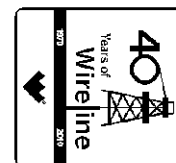




Weatherford

**COMPENSATED PHOTO DENSITY
COMPENSATED DUAL NEUTRON
LOGS**

COMPANY **WEXPRO COMPANY**
WELL **MUSSER 31**
FIELD **POWDER WASH**
PROVINCE/COUNTY **MOFFAT**
COUNTRY/STATE **USA/COLORADO**
LOCATION **SHL: 348' FNL & 607' FEL**



SEC **TWP** **RGE** **Other Services**
4 **11N** **97W** **MAI**
API Number **0508107468**
Permit Number

Permanent Datum G.L., Elevation 6601 feet
Log Measured From **KB**
Drilling Measured From **KB**

Elevations: feet
KB 6630.00
DF 6630.00
GL 6601.00

Date	07-DEC-2011	
Run Number	1	
Depth Driller	9095.00	feet
Depth Logger	6220.00	feet
First Reading	6199.00	feet
Last Reading	1537.00	feet
Casing Driller	1539.00	feet
Casing Logger	1537.00	feet
Bit Size	7.875	inches
Hole Fluid Type	WBM	
Density / Viscosity	10.40 lb/USg	15.00 CP
PH / Fluid Loss	9.00	8.00 ml/30Min
Sample Source	FLOWLINE	
Rm @ Measured Temp	4.26 @ 76.4	ohm-m
Rmf @ Measured Temp	3.41 @ 76.4	ohm-m
Rmc @ Measured Temp	5.11 @ 76.4	ohm-m
Source Rmf / Rmc	CALC	CALC
Rm @ BHT	2.27 @ 146.0	ohm-m
Time Since Circulation	4 HOURS	
Max Recorded Temp	146.00	deg F
Equipment Name	COMPACT	
Equipment / Base	13144	RK SPR
Recorded By	J.PAULSON	J.LIU
Witnessed By	R.BUSH	

BOREHOLE RECORD

Last Edited: 07-DEC-2011 12:50

Bit Size inches	Depth From feet	Depth To feet
7.875	1539.00	9095.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	9.625	0.00	1537.00	36.00

REMARKS

SOFTWARE VERSION 12.02.4401

TOOLS RUN: SHA, MCG, MDN, MPD, MIS-D, SKJ, MFE, MAI RUN IN COMBINATION.

HARDWARE: MPD: 8" PROFILE PLATE USED.
MAI: TWO 1 INCH STANDOFFS USED.
MFE: ONE 1 INCH STANDOFF USED.
MDN: DUAL BOWSPRING USED.

2.65 G/CC DENSITY MATRIX USED TO CALCULATE POROSITY.

TIGHT PULLS, BOREHOLE SIZE AND RUGOSITY WILL AFFECT REPEATABILITY AND DATA QUALITY.

ALL INTERVALS LOGGED AND SCALED PER CUSTOMER'S REQUEST.

TOTAL HOLE VOLUME FROM TD TO SURFACE CASING =1731 CUBIC FEET

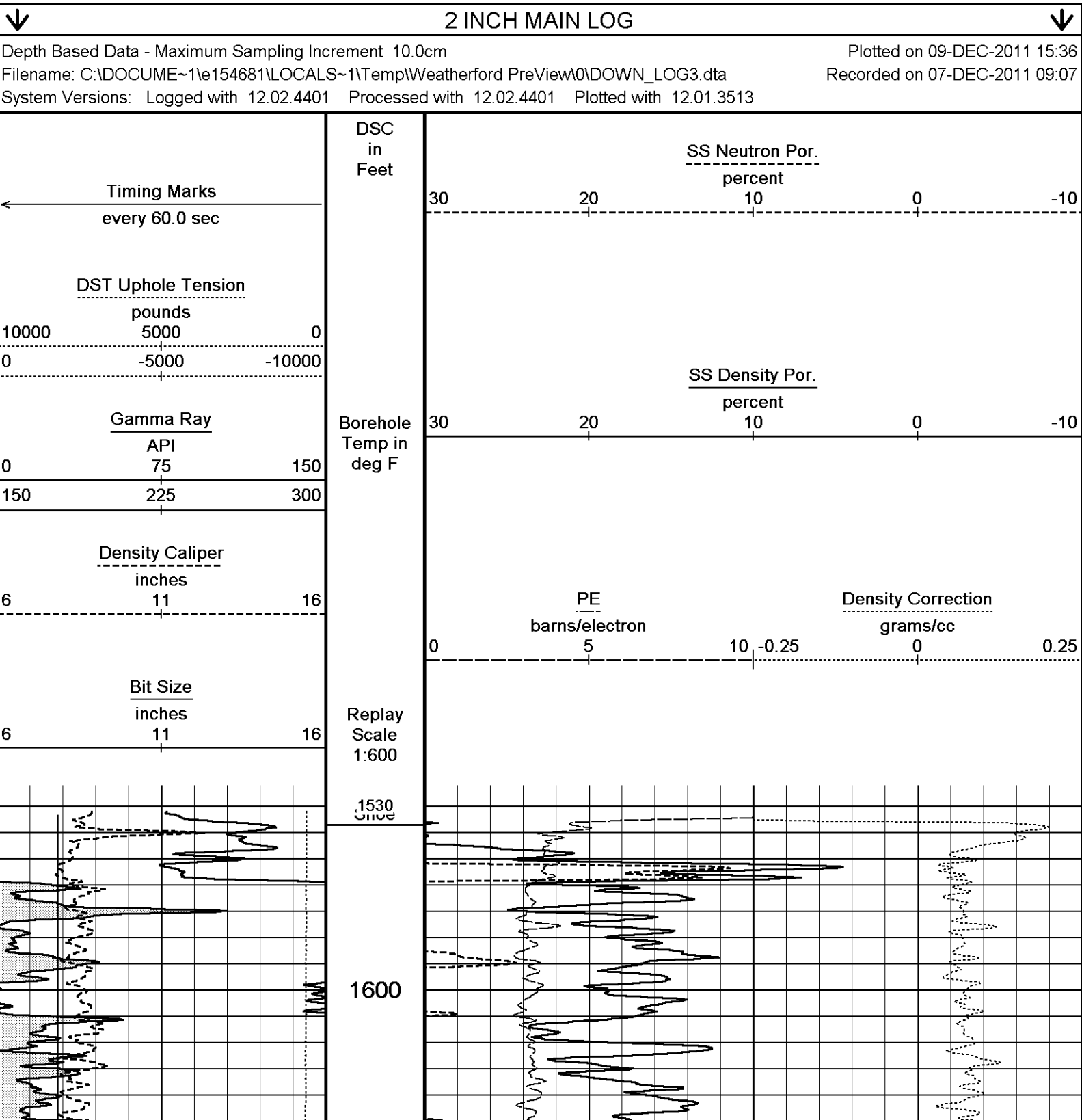
ANNUAL VOLUME WITH 4.5 INCH PRODUCTION CASING FROM TD TO SURFACE CASING = 1215 CUBIC FEET

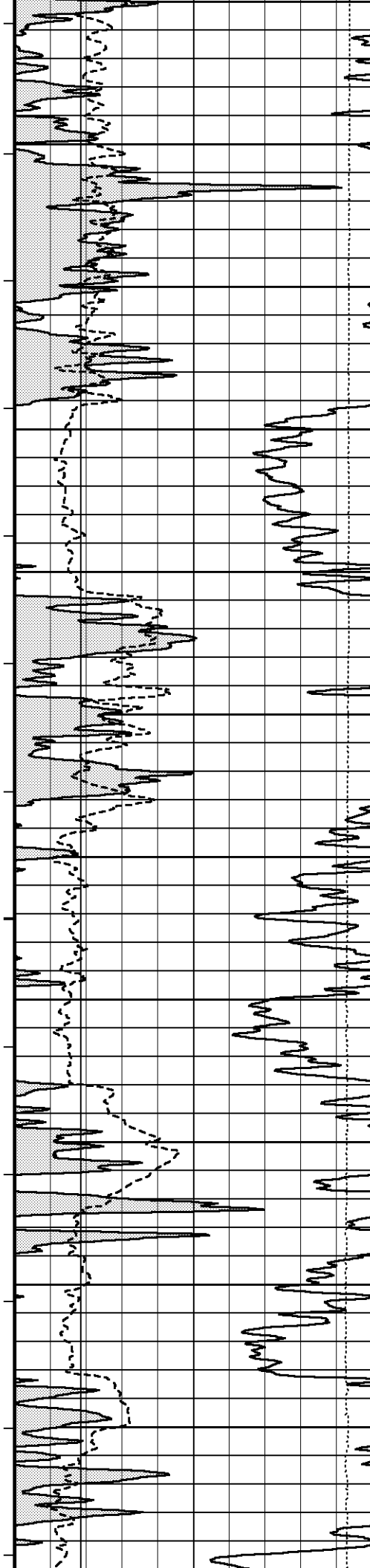
BRIDGED OFF AT 6220 AND LOGGED UP FROM THERE

SERVICE ORDER: #3526717
OPERATOR: D. SMITH
U. KIMBASSA

RIG: SST 88

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.





93°

1700

94°

1800

95°

1900

96°

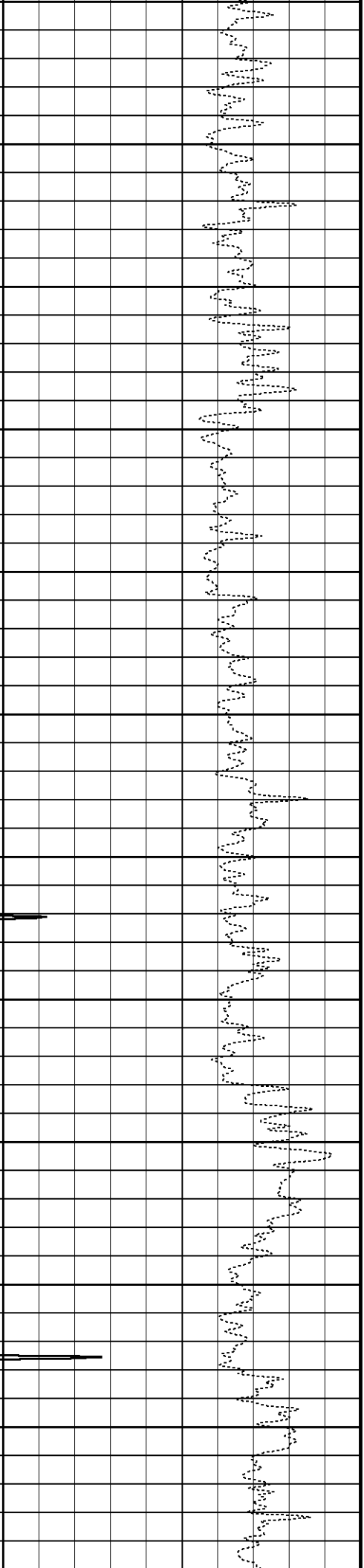
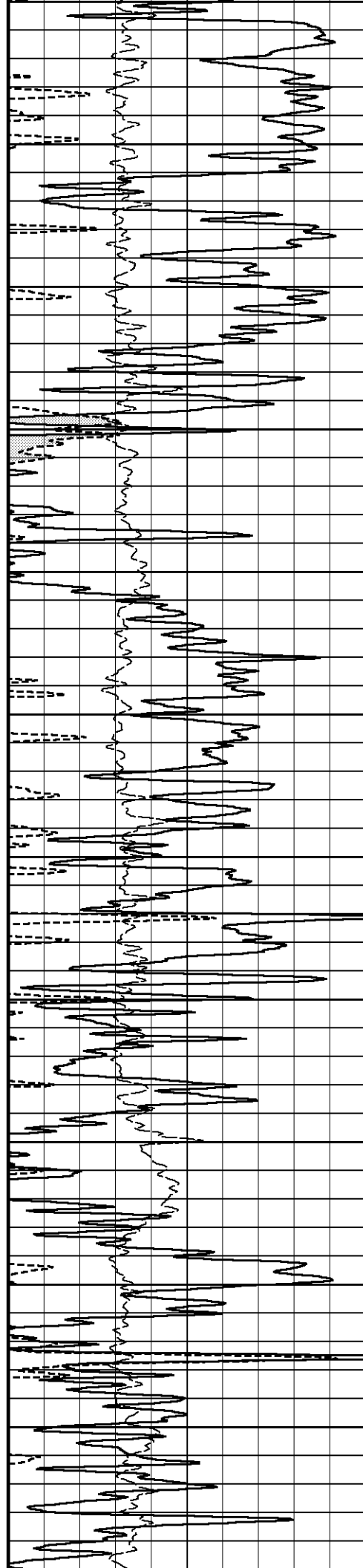
2000

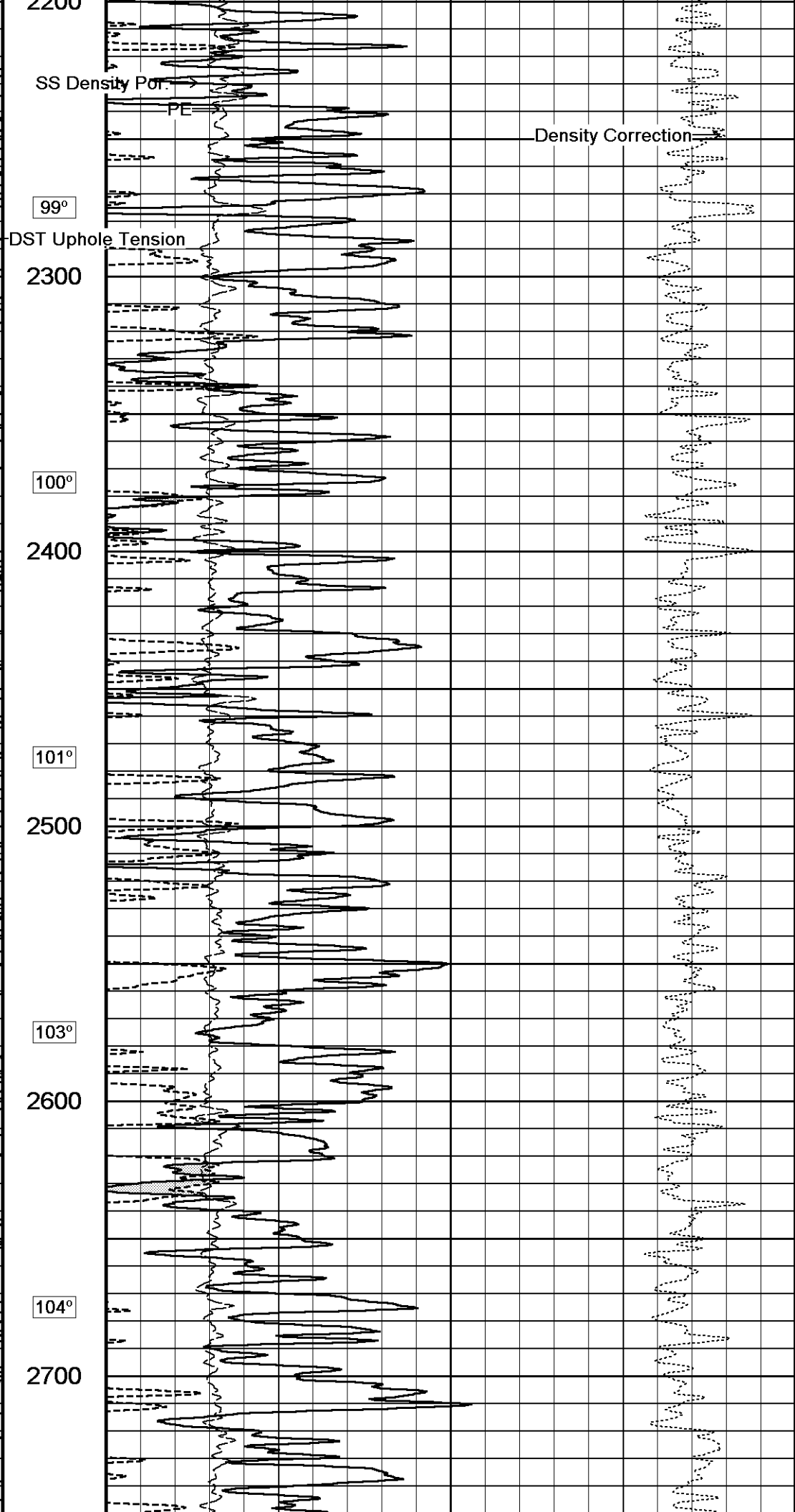
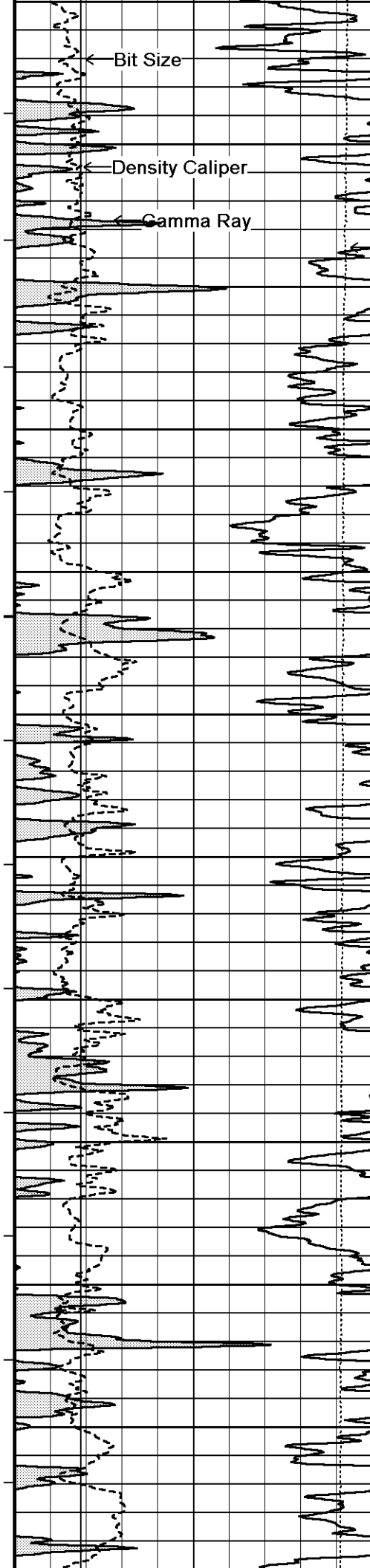
97°

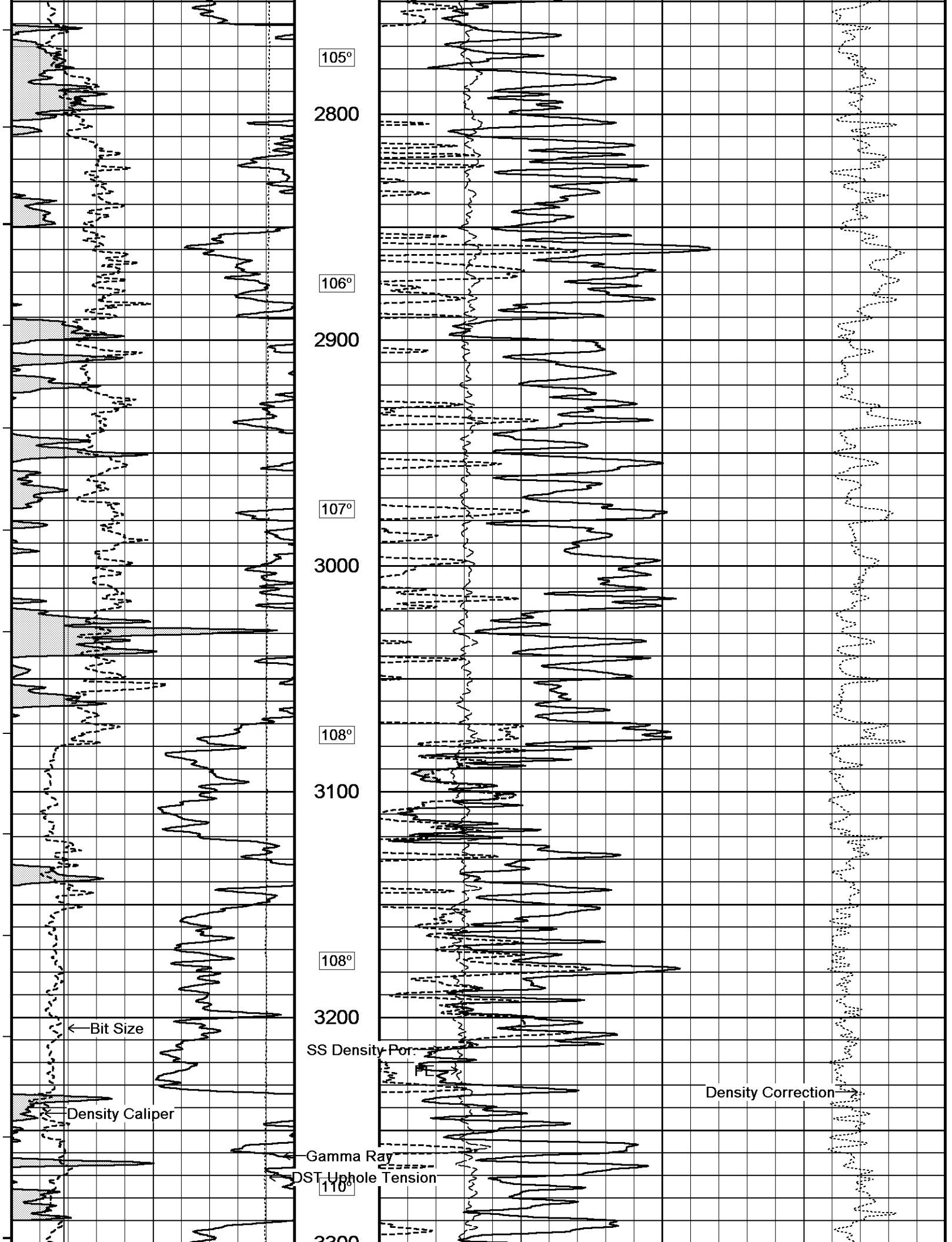
2100

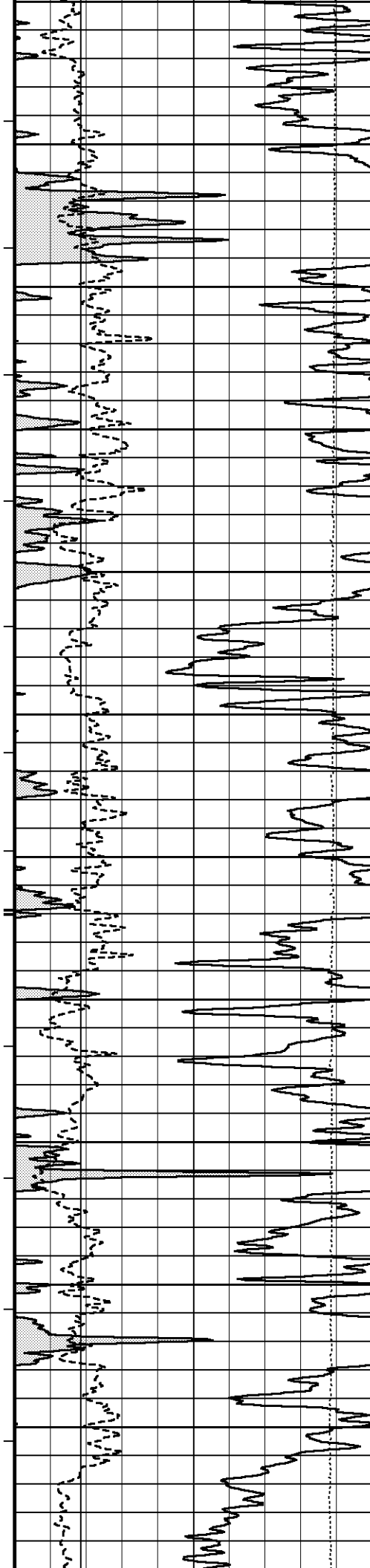
98°

2200









3500

111°

3400

112°

3500

113°

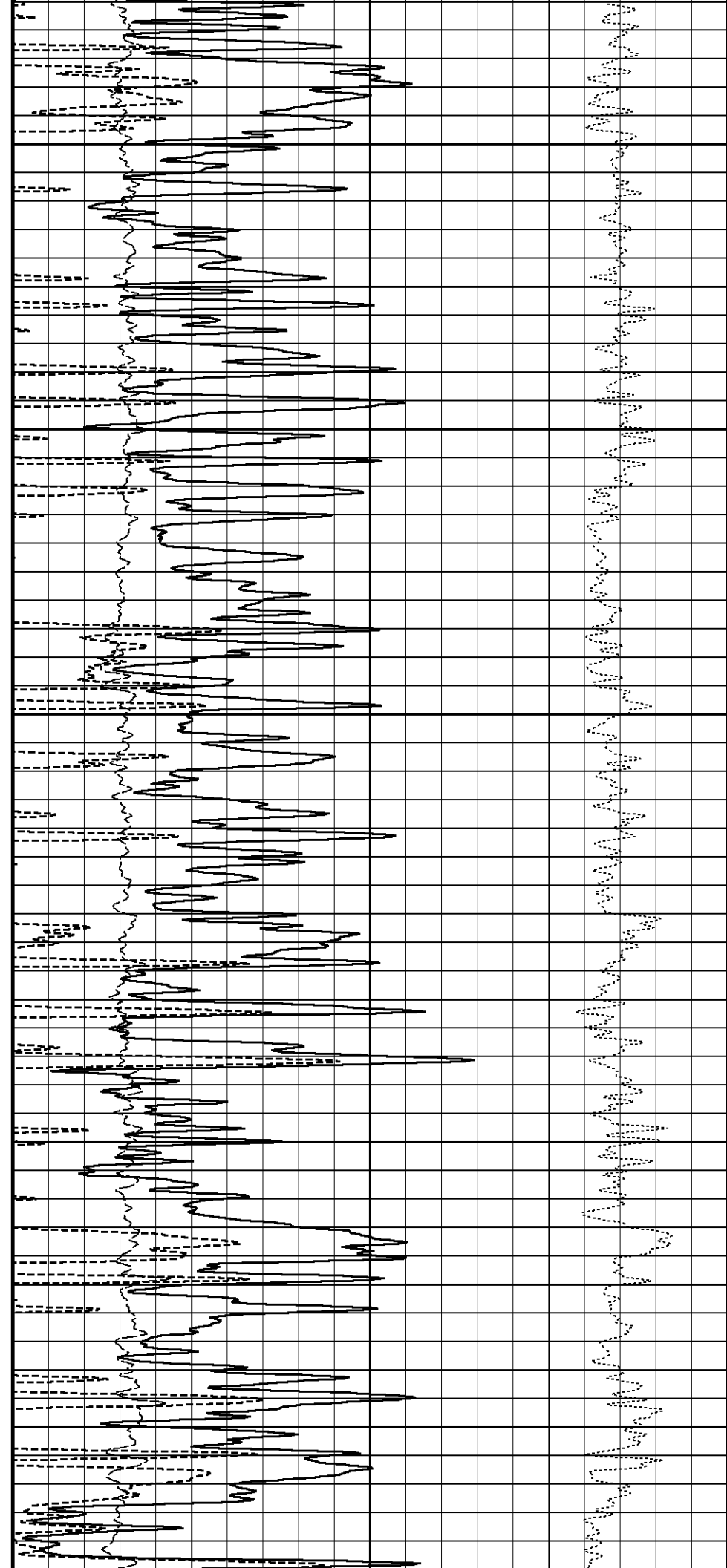
3600

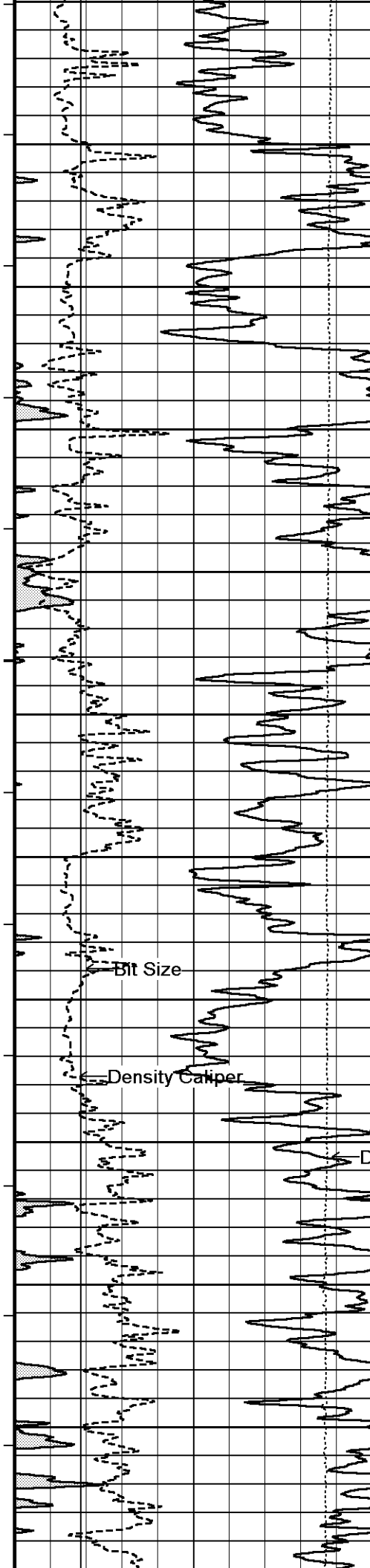
115°

3700

116°

3800





117°

3900

118°

4000

119°

4100

120°

4200

122°

4300

123°

4400

Bit Size

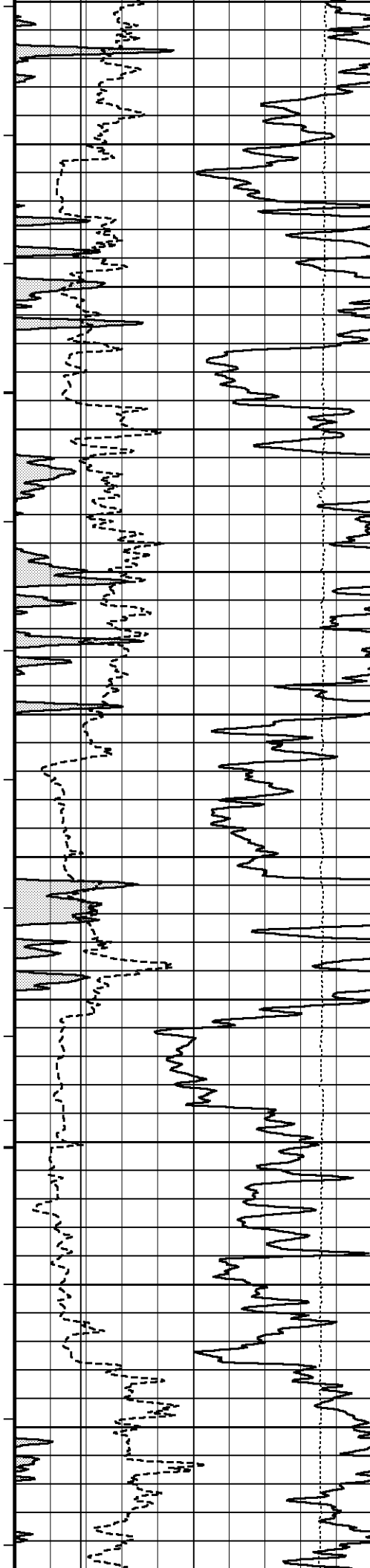
Density Caliper

Gamma Ray

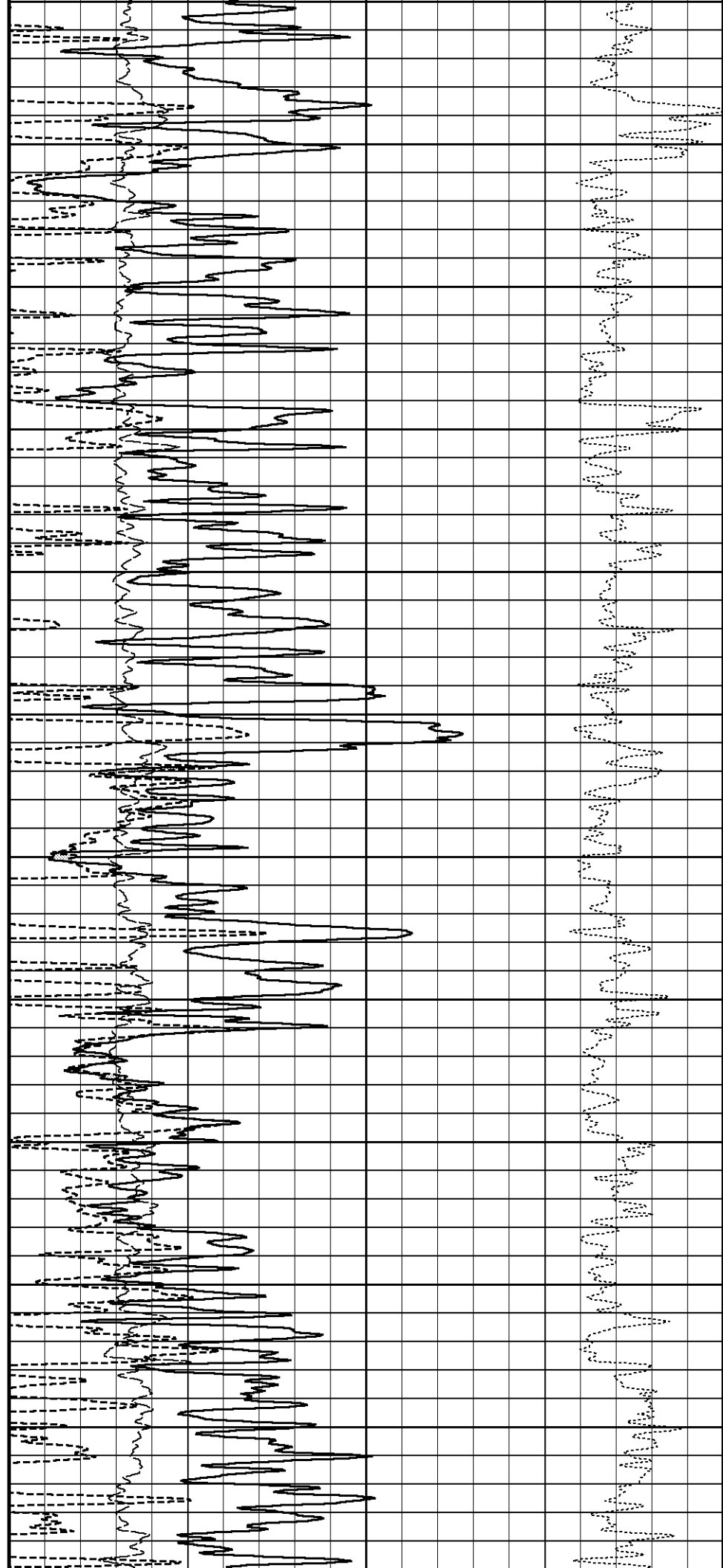
DST Uphole Tension

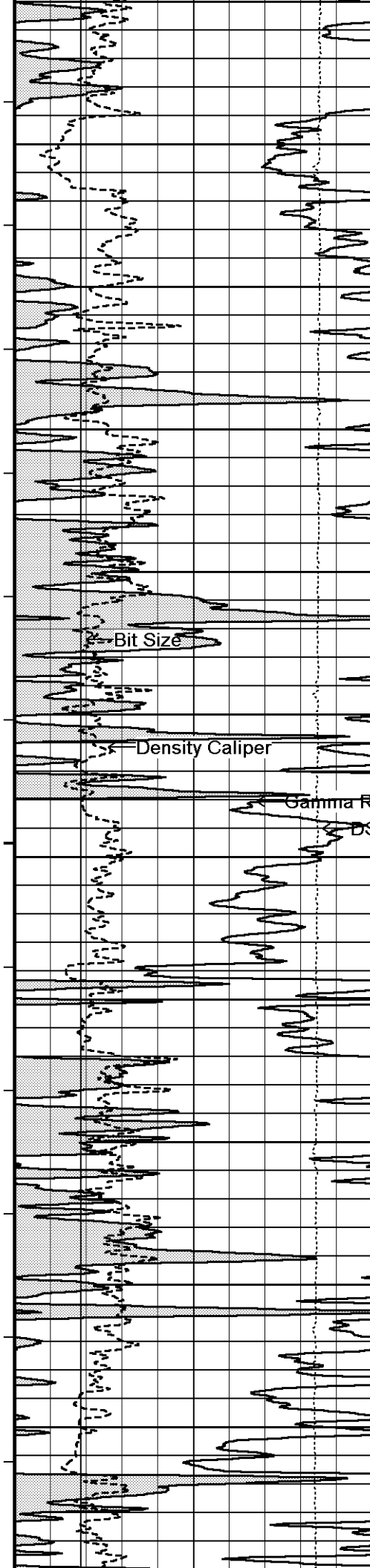
SS Density Por

Density Correction →



4400
124°
4500
125°
4600
126°
4700
127°
4800
128°
4900





130°

5000

131°

5100

132°

5200

134°

5300

135°

5400

137°

5500

Bit Size

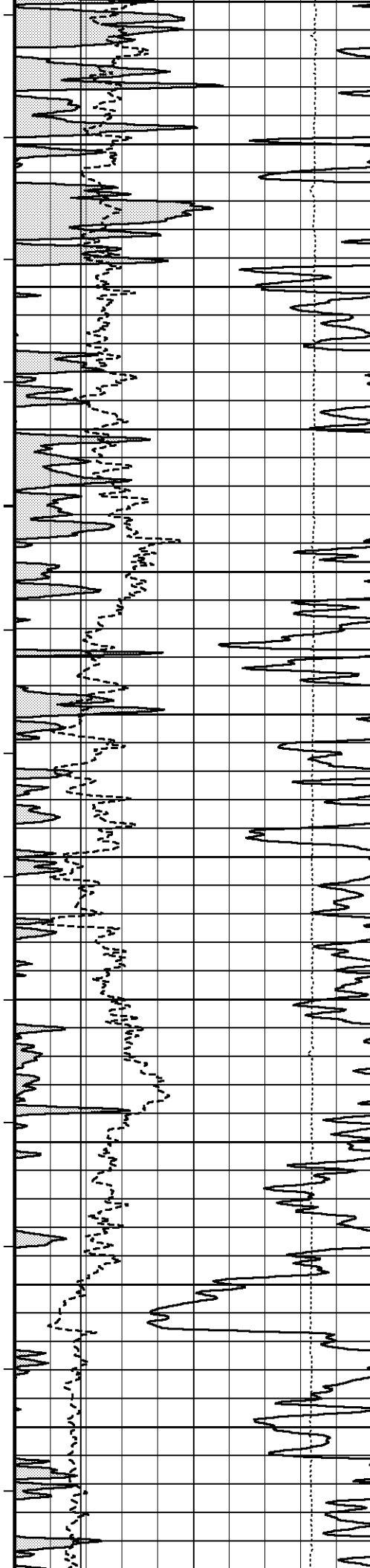
Density Caliper

Gamma Ray

DST Uphole Tension

SS Density Por.

Density Correction



5500

139°

5600

140°

5700

142°

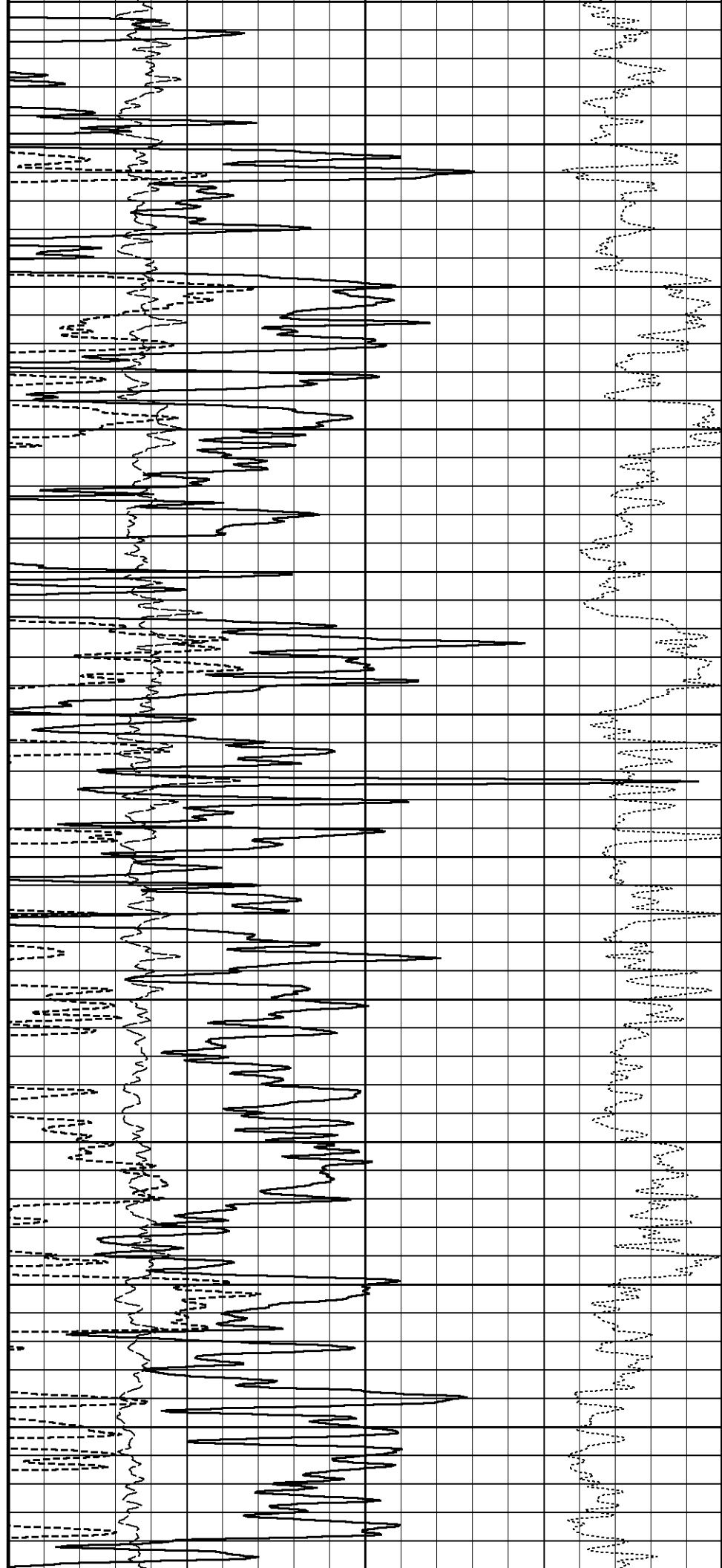
5800

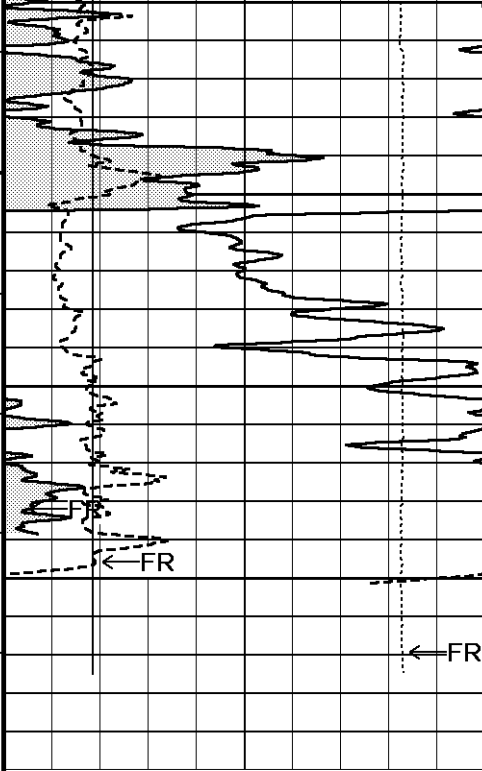
143°

5900

144°

6000





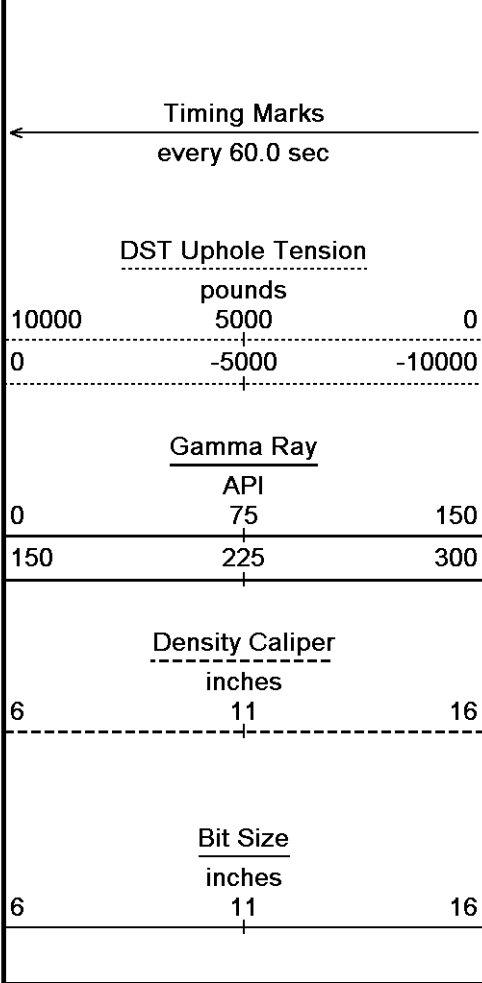
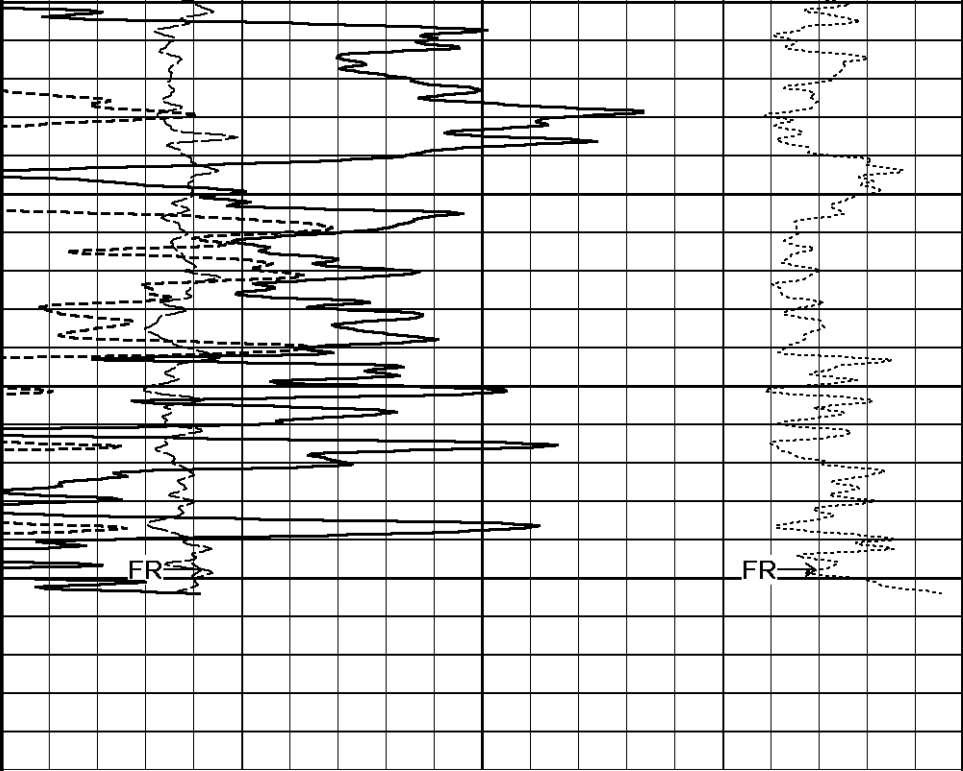
145°

6100

147°

6200

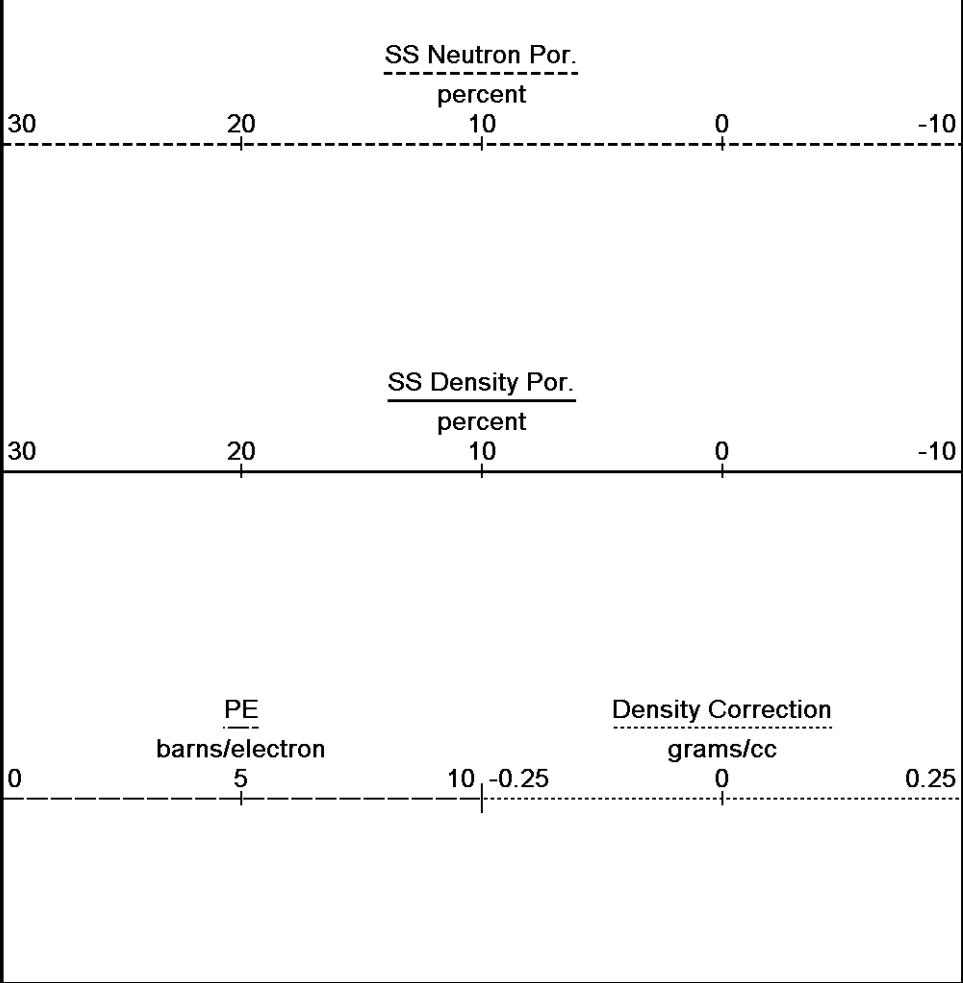
TD



DSC
in
Feet

Borehole
Temp in
deg F

Replay
Scale
1:600

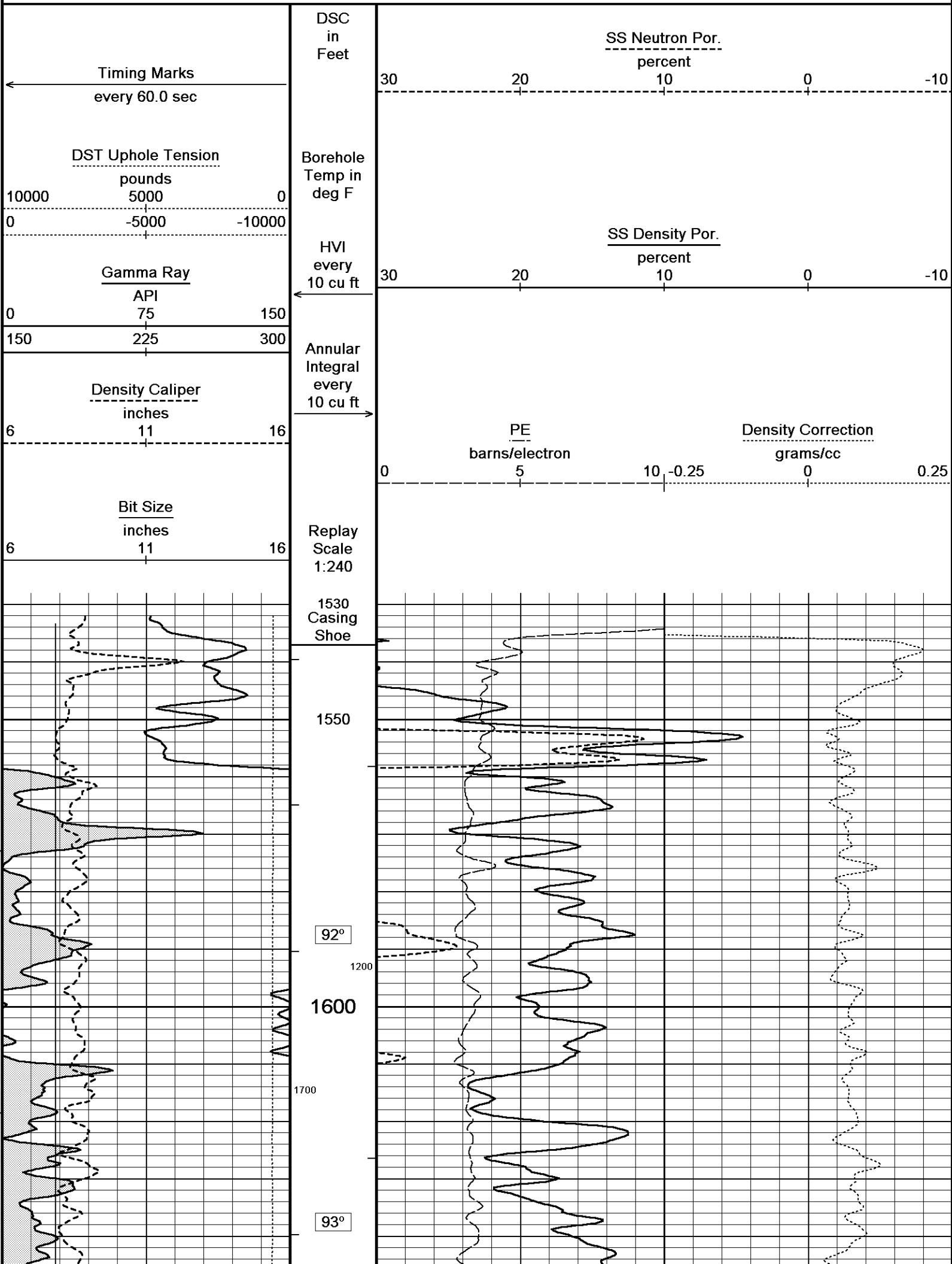


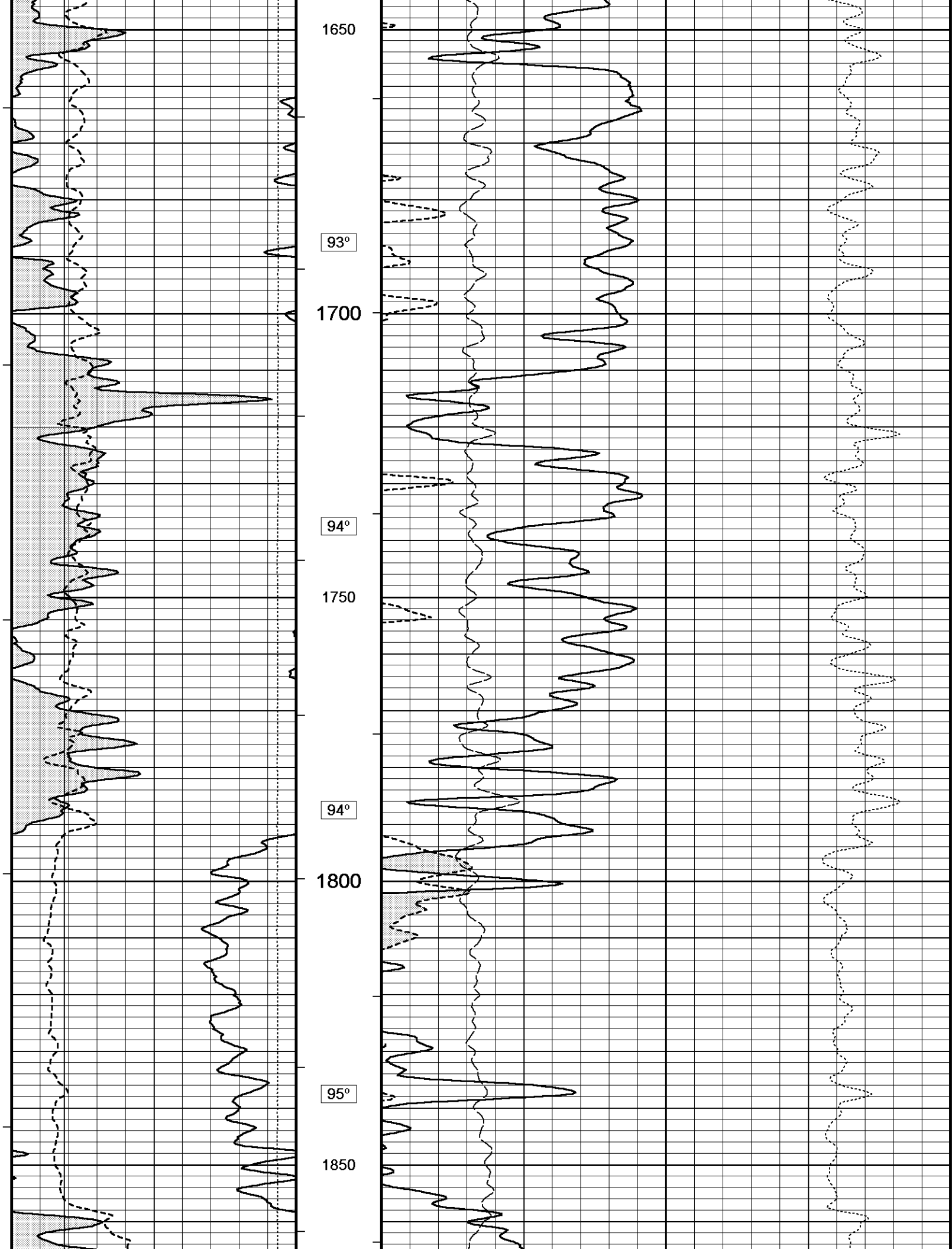
Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\DOCUME~1\154681\LOCALS~1\Temp\Weatherford PreView\0\DOWN_LOG3.dta
System Versions: Logged with 12.02.4401 Processed with 12.02.4401 Plotted with 12.01.3513

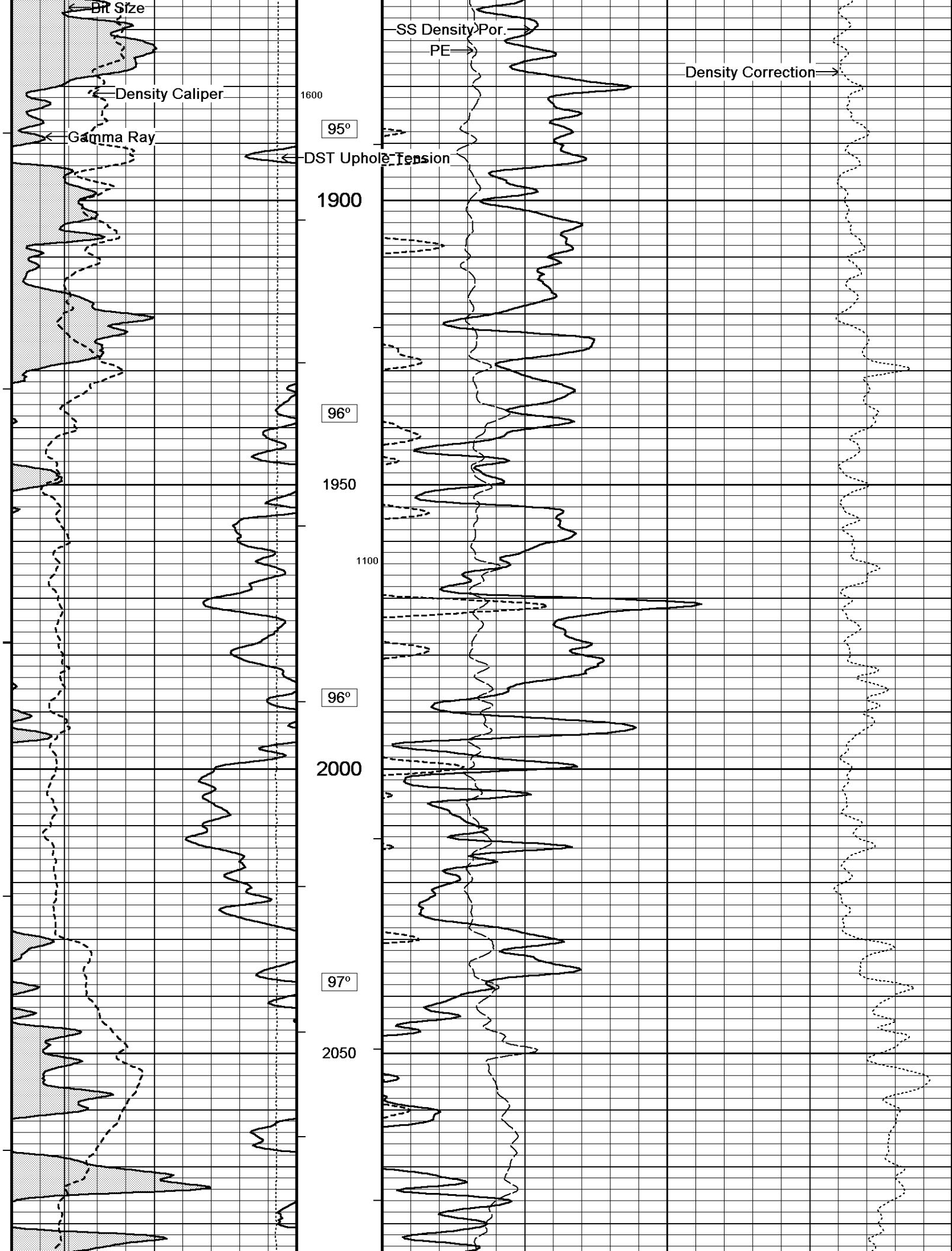
2 INCH MAIN LOG

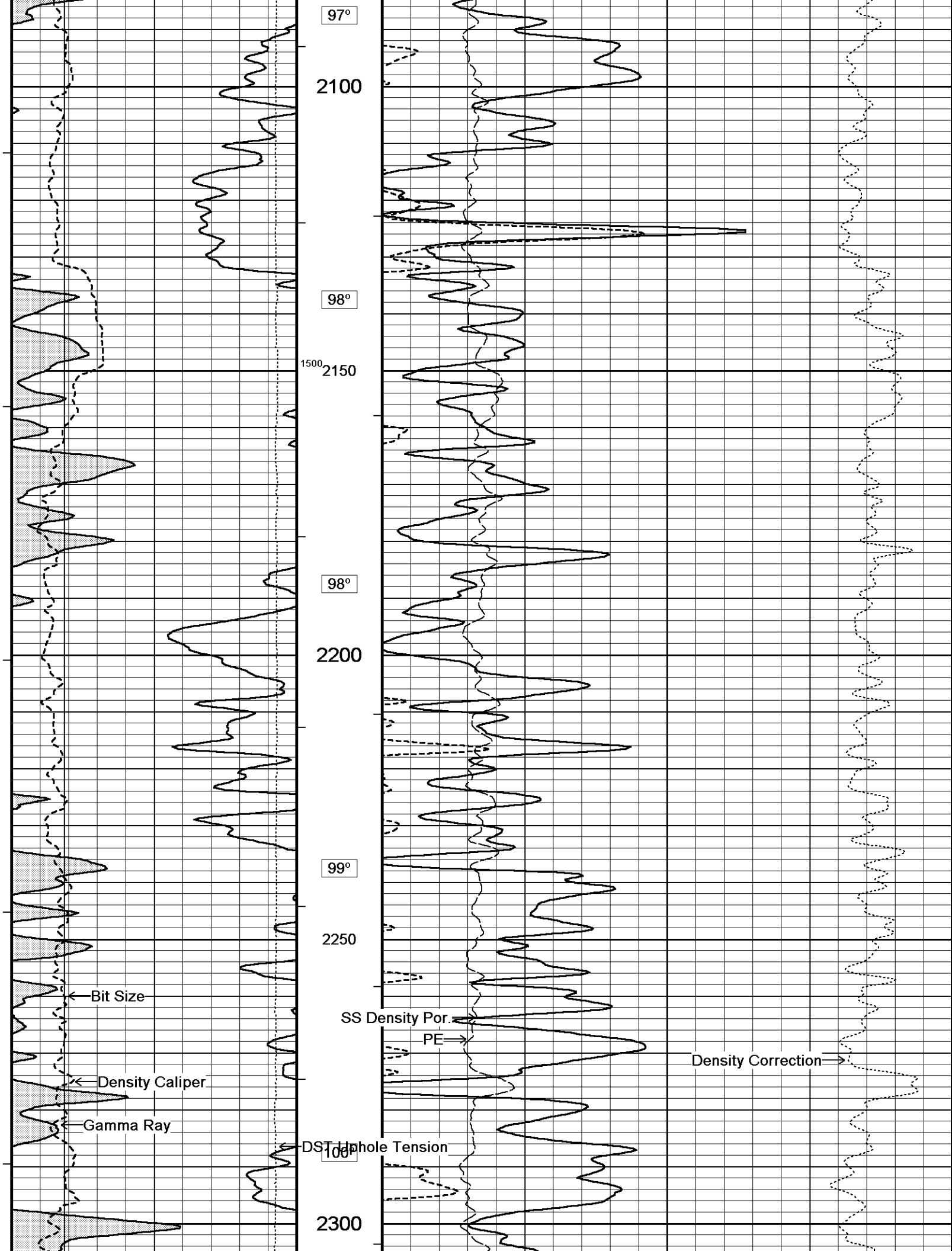
5 INCH MAIN LOG

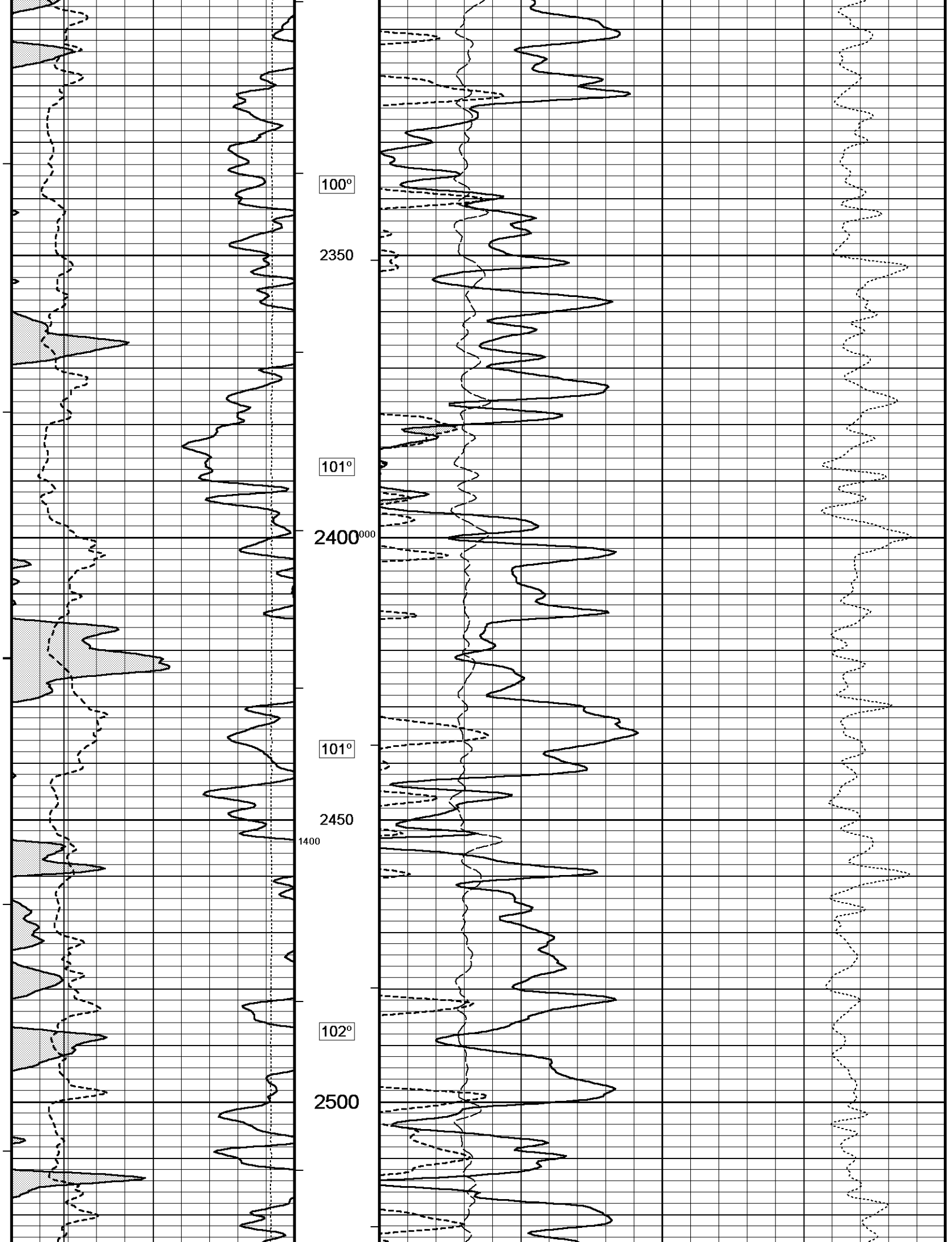
Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\DOCUME~1\154681\LOCALS~1\Temp\Weatherford PreView\0\DOWN_LOG3.dta
System Versions: Logged with 12.02.4401 Processed with 12.02.4401 Plotted with 12.01.3513

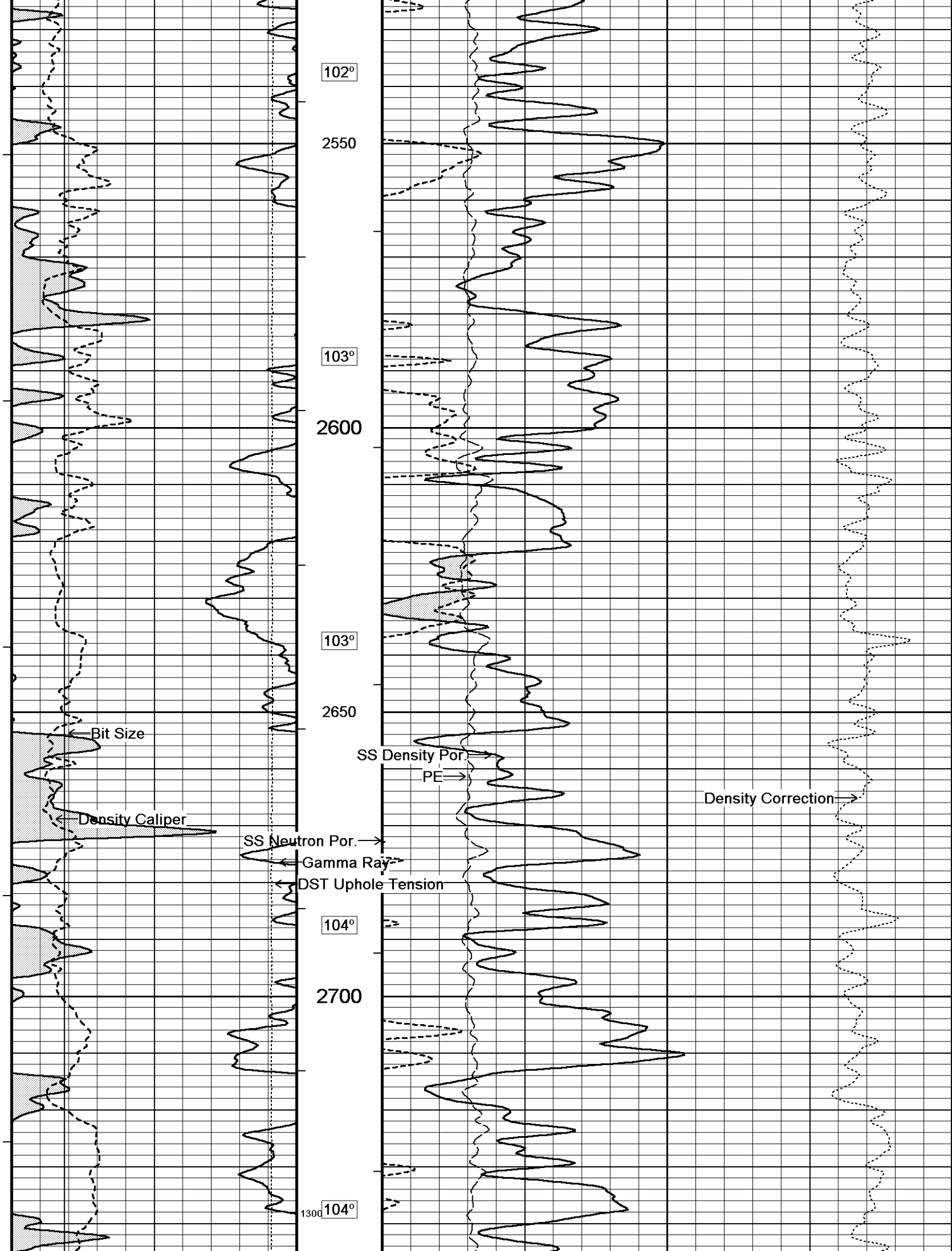


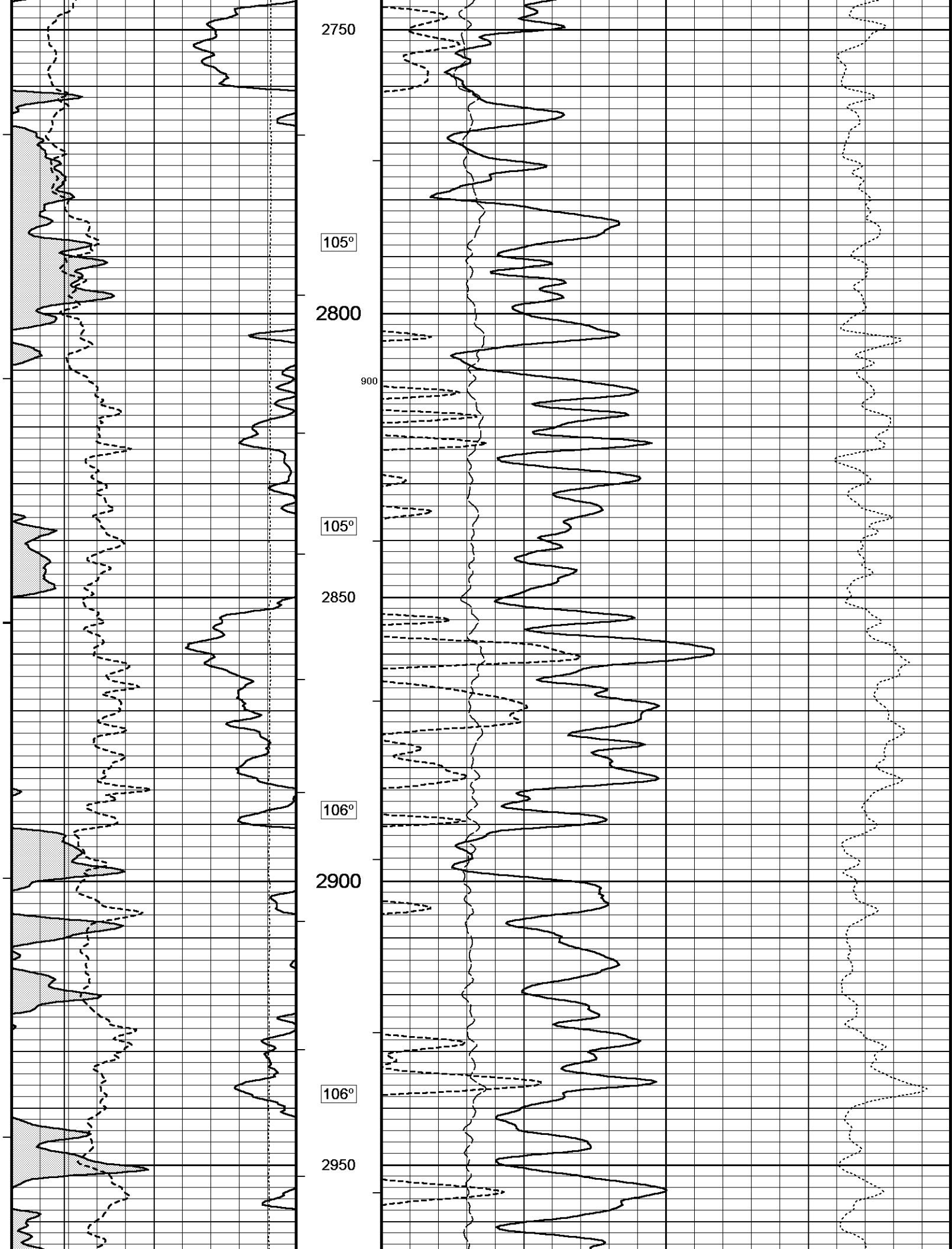


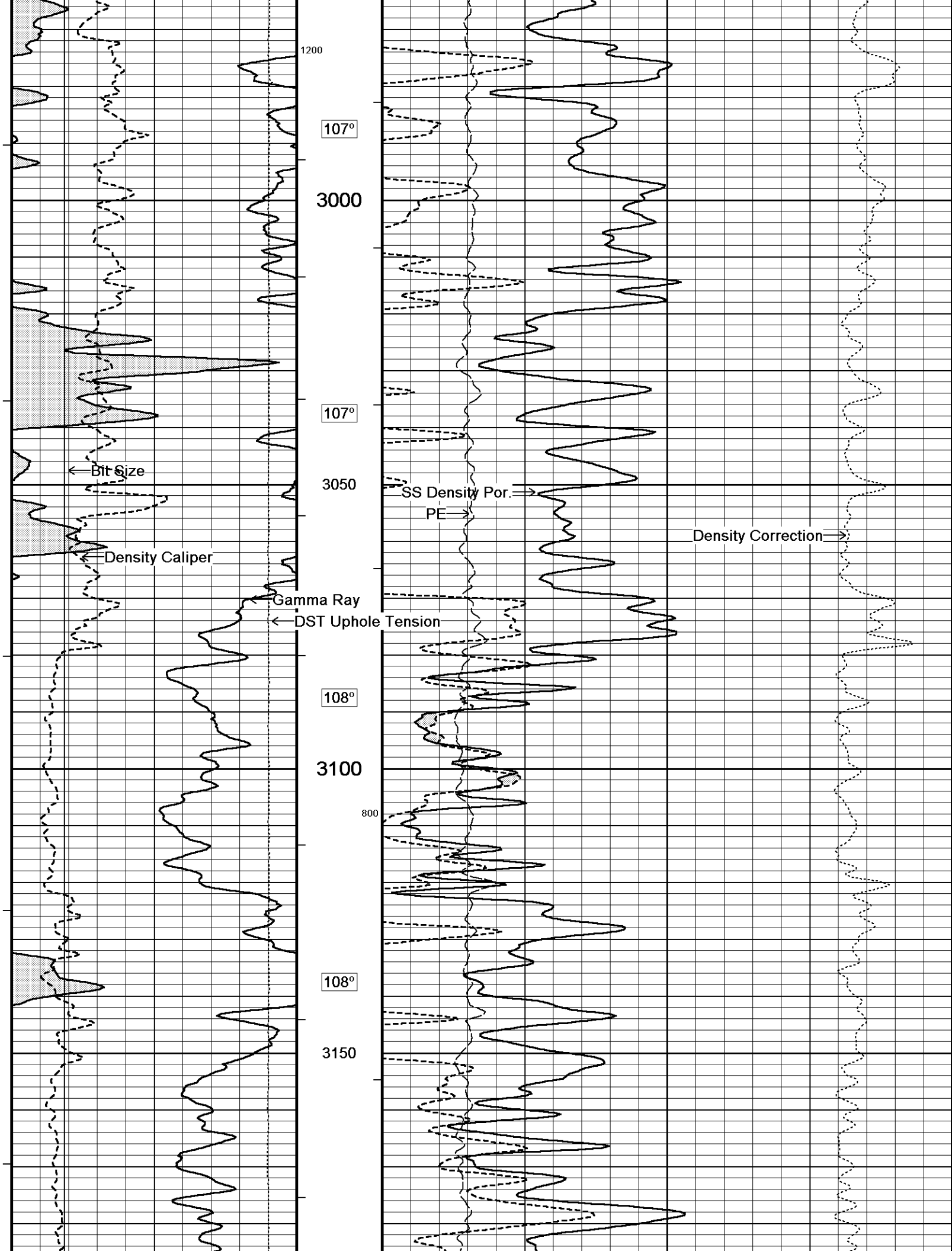


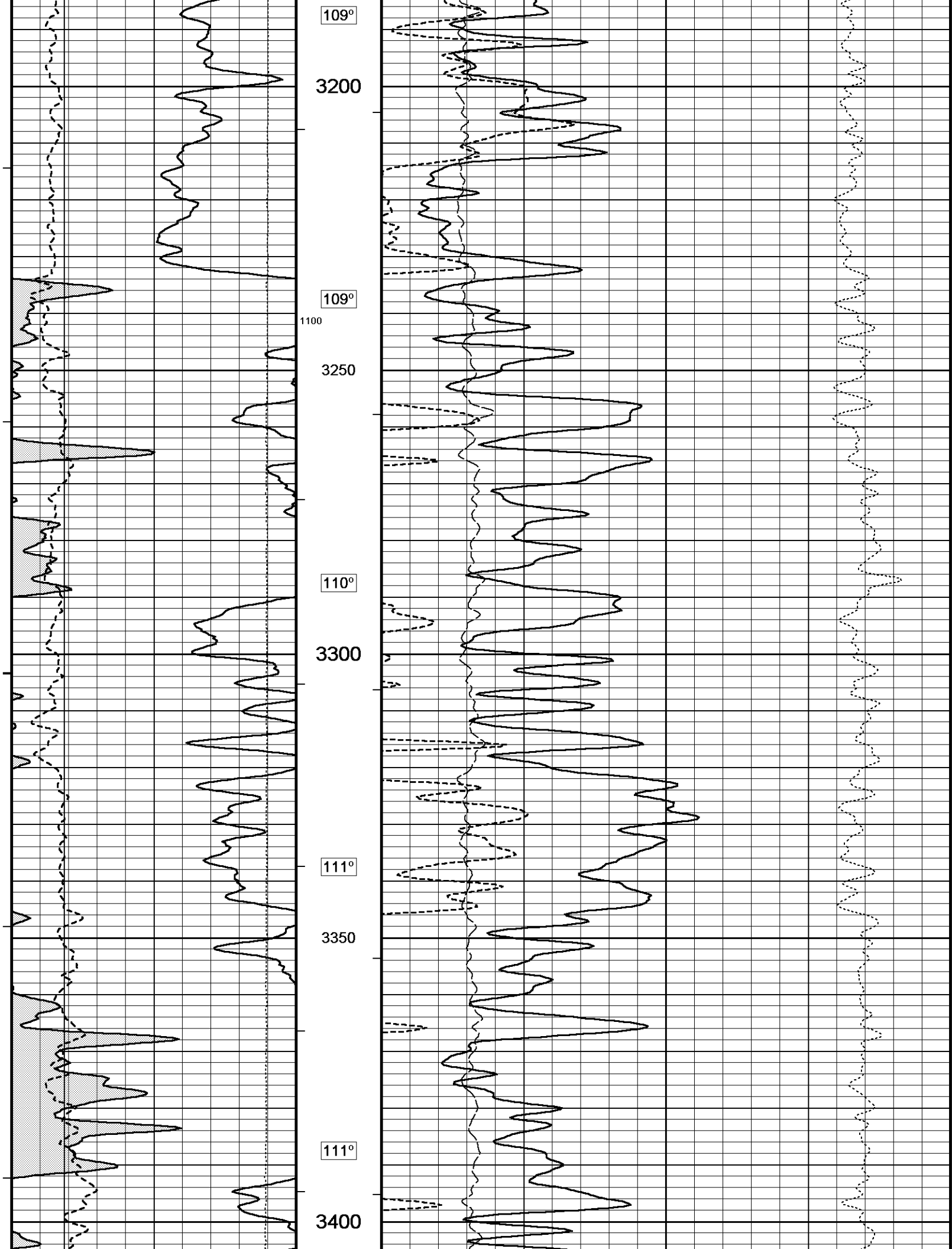


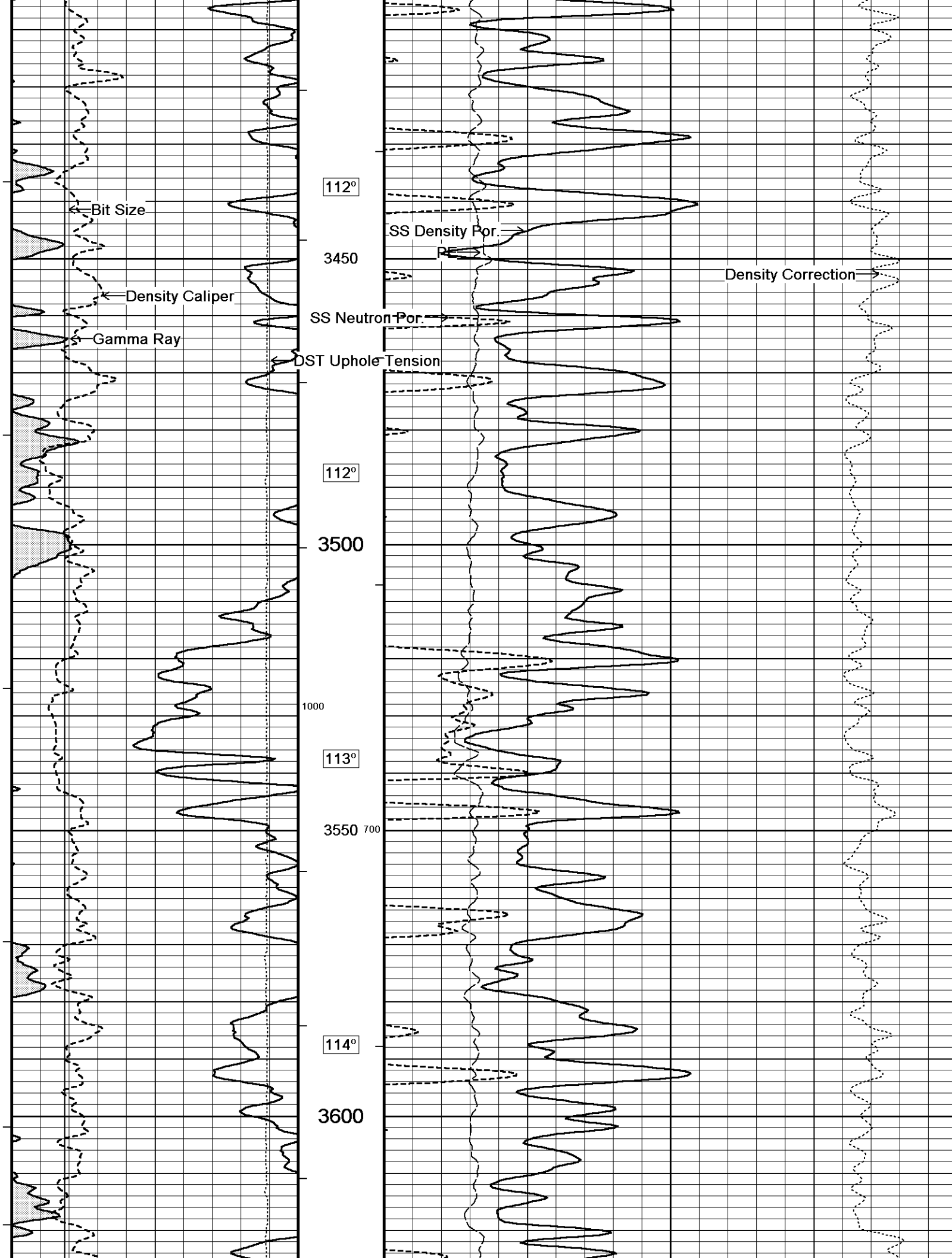


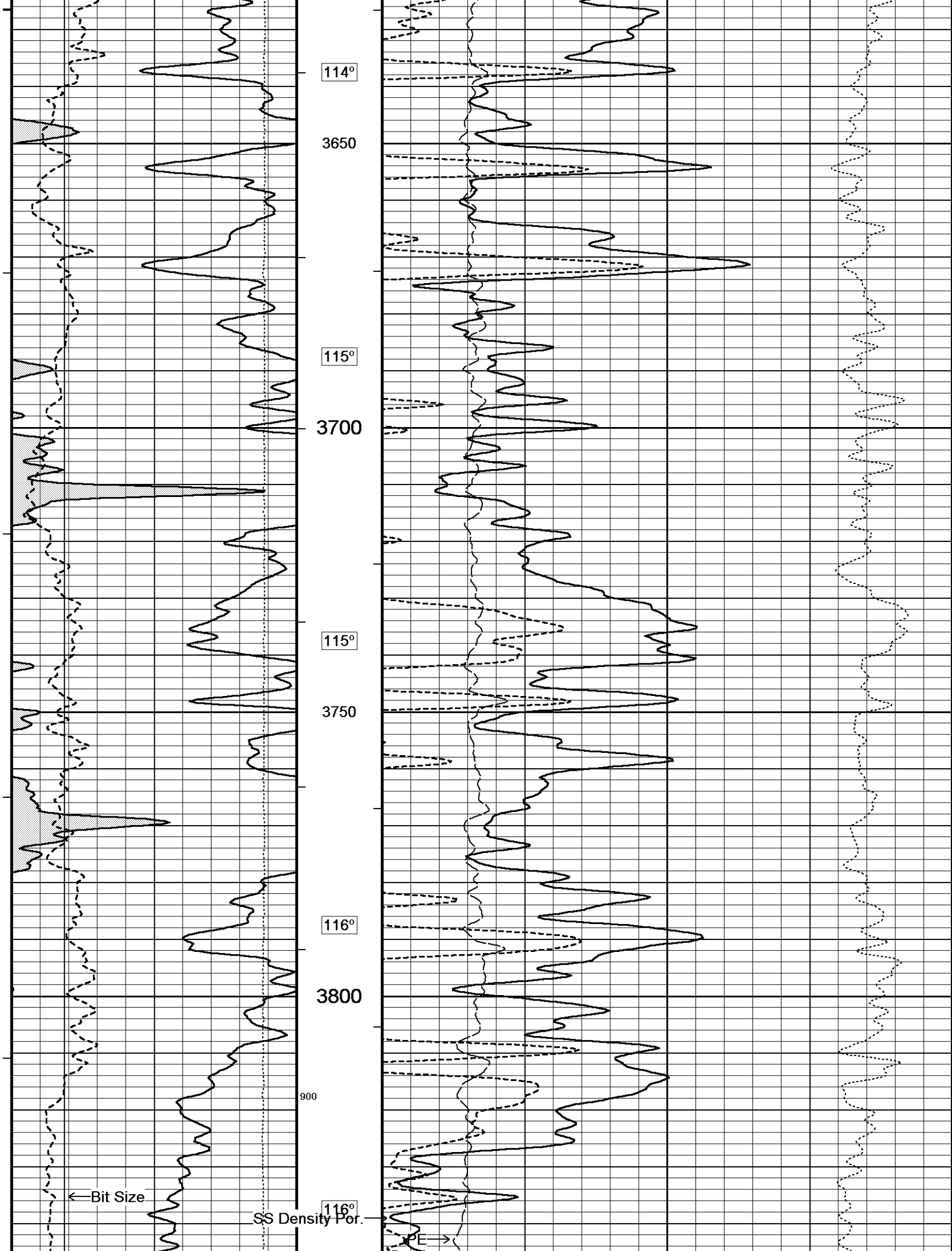


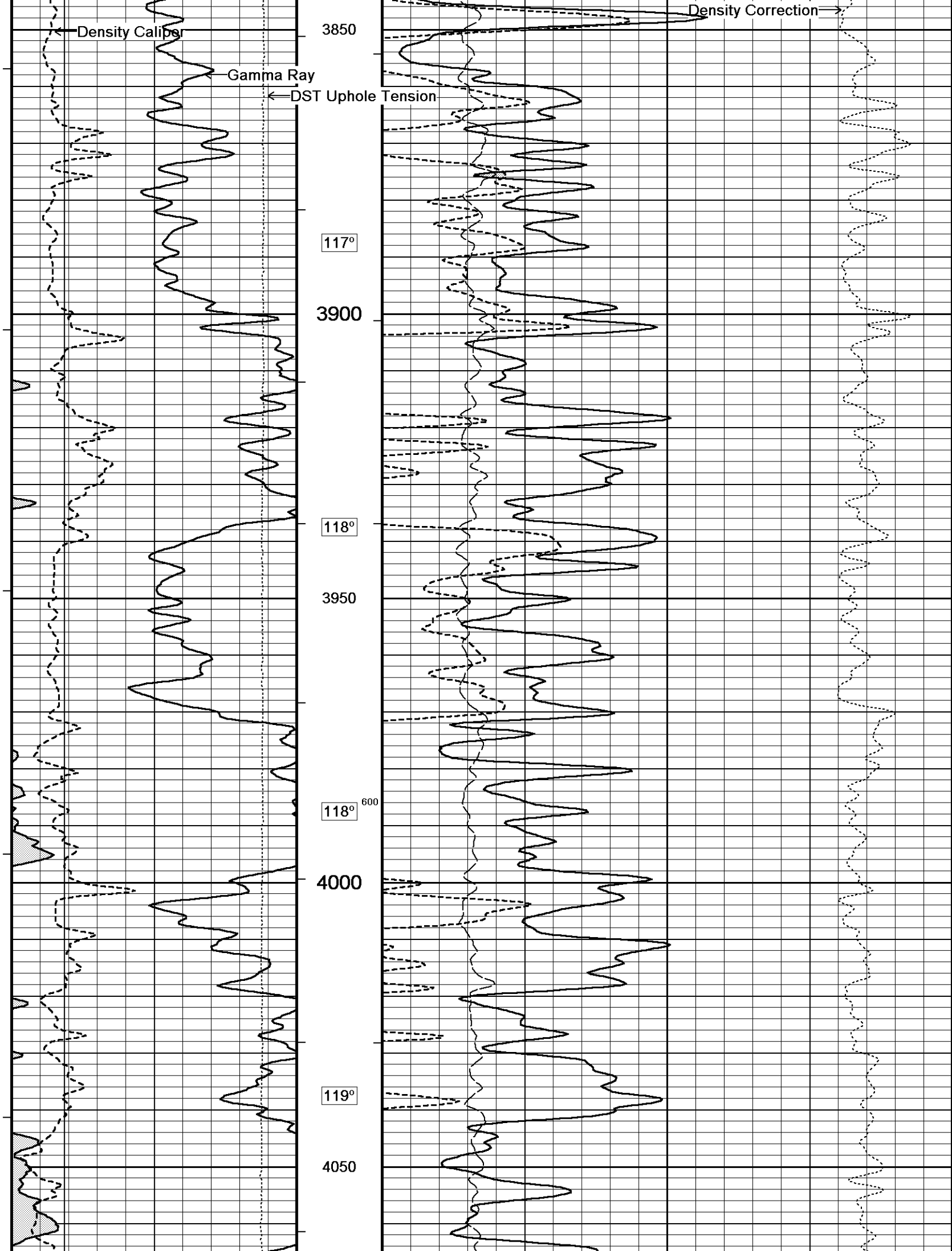


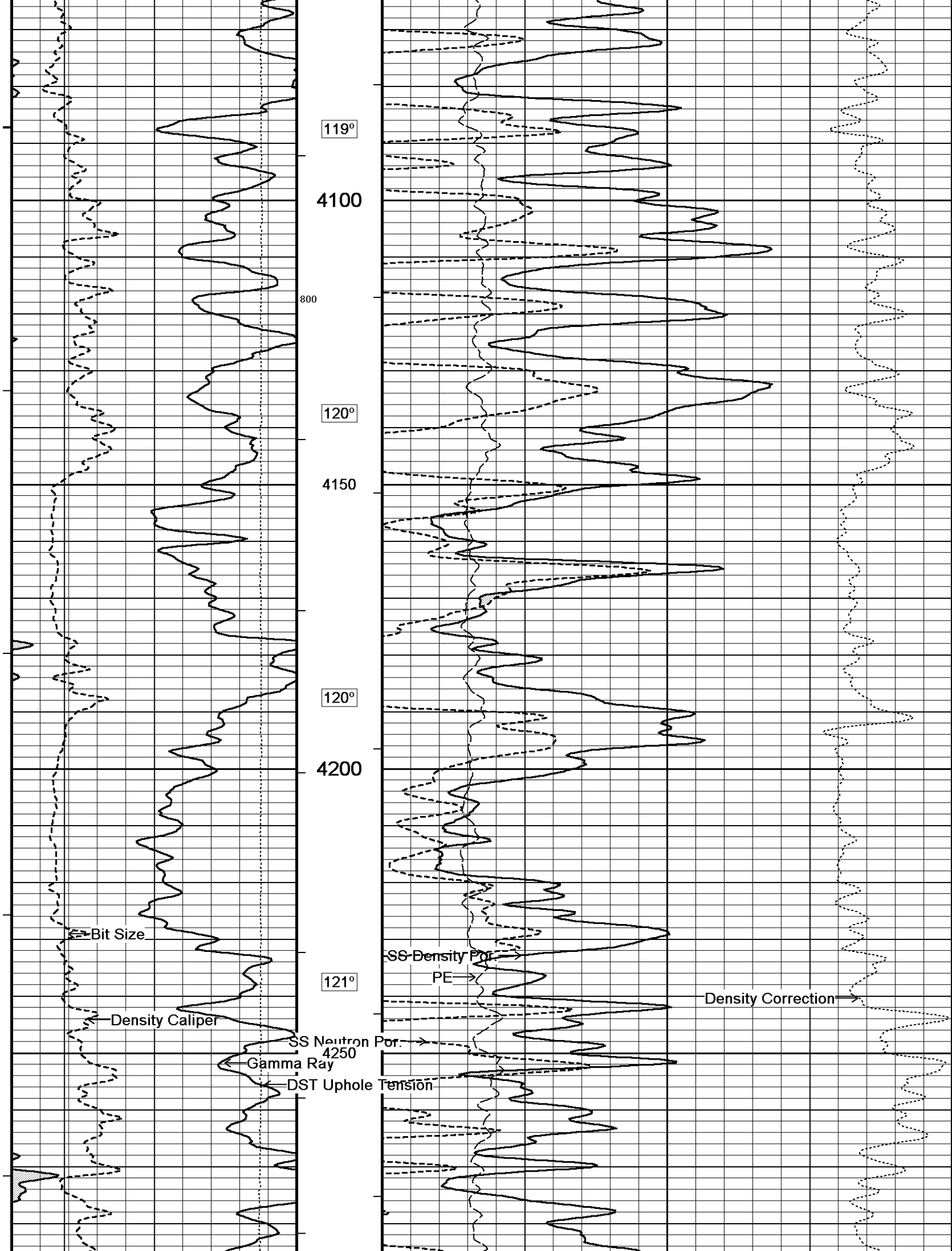


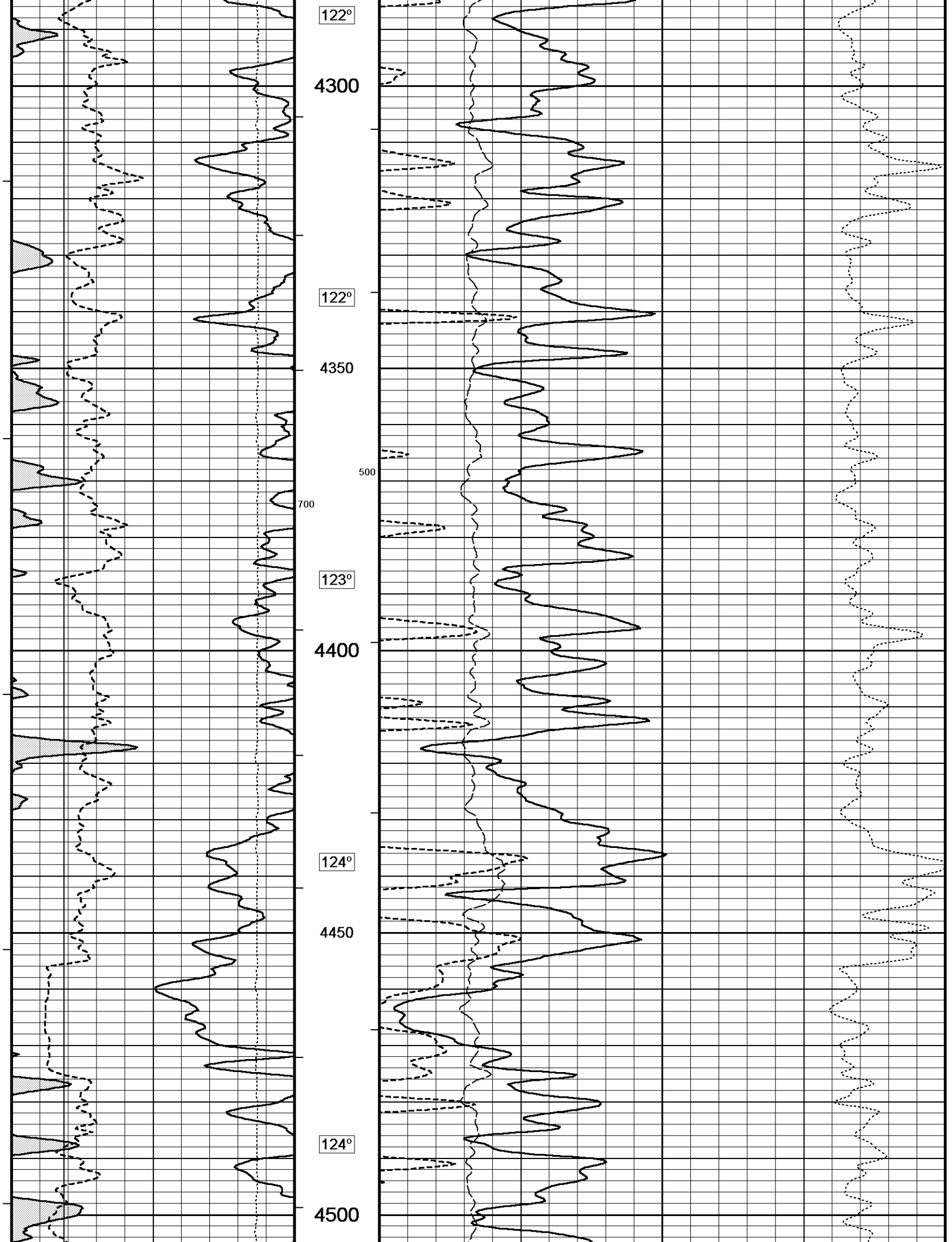


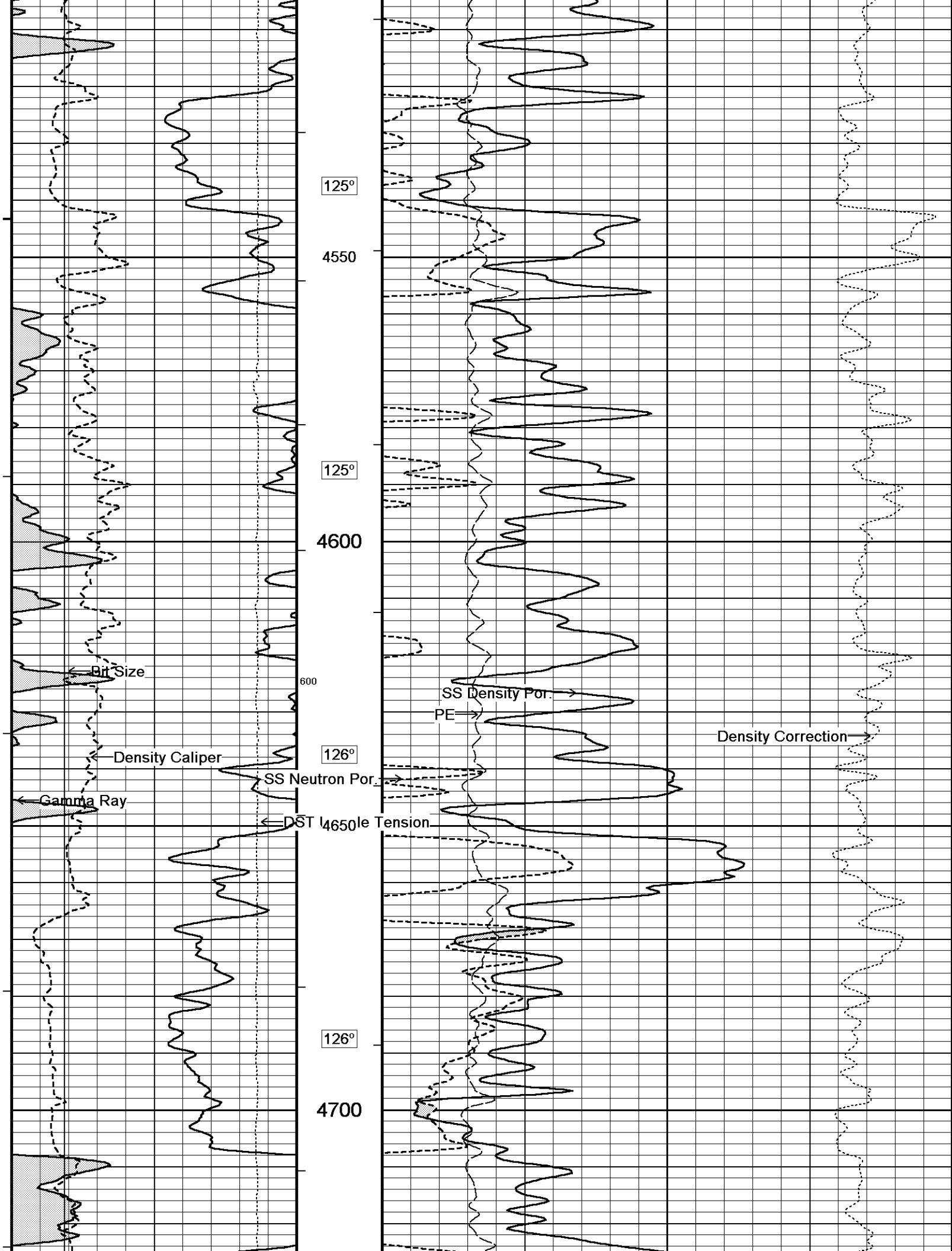


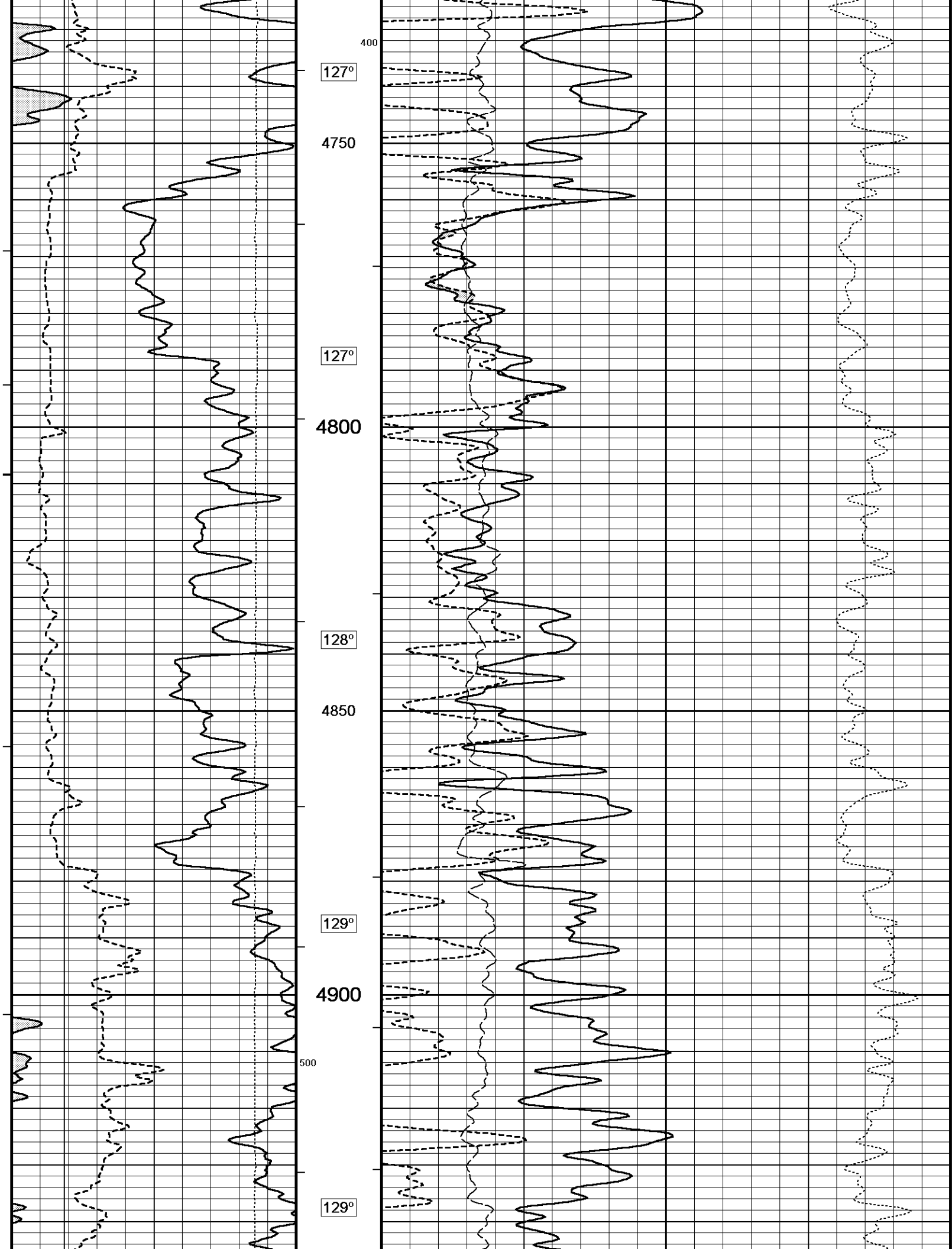


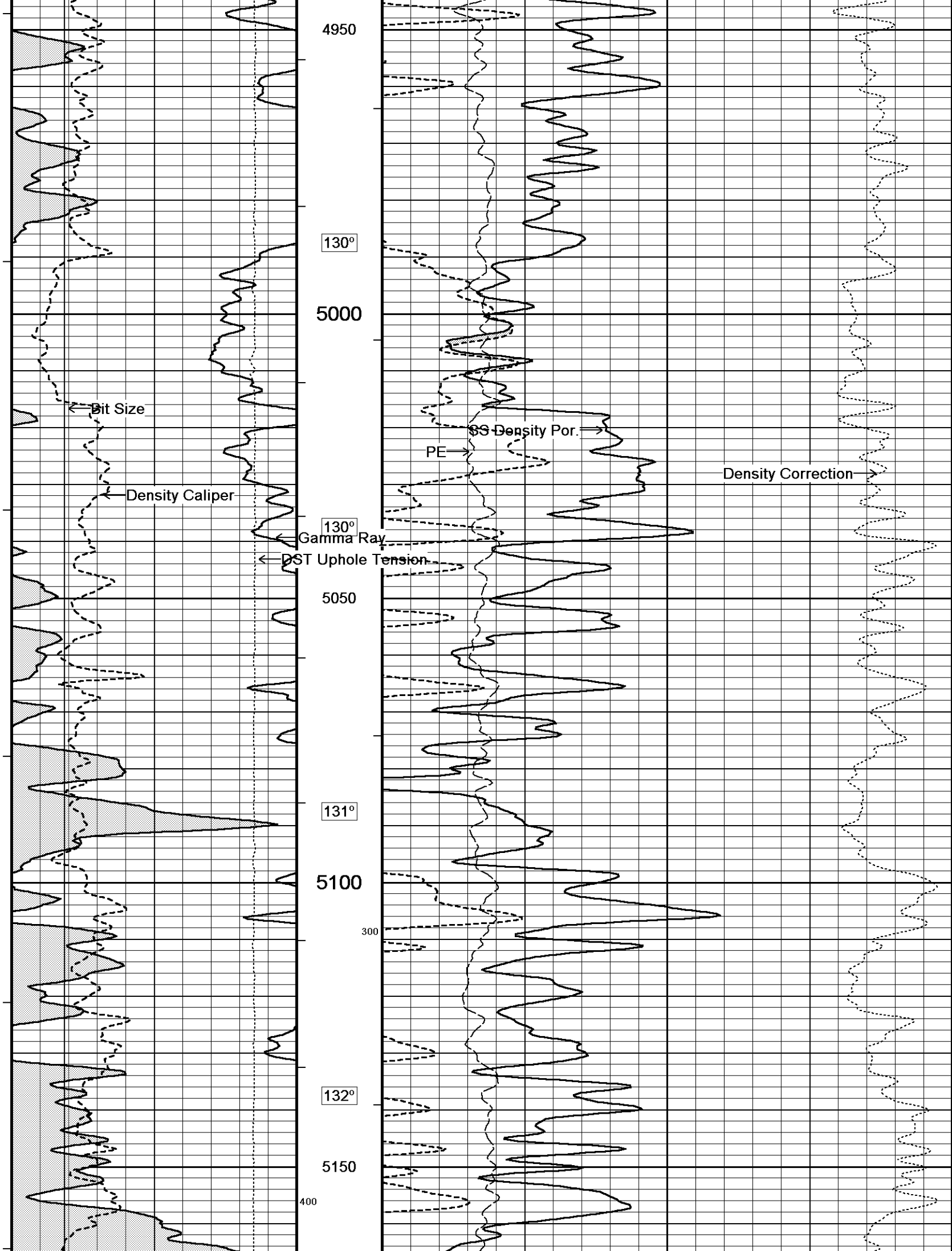


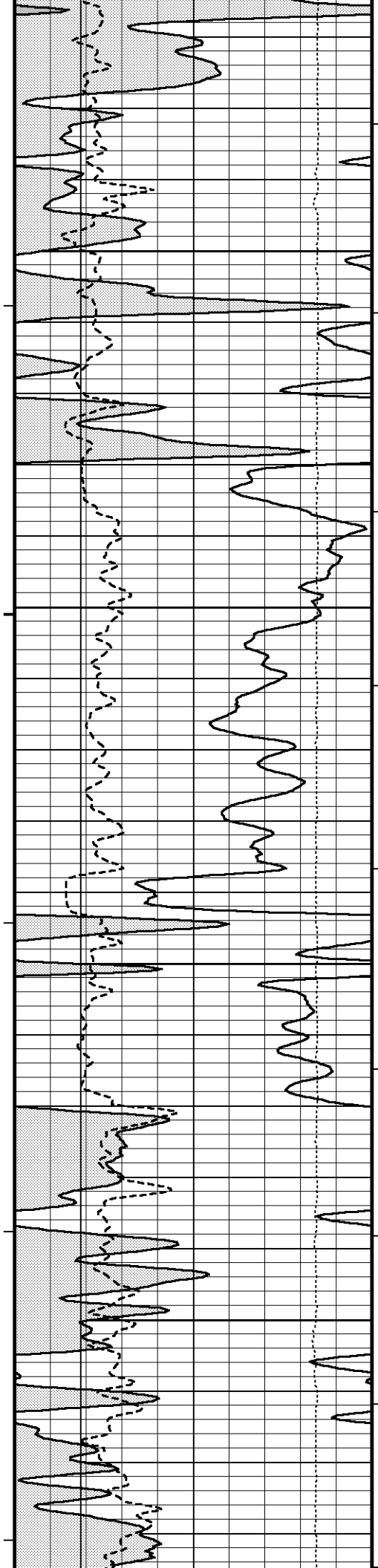












132°

5200

133°

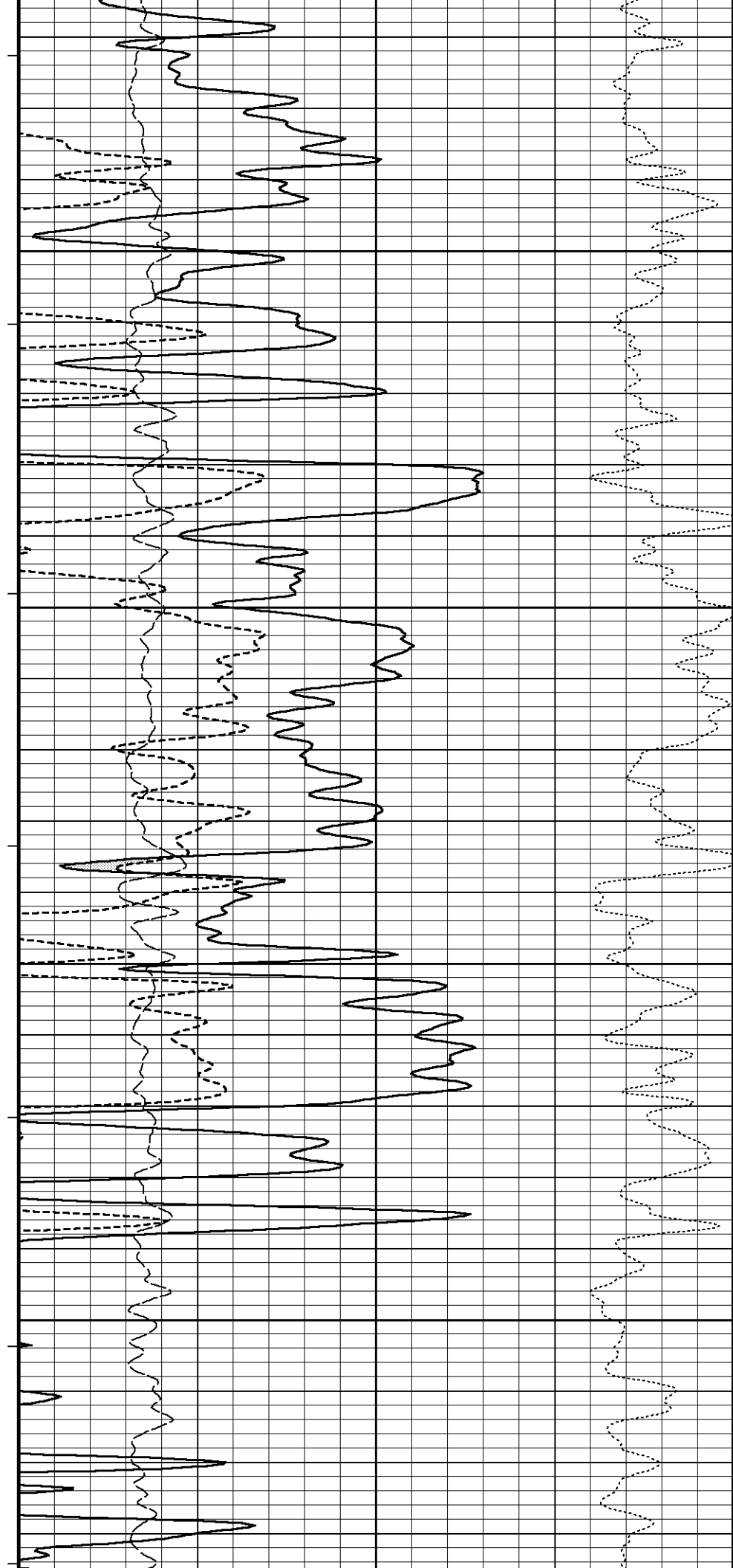
5250

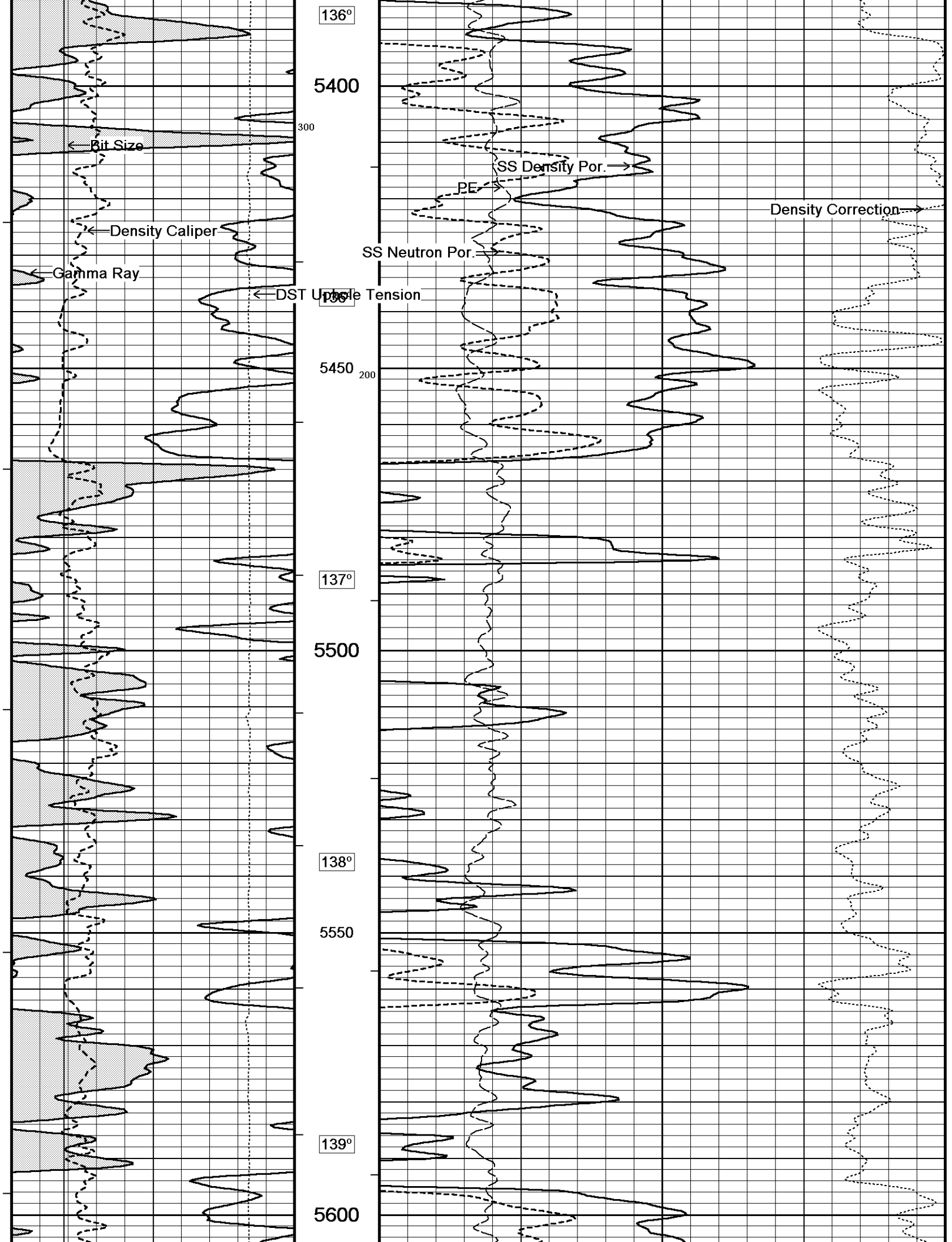
134°

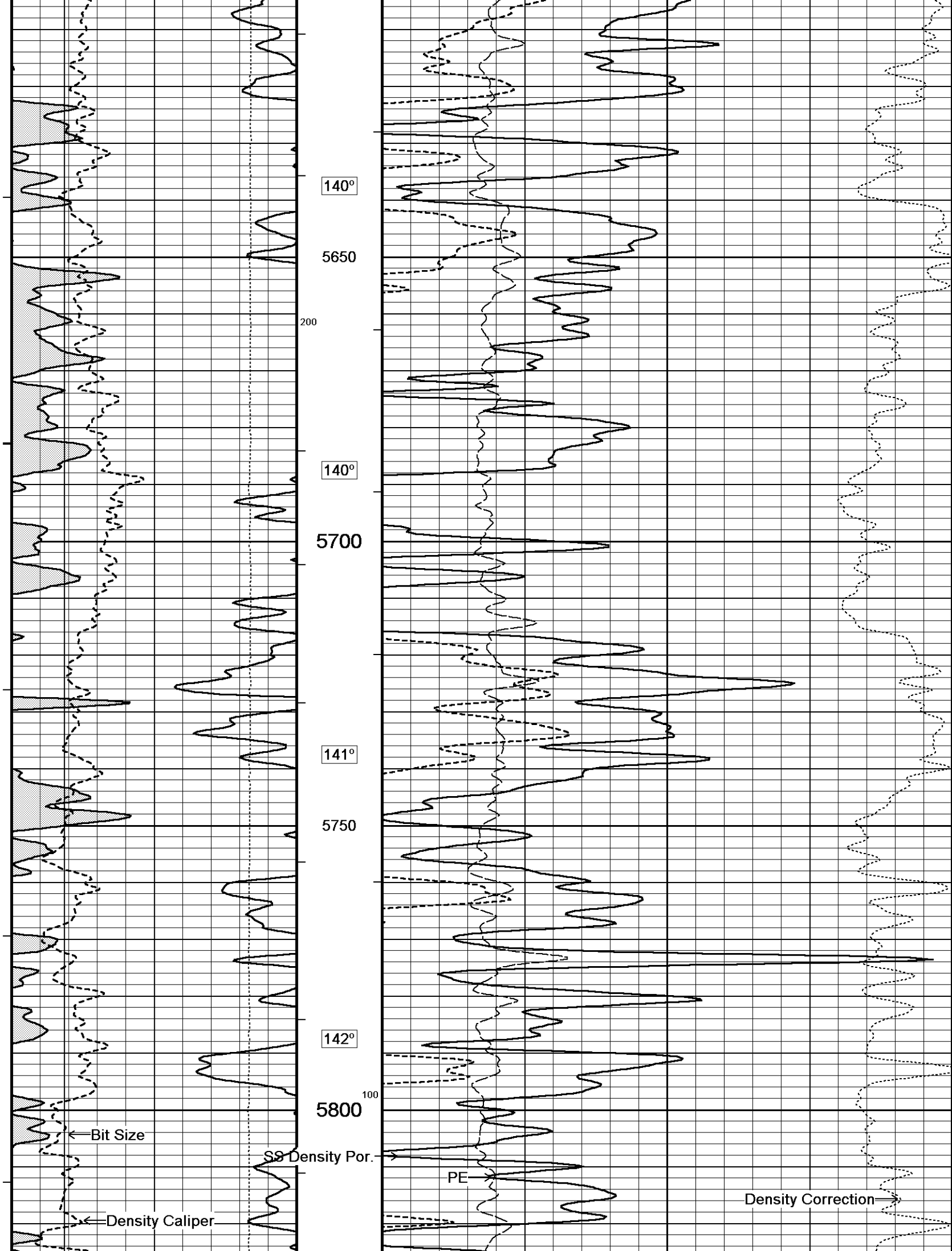
5300

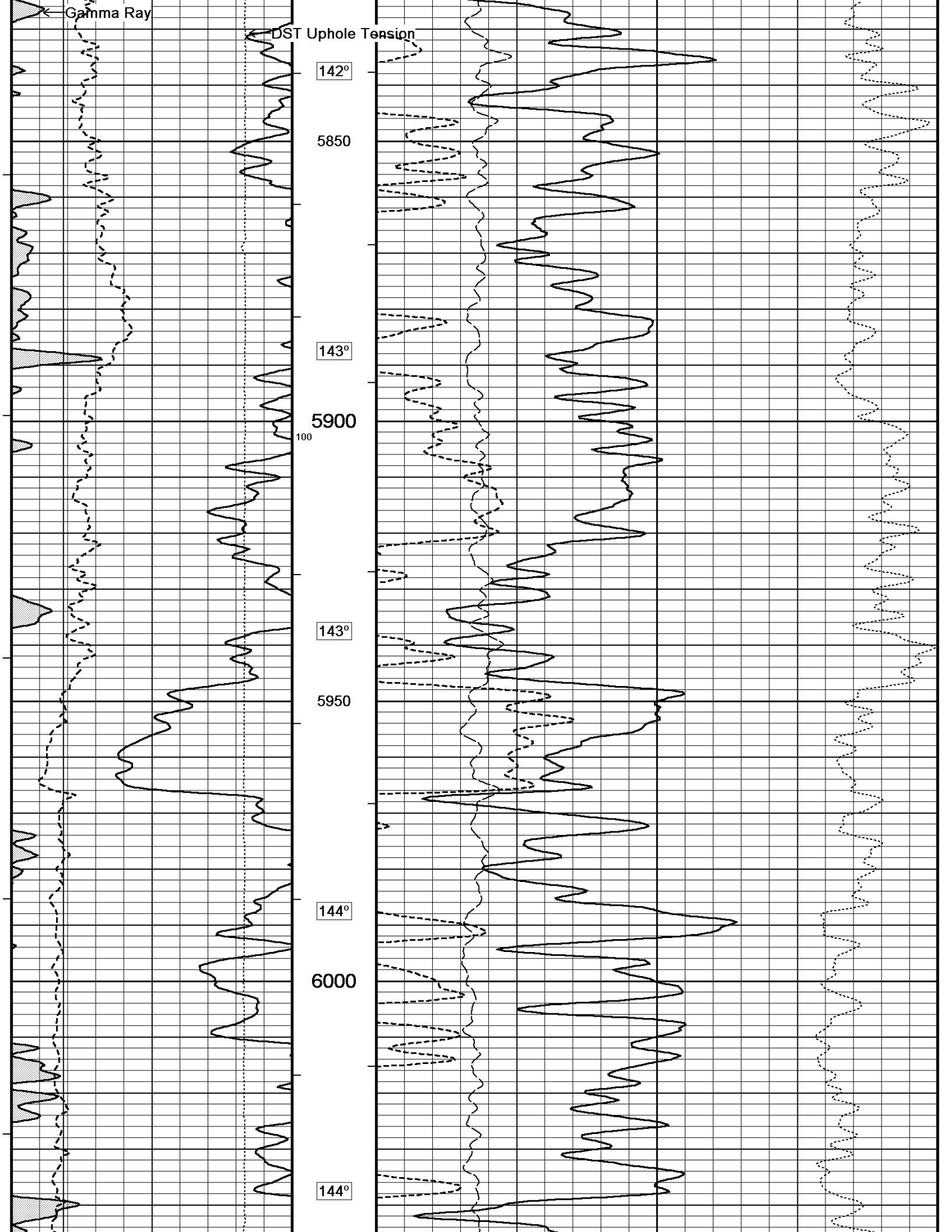
135°

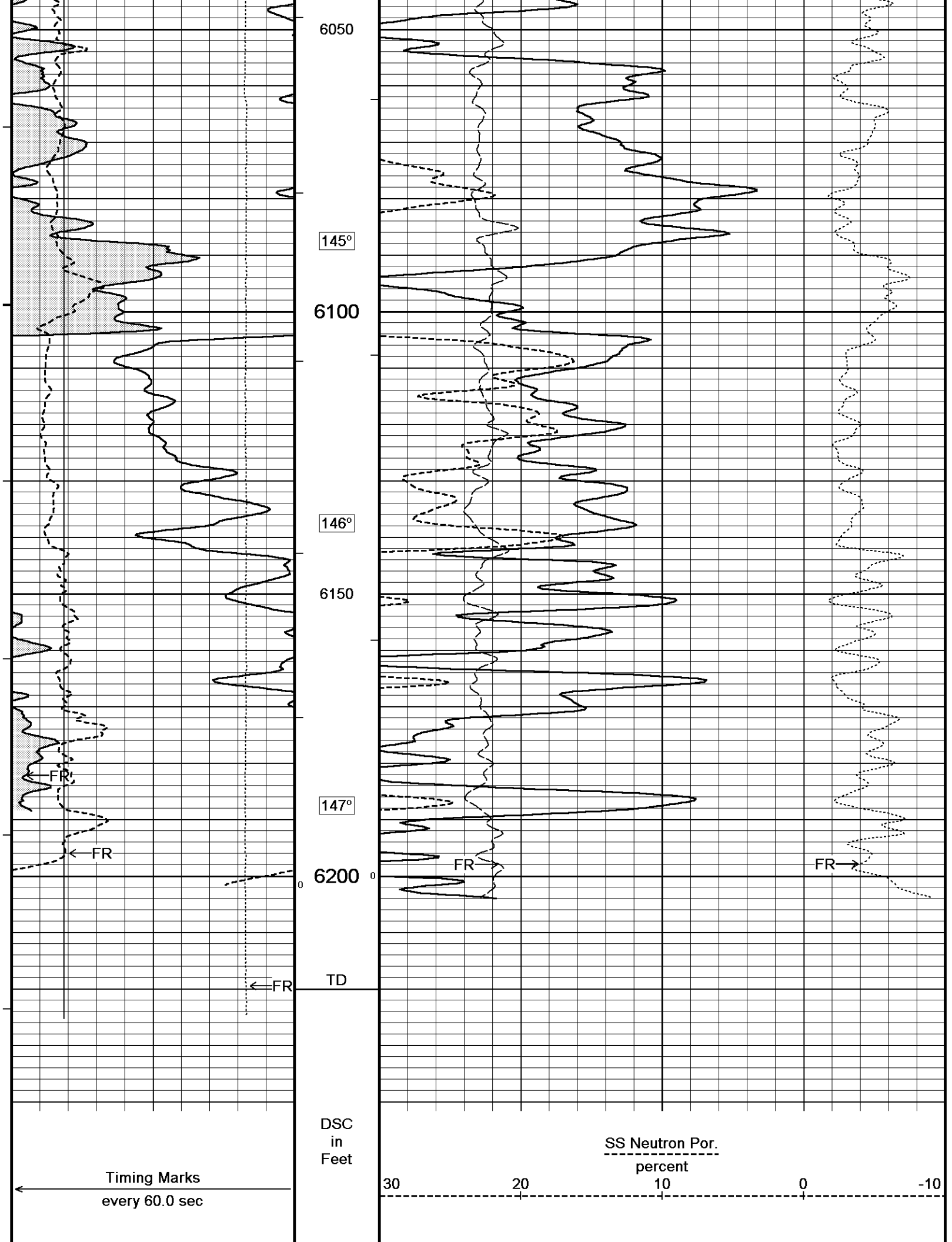
5350

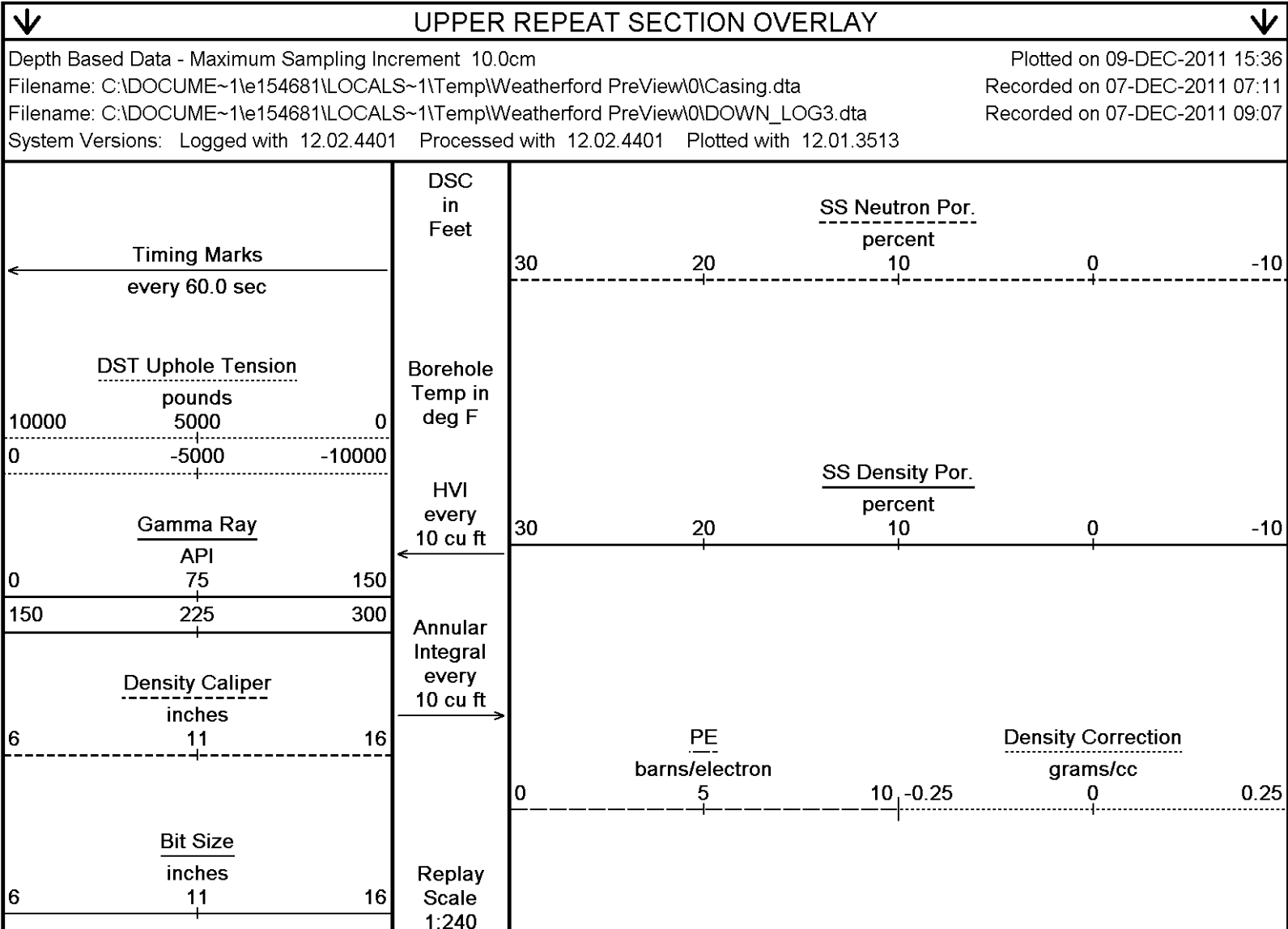
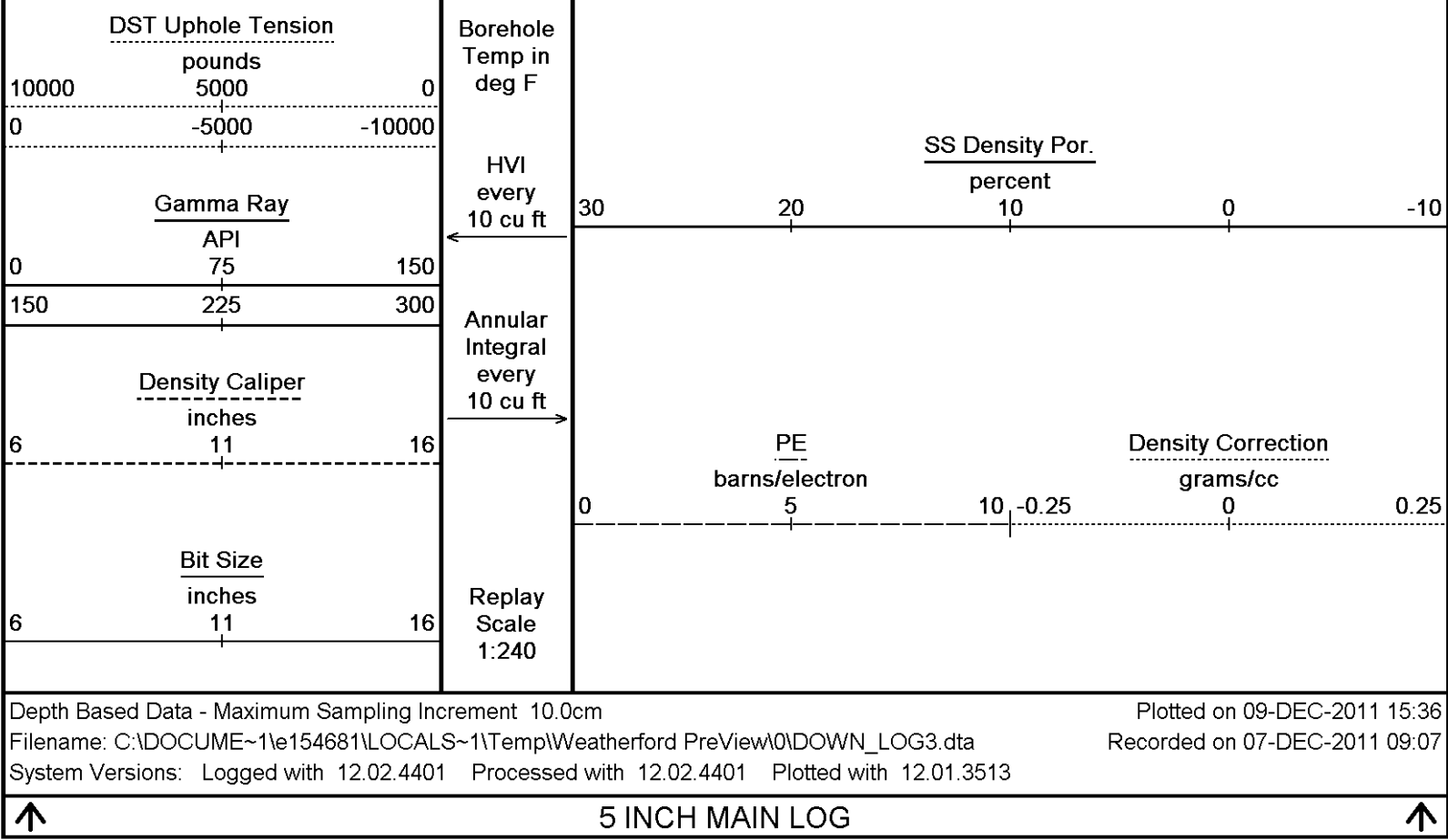


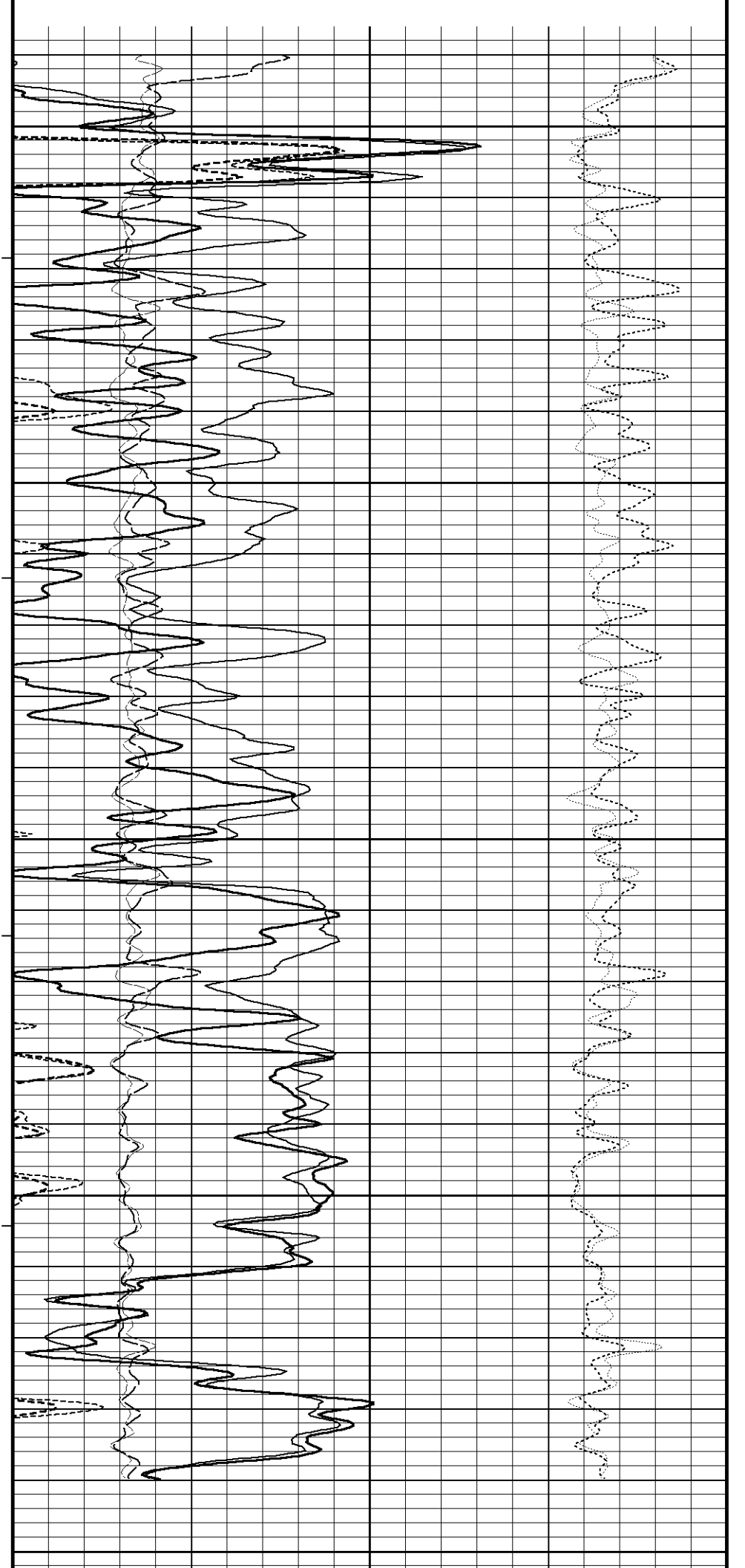
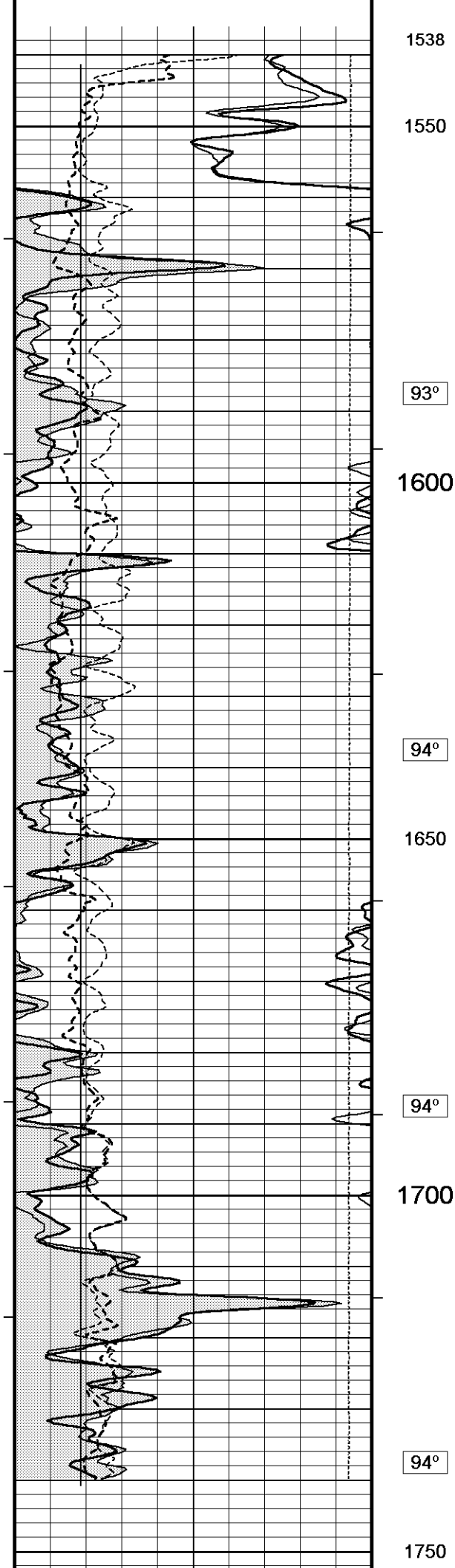


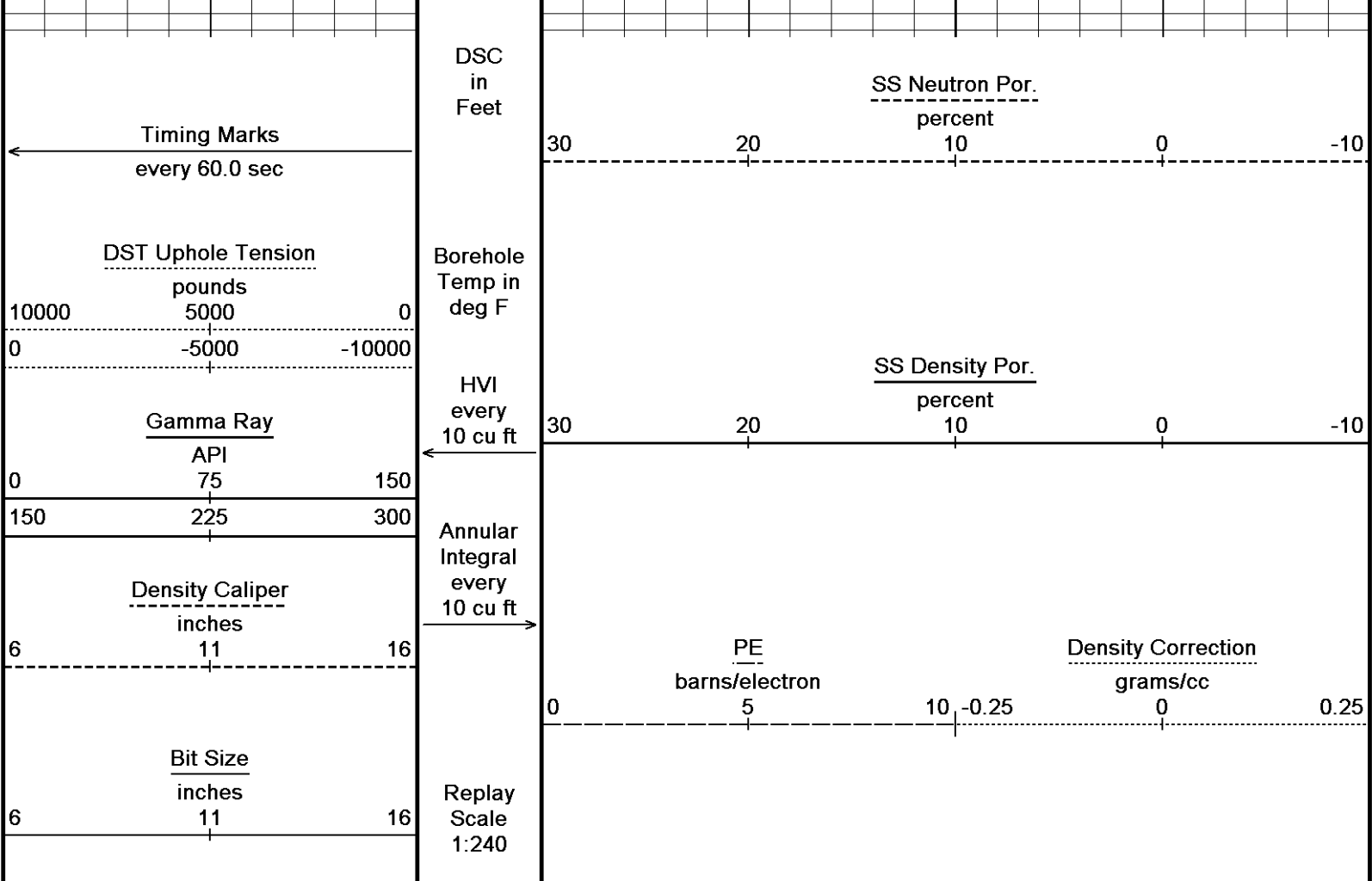












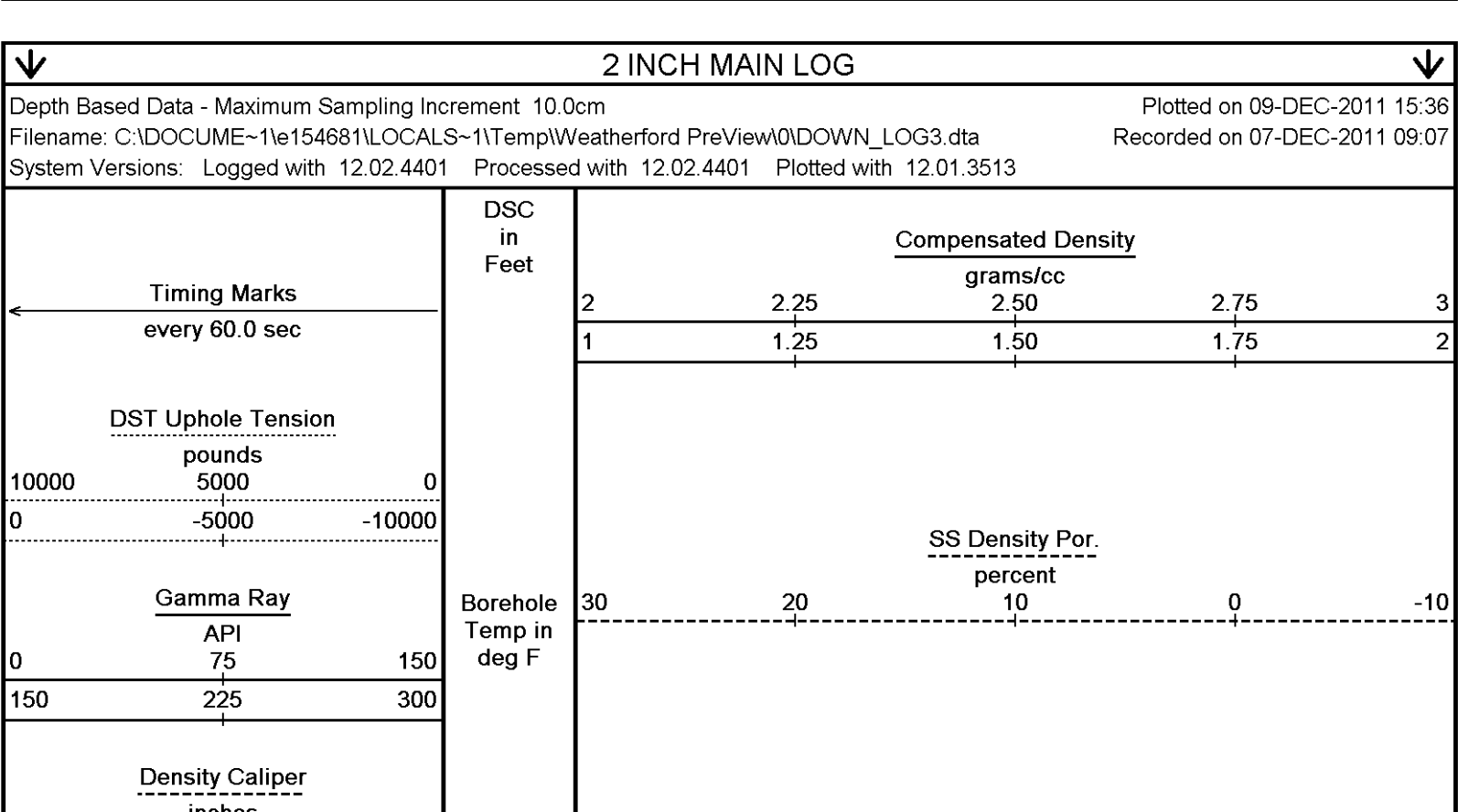
Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 09-DEC-2011 15:36

Filename: C:\DOCUME~1\154681\LOCALS~1\Temp\Weatherford PreView\0\Casing.dta
Recorded on 07-DEC-2011 07:11

Filename: C:\DOCUME~1\154681\LOCALS~1\Temp\Weatherford PreView\0\DOWN_LOG3.dta
Recorded on 07-DEC-2011 09:07

System Versions: Logged with 12.02.4401 Processed with 12.02.4401 Plotted with 12.01.3513

UPPER REPEAT SECTION OVERLAY



6 11 16
inches

Bit Size
inches

6 11 16

Replay
Scale
1:600

1530
Time

1600

93°

1700

94°

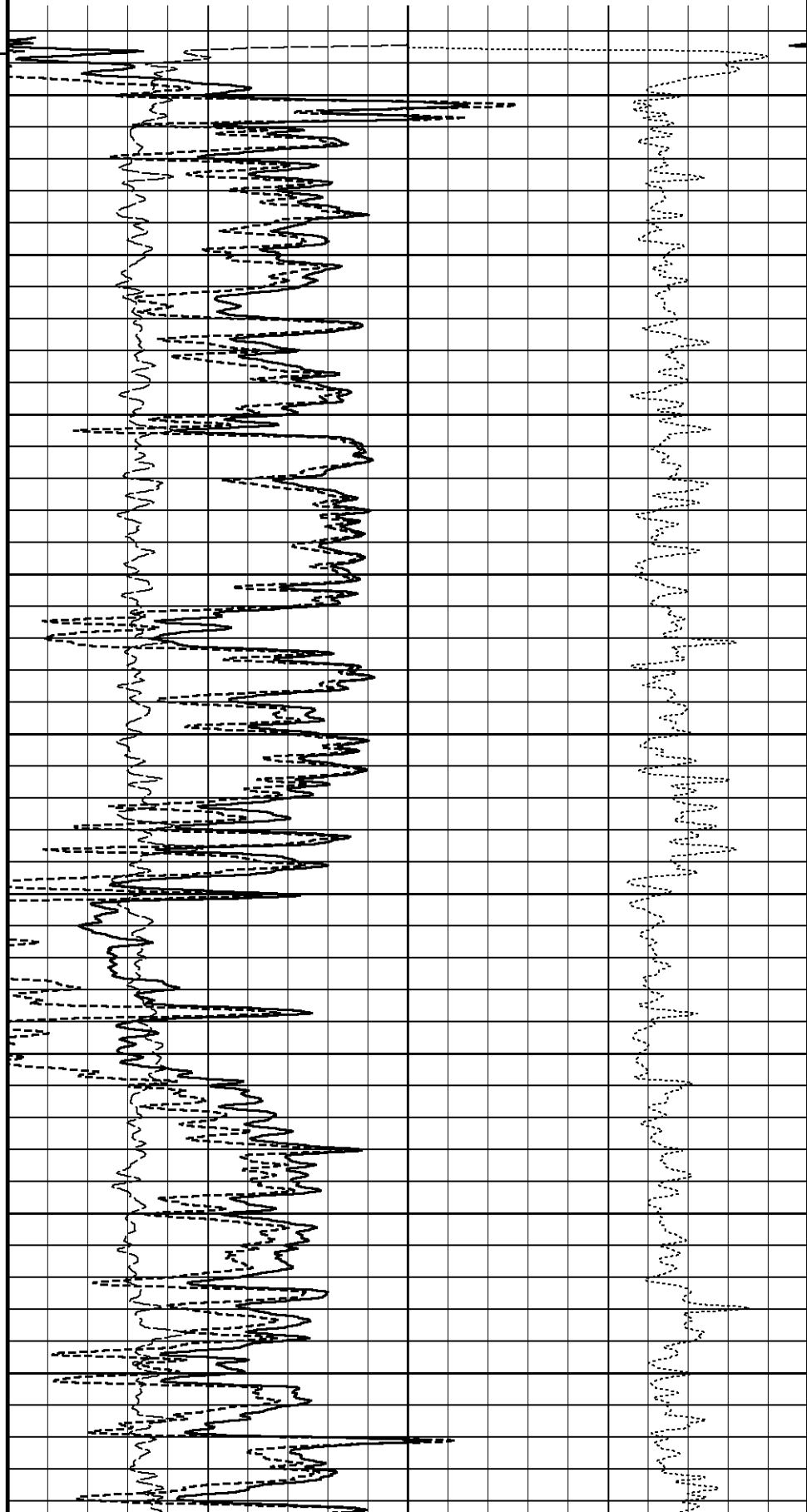
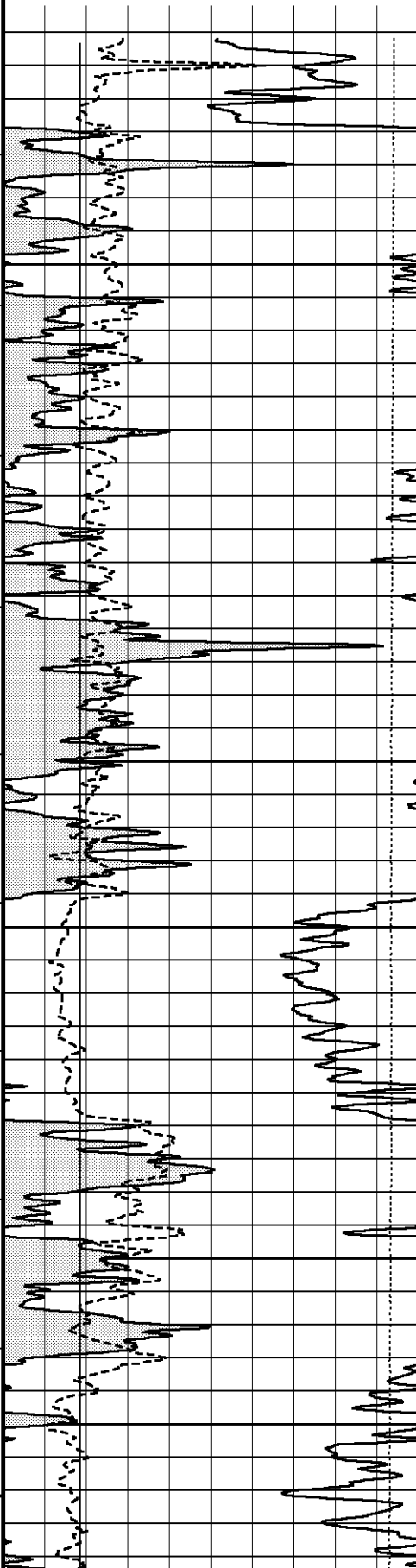
1800

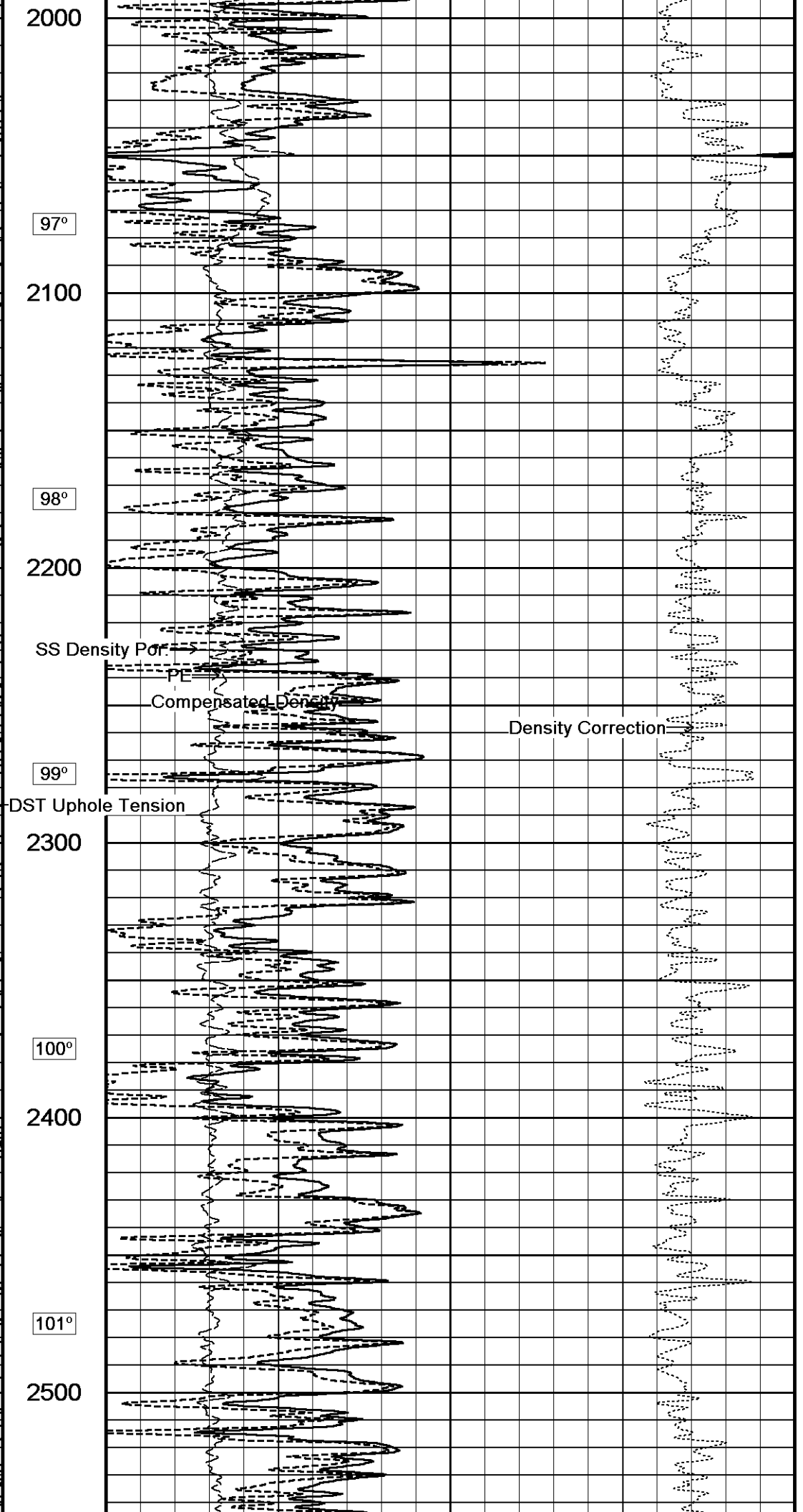
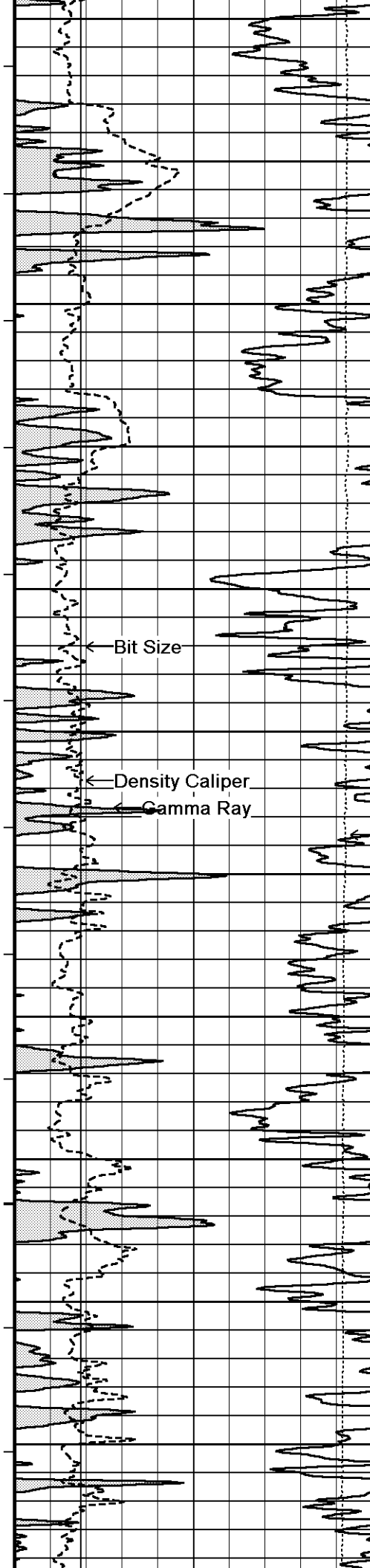
95°

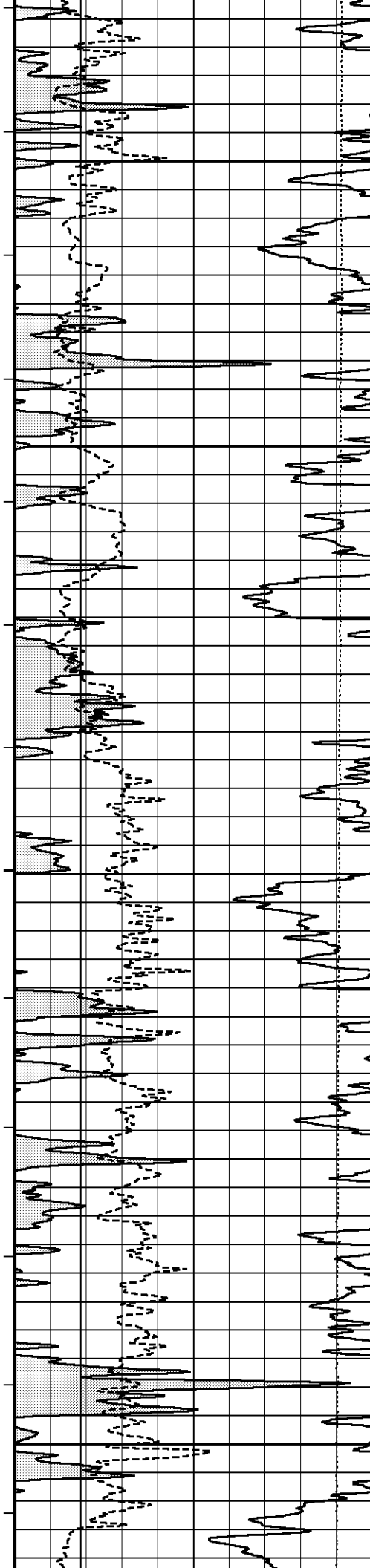
1900

96°

PE
barns/electron
Density Correction
grams/cc
0 5 10 -0.25 0 0.25







103°

2600

104°

2700

105°

2800

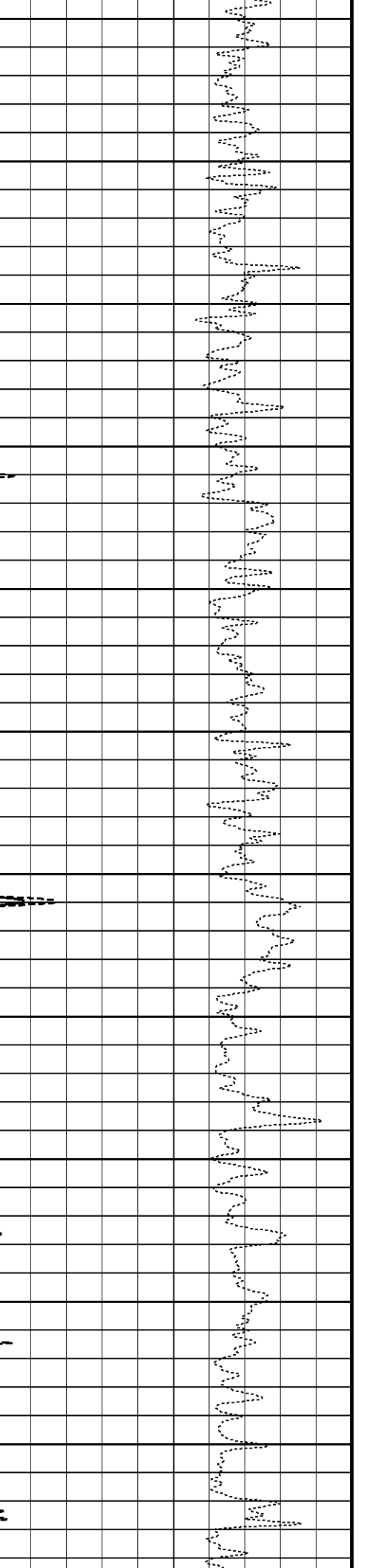
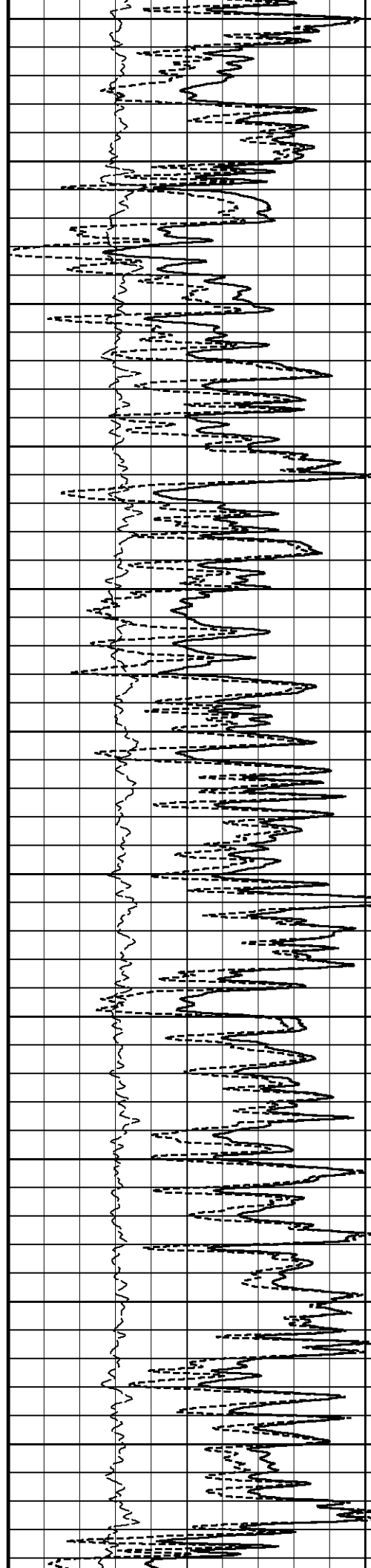
106°

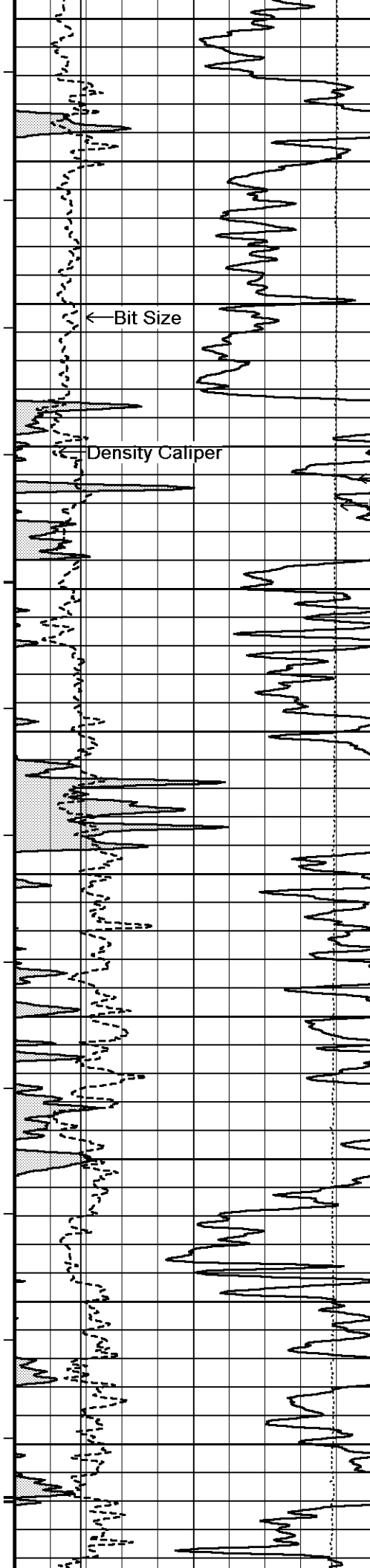
2900

107°

3000

108°





3100

108°

3200

SS Density Por.

PE

Compensated Density

Density Correction

Density Caliper

Gamma Ray

DST Up-hole Tension

110°

3300

111°

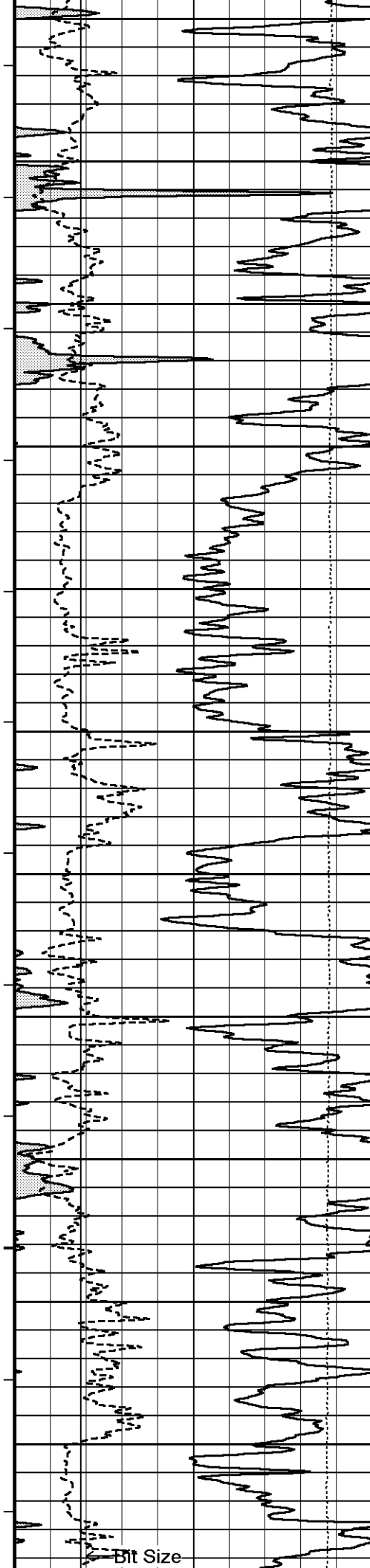
3400

112°

3500

113°

3600



115°

3700

116°

3800

117°

3900

118°

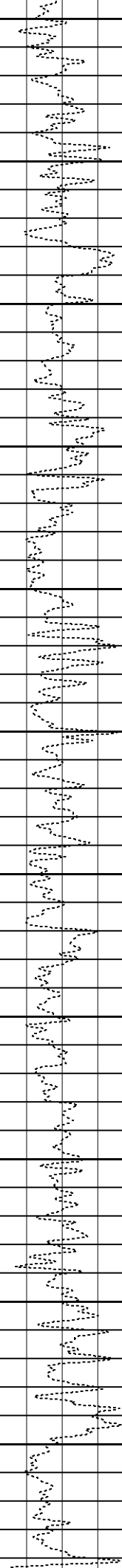
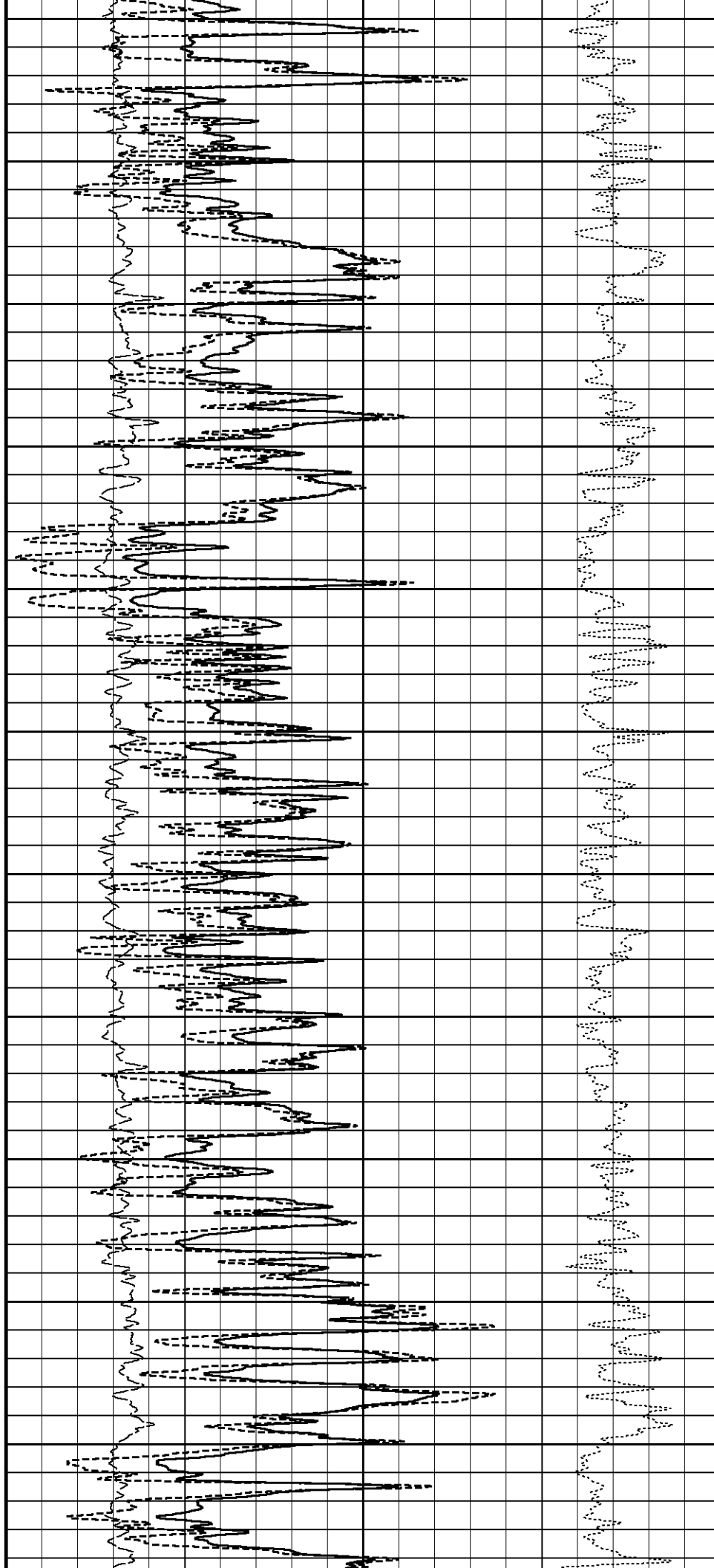
4000

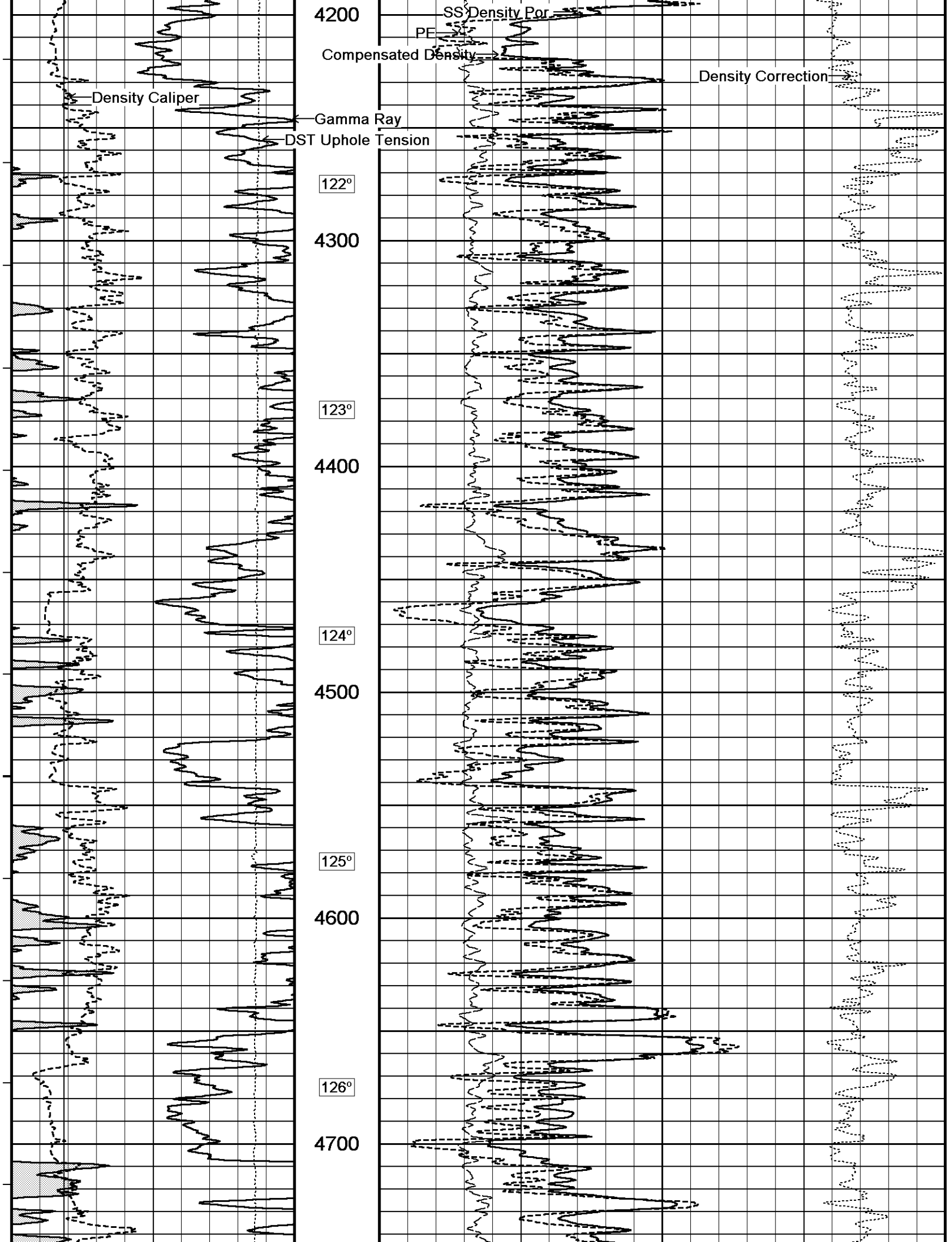
119°

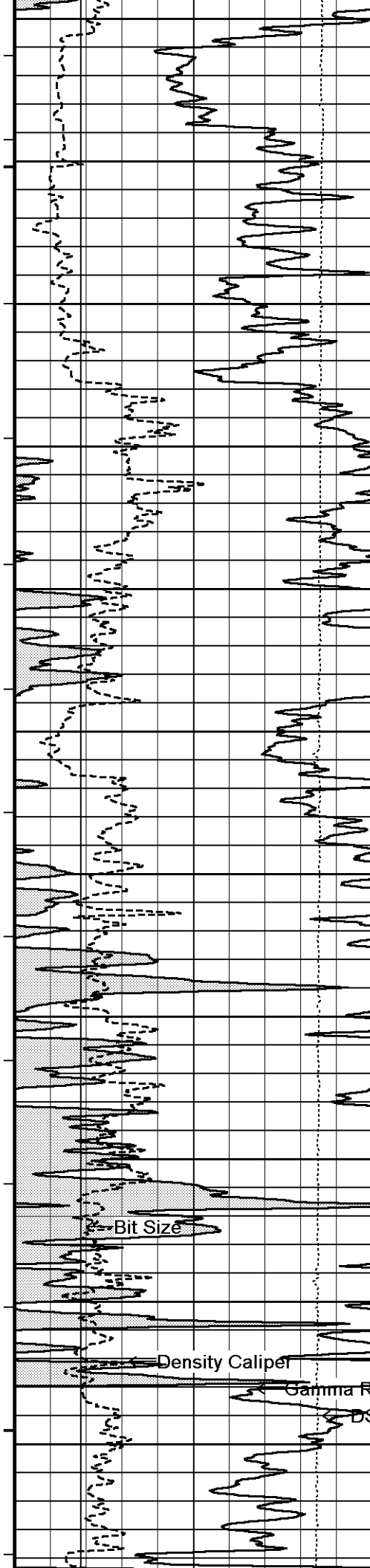
4100

120°

Bit Size







127°

4800

128°

4900

130°

5000

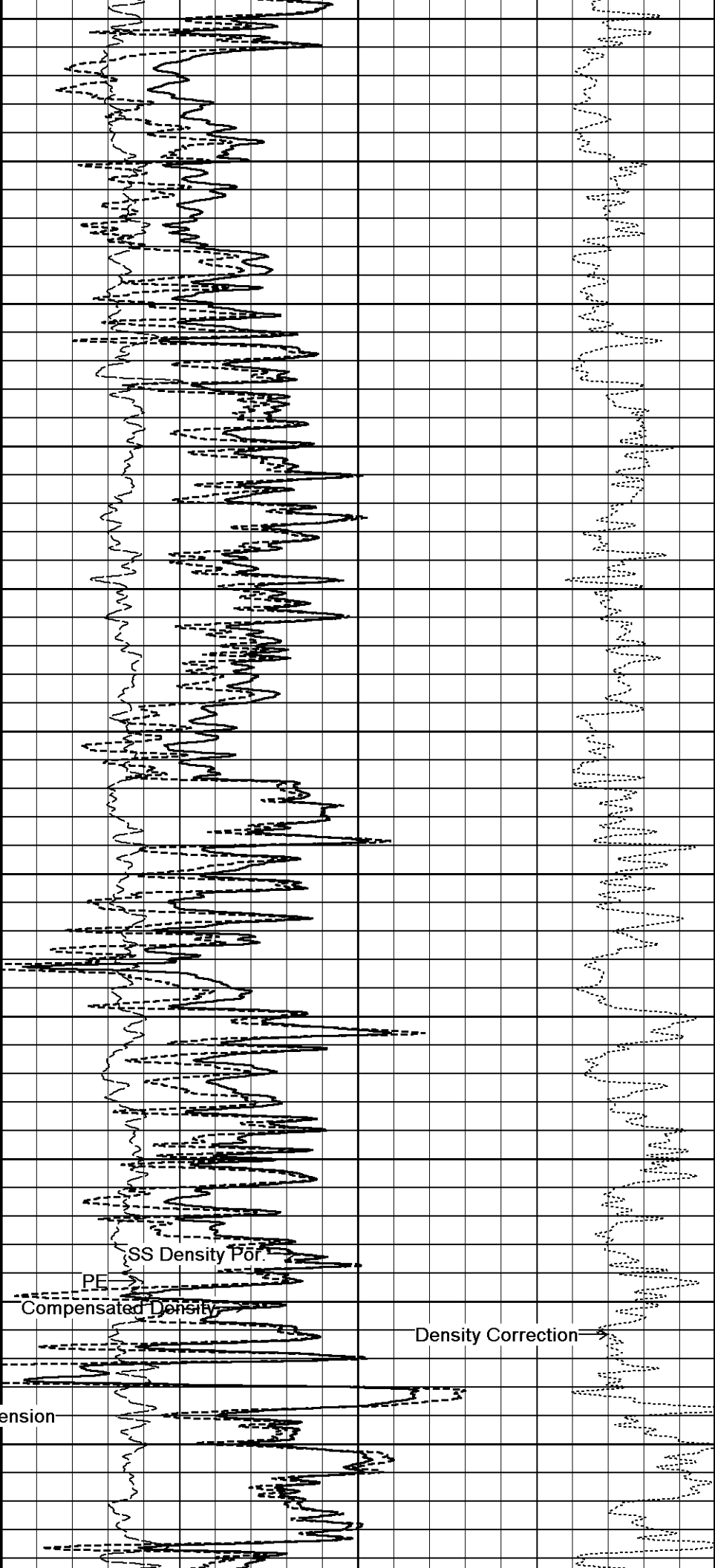
131°

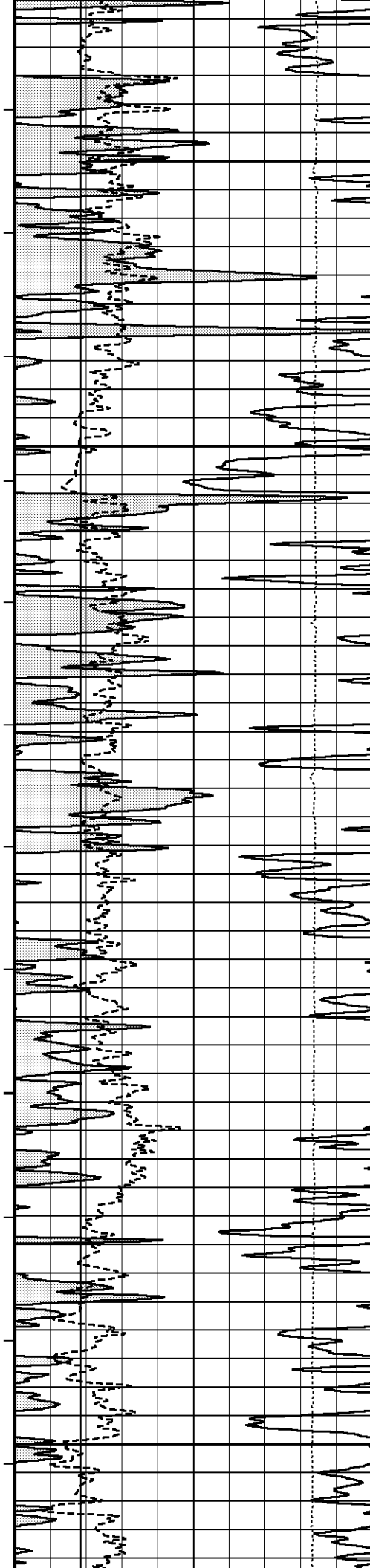
5100

132°

5200

134°





5300

135°

5400

137°

5500

139°

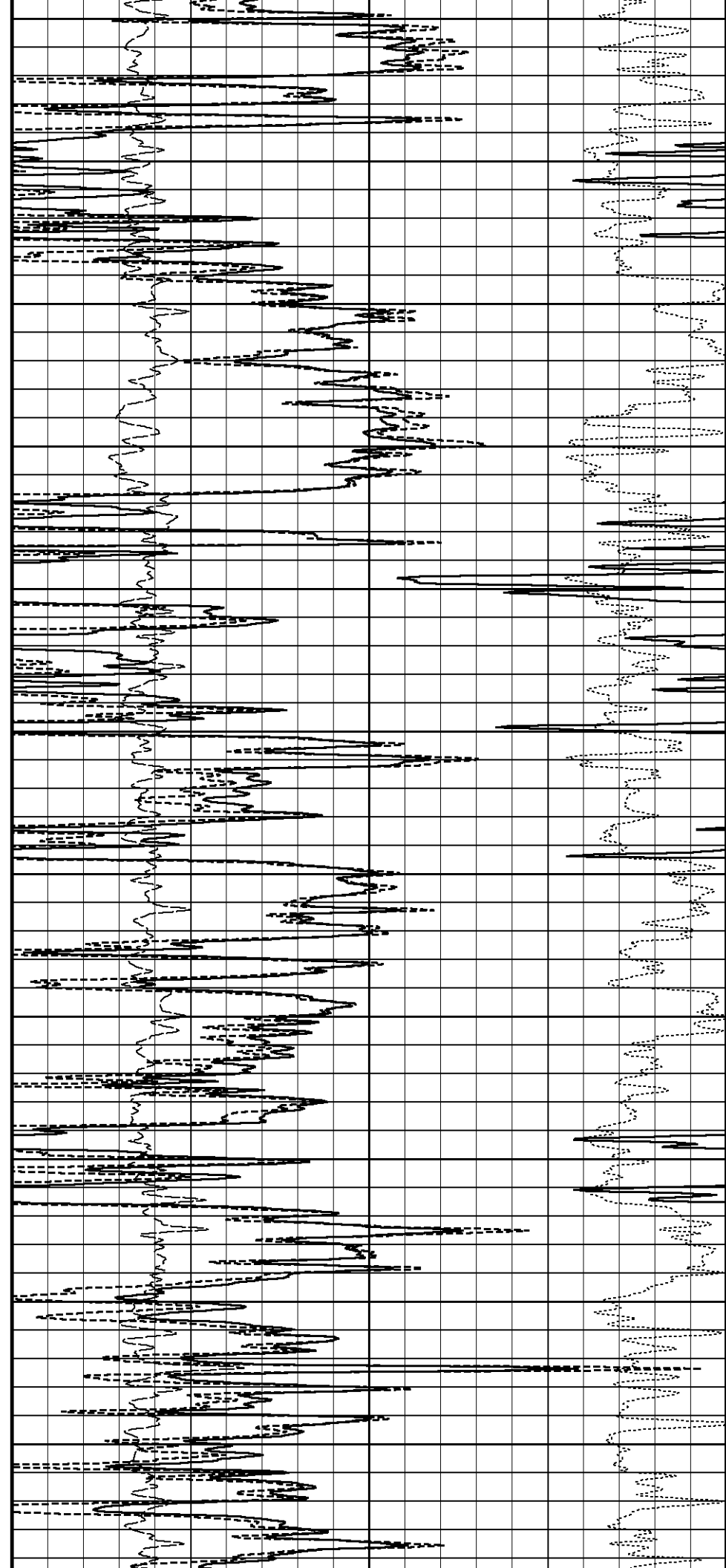
5600

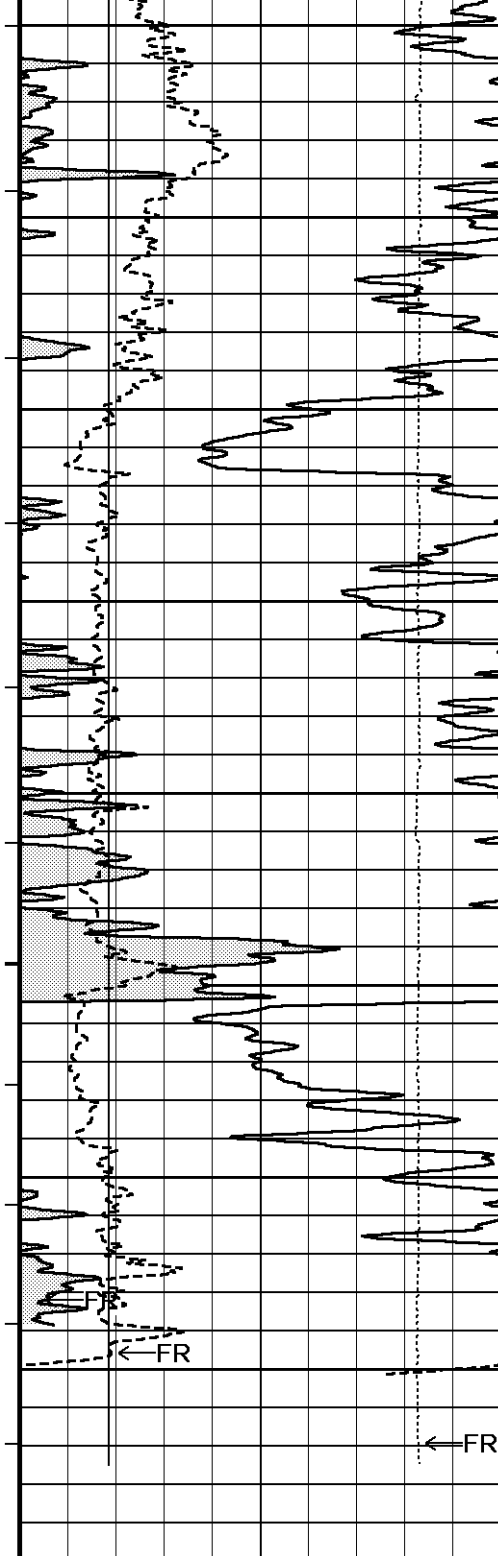
140°

5700

142°

5800





143°

5900

144°

6000

145°

6100

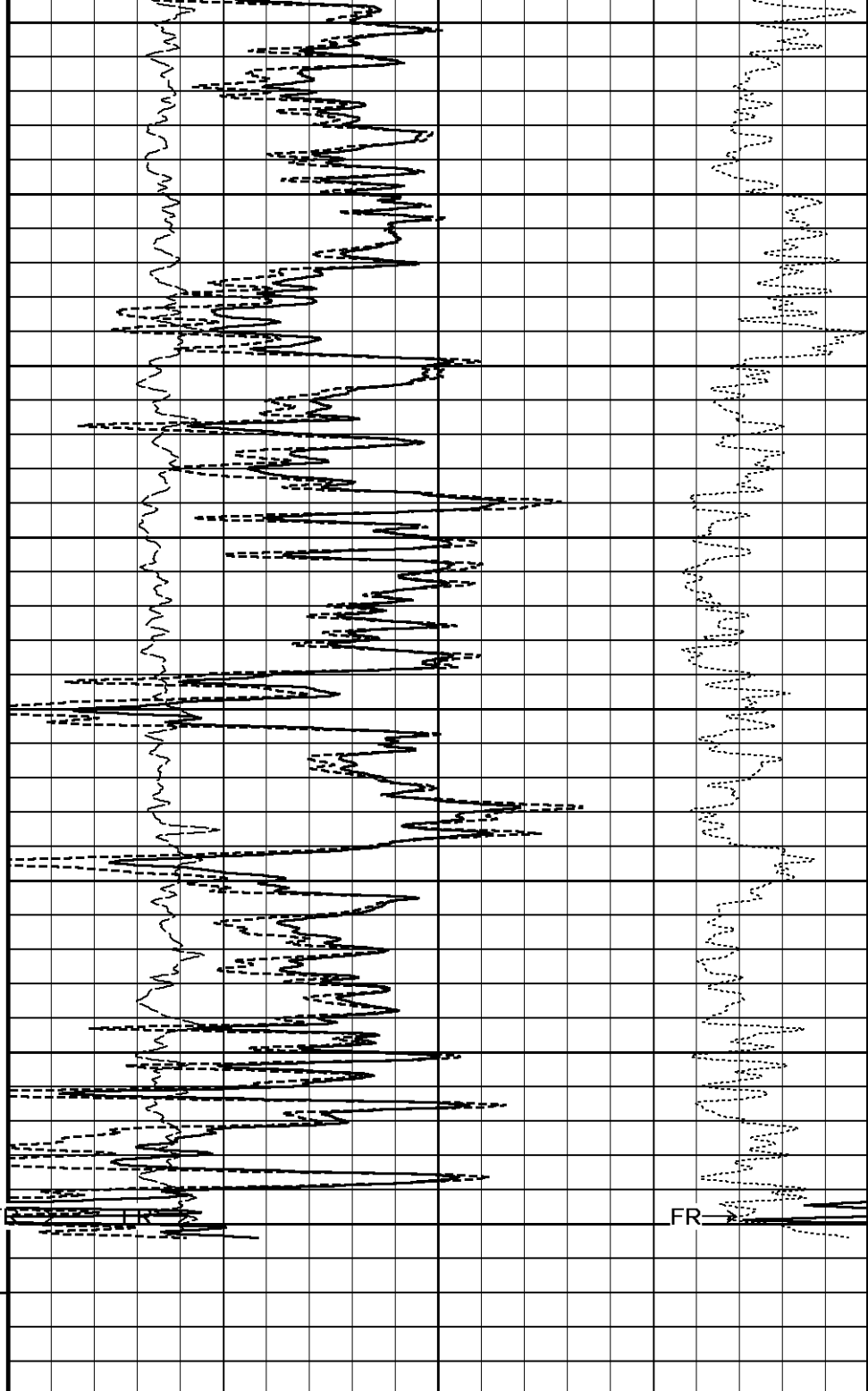
147°

6200

TD

DSC
in
Feet

Borehole
Temp in
deg F



Timing Marks
every 60.0 sec

DST Uphole Tension
pounds

10000 5000 0
0 -5000 -10000

Gamma Ray

0 75 150

Compensated Density

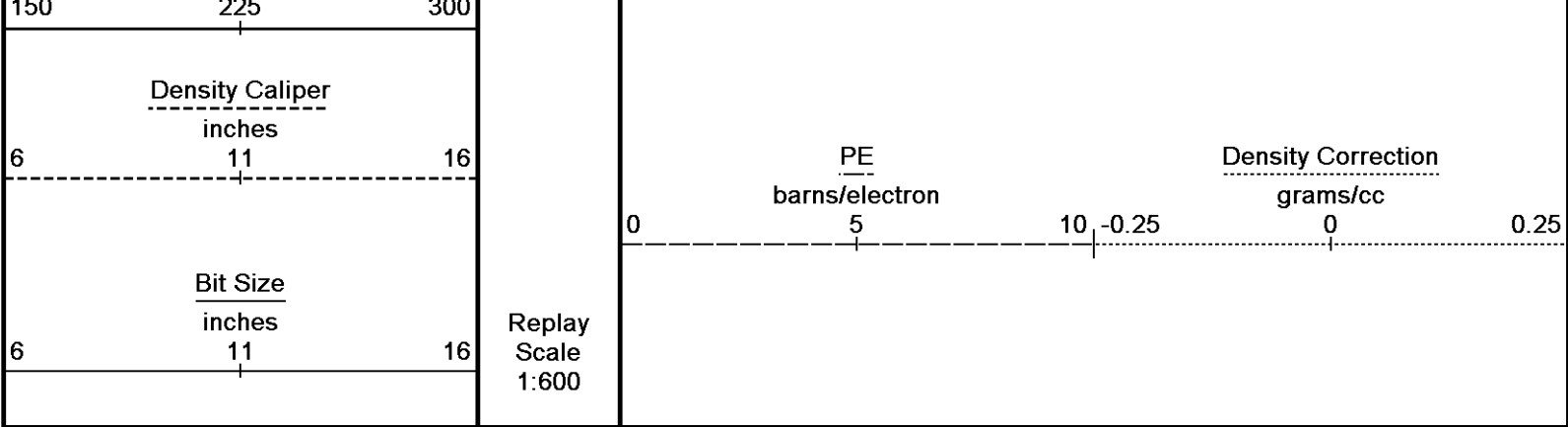
grams/cc

2 2.25 2.50 2.75 3
1 1.25 1.50 1.75 2

SS Density Por.

percent

30 20 10 0 -10



Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 09-DEC-2011 15:36

Filename: C:\DOCUME~1\154681\LOCALS~1\Temp\Weatherford PreView\0\DOWN_LOG3.dta

Recorded on 07-DEC-2011 09:07

System Versions: Logged with 12.02.4401 Processed with 12.02.4401 Plotted with 12.01.3513

↑

2 INCH MAIN LOG

↑

↓

5 INCH MAIN LOG

↓

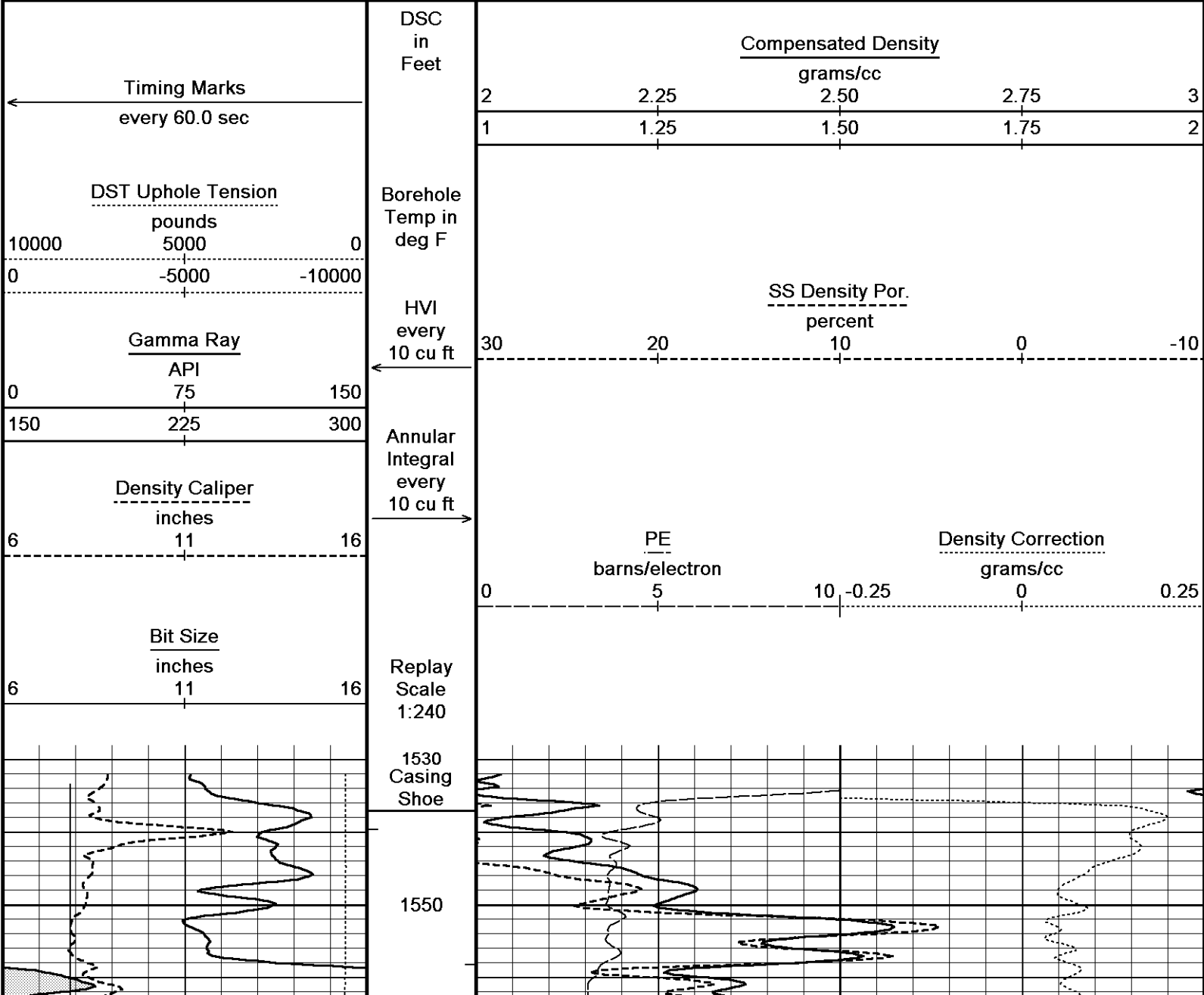
Depth Based Data - Maximum Sampling Increment 10.0cm

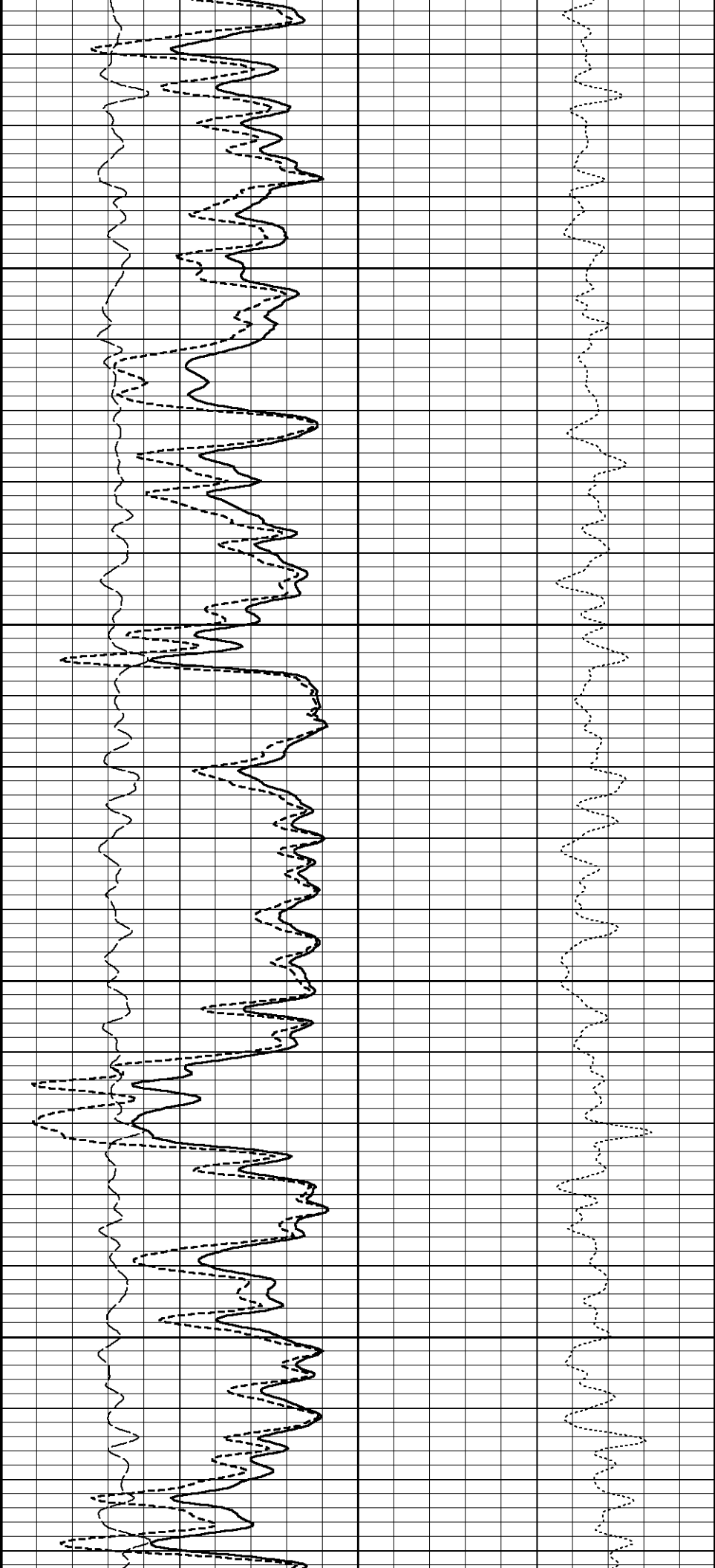
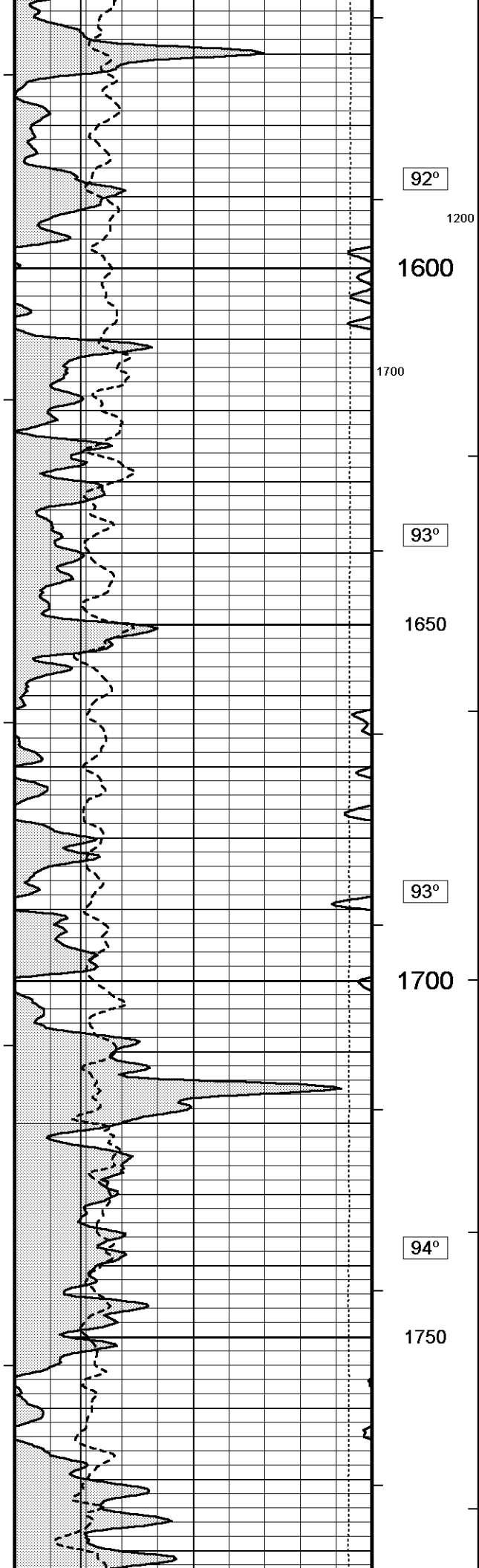
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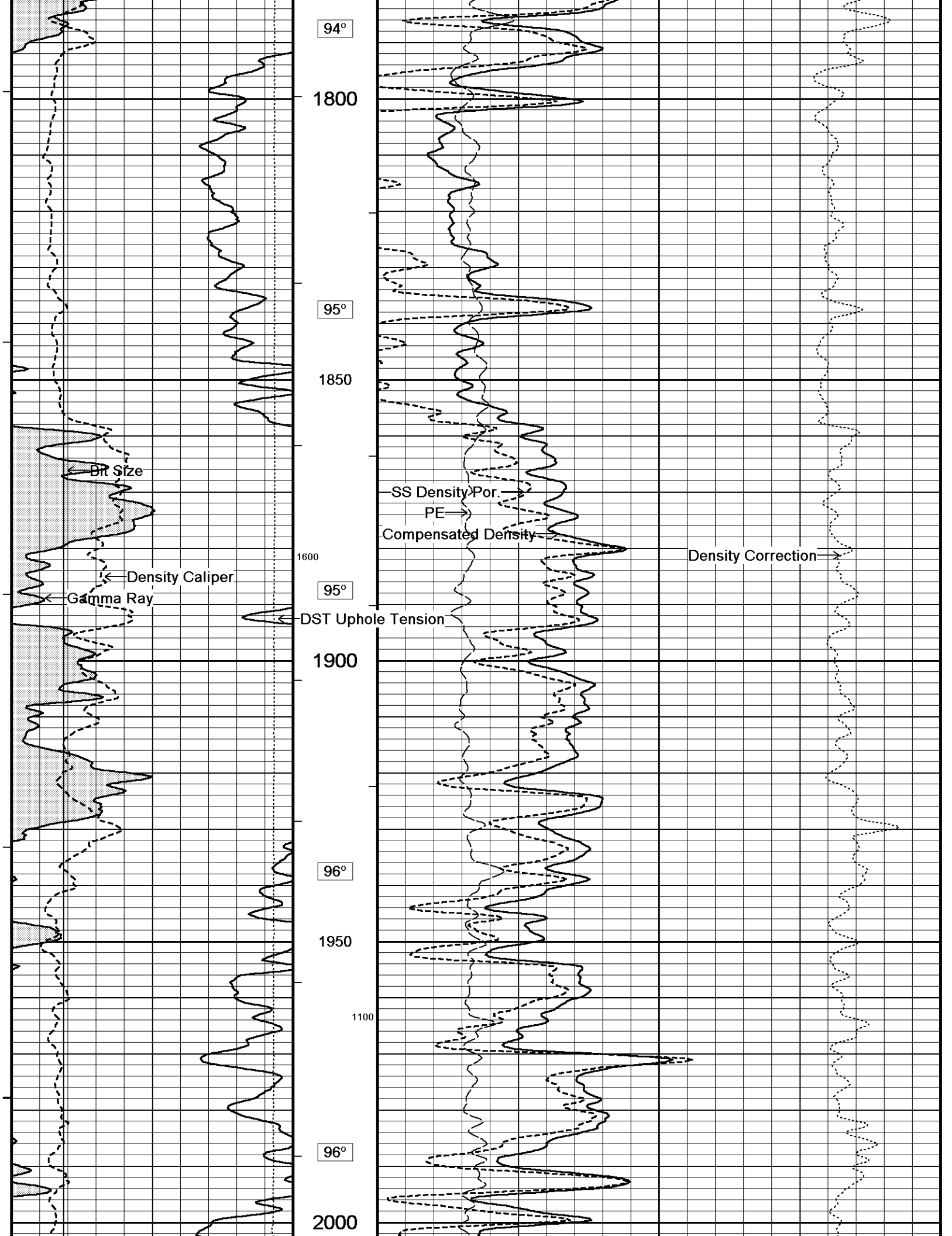
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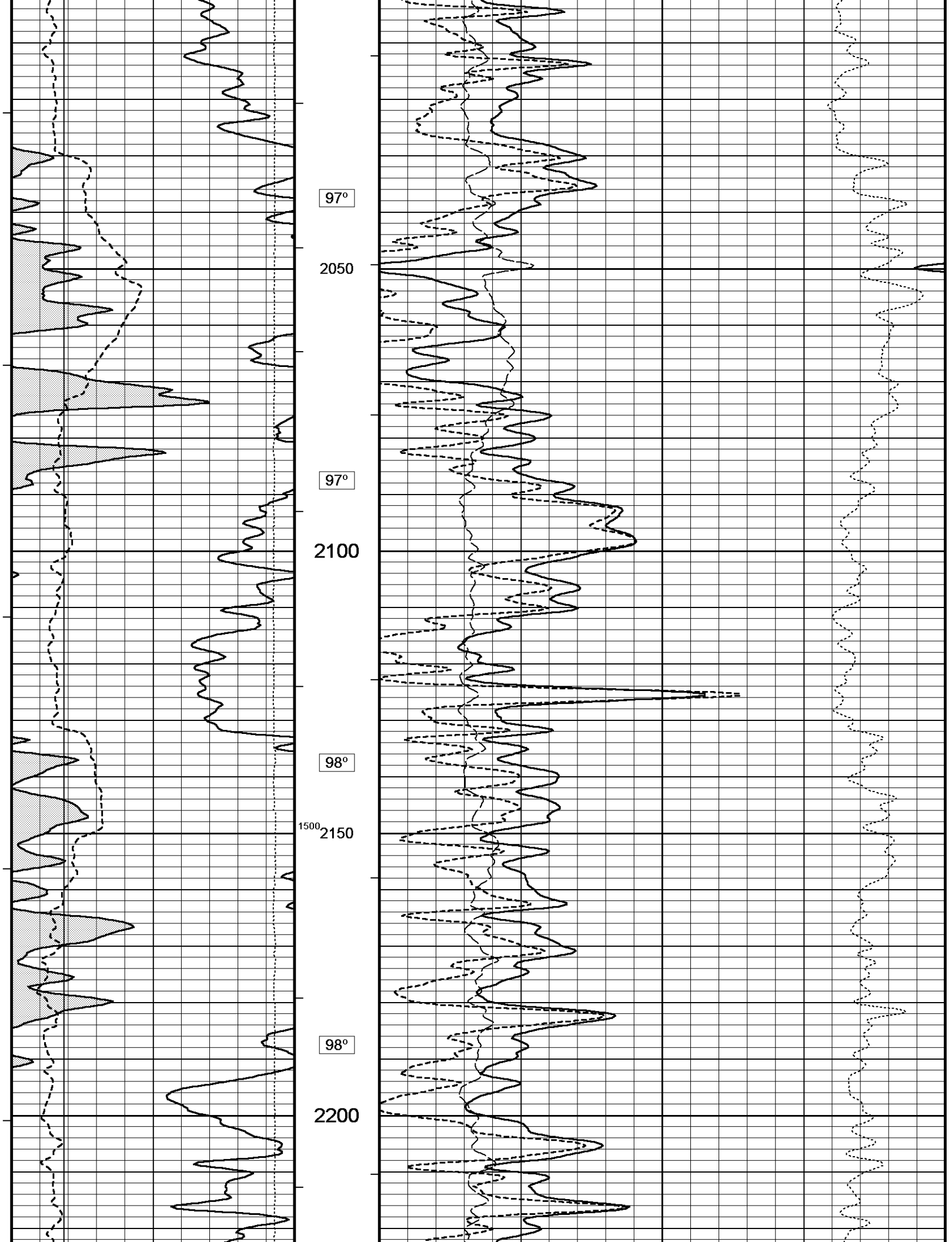
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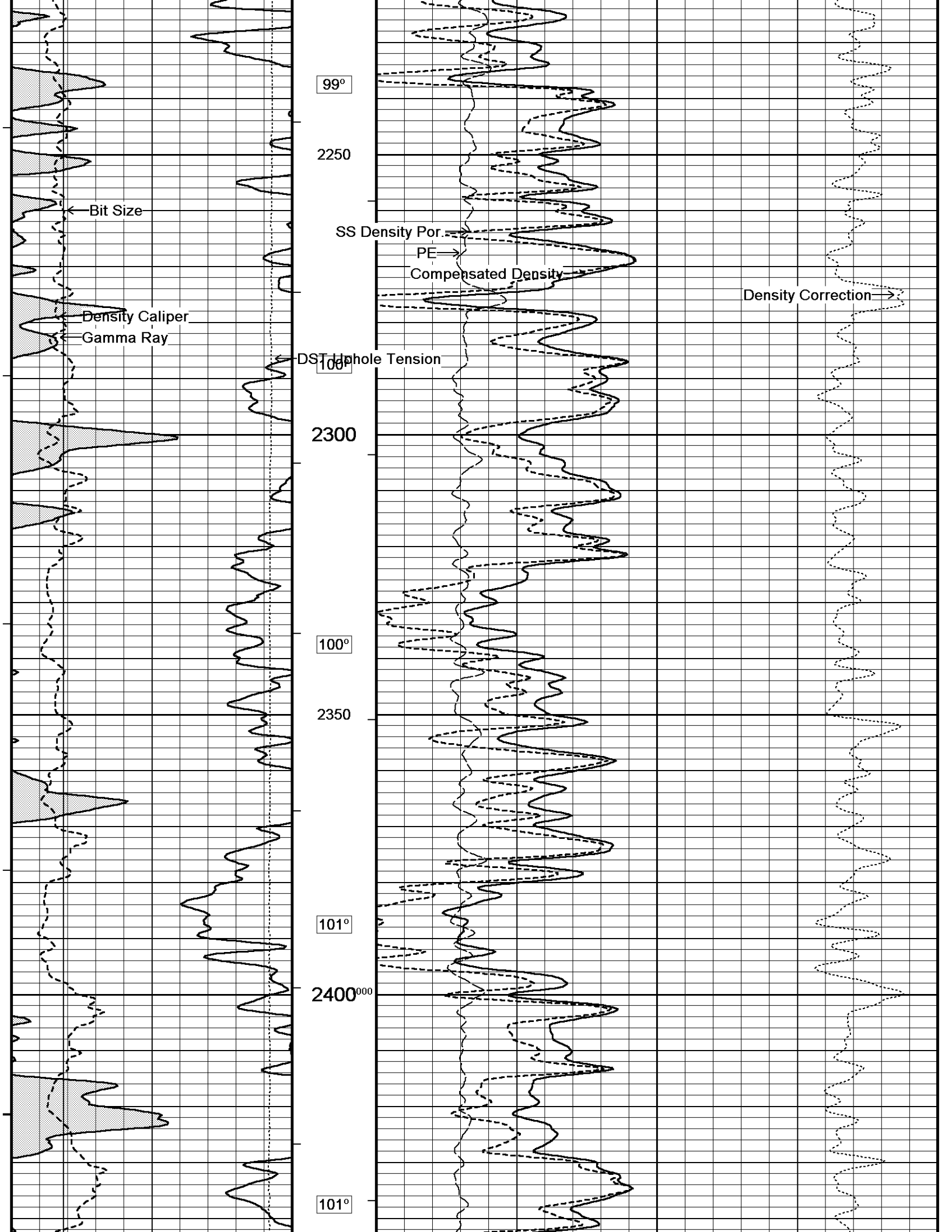
System Versions: Logged with 12.02.4401 Processed with 12.02.4401 Plotted with 12.01.3513

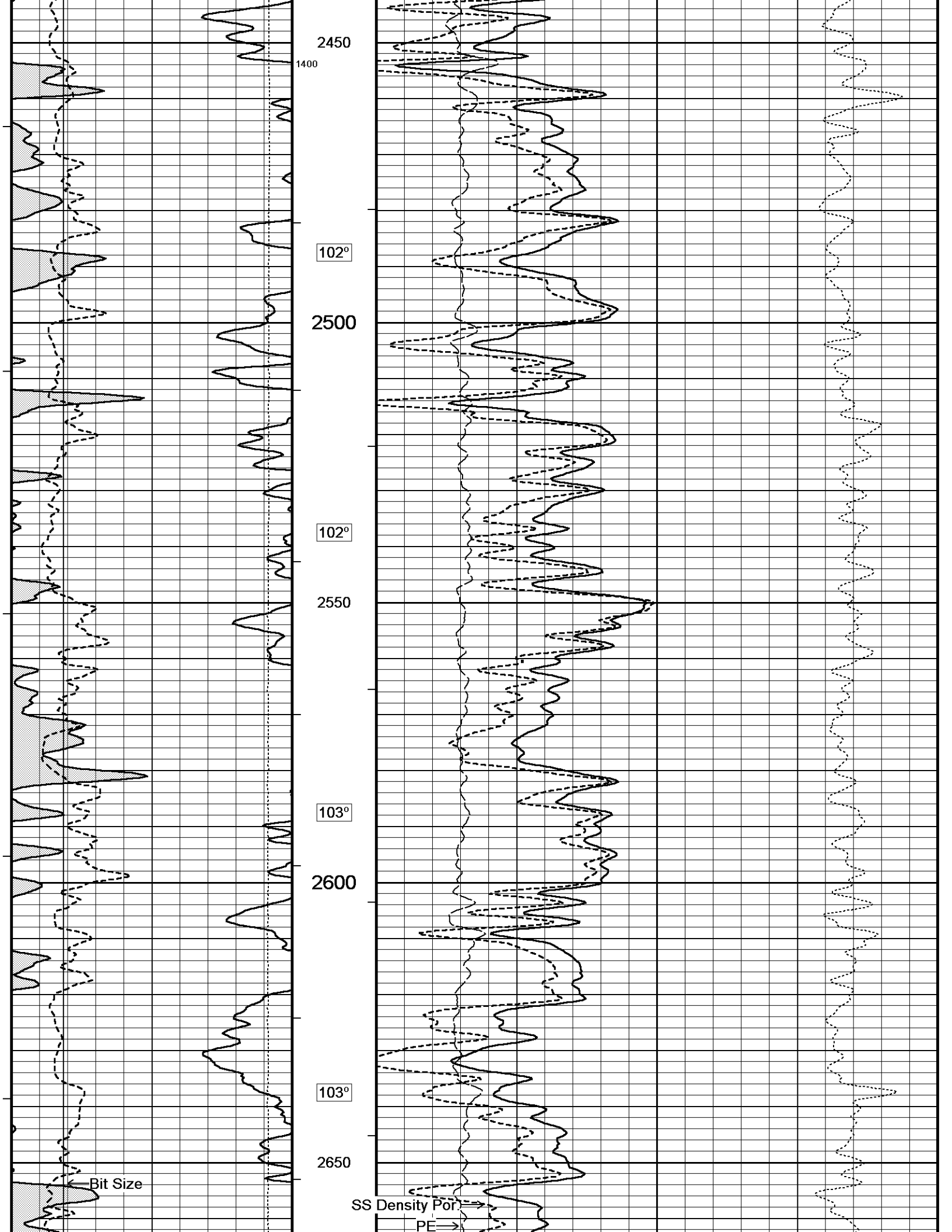


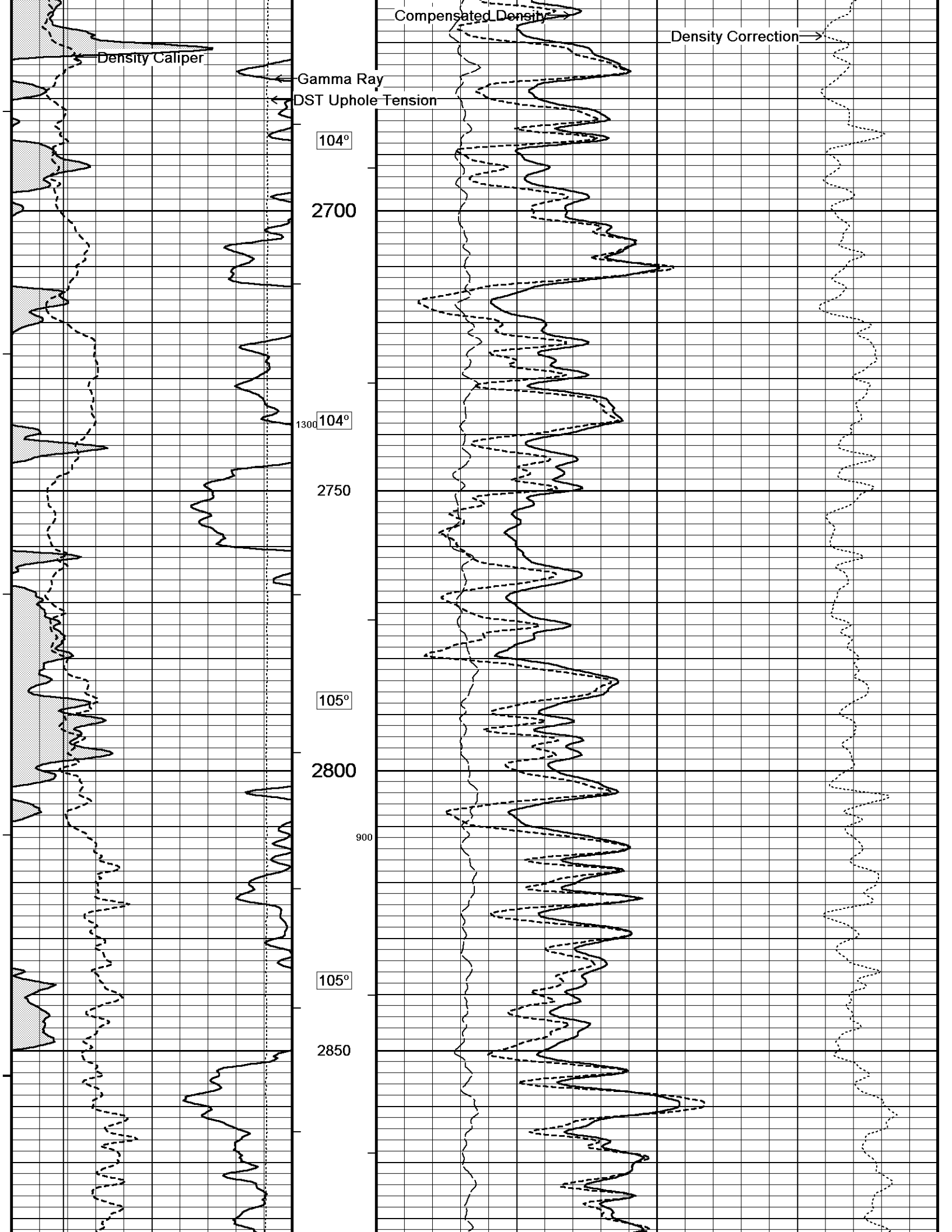


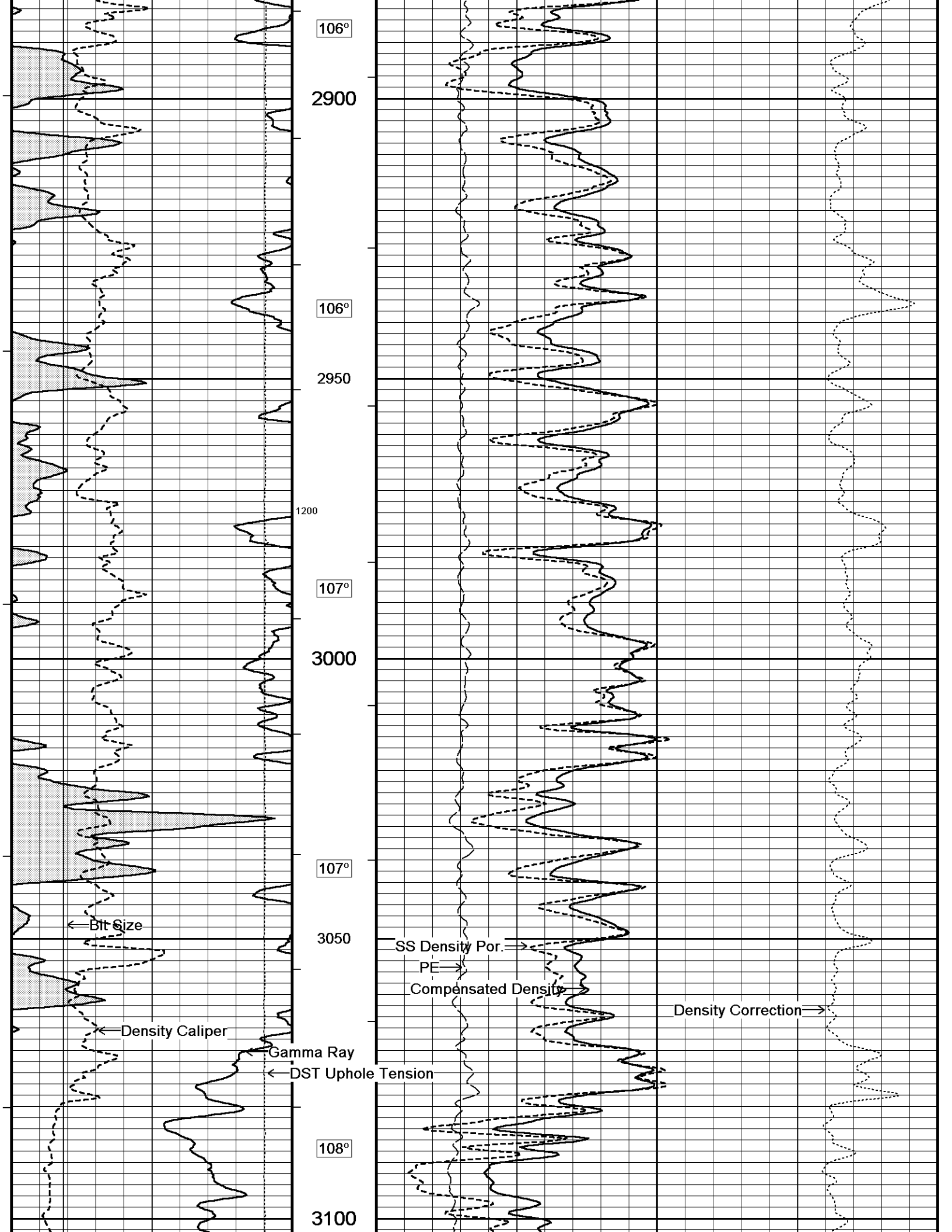


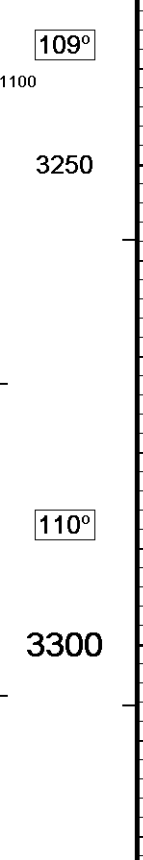
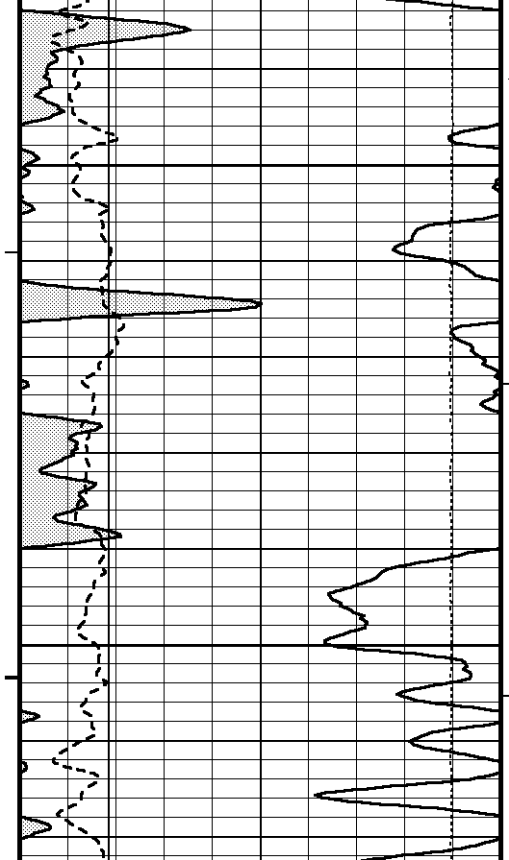
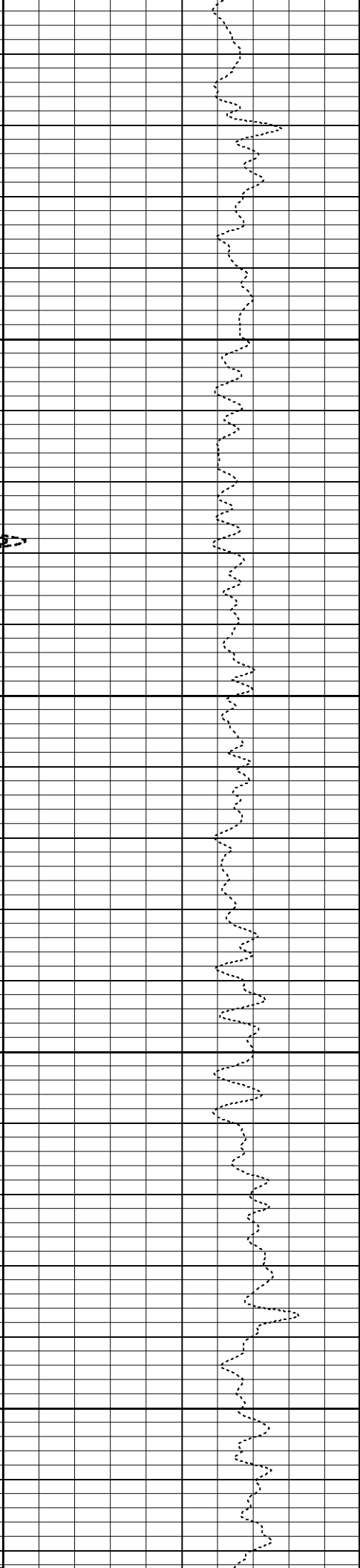
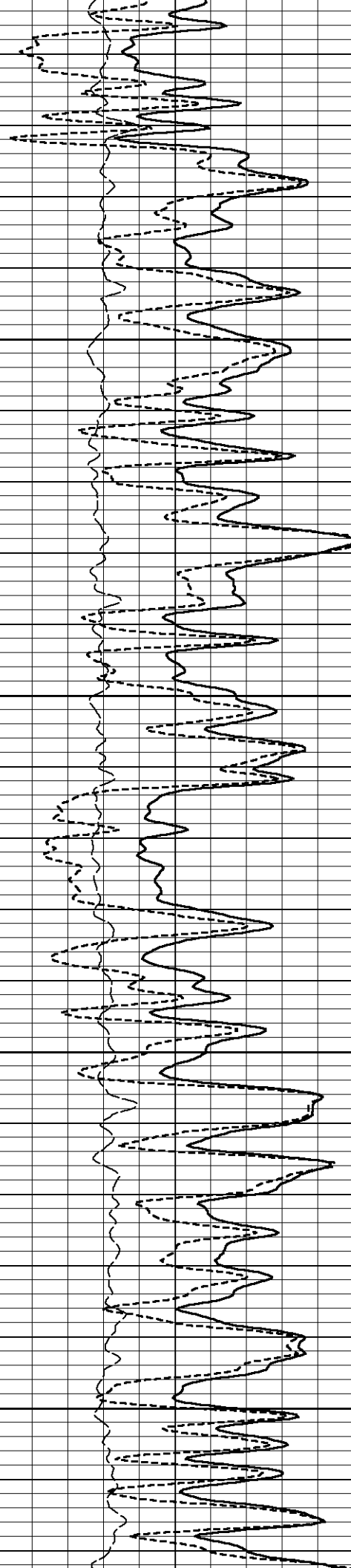
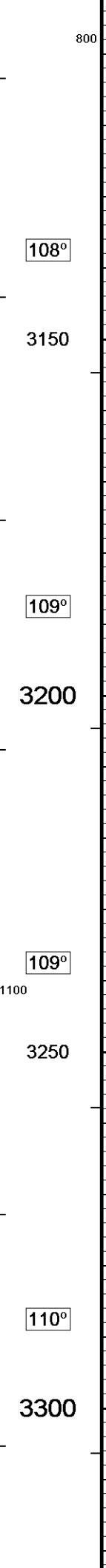
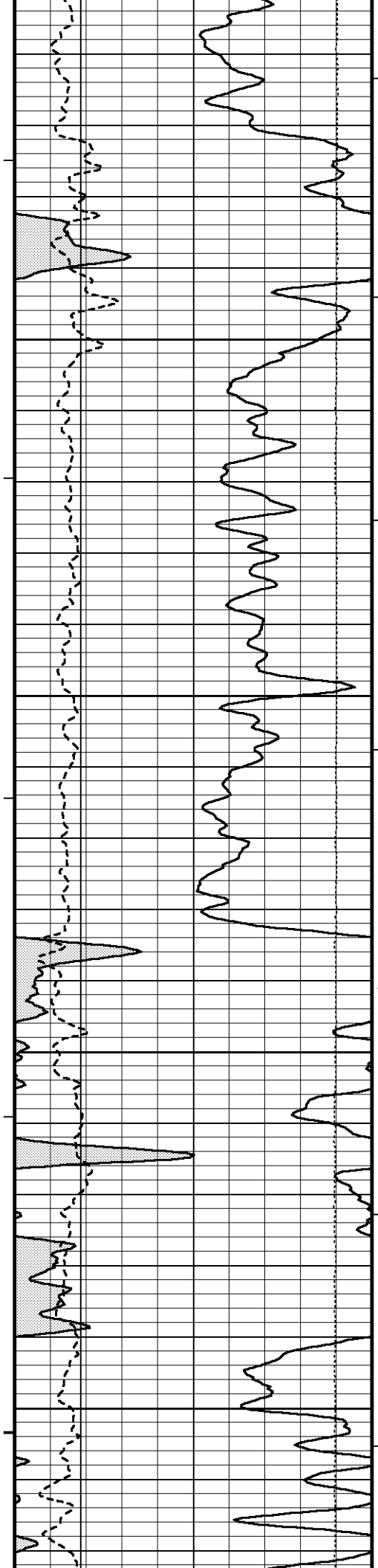


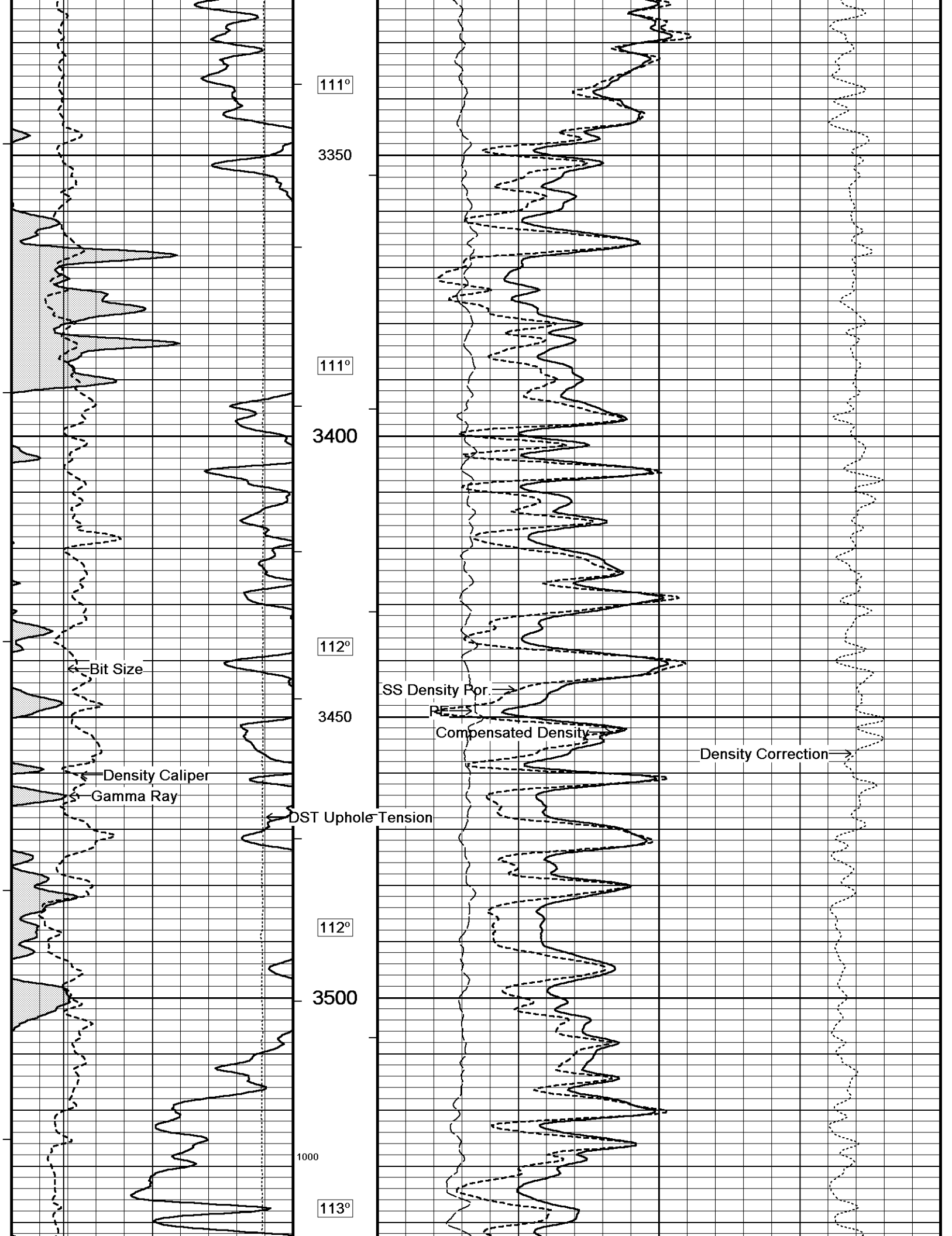


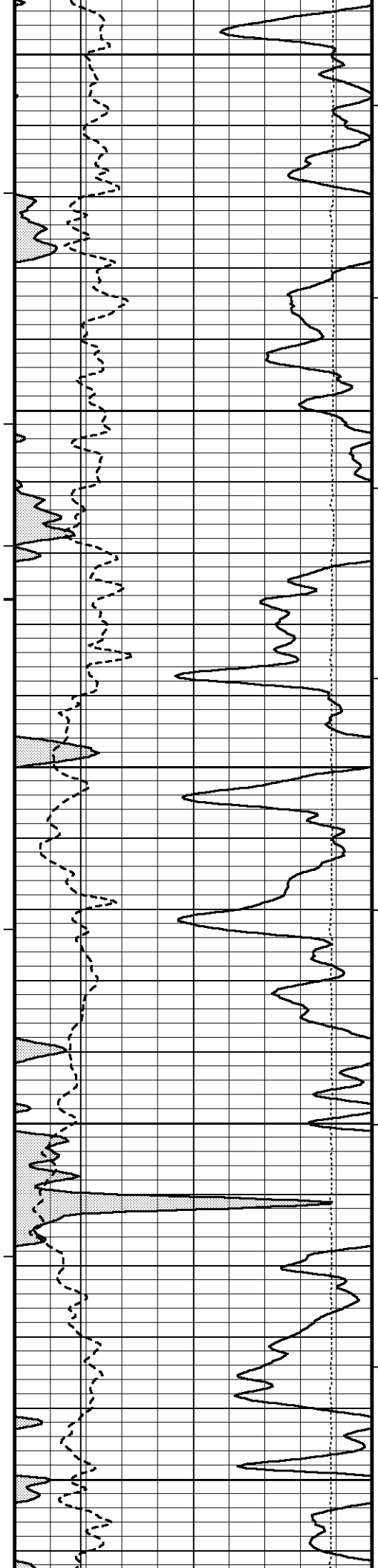












3550 700

114°

3600

114°

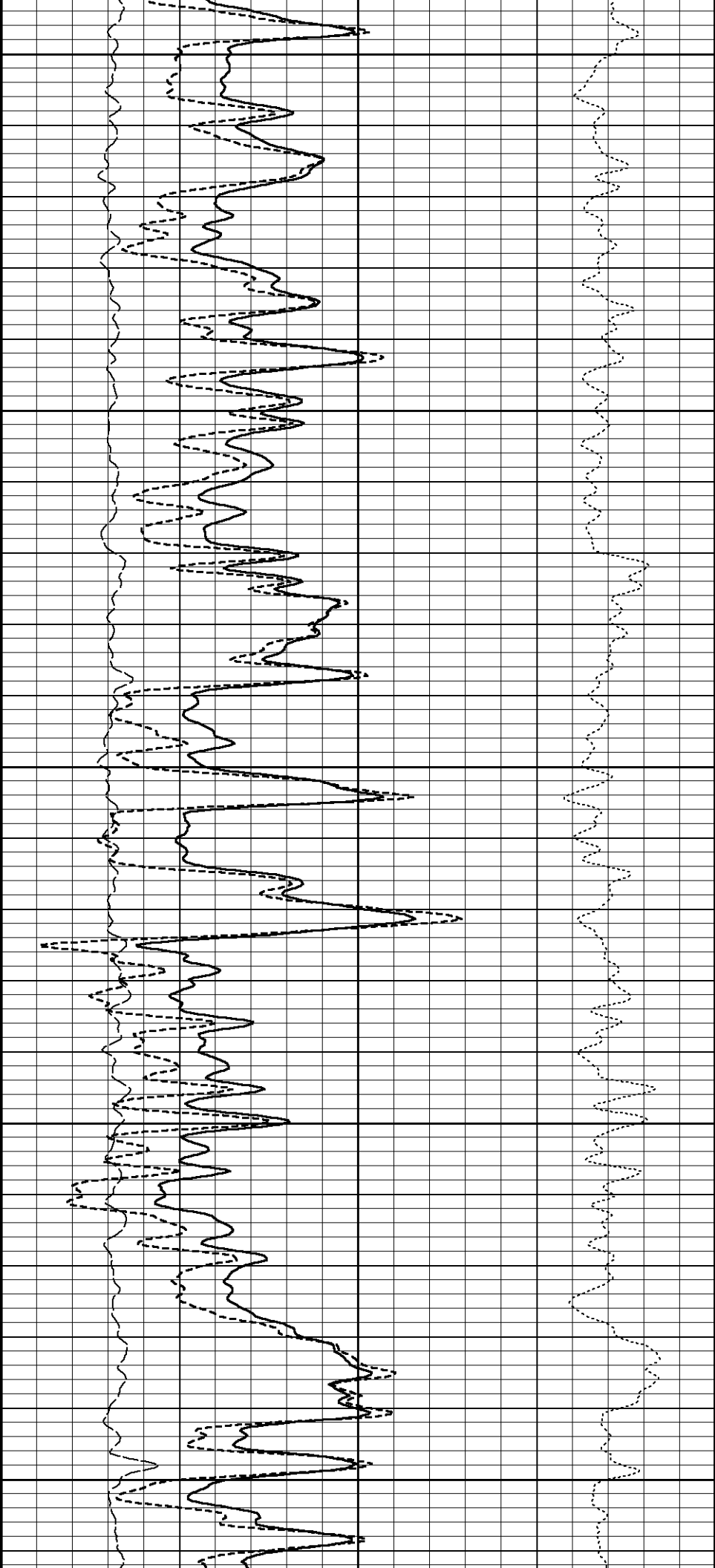
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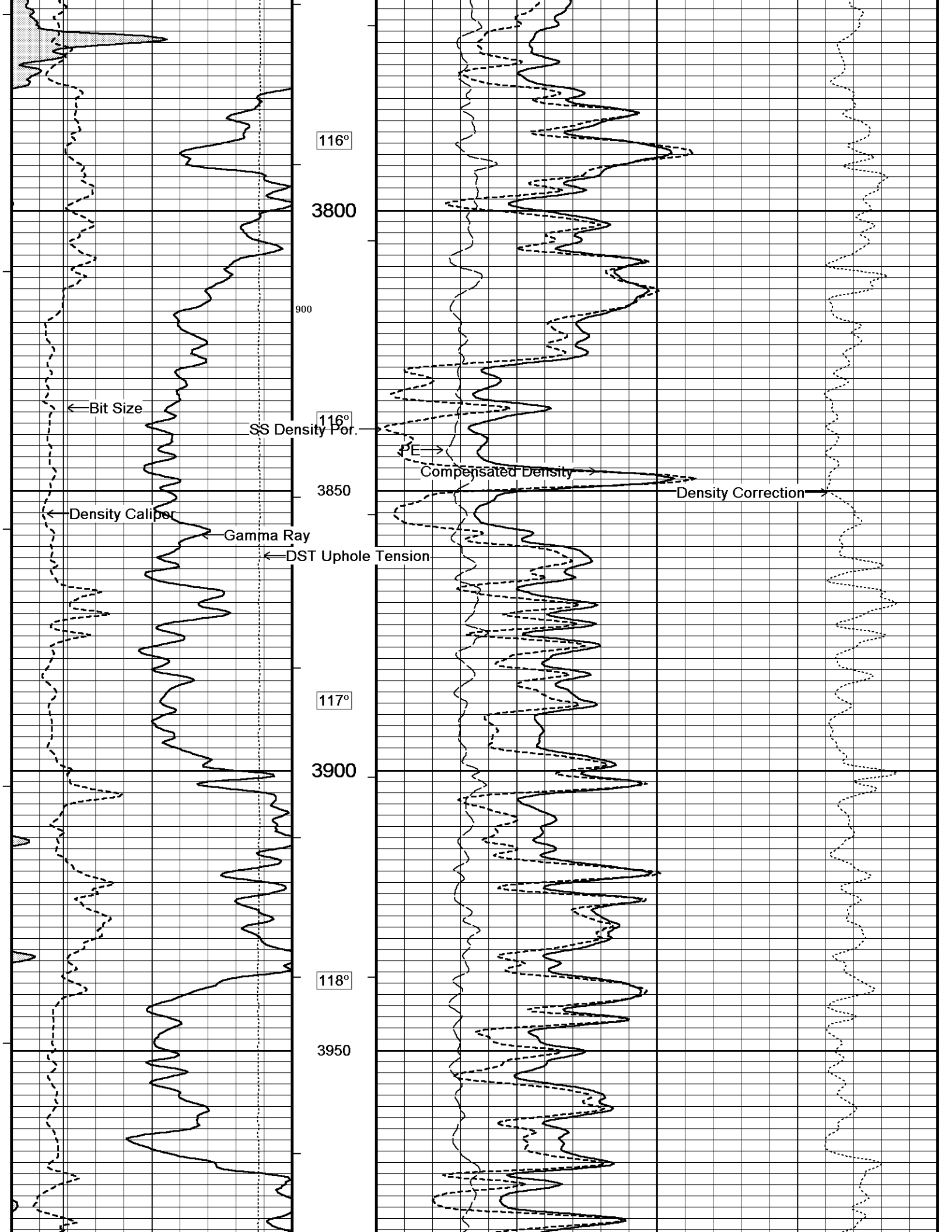
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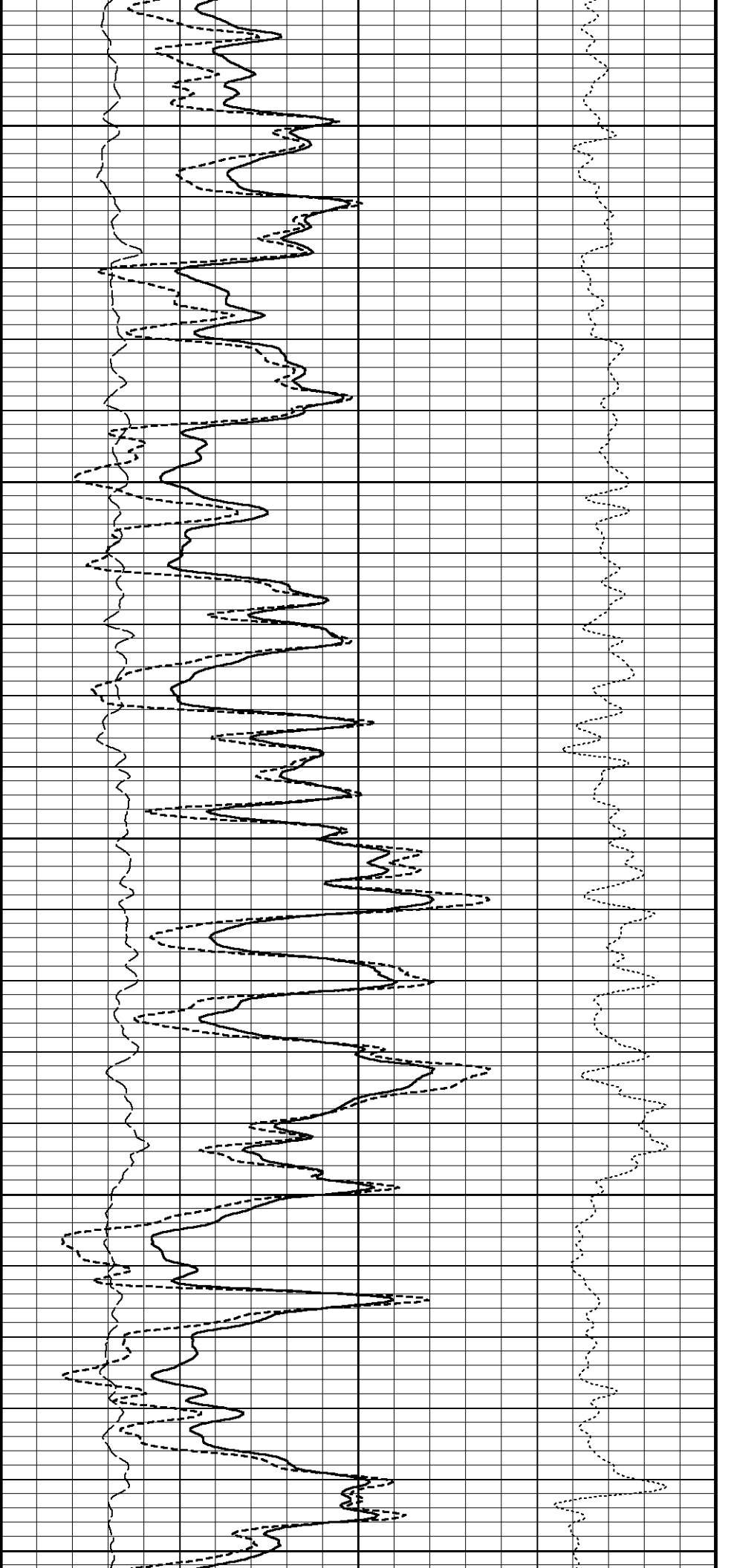
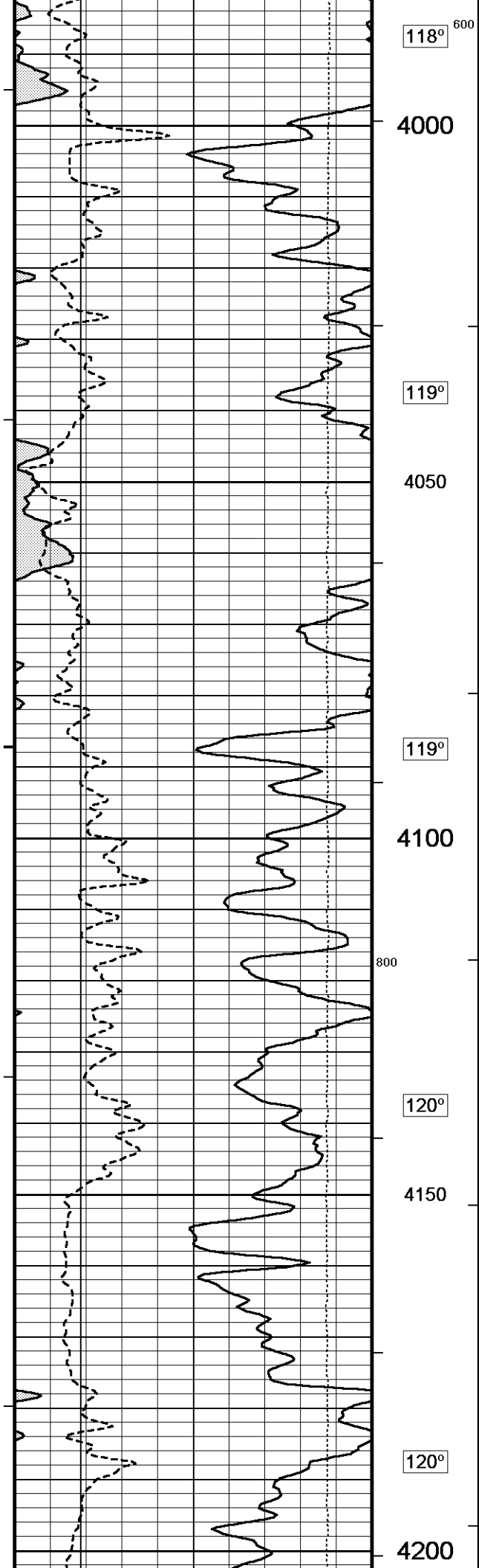
3700

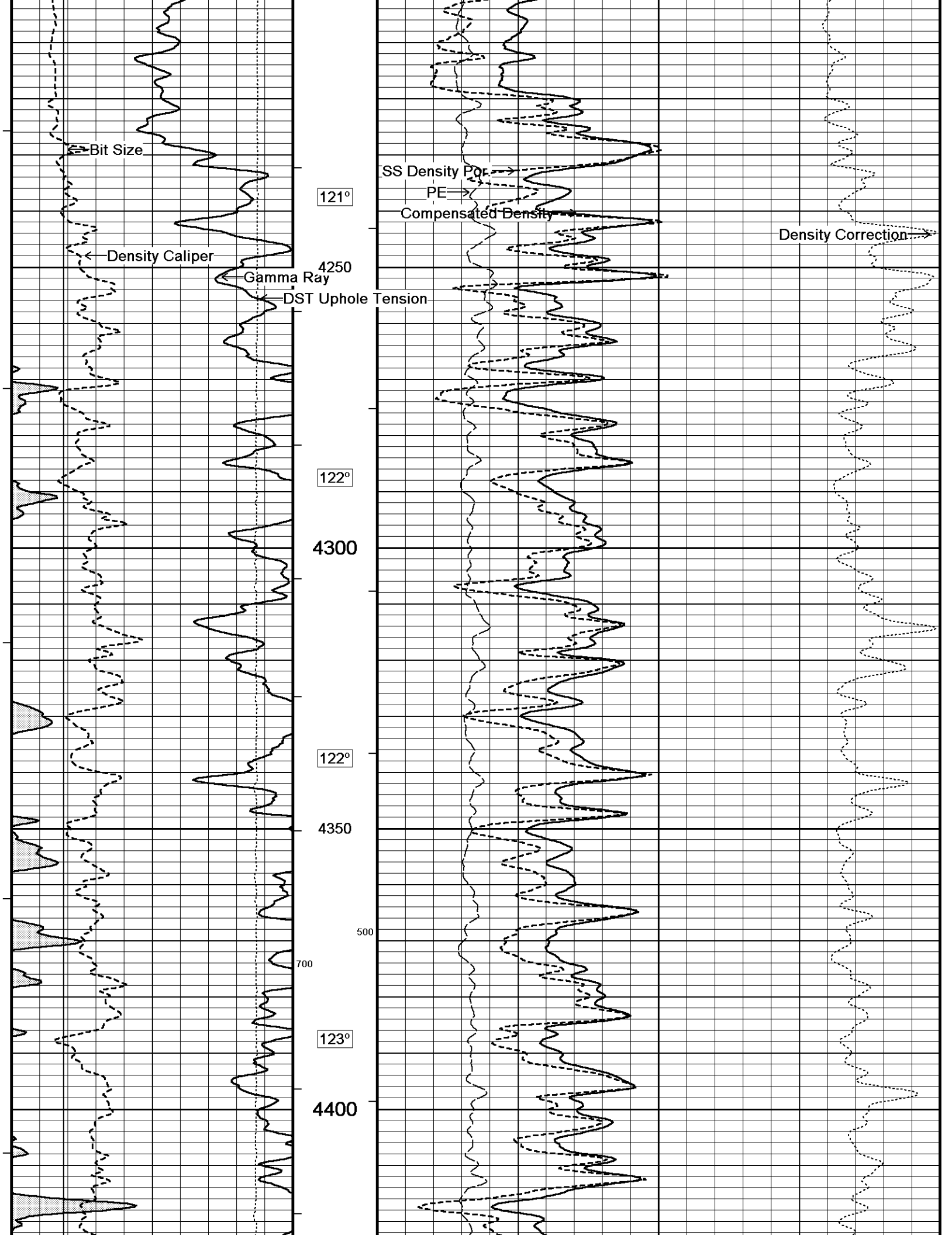
115°

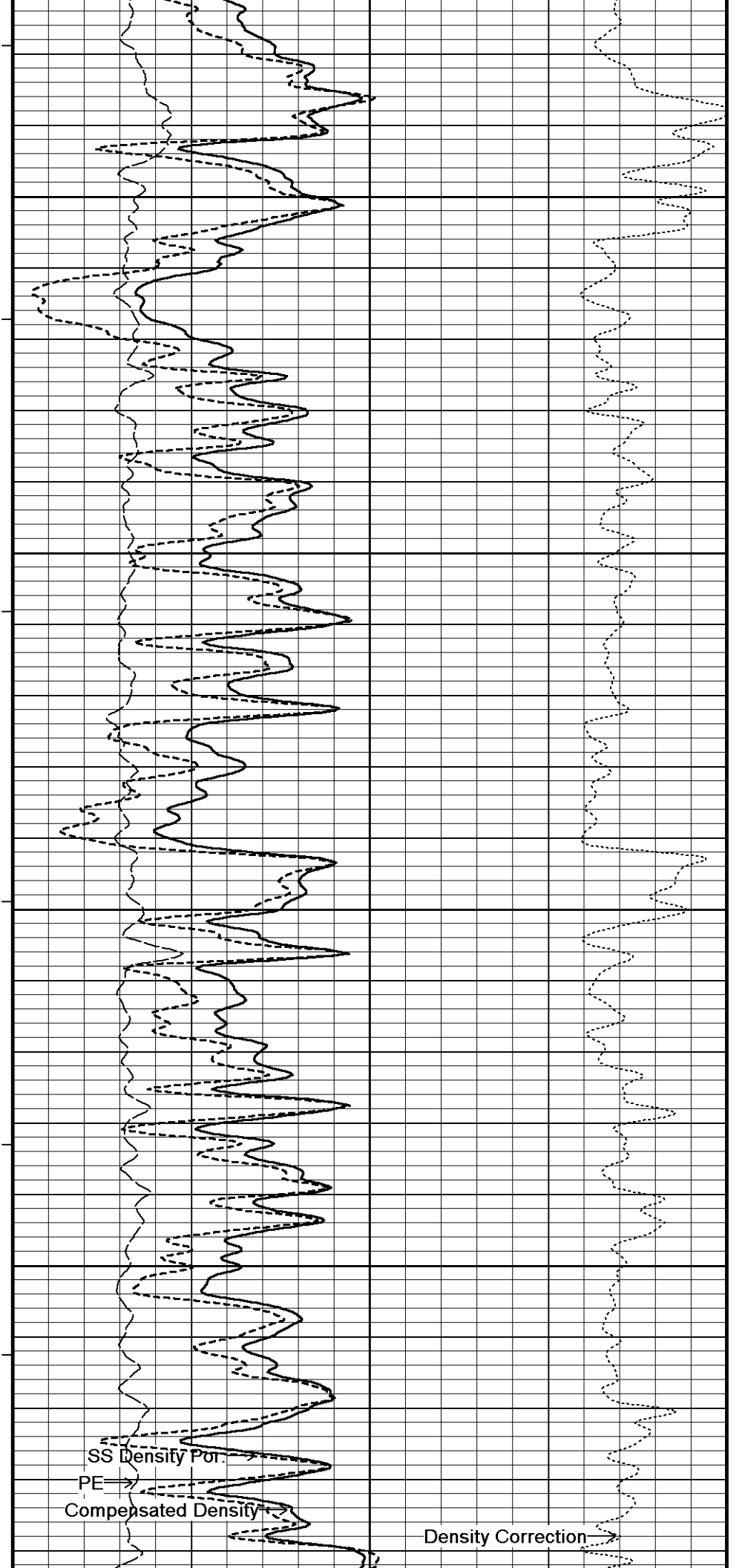
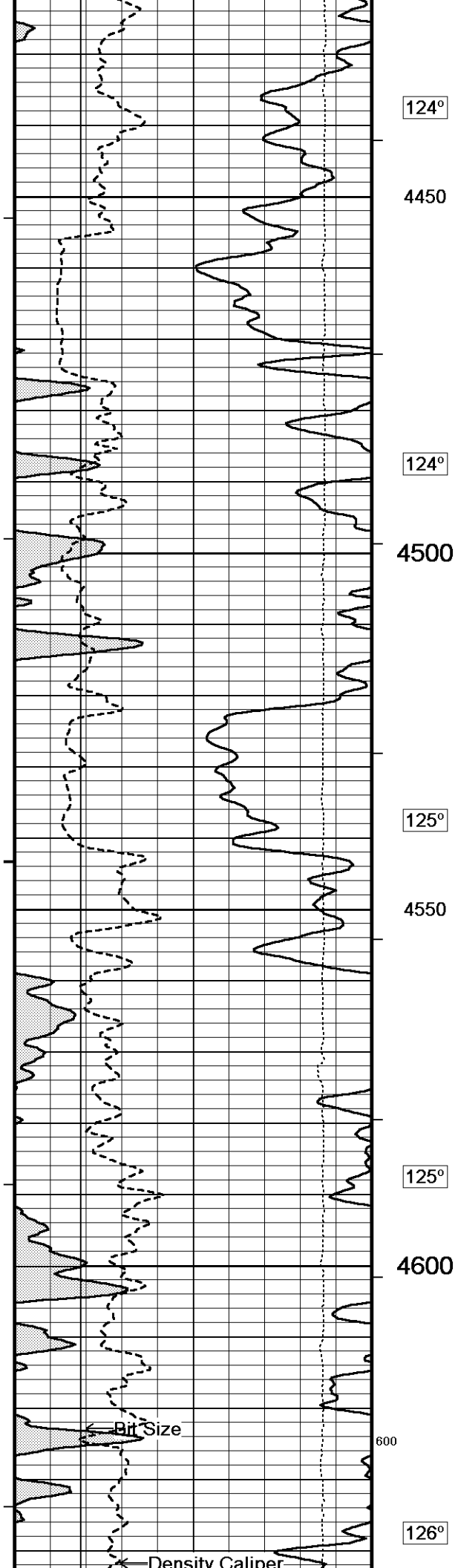
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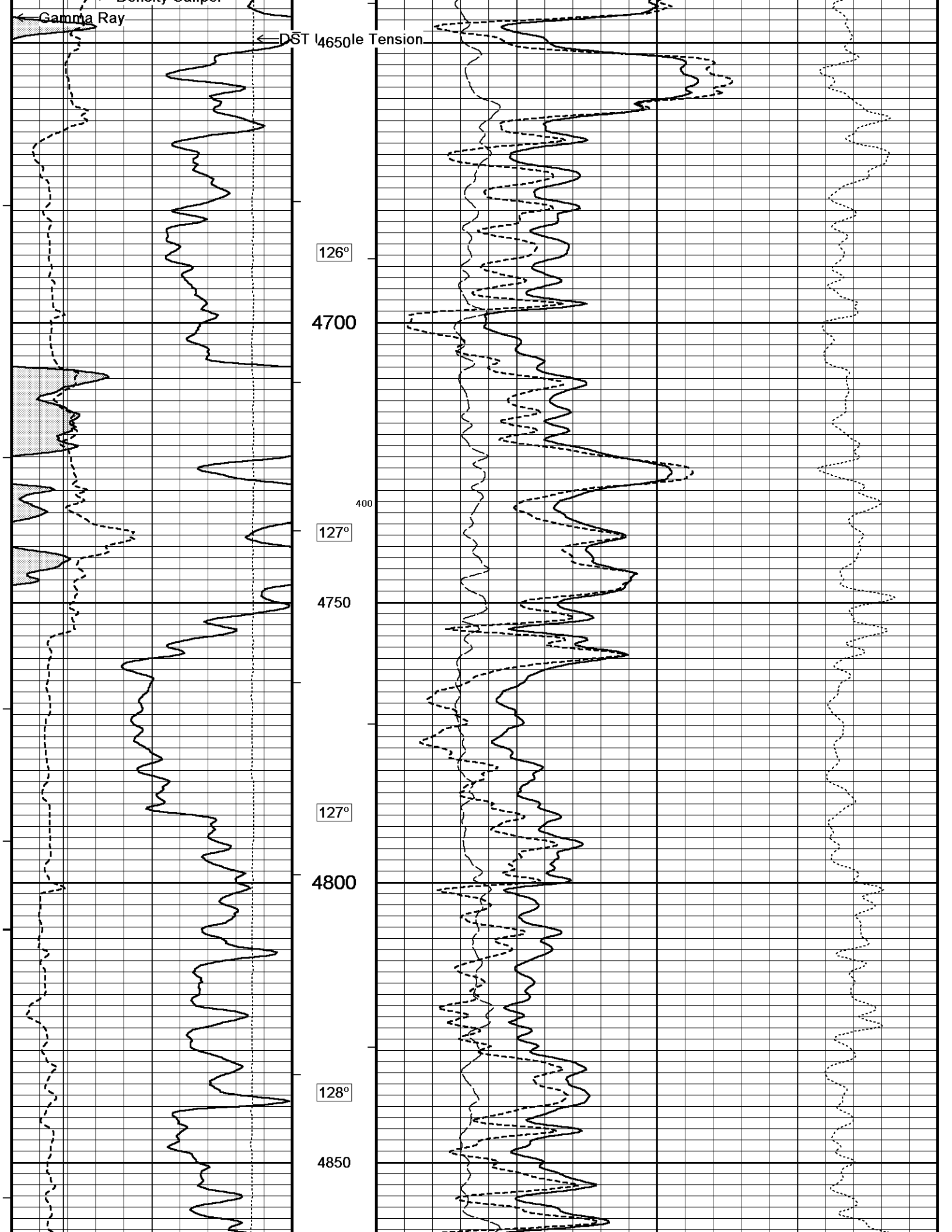


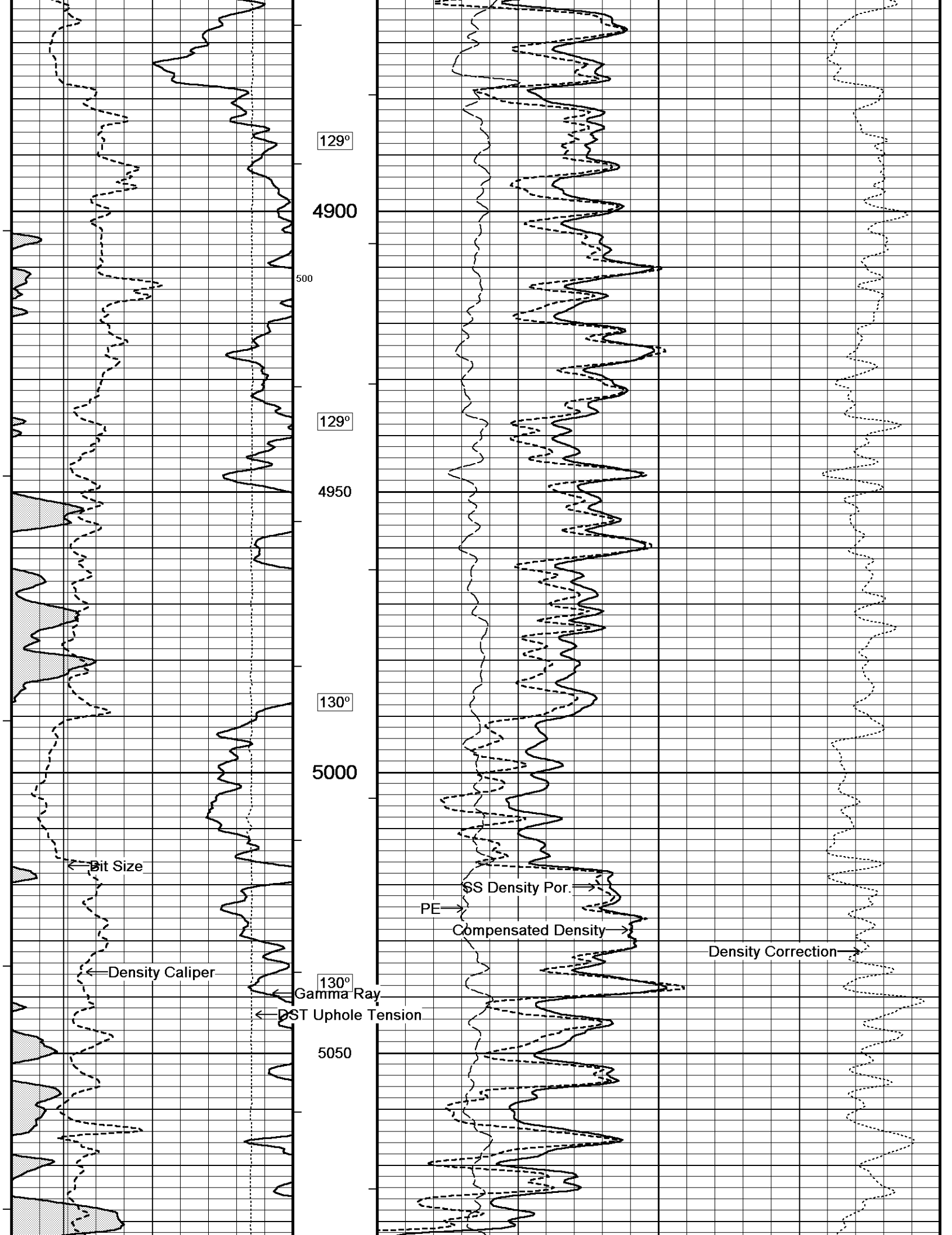


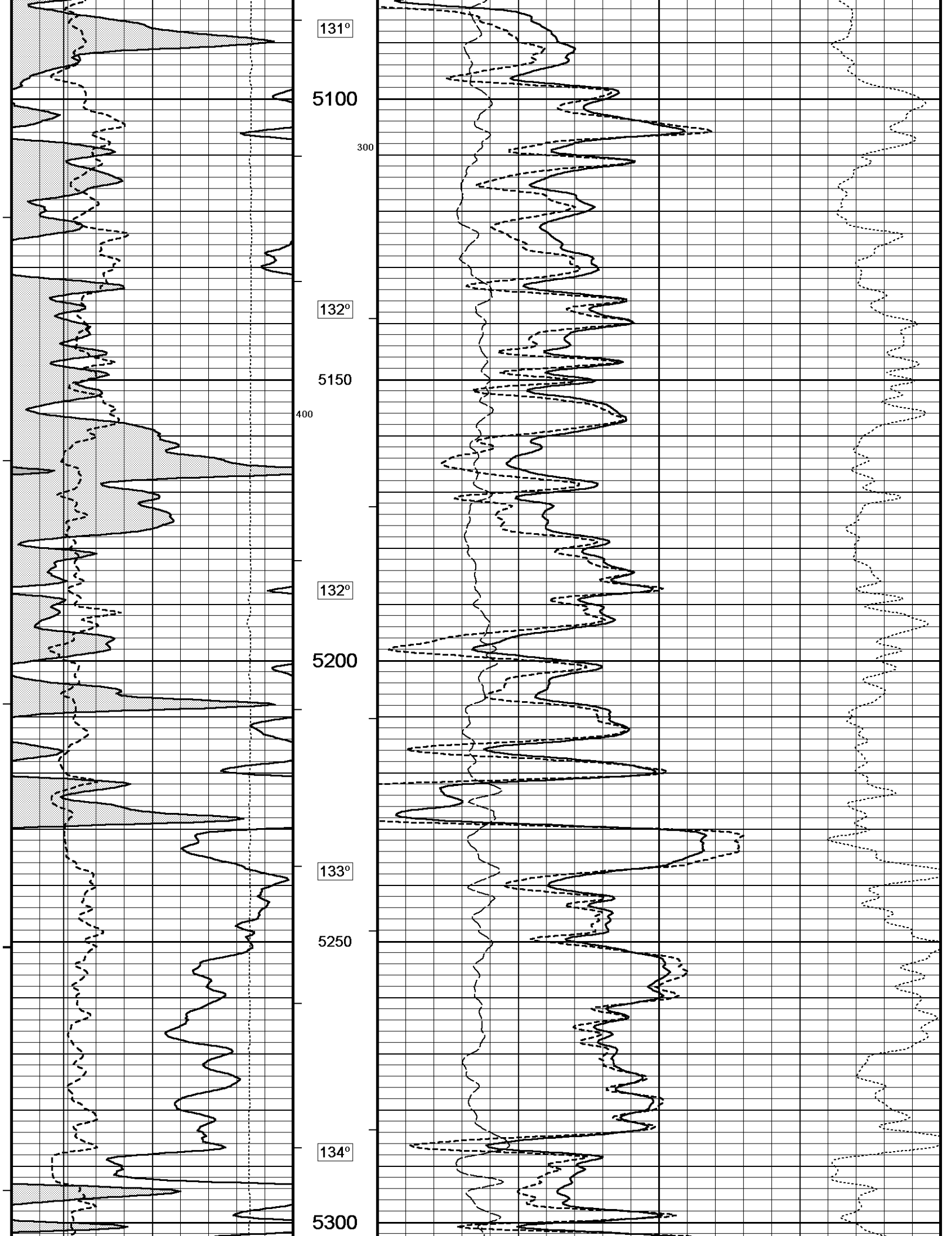


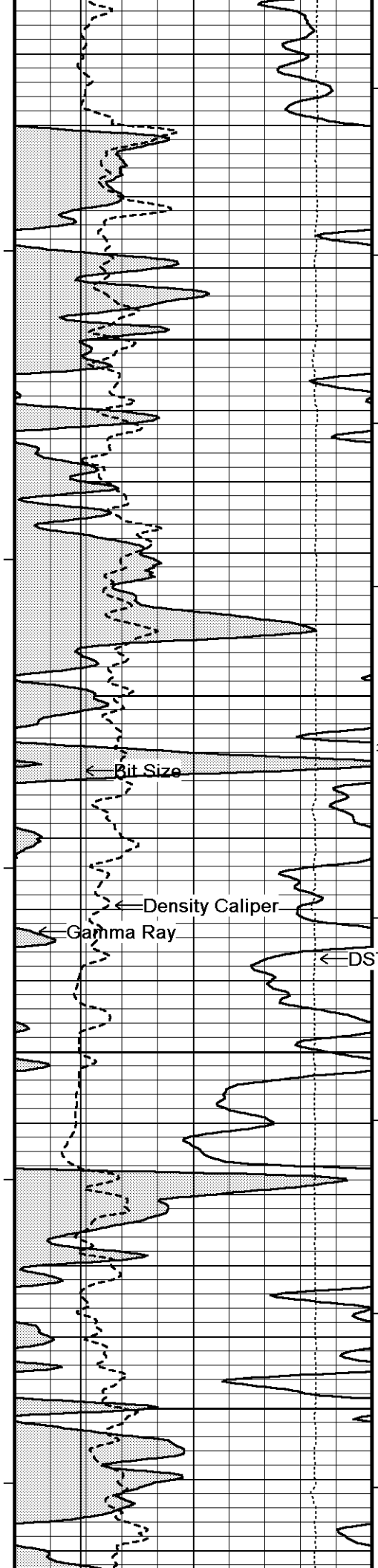




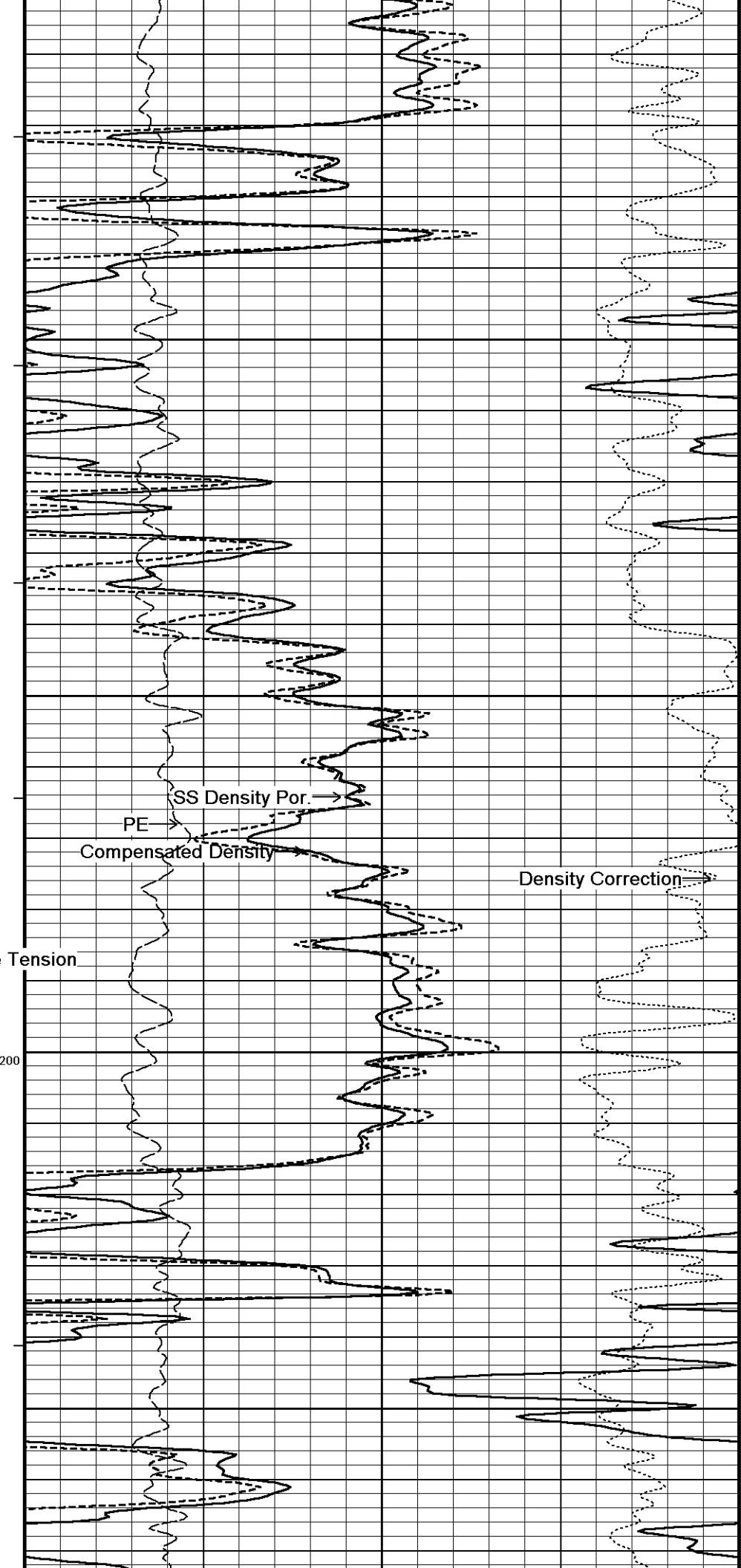








135°
5350
136°
5400
300
136°
5450
200
137°
5500



Bit Size

Density Caliper

Gamma Ray

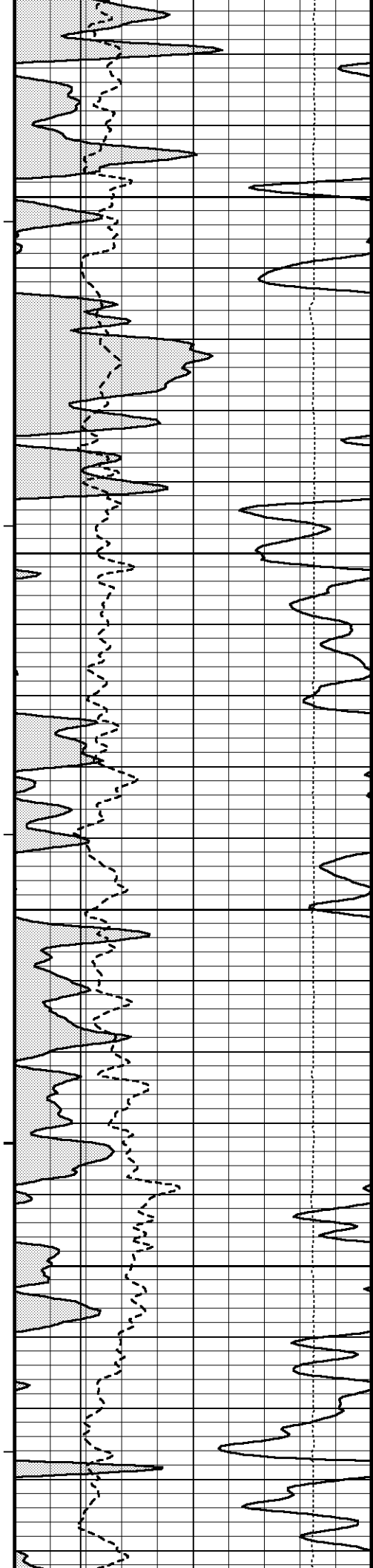
DST Up-hole Tension

SS Density Por.

PE

Compensated Density

Density Correction



138°

5550

139°

5600

140°

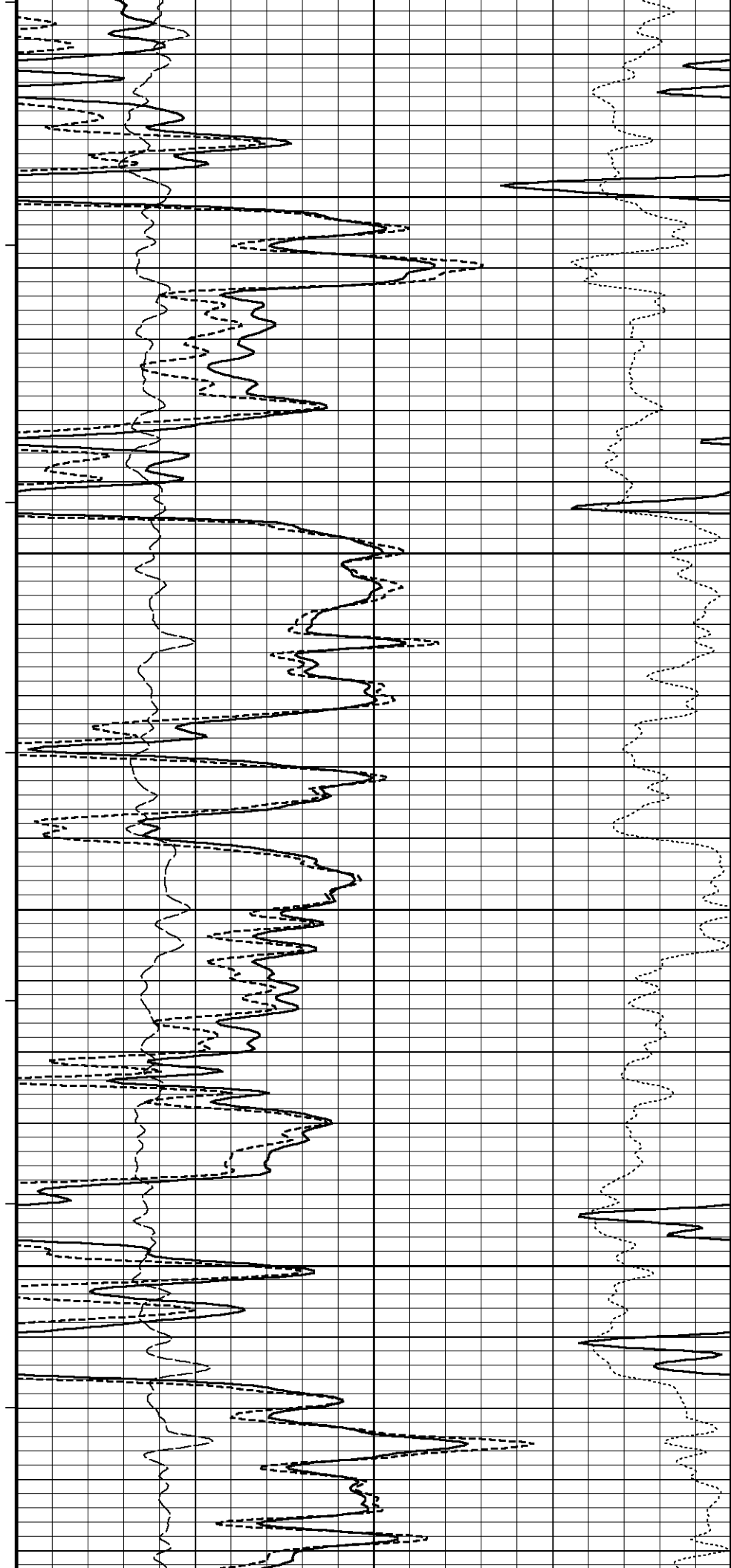
5650

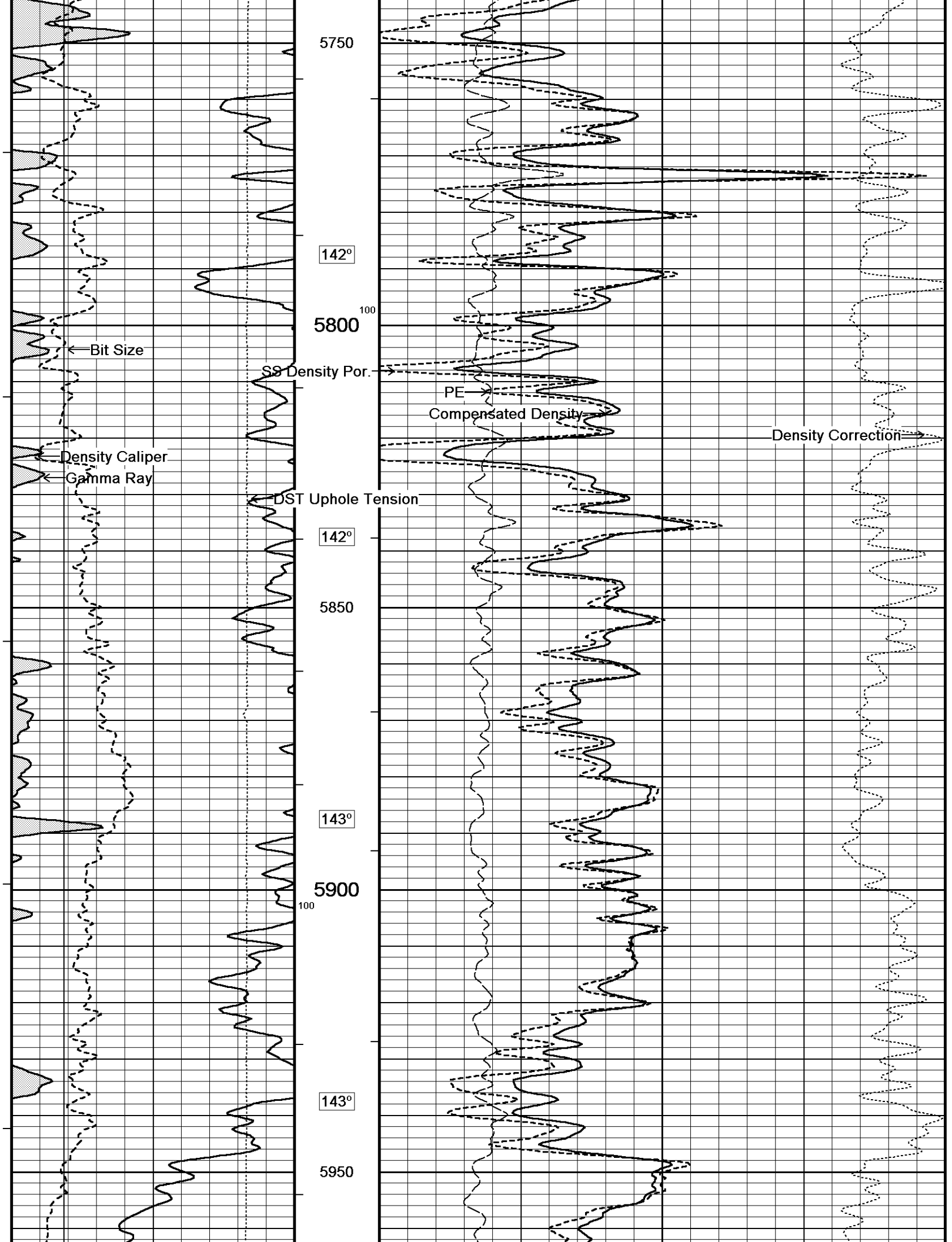
200

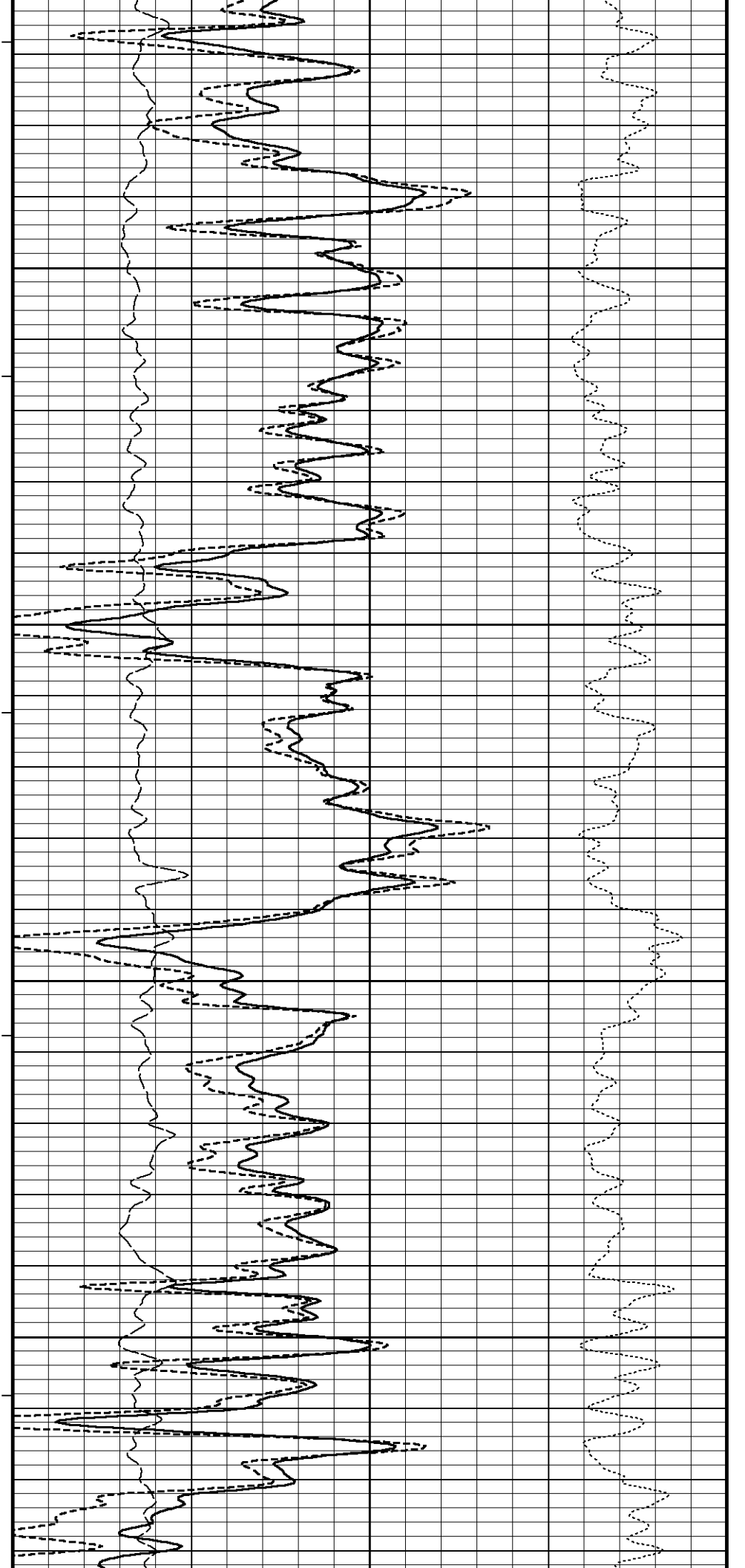
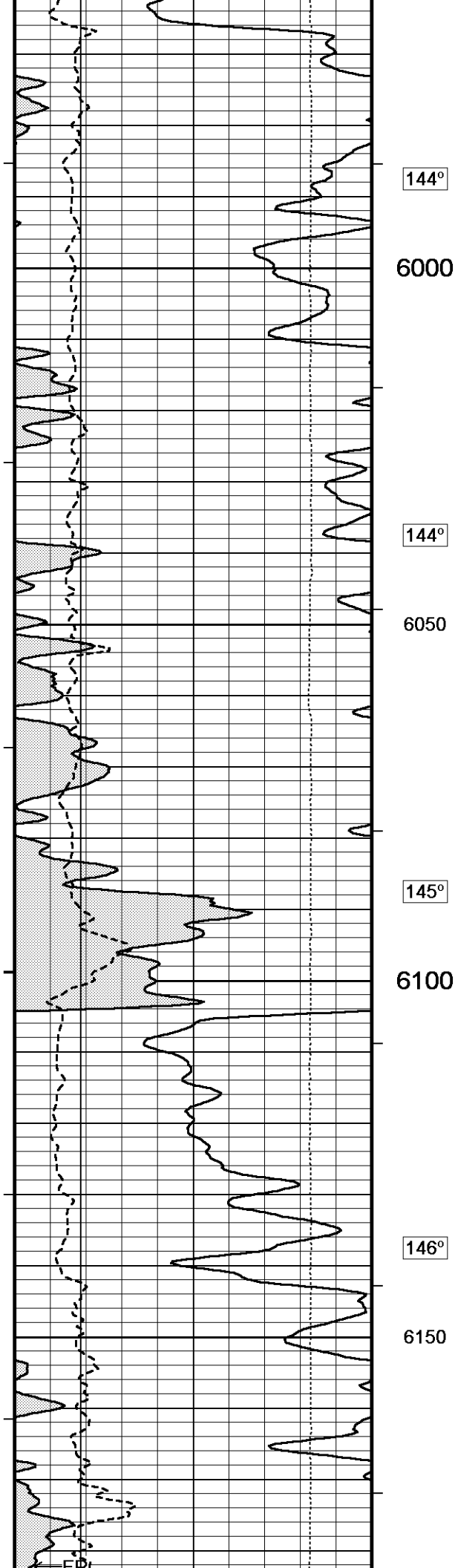
140°

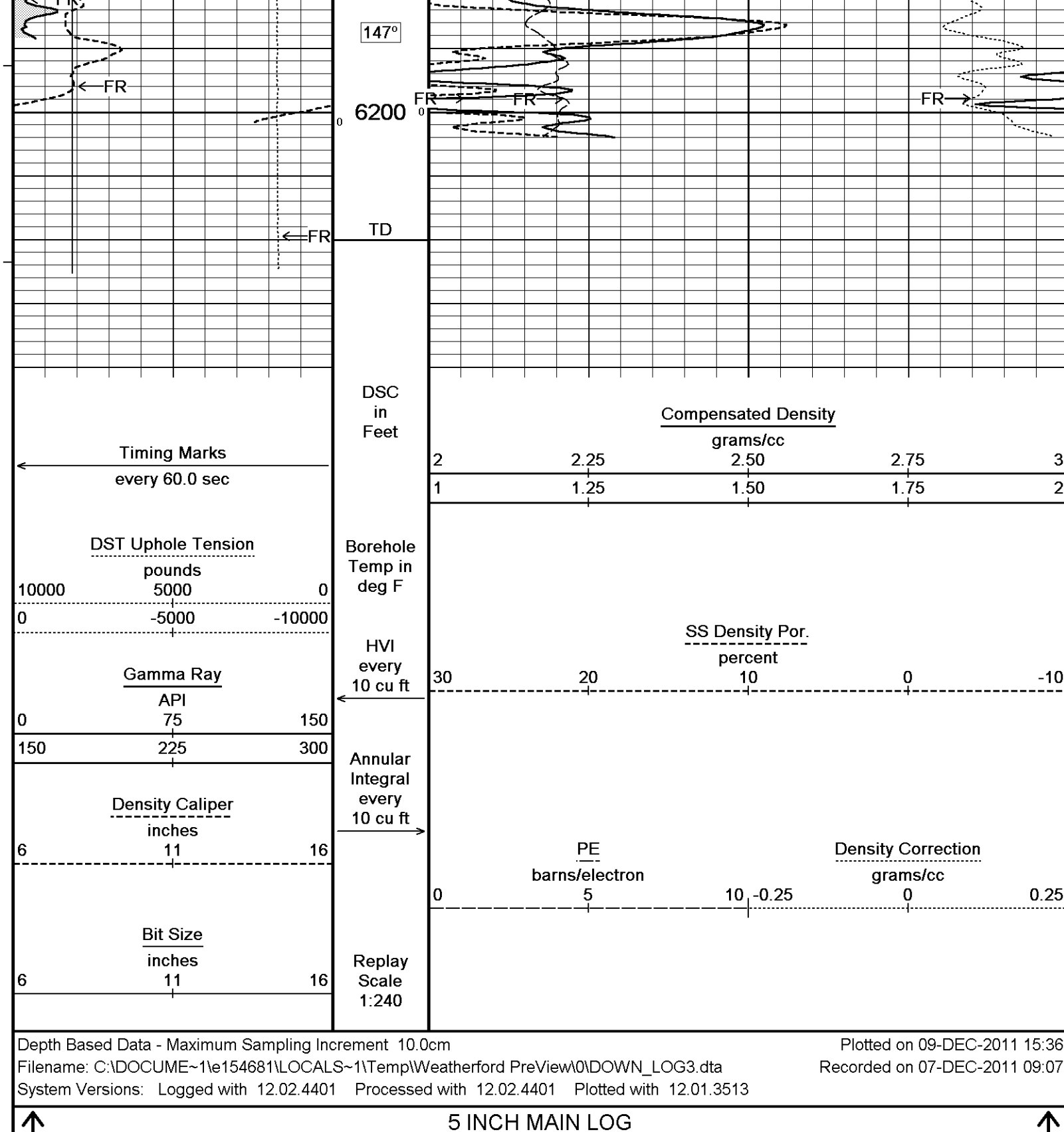
5700

141°









BEFORE SURVEY CALIBRATION

C:\DOCUME~1\154681\LOCALS~1\Temp\Weatherford PreView\0\DOWN_LOG3.dta

General Constants All 000

Last Edited on 07-DEC-2011 05:31

General Parameters

Mud Resistivity	4.260	ohm-metres
Mud Resistivity Temperature	76.400	degrees F
Water Level	0.000	feet
Density/Neutron Processing	Wet Hole	

Hole/Annular Volume and Differential Caliper Parameters			
HVOL Method	Single Caliper		
HVOL Caliper 1	Density Caliper		
HVOL Caliper 2	N/A		
Annular Volume Diameter	4.500	inches	
Caliper for Differential Caliper	Density Caliper		
Rwa Parameters			
Porosity used	Base Density Porosity		
Resistivity used	Array Ind. One Res Rt		
RWA Constant A	0.610		
RWA Constant M	2.150		
Down-hole Tension Calibration All 000			
			Field Calibration on 24-OCT-2010 04:34
Reading No	Measured	Calibrated (lbs)	
1	15659.85	0.00	
2	15734.68	370.00	
Down-hole Tension Calibration SMS 0			
			Field Calibration on 07-DEC-2011 06:41
Reading No	Measured	Calibrated (lbs)	
1	17182.45	0.00	
2	17346.58	300.00	
High Resolution Temperature Calibration MCG-C 115			
			Field Calibration on 01-JUL-2011 11:21
	Measured	Calibrated(Deg F)	
Lower	50.00	50.00	
Upper	75.00	75.00	
High Resolution Temperature Constants MCG-C 115			
			Last Edited on
Pre-filter Length	11		
SP Calibration MCG-C 115			
			Field Calibration on 28-NOV-2011 15:19
	Measured	Calibrated (mV)	
Reference 1	103.4	100.2	
Reference 2	-97.4	-100.2	
Gamma Calibration MCG-C 115			
			Field Calibration on 06-DEC-2011 14:39
	Measured	Calibrated (API)	
Background	76	51	
Calibrator (Gross)	853	570	
Calibrator (Net)	777	519	
Gamma Constants MCG-C 115			
			Last Edited on 07-DEC-2011 07:03
Gamma Calibrator Number	GRCC-119		
Mud Density	1.00	gm/cc	
Caliper Source for Processing	Density Caliper		
Tool Position	Eccentred		
Concentration of KCl	0.00	kppm	
Neutron Calibration MDN-B.J 372			
			Base Calibration on 07-NOV-2011 14:49 Field Check on 06-DEC-2011 14:55
Base Calibration			
	Measured	Calibrated (cps)	
	Near Far	Near	Far
	2901 89	3714	110
Ratio	32.694	33.764	
Field Calibrator at Base			
		Calibrated (cps)	
		2354	3415
Ratio		0.689	
Field Check			
		Calibrated (cps)	
		2315	3427
Ratio		0.676	
Neutron Constants MDN-B.J 372			
			Last Edited on 07-DEC-2011 07:03
Neutron Source Id	D31115P		

Neutron Source Id	P51113B		
Neutron Jig Number	NJ5299		
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	0.00	kppm	
Formation Fluid Salinity Source	None		
Formation Fluid Salinity	N/A	kppm	
Barite Mud Correction	Not Applied		

FE Calibration MFE-A.A 102			Base Calibration on 07-NOV-2011 11:17
			Field Check on 06-DEC-2011 14:45
Base Calibration			
	Measured	Calibrated (ohm-m)	
Reference 1	0.0	0.0	
Reference 2	978.7	126.8	
Base Check		280.0	
Field Check		280.0	

FE Constants MFE-A.A 102			Last Edited on 07-DEC-2011 05:29
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	1.0	inches	

High Resolution Temperature Calibration MAI-B.A 268			Field Calibration on 10-OCT-2011 15:43
	Measured	Calibrated(Deg F)	
Lower	50.00	50.00	
Upper	75.00	75.00	

High Resolution Temperature Constants MAI-B.A 268			Last Edited on
Pre-filter Length	11		

Induction Calibration MAI-B.A 268					Base Calibration on 07-NOV-2011 13:33	
					Field Check on 06-DEC-2011 14:33	
Base Calibration						
Test Loop Calibration		Measured		Calibrated (mmho/m)		
Channel	Low	High		Low	High	
1	17.2	459.3		9.3	966.2	
2	6.5	375.4		7.6	821.4	
3	3.7	255.1		5.2	566.0	
4	2.2	131.8		2.6	279.2	
Array Temperature		74.3	Deg F			
Channel	Base Check (mmho/m)		Field Check (mmho/m)			
	Low	High		Low	High	
1	0.0	0.0		10.8	3926.0	
2	0.0	0.0		28.5	3565.8	
3	0.0	0.0		27.7	3080.5	
4	0.0	0.0		18.7	2084.4	
Deep	0.0	0.0		17.0	2012.9	
Medium	0.0	0.0		40.9	4058.0	
Shallow	0.0	0.0		42.2	5266.3	
Array Temperature		0.0		47.9	Deg F	

Induction Constants MAI-B.A 268			Last Edited on 07-DEC-2011 06:55
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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	1.00	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-B 104

Base Calibration on 06-DEC-2011 11:01

Field Calibration on 06-DEC-2011 11:05

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	11778	3.99
2	20380	5.97
3	29068	7.96
4	37241	9.86
5	46400	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
7.95	7.96

Photo Density Calibration MPD-B 104

Base Calibration on 06-DEC-2011 10:30

Field Check on 06-DEC-2011 10:42

Density Calibration

Base Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	36975	12896	52994	19128
Reference 2	17425	2405	25185	2558

Field Check at Base

1270.5	1474.5
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Field Check

1271.6	1479.2
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PE Calibration

Base Calibration	Measured	Calibrated
WS	W/H	Ratio

	WS	WH	Ratio	Ratio
Background	236	1146		
Reference 1	12925	36819	0.356	0.309
Reference 2	5134	17296	0.303	0.274

Field Check at Base
235.8 1145.9

Field Check
238.5 1148.4

Density Constants MPD-B 104

Last Edited on 07-DEC-2011 05:30

Density Source Id	P15771B	
Nylon Calibrator Number	DNC -D 527	
Aluminium Calibrator Number	DAC-D 527	
Density Shoe Profile	8 inch	
Caliper Source for Processing	Density Caliper	
PE Correction to Density	Not Applied	
Mud Density	1.25	gm/cc
Mud Density Z/A Multiplier	1.11	
Mud Filtrate Density	1.00	gm/cc
Dry Hole Mud Filtrate Density	1.00	gm/cc
DNCT	0.00	gm/cc
CRCT	0.00	gm/cc
Density Z/A Correction	Hybrid	
Matrix Density (gm/cc)	Depth (ft)	
2.68	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	

DOWNHOLE EQUIPMENT

C:\DOCUME~1\154681\LOCALS~1\Temp\Weatherford PreView0\DOWN_LOG3.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

SHA-F Compact Swivel Head Adaptor
SHA-F 67 LG: 2.74 ft WT: 26.5 lb OD: 2.24 in

Compact Comms Gamma
MCG-C 115 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

Compact Neutron
MDN-B.J 372 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

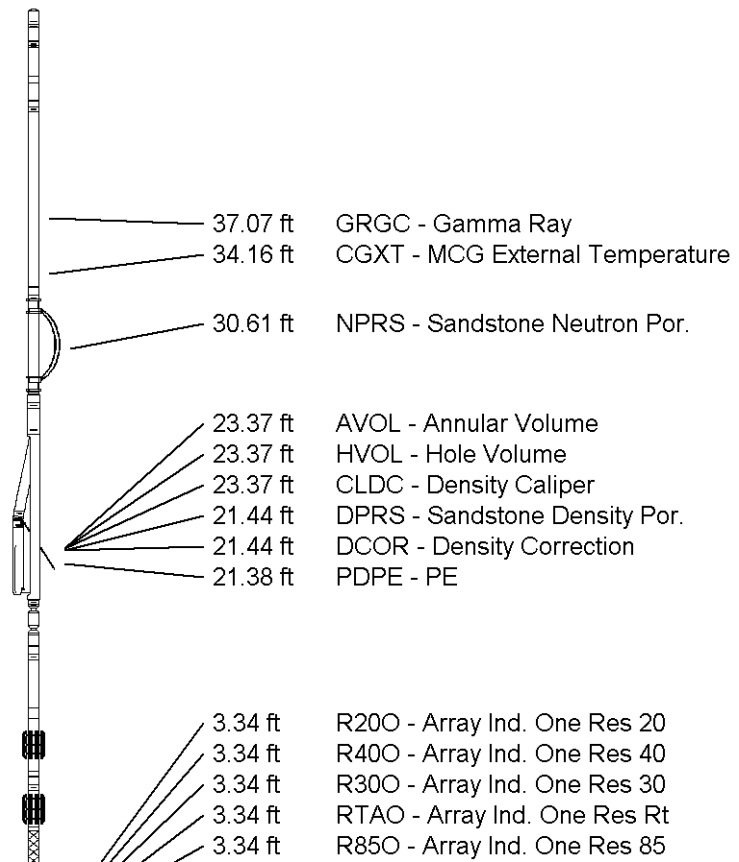
Compact Density/Caliper
MPD-B 104 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

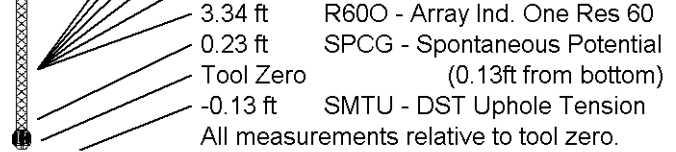
SKJ-D Compact Knuckle Joint
SKJ-D 34 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

Compact Focussed Electric
MFE-A.A 102 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

Compact Induction
MAI-B.A 268 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in


Total Length: 46.67 ft Weight: 368.2 lb





COMPANY WEXPRO COMPANY
 WELL MUSSER 31
 FIELD POWDER WASH
 PROVINCE/COUNTY MOFFAT
 COUNTRY/STATE USA/COLORADO

Elevation Kelly Bushing	6630.00	feet	First Reading	6199.00	feet
Elevation Drill Floor	6630.00	feet	Depth Driller	9095.00	feet
Elevation Ground Level	6601.00	feet	Depth Logger	6220.00	feet



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COMPENSATED PHOTO DENSITY
 COMPENSATED DUAL NEUTRON
 LOGS

