



Weatherford[®]

ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG

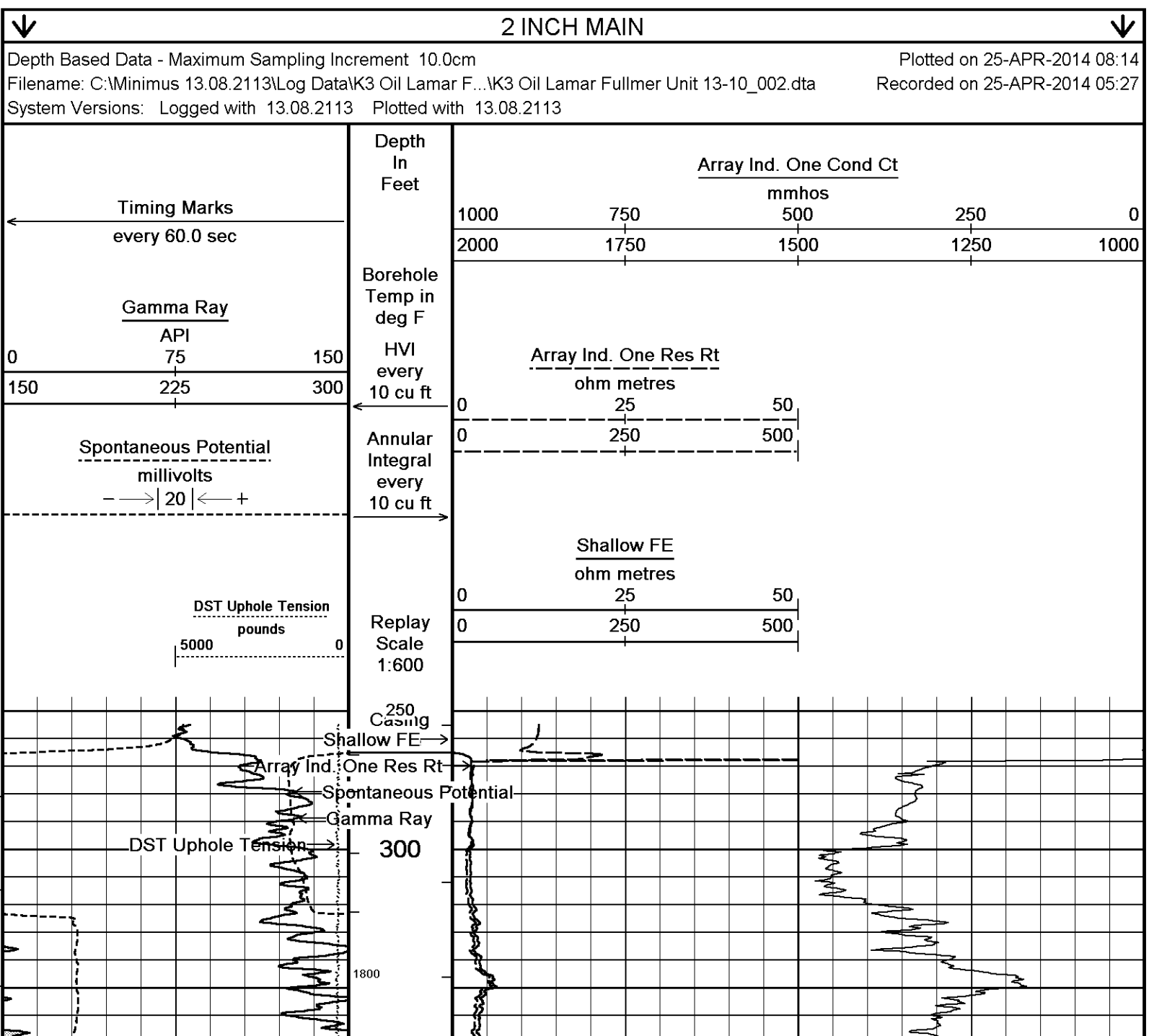
COMPANY				K3 OIL & GAS OPERATING COMPANY			
WELL				LAMAR FULLMER UNIT 13-10			
FIELD				WILDCAT			
PROVINCE/COUNTY				GOVE			
COUNTRY/STATE				U.S.A. / KANSAS			
LOCATION				1824' FSL & 1921' FEL			
SEC 13	TWP 15S	RGE 29W	Other Services		MML		
Latitude			MPD/MDN				
Longitude			MSS				
API Number	15-063-22199						
Permanent Datum GL, Elevation 2448 feet						Elevations: KB 2456.00 DF 2454.00 GL 2448.00	
Log Measured From KB							
Drilling Measured From KB							
Date	25-APR-2014						
Run Number	ONE						
Service Order	4558-85583672						
Depth Driller	4421.00					feet	
Depth Logger	4421.00					feet	
First Reading	4418.00					feet	
Last Reading	265.00					feet	
Casing Driller	270.00					feet	
Casing Logger	265.00					feet	
Bit Size	7.875					inches	
Hole Fluid Type	CHEMICAL						
Density / Viscosity	9.30 lb/USg		48.00 CP				
PH / Fluid Loss	9.00		8.00 ml/30Min				
Sample Source	FLOWLINE						
Rm @ Measured Temp	0.77 @ 92.0					ohm-m	
Rmf @ Measured Temp	0.62 @ 92.0					ohm-m	
Rmc @ Measured Temp	0.92 @ 92.0					ohm-m	
Source Rmf / Rmc	CALC		CALC				
Rm @ BHT	0.58 @123.0		ohm-m				
Time Since Circulation	4 HOURS						
Max Recorded Temp	123.00		deg F				
Equipment / Base	13096		LIB				
Recorded By	ADAM SILL						
Witnessed By	PAT DEENIHAN						
JOB #	LB14-128						

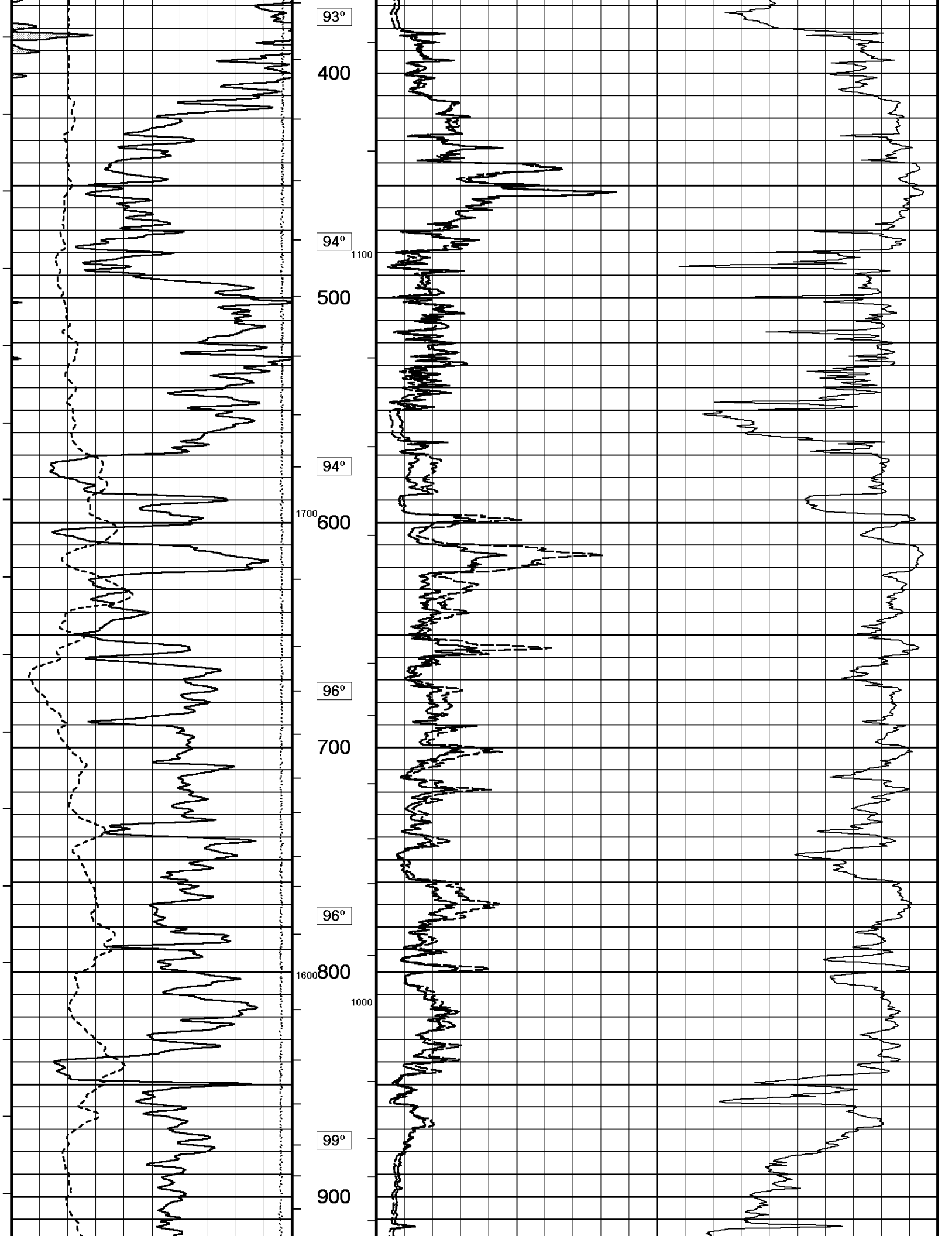
BOREHOLE RECORD					Last Edited: 25-APR-2014 02:45
Bit Size inches		Depth From feet		Depth To feet	
7.875		270.00		4421.00	
CASING RECORD					
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft	
SURFACE	8.625	0.00	270.00	24.00	

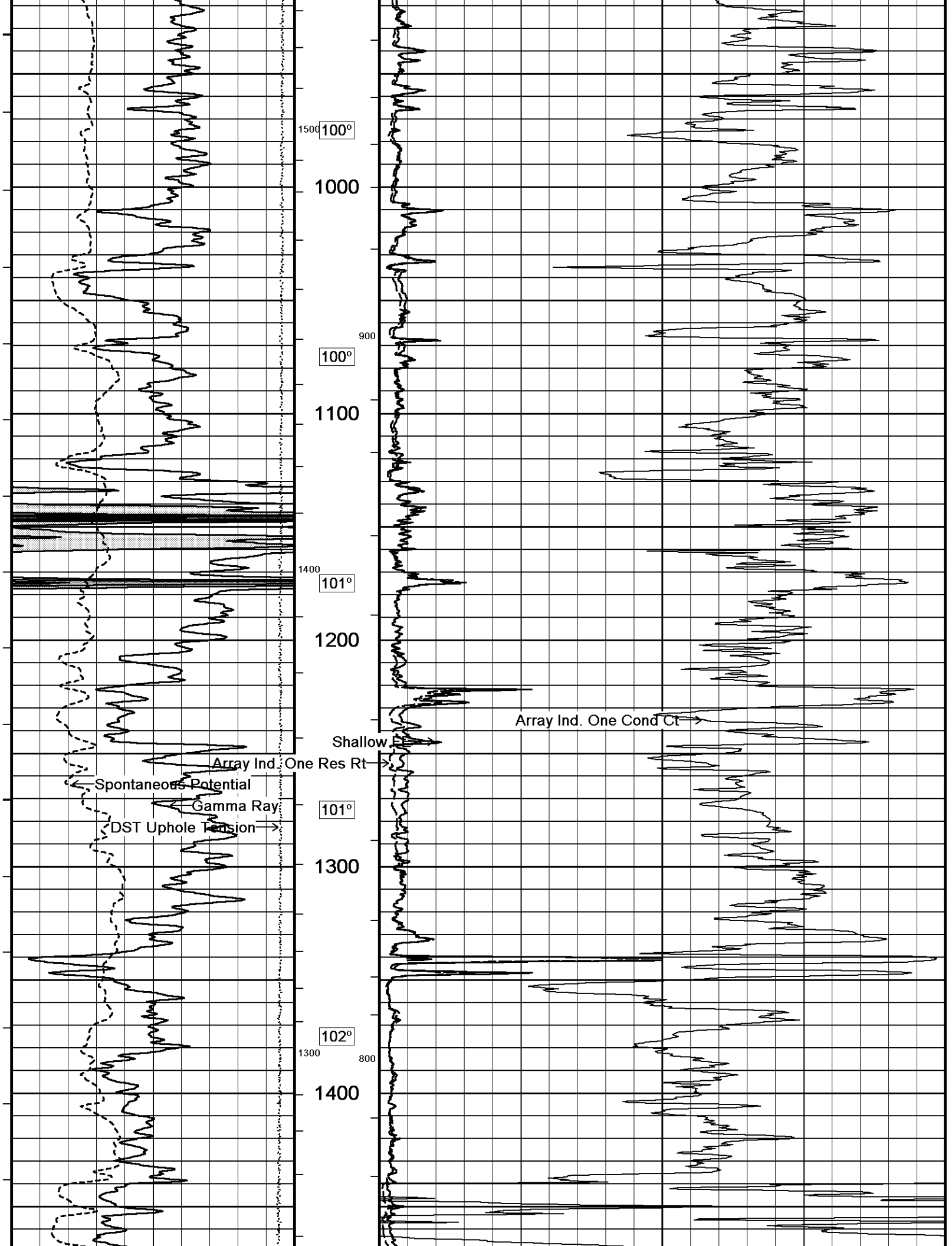
REMARKS
- SOFTWARE ISSUE: WLS 13.08.2113
- TOOL STRING: MCG, MML, MDN, MPD, MFE, MSS, MAI RUN IN COMBINATION
- HARDWARE: DUAL BOWSPRING ECCENTRALIZER USED ON MDN. 0.5 INCH STANDOFF USED ON MFE. TWO 0.5 INCH STANDOFFS USED ON MSS. 0.5 INCH STANDOFF USED ON MAI.
- 2.71 G/CC LIMESTONE DENSITY MATRIX USED 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: 1841 CU. FT.
- ANNUILLAR HOLE VOLUME WITH 5.5 INCH CASING FROM TD TO 3300 FEET: 191 CU. FT.

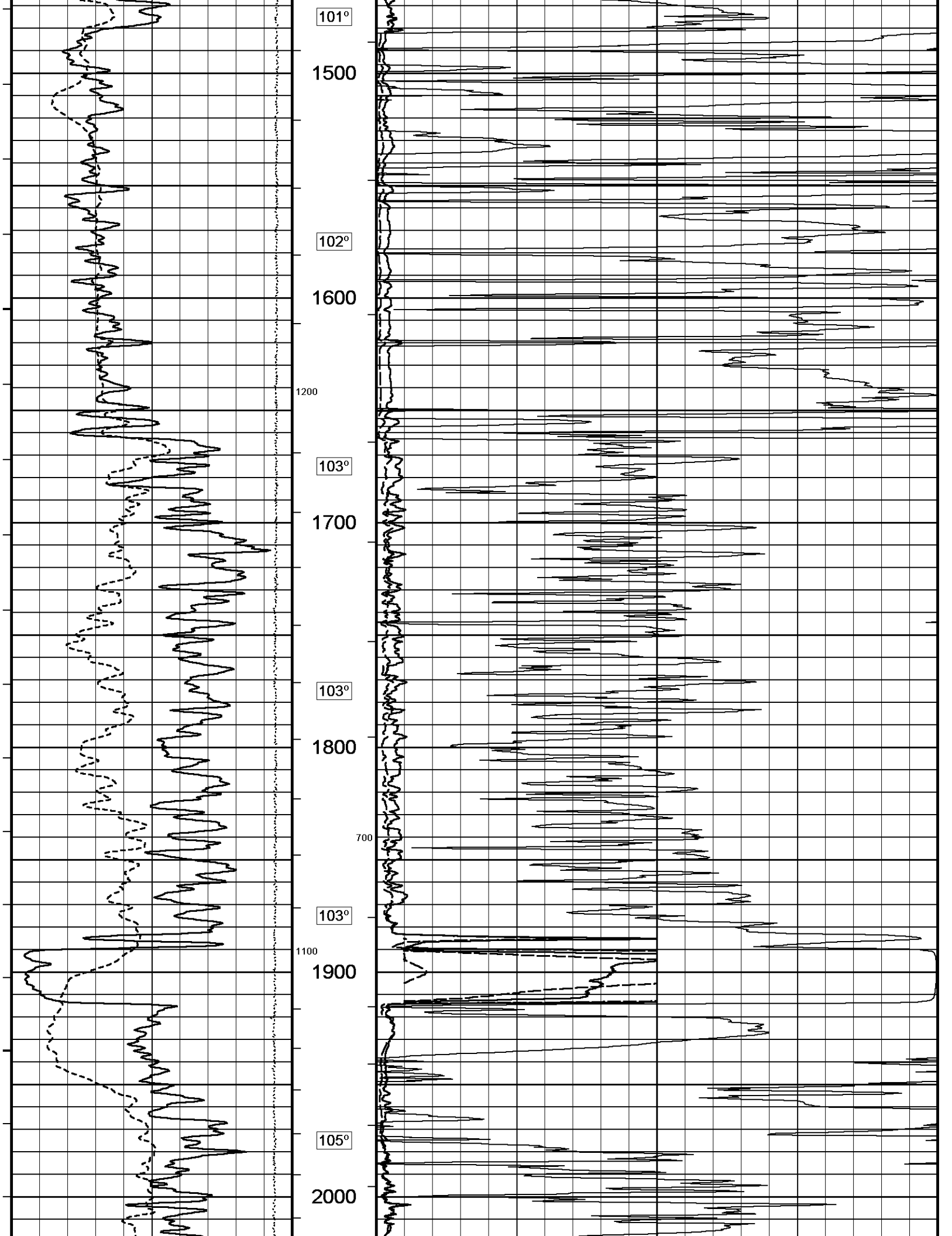
- OPERATORS: J. LaPOINT.

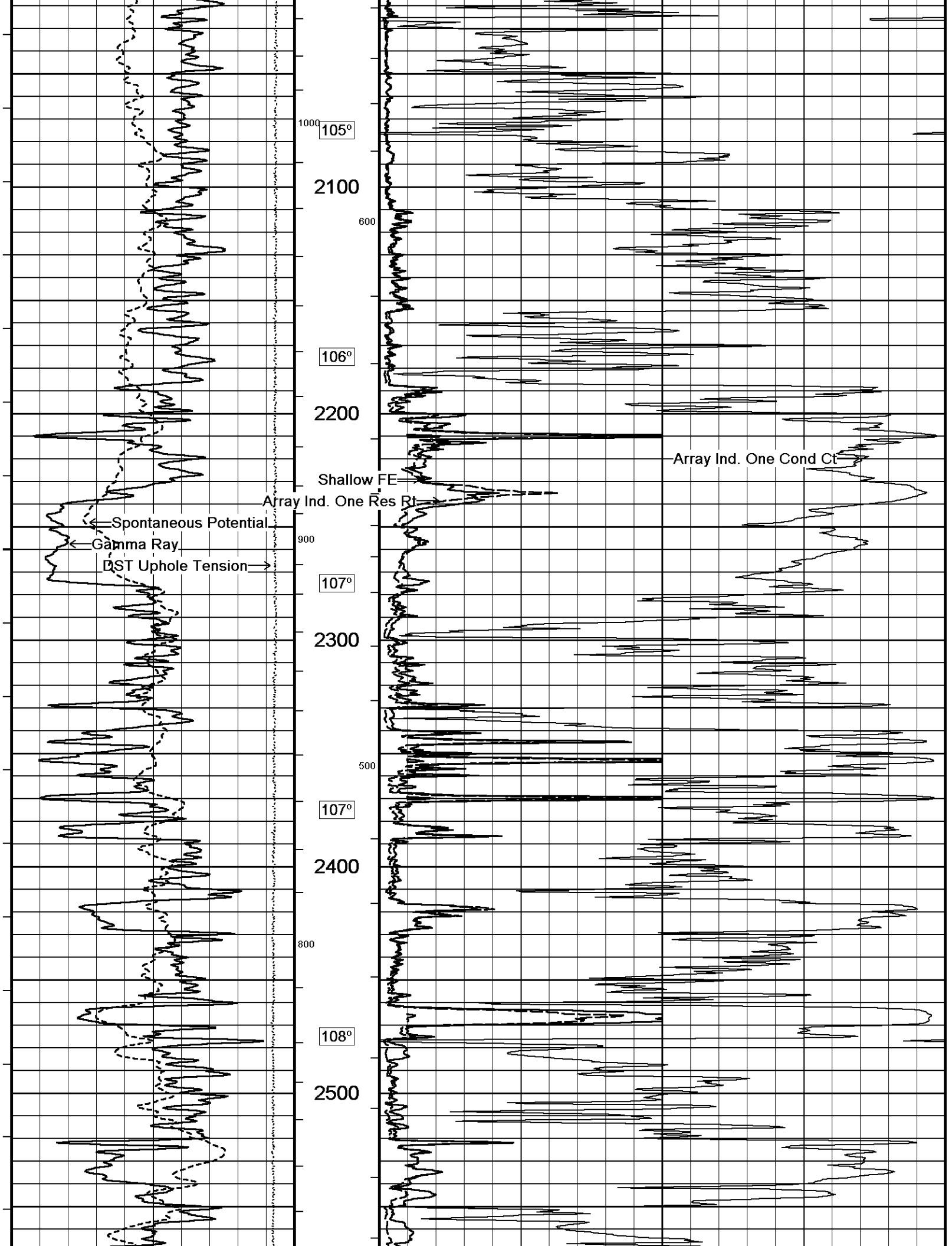
In interpreting, communicating or providing information and/or making recommendations, either written or oral, as to logs or test or other data, type or amount of material, or Work or other service to be furnished, or manner of performance, or in predicting results to be obtained, the Contractor will 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.

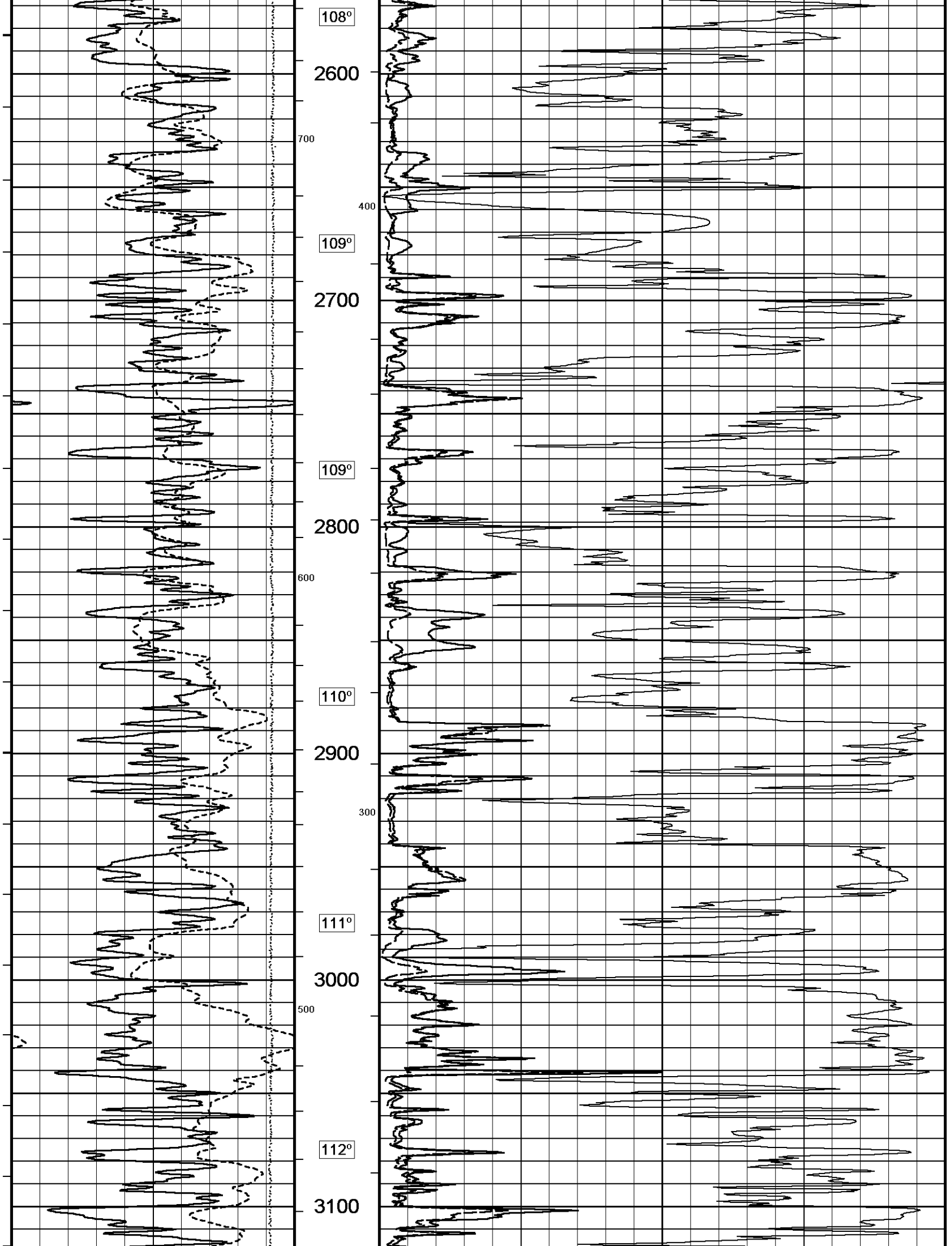


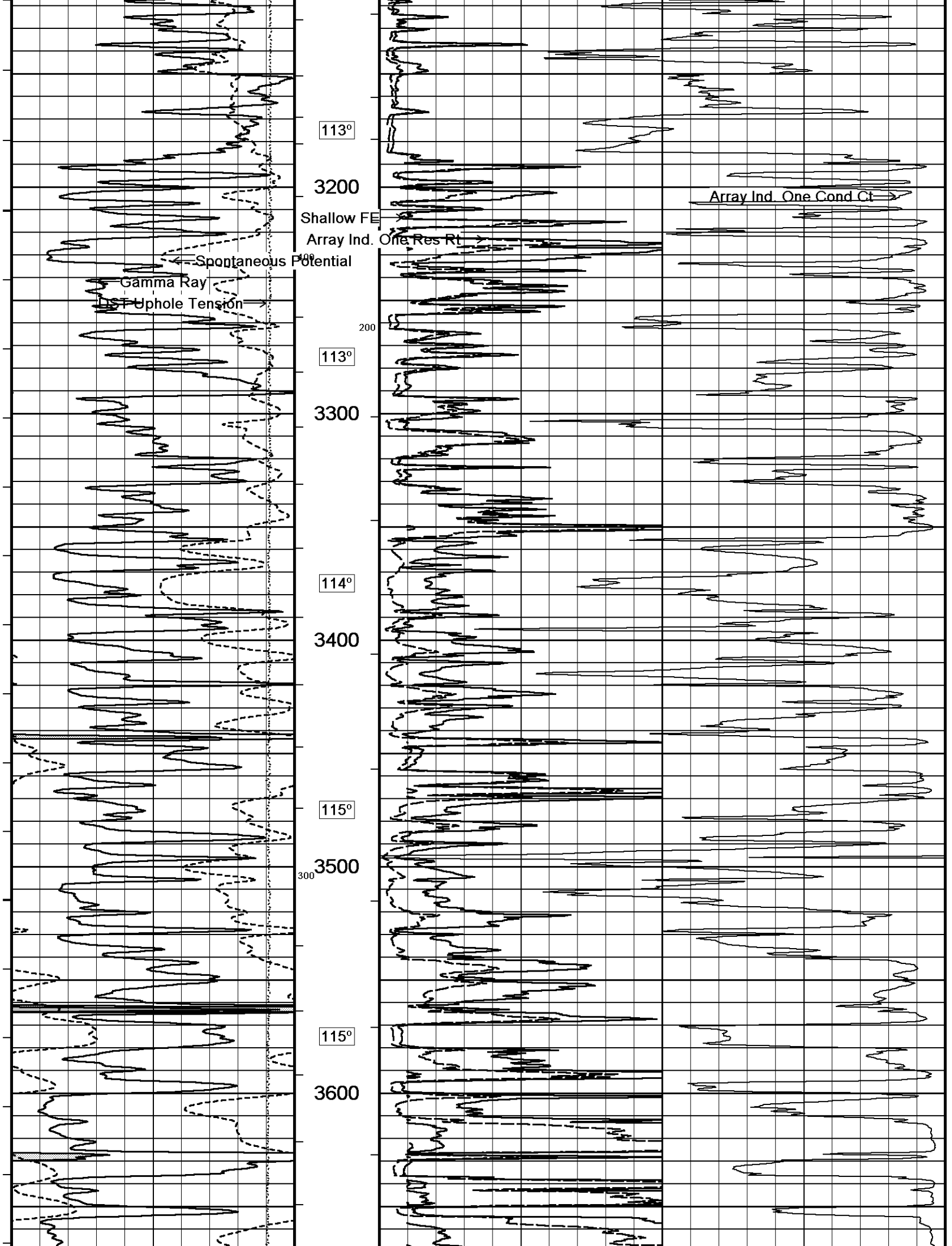


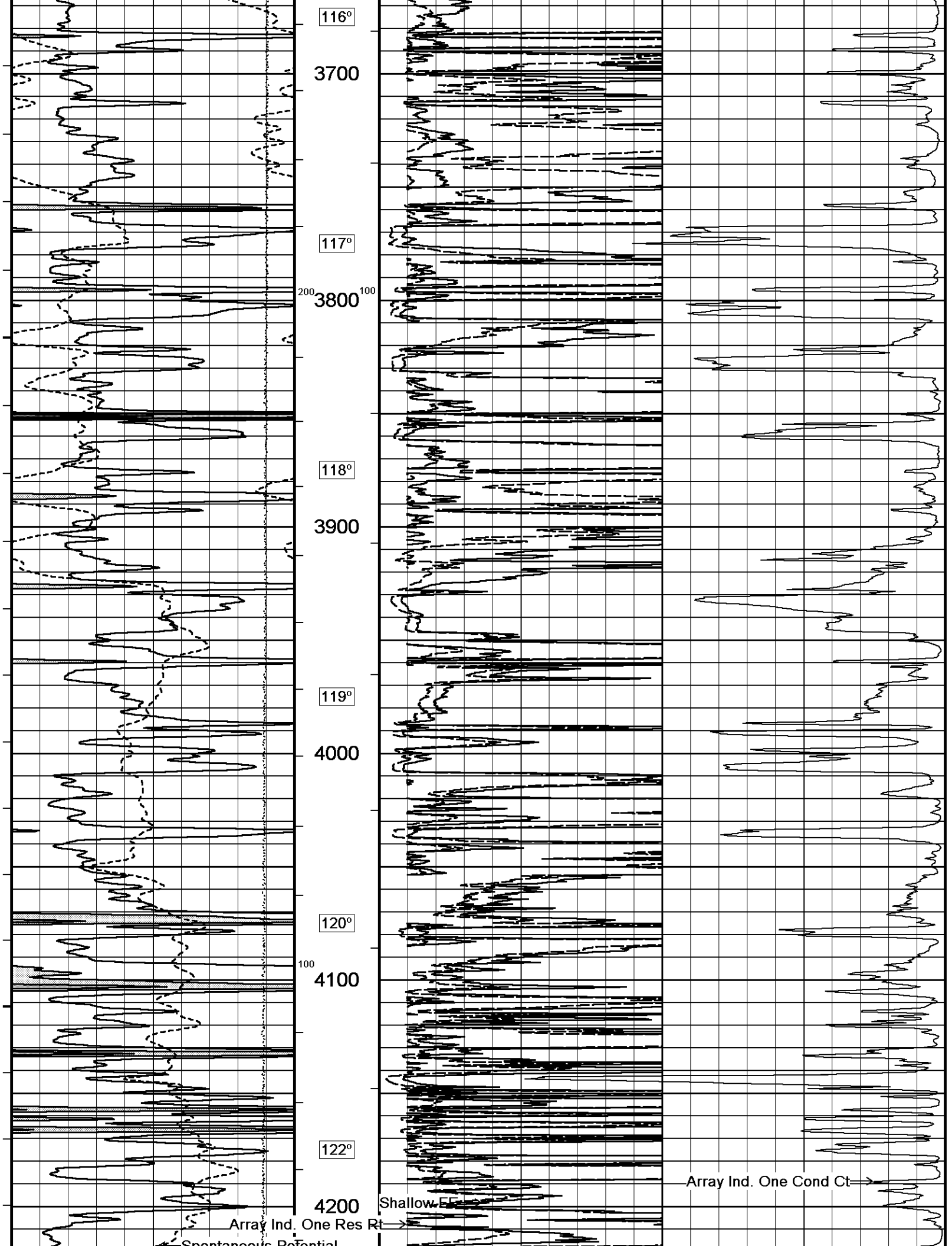


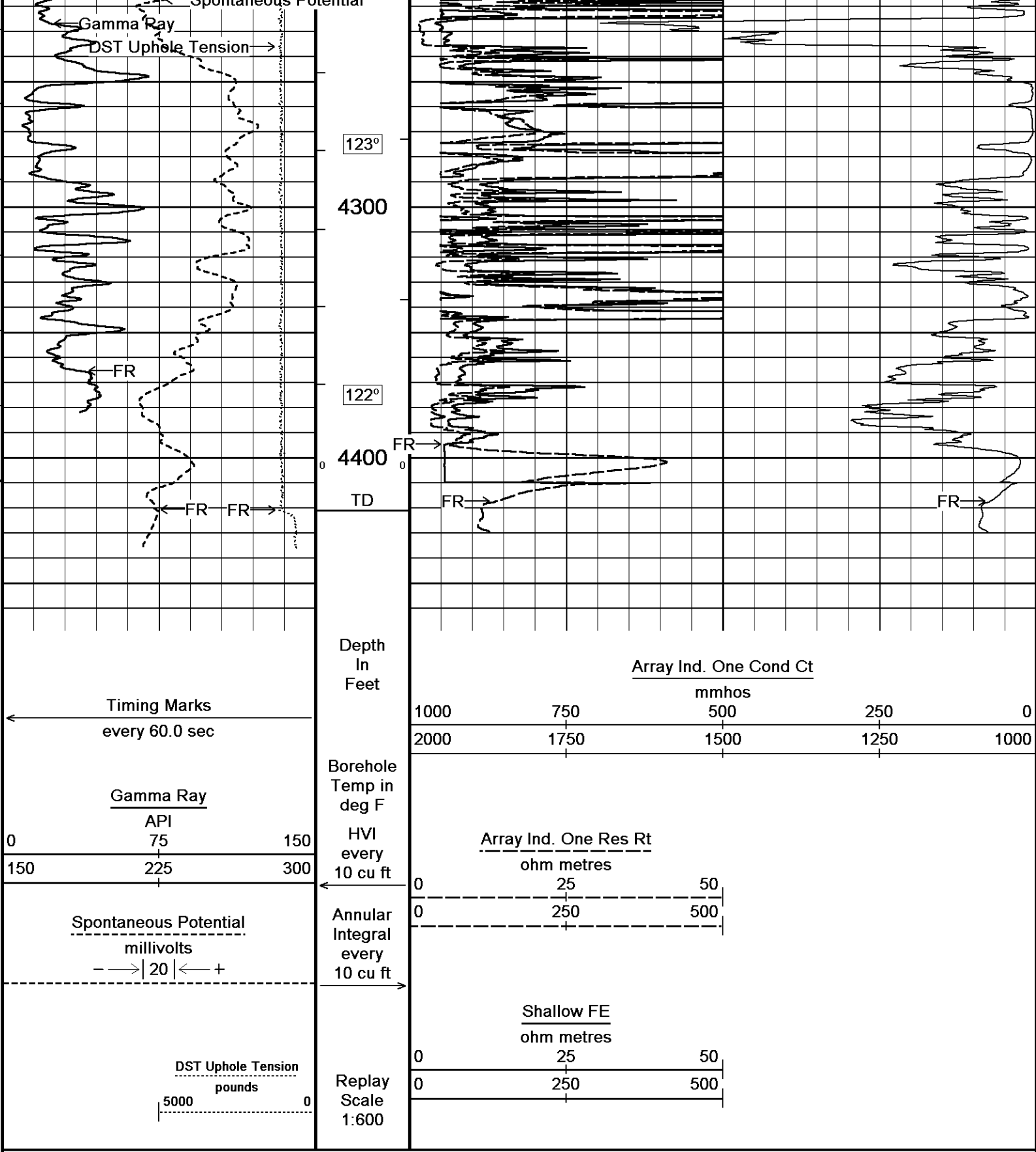










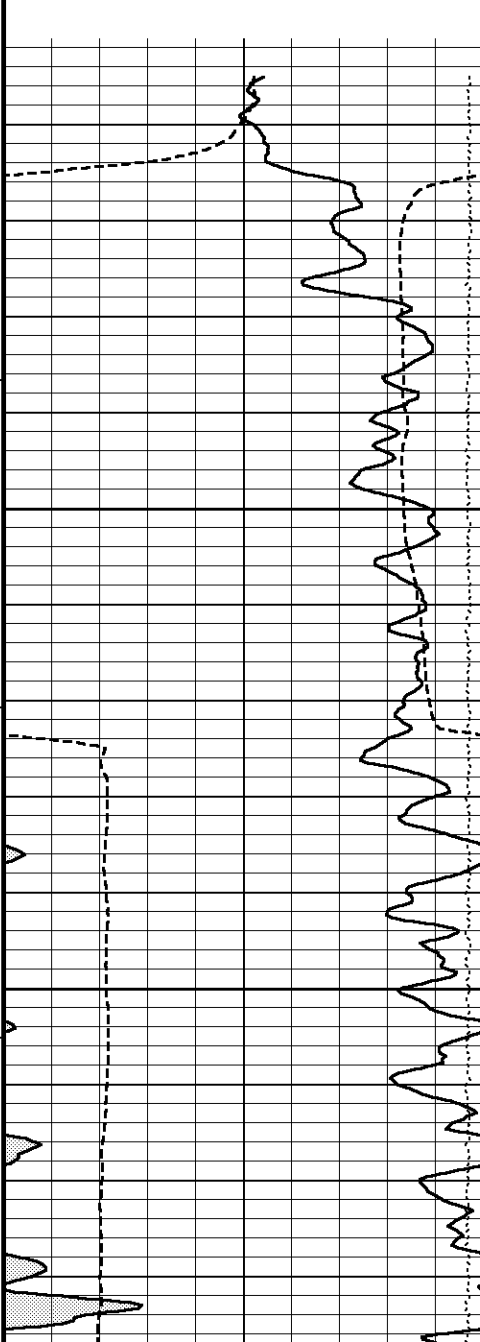
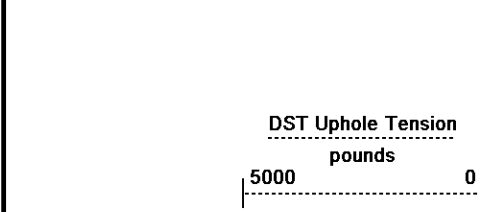
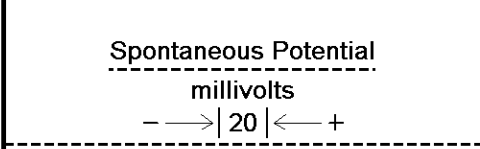
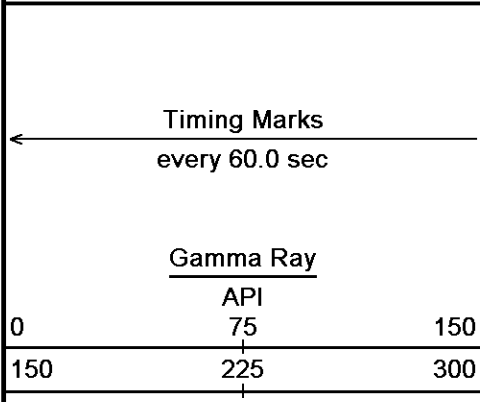


Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 13.08.2113\Log Data\K3 Oil Lamar F...K3 Oil Lamar Fullmer Unit 13-10_002.dta
System Versions: Logged with 13.08.2113 Plotted with 13.08.2113

2 INCH MAIN

5 INCH MAIN

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 13.08.2113\Log Data\K3 Oil Lamar F...K3 Oil Lamar Fullmer Unit 13-10_002.dta
System Versions: Logged with 13.08.2113 Plotted with 13.08.2113



Depth
In
Feet

Borehole
Temp in
deg F

HVI
every
10 cu ft

Annular
Integral
every
10 cu ft

Replay
Scale
1:240

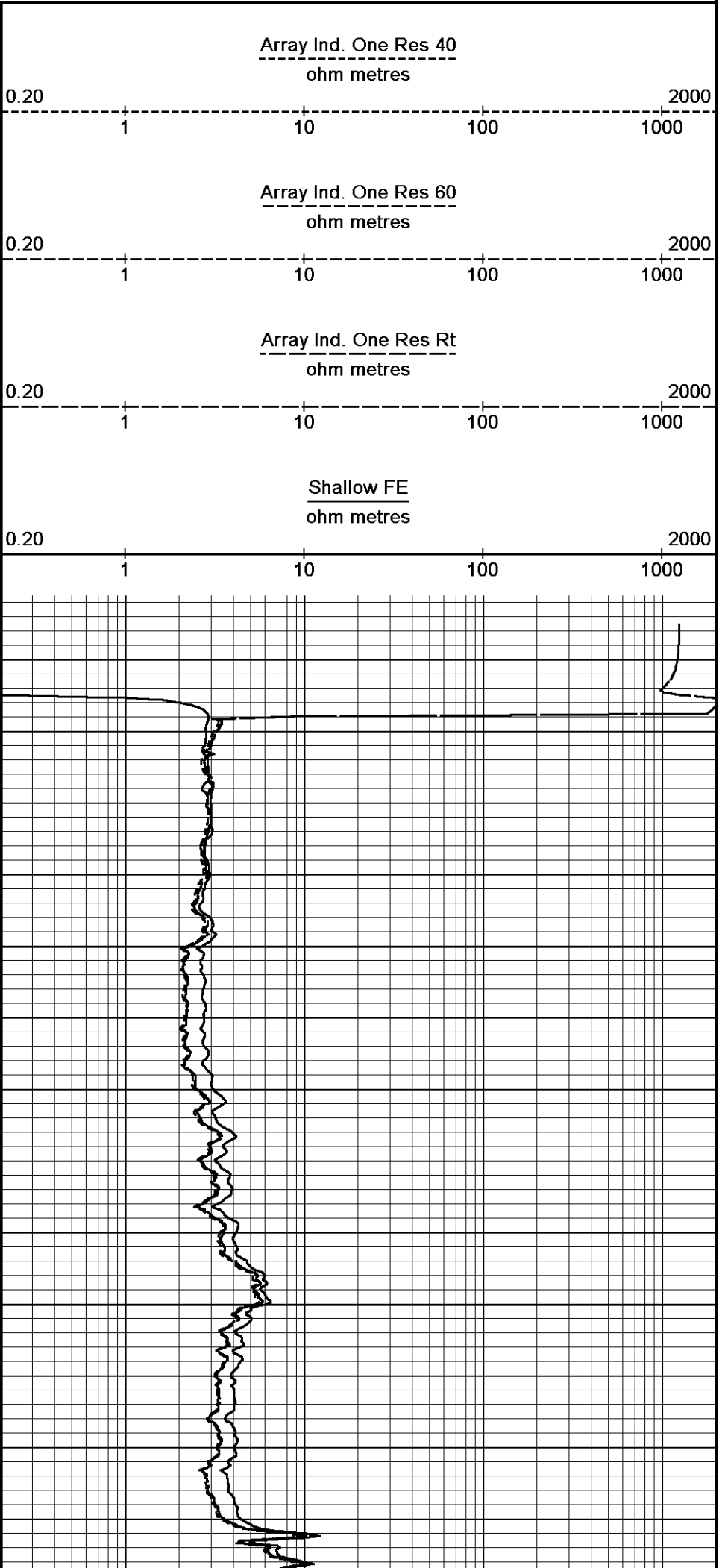
254
Casing
Shoe

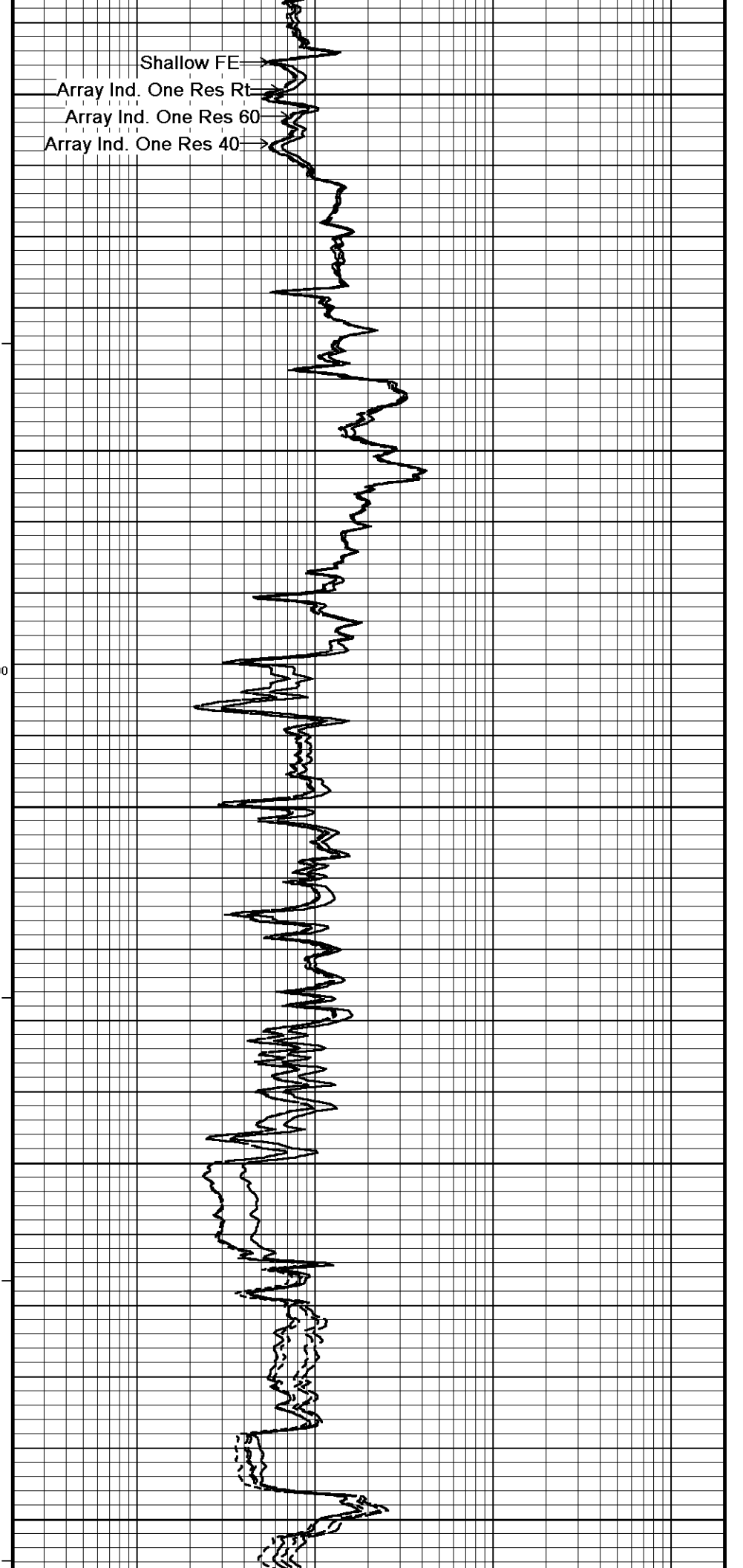
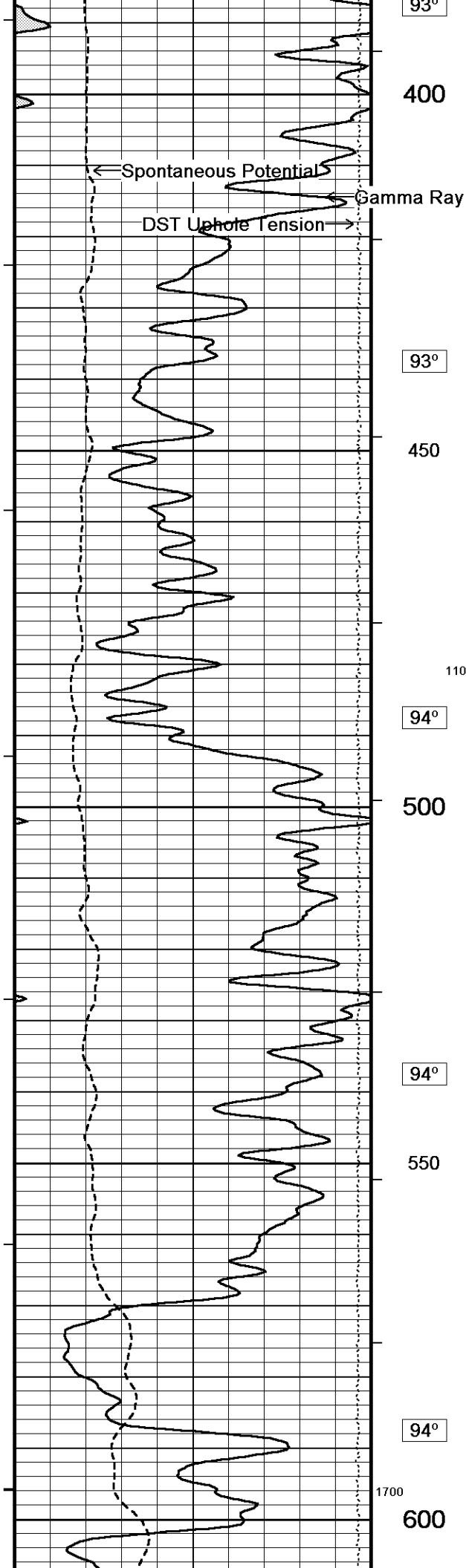
300

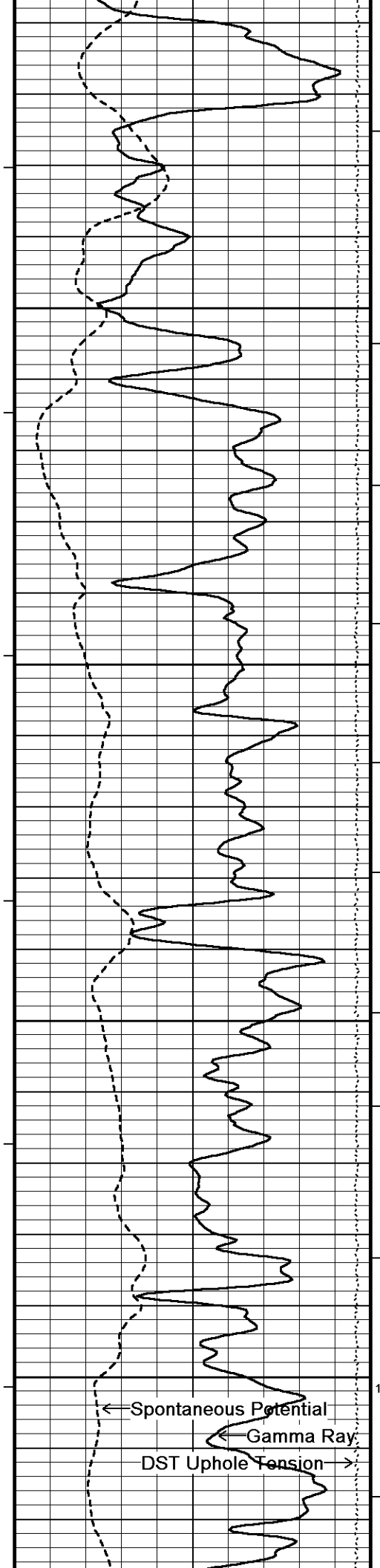
92°

1800
350

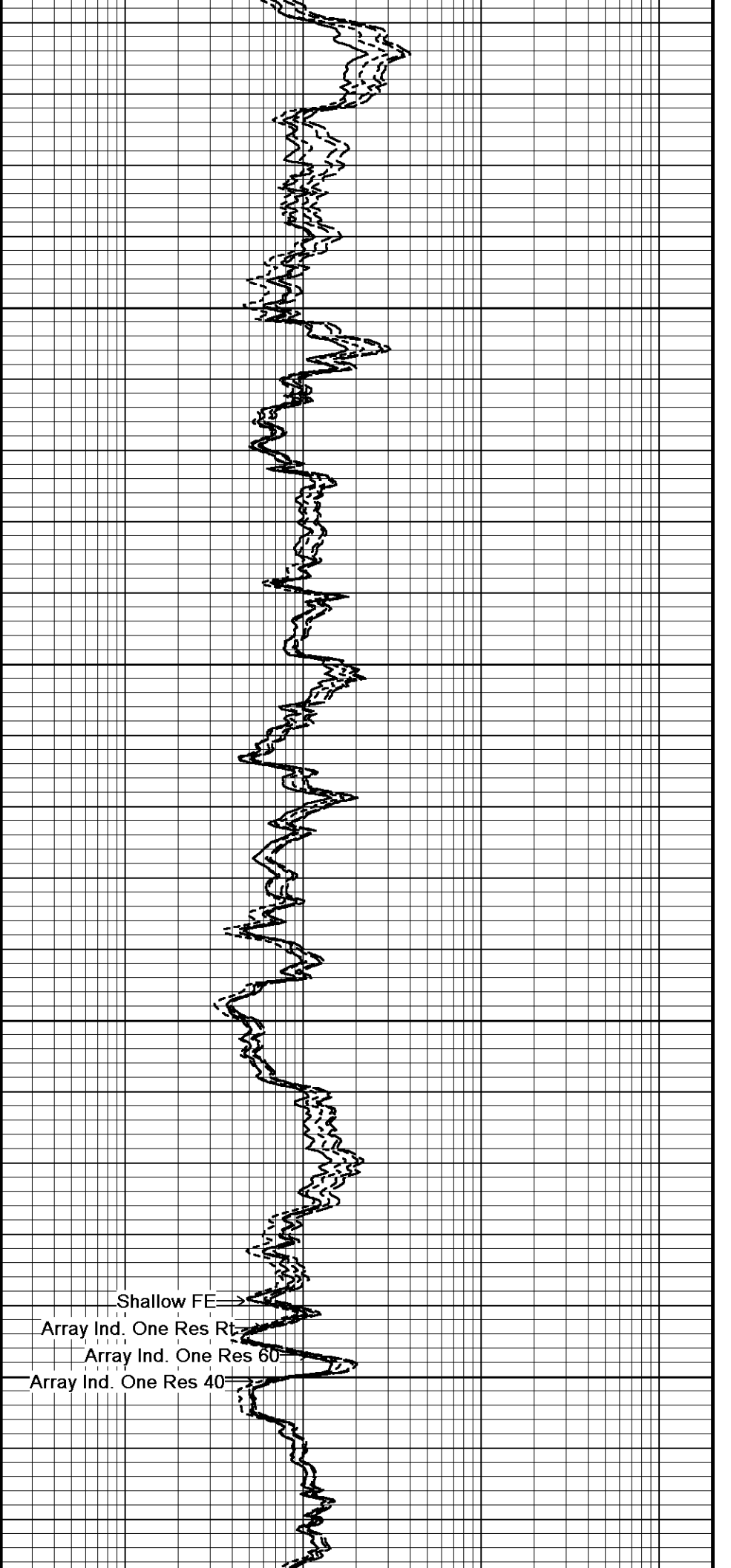
220

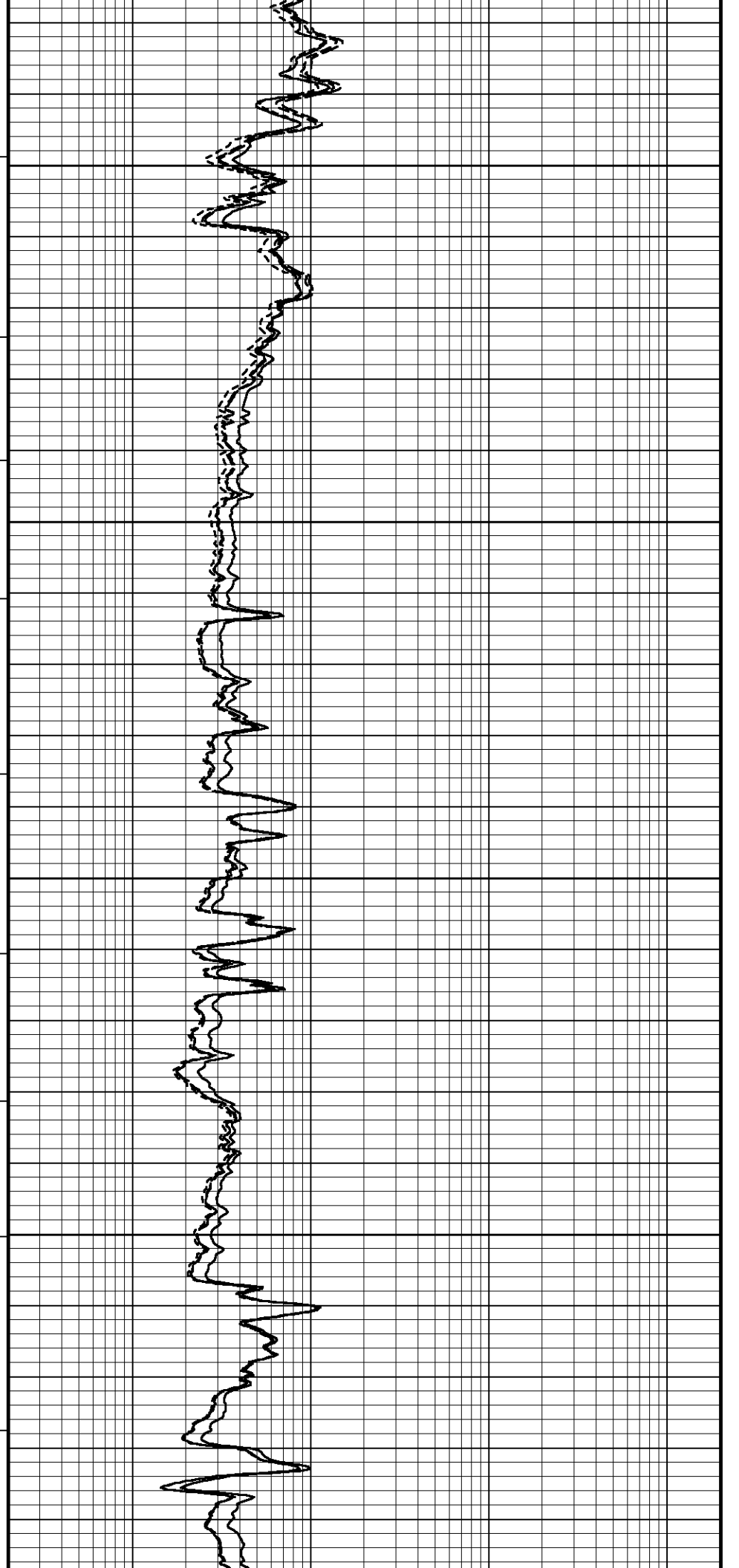
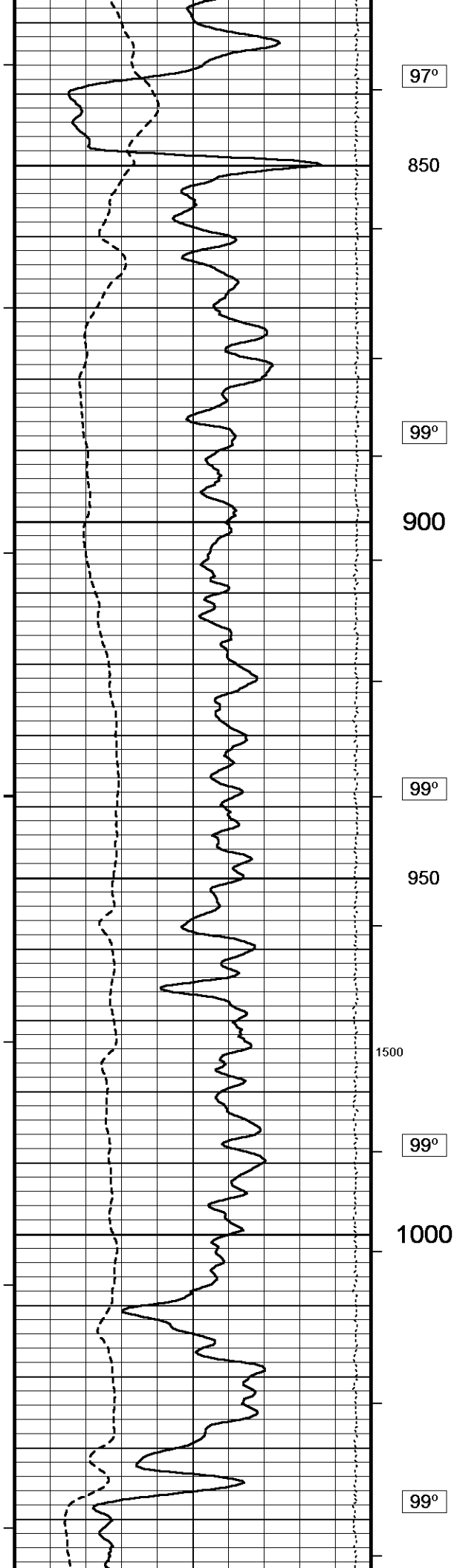


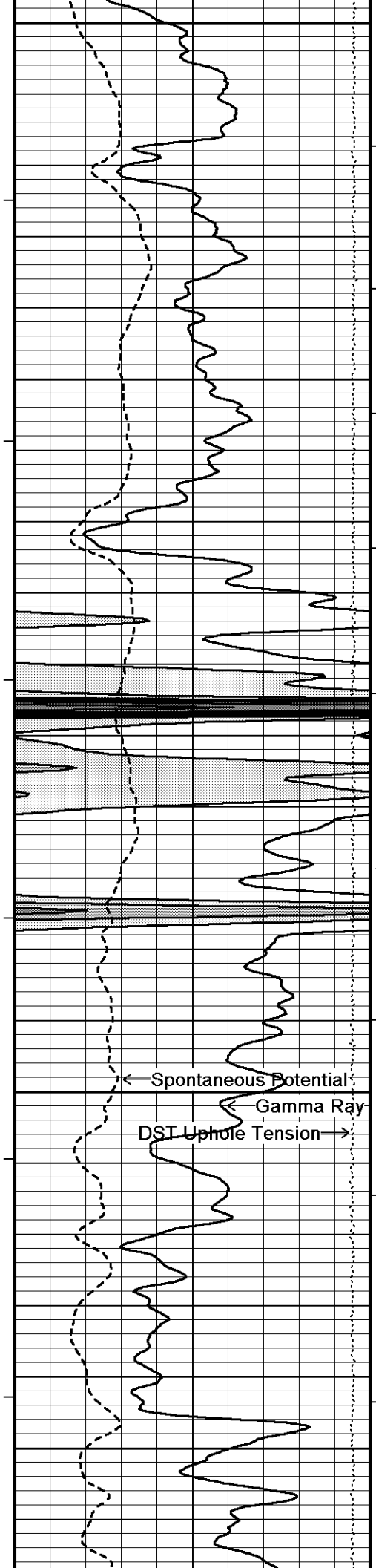




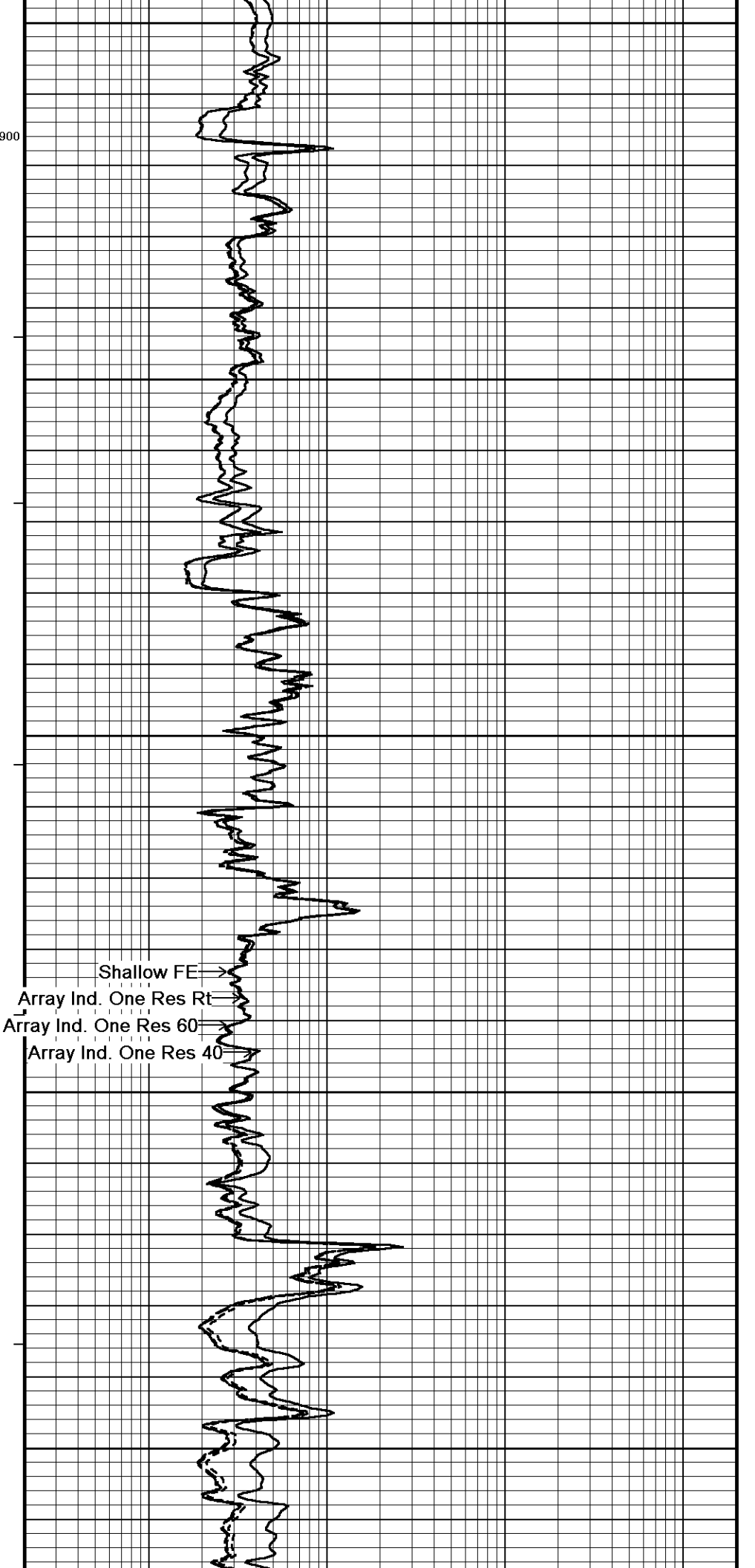
95°
650
96°
700
96°
750
96°
800
1600
1000



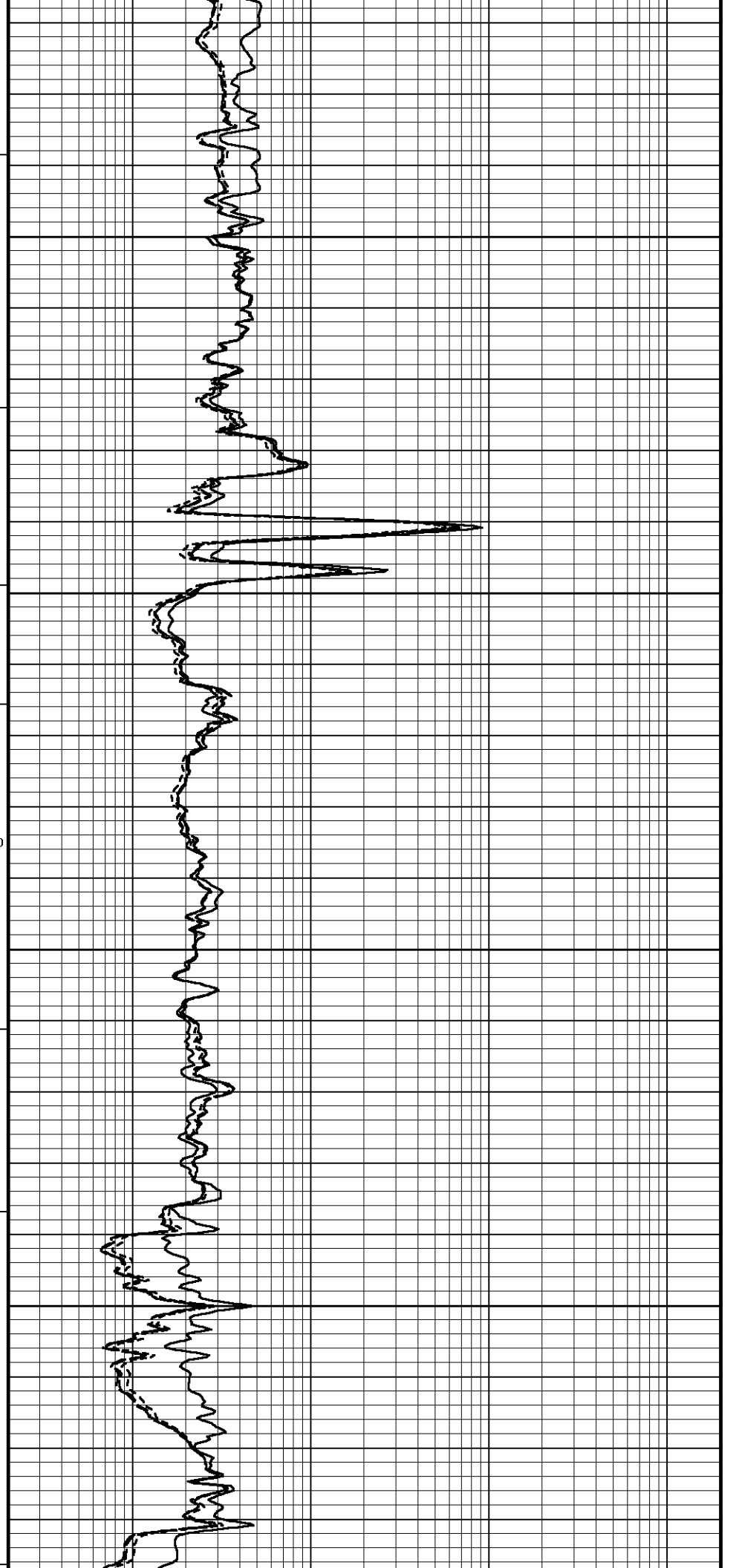
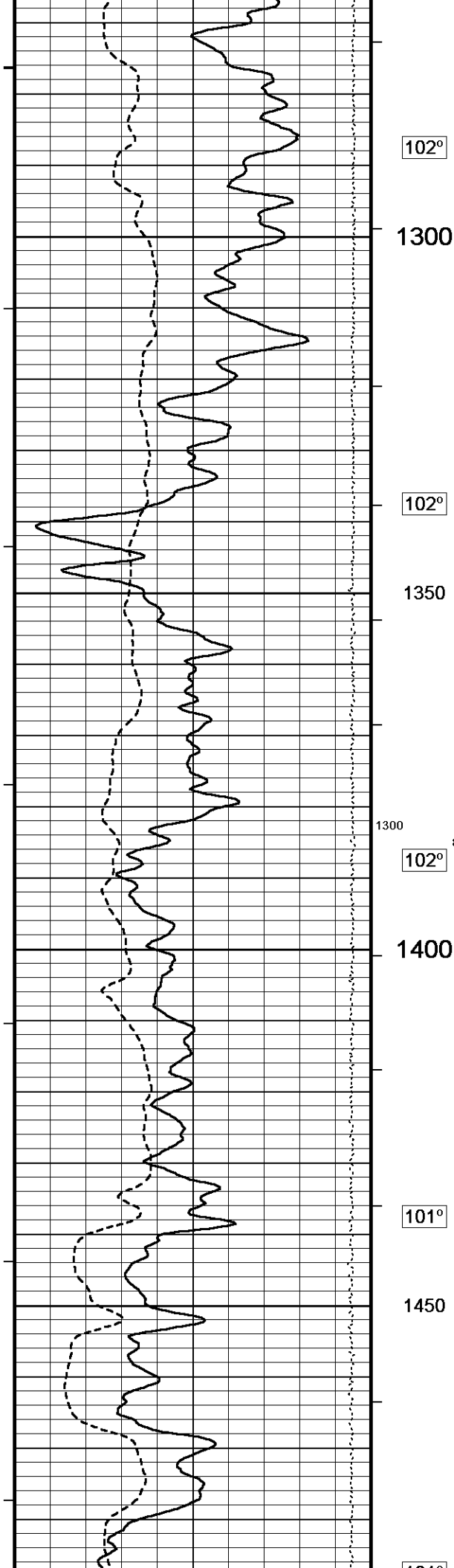


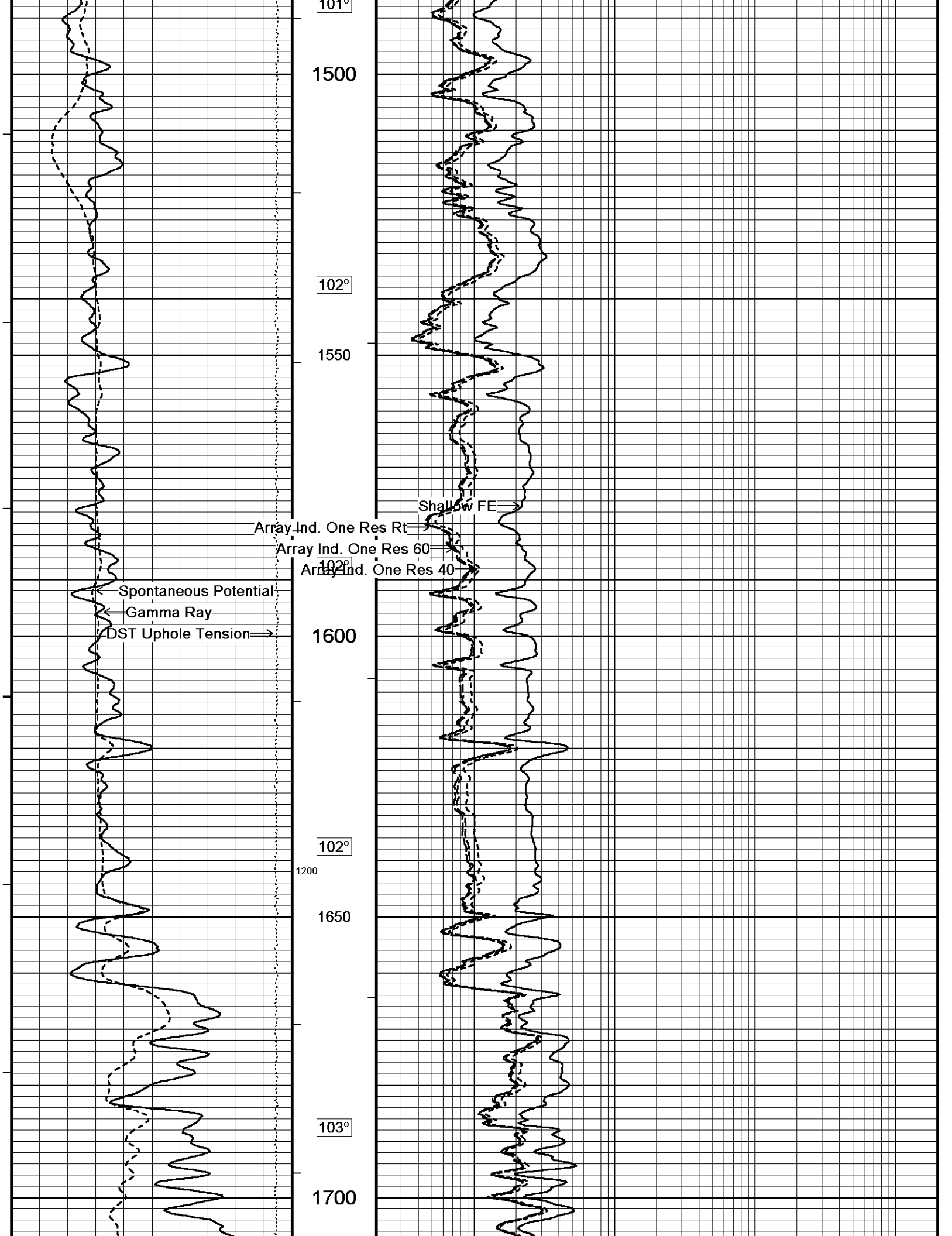


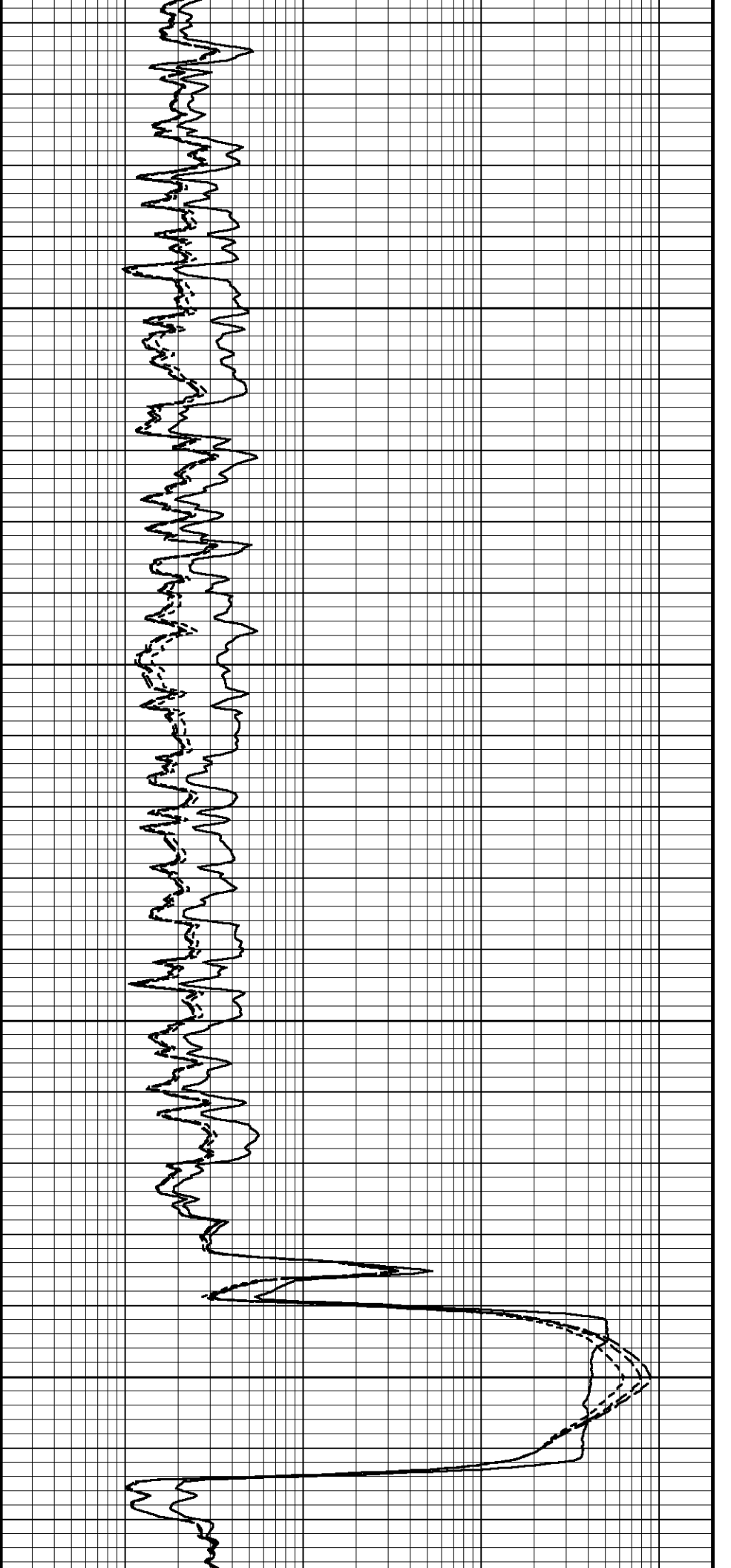
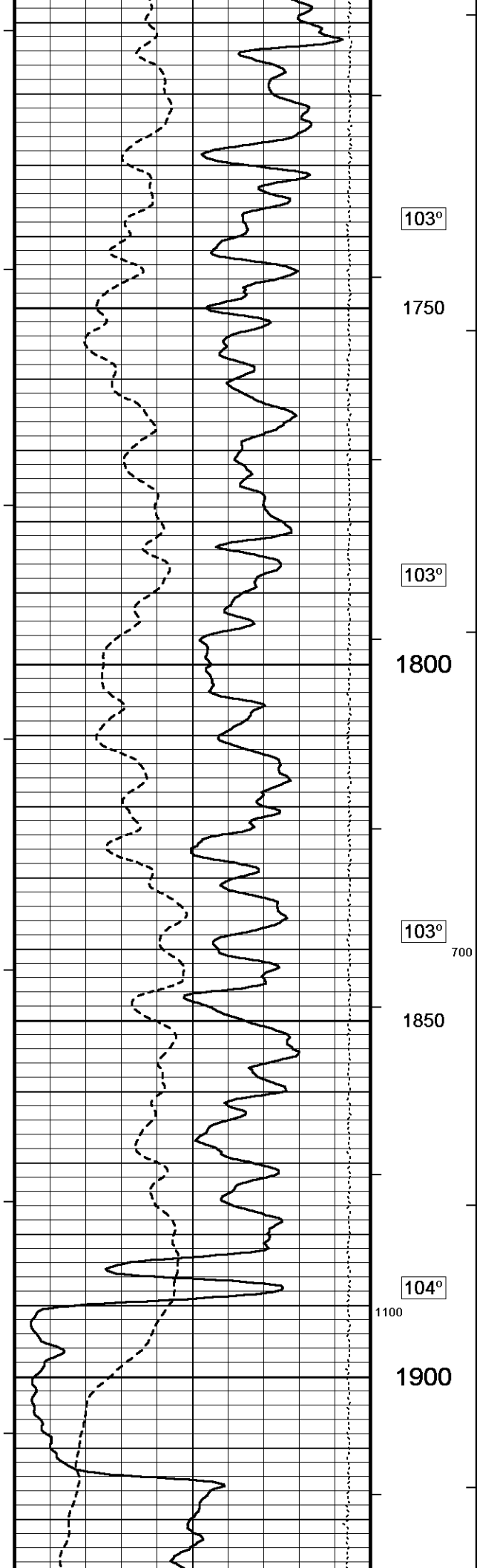
1050
900
100°
1100
100°
1150
1400
100°
1200
101°
1250

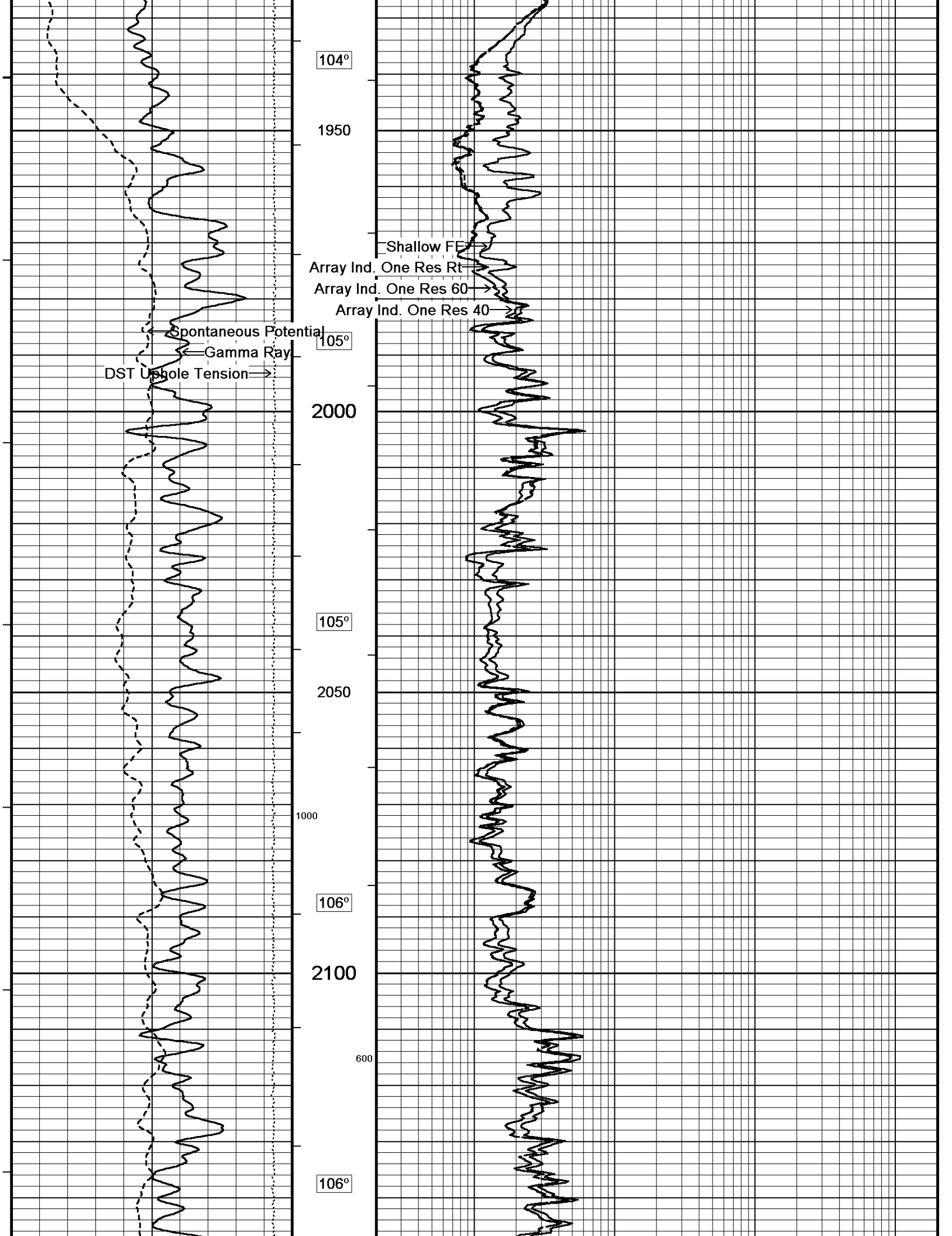


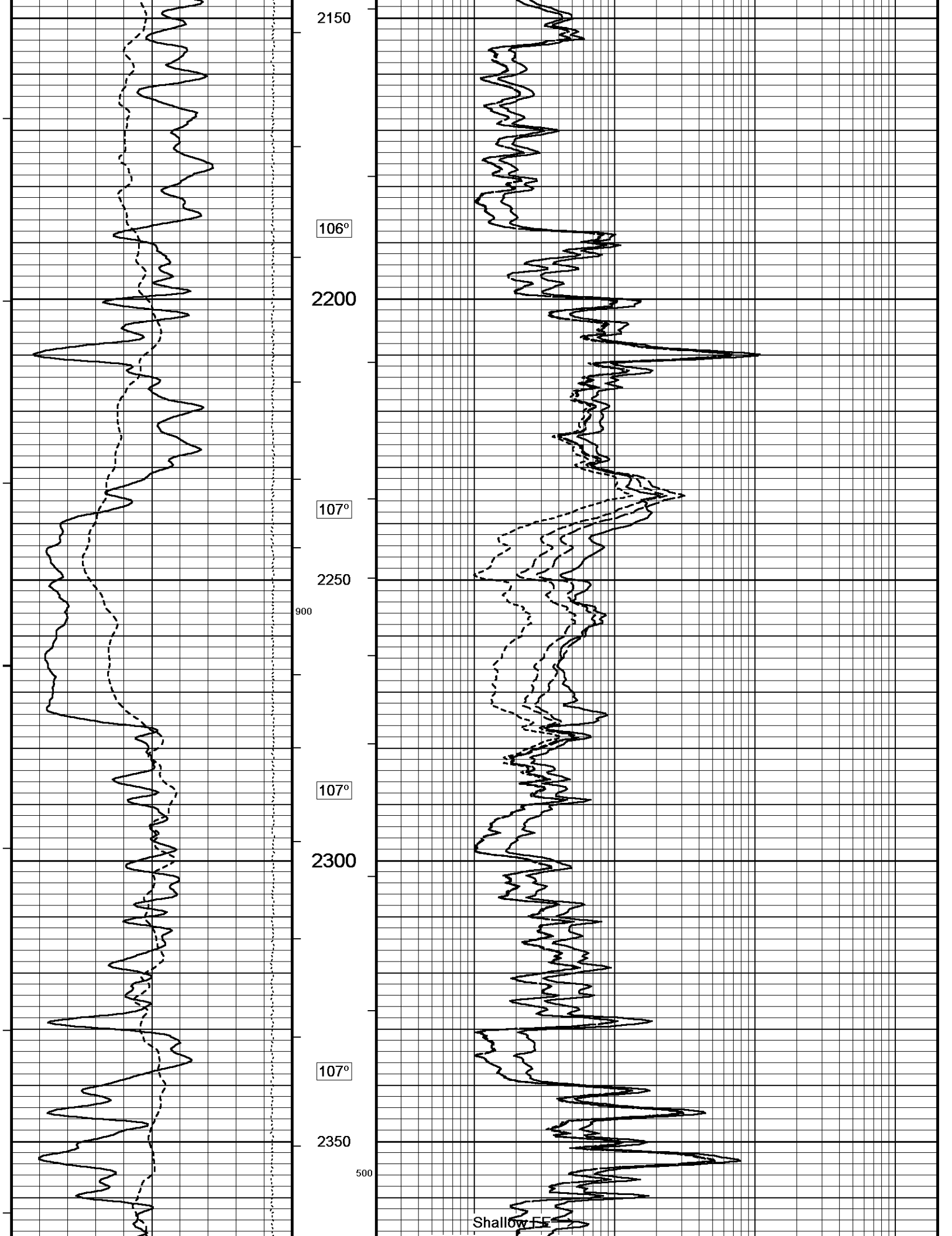
Shallow FE
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40

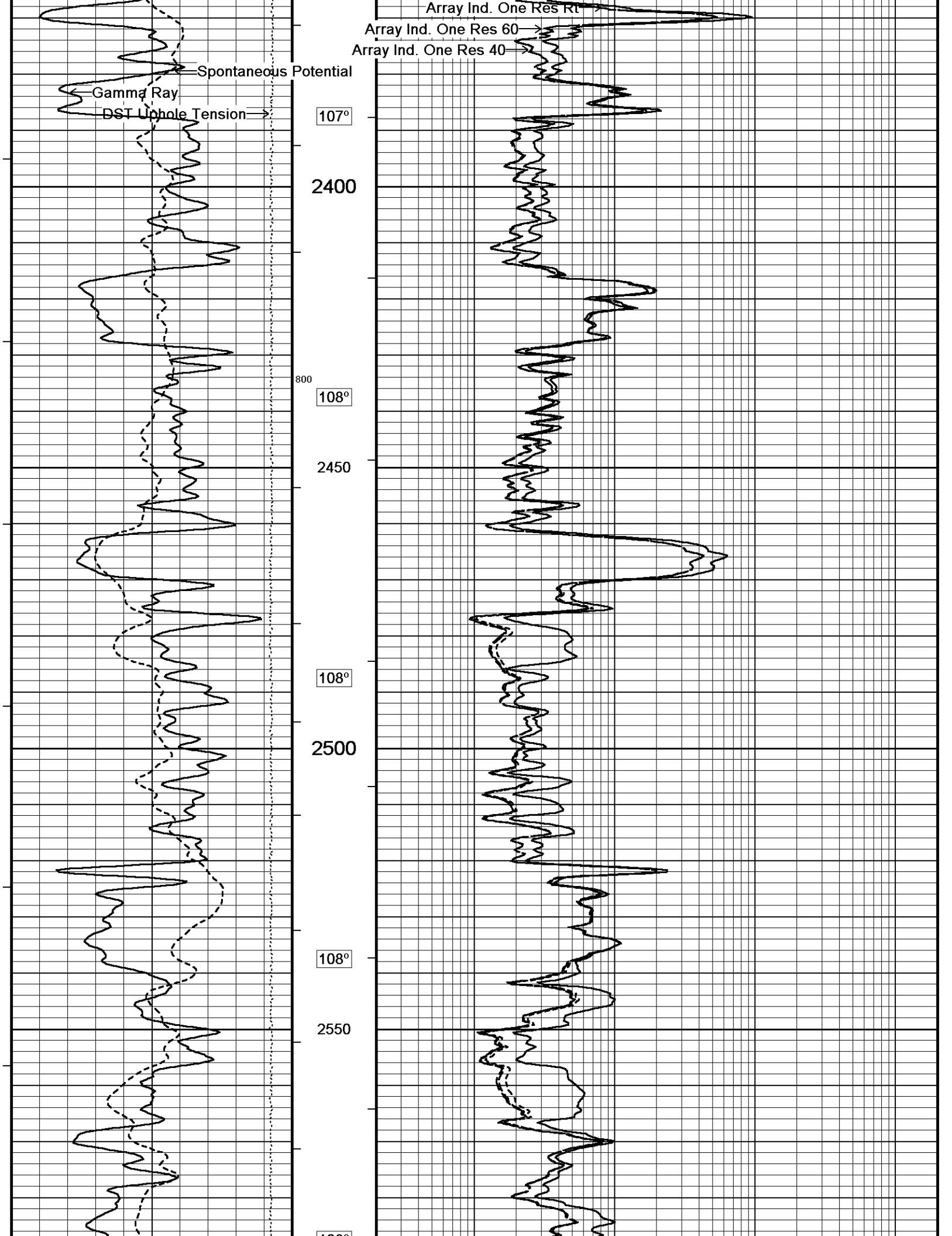


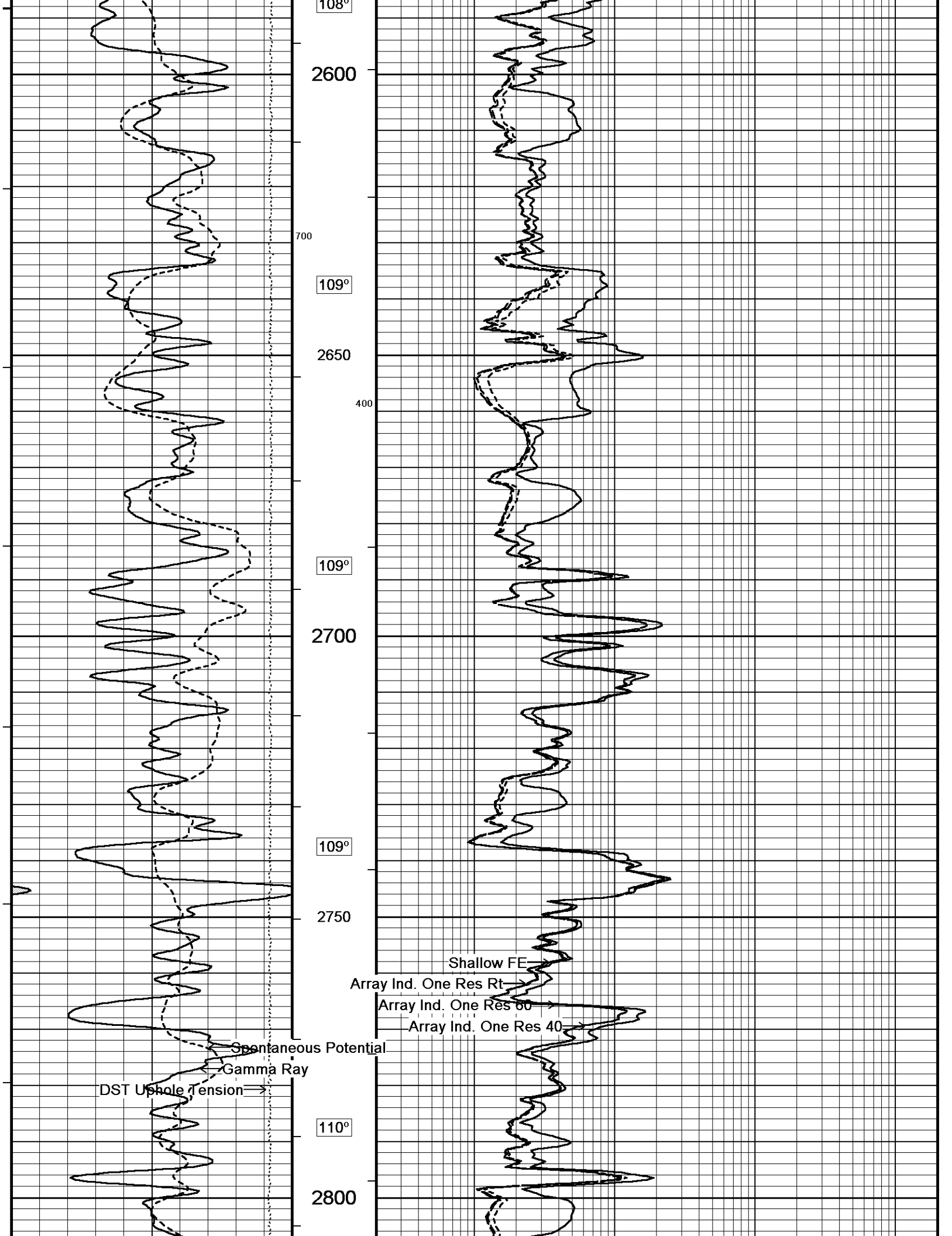


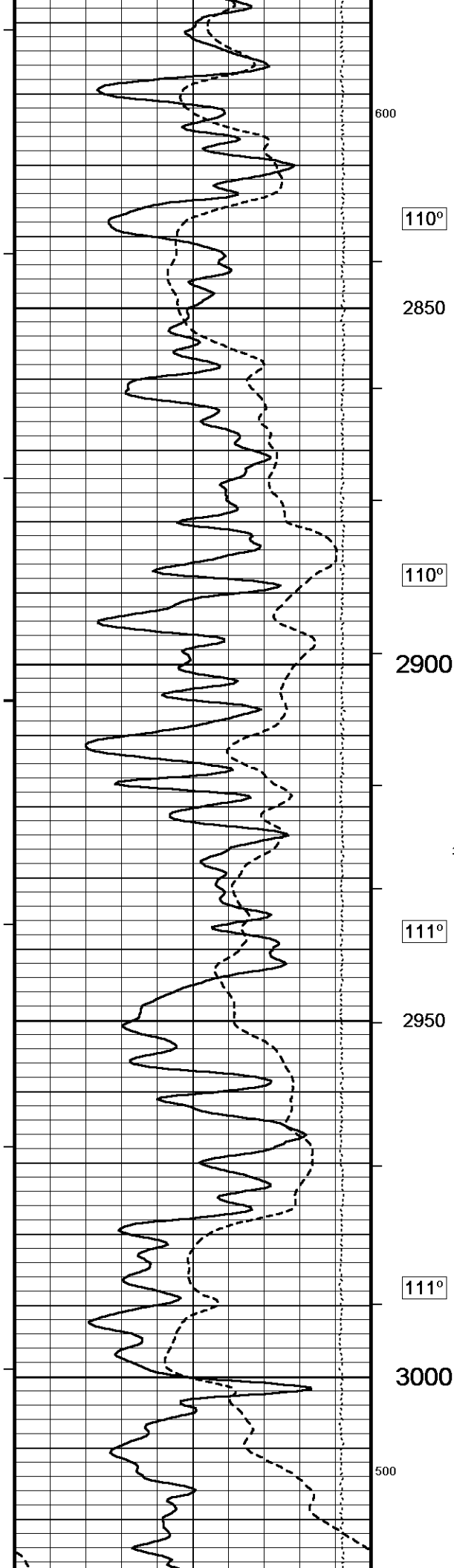










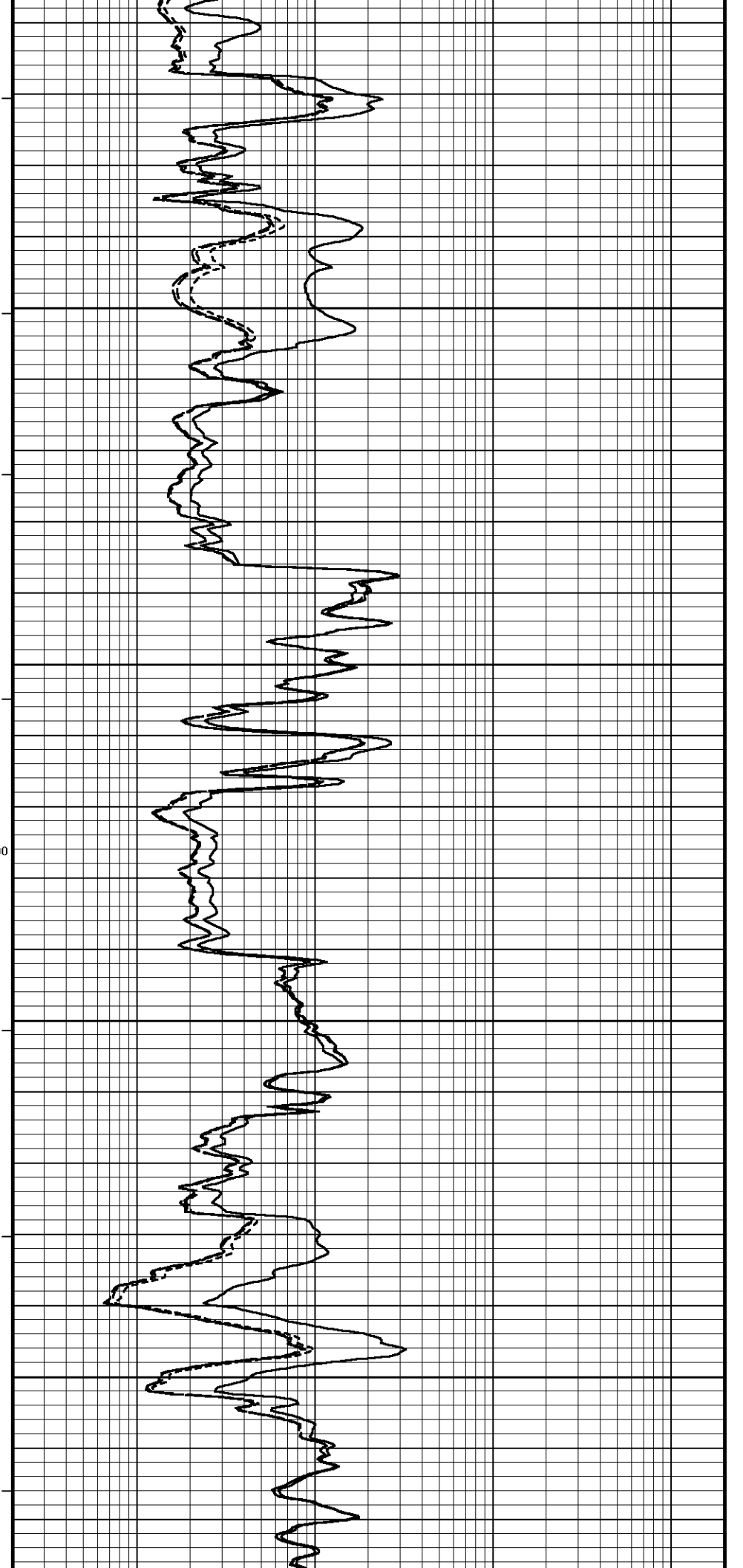


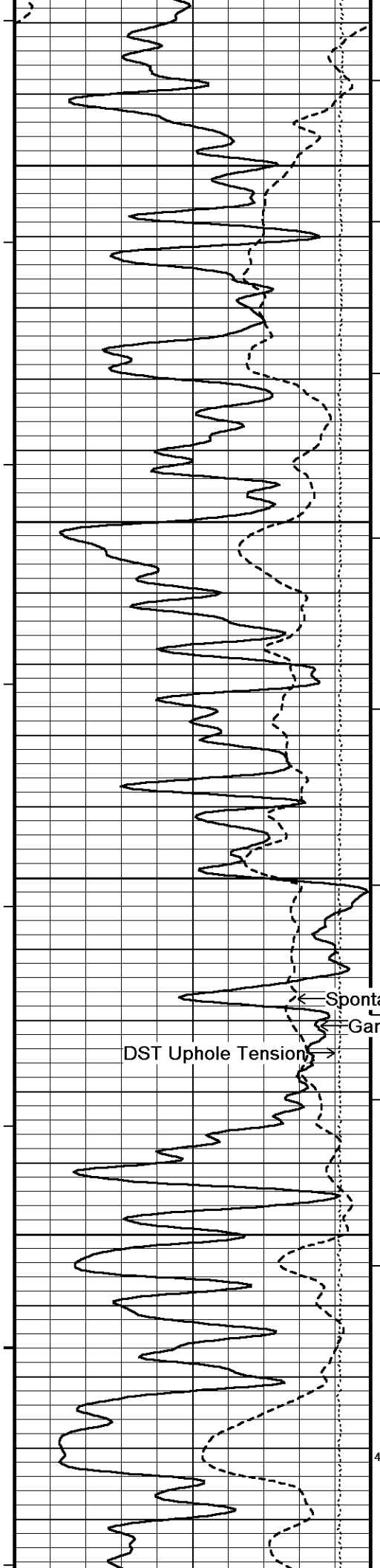
110°

110°

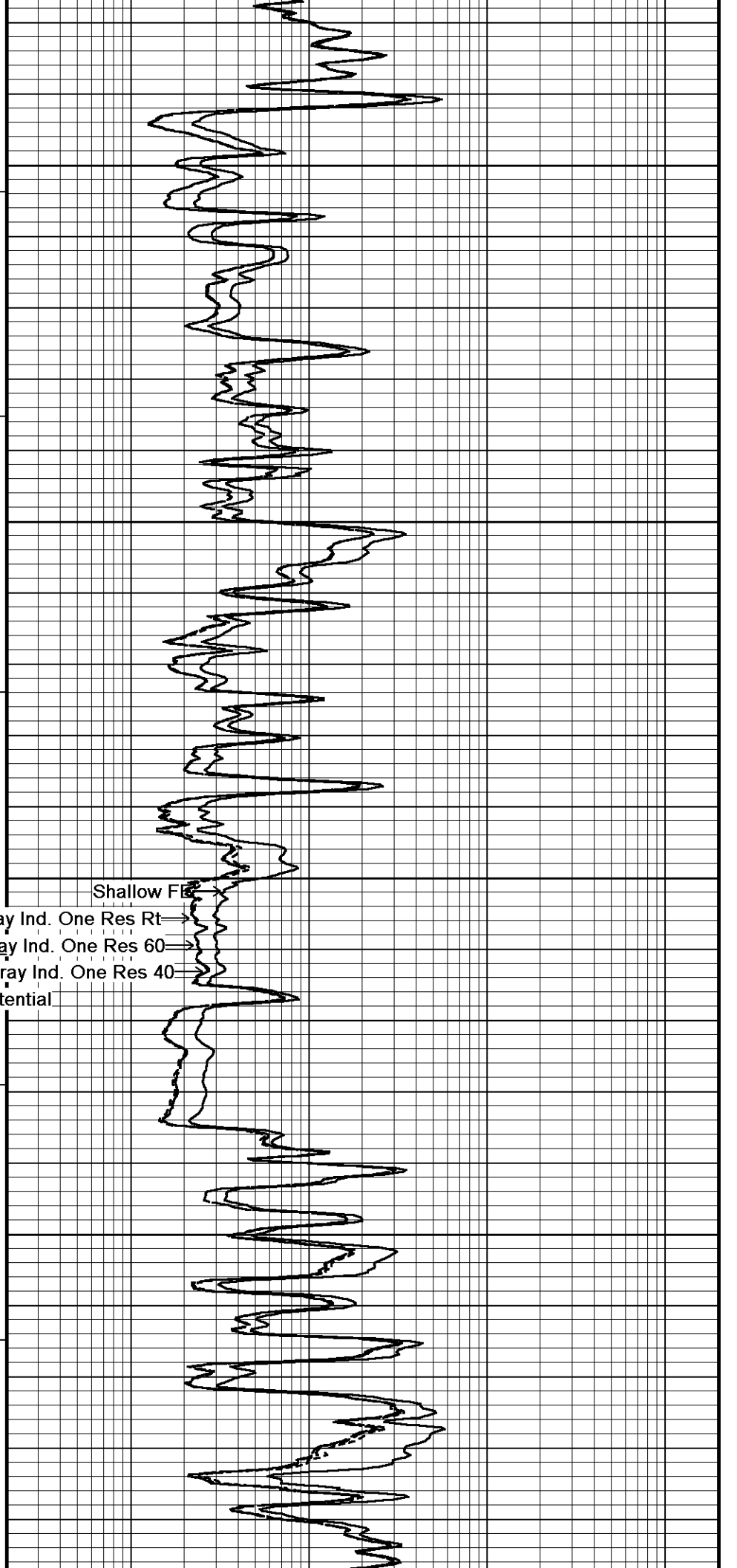
111°

111°

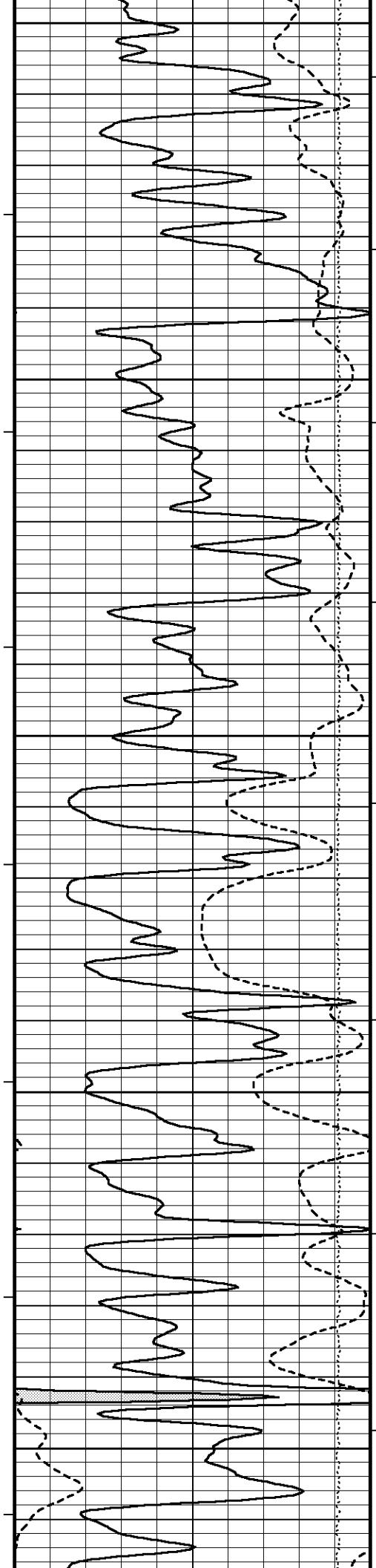




111°
3050
112°
3100
112°
3150
113°
3200
400
113°



Shallow F
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Spontaneous Potential
Gamma Ray
DST Uphole Tension



3250

200

113°

3300

114°

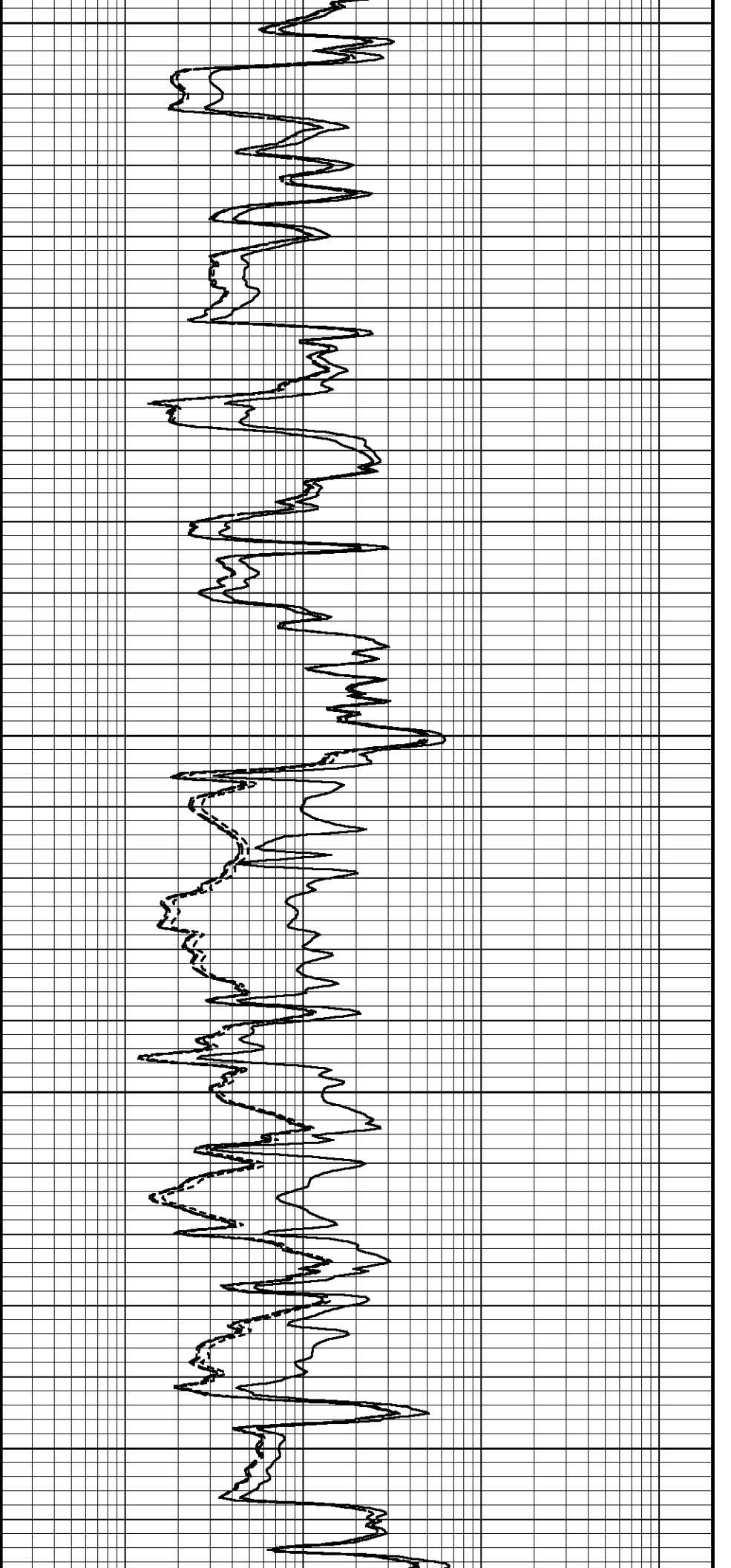
3350

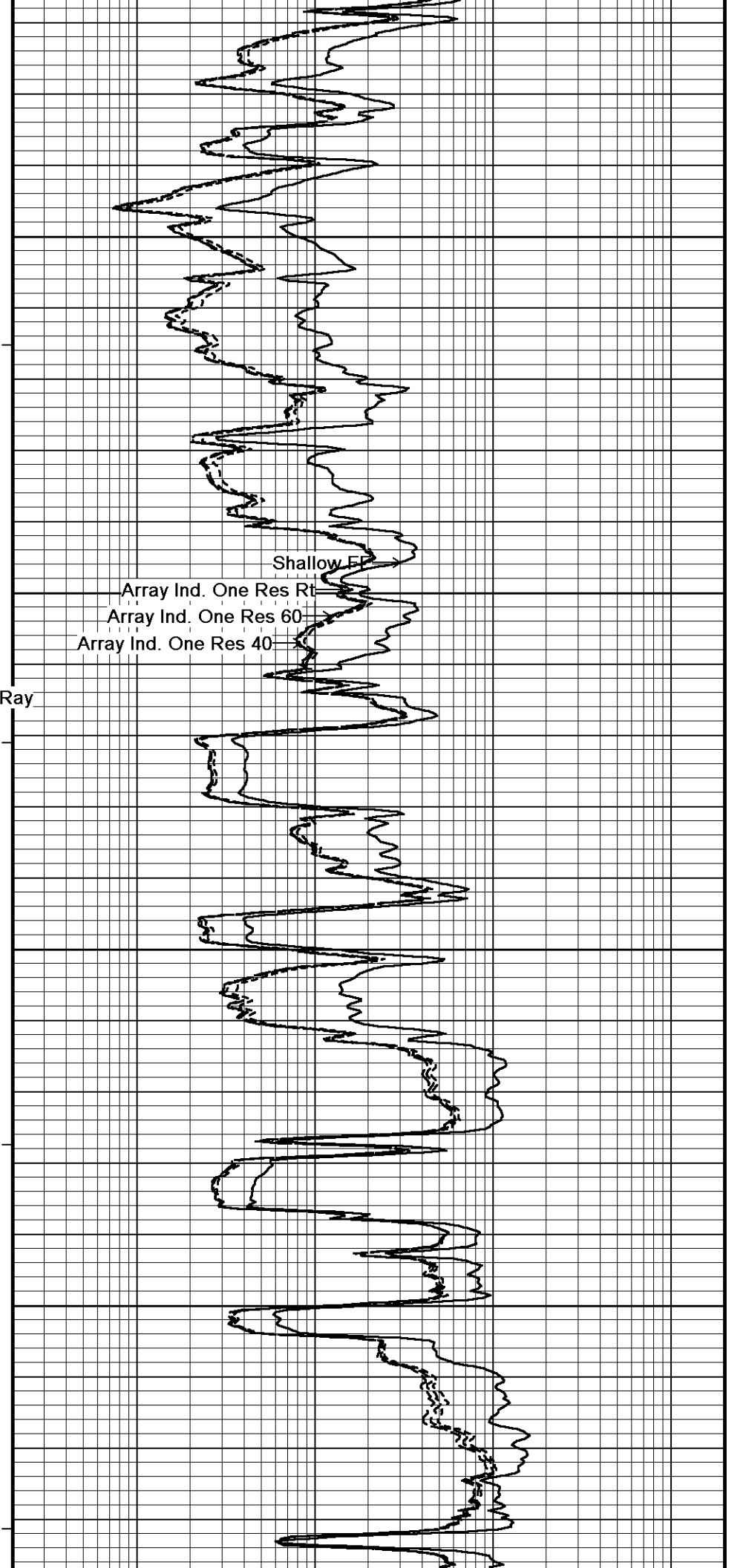
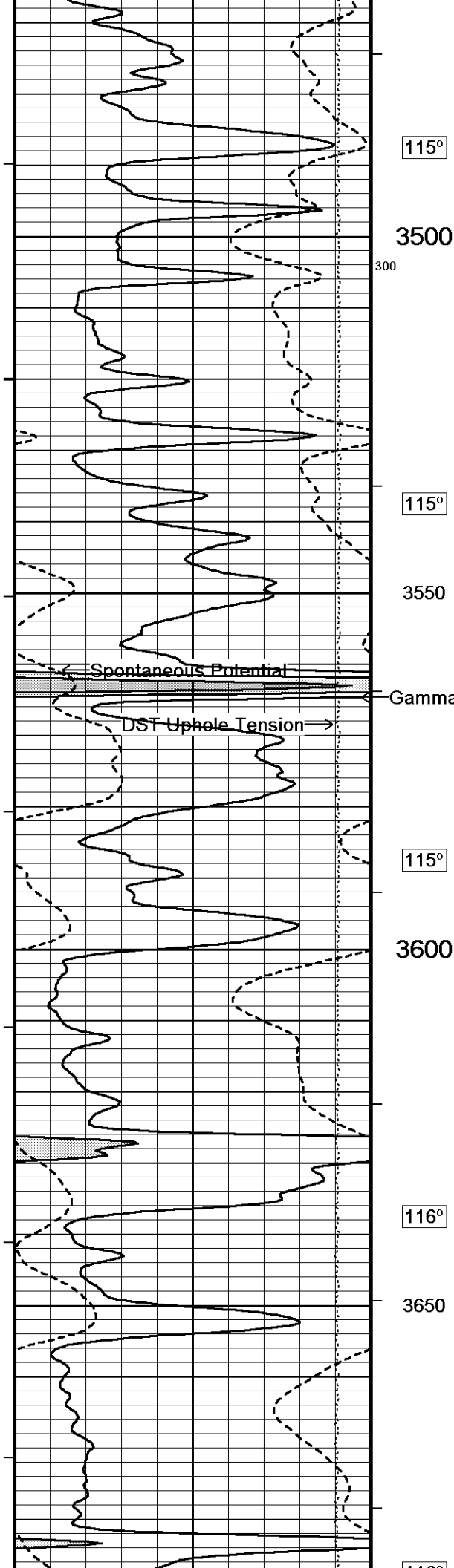
114°

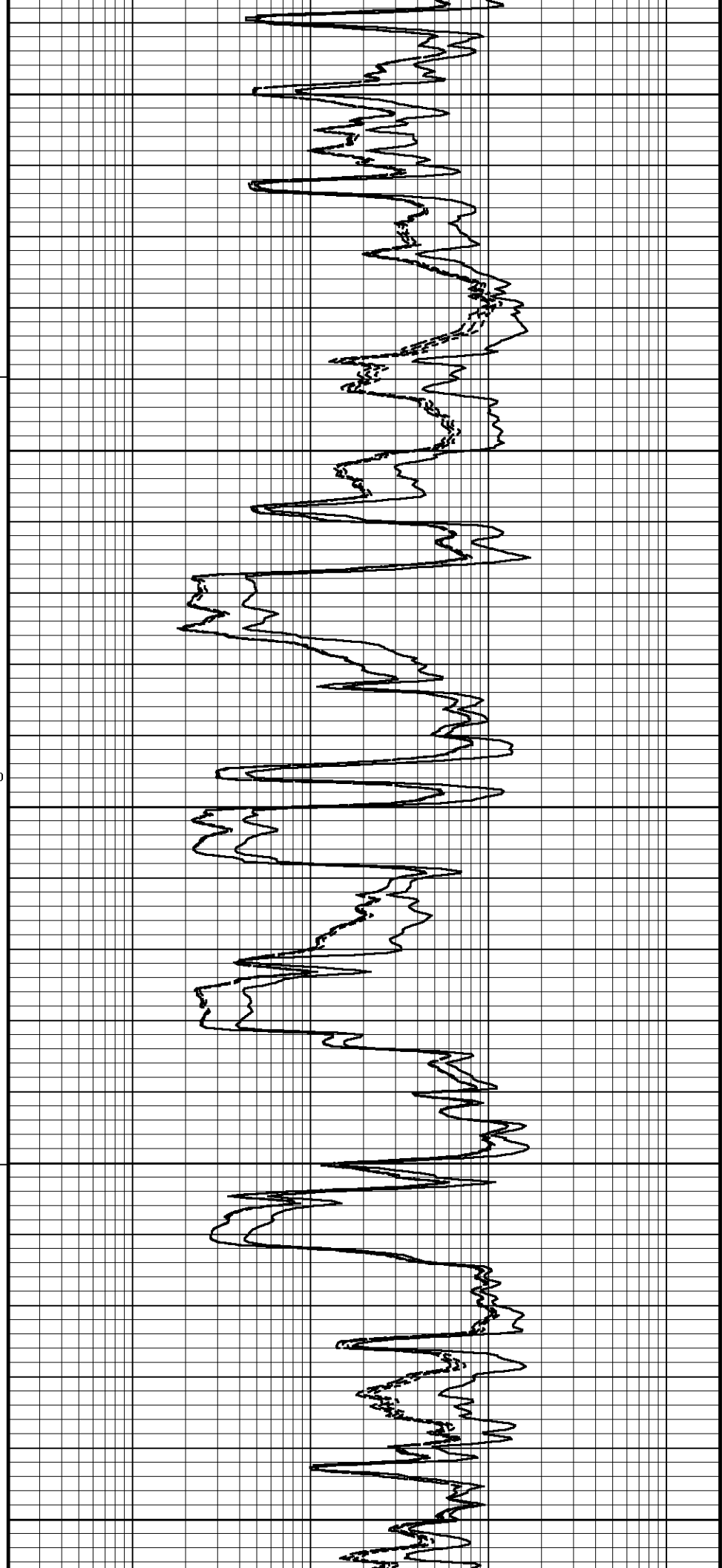
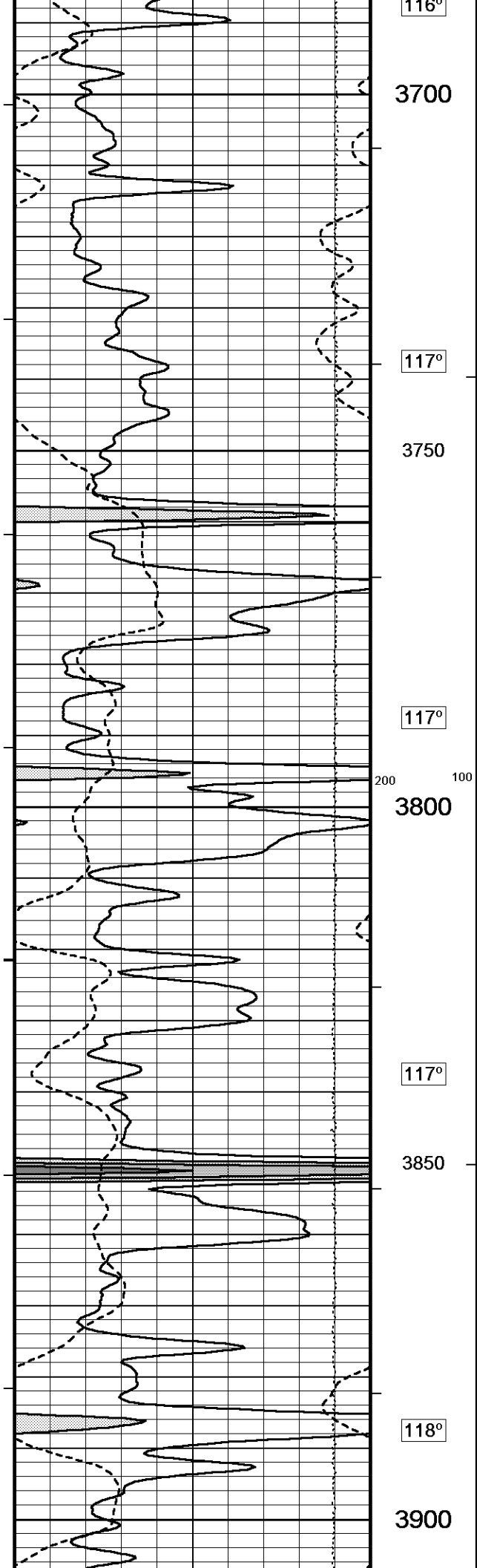
3400

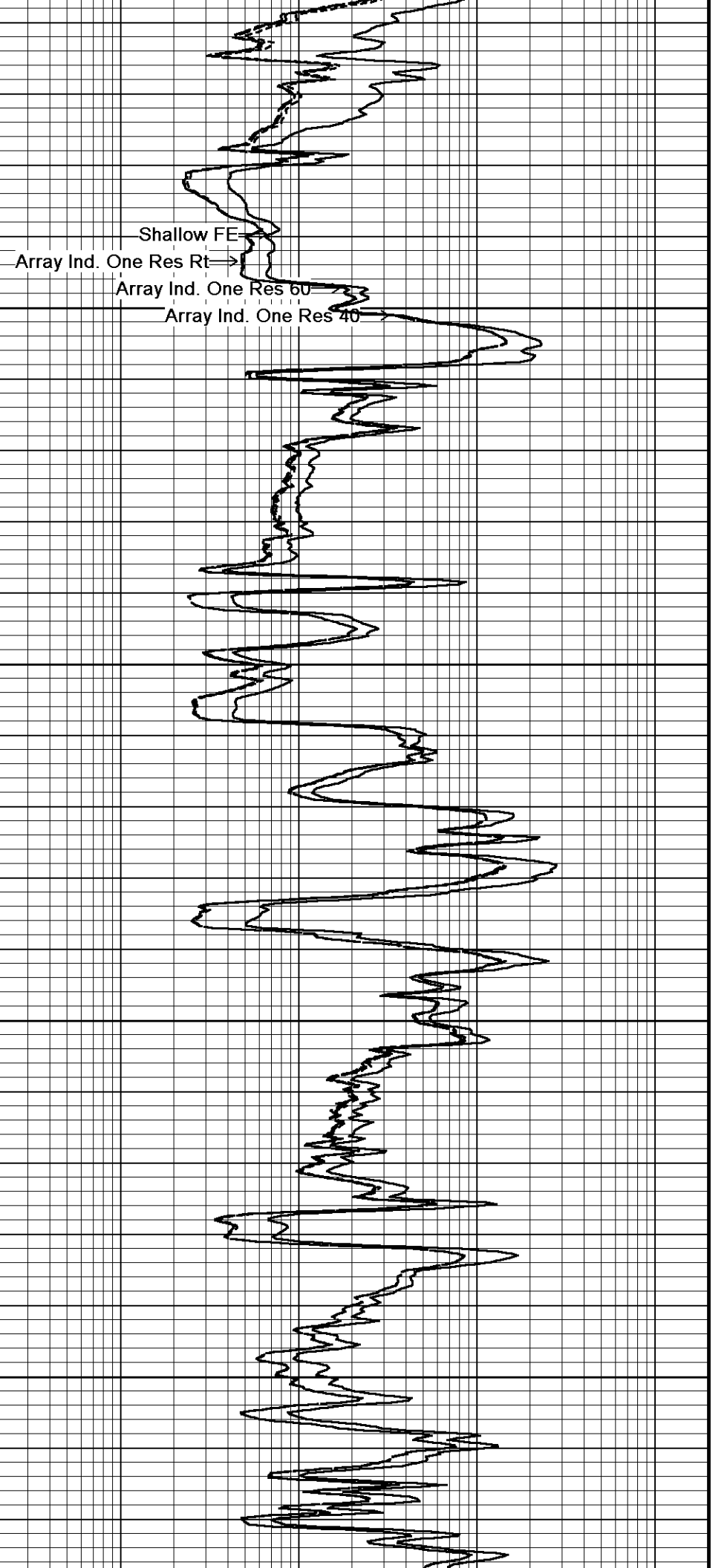
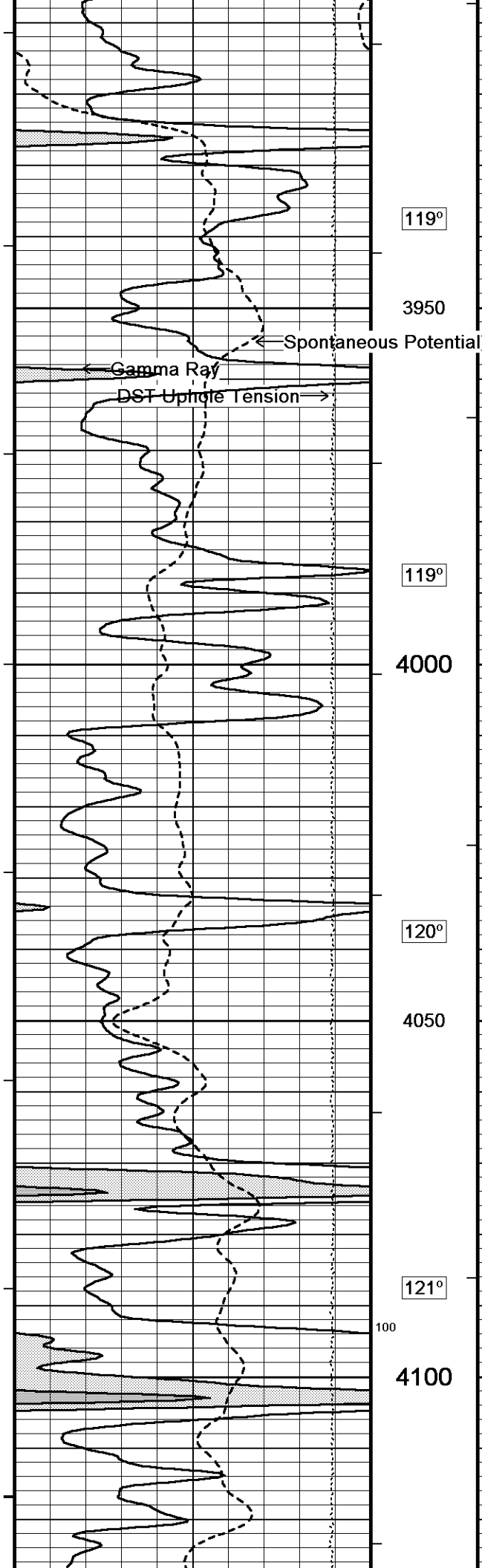
114°

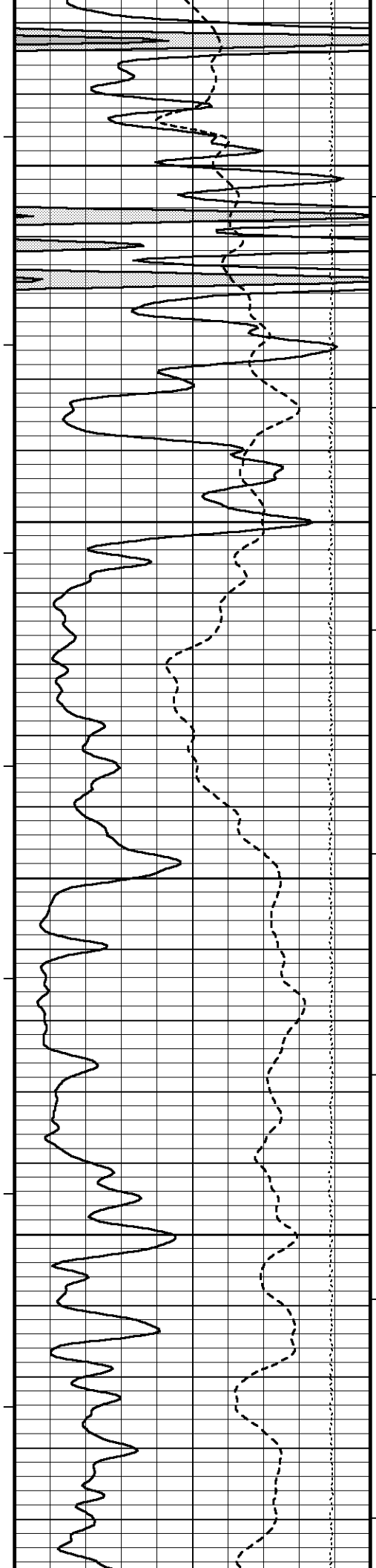
3450











121°

4150

122°

4200

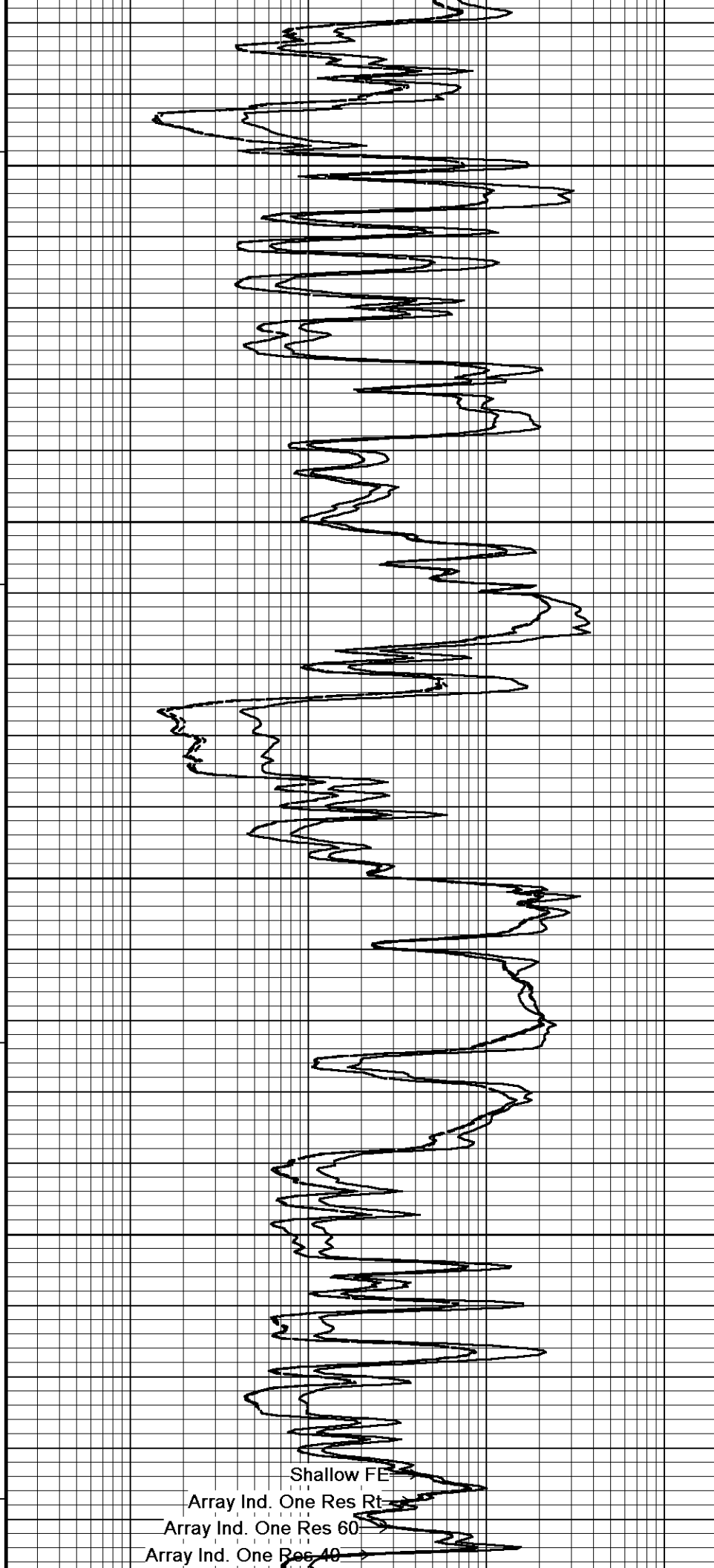
123°

4250

123°

4300

123°

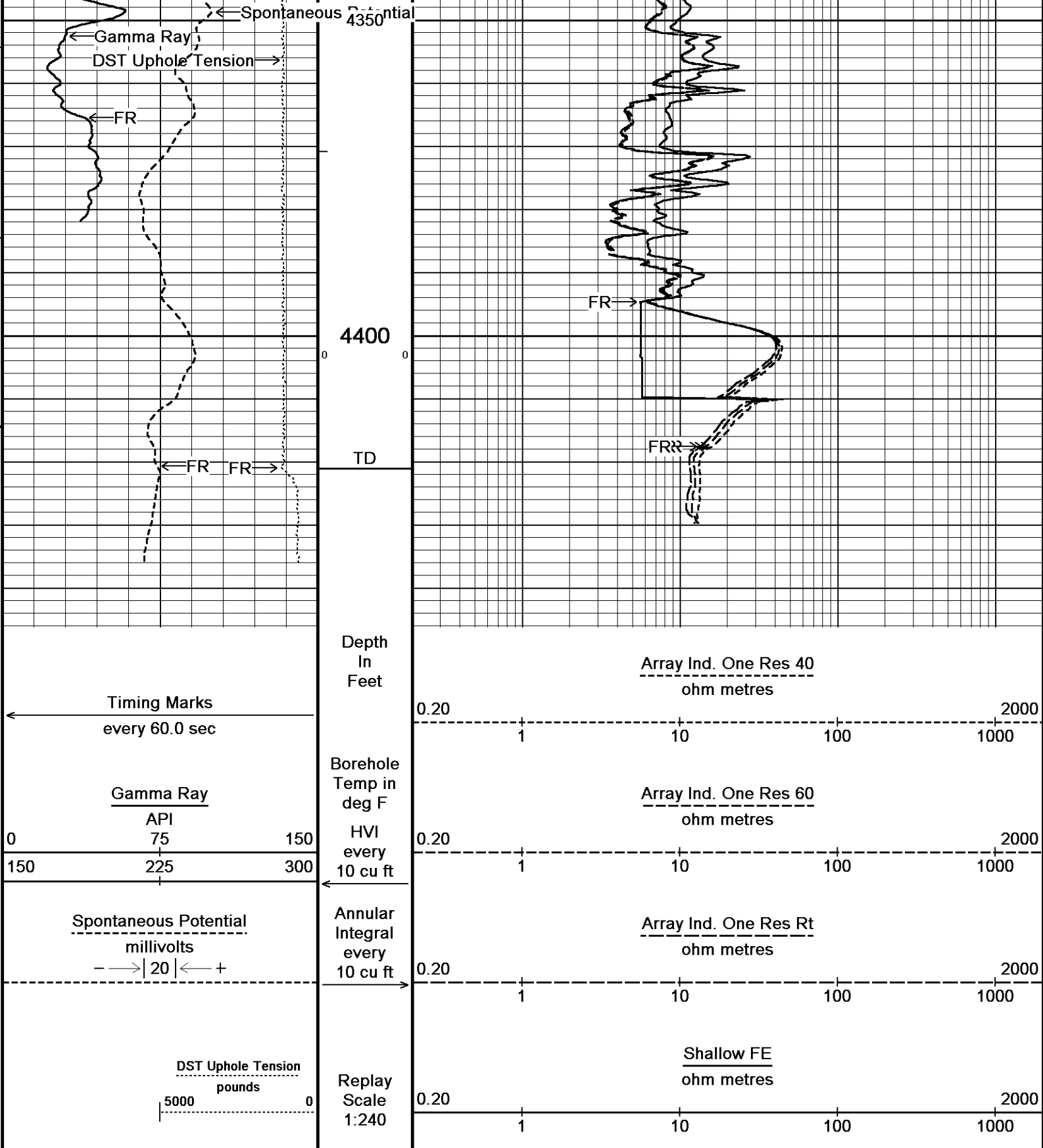


Shallow FE

Array Ind. One Res Rt

Array Ind. One Res 60

Array Ind. One Res 40

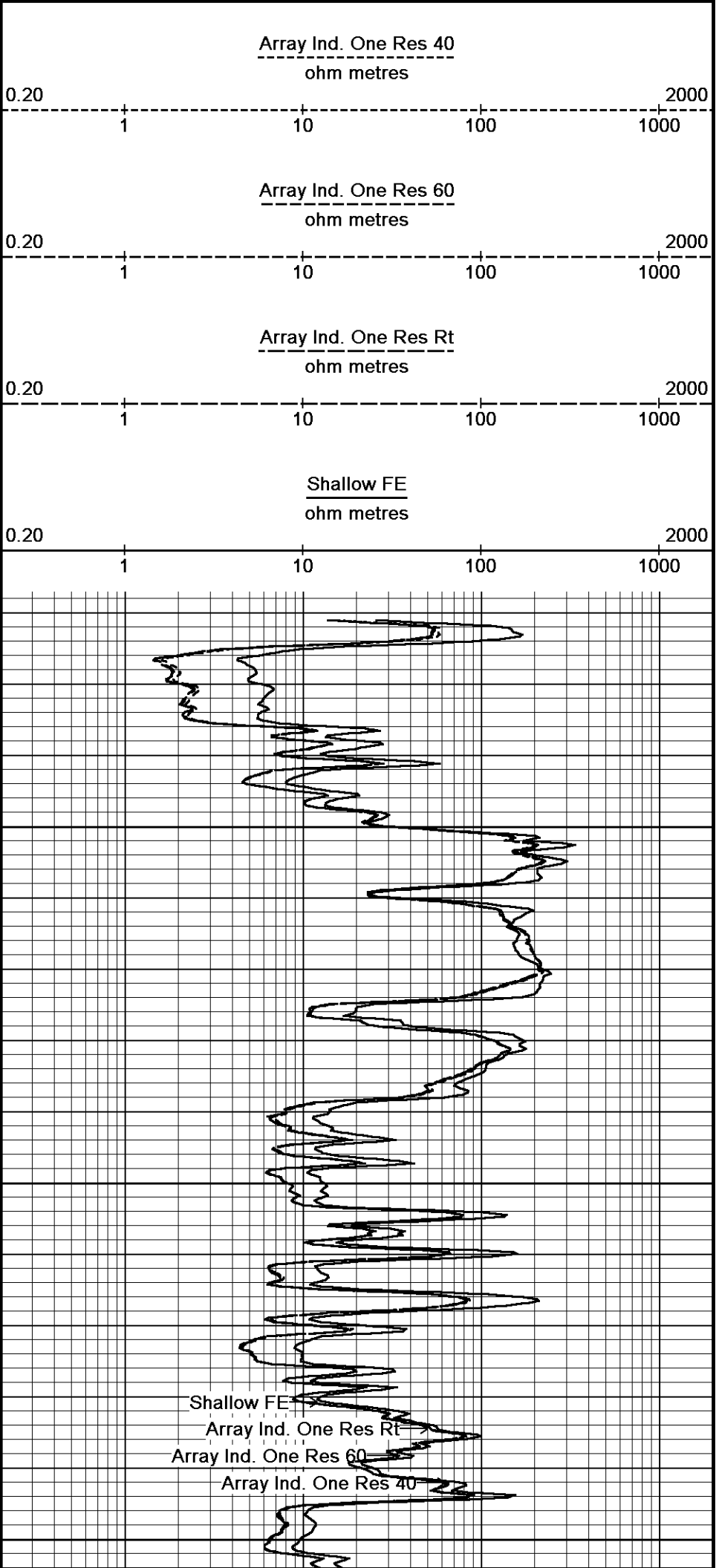
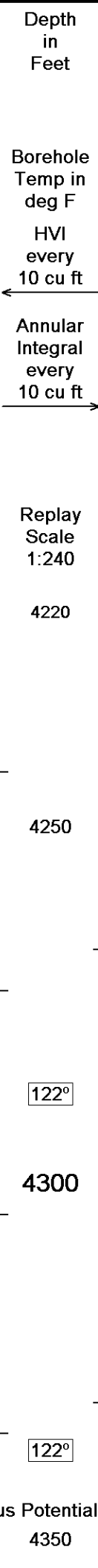
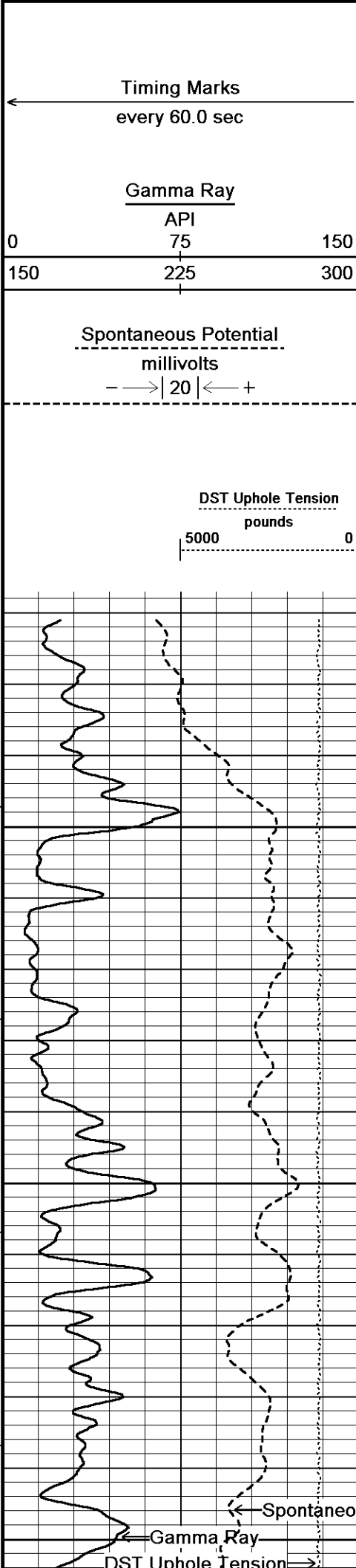


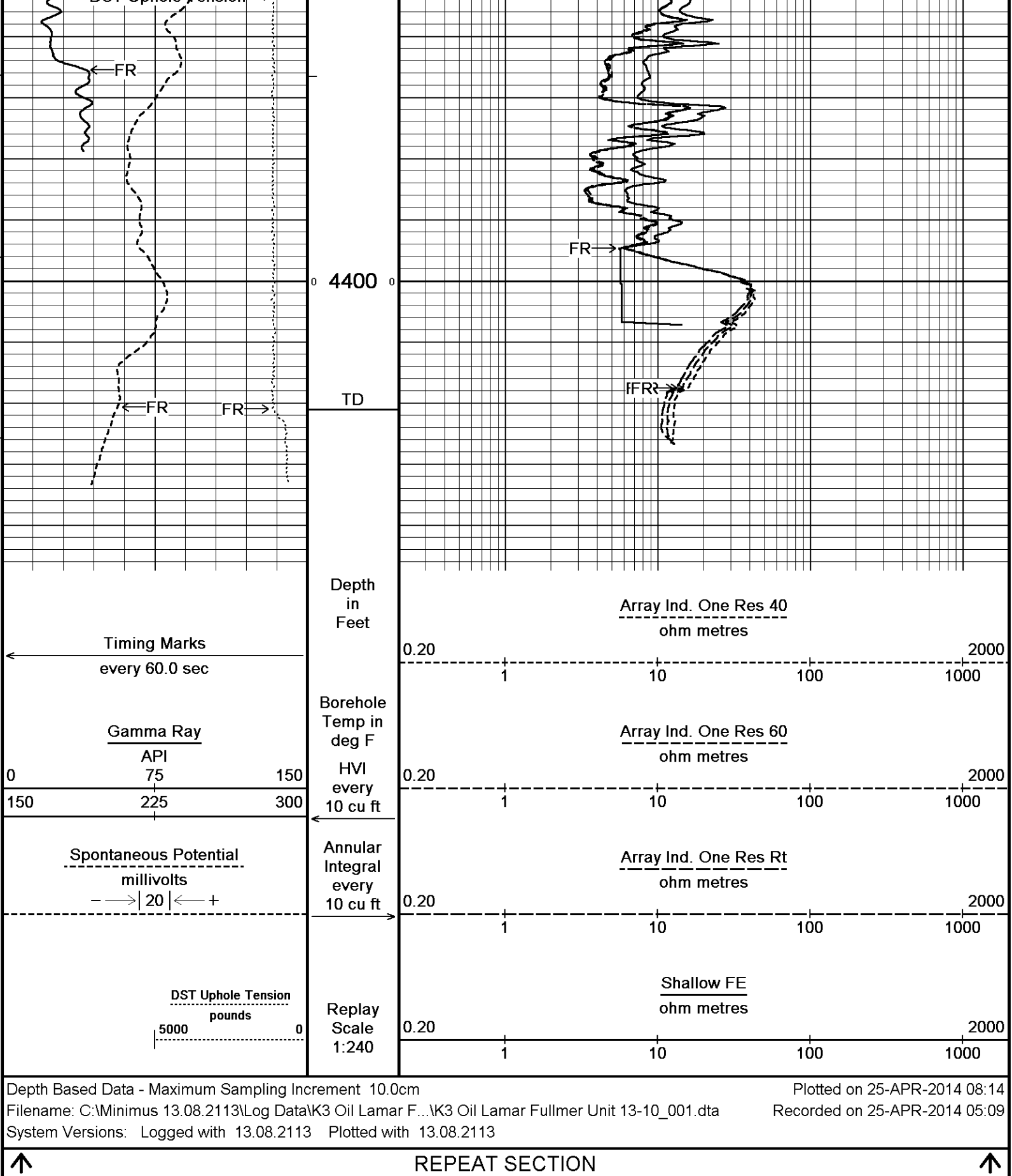
Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 13.08.2113\Log Data\K3 Oil Lamar F...\K3 Oil Lamar Fullmer Unit 13-10_002.dta
System Versions: Logged with 13.08.2113 Plotted with 13.08.2113

5 INCH MAIN

REPEAT SECTION

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 13.08.2113\Log Data\K3 Oil Lamar F...\K3 Oil Lamar Fullmer Unit 13-10_001.dta
System Versions: Logged with 13.08.2113 Plotted with 13.08.2113





BEFORE SURVEY CALIBRATION

C:\Minimus 13.08.2113\Log Data\K3 Oil Lamar Fullmer Unit 13-10\K3 Oil Lamar Fullmer Unit 13-10_001.dta

General Constants All 000

Last Edited on 25-APR-2014,04:42

General Parameters

Mud Resistivity

0.770

ohm-metres

Mud Resistivity	92.000	ohm metres
Water Level	0.000	degrees F
Borehole Fluid Processing	Wet Hole	feet
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	MML Caliper	
Rwa Parameters		
Porosity used	Crossplot Porosity	
Resistivity used	Array Ind. One 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 23-APR-2014 20:17
Reading No	Measured	Calibrated (lbs)	
1	15076.45	0.00	
2	16570.90	577.60	

Gamma Calibration MCG-D.K 469			Field Calibration on 18-APR-2014 19:23
	Measured	Calibrated (API)	
Background	73	50	
Calibrator (Gross)	1115	775	
Calibrator (Net)	1042	725	

Gamma Constants MCG-D.K 469			Last Edited on 25-APR-2014,03:00
Gamma Calibrator Number	GRC038		
Mud Density	1.12	gm/cc	
Caliper Source for Processing	Density Caliper		
Tool Position	Eccentred		
Concentration of KCl		kppm	
K Mud Type	Chloride		
K Mud Concentration	0.00	%	

High Resolution Temperature Calibration MCG-D.K 469			Field Calibration on 18-APR-2014,19:10
	Measured	Calibrated(Deg F)	
Lower	10.00	10.00	
Upper	100.00	100.00	

High Resolution Temperature Constants MCG-D.K 469			Last Edited on 25-APR-2014,03:00
Pre-filter Length	11		

SP Calibration MCG-D.K 469			Field Calibration on 17-APR-2014 09:58
	Measured	Calibrated (mV)	
Reference 1	100.1	99.9	
Reference 2	-99.0	-100.0	

Caliper Calibration MML-A 3			Base Calibration on 25-MAR-2014 11:38 Field Calibration on 18-APR-2014 19:07
Base Calibration			
Reading No	Measured	Calibrator Size (in)	
1	14836	5.98	
2	18178	7.97	
3	21362	9.86	
4	25372	11.92	
5	0	0.00	
6	N/A	N/A	
Field Calibration			
	Measured Caliper (in)	Actual Caliper (in)	
	7.98	7.97	

Micro Normal and Micro Inverse Calibration MML-A 3			Base Calibration on 25-MAR-2014 11:48
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Base Calibration

Channel	Measured		Calibrated (ohm-m)	
	Resistor 1	Resistor 2	Resistor 1	Resistor 2
Micro Normal	10.0	50.0	5.1	25.6
Micro Inverse	10.0	49.9	3.4	16.9
Channel	Base Check (ohm-m)		Field Check (ohm-m)	
Micro Normal	77.3		77.3	
Micro Inverse	51.2		51.2	

Micro Normal and Micro Inverse Constants MML-A 3

Last Edited on 25-APR-2014,03:00

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	

Neutron Calibration MDN-A.B 66

Base Calibration on 24-MAR-2014 14:50

Field Check on 18-APR-2014 19:30

Base Calibration				
Ratio	Measured		Calibrated (cps)	
	Near	Far	Near	Far
	3064	94	3714	110
	32.437		33.764	
Field Calibrator at Base			Calibrated (cps)	
Ratio			1641	2431
			0.675	
Field Check			Calibrated (cps)	
Ratio			1667	2436
			0.684	

Neutron Constants MDN-A.B 66

Last Edited on 25-APR-2014,03:00

Neutron Source Id	P0204NN	
Neutron Jig Number	5824NE	
Epithermal Neutron		
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-A.A 135

Base Calibration on 25-MAR-2014 12:07

Field Check on 18-APR-2014 18:56

Base Calibration		
	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	963.6	126.8
Base Check		281.2
Field Check		281.2

FE Constants MFE-A.A 135

Last Edited on 25-APR-2014,02:59

Running Mode	No Sleeve		
MFE K Factor	0.1268		
Caliper Source for FE correction	Density Caliper		
Caliper Value for FE correction	N/A		
Rm Source for FE correction	Temperature Corr		
		inches	

Rm Source for P.E. correction	Temperature Cor
Temp. for Rm Corr.	MCG External Temperature
Stand-off	0.5 inches

Sonic Constants MSS-A.A 73

Last Edited on 25-APR-2014,02:58

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	
Correction for Sonde Skew	Applied	
Cycle Stretch Algorithm	Applied	
MN3FT	0.00	micro-sec
MX3FT	1500.00	micro-sec
Hunt-Raymer Constant	83.13	micro-sec/ft

Sonde Mode	Compensated
Hole Type	Open Hole

Sonde Parameters

	Measured	Calibrated
Offset	0.0000	0.0000
Free Pipe	0.0000	

Peak Amplitude Source

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)
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00

Full Waveform Parameters

Use 3' Waveform to derive TR	No
Use 4' Waveform to derive TR	No
Use 5' Waveform to derive TR	No
Use 6' Waveform to derive TR	No
3' Waveform Discriminator Level	0.30 mV
4' Waveform Discriminator Level	0.30 mV
5' Waveform Discriminator Level	0.15 mV
6' Waveform Discriminator Level	0.15 mV
3' Waveform Filter	
4' Waveform Filter	
5' Waveform Filter	
6' Waveform Filter	

Semblance Level	0.50
Semblance Window Width	120.00 micro-sec
Sonic 1 Despiker	100.00 micro-sec/ft
Sonic 2 Despiker	100.00 micro-sec/ft

Induction Calibration MAI-A.A 167

Base Calibration on 22-FEB-2014,14:07

Field Check on 18-APR-2014 18:52

Base Calibration

Test Loop Calibration	Measured		Calibrated (mmho/m)	
Channel	Low	High	Low	High
1	17.3	474.2	9.3	967.1
2	6.3	388.4	7.6	822.1
3	3.3	259.4	5.2	566.5
4	1.9	133.0	2.6	279.5

Array Temperature 76.8 Deg F

Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1			12.7	3842.1
2			29.5	3479.9
3			29.1	3056.0
4			19.8	2083.9
Deep			18.6	2051.4
Medium			42.2	3994.9
Shallow			42.8	5057.7

Array Temperature 69.0 Deg F

Induction Constants MAI-A.A 167

Last Edited on 25-APR-2014,02:58

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

Borehole Normalisation

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

Calibration Site Corrections

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

Apparent Porosity and Water Saturation Constants

Archie Constant (A)	1.00	
Cementation Exponent (M)	2.00	
Saturation Exponent (N)	2.00	
Saturation of Water for 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 18-APR-2014,18:52

	Measured	Calibrated(Deg F)
Lower	10.00	10.00
Upper	100.00	100.00

High Resolution Temperature Constants MAI-A.A 167

Last Edited on 18-APR-2014,18:52

Pre-filter Length 11

Caliper Calibration MPD-D.A 482

Base Calibration on 10-APR-2014 12:34

Field Calibration on 17-APR-2014 10:16

Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	16267	3.99
2	26446	5.98
3	36593	7.97

4	46367	9.86
5	57395	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
7.92	7.97

Photo Density Calibration MPD-D.A 482

Base Calibration on 24-MAR-2014 13:51
Field Check on 17-APR-2014 10:21

Density Calibration

Base Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Background	1244	1407		
Reference 1	59945	29818	59556	30836
Reference 2	25150	2828	24941	2541

Field Check at Base

1243.8	1406.7
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Field Check

1236.7	1411.8
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PE Calibration

Base Calibration	WS	Measured		Calibrated Ratio
		WH	Ratio	
Background	235	1114		
Reference 1	26220	59734	0.443	0.371
Reference 2	7692	25010	0.312	0.272

Field Check at Base

235.0	1114.4
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Field Check

233.6	1108.6
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Density Constants MPD-D.A 482

Last Edited on 25-APR-2014,02:59

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	1.12 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 (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

DOWNHOLE EQUIPMENT

C:\Minimus 13.08.2113\Log Data\K3 Oil Lamar Fullmer Unit 13-10\K3 Oil Lamar Fullmer Unit 13-10_001.dta

CBH-C, Cablehead, 11 pin
CBH-C 0 LG: 2.40 ft WT: 24.3 lb OD: 2.244 in



Compact Comms Gamma

55.39 ft GRGC - Gamma Ray

Arford		ARRAY INDUCTION SHALLOW FOCUSED ELECTRIC LOG	
K3 OIL & GAS OPERATING COMPANY LAMAR FULLMER UNIT 13-10 WILDCAT GOVE U.S.A. / KANSAS 1824' FSL & 1921' FEL			
S	RSE 239M	Other Services	
MSS	MPDOWN	MML	
15-065-22193			
Elevation 2448 feet			
25-APR-2014	25-APR-2014	KB	2463.00
ONE	ONE	DF	2464.00
4558-5583972	4558-5583972	GL	2448.00
4421.00	feet		
4421.00	feet		
4418.00	feet		
265.00	feet		
270.00	feet		
265.00	feet		
7.875	inches		
CHEMICAL			
9.30	lb/0.5g	48.00	CP
9.00		8.00	mid30min
FLOWLINE			
0.77 @ 92.0	0in-m		
0.62 @ 92.0	0in-m		
0.92 @ 92.0	0in-m		
CALC	CALC		
0.58 @ 13.0	0in-m		
4 HOURS		deg F	
123.00			
13096	LIB		
ADAM SILL			
PAI DEENHAN			
LB147-28			

1 INCH MAIN

Depth Based Data - Maximum Sampling Increment 10.0cm

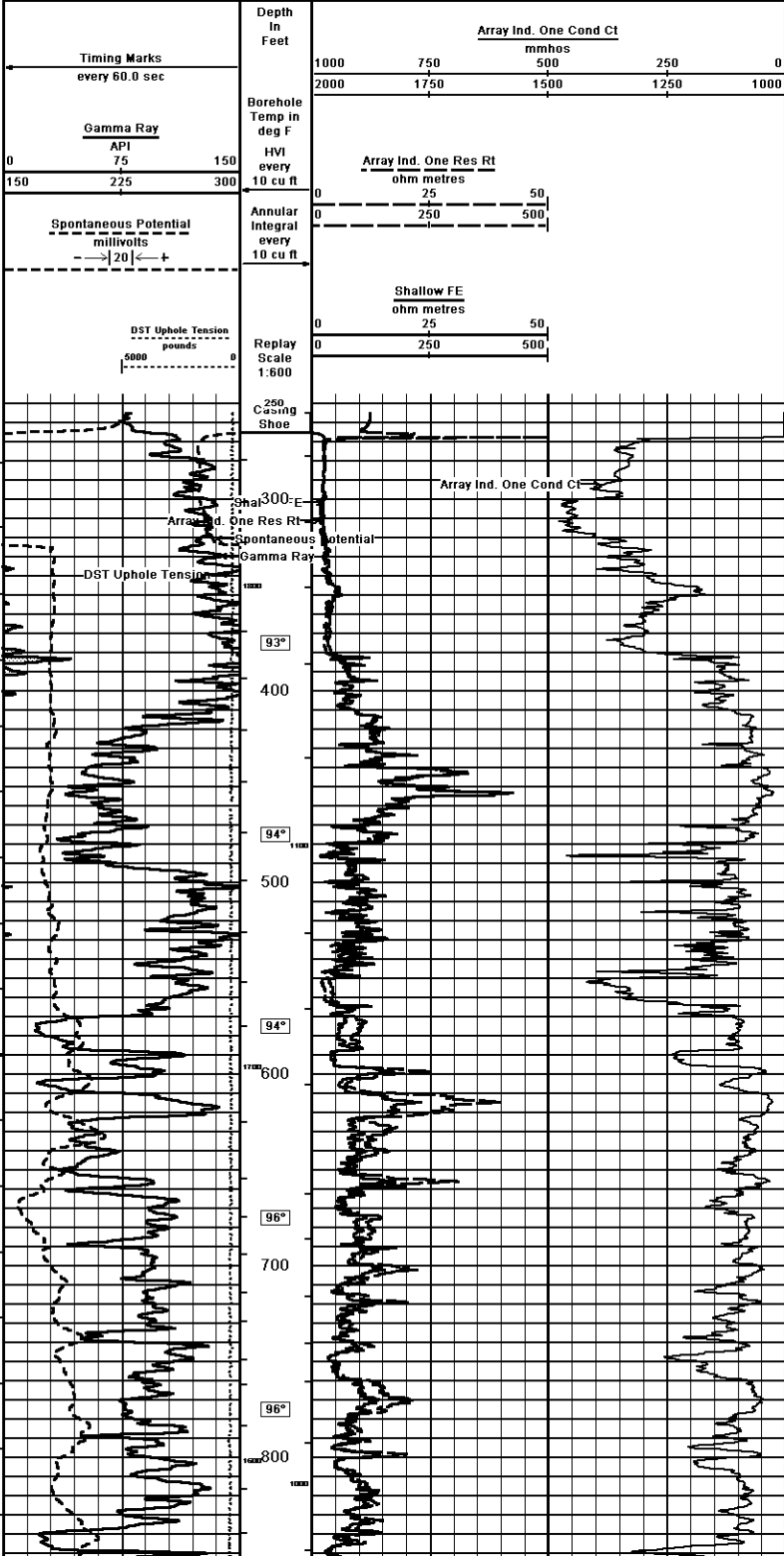
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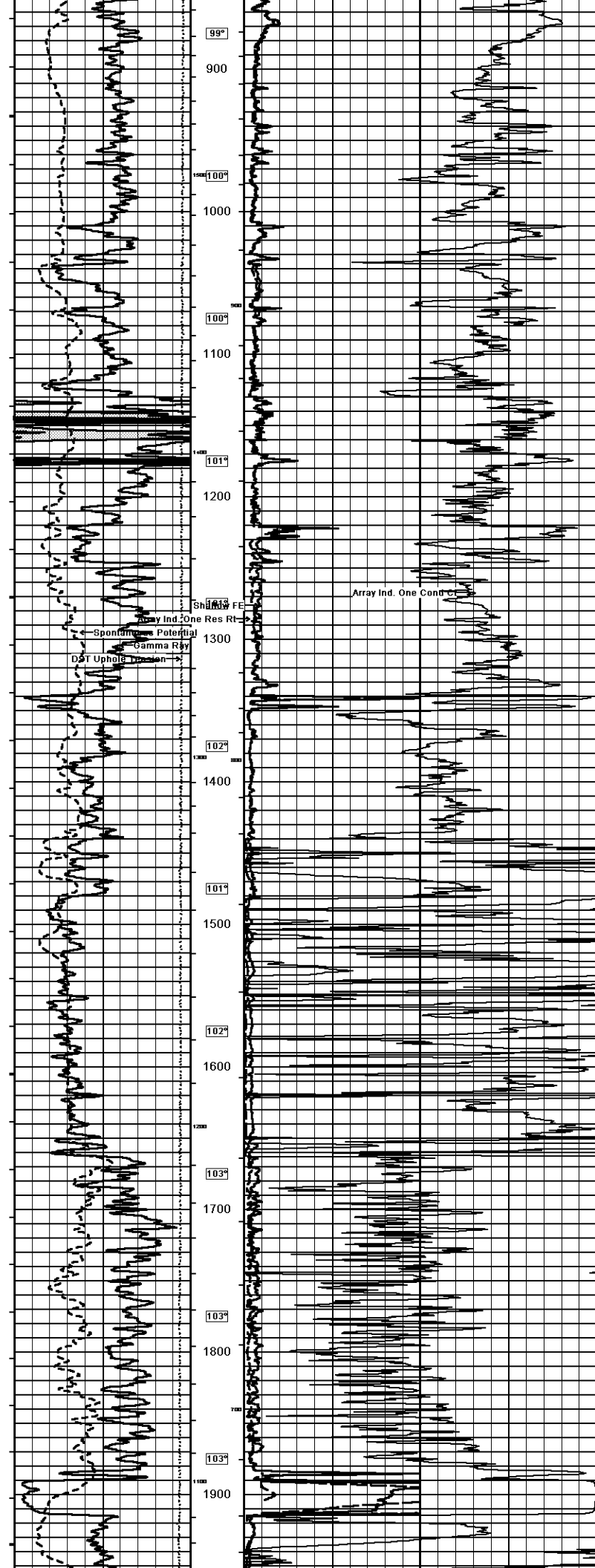
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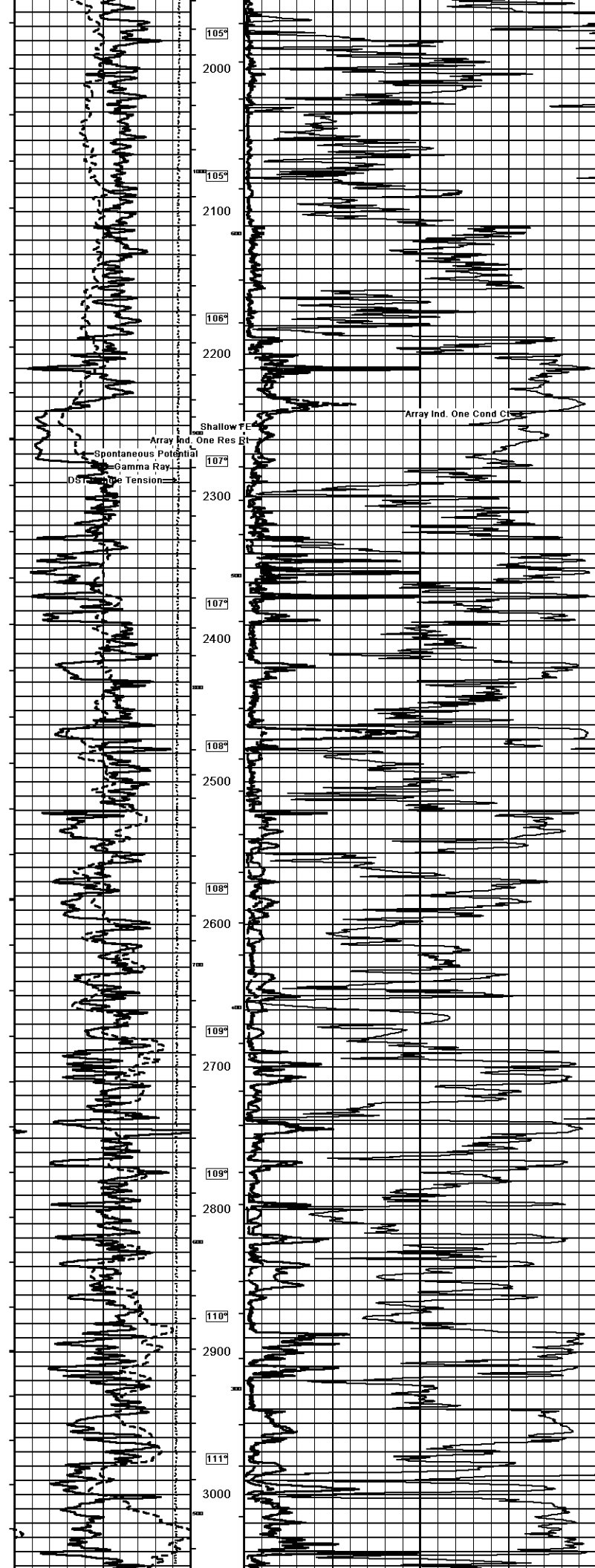
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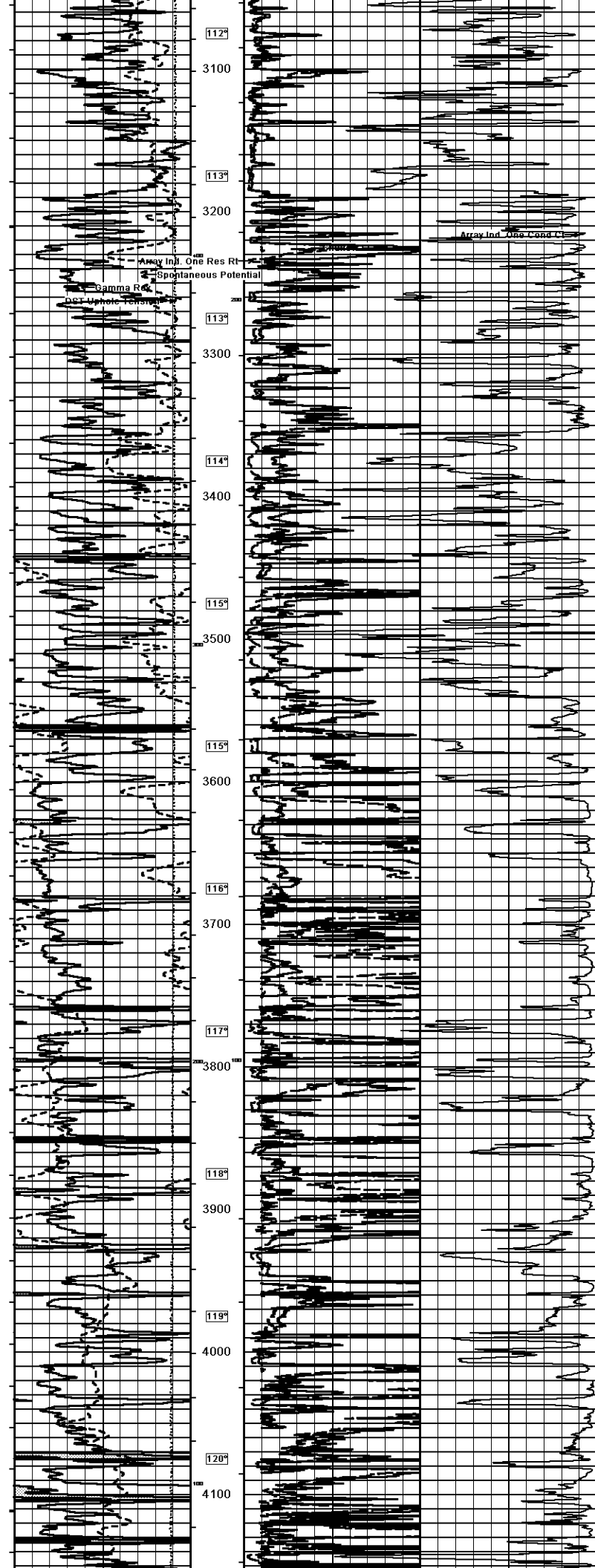
System Versions: Logged with 13.08.2113

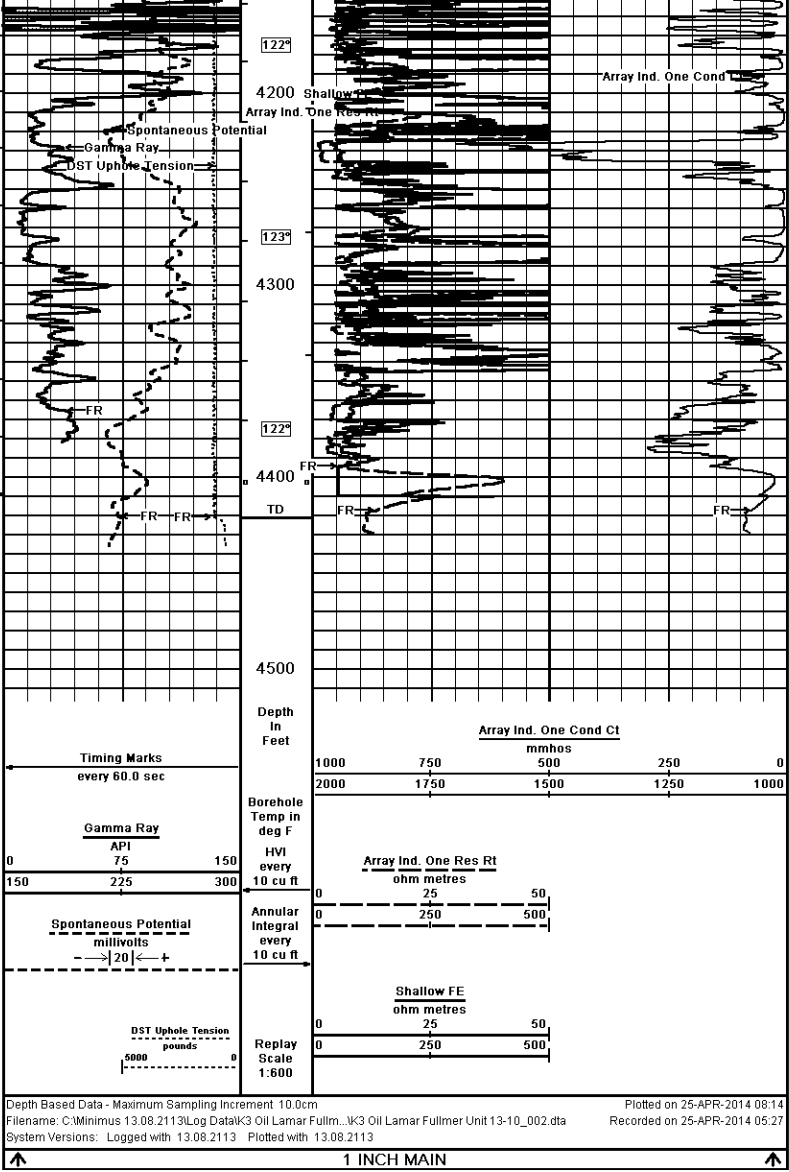
Plotted with 13.08.2113











COMPANY		K3 OIL & GAS OPERATING COMPANY			
WELL		LAMAR FULLMER UNIT 13-10			
FIELD		WILDCAT			
PROVINCE/COUNTY		GOVE			
COUNTRY/STATE		U.S.A. / KANSAS			
Elevation Kelly Bushing	2456.00	feet	First Reading	4418.00	feet
Elevation Drill Floor	2454.00	feet	Depth Driller	4421.00	feet
Elevation Ground Level	2448.00	feet	Depth Logger	4421.00	feet
 Weatherford			ARRAY INDUCTION		
			SHALLOW FOCUSED		
			ELECTRIC LOG		