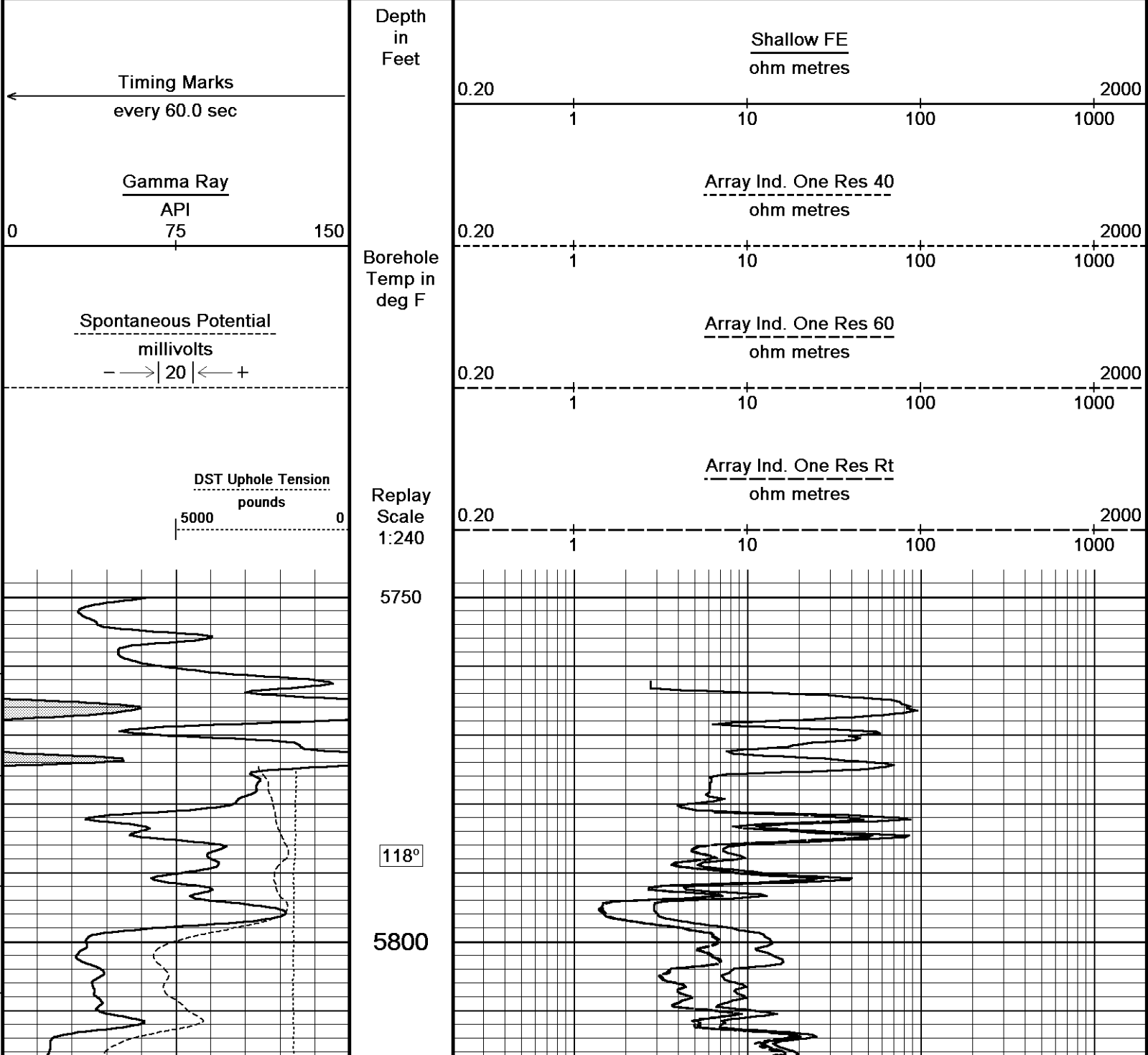


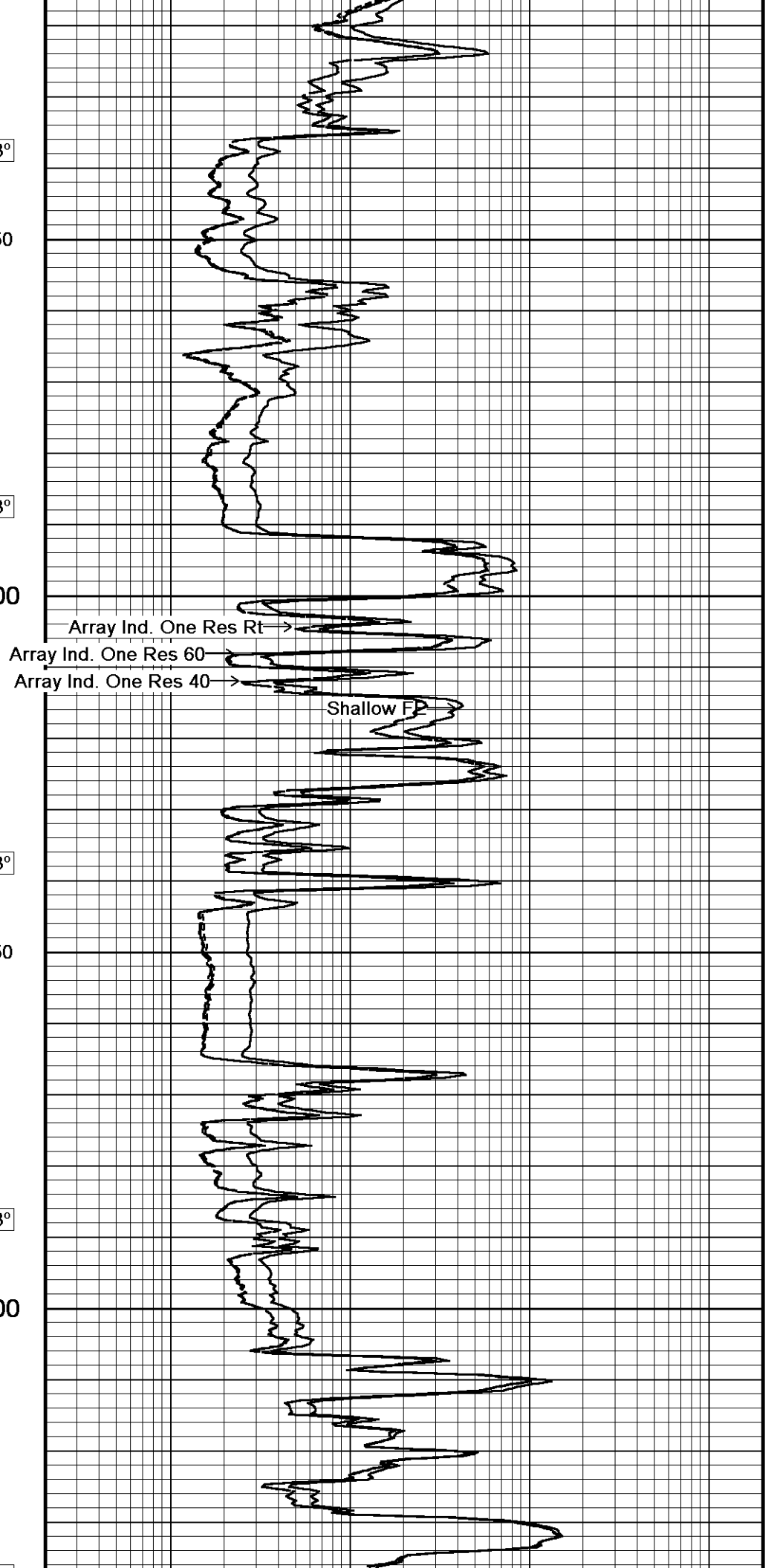
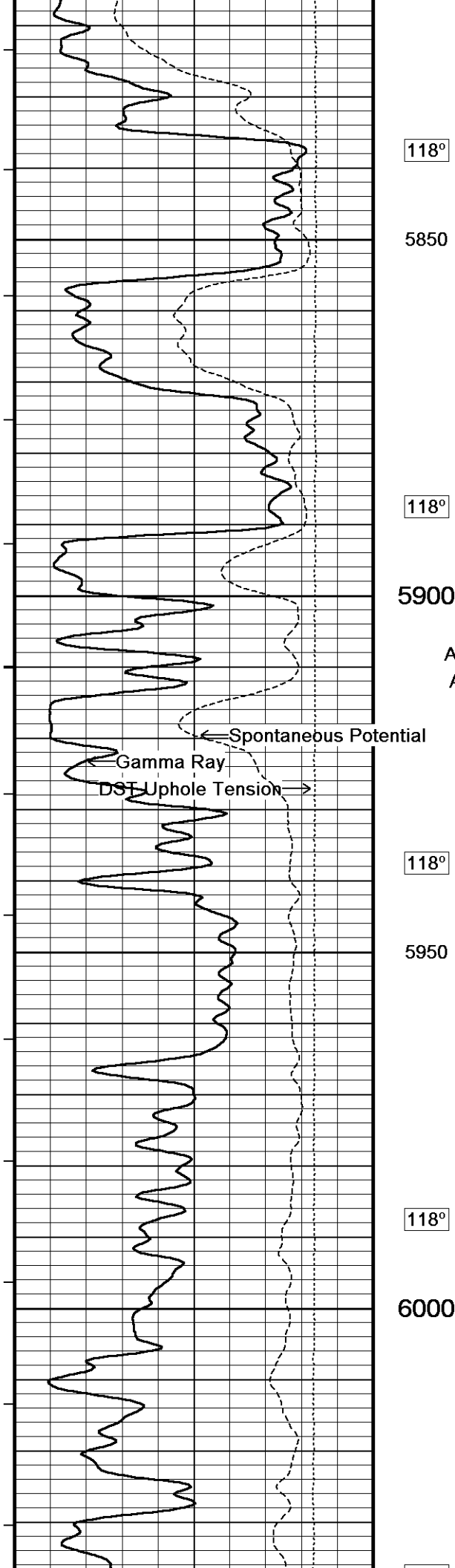
Depth Based Data - Maximum Sampling Increment 2.5cm Plotted on 12-MAY-2011 15:08
Filename: C:\DOCUME~1\PES\LOCALS~1\Temp\W... \CROOKED CREEK #3-8 2.67 MATRIX_001.dta Recorded on 12-MAY-2011 11:37
System Versions: Logged with 11.03.2789 Processed with 11.03.2789 Plotted with 11.02.2164

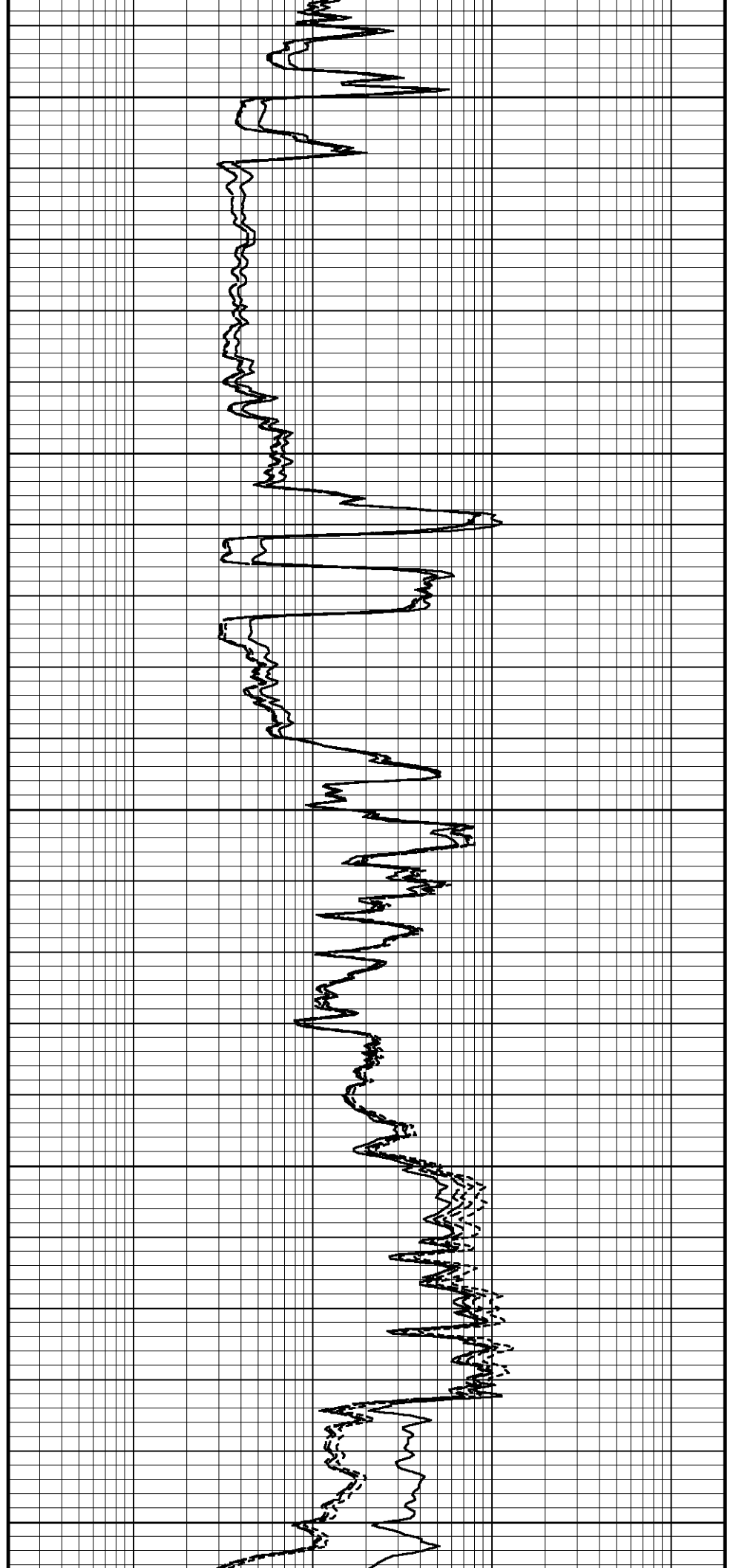
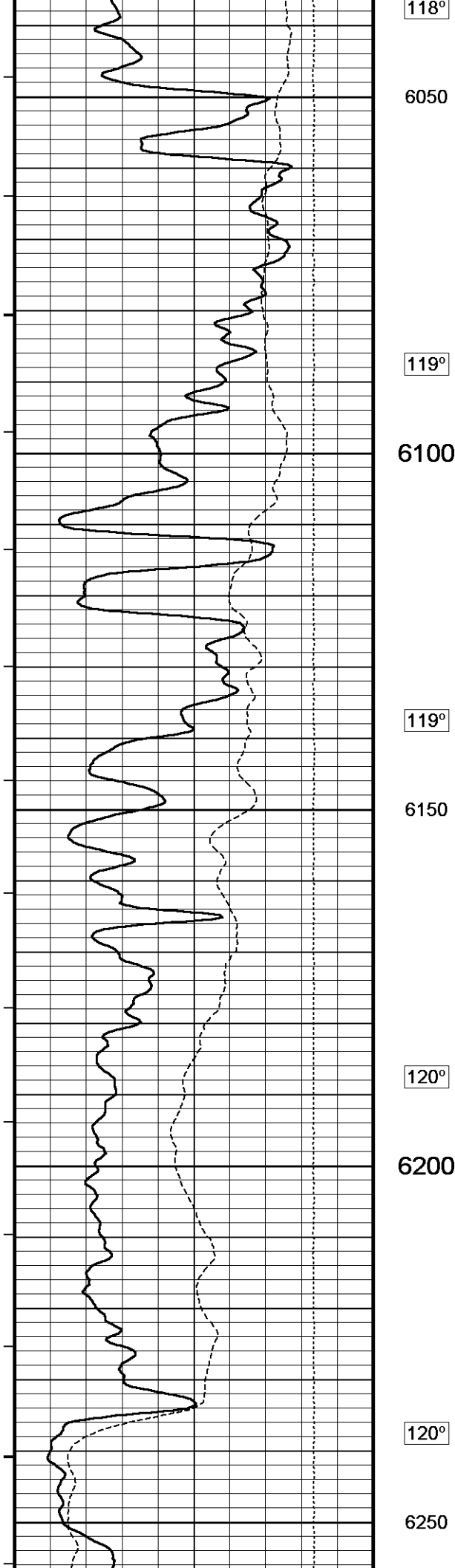
↑ HIGH RESOLUTION 2.67 MATRIX ↑

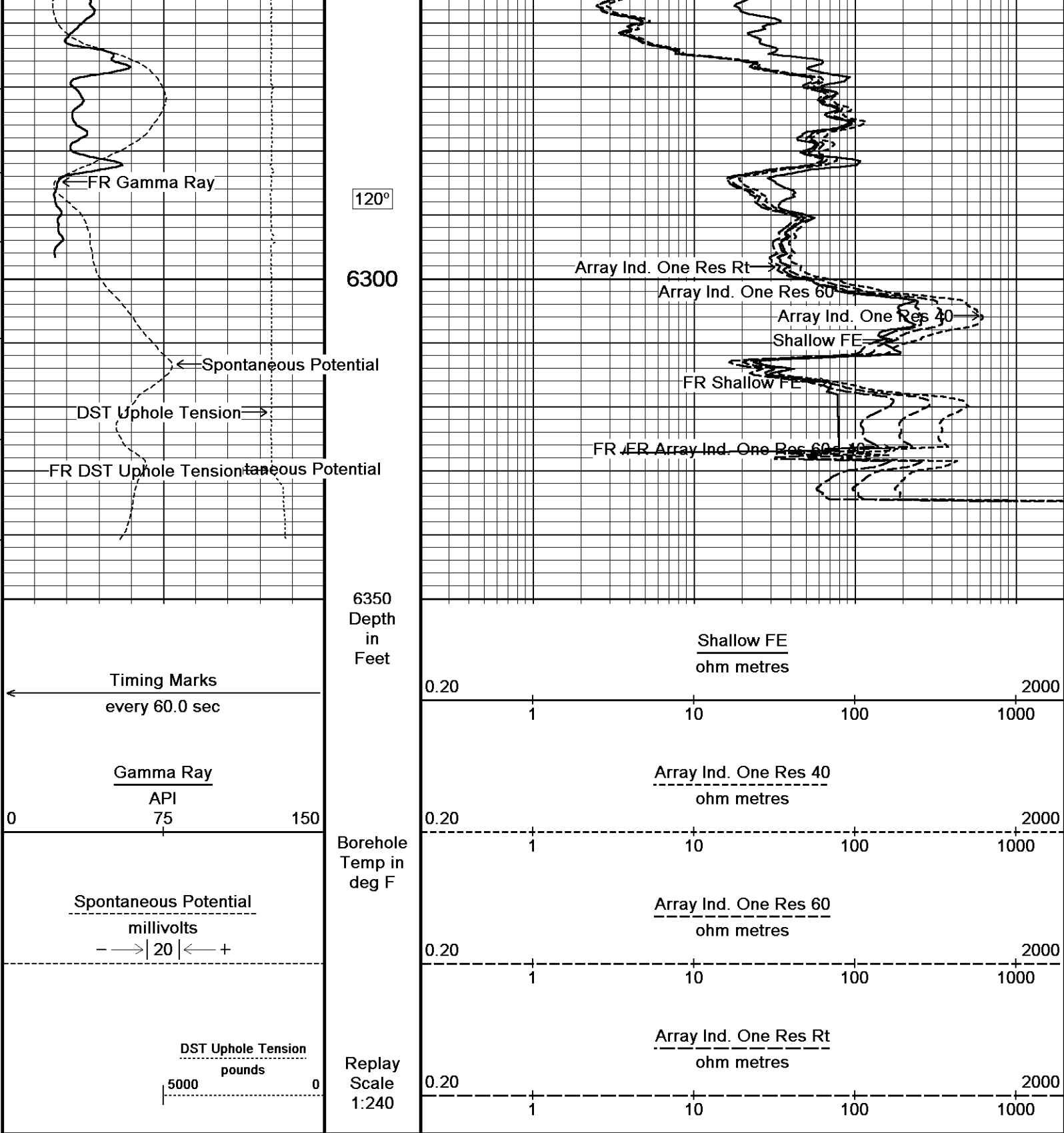
↓ REPEAT SECTION ↓

Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 12-MAY-2011 15:08
Filename: C:\DOCUME~1\PES\LOCALS~1\Temp\W... \CROOKED CREEK #3-8 2.67 MATRIX_002.dta Recorded on 12-MAY-2011 11:37
System Versions: Logged with 11.03.2789 Processed with 11.03.2789 Plotted with 11.02.2164









Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 12-MAY-2011 15:08

Filename: C:\DOCUME~1\PES\LOCALS~1\Temp\W... CROOKED CREEK #3-8 2.67 MATRIX_002.dta

Recorded on 12-MAY-2011 11:37

System Versions: Logged with 11.03.2789 Processed with 11.03.2789 Plotted with 11.02.2164

↑ REPEAT SECTION ↑

BEFORE SURVEY CALIBRATION

C:\DOCUME~1\PES\LOCALS~1\Temp\Weatherford PreView\0\ CROOKED CREEK #3-8.dta

General Constants All 000

Last Edited on 12-MAY-2011,14:39

General Parameters

Max Depth 10000

Mud Resistivity	0.360	ohm-metres		
Mud Resistivity Temperature	91.000	degrees F		
Water Level	0.000	feet		
Density/Neutron 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. One Res Rt			
RWA Constant A	1.000			
RWA Constant M	2.000			
Down-hole Tension Calibration All 000				
		Field Calibration on 30-JUN-2010		
Reading No	Measured	Calibrated (lbs)		
1	14112.01	10.00		
2	15164.79	427.00		
Down-hole Tension Calibration SMS 0				
		Field Calibration on 30-JUN-2010		
Reading No	Measured	Calibrated (lbs)		
1	14112.01	10.00		
2	15164.79	427.00		
High Resolution Temperature Calibration MCG-C 139				
		Field Calibration on 03-SEP-2010,11:23		
	Measured	Calibrated(Deg F)		
Lower	50.00	50.00		
Upper	75.00	75.00		
High Resolution Temperature Constants MCG-C 139				
		Last Edited on		
Pre-filter Length	11			
SP Calibration MCG-C 139				
		Field Calibration on 04-MAR-2011 06:37		
	Measured	Calibrated (mV)		
Reference 1	103.7	100.0		
Reference 2	-96.9	-100.0		
Gamma Calibration MCG-C 139				
		Field Calibration on 03-MAY-2011 10:00		
	Measured	Calibrated (API)		
Background	65	43		
Calibrator (Gross)	1142	768		
Calibrator (Net)	1077	725		
Gamma Constants MCG-C 139				
		Last Edited on 08-MAY-2011,18:39		
Gamma Calibrator Number	grc38			
Mud Density	1.09	gm/cc		
Caliper Source for Processing	Density Caliper			
Tool Position	Eccentred			
Concentration of KCl	0.00	kppm		
Micro Normal and Micro Inverse Calibration MML-A 16				
		Base Calibration on 11-MAR-2011 11:10		
		Field Check on 25-APR-2011 20:38		
Base Calibration				
Channel	Resistor 1	Measured Resistor 2	Calibrated (ohm-m) Resistor 1	Resistor 2
Micro Normal	12.2	60.2	2.6	12.8
Micro Inverse	15.6	78.3	1.7	8.4
Channel	Base Check (ohm-m)		Field Check (ohm-m)	
Micro Normal	32.1		32.1	
Micro Inverse	16.3		16.3	
Micro Normal and Micro Inverse Constants MML-A 16			Last Edited on 11-APR-2011,09:08	

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	N/A inches

Caliper Calibration MML-A 16

Base Calibration on 11-MAR-2011 11:20

Field Calibration on 03-MAY-2011 09:52

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	13875	5.98
2	17350	7.97
3	20581	9.86
4	24656	11.92
5	0	0.00
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
6.05	5.98

Neutron Calibration MDN-A.B 66

Base Calibration on 11-MAR-2011 13:54

Field Check on 03-MAY-2011 09:48

Base Calibration

	Measured		Calibrated (cps)	
	Near	Far	Near	Far
	3091	97	3714	110
Ratio	31.957		33.764	

Field Calibrator at Base

	Calibrated (cps)	
	1660	2371
Ratio	0.700	

Field Check

	Calibrated (cps)	
	1651	2372
Ratio	0.696	

Neutron Constants MDN-A.B 66

Last Edited on 08-MAY-2011,18:39

Neutron Source Id	P58125B
Neutron Jig Number	5824NE
Epithermal Neutron	No
Caliper Source for Processing	Density Caliper
Stand-off	0.00 inches
Mud Density	1.09 gm/cc
Limestone Sigma	7.10 cu
Sandstone Sigma	4.26 cu
Dolomite Sigma	4.70 cu
Formation Pressure Source	Constant Value
Formation Pressure	0.00 kpsi
Temperature Source	Constant Value
Temperature	68.00 degrees F
Mud Salinity	0.00 kppm
Formation Fluid Salinity Source	Constant Value
Formation Fluid Salinity	0.00 kppm
Barite Mud Correction	Not Applied

FE Calibration MFE-A.A 52

Base Calibration on 11-MAR-2011 10:55

Field Check on 25-APR-2011 20:34

Base Calibration

	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	965.7	126.8

Base Check	279.9
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Field Check	279.9
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FE Constants MFE-A.A 52

Last Edited on 28-APR-2011,22:25

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
High Resolution Temperature Calibration MAI-A.A 167		
	Measured	Calibrated(Deg F)
Lower	1.00	33.80
Upper	11.00	51.80
High Resolution Temperature Constants MAI-A.A 167		
Pre-filter Length	11	Last Edited on
Induction Calibration MAI-A.A 167		
		Base Calibration on 11-MAR-2011,09:58
		Field Check on 25-APR-2011 20:33
Base Calibration		
Test Loop Calibration		
Channel	Measured	Calibrated (mmho/m)
	Low	High
1	17.3	474.2
2	6.3	388.4
3	3.3	259.4
4	1.9	133.0
Array Temperature	76.8	Deg F
Channel		
	Base Check (mmho/m)	Field Check (mmho/m)
	Low	High
1	0.0	0.0
2	0.0	0.0
3	0.0	0.0
4	0.0	0.0
Deep	0.0	0.0
Medium	0.0	0.0
Shallow	0.0	0.0
Array Temperature	0.0	57.8 Deg F
Induction Constants MAI-A.A 167		
		Last Edited on 24-APR-2011,22:39
Induction Model		
Caliper for Borehole Corr.	RtAP-WBM	
Hole Size for Borehole Correction	Density Caliper	
Tool Centred	N/A	inches
Stand-off Type	No	
Stand-off	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 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	

Caliper Calibration MPD-B 35

Base Calibration on 11-MAR-2011 11:34

Field Calibration on 03-MAY-2011 09:34

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	17936	3.99
2	28079	5.98
3	38384	7.97
4	48048	9.86
5	59047	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
5.98	5.98

Photo Density Calibration MPD-B 35

Base Calibration on 11-MAR-2011 11:54

Field Check on 03-MAY-2011 09:41

Density Calibration

Base Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	57876	27553	59556	30836
Reference 2	23524	2615	24941	2541

Field Check at Base

1175.2 1398.5

Field Check

1175.2 1388.6

PE Calibration

Base Calibration	WS	Measured		Calibrated Ratio
		WH	Ratio	
Background	211	1039		
Reference 1	21426	57673	0.375	0.371
Reference 2	6234	23377	0.270	0.272

Field Check at Base

211.2 1039.0

Field Check

211.0 1039.0

Density Constants MPD-B 35

Last Edited on 08-MAY-2011,18:40

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	1.09 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

DOWNHOLE EQUIPMENT

C:\DOCUME~1\PES\LOCALS~1\Temp\Weatherford PreView\0\ CROOKED CREEK #3-8.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-C 139 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

Compact Micro-log
MML-A 16 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

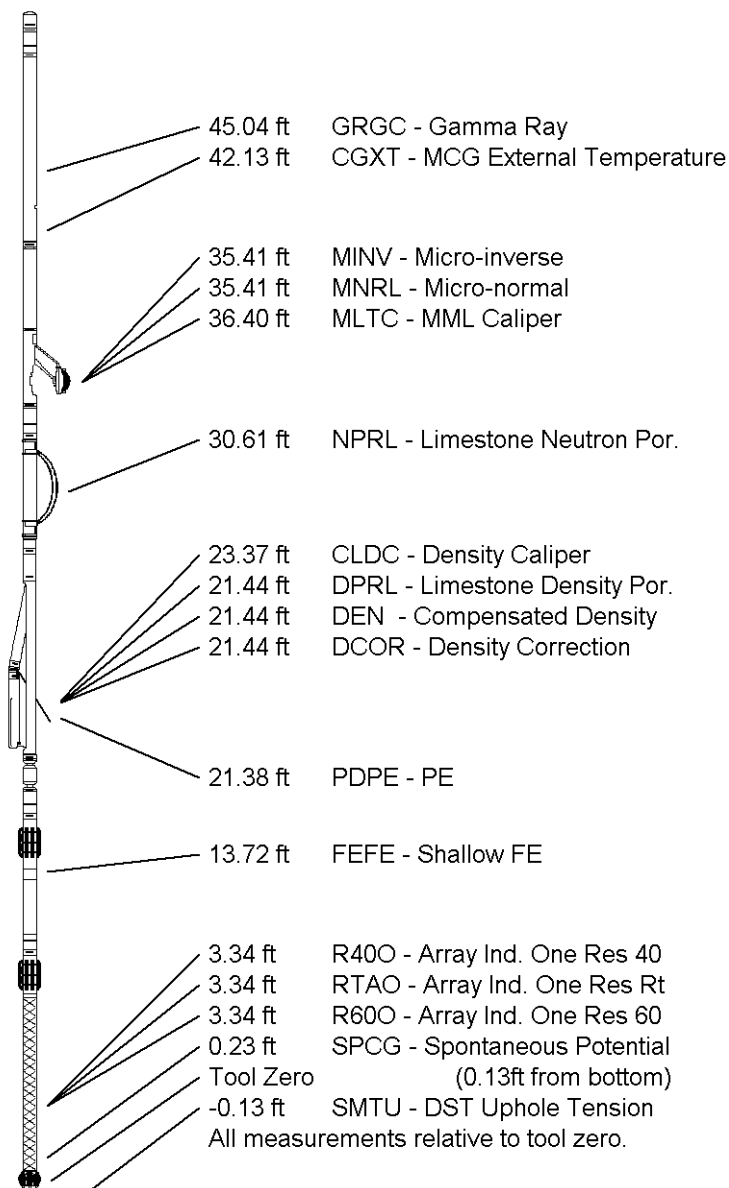
Compact Density/Caliper
MPD-B 35 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

SKJ-D.A Compact Knuckle Joint
SKJ-D.A 36 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

Compact Focussed Electric
MFE-A.A 52 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: 51.90 ft Weight: 423.3 lb



COMPANY

O'BRIEN ENERGY

WELL

CROOKED CREEK #3-8

FIELD

ANGELL SOUTH

PROVINCE/COUNTY

MEADE

COUNTRY/STATE

UNITED STATES / KANSAS

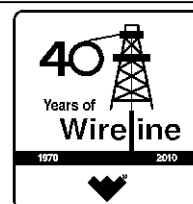
Elevation Kelly Bushing	2699.00	feet
Elevation Drill Floor	2697.00	feet
Elevation Ground Level	2687.00	feet

First Reading	6327.00	feet
Depth Driller	6330.00	feet
Depth Logger	6330.00	feet



Weatherford®

ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG





Weatherford

ARRAY INDUCTION SHALLOW FOCUSED ELECTRIC LOG

COMPANY O'BRIEN ENERGY

WELL ANGELL SOUTH

PROVINCE/COUNTRY MEADE

COUNTY/STATE UNITED STATES / KANSAS

LOCATION 6607 FSL & 1650 FEL



ASR Number	8	TYPE	33S	RE	29W	Other Services	MPLDMON
Serial Number	15-118-21291					MML	

Date 12-MAY-2011

Run Number ONE

Depth Driller 6330.00 feet

Depth Logger 6330.00 feet

First Reading 6327.00 feet

Last Reading 1496.00 feet

Casing Driller 1496.00 feet

Casing Logger 1496.00 feet

Bit Size 7.880 inches

Whole Pipe Type CHEMICAL

Density/Viscosity 8.90 lb/cuSg

PH / Fluid Loss 10.50

Sample Source FLOWLINE

Rim @ Measured Temp 0.36 @ 91.0 o/nrm

Rim @ Measured Temp 0.29 @ 91.0 o/nrm

Rim @ Measured Temp 0.43 @ 91.0 o/nrm

Source Rinf / Rmc CALC

Rim @ BHT 0.27 @ 20.0 o/nrm

Time Since Circulation 4 HOURS

Max Recorded Temp 120.00 deg F

Equipment Name COMPACT

Equipment Base 13075

Recorded By JUSTIN SCHEFFE

Entered By ROGER PETERSON

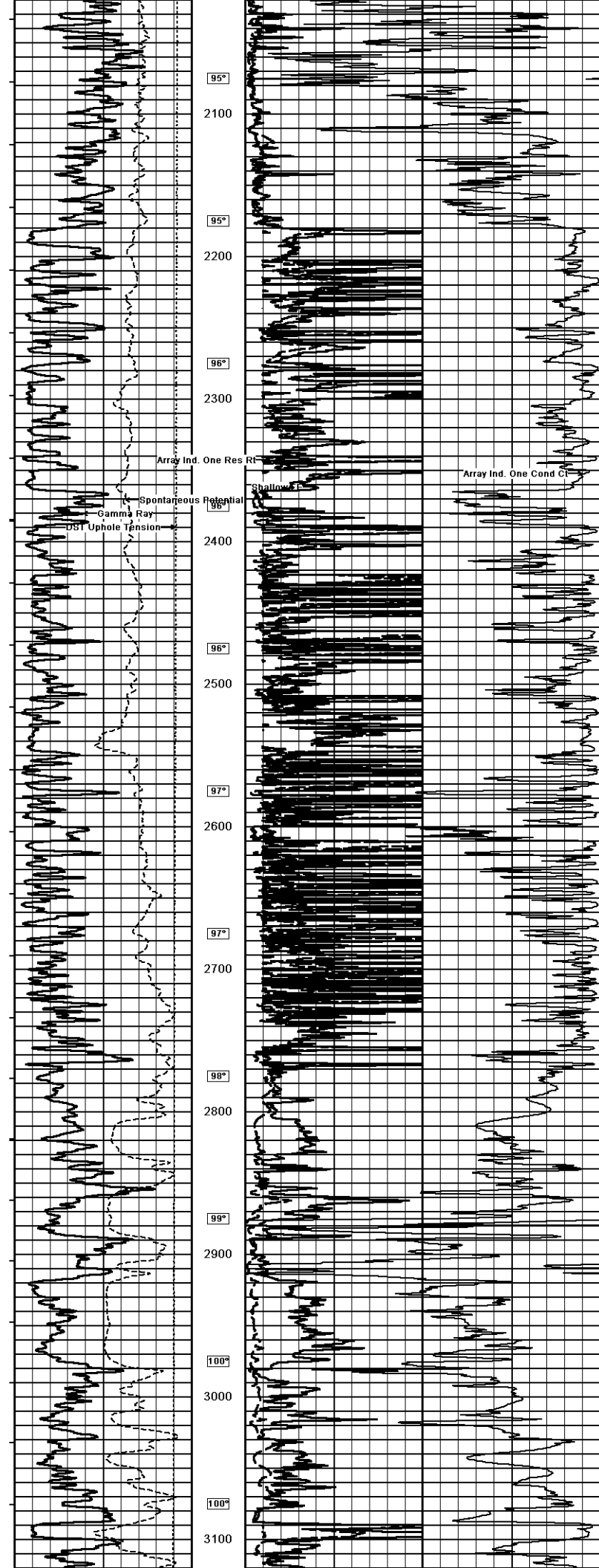
IO

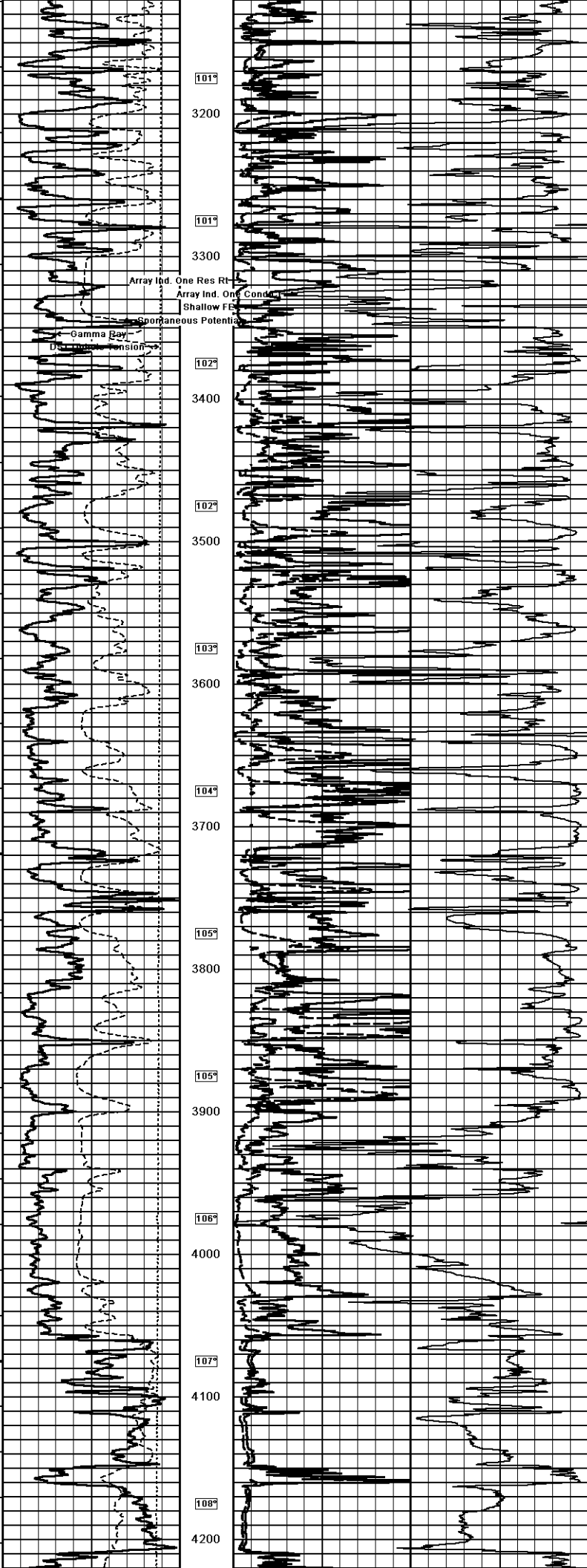
Elevation:

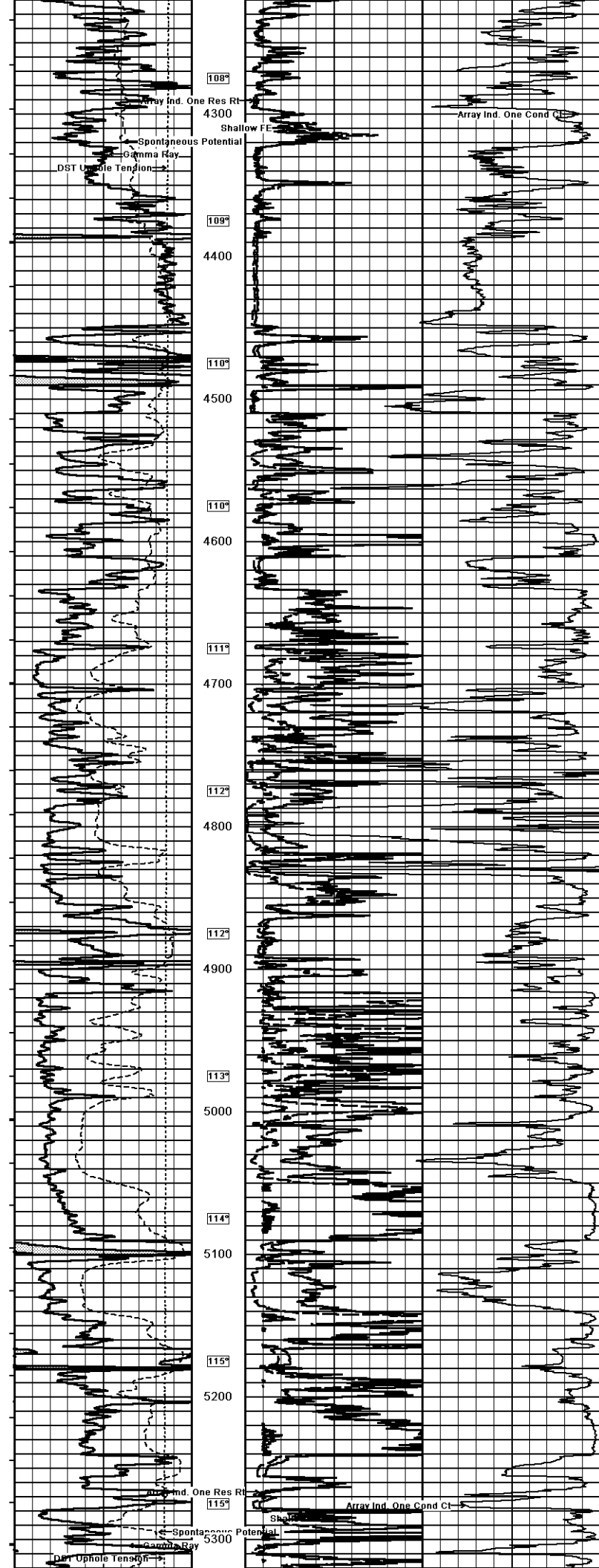
HB 2699.00 feet

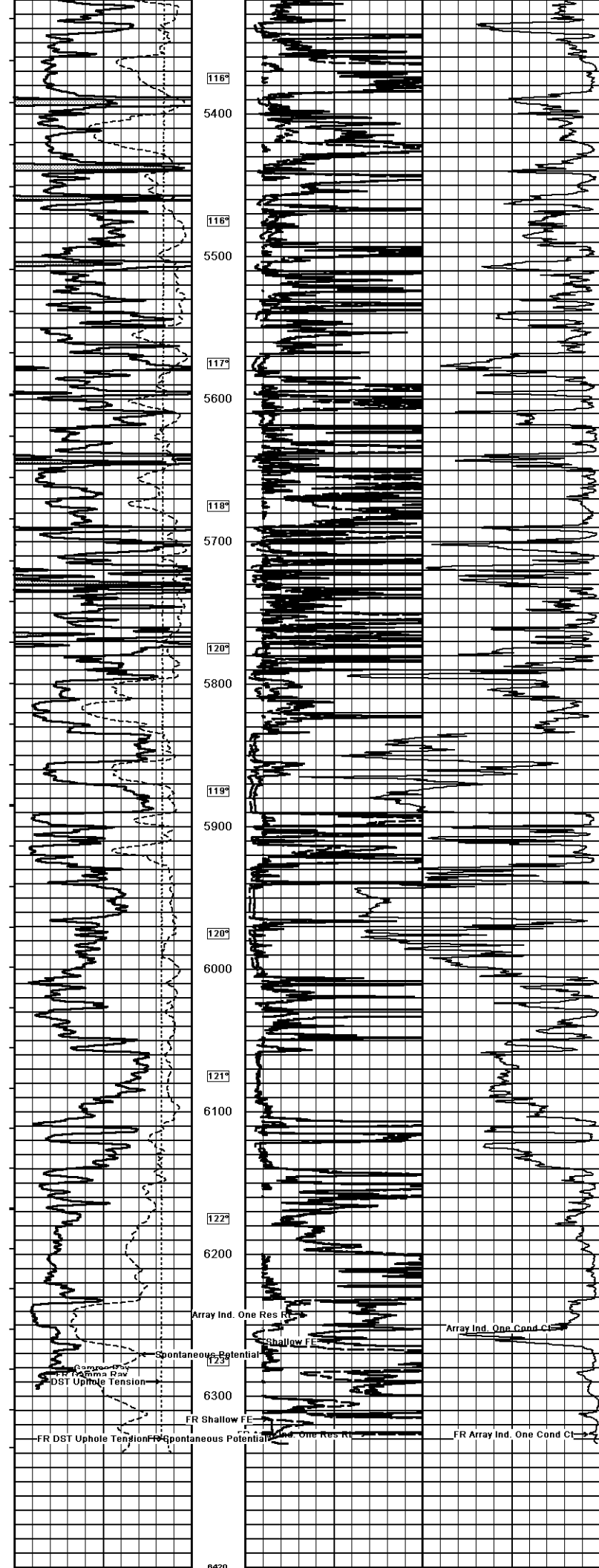
DB 2697.00 feet

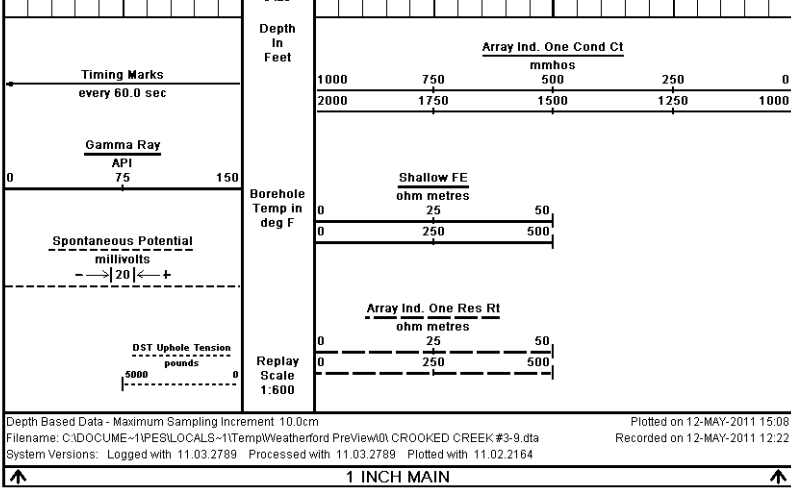
OL 2697.00 feet











COMPANY O'BRIEN ENERGY	
WELL CROOKED CREEK #3-8	
FIELD ANGELL SOUTH	
PROVINCE/COUNTY MEADE	
COUNTRY/STATE UNITED STATES / KANSAS	
Elevation Kelly Bushing 2699.00 feet	First Reading 6327.00 feet
Elevation Drill Floor 2697.00 feet	Depth Driller 6330.00 feet
Elevation Ground Level 2687.00 feet	Depth Logger 6330.00 feet



ARRAY INDUCTION
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