

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

COMPANY				CIMAREX ENERGY CO.			
WELL				HAMMER 19-5			
FIELD				LETTE SE			
PROVINCE/COUNTY				HASKELL			
COUNTRY/STATE				U.S.A. / KANSAS			
LOCATION				330' FSL & 1320' FEL S2 S2 SE			
SEC	TWP	RGE	Other Services		CMI		
19	30S	31W	MPD/MDN				
API Number		15-081-22026		MML			
Permit Number							
Permanent Datum GL, Elevation 2848 feet							
Log Measured From KB							
Drilling Measured From KB							
Date	26-AUG-2013						
Run Number	ONE						
Service Order	3539920						
Depth Driller	5544.00			feet			
Depth Logger	5540.00			feet			
First Reading	5537.00			feet			
Last Reading	1861.00			feet			
Casing Driller	1860.00			feet			
Casing Logger	1861.00			feet			
Bit Size	7.875			inches			
Hole Fluid Type	GEL						
Density / Viscosity	9.30	lb/USg	47.00	CP			
PH / Fluid Loss	11.50		8.40	ml/30Min			
Sample Source	FLOW LINE						
Rm @ Measured Temp	1.12 @ 62.0			ohm-m			
Rmf @ Measured Temp	0.90 @ 62.0			ohm-m			
Rmc @ Measured Temp	1.34 @ 62.0			ohm-m			
Source Rmf / Rmc	CALC		CALC				
Rm @ BHT	0.54 @ 128.0			ohm-m			
Time Since Circulation	5 HRS						
Max Recorded Temp	128.00			deg F			
Equipment / Base	13244		LIB				
Recorded By	R.HOFFMAN						
Witnessed By	T. KOLODZIEJ						
IOB #	LB 13-234						

BOREHOLE RECORD

Last Edited: 26-AUG-2013 07:30

Bit Size inches	Depth From feet	Depth To feet
7.875	1860.00	5544.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	1860.00	24.00

REMARKS

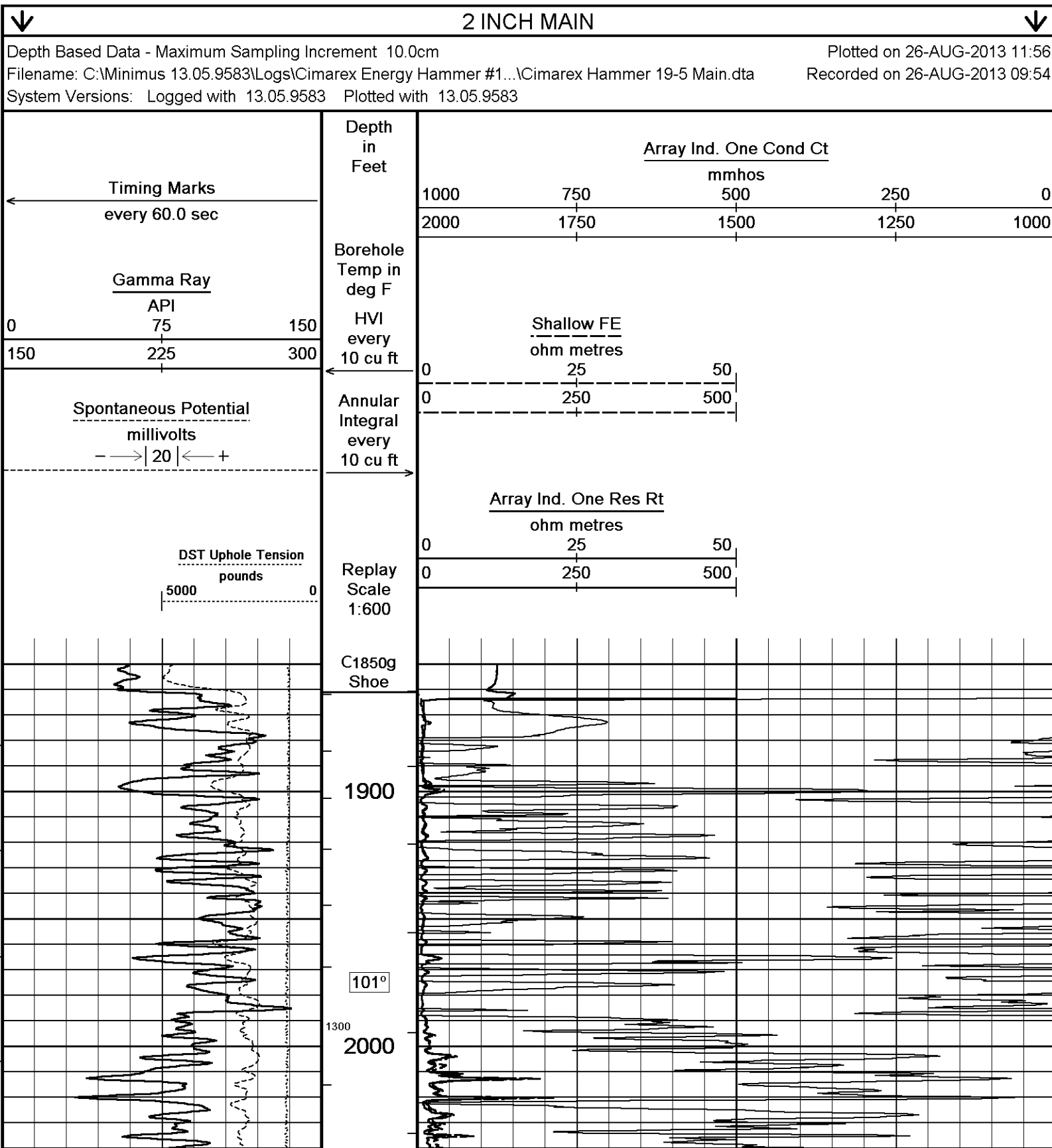
- SOFTWARE ISSUE: WLS 13.05.9583.
- RUN ONE: MCG, MML, MDN, MPD, MIE, MFE, MAI RAN IN COMBINATION.
 - HARDWARE: DUAL BOWSPRING USED ON MDN.
 - TWO 0.5 INCH STANDOFFS USED ON MSS.
 - CENTRALIZER BOWSPRING ON MIM.
 - STANDOFF USED ON MIE.
- 2.71 G/CC LIMESTONE DENSITY MATRIX USED TO CALCULATE POROSITY.
- 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: 1362 CU.FT.
- ANNULAR HOLE VOLUME WITH 5.5 INCH PRODUCTION CASING FROM TD 4000 FEET: 275 CU.FT.

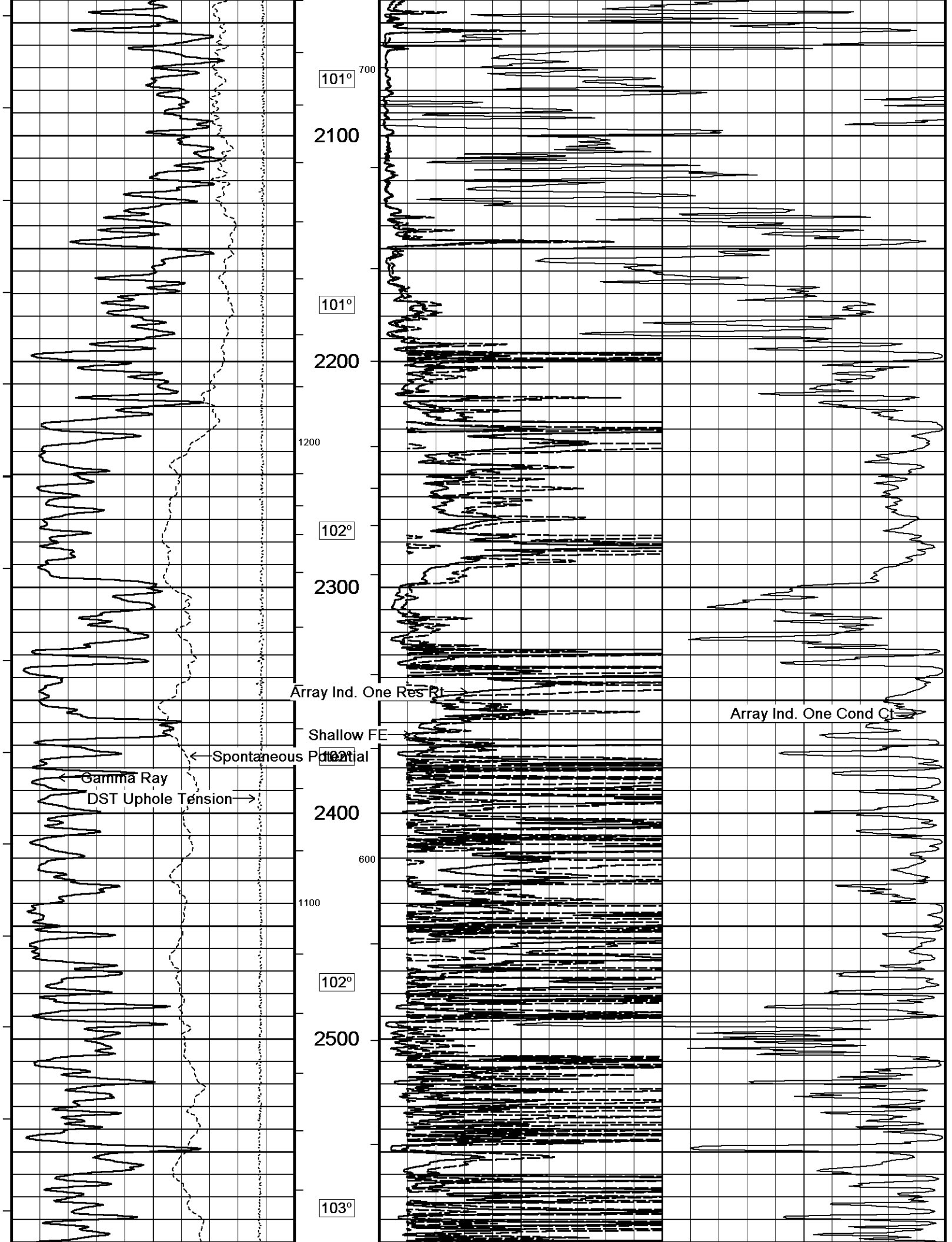
- RIG: TOM CAT DRILLING RIG #4

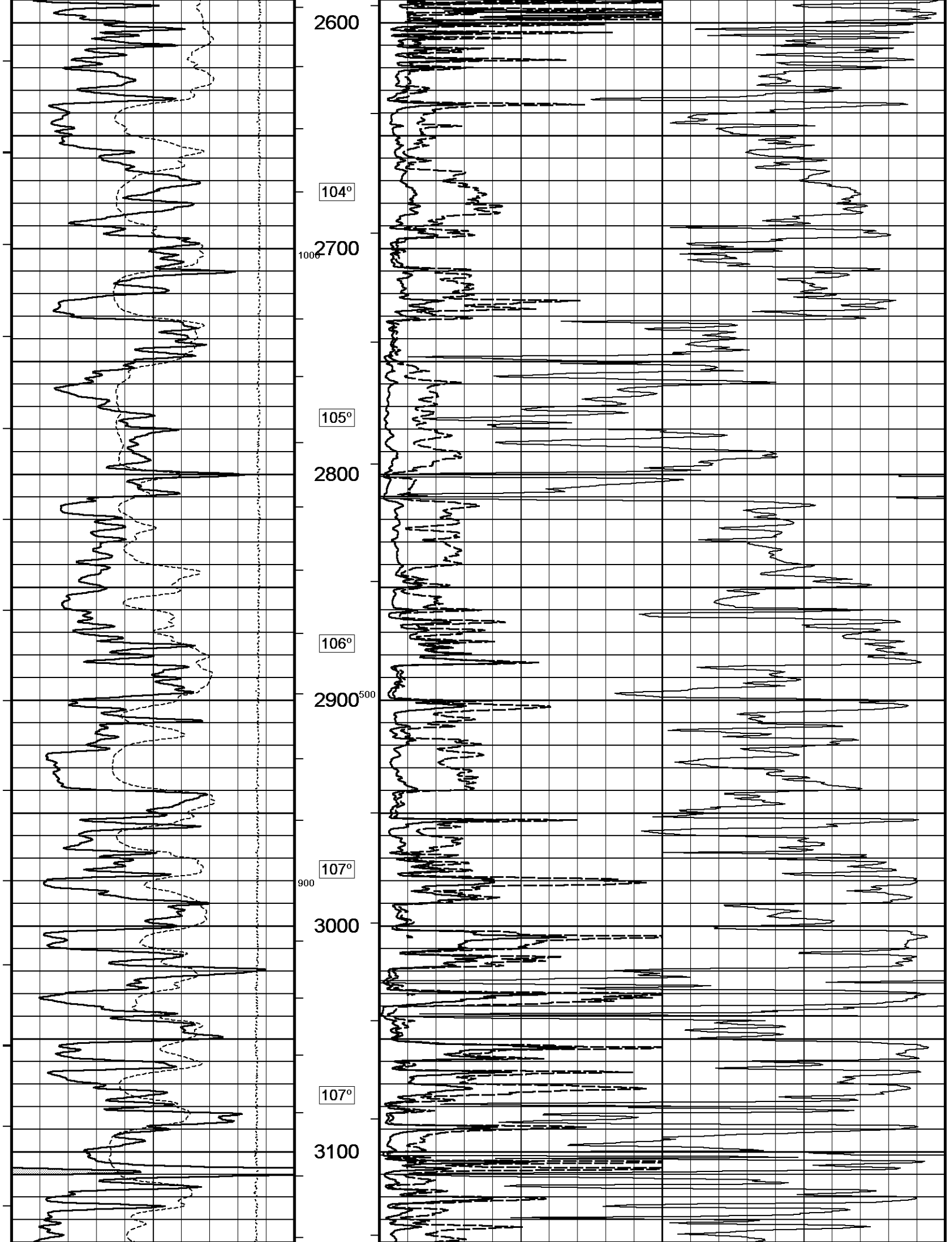
- ENGINEER: R. HOFFMAN

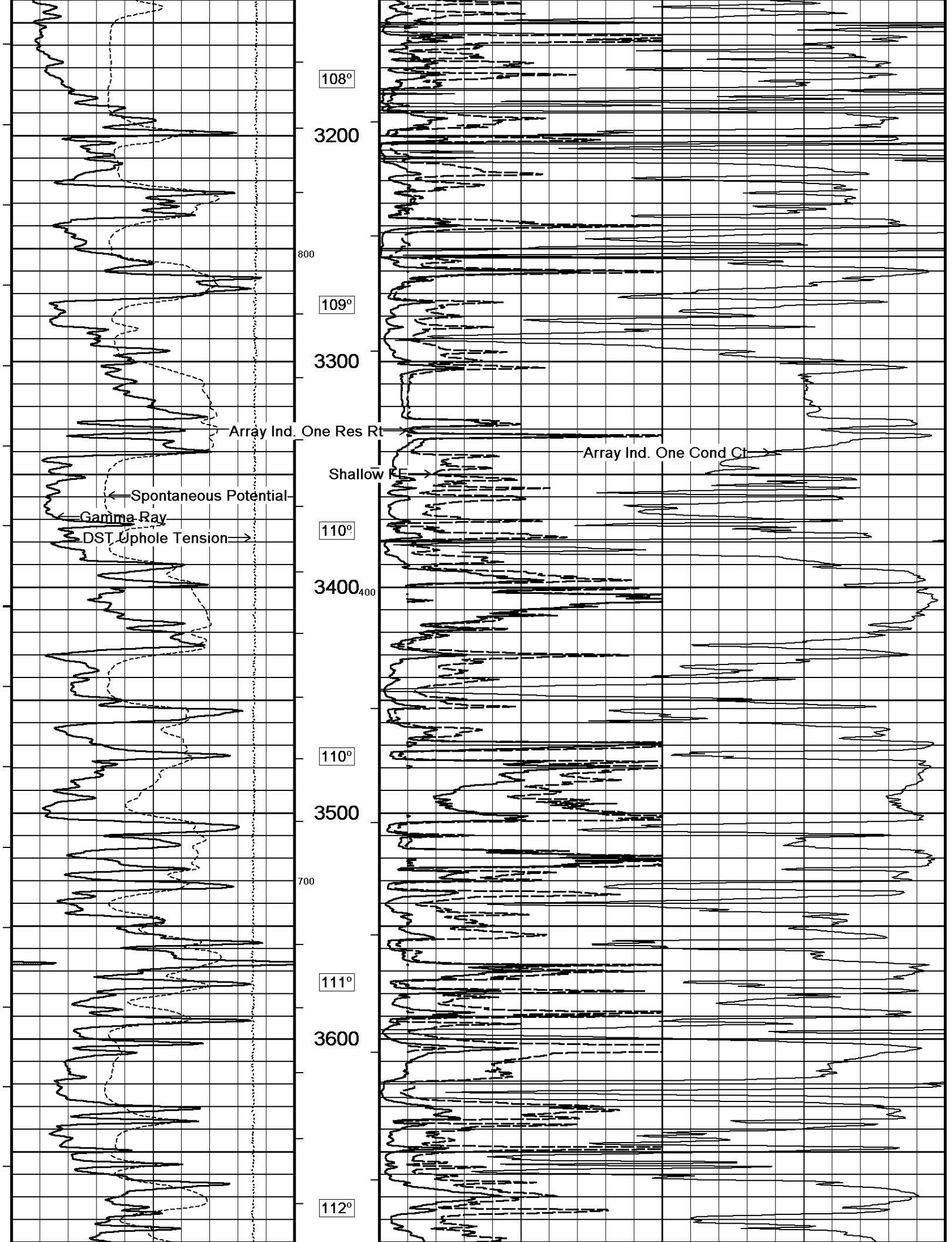
- OPERATOR: C. RAMIREZ.

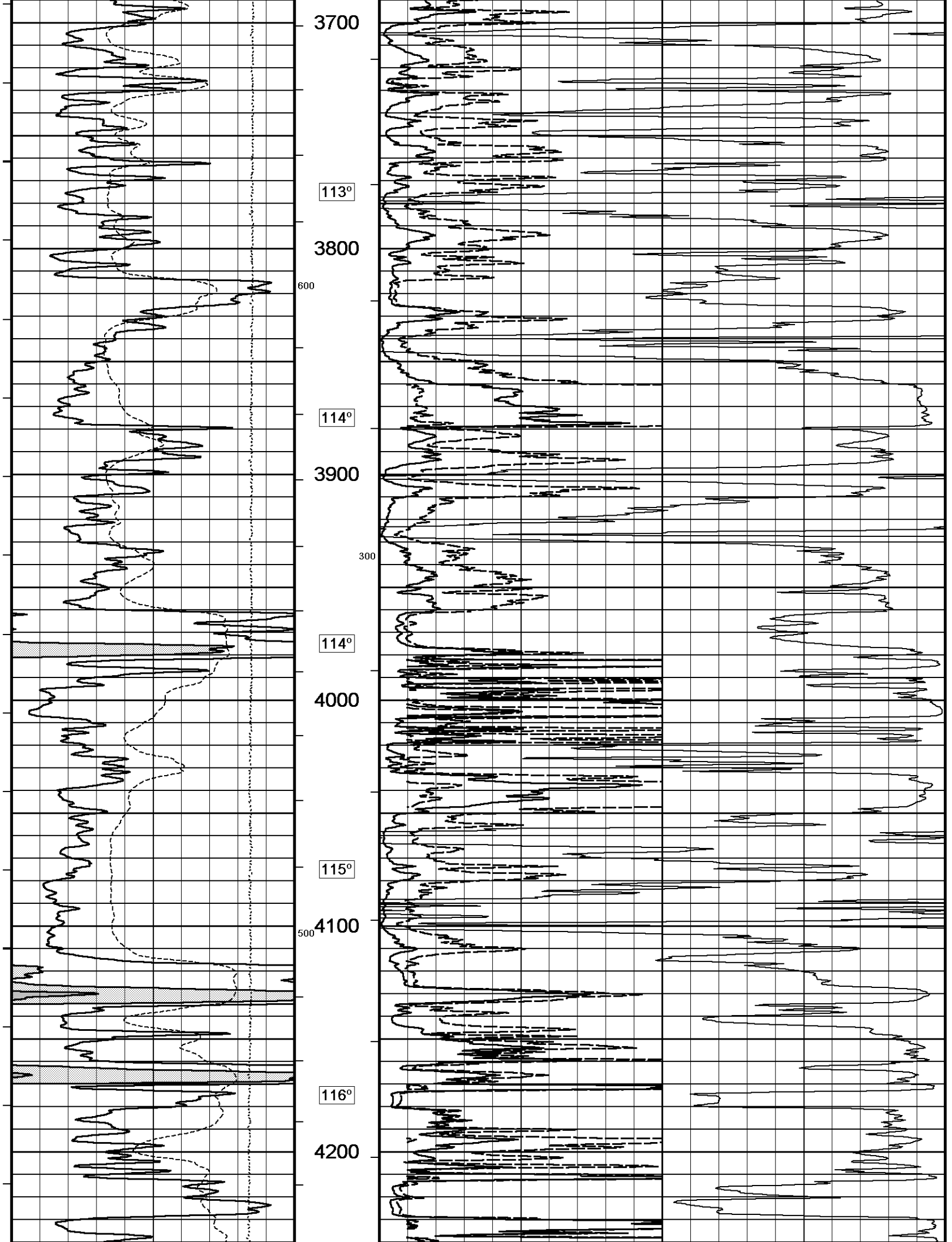
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not, guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, costs,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

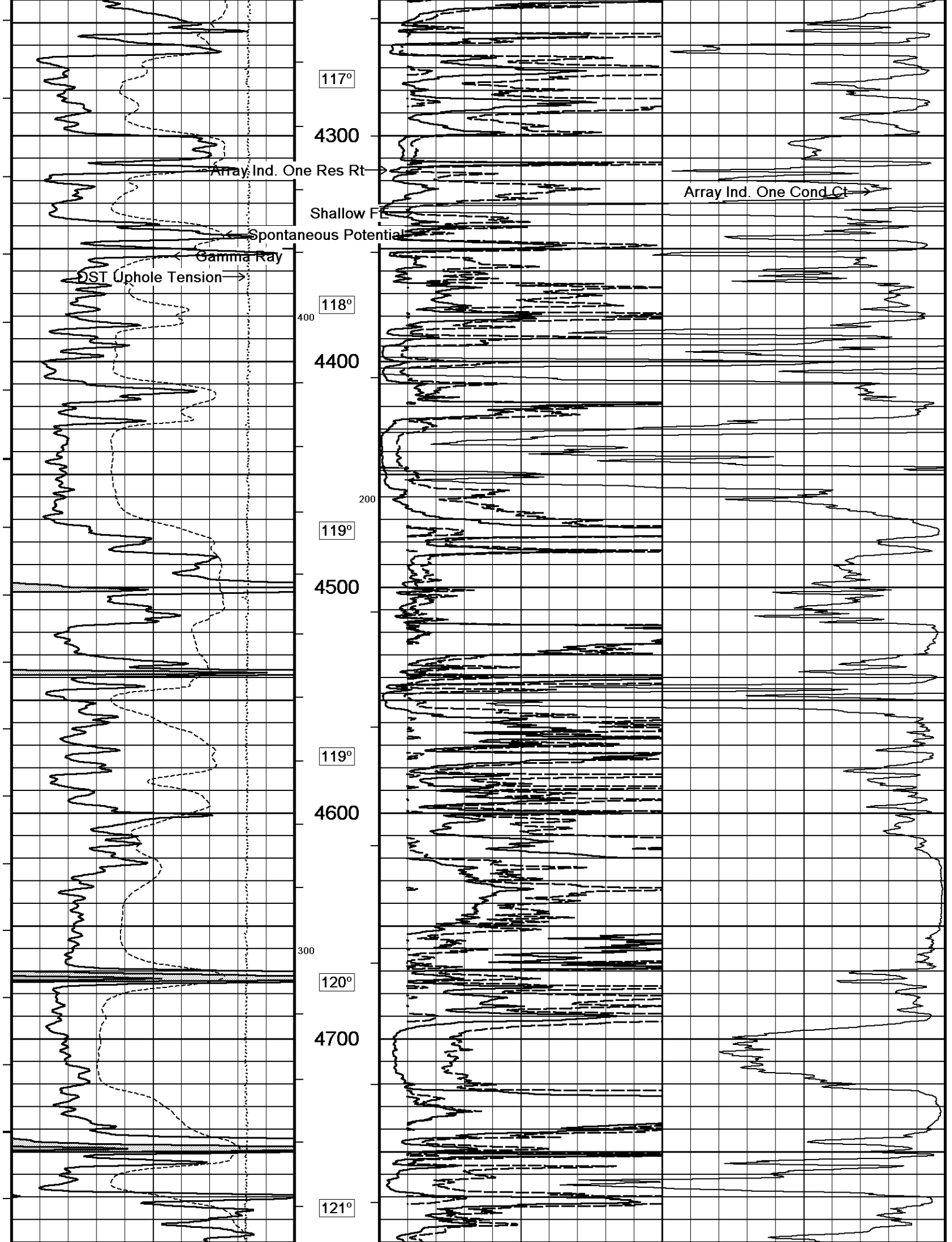


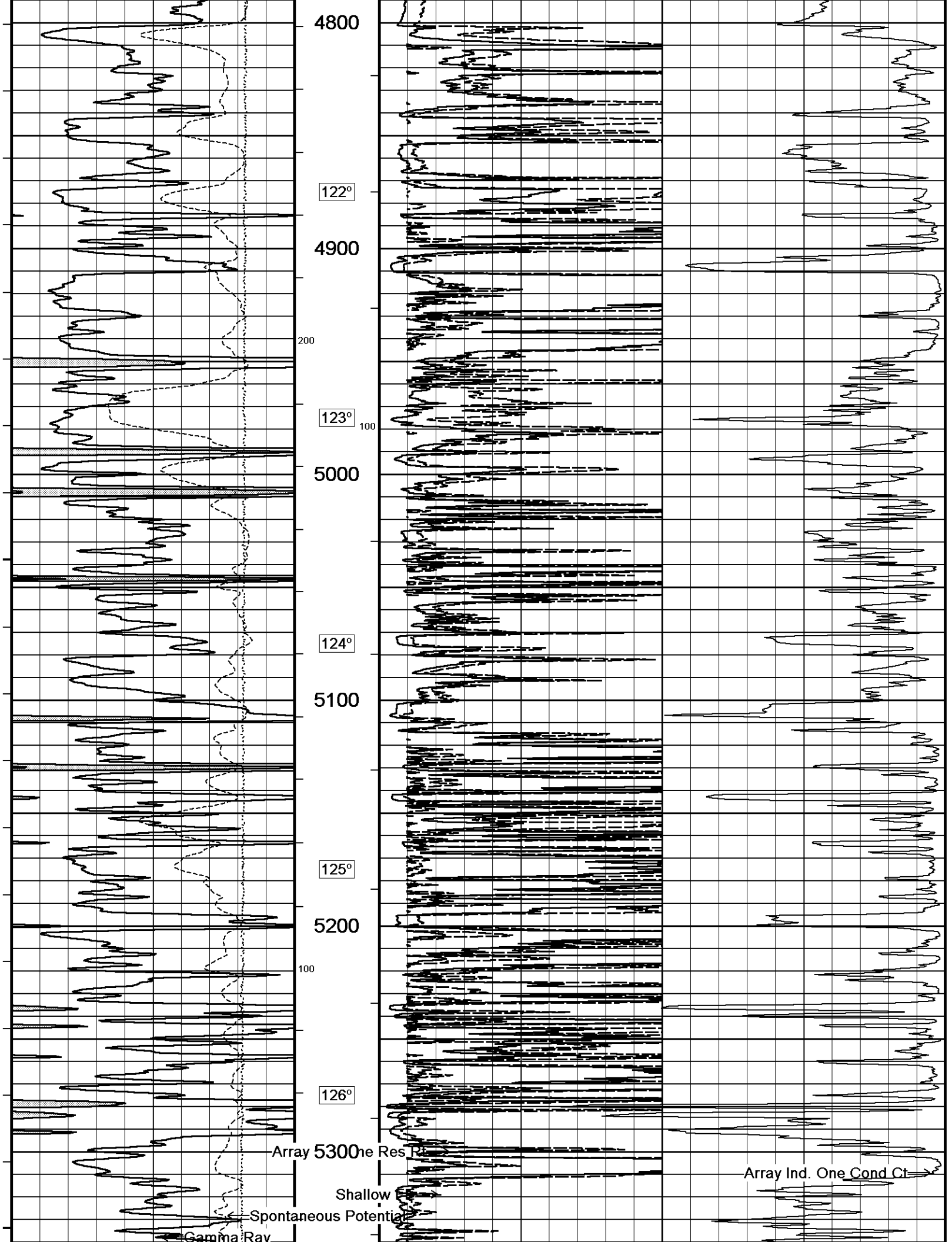


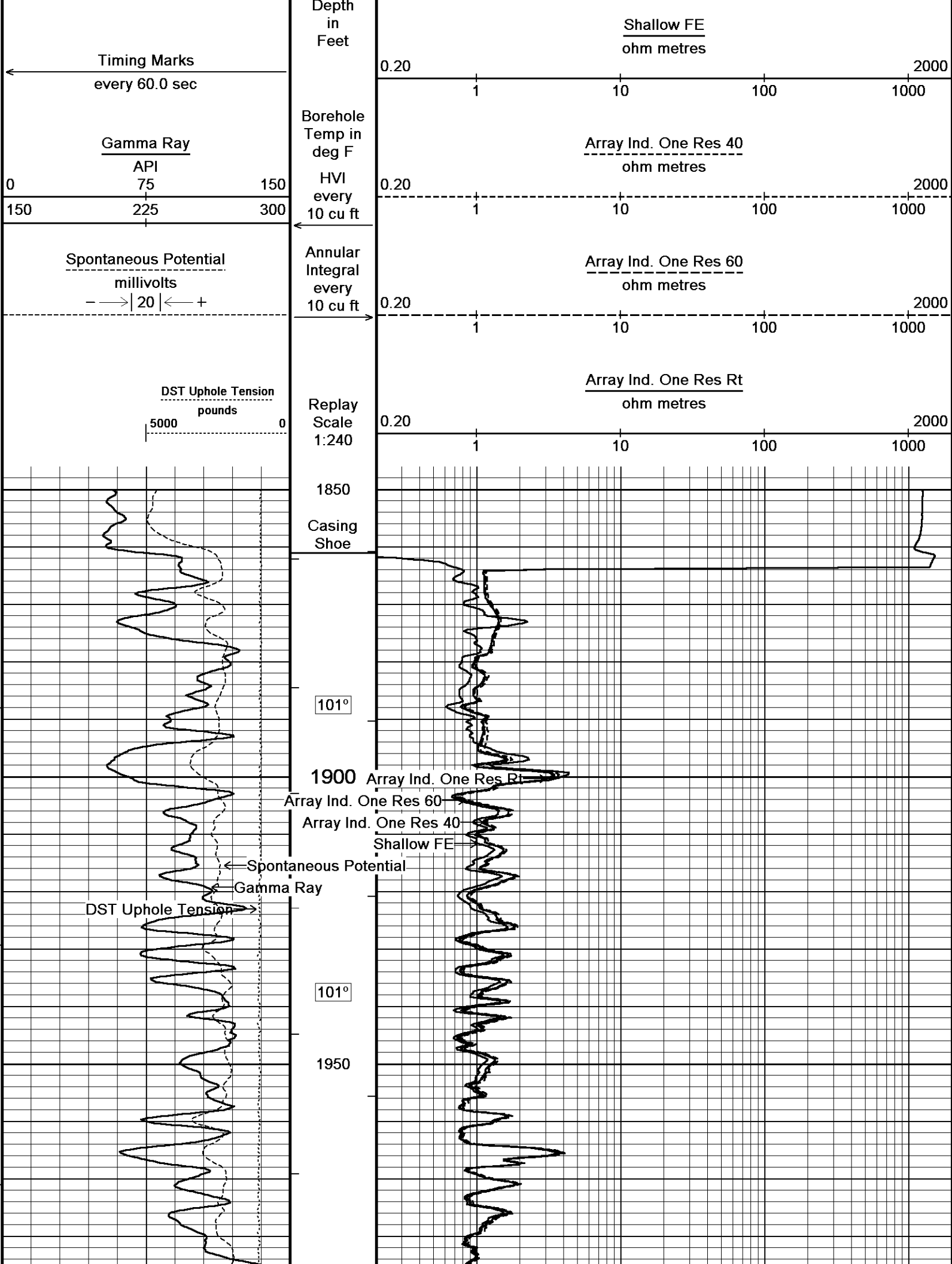


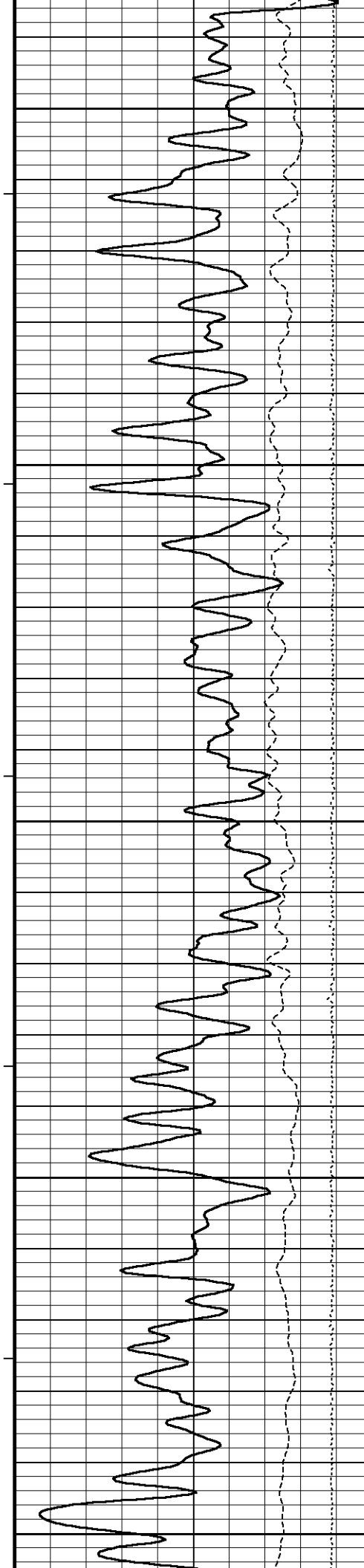




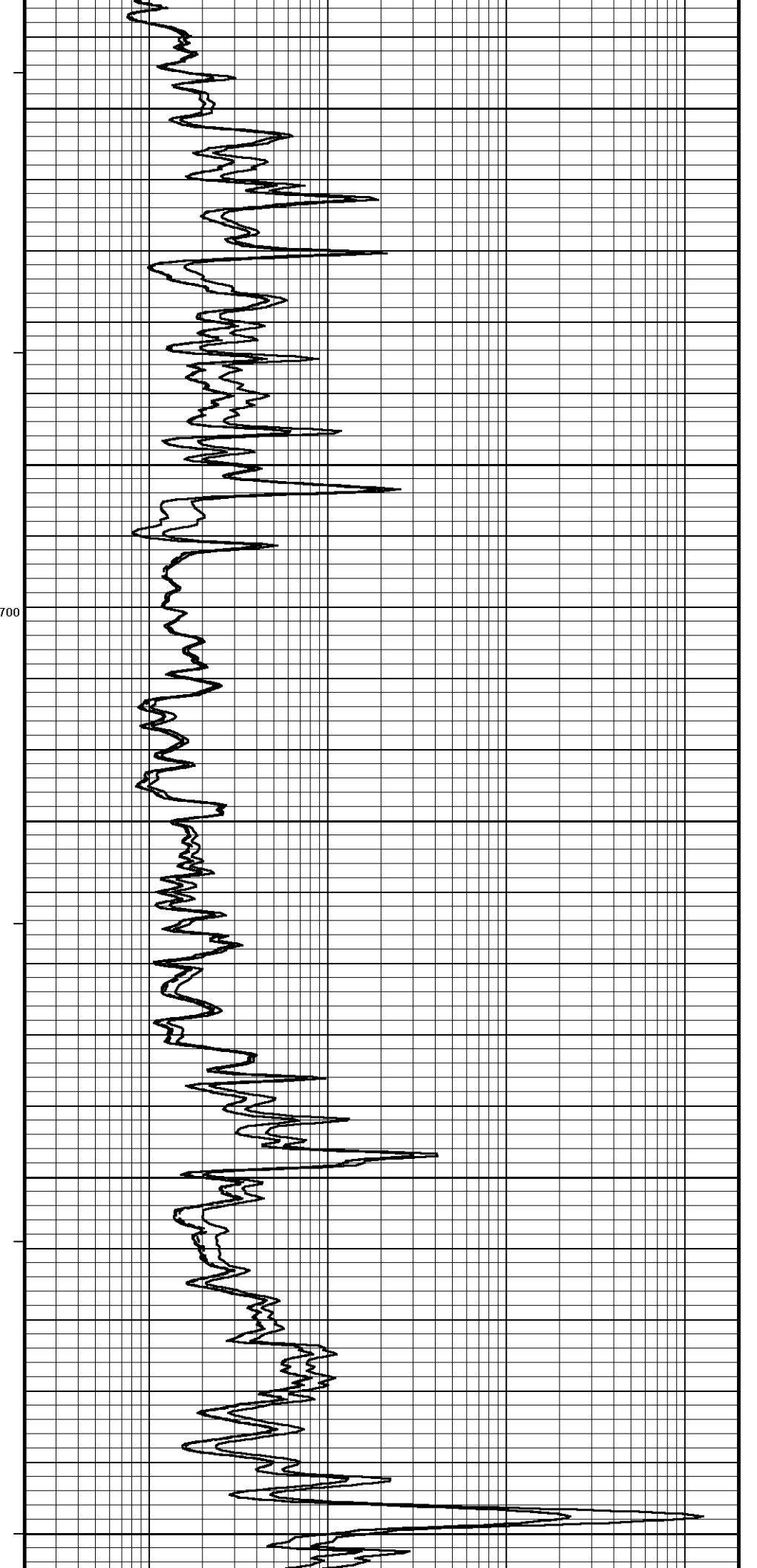




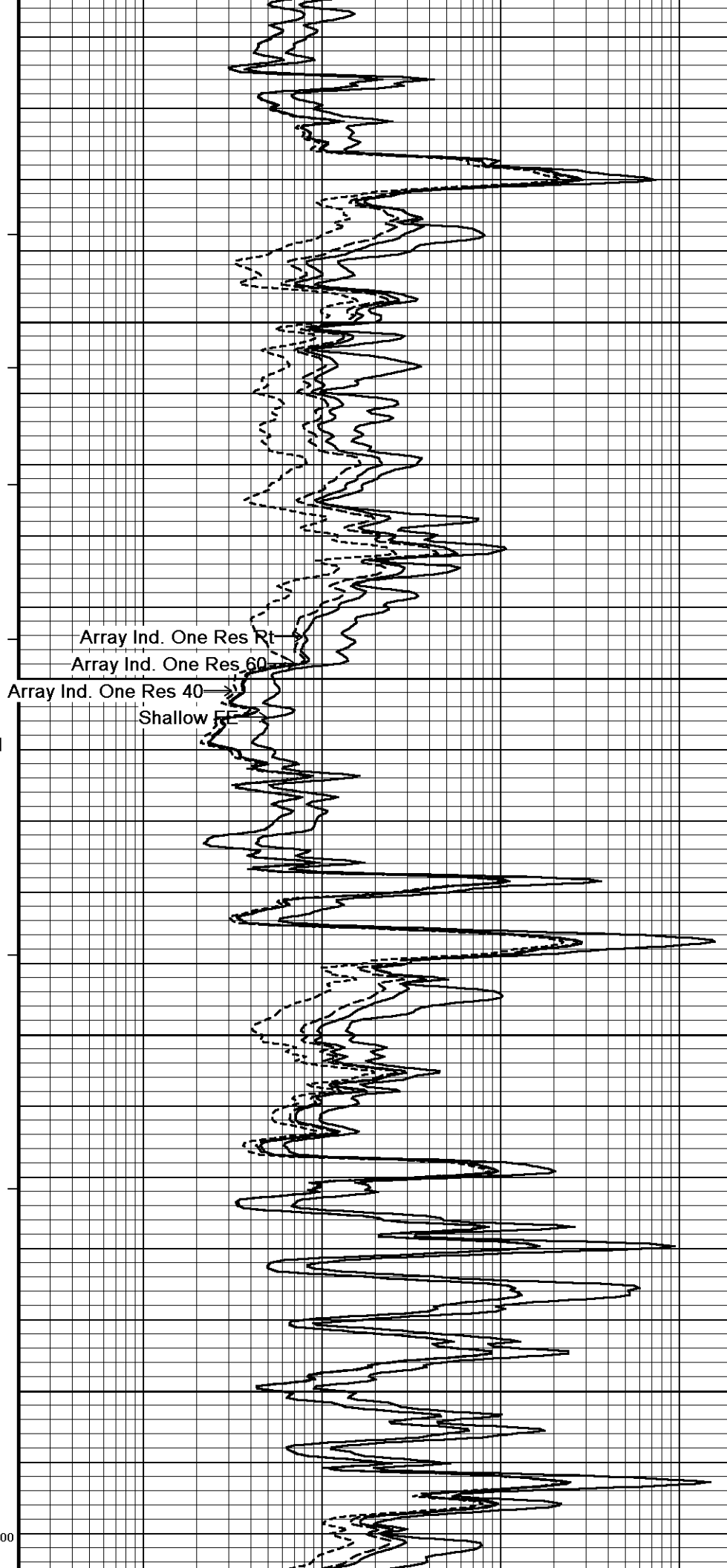
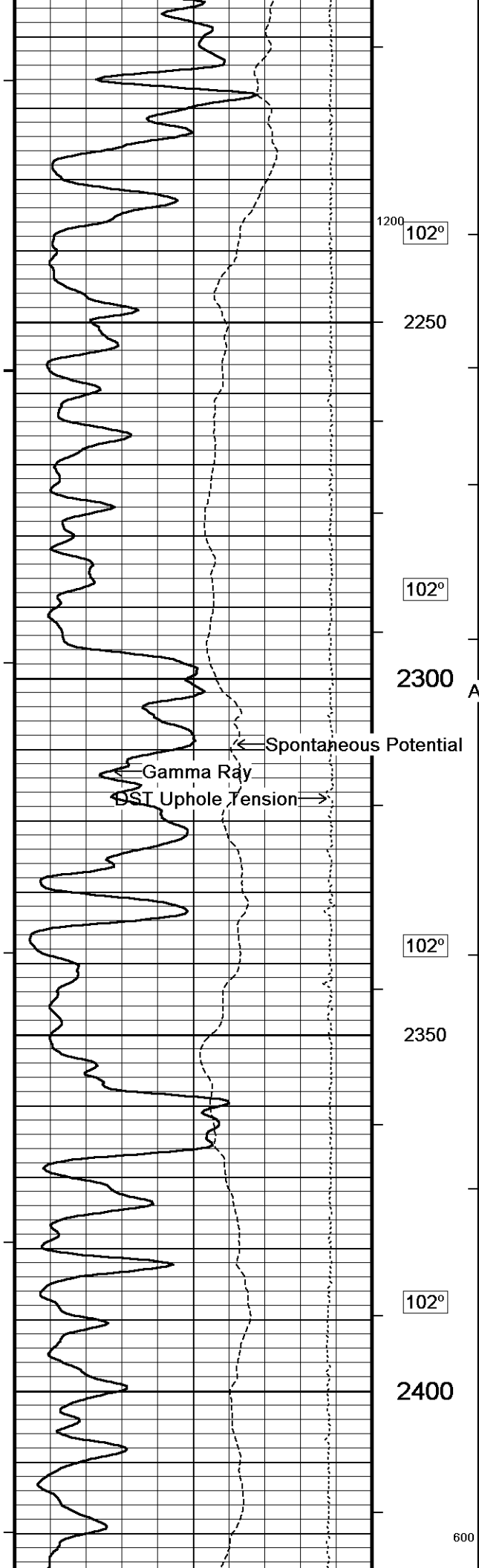


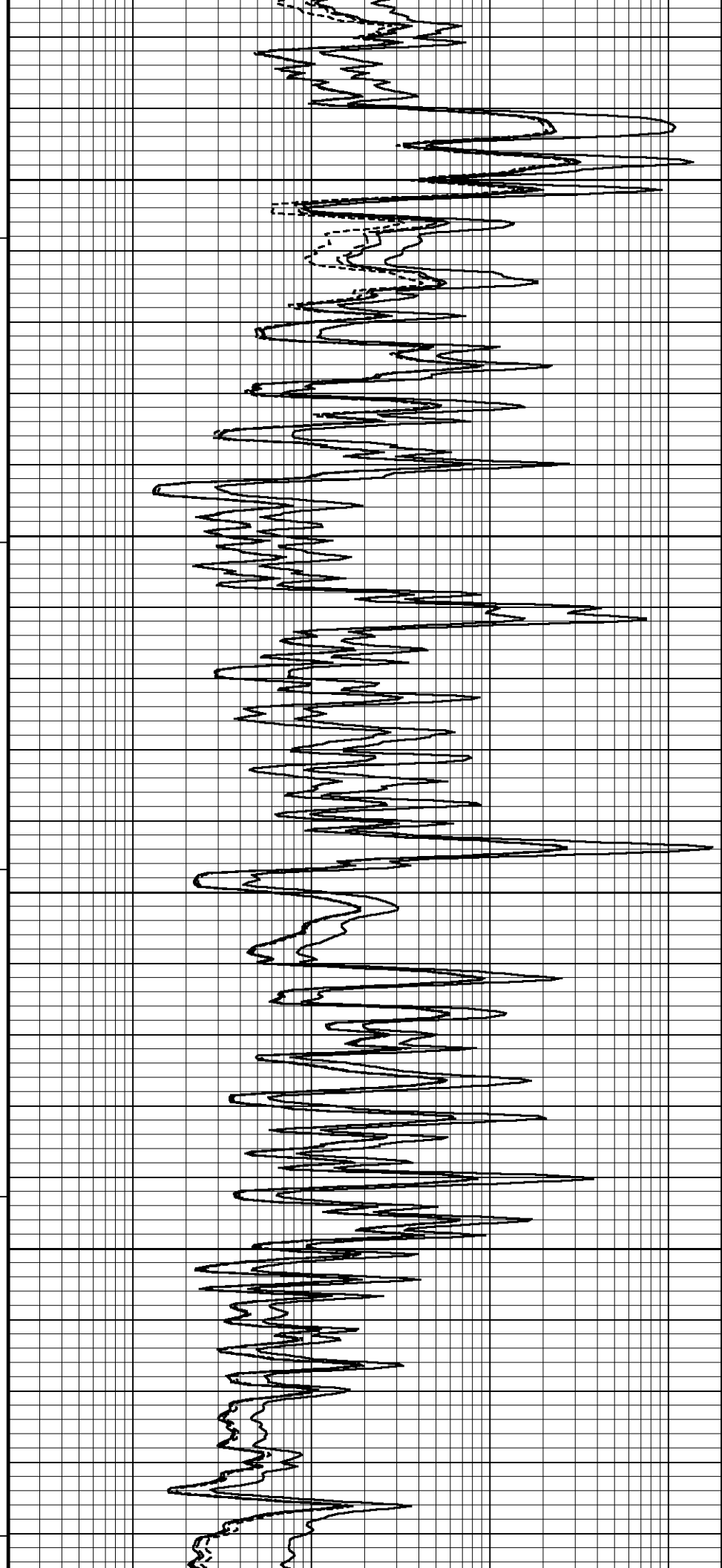
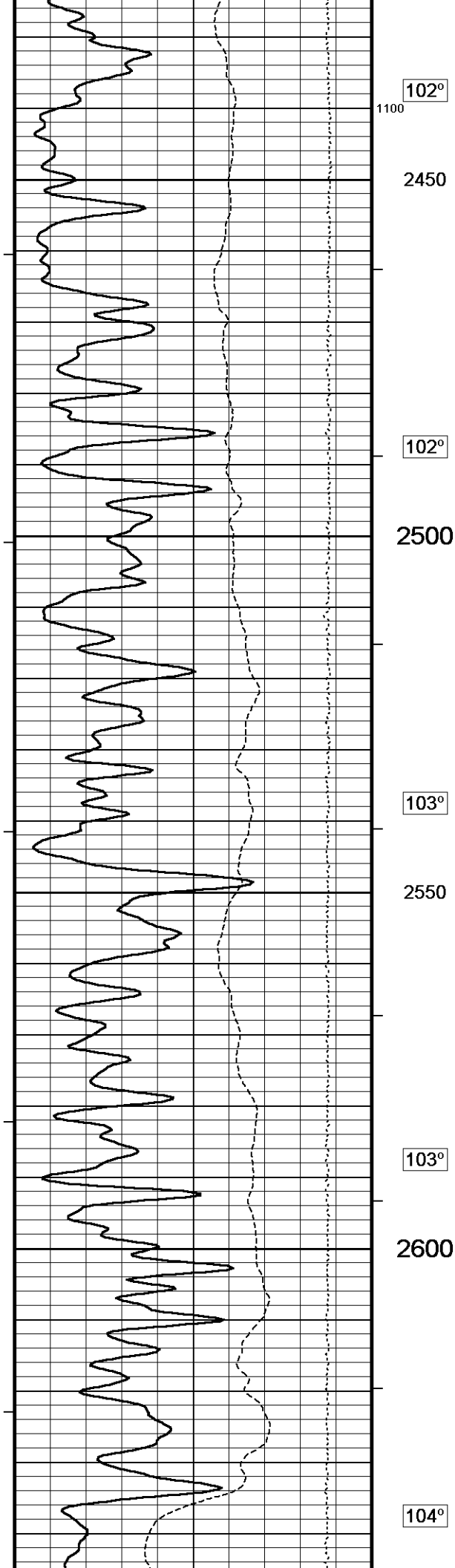


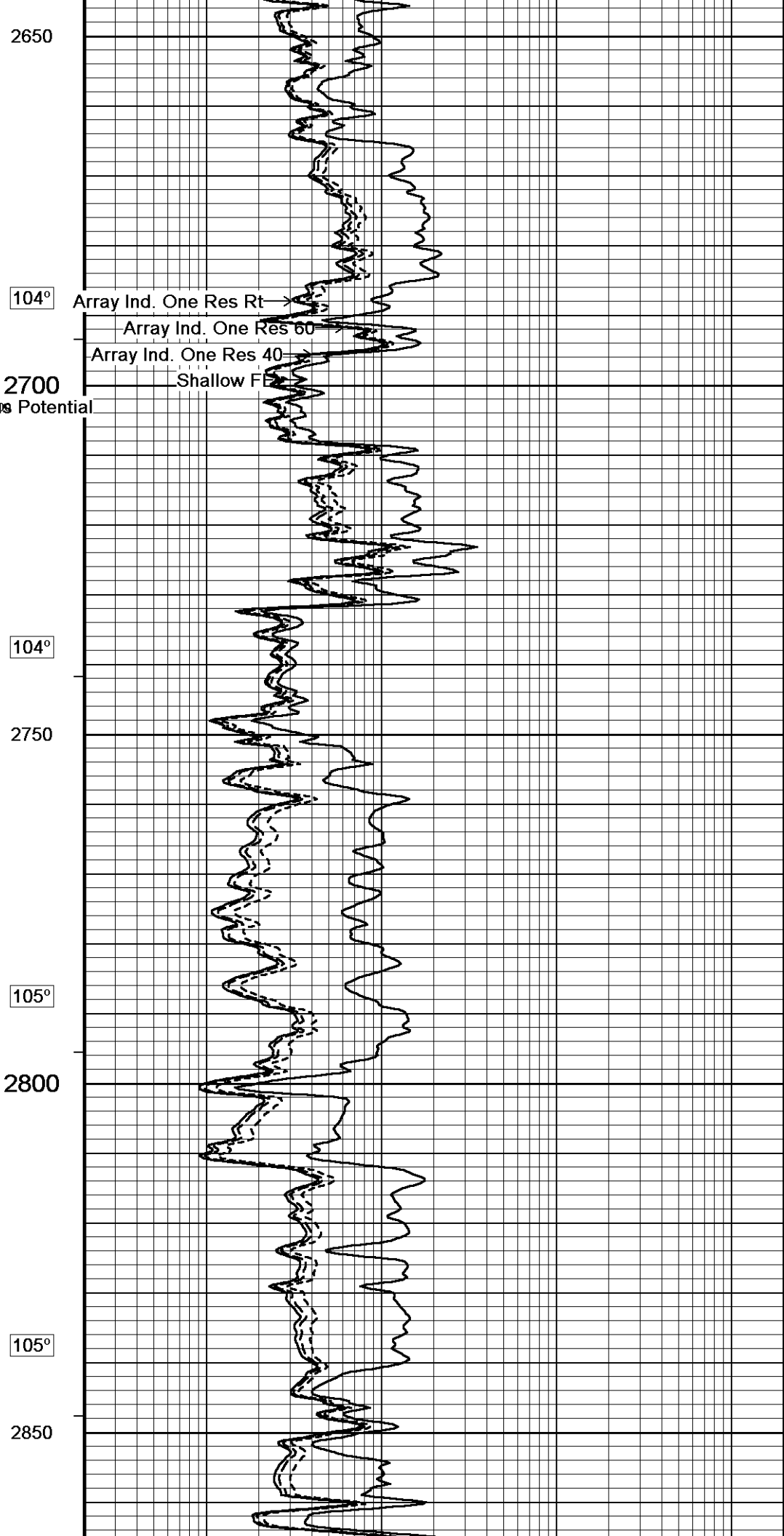
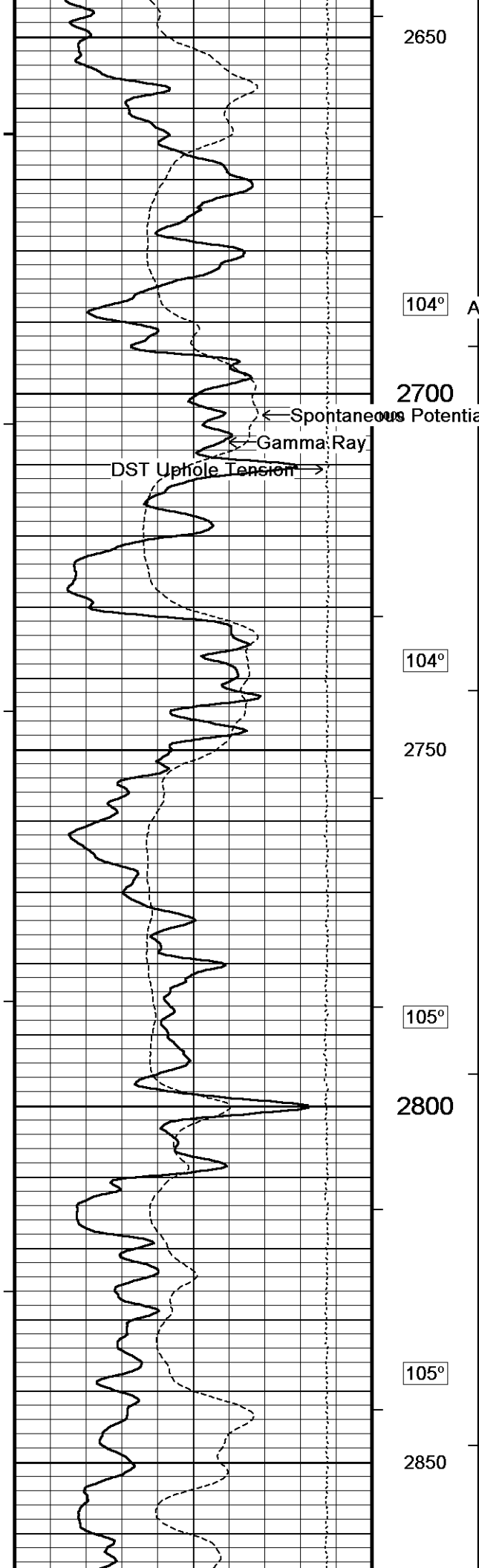
101°
1300
2000
2050
2100
2150
2200

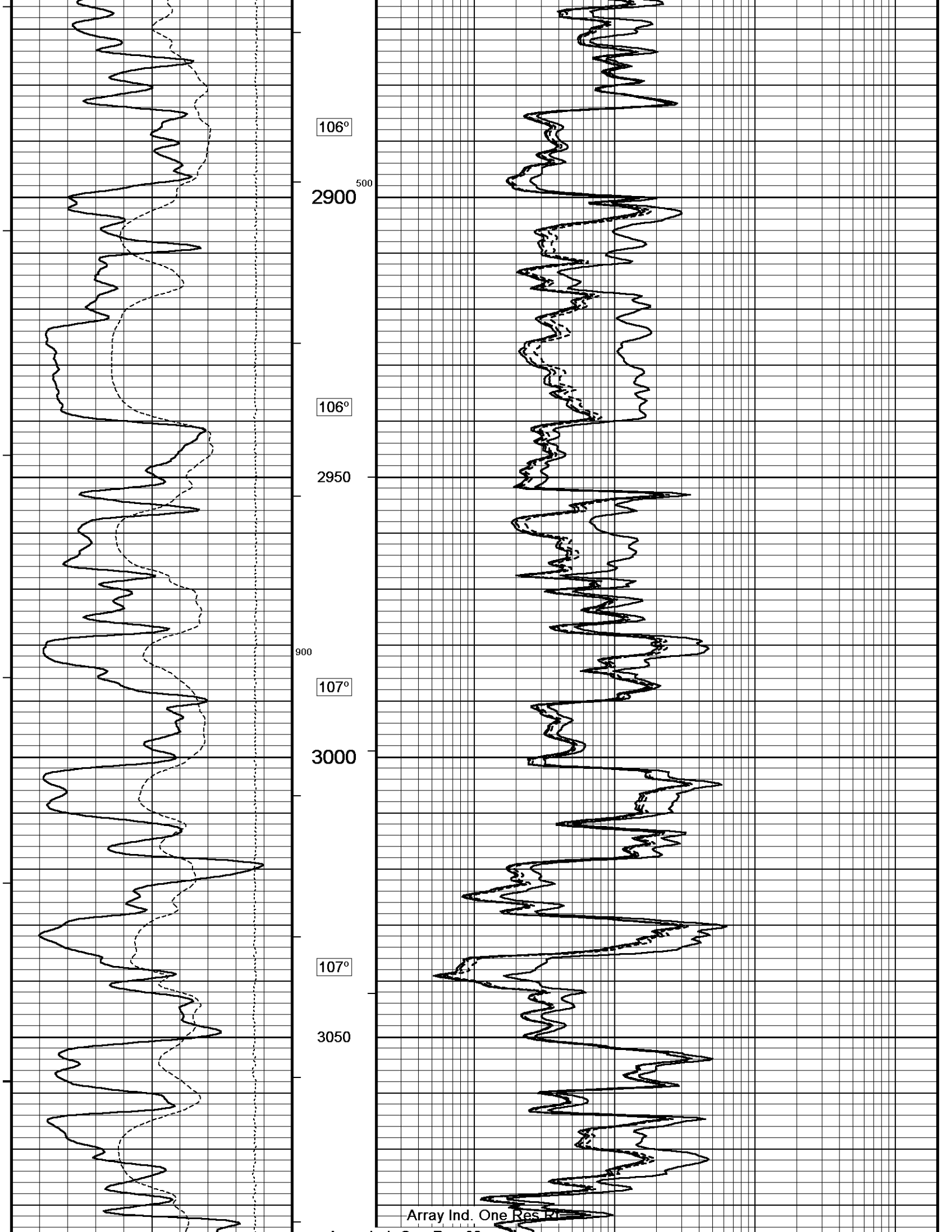


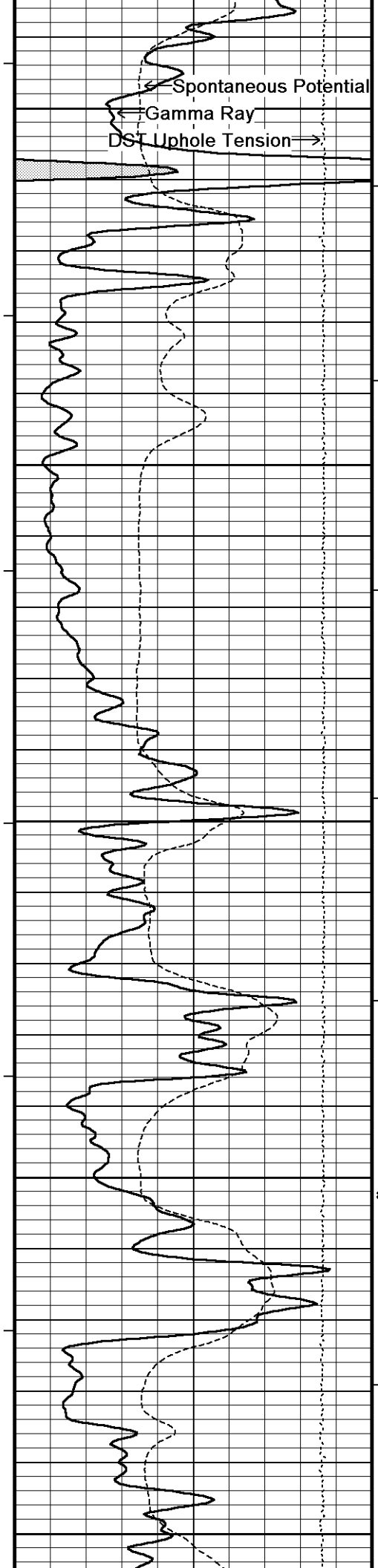
101°
700
2100
2150
2200











3100

108°

3150

108°

3200

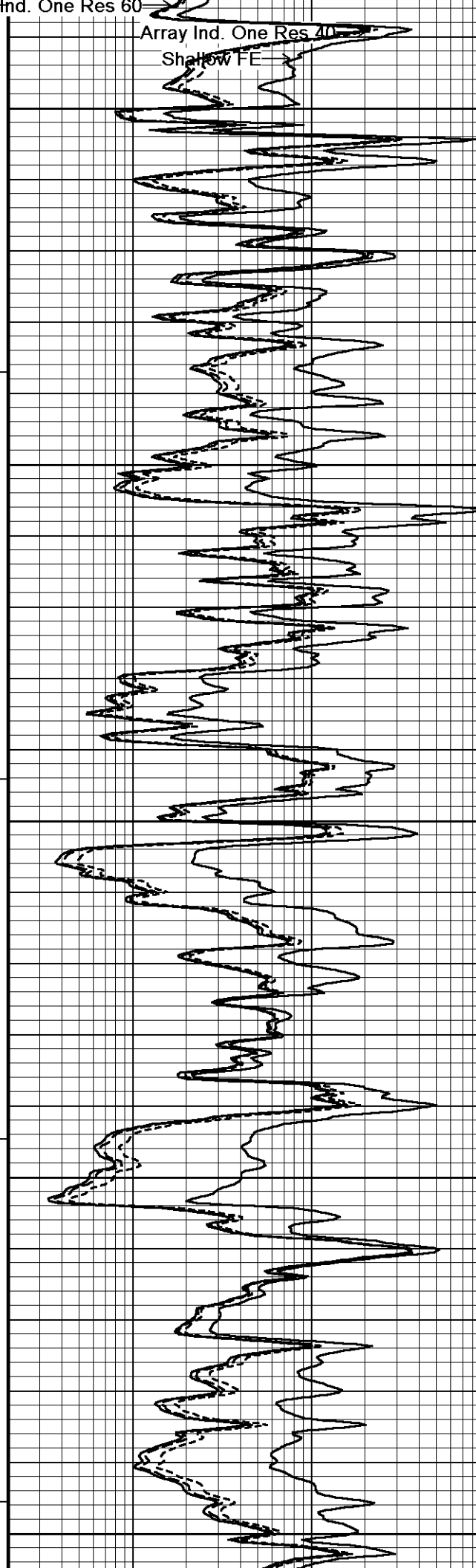
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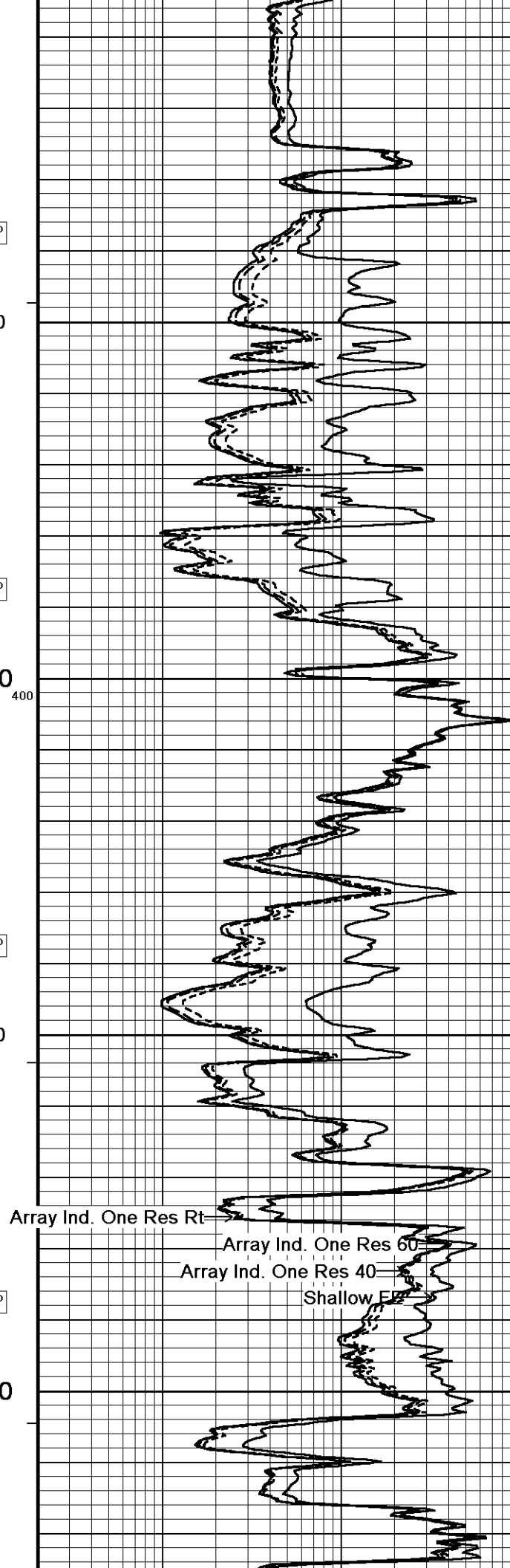
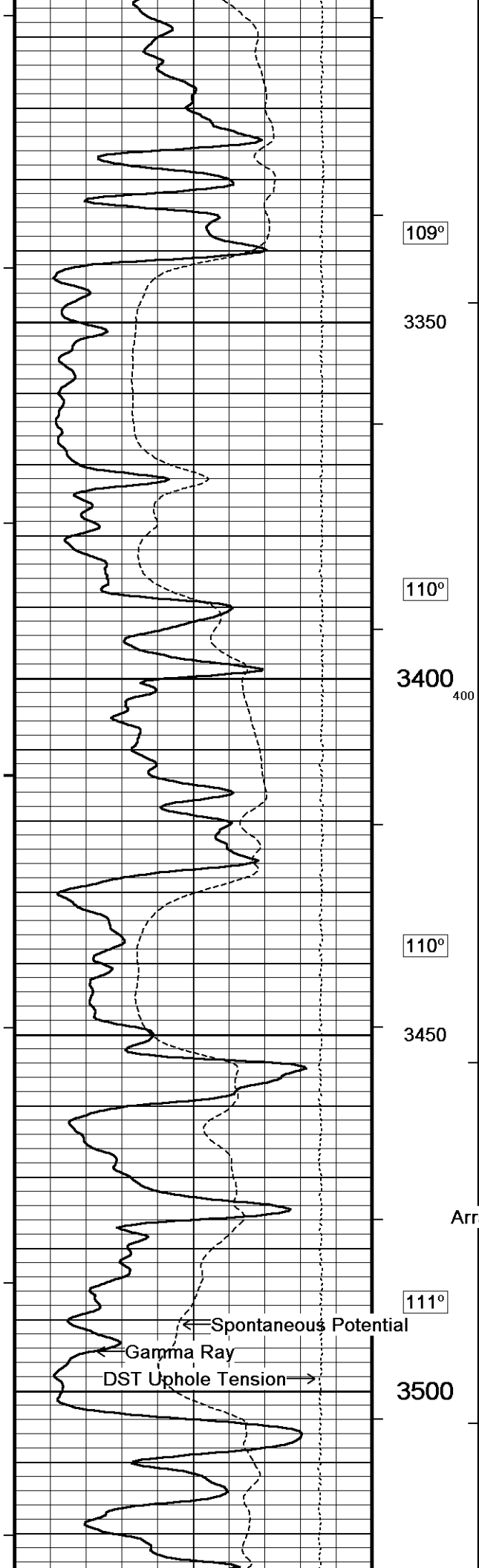
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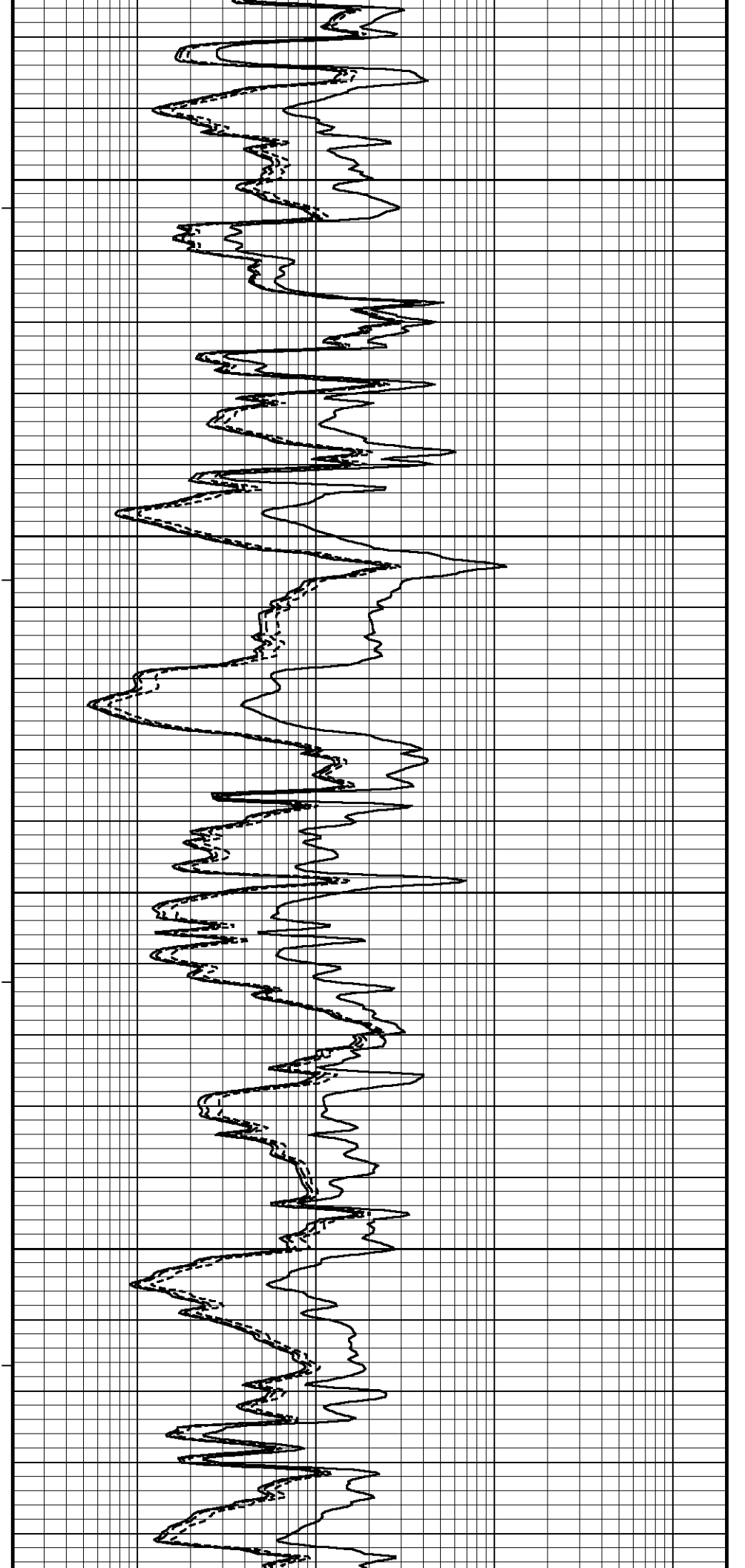
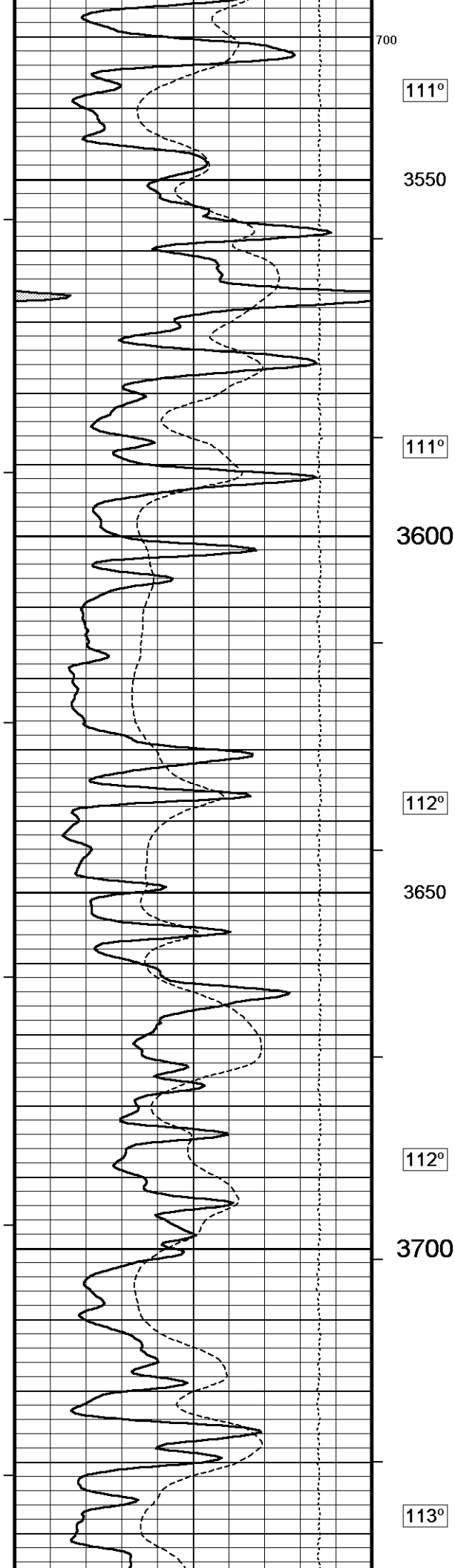
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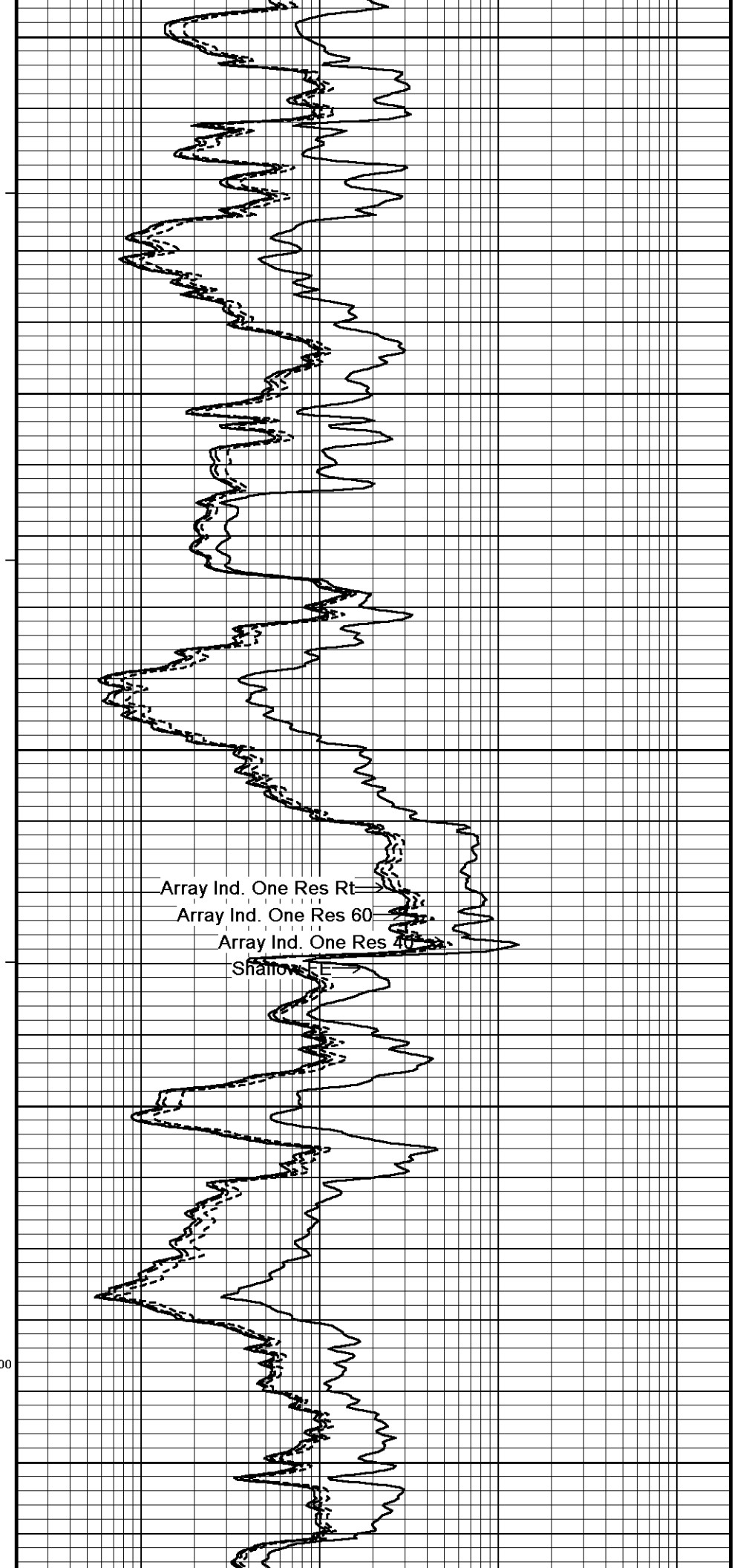
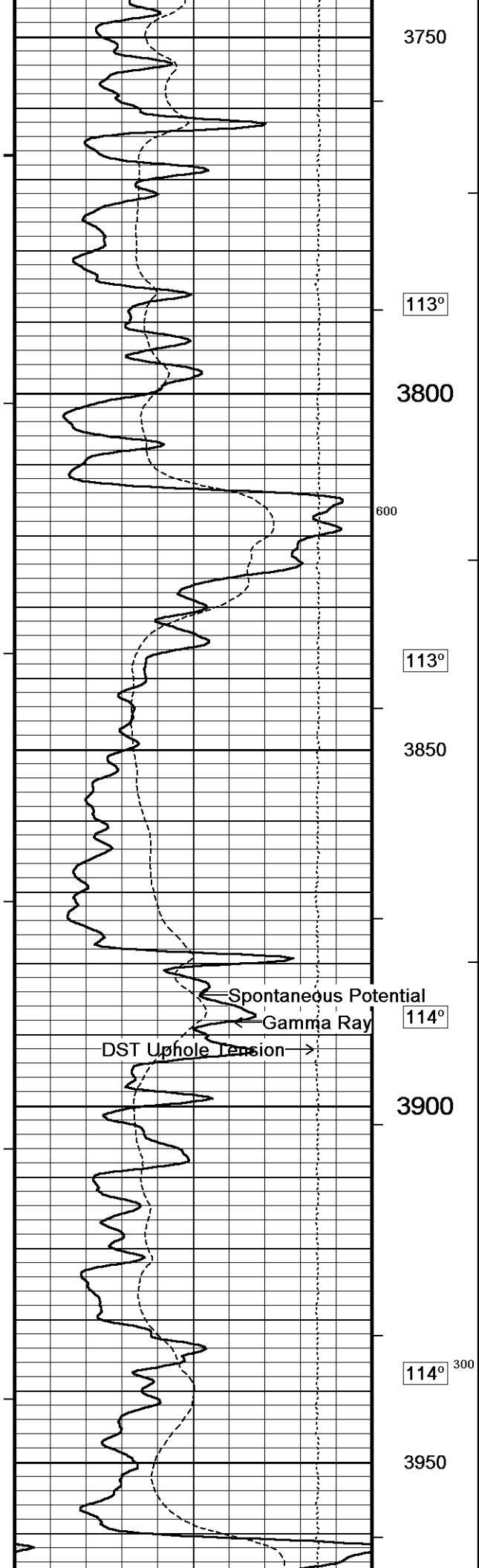
3300

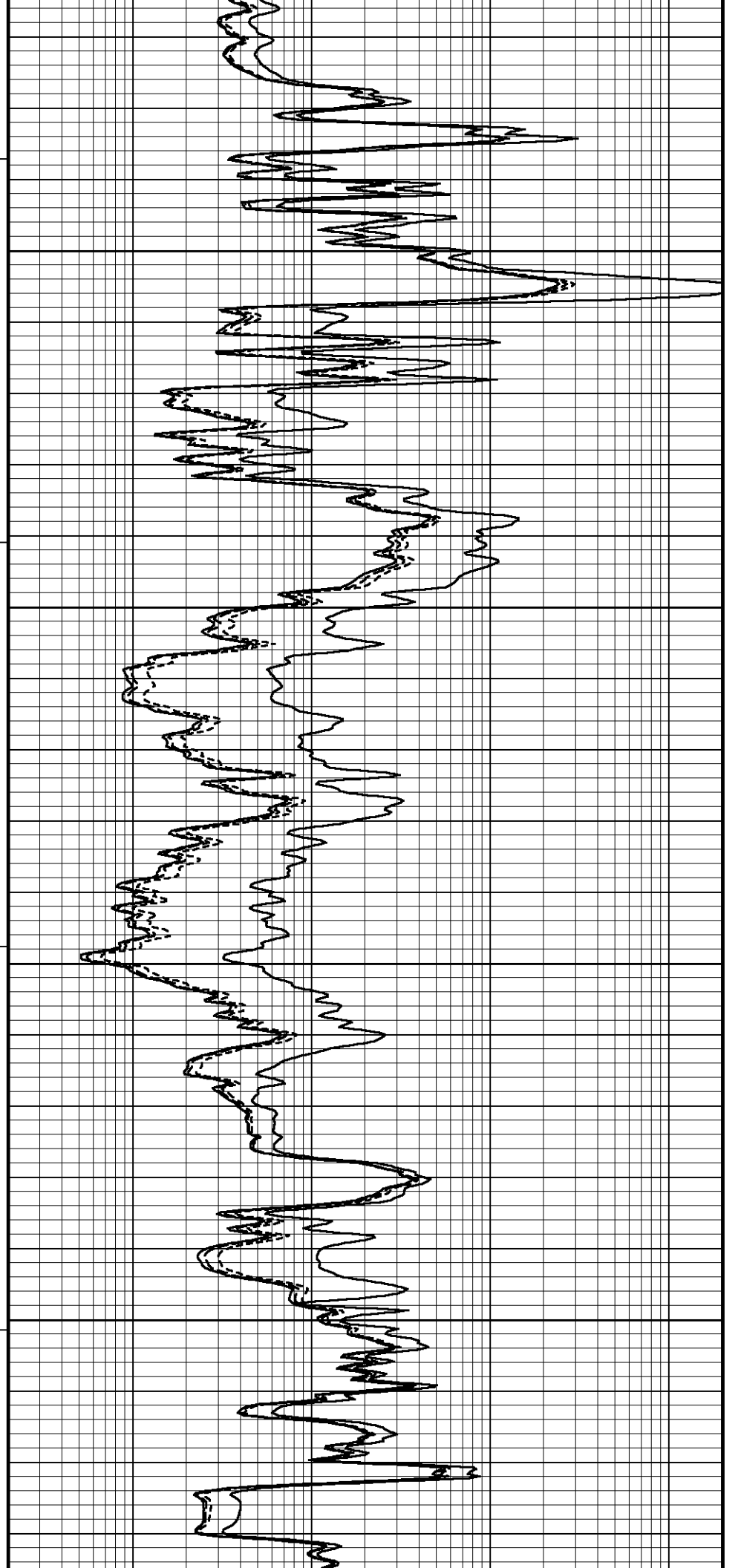
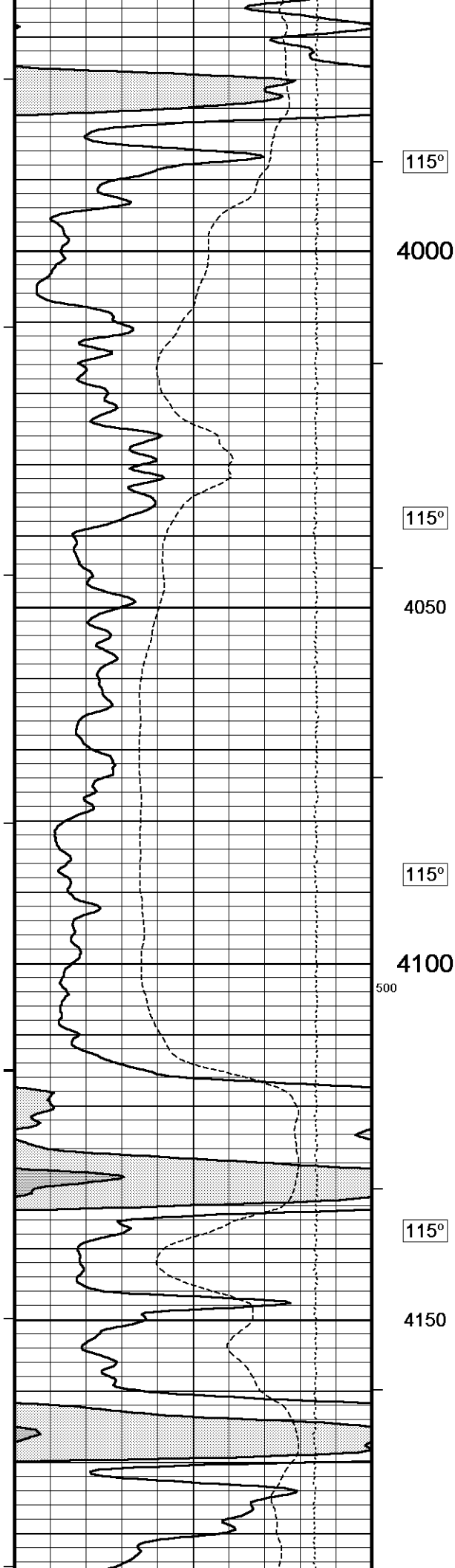
800

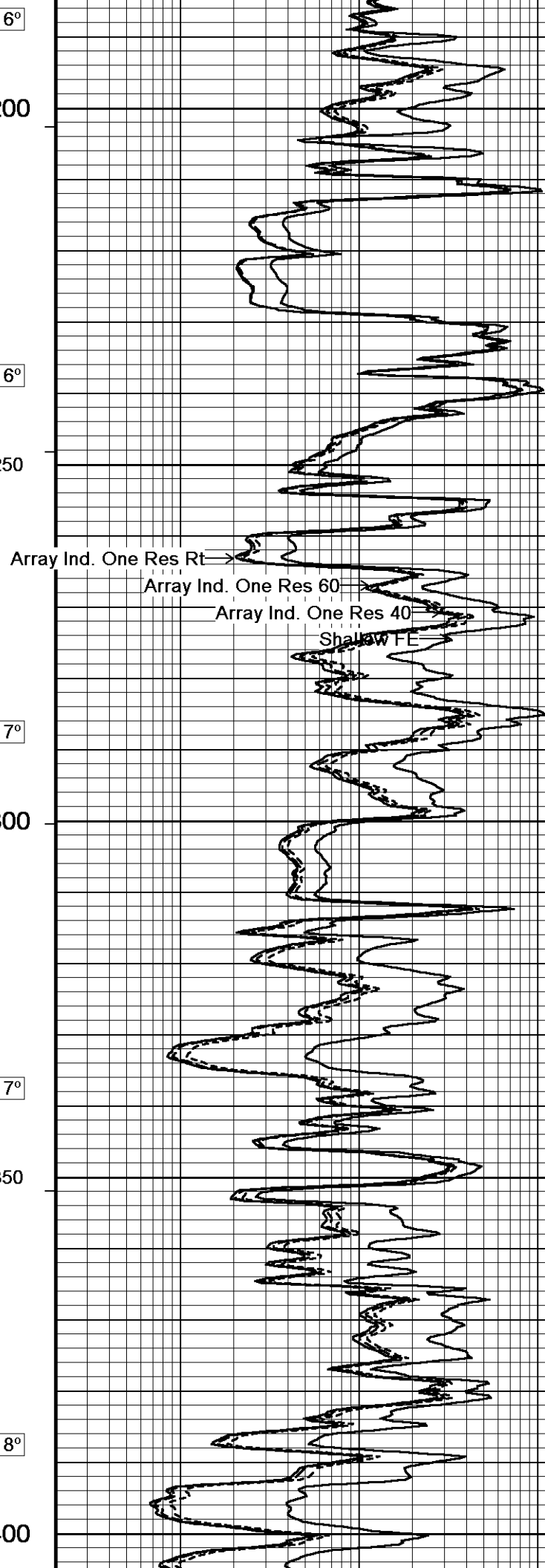
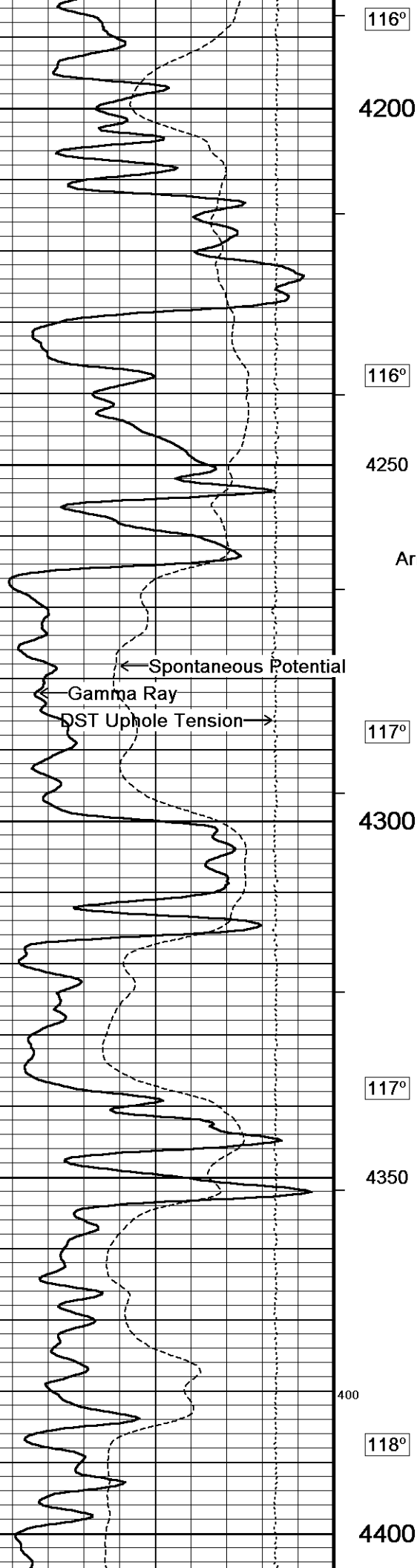


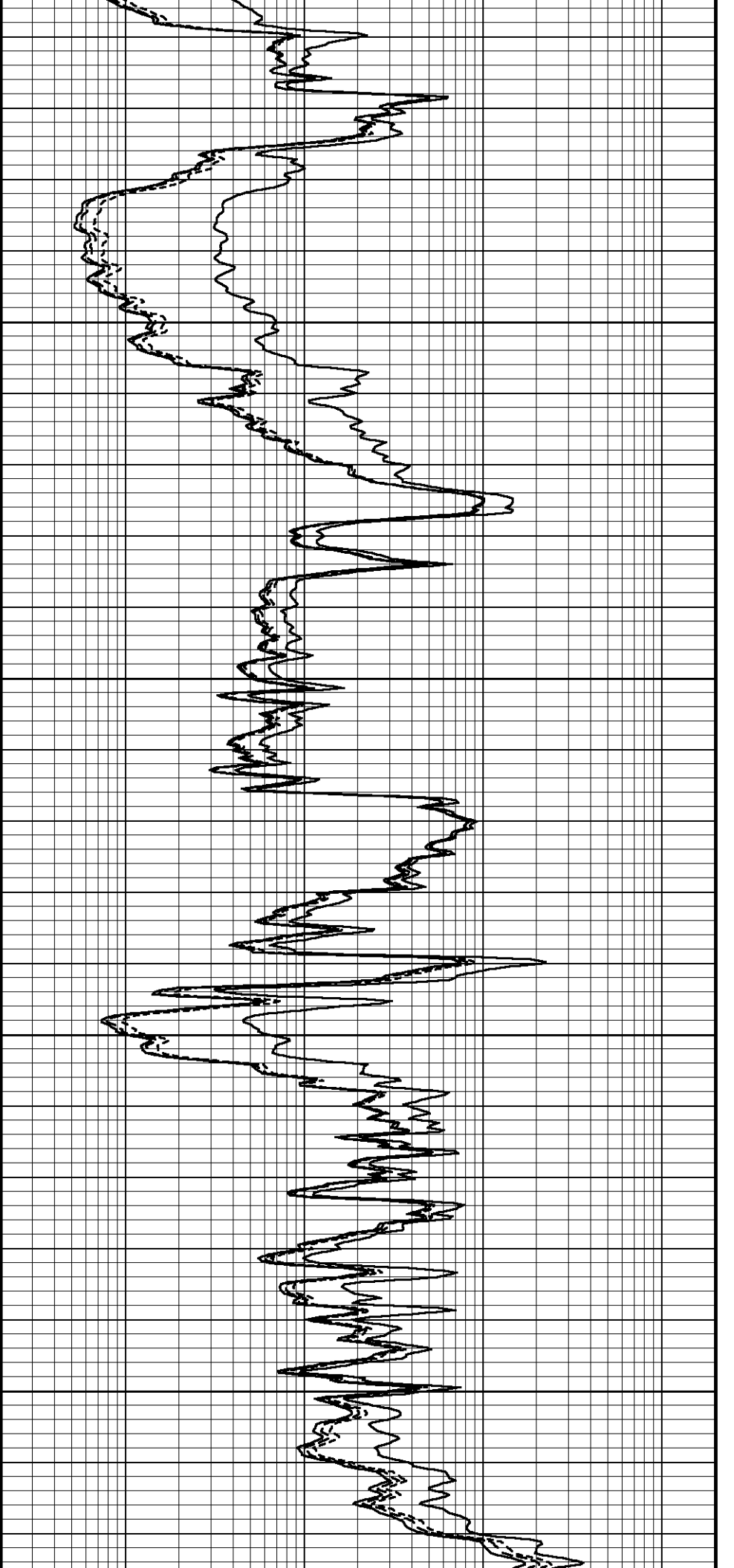
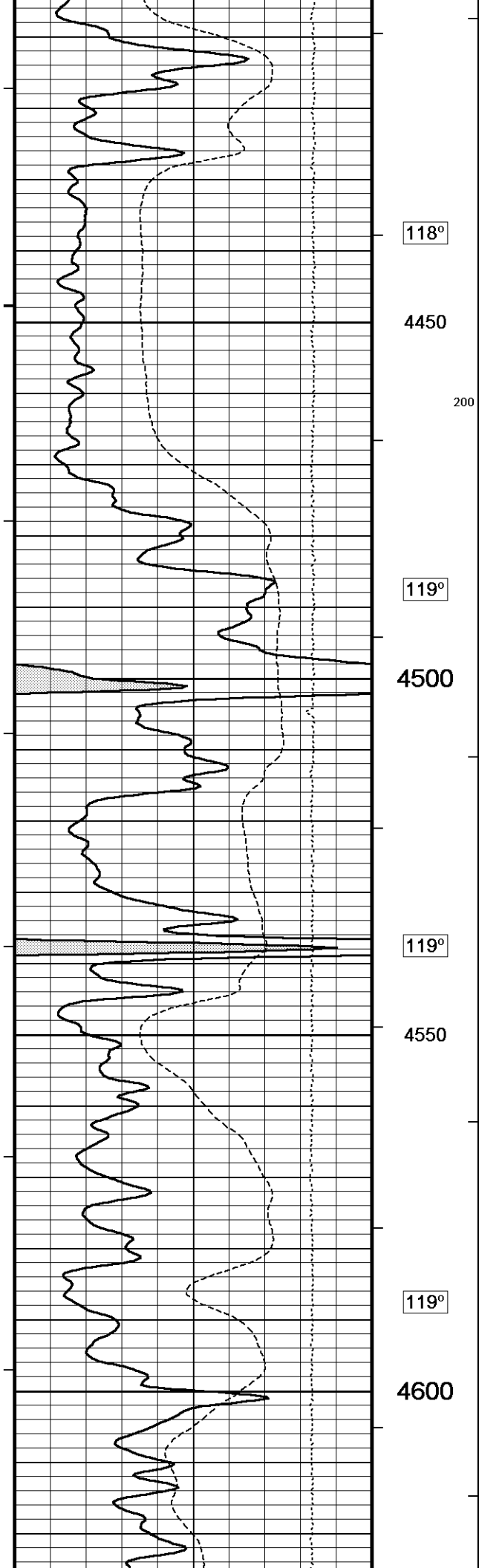


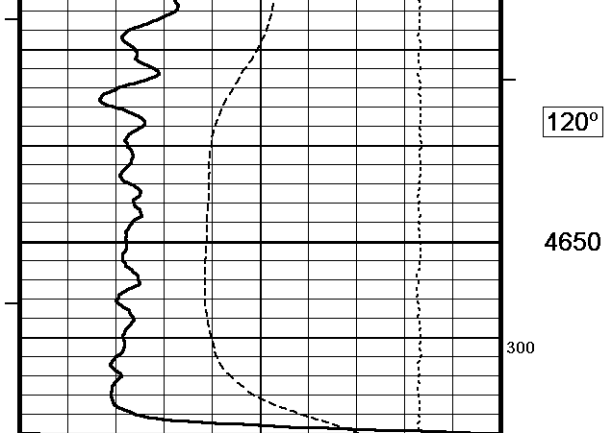








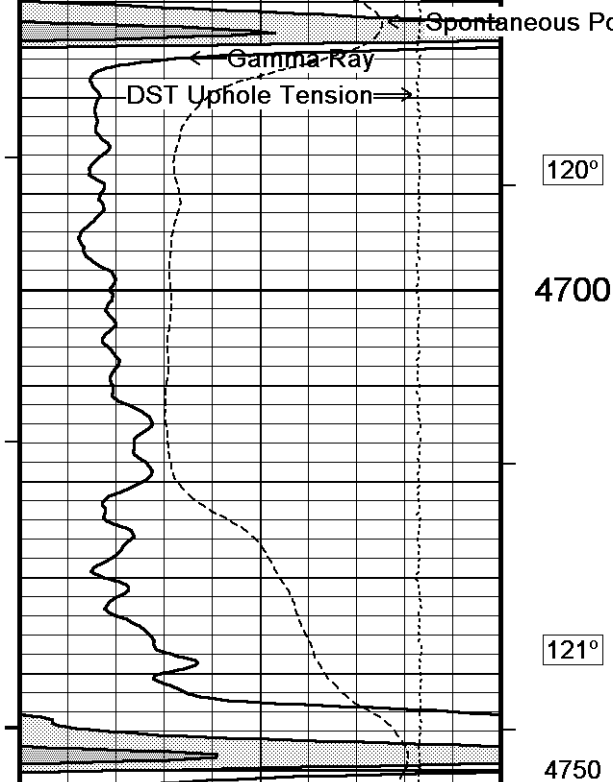




120°

4650

300



120°

4700

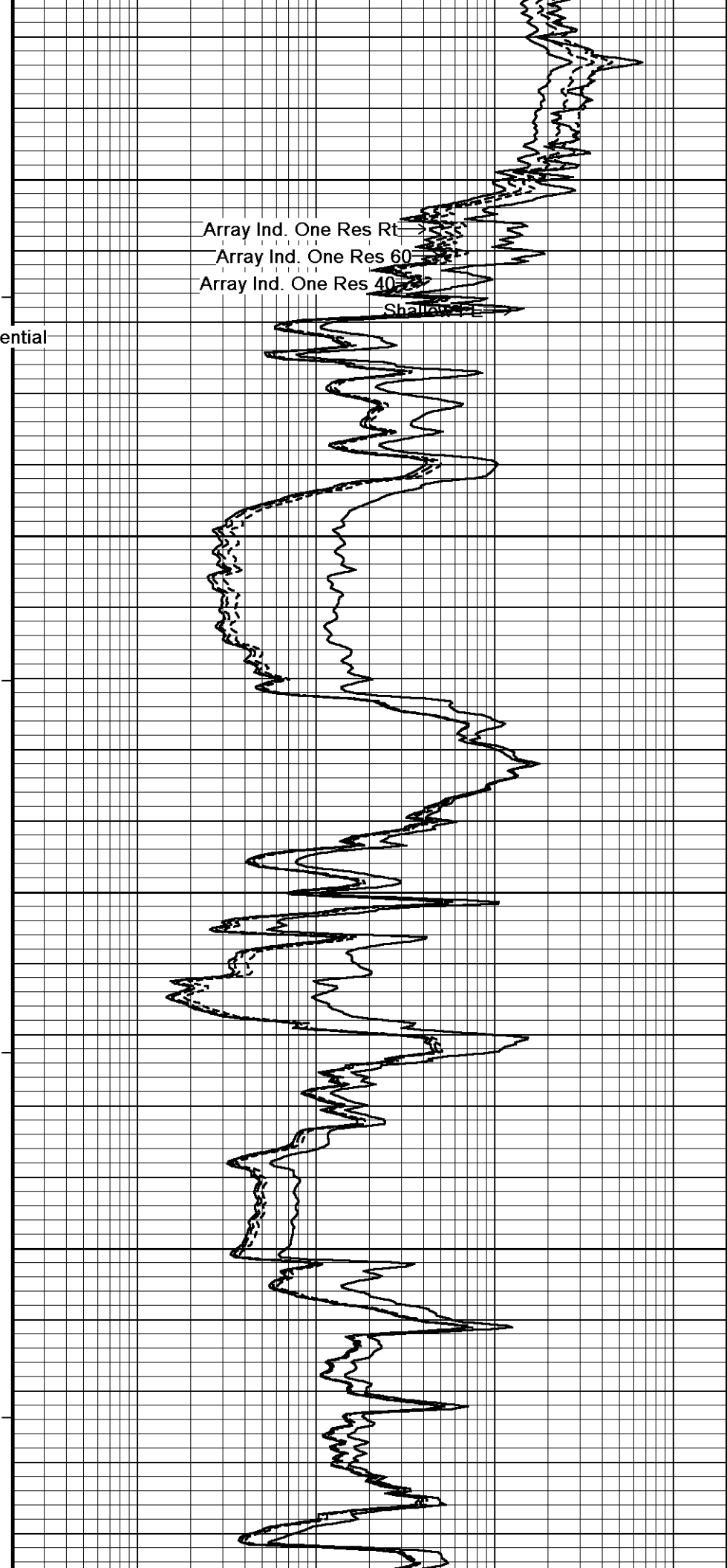
121°

4750

121°

4800

122°

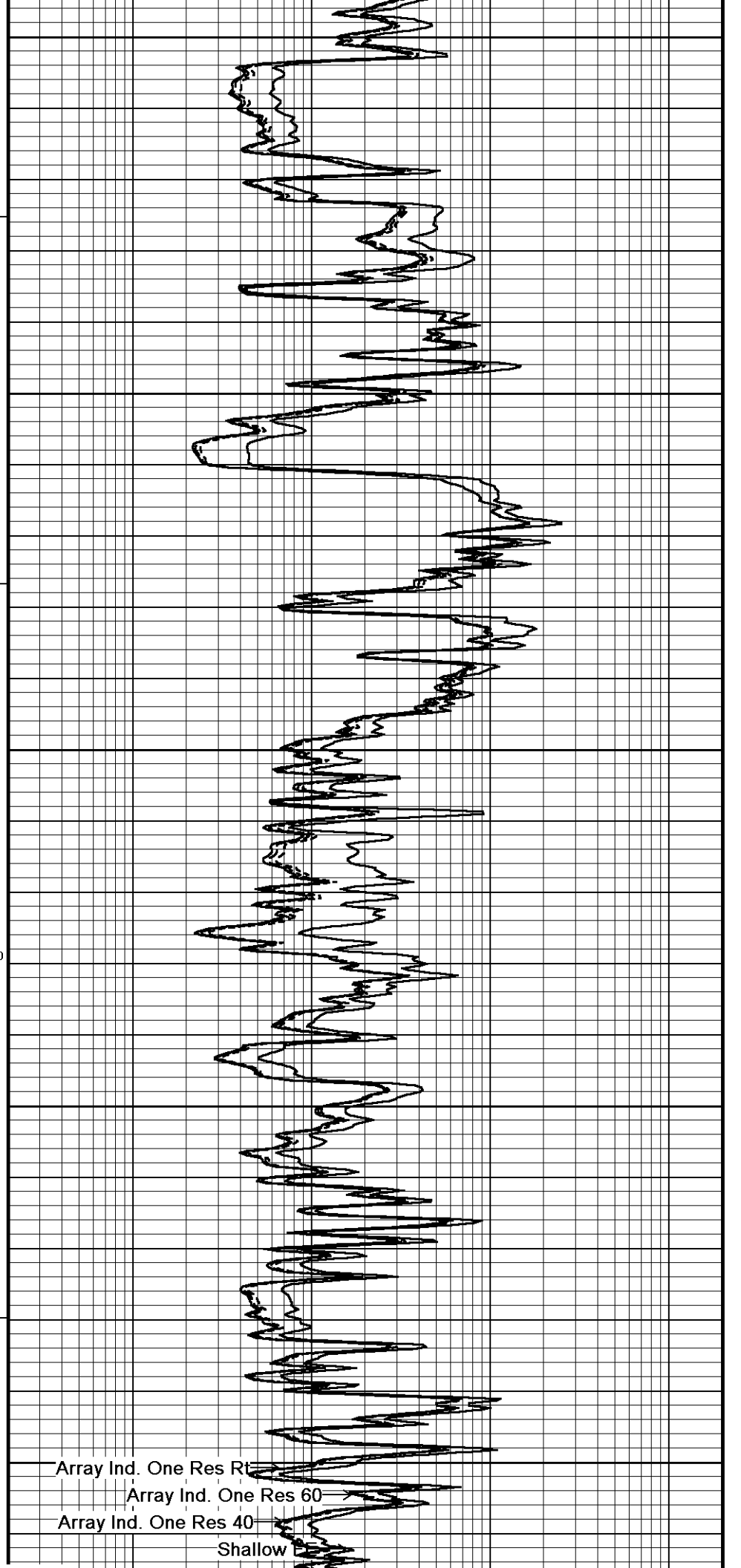
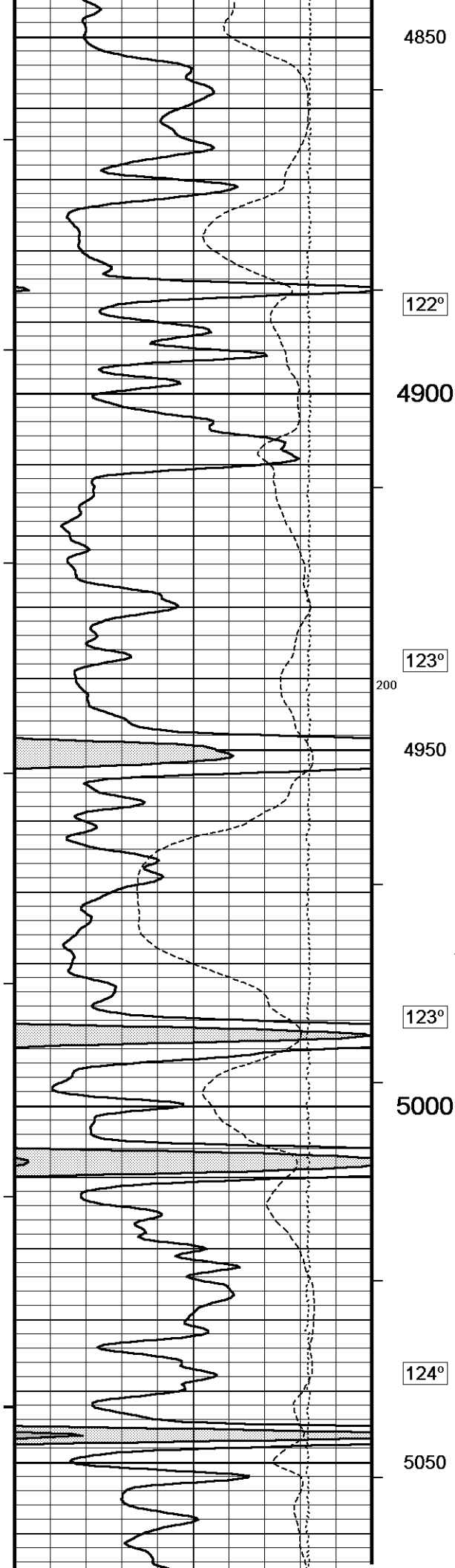


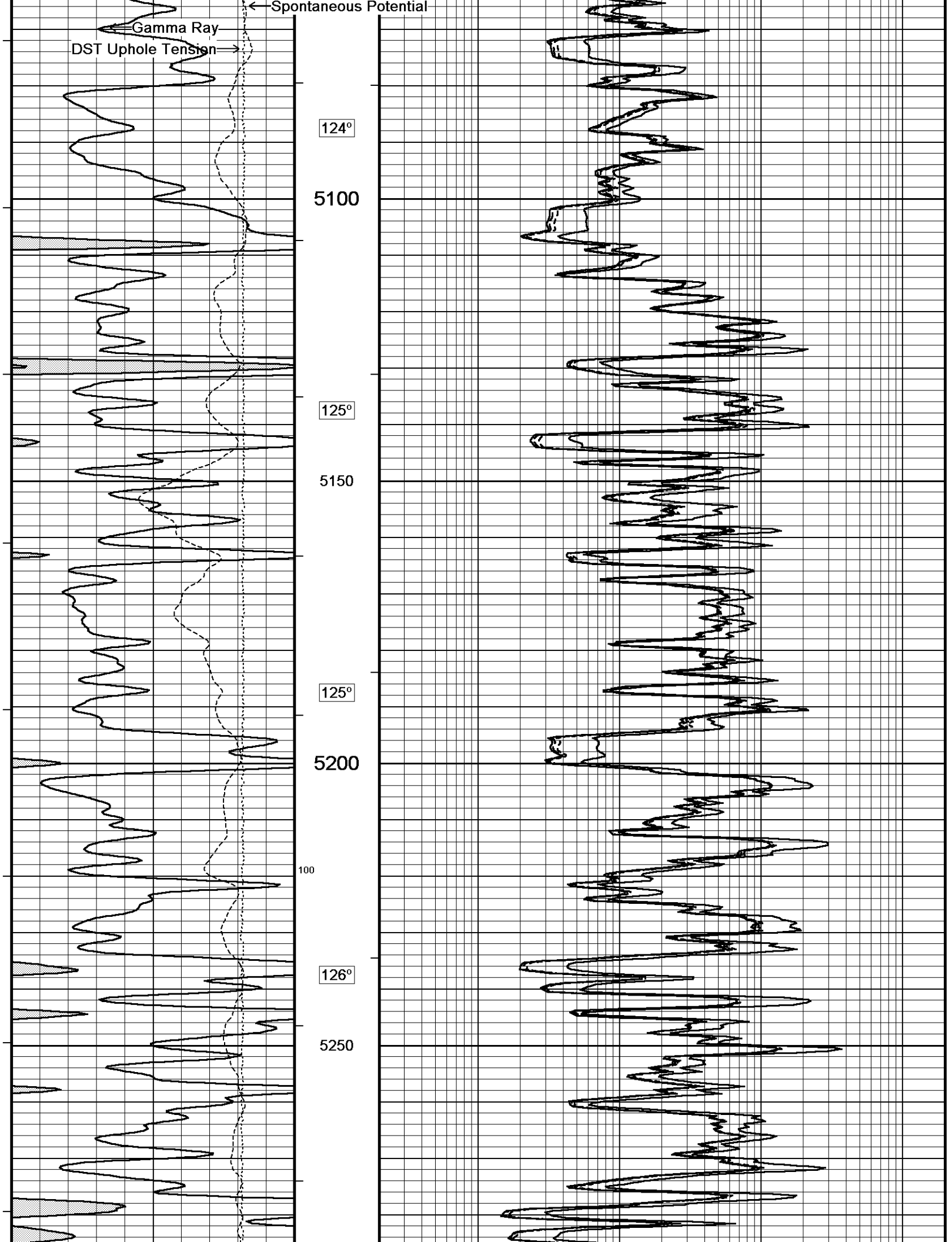
Array Ind. One Res Rt

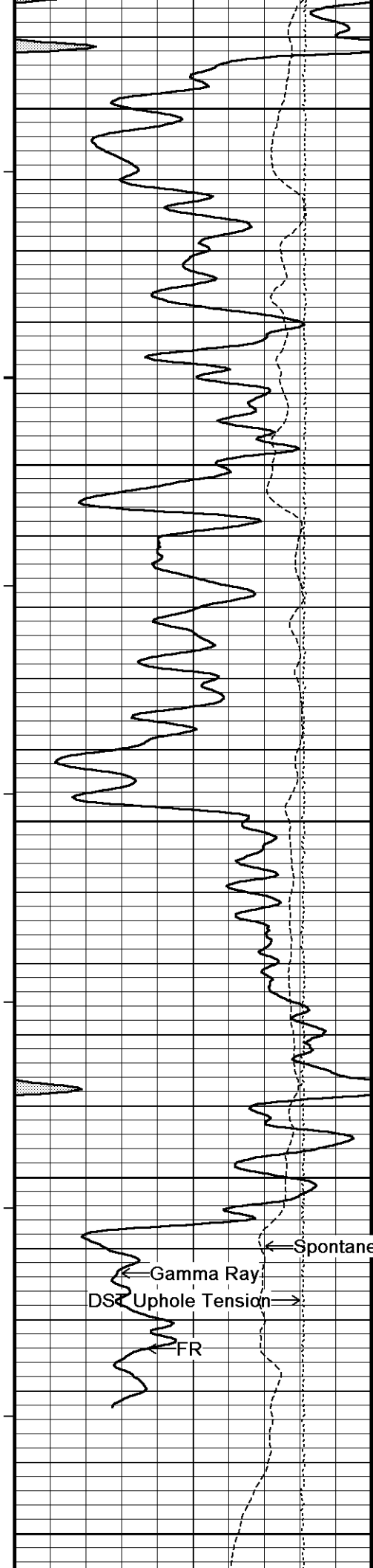
Array Ind. One Res 60

Array Ind. One Res 40

Shallow PE







127°

5300

127°

5350

128°

5400

128°

5450

5500

← Gamma Ray
DSI Uphole Tension →
FR

← Spontaneous Potential

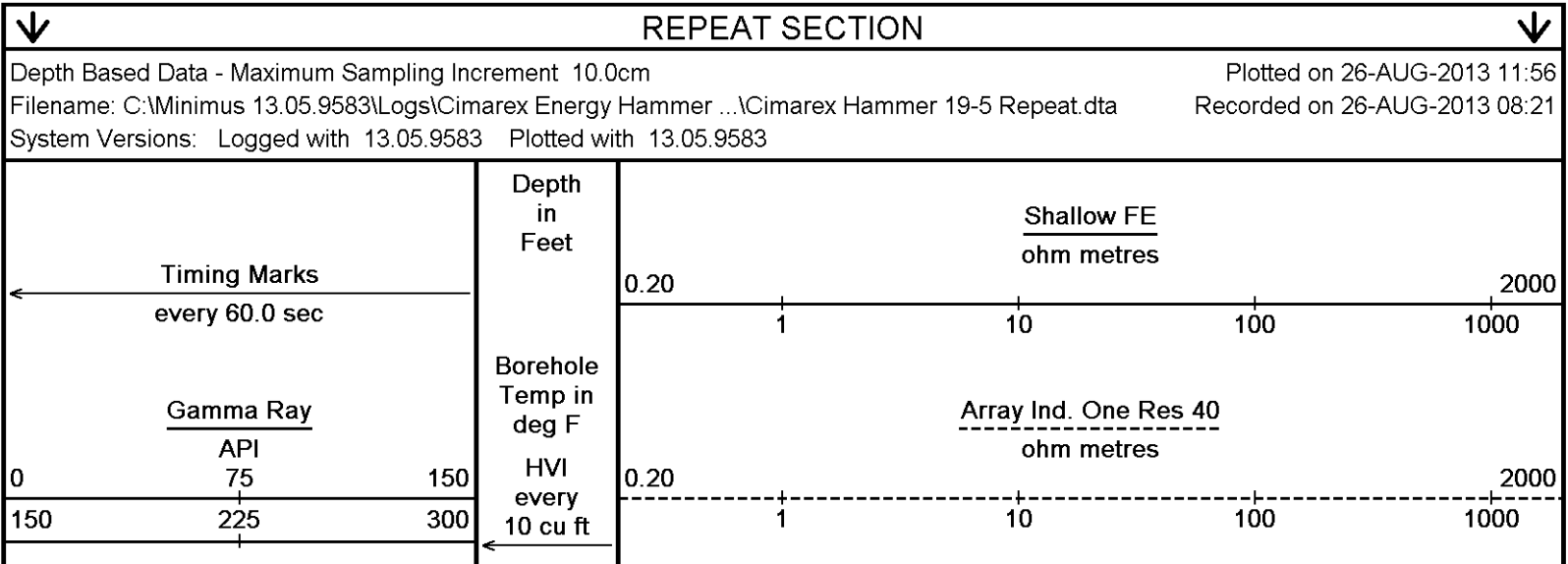
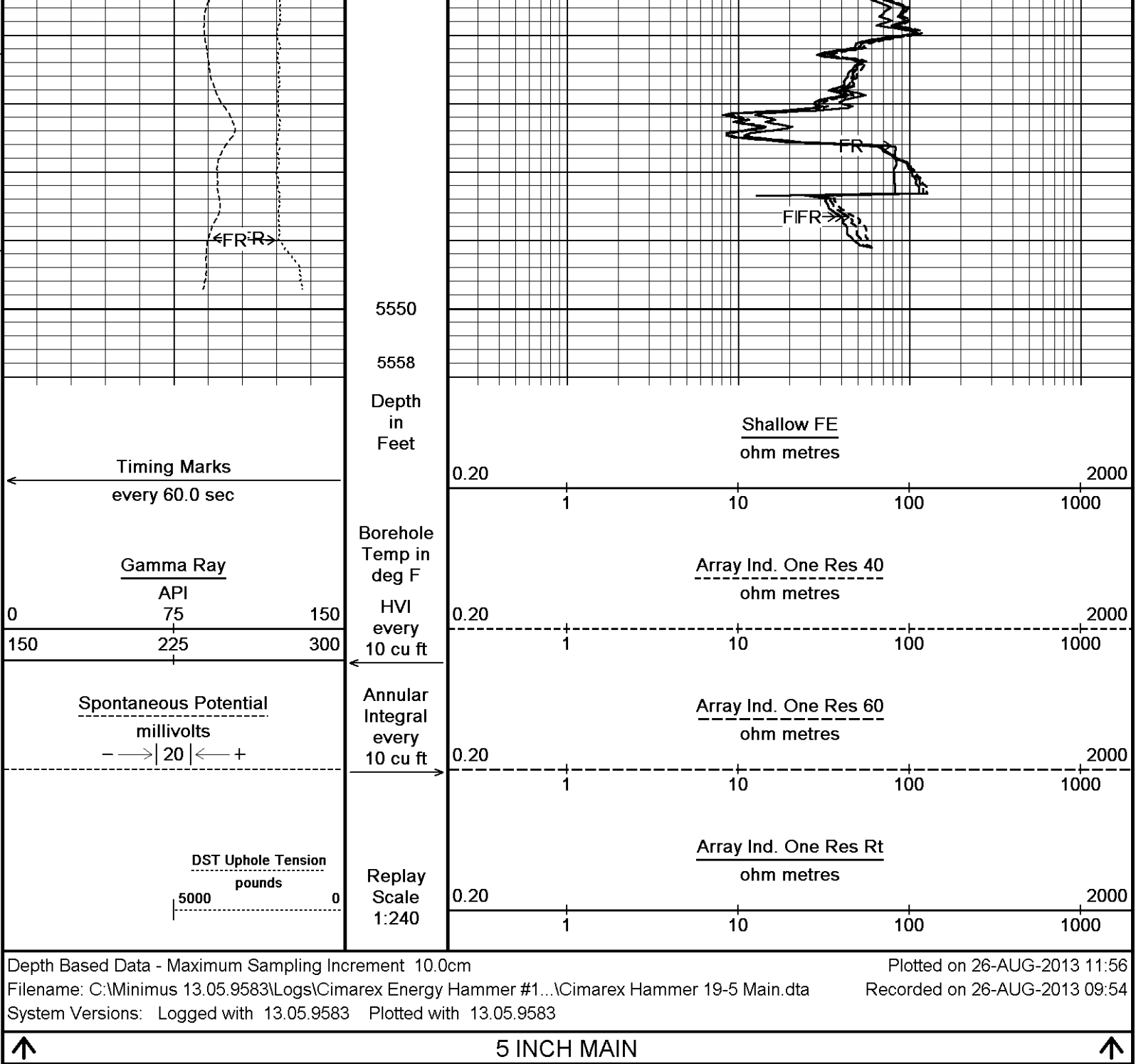
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE

Array Ind. One Res Rt

Array Ind. One Res 60

Array Ind. One Res 40

Shallow FE



Spontaneous Potential

millivolts

—>| 20 |<— +

Annular
Integral
every
10 cu ft

Array Ind. One Res 60

ohm metres

0.20

2000

1

10

100

1000

DST Uphole Tension

pounds

5000

0

Replay
Scale
1:240

Array Ind. One Res Rt

ohm metres

0.20

2000

1

10

100

1000

5200

100

125°

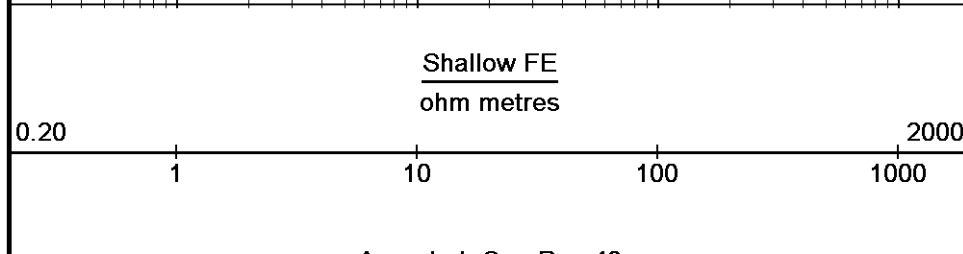
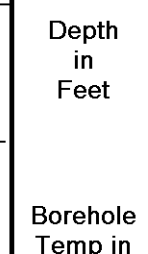
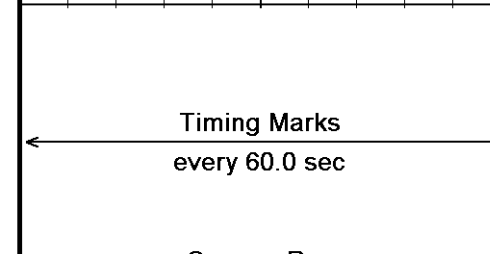
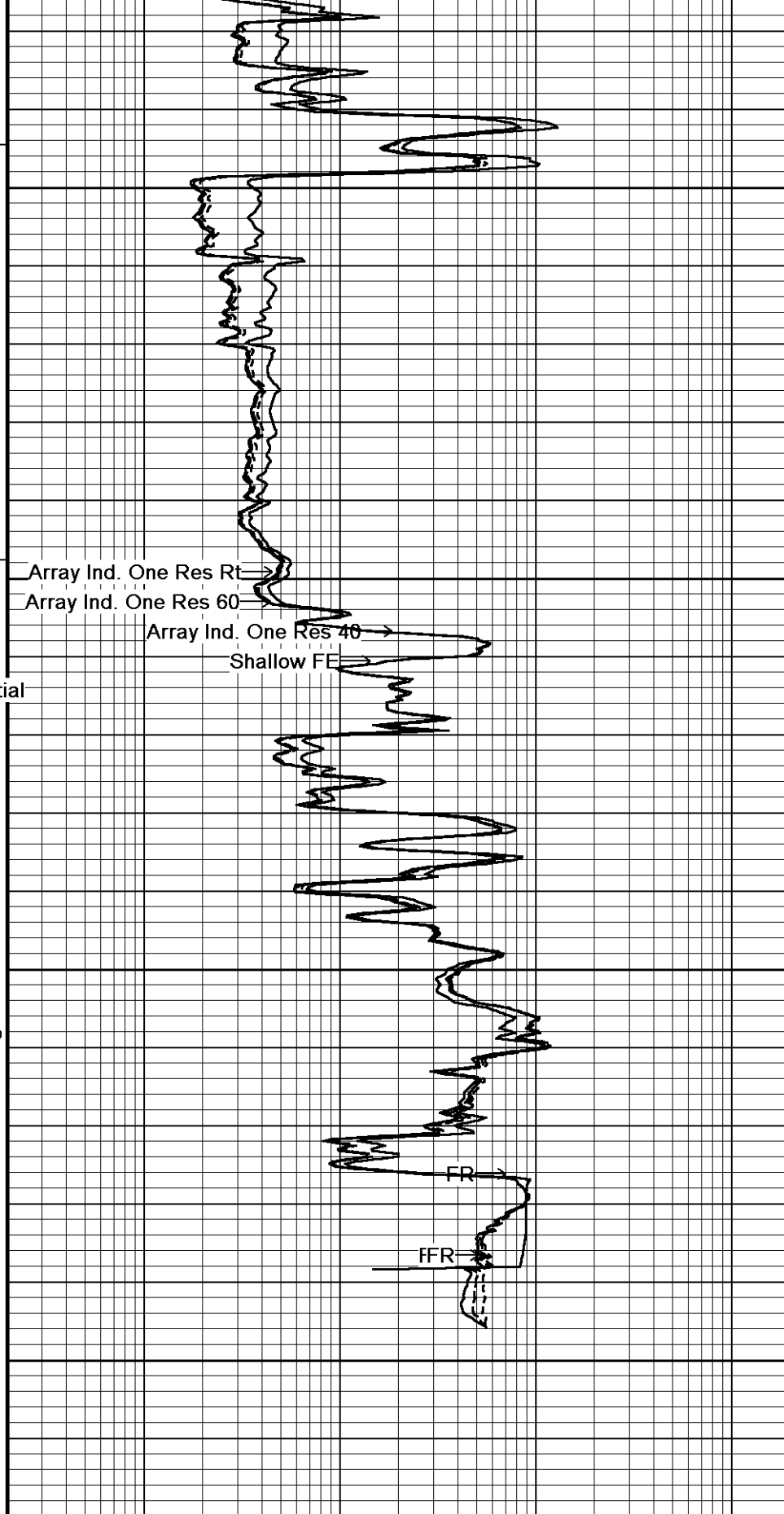
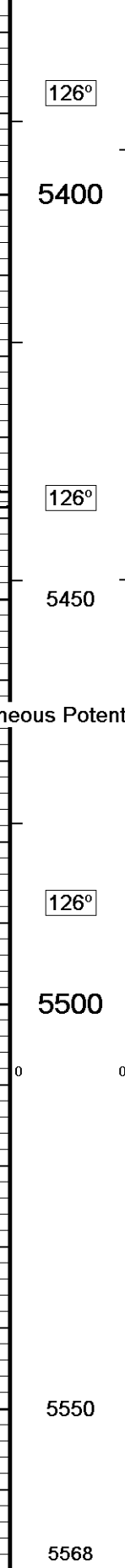
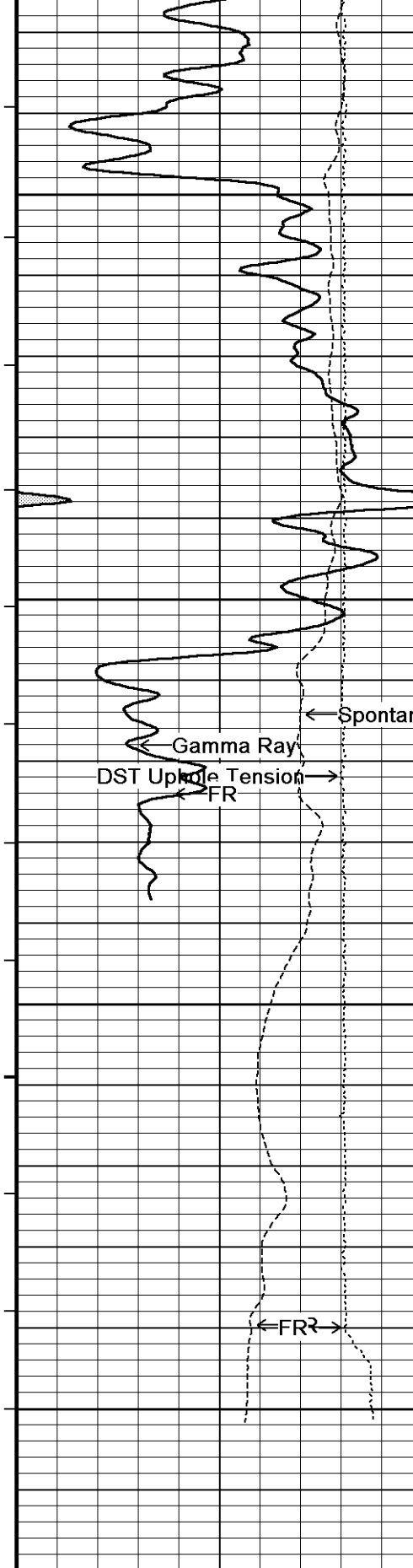
5250

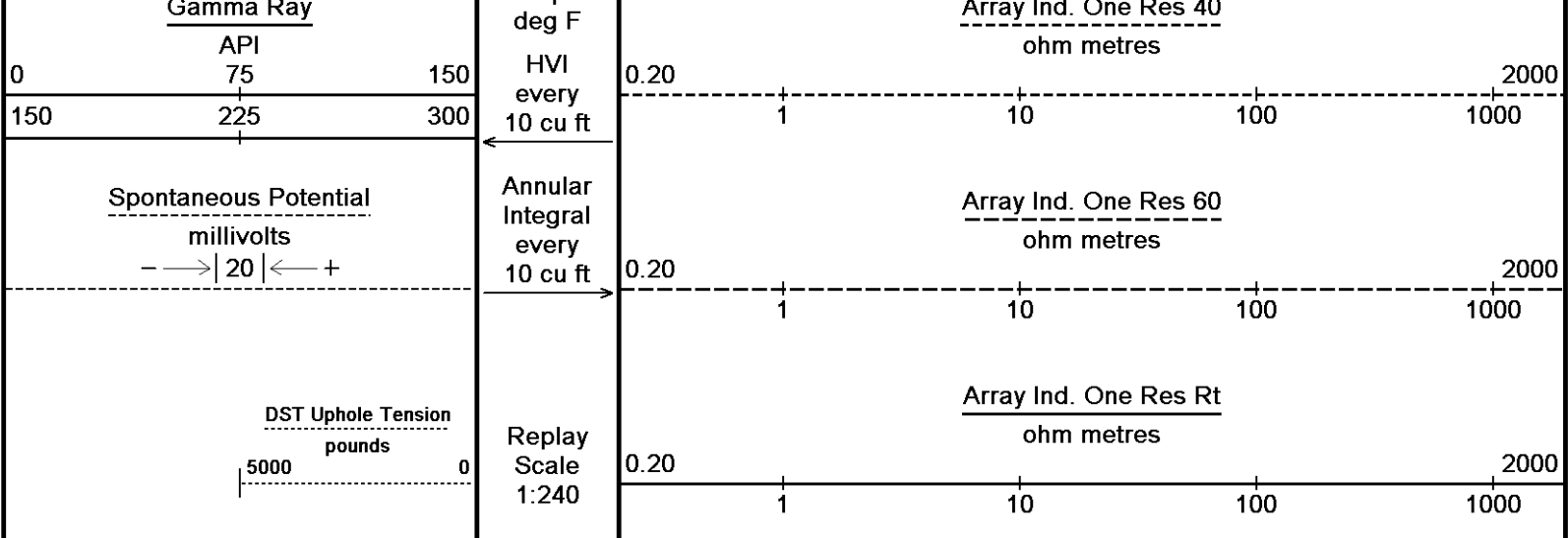
125°

5300

126°

5350





Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 26-AUG-2013 11:56

Filename: C:\Minimus 13.05.9583\Logs\Cimarex Energy Hammer ...\Cimarex Hammer 19-5 Repeat.dta

Recorded on 26-AUG-2013 08:21

System Versions: Logged with 13.05.9583 Plotted with 13.05.9583

↑

REPEAT SECTION

↑

BEFORE SURVEY CALIBRATION

C:\Minimus 13.05.9583\Logs\Cimarex Energy Hammer #19-5\Cimarex Hammer 19-5 Main.dta

General Constants All 000

Last Edited on 26-AUG-2013,06:03

General Parameters

Mud Resistivity1.120ohm-metres

Mud Resistivity Temperature62.000degrees F

Water Level0.000feet

Borehole Fluid ProcessingWet Hole

Hole/Annular Volume and Differential Caliper Parameters

HVOL MethodSingle Caliper

HVOL Caliper 1Density Caliper

HVOL Caliper 2N/A

Annular Volume Diameter5.500inches

Caliper for Differential CaliperDensity Caliper

Rwa Parameters

Porosity usedBase Density Porosity

Resistivity usedArray Ind. Four Res Rt

RWA Constant A0.610

RWA Constant M2.150

SW/APOR Tool Source0.000

Gamma Calibration MCG-D.K 443

Field Calibration on 25-AUG-2013 20:40

MeasuredCalibrated (API)

Background6746

Calibrator (Gross)1131771

Calibrator (Net)1064725

Gamma Constants MCG-D.K 443

Last Edited on 26-AUG-2013,06:03

Gamma Calibrator NumberGRC38

Mud Density1.12gm/cc

Caliper Source for ProcessingDensity Caliper

Tool PositionEccentred

Concentration of KClkppm

K Mud TypeChloride

K Mud Concentration0.00%

SP Calibration MCG-D.K 443

Field Calibration on 23-AUG-2013,11:54

MeasuredCalibrated (mV)

Reference 1100.1100.0

Reference 2	-100.5	-100.0		
High Resolution Temperature Calibration MCG-D.K 443			Field Calibration on 23-AUG-2013,11:53	
	Measured	Calibrated(Deg F)		
Lower	50.00	50.00		
Upper	75.00	75.00		
High Resolution Temperature Constants MCG-D.K 443			Last Edited on 23-AUG-2013,11:59	
Pre-filter Length	11			
Caliper Calibration MML-A 16			Base Calibration on 16-AUG-2013 09:13 Field Calibration on 25-AUG-2013 20:46	
Base Calibration				
Reading No	Measured	Calibrator Size (in)		
1	13832	5.98		
2	16950	7.97		
3	20199	9.86		
4	24116	11.92		
5	0	0.00		
6	N/A	N/A		
Field Calibration				
	Measured Caliper (in)	Actual Caliper (in)		
	5.96	5.98		
Micro Normal and Micro Inverse Calibration MML-A 16			Base Calibration on 16-AUG-2013 09:25 Field Check on 25-AUG-2013 20:45	
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	15.6	78.3	5.0	25.0
Channel	Base Check (ohm-m)		Field Check (ohm-m)	
Micro Normal	62.9		62.9	
Micro Inverse	48.3		48.3	
Micro Normal and Micro Inverse Constants MML-A 16			Last Edited on 25-AUG-2013,20:40	
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-B.J 387			Base Calibration on 16-AUG-2013 14:44 Field Check on 23-AUG-2013 10:33	
Base Calibration				
	Measured	Calibrated (cps)		
	Near Far	Near Far		
	3010 92	3714 110		
Ratio	32.584		33.764	
Field Calibrator at Base		Calibrated (cps)		
		1653 2429		
Ratio	0.681			
Field Check		Calibrated (cps)		
		1653 2452		
Ratio	0.674			
Neutron Constants MDN-B.J 387			Last Edited on 23-AUG-2013,10:30	
Neutron Source Id	P58125B			
Neutron Jig Number	5824NE			
Epithermal Neutron	No			
Caliper Source for Processing	Bit Size			
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 55		Base Calibration on 16-AUG-2013 08:59 Field Check on 23-AUG-2013 10:20	
Base Calibration			
	Measured	Calibrated (ohm-m)	
Reference 1	0.0	0.0	
Reference 2	950.9	126.8	
Base Check		281.6	
Field Check		281.8	

FE Constants MFE-A.A 55		Last Edited on 26-AUG-2013,06:02	
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	Constant Value		
Temp. for Rm Corr.	N/A		
Stand-off	Centred	inches	

Induction Calibration MAI-A.A 178				Base Calibration on 29-APR-2013,09:40	
				Field Check on 23-AUG-2013 10:19	
Base Calibration					
Test Loop Calibration		Measured		Calibrated (mmho/m)	
Channel	Low	High	Low	High	
1	17.6	484.7	9.3	966.2	
2	6.2	391.4	7.6	821.4	
3	4.0	264.5	5.2	566.0	
4	2.3	135.1	2.6	279.2	
Array Temperature		77.0	Deg F		
Channel	Base Check (mmho/m)		Field Check (mmho/m)		
	Low	High	Low	High	
1	0.0	0.0	12.8	3763.3	
2	0.0	0.0	29.8	3467.3	
3	0.0	0.0	27.3	3014.2	
4	0.0	0.0	18.8	2065.0	
Deep			15.9	1995.4	
Medium			40.3	3955.4	
Shallow			45.7	5082.3	
Array Temperature		0.0	79.8	Deg F	

Induction Constants MAI-A.A 178		Last Edited on 26-AUG-2013,06:02			
Induction Model	RtAP-WBM				
Caliper for Borehole Corr.	MML 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

RFM1 0.0000 RFM2 0.0000 RFM3 0.0000 RFM4 0.0000

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 178

Field Calibration on 30-APR-2013,11:24

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

High Resolution Temperature Constants MAI-A.A 178

Last Edited on 30-MAY-2013,19:58

Pre-filter Length	11
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Accelerometer Parameters MIE-B.A 254

Date Of Last Accelerometer Calibration 28-JUN-2012,12:18

	X Accelerometer	Y Accelerometer	Z Accelerometer
Slope	-1.098933	-1.108676	-1.107830
Offset	0.004383	0.002543	0.005594

Accelerometer Constants MIE-B.A 254

Last Edited on 07-MAY-2013,13:52

Accelerometer Calibrator Number 000

Accelerometer Temperature Characterisation

X Accelerometer

Serial Number 1135

Calibration Date 10-May-2012

	B0	B1	B2	B3
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Bias(g)	0.00000e+000	3.80136e-005	-1.44052e-008	1.07611e-010
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	SF0	SF1	SF2	SF3
--	-----	-----	-----	-----

Scale Factor(mA/g)	3.00000e+000	2.76201e-004	2.79882e-007	1.31941e-009
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Y Accelerometer

Serial Number 1137

Calibration Date 10-May-2012

	B0	B1	B2	B3
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Bias(g)	0.00000e+000	5.58386e-005	9.83739e-009	-1.99670e-011
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	SF0	SF1	SF2	SF3
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Scale Factor(mA/g)	3.00000e+000	2.77779e-004	1.92151e-007	1.16282e-009
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Z Accelerometer

Serial Number 1096

Calibration Date 29-Jun-2011

	B0	B1	B2	B3
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Bias(g)	0.00000e+000	1.18445e-005	-1.40013e-009	1.45484e-010
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	SF0	SF1	SF2	SF3
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Scale Factor(mA/g)	3.00000e+000	2.85296e-004	2.19938e-007	1.07369e-009
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Caliper Calibration MIE-B.A 254

Base Calibration on 28-JUN-2013 11:46

Field Calibration on 25-AUG-2013 20:33

Base Calibration

Reading No	Pads 1-5 Meas.	Pads 3-7 Meas.	Calibrator Size (in)
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1	25947	25206	5.98
2	35996	35798	7.97
3	45695	45741	9.86
4	57194	57363	11.92
5	0	0	0.00

Reading No	Pad 2 Meas.	Pad 4 Meas.	Pad 6 Meas.	Pad 8 Meas.	Calibrator Size (in)
1	25173	25605	25407	25834	5.98
2	33891	34086	34350	34577	7.97
3	42019	42297	42807	42696	9.86
4	51555	52094	52685	52573	11.92
5	0	0	0	0	0.00

Field Calibration

Measured Pads 1-5 Caliper(in)	Measured Pads 3-7 Caliper(in)	Actual Caliper(in)		
5.92	6.04	5.98		
Measured Pad 2 Caliper(in)	Measured Pad 4 Caliper(in)	Measured Pad 6 Caliper(in)	Measured Pad 8 Caliper(in)	Actual Caliper(in)
3.06	2.99	2.95	2.99	5.98

Caliper Constants MIE-B.A 254

Last Edited on 01-MAY-2013,17:06

Caliper Difference for BRKT 0.120 inches

Magnetometer Parameters MIE-B.A 254

Date Of Last Magnetometer Calibration 20-FEB-2013,16:25

	X Magnetometer	Y Magnetometer	Z Magnetometer
Slope	-1.000000	-1.000126	-0.998001
Offset	-0.000662	-0.013917	0.004180

Magnetometer Constants MIE-B.A 254

Last Edited on

Magnetometer Calibrator Number 000

Navigation Constants MIE-B.A 254

Last Edited on 26-AUG-2013,06:20

Magnetic Declination 6.12 degrees East

Imager Pad Check MIE-B.A 254

Field Check on

Pad 1	Pad Not Tested	Pad 5	Pad Not Tested
Pad 2	Pad Not Tested	Pad 6	Pad Not Tested
Pad 3	Pad Not Tested	Pad 7	Pad Not Tested
Pad 4	Pad Not Tested	Pad 8	Pad Not Tested

Compact Micro Imager Constants MIE-B.A 254

Last Edited on 25-AUG-2013,20:32

Sonde Configuration	Imager Mode
Arm-Pad Kit	Normal Pads (12.25 in)
Arm-Pad Kit Serial Number	N/A
Centre Pad 1 Rotational Offset	0.00 degrees
Image/Borehole Ovality Reference	Azimuth of Pad 1
Non Active Buttons	Omit
Search Angle	0.00 degrees
Correlation Interval	3.28 feet
Correlation Step	1.64 feet
Current Offset	0.0000 mAmp
Squasher Start	0.0500 mAmp
Image Processing	Enabled

Photo Density Calibration MPD-B 59

Base Calibration on 23-AUG-2013 11:44

Field Check on 23-AUG-2013 11:53

Density Calibration		Measured	Calibrated (sdu)
Base Calibration			
	Near	Far	Near Far
Reference 1	58612	28481	59556 30836
Reference 2	23605	2511	24941 2541
Field Check at Base			
	1186.0	1254.6	

Field Check

1184.3 1253.5

PE Calibration

Base Calibration

	WS	Measured WH	Ratio	Calibrated Ratio
Background	217	1063		
Reference 1	21648	58418	0.374	0.371
Reference 2	6282	23469	0.271	0.272

Field Check at Base

216.6 1062.7

Field Check

213.2 1058.6

Density Constants MPD-B 59

Last Edited on 26-AUG-2013,06:03

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 (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	

Caliper Calibration MPD-B 59

Base Calibration on 23-AUG-2013 11:17

Field Calibration on 23-AUG-2013 11:19

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	16284	3.99
2	23984	5.98
3	31584	7.97
4	39888	9.86
5	49152	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
5.91	5.98

Down-hole Tension Calibration SMS 0

Field Calibration on 26-AUG-2013 07:17

Reading No	Measured	Calibrated (lbs)
1	15380.34	0.00
2	16307.40	570.00

DOWNHOLE EQUIPMENT

C:\Minimus 13.05.9583\Logs\Cimarex Energy Hammer #19-5\Cimarex Hammer 19-5 Main.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-D.K 443 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-B.J 387 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Density/Caliper
MPD-B 59 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

SKJ-D.A Compact Knuckle Joint
SKJ-D.A 37 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

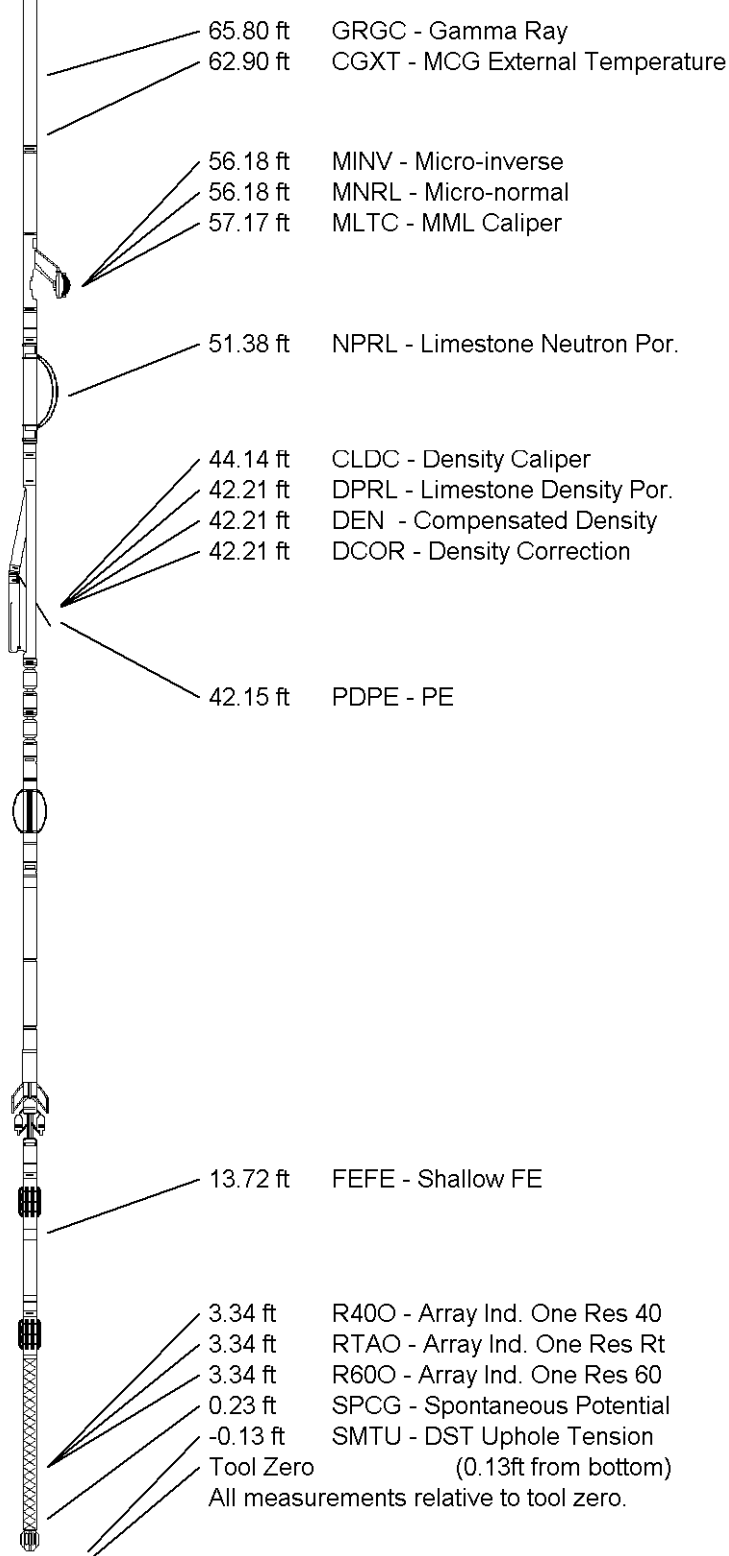
Compact MMI Memory Section
MIM-A.A 119 LG: 4.65 ft WT: 26.5 lb OD: 2.24 in

Compact MMI Electrode Section
MIE-B.A 254 LG: 13.96 ft WT: 99.2 lb OD: 4.09 in

Compact Focussed Electric
MFE-A.A 55 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

Compact Induction
MAI-A.A 178 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 72.67 ft Weight: 573.2 lb



COMPANY	CIMAREX ENERGY CO.
WELL	HAMMER 19-5
FIELD	LETTE SE
PROVINCE/COUNTY	HASKELL
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	2857.00	feet	First Reading	5537.00	feet
Elevation Drill Floor	2855.00	feet	Depth Driller	5544.00	feet
Elevation Ground Level	2848.00	feet	Depth Logger	5540.00	feet

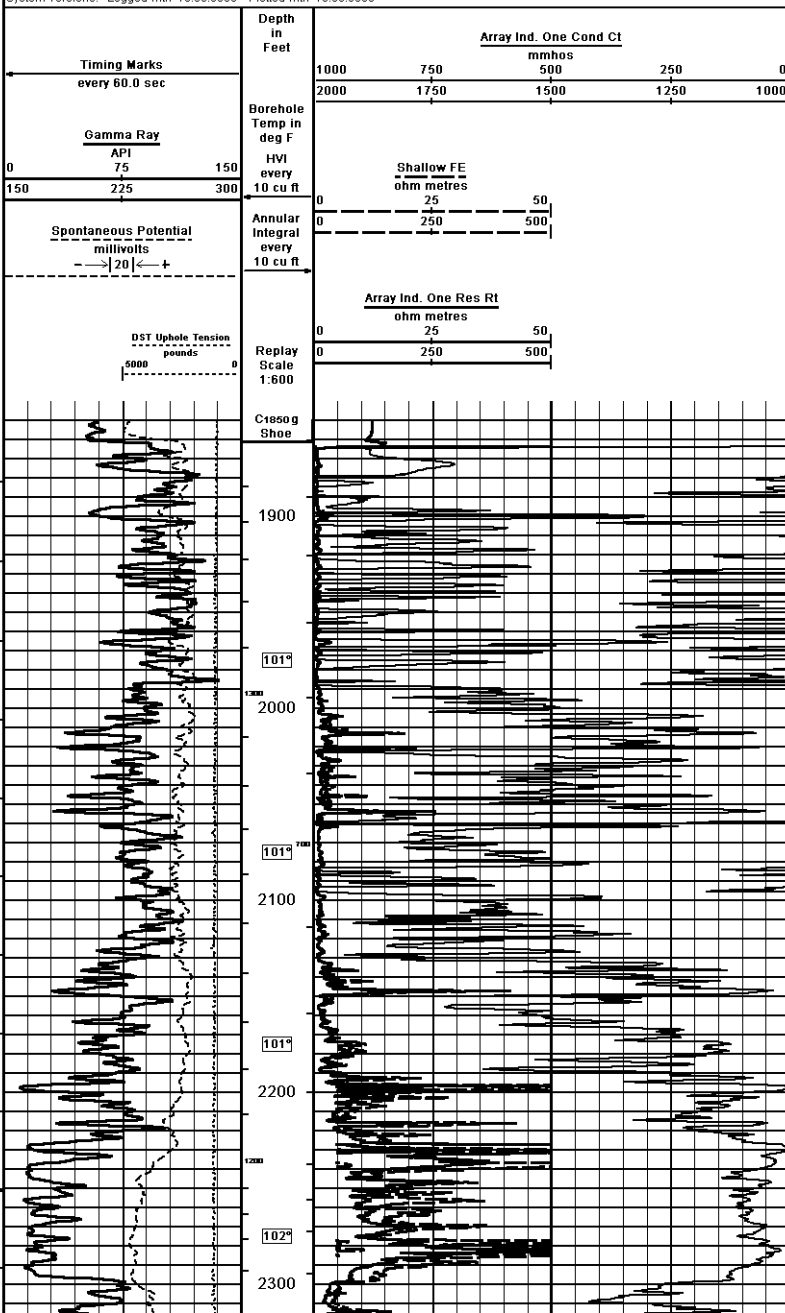


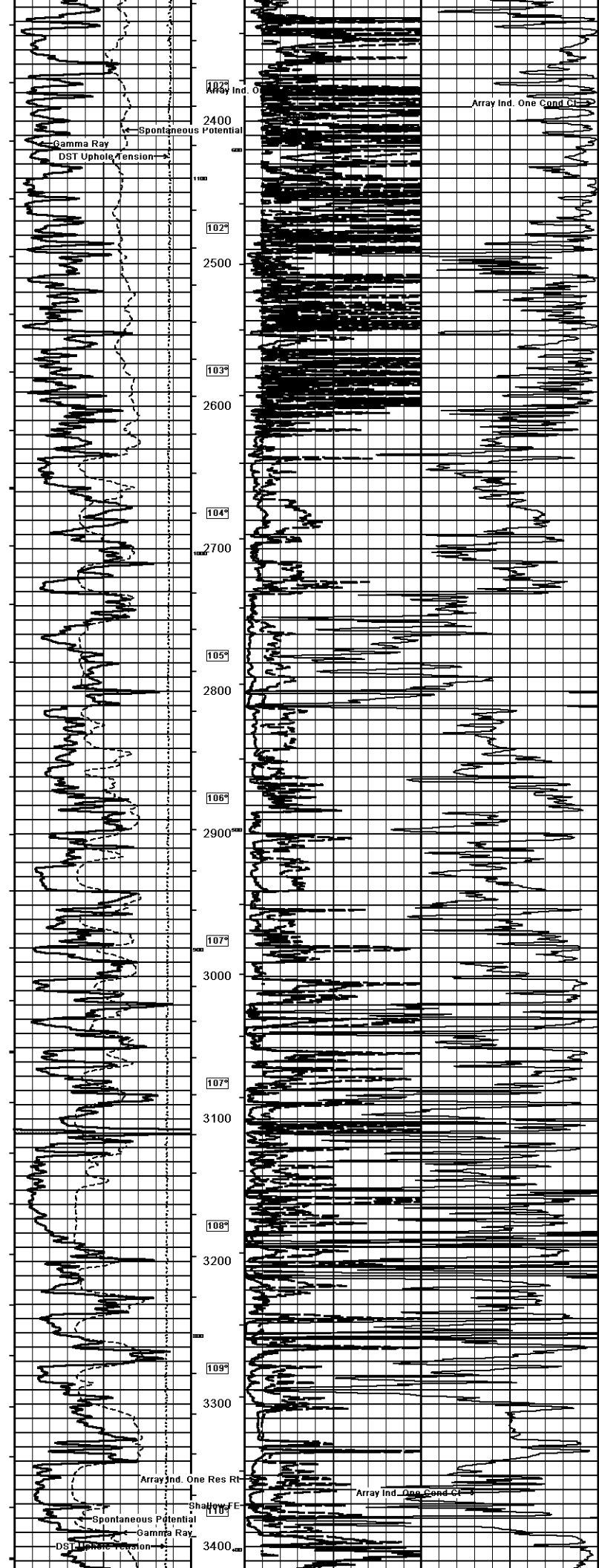
ARRAY INDUCTION
SHALLOW FOCUSED

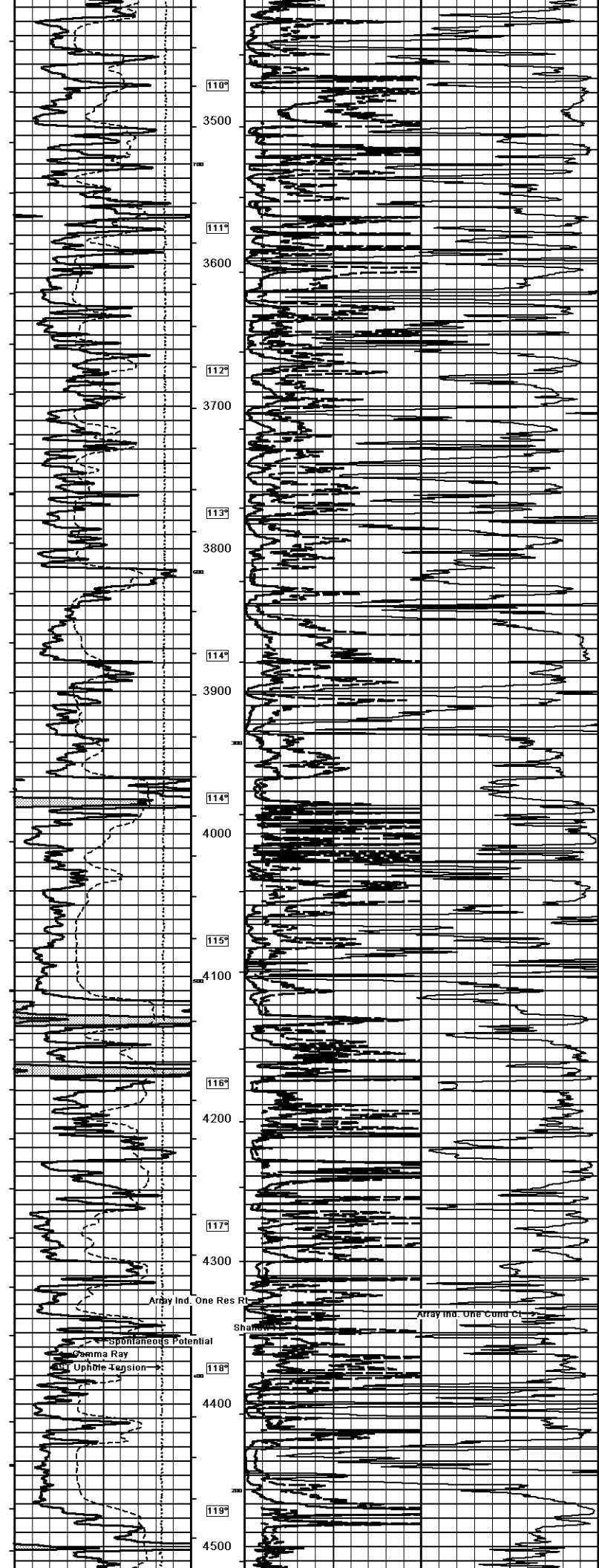
Weatherford		ARRAY INDUCTION SHALLOW FOCUSED ELECTRIC LOG	
COMPANY WELL FIELD PROVINCE/COUNTY COUNTRY/STATE LOCATION		CIMAREX ENERGY CO. HAMMER 19-5 LETTE SE HASKELL U.S.A. / KANSAS 330' FSL & 1320' FEL S2 S2 SE	
SEC 19	TYPE 30S	ROE 31W	Other Services MPC/DNDN
JOH Number 15-081-22026	MML		CMI
Permit Number	15-081-22026		
Permanent Datum Q.L. Elevation 2848 feet			Top of Bone: LBP 2857.00 LCP 2855.00 Q.L. 2848.00
Log Measured From KB			
Drilling Measured From KB			
Date	26-AUG-2013		
Run Number	ONE		
Service Order	3539920		
Depth Driller	5544.00		feet
Depth Logger	5544.00		feet
First Reading	5537.00		feet
Last Reading	1881.00		feet
Casing Driller	1881.00		feet
Casing Logger	1881.00		feet
Bit Size	7.875		inches
Flow Fluid Type	GEL		
Density/Viscosity	9.30 lb/USG		47.00 CP
PH / Fluid Loss	11.50		8.40 ml/20min
Sample Source	FLOW LINE		
Rm @ Measured Temp	1.12 @ 62.0		ohm-m
Rmc @ Measured Temp	0.90 @ 62.0		ohm-m
Rmc @ Measured Temp	1.34 @ 62.0		ohm-m
Source Rmt/Rmc	CALC		CALC
Rm @ BHT	0.54 @ 28.0		ohm-m
Time Since Circulation	5 HRS		
Max Recorded Temp	128.00		deg F
Equipment / Base	12344		
Recorded By	RHOTMAN		
Witnessed By	T. KOLODZIEJ		
Job #	LB19-234		

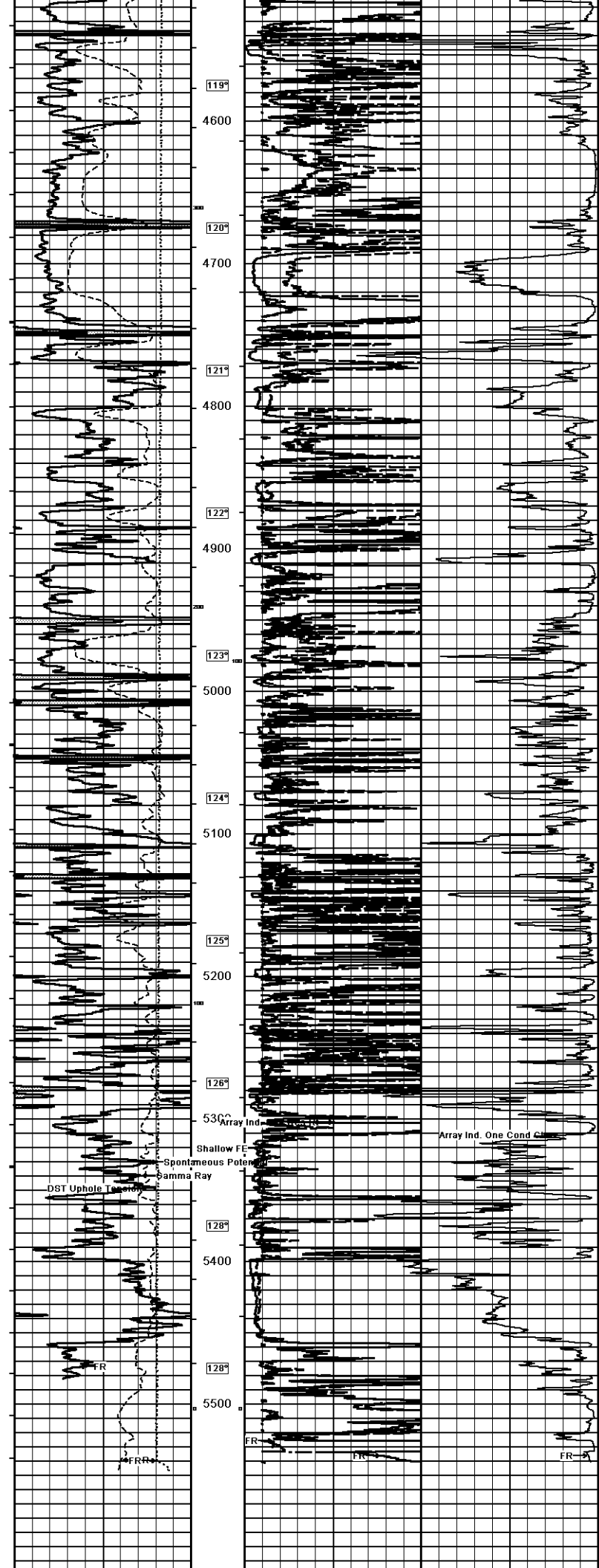
1 INCH MAIN

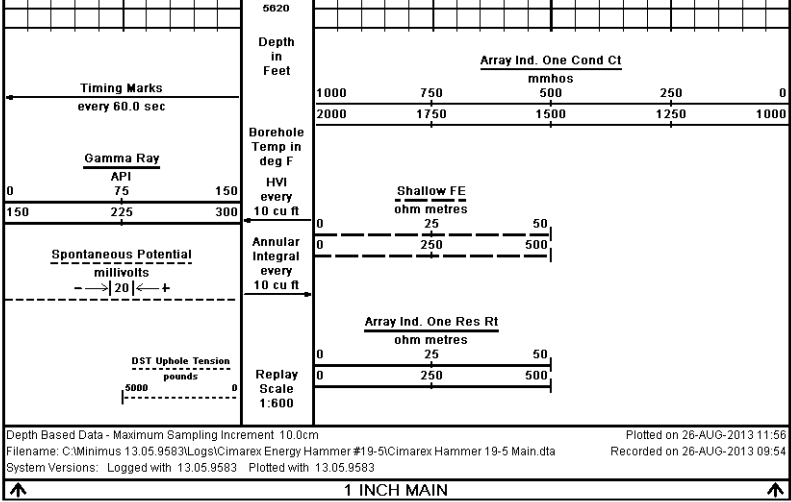
Depth Based Data - Maximum Sampling Increment: 10.0cm
Plotted on 26-AUG-2013 11:56
Filename: C:\Minimus 13.05.9583\Logs\Cimarex Energy Hammer #19-5\Cimarex Hammer 19-5 Main.dta
Recorded on 26-AUG-2013 09:54
System Versions: Logged with 13.05.9583 Plotted with 13.05.9583











COMPANY		CIMAREX ENERGY CO.			
WELL		HAMMER 19-5			
FIELD		LETTE SE			
PROVINCE/COUNTY		HASKELL			
COUNTRY/STATE		U.S.A. / KANSAS			
Elevation Kelly Bushing	2857.00	feet	First Reading	5537.00	feet
Elevation Drill Floor	2855.00	feet	Depth Driller	5544.00	feet
Elevation Ground Level	2848.00	feet	Depth Logger	5540.00	feet
			ARRAY INDUCTION		
			SHALLOW FOCUSED		
			ELECTRIC LOG		