



ARRAY INDUCTION - RTAP SHALLOW FOCUSED ELECTRIC LOG

COMPANY			BILL BARRETT CORPORATION		
WELL			GGU MILLER 24D-32-691		
FIELD			GIBSON GULCH		
PROVINCE/COUNTY			GARFIELD		
COUNTRY/STATE			U.S.A. / COLORADO		
LOCATION			SHL: 1225' FSL & 2288' FWL BHL: 1184' FSL & 1990' FWL		
SEC	TWP	RGE	Other Services		
32	6S	91W	MPD/MDN		
API Number		05-045-19427			
Permit Number					
Permanent Datum G.L., Elevation 6120 feet					
Log Measured From K.B. @ 22 FEET above Permanent Datum					
Drilling Measured From K.B.					
Date	20-NOV-2010		Elevations:		
Run Number	ONE				
Depth Driller	7875.00	feet			
Depth Logger	7878.00	feet			
First Reading	7875.00				
Last Reading	788.00				
Casing Driller	788.00	feet			
Casing Logger	788.00	feet			
Bit Size	7.875	inches			
Hole Fluid Type	LSND				
Density / Viscosity	10.70 lb/USg	50.00 CP			
PH / Fluid Loss	8.80	7.20 ml/30Min			
Sample Source	FLOW LINE				
Rm @ Measured Temp	1.81 @ 90.0	ohm-m			
Rmf @ Measured Temp	1.45 @ 90.0	ohm-m			
Rmc @ Measured Temp	2.17 @ 90.0	ohm-m			
Source Rmf / Rmc	CALC	CALC			
Rm @ BHT	0.824 @202.0	ohm-m			
Time Since Circulation	6 HOURS				
Max Recorded Temp	202.00	deg F			
Equipment Name	COMPACT				
Equipment / Base	13045	GD JCT			
Recorded By	D.KUNTZ	J.GARCIA			
Witnessed By	C.CROW				

BOREHOLE RECORD			Last Edited: 20-NOV-2010 15:35
Bit Size inches	Depth From feet	Depth To feet	
8.750	788.00	3697.00	
7.880	3697.00	7875.00	
CASING RECORD			
Type	Size inches	Depth From feet	Shoe Depth feet
SURFACE	9.625	0.00	788.00
Weight pounds/ft			
36.00			

REMARKS	
TOOLS: SHA, MCG, MDN, MPD, SKJ, MFE, AND MAI RAN IN COMBINATION	
HARDWARE: MPD: (1) 8 INCH PROFILE PLATE MAI: (1) 0.5 INCH STANDOFF MDN: (1) DUAL BOWSPRING	
2.68 G/CC DENSITY MATRIX USED TO CALCULATE POROSITY.	
ALL INTERVALS LOGGED AND SCALED PER CUSTOMER'S REQUEST.	
TIGHT PULLS, BOREHOLE SIZE, AND RUGOSITY WILL AFFECT REPEATABILITY AND DATA QUALITY.	
UNDERGAUGE CALIPER READINGS FROM 7510-7550 FEET AND FROM 6600-6625 FEET REPEATED AND VERIFIED.	
UNDERGAUGE CALIPER READINGS FROM 7380-7400 FEET NOT REPEATED DUE TO WIRELINE HITTING A LEDGE AT THE SAME DEPTH WHILE RUNNING IN HOLE.	

TIGHT PULL ENCOUNTERED AT 6790 FEET AND PULLED 2700 POUNDS.

CALIPER CHECK IN CASING PRESENTED, REFERENCE I.D. = 9.10" (9 5/8", 36 LB/FT CASING)

8.75 INCH BIT USED FROM SURFACE CASING TO 3697 FEET.

TOTAL HOLE VOLUME FROM TD TO SURFACE CASING = 2705 CU.FT.

ANNULAR VOLUME WITH 4.5 INCH PRODUCTION CASING = 1925 CU.FT.

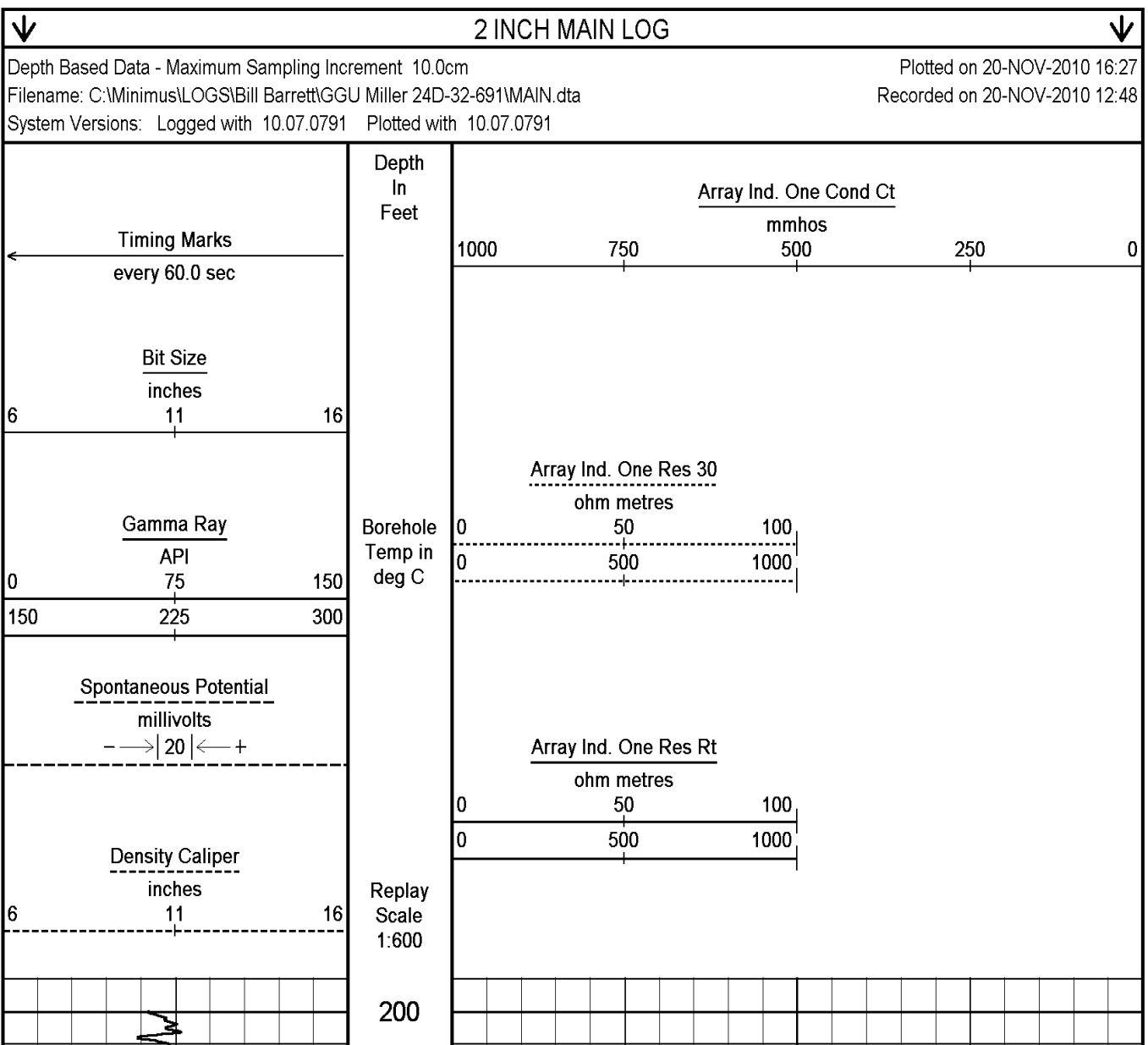
ENGINEER: D.KUNTZ / J.GARCIA/ O.GOYZUETA(JFE)

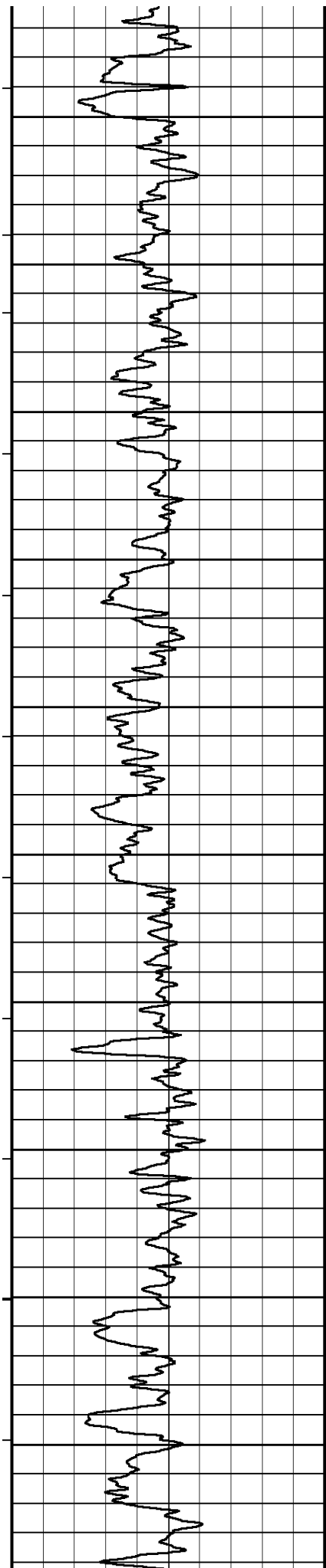
OPERATOR: S.KAISER

SERVICE ORDER: #3526198

RIG: PATTERSON #307

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.





35°

300

36°

400

37°

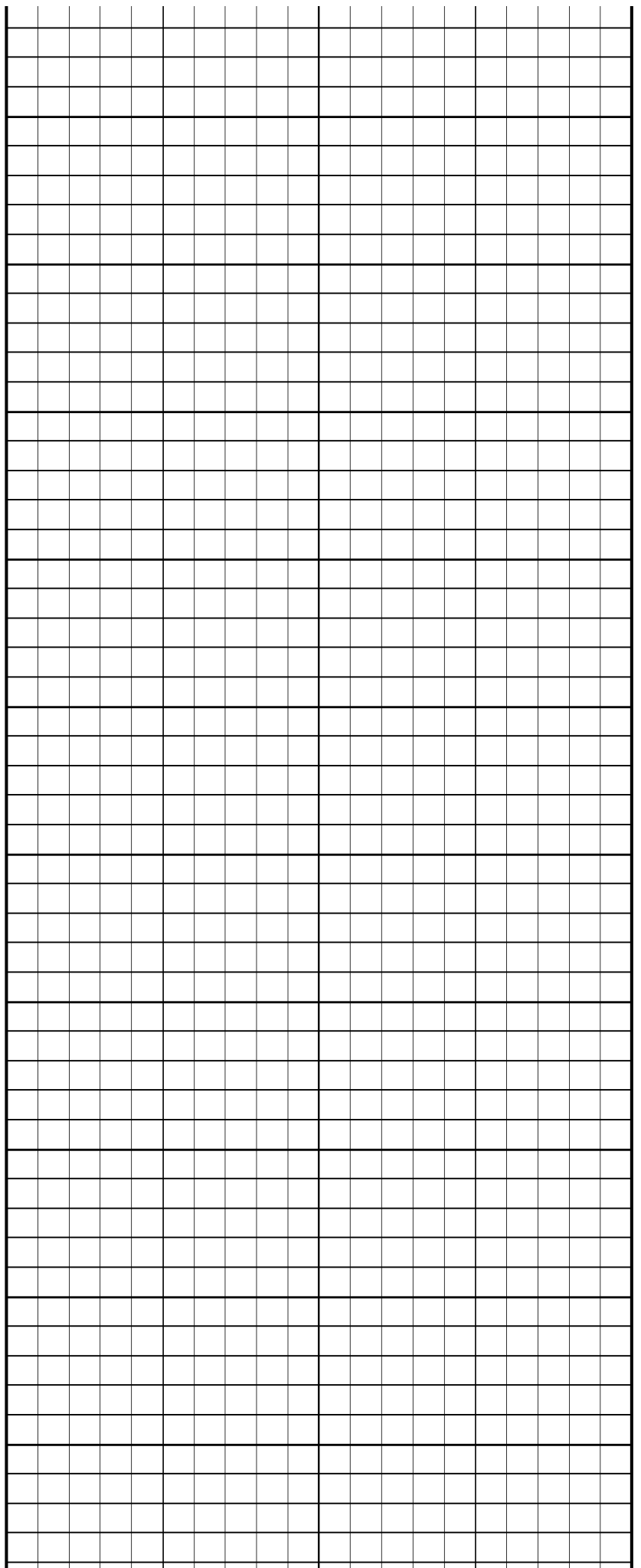
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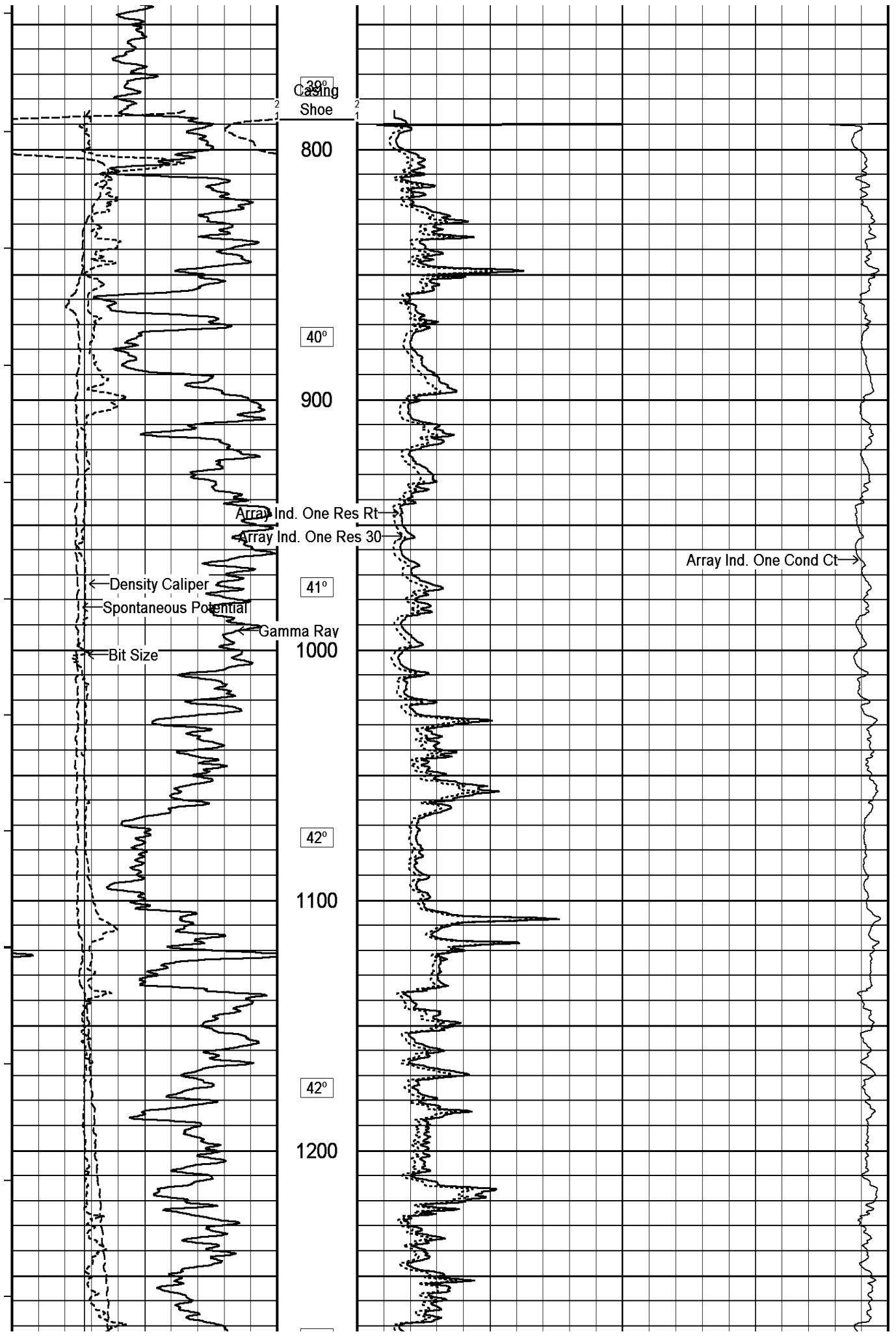
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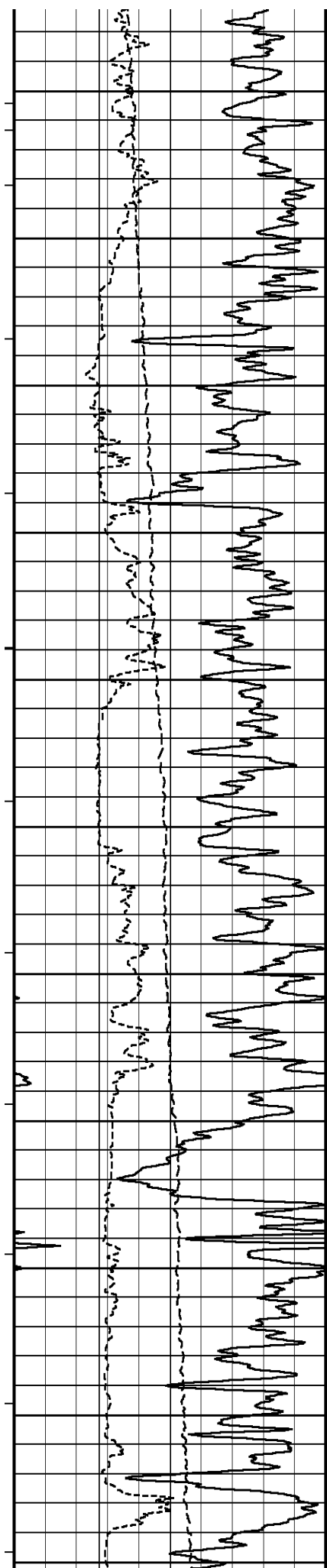
600

38°

700







43°

1300

44°

1400

44°

1500

45°

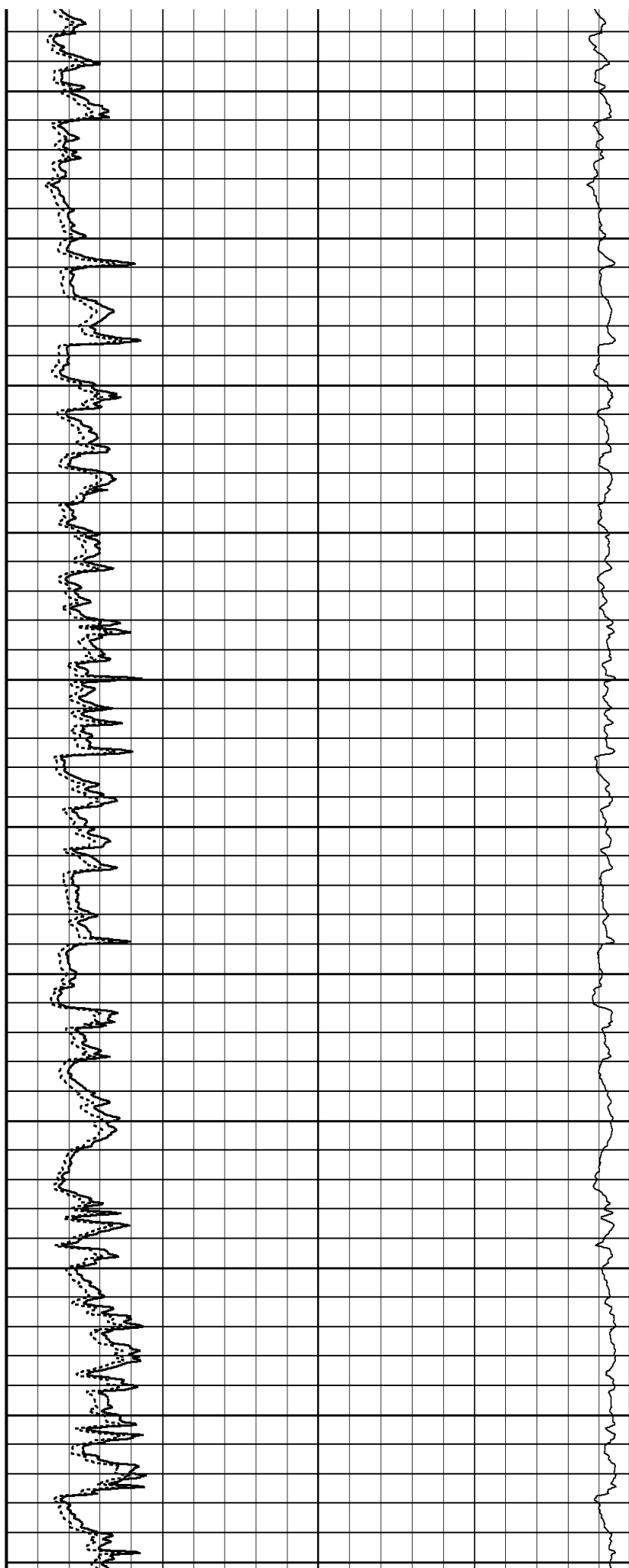
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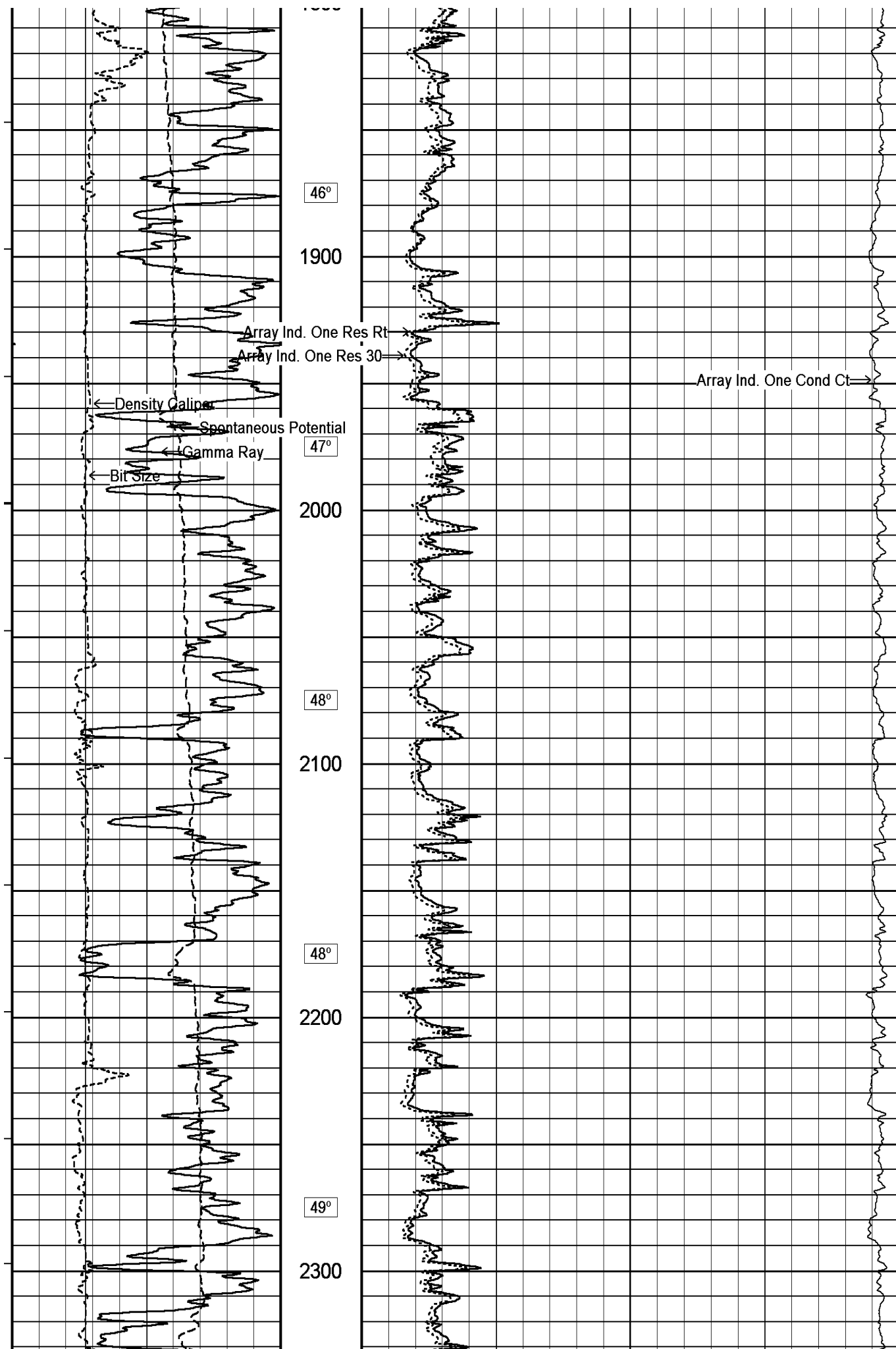
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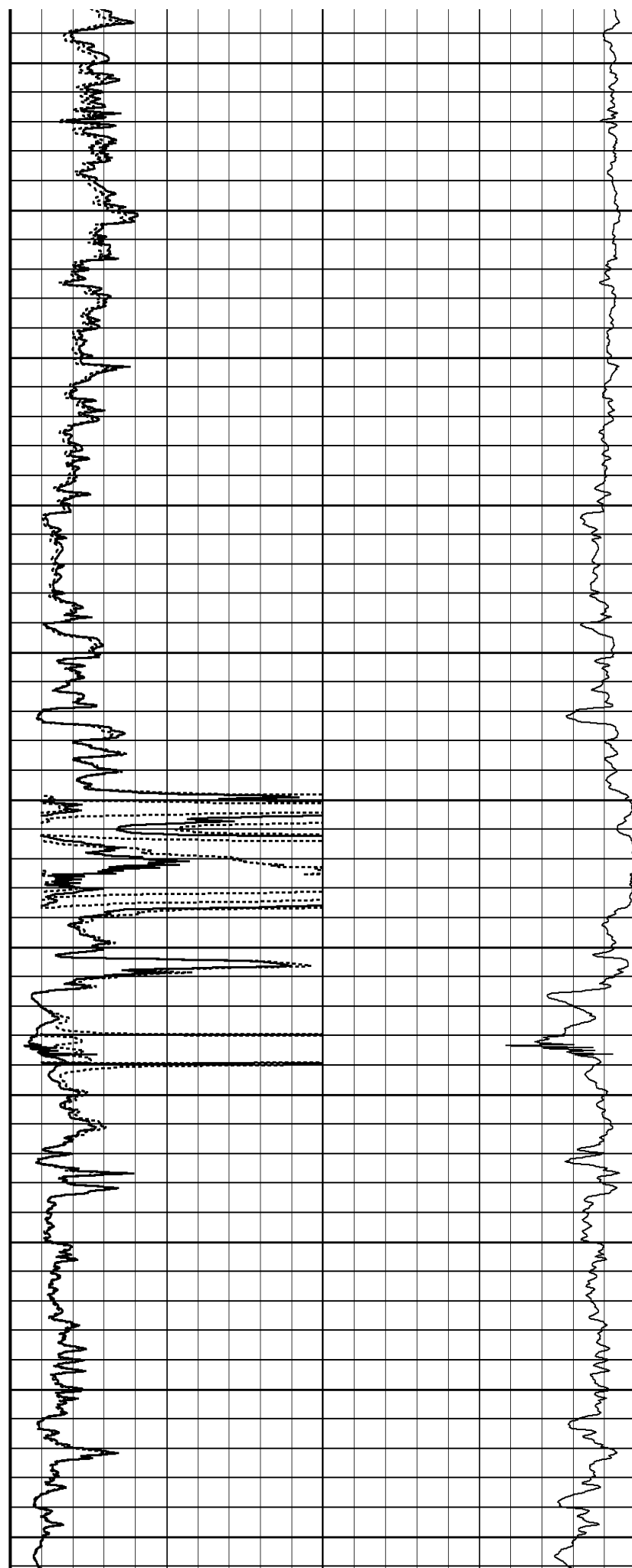
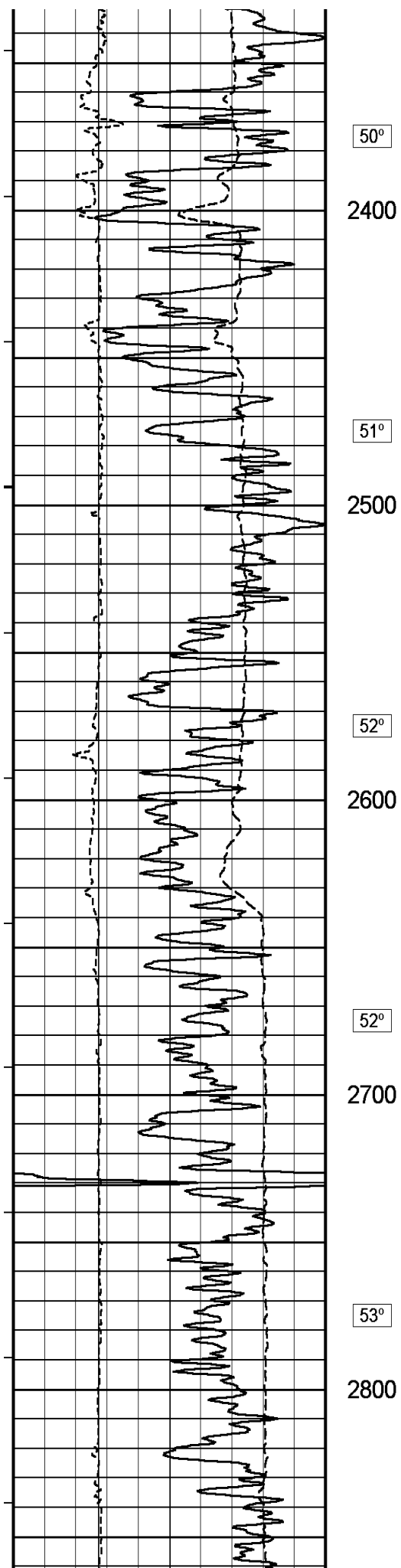
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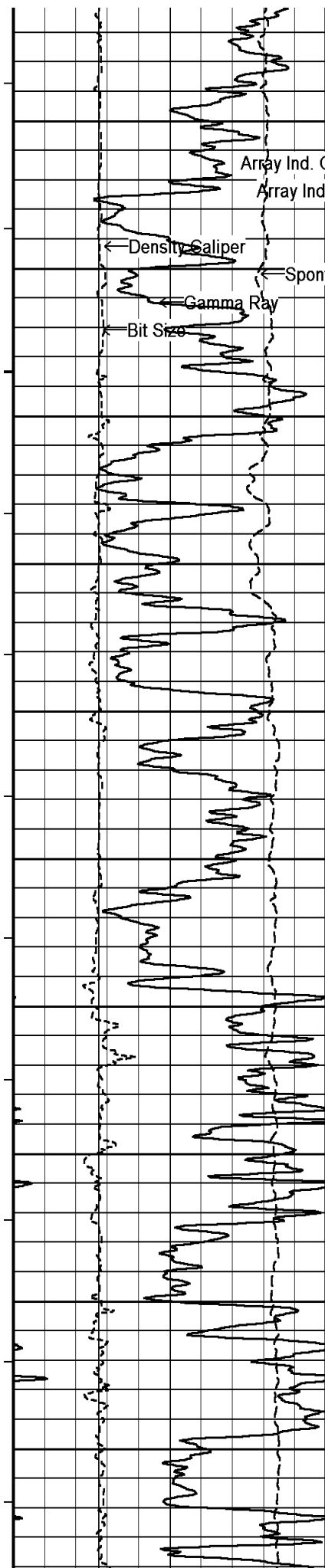
46°

1800









54°

2900

Array Ind. One Res Rt →

Array Ind. One Res 30 →

← Density Caliper

← Gamma Ray

← Bit Size

← Spontaneous Potential

55°

3000

55°

3100

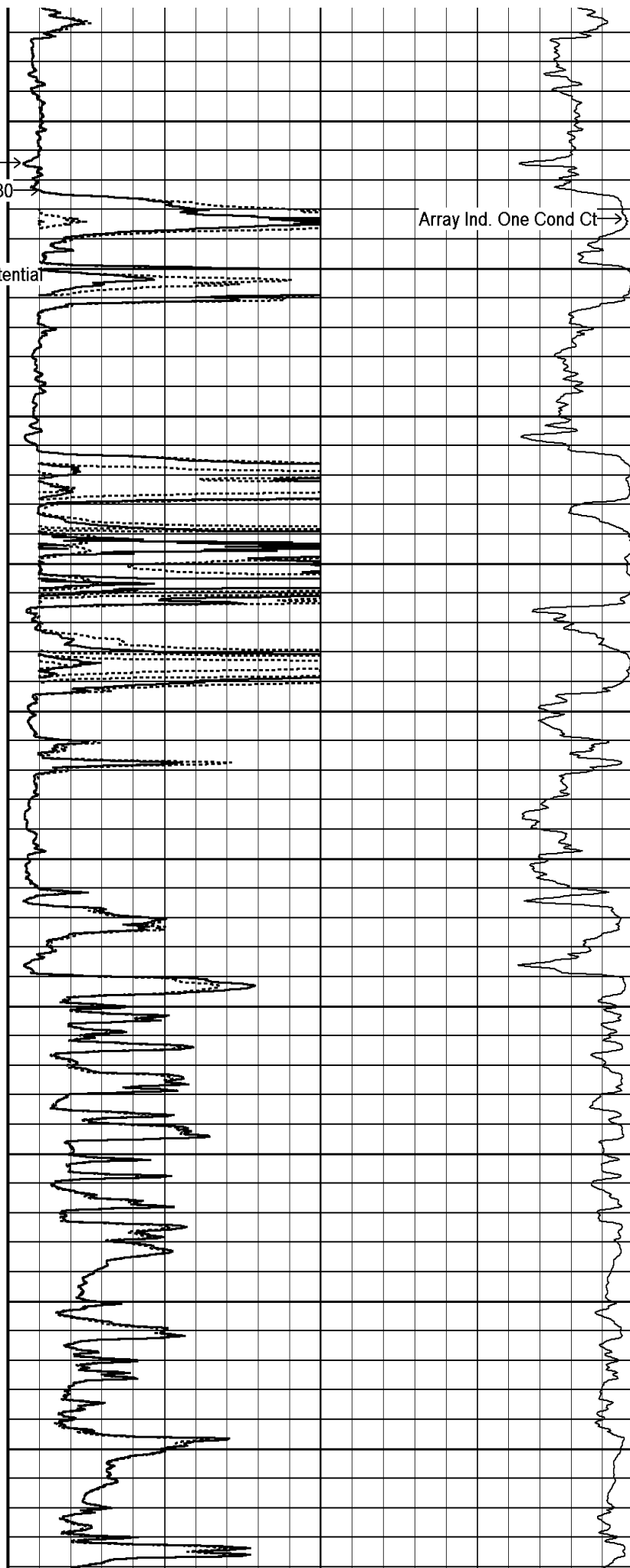
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3200

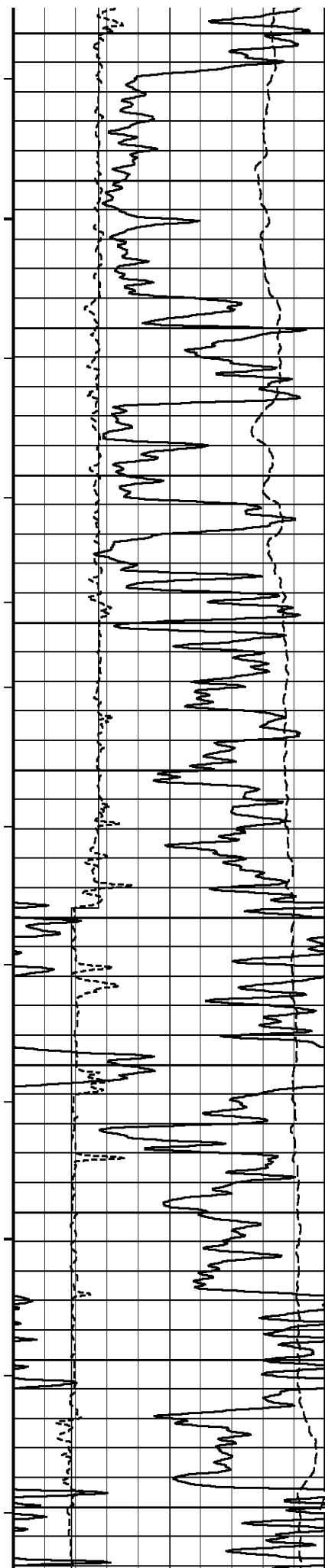
56°

3300

56°



Array Ind. One Cond Ct →



3400

57°

3500

58°

3600

58°

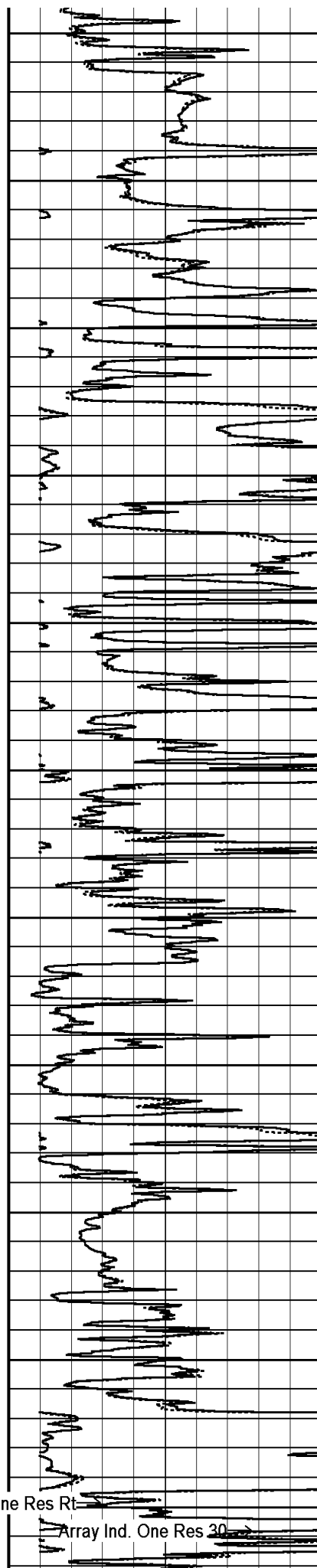
3700

59°

3800

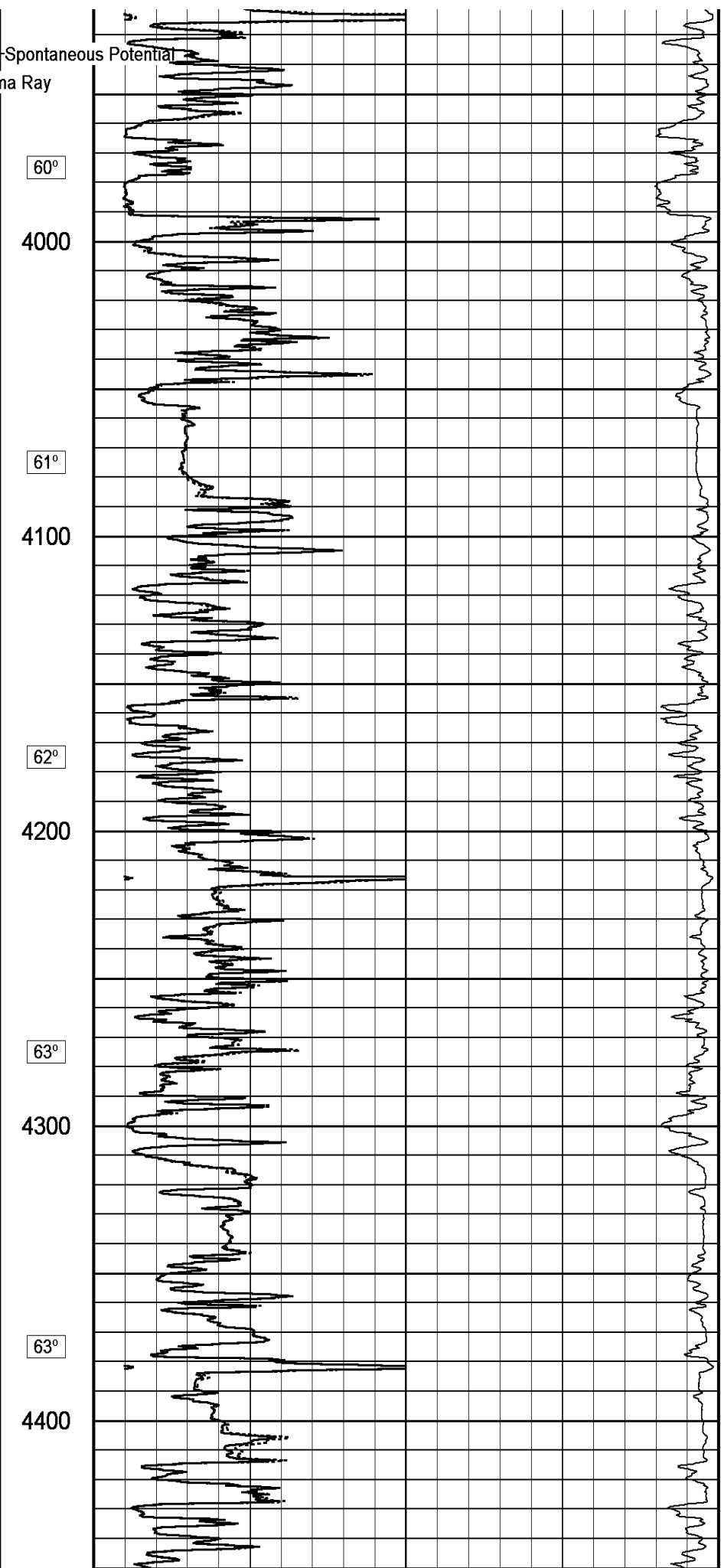
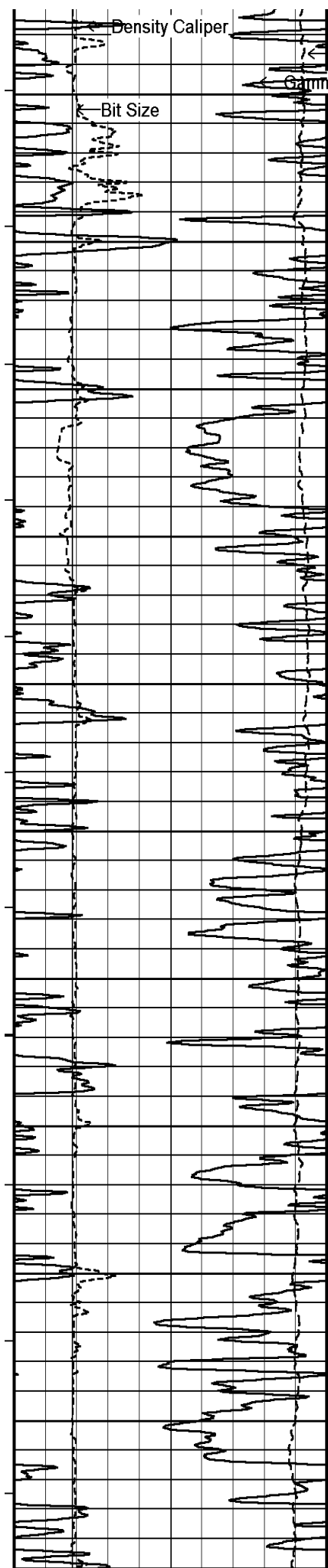
60°

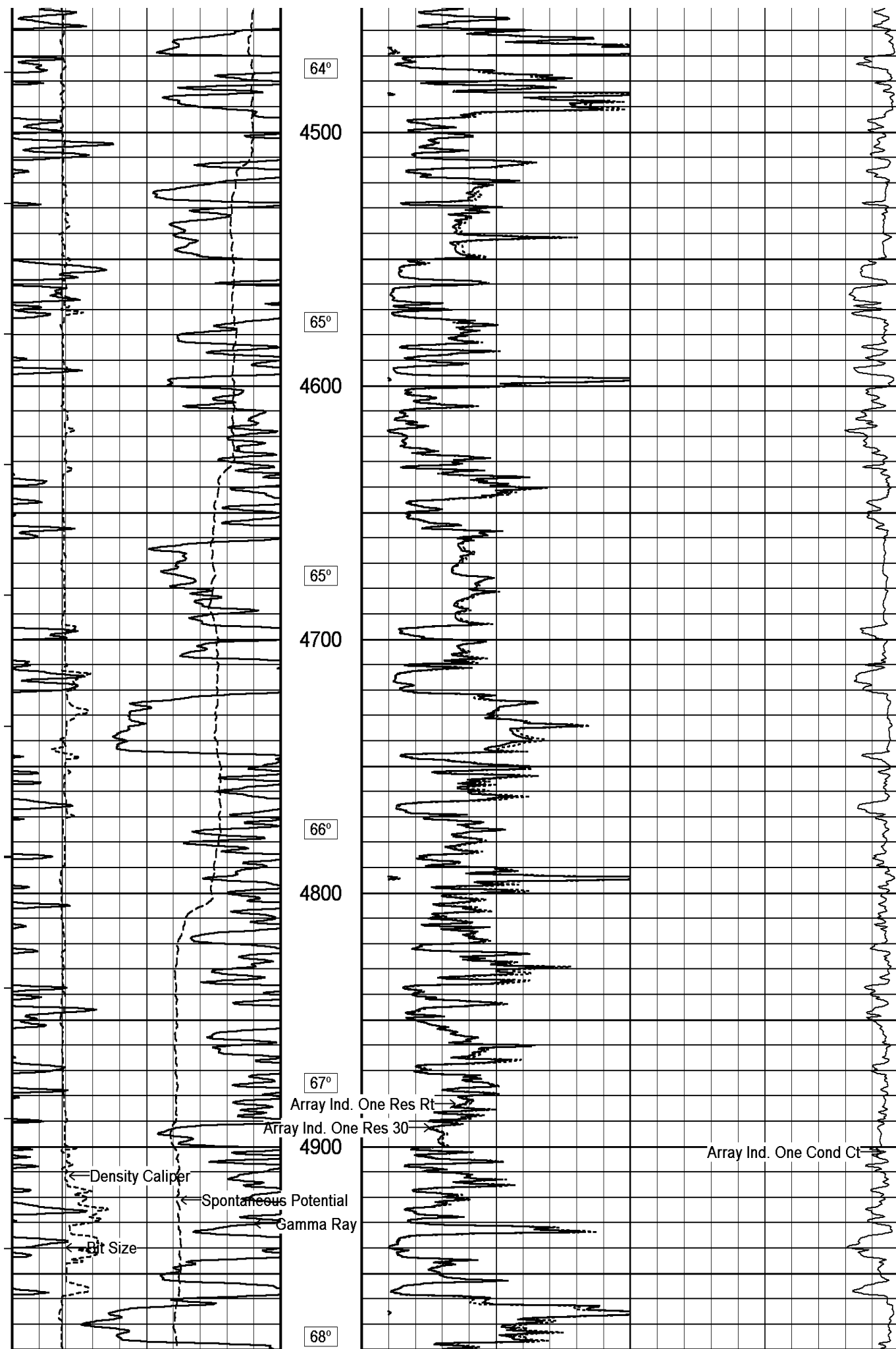
3900 One Res Rt

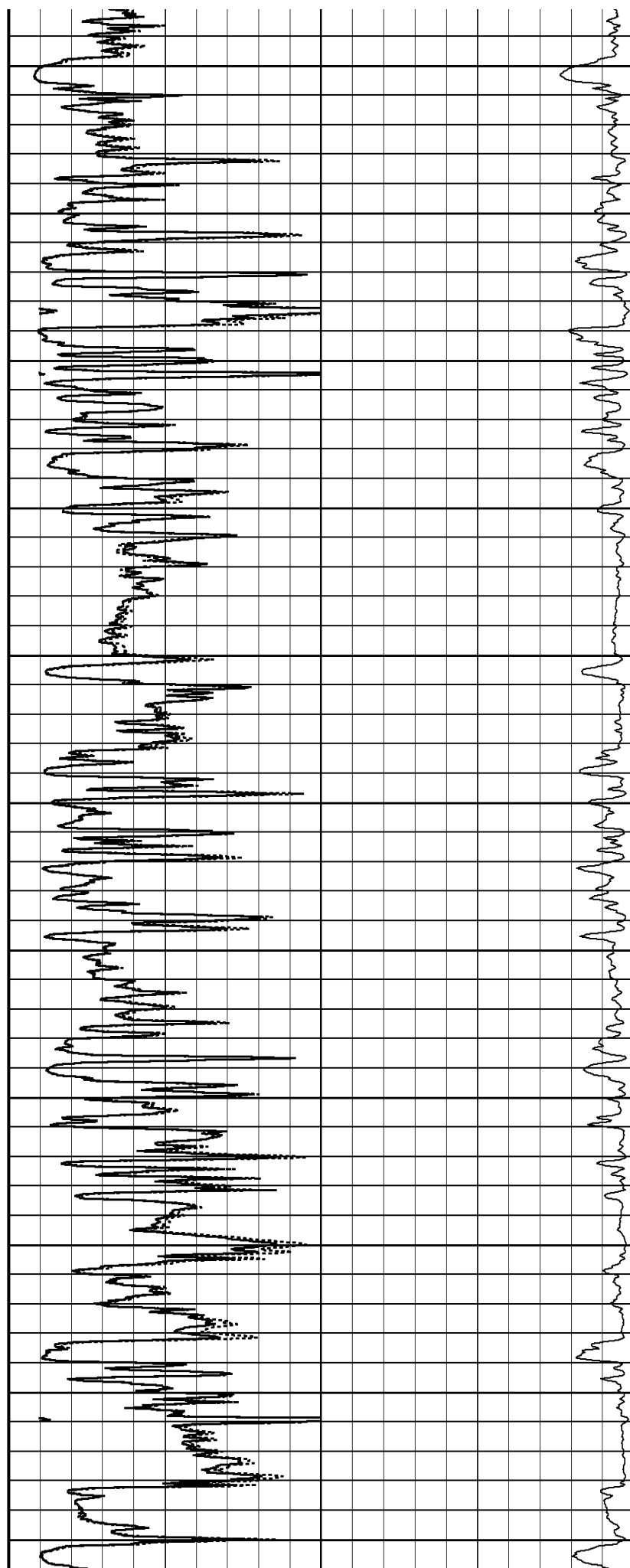
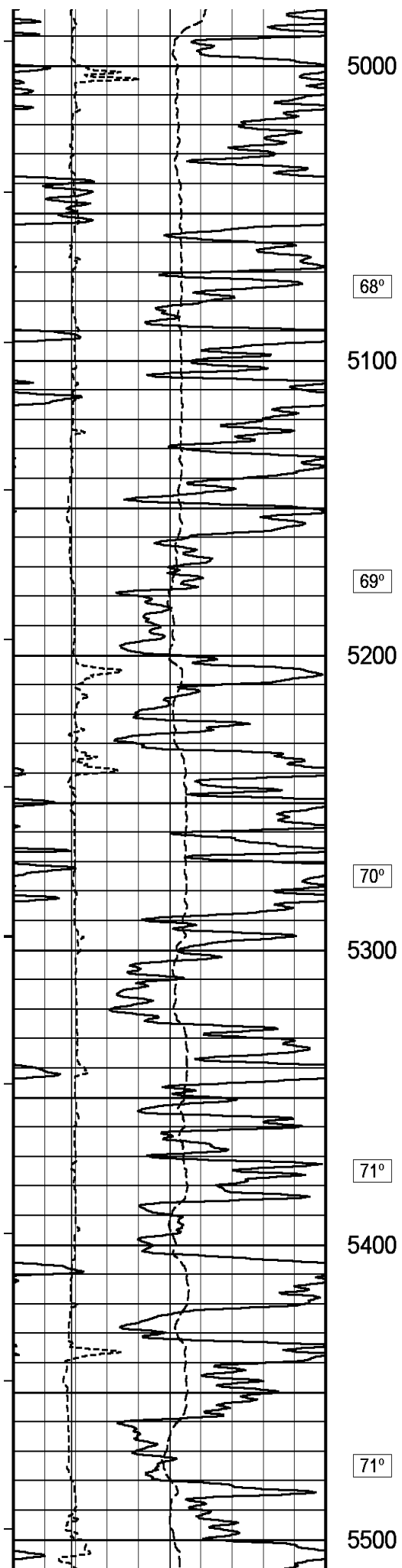


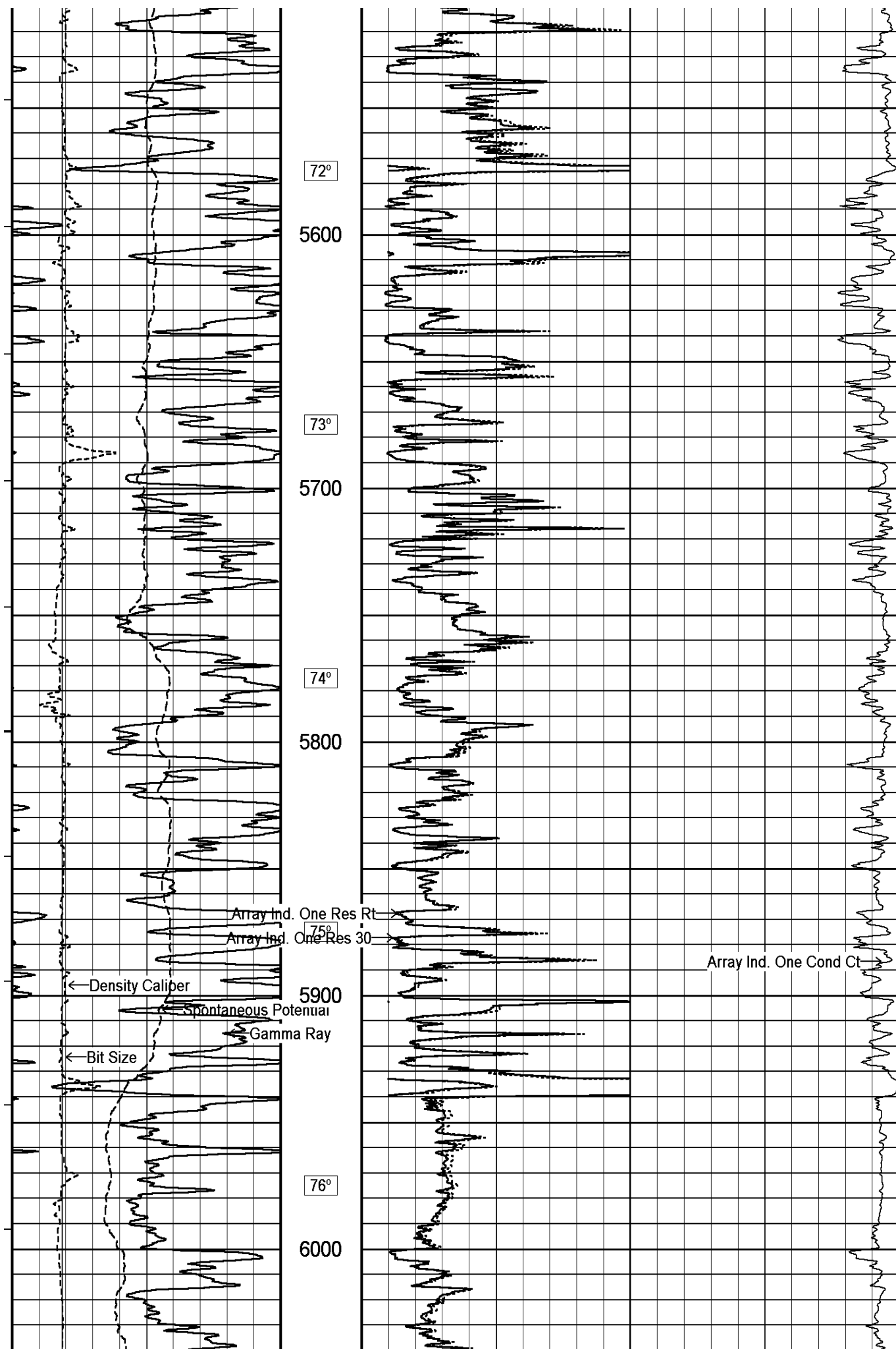
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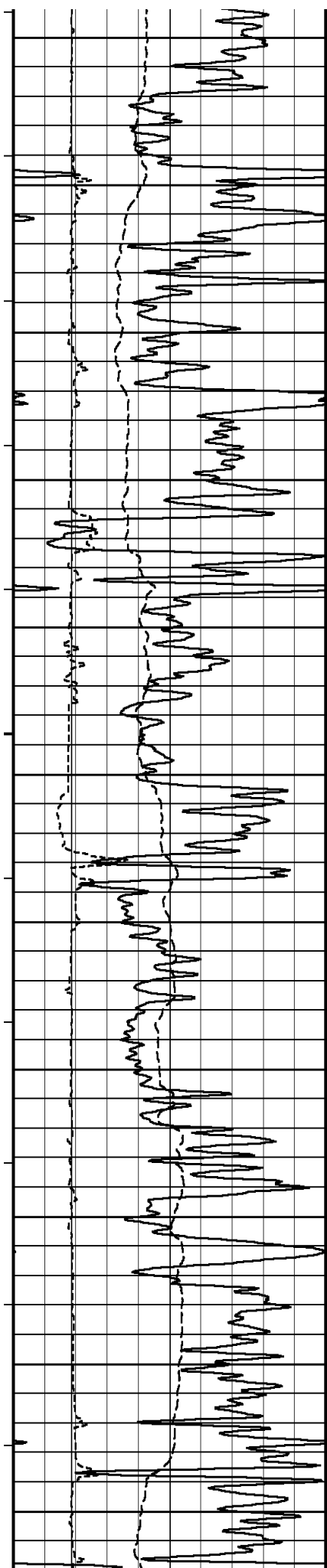
Array Ind. One Cond Ct











77°

6100

78°

6200

79°

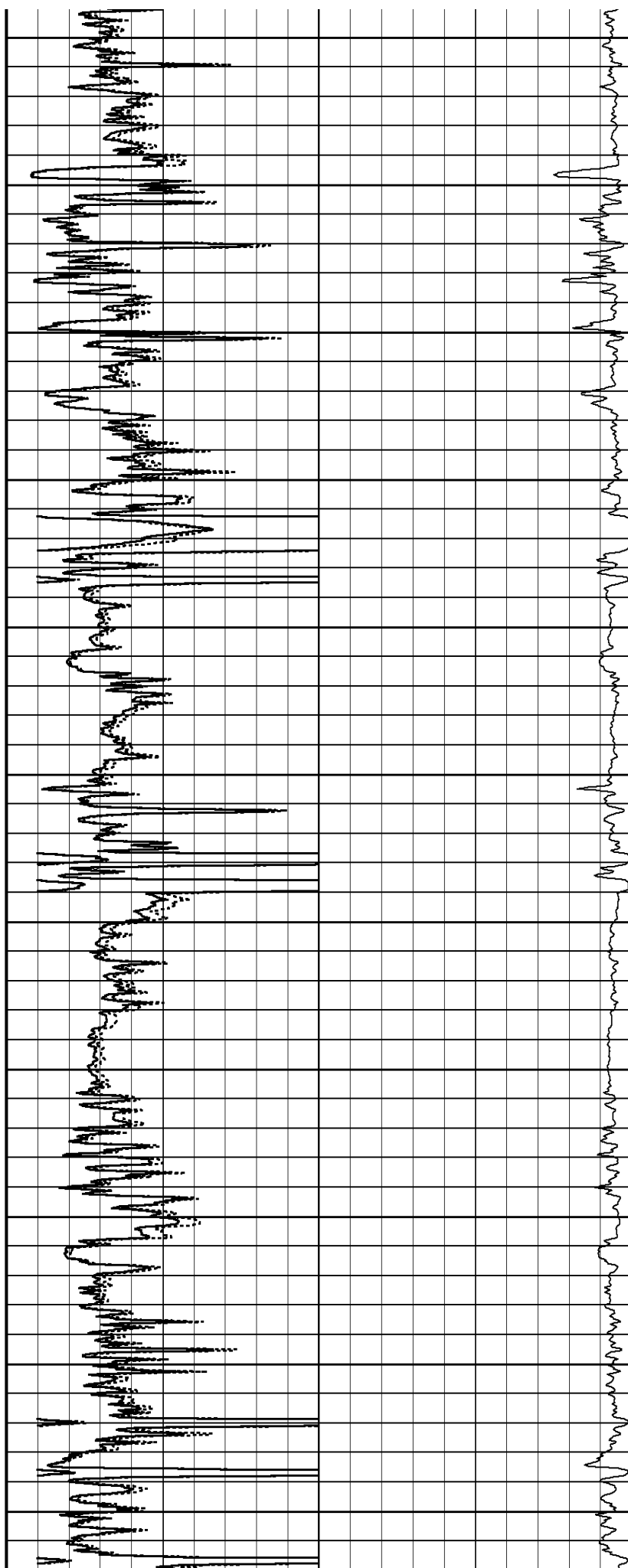
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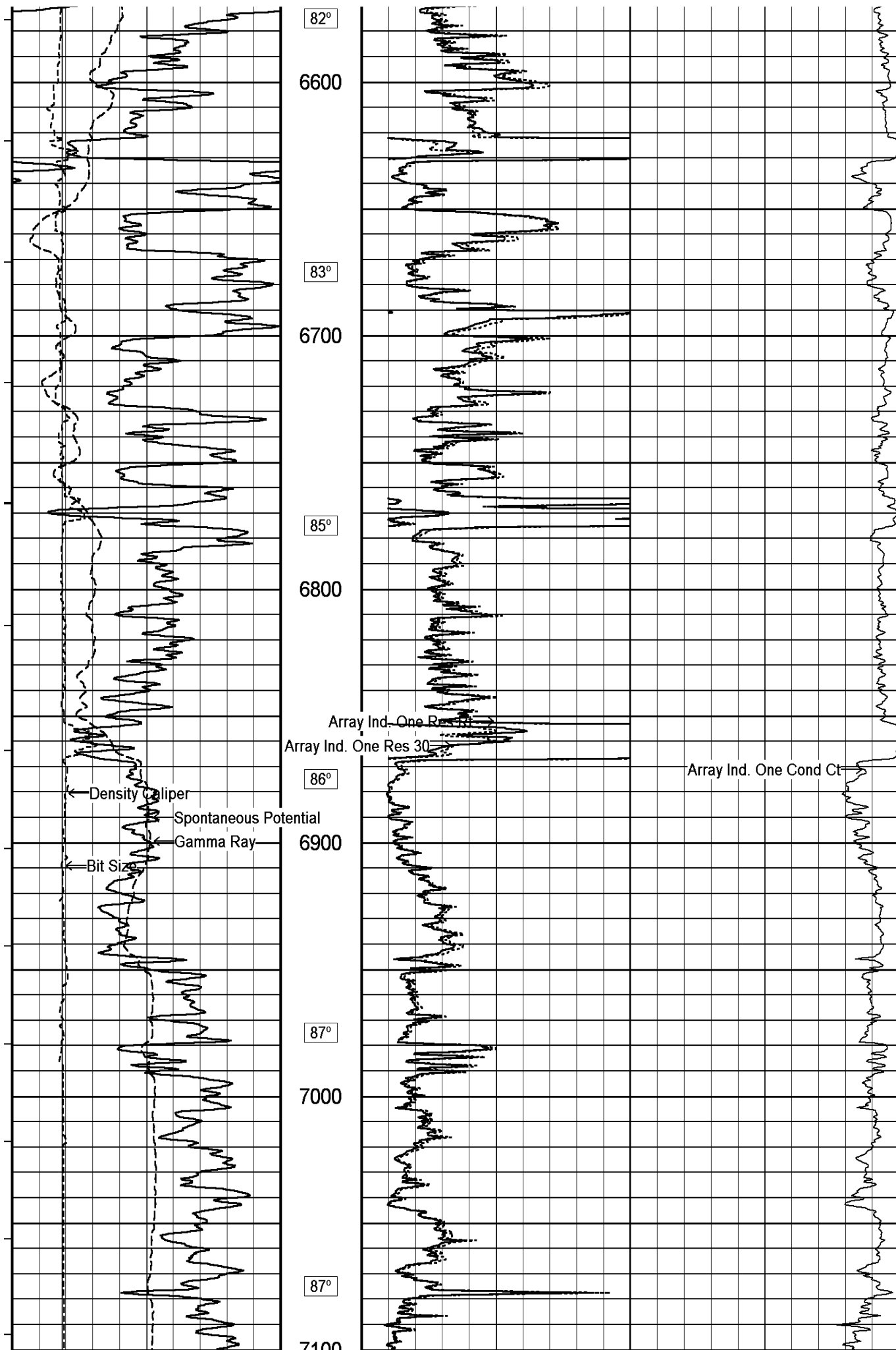
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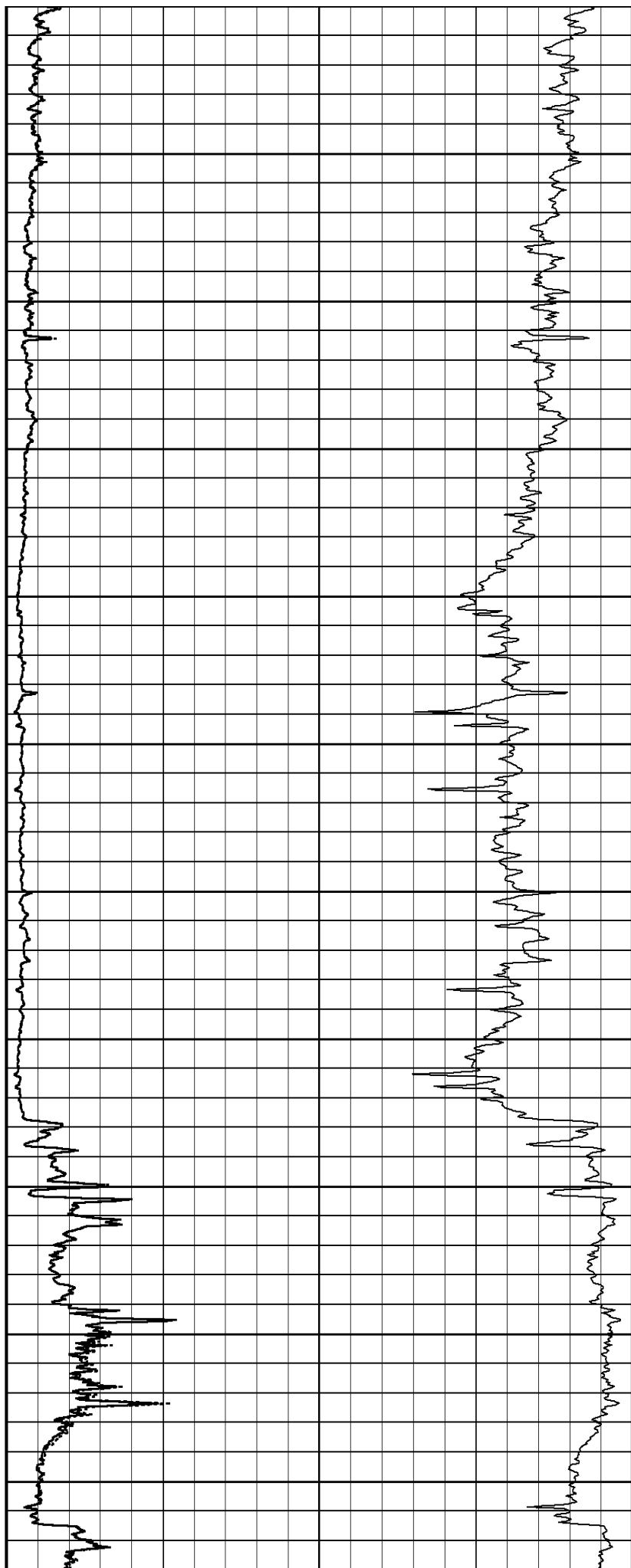
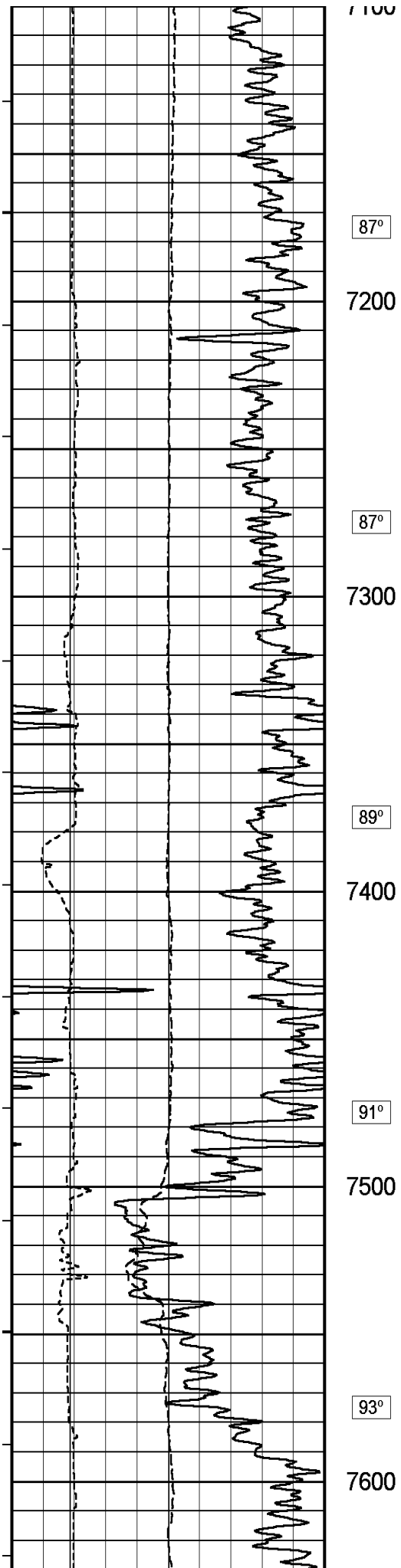
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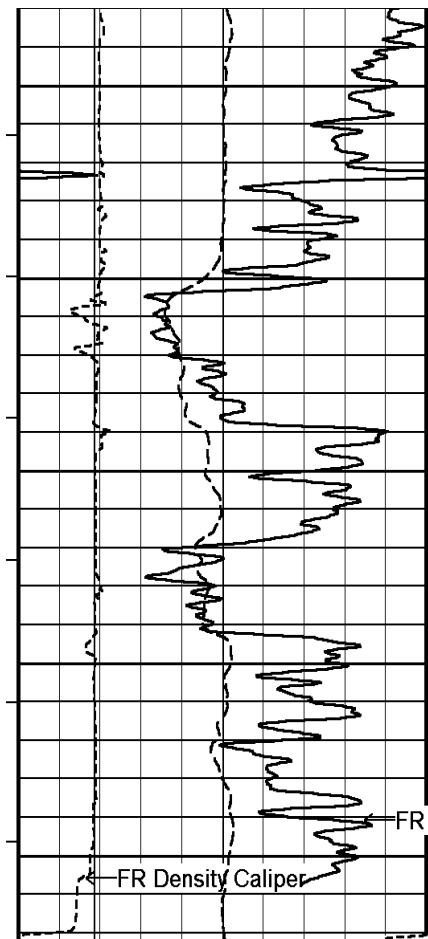
81°

6500









95°

7700

94°

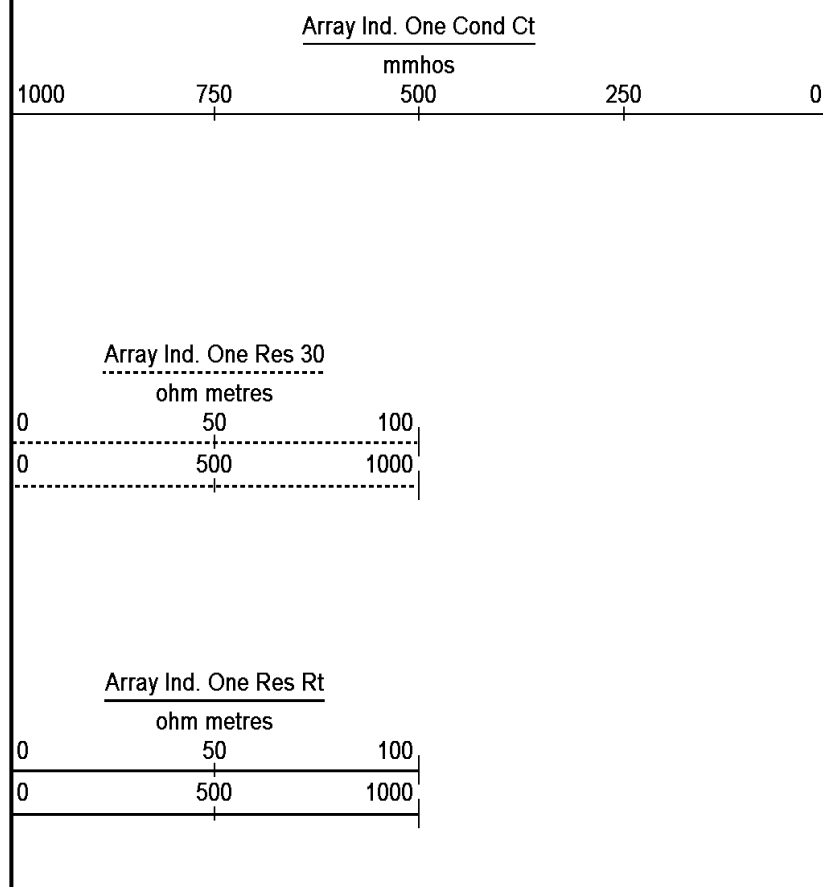
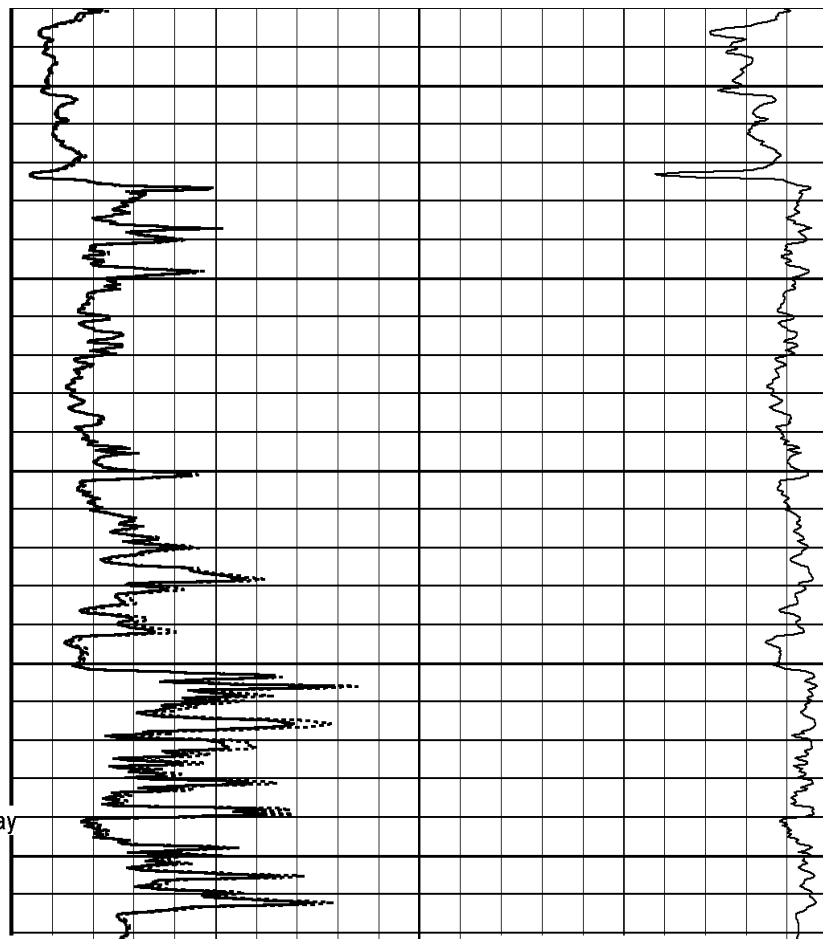
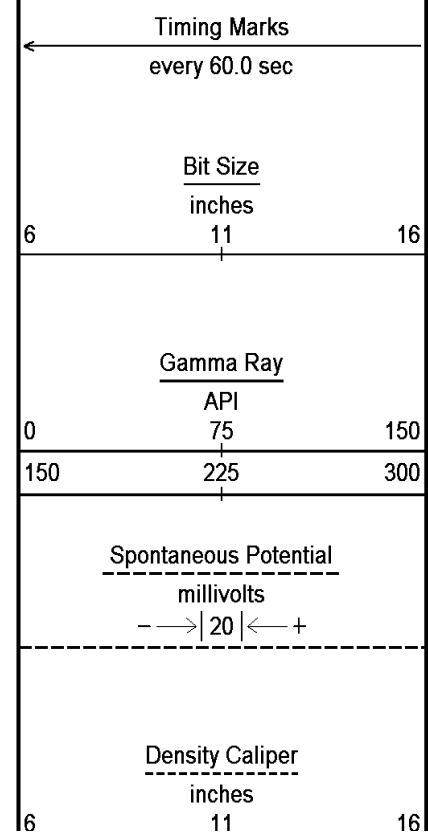
7800

7900

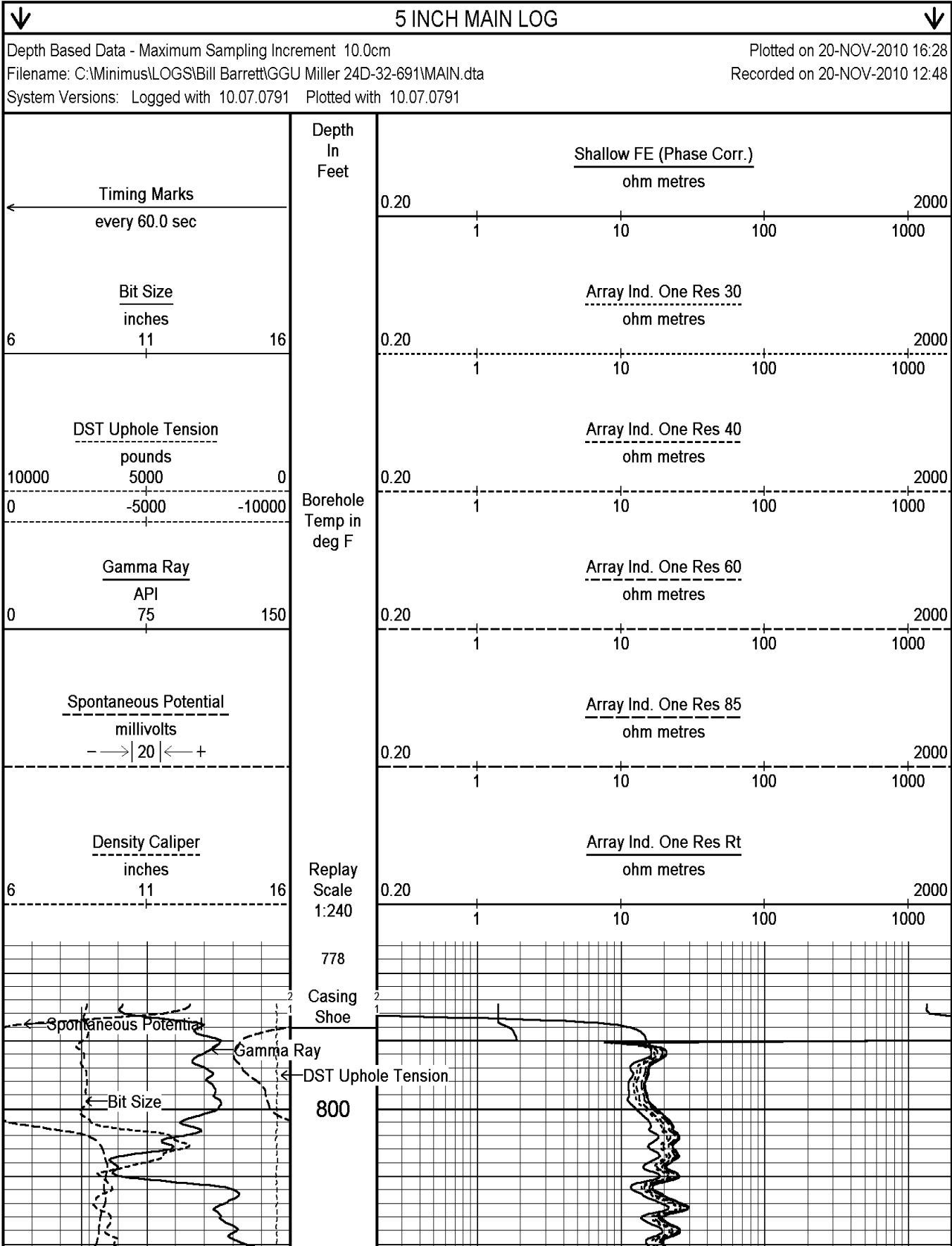
Depth
In
Feet

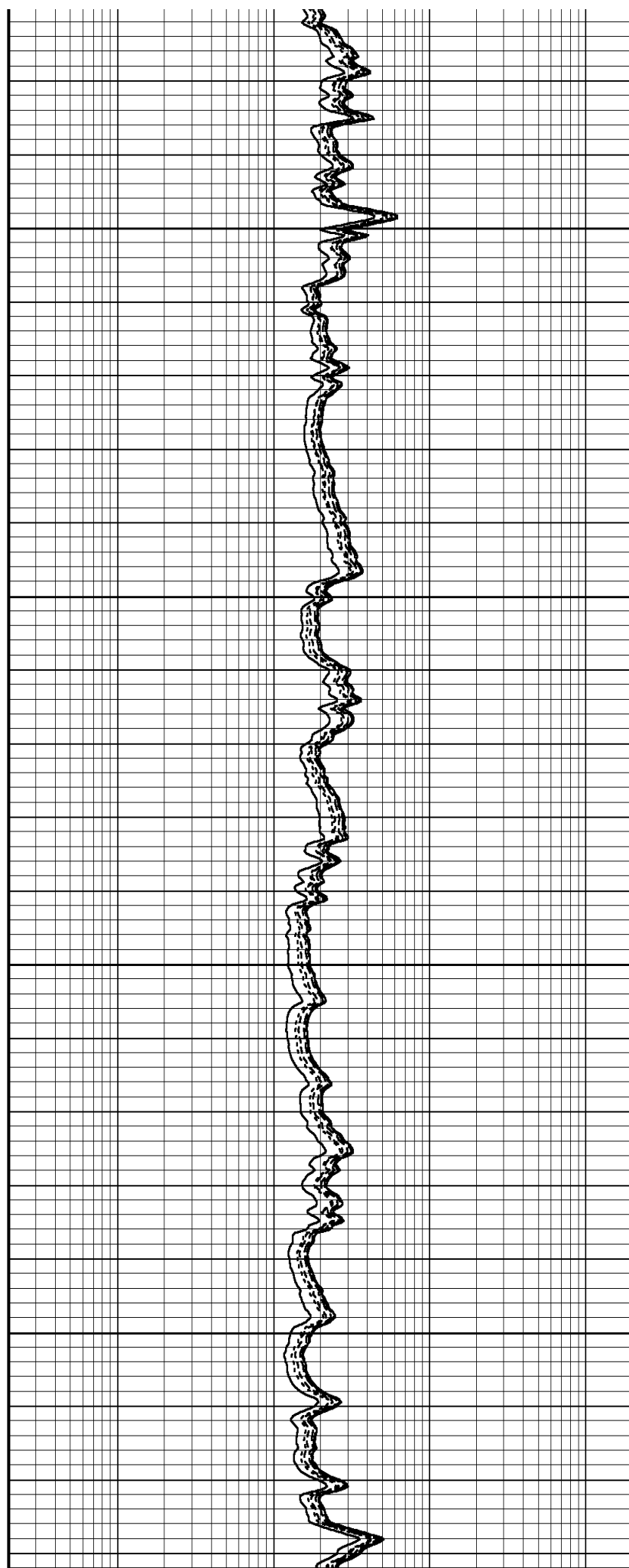
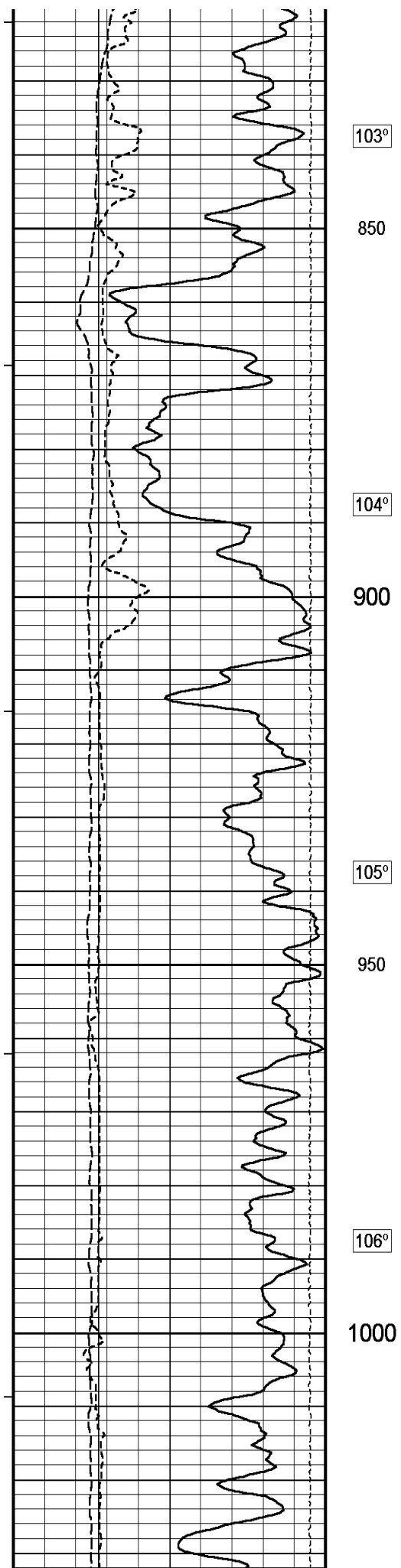
Borehole
Temp in
deg C

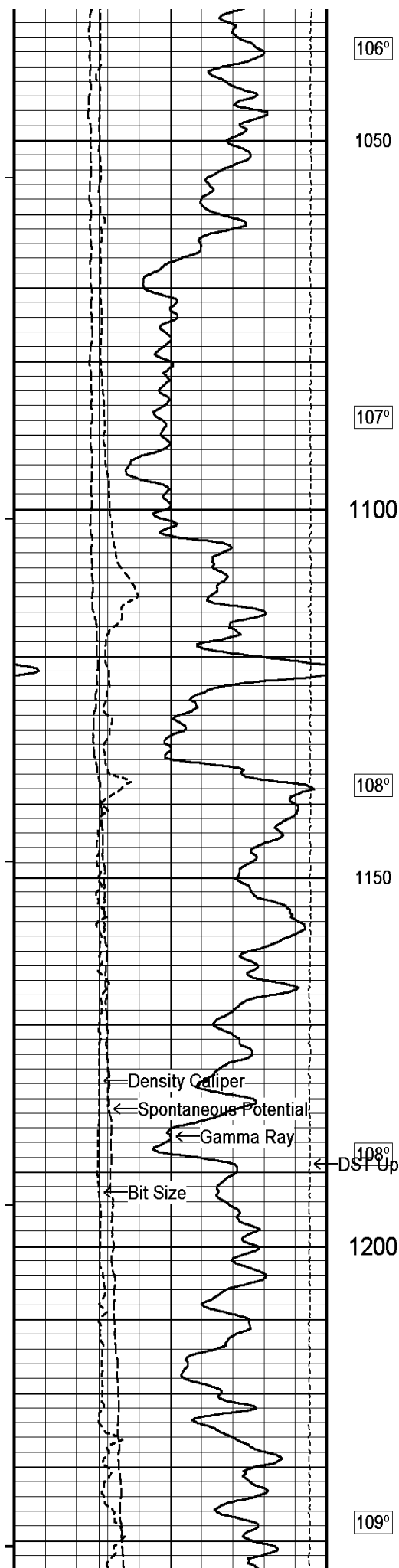
Replay
Scale



	1:600	
Depth Based Data - Maximum Sampling Increment 10.0cm		Plotted on 20-NOV-2010 16:28
Filename: C:\Minimus\LOGS\Bill Barrett\GGU Miller 24D-32-691\MAIN.dta		Recorded on 20-NOV-2010 12:48
System Versions: Logged with 10.07.0791 Plotted with 10.07.0791		
↑	2 INCH MAIN LOG	↑







106°

1050

107°

1100

108°

1150

108°

1200

109°

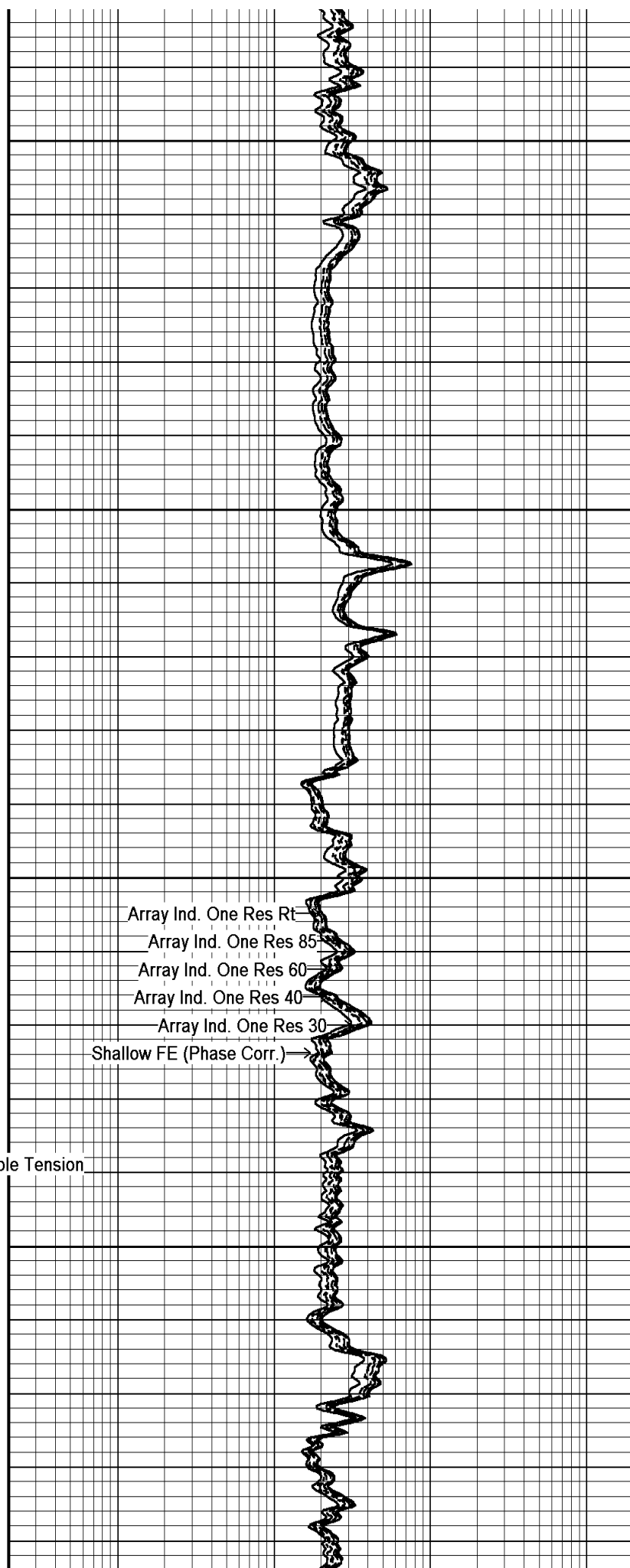
Density Caliper

Spontaneous Potential

Gamma Ray

Bit Size

DST Uphole Tension



Array Ind. One Res Rt

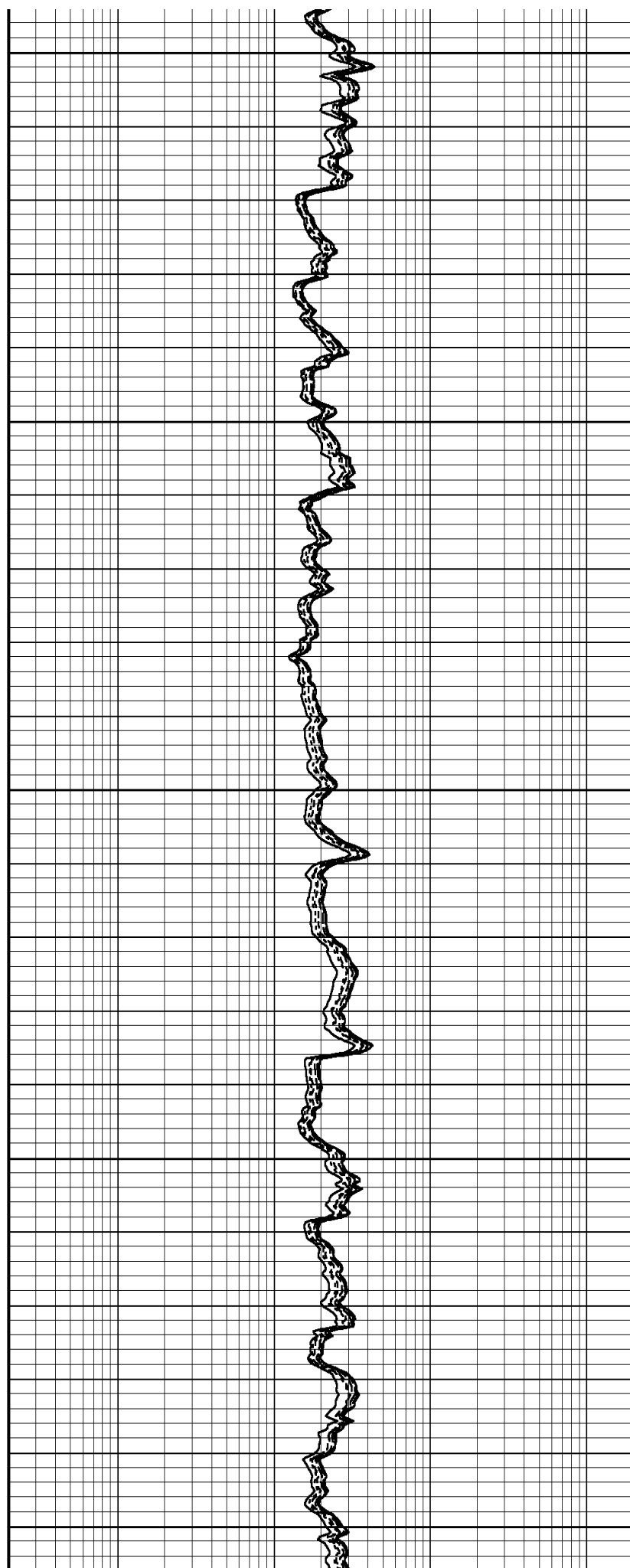
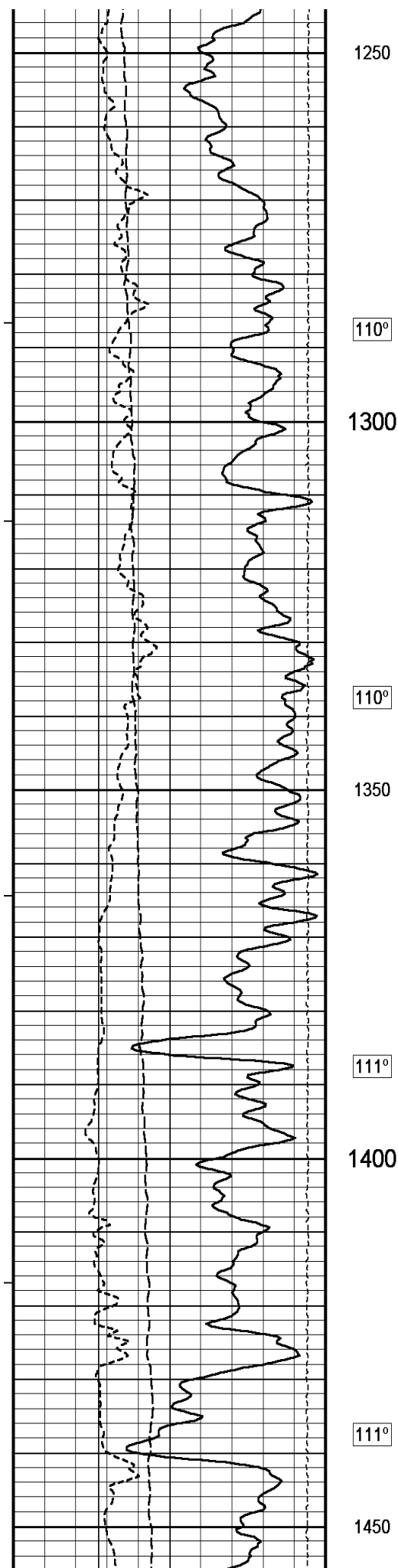
Array Ind. One Res 85

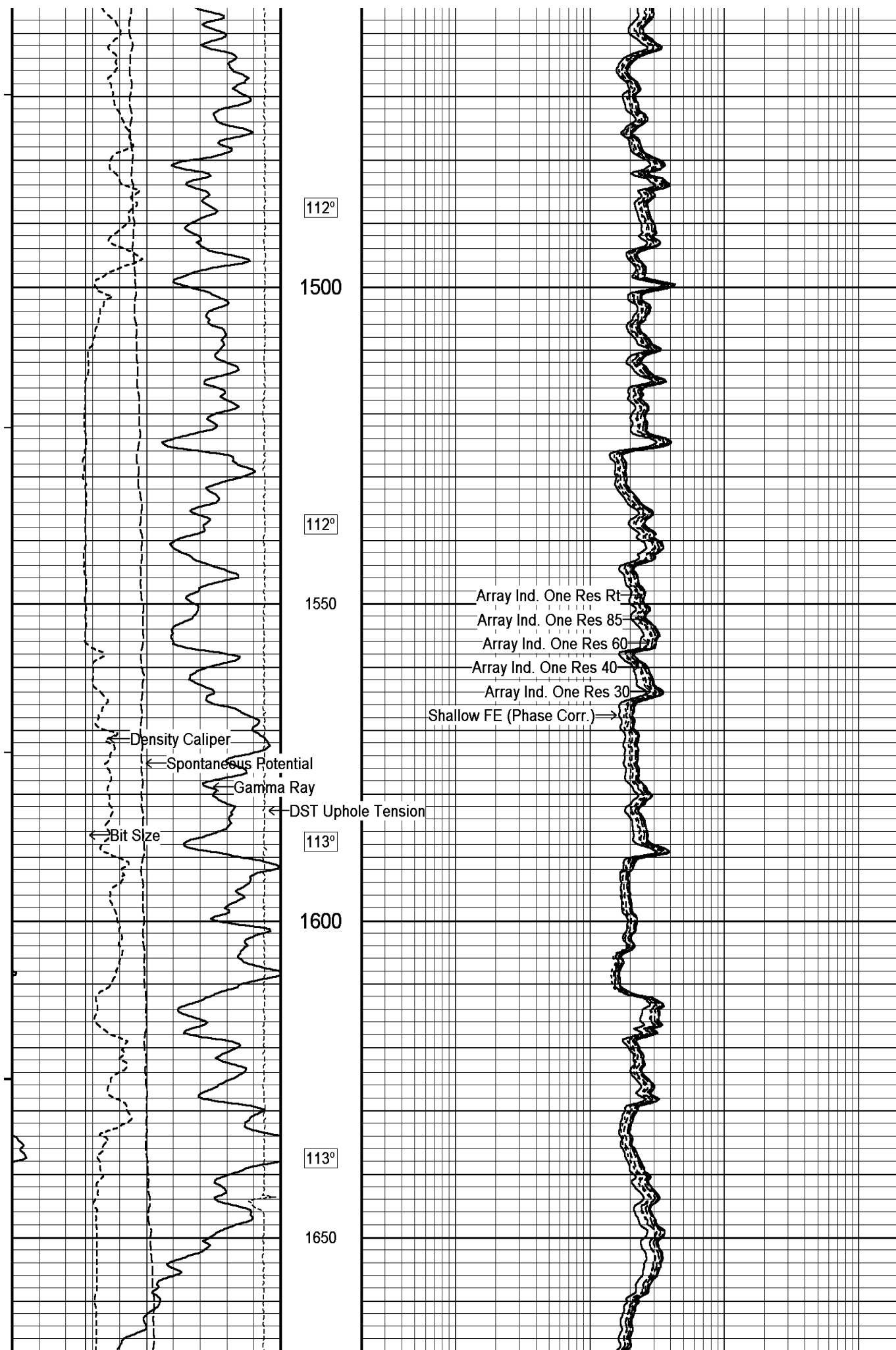
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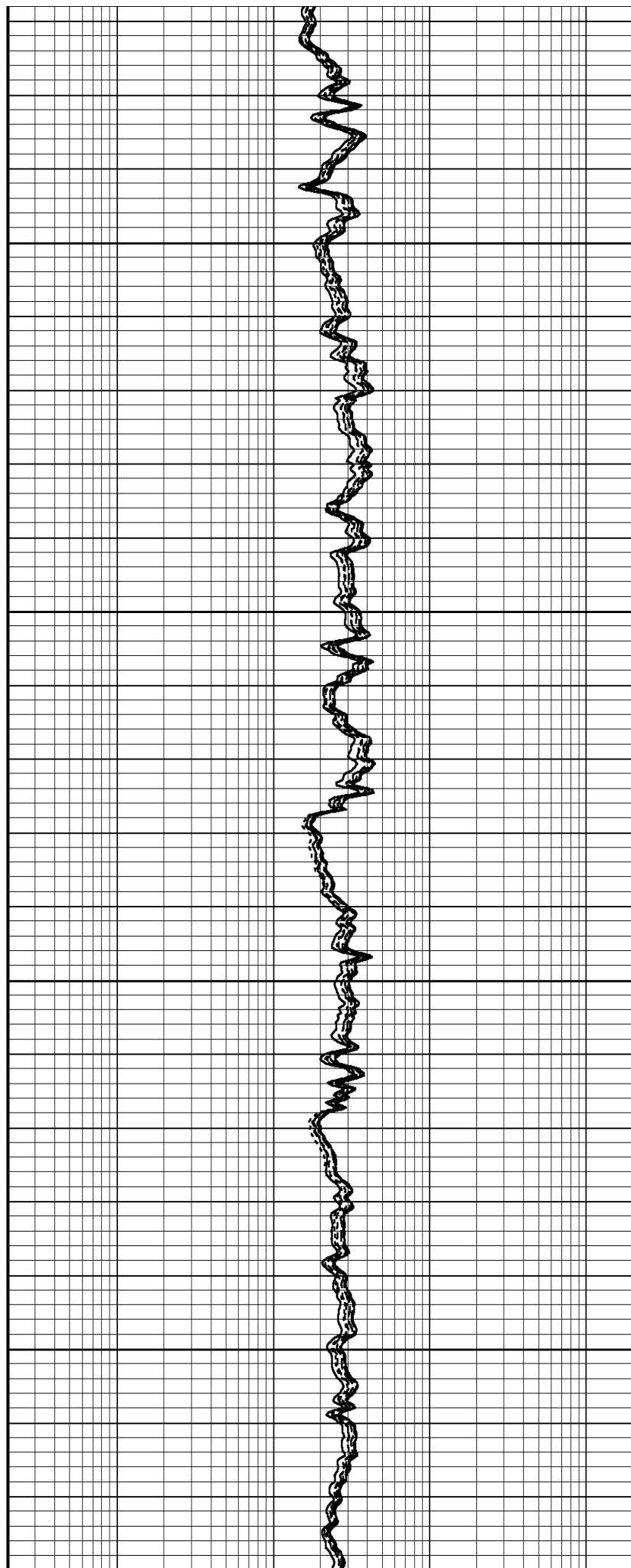
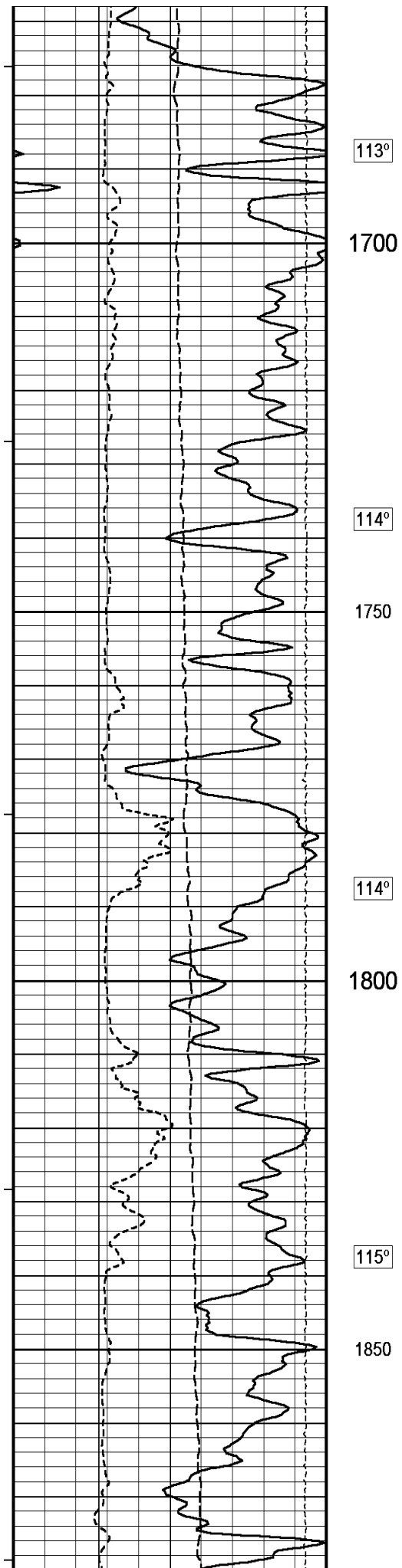
Array Ind. One Res 40

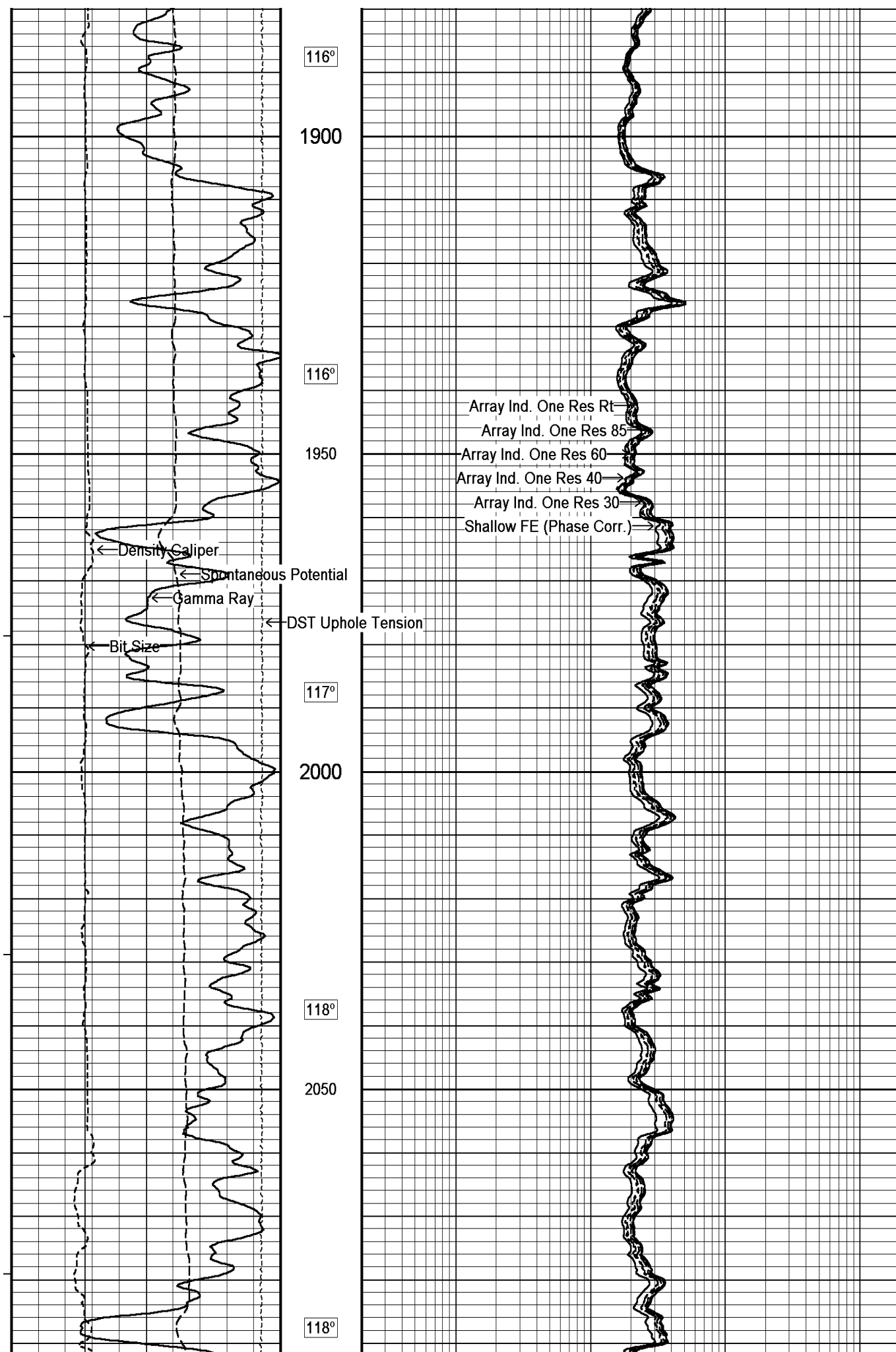
Array Ind. One Res 30

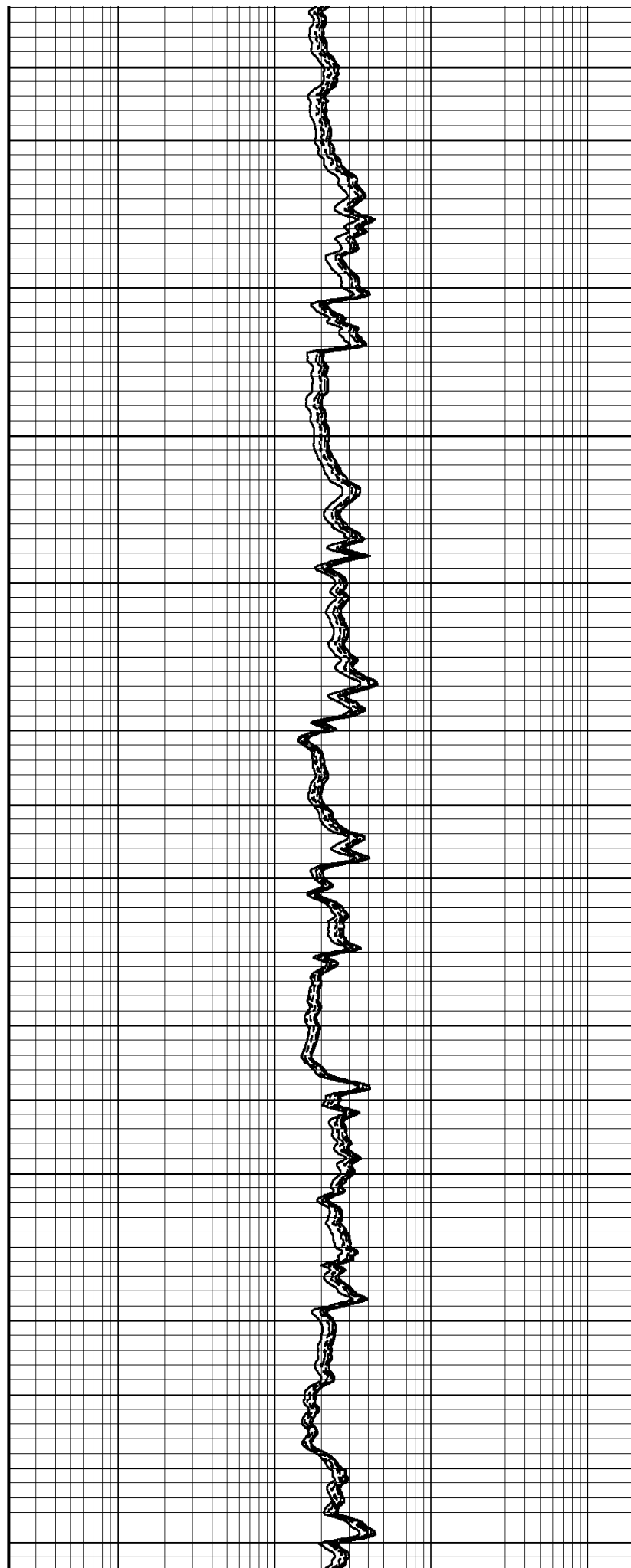
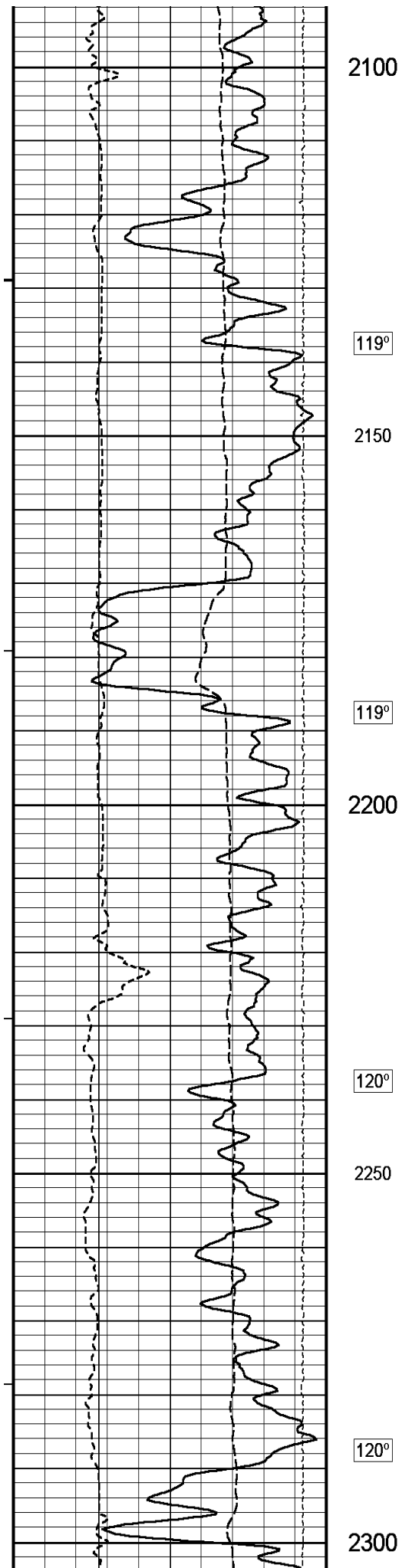
Shallow FE (Phase Corr.)

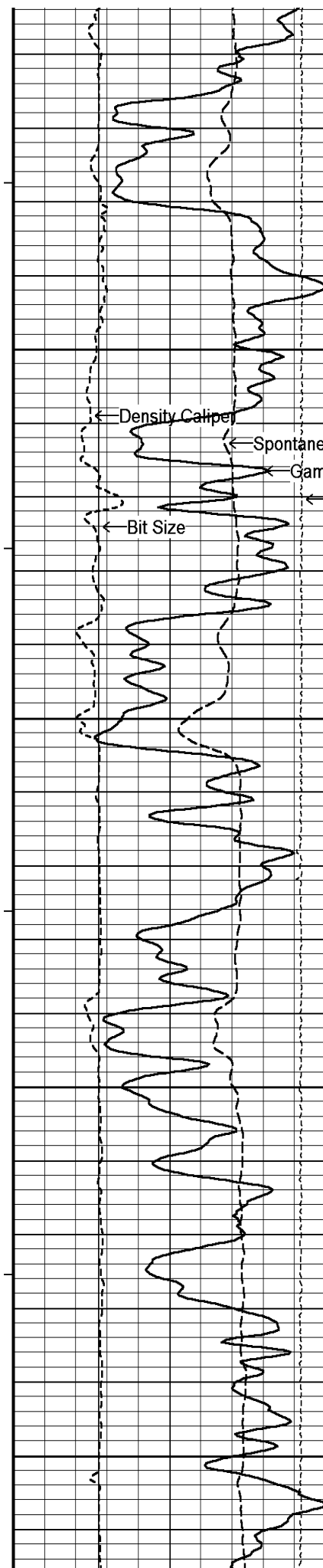












121°

2350

122°

2400

122°

2450

123°

2500

Density Caliper

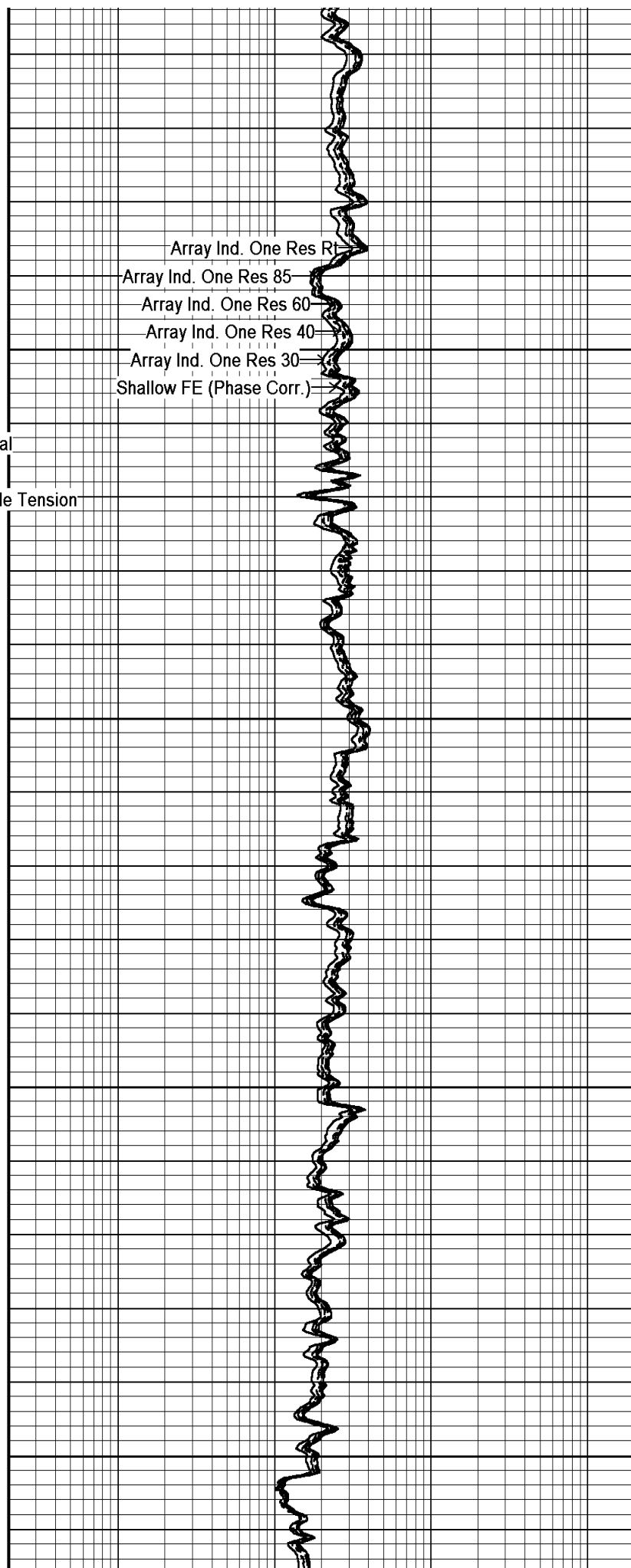
Spontaneous Potential

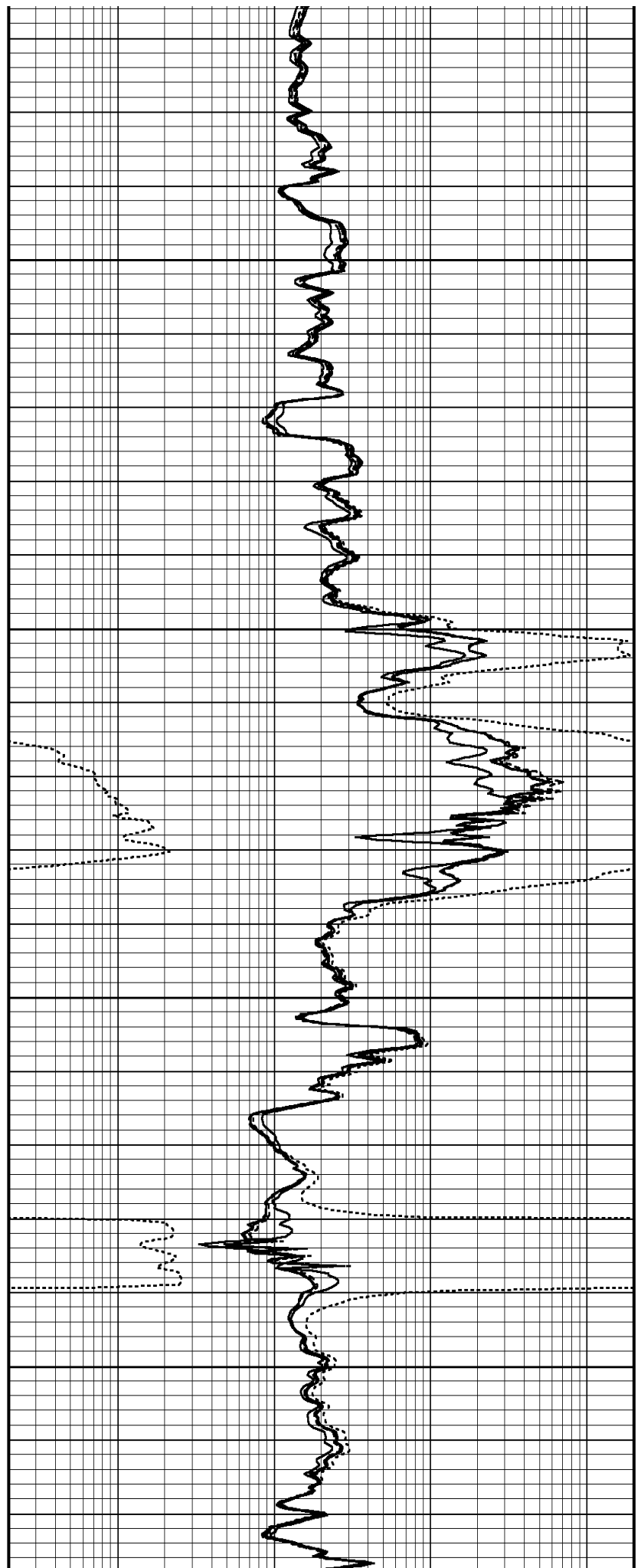
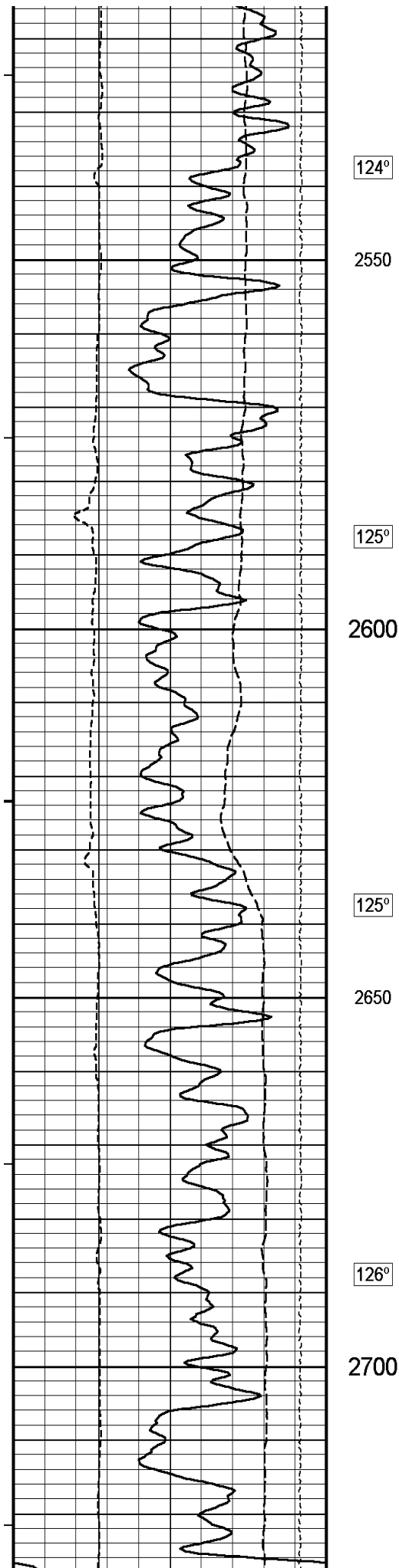
Gamma Ray

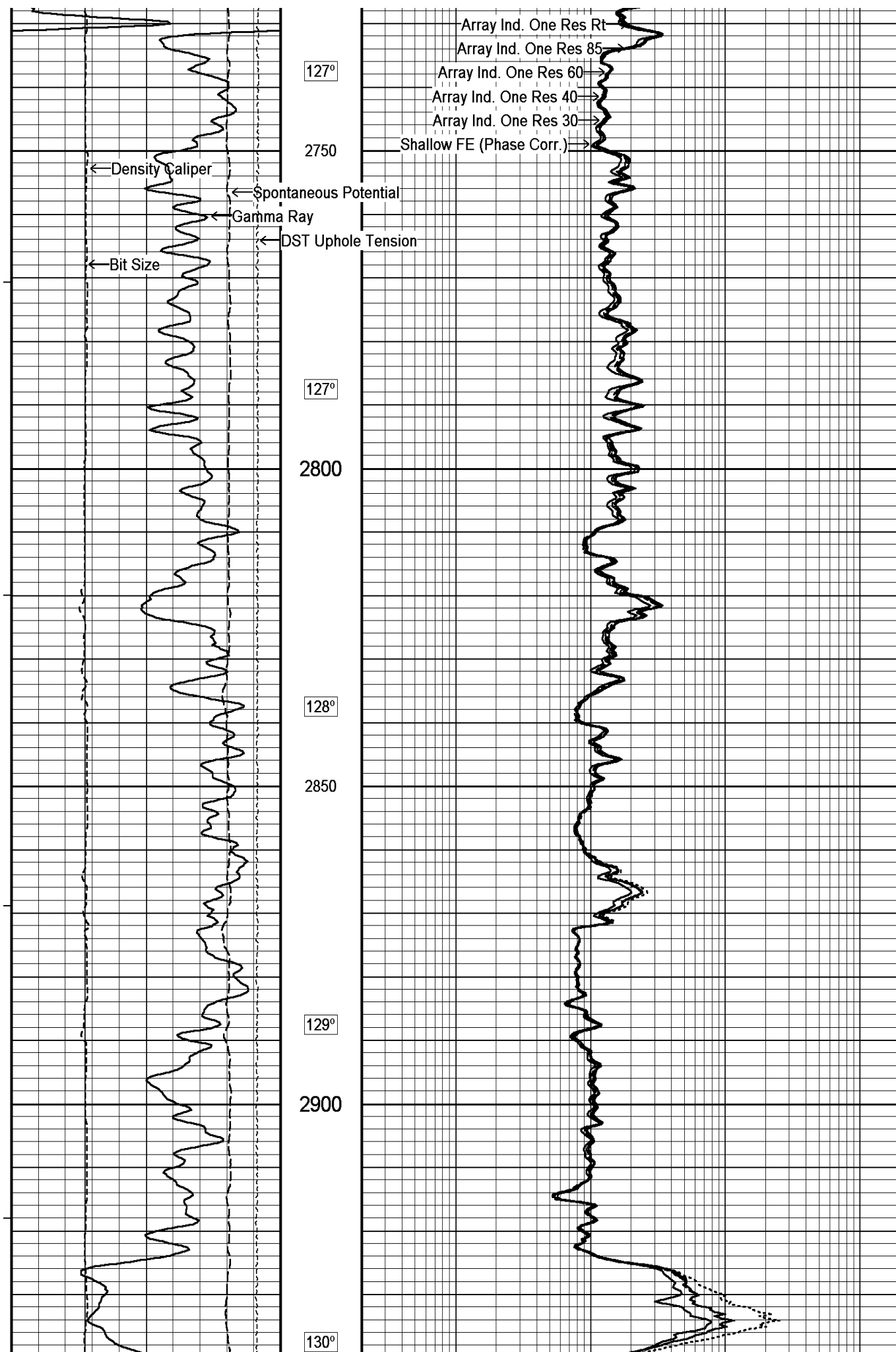
DST Uphole Tension

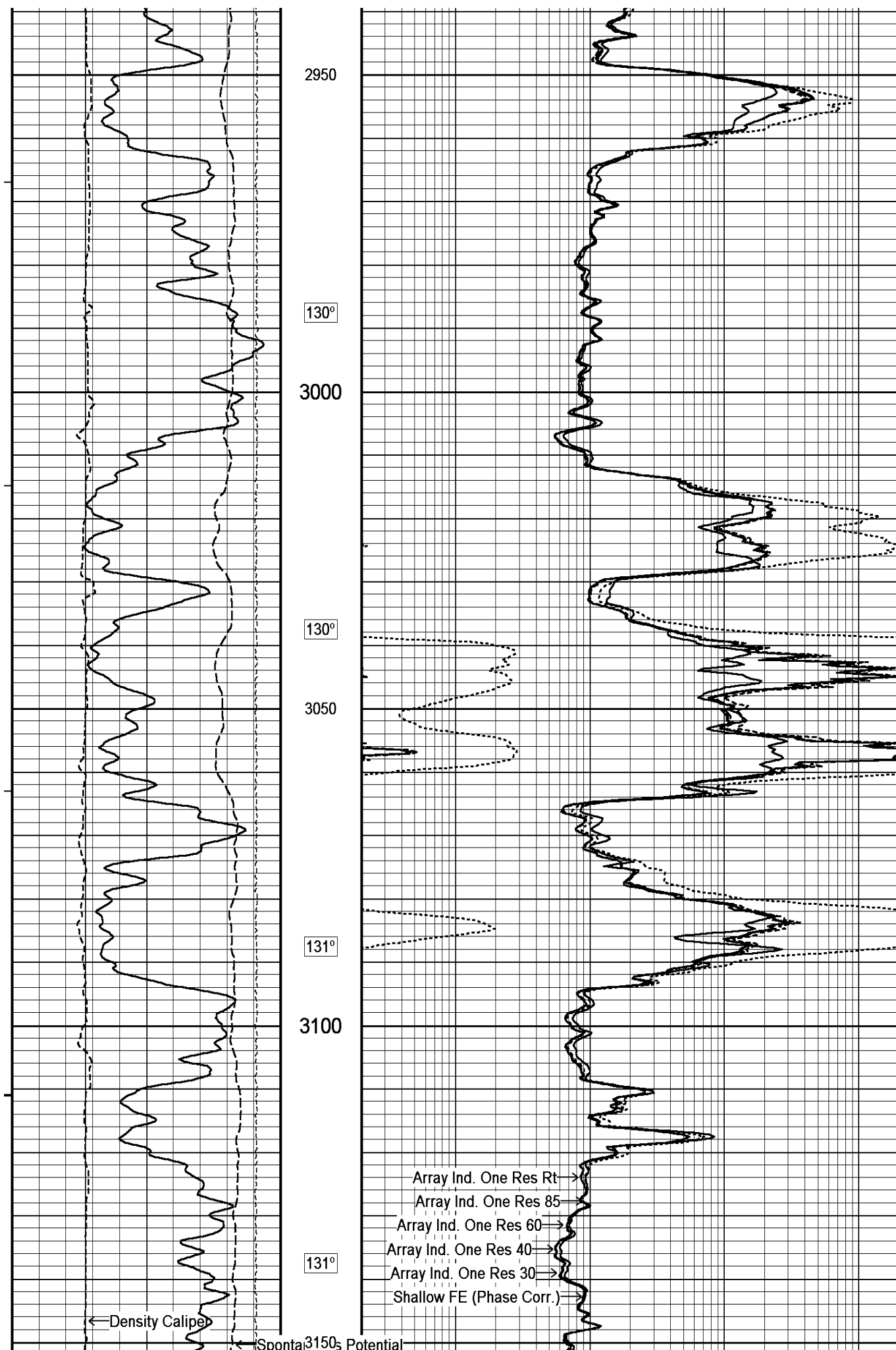
Bit Size

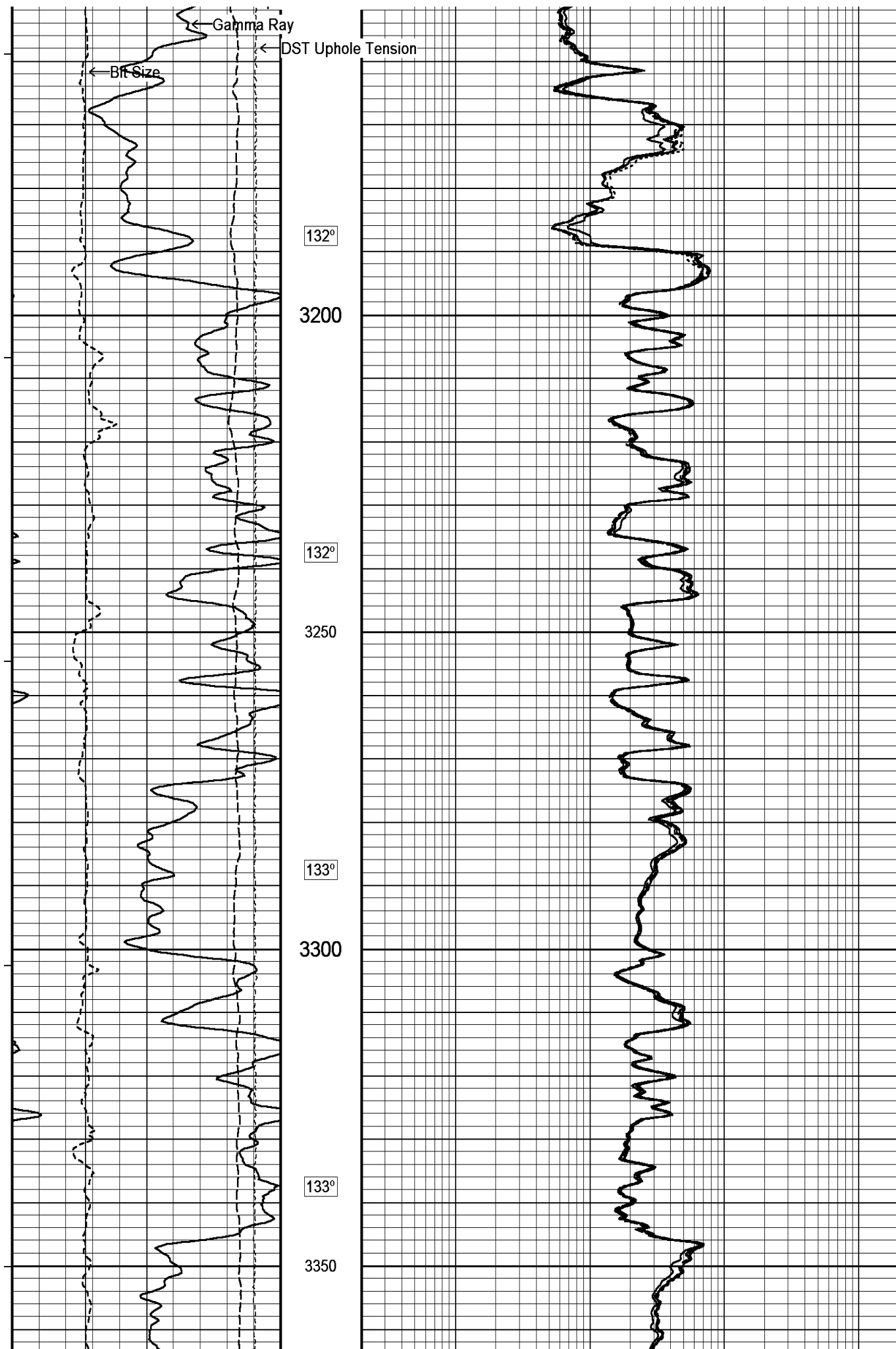
Array Ind. One Res Rt
Array Ind. One Res 85
Array Ind. One Res 60
Array Ind. One Res 40
Array Ind. One Res 30
Shallow FE (Phase Corr.)

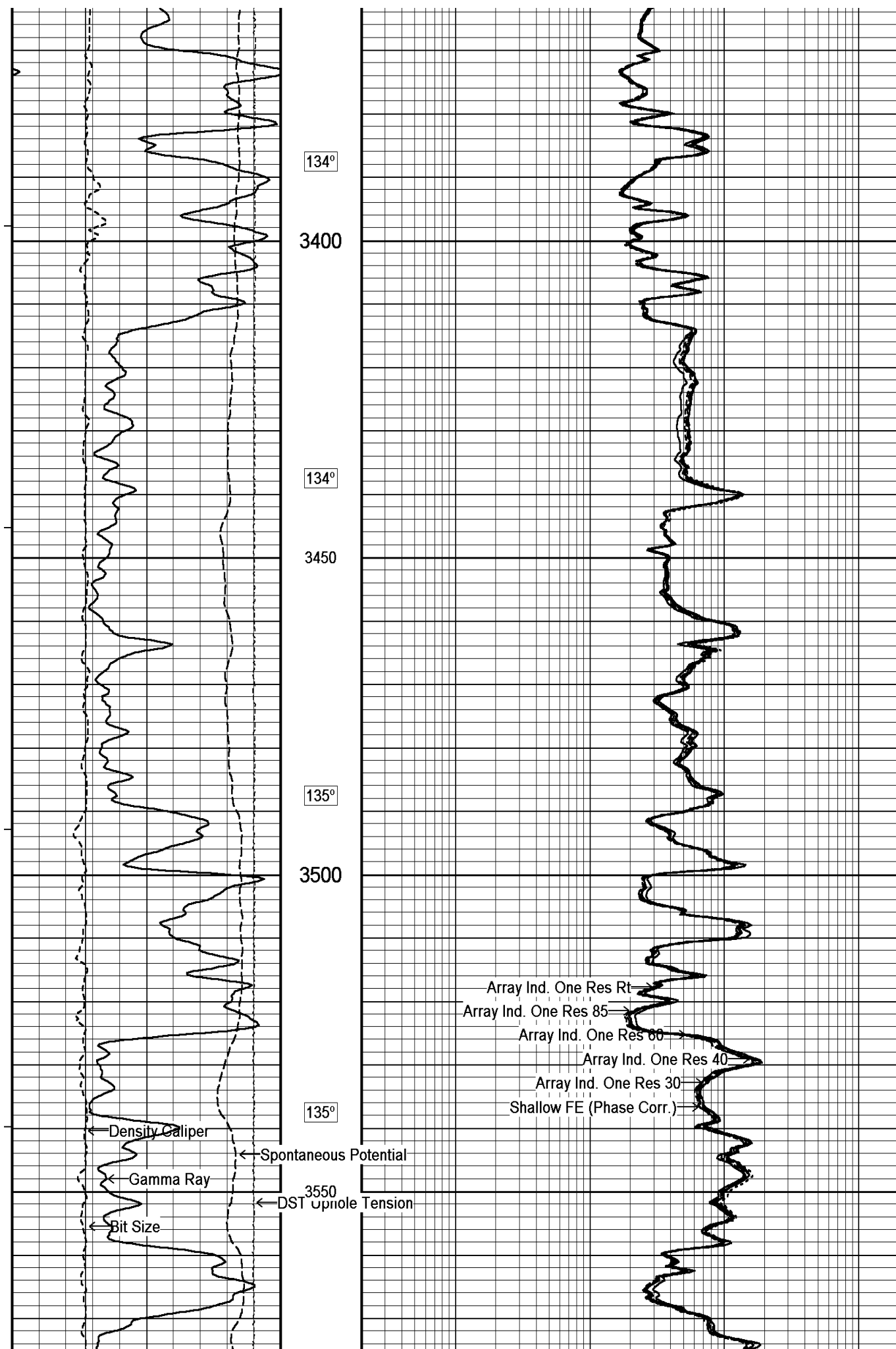


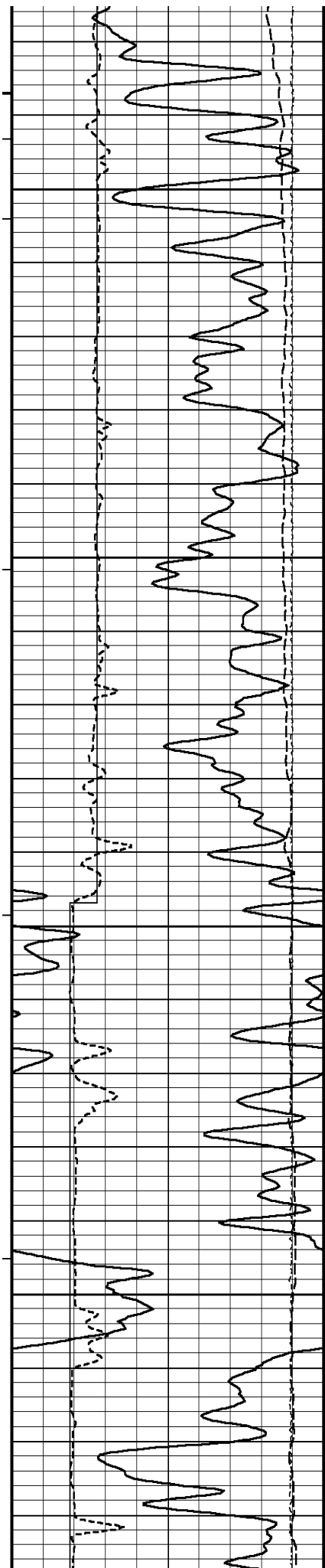












136°

3600

137°

3650

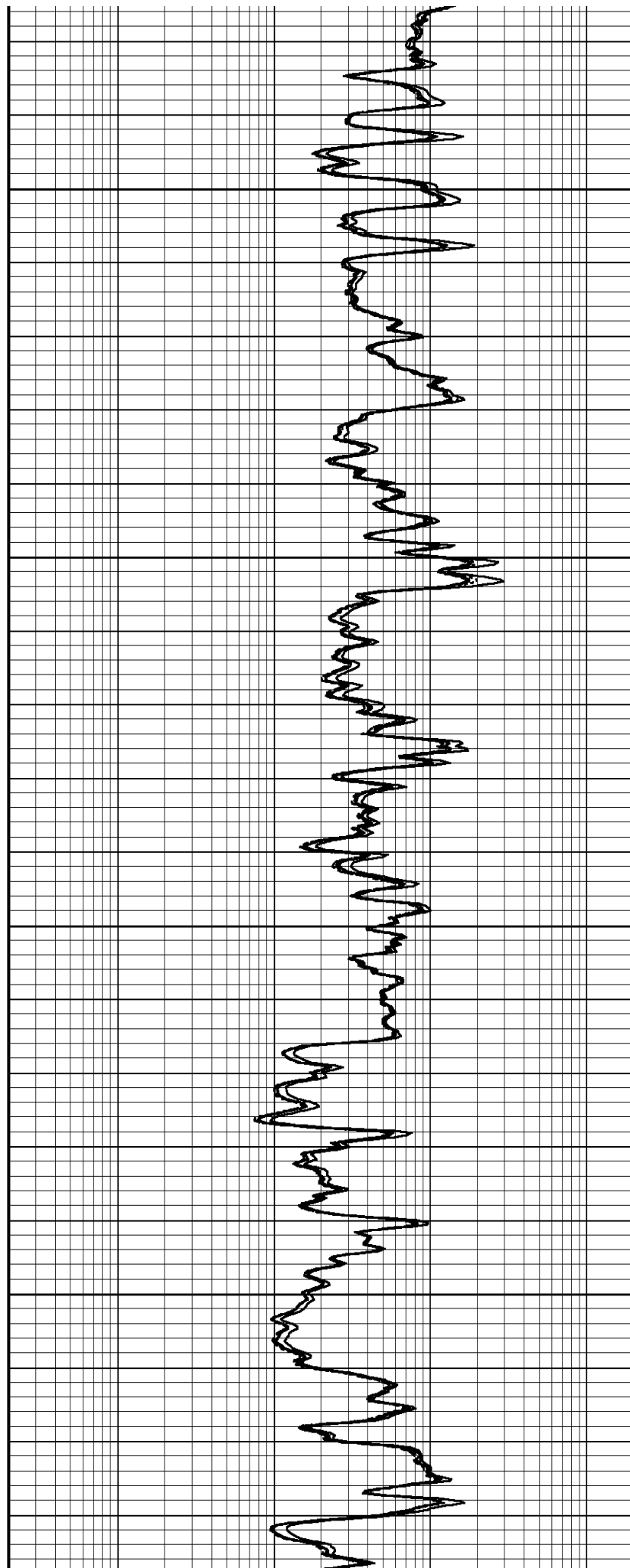
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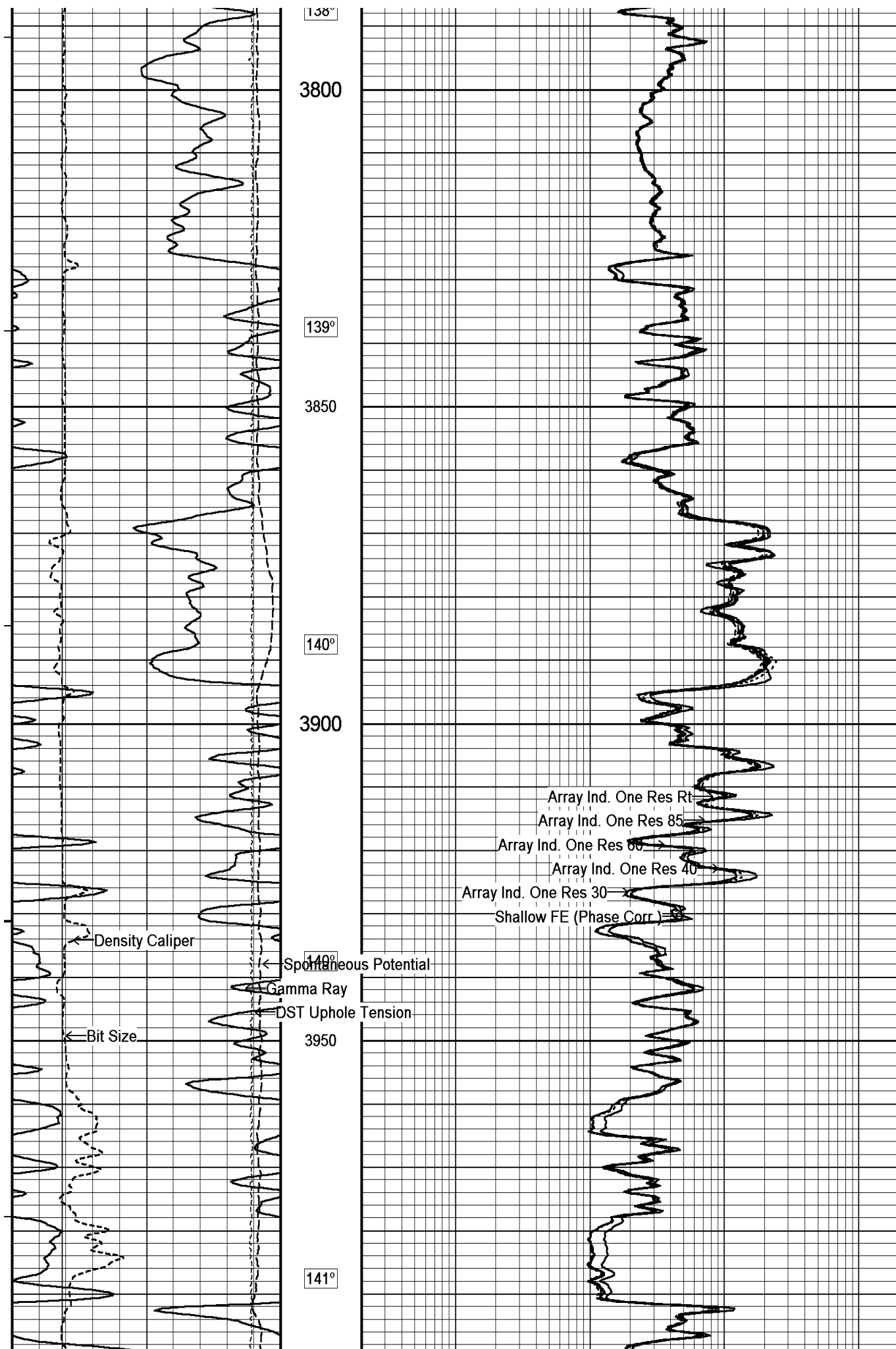
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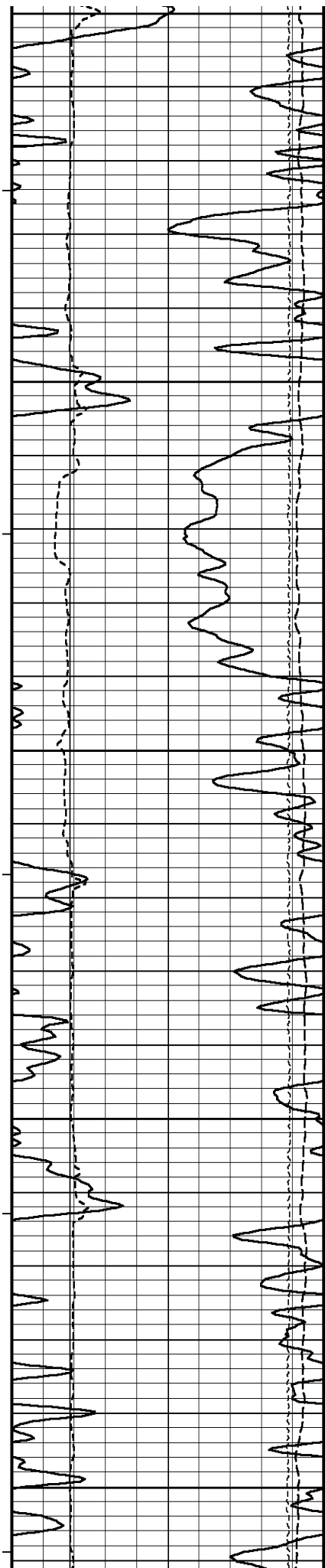
138°

3750

4000







4000

142°

4050

142°

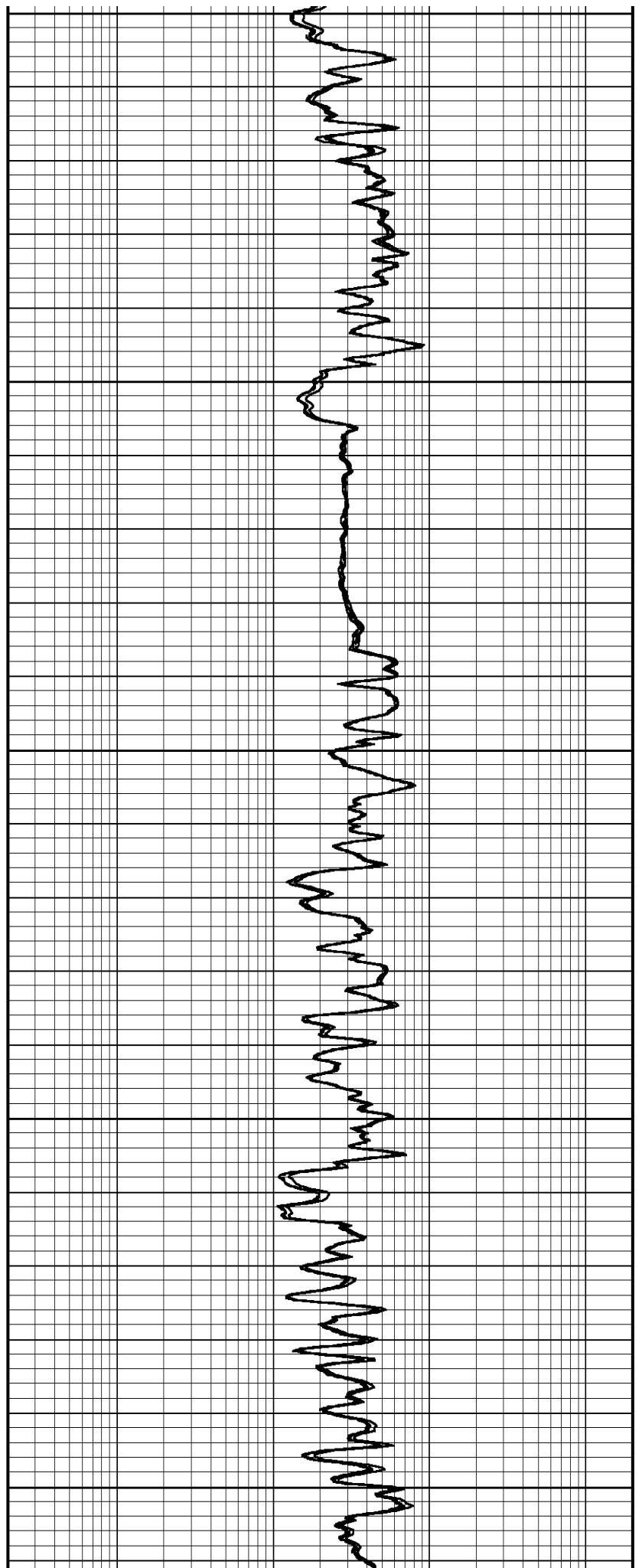
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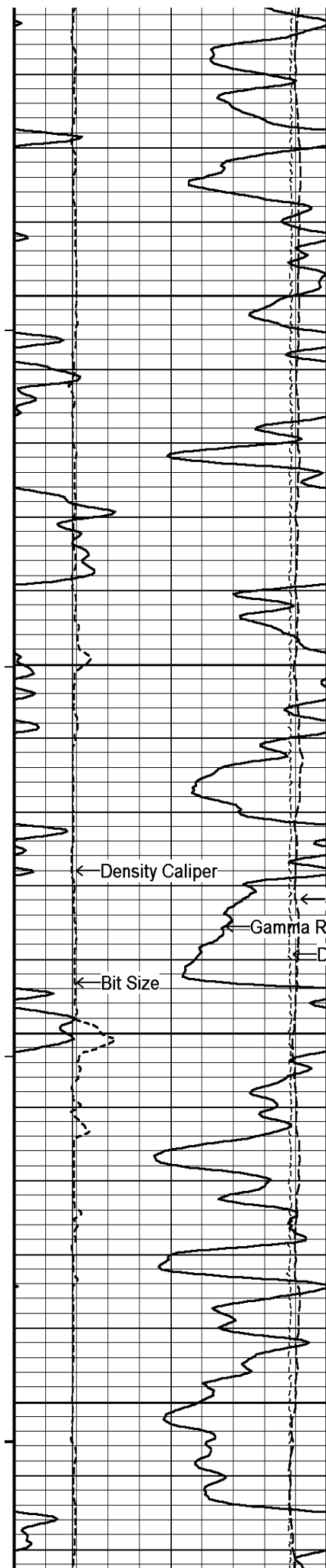
143°

4150

143°

4200





144°

4250

145°

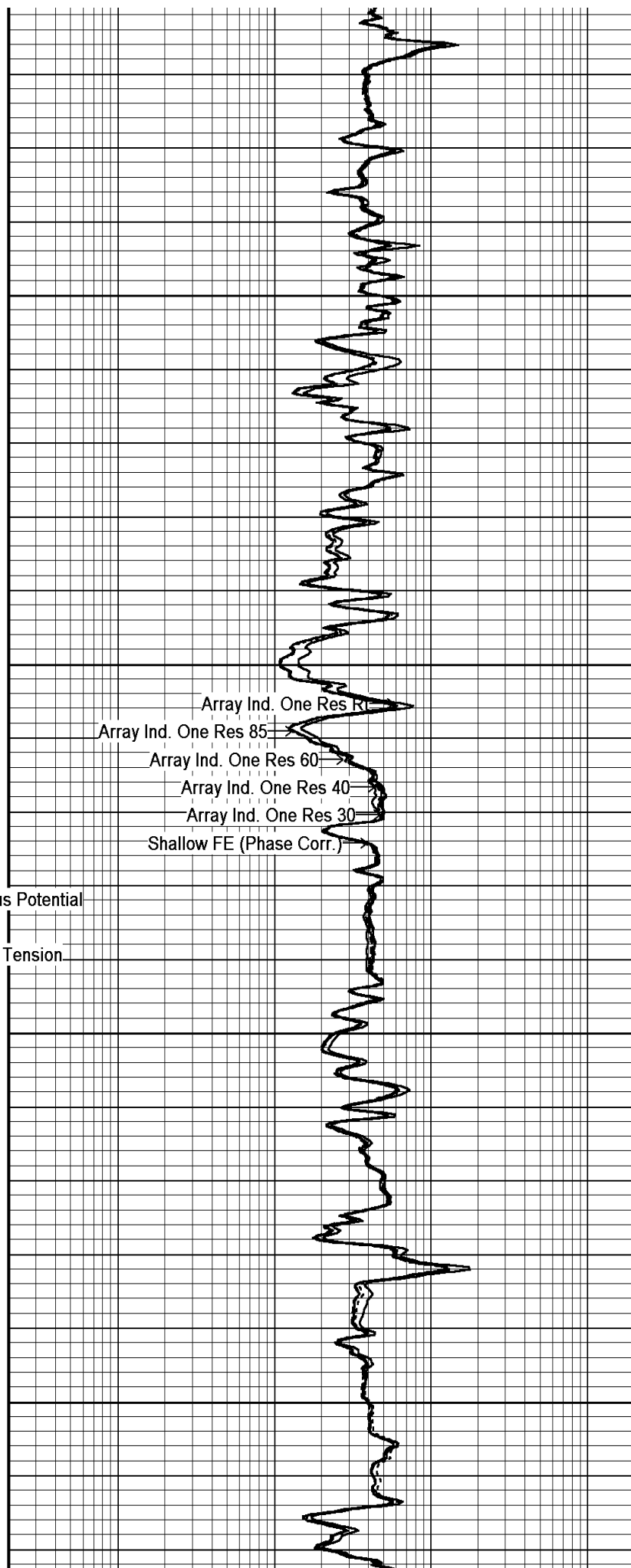
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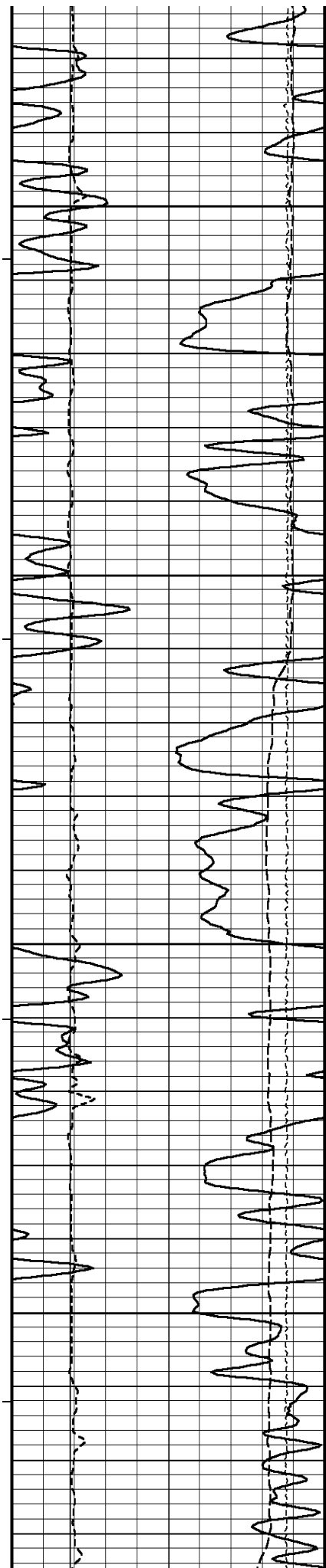
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4350

146°

4400





147°

4450

147°

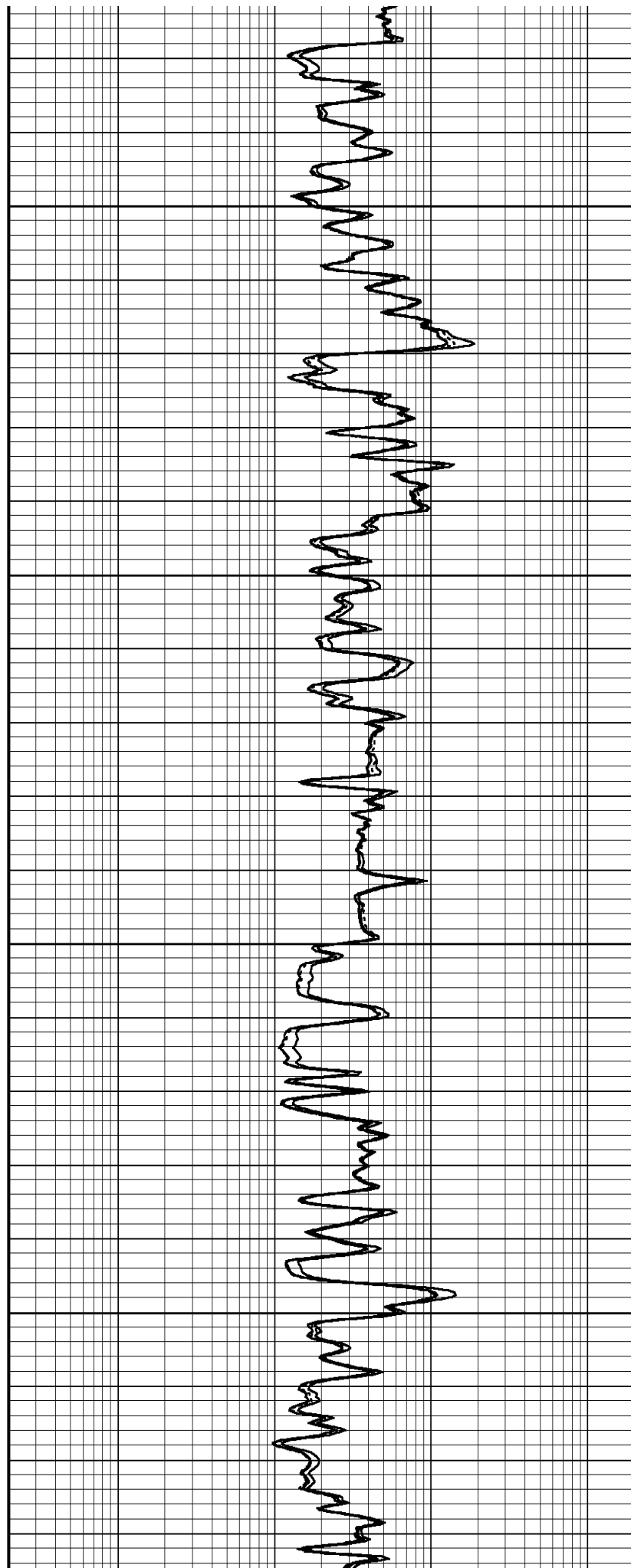
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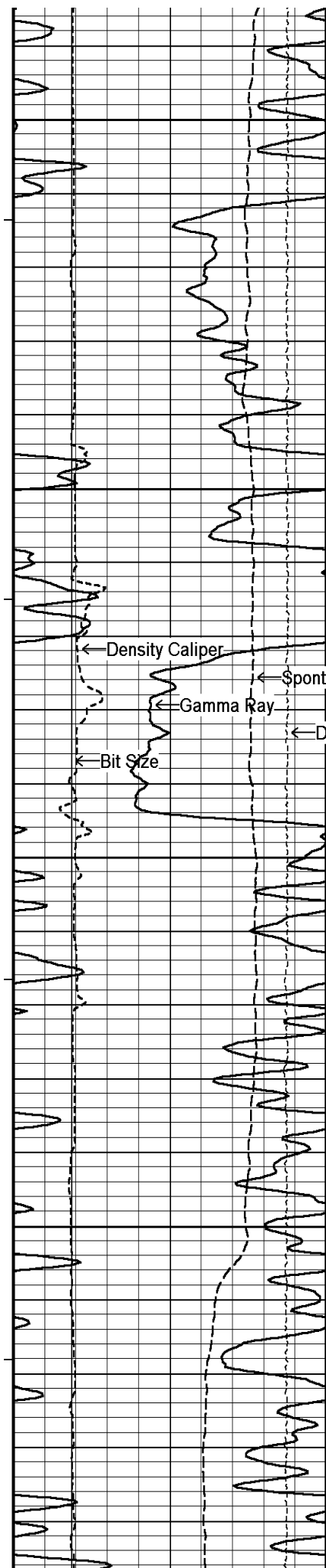
148°

4550

149°

4600





149°

4650

150°

4700

Array Ind. One Res Rt
Array Ind. One Res 85
Array Ind. One Res 60
Array Ind. One Res 40
Array Ind. One Res 30
Shallow FE (Phase Corr.)

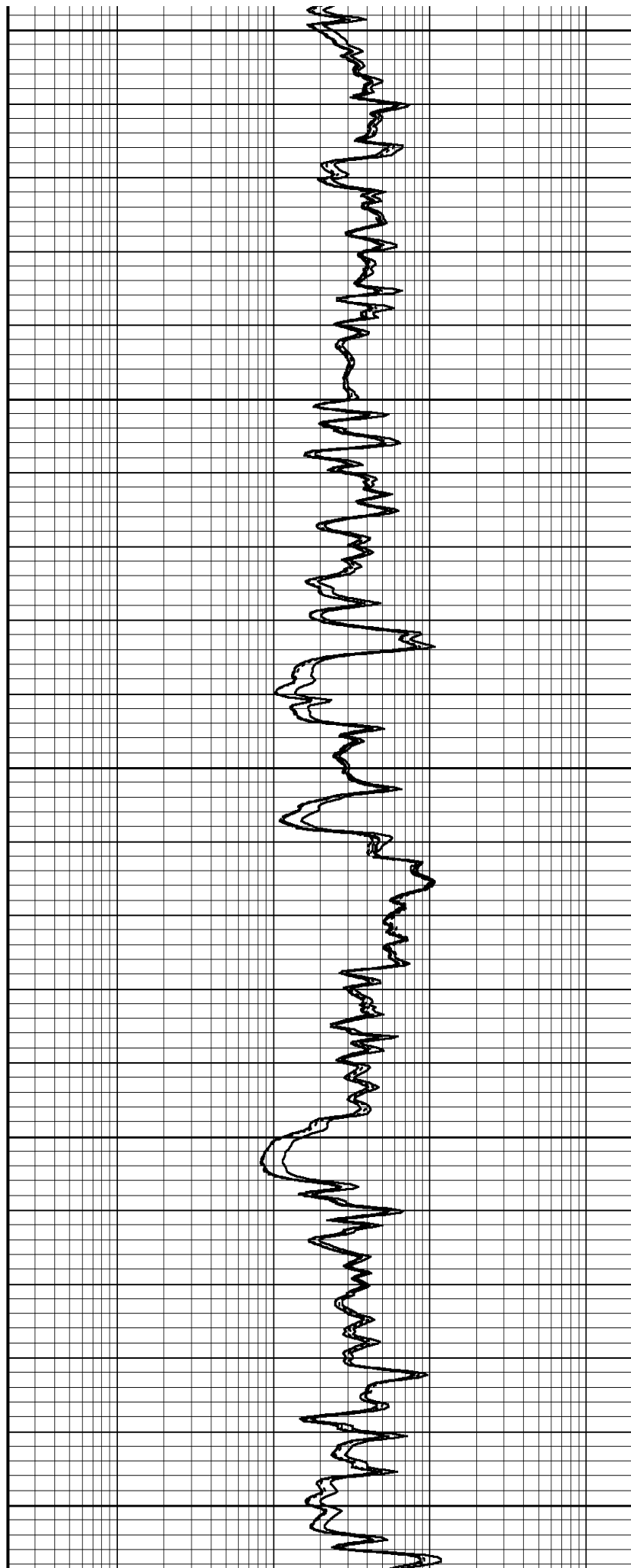
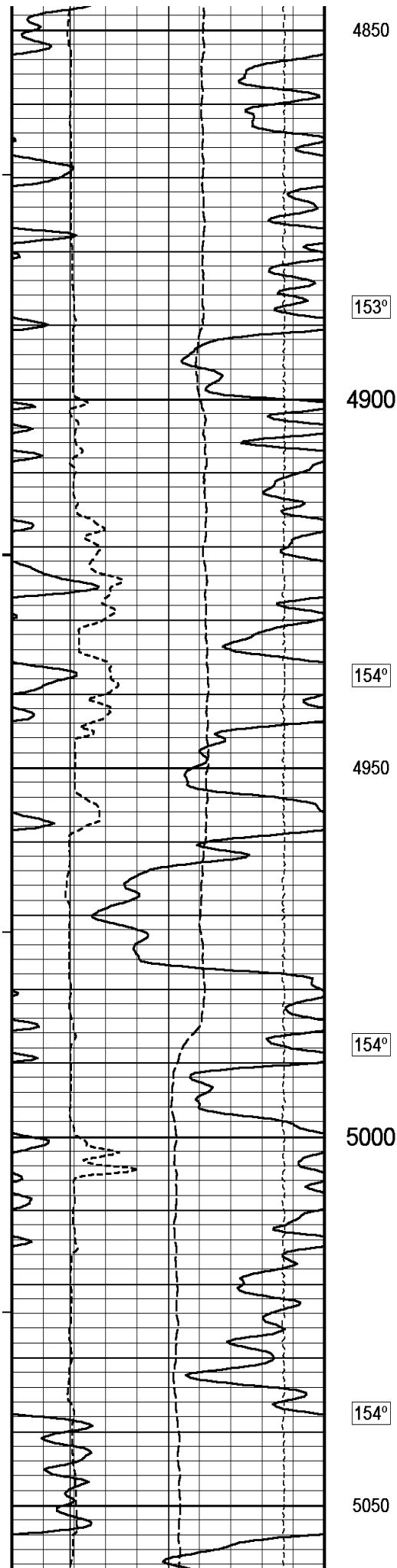
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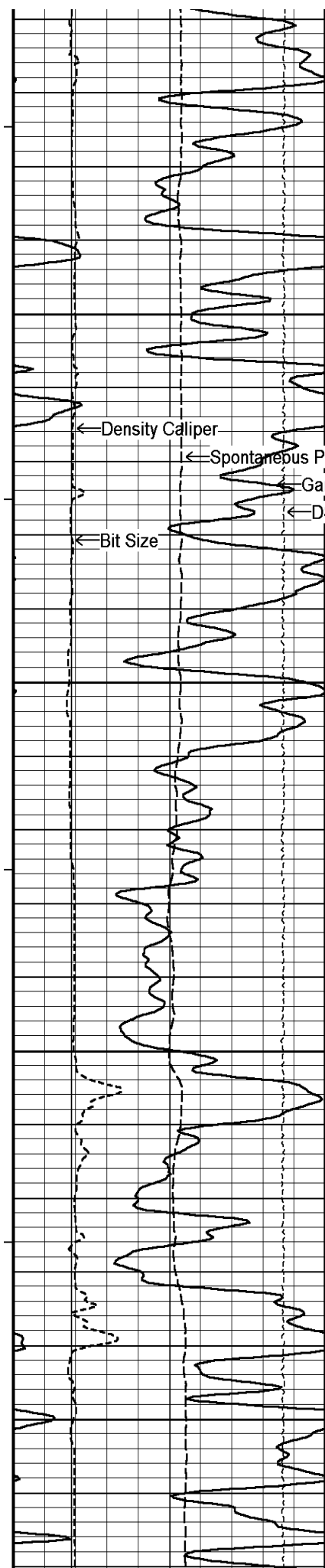
4750

151°

4800

152°





155°

5100

← Density Caliper

← Spontaneous Potential

Gamma Ray

← DST Uphole Tension

← Bit Size

156°

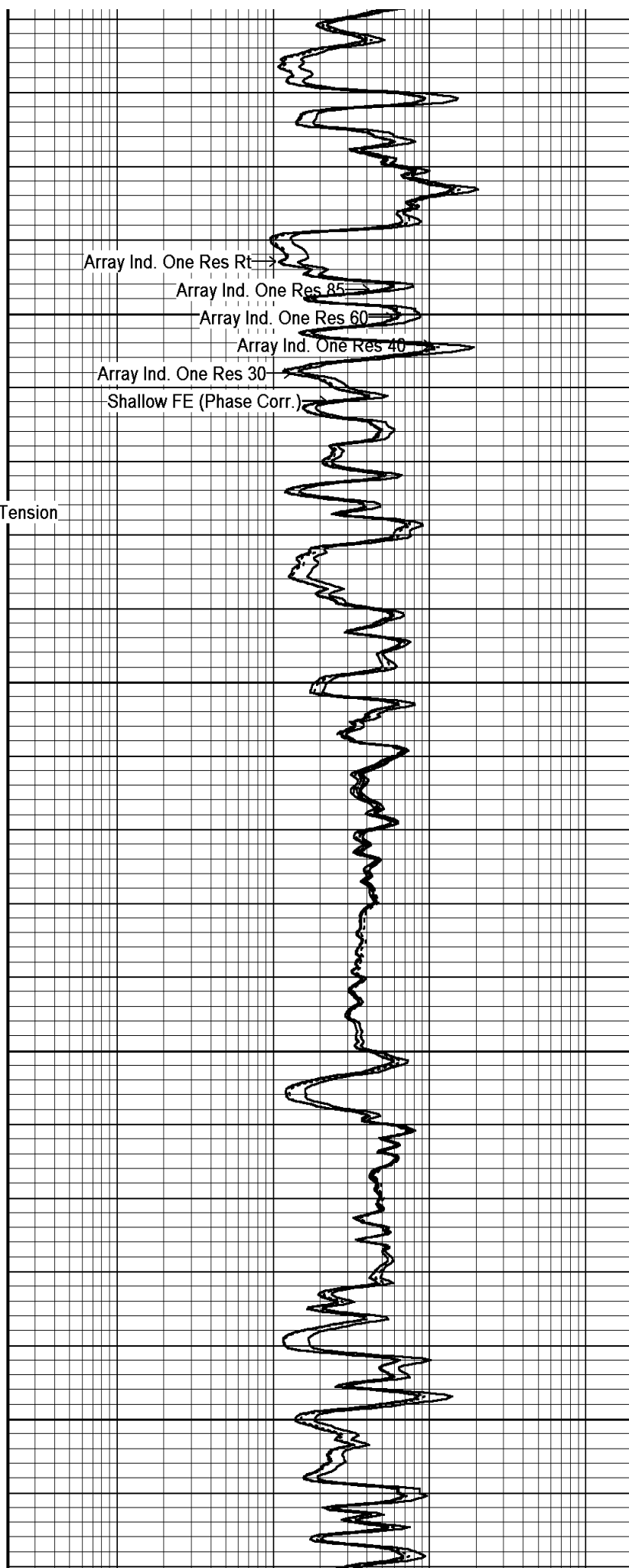
5150

157°

5200

157°

5250



Array Ind. One Res Rt

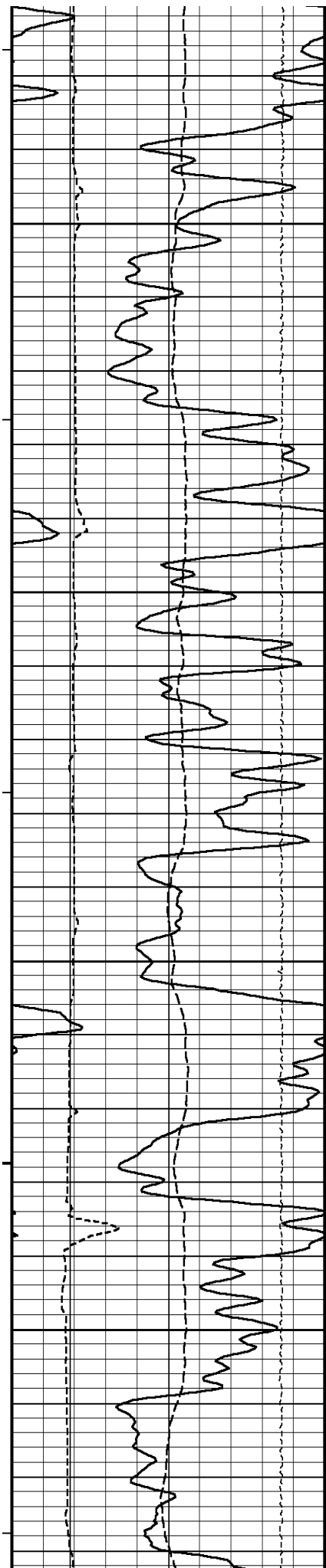
Array Ind. One Res 85

Array Ind. One Res 60

Array Ind. One Res 40

Array Ind. One Res 30

Shallow FE (Phase Corr.)



158°

5300

158°

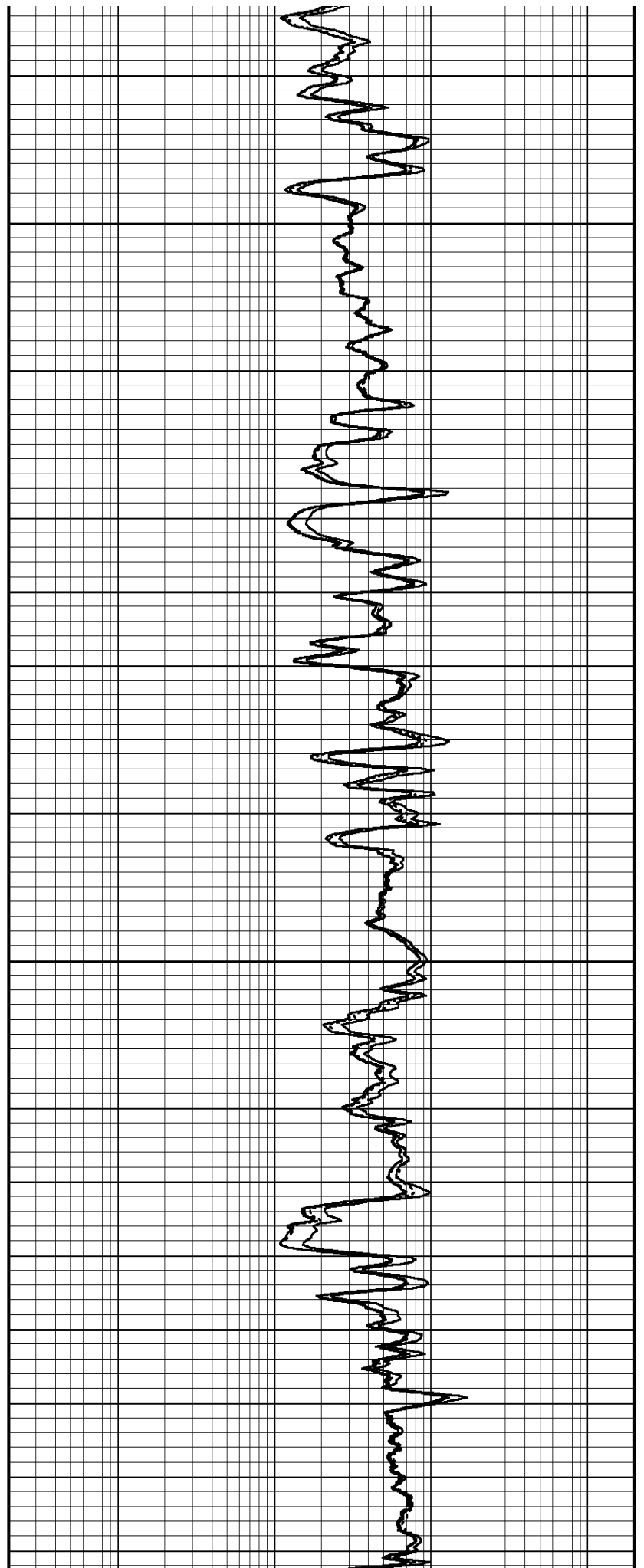
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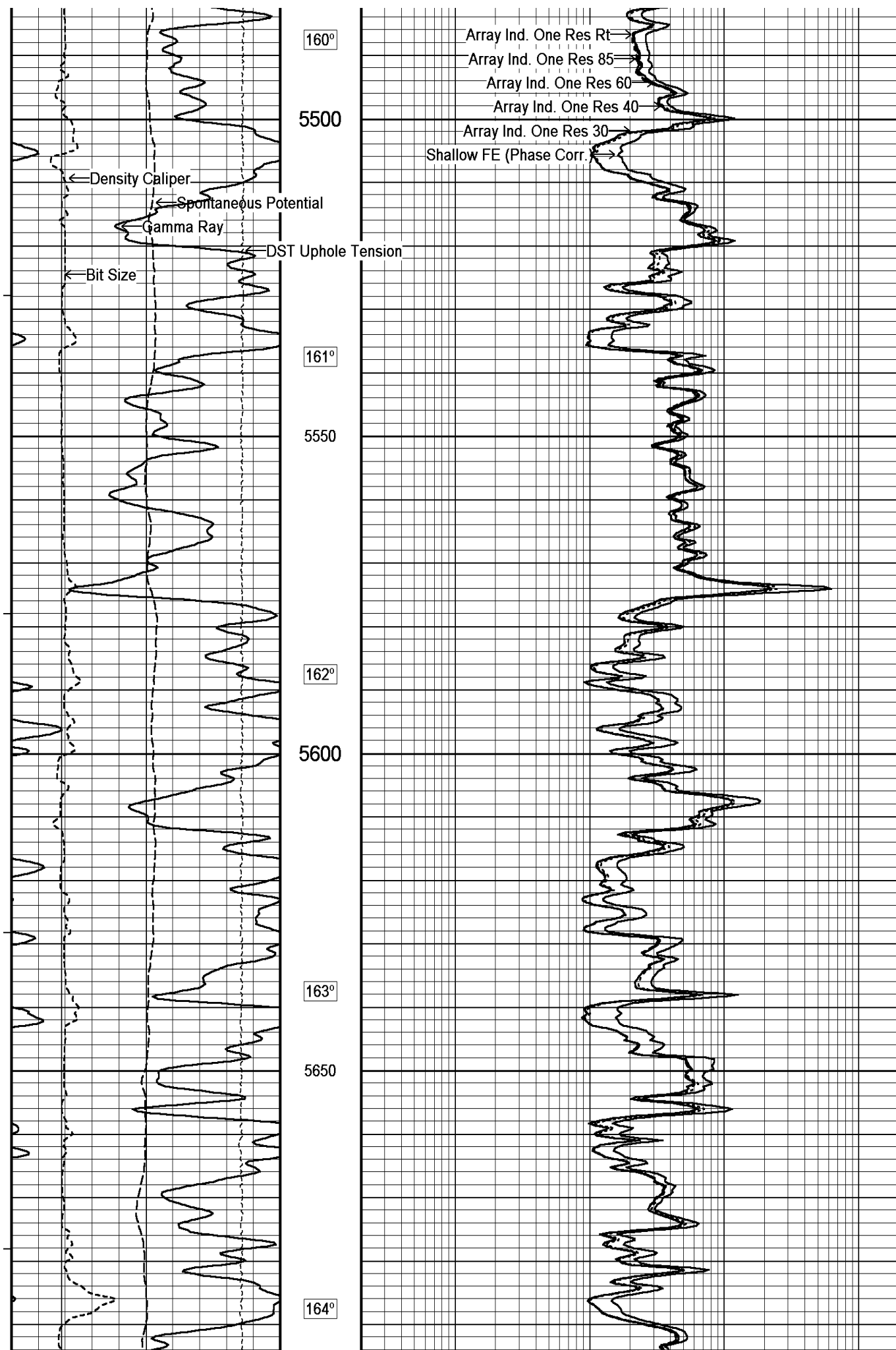
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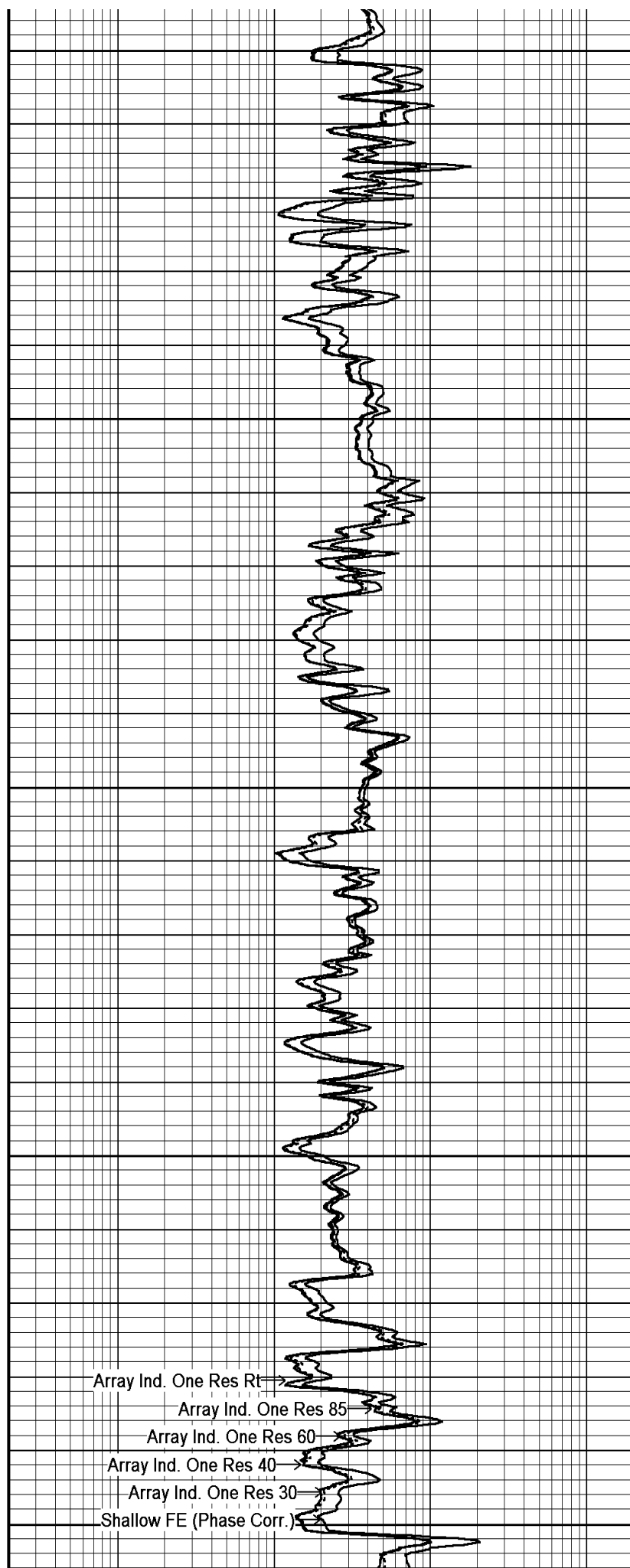
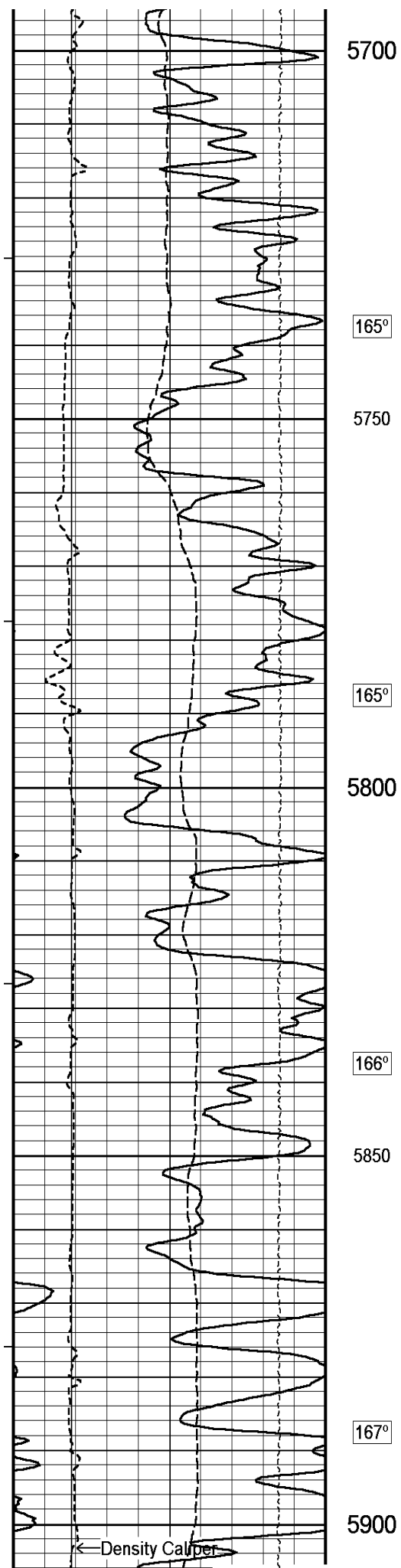
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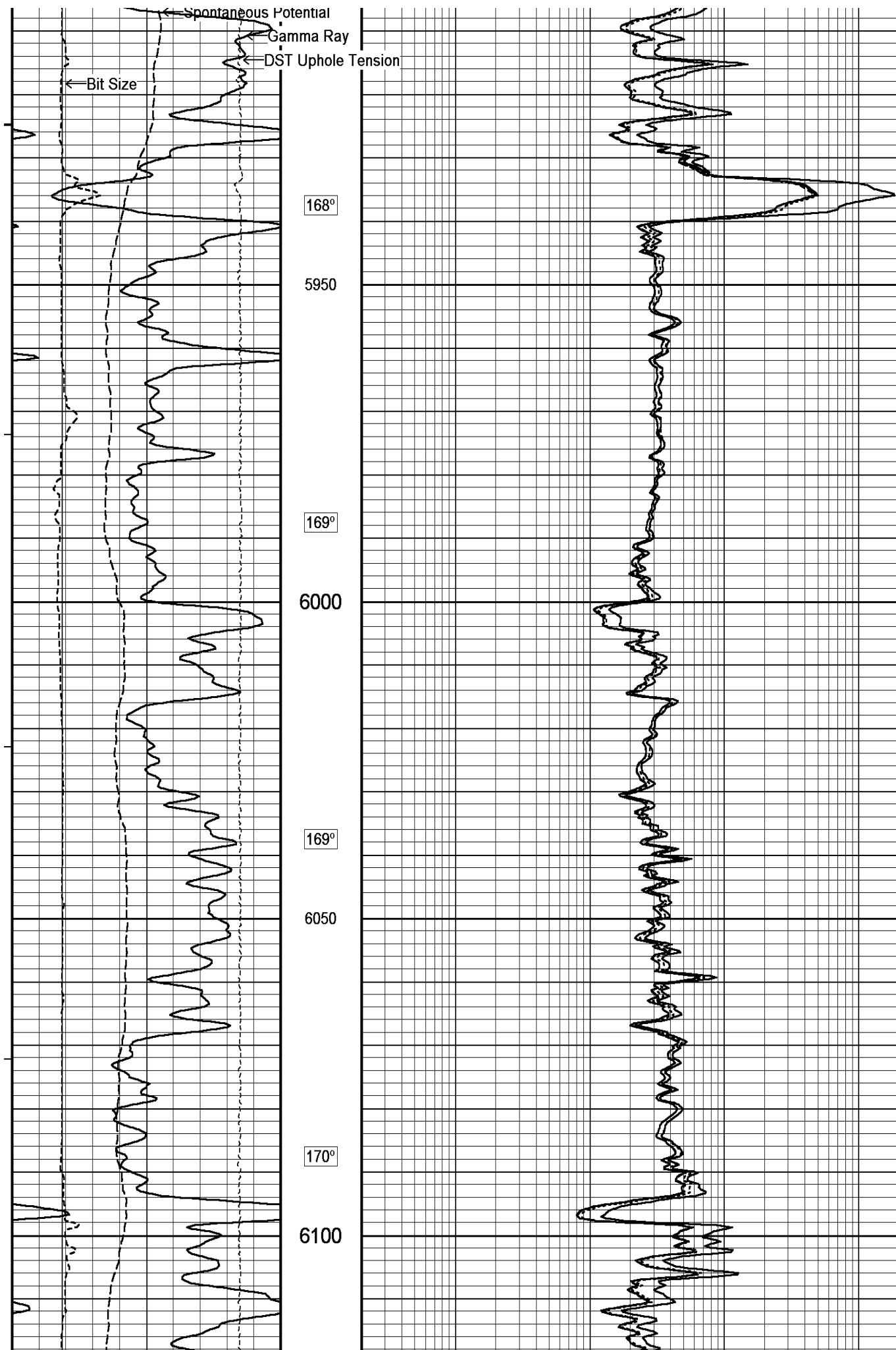
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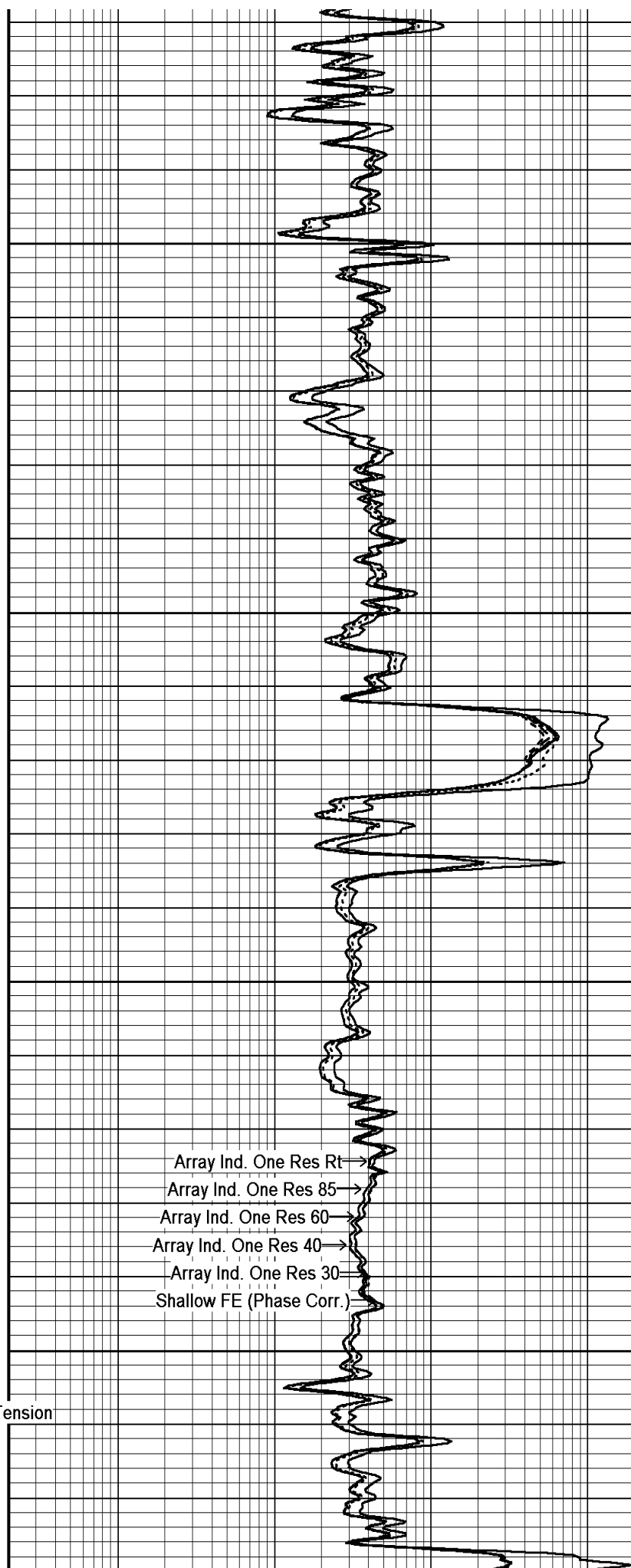
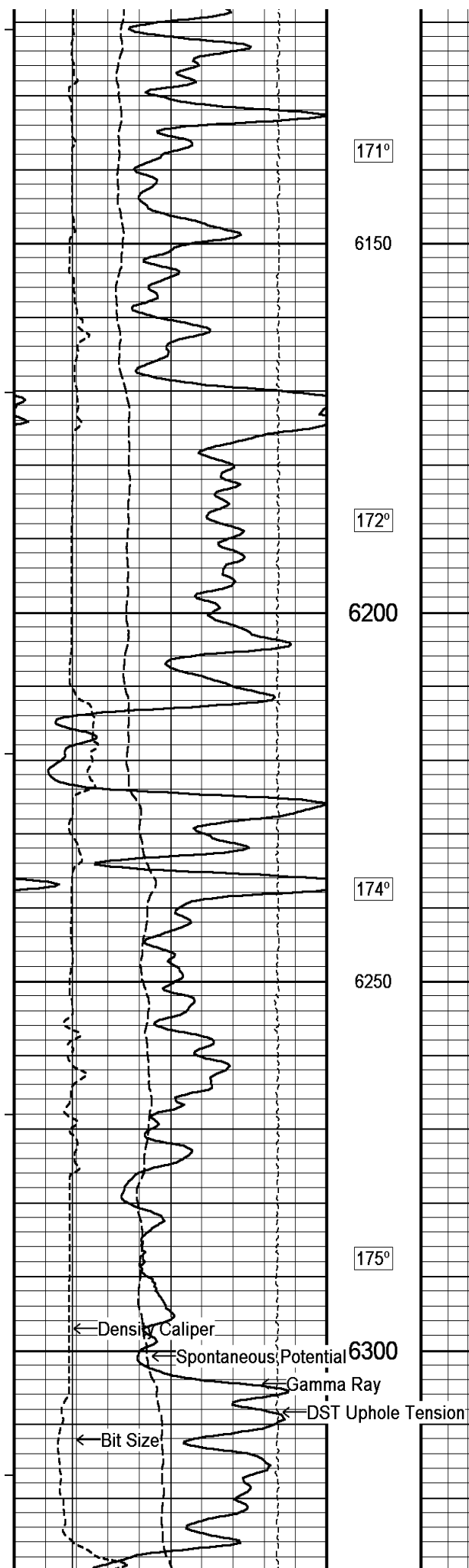
5450

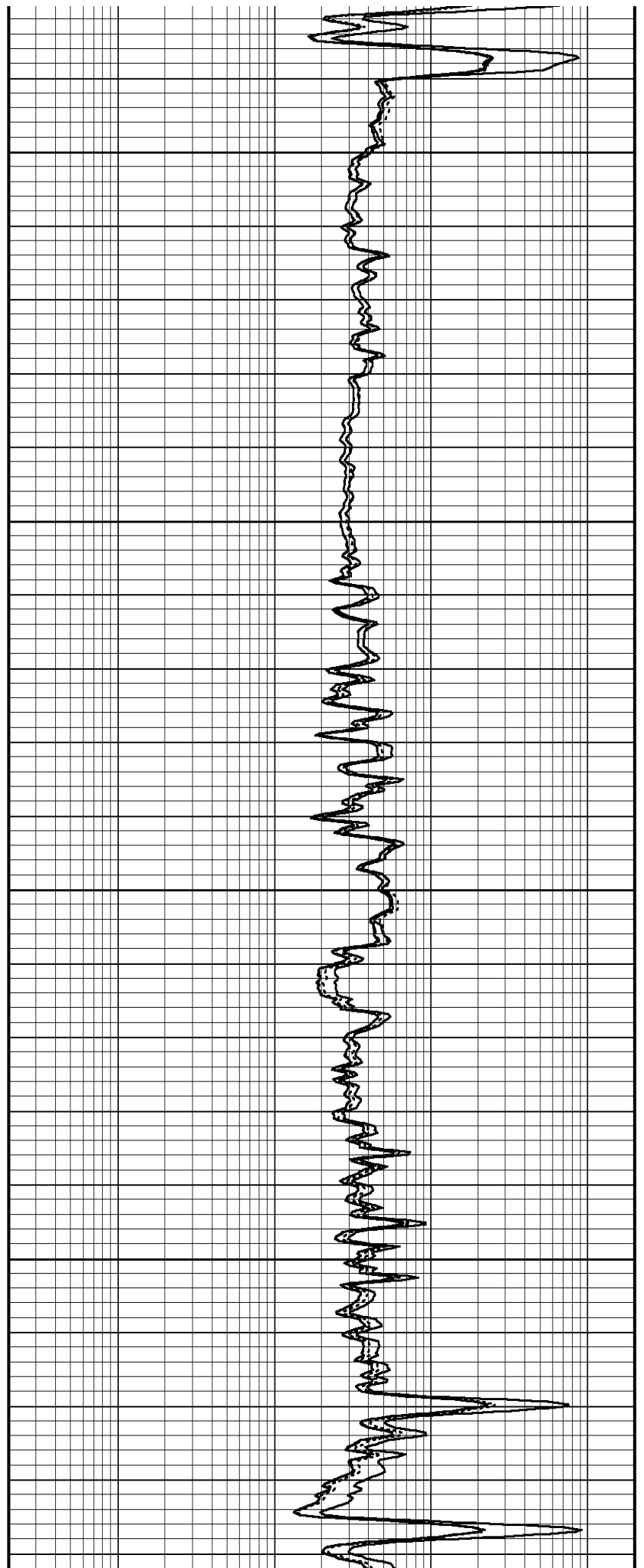
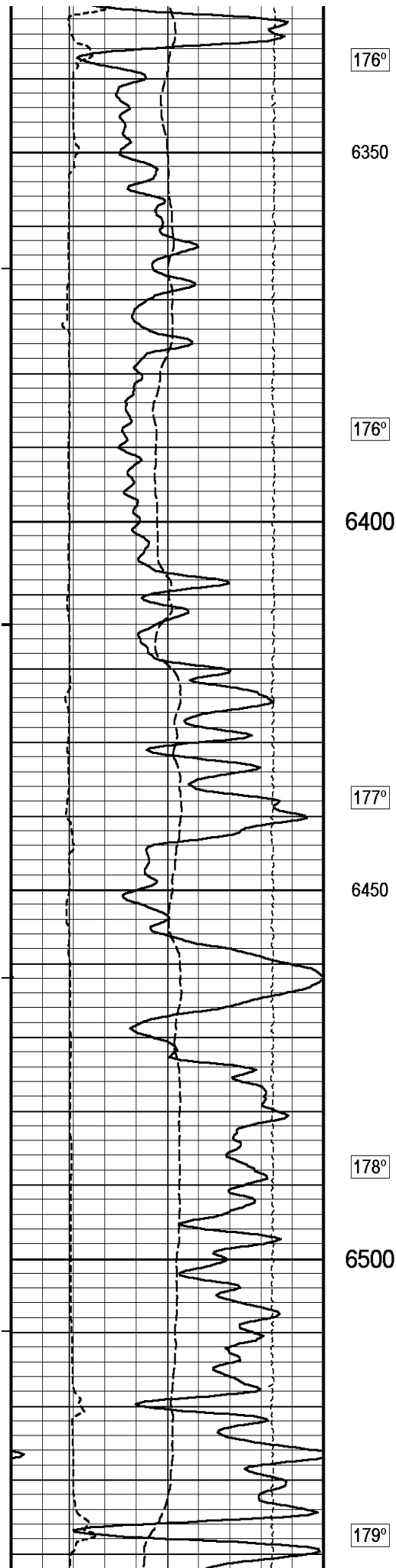


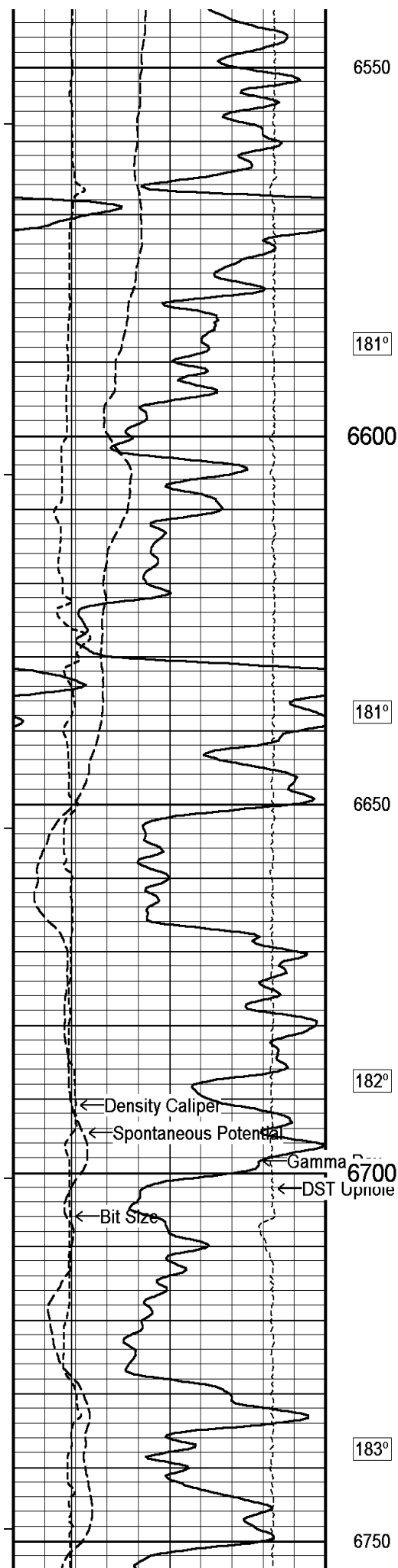












6550

181°

6600

181°

6650

182°

6700

183°

6750

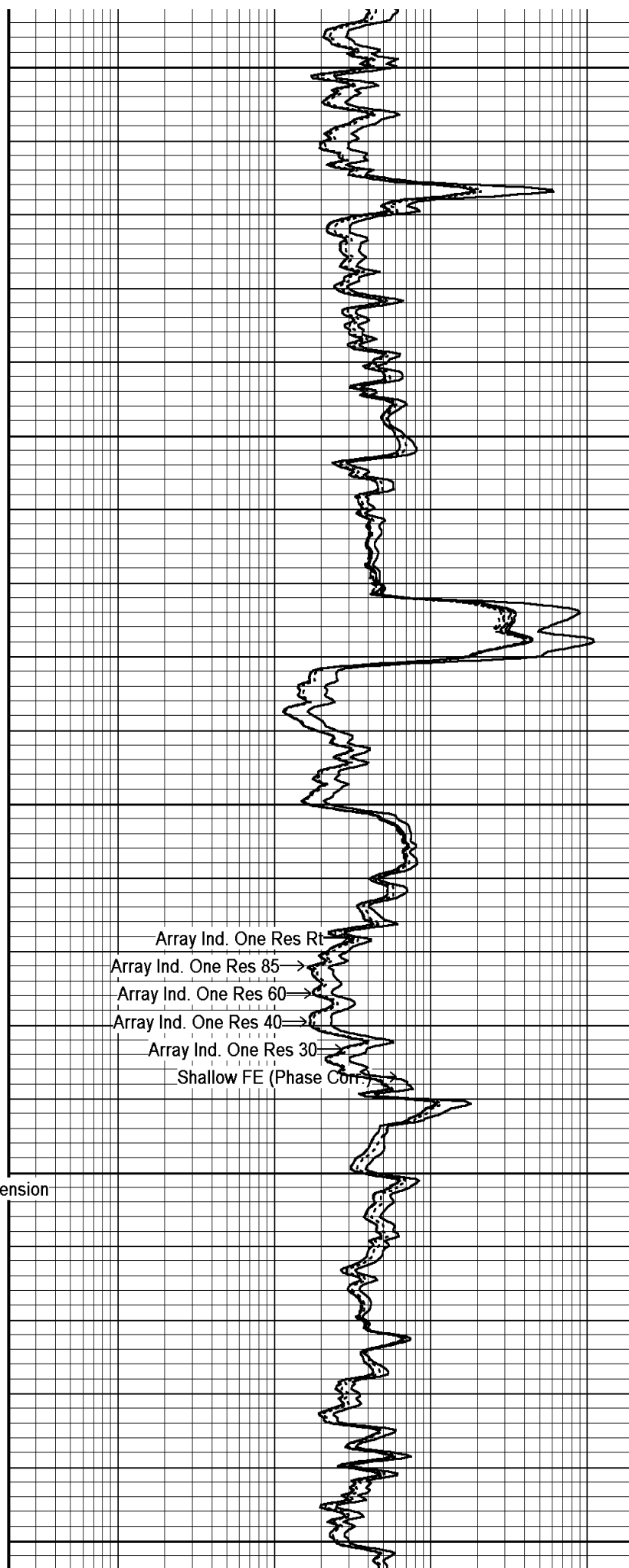
← Density Caliper

← Spontaneous Potential

← Gamma Ray

← Bit Size

← DST Upcore Tension



Array Ind. One Res Rt

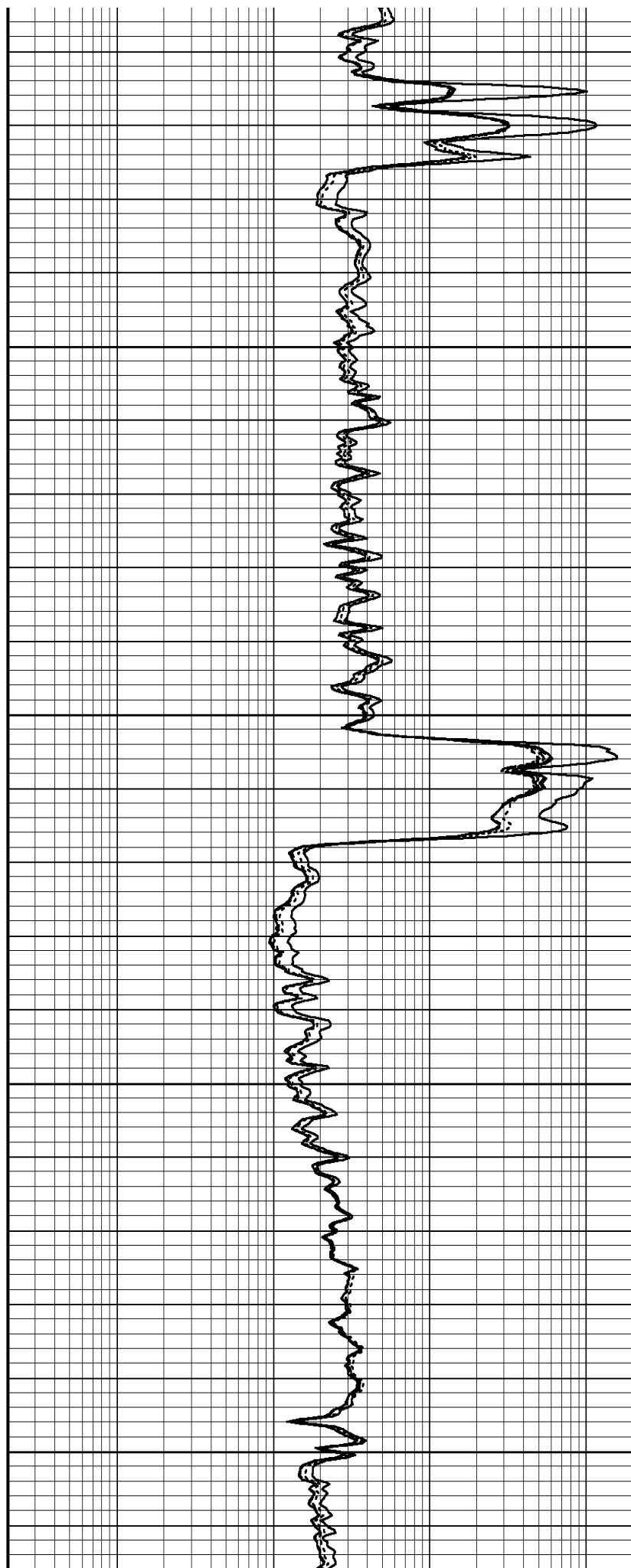
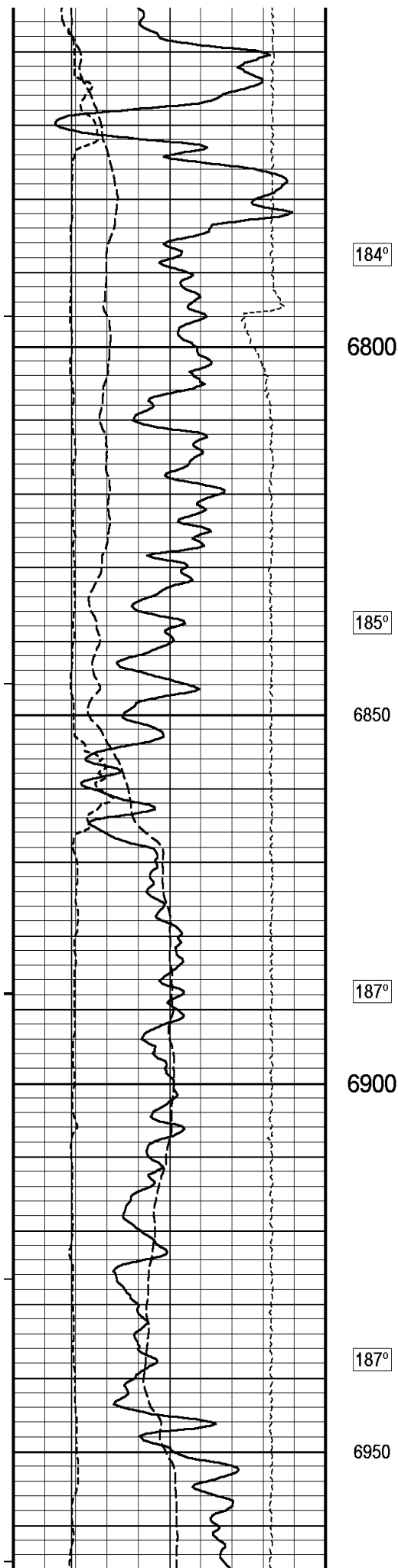
Array Ind. One Res 85 →

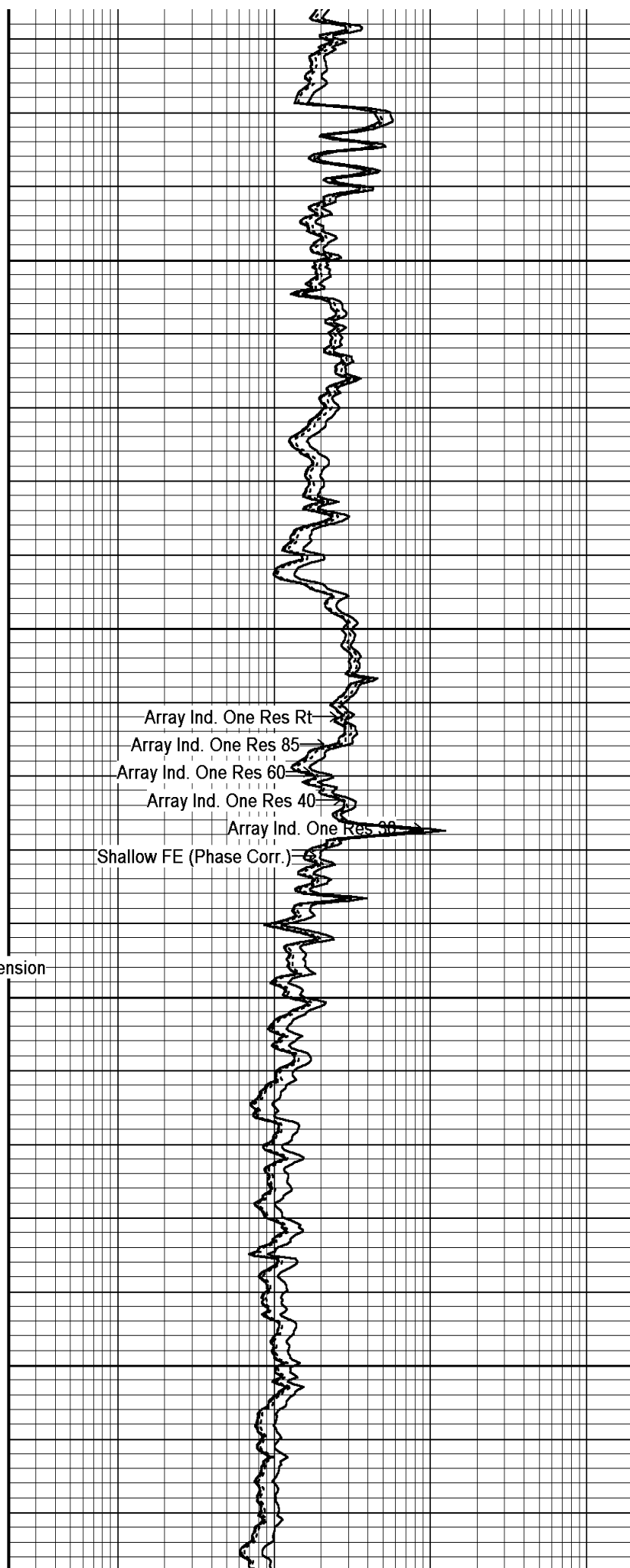
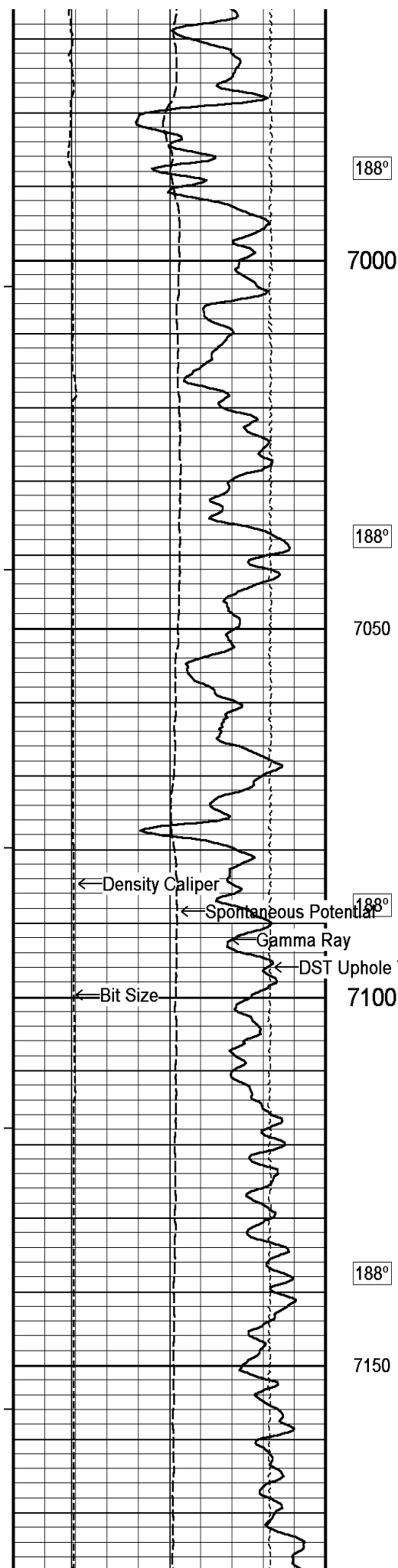
Array Ind. One Res 60 →

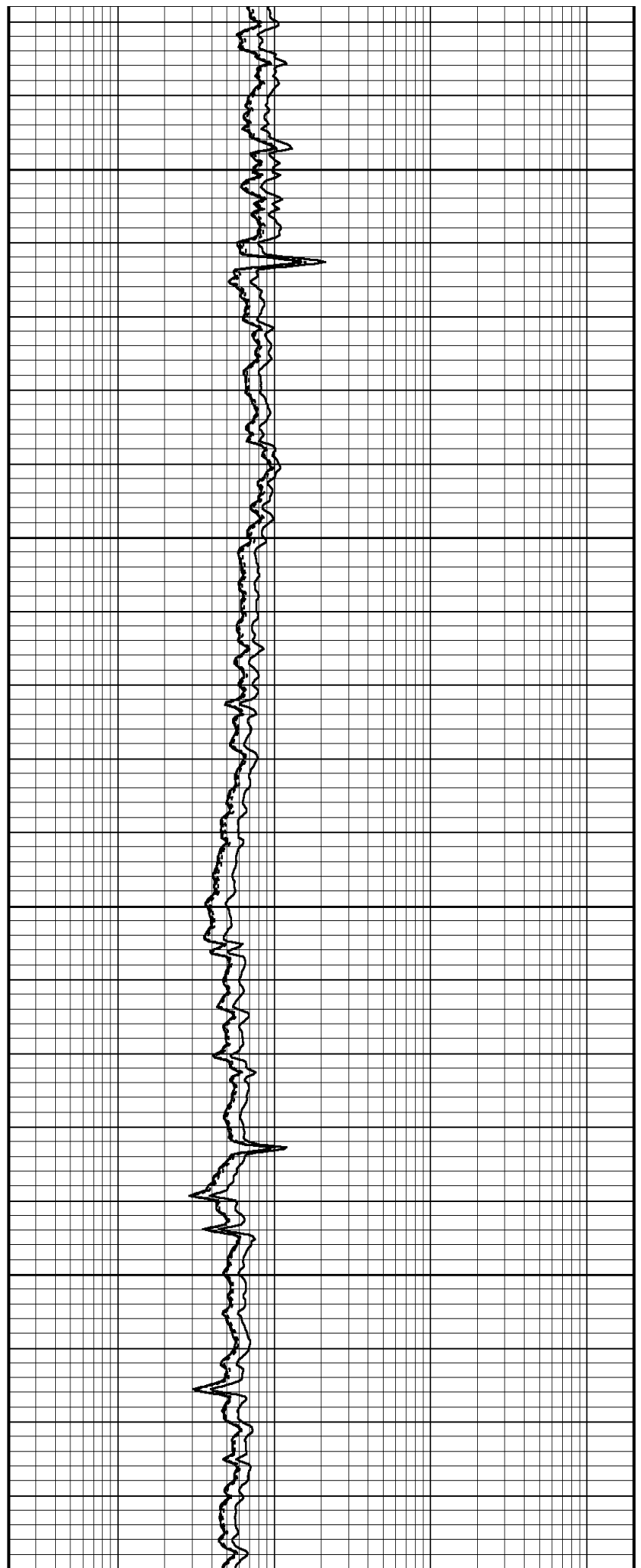
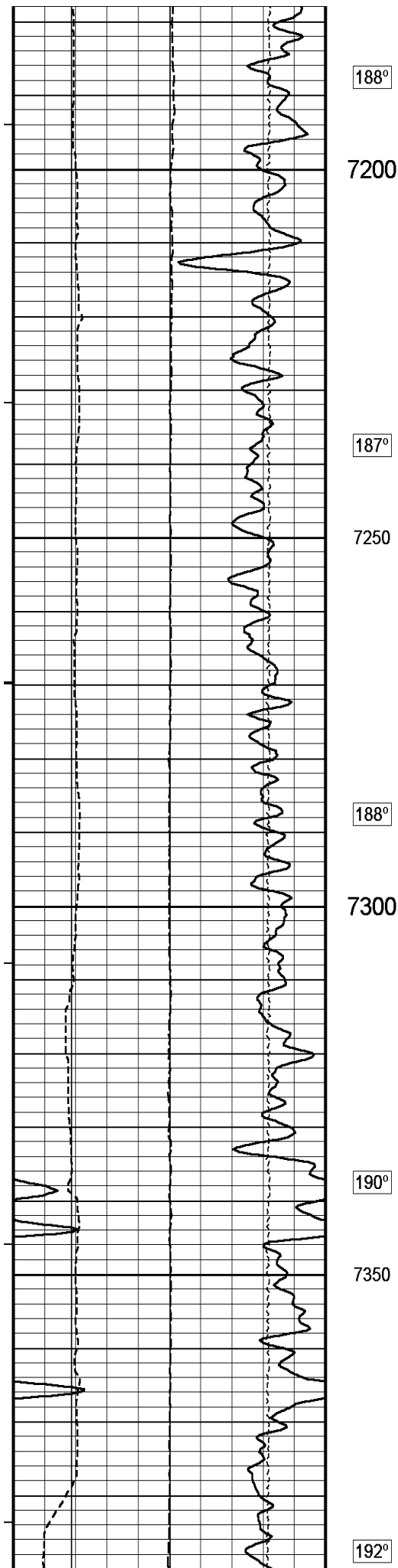
Array Ind. One Res 40 →

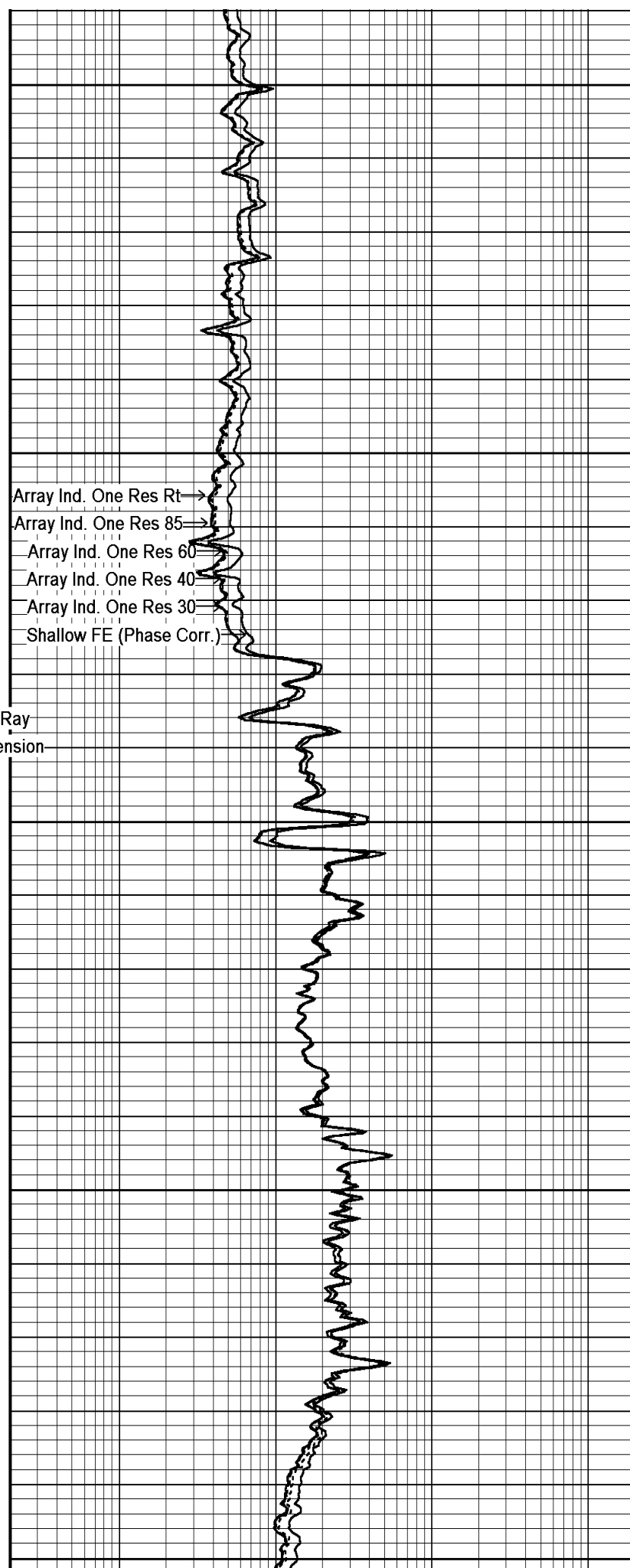
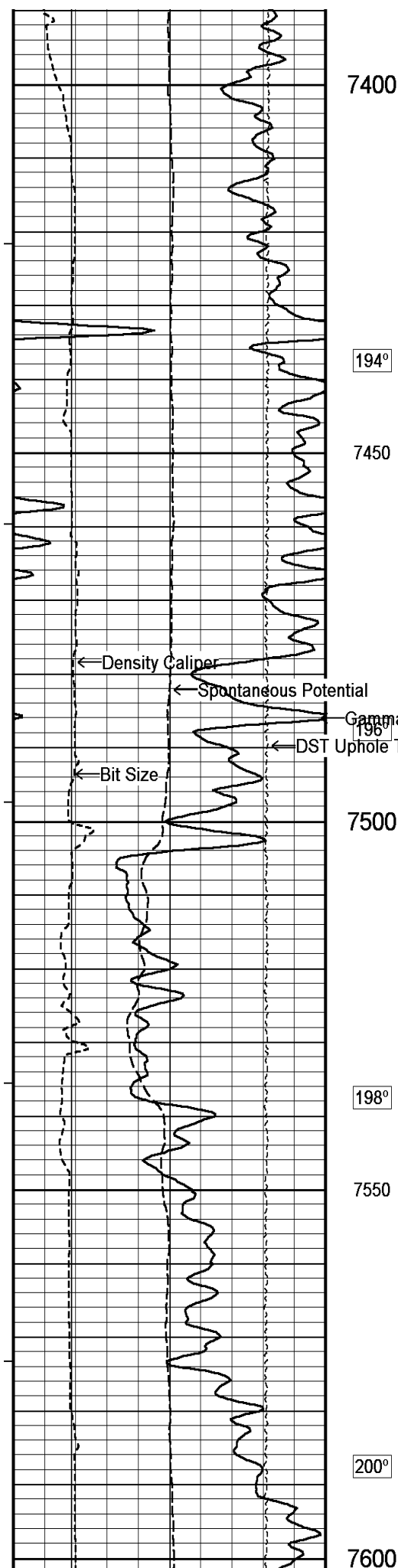
Array Ind. One Res 30 →

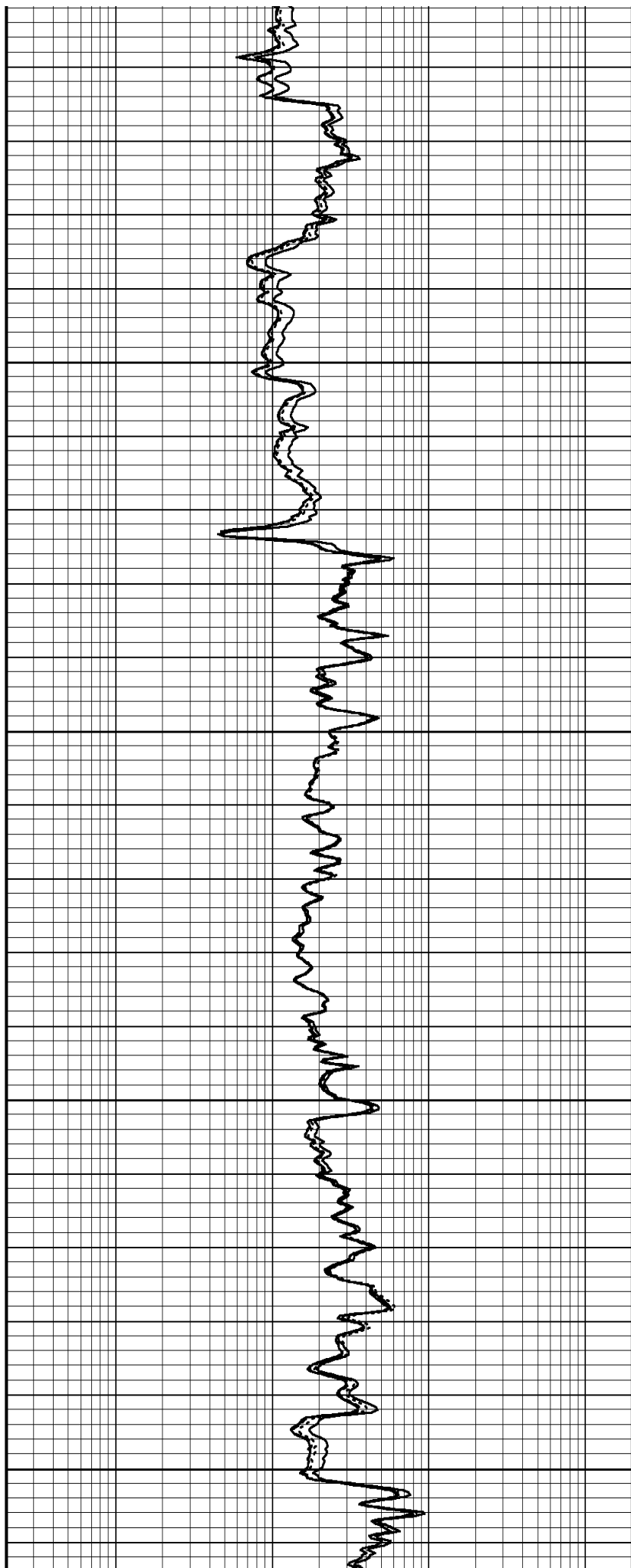
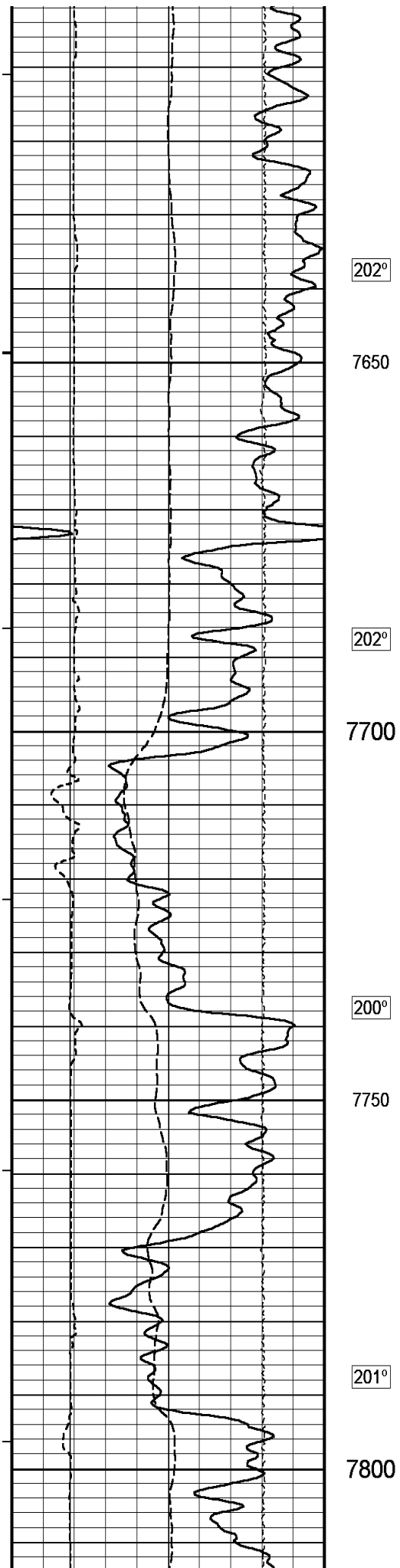
Shallow FE (Phase Con) →

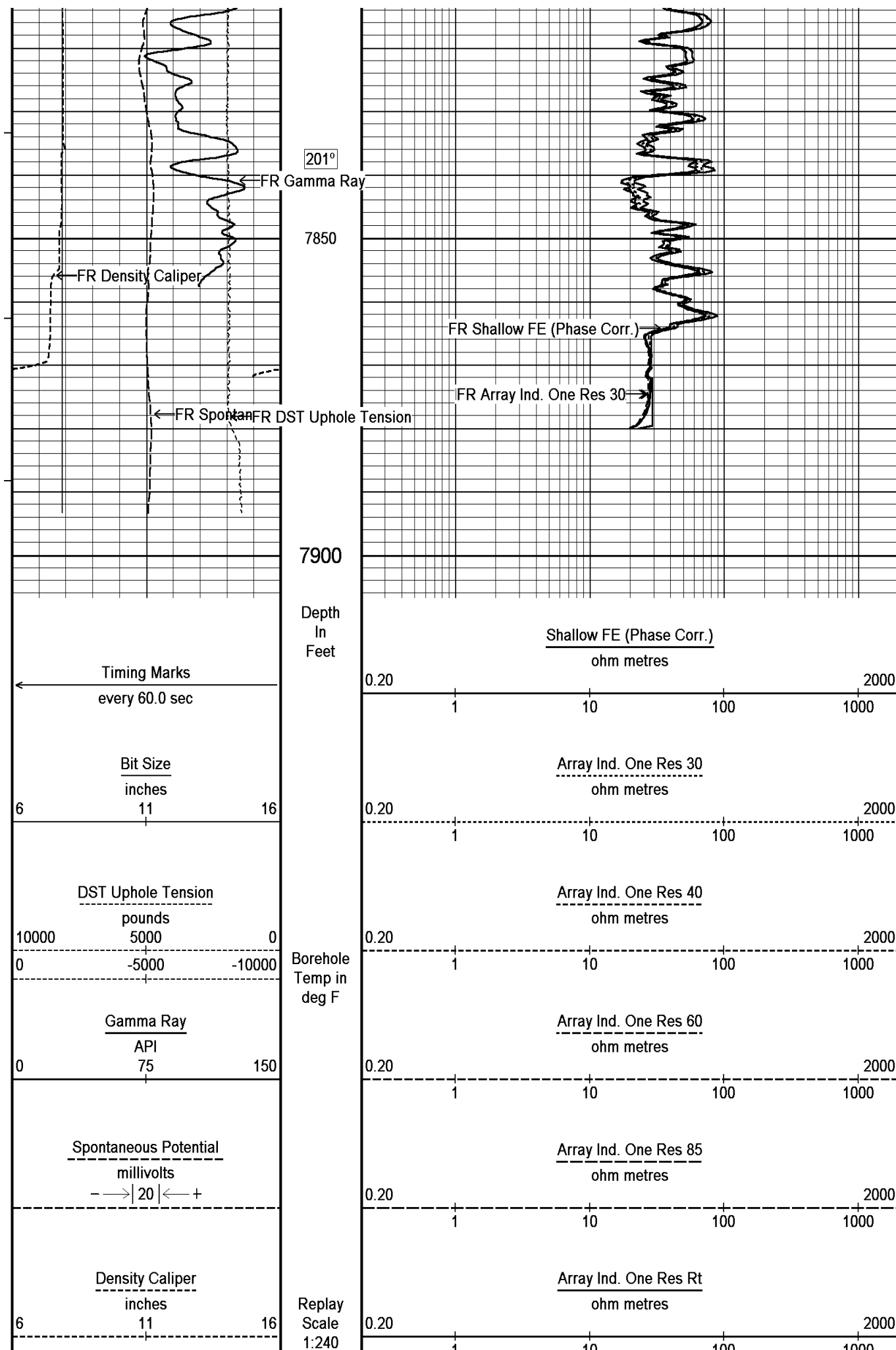












Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 20-NOV-2010 16:28

Filename: C:\Minimus\LOGS\Bill Barrett\GGU Miller 24D-32-691\MAIN.dta

Recorded on 20-NOV-2010 12:48

System Versions: Logged with 10.07.0791 Plotted with 10.07.0791



5 INCH MAIN LOG



OVERLAY



Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 20-NOV-2010 16:28

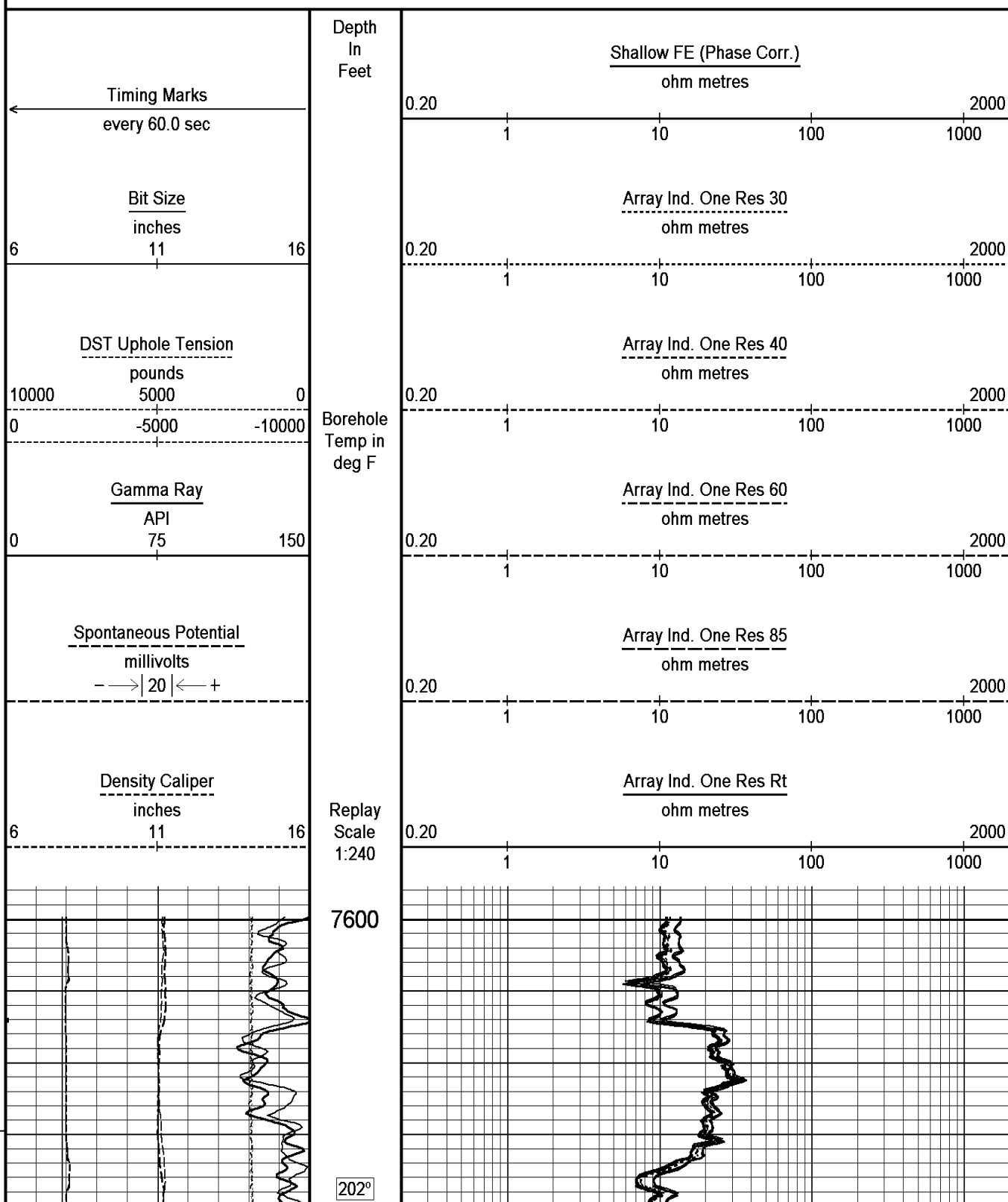
Filename: C:\Minimus\LOGS\Bill Barrett\GGU Miller 24D-32-691\REPEAT.dta

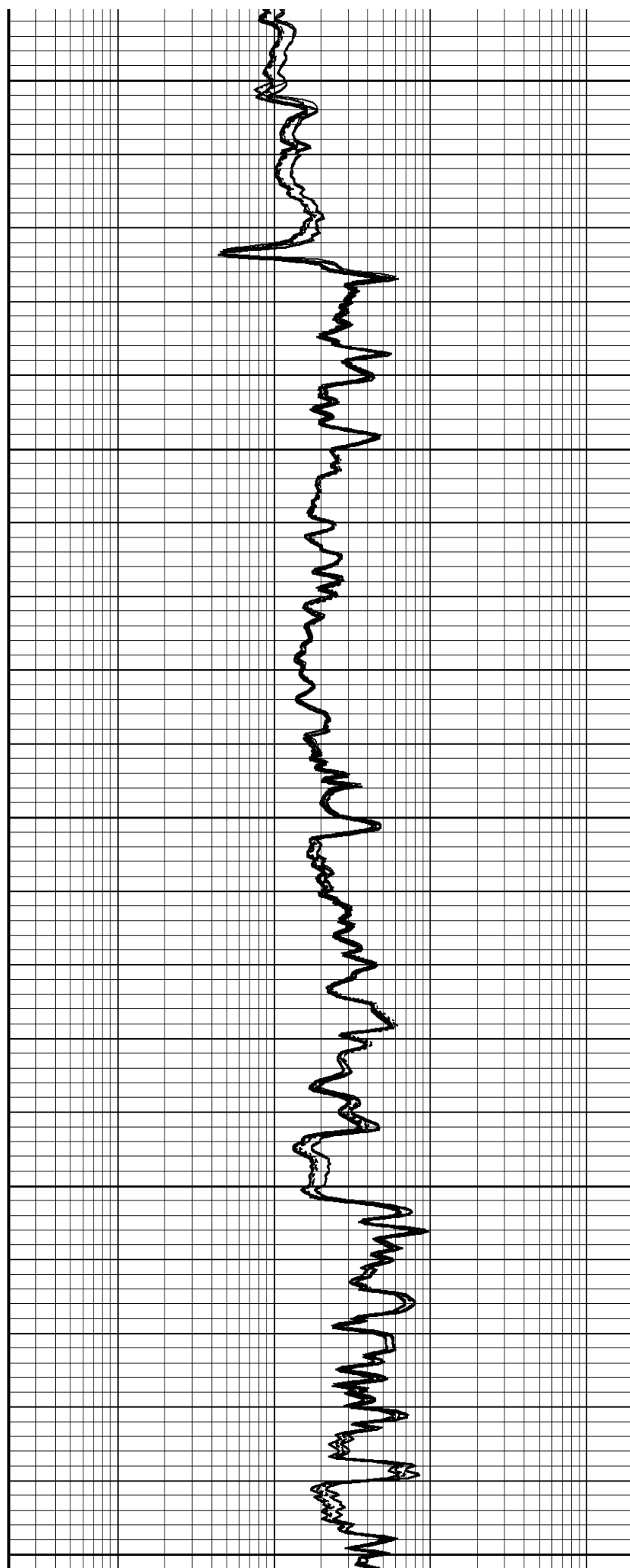
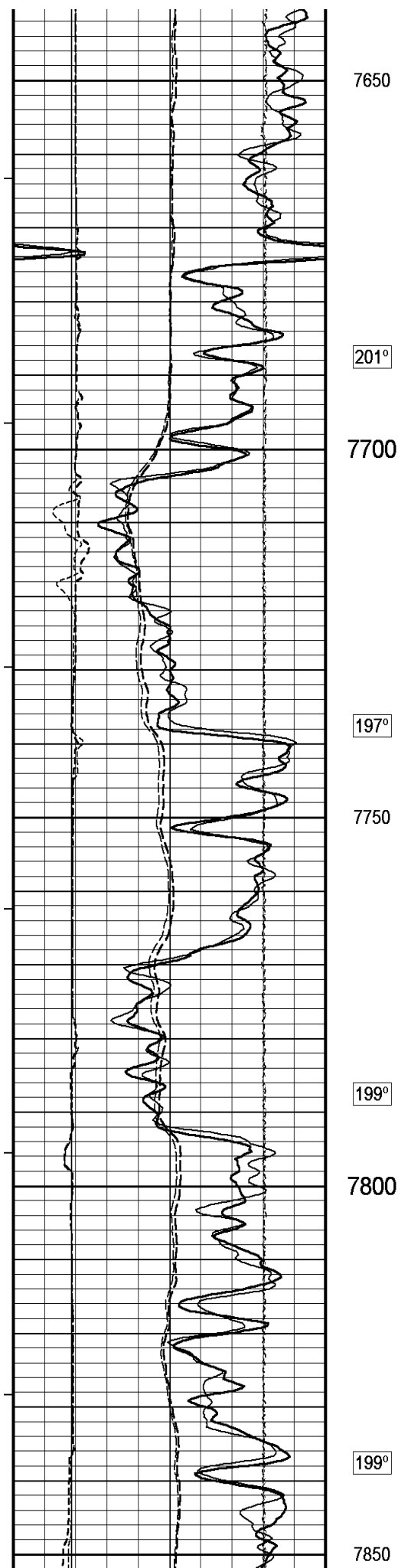
Recorded on 20-NOV-2010 12:28

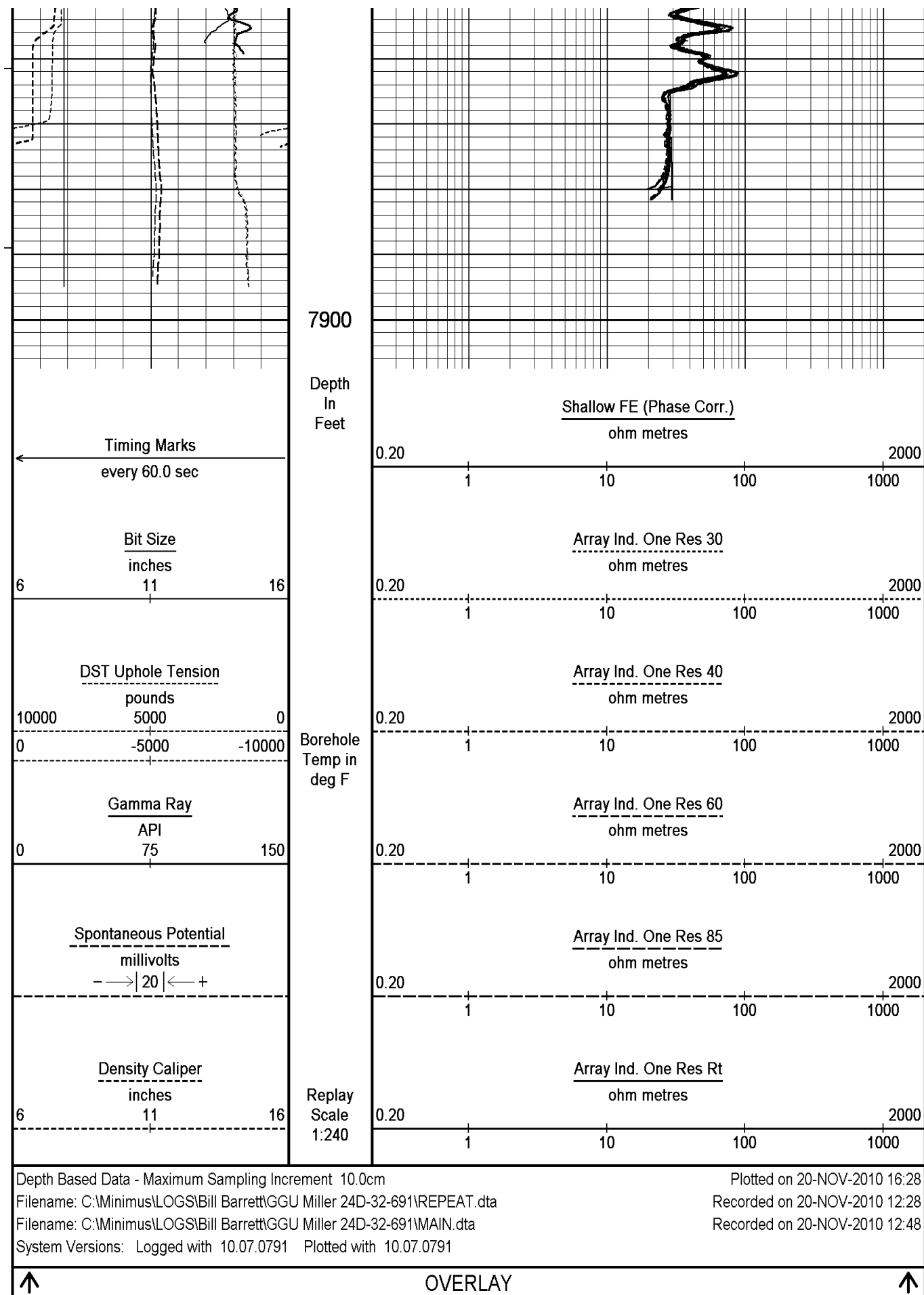
Filename: C:\Minimus\LOGS\Bill Barrett\GGU Miller 24D-32-691\MAIN.dta

Recorded on 20-NOV-2010 12:48

System Versions: Logged with 10.07.0791 Plotted with 10.07.0791







BEFORE SURVEY CALIBRATION

C:\Minimus\LOGS\Bill Barrett\GGU Miller 24D-32-691\REPEAT.dta

General Constants All 000

Last Edited on 20-NOV-2010,11:53

General Parameters

Mud Resistivity	1.810	ohm-metres
Mud Resistivity Temperature	90.000	degrees F
Water Level	0.000	feet
Density/Neutron Processing	Wet Hole	

Hole/Annular Volume and Differential Caliper Parameters

HVOL Caliper 1	Density Caliper	
HVOL Caliper 2	None	
Annular Volume Diameter	4.500	inches
Caliper for Differential Caliper	None	

Rwa Parameters

Porosity used	Base Density Porosity
Resistivity used	Array Ind. One Res Rt
RWA Constant A	0.610
RWA Constant M	2.150

Down-hole Tension Calibration SMS 000

Field Calibration on 20-NOV-2010 11:09

Reading No	Measured	Calibrated (lbs)
1	15548.93	0.00
2	17625.57	365.00

High Resolution Temperature Calibration MCG 287

Field Calibration on 20-NOV-2010,11:20

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

High Resolution Temperature Constants MCG 287

Last Edited on 27-OCT-2010,11:54

Pre-filter Length	11
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SP Calibration MCG 287

Field Calibration on 20-NOV-2010,11:20

	Measured	Calibrated (mV)
Reference 1	95.0	104.2
Reference 2	-87.4	-104.5

Gamma Calibration MCG 287

Field Calibration on 20-NOV-2010,11:20

	Measured	Calibrated (API)
Background	90	62
Calibrator (Gross)	848	589
Calibrator (Net)	759	527

Gamma Constants MCG 287

Last Edited on 20-NOV-2010,11:19

Gamma Calibrator Number	GRC-174	
Mud Density	1.00	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl	0.00	kppm

Neutron Calibration MDN 112

Base Calibration on 25-OCT-2010,16:11

Field Check on 20-NOV-2010,11:18

Base Calibration

	Measured		Calibrated (cps)	
	Near	Far	Near	Far
	3130	99	3714	110
Ratio	31.503		33.764	

Field Calibrator at Base

	Calibrated (cps)
	2252 3194
Ratio	0.705

Field Check	Calibrated (cps)
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Field Check	Calibrated (cps)	
Ratio	2249	3167
	0.710	
Neutron Constants MDN 112		Last Edited on 20-NOV-2010,09:37
Neutron Source Id	P44384	
Neutron Jig Number	NJ6584	
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	7.00	cu
Dolomite Sigma	4.70	cu
Formation Pressure Source	None	
Formation Pressure	N/A	kpsi
Temperature Source	None	
Temperature	N/A	degrees F
Mud Salinity	1.00	kppm
Formation Fluid Salinity Source	None	
Formation Fluid Salinity	N/A	kppm
Barite Mud Correction	Not Applied	
FE Calibration MFE 179		Base Calibration on 15-OCT-2010 11:16 Field Check on 20-NOV-2010 11:13
Base Calibration		
	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	962.4	126.8
Base Check		280.5
Field Check		280.7
FE Constants MFE 179		Last Edited on 20-NOV-2010,09:40
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 106		Field Calibration on 20-NOV-2010,11:12
	Measured	Calibrated(Deg F)
Lower	50.00	50.00
Upper	75.00	75.00
High Resolution Temperature Constants MAI 106		Last Edited on 10-NOV-2010,07:35
Pre-filter Length	11	
Induction Calibration MAI 106		Base Calibration on Field Check on 20-NOV-2010 11:12
Base Calibration		
Test Loop Calibration		Measured
Channel	Low	High
1	16.5	486.3
2	5.8	391.9
3	3.0	262.9
4	1.4	138.3
Array Temperature	74.6	Deg F
Channel		Base 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
Channel		Field Check (mmho/m)
	Low	High
1	15.5	3750.1
2	31.1	3456.0
3	33.3	3333.3
4	33.3	3333.3

3	0.0	0.0	29.9	3023.2
4	0.0	0.0	20.2	2003.0
Deep	0.0	0.0	18.7	1962.6
Medium	0.0	0.0	43.2	4027.1
Shallow	0.0	0.0	45.8	5109.9
Array Temperature		0.0	82.0	Deg F
Induction Constants MAI 106			Last Edited on 20-NOV-2010,09:41	
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		6.0000		
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		
Caliper Calibration MPD 220			Base Calibration on 27-OCT-2010,18:51	
			Field Calibration on 20-NOV-2010,09:38	
Base Calibration				
Reading No		Measured	Calibrator Size (in)	
1		14272	4.00	
2		22416	5.96	
3		30368	7.98	
4		38432	9.86	
5		47536	11.88	
6		N/A	N/A	
Field Calibration				
		Measured Caliper (in)	Actual Caliper (in)	
		8.90	8.93	
Photo Density Calibration MPD 220			Base Calibration on 27-OCT-2010 19:35	
			Field Check on 20-NOV-2010 11:18	
Density Calibration				
Base Calibration				
		Measured	Calibrated (sdu)	
		Near Far	Near	Far
Reference 1	52933	16878	53237	19445

Reference 2	24114	2409	25135	2545
Field Check at Base	1196.9	1213.9		
Field Check	1191.4	1210.9		
PE Calibration				
Base Calibration		Measured		Calibrated
	WS	WH	Ratio	Ratio
Background	215	1060		
Reference 1	17971	52737	0.344	0.320
Reference 2	6633	23964	0.280	0.274
Field Check at Base	214.5	1059.9		
Field Check	214.6	1055.3		

Density Constants MPD 220

Last Edited on 20-NOV-2010,09:39

Density Source Id	P44263B
Nylon Calibrator Number	532
Aluminium Calibrator Number	532
Density Shoe Profile	8 inch
Caliper Source for Processing	Density Caliper
PE Correction to Density	Not Applied
Mud Density	1.28 gm/cc
Mud Density Z/A Correction	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)
2.68	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

AFTER SURVEY CALIBRATION

C:\Minimus\LOGS\Bill Barrett\GGU Miller 24D-32-691\MAIN.dta

FE Check MFE 179

Before Survey Check 20-NOV-2010 11:13
After Survey Check on 20-NOV-2010 15:53

Before (ohm-m)	After (ohm-m)
280.7	280.7

Induction Check MAI 106

Before Survey Check on
After Survey Check on 20-NOV-2010 15:51

Channel	Before Survey (mmho/m)		After Survey (mmho/m)	
	Low	High	Low	High
1	0.0	0.0	15.5	3750.2
2	0.0	0.0	31.1	3456.0
3	0.0	0.0	29.9	3023.2
4	0.0	0.0	20.3	2002.9
Deep	0.0	0.0	18.8	1962.6
Medium	0.0	0.0	43.2	4027.2
Shallow	0.0	0.0	45.8	5109.8

Array Temperature 0.0 81.0 Den F

Photo Density Check MPD 220

Before Survey Check on 20-NOV-2010 11:18
After Survey Check on 20-NOV-2010 15:57

Density Check

	Near		Far	
	Before	After	Before	After
	1191.4	1189.6	1210.9	1204.9

PE Check

	Before	After
WS	214.6	213.2
WH	1055.3	1053.6

DOWNHOLE EQUIPMENT

C:\Minimus\LOGS\Bill Barrett\GGU Miller 24D-32-691\MAIN.dta

3/8" Triple Cone Cable Head (MCB C A)

MCB 5 Length: 1.58 ft Weight: 15.4 lb

SHA-J.A Compact Swivel Head Adaptor

SHA 213 Length: 2.30 ft Weight: 22.0 lb

Compact Gamma

MCG 287 Length: 8.70 ft Weight: 63.9 lb

Compact Neutron

MDN 112 Length: 5.04 ft Weight: 50.7 lb

Compact Density/Caliper

MPD 220 Length: 9.59 ft Weight: 90.4 lb

SKJ-D.A Compact Knuckle Joint

SKJ 154 Length: 2.17 ft Weight: 24.3 lb

Compact Focussed Electric

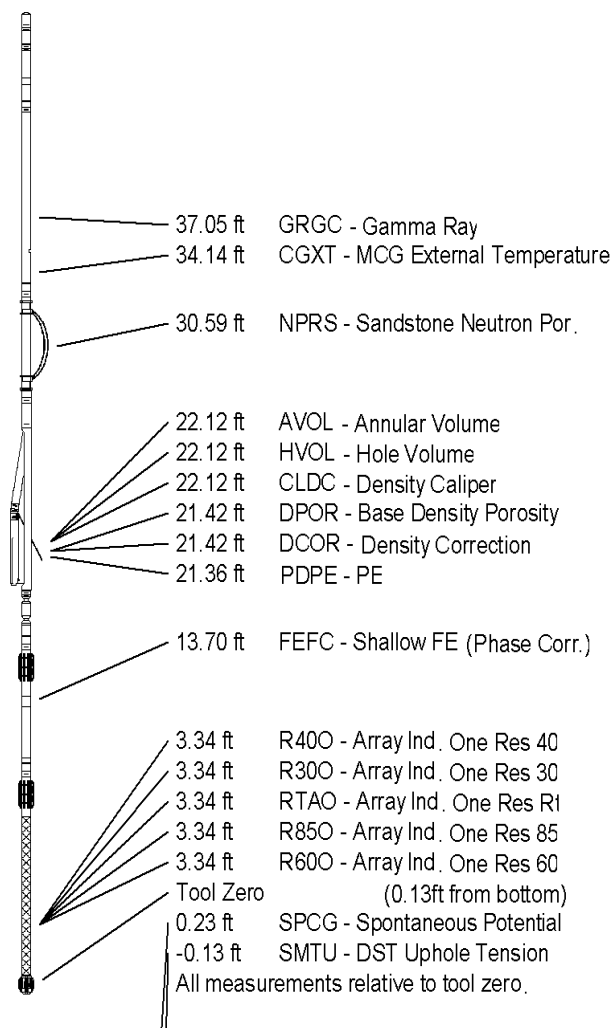
MFE 179 Length: 6.03 ft Weight: 48.5 lb

Compact Induction

MAI 106 Length: 10.81 ft Weight: 48.5 lb

Total Length: 46.21 ft

Weight: 363.8 lb



COMPANY

BILL BARRETT CORPORATION

WELL

GGU MILLER 24D-32-691

FIELD

GIBSON GULCH

PROVINCE/COUNTY

GARFIELD

COUNTRY/STATE

U.S.A. / COLORADO

Elevation Kelly Bushing	6142.00	feet
Elevation Drill Floor	6141.00	feet
Elevation Ground Level	6120.00	feet

First Reading	7875.00	
Depth Driller	7875.00	feet
Depth Logger	7878.00	feet



ARRAY INDUCTION - RTAP

ARRAY INDUCTION - RTAP
SHALLOW FOCUSED
ELECTRIC LOG

COMPANY		BILL BARRETT CORPORATION			
WELL		GGU MILLER 24D-32-691			
FIELD		GIBSON GULCH			
PROVINCE/COUNTRY		GARFIELD U.S.A. / COLORADO			
LOCATION		SHL: 1225' FSL & 2288' FWL			
BHL: 1184' FSL & 1990' FWL					
SEC	TEMP	REF	Other Services		
32	91W		MP/DMDN		
API Number	05-045-19427				
Permanent Datum G.L. Elevation 6120 feet					
Logging Measured From K.G. @ 22 FEET above Permanent Datum					
Logging Measured From K.G.					
Run Number	20-NOV-2010				
Depth	ONE				
Depth Logger	7875.00 feet				
First Reading	7875.00 feet				
Last Reading	7880.00 feet				
Casing Logger	7880.00 feet				
Bit Size	7/8" inches				
Bit Size Type	10/20 bit/sig				
Density / Viscosity	7/20 m/dm				
Flow Line	FLOW LINE				
Sample Source	1.81 @ 90.0 ohm-m				
Bit @ Measured Temp	1.45 @ 90.0 ohm-m				
Bit @ Measured Temp	2.17 @ 90.0 ohm-m				
Source Ref / Rms	CALC				
Bit @ Bit / Rms	CALC				
Bit @ Bit / Rms	6.14 @ 202.0 ohm-m				
Max Recorded Temp	202.00 deg F				
Equipment Name	COMPACT				
Equipment / Base	13045				
Recorded By	D KUNTZ				
Witnessed By	C CROW				
		J GARCIA			

