



COMPENSATED PHOTO DENSITY COMPENSATED DUAL NEUTRON LOG

COMPANY				BILL BARRETT CORPORATION			
WELL				GGU MILLER 23B-32-691			
FIELD				GIBSON GULCH			
PROVINCE/COUNTY				GARFIELD			
COUNTRY/STATE				U.S.A. / COLORADO			
LOCATION				SHL: 1241' FSL & 2293' FWL BHL: 1800' FSL & 1990' FWL			
SEC	TWP	RGE	Other Services				
32	6S	91W	MAI/MFE				
API Number		05-045-19424					
Permit Number							
Permanent Datum G.L., Elevation 6121 feet						Elevations:	
Log Measured From K.B. @ 23 FEET above Permanent Datum						KB 6144.00	
Drilling Measured From K.B.						DF 6143.00	
						GL 6121.00	
Date	25-NOV-2010						
Run Number	ONE						
Depth Driller	7250.00					feet	
Depth Logger	7253.00					feet	
First Reading	7232.00						
Last Reading	784.00						
Casing Driller	780.00					feet	
Casing Logger	784.00					feet	
Bit Size	7.875					inches	
Hole Fluid Type	LSND						
Density / Viscosity	10.50 lb/USg		55.00 CP				
PH / Fluid Loss	9.60		7.00 ml/30Min				
Sample Source	FLOW LINE						
Rm @ Measured Temp	2.16 @ 87.7					ohm-m	
Rmf @ Measured Temp	1.73 @ 87.7					ohm-m	
Rmc @ Measured Temp	2.59 @ 87.7					ohm-m	
Source Rmf / Rmc	CALC		CALC				
Rm @ BHT	1.0 @ 193.0		ohm-m				
Time Since Circulation	6 HOURS						
Max Recorded Temp	194.00					deg F	
Equipment Name	COMPACT						
Equipment / Base	13045		GD JCT				
Recorded By	R. BROWN						
Witnessed By	C.CROW						

BOREHOLE RECORD			Last Edited: 25-NOV-2010 00:37
Bit Size inches	Depth From feet	Depth To feet	
8.750	780.00	4730.00	
7.875	4730.00	7250.00	

CASING RECORD				
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	9.625	0.00	780.00	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.	
CALIPER CHECK IN CASING PRESENTED, REFERENCE I.D. = 8.98" (9 5/8", 36 LB/FT CASING)	
8.75 INCH BIT USED FROM SURFACE CASING TO 4730 FEET.	
TOOL ROLL-OVER THROUGHOUT EXTENT OF LOG. SEVERAL REPEAT PASSES WERE ATTEMPTED TO CORRECT THE ISSUE, HOWEVER, CALIPER STILL READ UNDERGAUGED THROUGH THE FOLLOWING ZONES: FROM 6460 - 6440 FEET, 6345 - 6314 FEET, 6210 - 6190 FEET, 5894 - 5878 FEET AND 4772 - 4760 FEET	

6210 = 6150 FEET, 5854 = 5878 FEET AND 4772 = 4760 FEET.

DATA SPLICED AT 6800 FEET, 6660 FEET, 6500 FEET, 6460 FEET, 6210 FEET, 5900 FEET, 4780 FEET, AND 2570 FEET.

TOTAL HOLE VOLUME FROM TD TO SURFACE CASING = 2480 CU.FT.

ANNULAR VOLUME WITH 4.5 INCH PRODUCTION CASING = 1760 CU.FT.

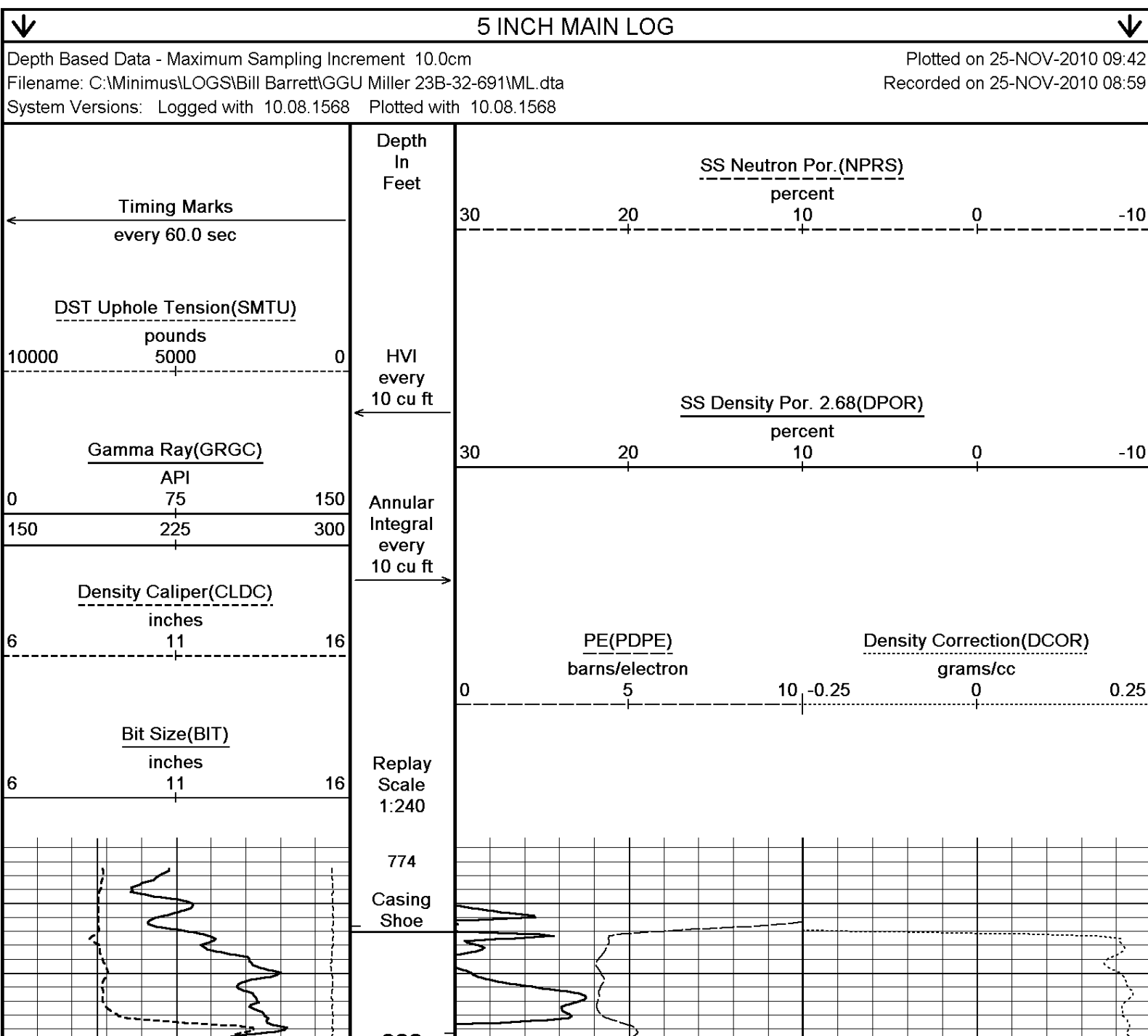
ENGINEER: R. BROWN

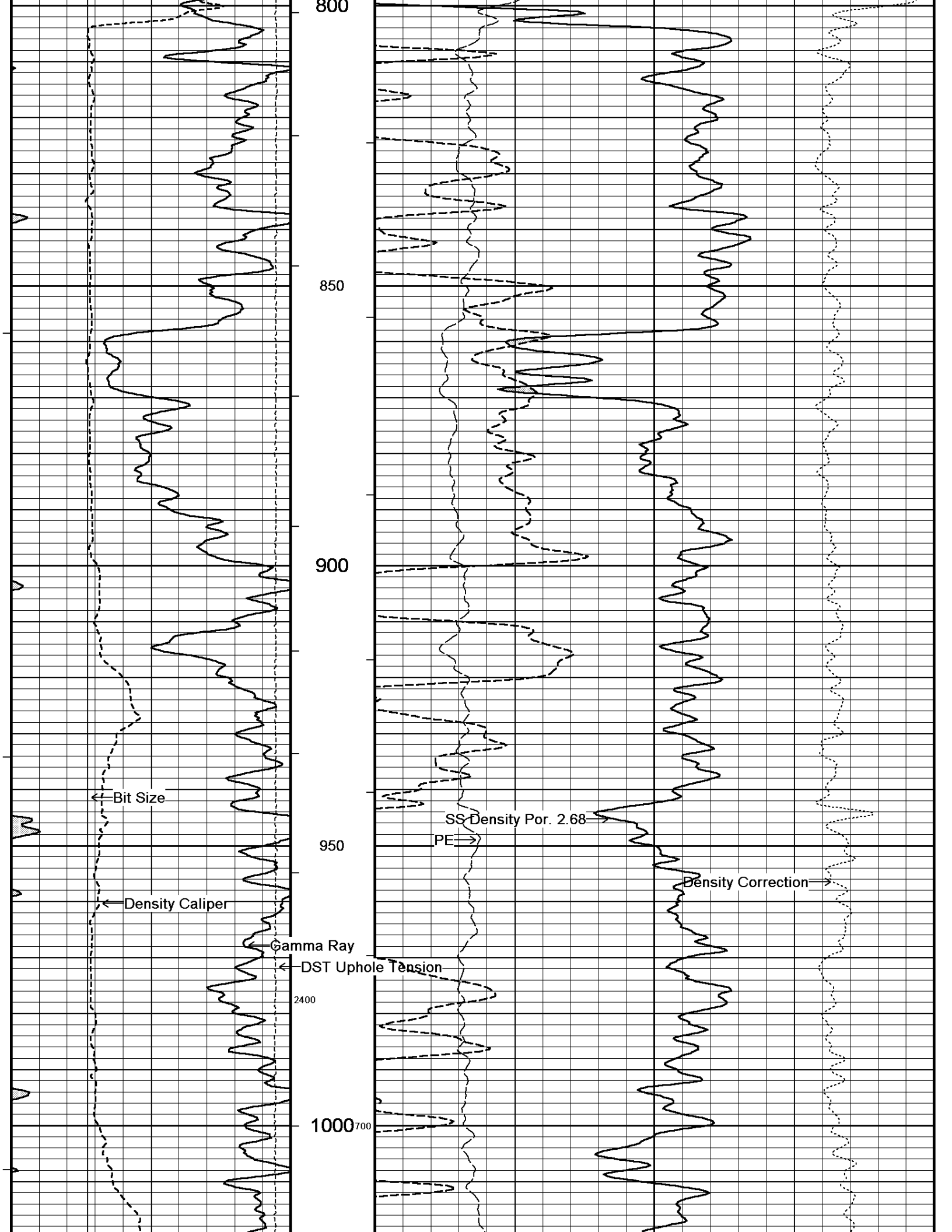
OPERATOR(S): S.KAISER, L. STAAKE

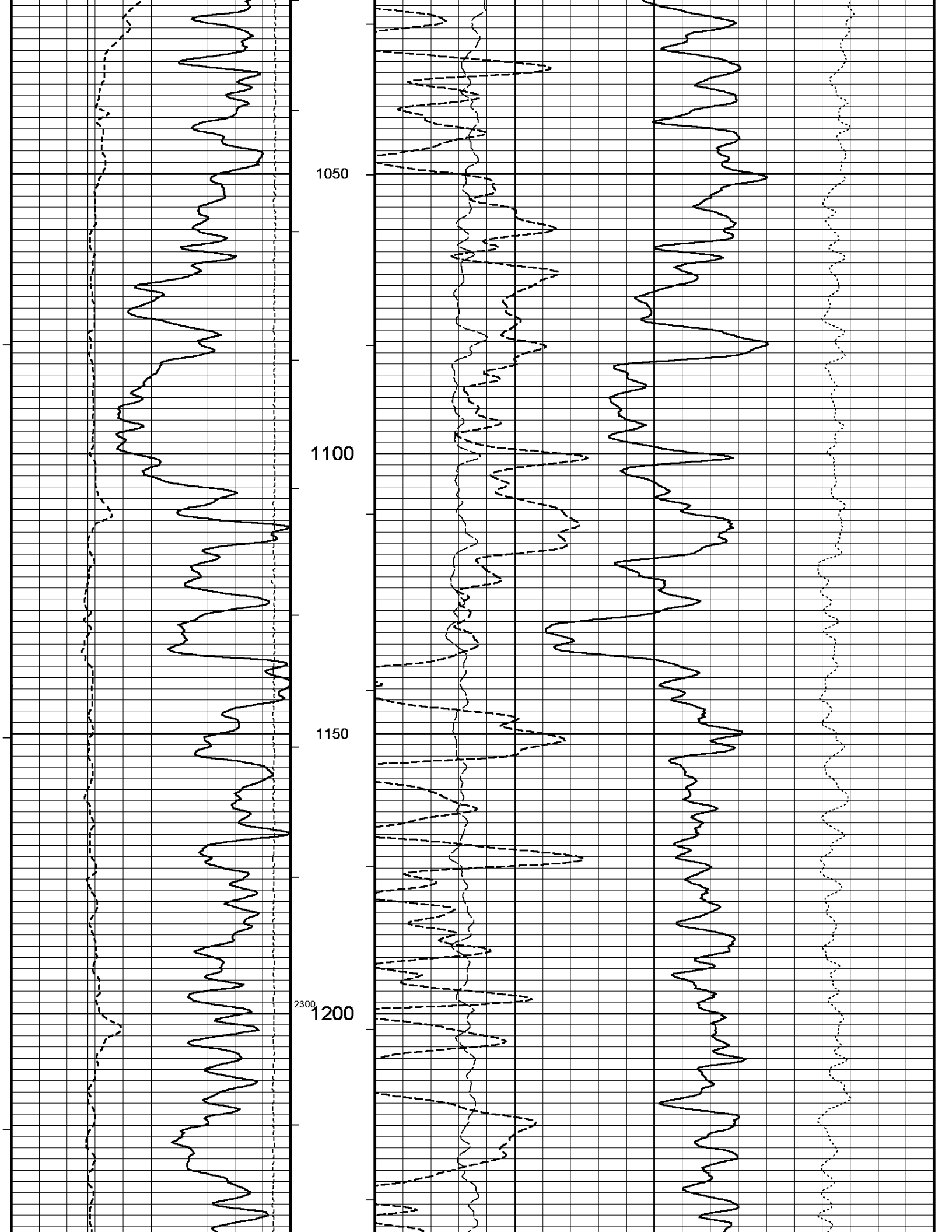
SERVICE ORDER: #3526201

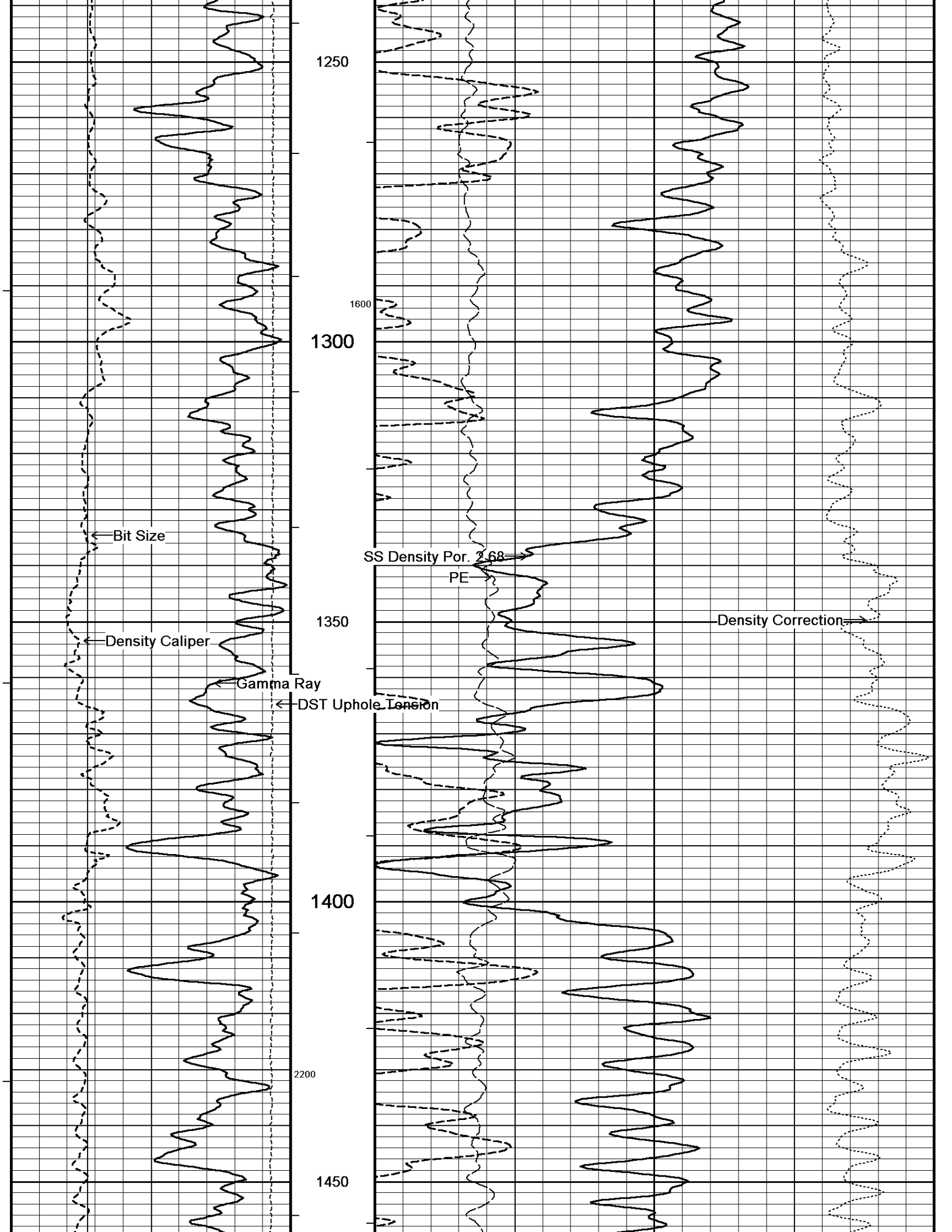
RIG: PATTERSON #307

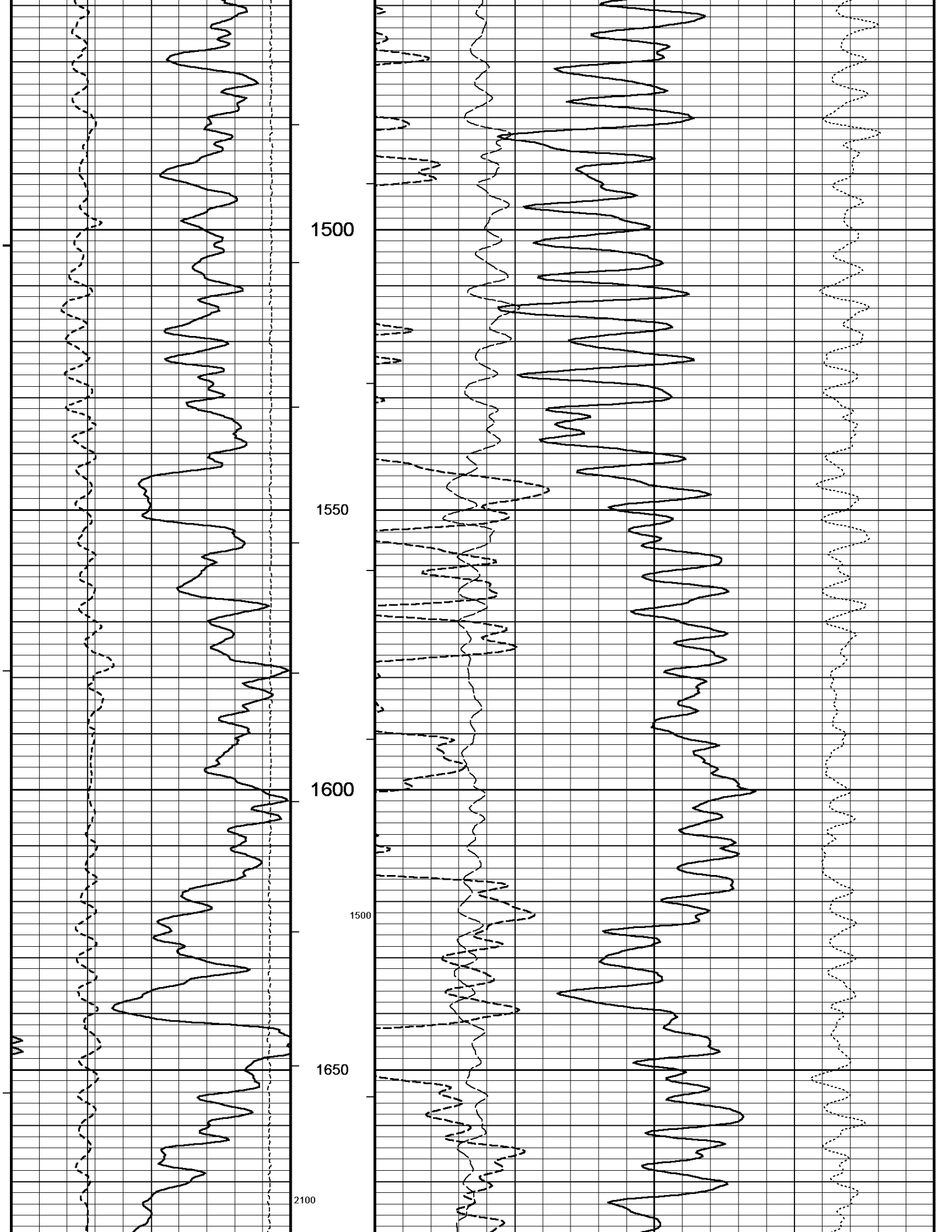
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not, guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, costs,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

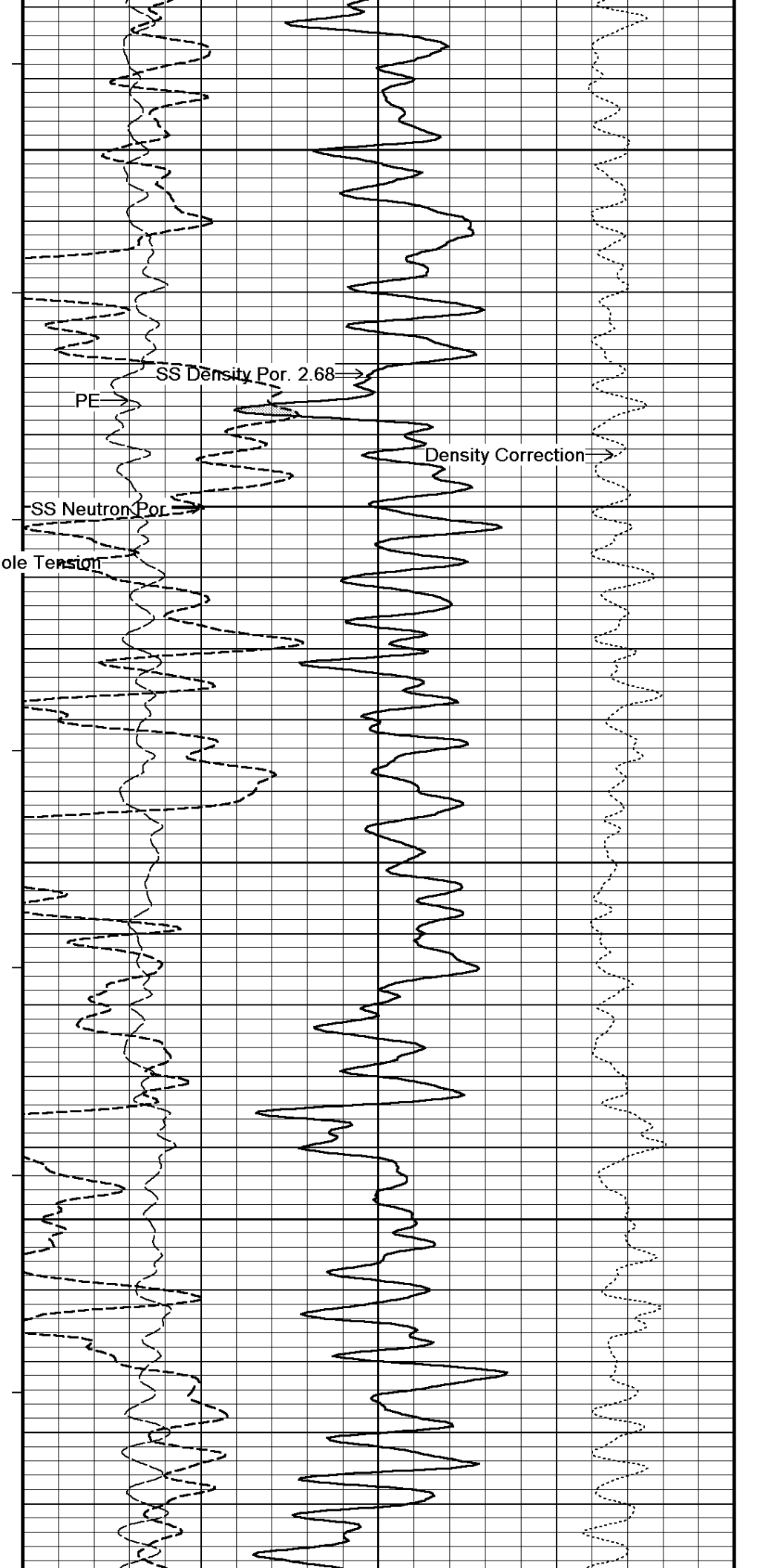
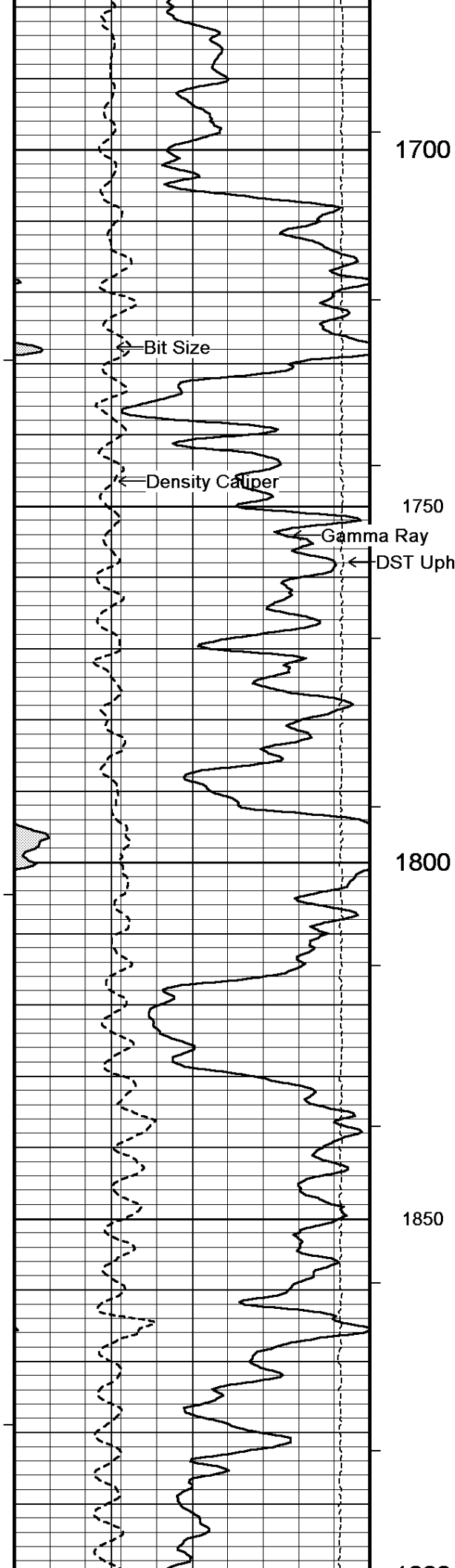


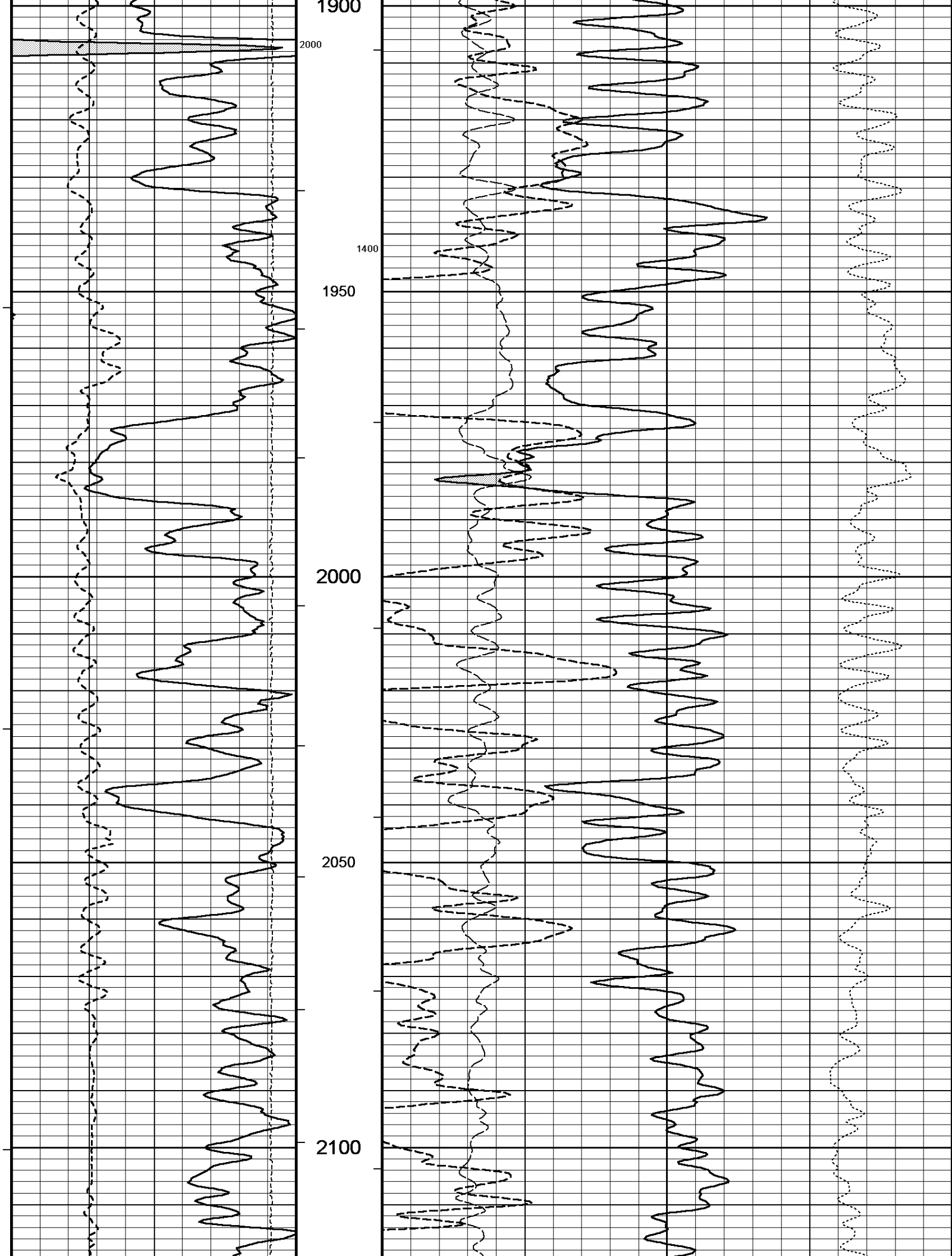


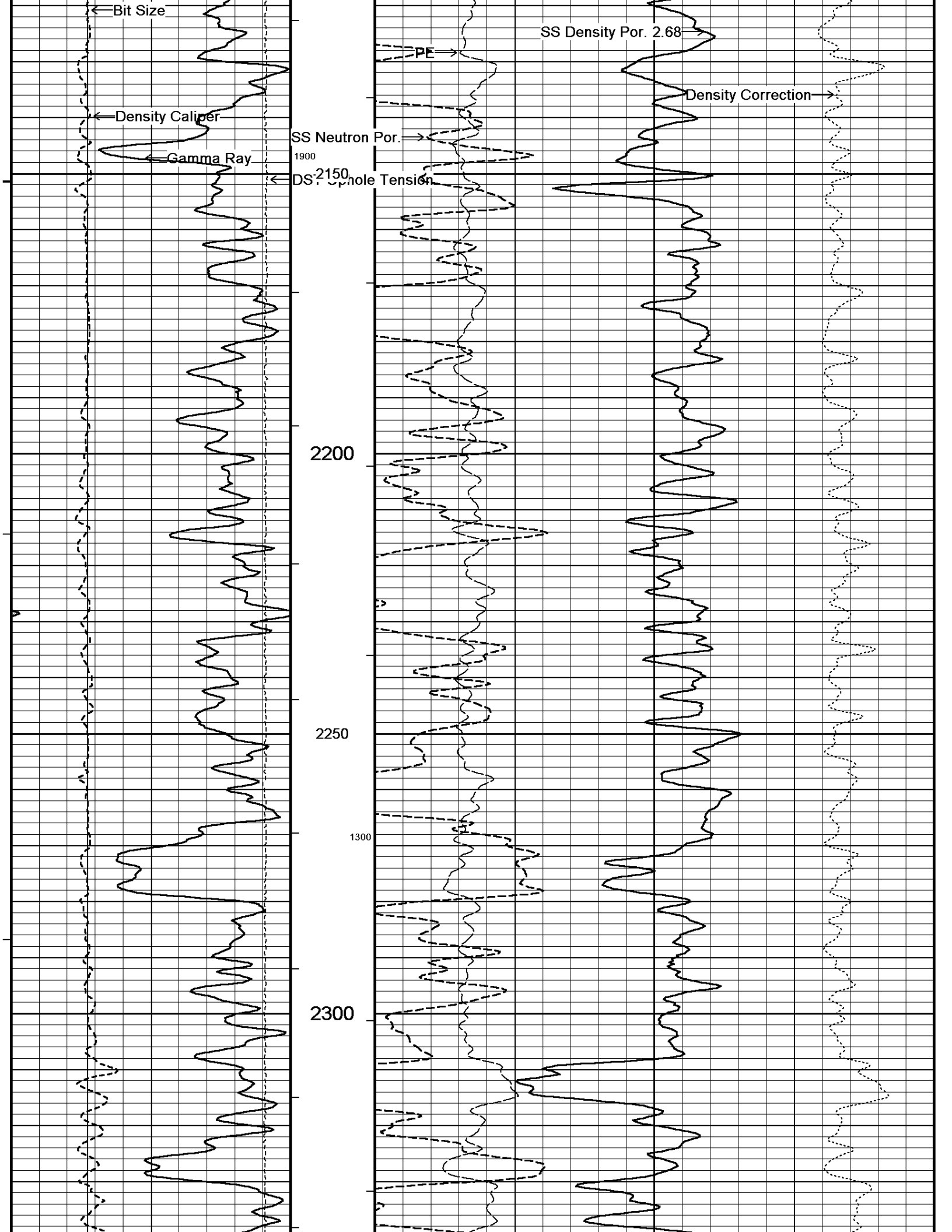


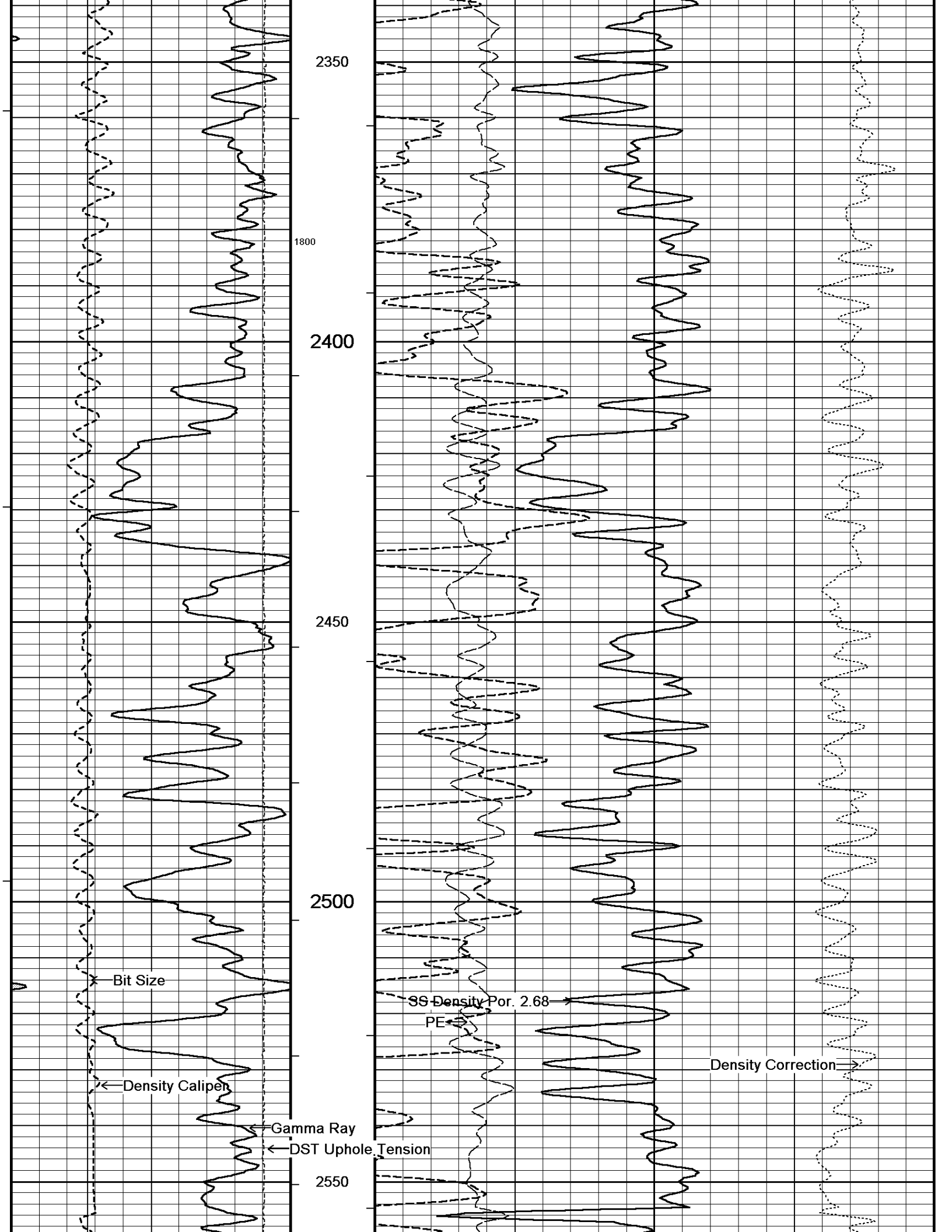


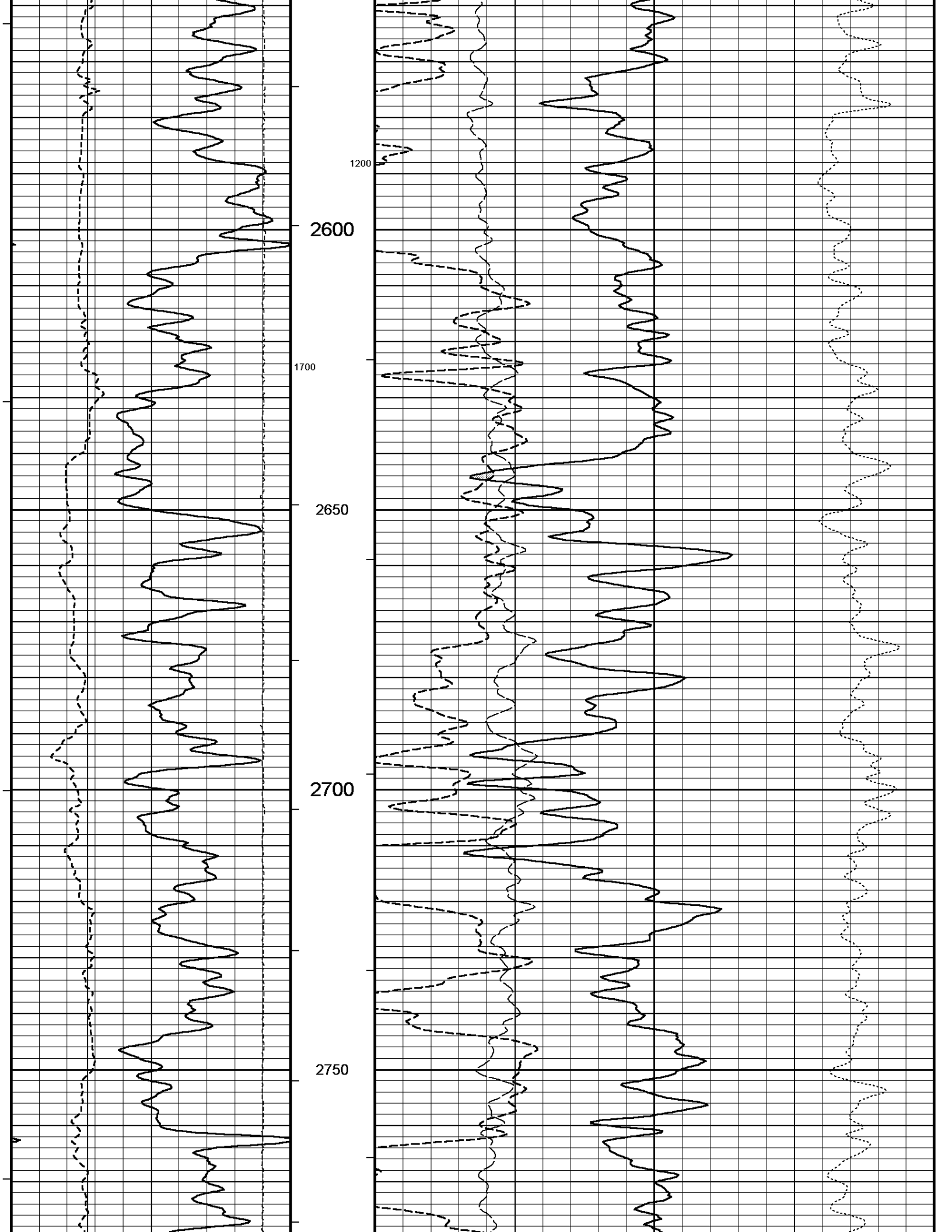


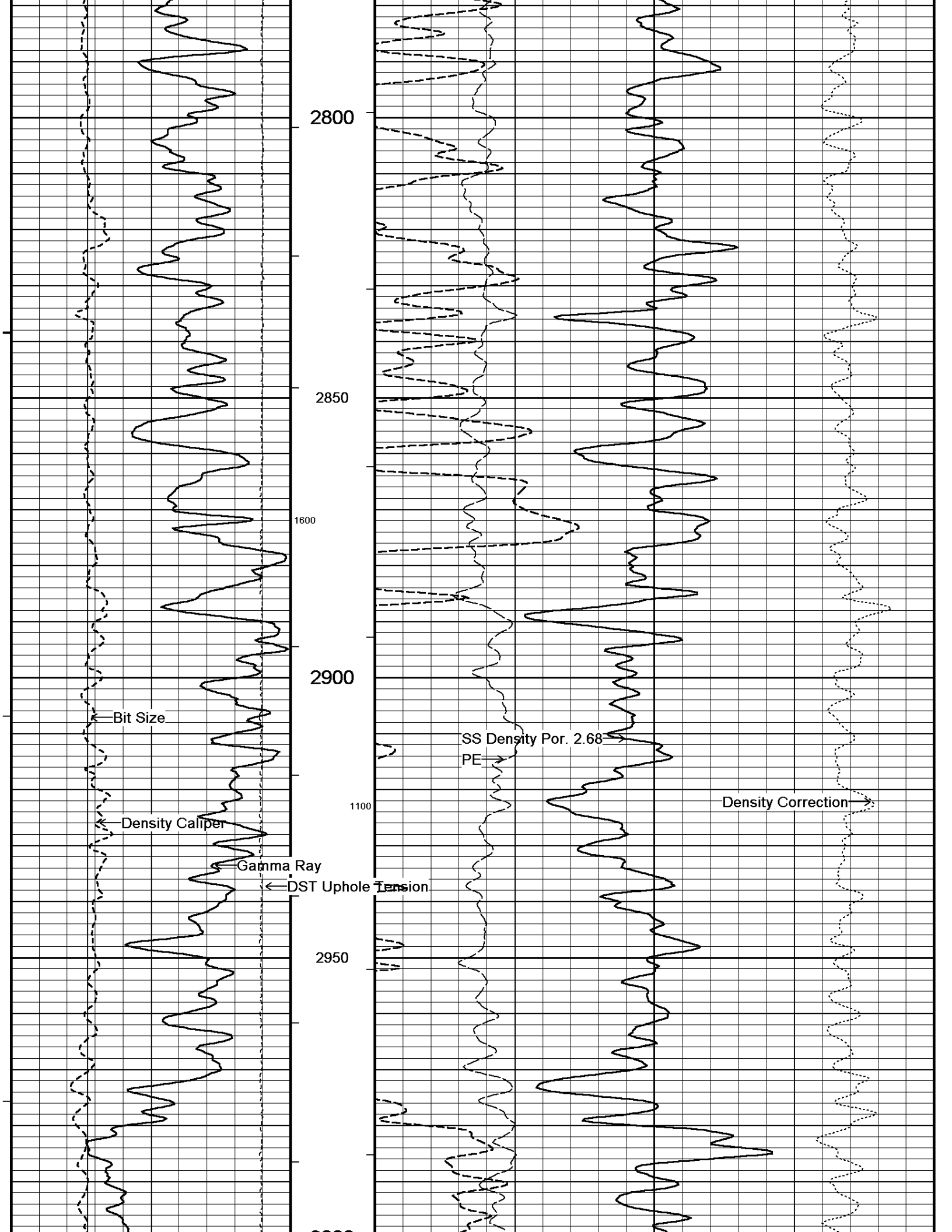


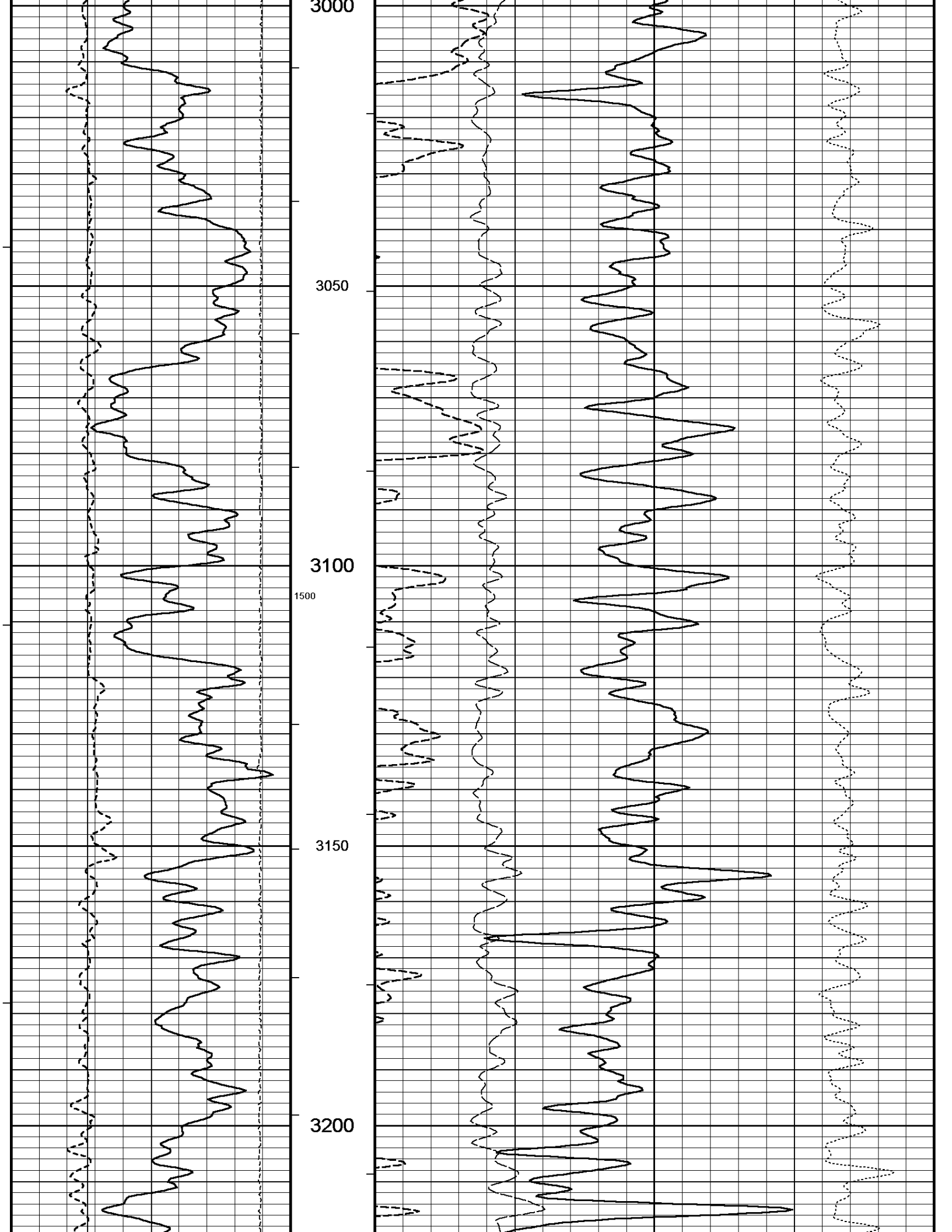


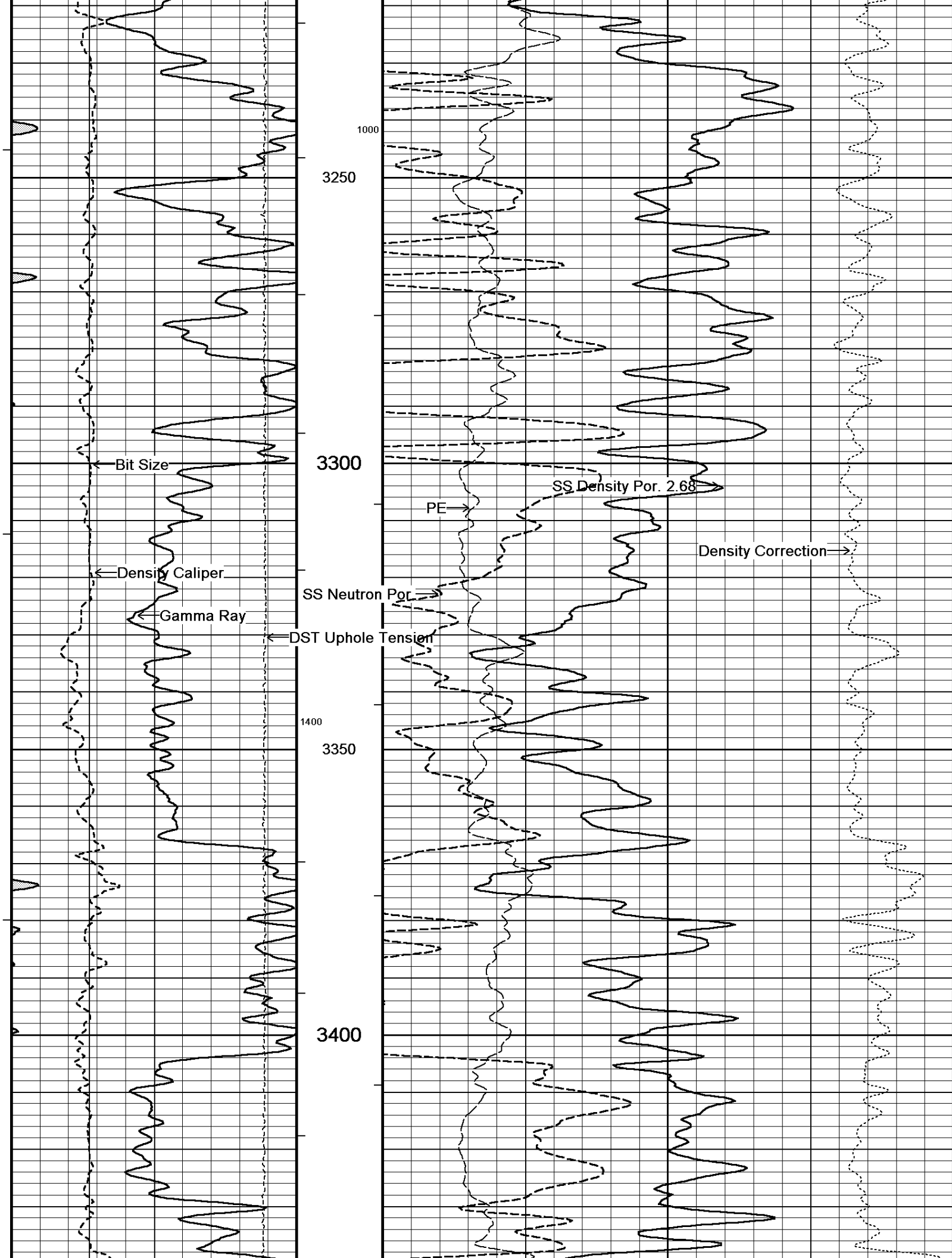


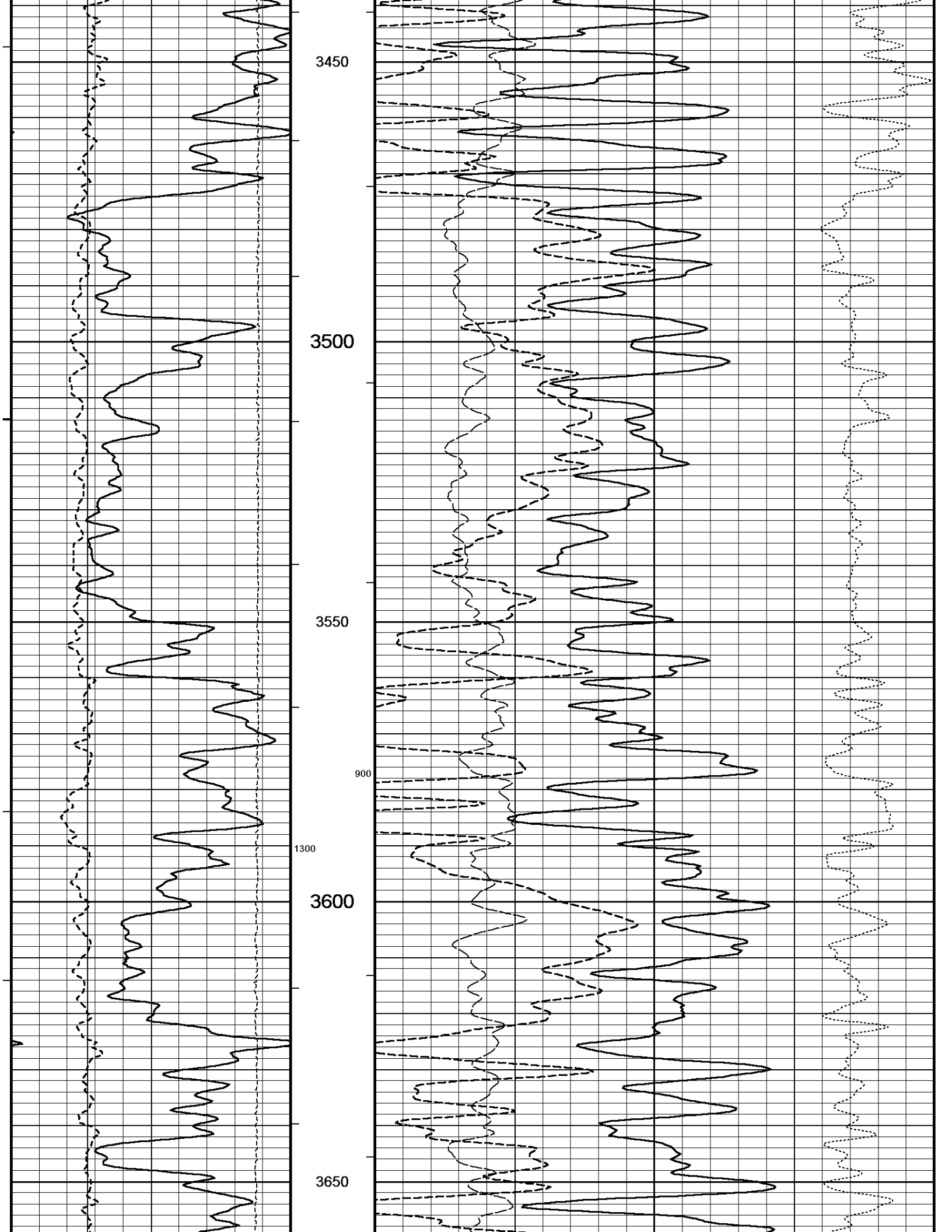


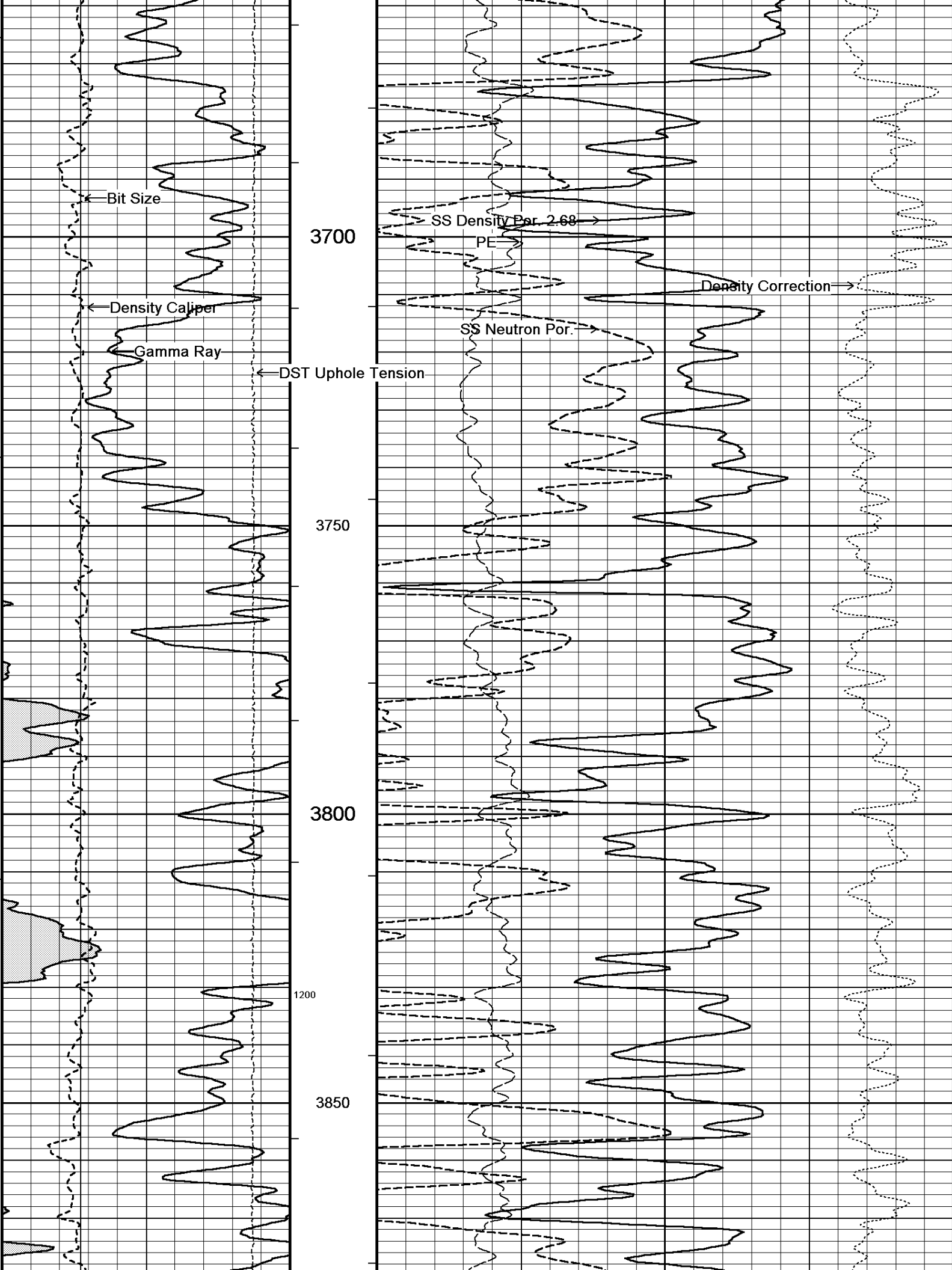


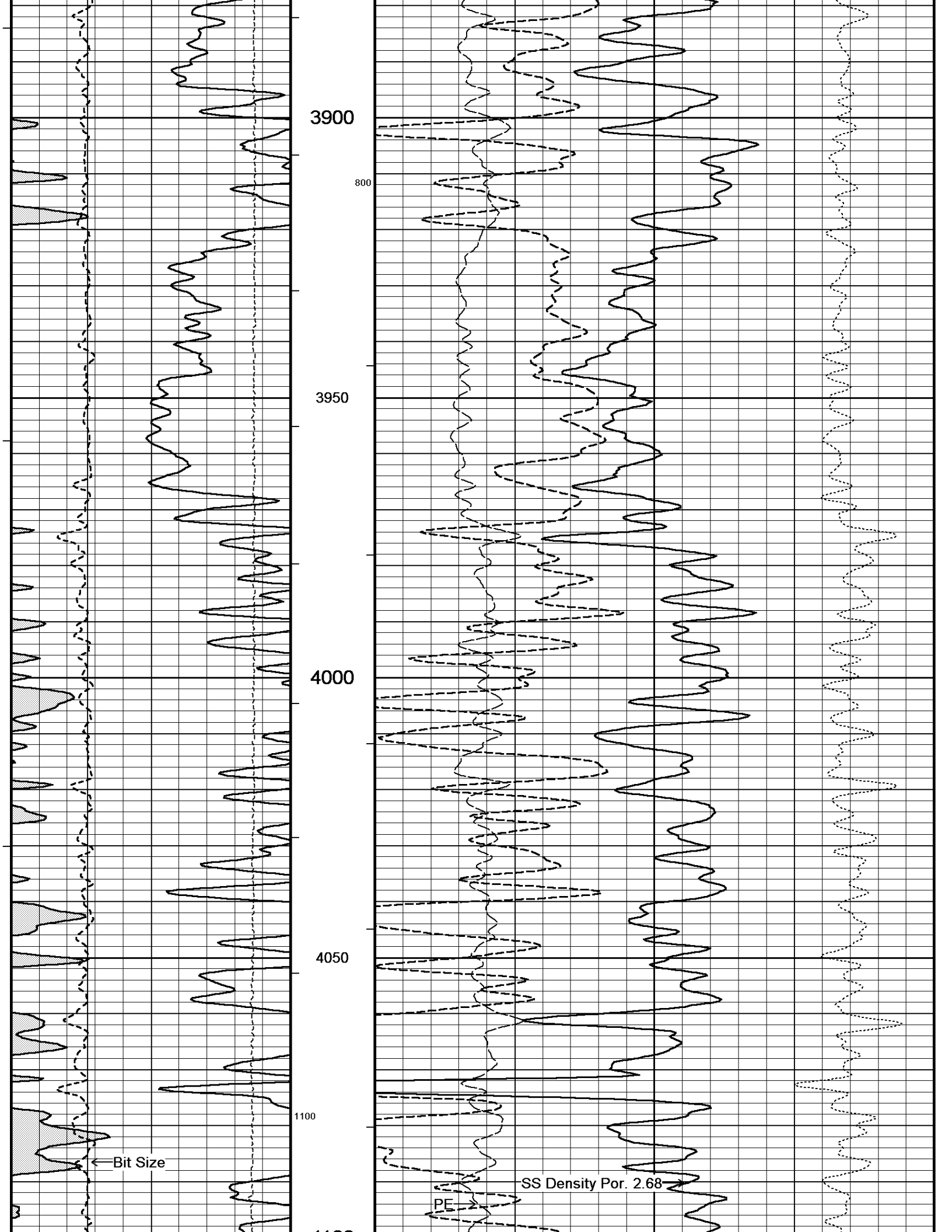


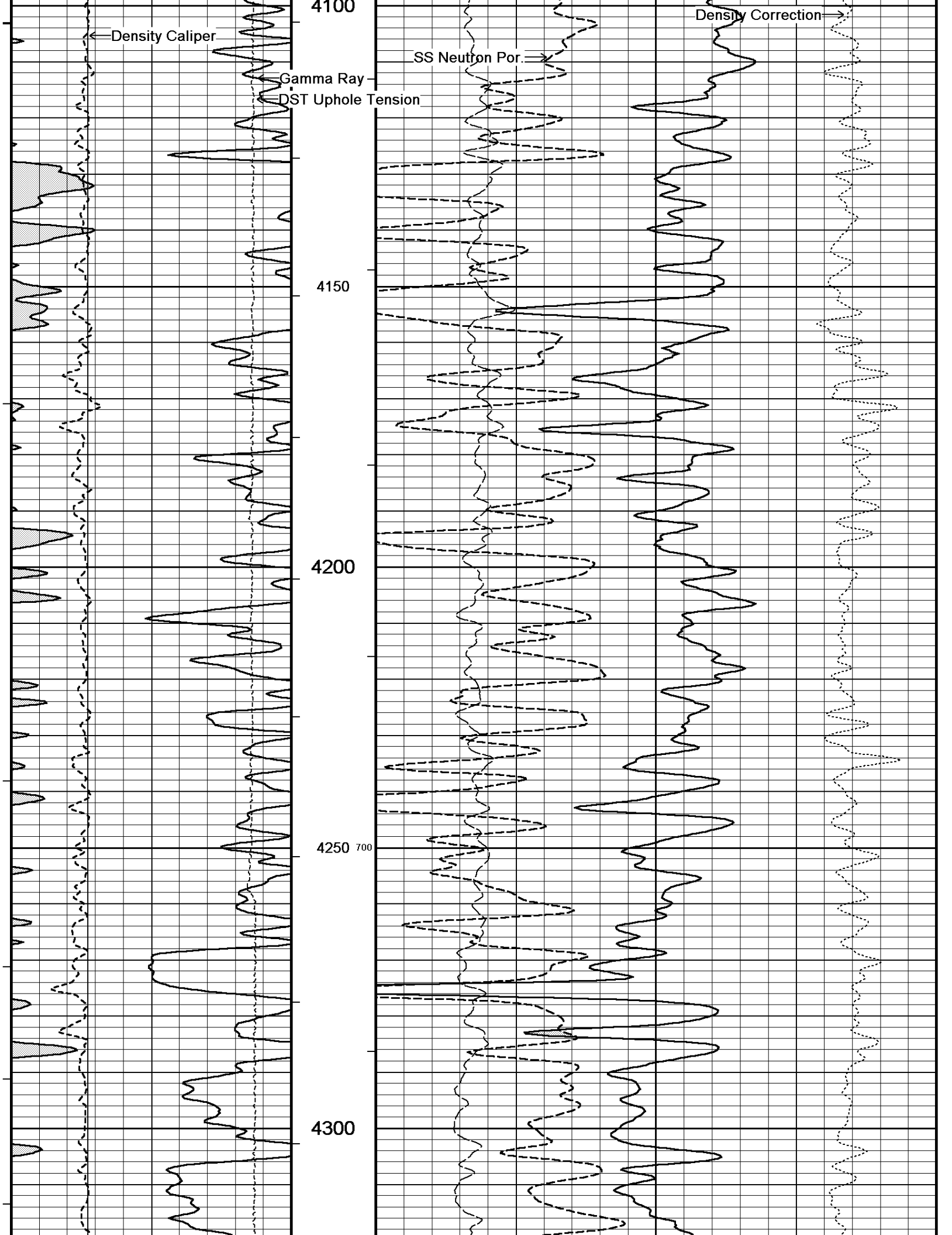


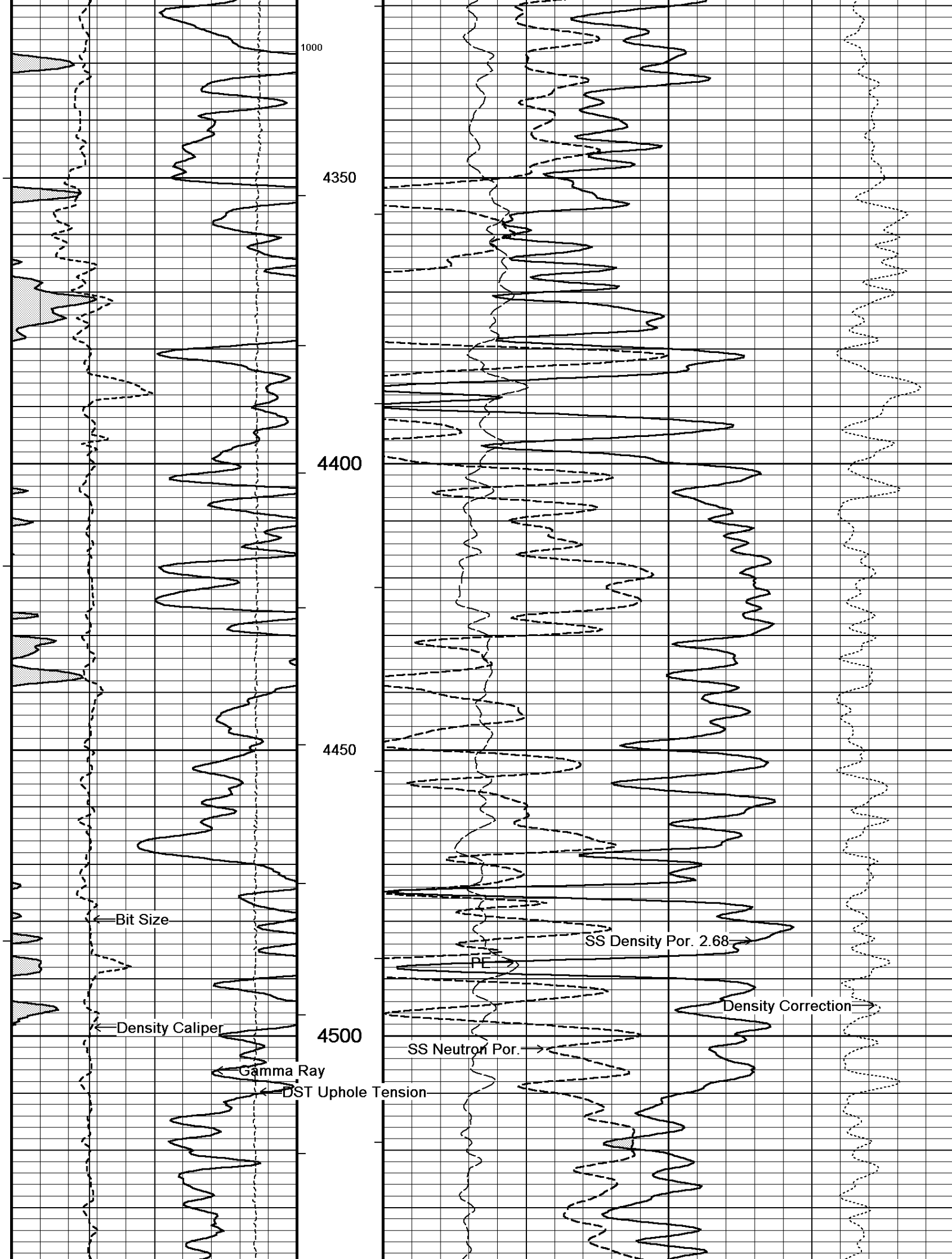


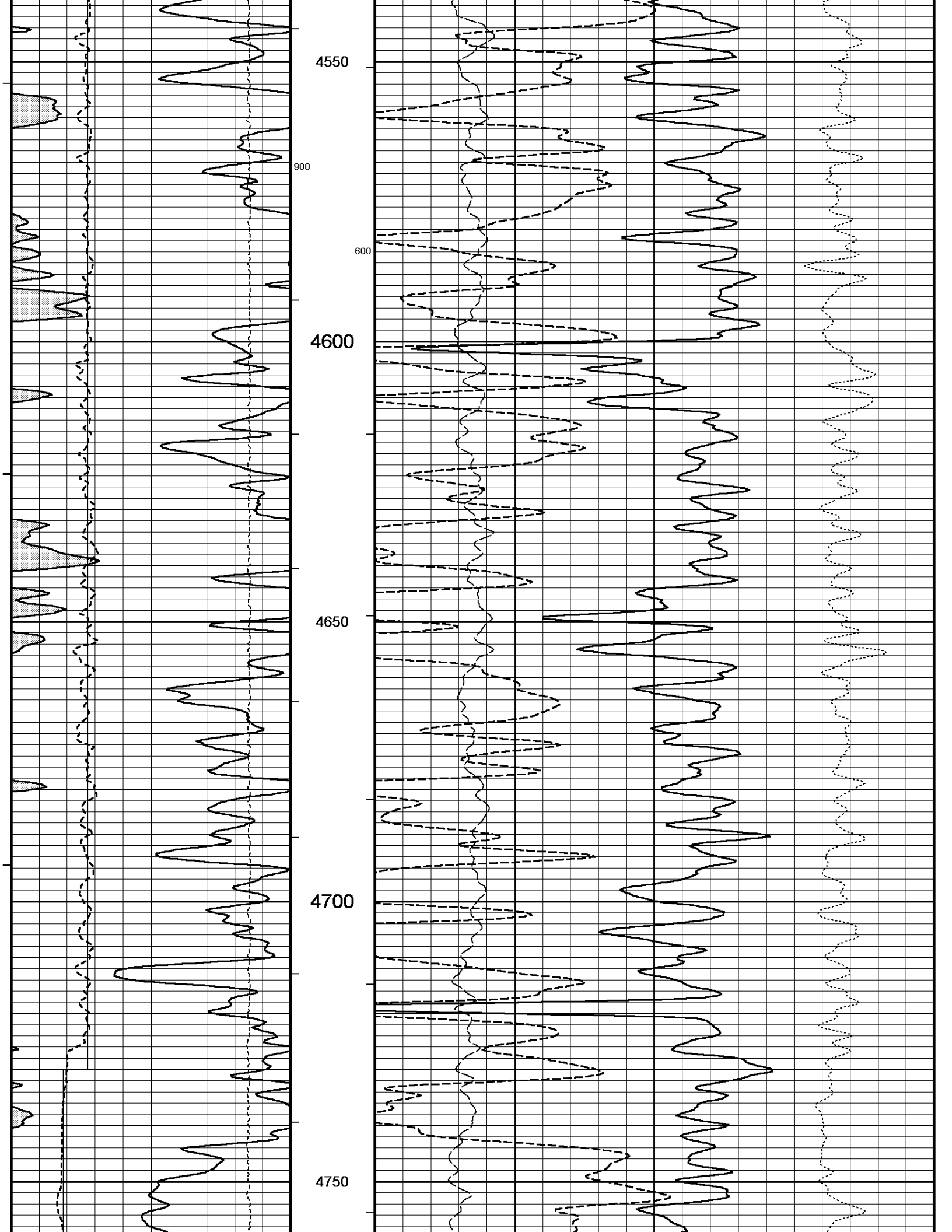


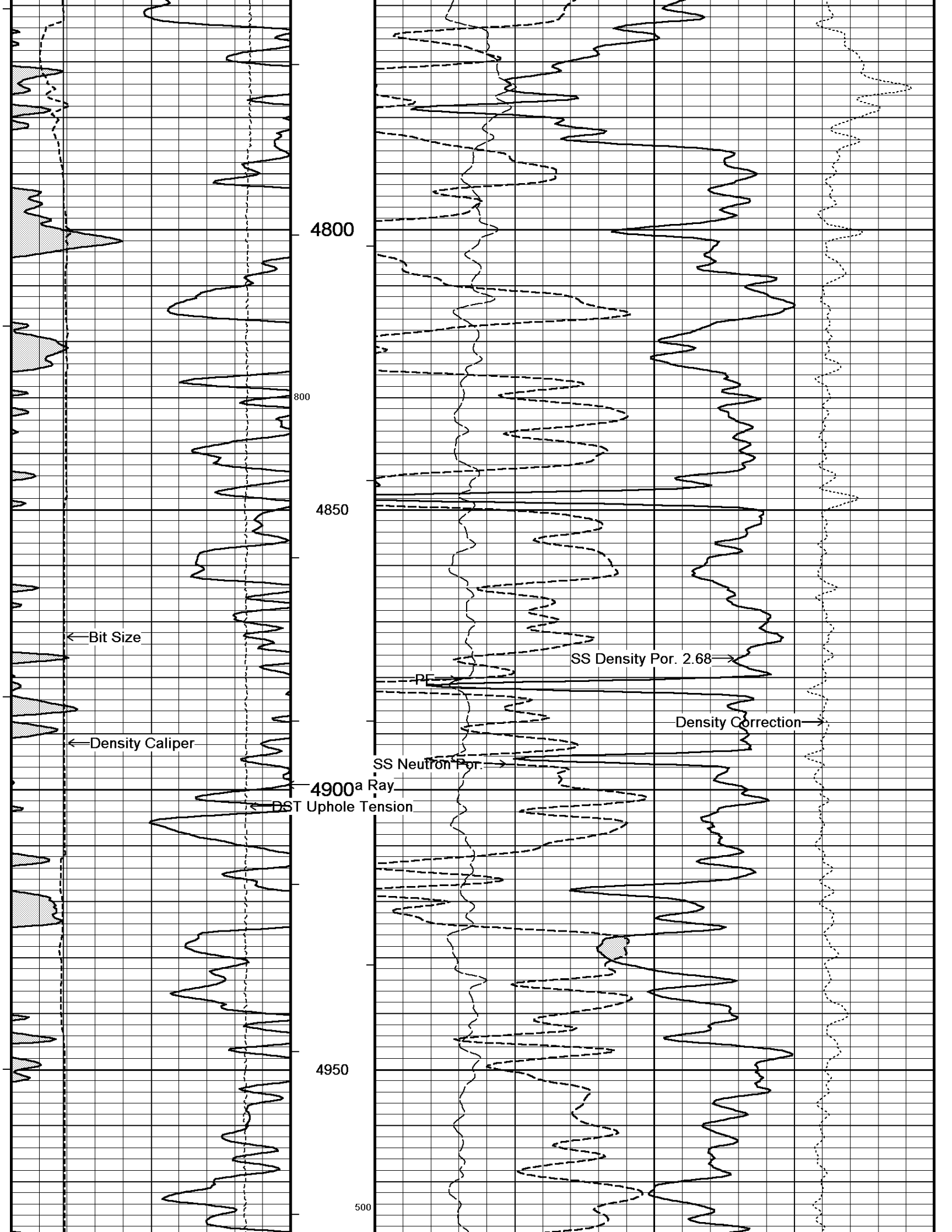


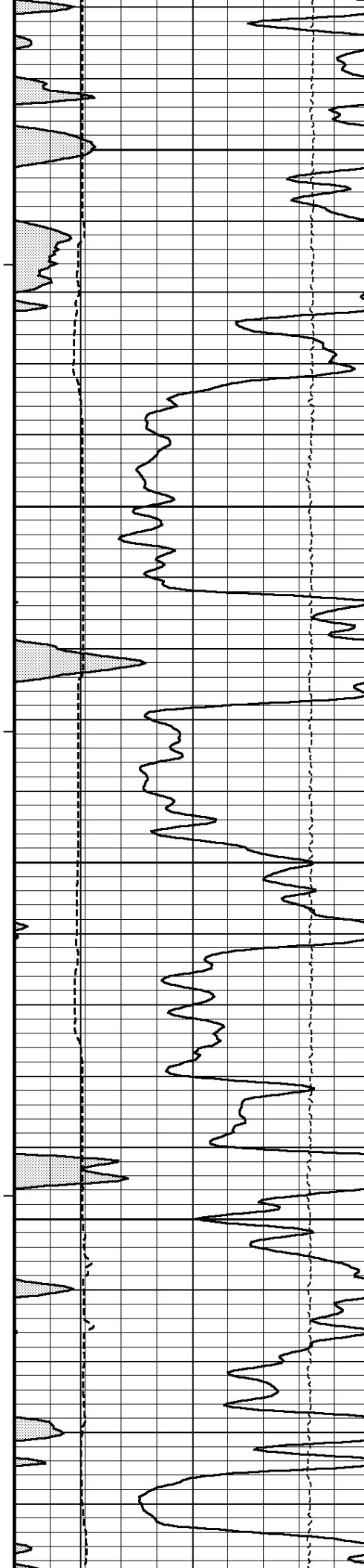












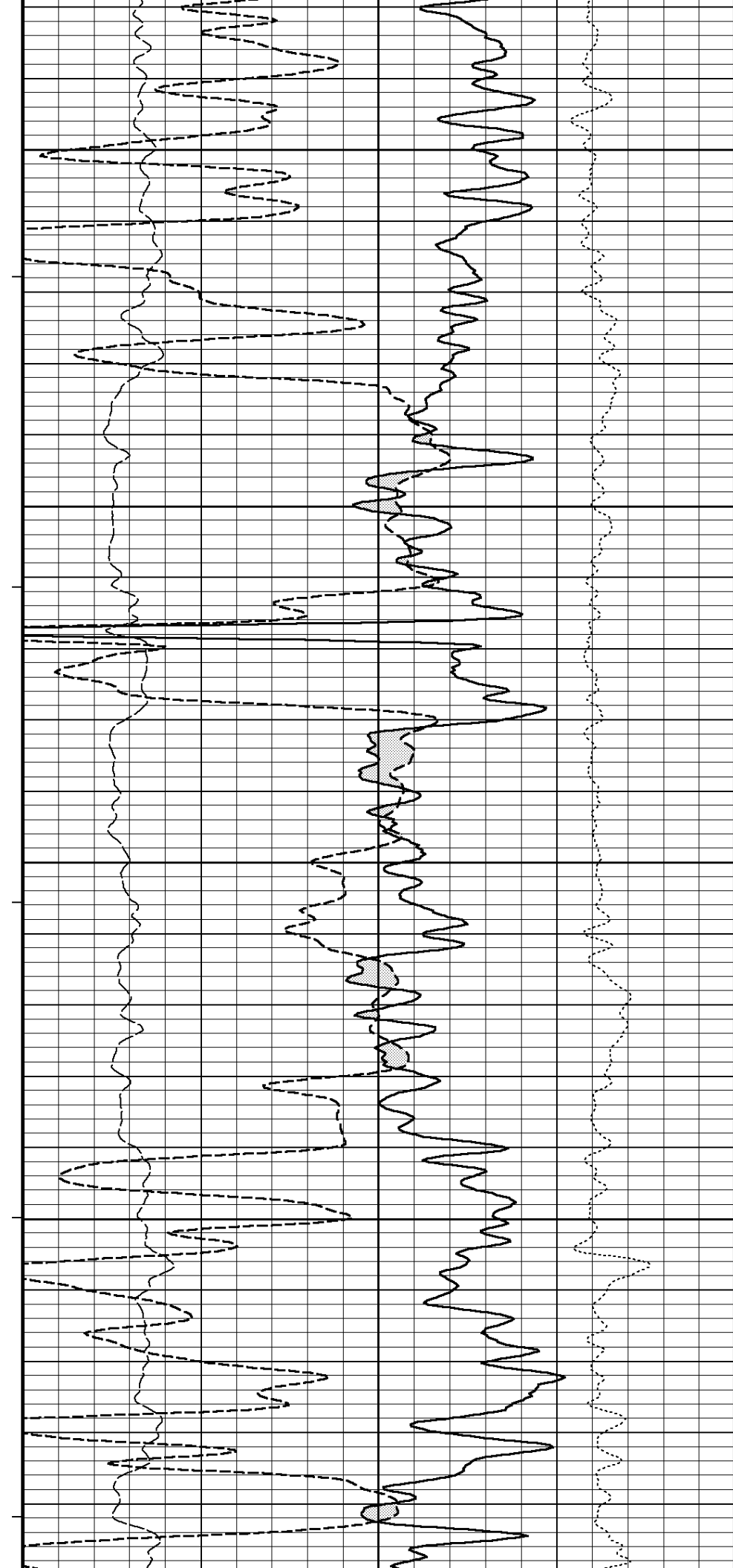
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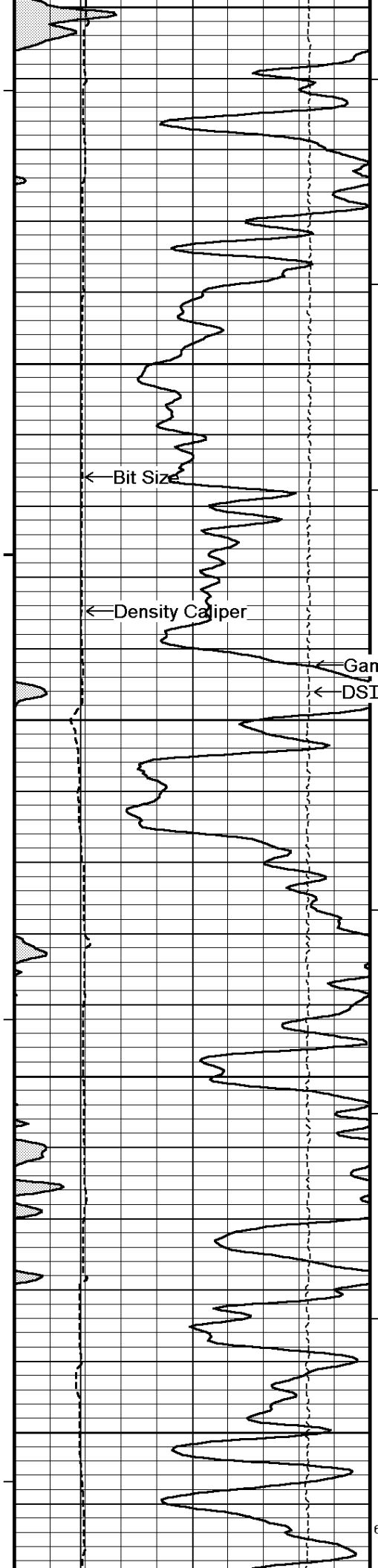
5050

5100

700

5150





5200

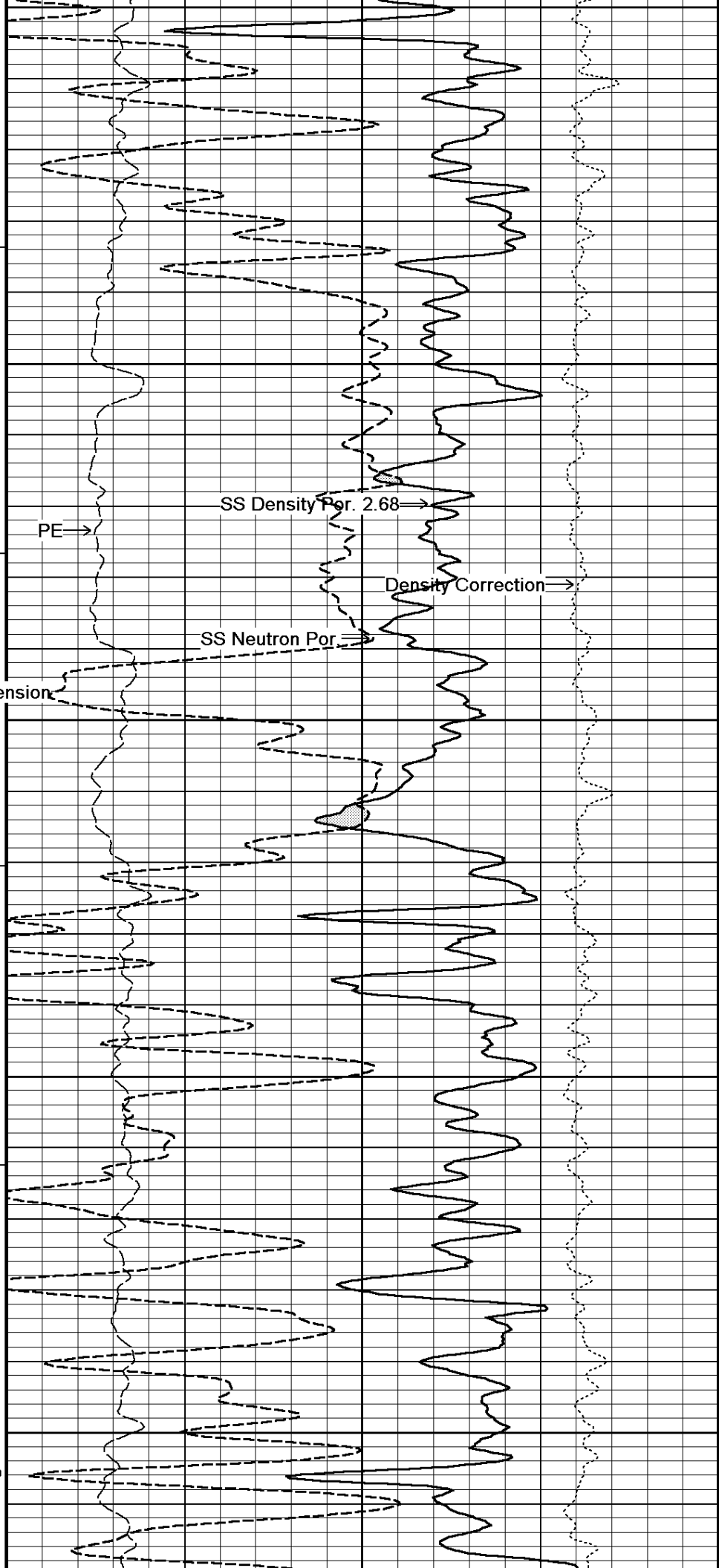
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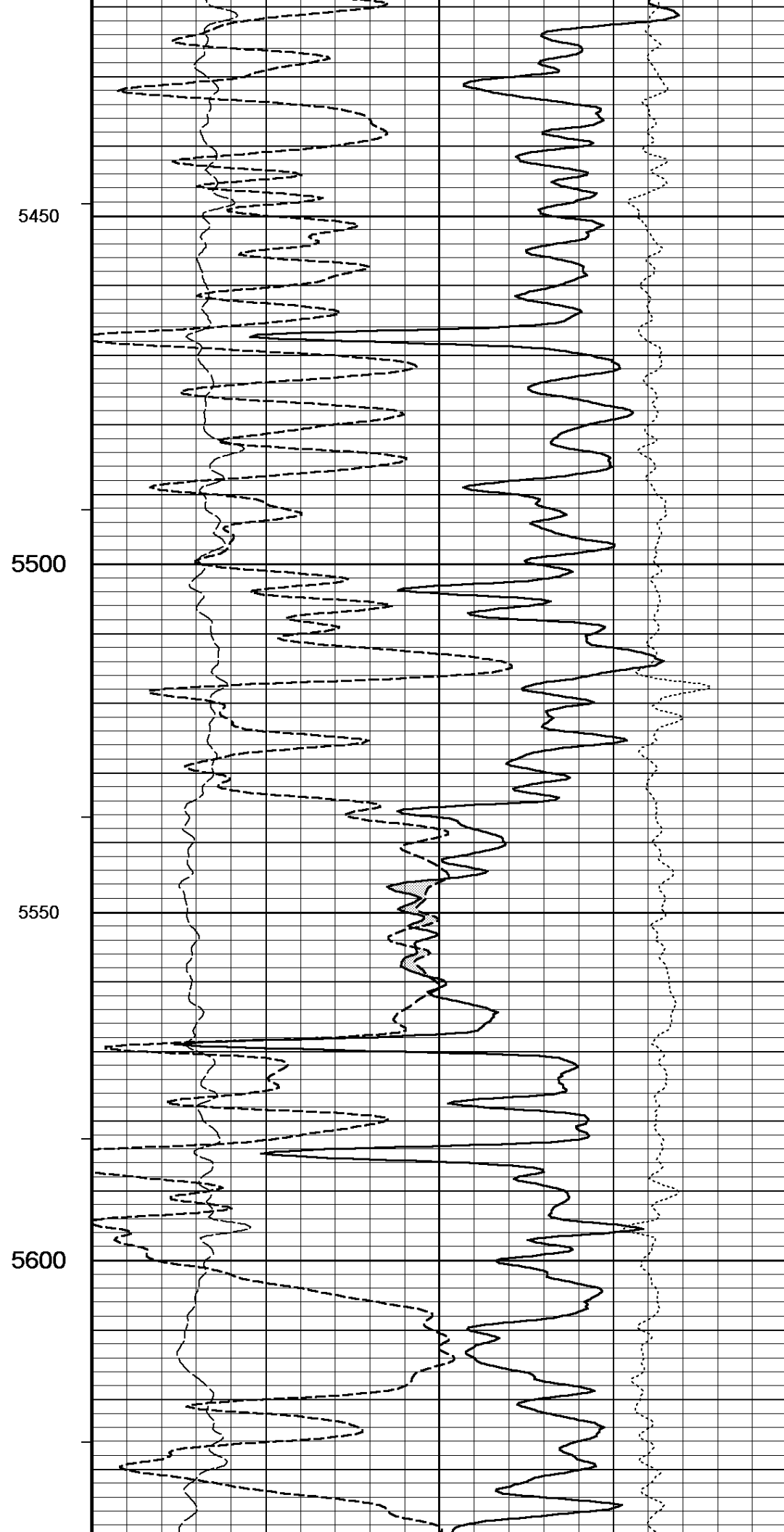
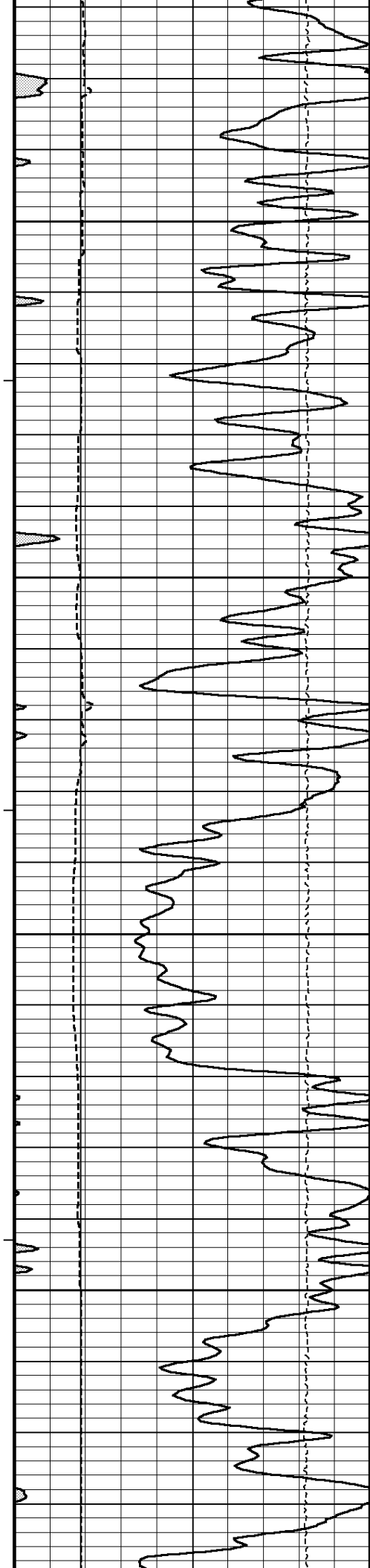
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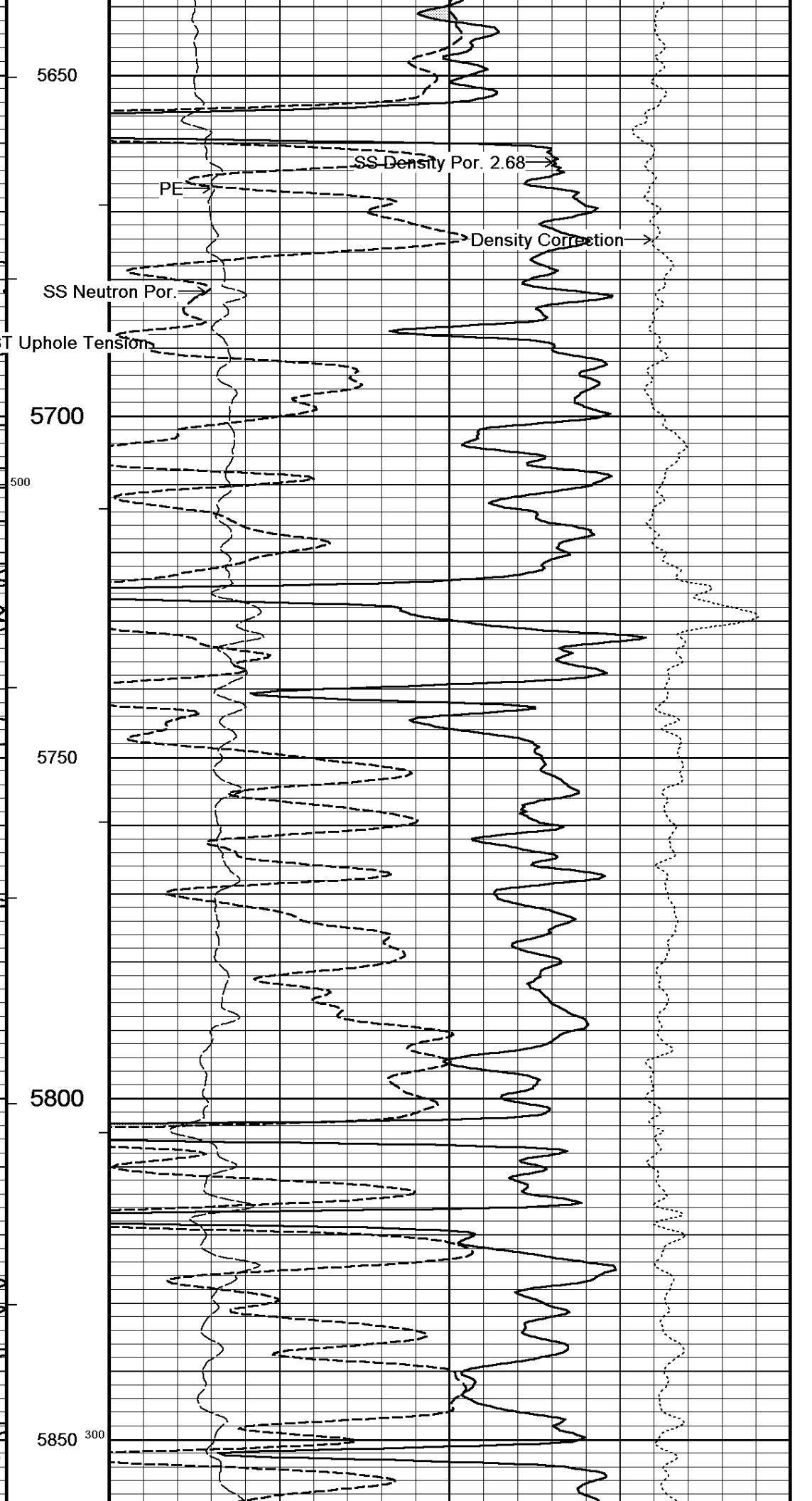
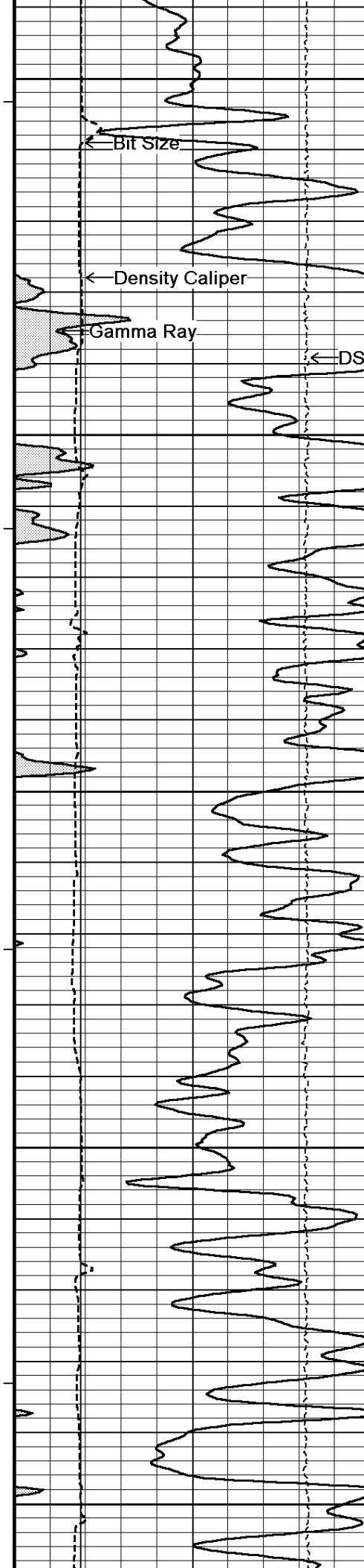
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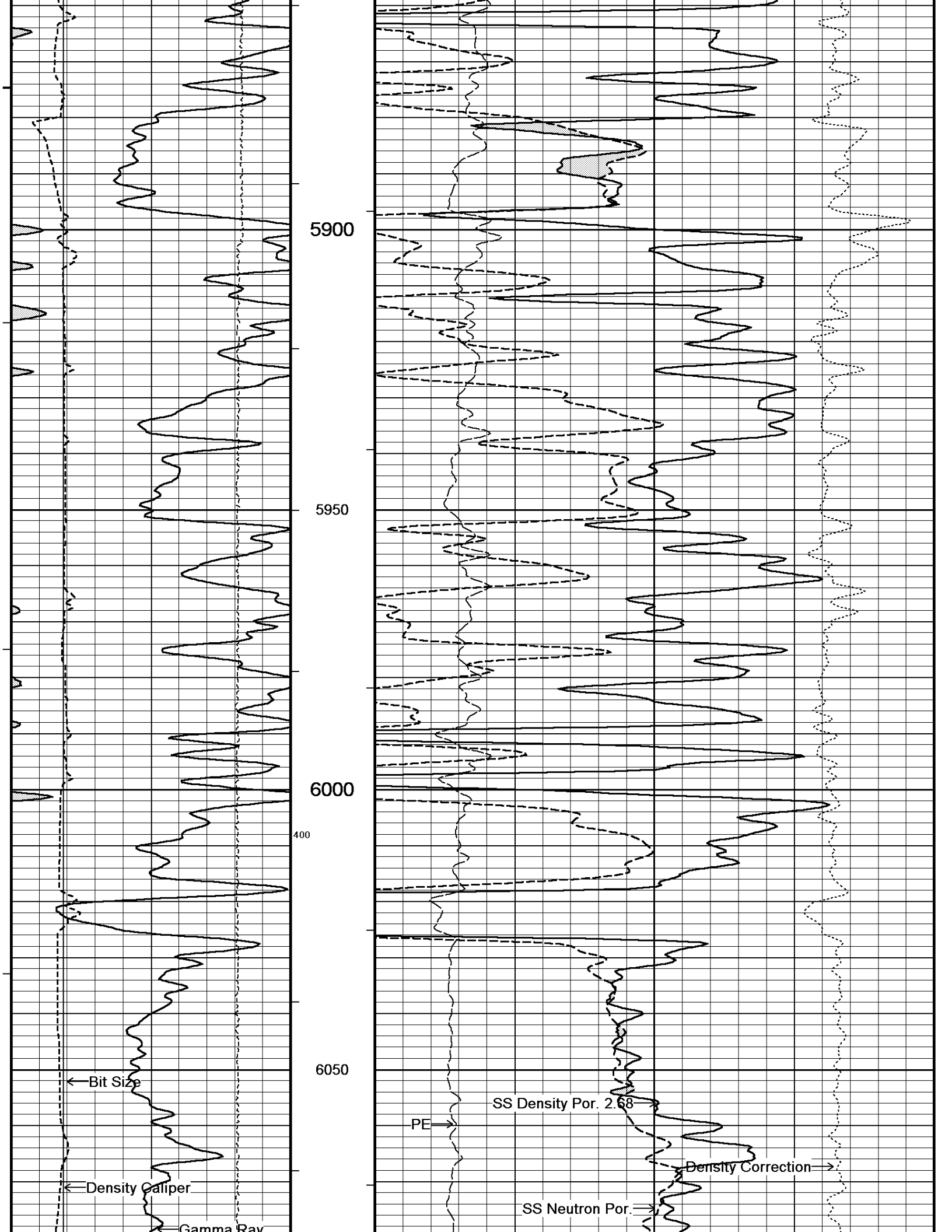
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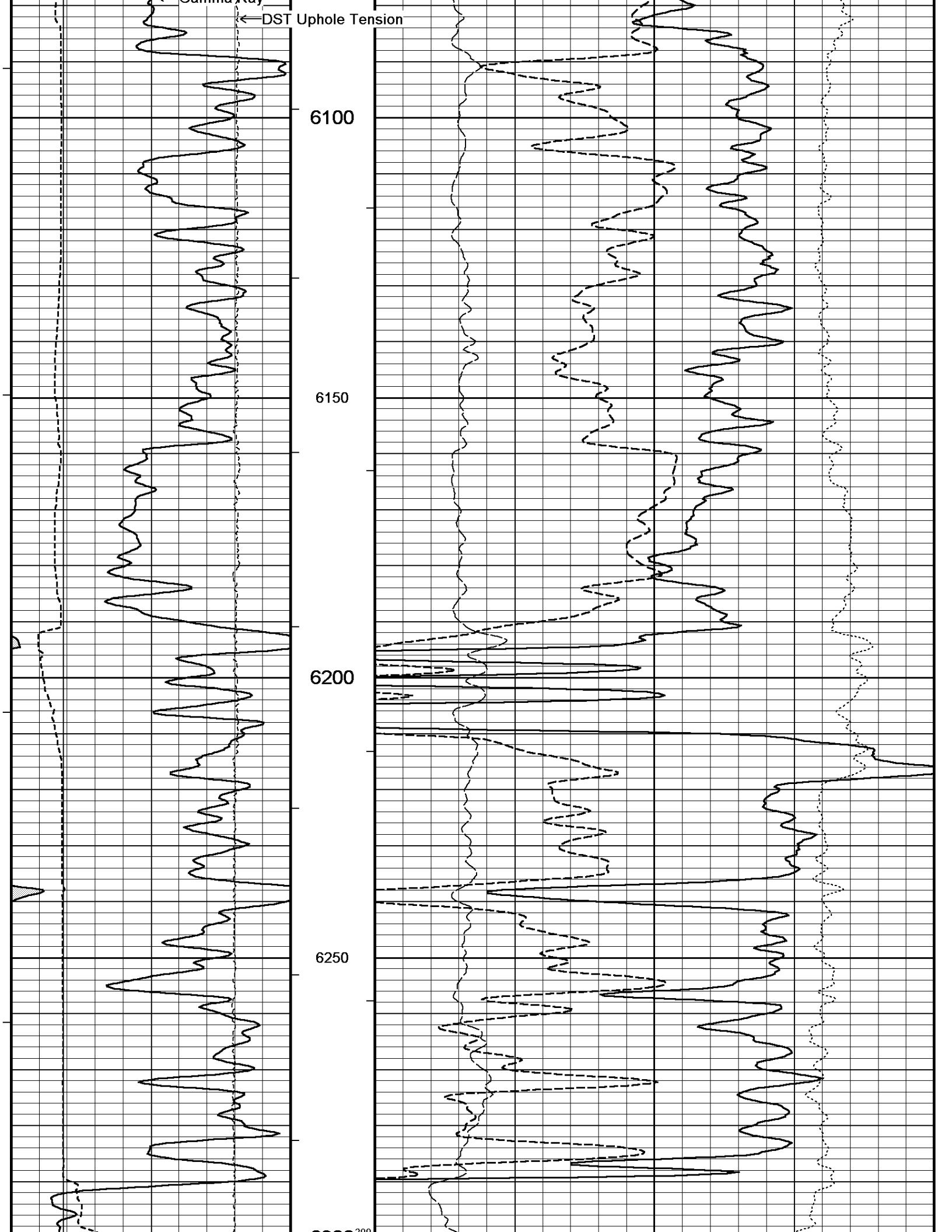
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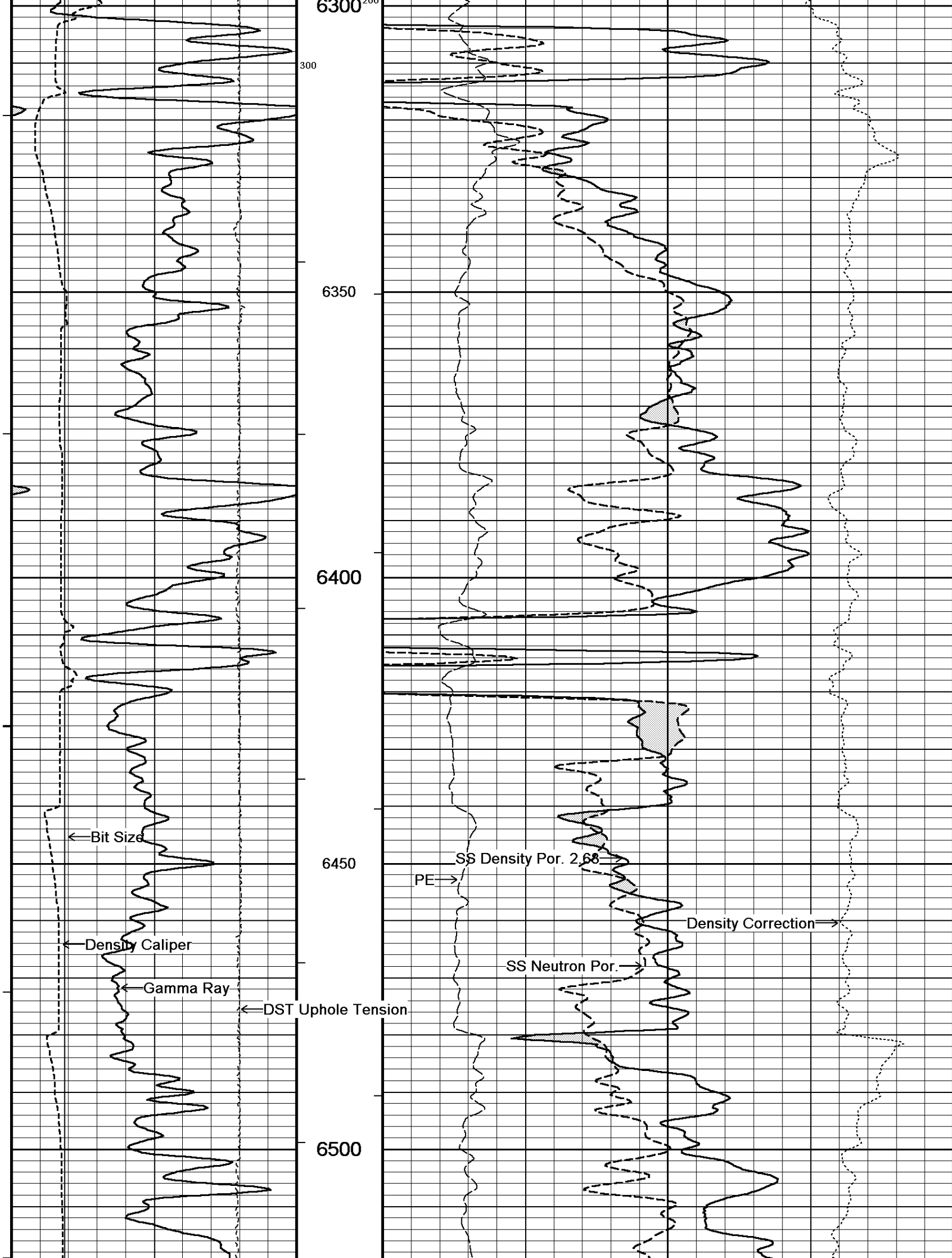


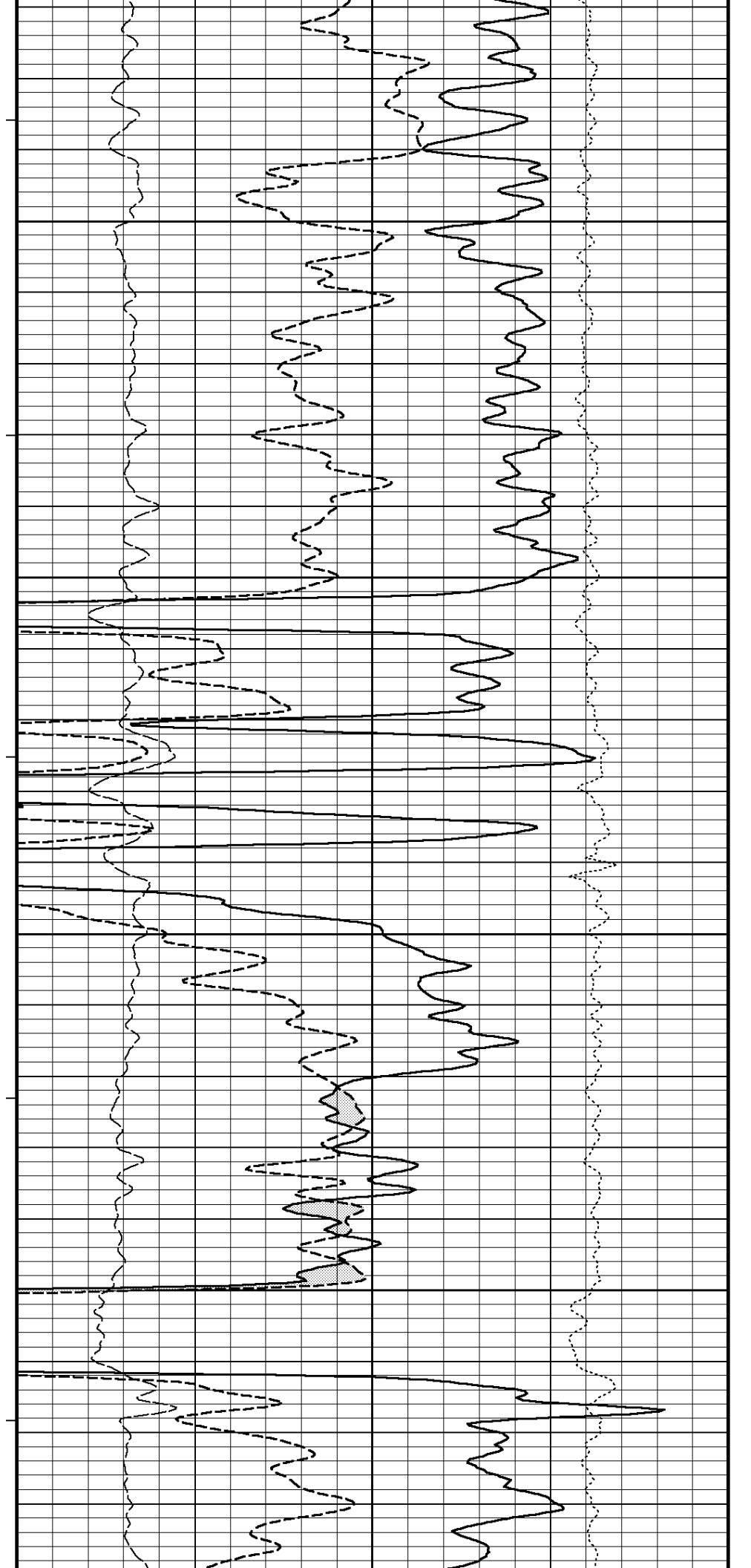
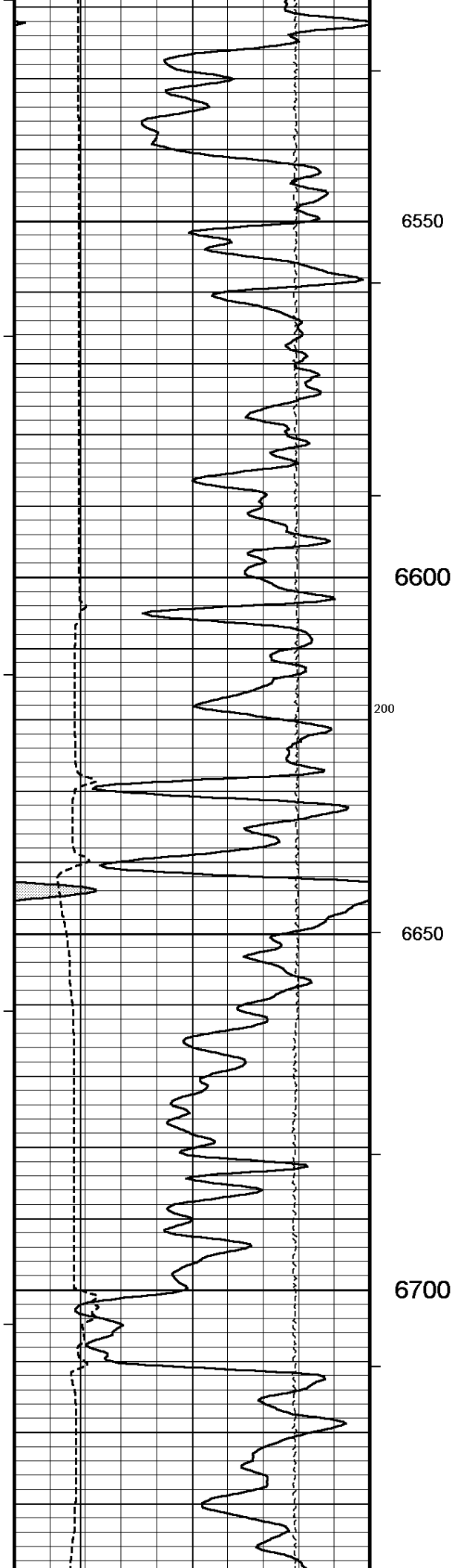


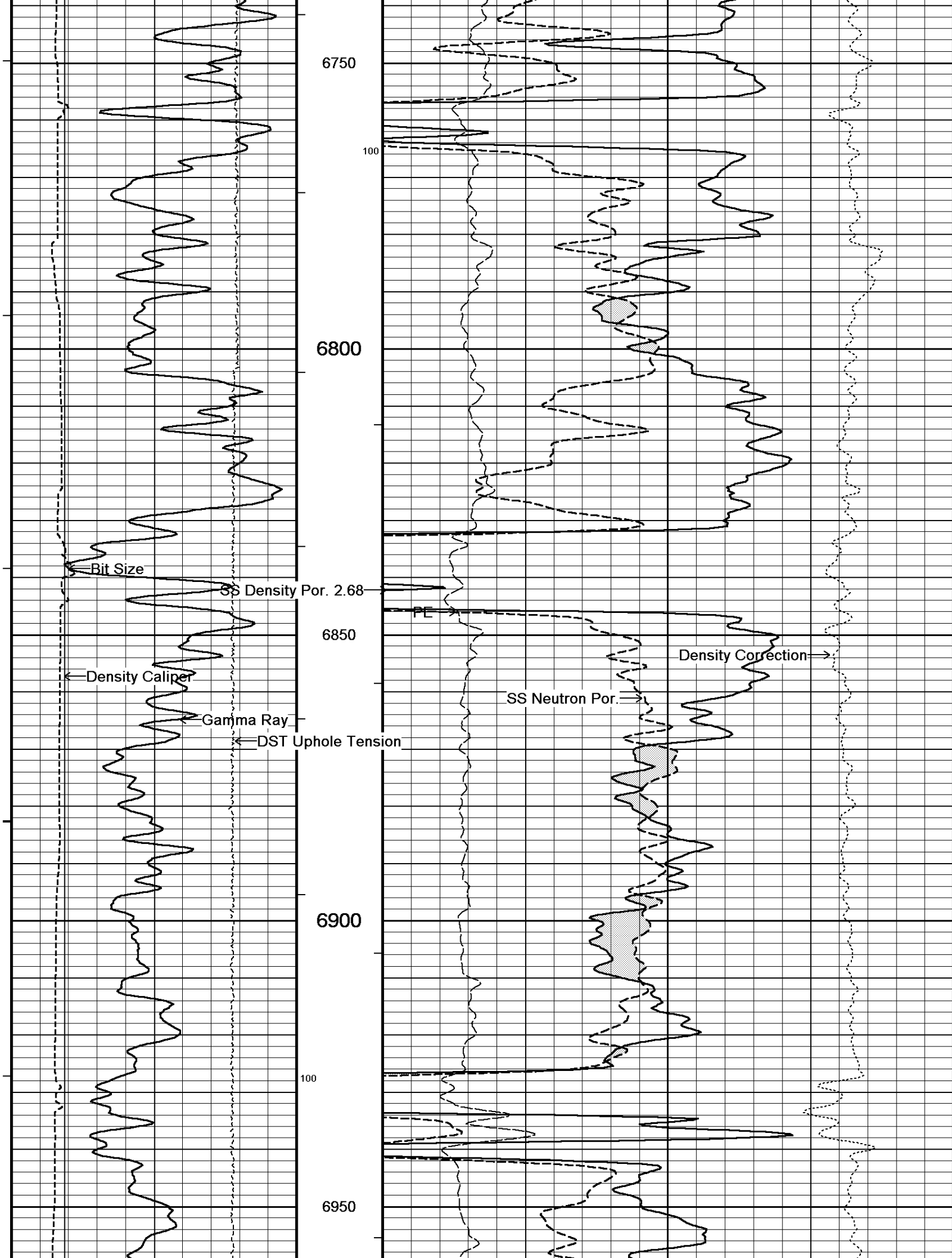


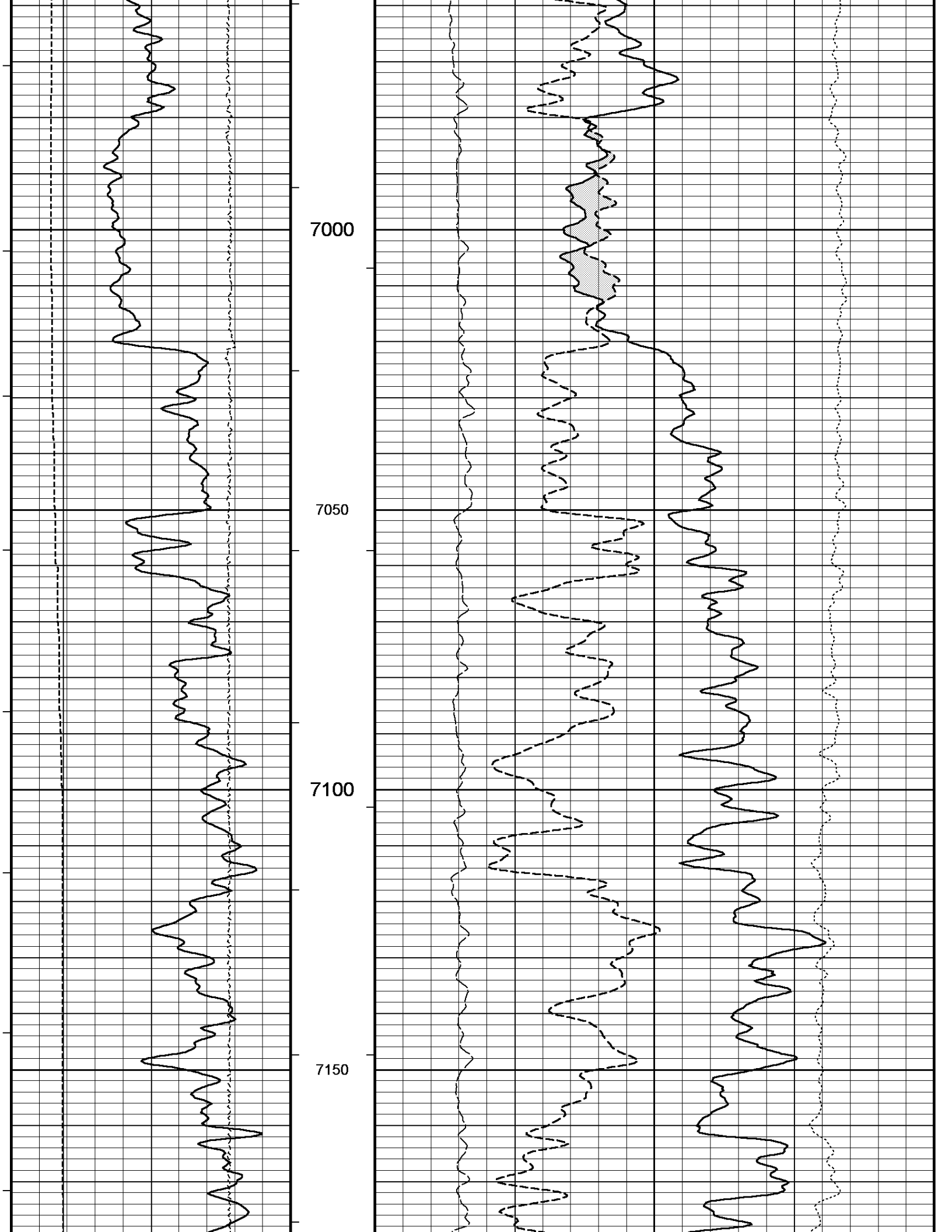


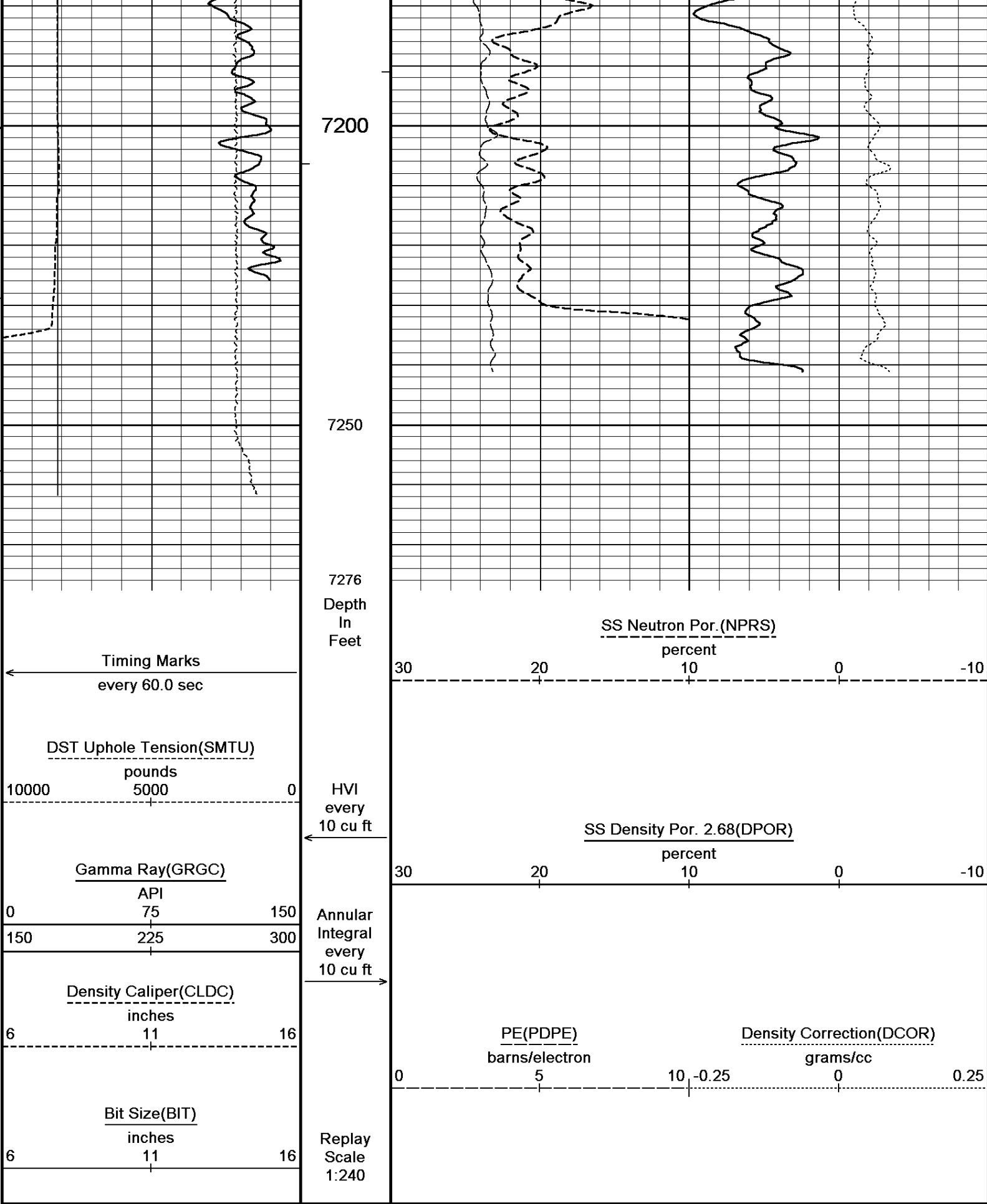


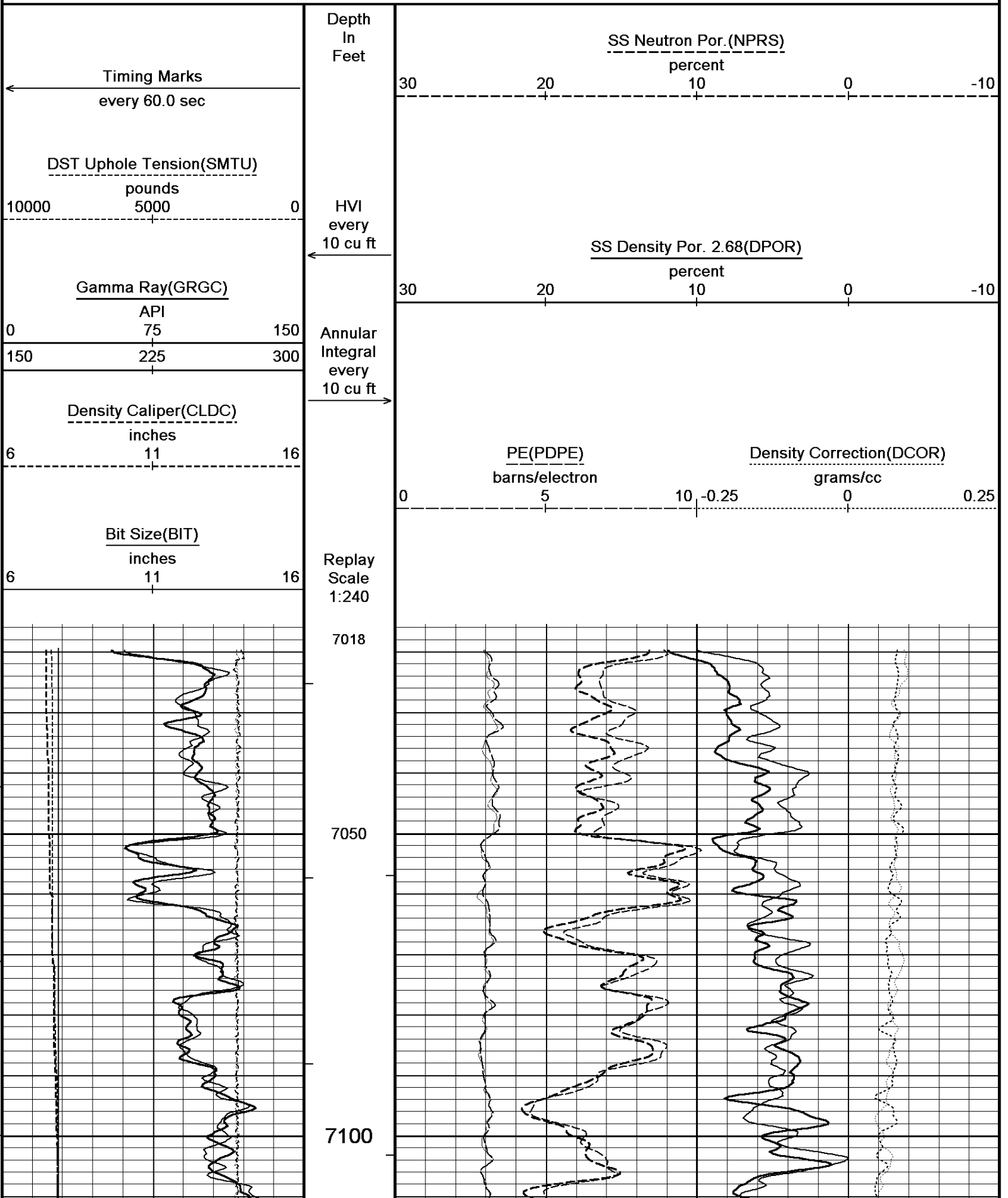


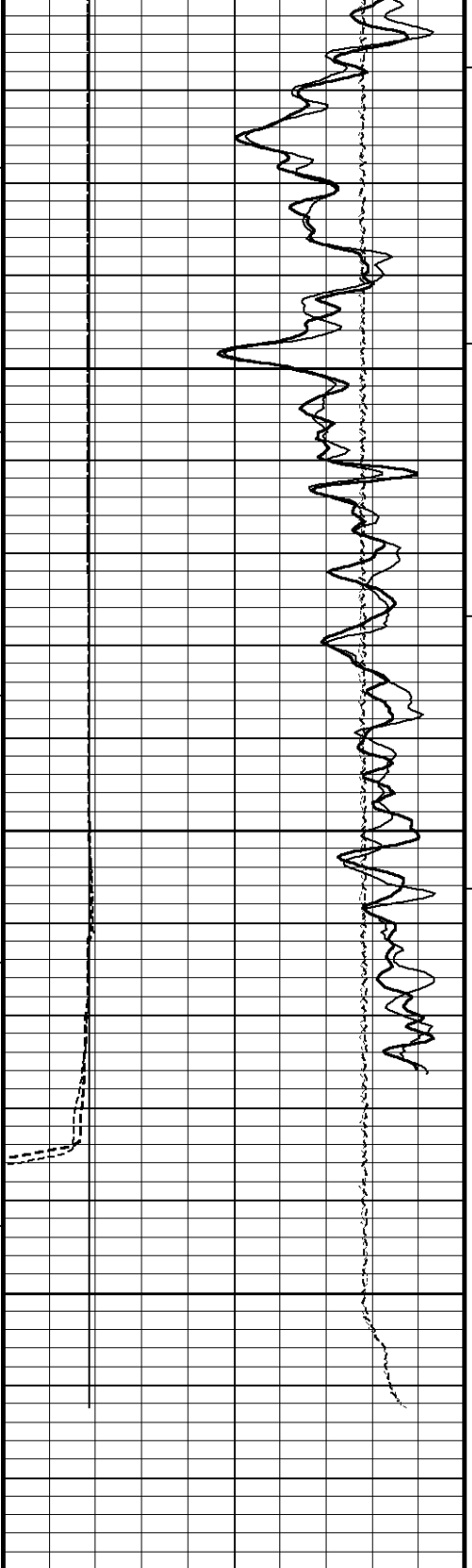












7150

7200

7250

7278

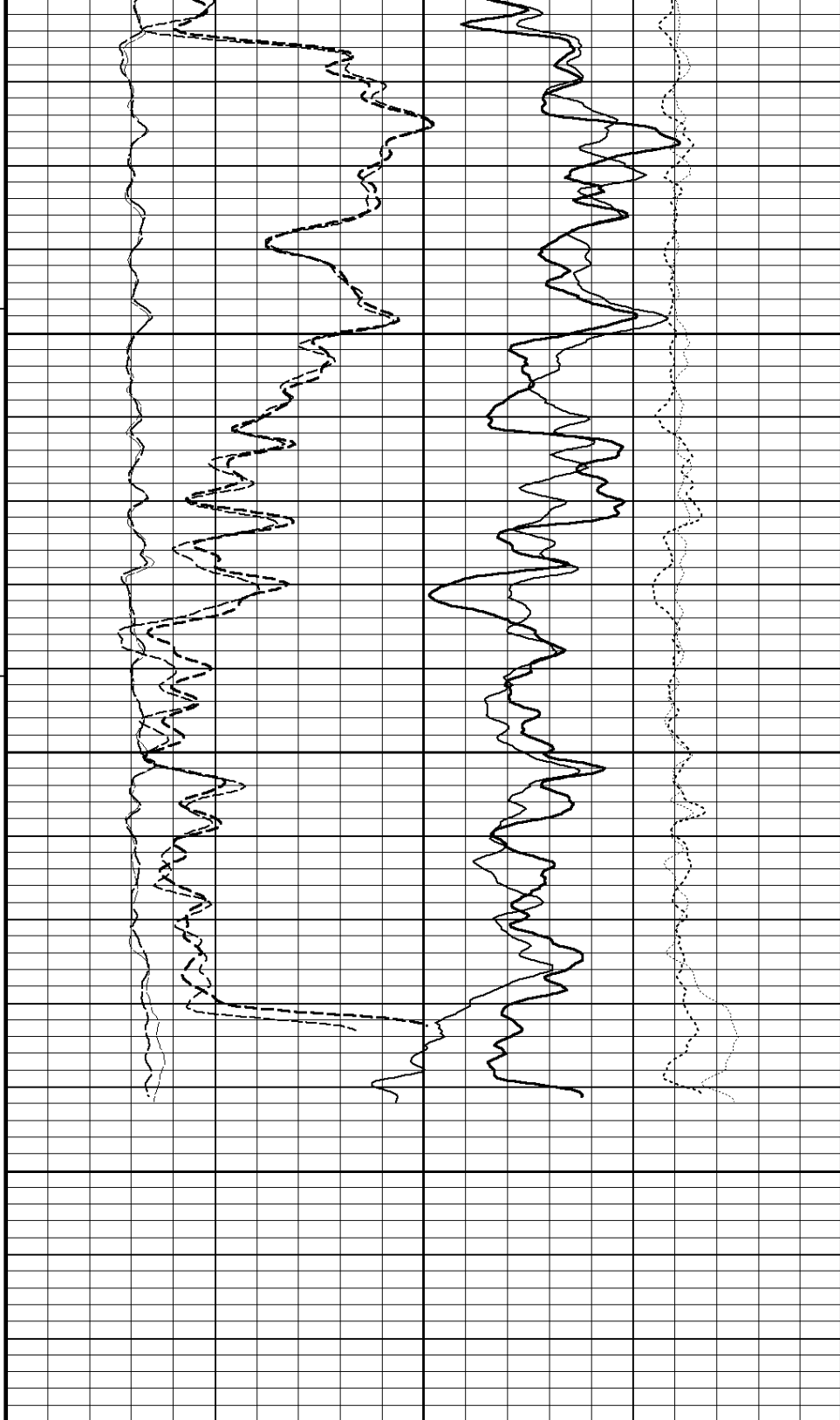
Depth
In
Feet

← Timing Marks
every 60.0 sec

DST Uphole Tension(SMTU)
pounds
10000 5000 0

HVI
every
10 cu ft
←

Gamma Ray(GRGC)

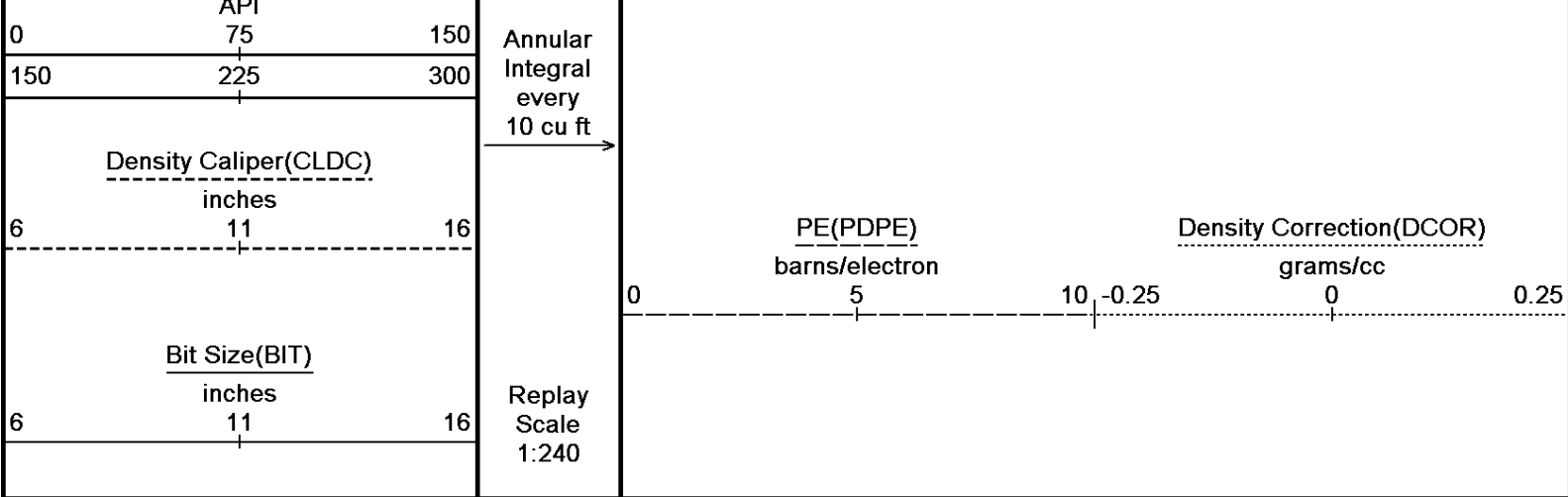


SS Neutron Por.(NPRS)
percent

30 20 10 0 -10

SS Density Por. 2.68(DPOR)
percent

30 20 10 0 -10



Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus\LOGS\Bill Barrett\GGU Miller 23B-32-691\ML.dta
Filename: C:\Minimus\LOGS\Bill Barrett\GGU Miller 23B-32-691\RP.dta
System Versions: Logged with 10.08.1568 Plotted with 10.08.1568

Plotted on 25-NOV-2010 09:42
Recorded on 25-NOV-2010 08:59
Recorded on 25-NOV-2010 06:33

↑

OVERLAY

↑

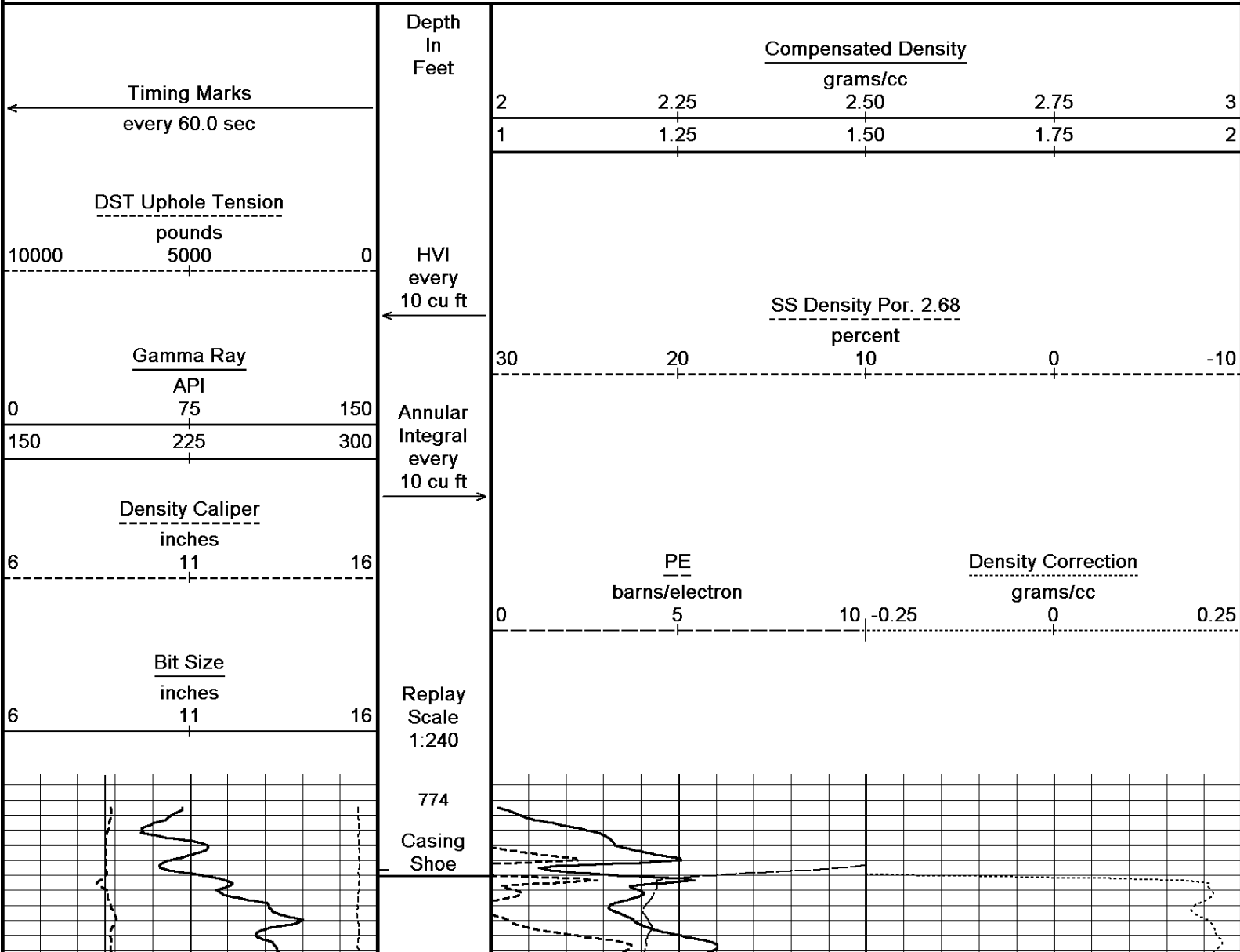
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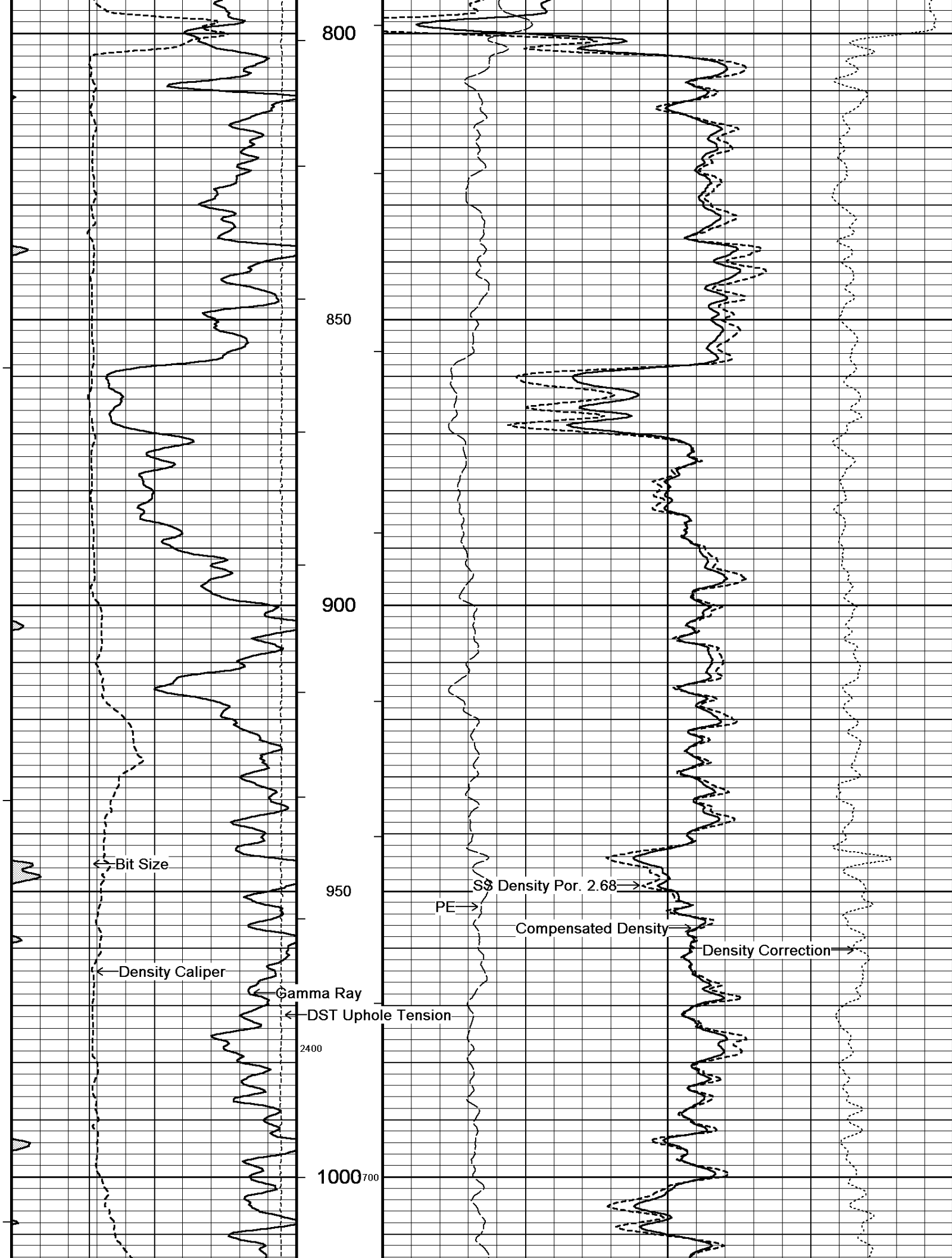
5 INCH MAIN LOG

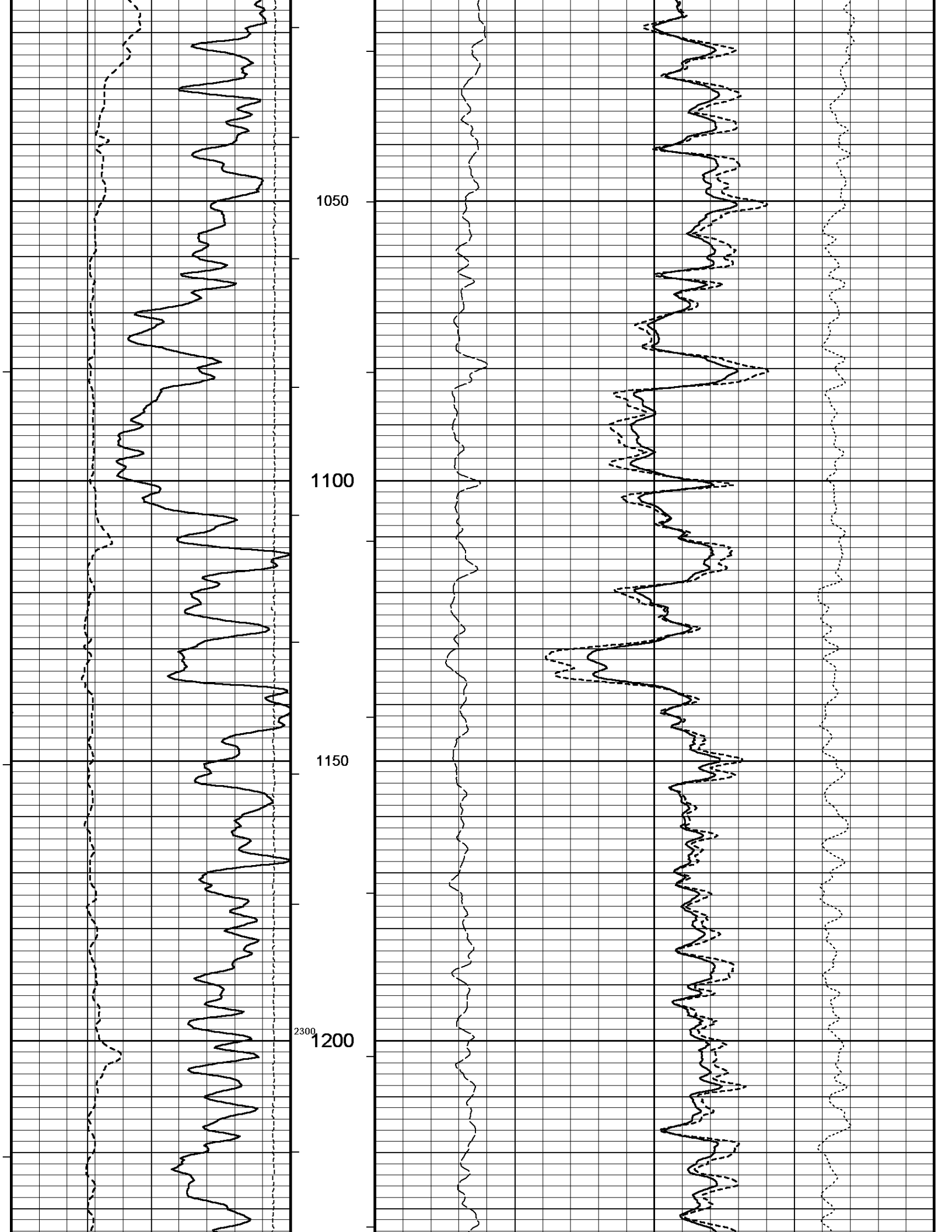
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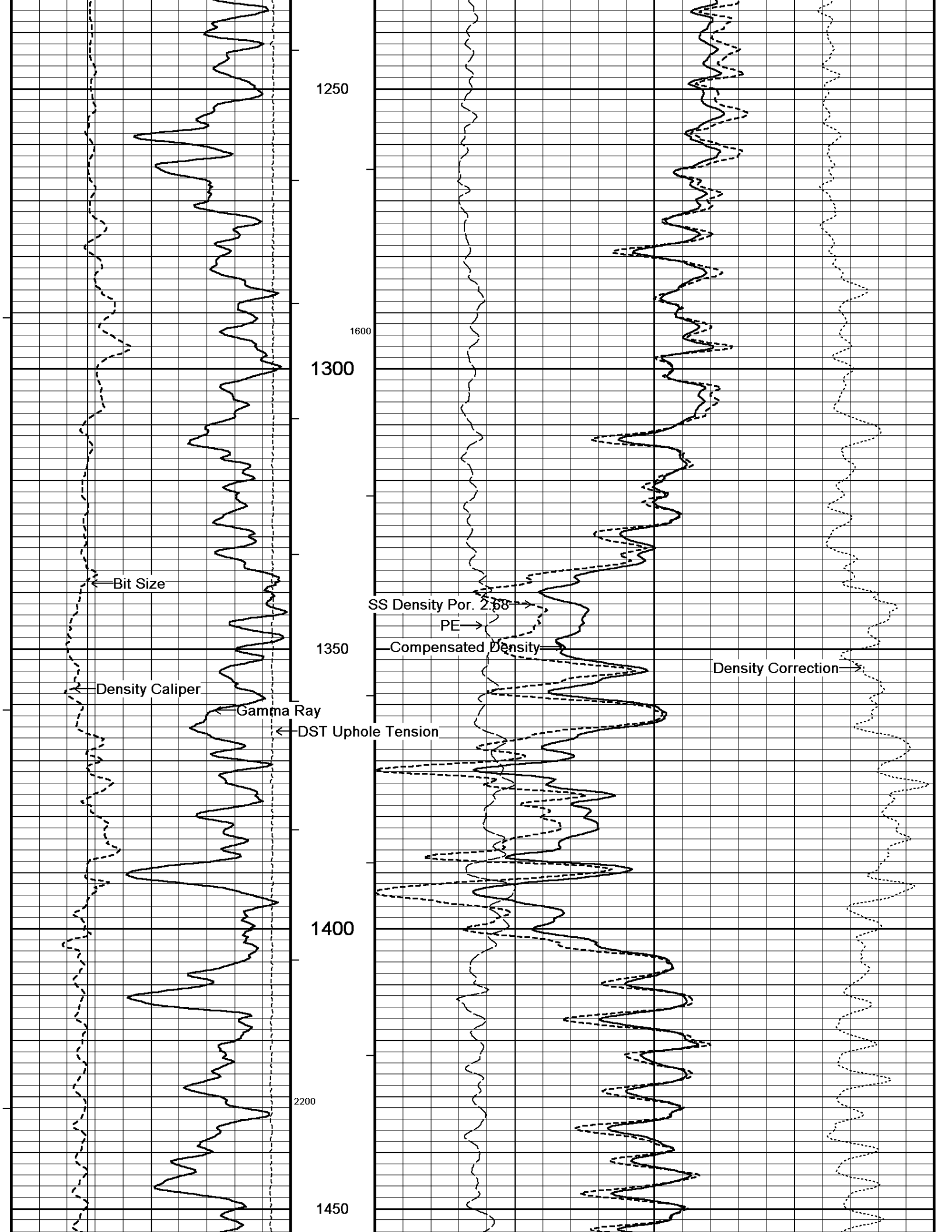
Depth Based Data - Maximum Sampling Increment 10.0cm
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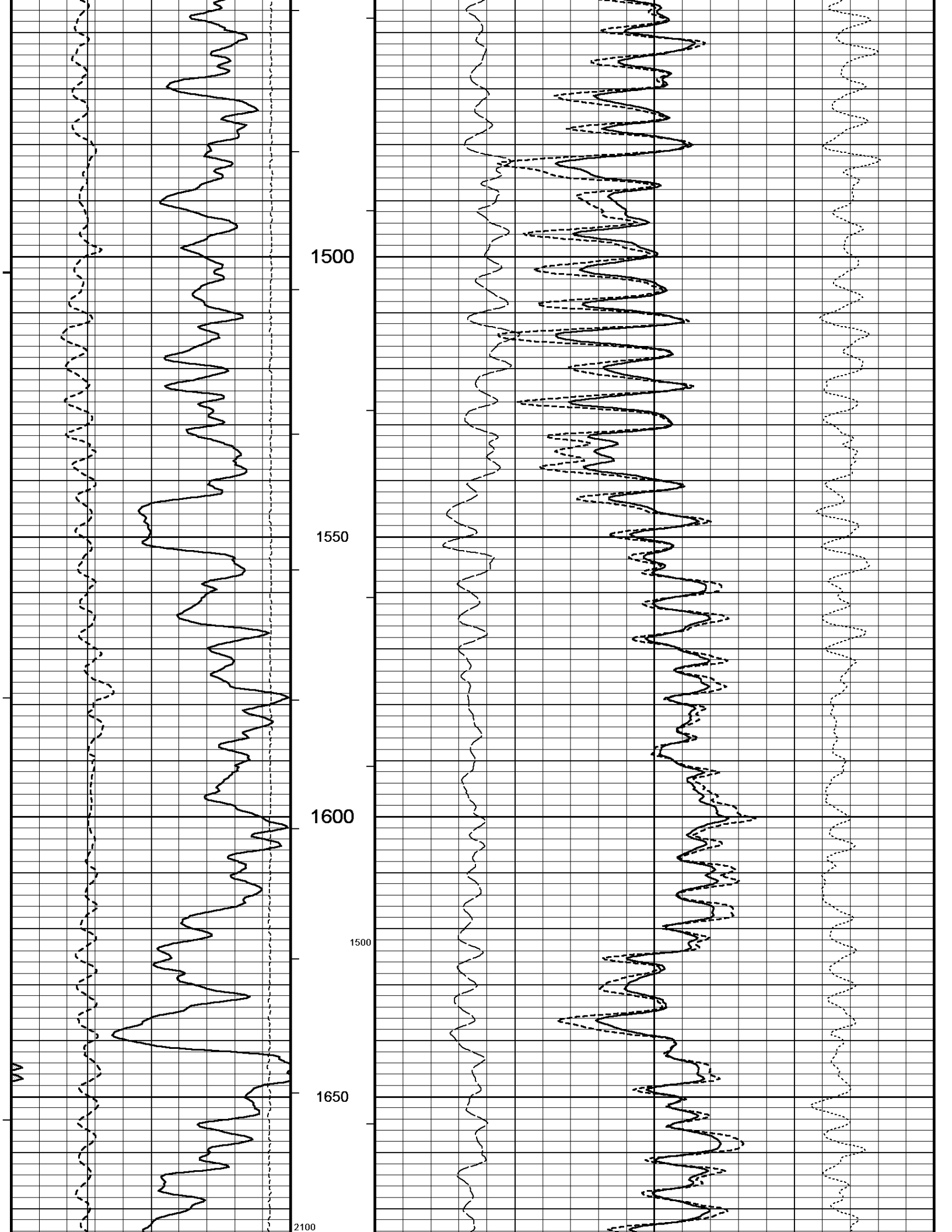
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Recorded on 25-NOV-2010 08:59

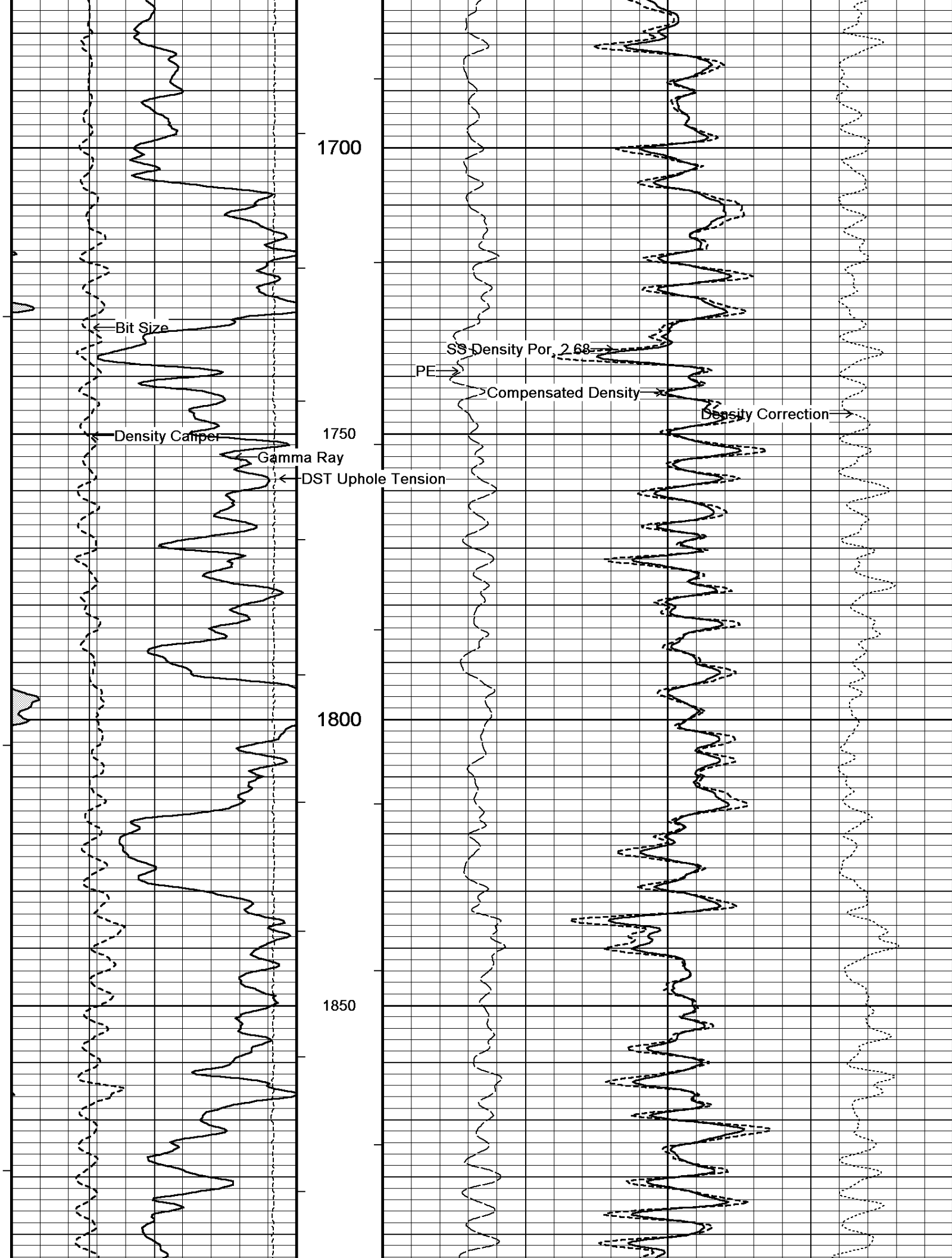


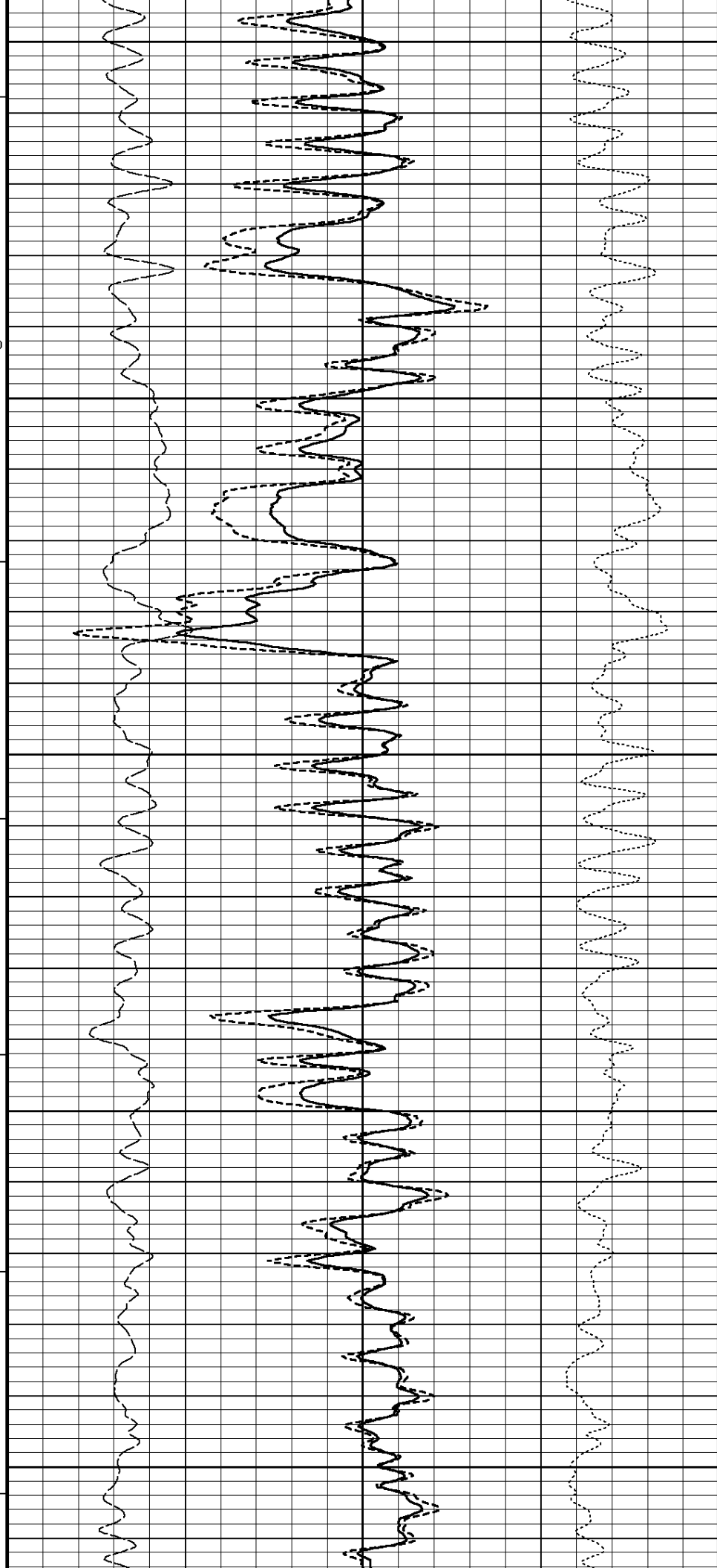
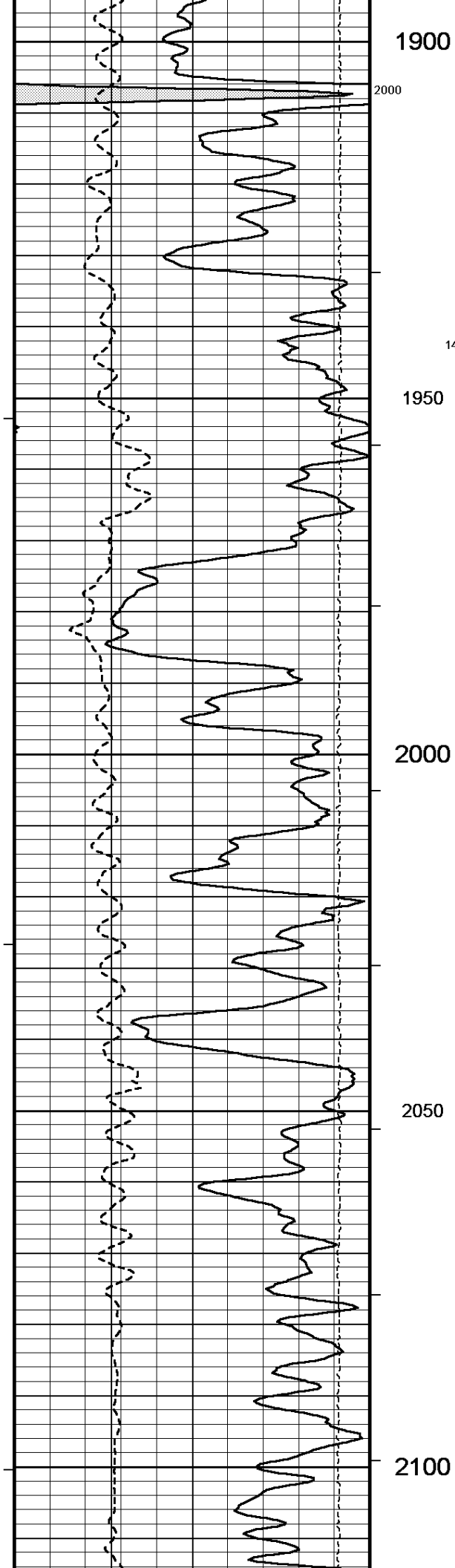


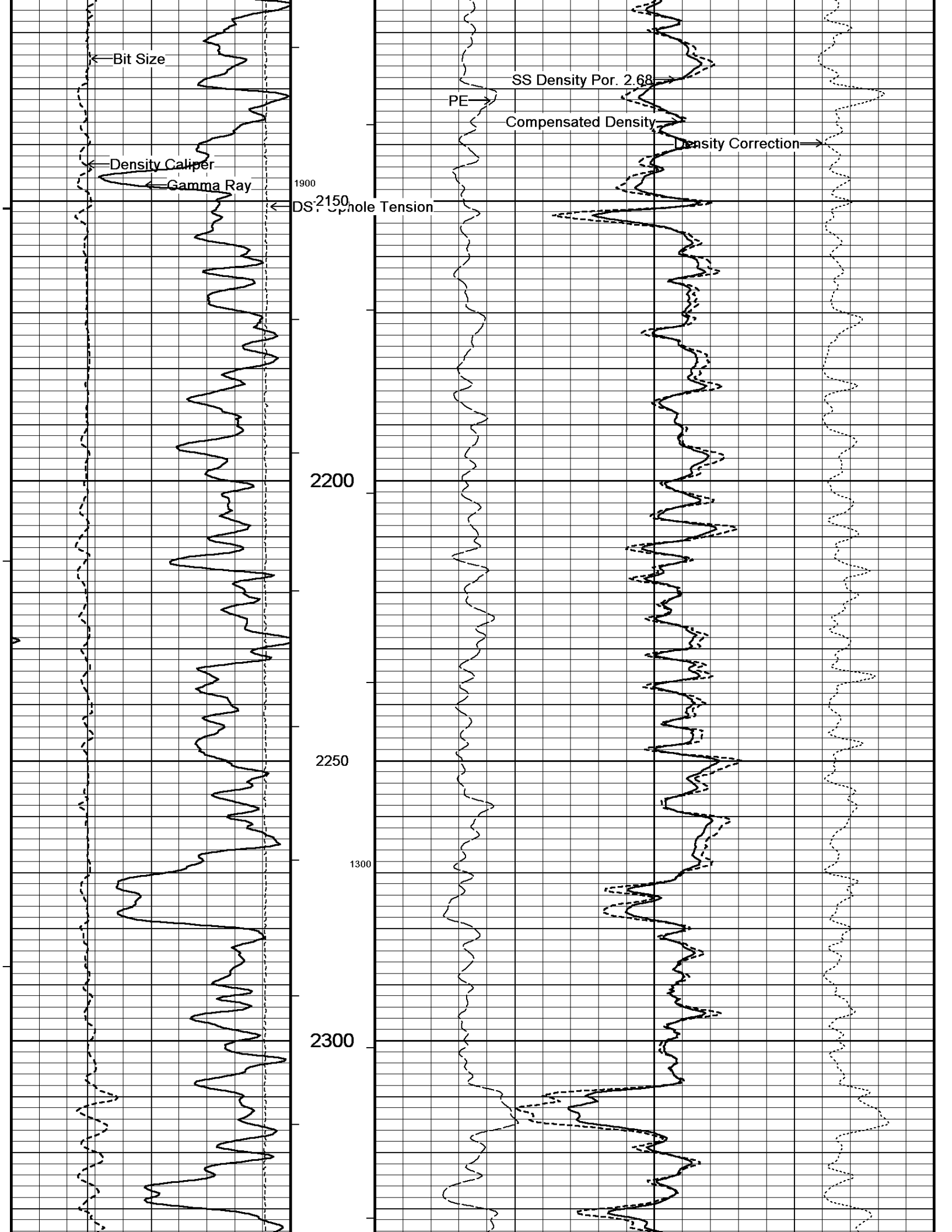


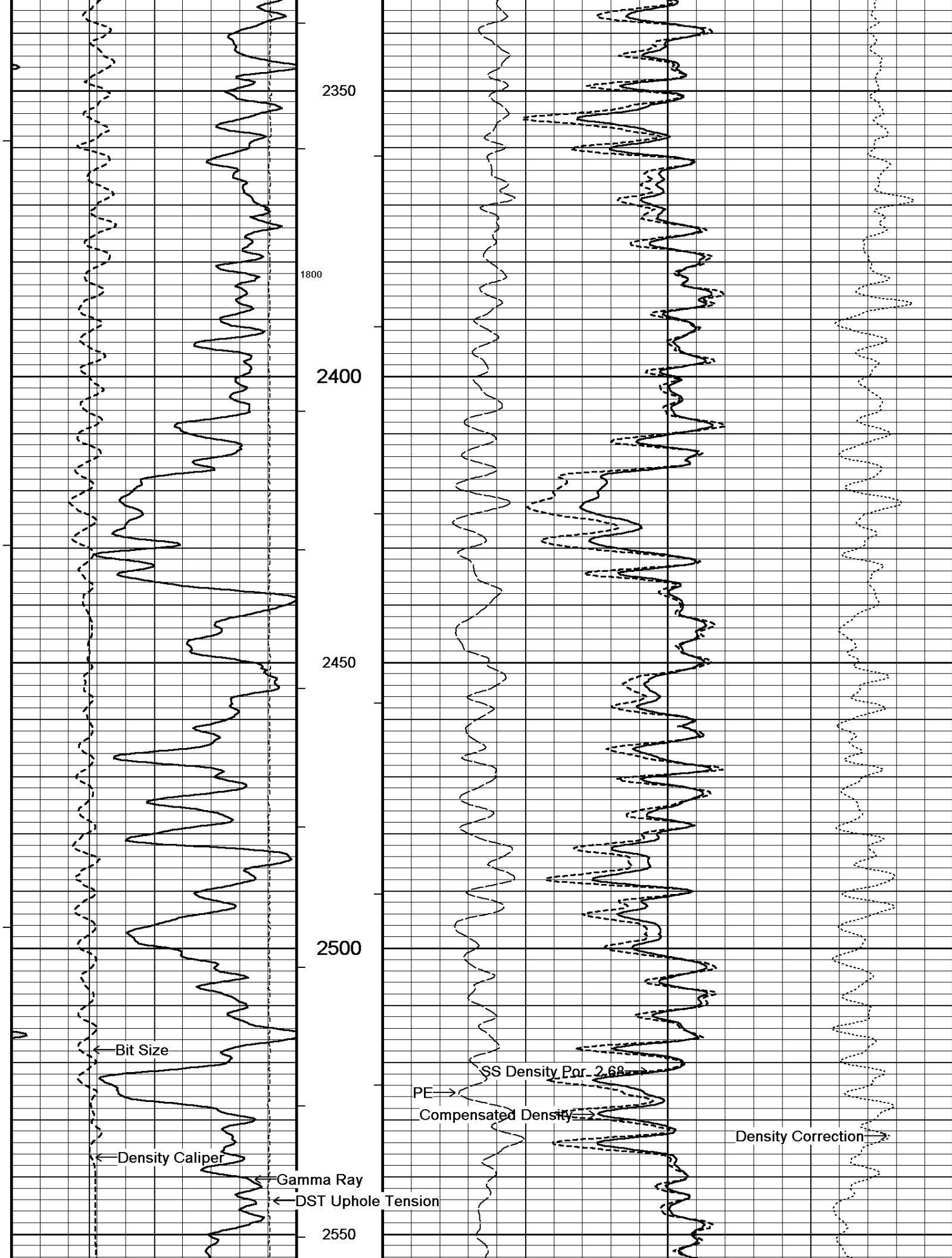


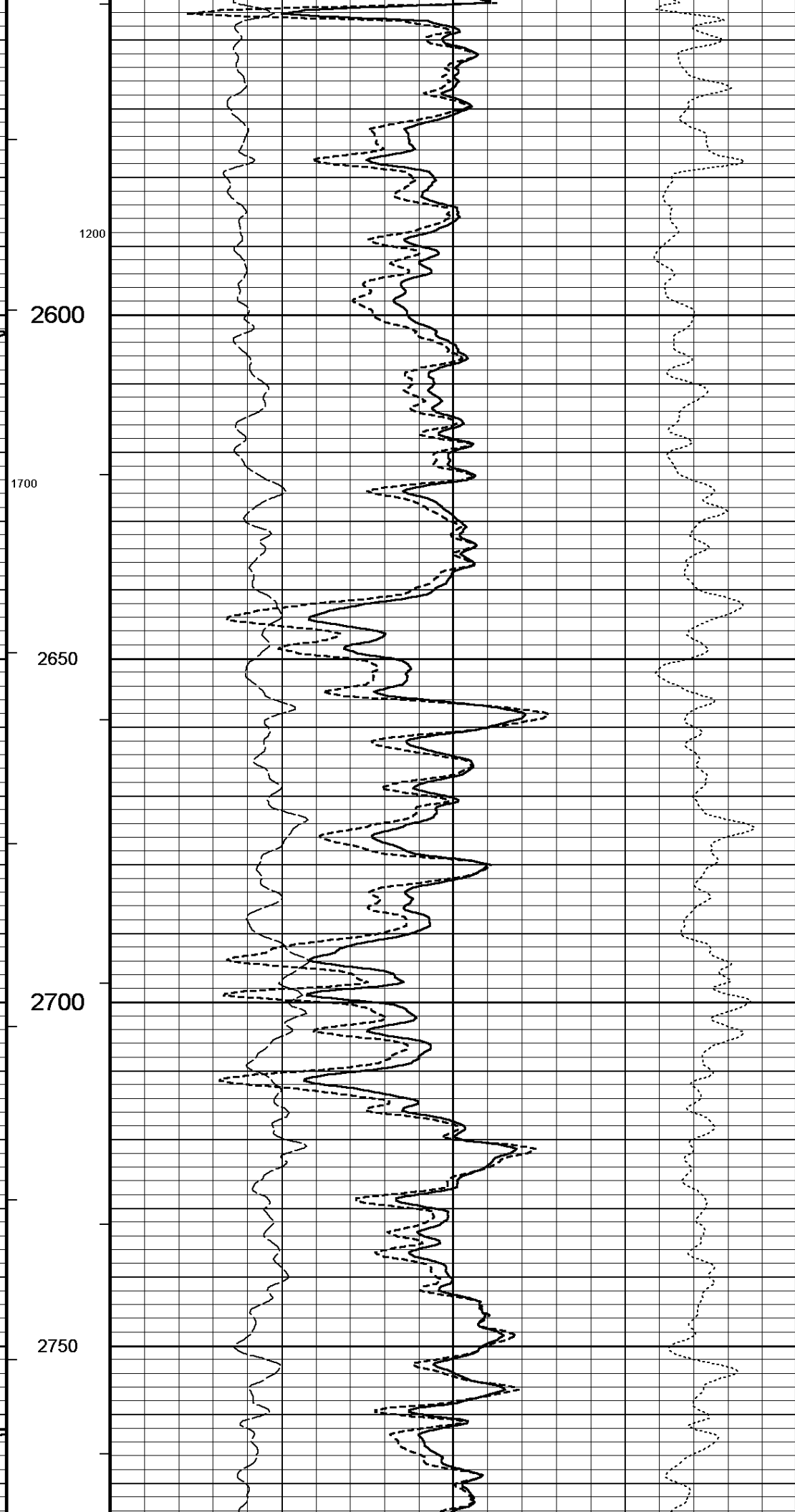
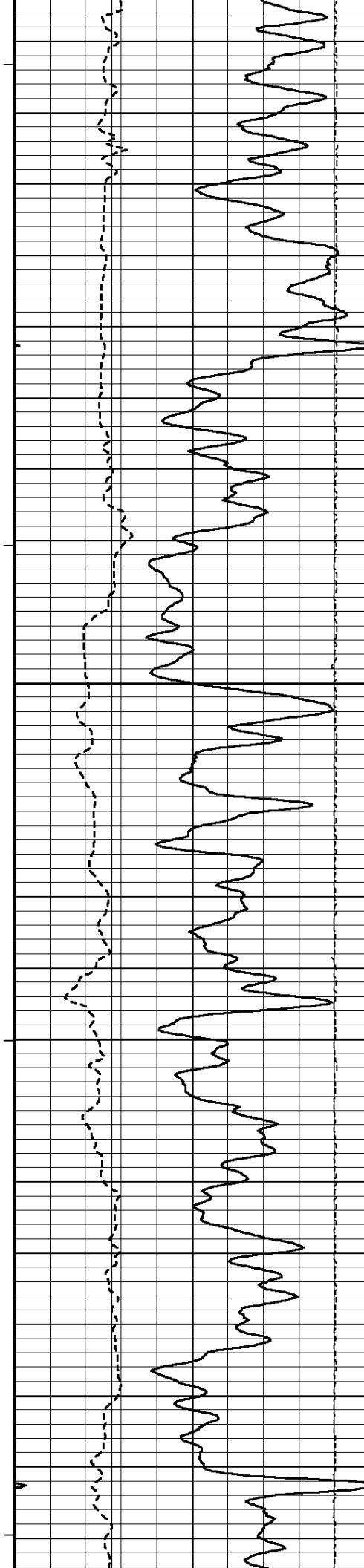


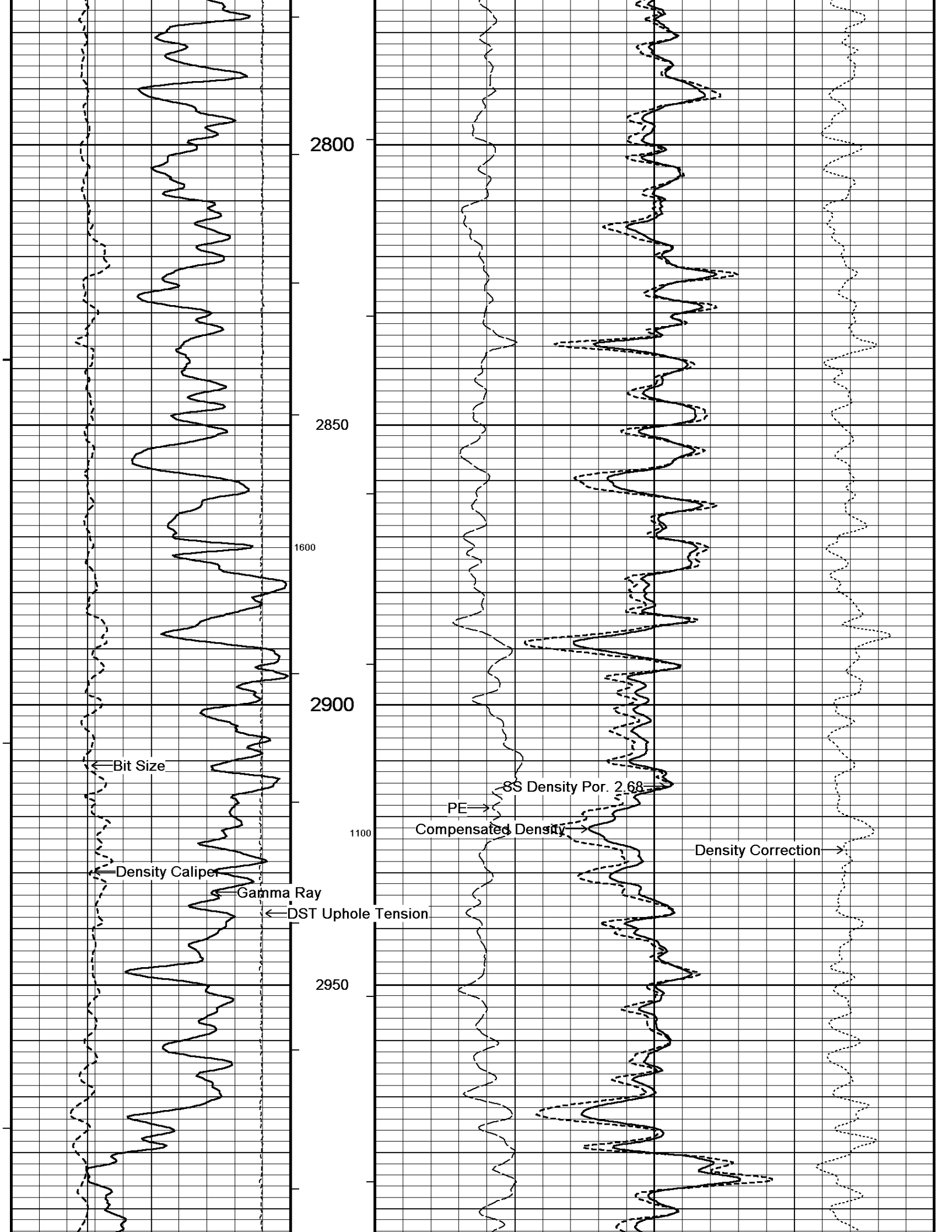


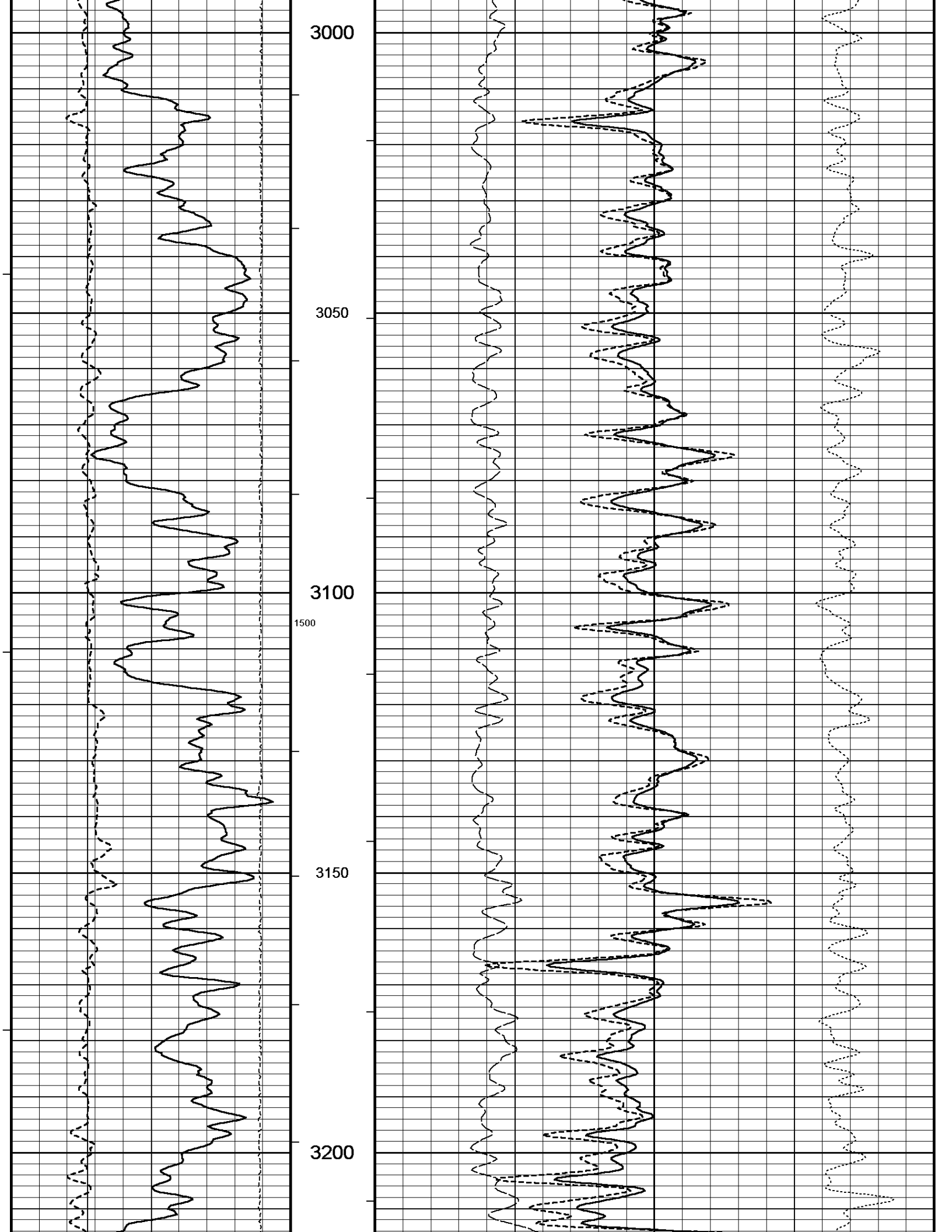


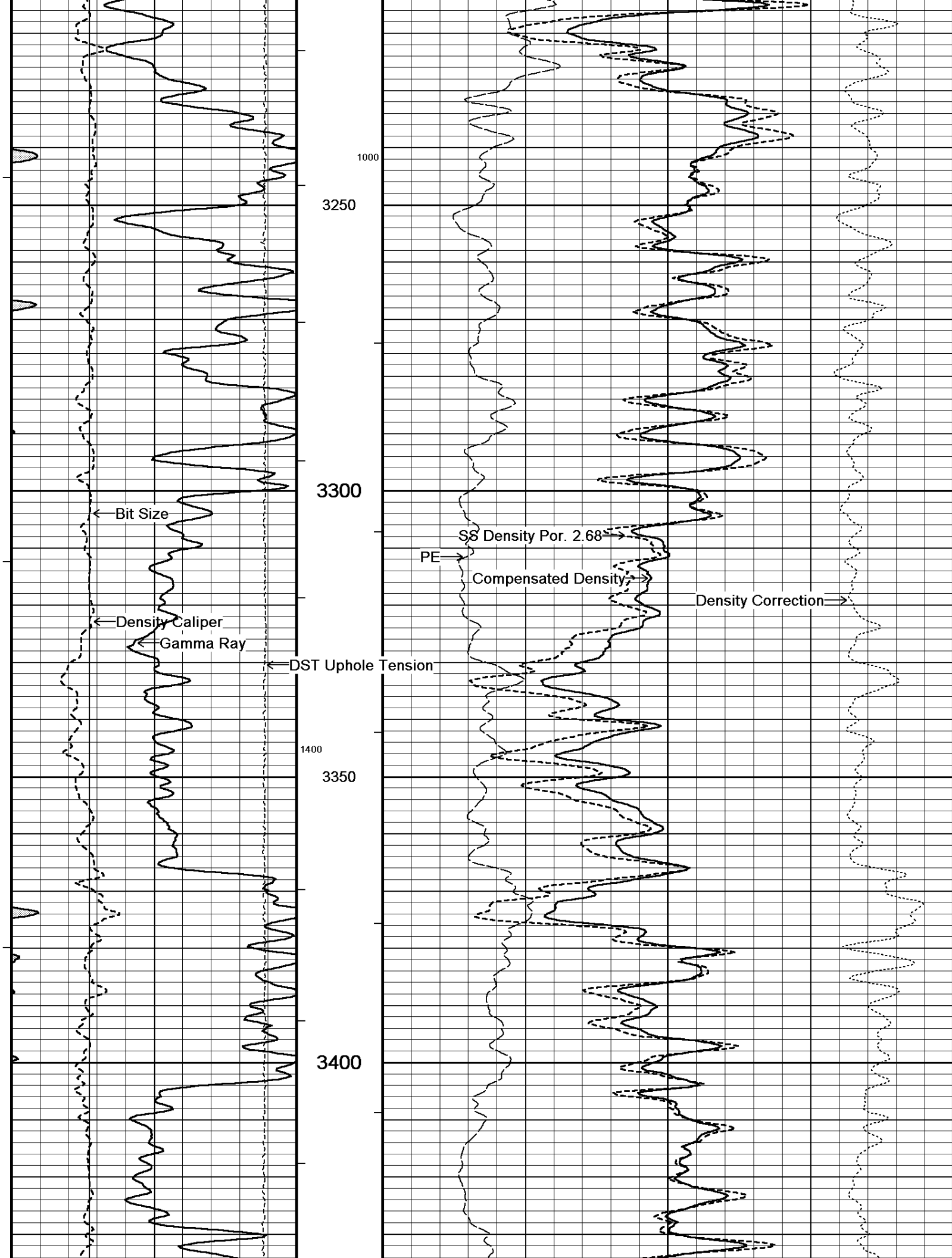


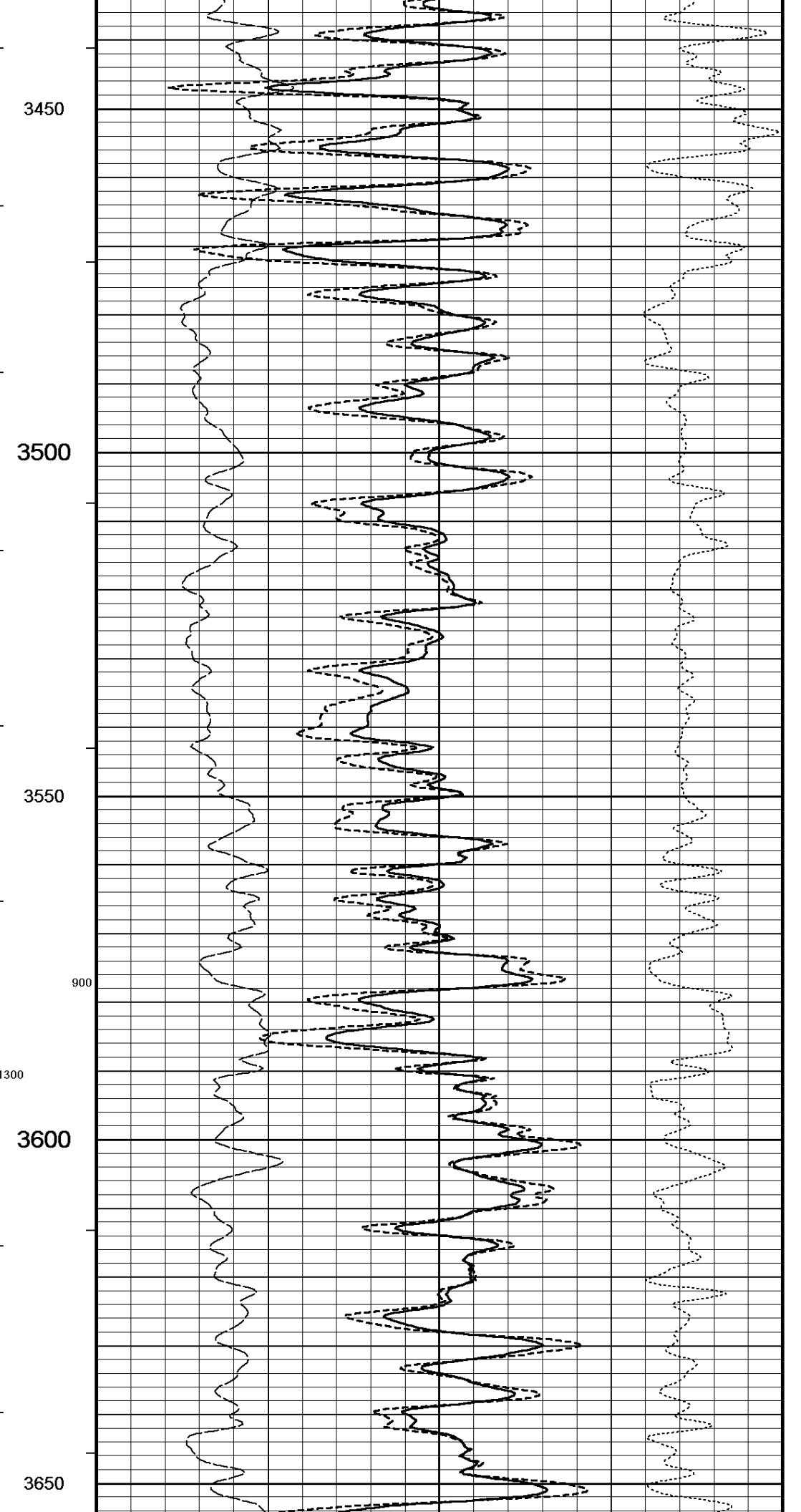
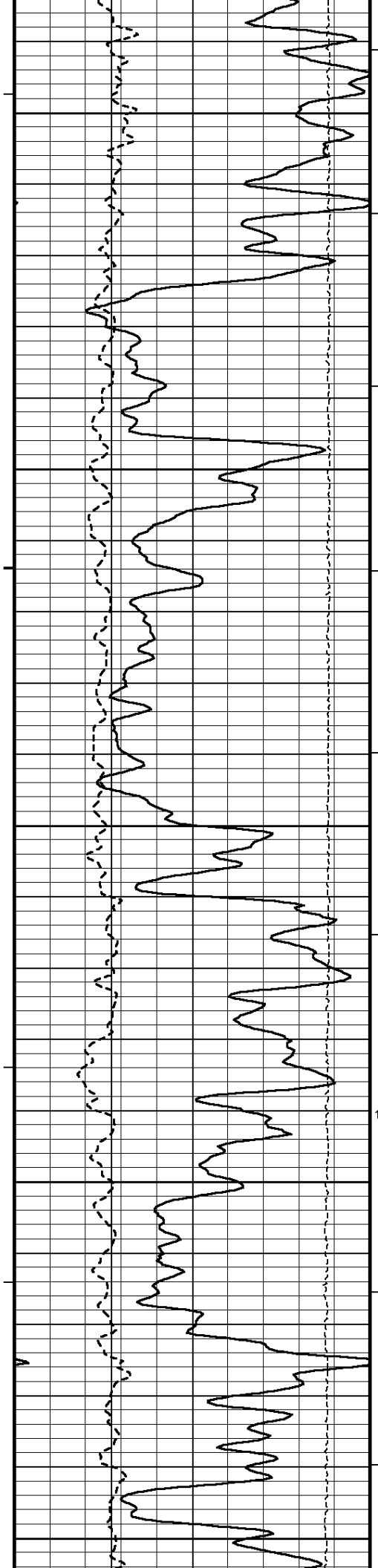


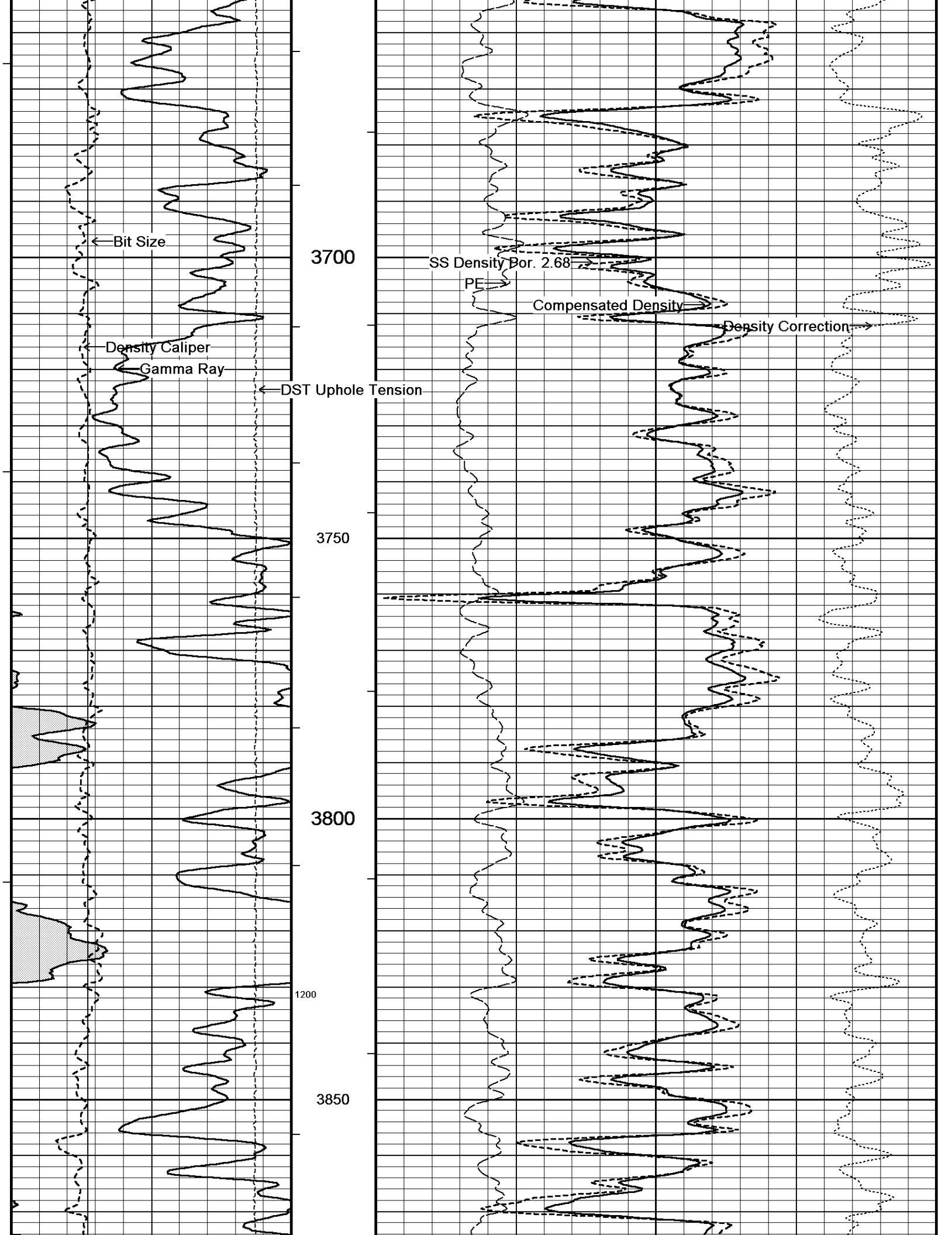


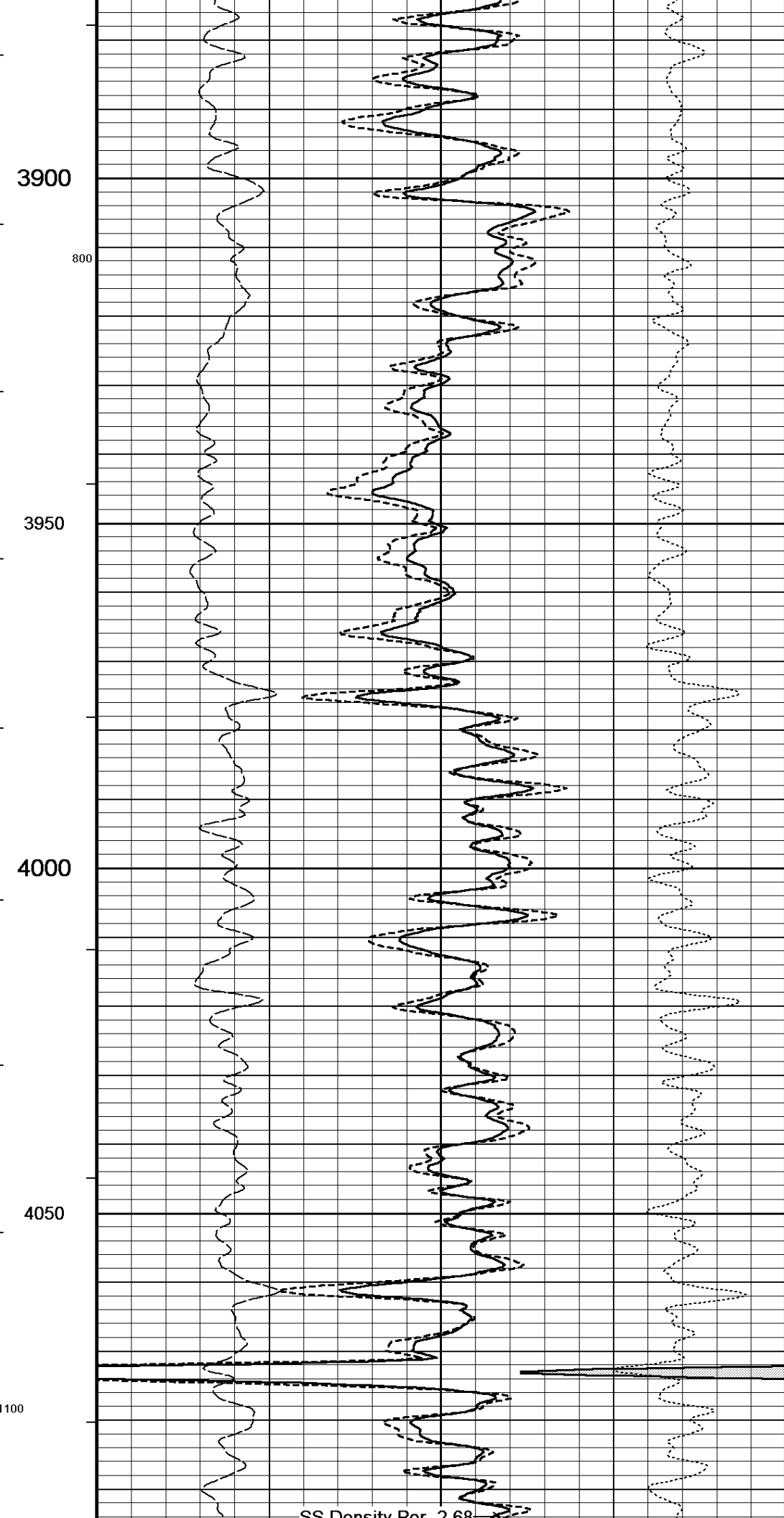
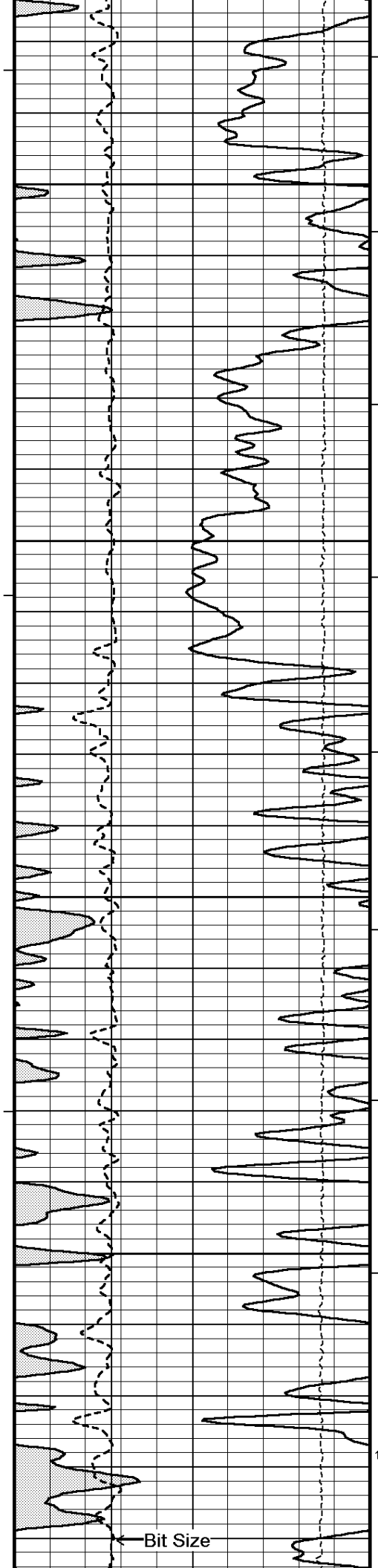


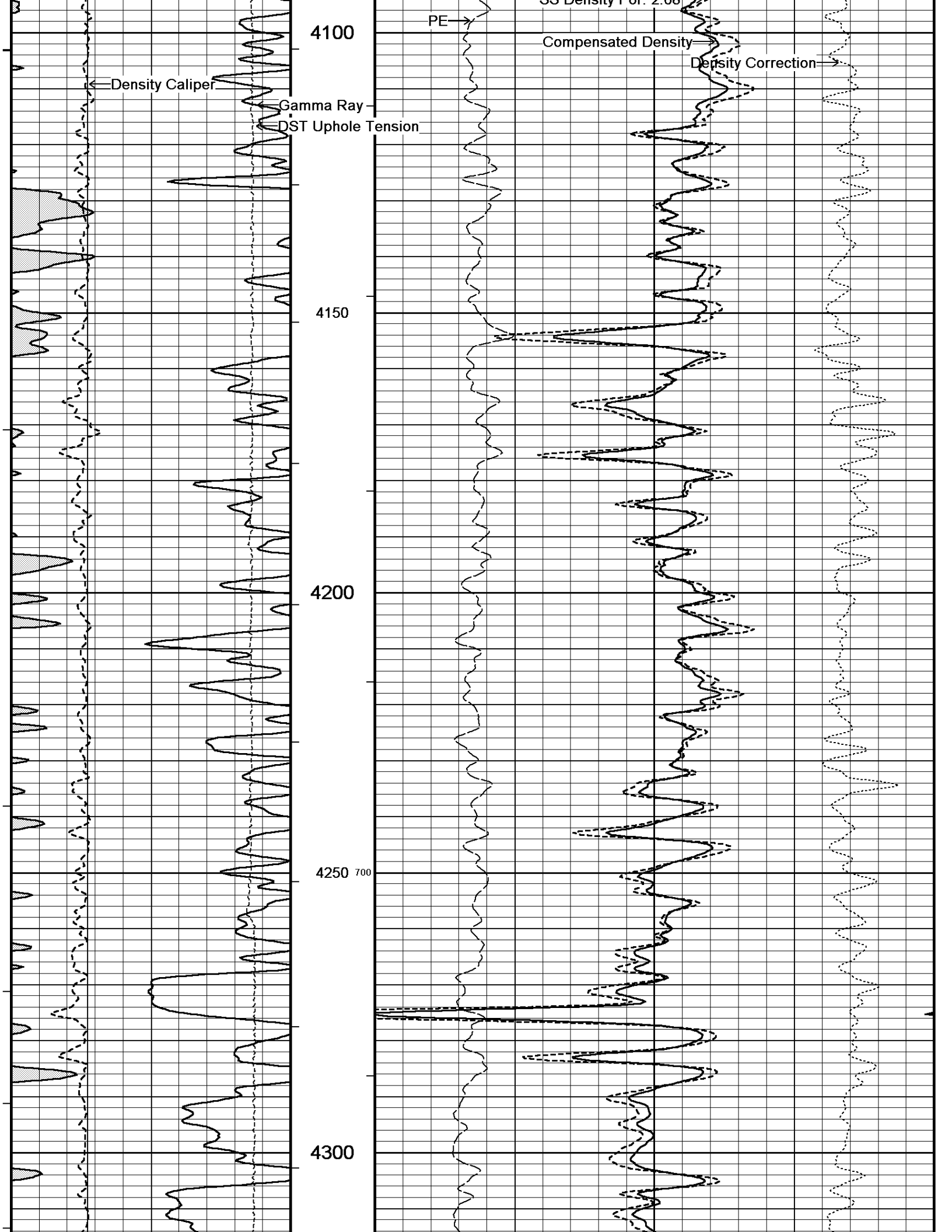


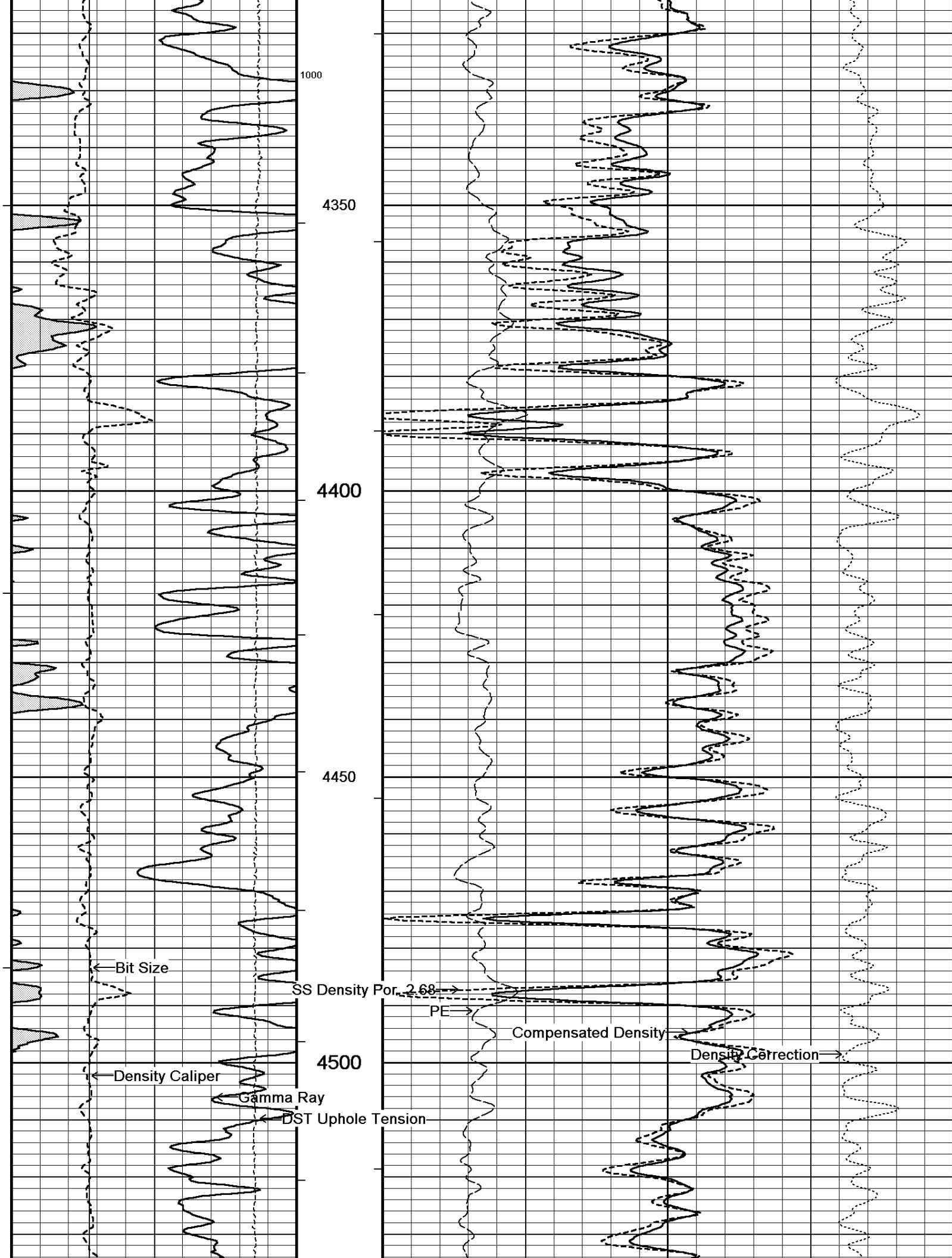


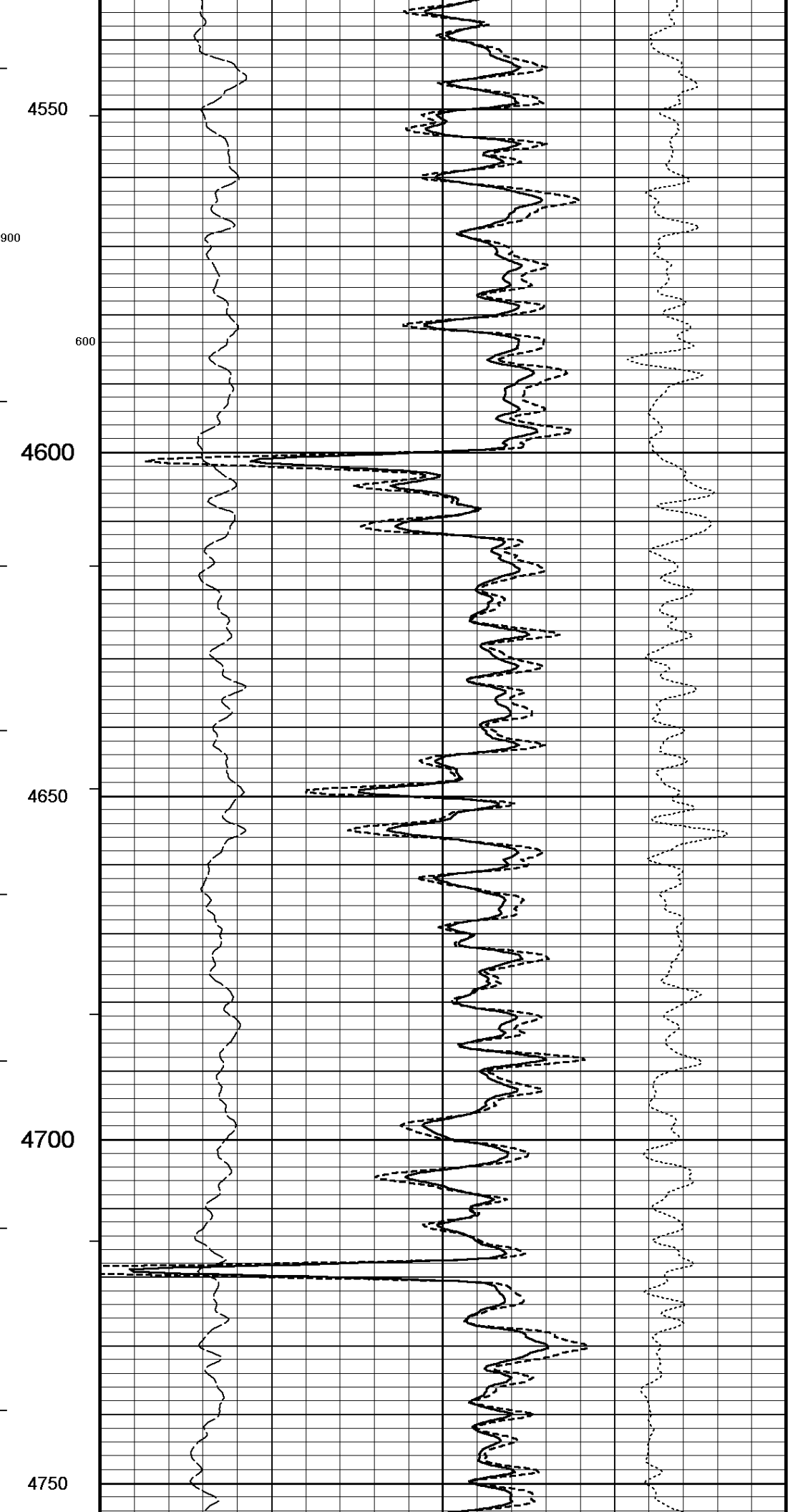
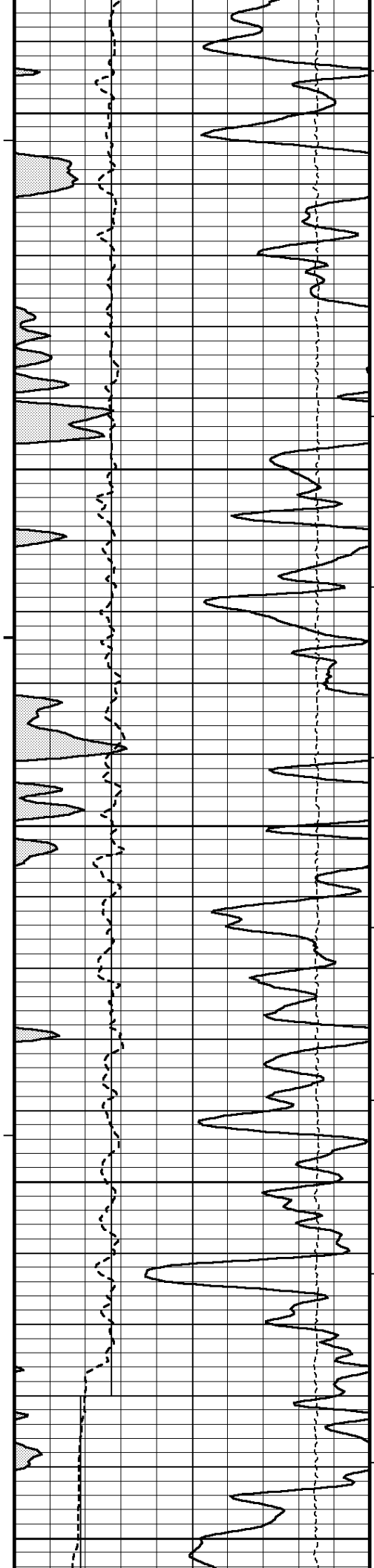


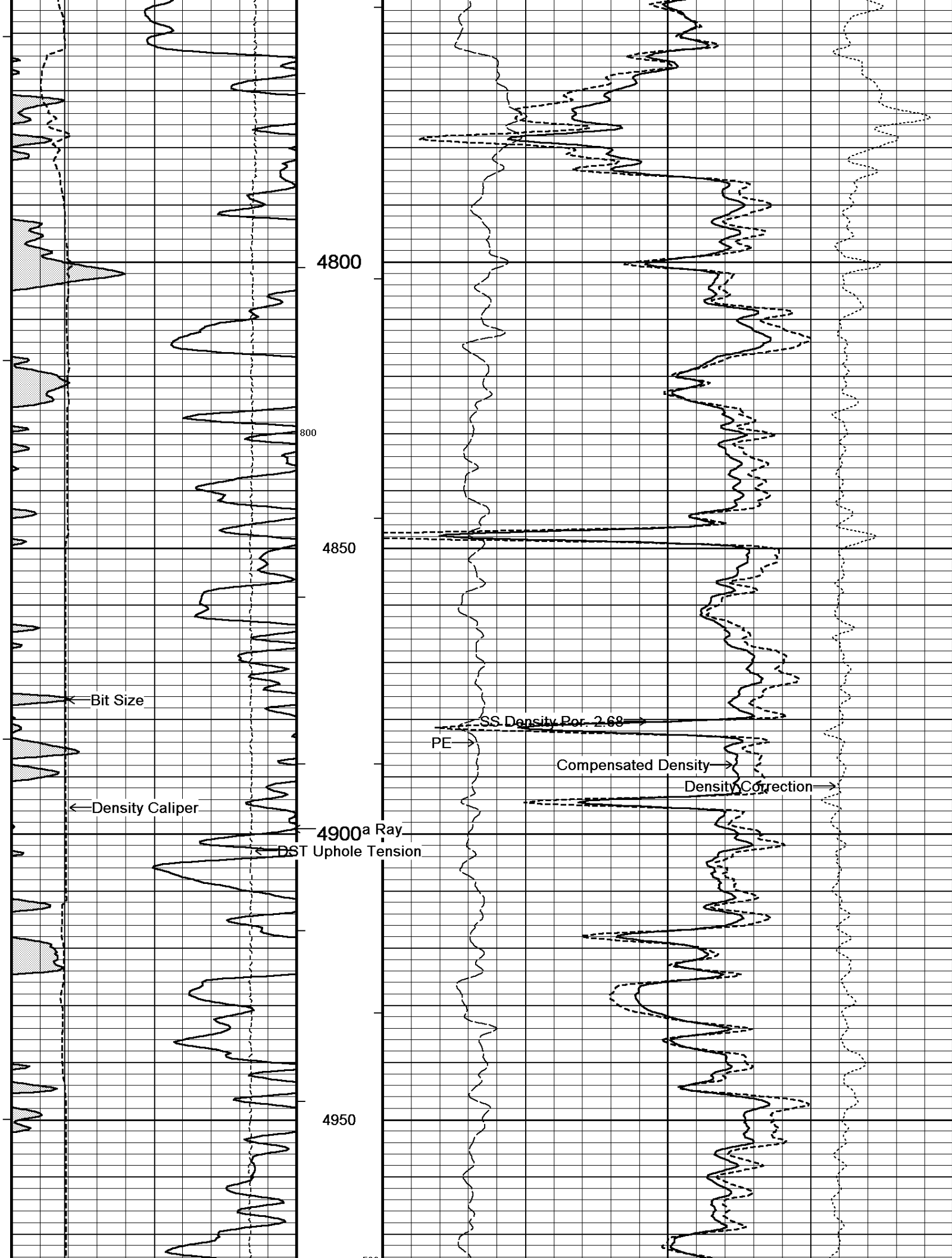


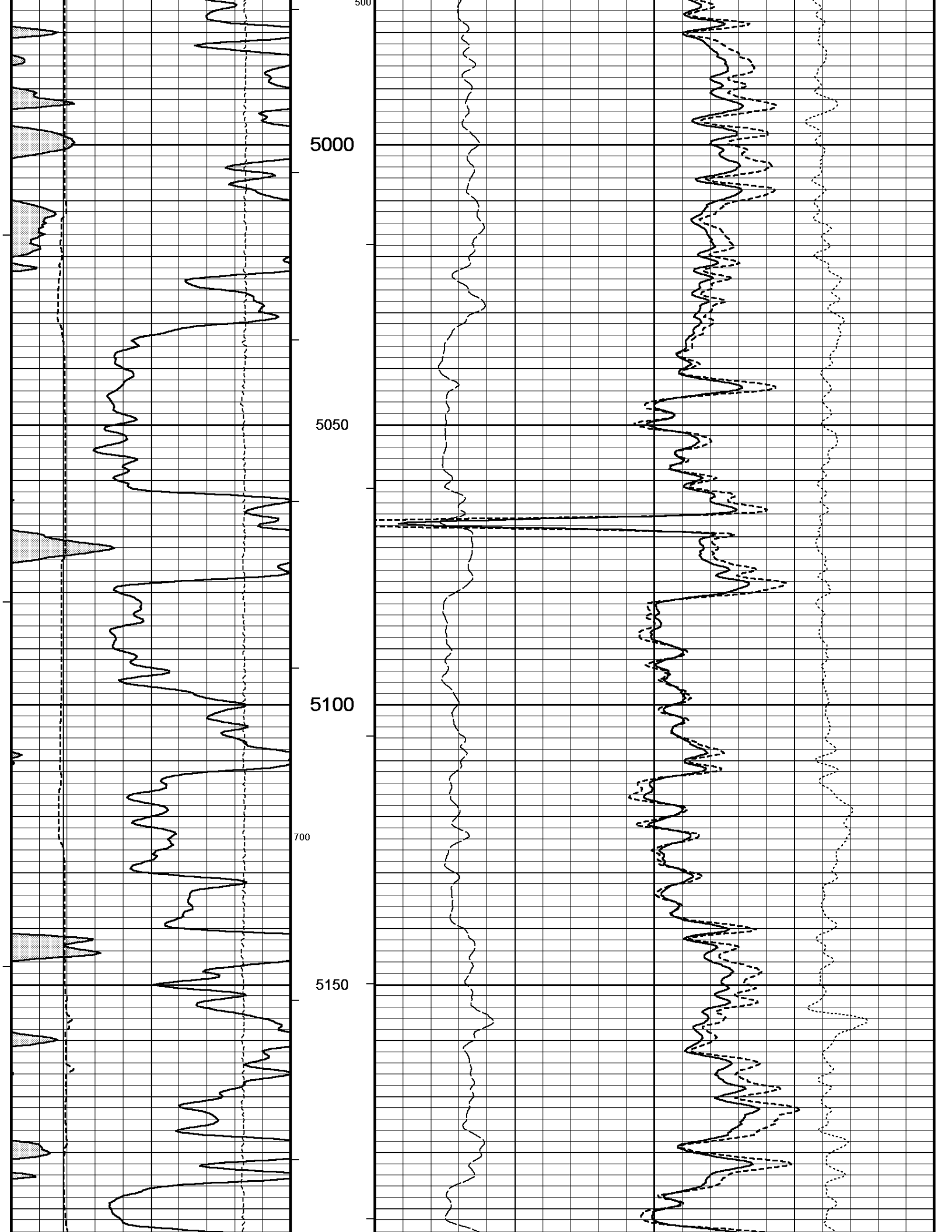


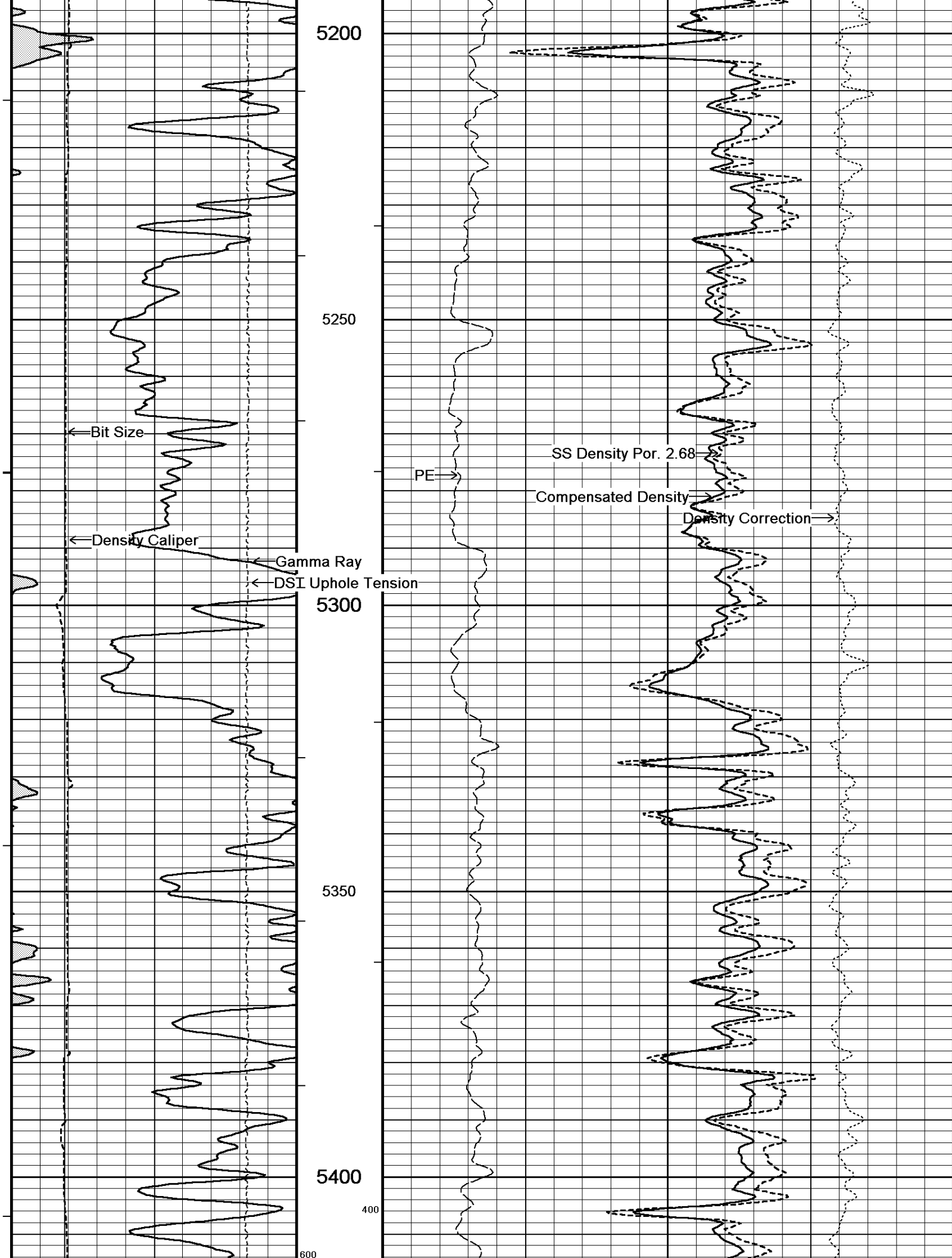


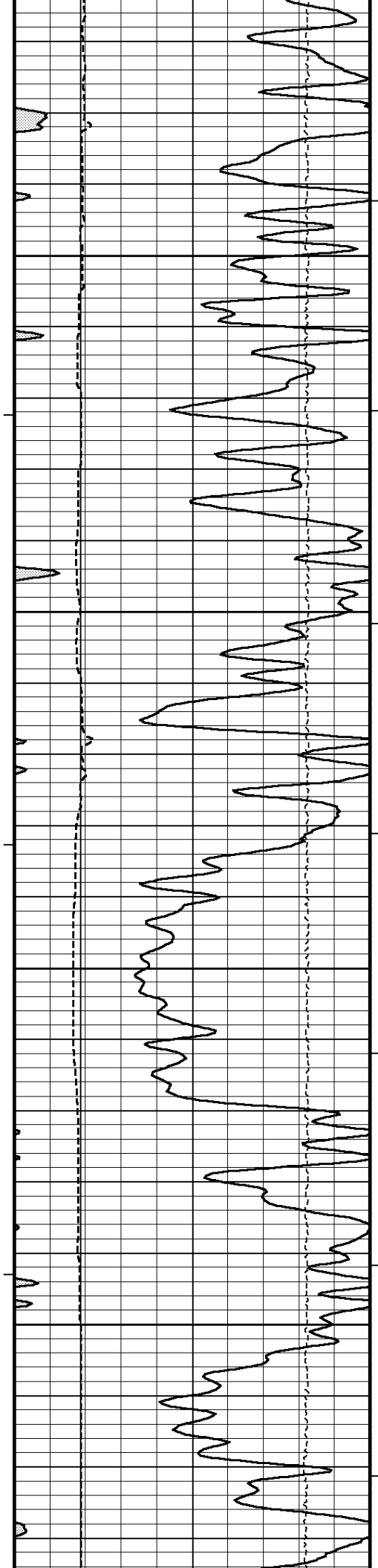










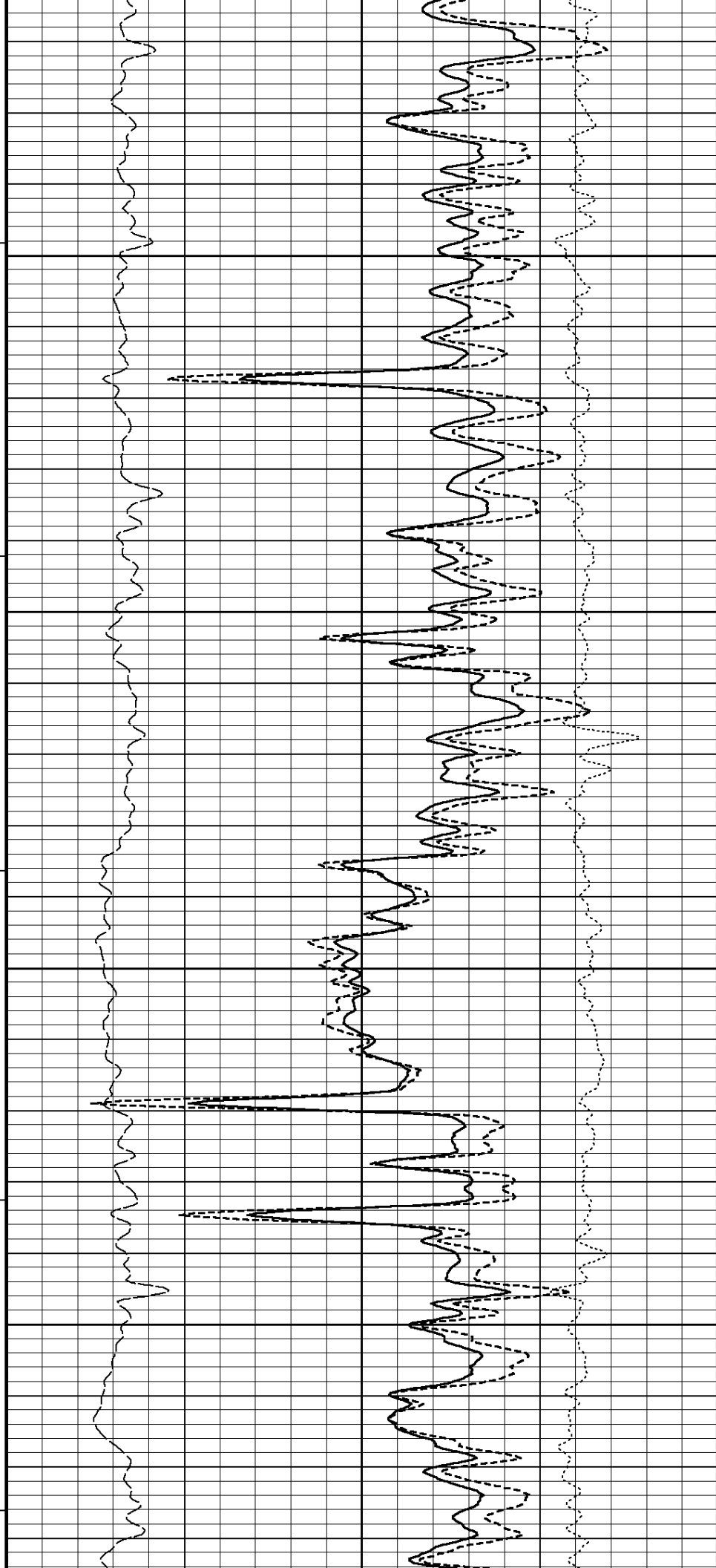


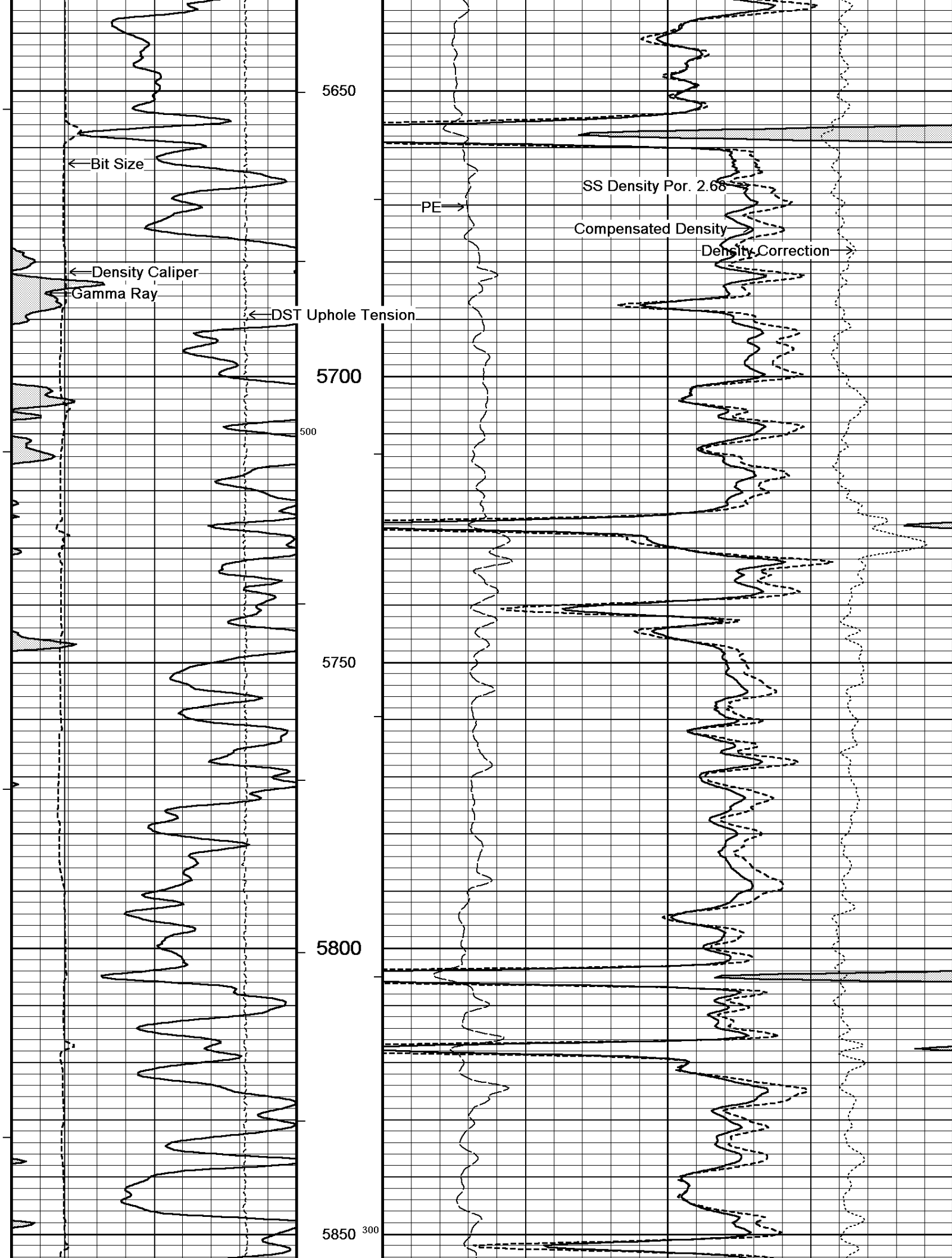
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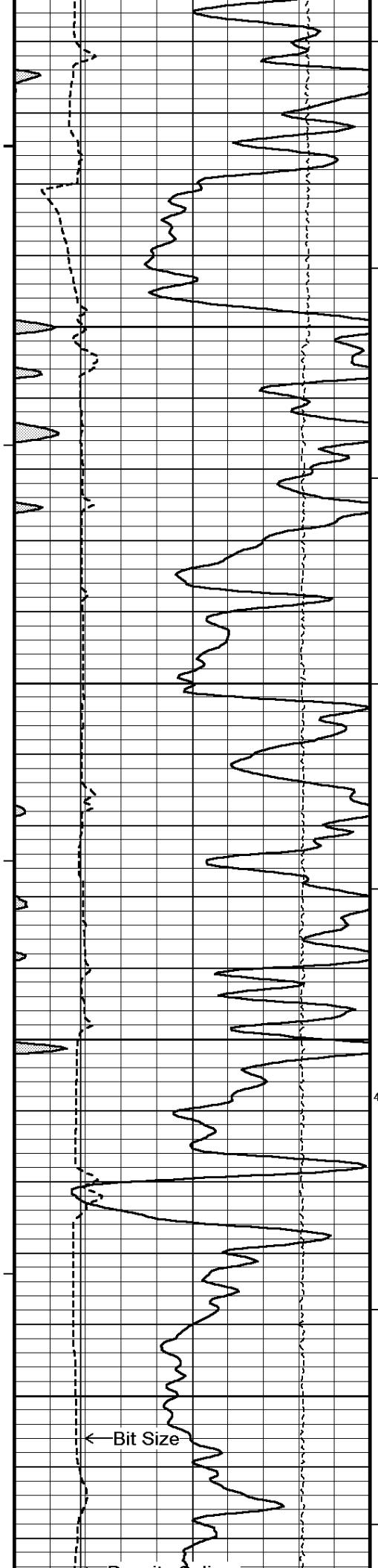
5500

5550

5600





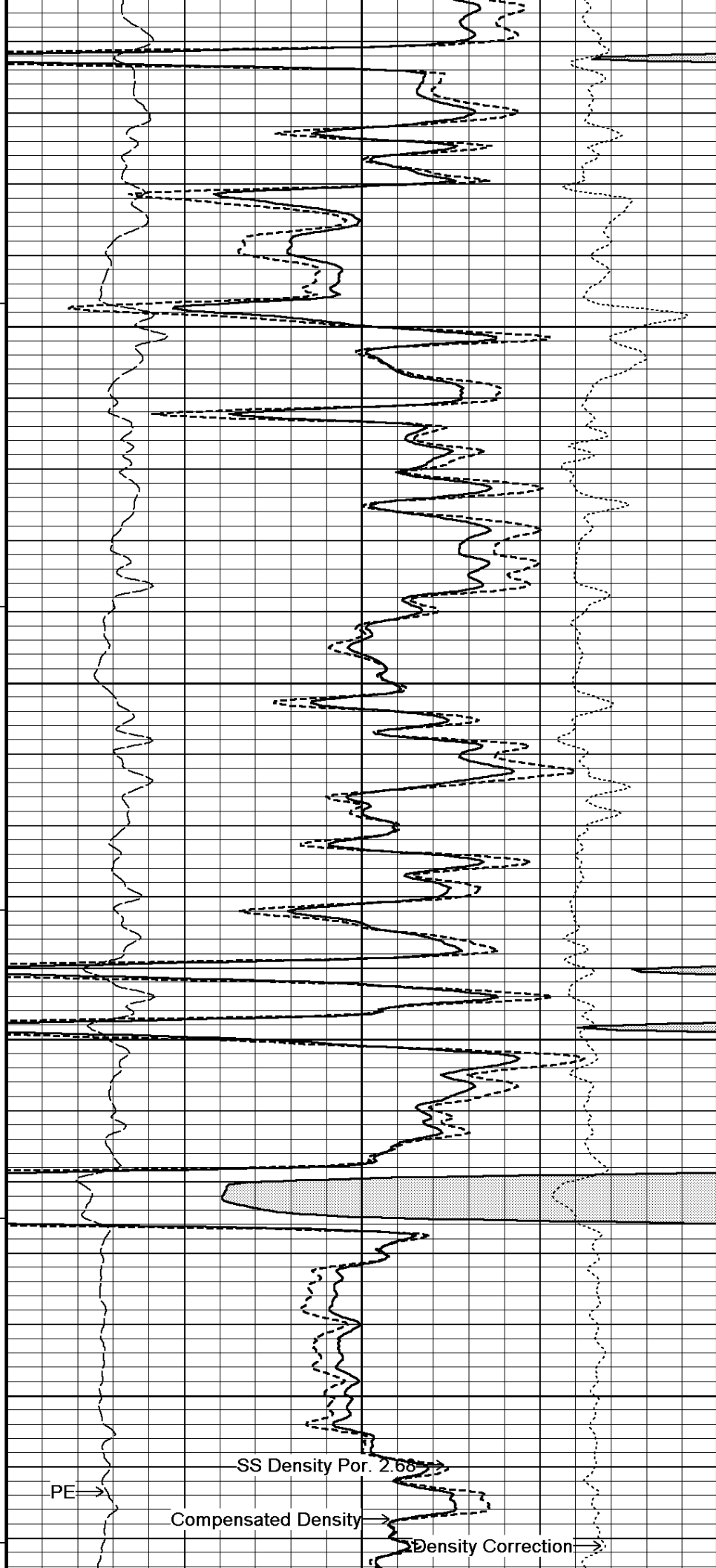


5900

5950

6000

6050



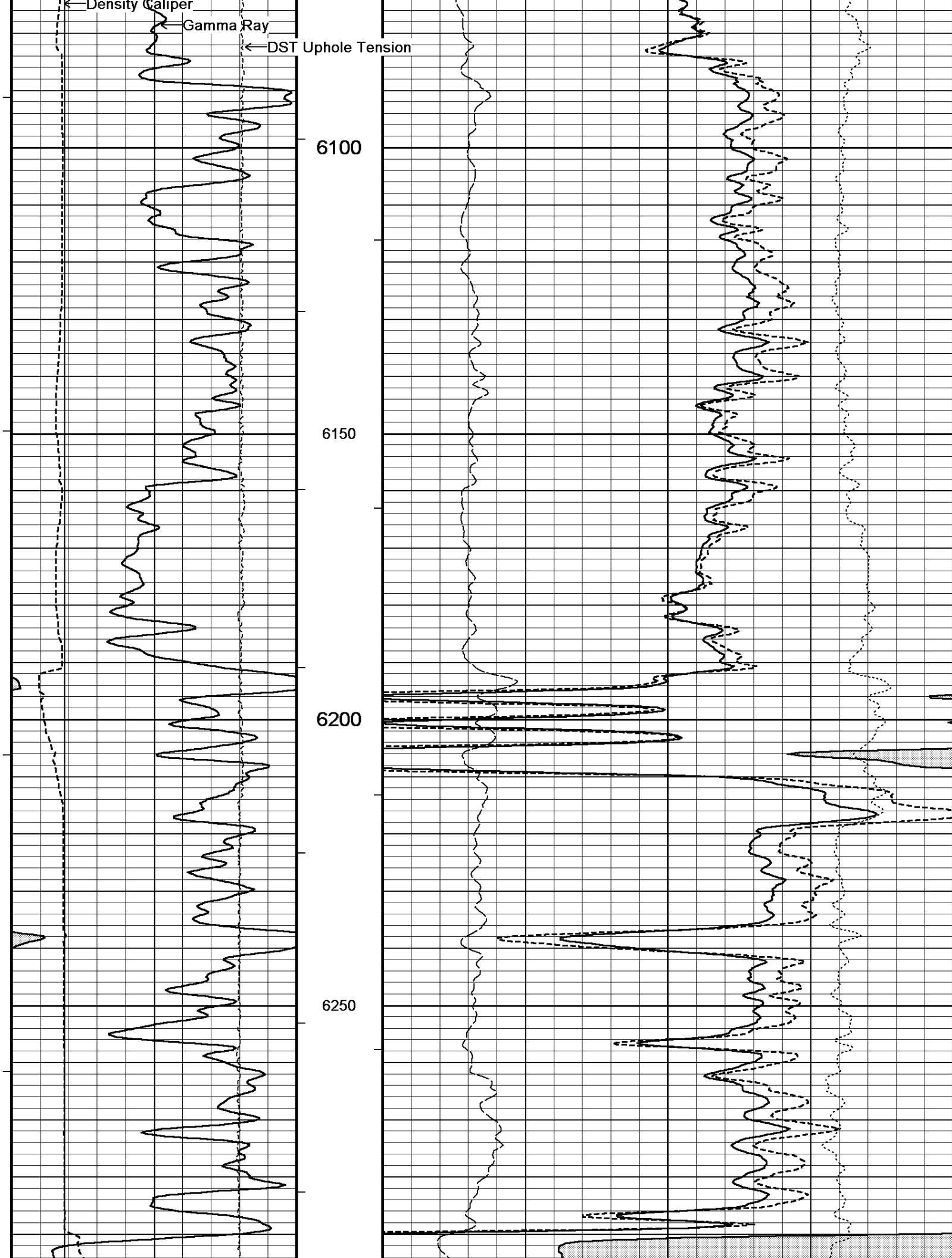
← Bit Size

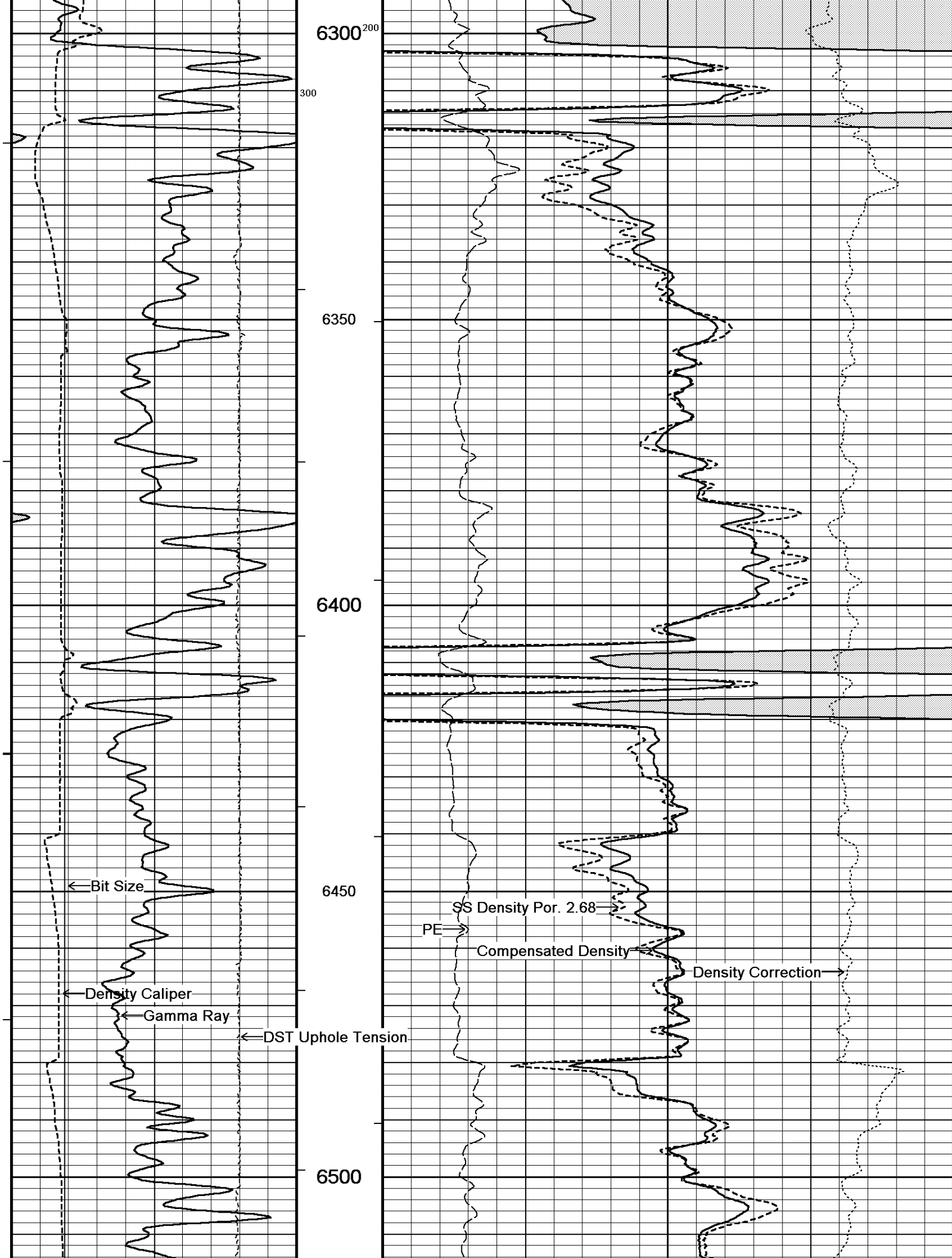
PE →

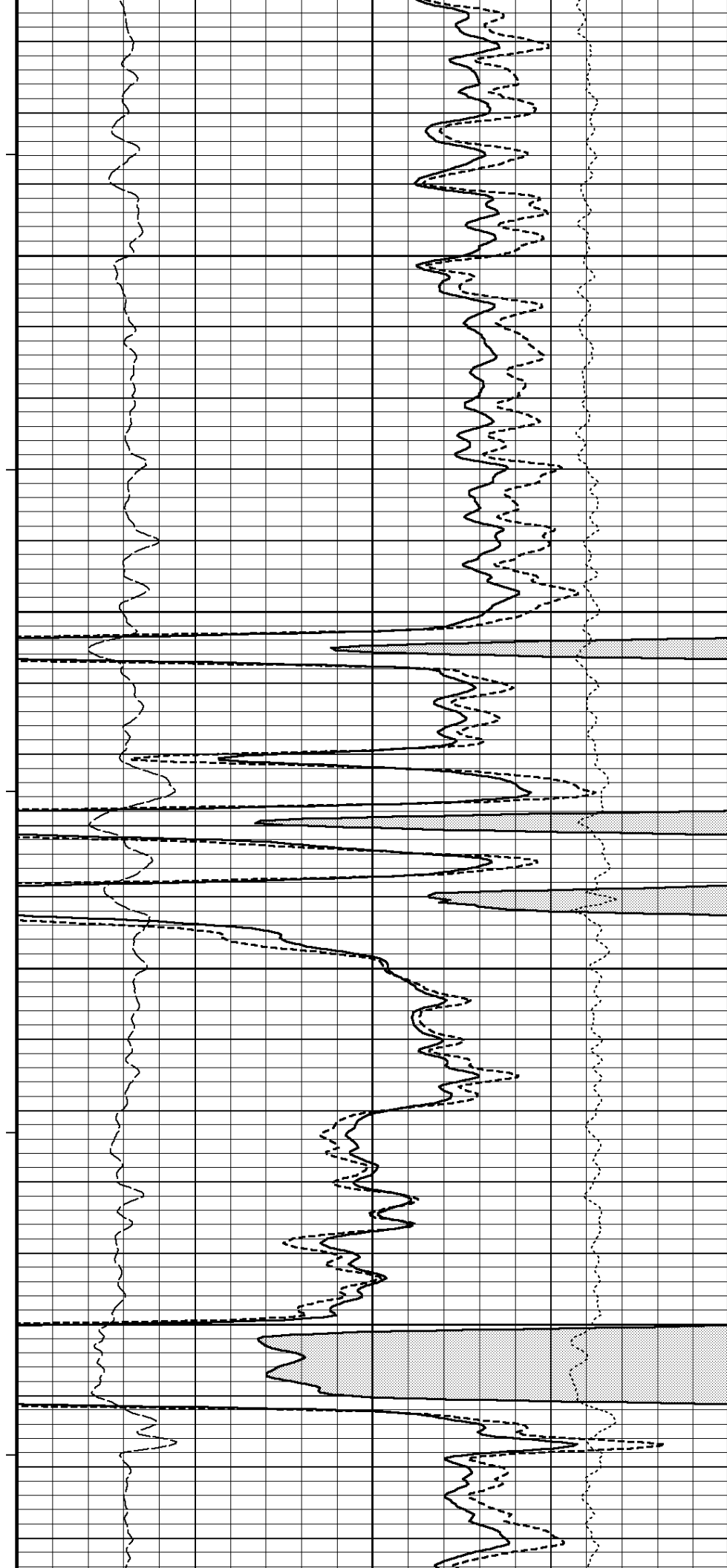
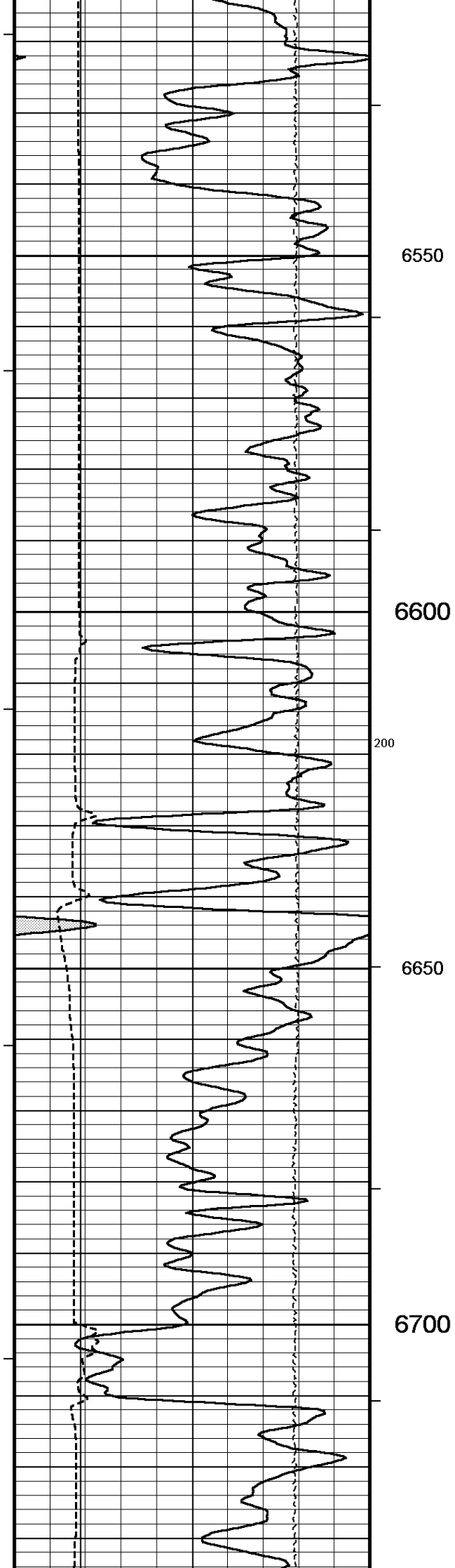
Compensated Density →

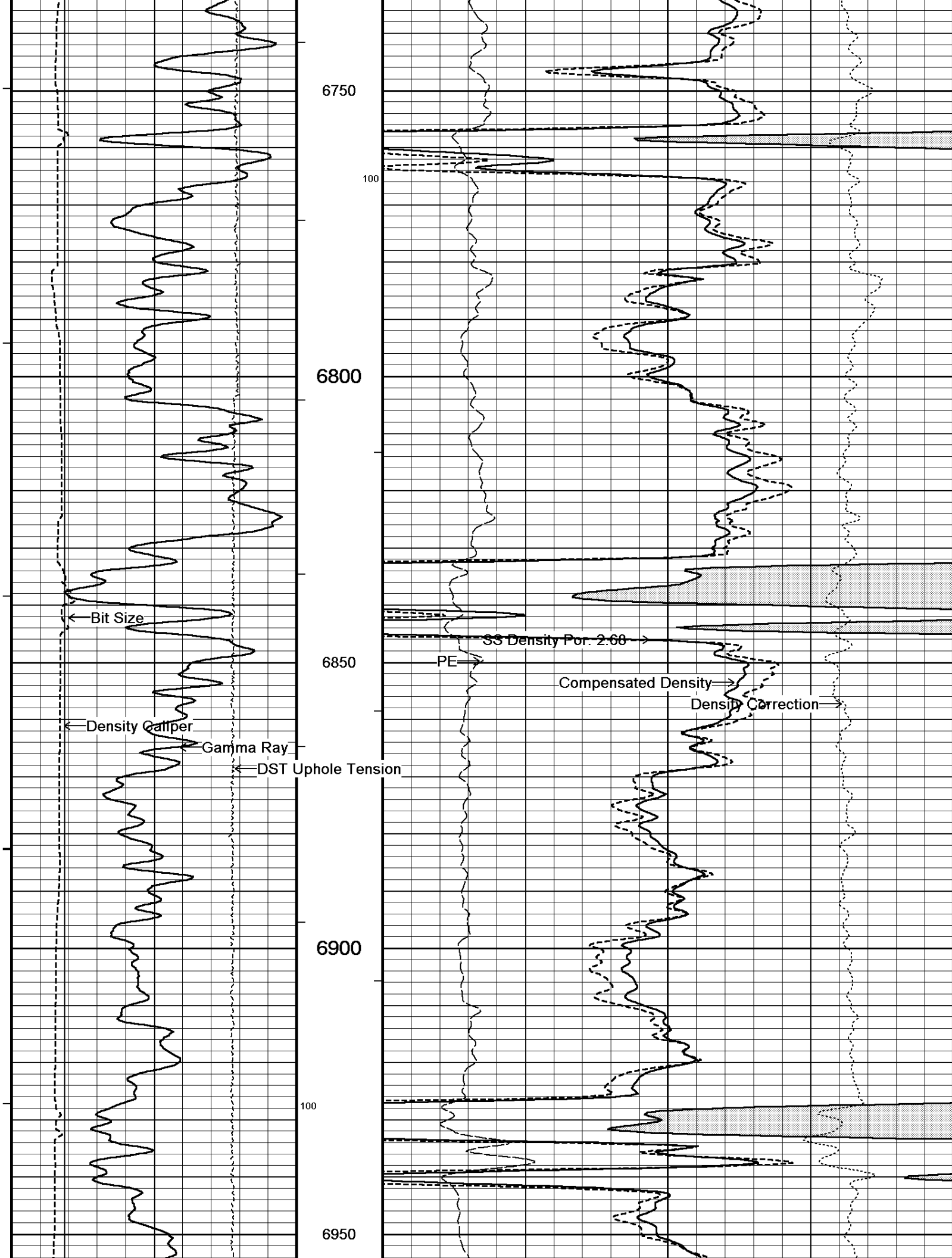
SS Density Por. 2.68 →

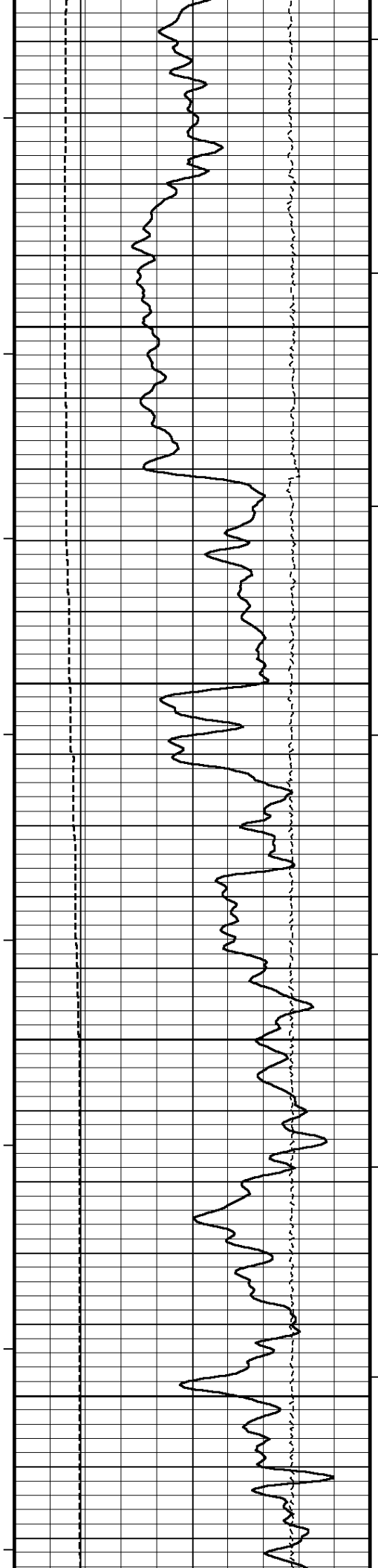
Density Correction →



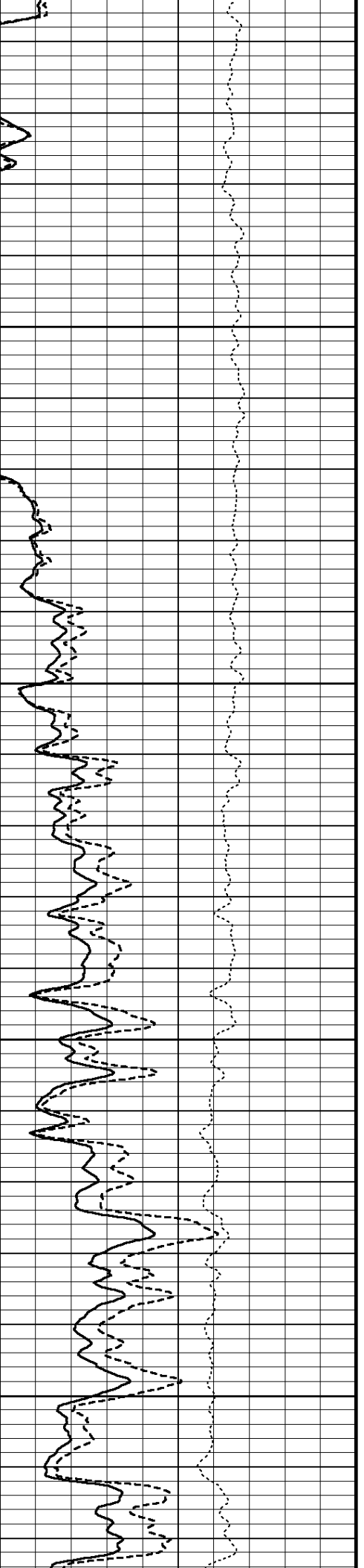
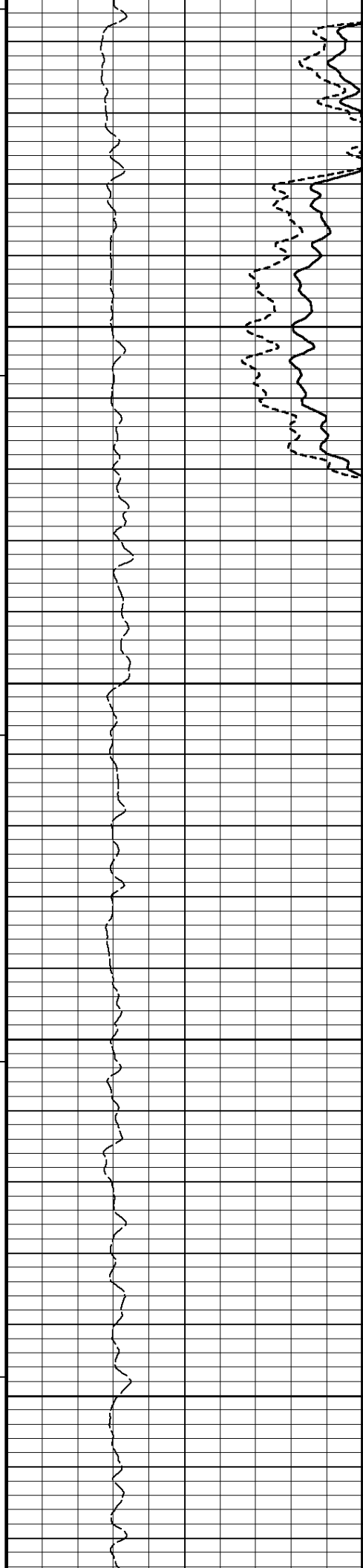


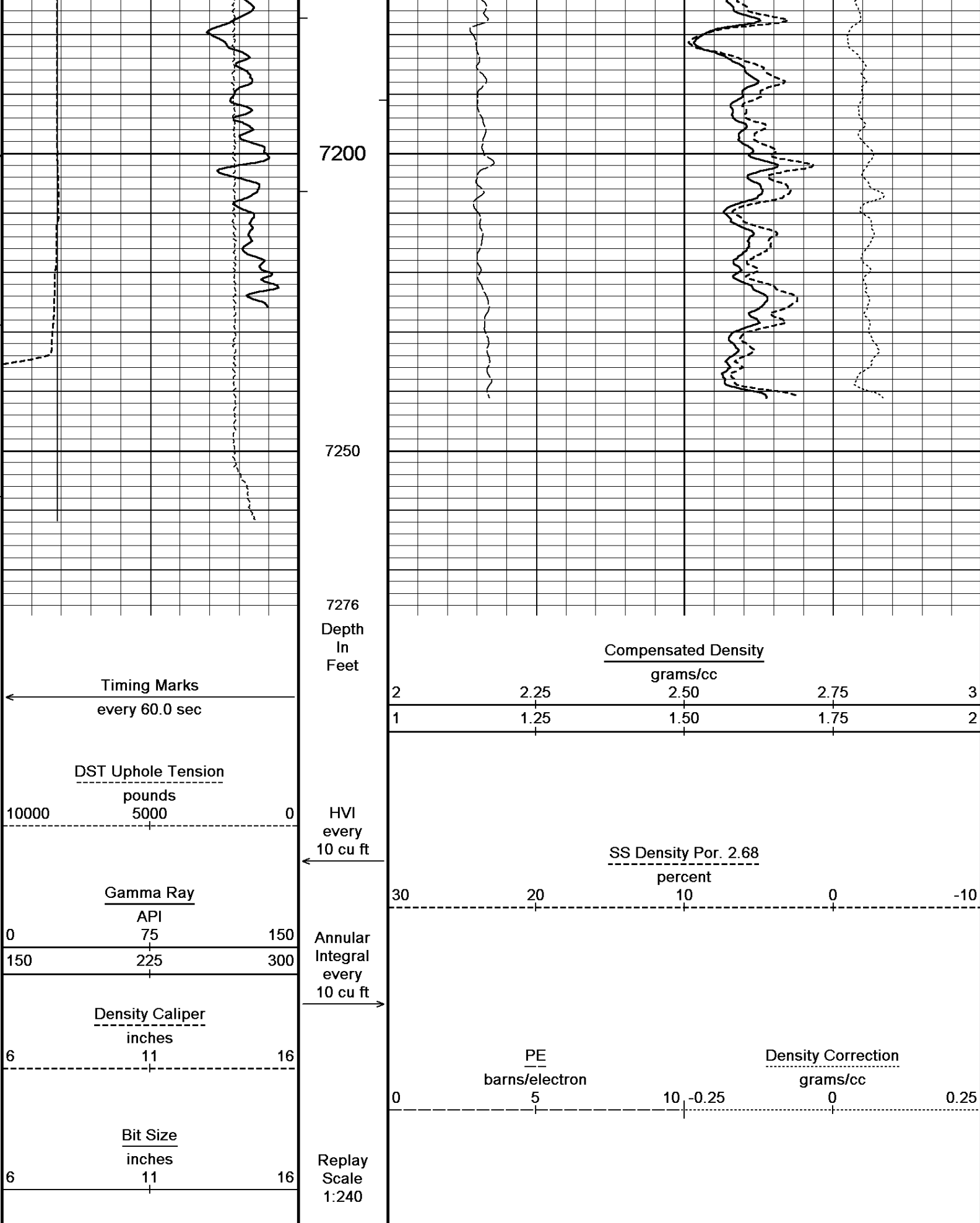






7000
7050
7100
7150







OVERLAY



Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 25-NOV-2010 09:42

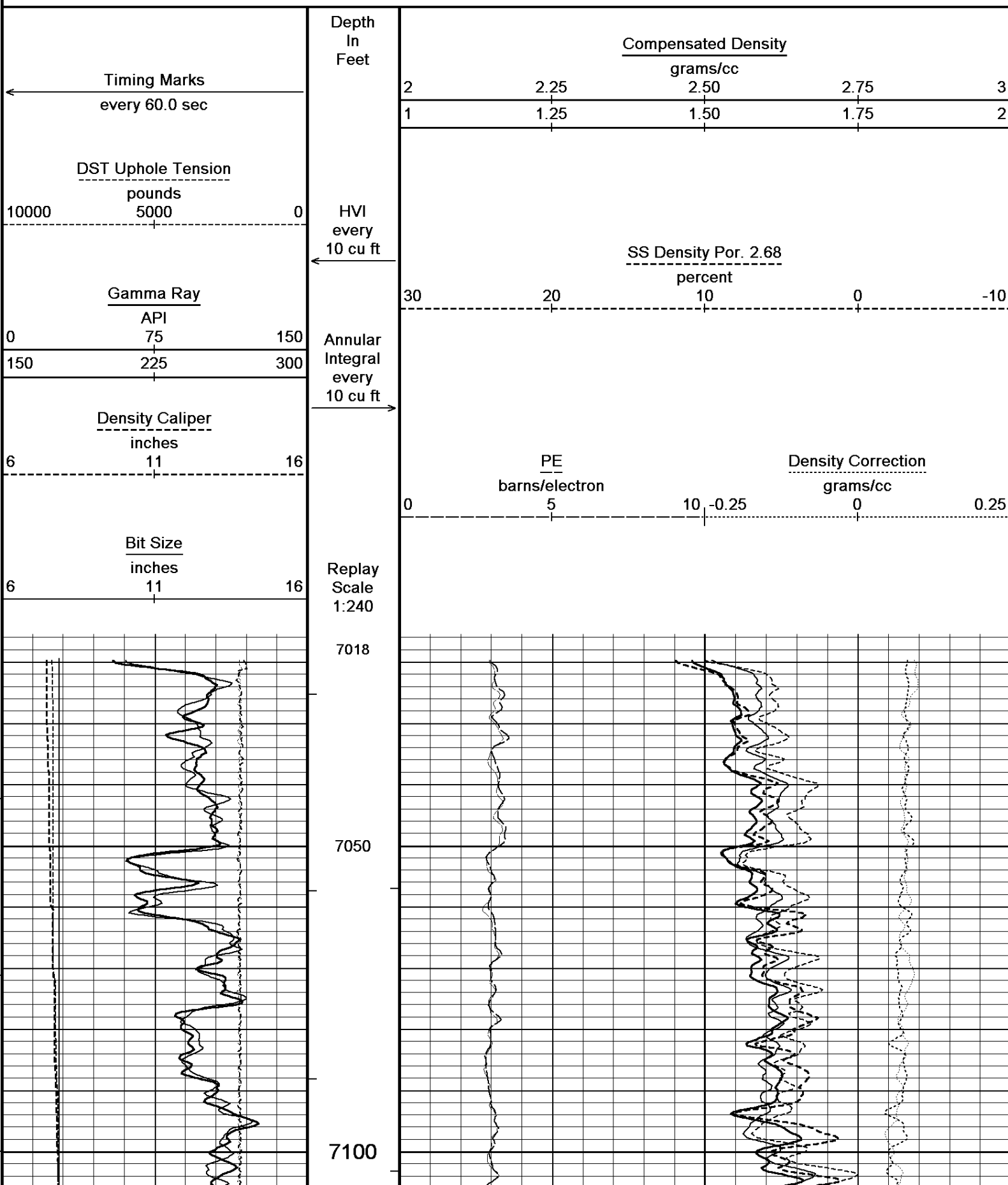
Filename: C:\Minimus\LOGS\Bill Barrett\GGU Miller 23B-32-691\ML.dta

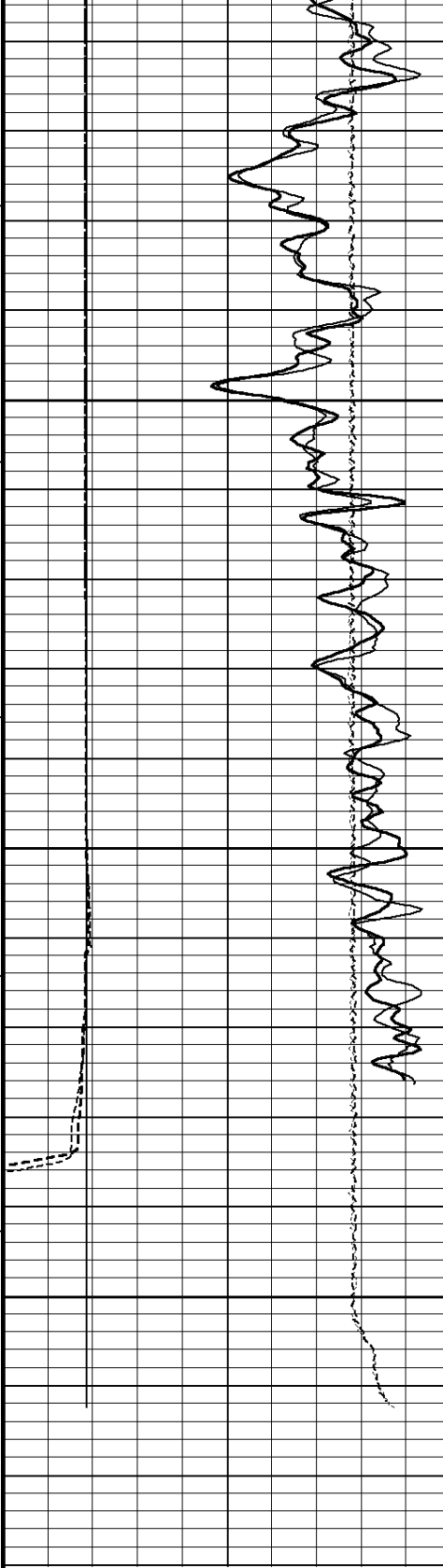
Recorded on 25-NOV-2010 08:59

Filename: C:\Minimus\LOGS\Bill Barrett\GGU Miller 23B-32-691\RP.dta

Recorded on 25-NOV-2010 06:33

System Versions: Logged with 10.08.1568 Plotted with 10.08.1568





7150

7200

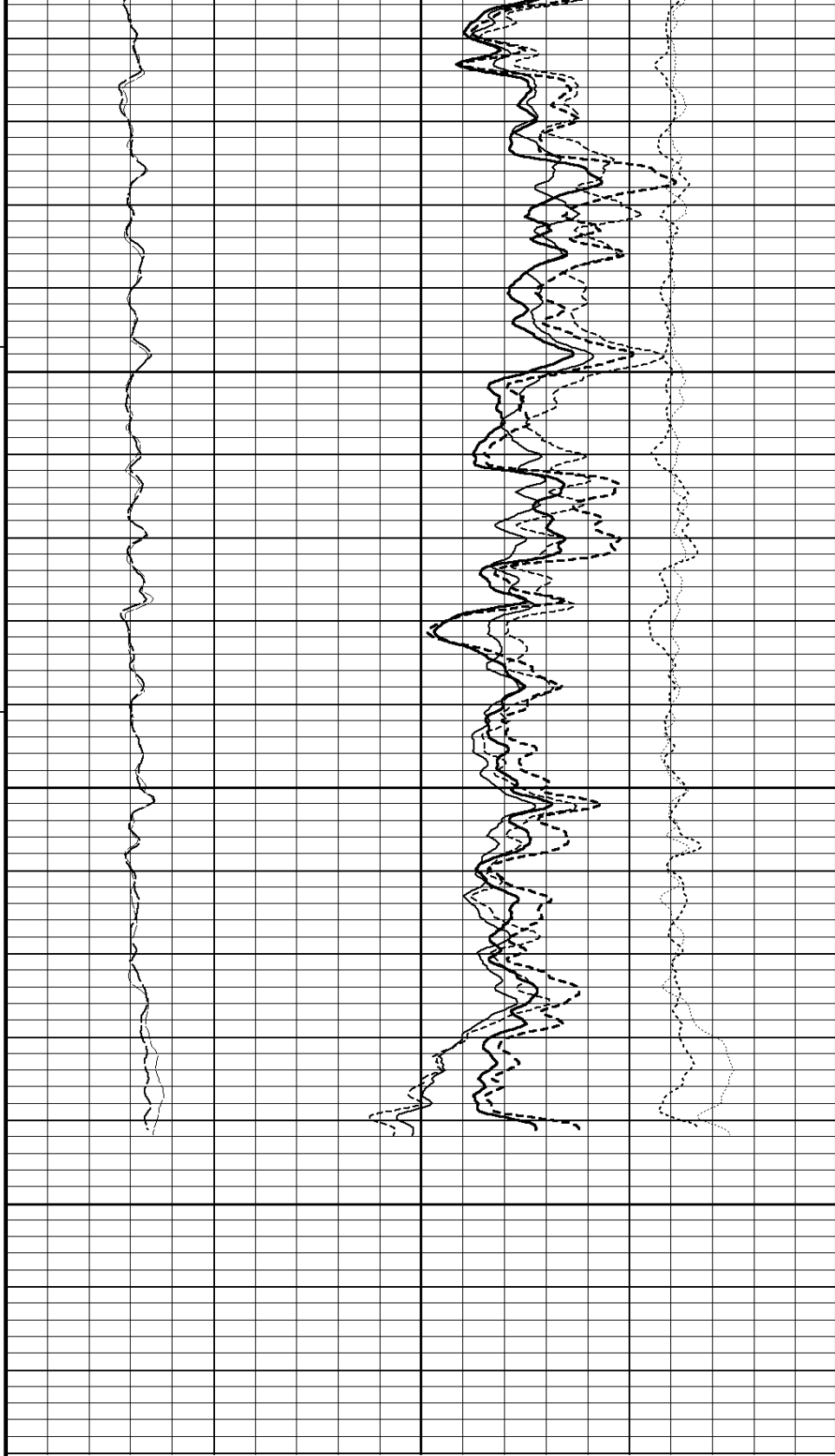
7250

7278
Depth
In
Feet

Timing Marks
every 60.0 sec

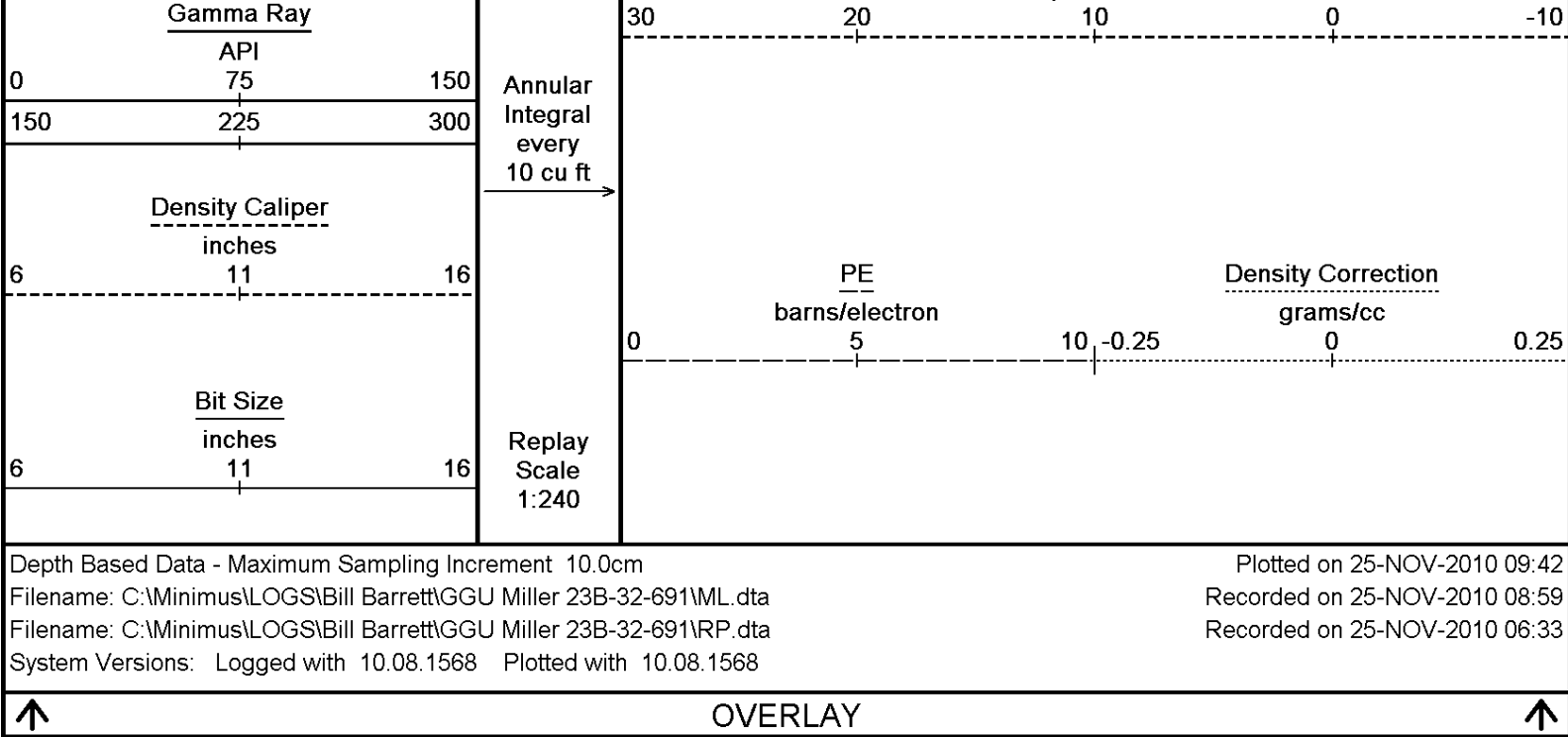
DST Uphole Tension
pounds
10000 5000 0

HVI
every
10 cu ft



Compensated Density
grams/cc
2 2.25 2.50 2.75 3
1 1.25 1.50 1.75 2

SS Density Por. 2.68
percent



BEFORE SURVEY CALIBRATION			
C:\Minimus\LOGS\Bill Barrett\GGU Miller 23B-32-691\SETUP.dta			
General Constants All 000		Last Edited on 25-NOV-2010,00:49	
General Parameters			
Mud Resistivity	2.160	ohm-metres	
Mud Resistivity Temperature	87.700	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	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 25-NOV-2010 02:36	
Reading No	Measured	Calibrated (lbs)	
1	15330.33	0.00	
2	17092.43	363.80	
High Resolution Temperature Calibration MCG 287		Field Calibration on 25-NOV-2010,00:57	
	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		
SP Calibration MCG 287		Field Calibration on 25-NOV-2010,00:57	
	Measured	Calibrated (mV)	
Reference 1	95.0	104.2	
Reference 2	-87.4	-104.5	

Gamma Calibration MCG 287			Field Calibration on 25-NOV-2010 00:56		
	Measured		Calibrated (API)		
Background	110		74		
Calibrator (Gross)	889		601		
Calibrator (Net)	779		527		
Gamma Constants MCG 287			Last Edited on 25-NOV-2010,00:52		
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 25-NOV-2010 01:01		
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)		
			2156 3108		
Ratio			0.694		
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	0.00		kpsi		
Temperature Source	None				
Temperature	20.00		degrees F		
Mud Salinity	1.00		kppm		
Formation Fluid Salinity Source	None				
Formation Fluid Salinity	0.00		kppm		
Barite Mud Correction	Not Applied				
FE Calibration MFE 179			Base Calibration on 15-OCT-2010 11:16 Field Check on 25-NOV-2010 02:40		
Base Calibration					
	Measured		Calibrated (ohm-m)		
Reference 1	0.0		0.0		
Reference 2	962.4		126.8		
Base Check			280.5		
Field Check			280.5		
FE Constants MFE 179			Last Edited on 25-NOV-2010,01:05		
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 25-NOV-2010,01:06	
		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 22-NOV-2010,16:09 Field Check on 25-NOV-2010 02:39	
Base Calibration						
Test Loop Calibration		Measured		Calibrated (mmho/m)		
Channel		Low	High	Low	High	
1		16.5	486.3	9.3	966.2	
2		5.8	391.9	7.6	821.4	
3		3.0	262.9	5.2	566.0	
4		1.4	138.3	2.6	279.2	
Array Temperature		74.6		Deg F		
Channel	Base Check (mmho/m)		Field Check (mmho/m)			
	Low	High	Low	High		
1	0.0	0.0	15.0	3748.4		
2	0.0	0.0	30.9	3455.1		
3	0.0	0.0	29.7	3022.5		
4	0.0	0.0	20.2	2002.7		
Deep	0.0	0.0	18.7	1962.3		
Medium	0.0	0.0	43.1	4026.1		
Shallow	0.0	0.0	45.5	5108.4		
Array Temperature		0.0		74.7	Deg F	
Induction Constants MAI 106					Last Edited on 25-NOV-2010,02:39	
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					

Base Calibration on 25-NOV-2010,01:03
Field Calibration on 25-NOV-2010,01:04

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 25-NOV-2010 02:44

Density Calibration		Measured		Calibrated (sdu)	
Base Calibration		Near	Far	Near	Far
Reference 1	52933	16878	53237	19445	
Reference 2	24114	2409	25135	2545	

Field Check at Base	1196.9	1213.9
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Field Check	1191.9	1211.7
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PE Calibration

Base Calibration	WS	WH	Ratio	Calibrated 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
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Field Check	213.6	1053.6
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Density Constants MPD 220

Last Edited on 25-NOV-2010,01:02

[illegible]

DOWNHOLE EQUIPMENT

C:\Minimus\LOGS\Bill Barrett\GGU Miller 23B-32-691\ML.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

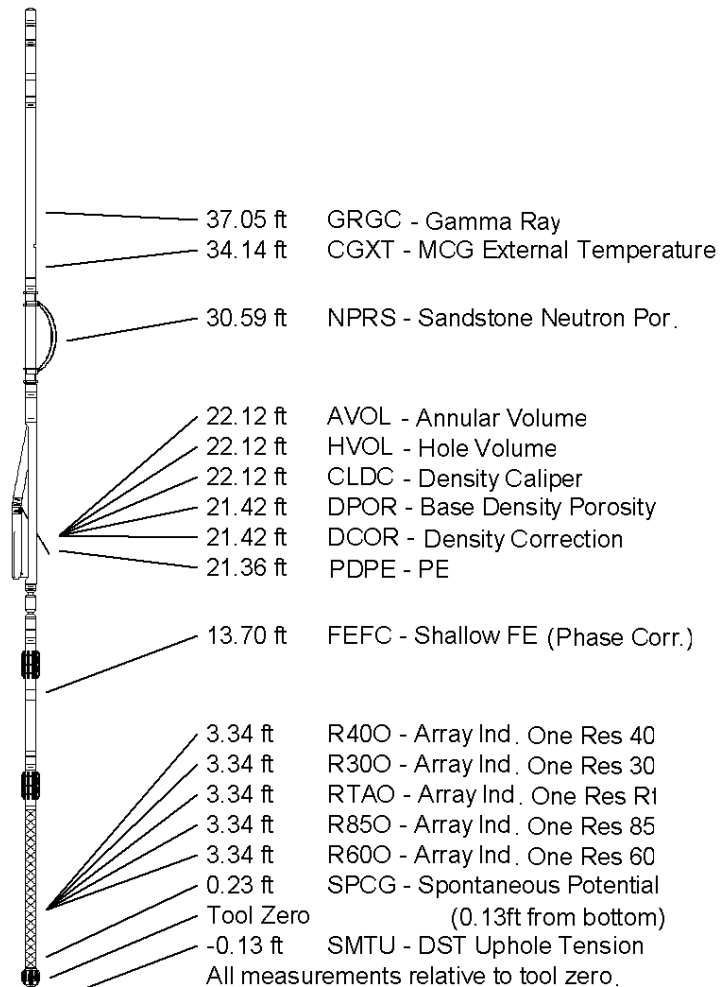
Compact Density/Caliper
MPD 220 Length: 9.59 ft Weight: 90.4 lb

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 23B-32-691
FIELD	GIBSON GULCH
PROVINCE/COUNTY	GARFIELD
COUNTRY/STATE	U.S.A. / COLORADO

Elevation Kelly Bushing	6144.00	feet	First Reading	7232.00	
Elevation Drill Floor	6143.00	feet	Depth Driller	7250.00	feet
Elevation Ground Level	6121.00	feet	Depth Logger	7253.00	feet



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