

COMPENSATED PHOTO DENSITY COMPENSATED DUAL NEUTRON LOG

COMPANY				WHITING OIL & GAS			
WELL				BOIES #B-19P-O3			
FIELD				SULPHUR CREEK			
PROVINCE/COUNTY				RIO BLANCO			
COUNTRY/STATE				U.S.A. / COLORADO			
LOCATION				SHL: 306' FSL & 1184' FEL			
				BHL: 515' FSL & 2019' FEL			
LSD	SEC	TWP	RGE	Other Services			
	19	2S	97W	MAI/MFE			
API Number		05-103-11067					
Permit Number							
Permanent Datum				G.L., Elevation 6246 feet		Elevations:	
Log Measured From K.B. @ 30 FEET above Permanent Datum						KB	6278.00
Drilling Measured From K.B.						DF	6277.00
						GL	6248.00
Date	15-JUL-2008						
Run Number	ONE						
Depth Driller	10930.00			feet			
Depth Logger	10954.00			feet			
First Reading	10933.00			feet			
Last Reading	4966.00			feet			
Casing Driller	5000.00			feet			
Casing Logger	4966.00			feet			
Bit Size	8.75			inches			
Hole Fluid Type	LSND						
Density / Viscosity	9.60		lb/USg	60.00		CP	
PH / Fluid Loss	9.00			5.60		ml/30Min	
Sample Source	FLOW LINE						
Rm @ Measured Temp	1.56 @ 99.7			ohm-m			
Rmf @ Measured Temp	1.25 @ 99.7			ohm-m			
Rmc @ Measured Temp	1.87 @ 99.7			ohm-m			
Source Rmf / Rmc	CALC		CALC				
Rm @ BHT	0.67 @238.0		ohm-m				
Time Since Circulation	10 HOURS						
Max Recorded Temp	238.00		deg F				
Equipment Name	COMPACT						
Equipment / Base	13038		GDUCT				
Recorded By	C. PHILLIPS						
Witnessed By	A. FULLER						
Last Title	Last Line			Last Line			

BOREHOLE RECORD					Last Edited: 16-JUL-2008 14:56
Bit Size inches		Depth From feet		Depth To feet	
8.750		5000.00		11930.00	
CASING RECORD					
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft	
SURFACE	9.625	0.00	5000.00	36.00	

REMARKS
TOOLS RAN: SHA, MCG, MDN, MPD, SKJ, MFE, MAI RAN IN COMBINATION.
HARDWARE: MDN: DUAL NEUTRON BOWSPRING USED. MPD: 8 INCH PROFILE PLATE USED. MAI: TWO 0.5 INCH STANDOFFS USED.
FIRST RUN BRIDGED OFF AT 10013 FEET. RIG MADE WIPER TRIP IN AN ATTEMPT TO LOG THE BOTTOM SECTION. SECOND RUN T.D. 10954 FEET. DATA SPLICED AT 9950 FEET.
2.68 G/CC DENSITY MATRIX USED TO CALCULATE POROSITY.
ALL INTERVALS LOGGED AND SCALED PER CUSTOMER'S REQUEST.
LOGS WERE RAN FROM TD TO SURFACE CASING AS PER ONSITE COMPANY REP.
MAXIMUM DEVIATION APPROX 11 DEGREES.
BOREHOLE SIZE AND RUGOSITY WILL AFFECT DATA QUALITY.

TOTAL HOLE VOLUME FROM CASING TO T.D. WAS APPROXIMATELY 2580 CUBIC FEET.

ANNULAR HOLE VOLUME FROM SURFACE CASING TO T.D. BASED ON 4.5 INCH PRODUCTION CASING WAS APPROXIMATELY 1920 CUBIC FEET.

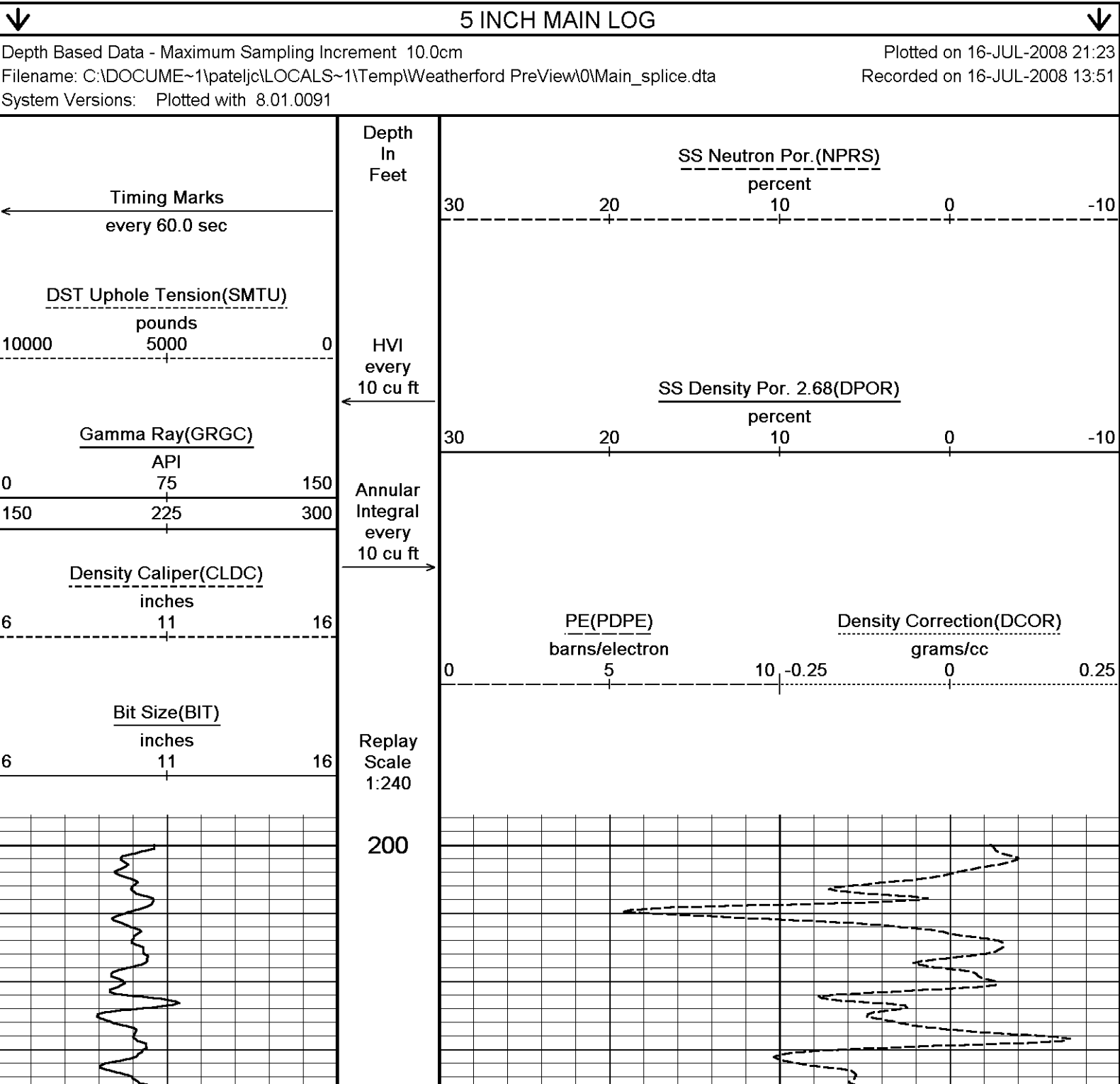
SERVICE ORDER # 3511307

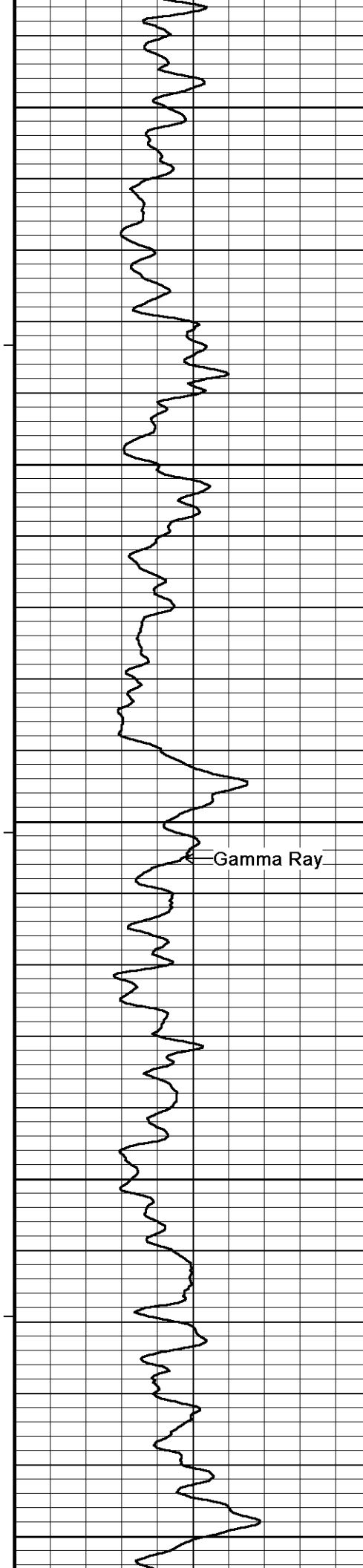
RIG: GREY WOLF #106

ENGINEER(S): C. PHILLIPS

OPERATOR(S): J. YOAKUM

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.





250

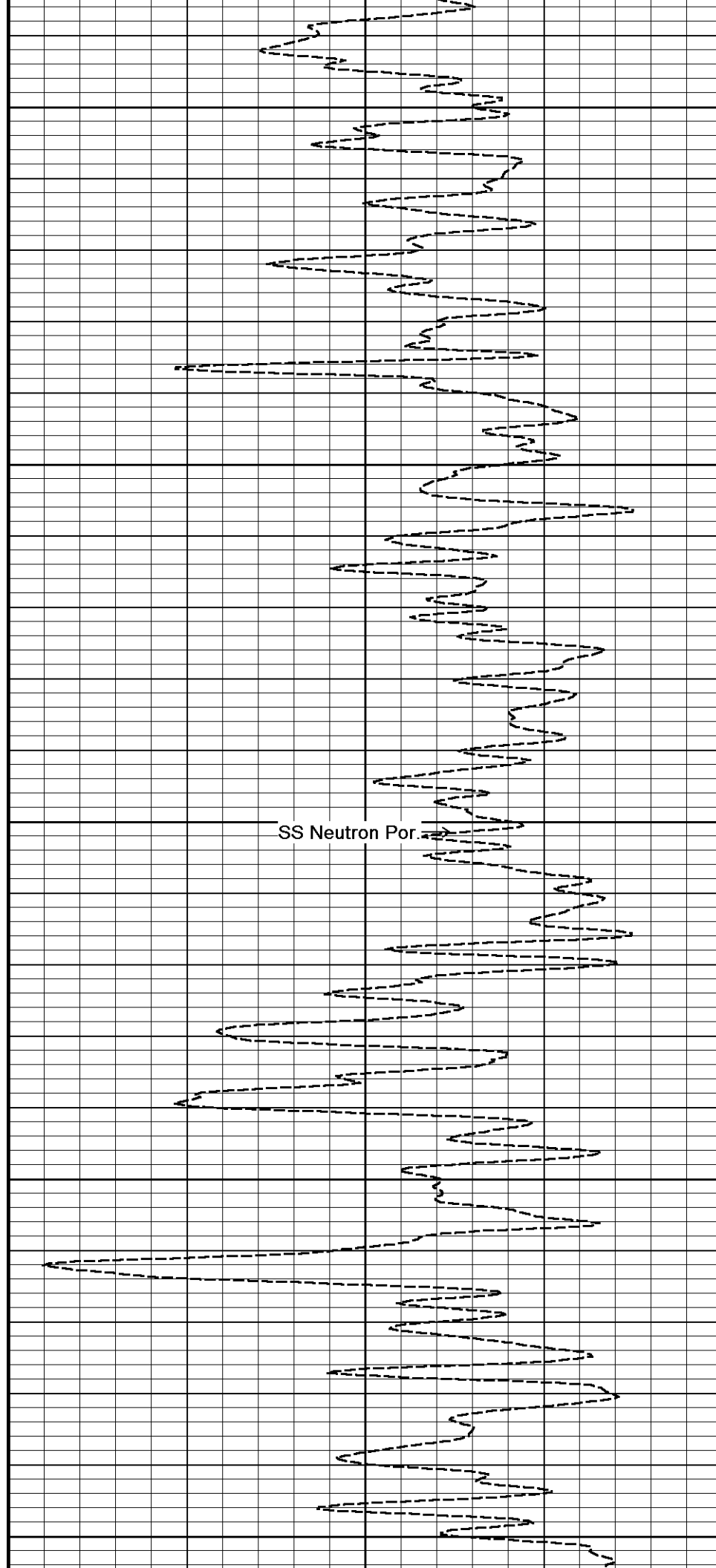
300

350

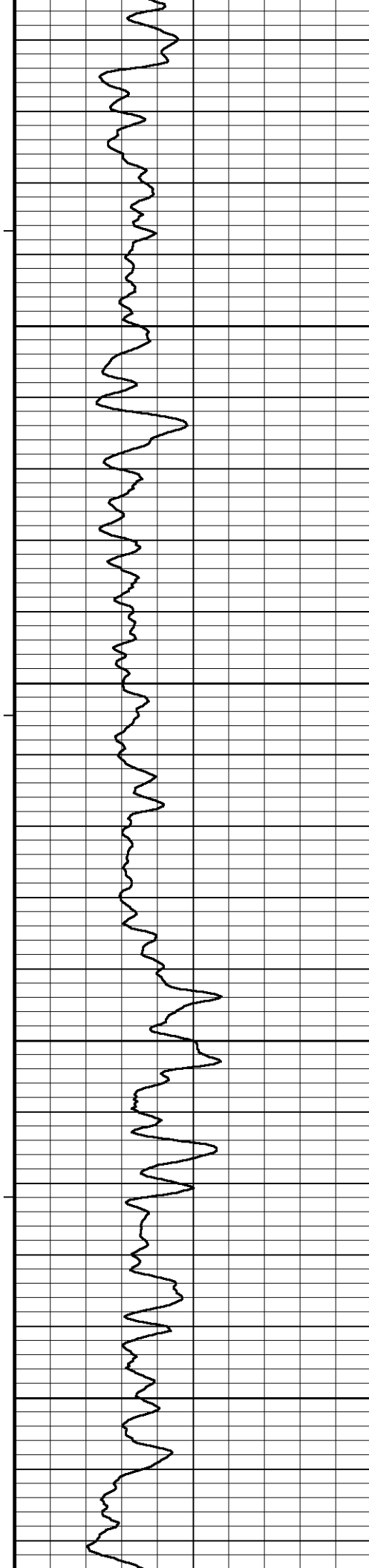
400

450

Gamma Ray



SS Neutron Por.

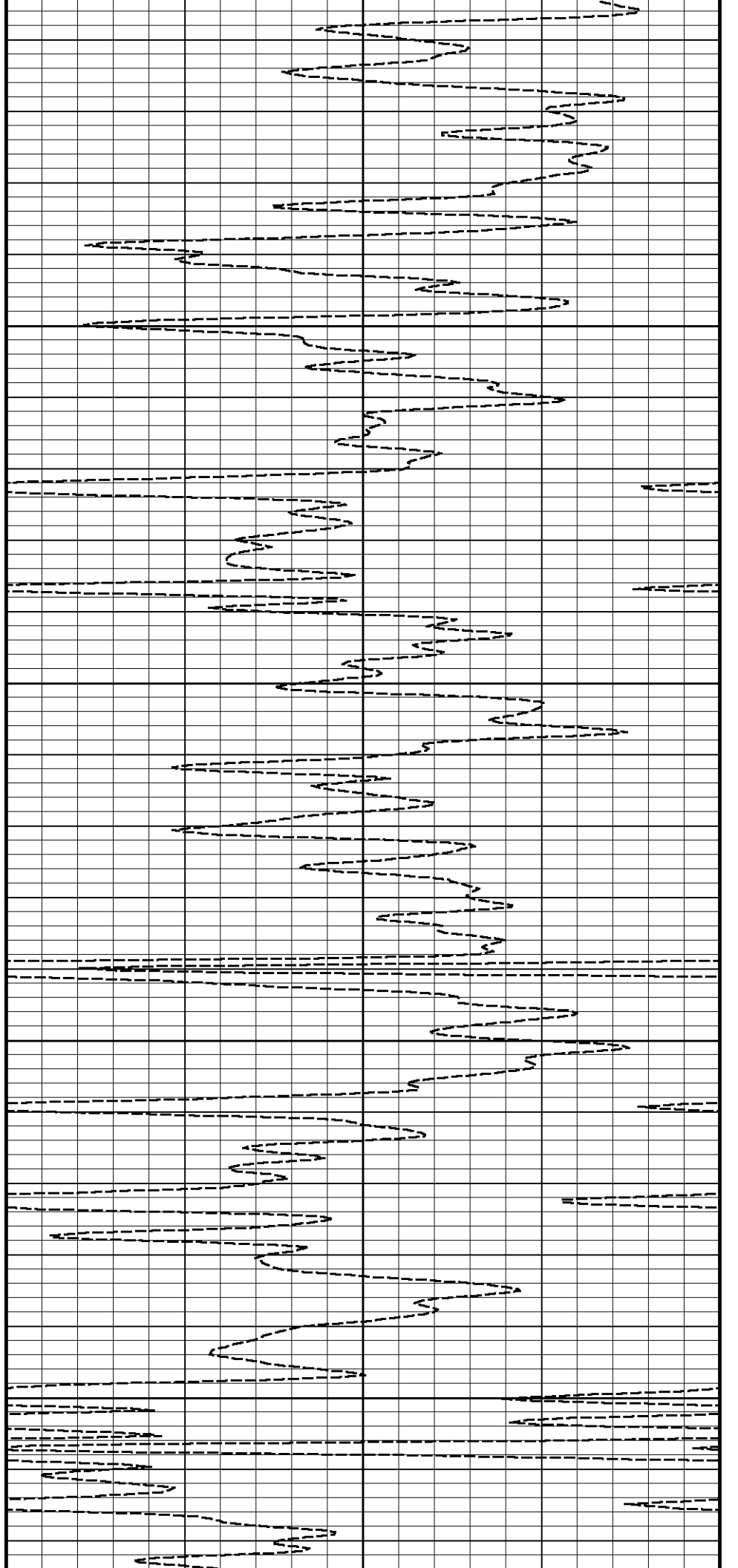


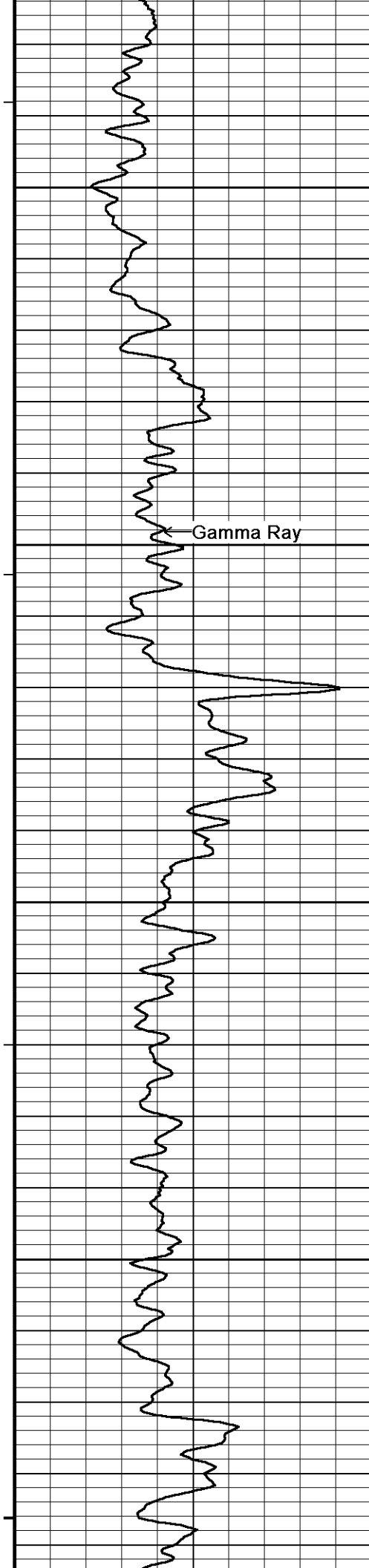
500

550

600

650



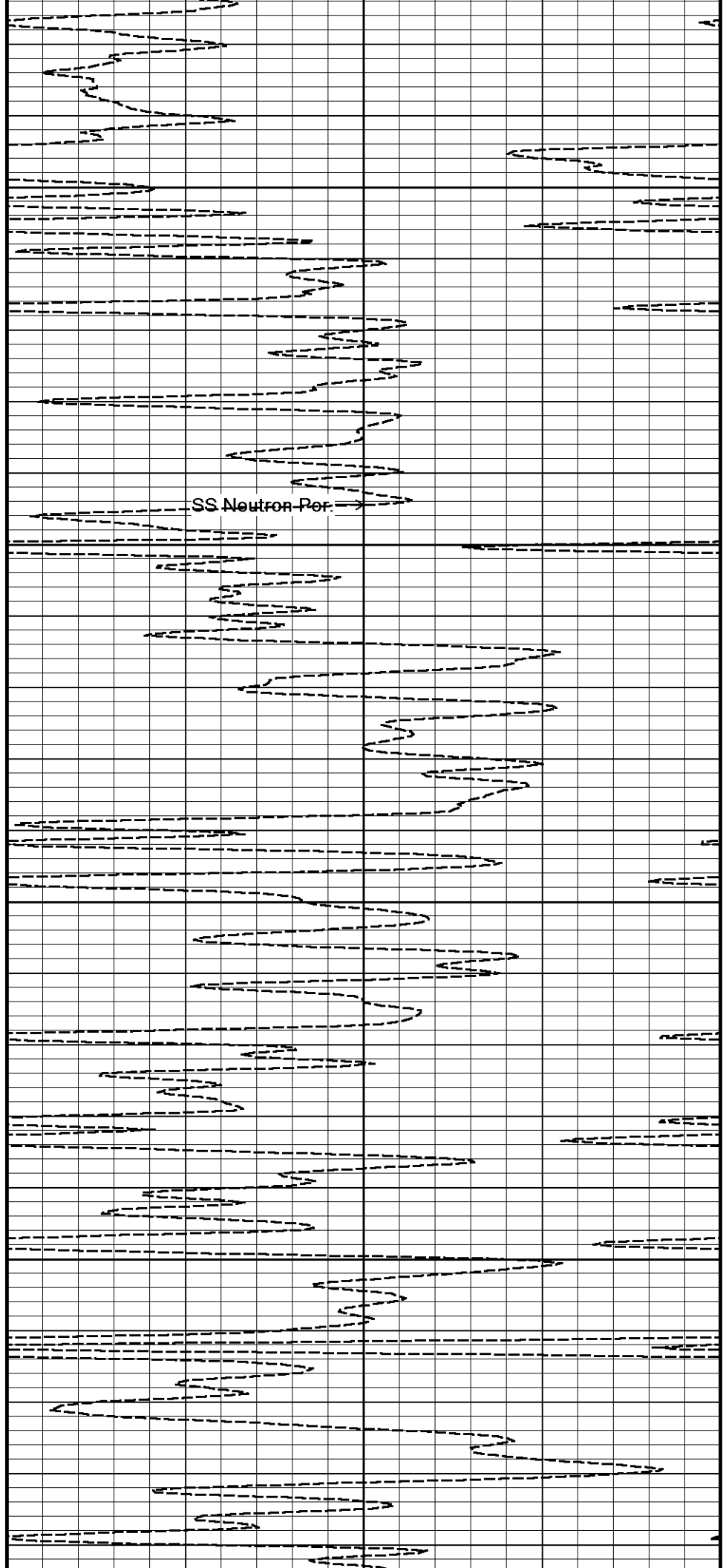


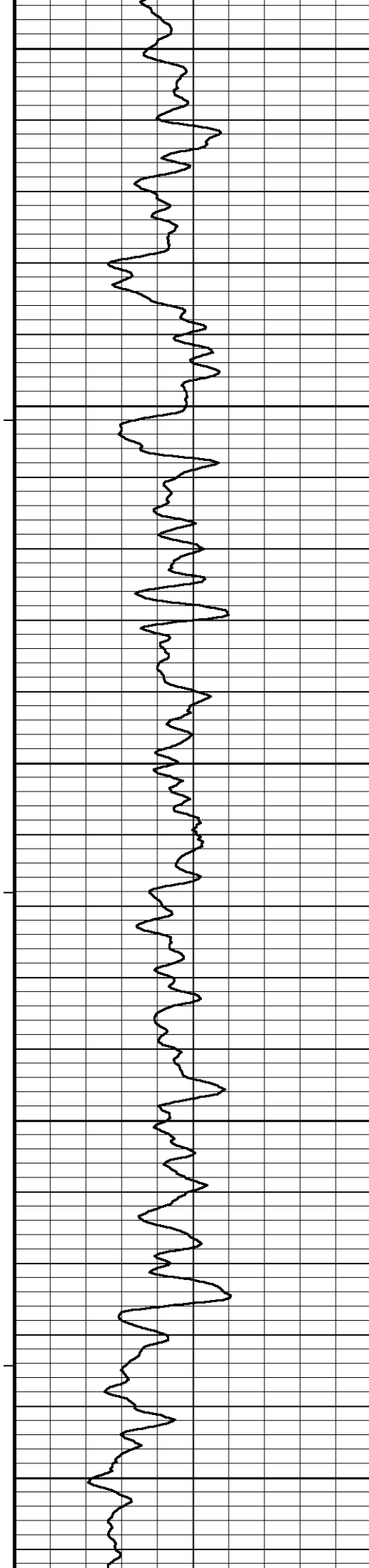
700

750

800

850





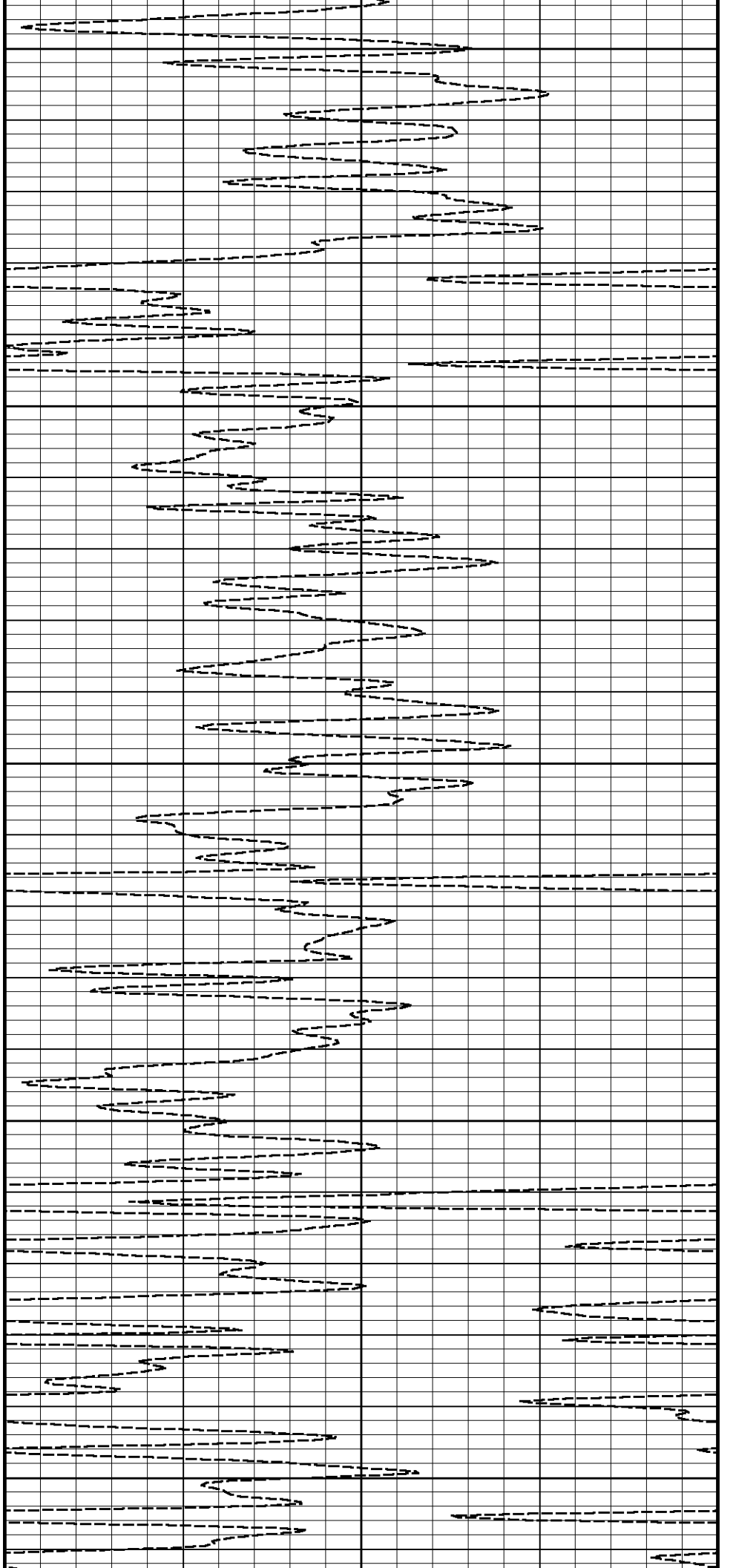
900

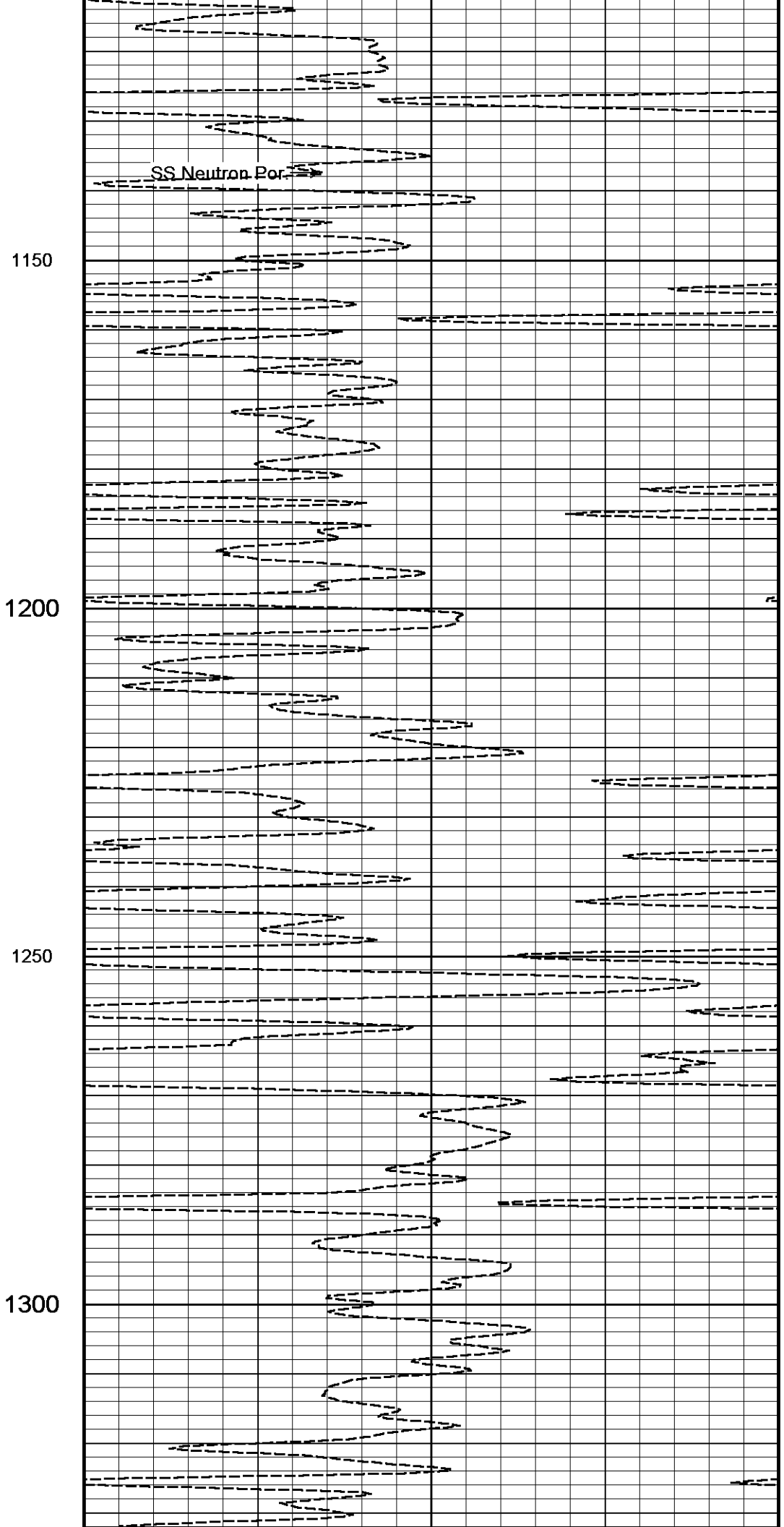
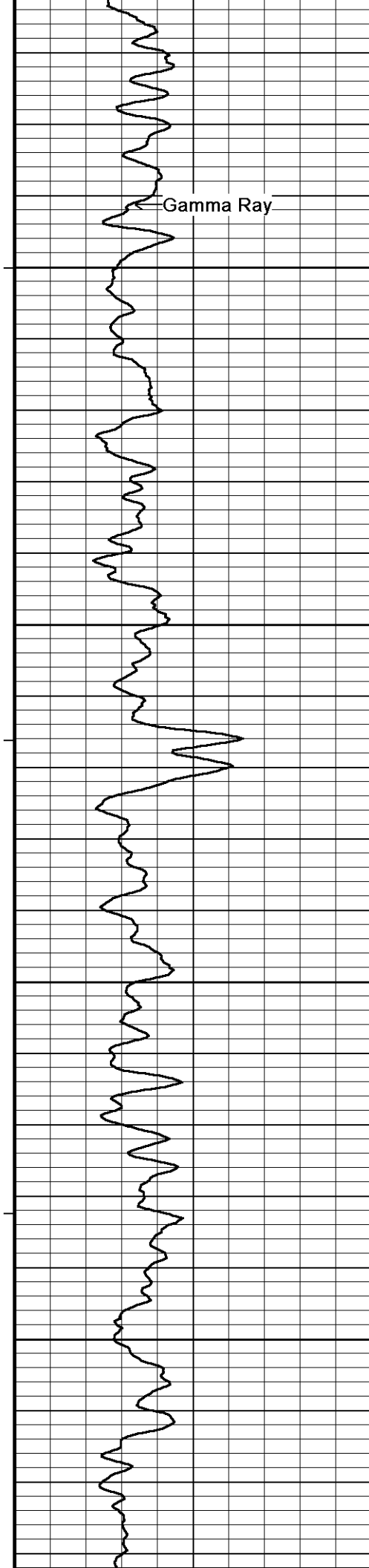
950

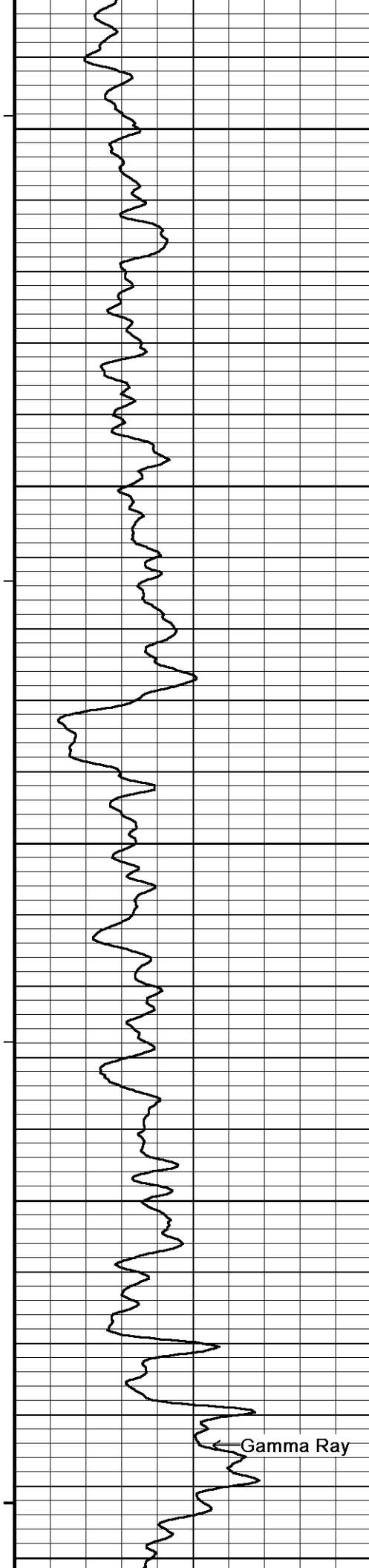
1000

1050

1100







Gamma Ray

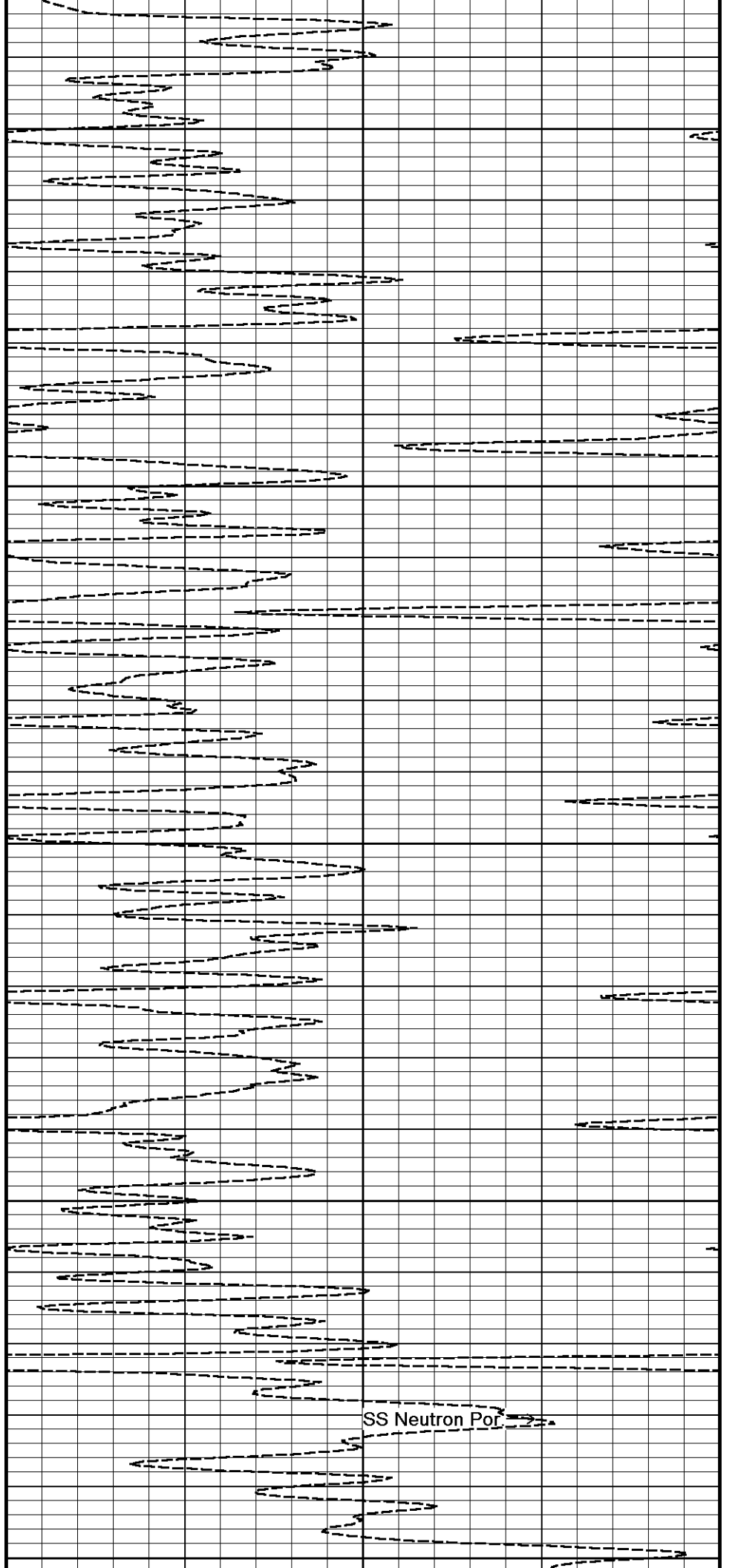
1350

1400

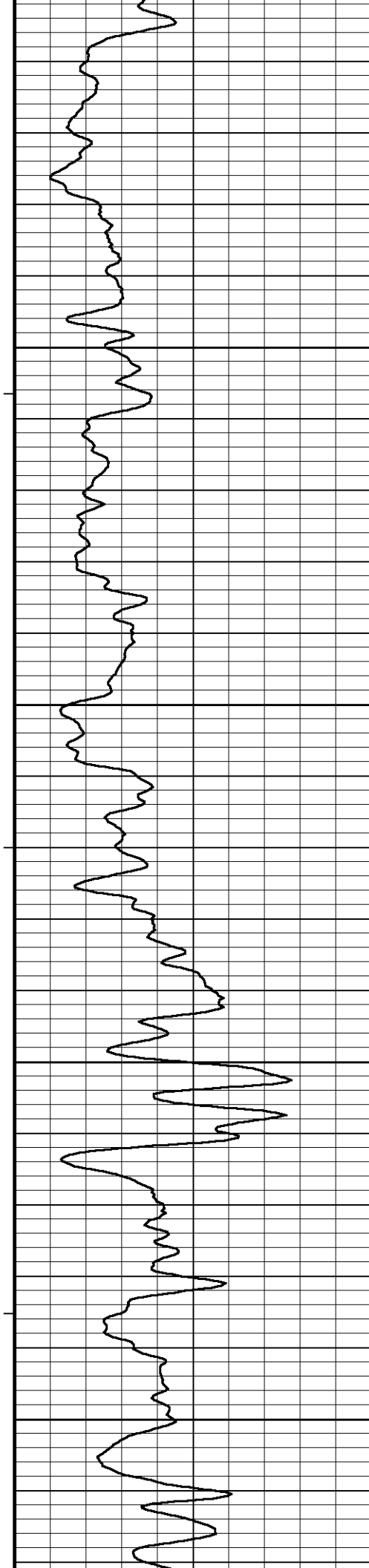
1450

1500

1550



SS Neutron Por

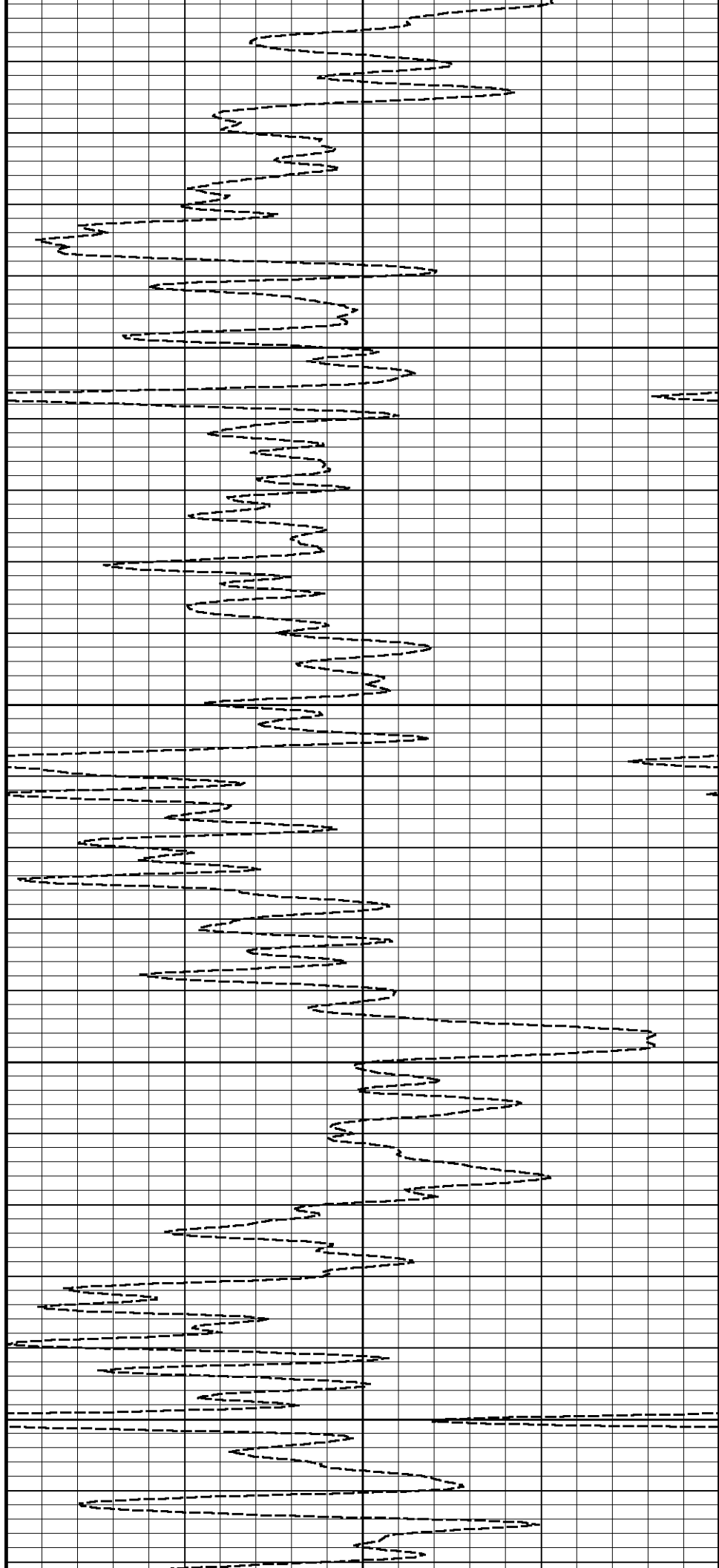


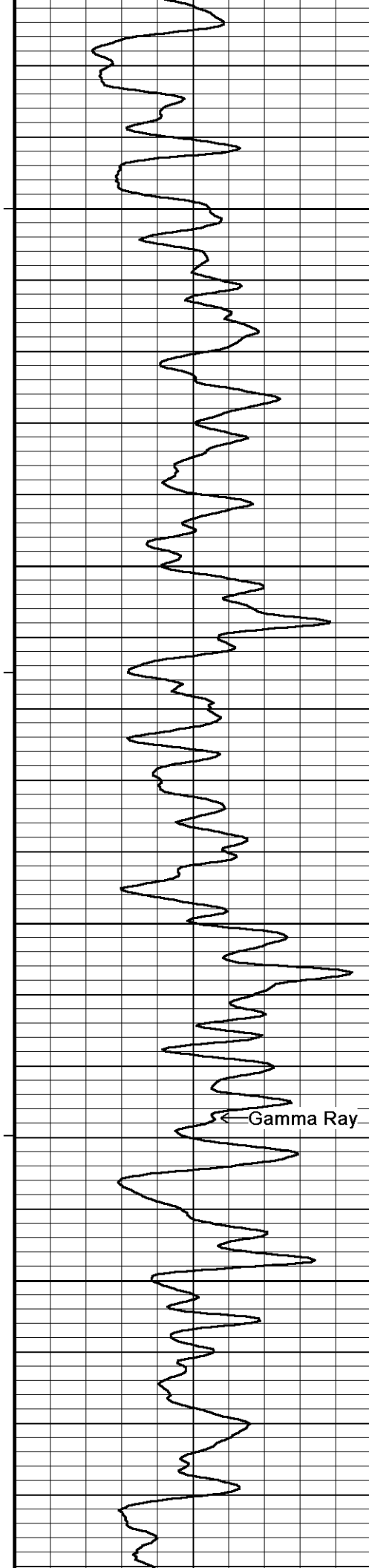
1600

1650

1700

1750





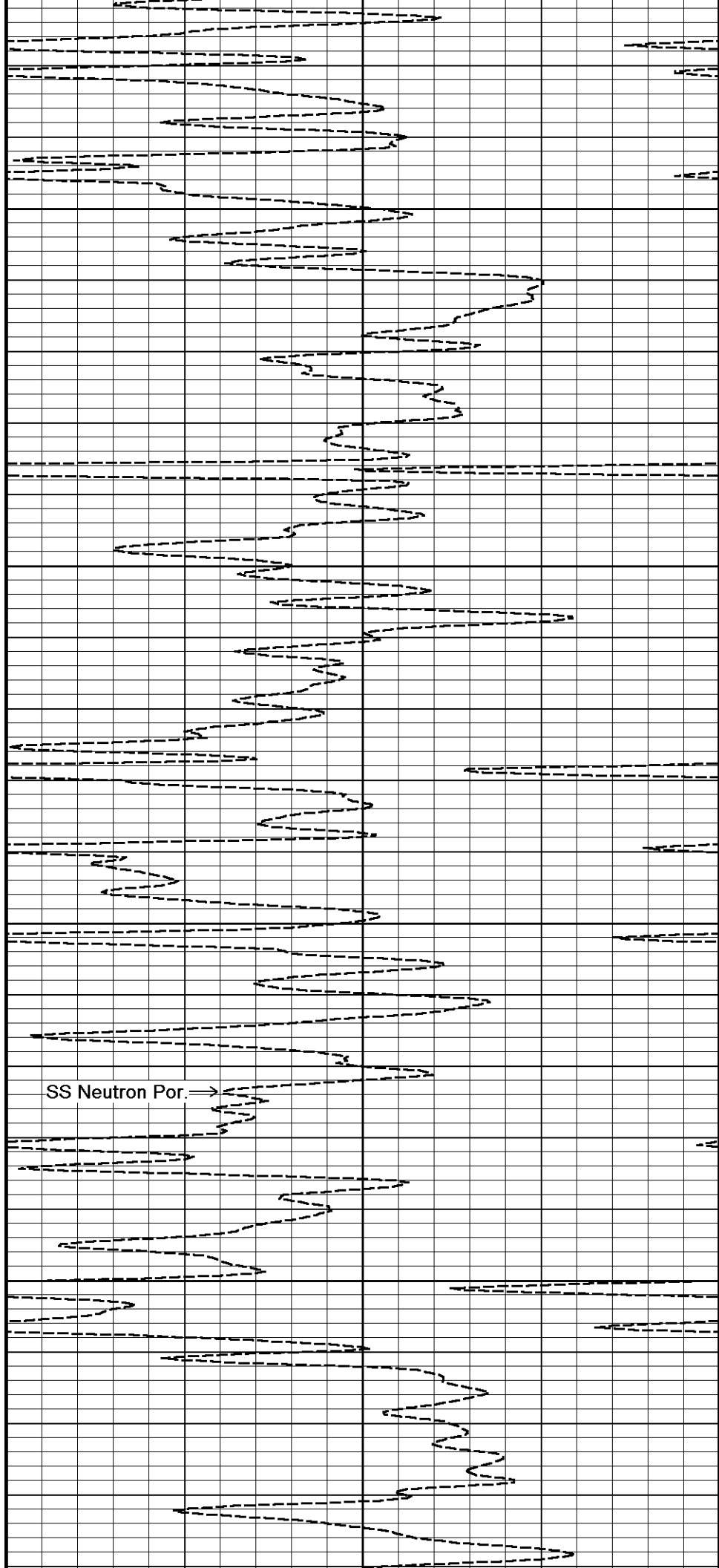
1800

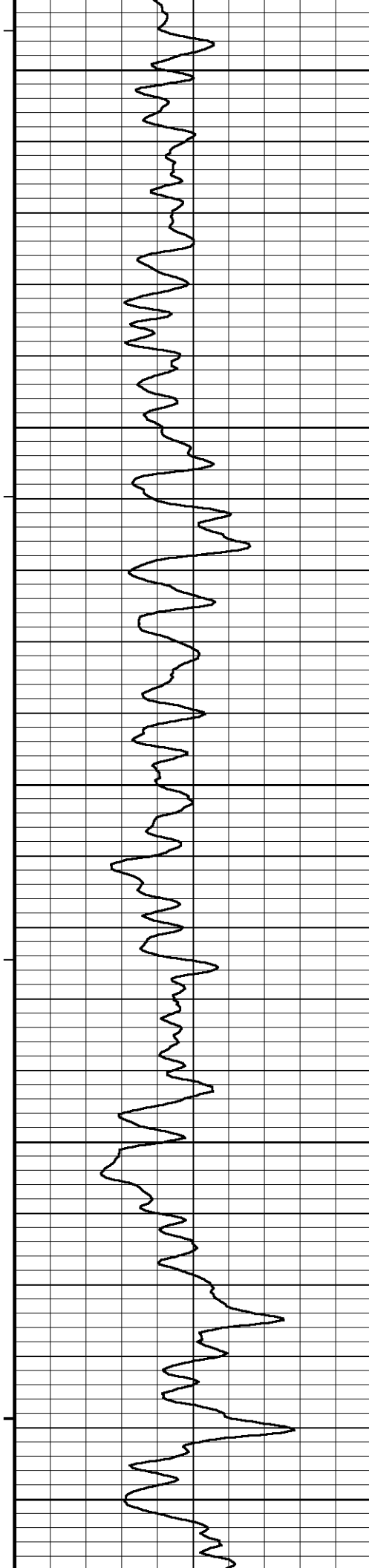
1850

1900

1950

SS Neutron Por. →





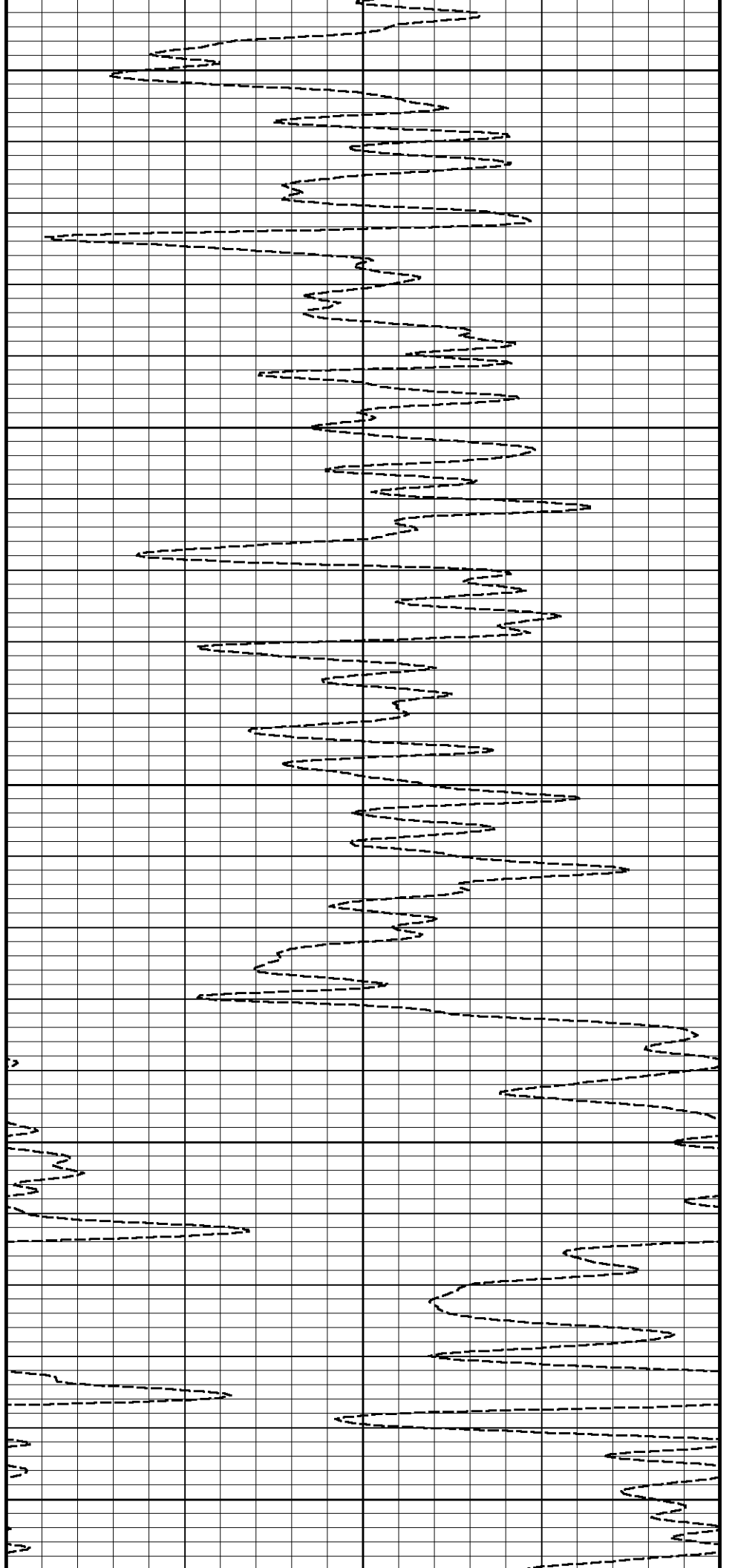
2000

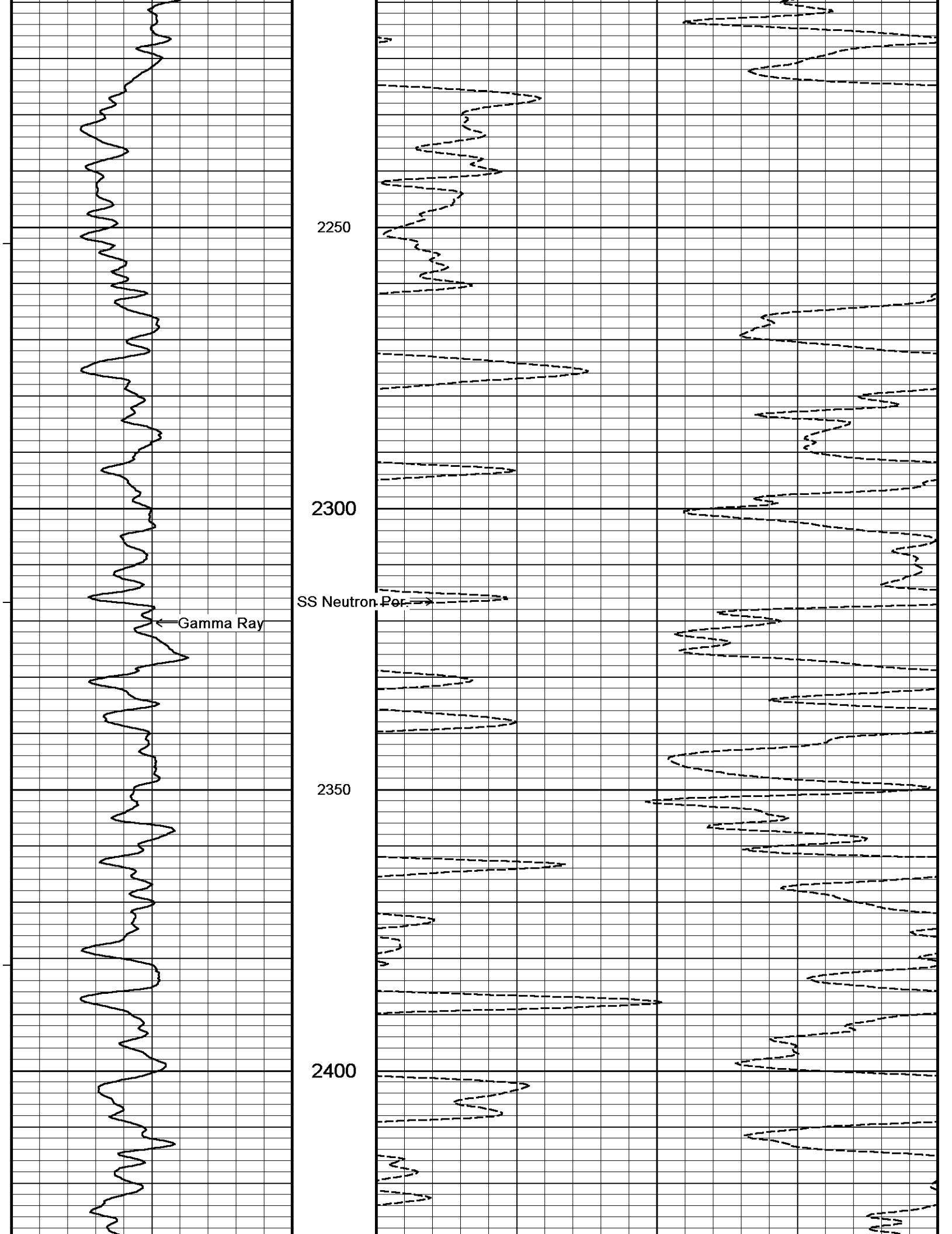
2050

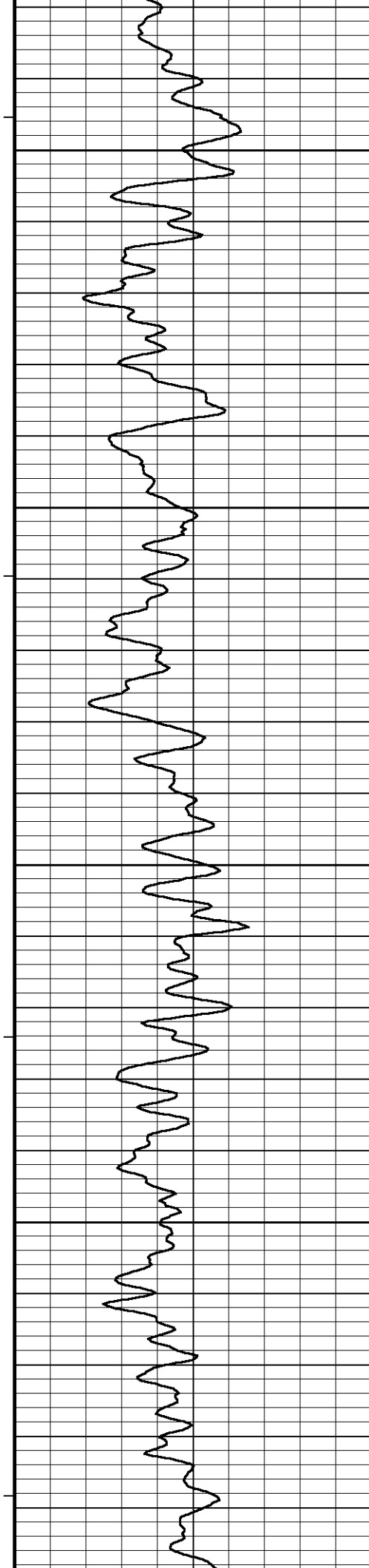
2100

2150

2200





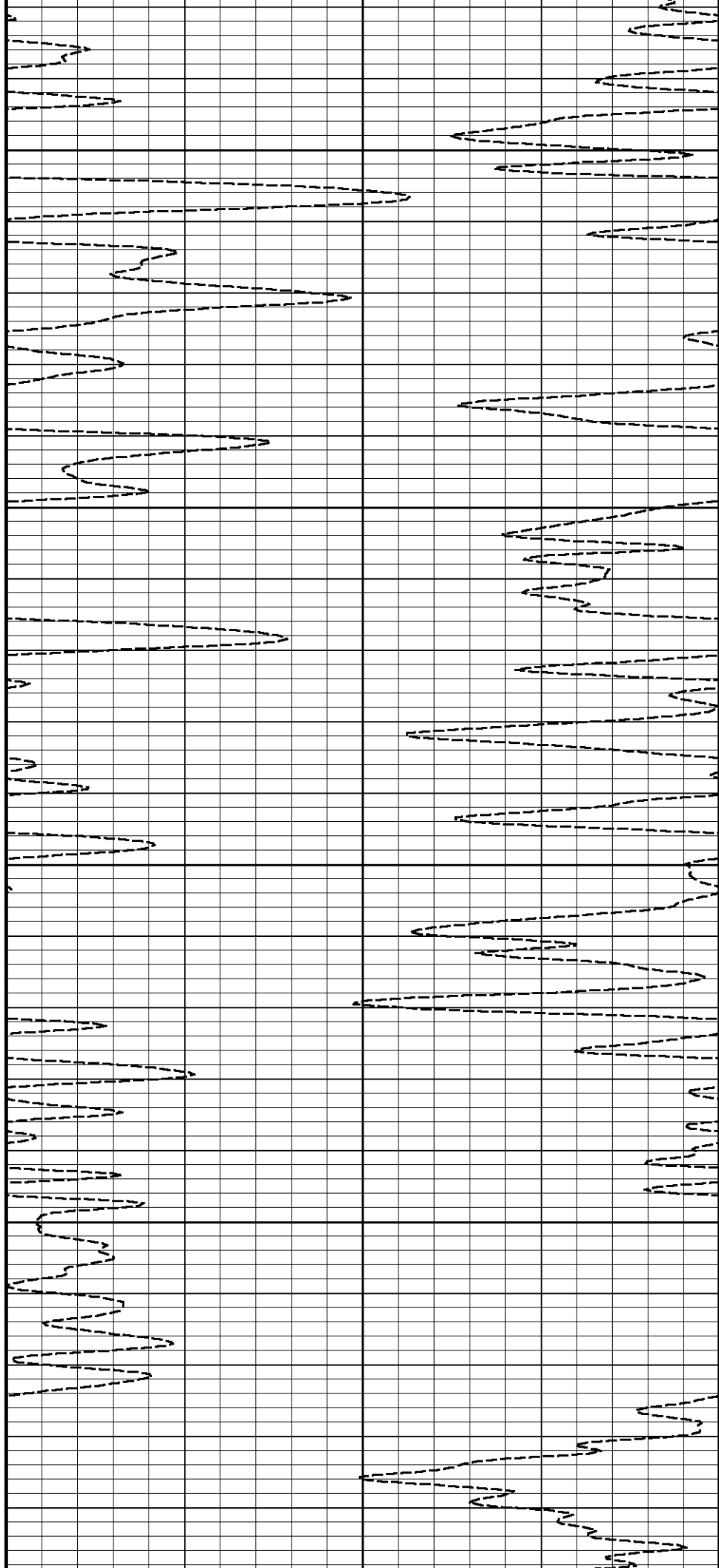


2450

2500

2550

2600





2650

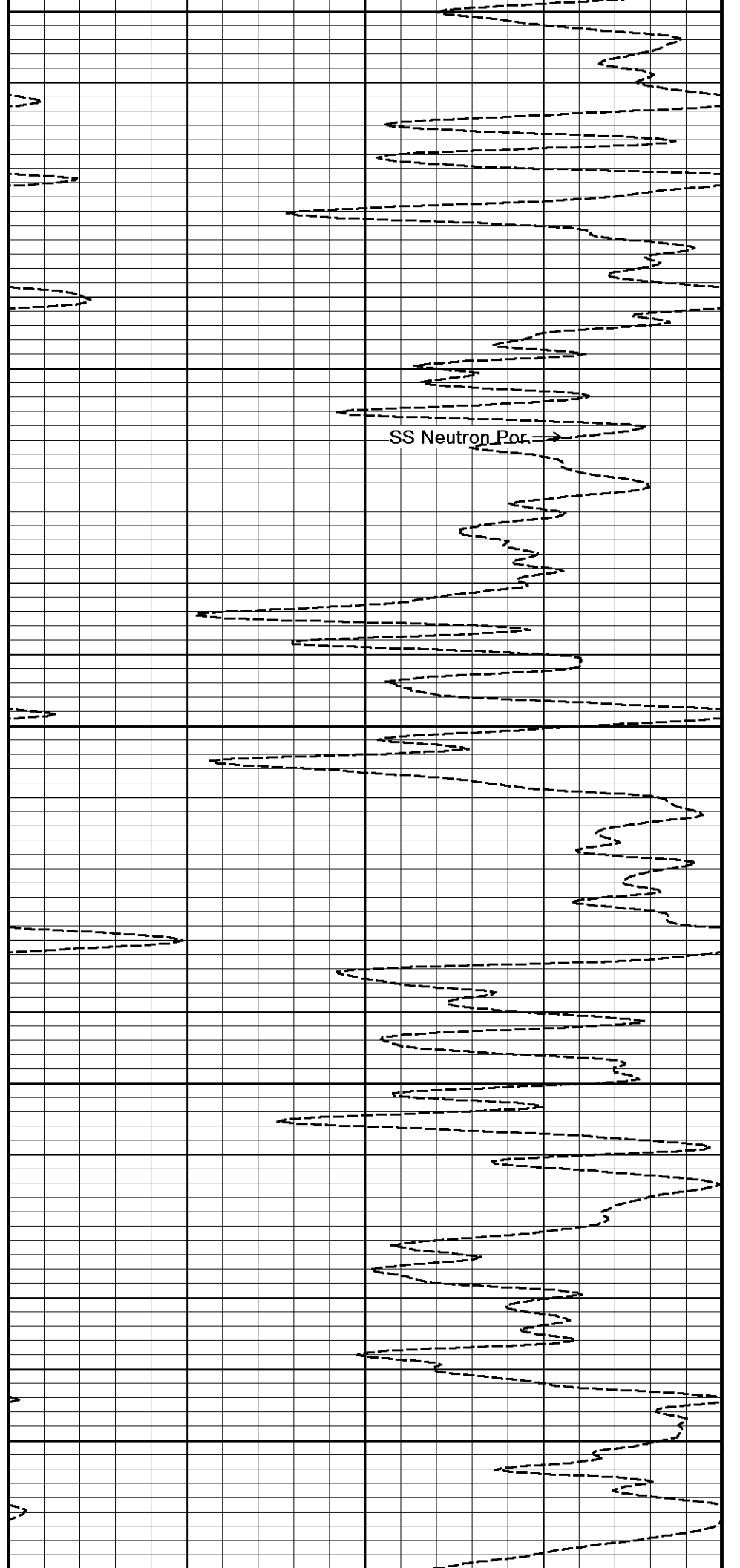
2700

2750

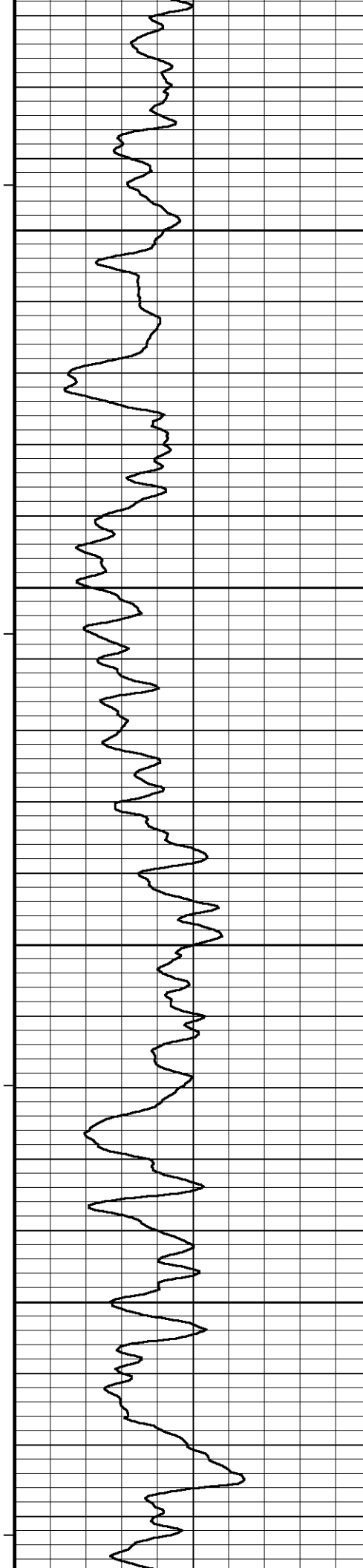
2800

2850

Gamma Ray



SS Neutron Por.

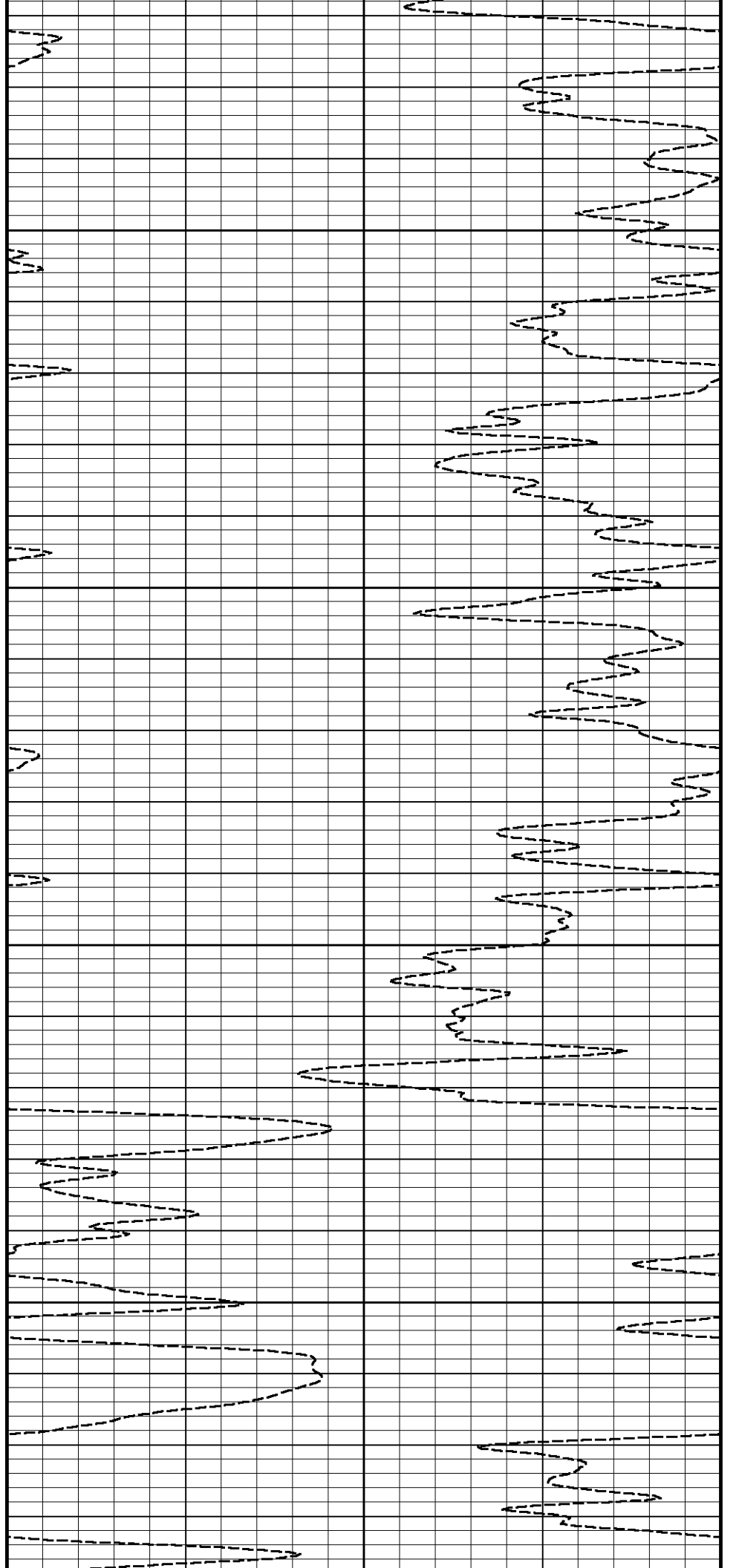


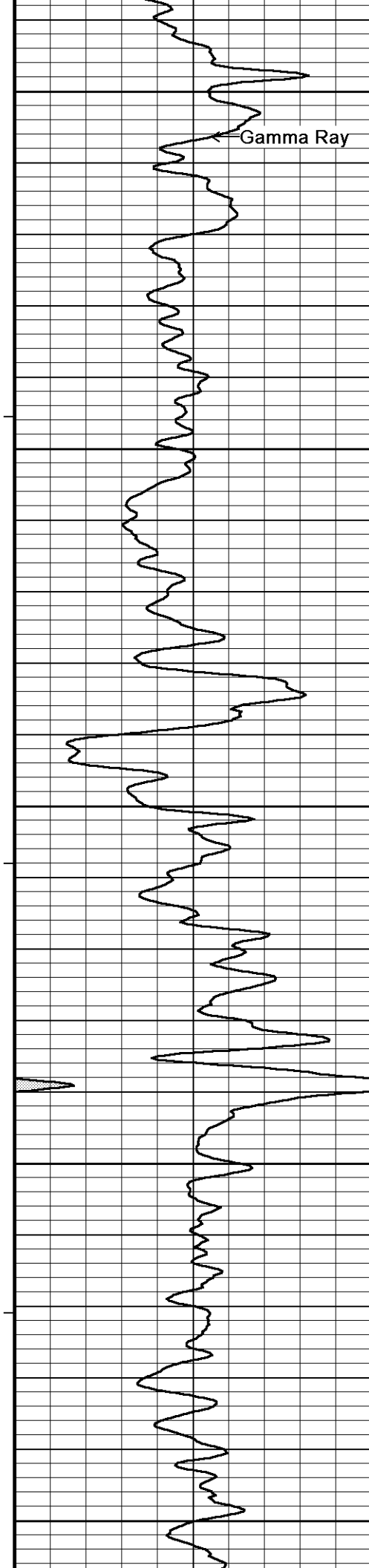
2900

2950

3000

3050





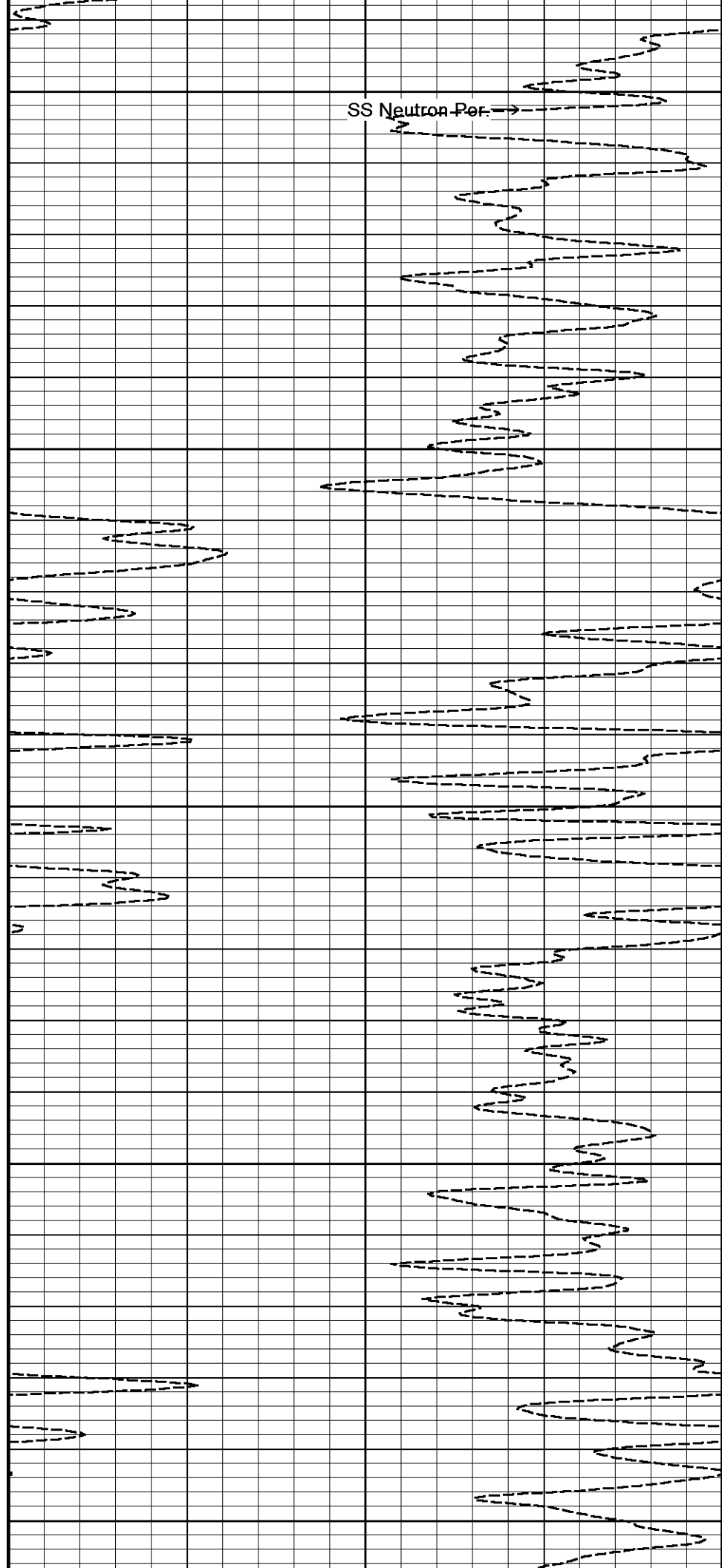
3100

3150

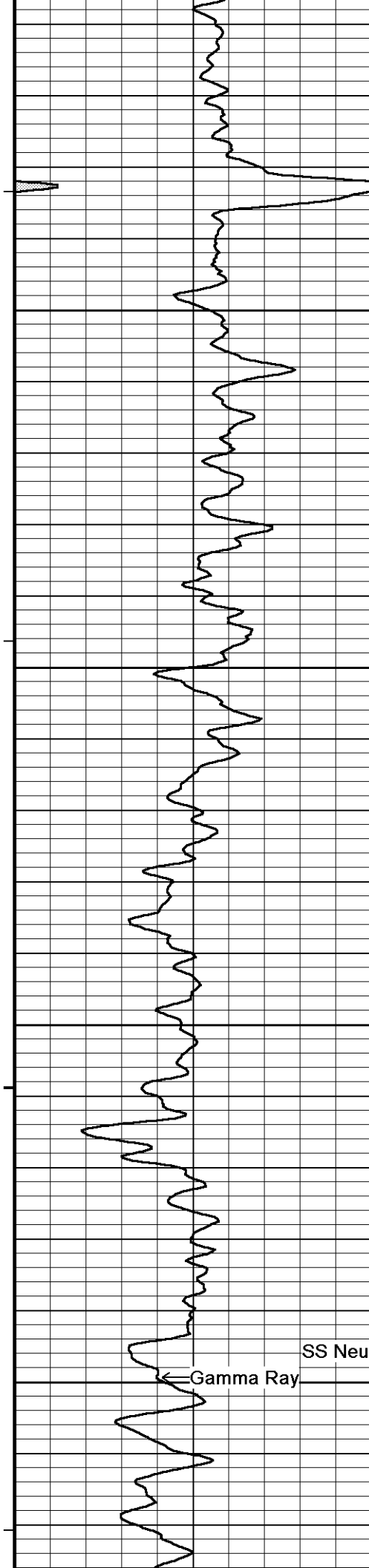
3200

3250

3300



SS Neutron Por. →



3350

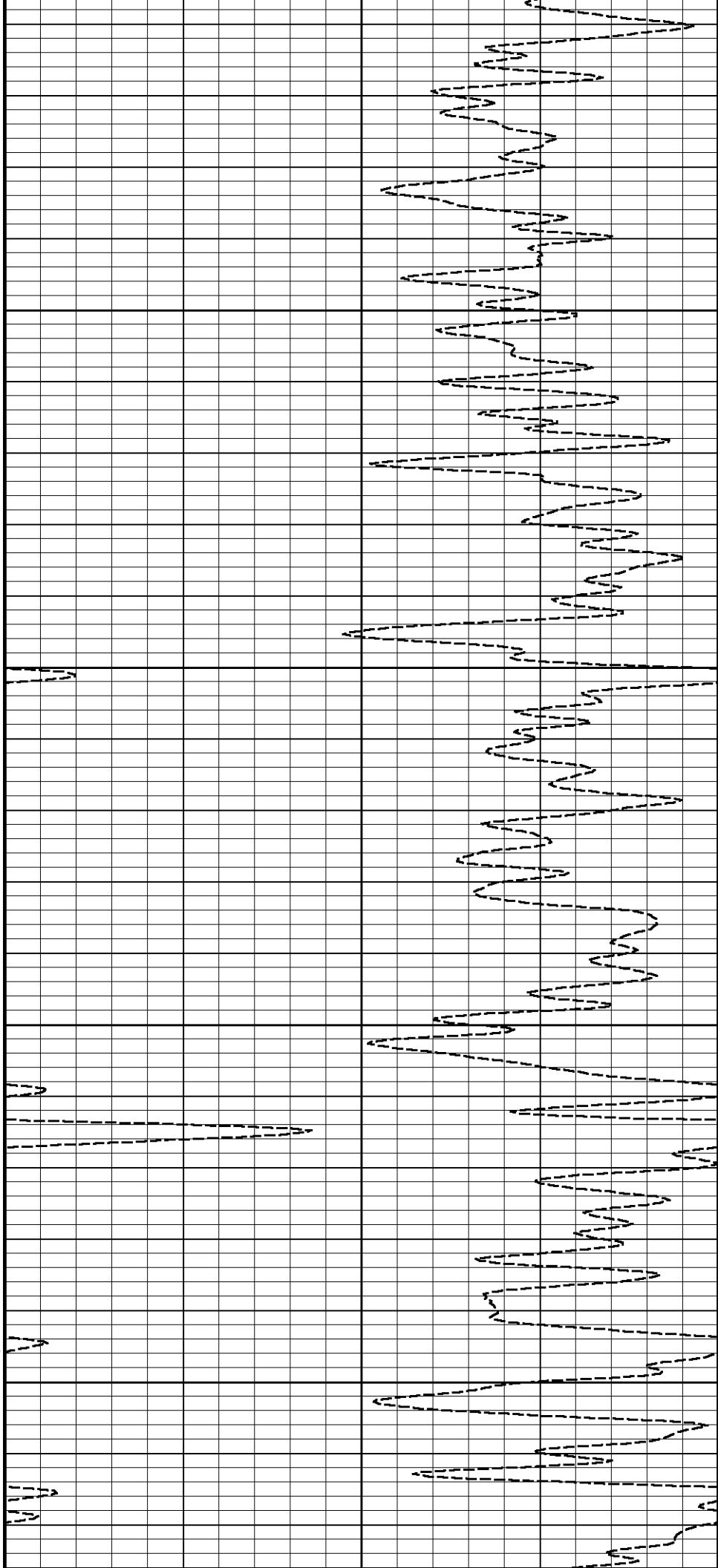
3400

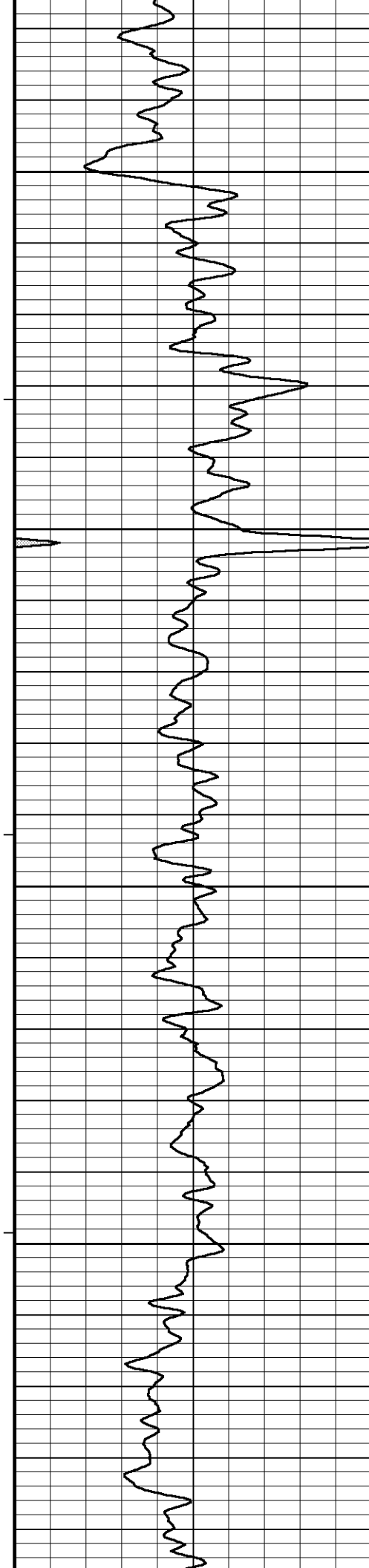
3450

SS Neutron Por. →

3500

← Gamma Ray



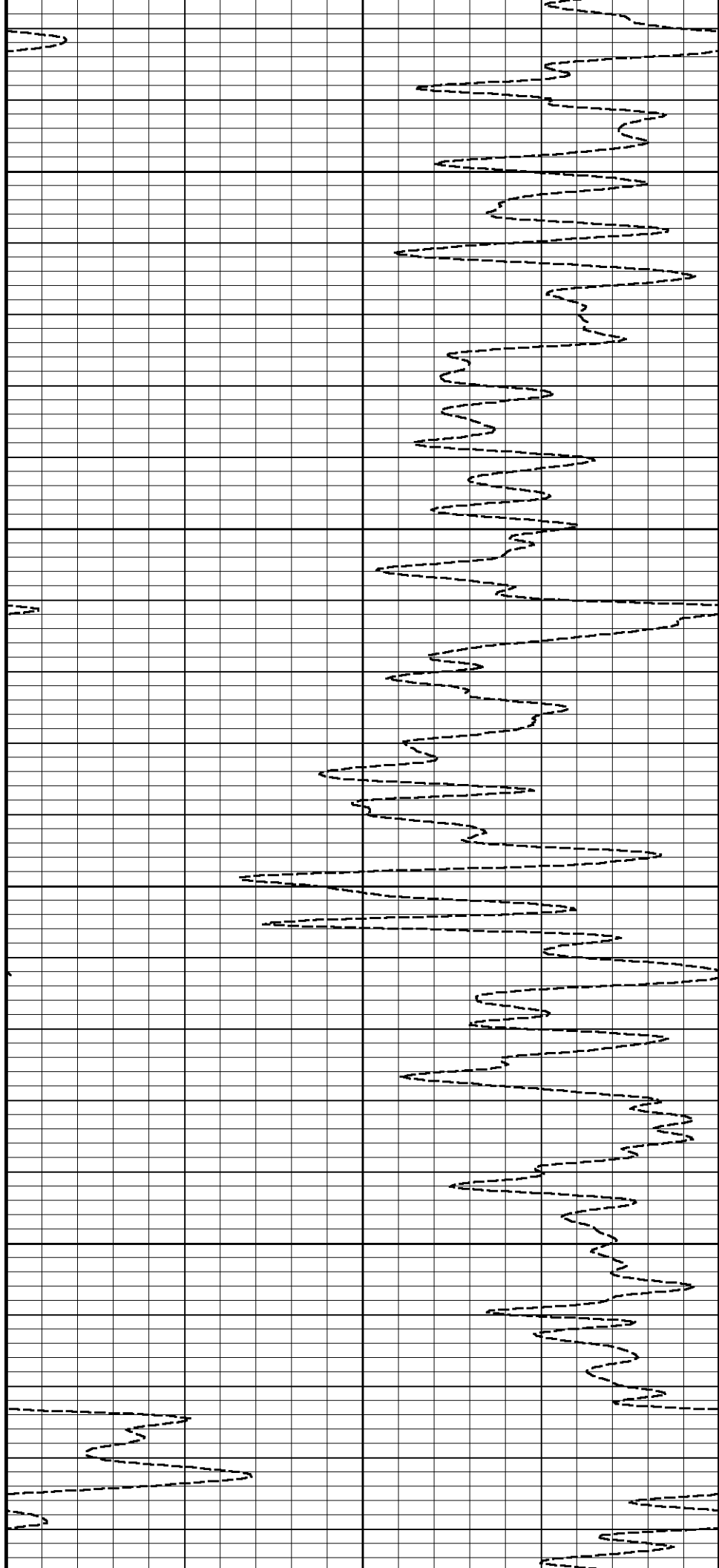


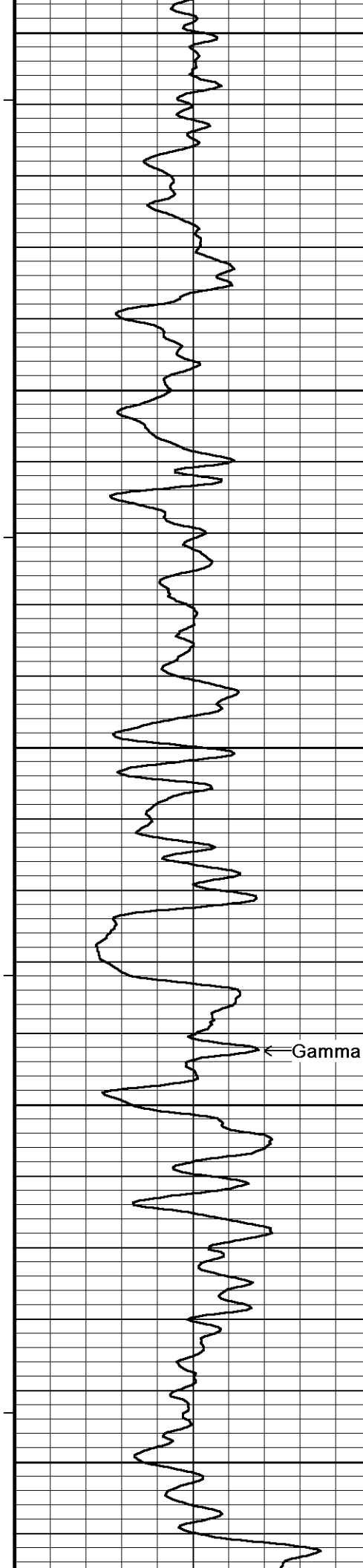
3550

3600

3650

3700





← Gamma Ray

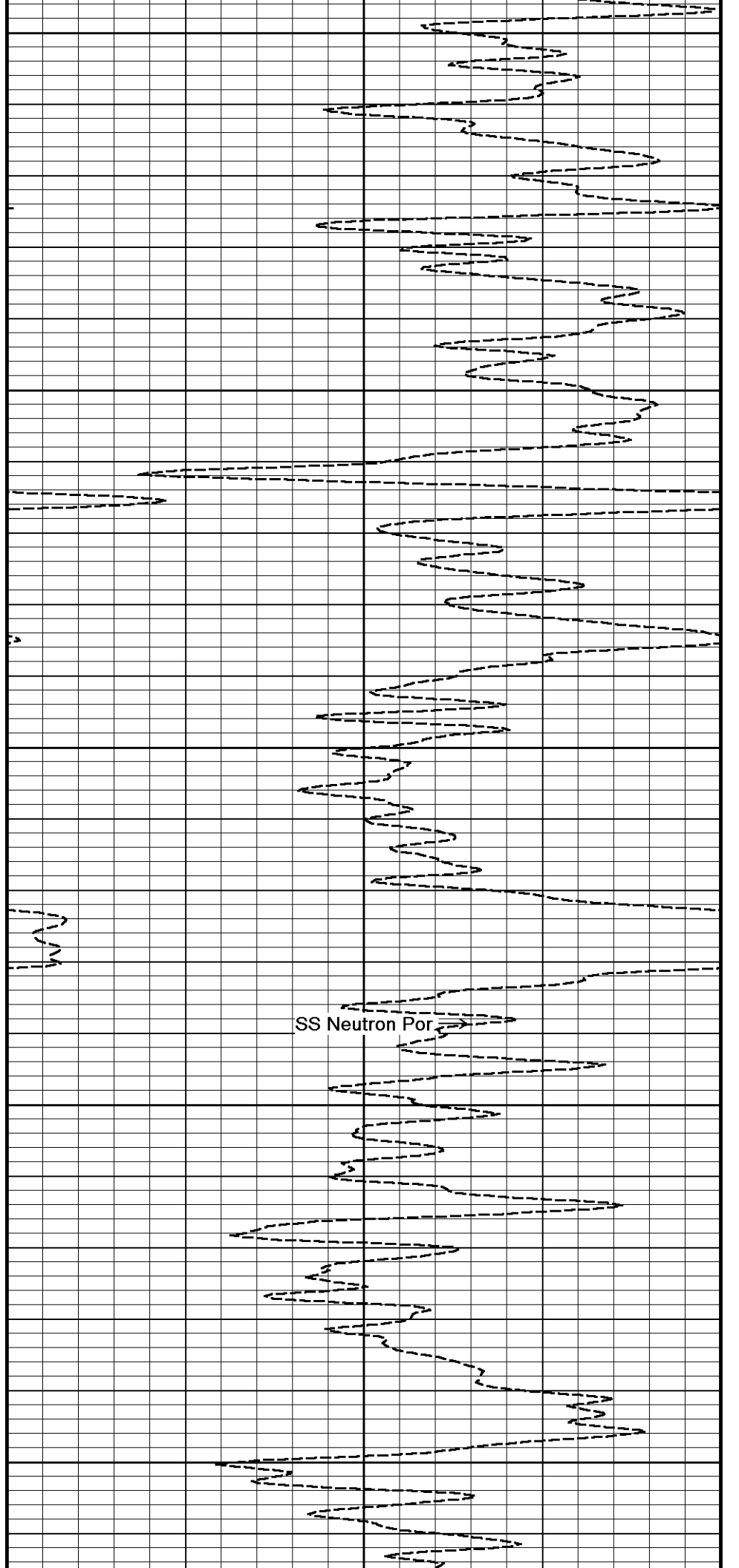
3750

3800

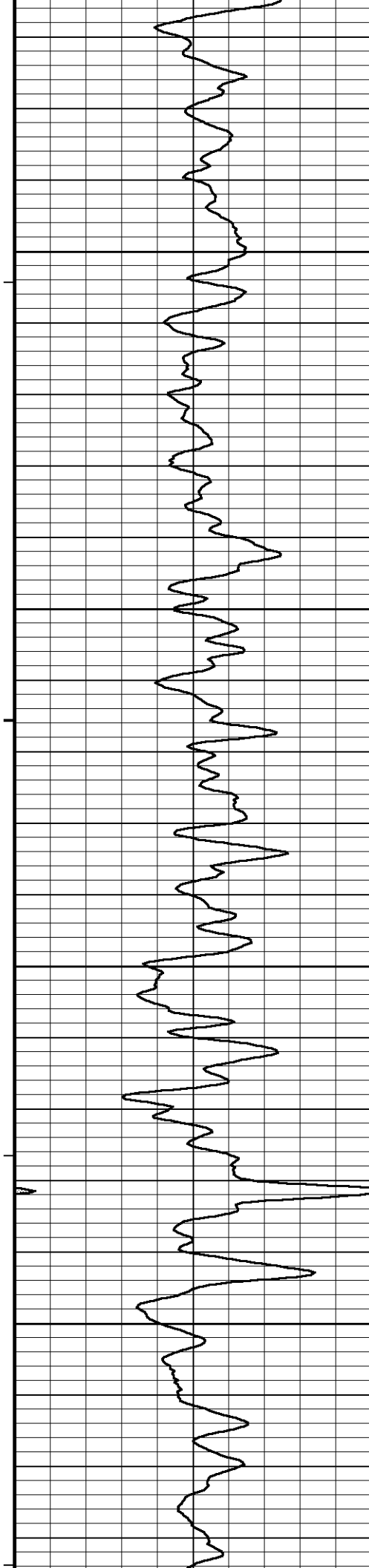
3850

3900

3950



SS Neutron Por

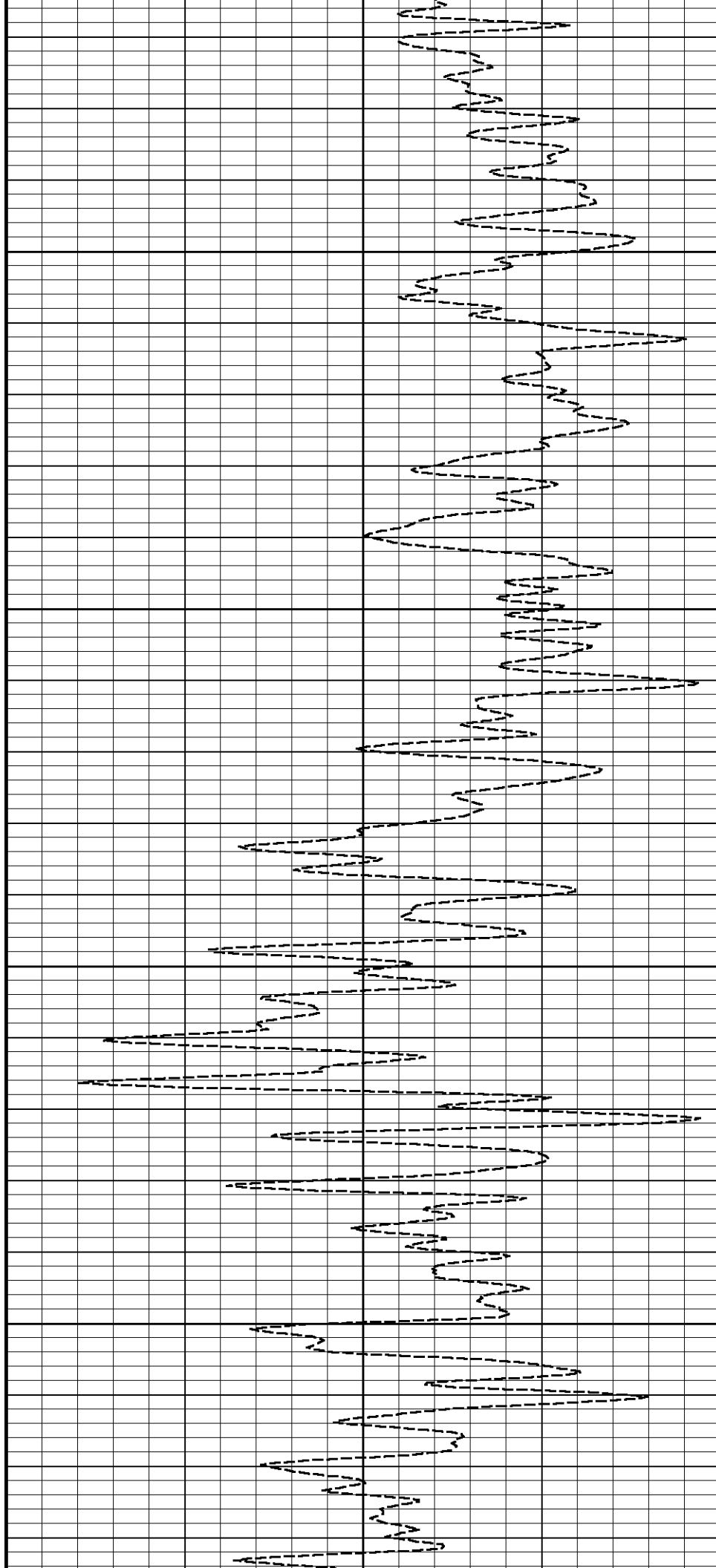


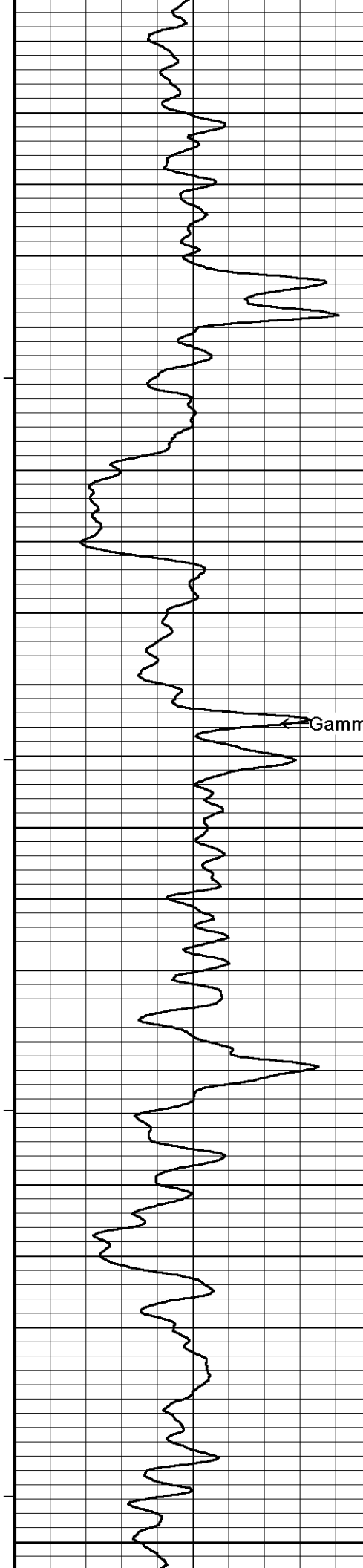
4000

4050

4100

4150





4200

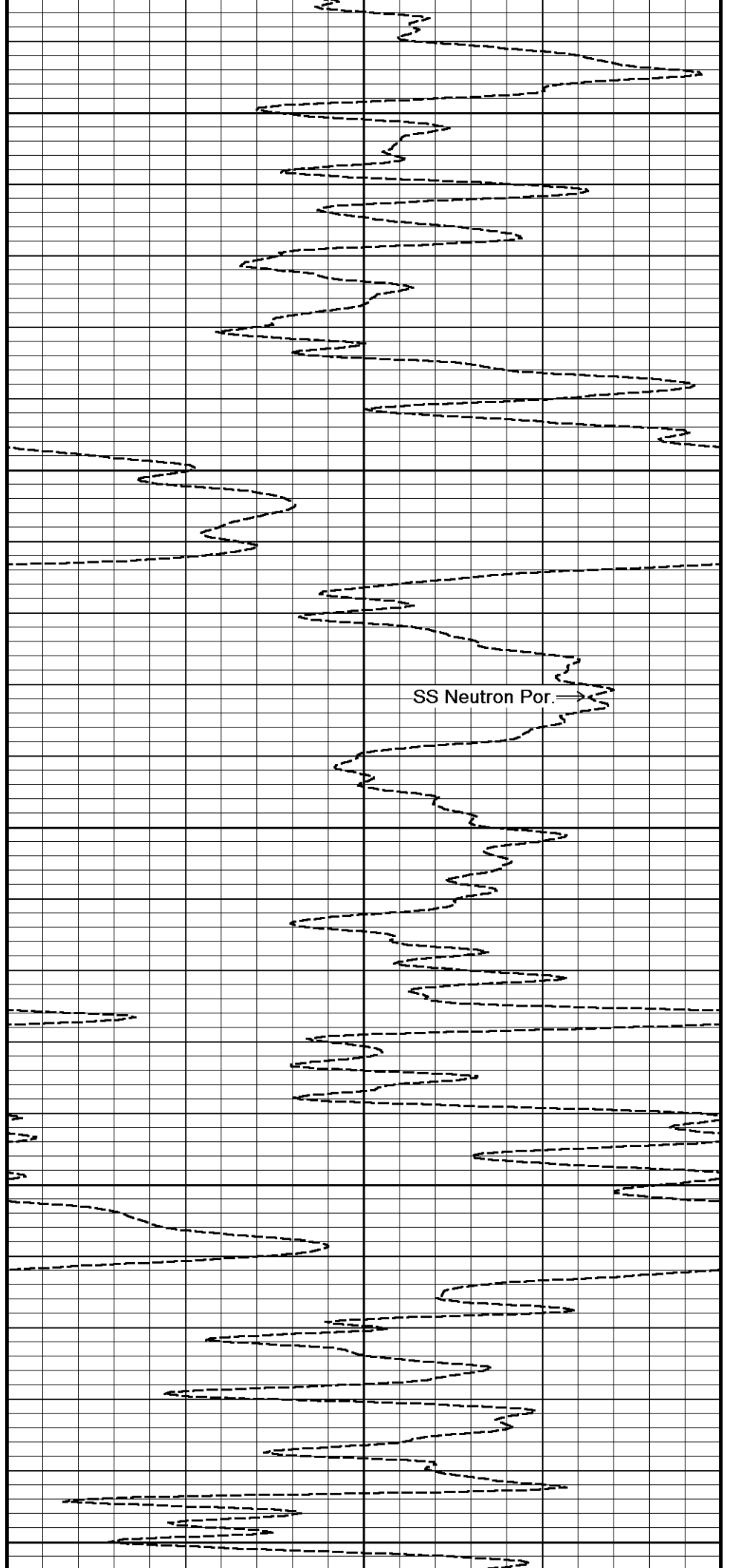
4250

4300

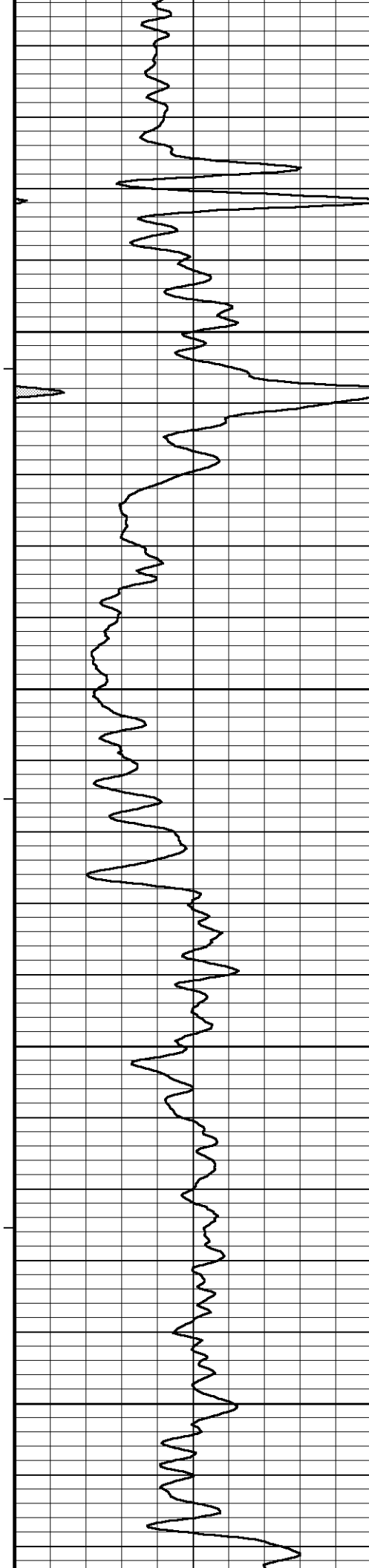
4350

4400

← Gamma Ray



SS Neutron Por. →

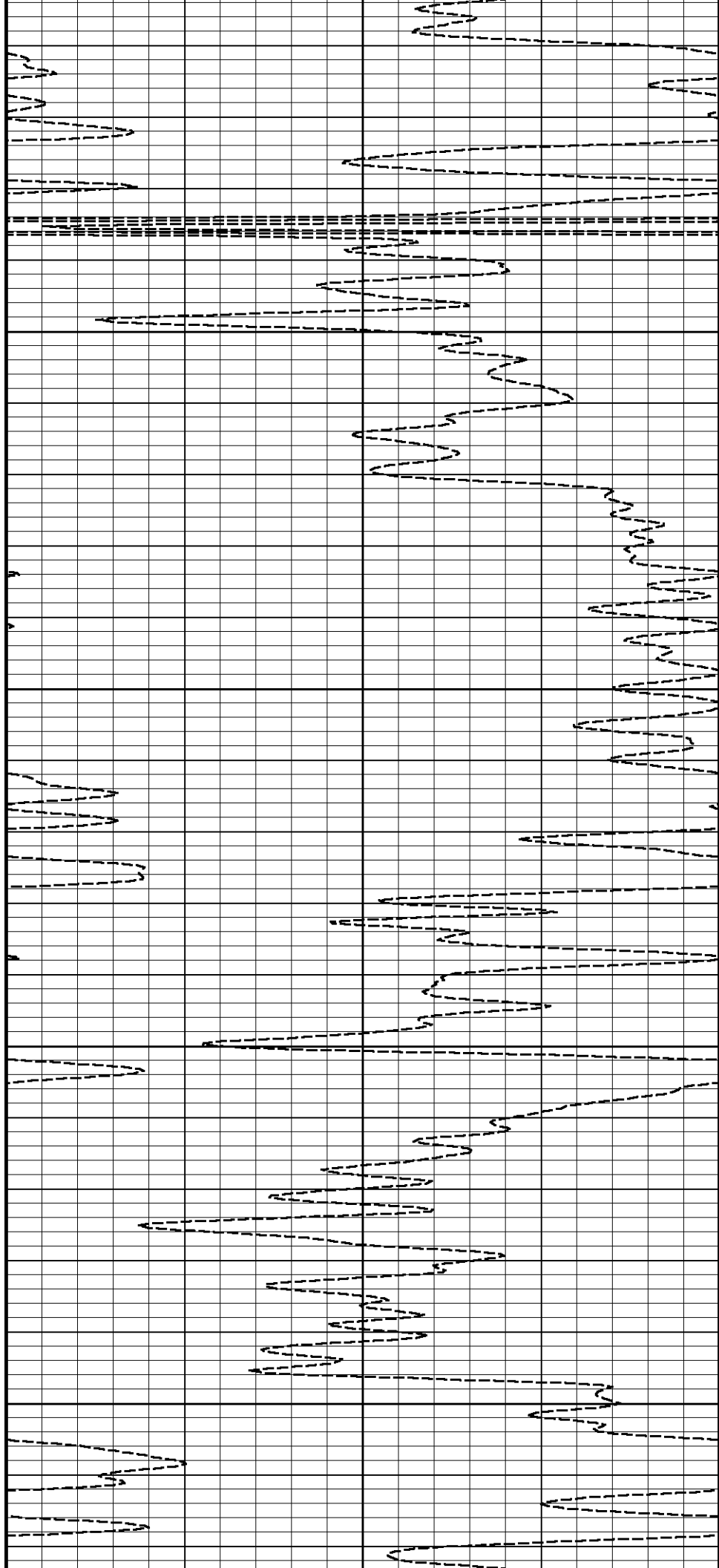


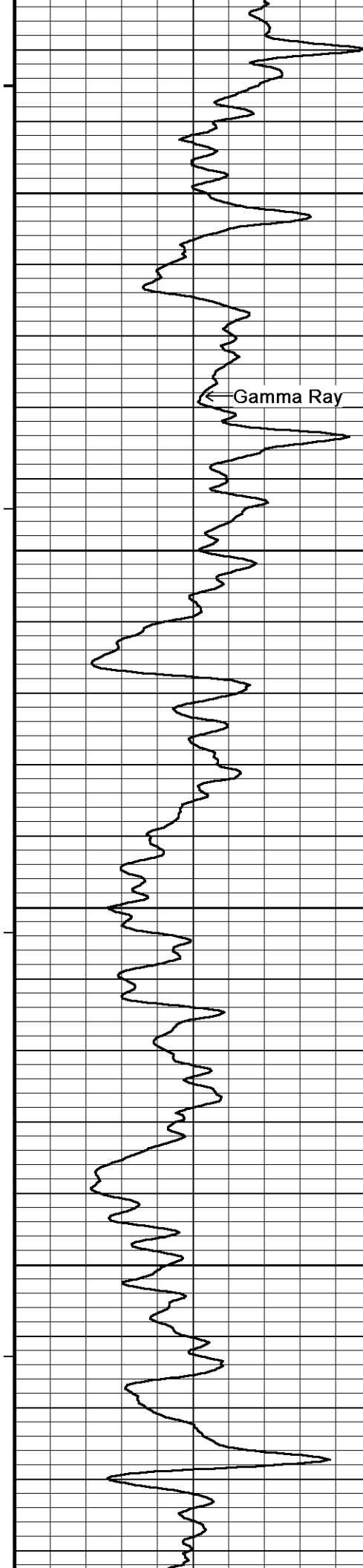
4450

4500

4550

4600





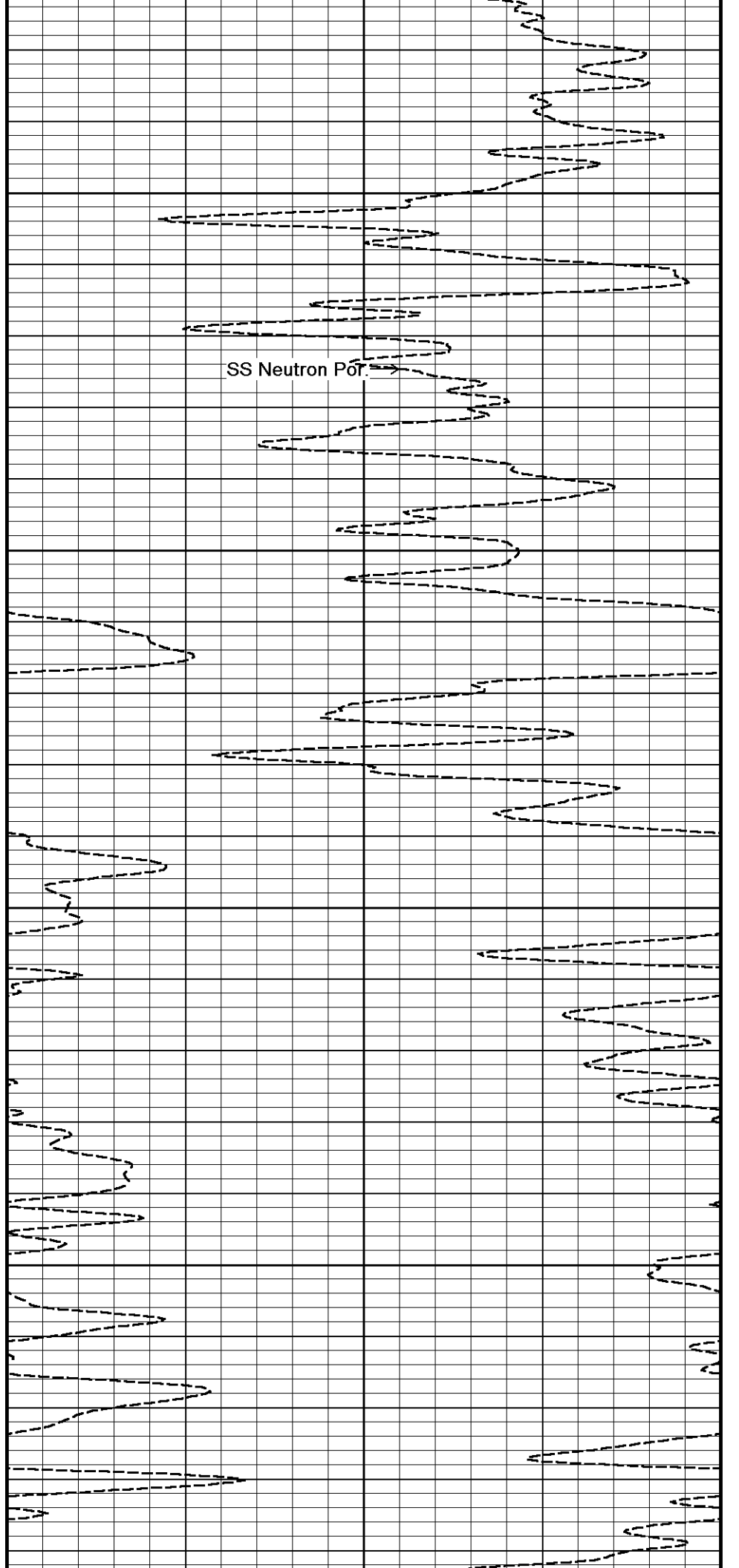
Gamma Ray

4650

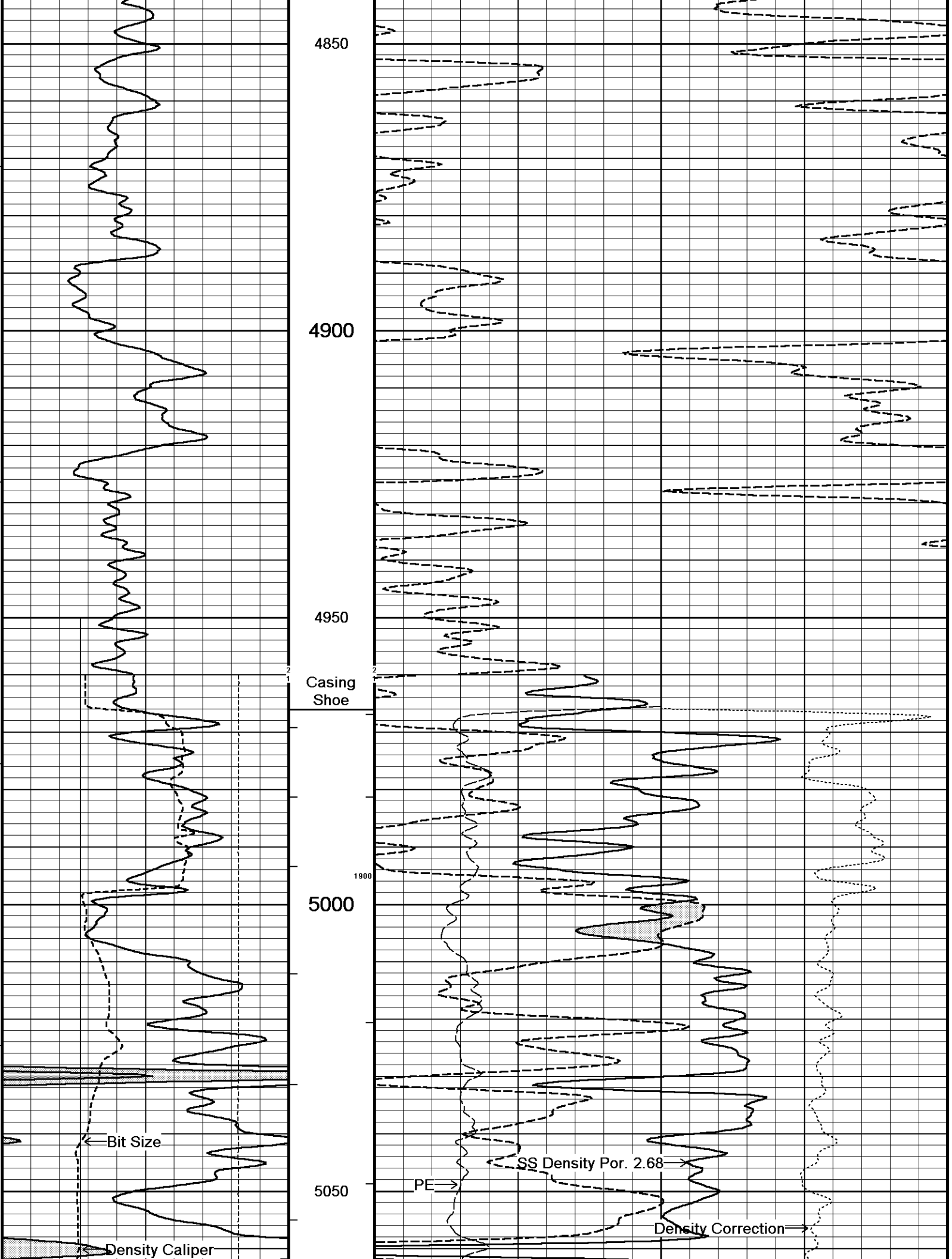
4700

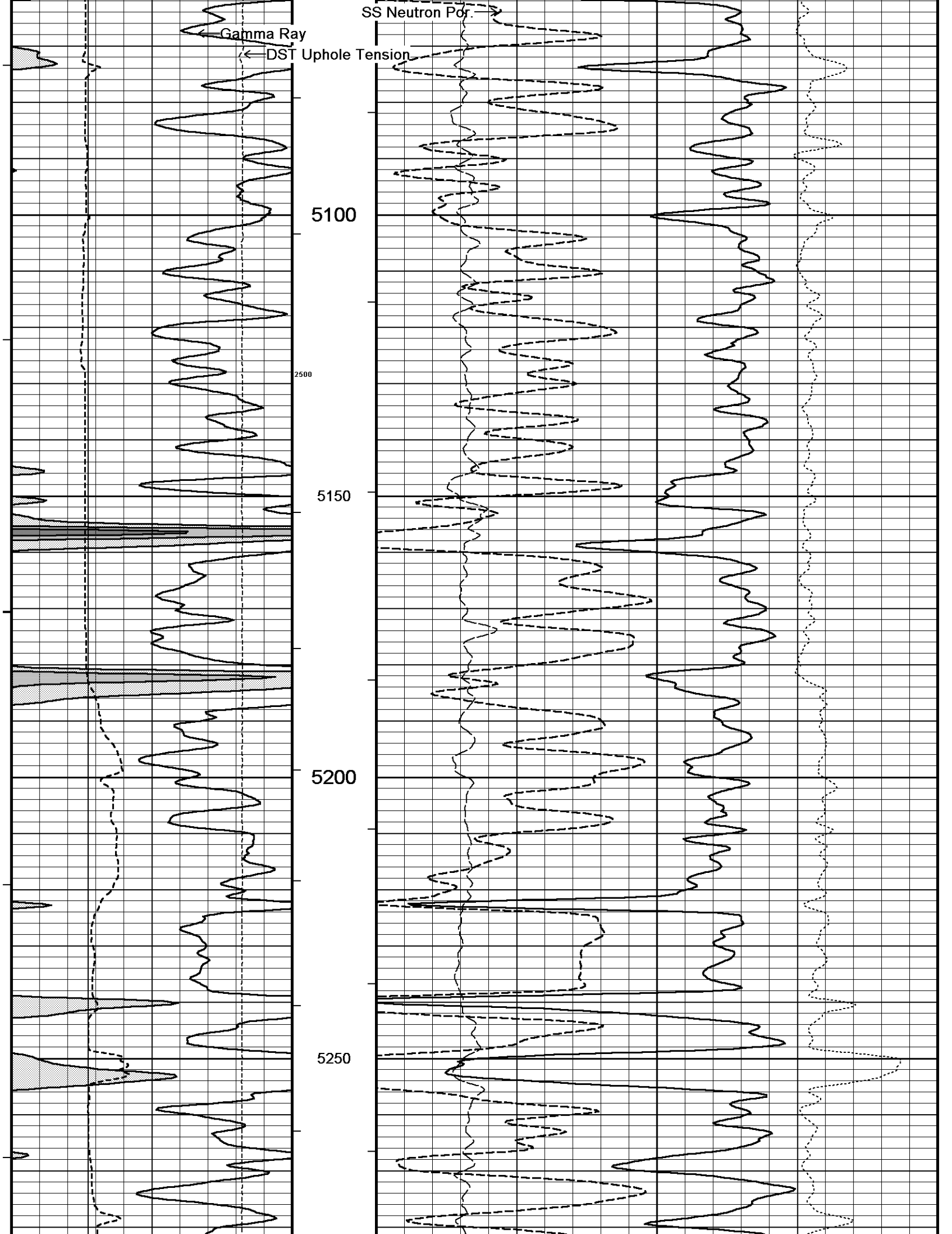
4750

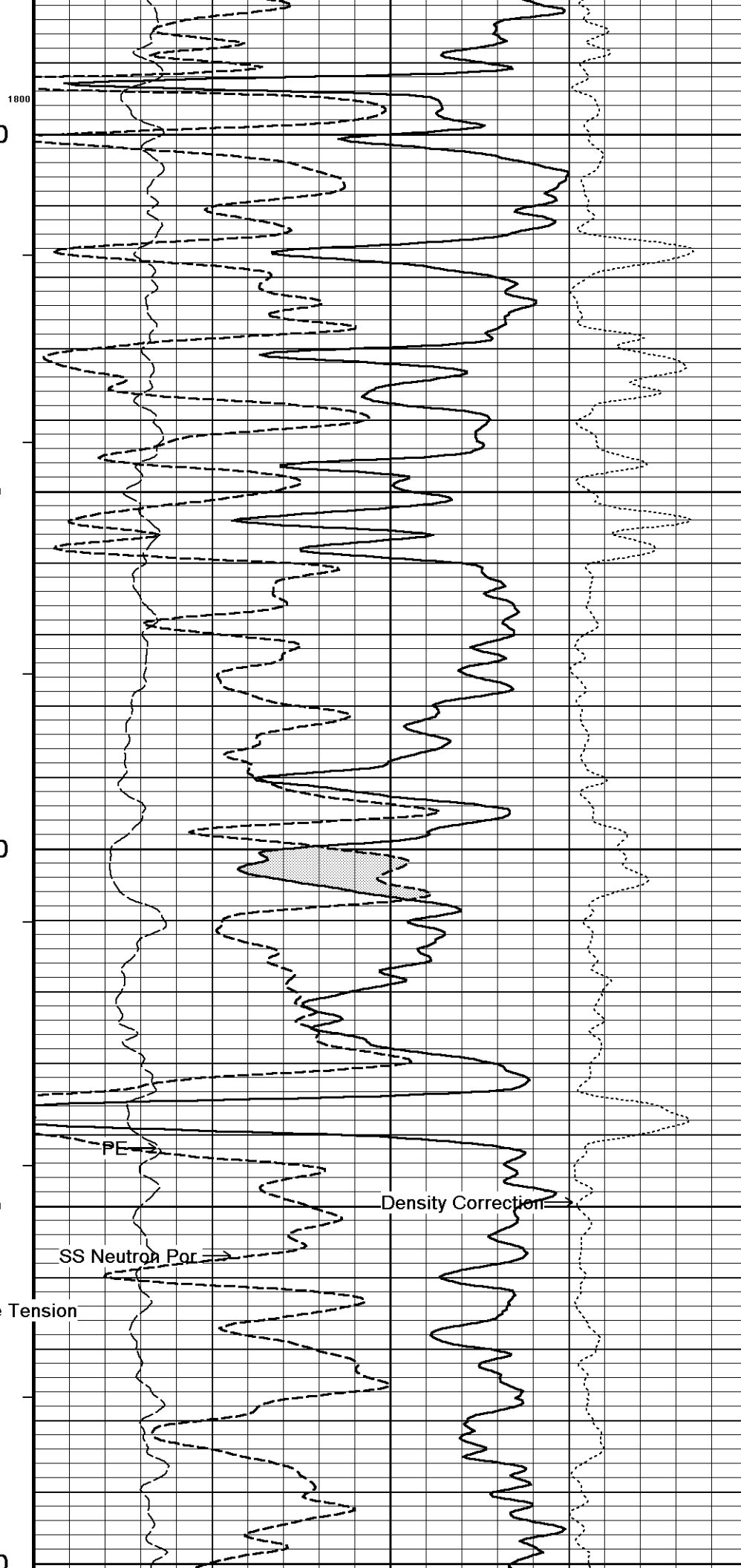
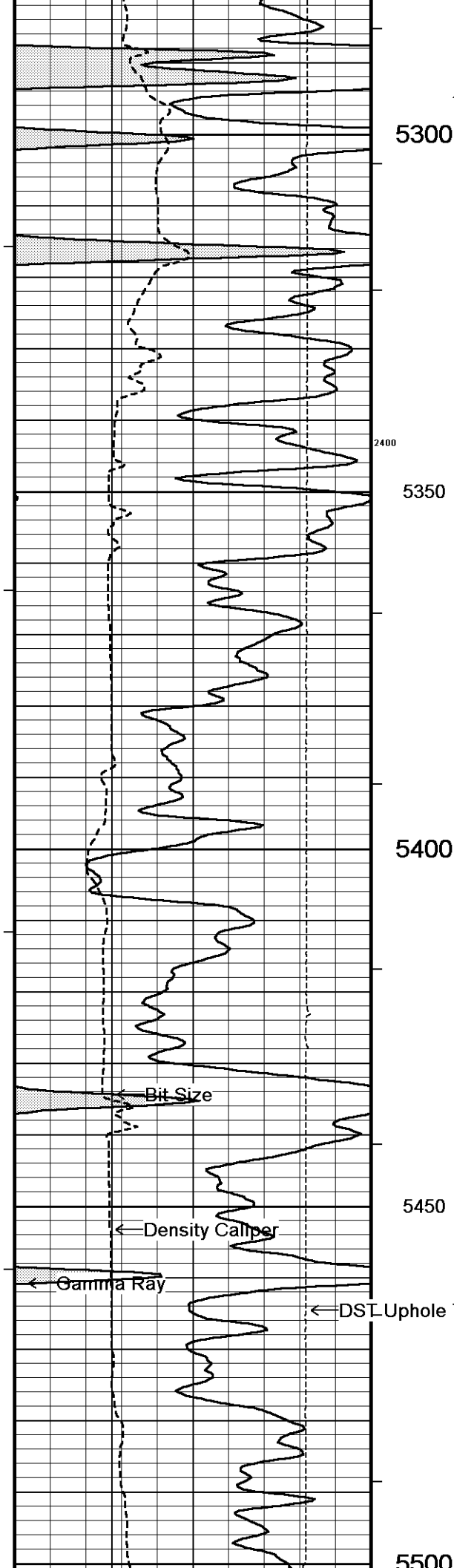
4800

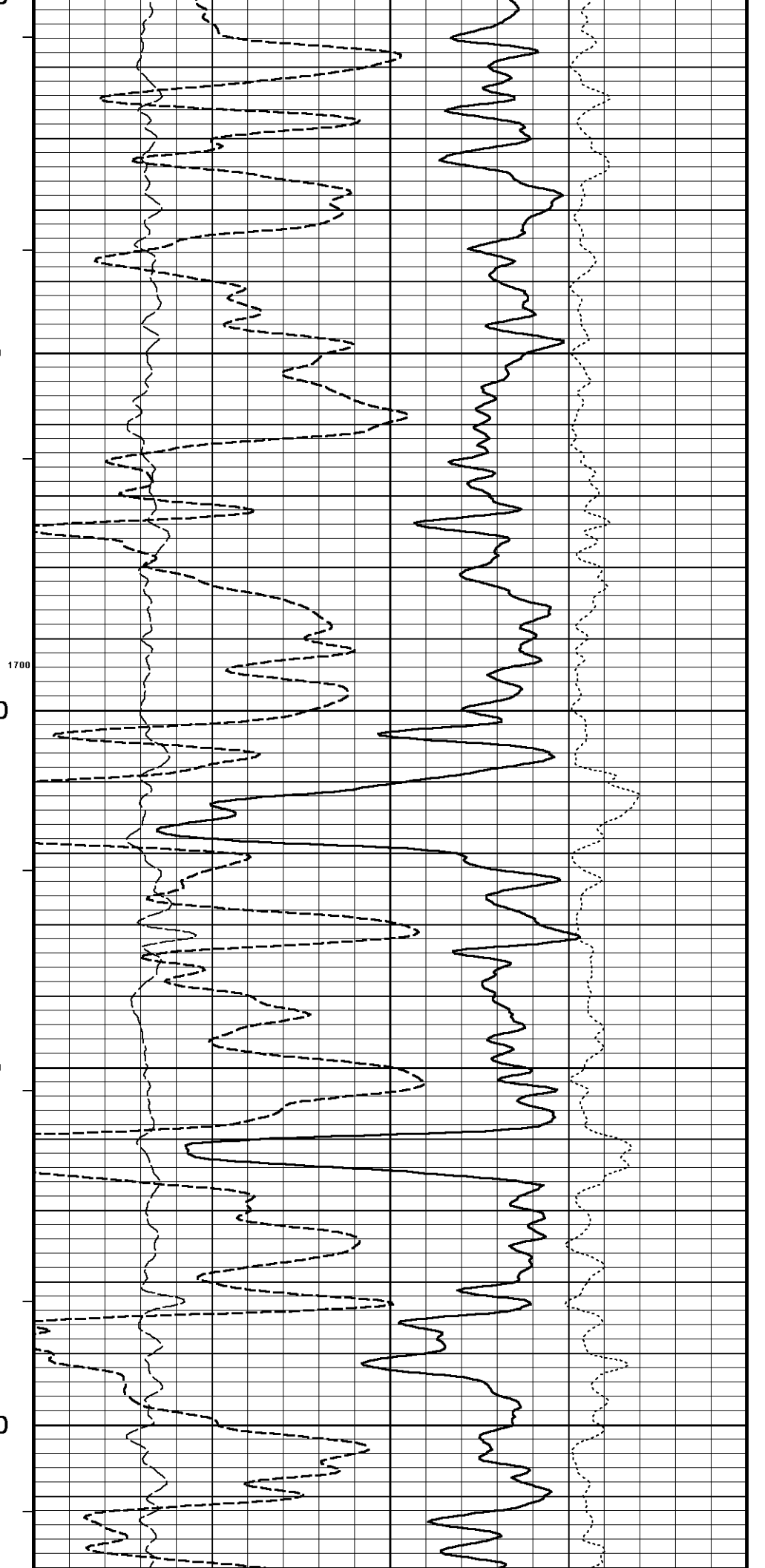
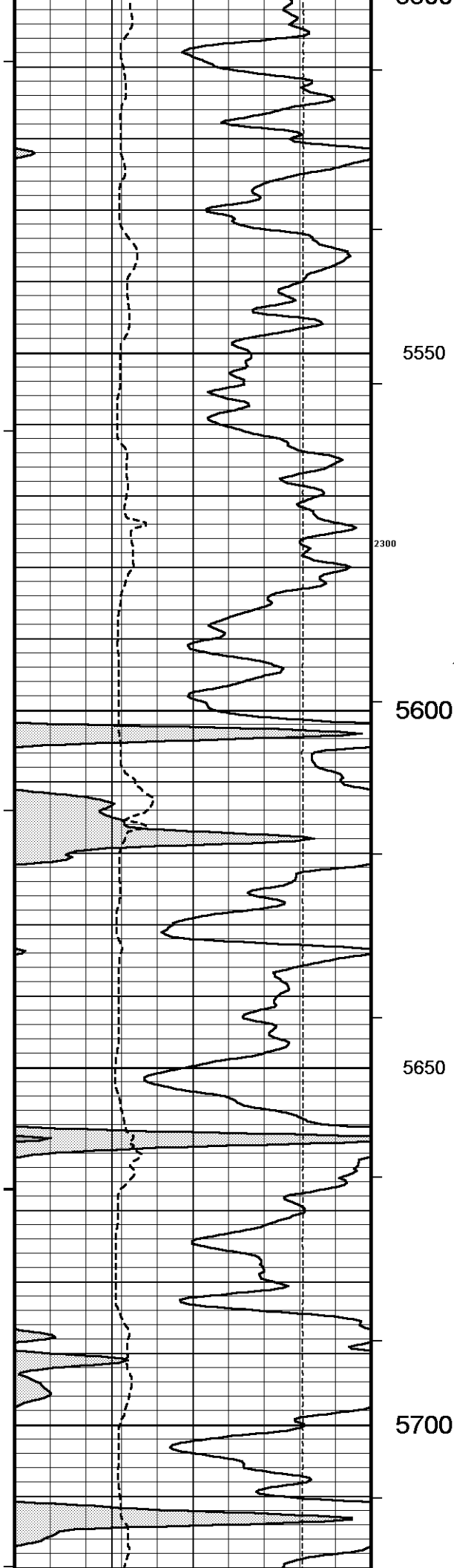


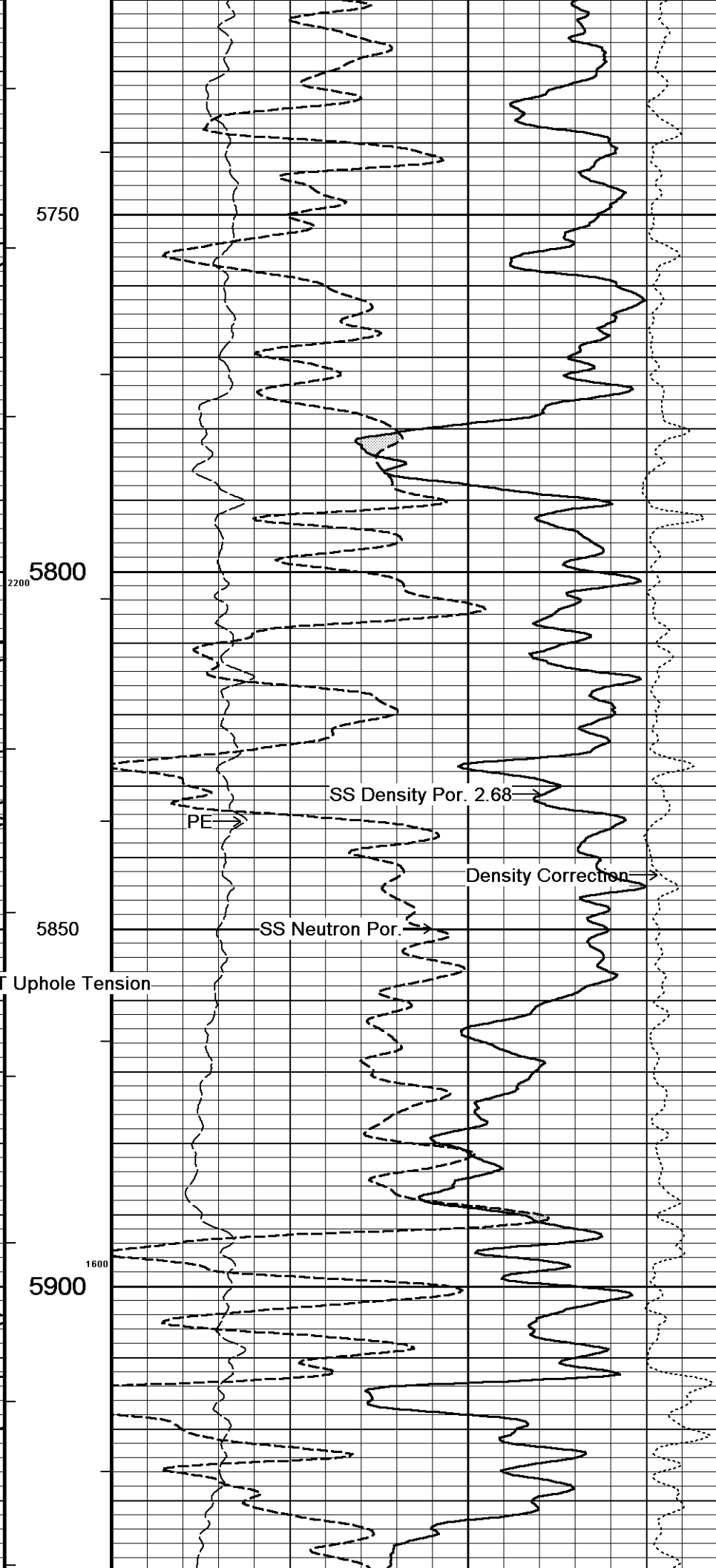
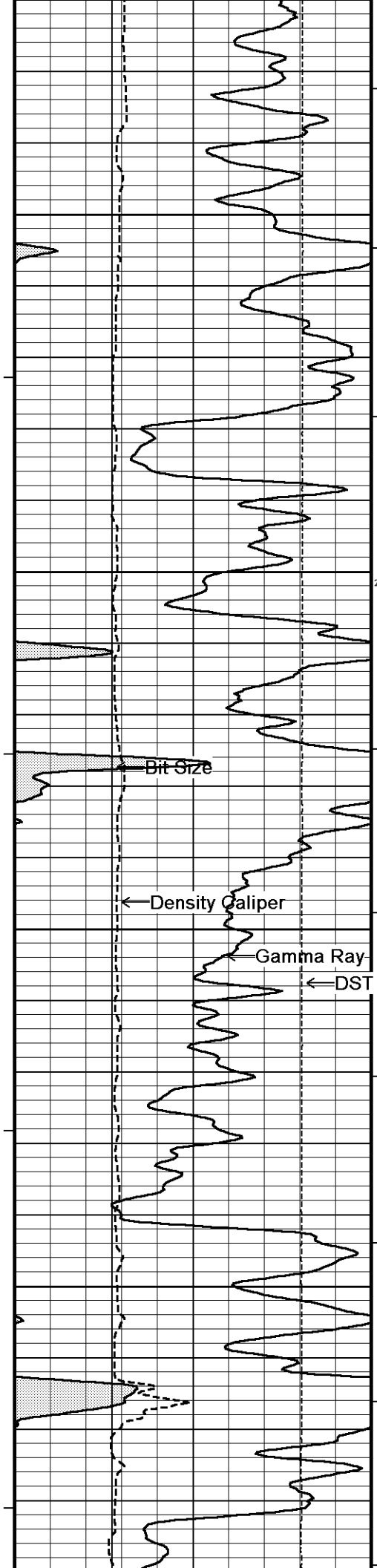
SS Neutron Por.

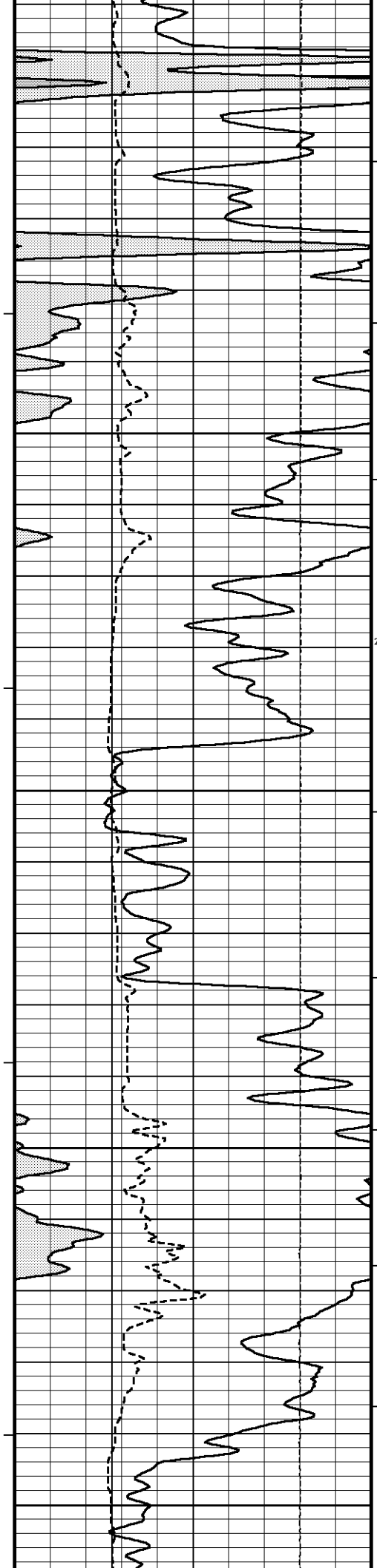












5950

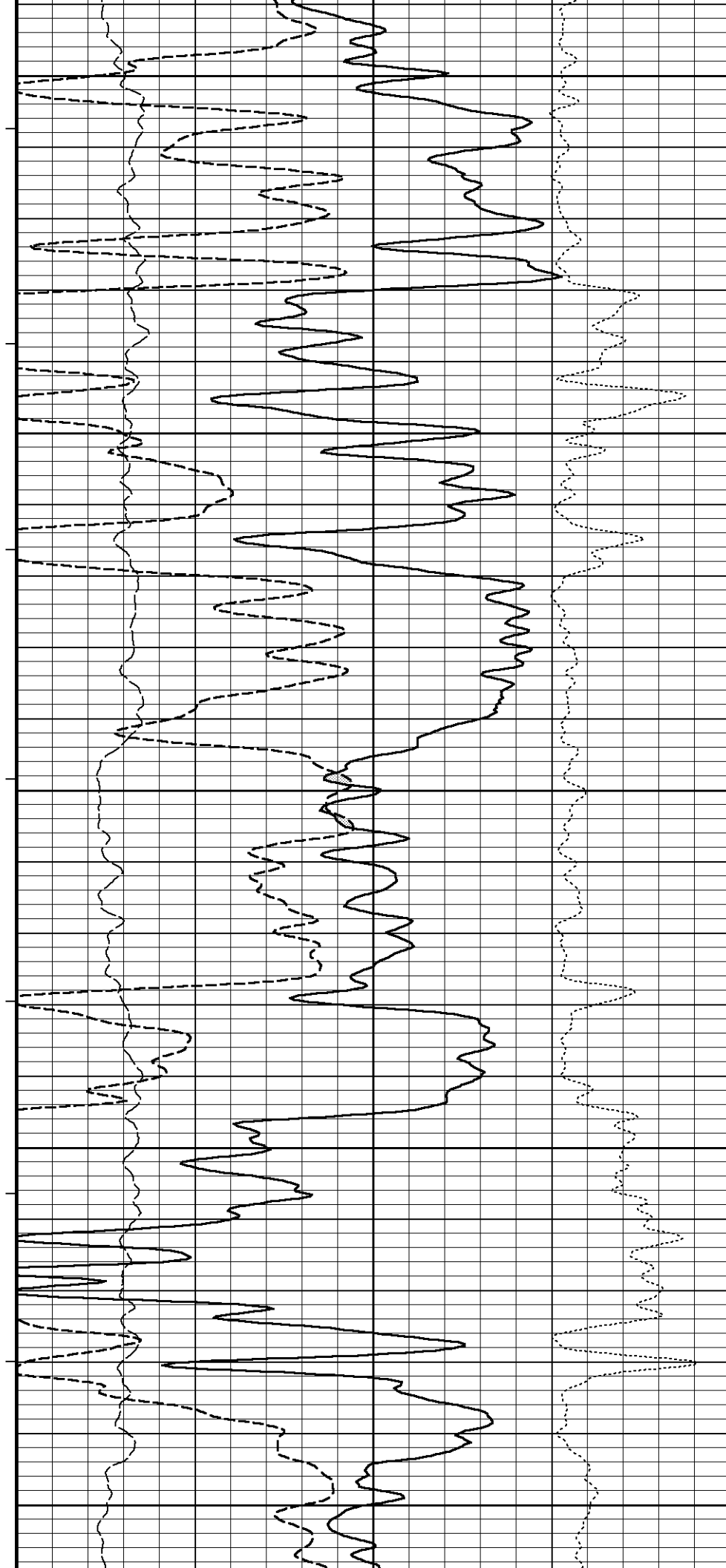
6000

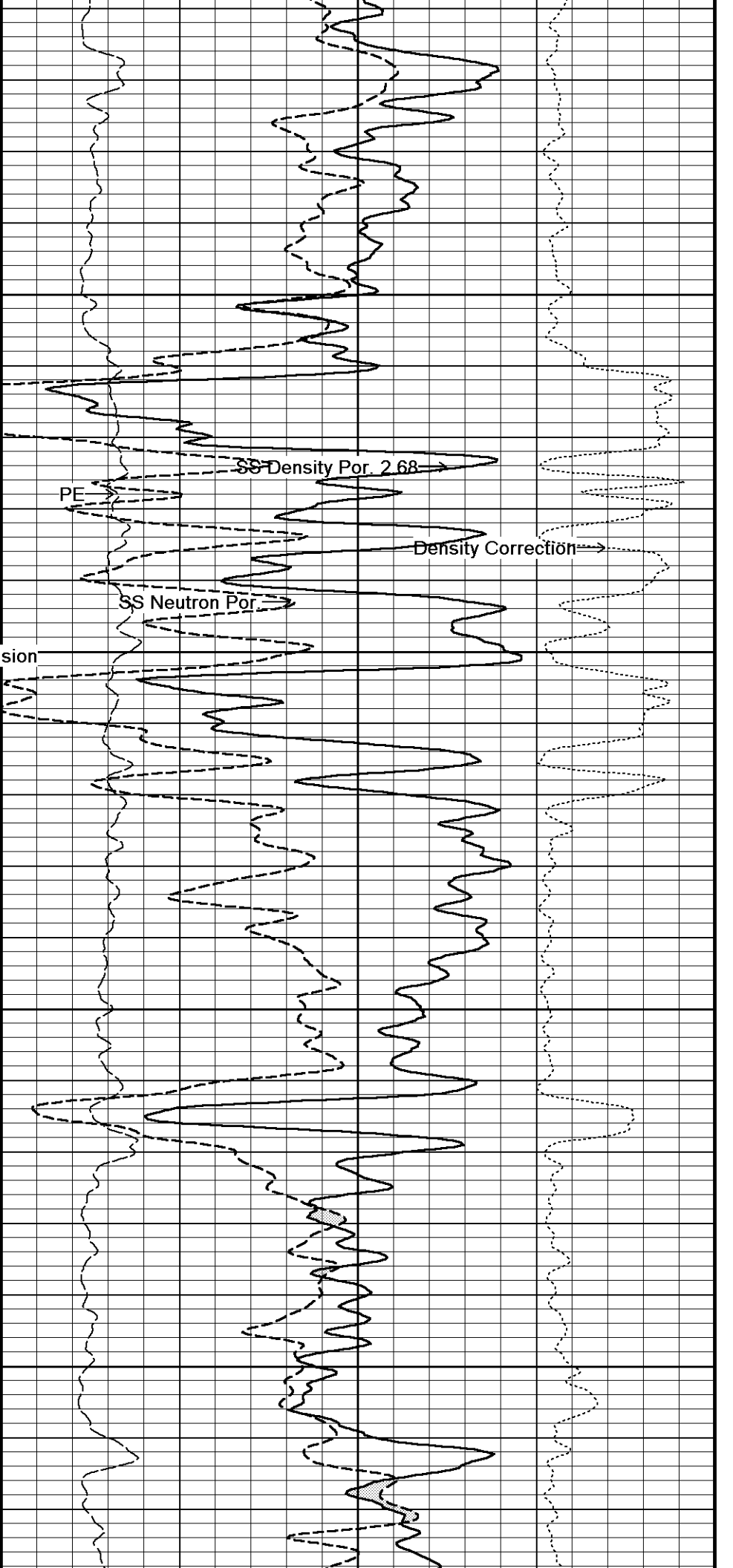
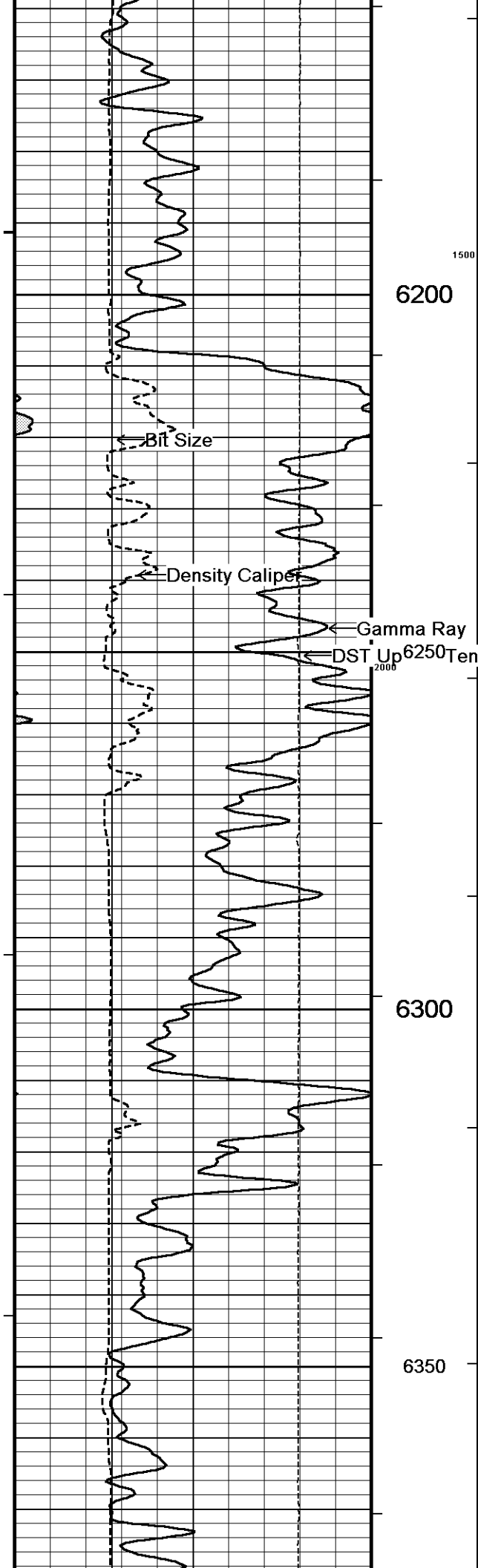
2100

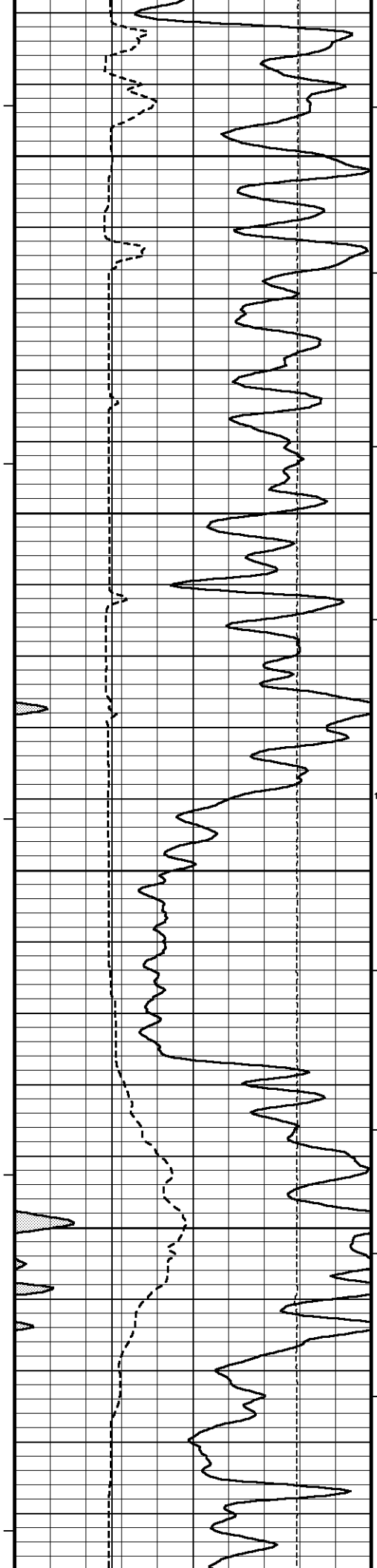
6050

6100

6150







6400

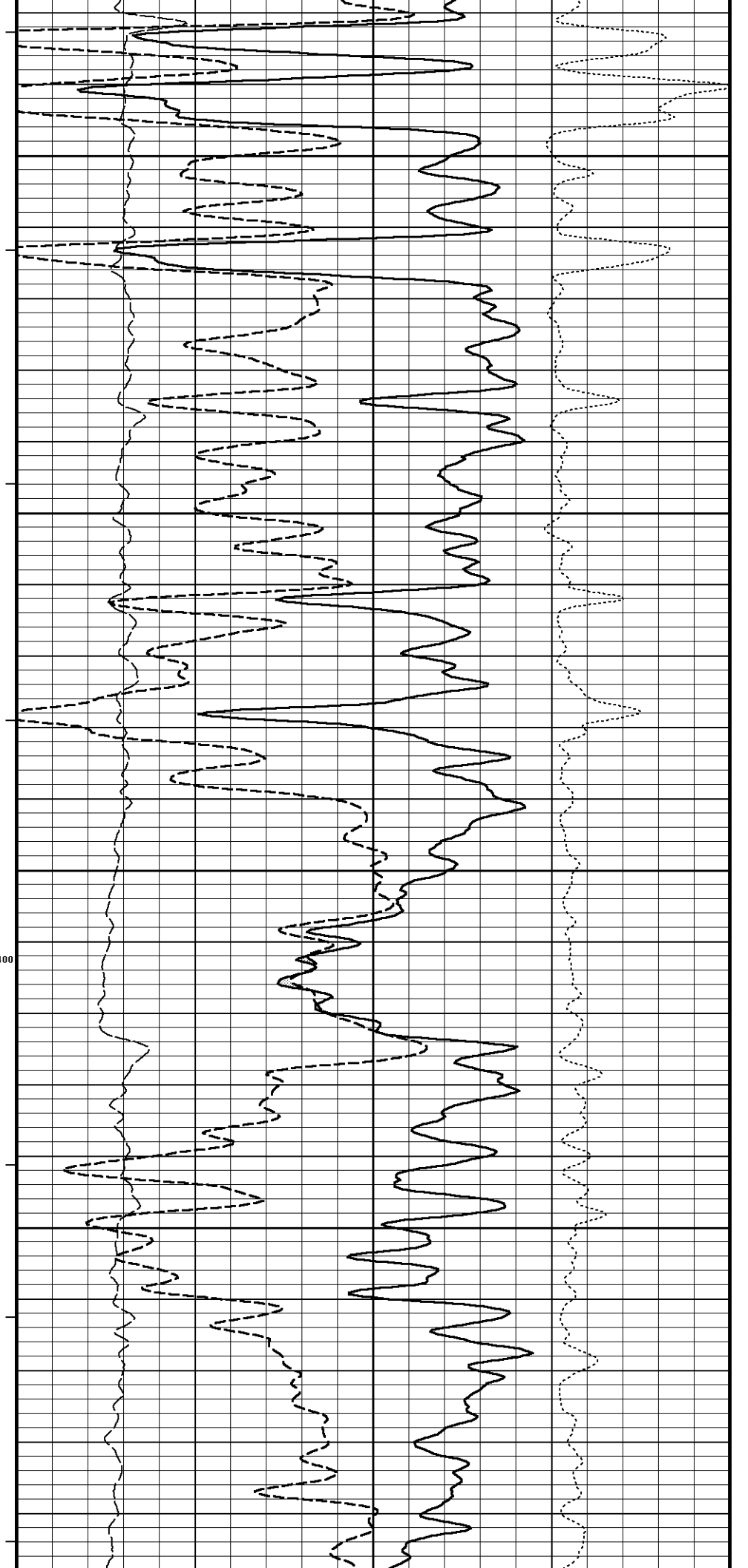
6450

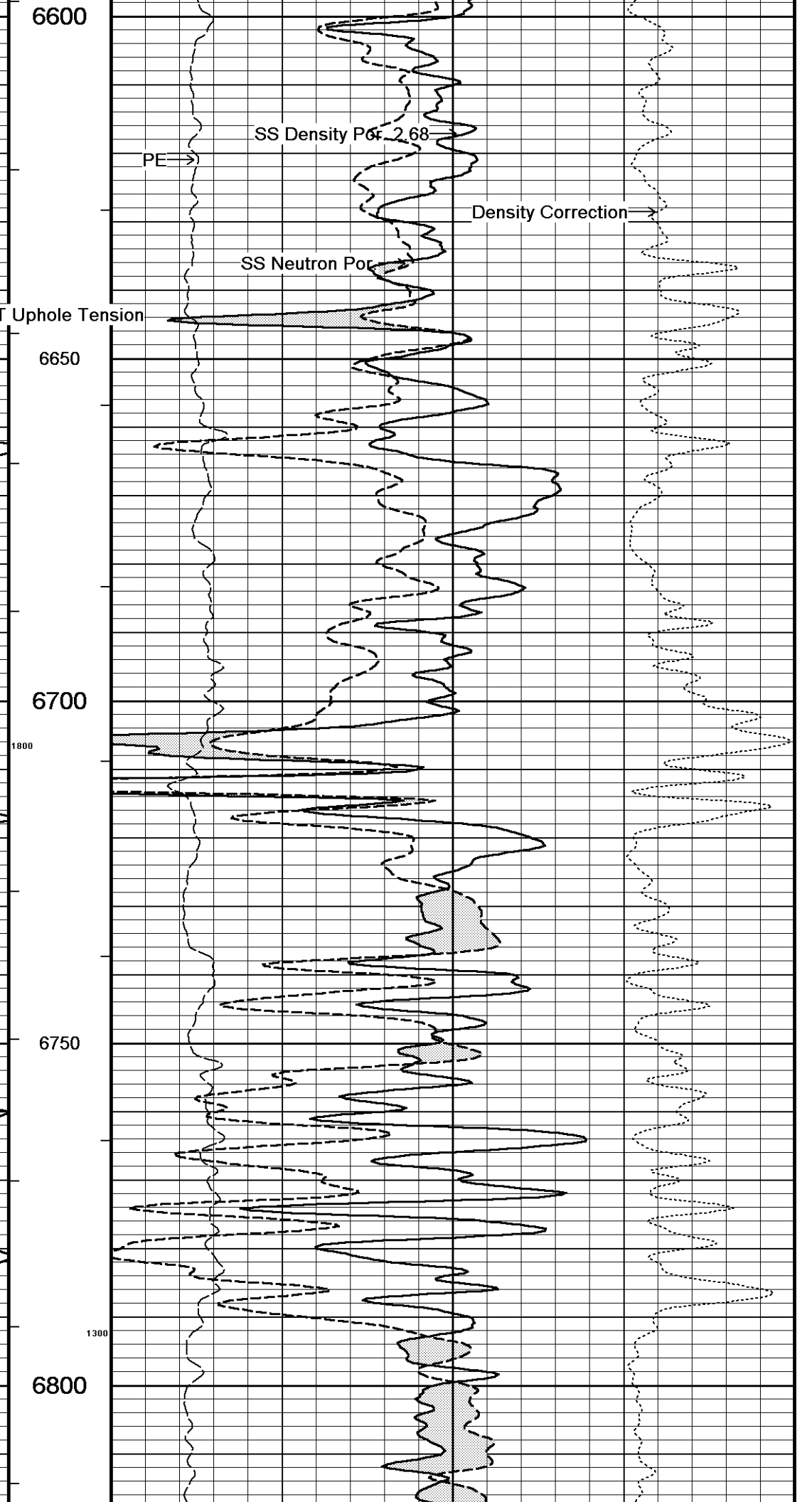
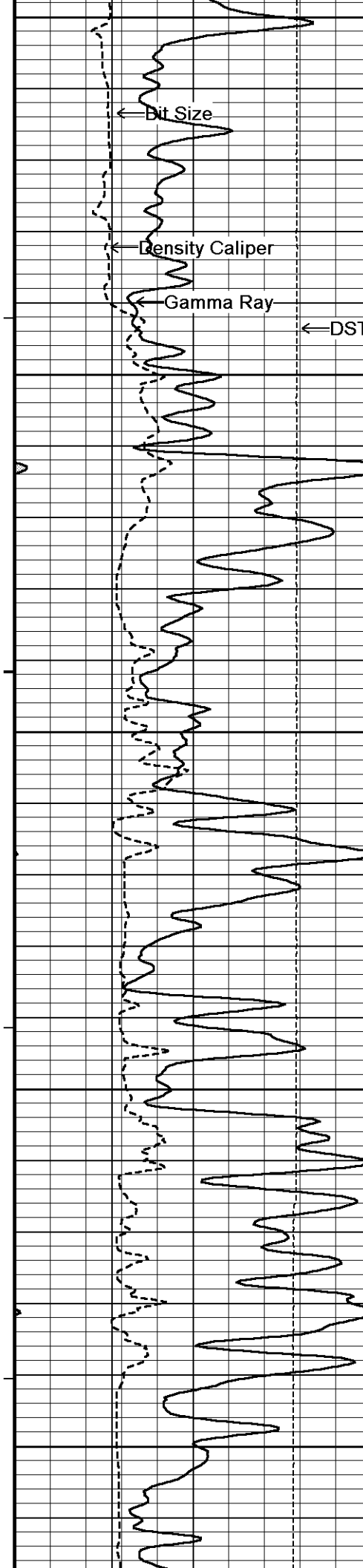
1900

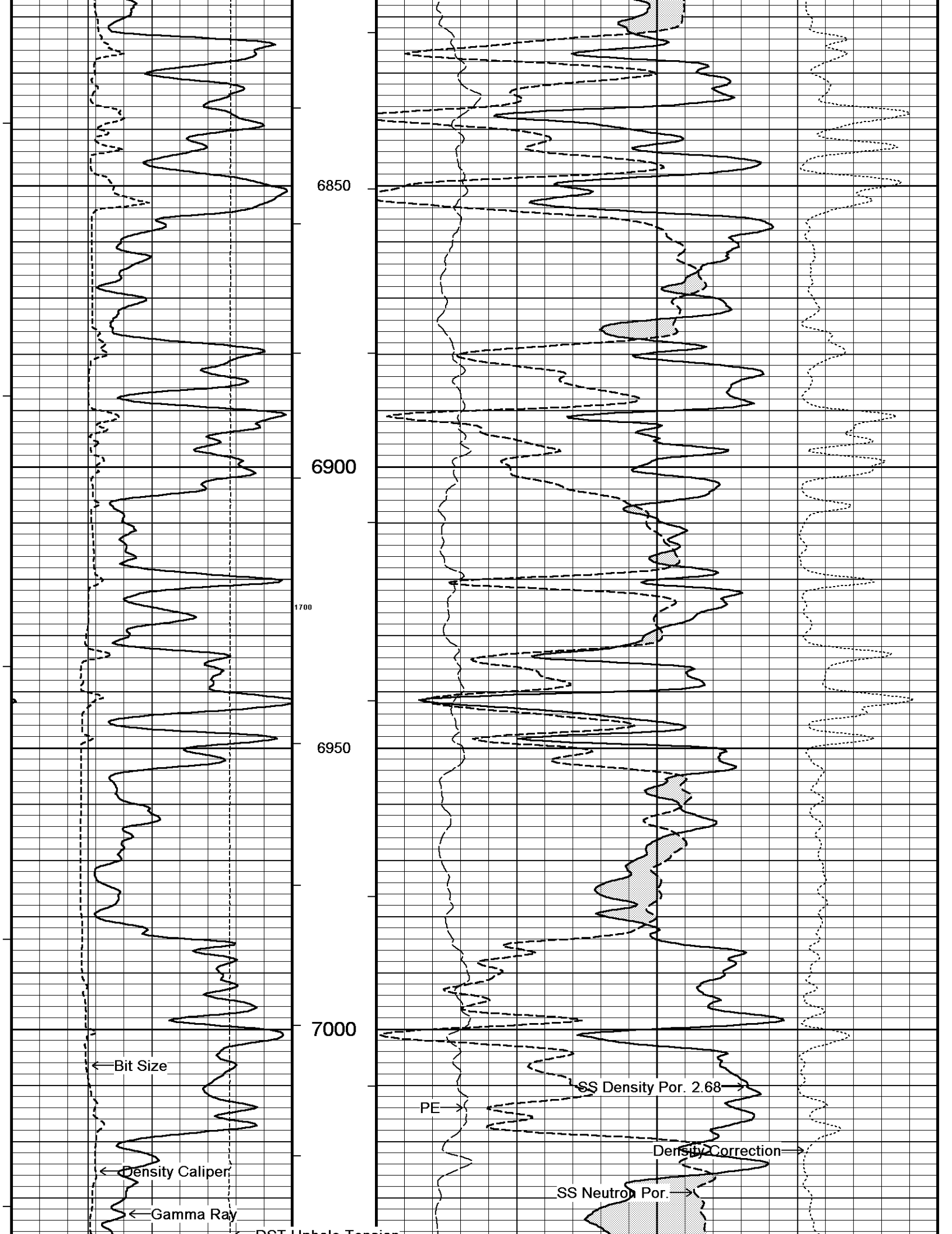
6500

1400

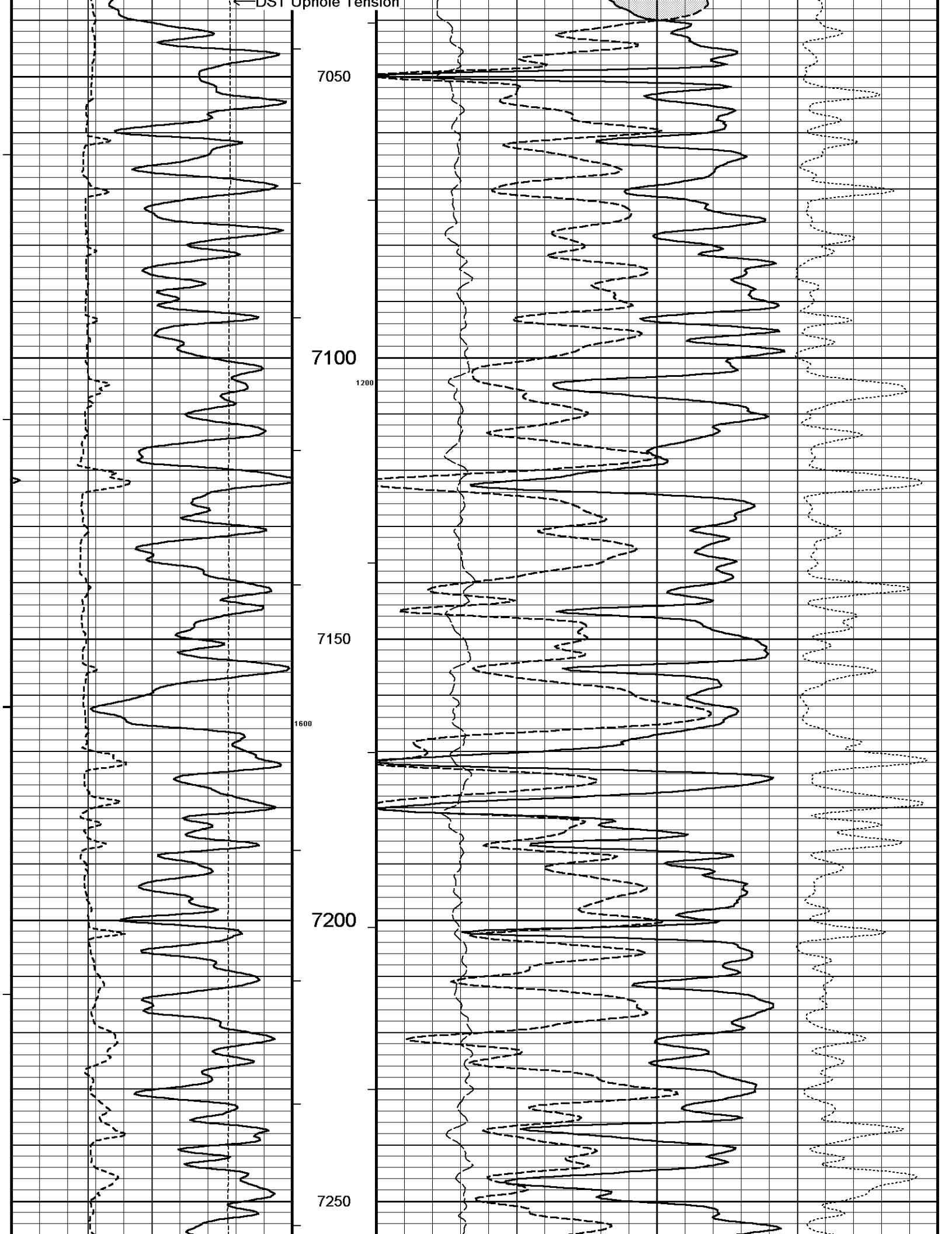
6550

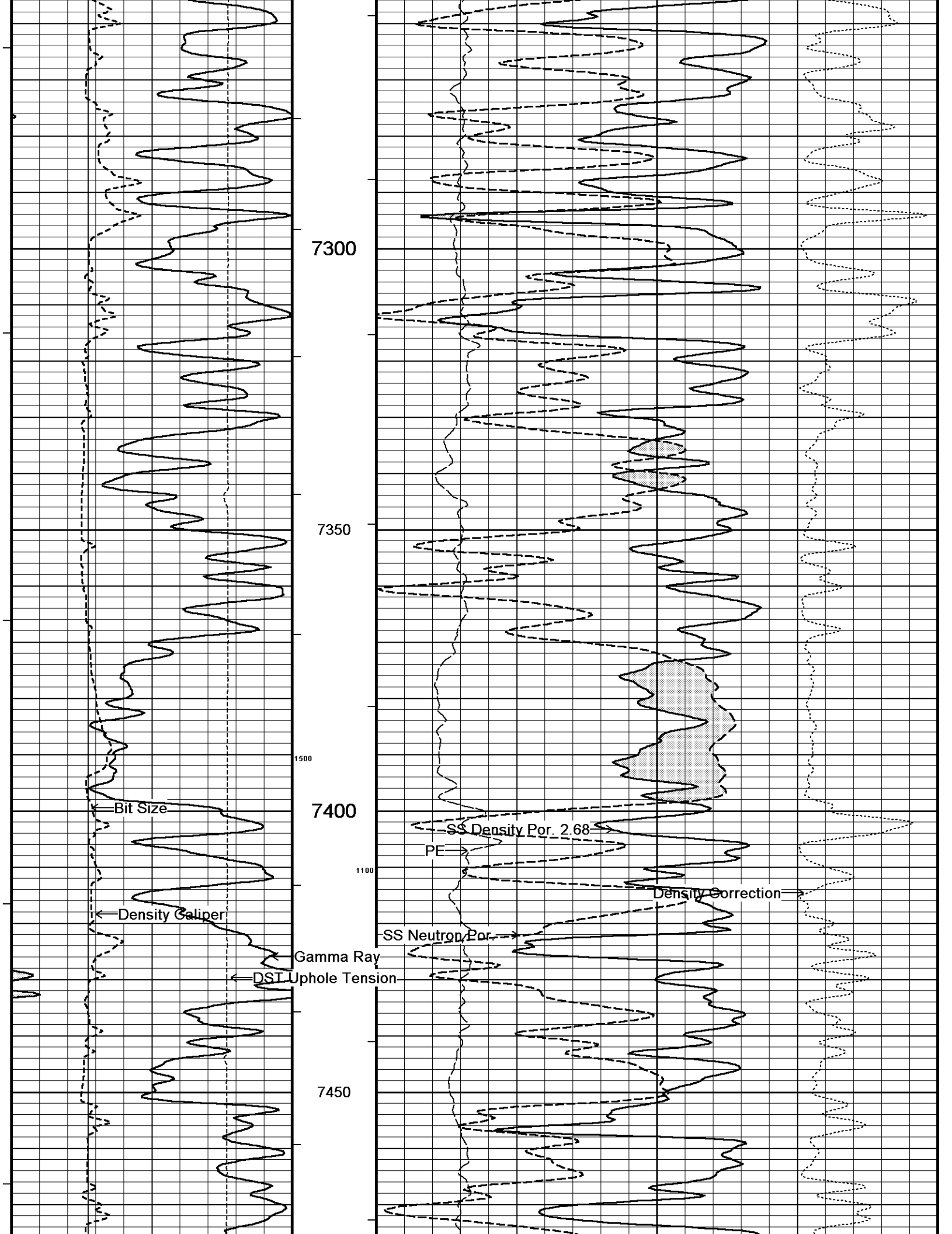


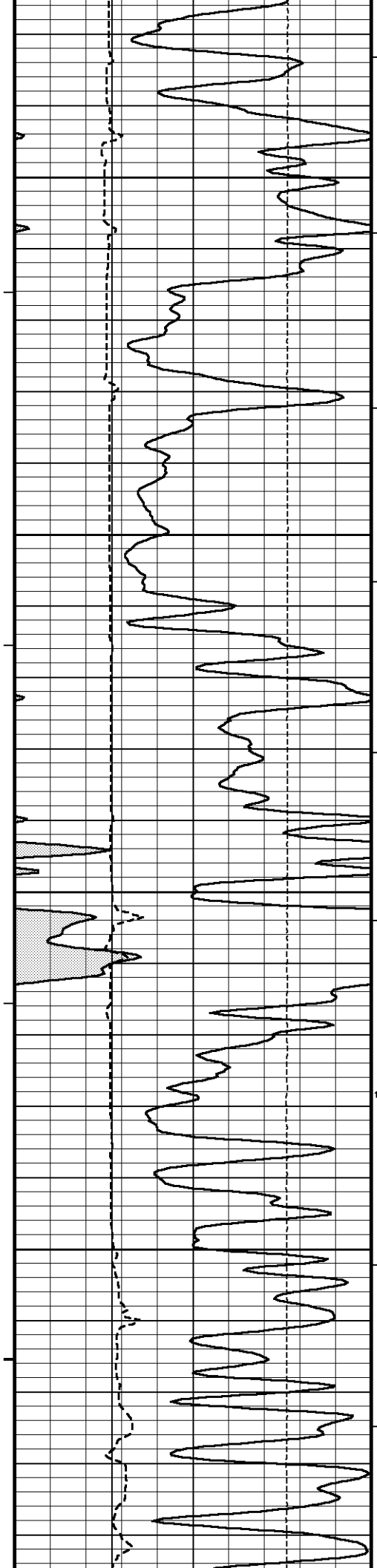




← DSI Uphole Tension







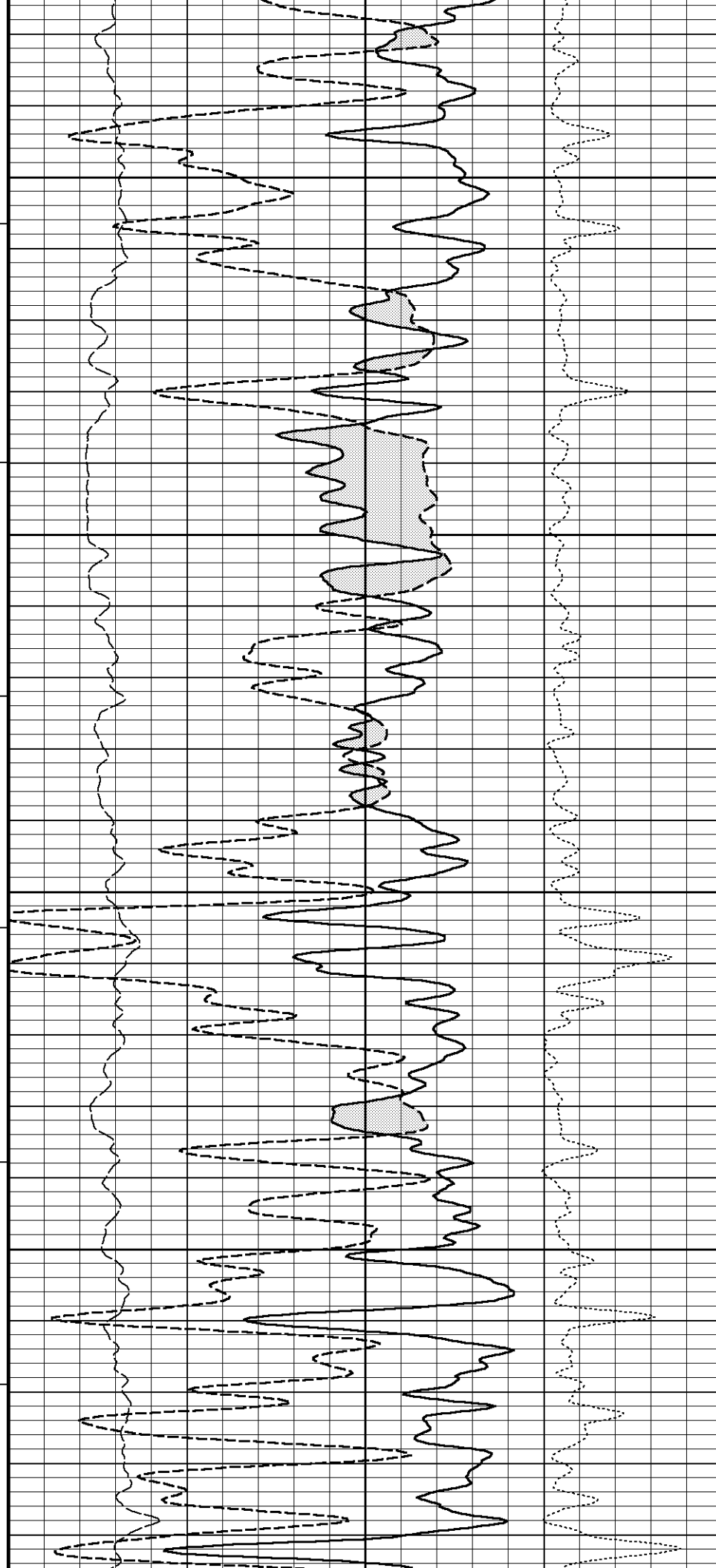
7500

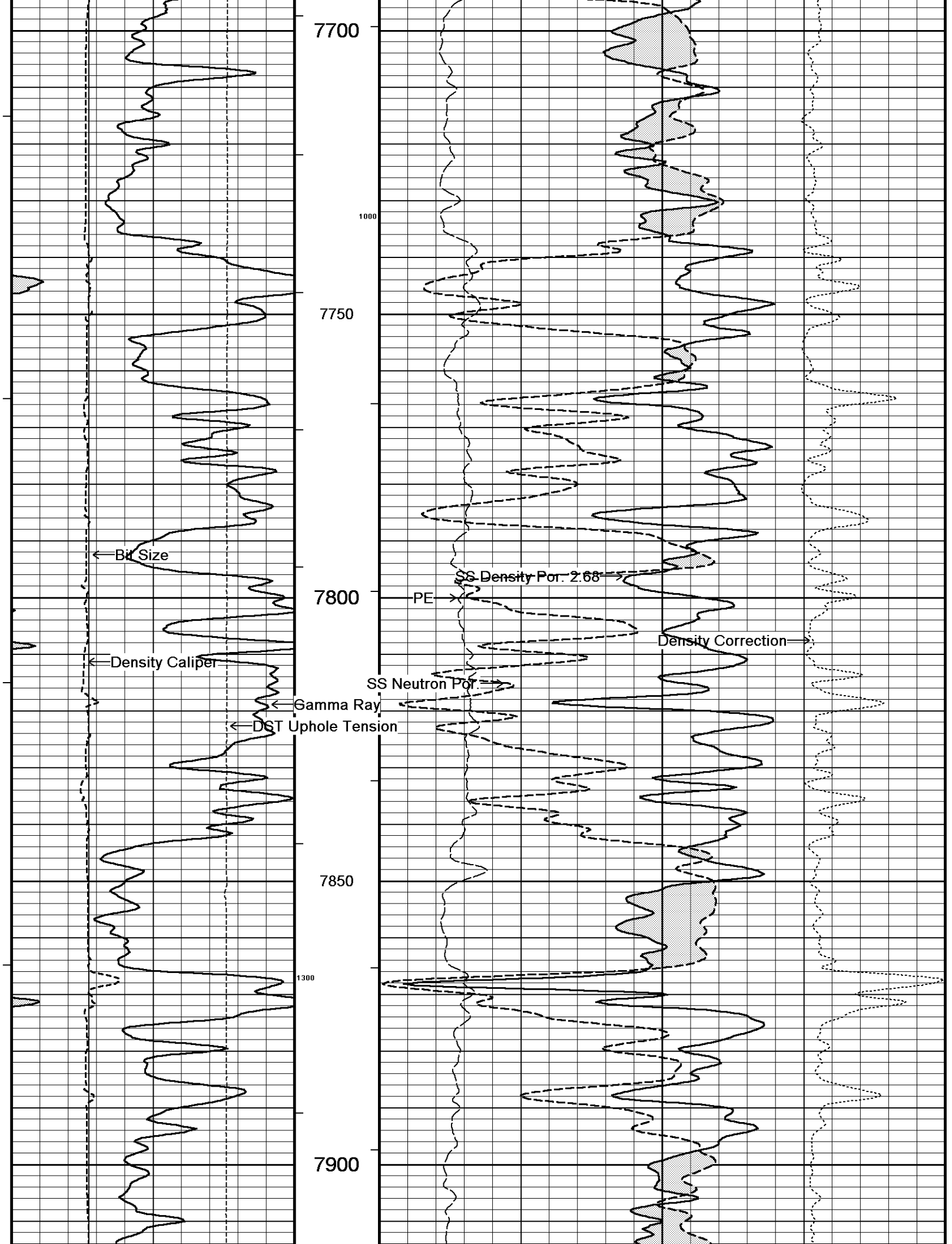
7550

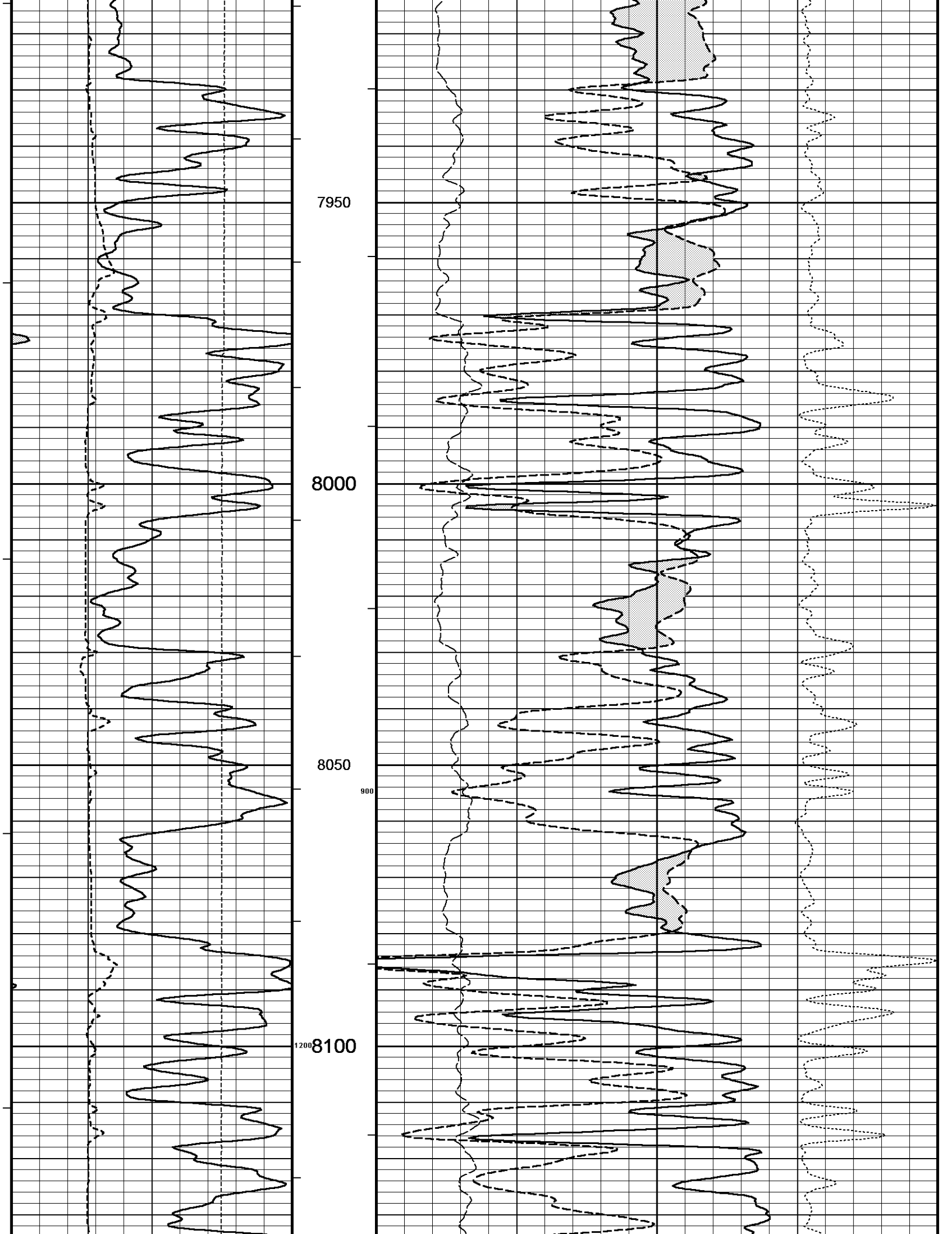
7600

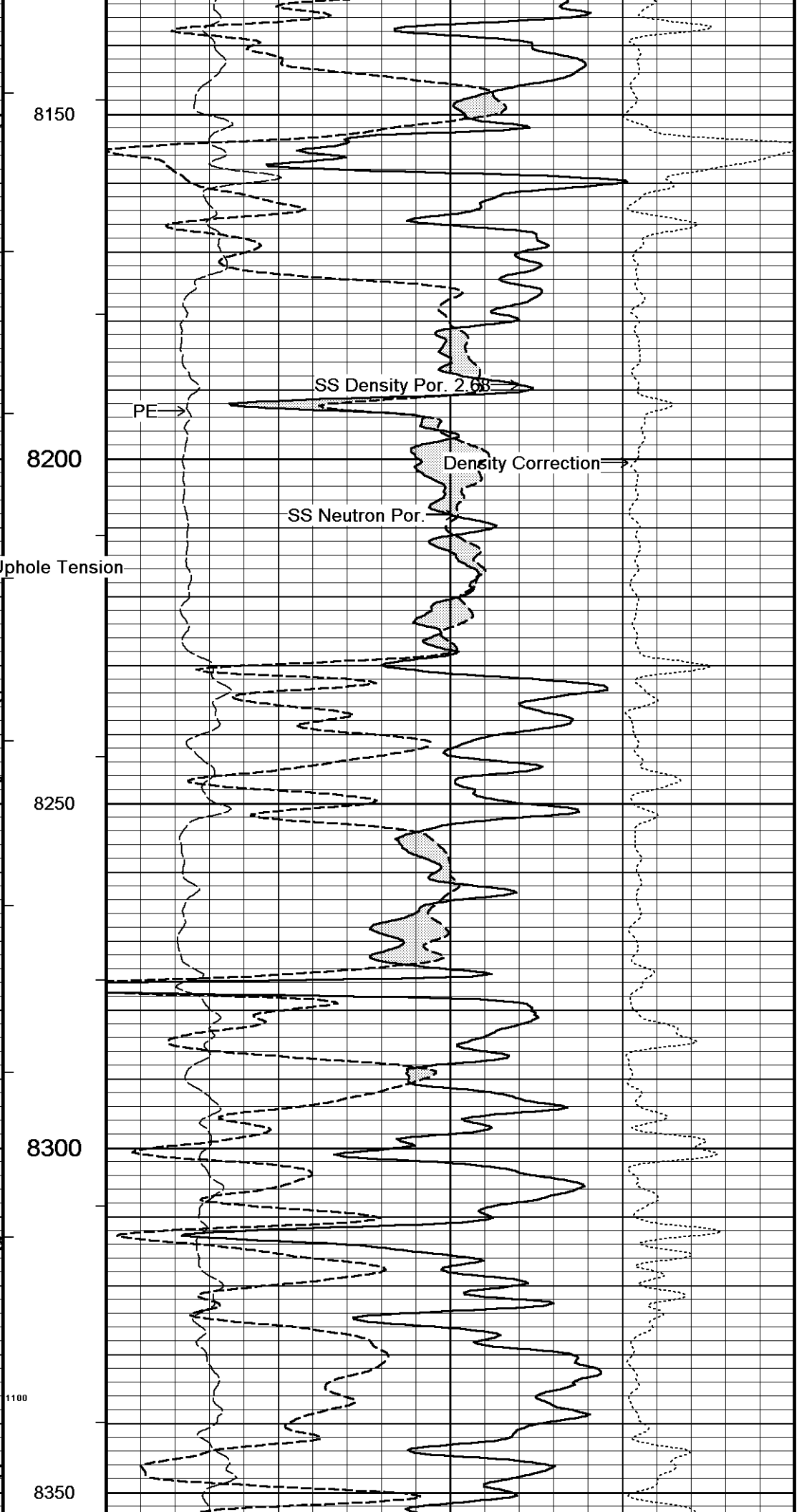
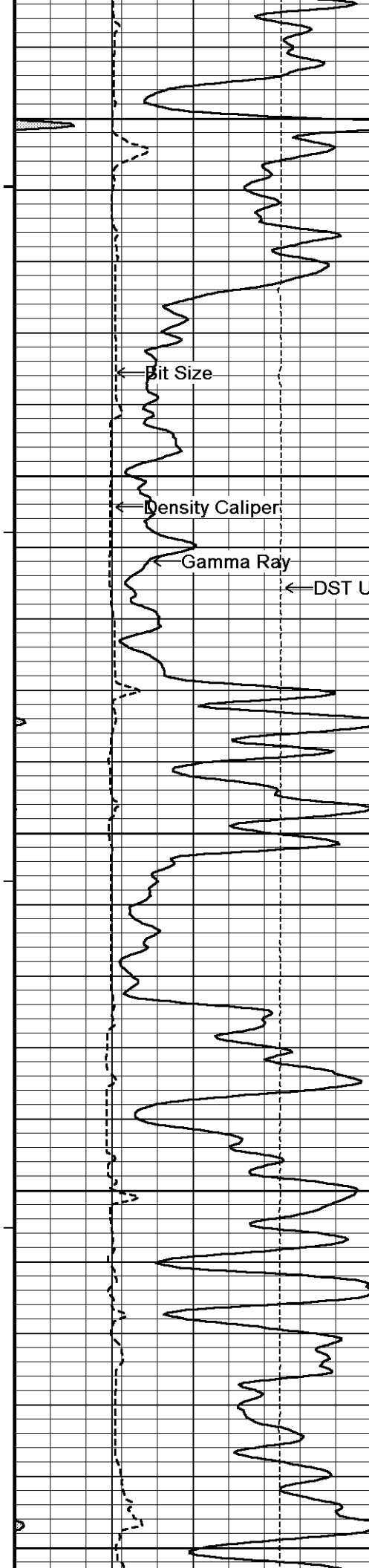
1400

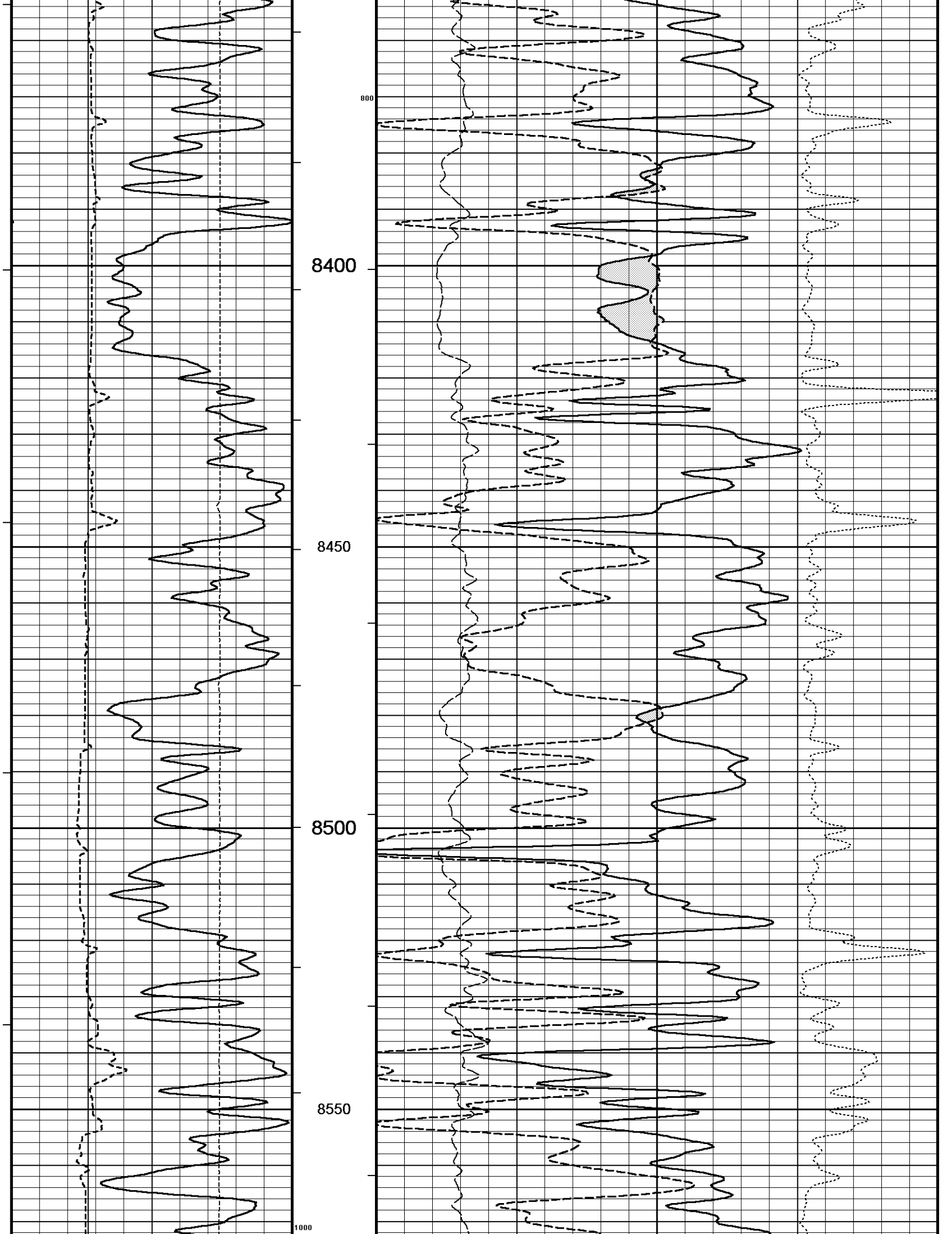
7650

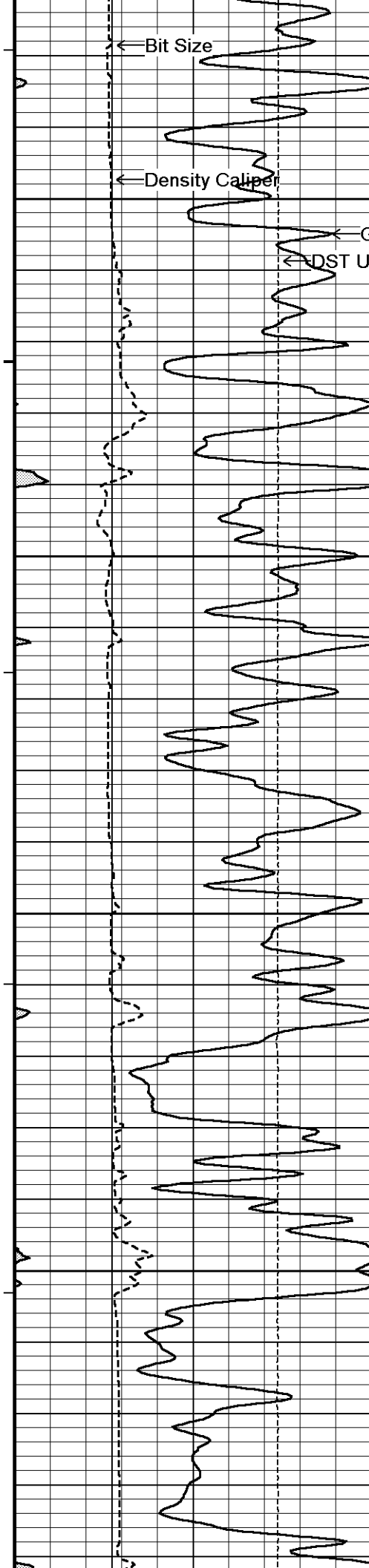












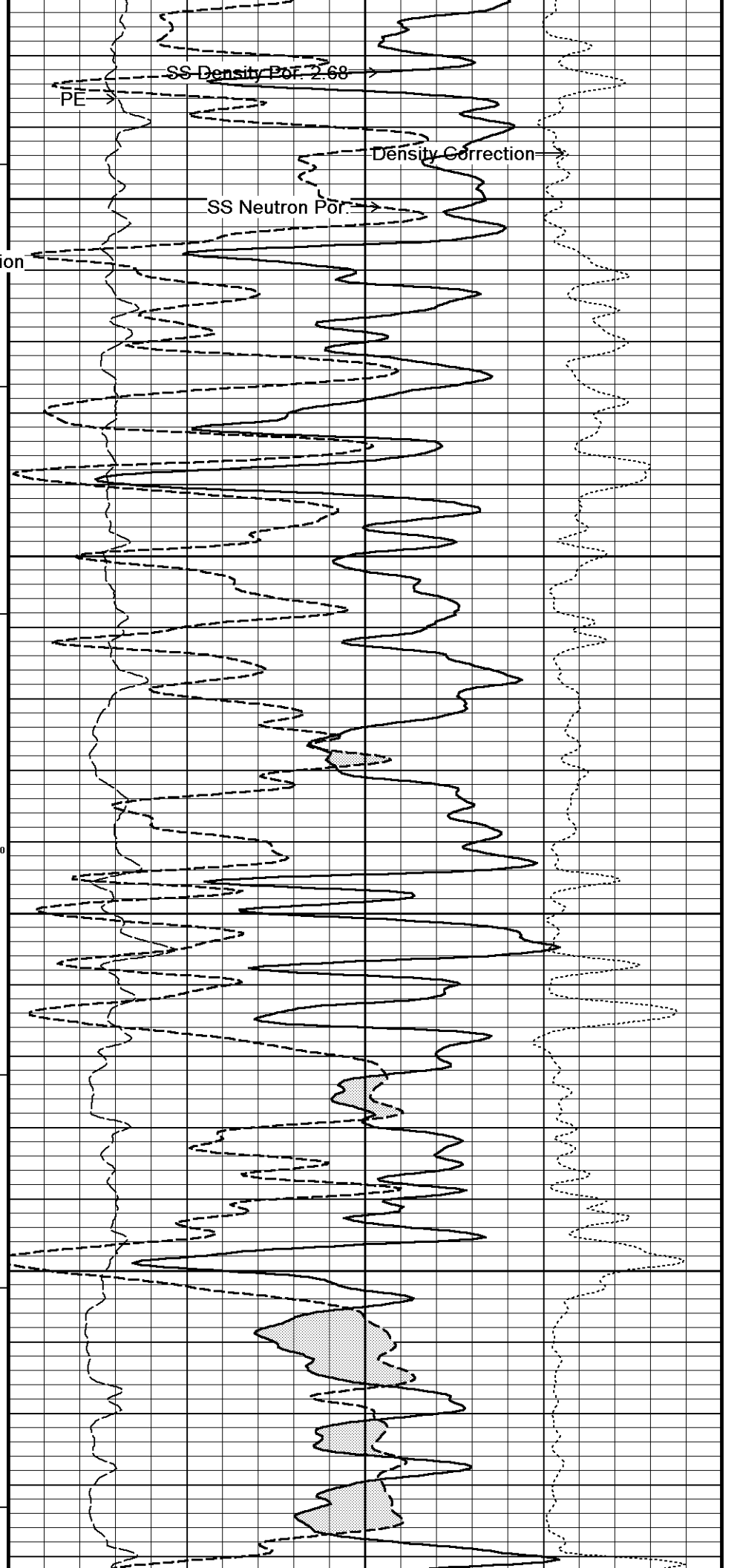
8600

8650

700

8700

8750

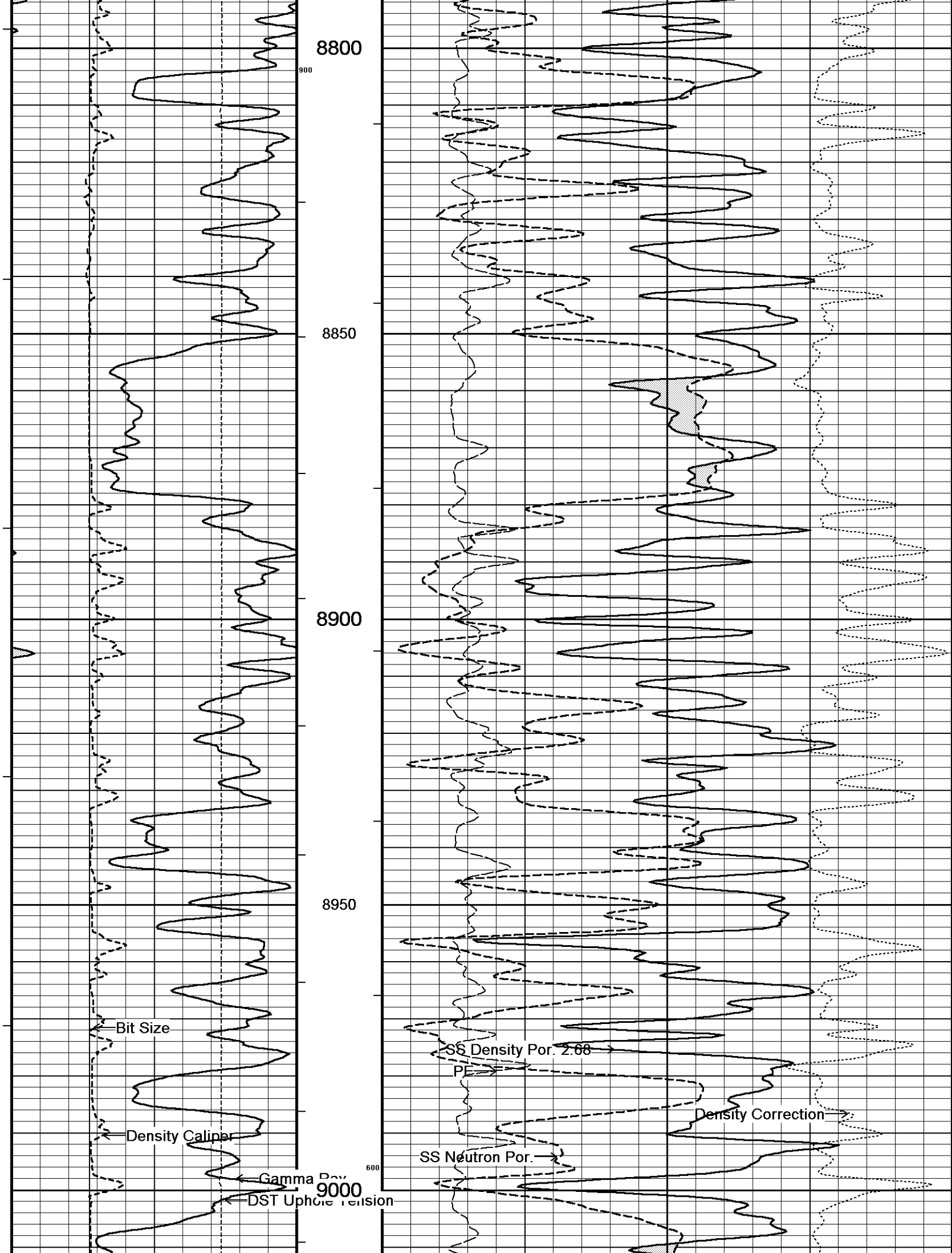


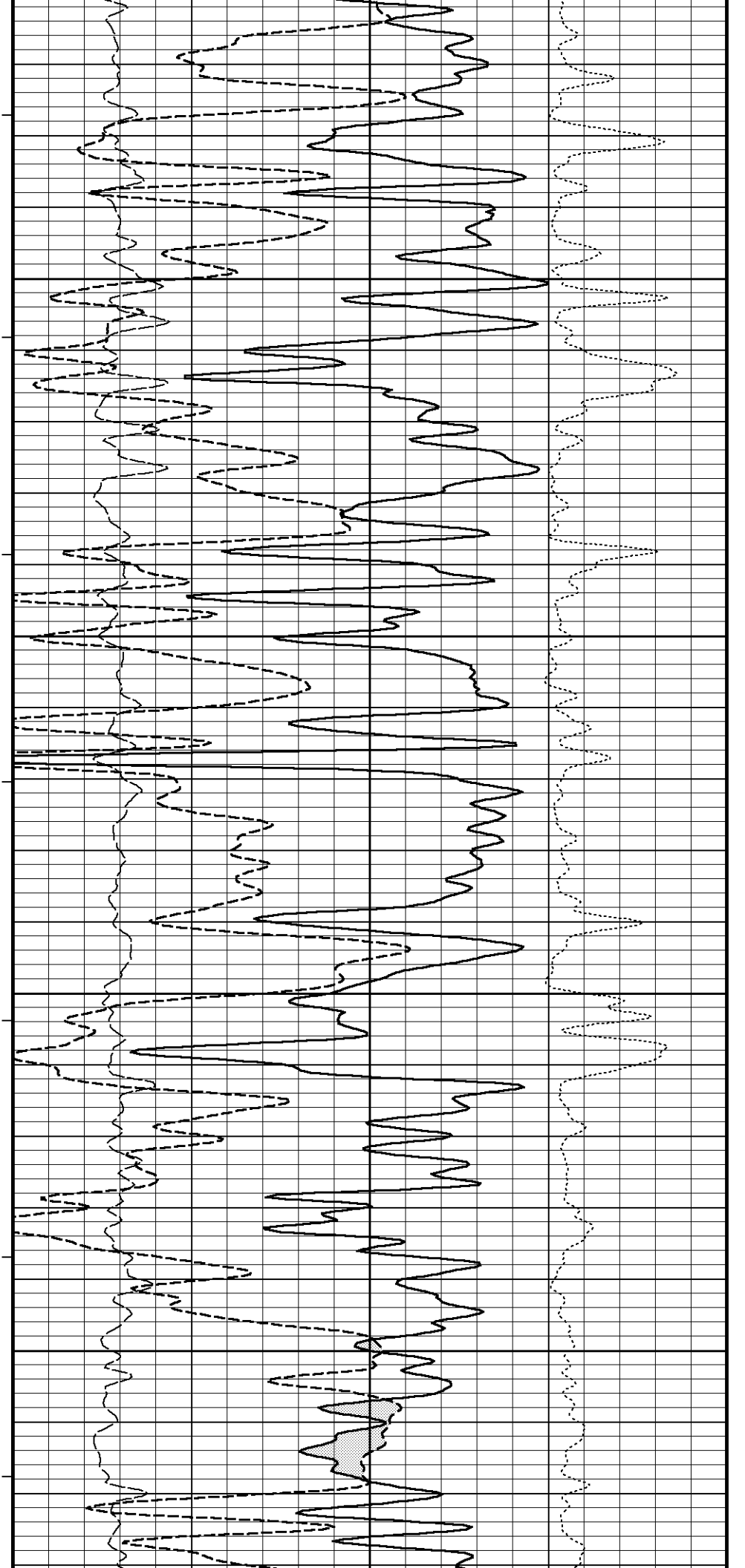
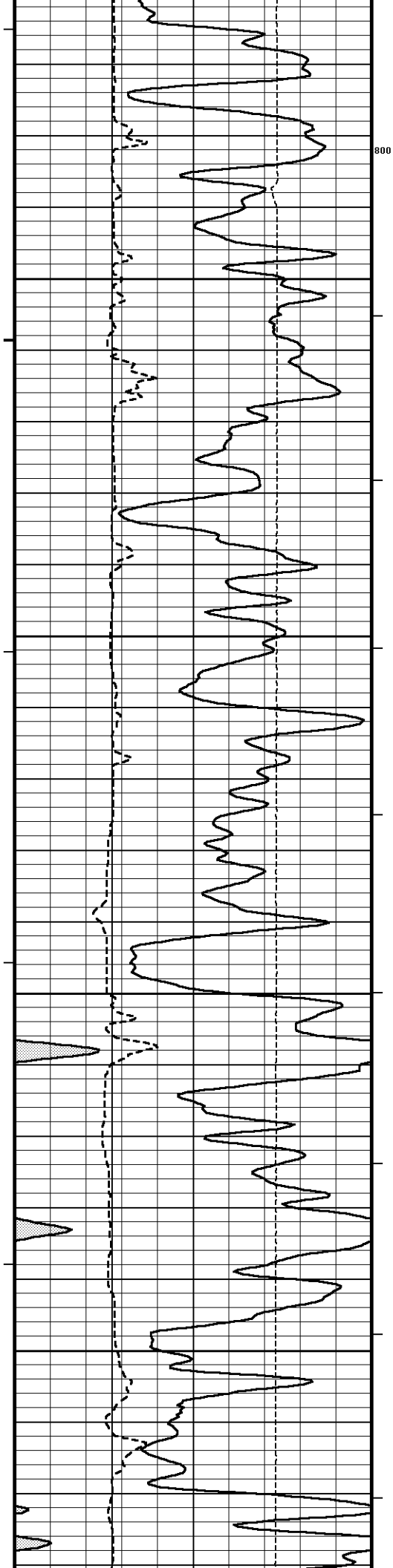
SS Density Por. 2.68

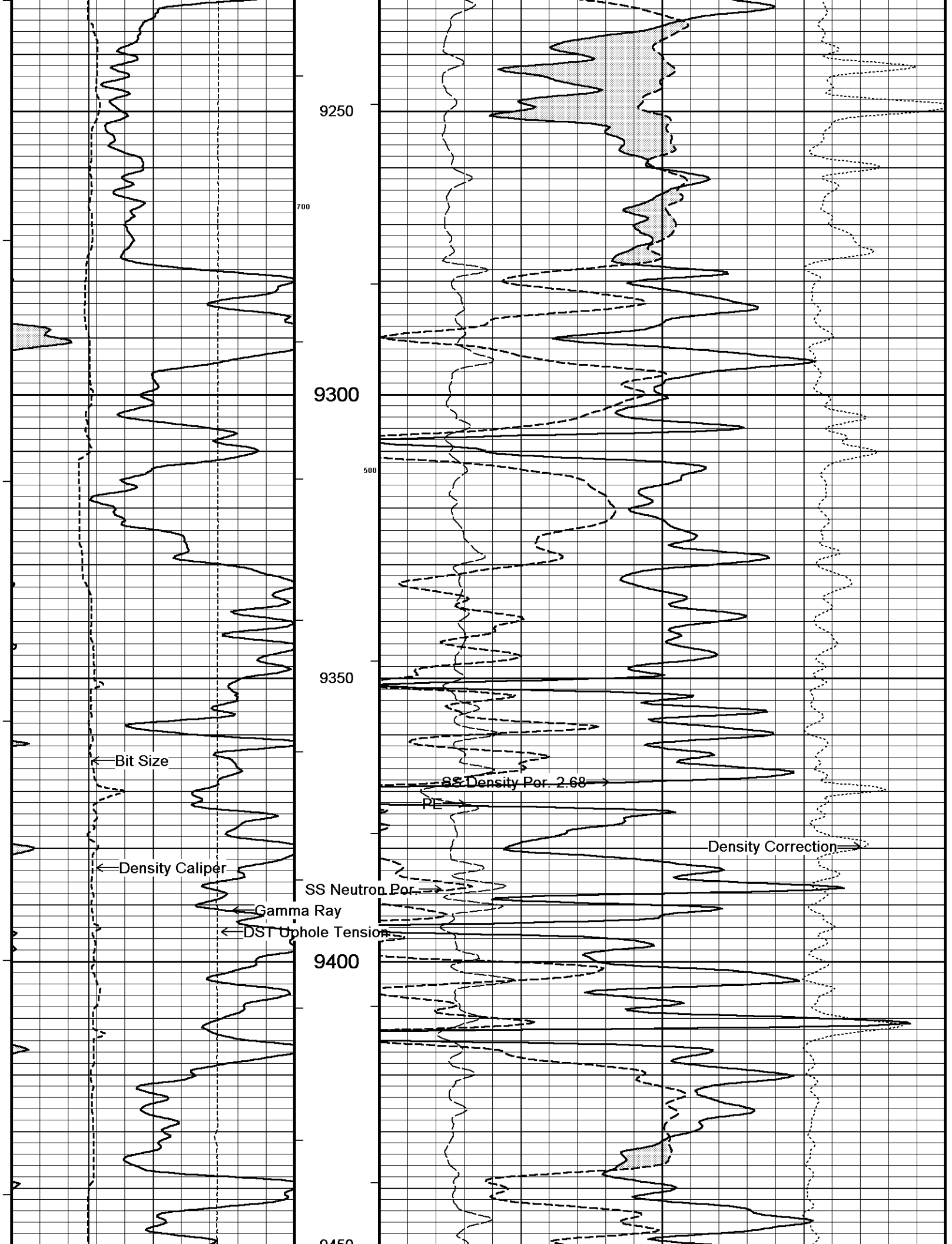
PE

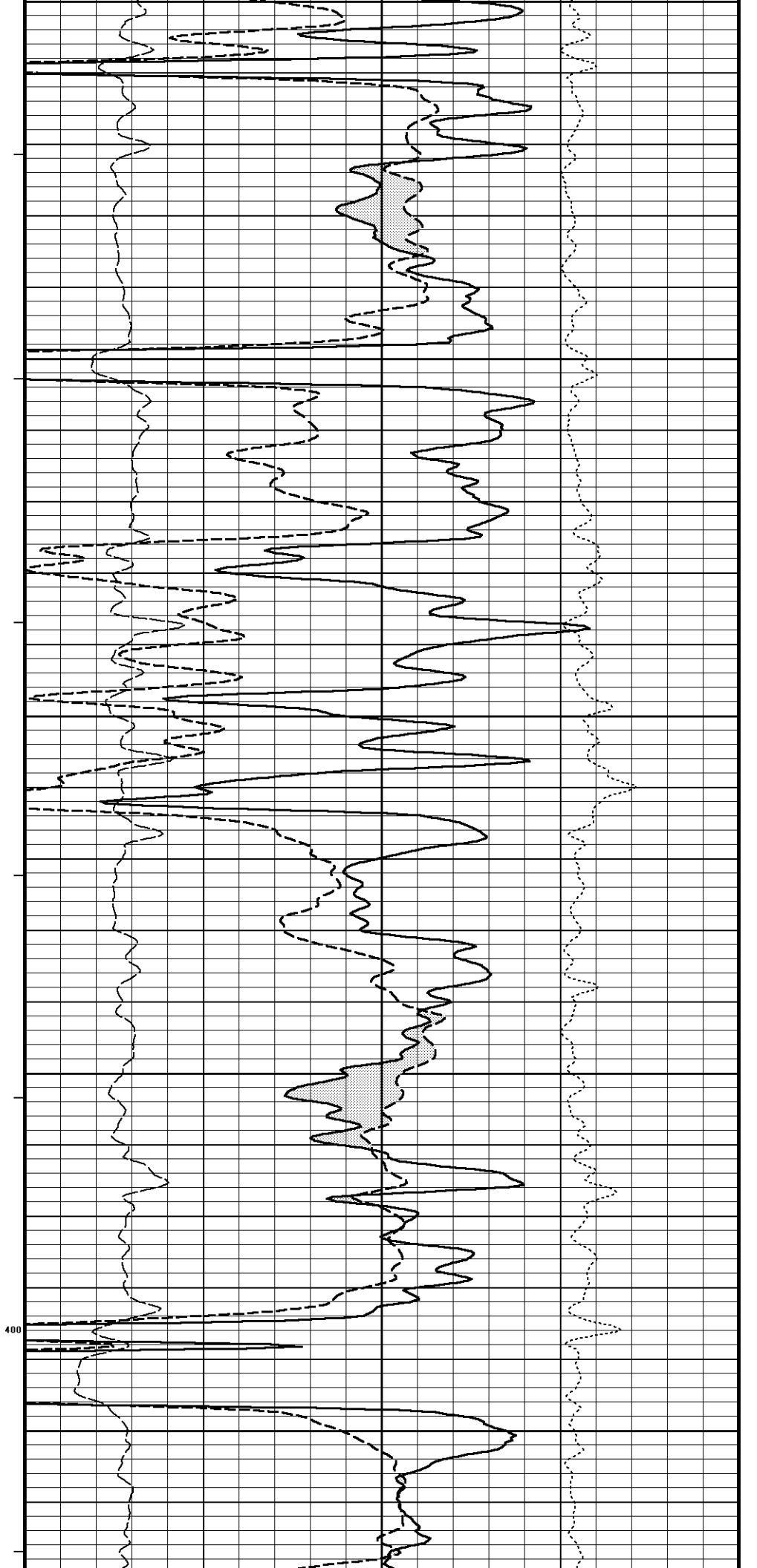
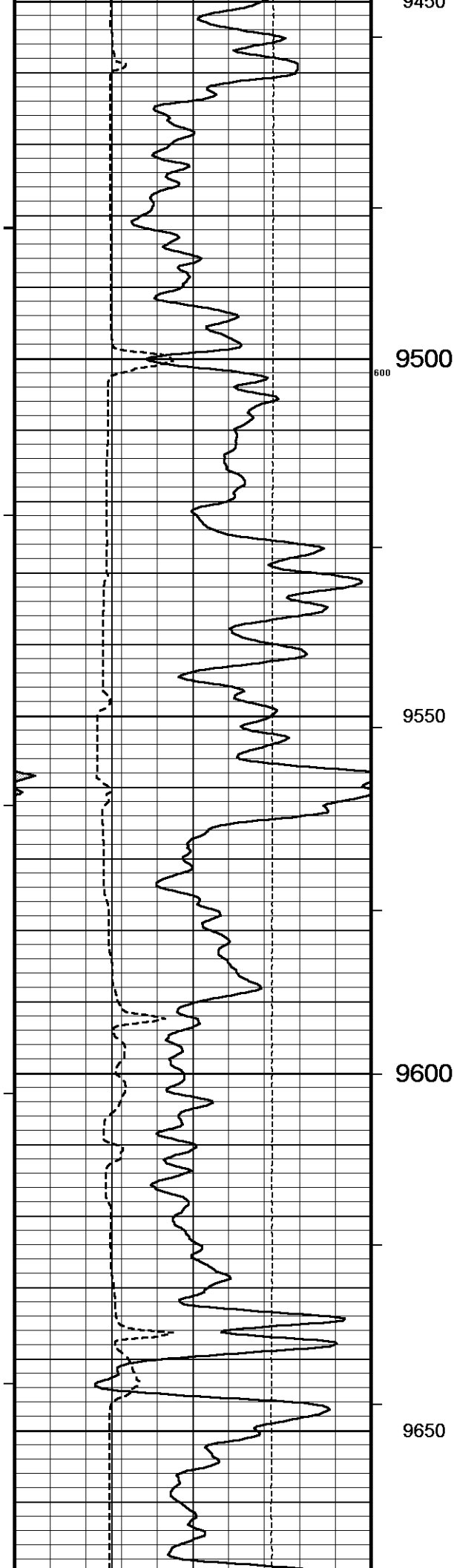
Density Correction

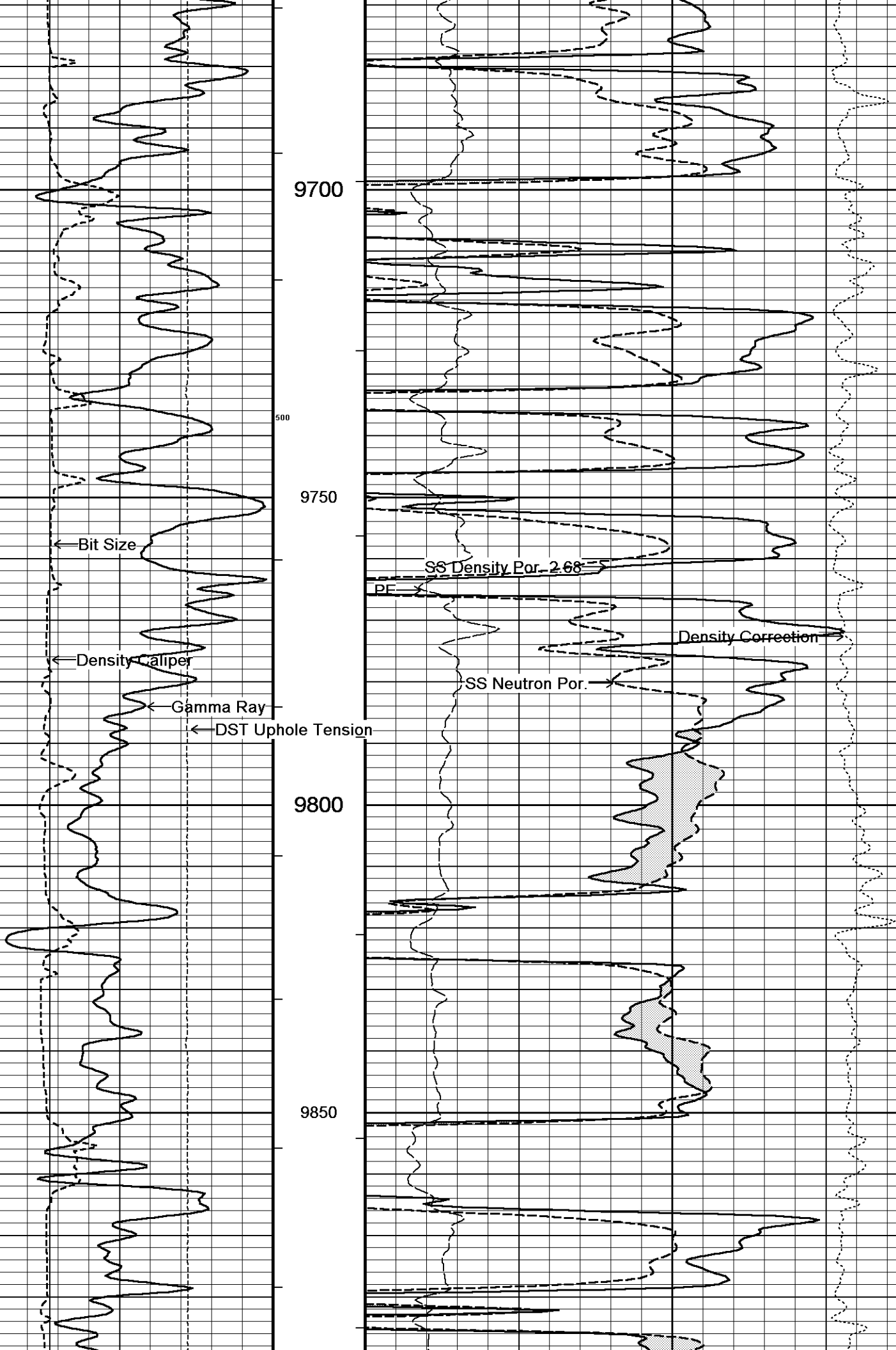
SS Neutron Por.

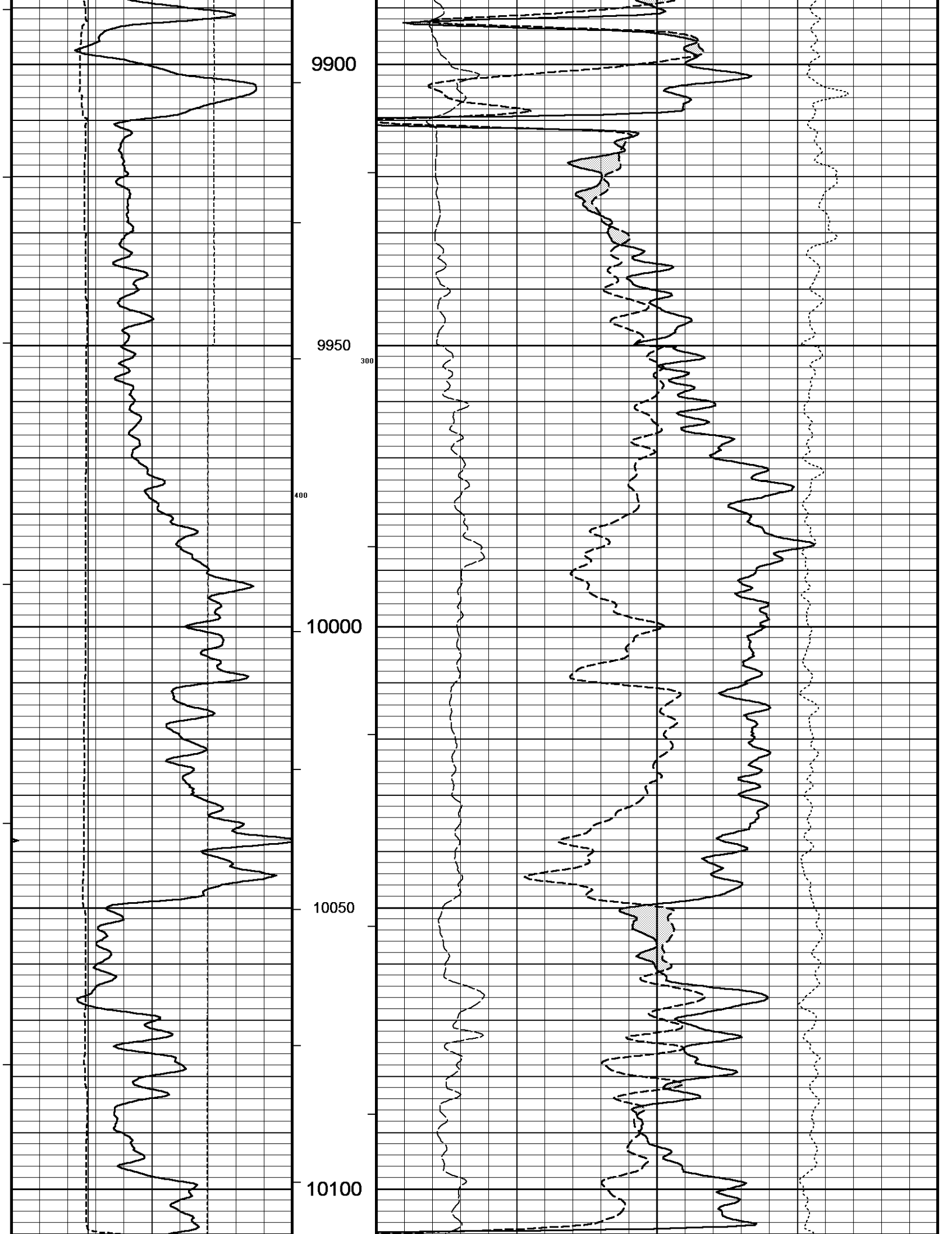


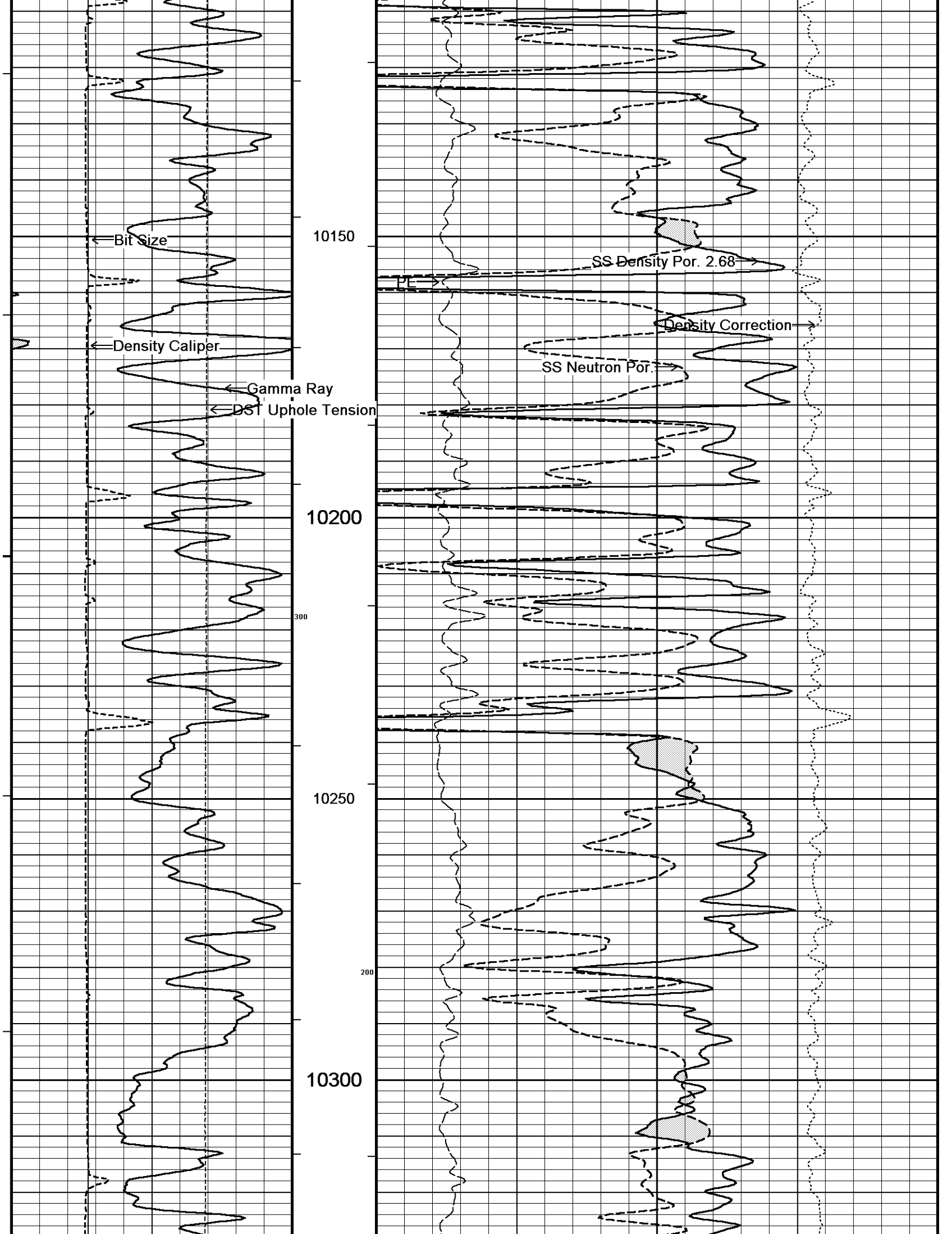


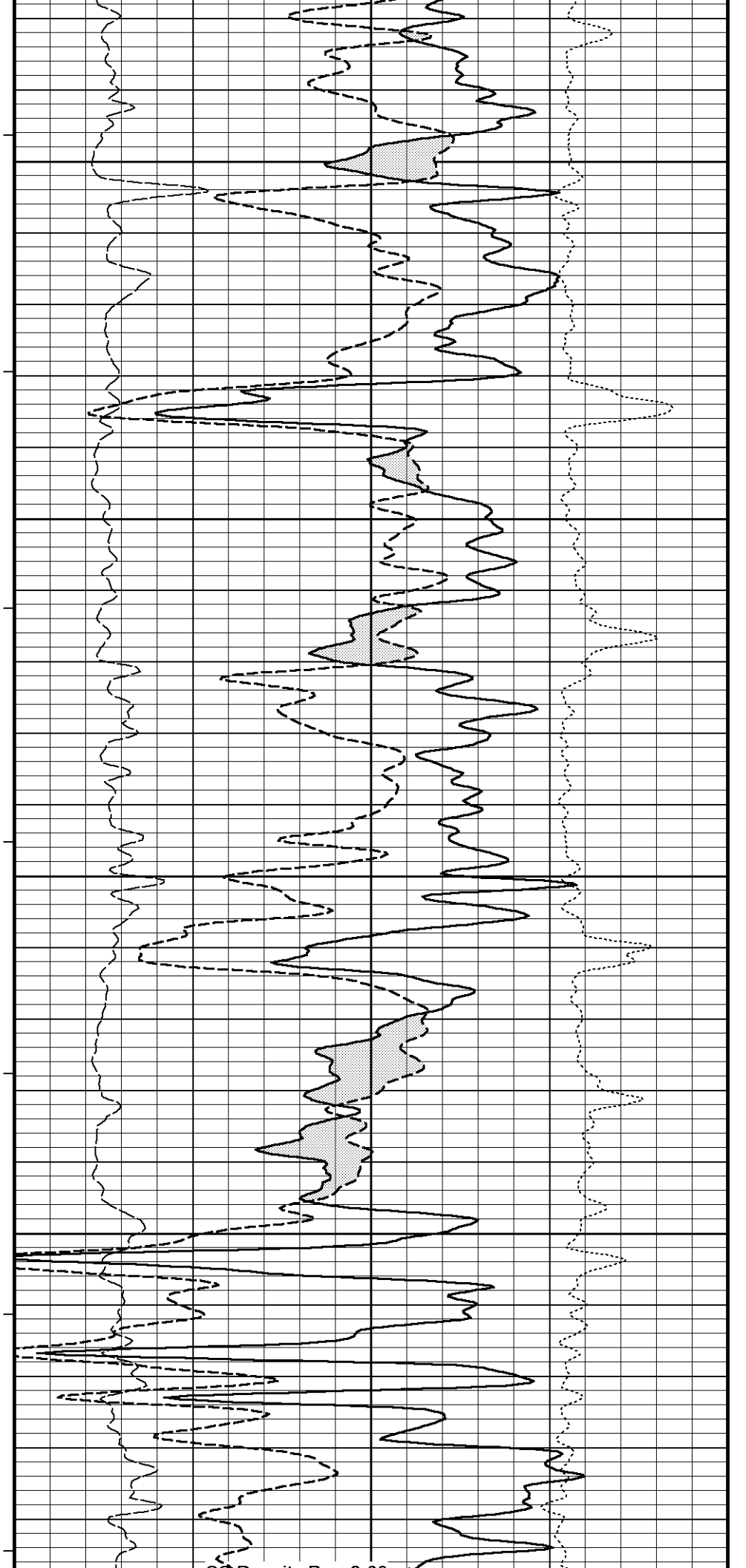
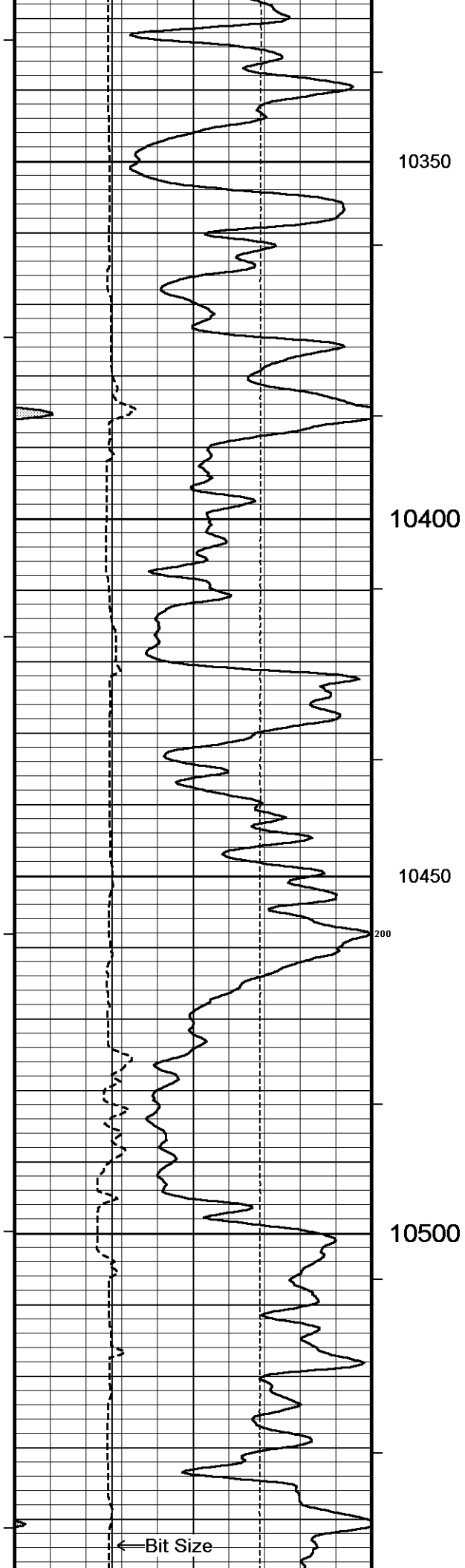


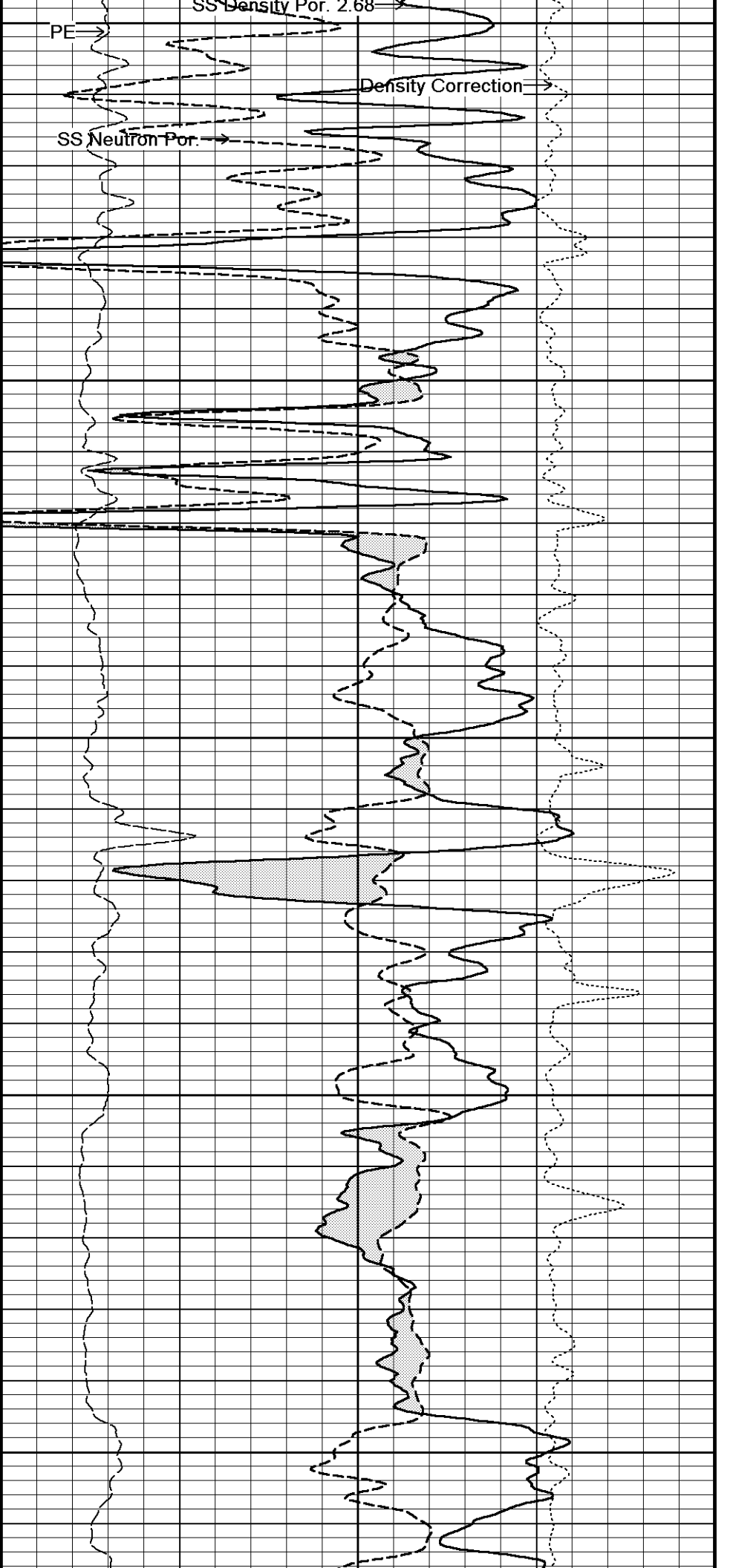
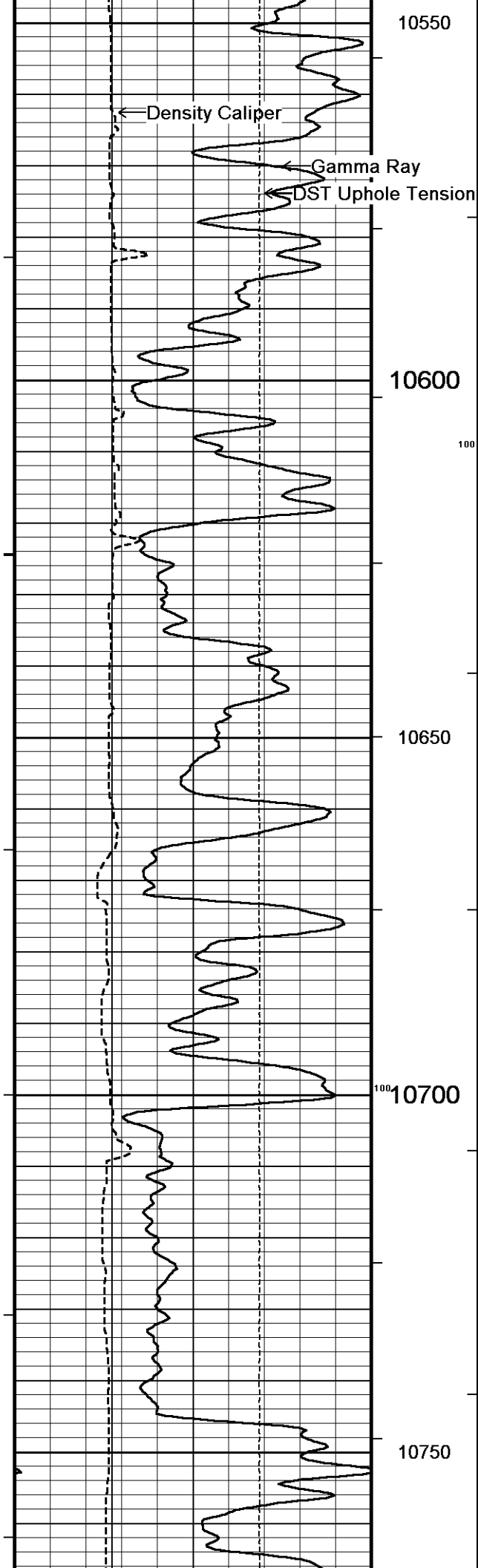


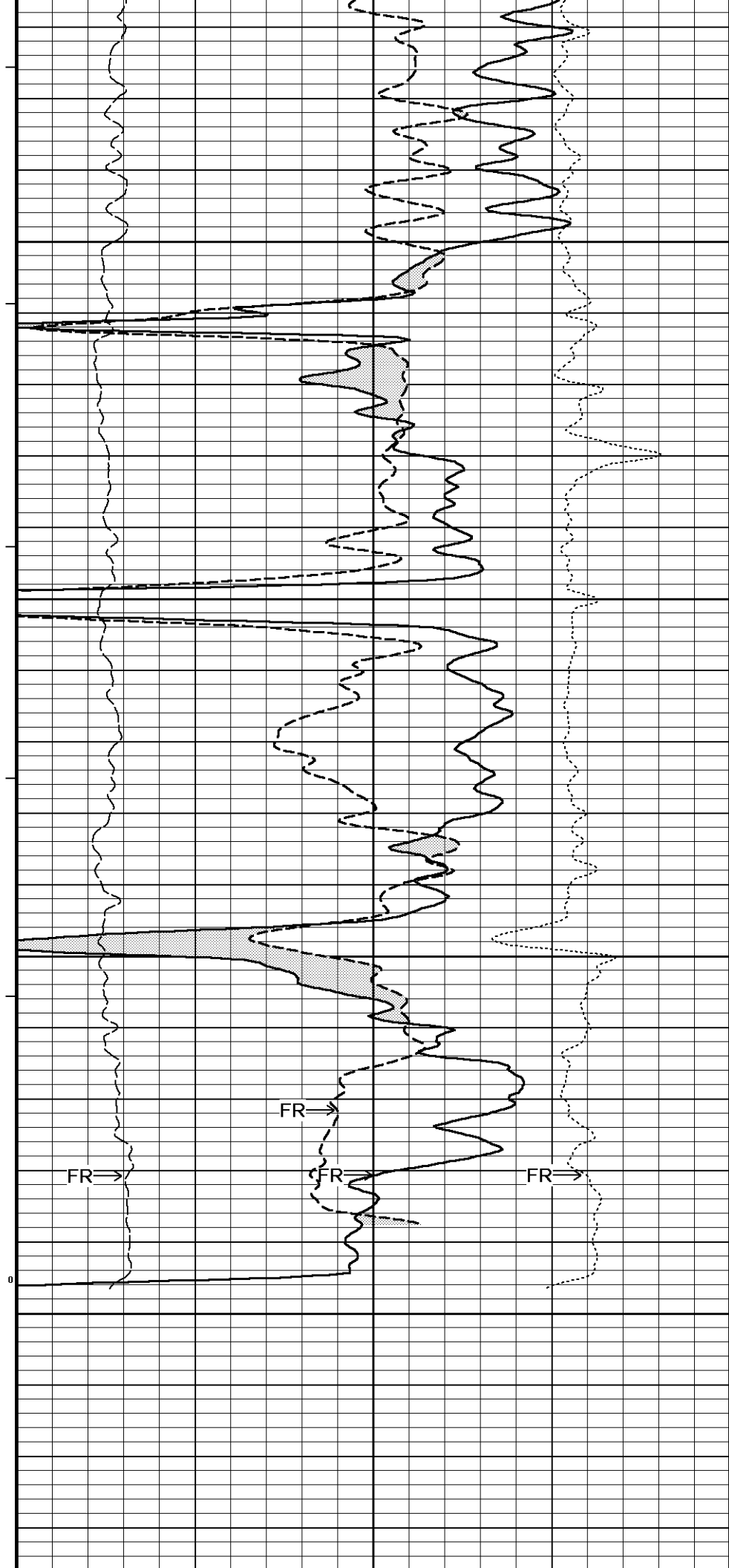
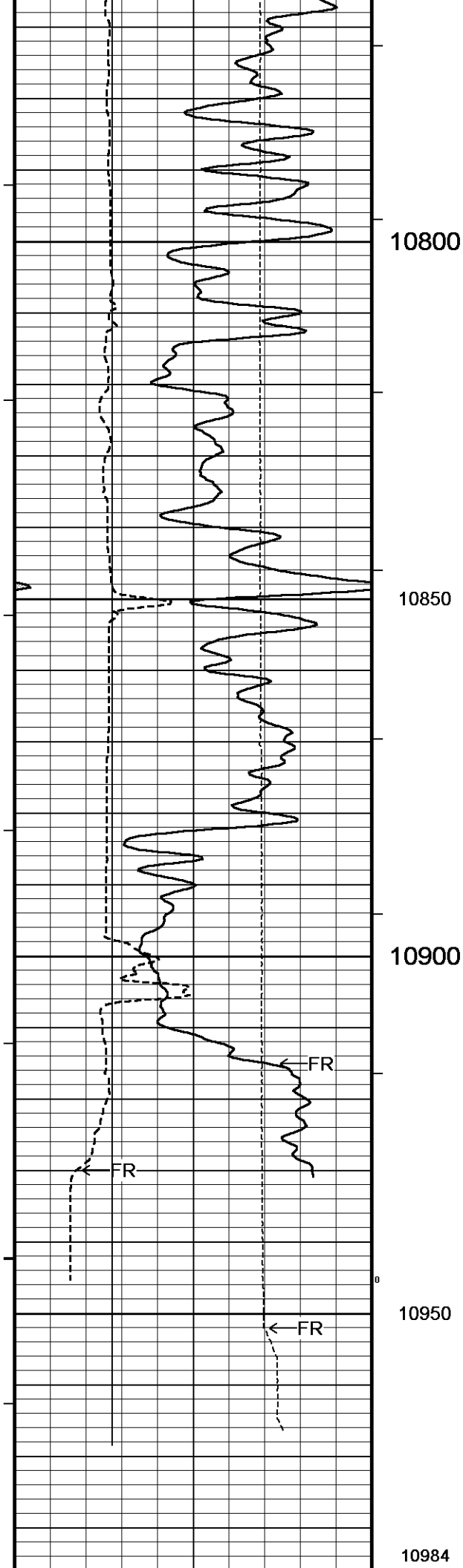


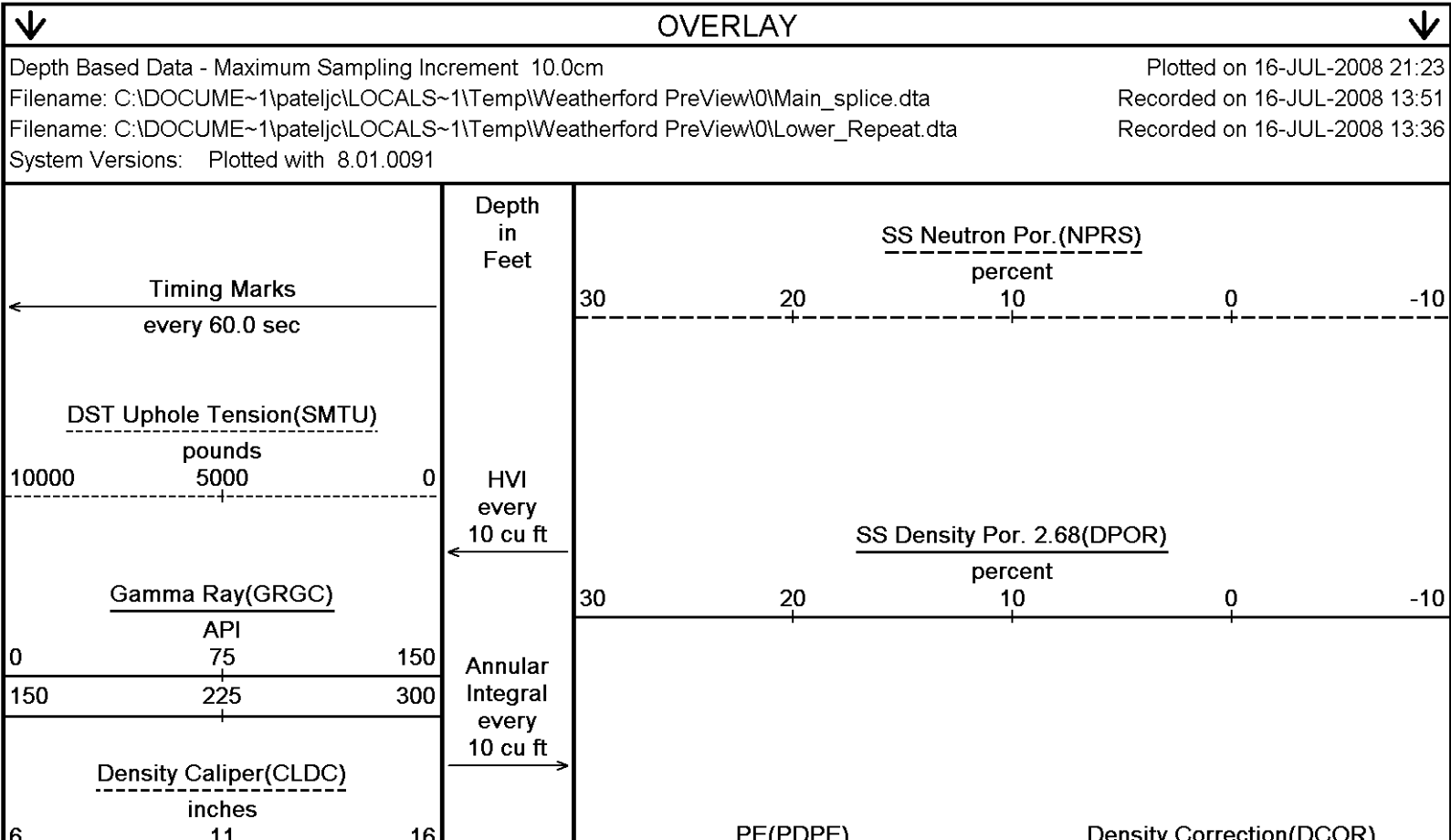
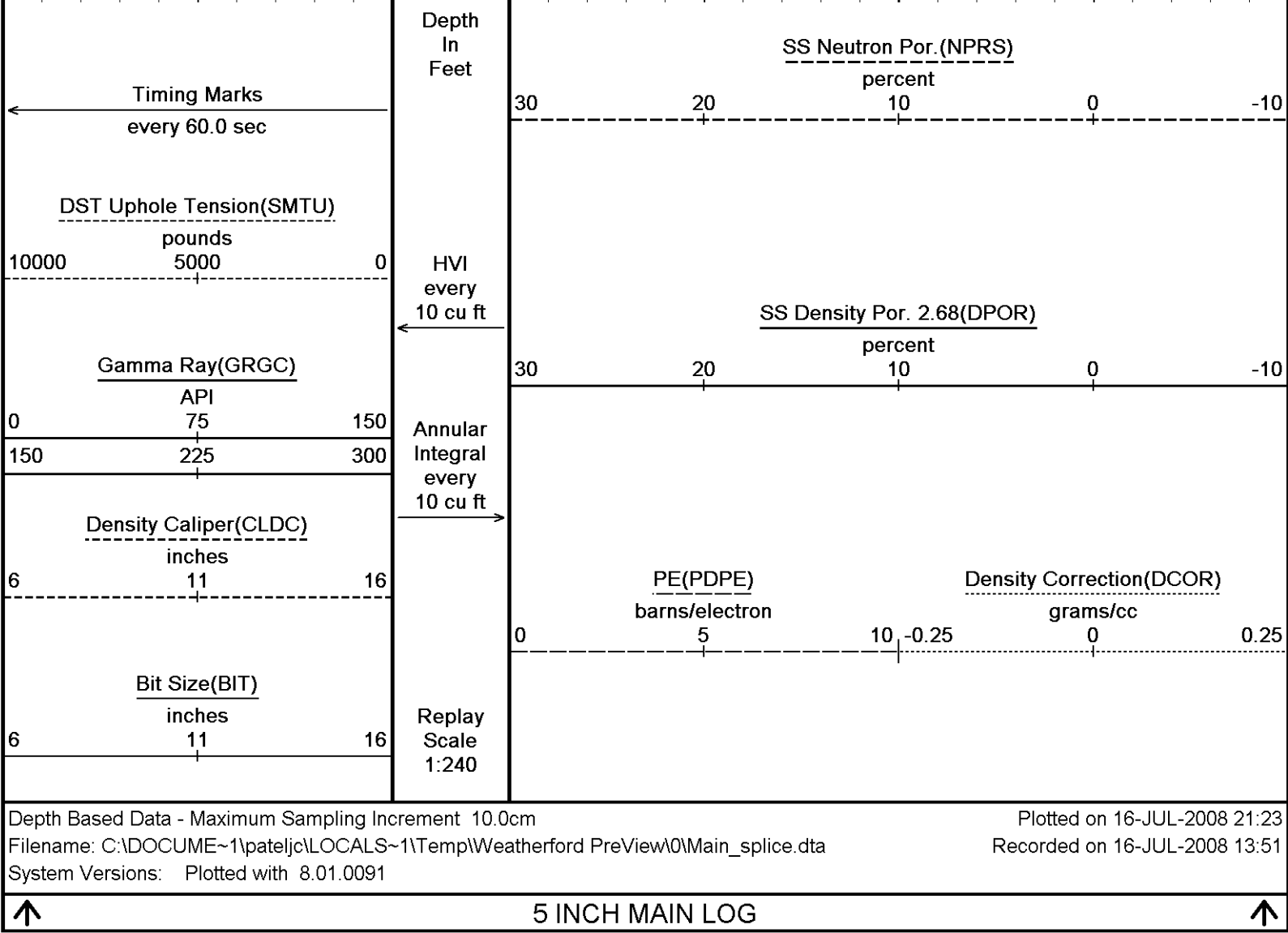


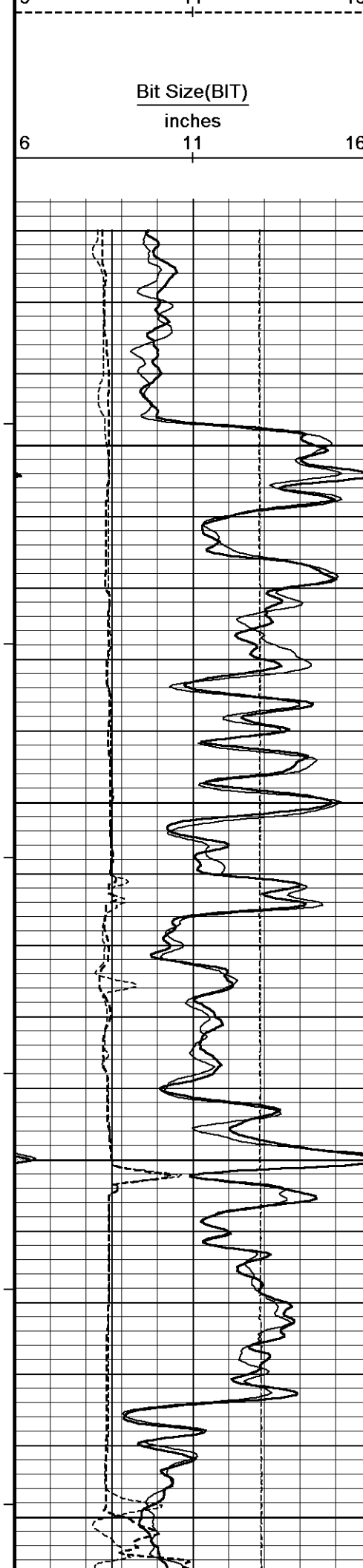












Replay
Scale
1:240

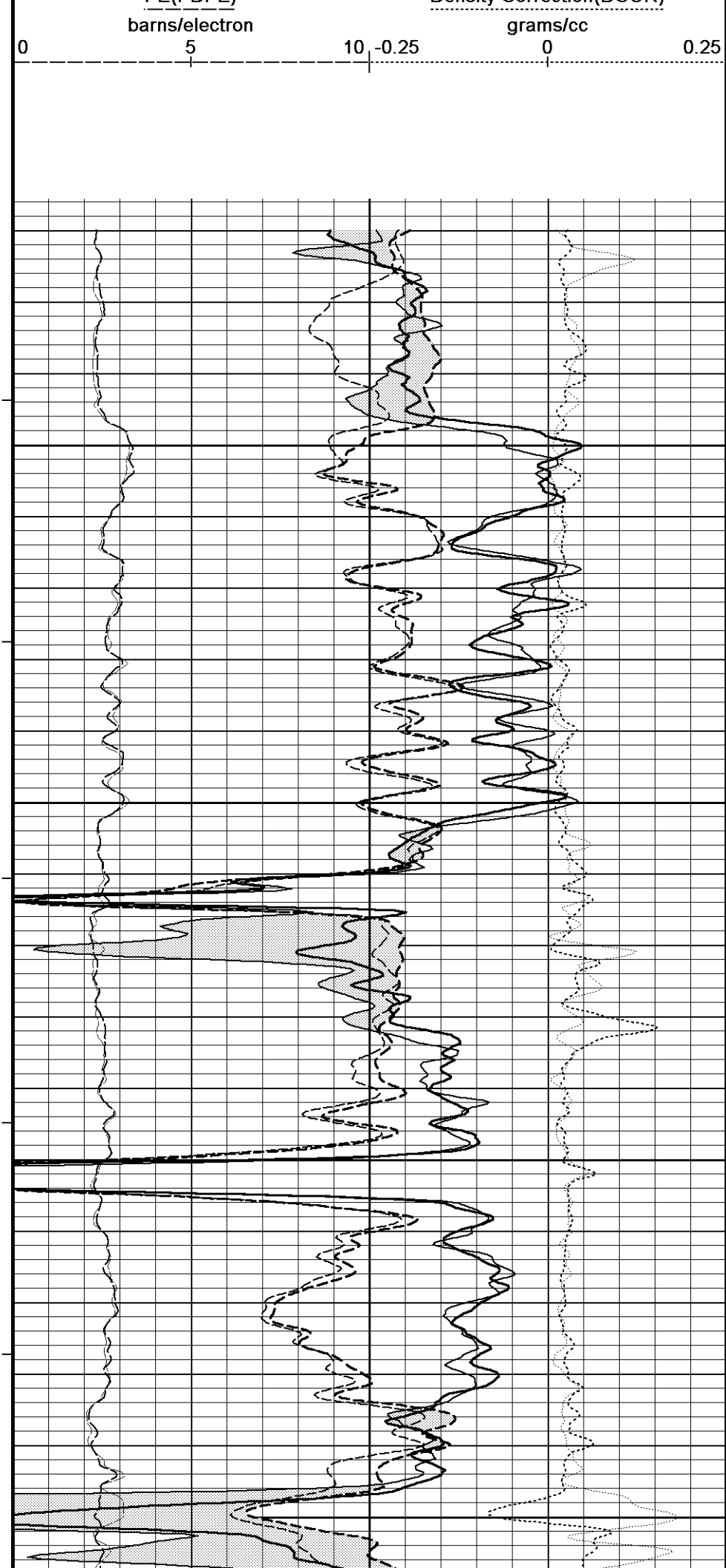
10718

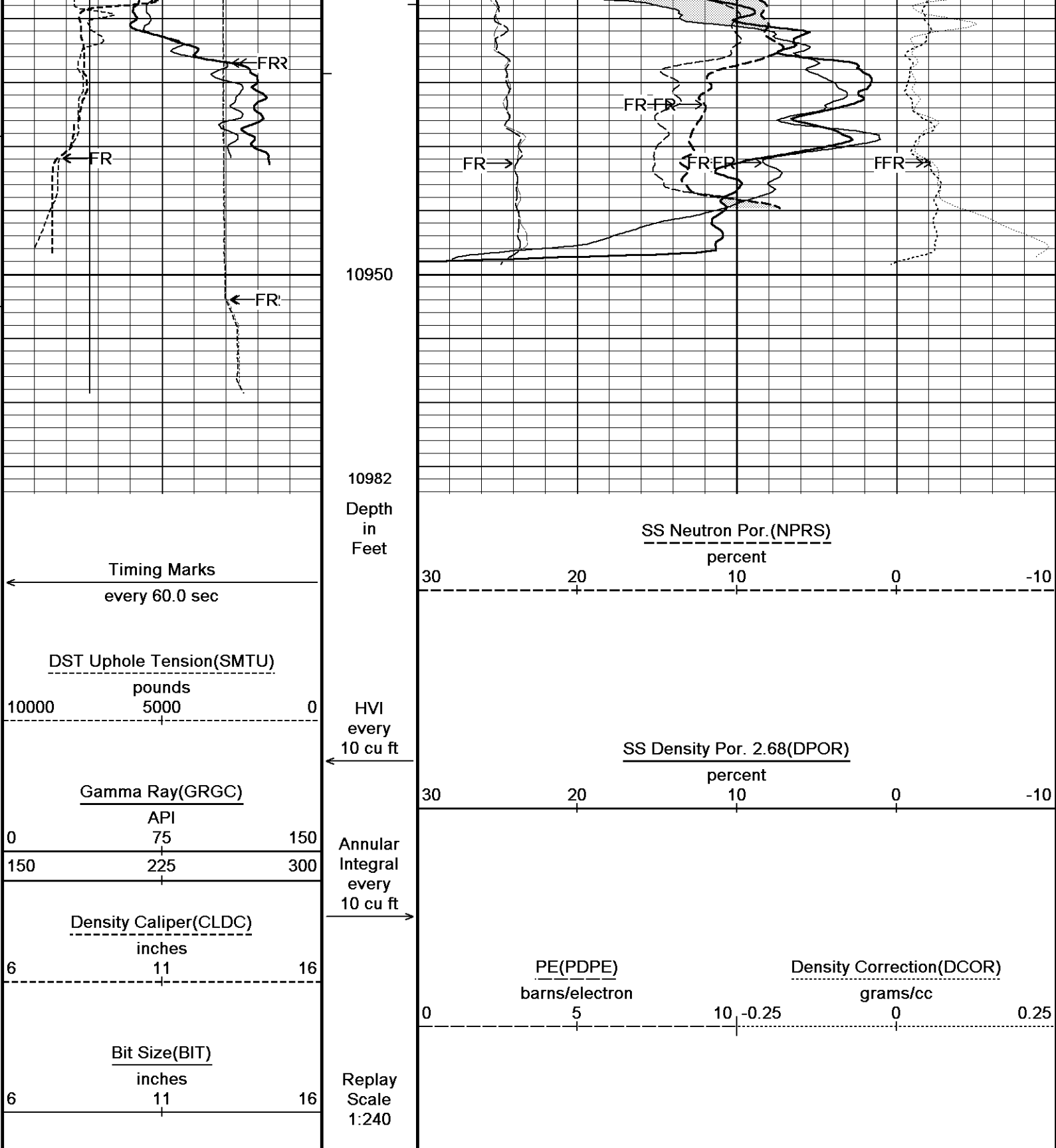
10750

10800

10850

10900





Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\DOCUME~1\pateljc\LOCALS~1\Temp\Weatherford PreView\0\Main_splice.dta
Filename: C:\DOCUME~1\pateljc\LOCALS~1\Temp\Weatherford PreView\0\Lower_Repeat.dta
System Versions: Plotted with 8.01.0091

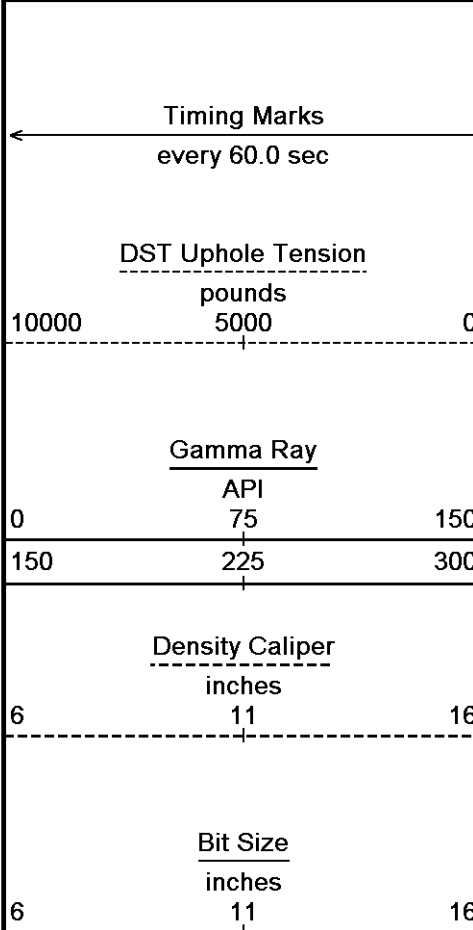
Plotted on 16-JUL-2008 21:23
Recorded on 16-JUL-2008 13:51
Recorded on 16-JUL-2008 13:36

↑ OVERLAY ↑

↓ 5 INCH MAIN LOG ↓

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\DOCUME~1\pateljc\LOCALS~1\Temp\Weatherford PreView\0\Main_splice.dta
System Versions: Plotted with 8.01.0091

Plotted on 16-JUL-2008 21:23
Recorded on 16-JUL-2008 13:51

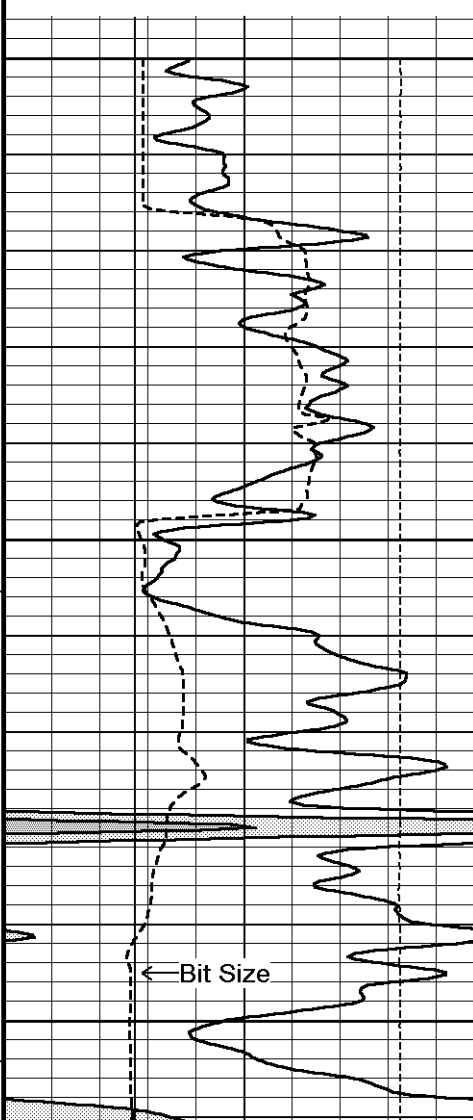


DSC
in
Feet

HVI
every
10 cu ft

Annular
Integral
every
10 cu ft

Replay
Scale
1:240

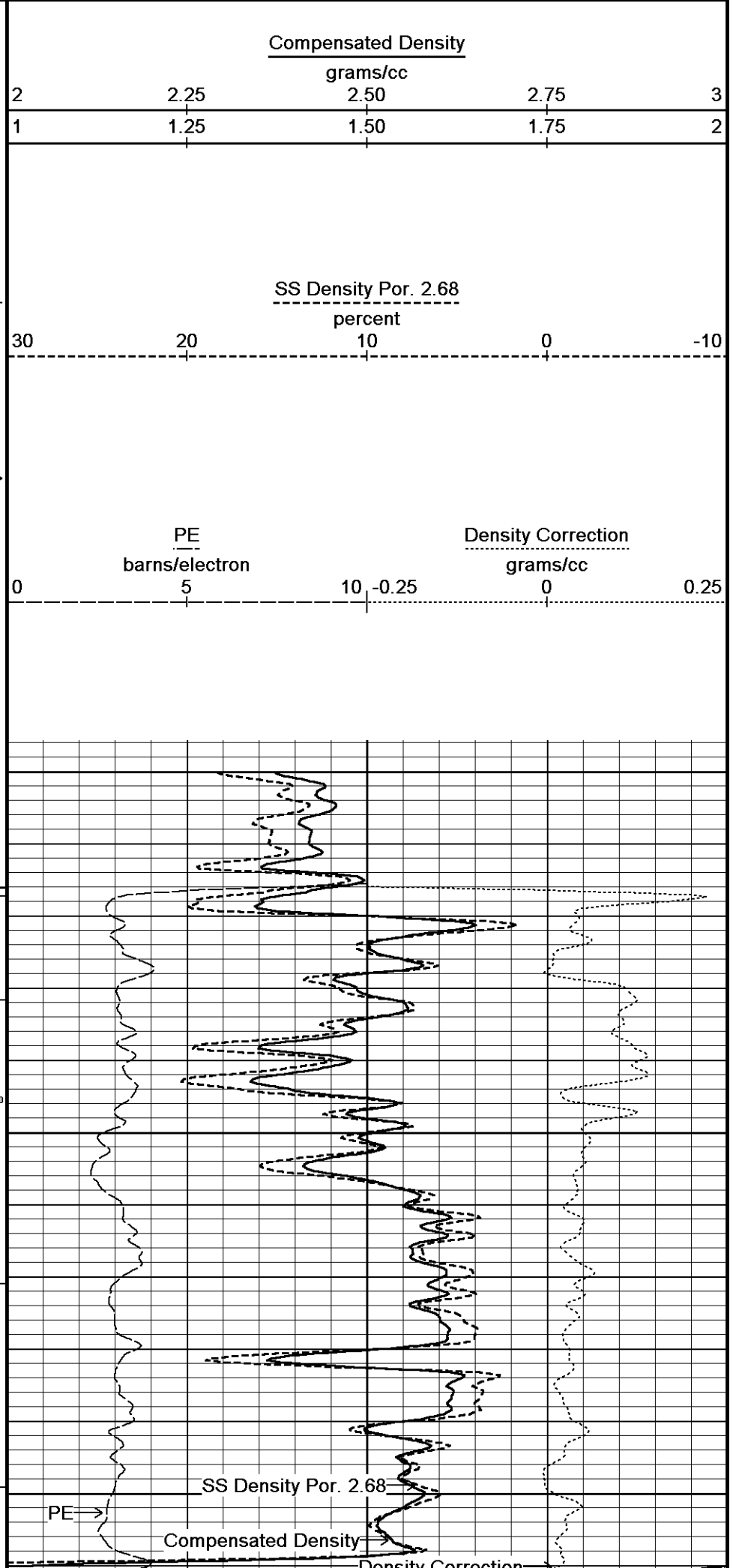


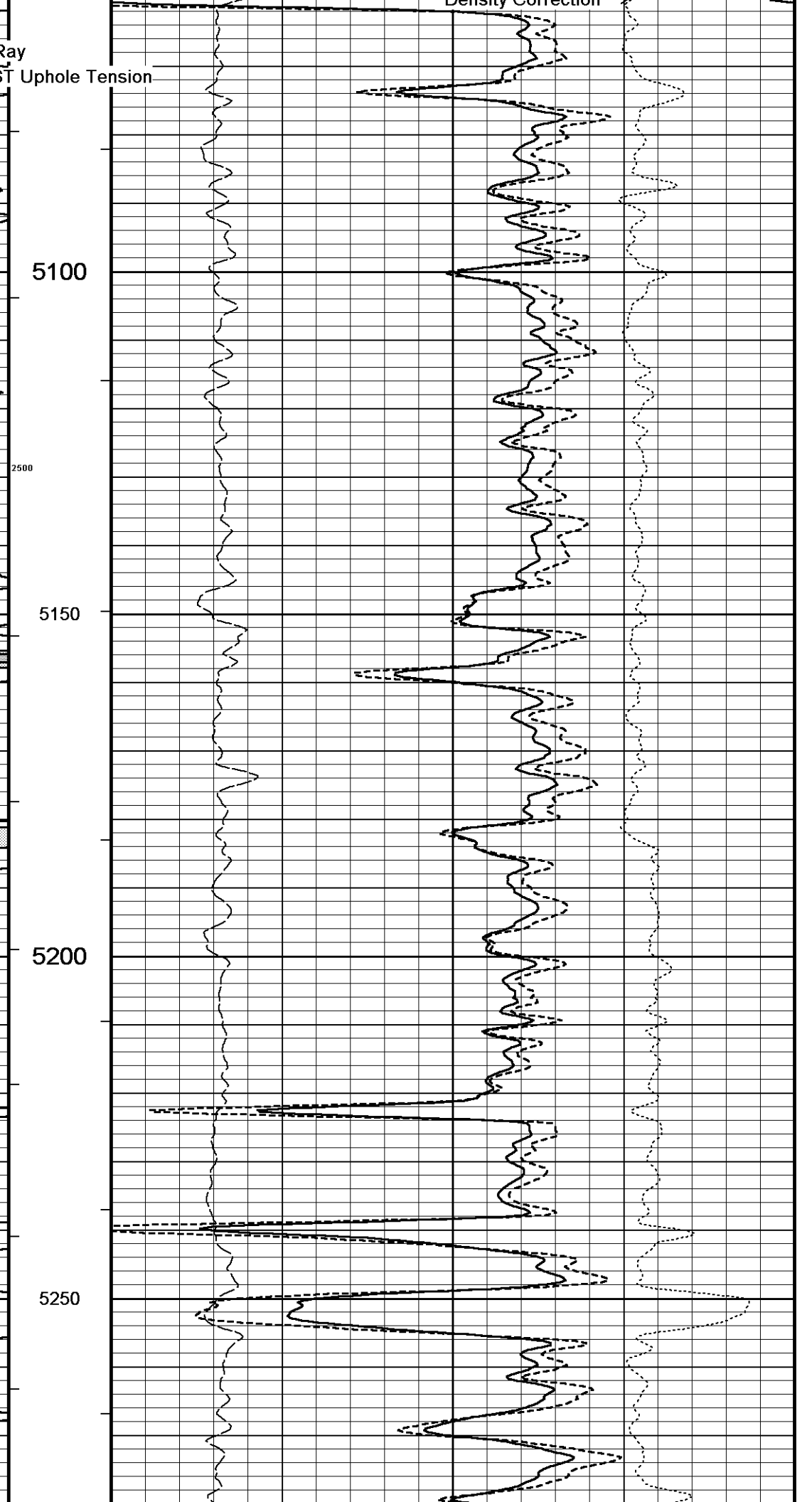
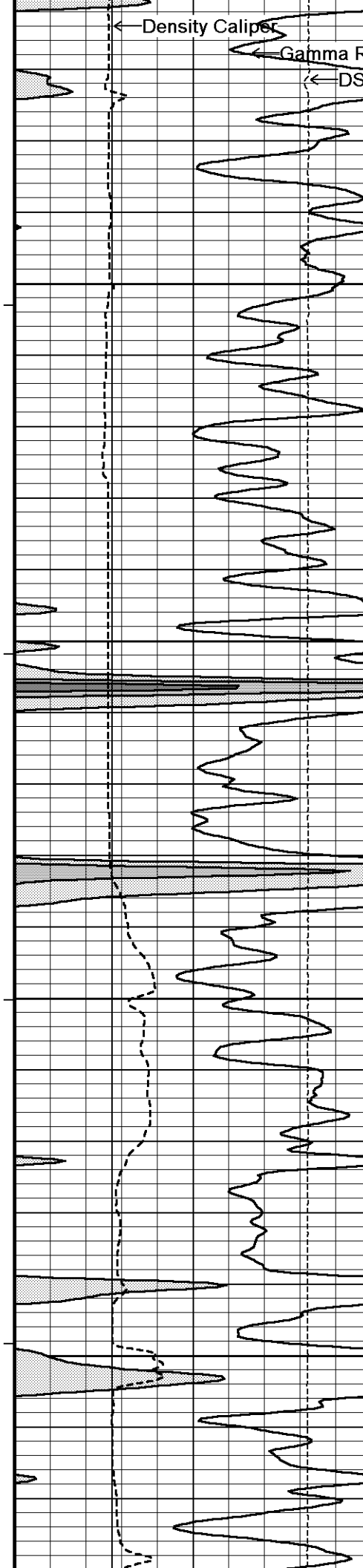
4950

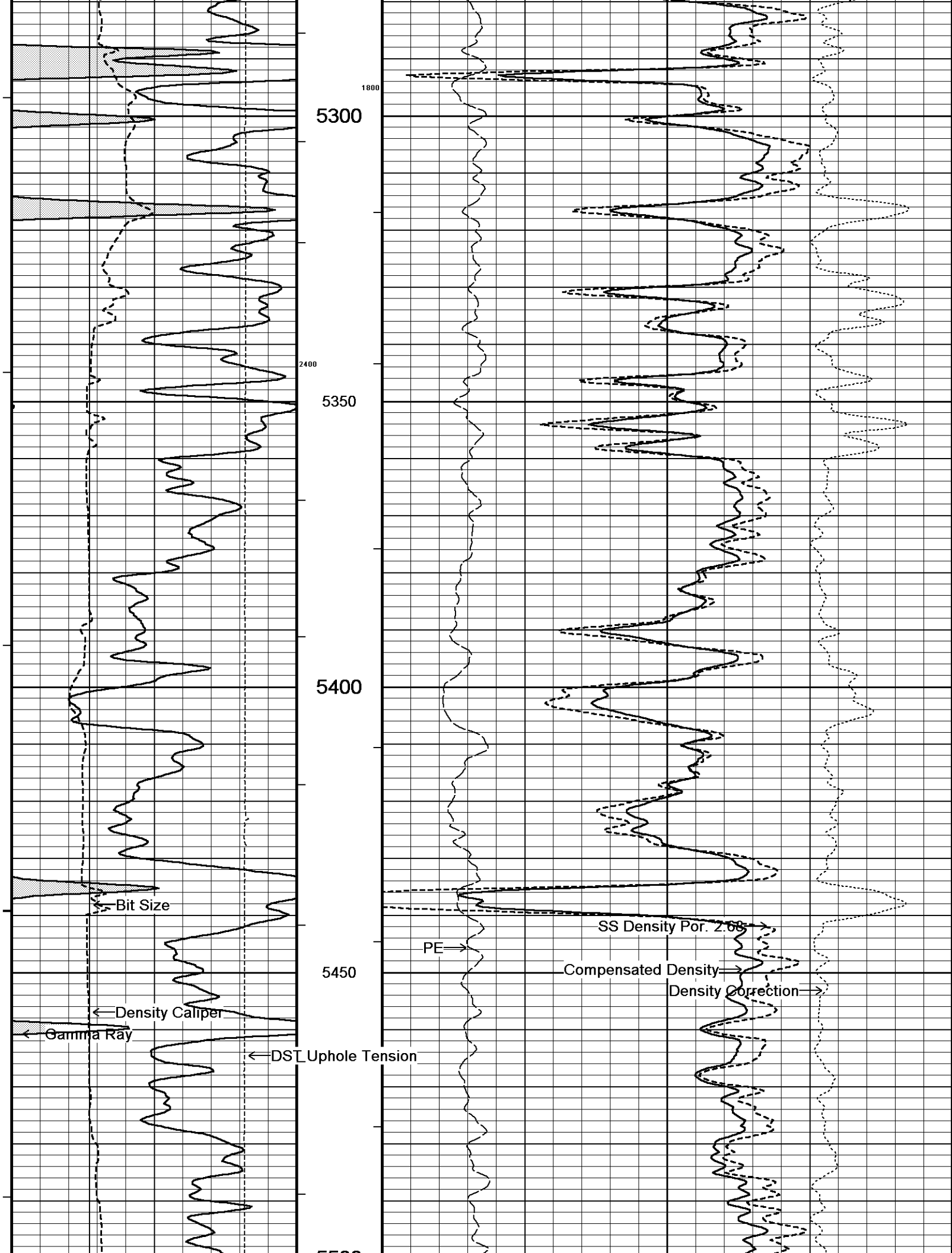
Casing
Shoe

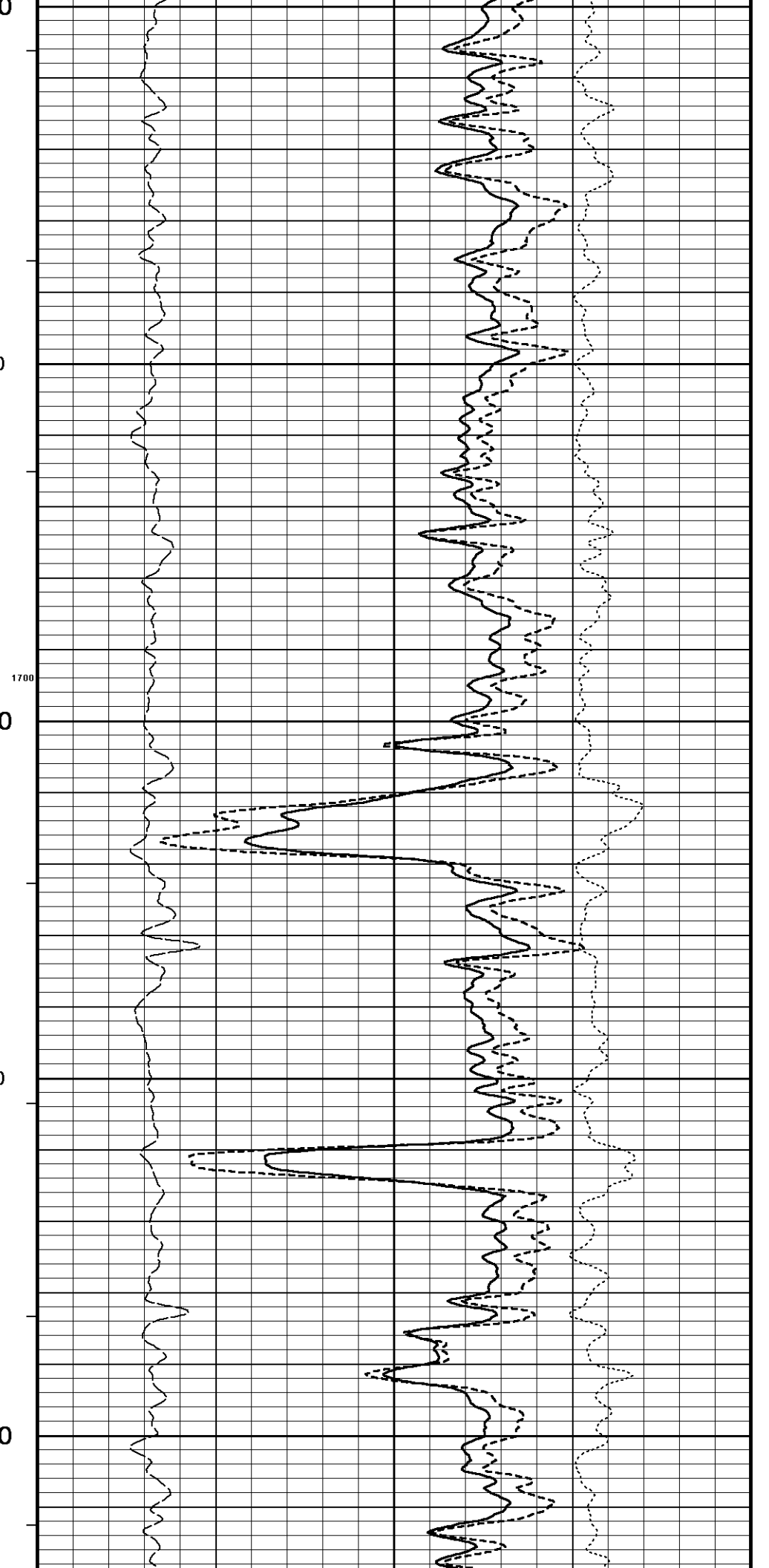
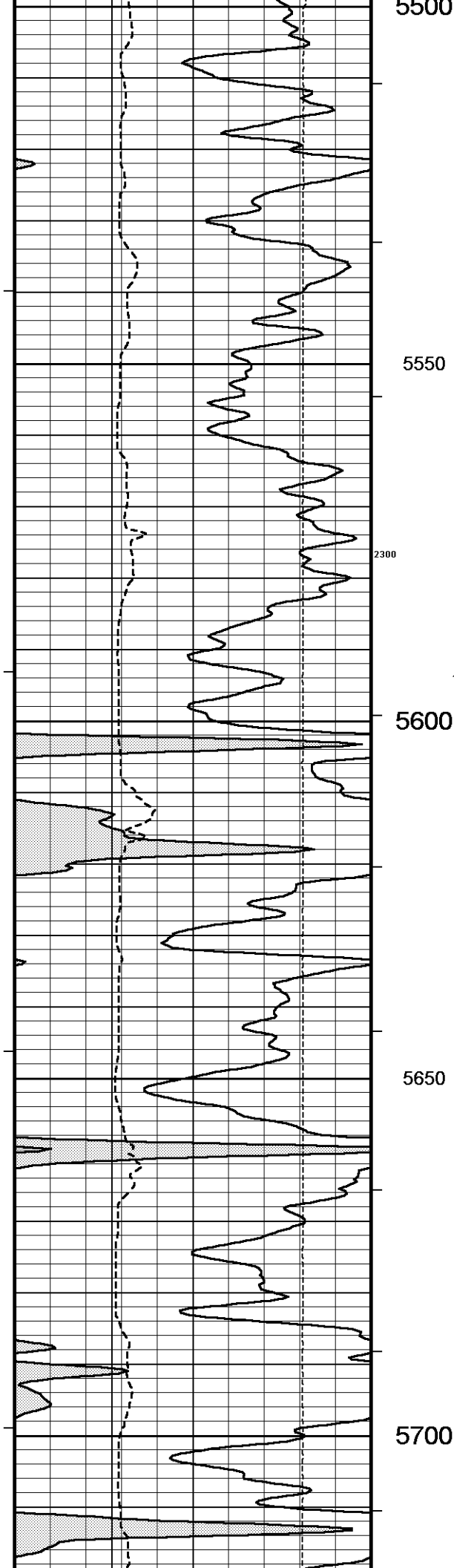
5000

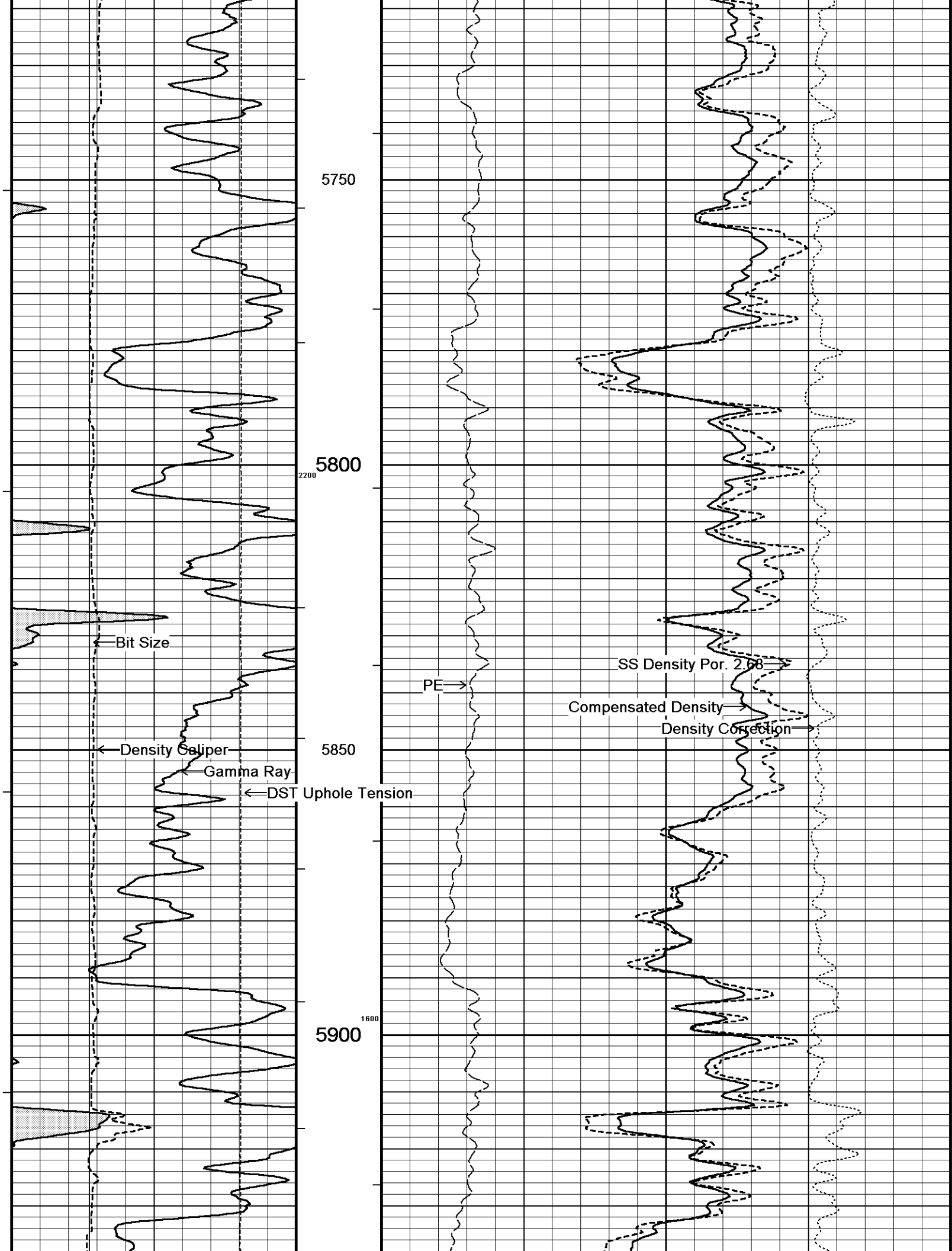
5050

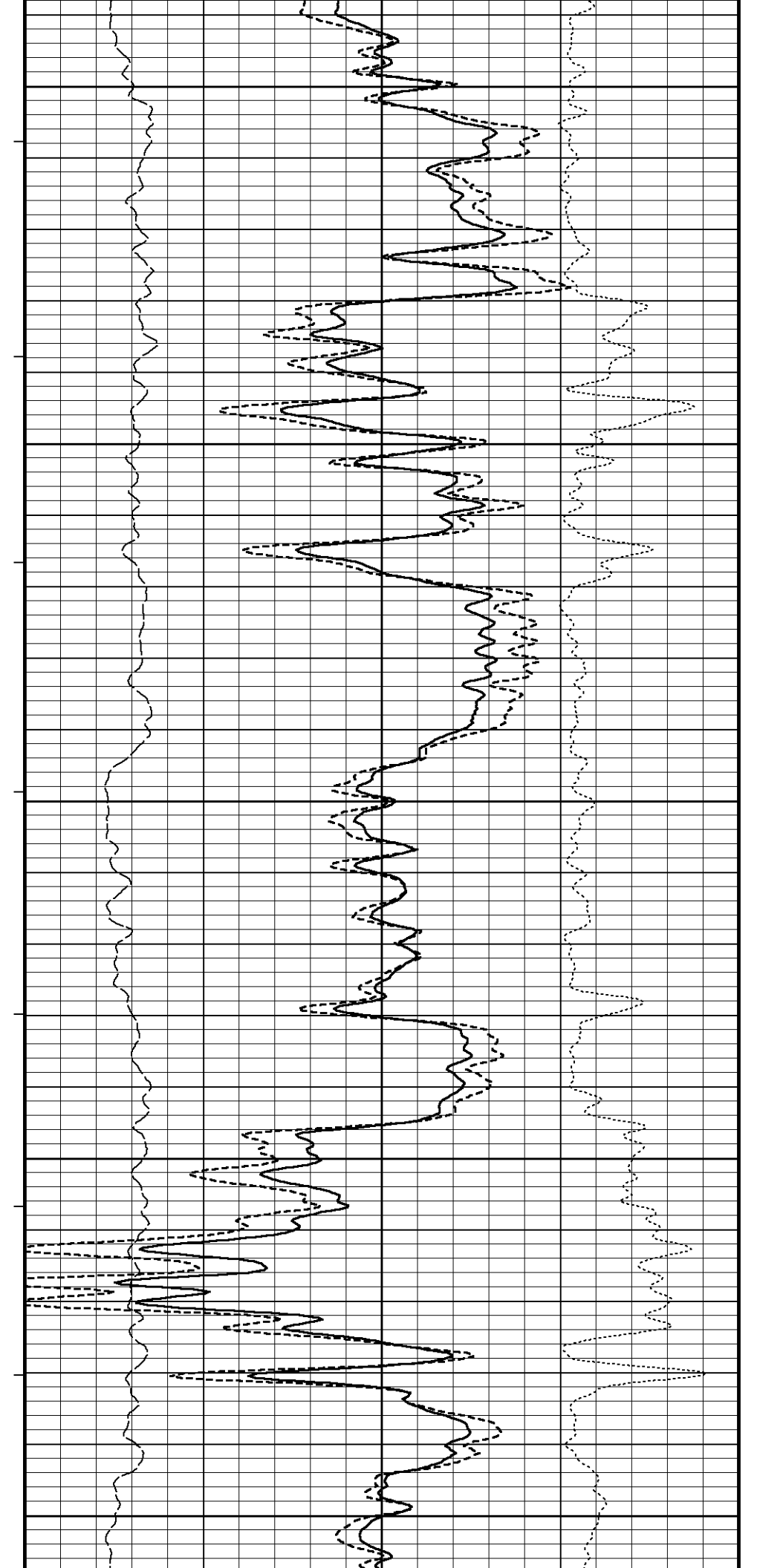
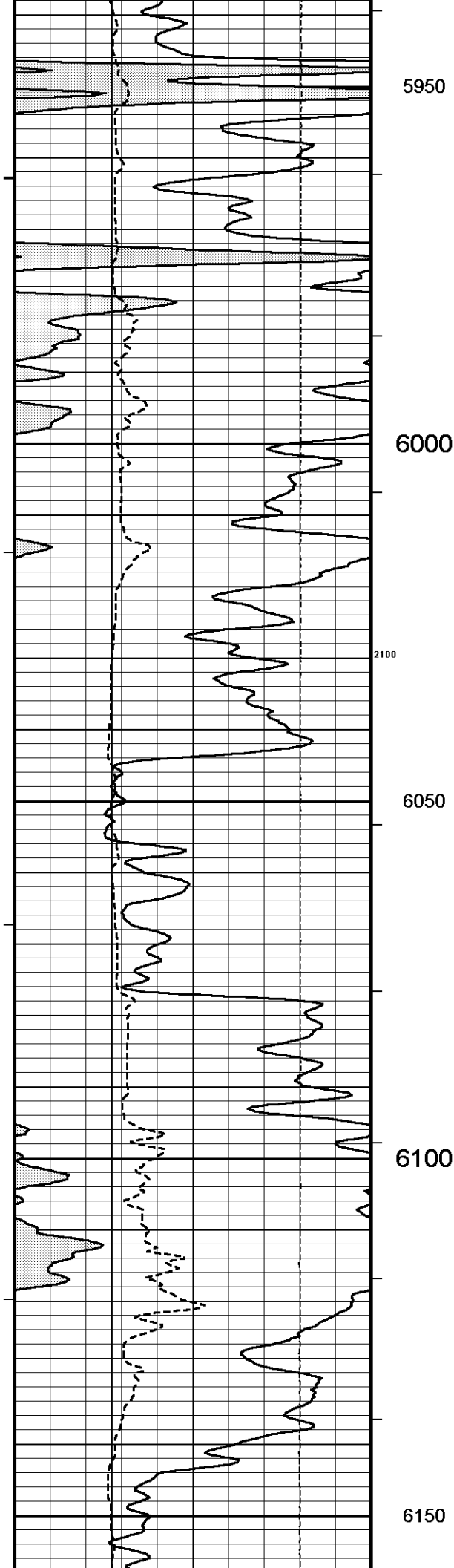


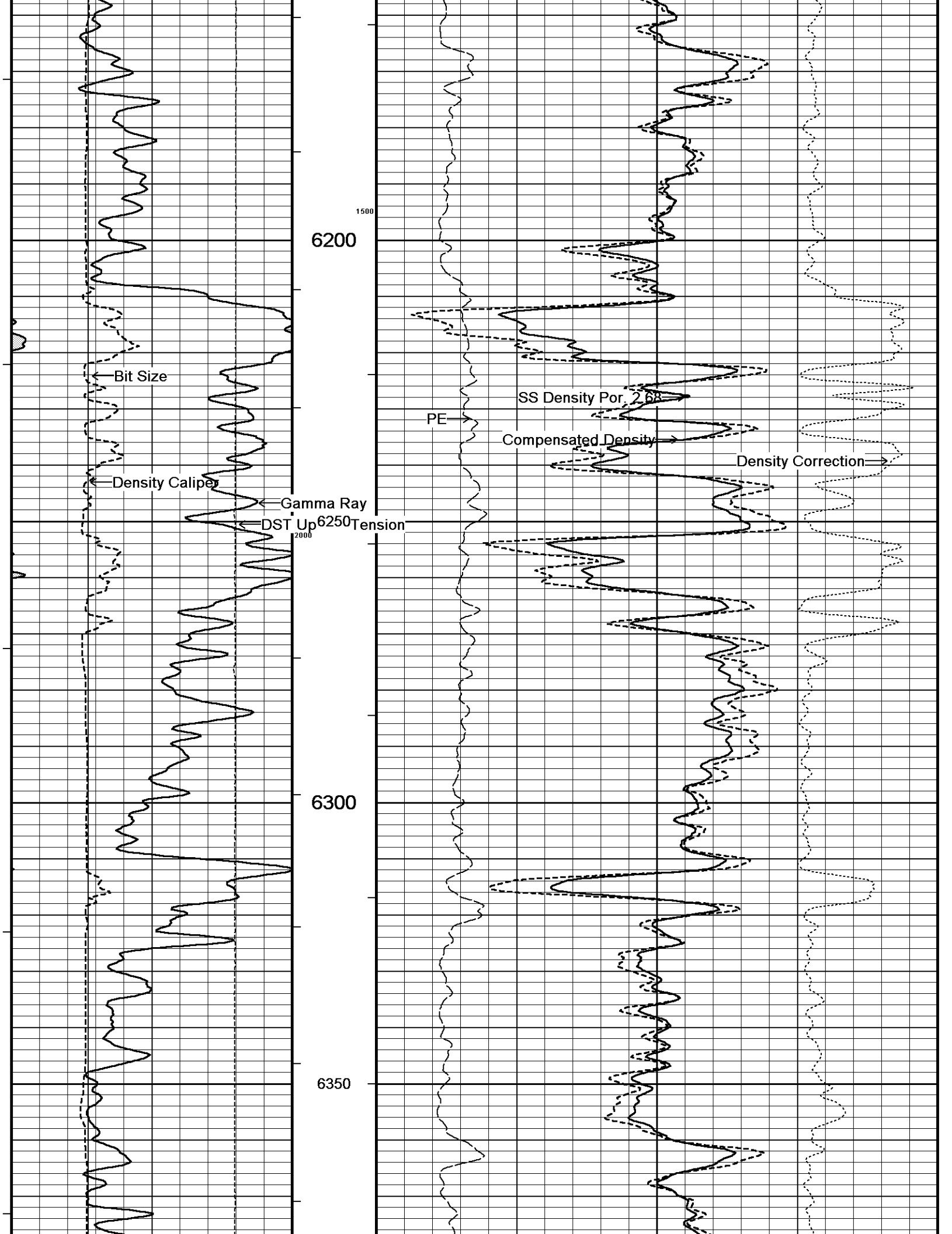


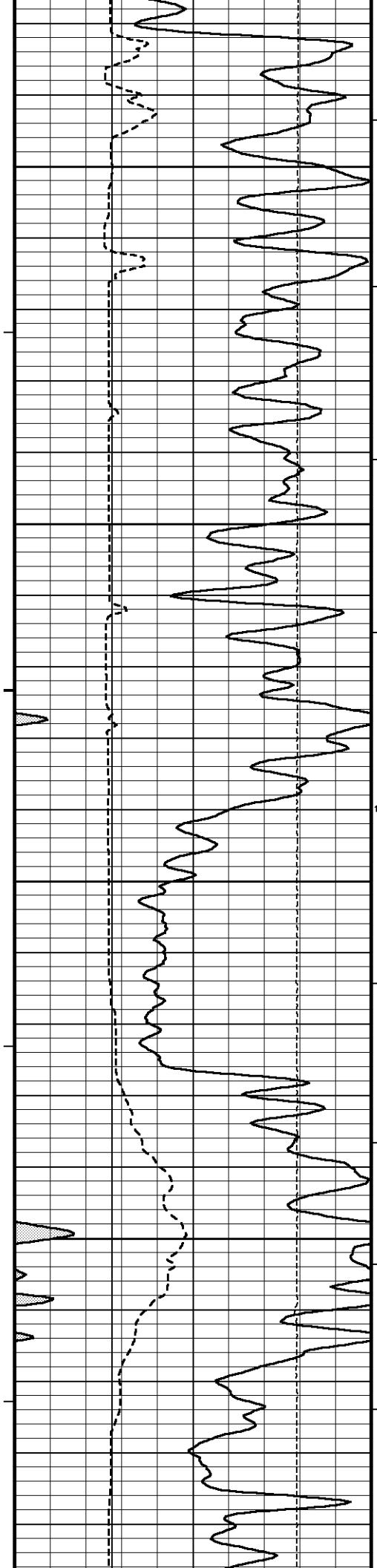












6400

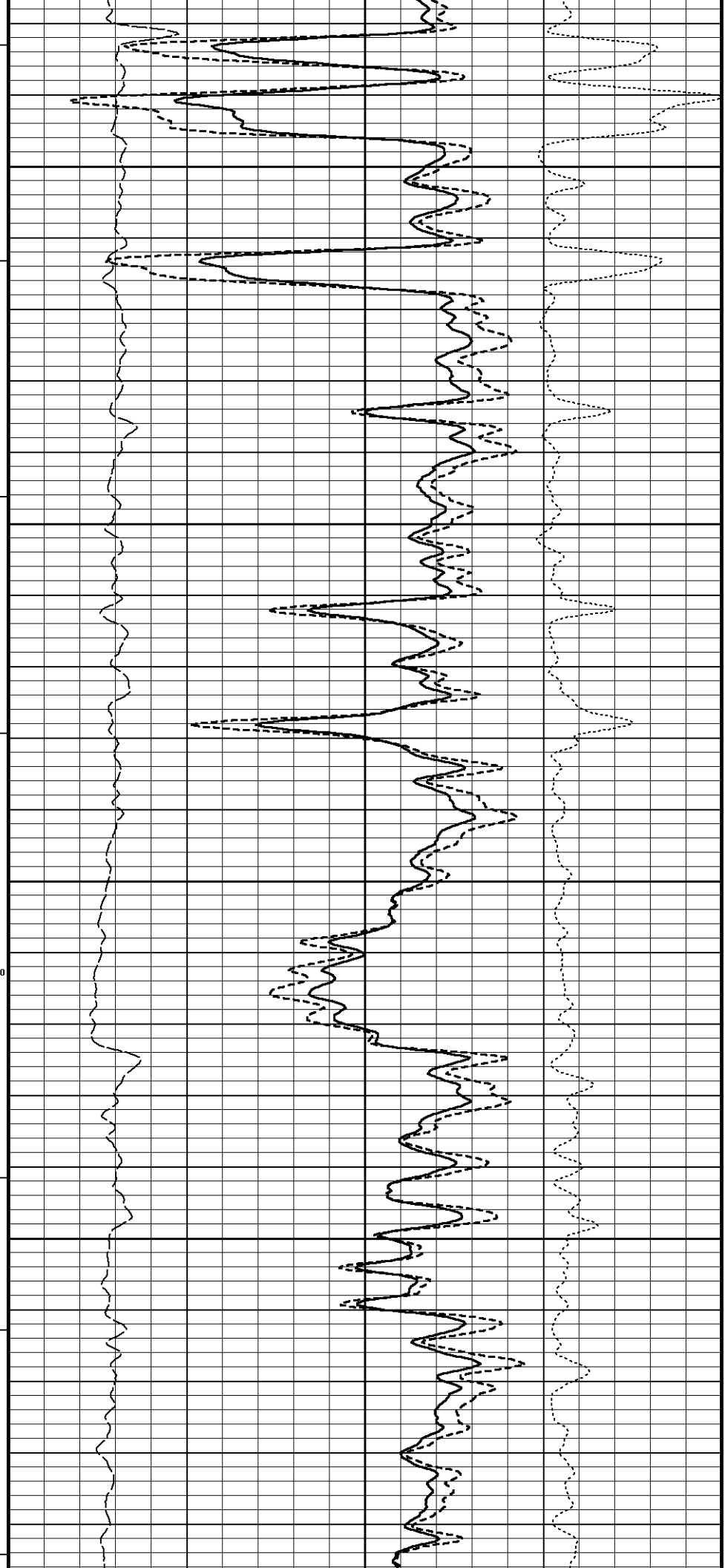
6450

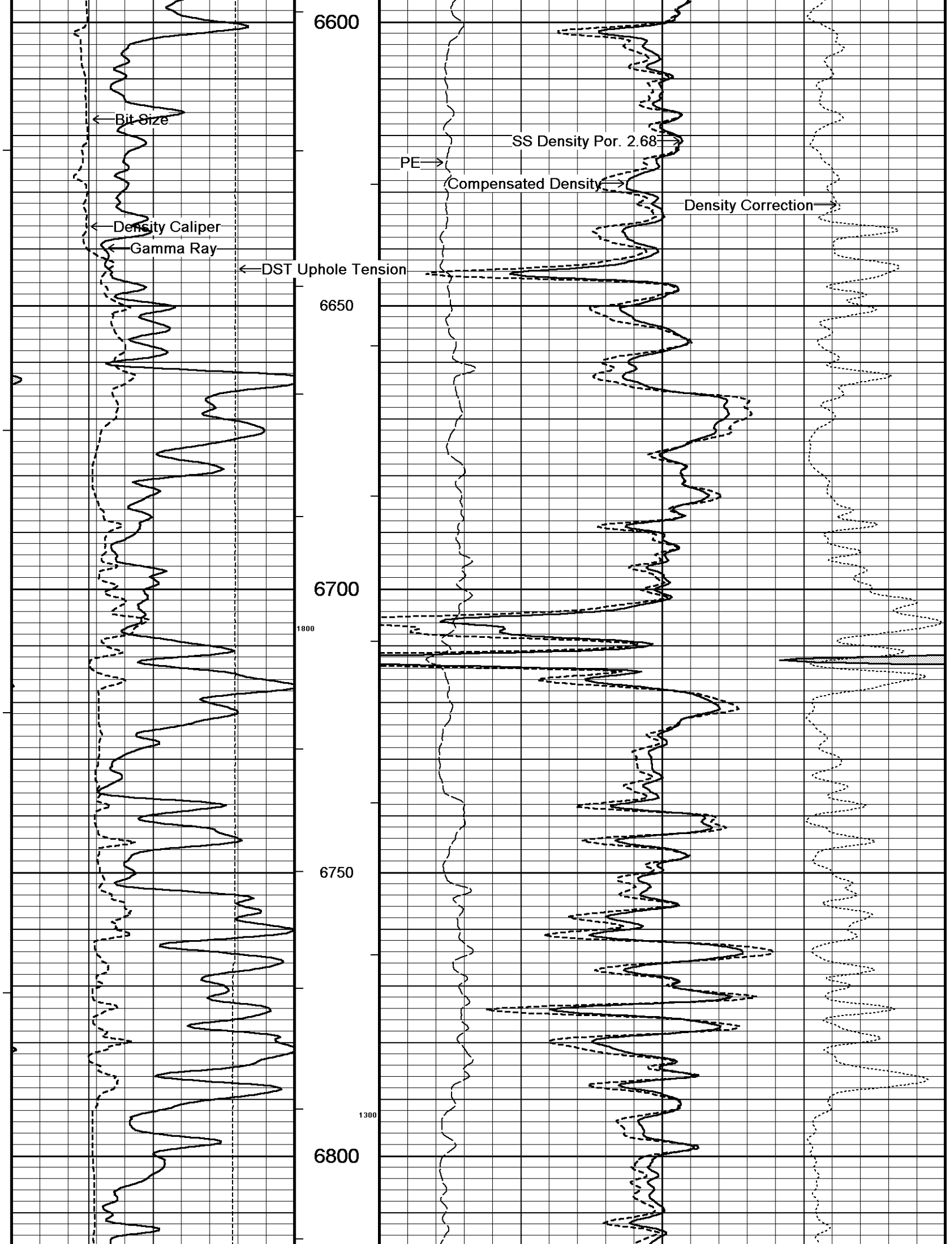
1900

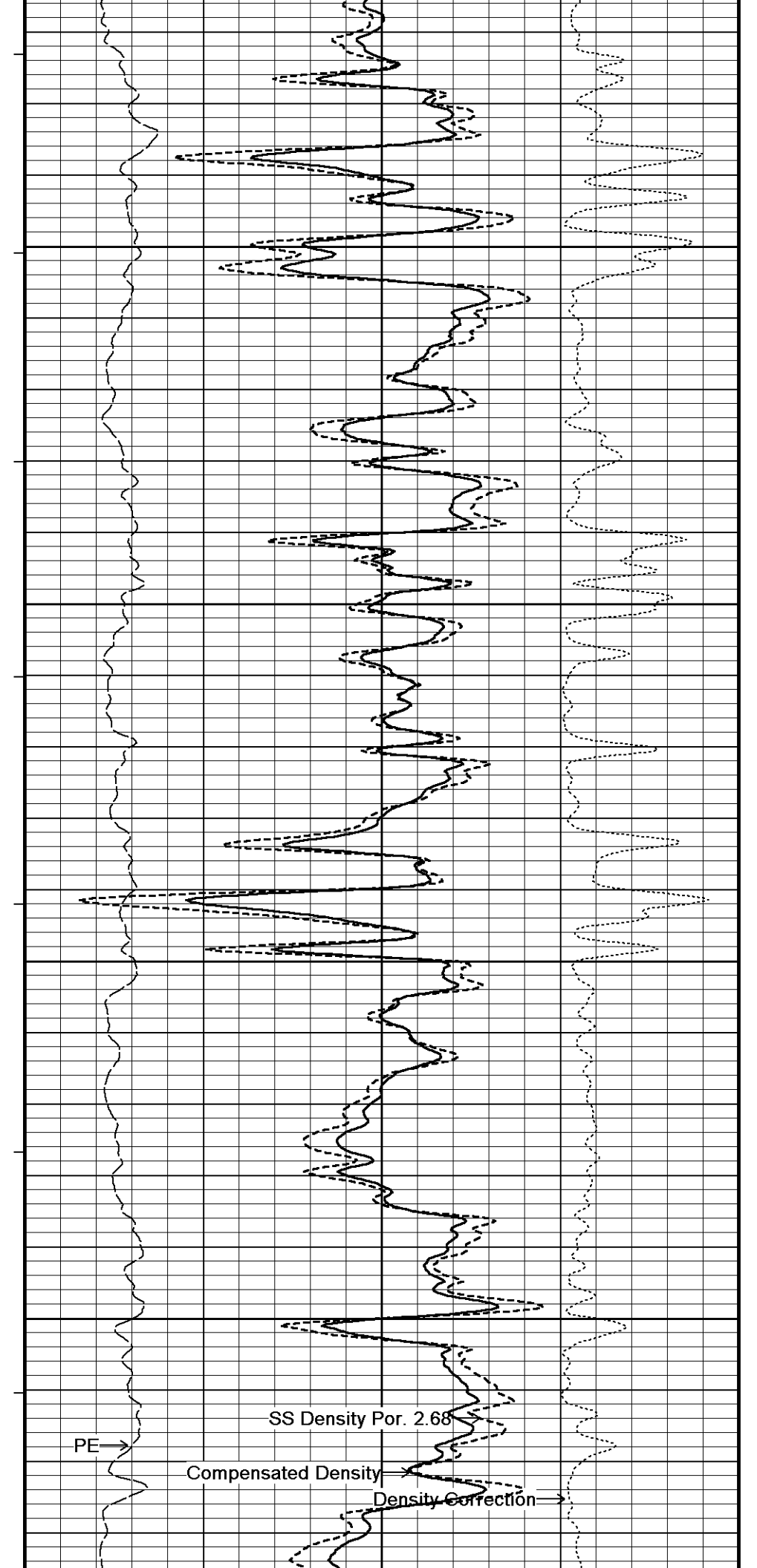
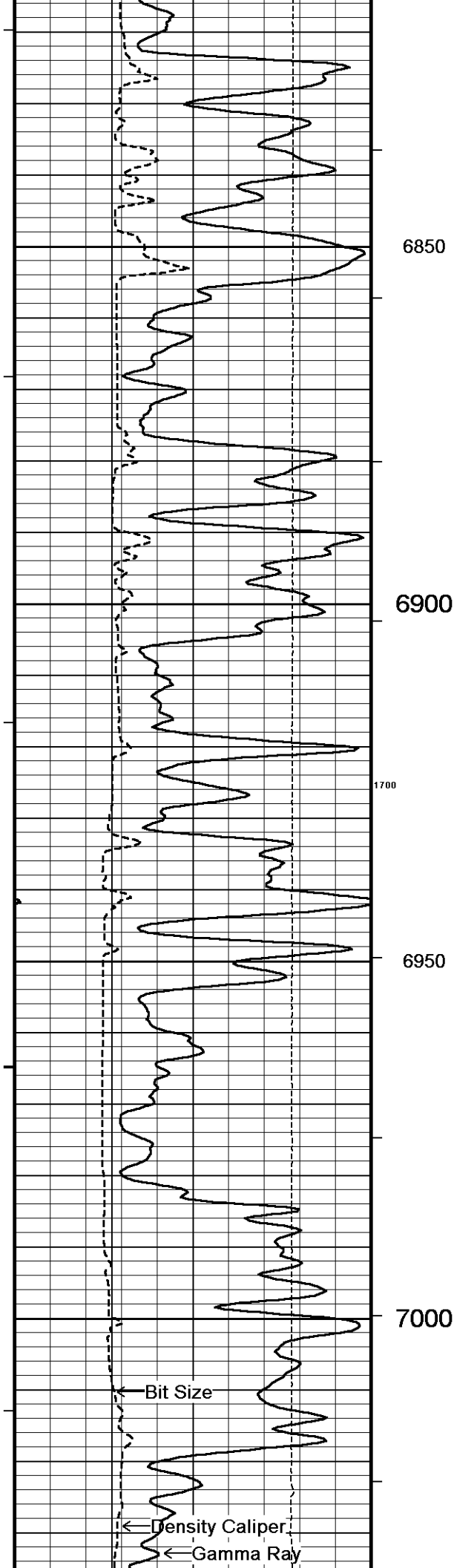
6500

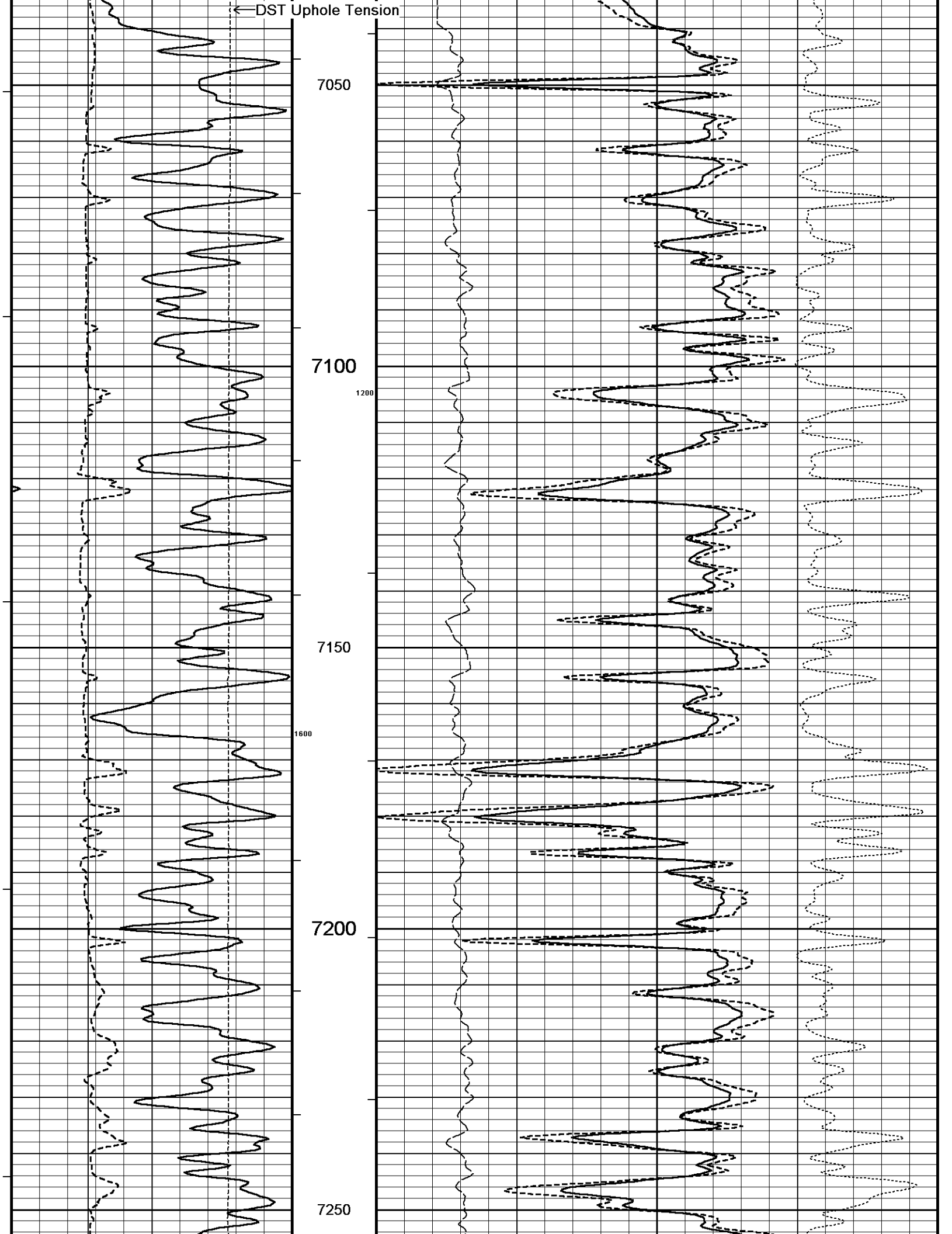
1400

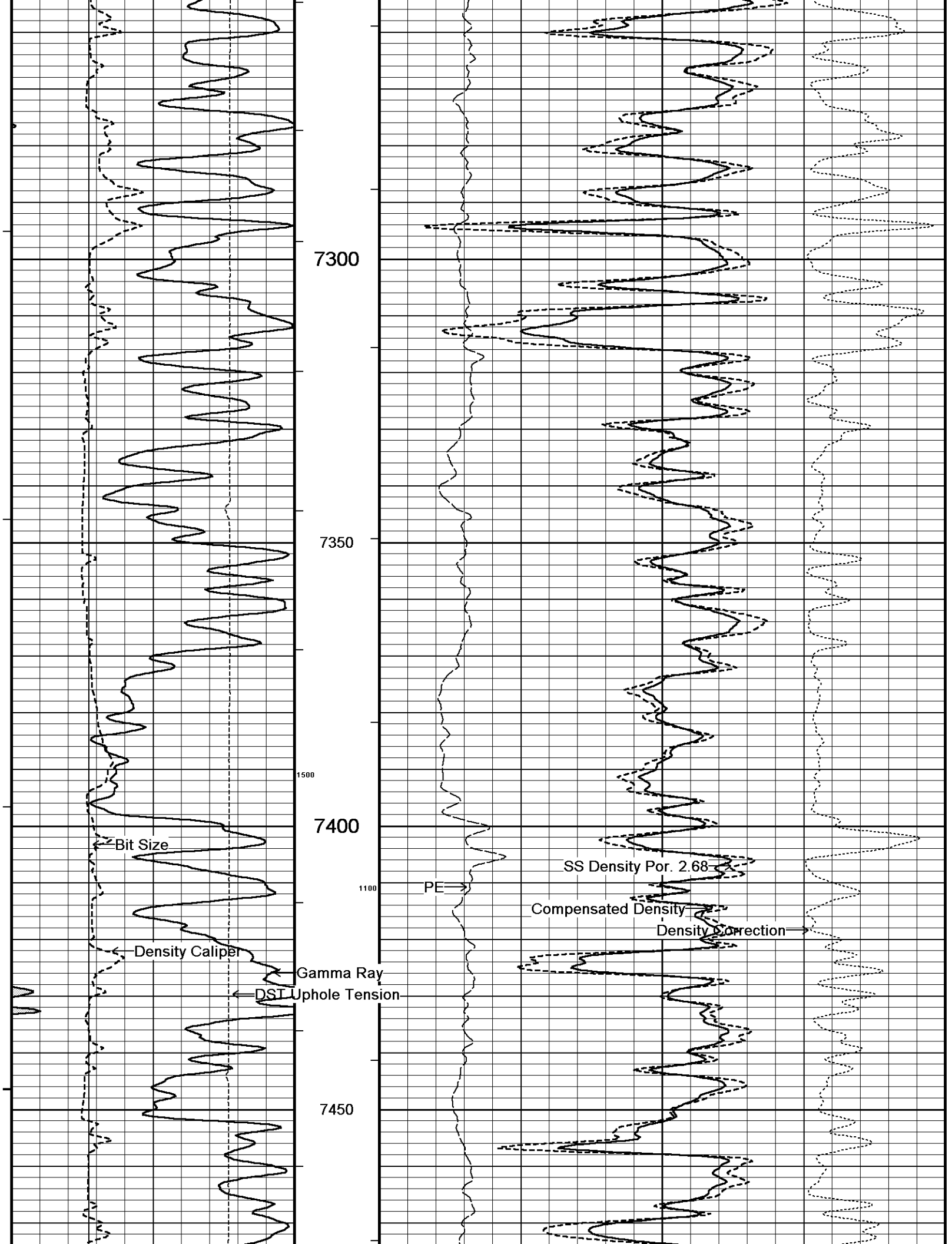
6550

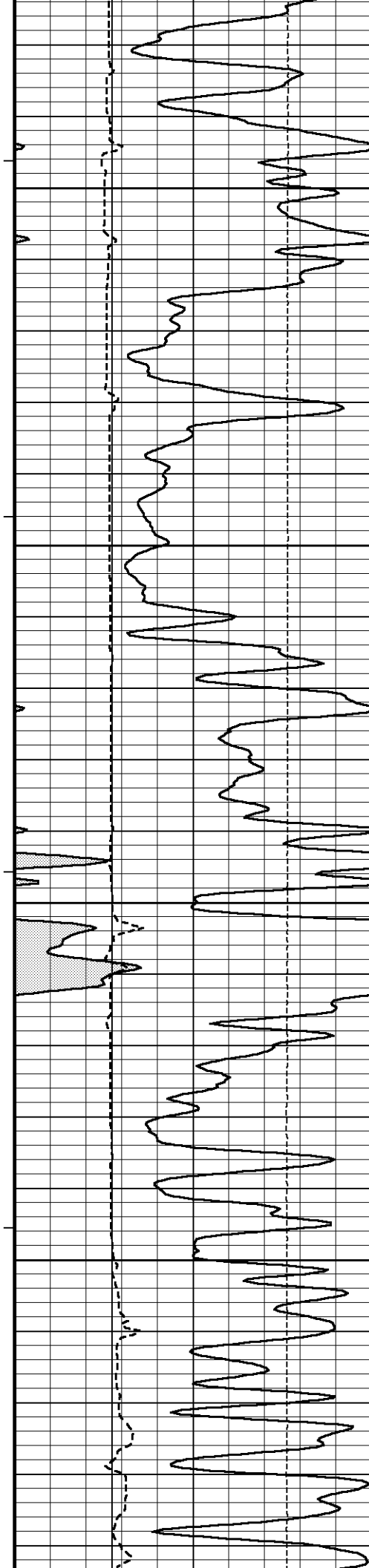












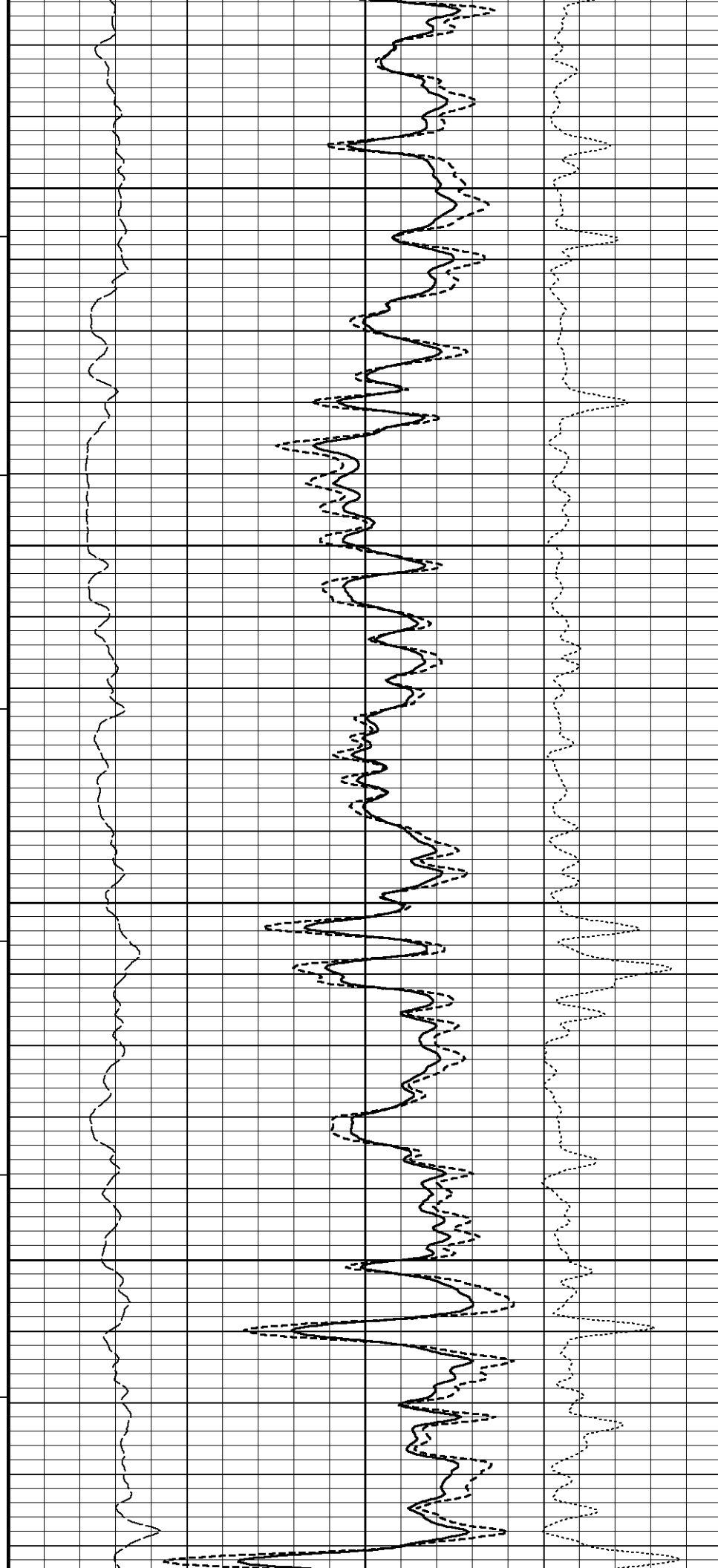
7500

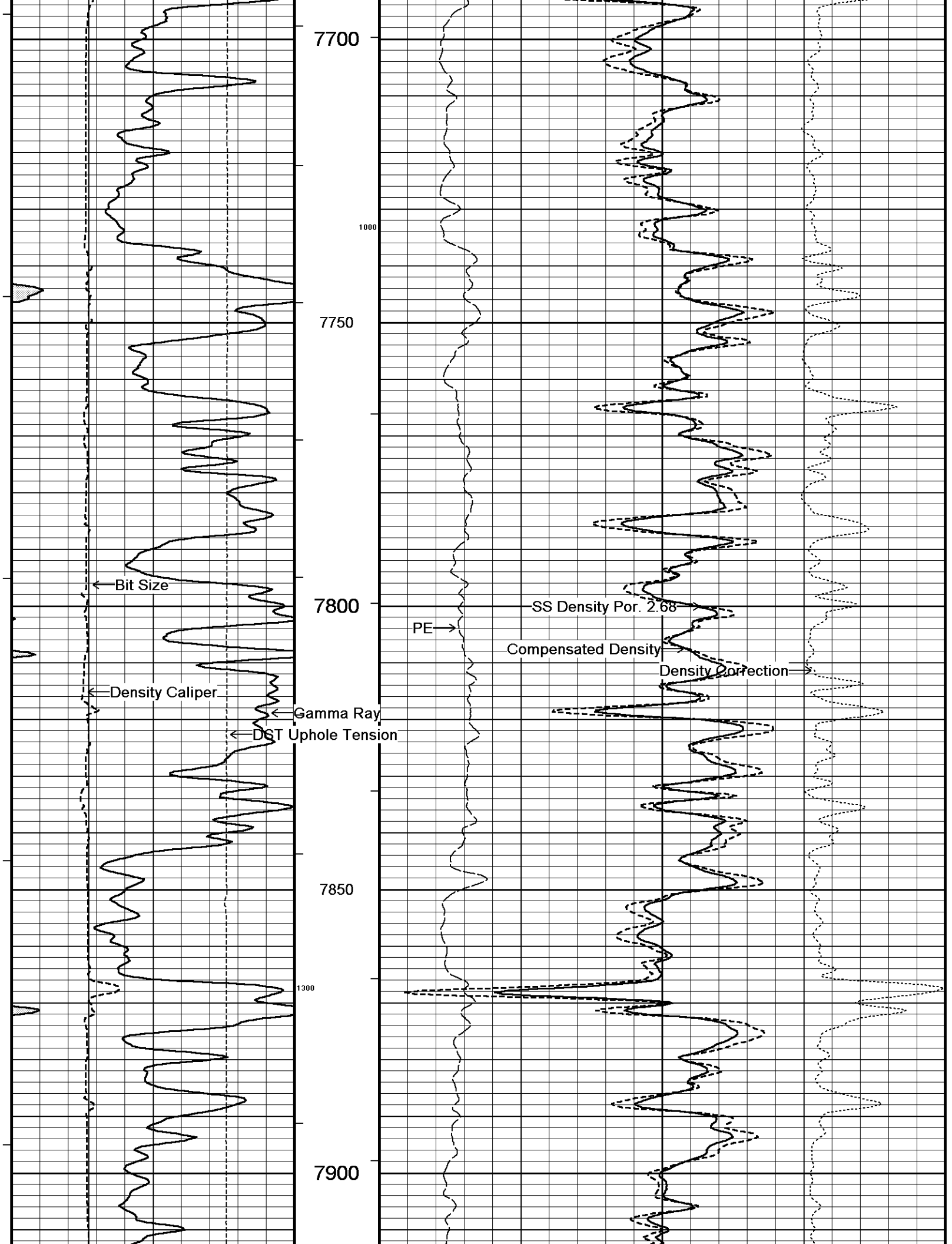
7550

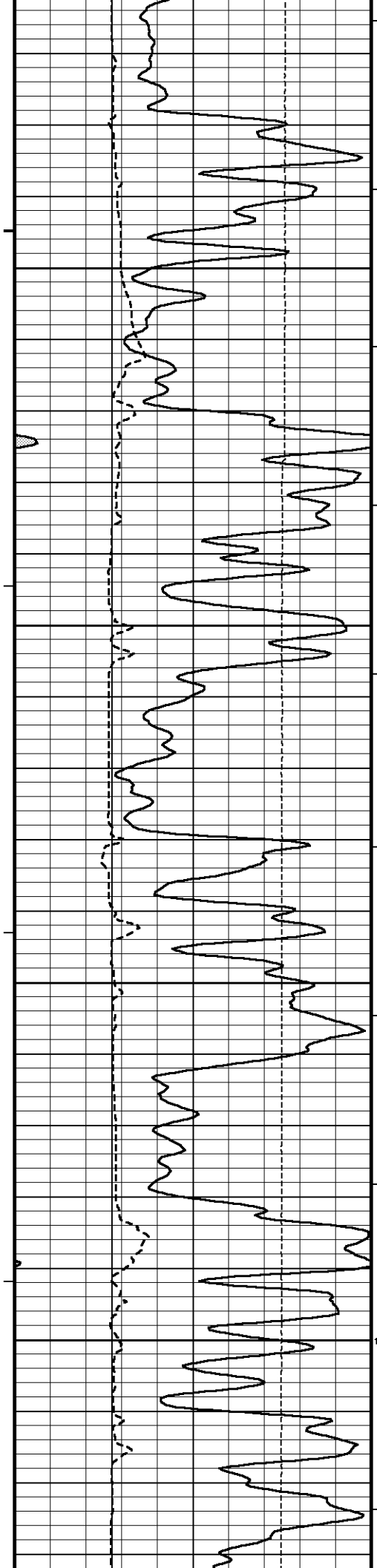
7600

1400

7650





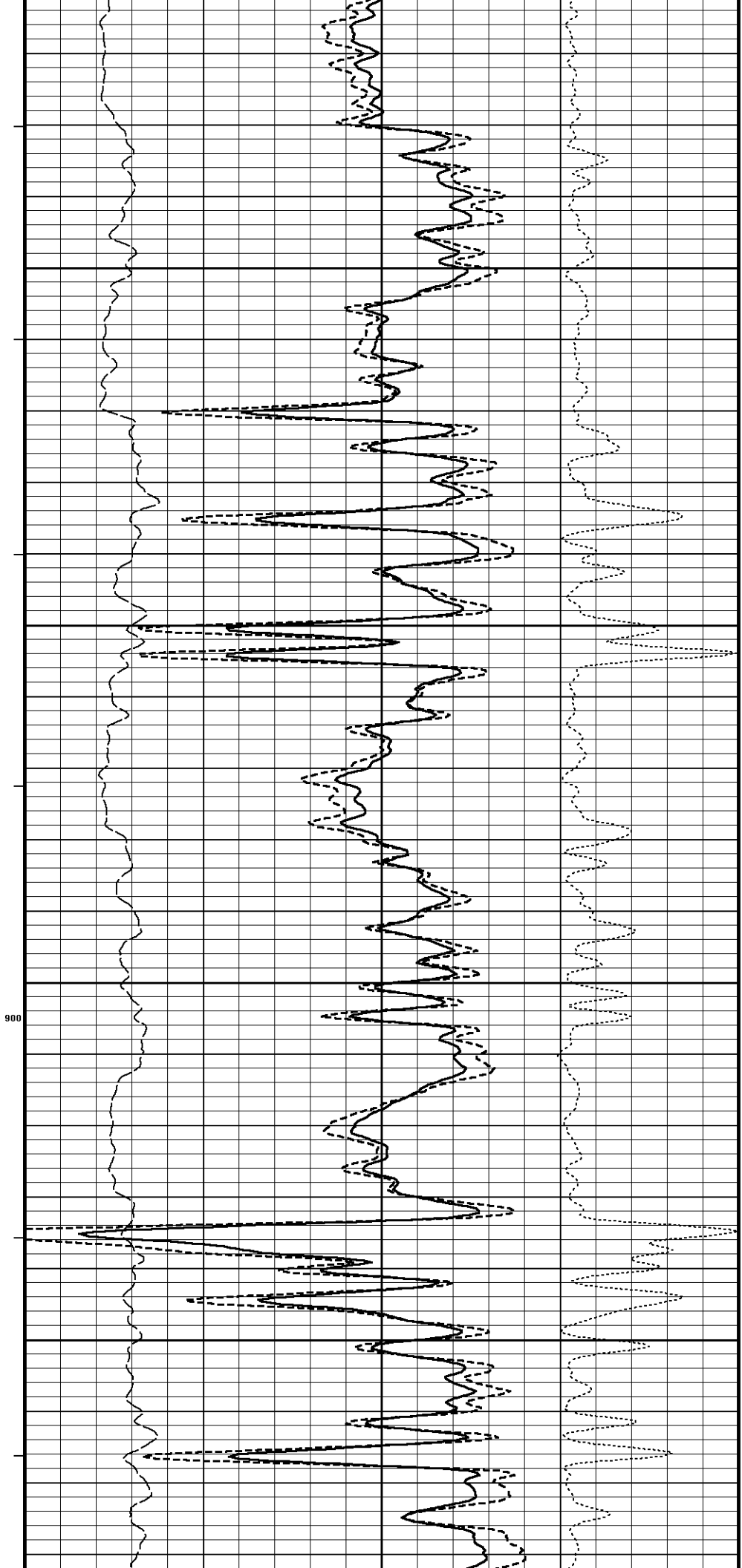


7950

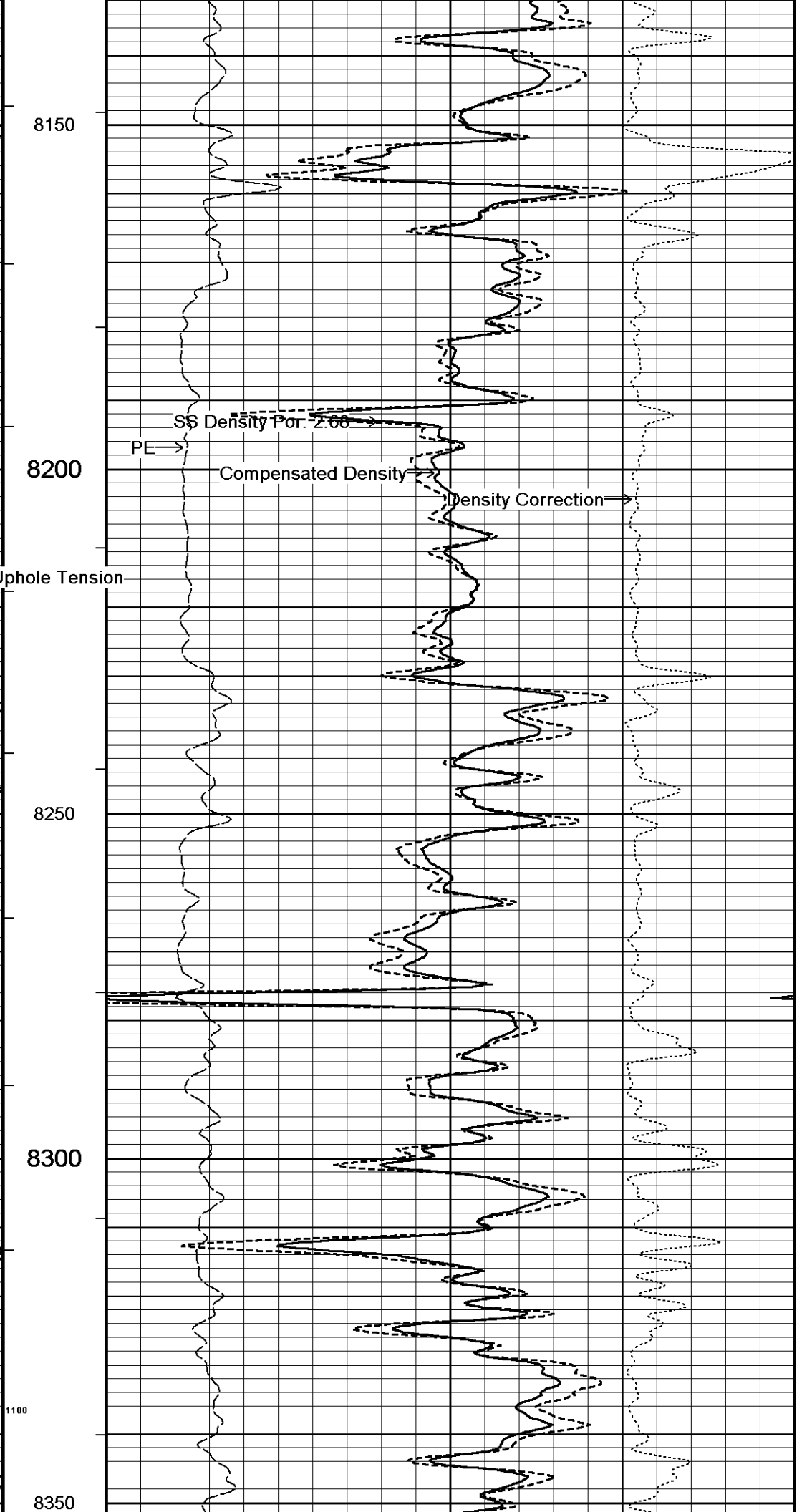
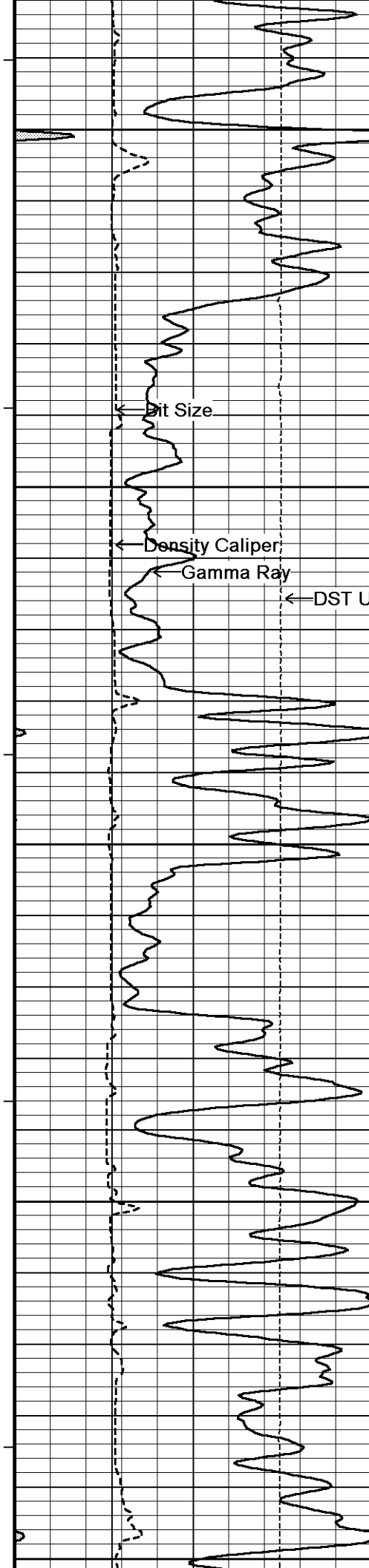
8000

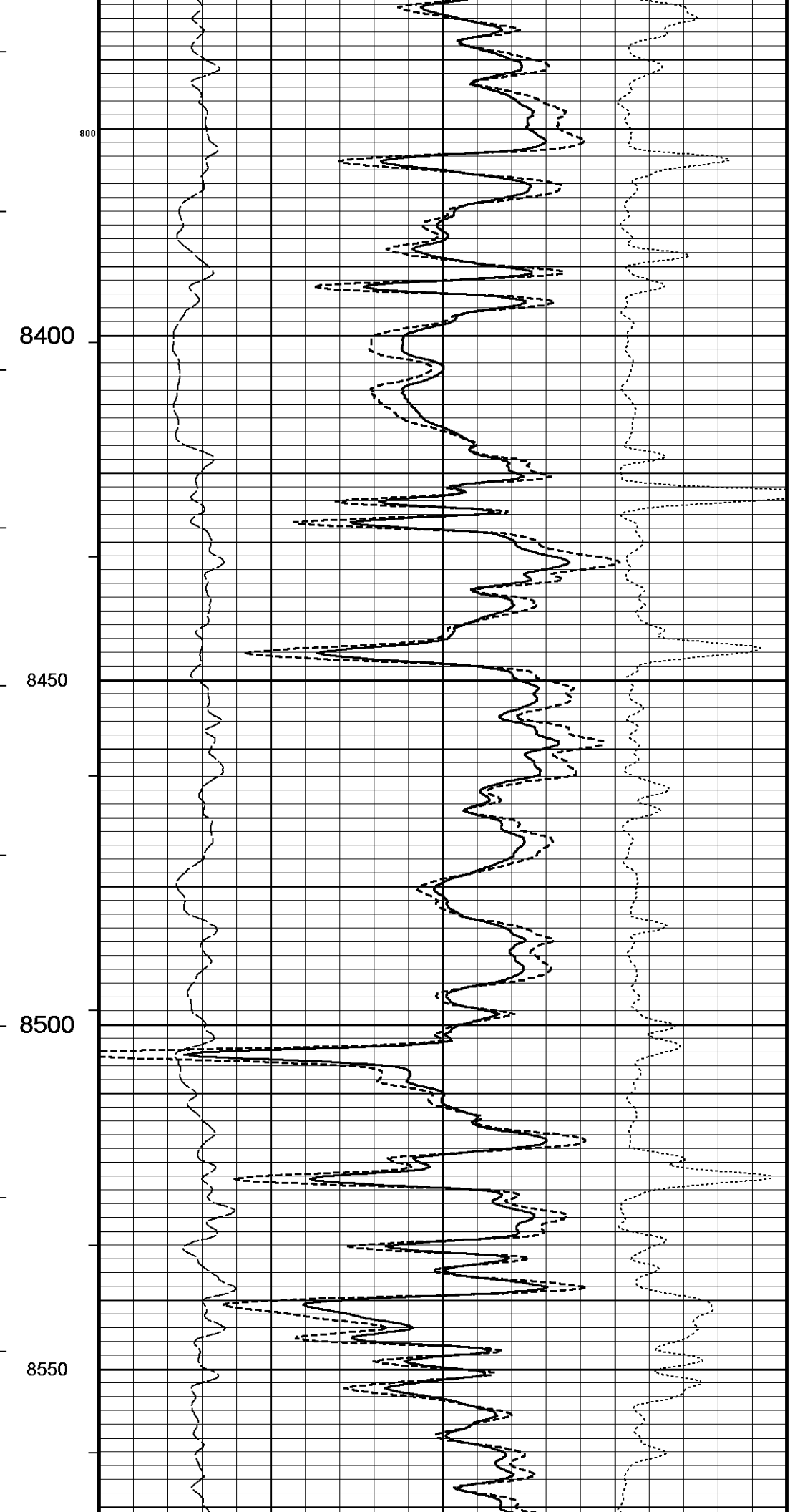
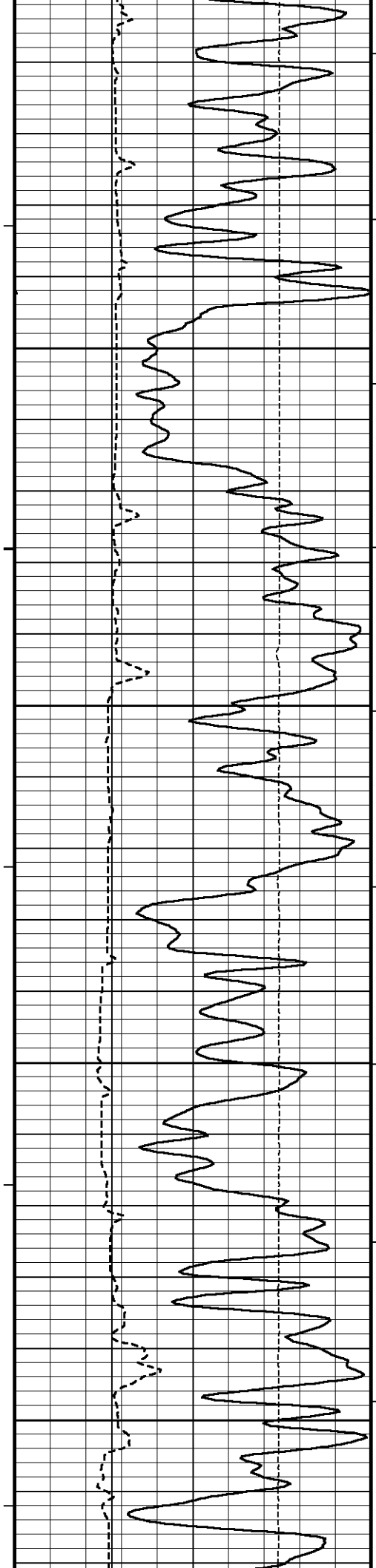
8050

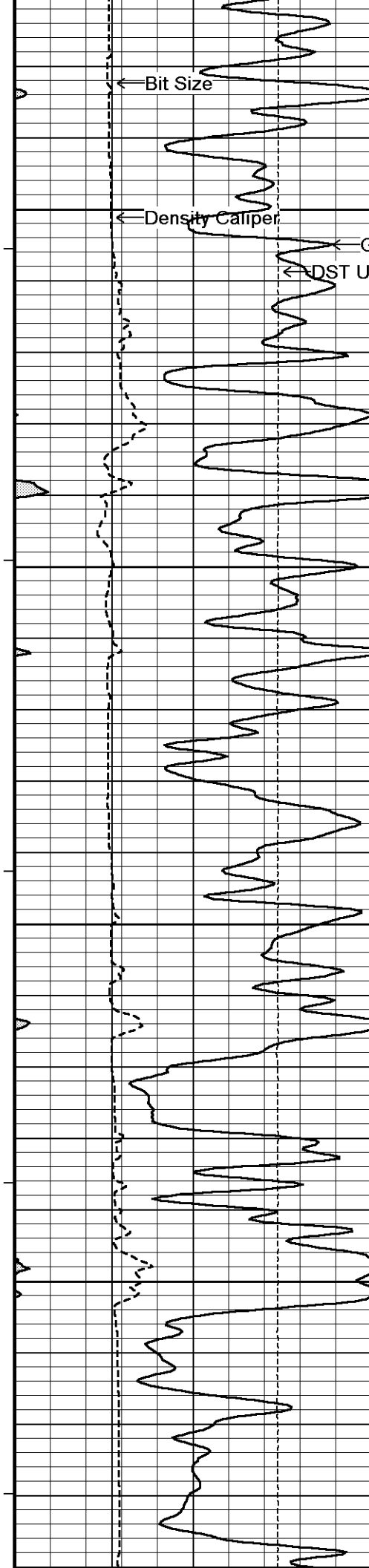
8100



900







1000

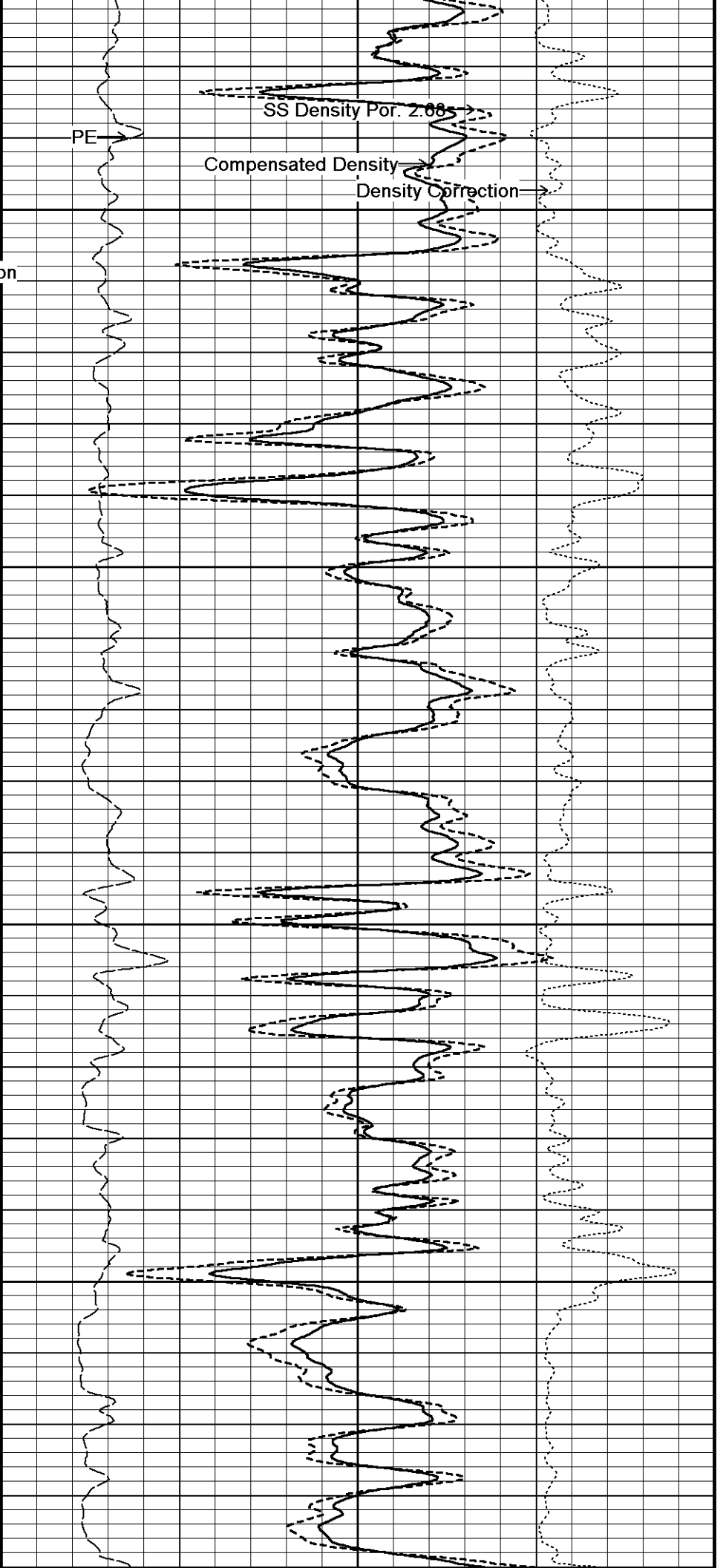
8600

8650

8700

8750

700

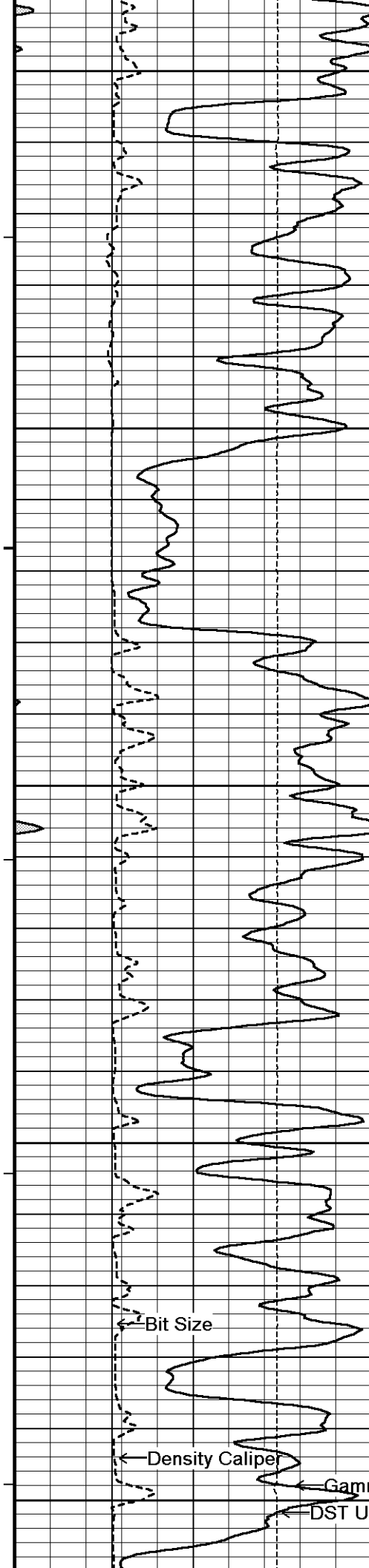


PE

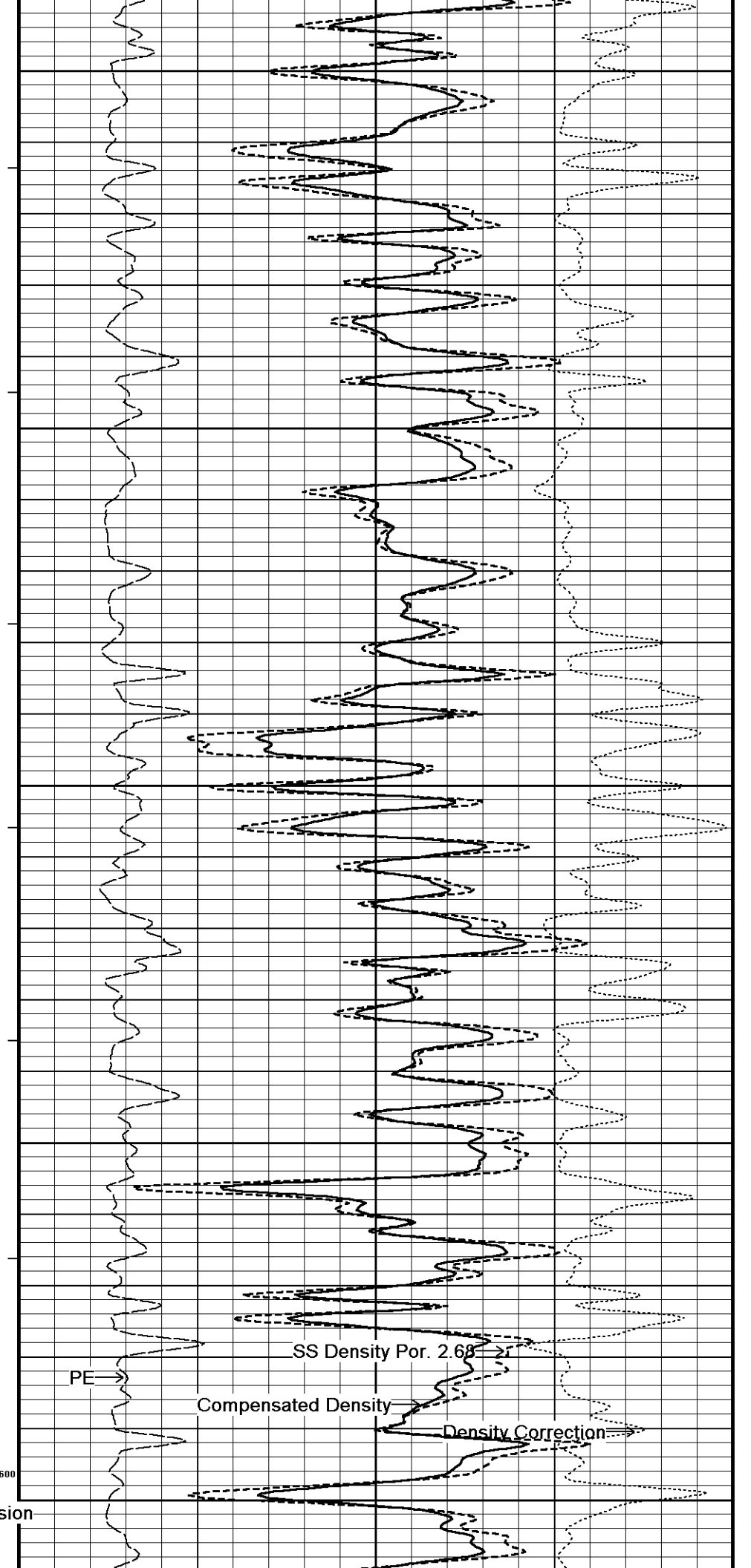
SS Density Por. z.08

Compensated Density

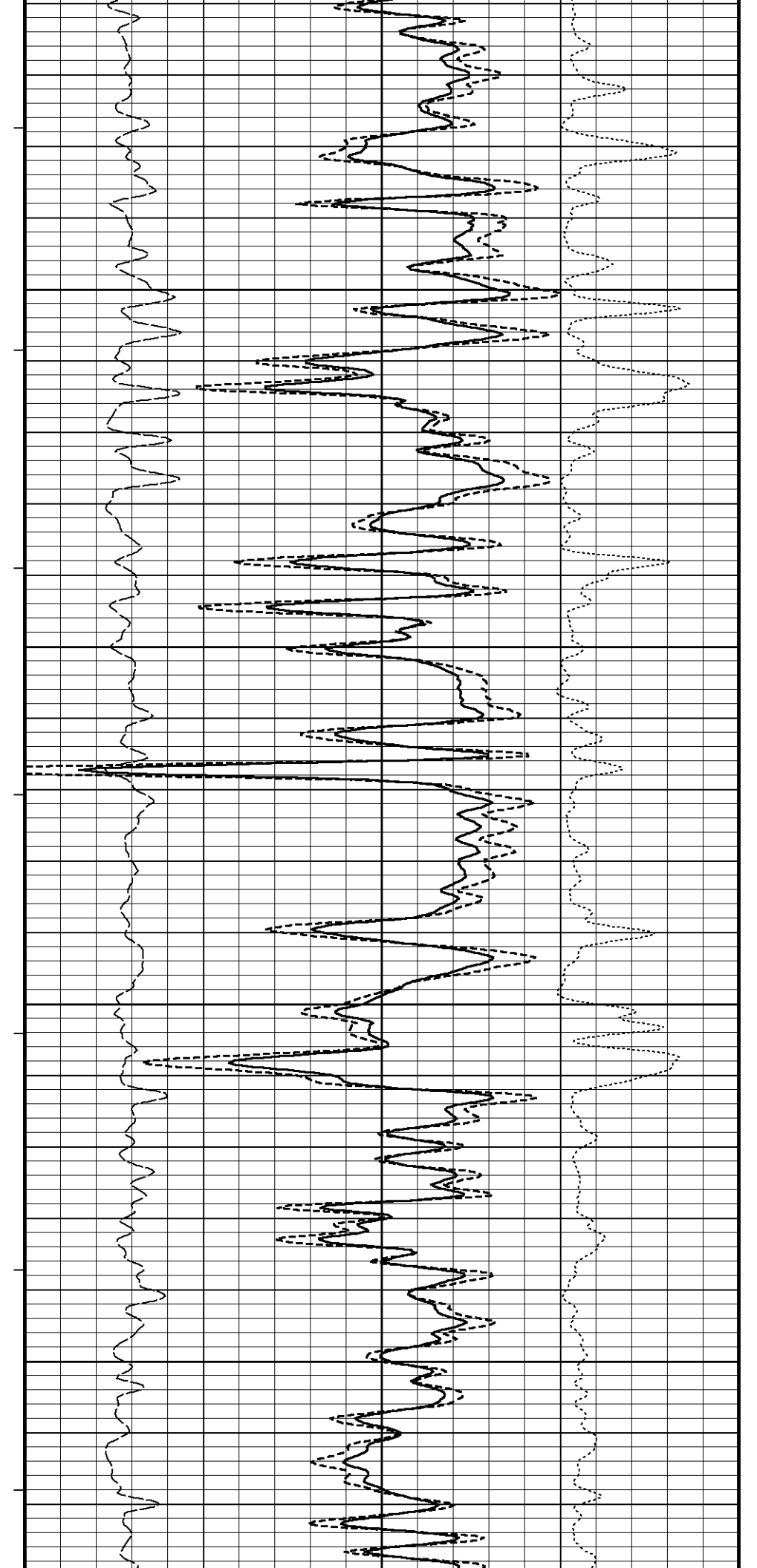
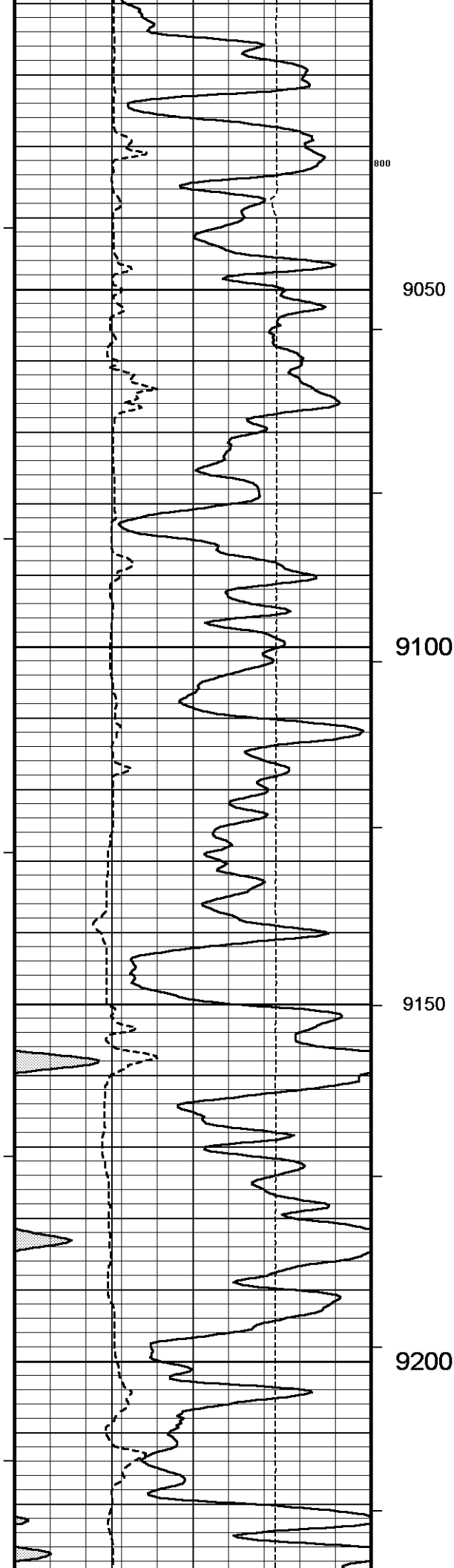
Density Correction

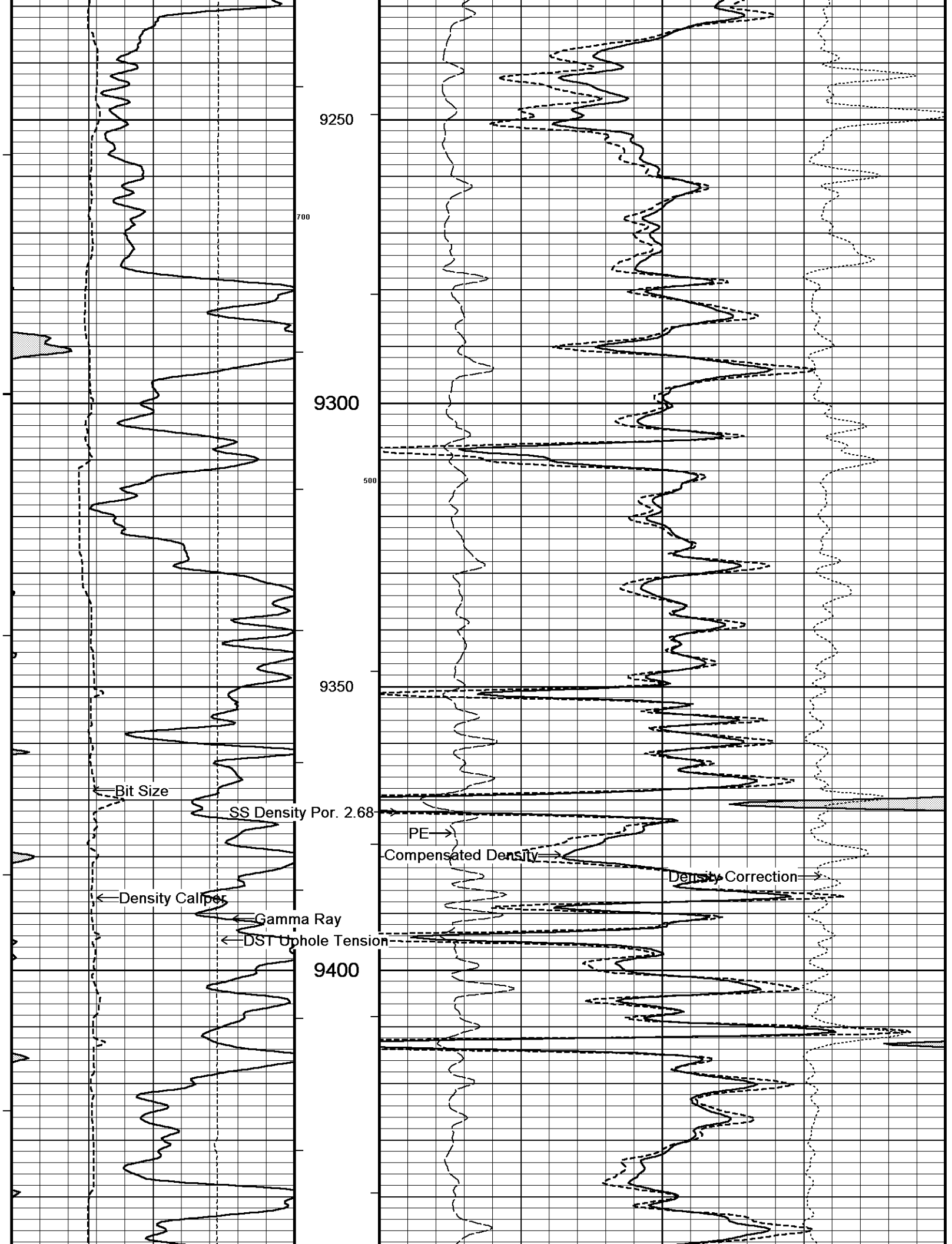


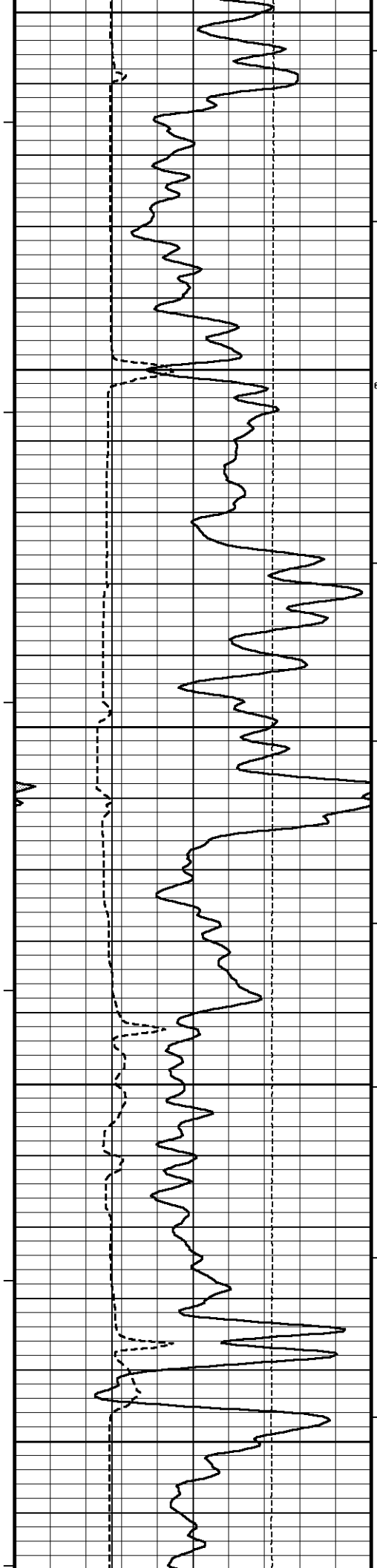
8800
8850
8900
8950
9000
DST Upflow
Gamma Ray
Density Caliper
Bit Size



PE
SS Density Por. 2.68
Compensated Density
Density Correction







9450

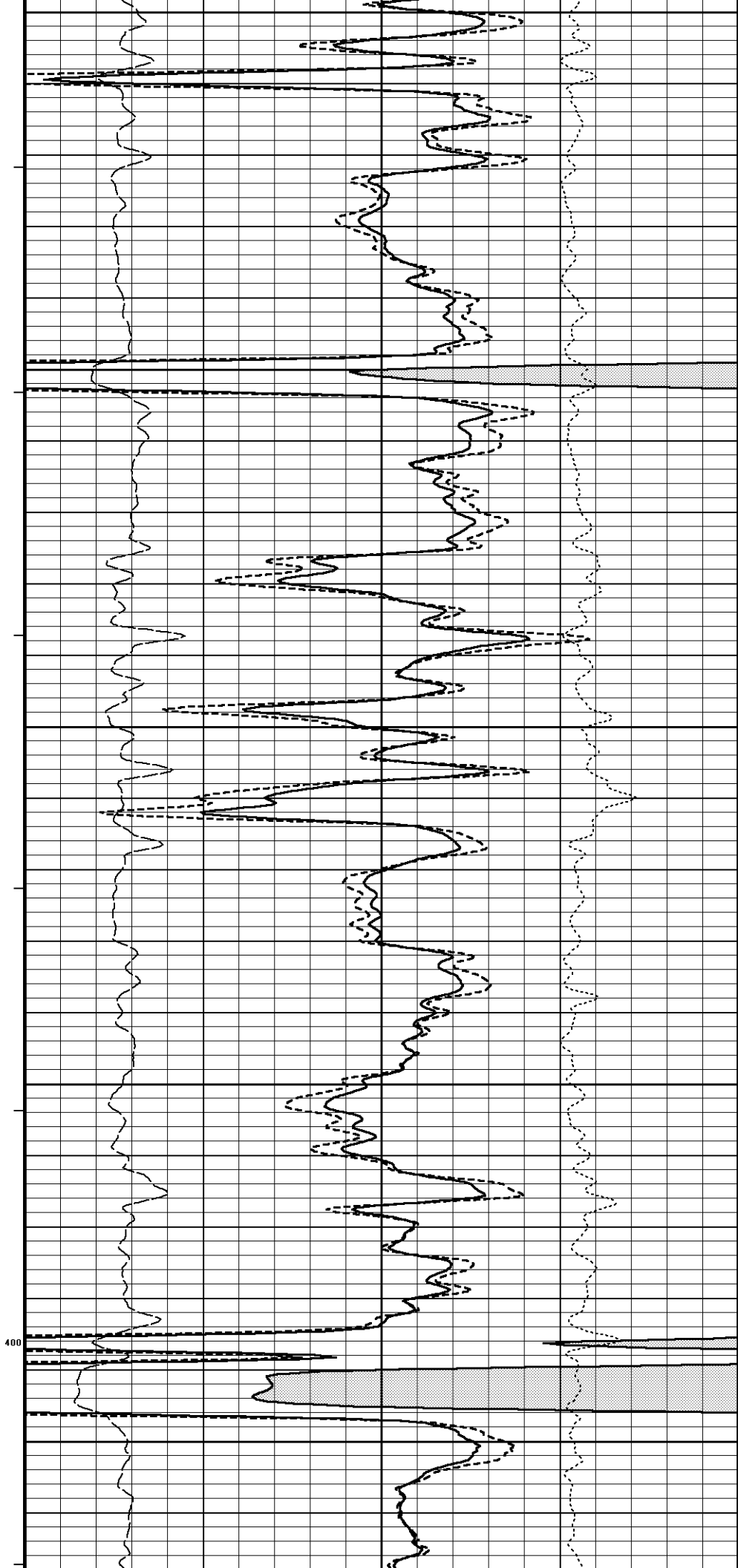
9500

9550

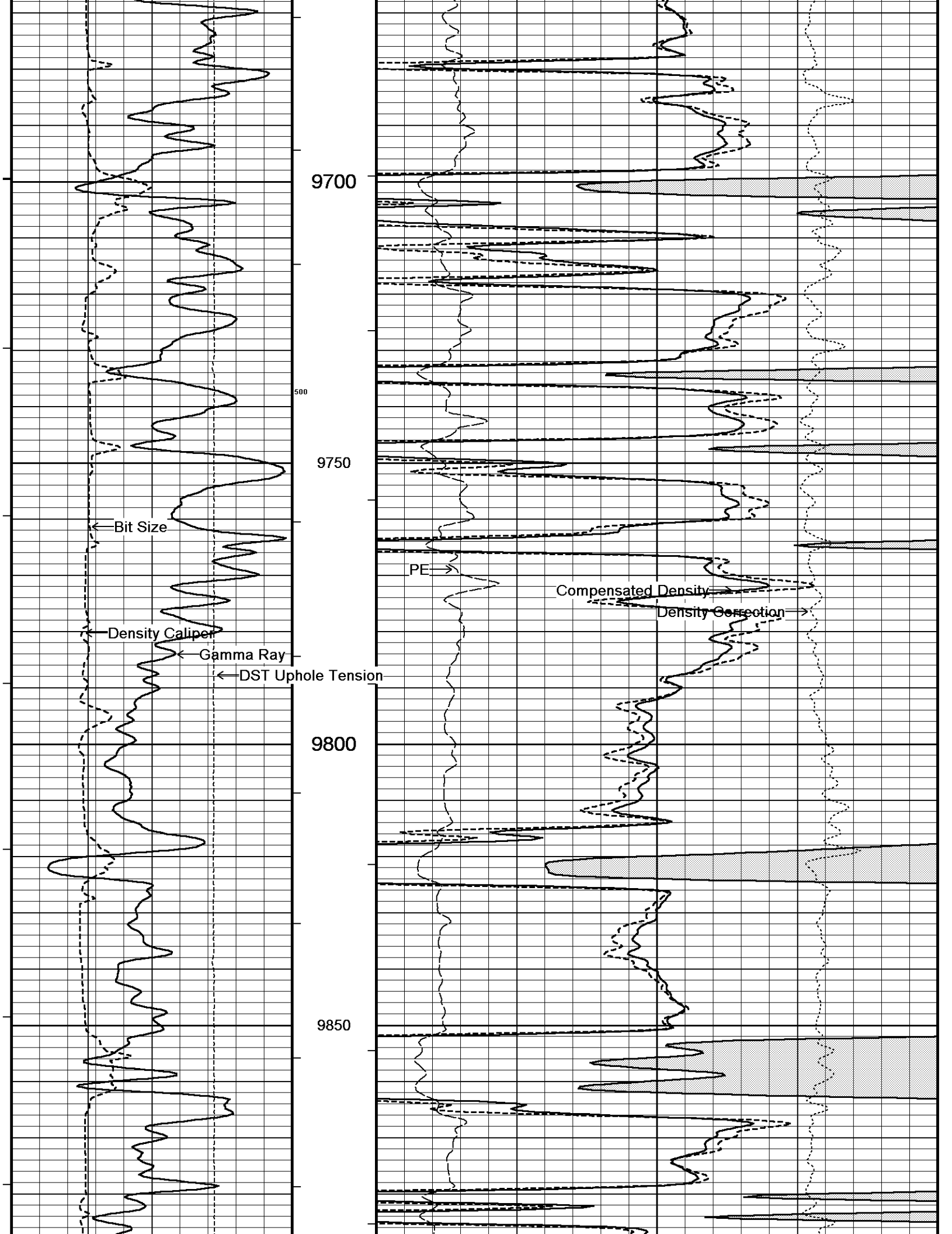
9600

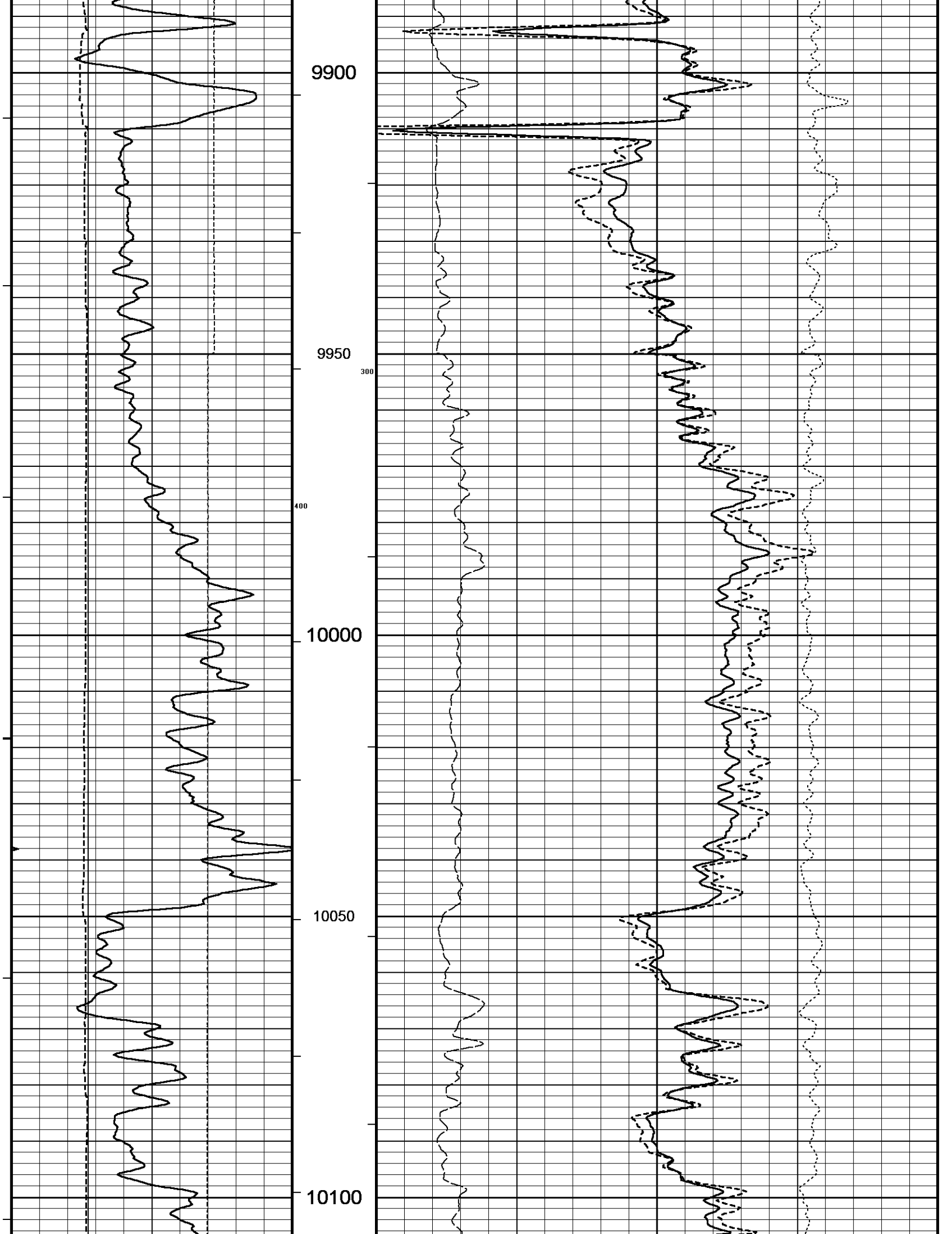
9650

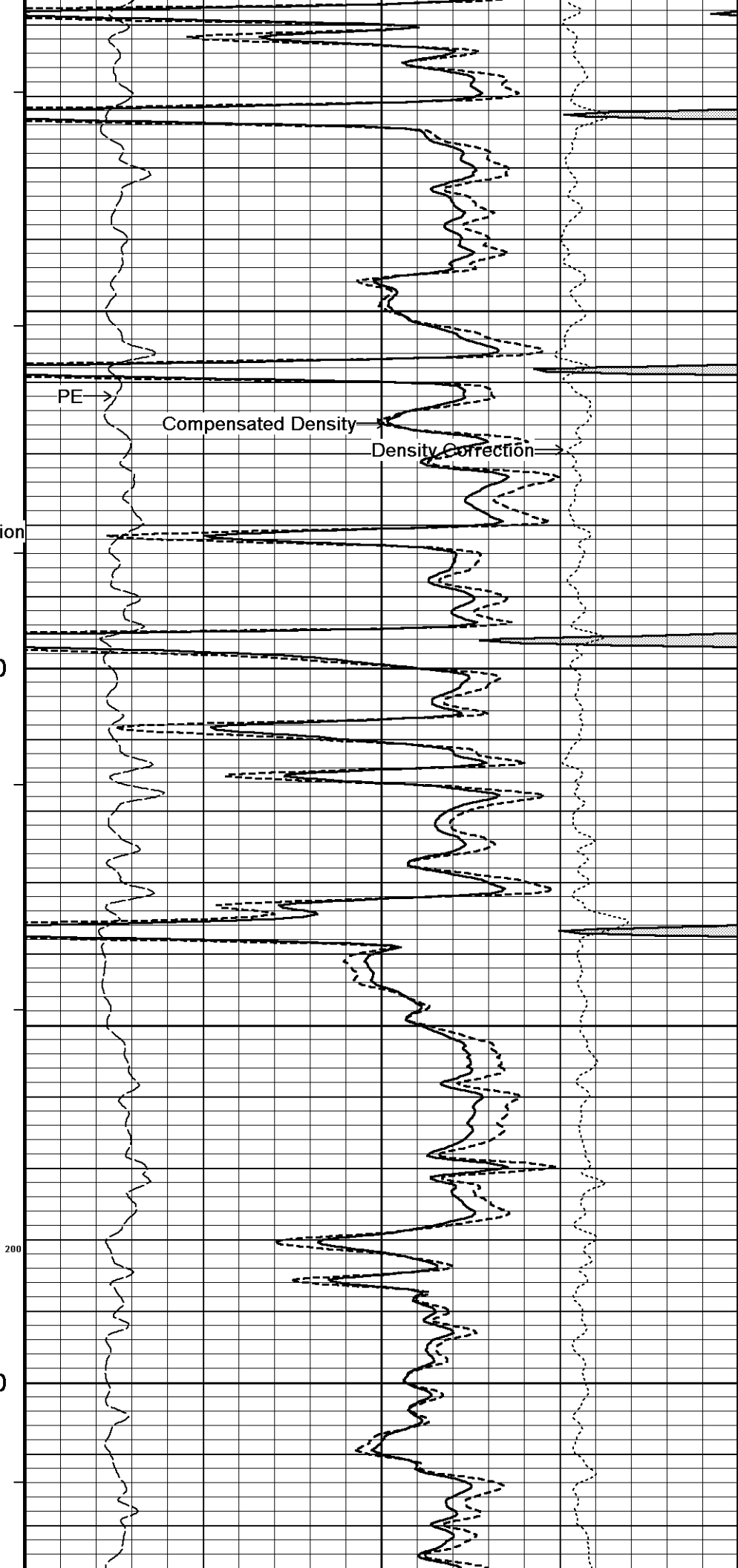
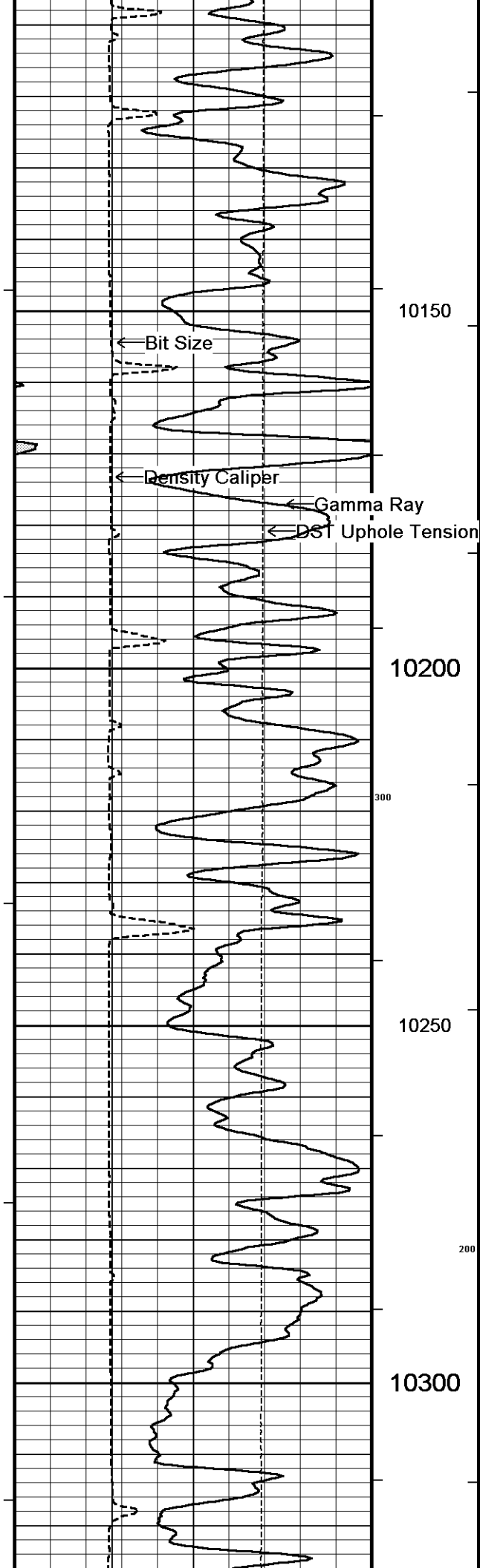
600

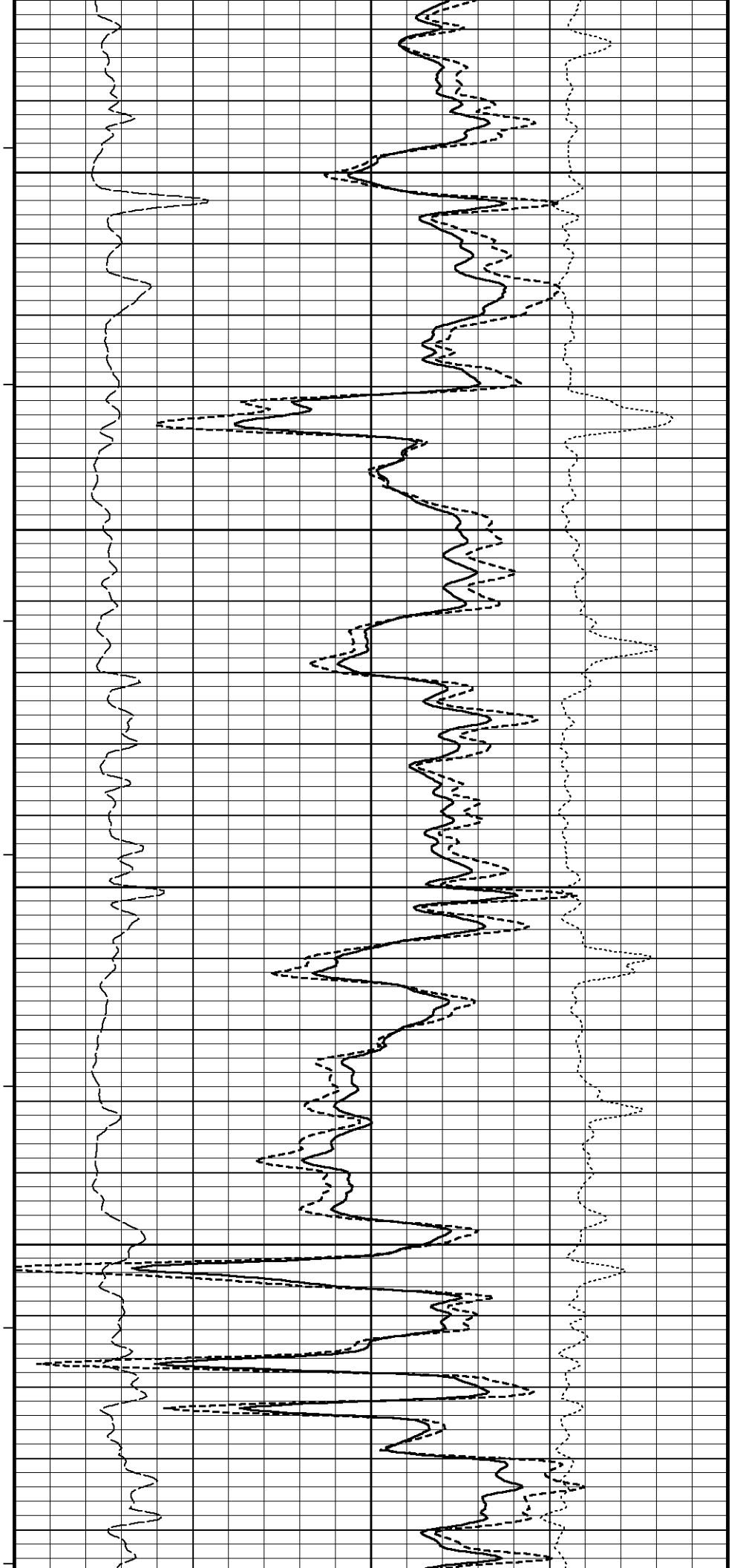
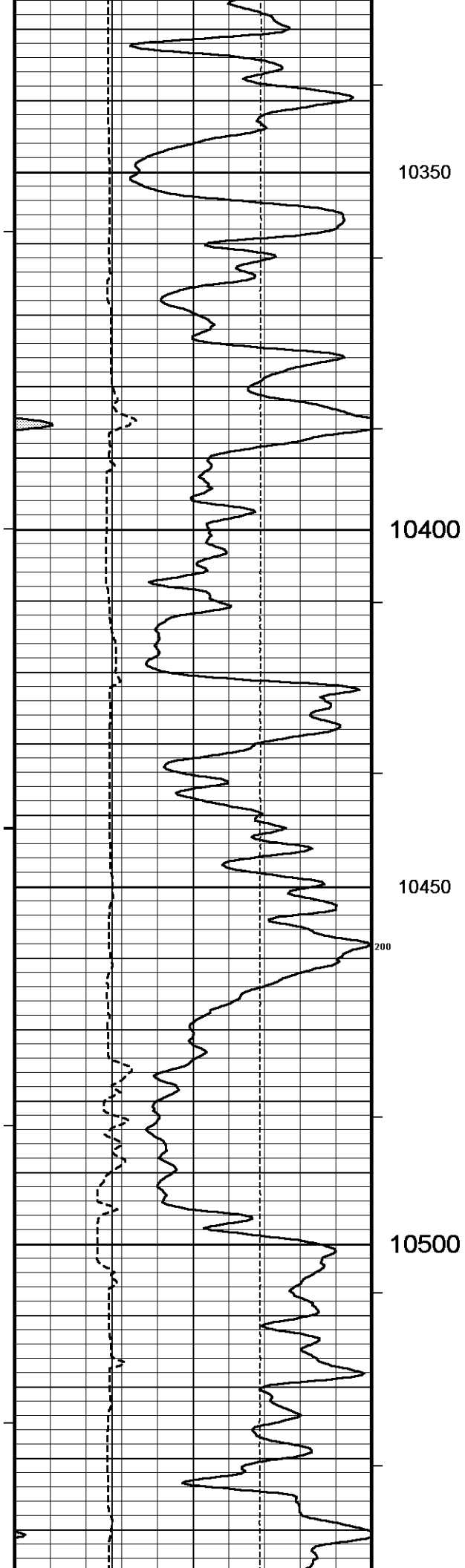


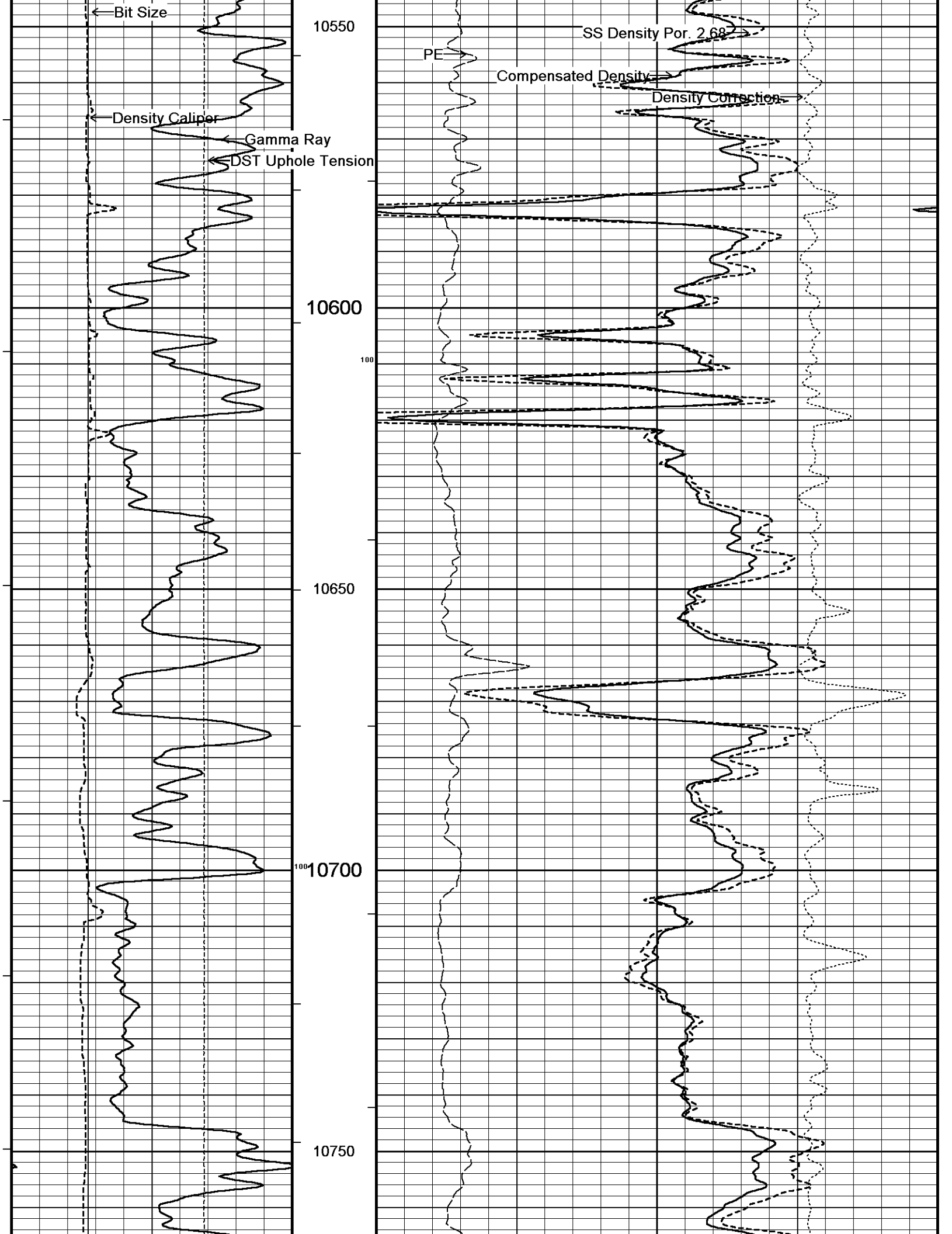
400

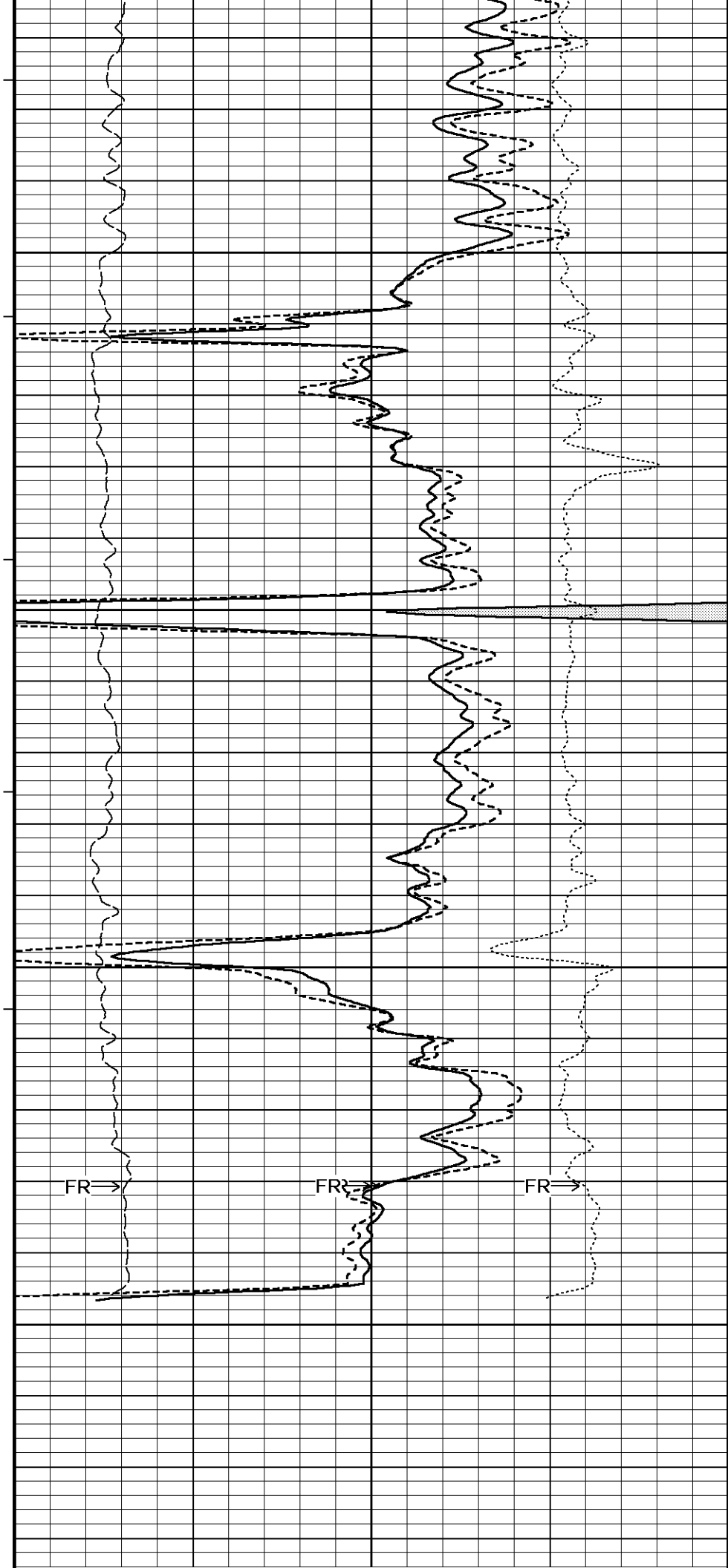
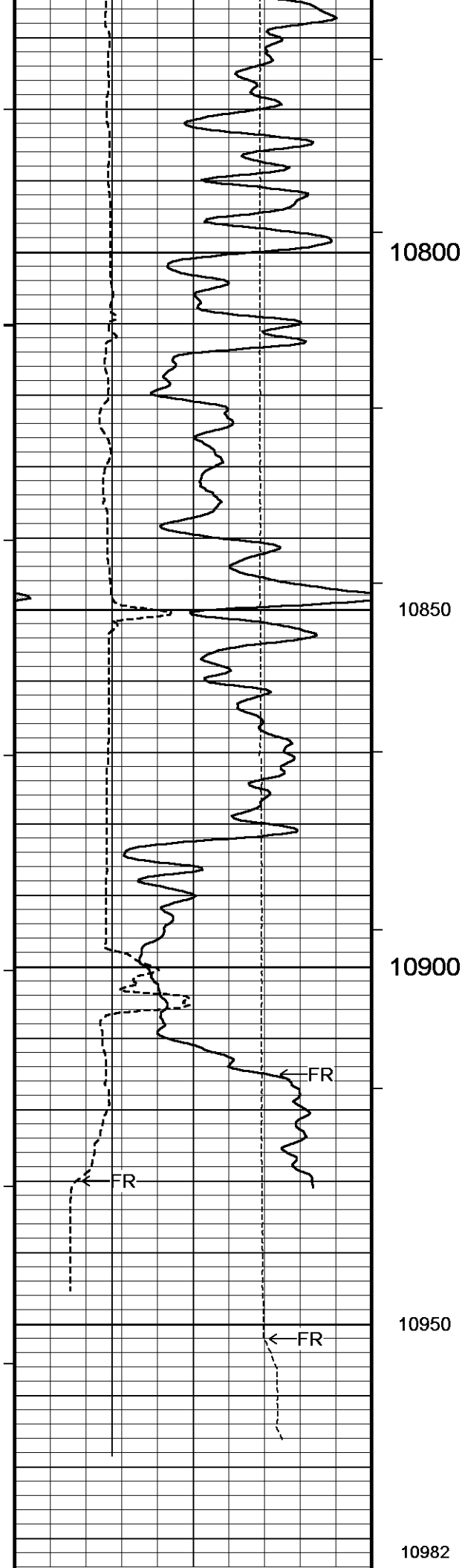


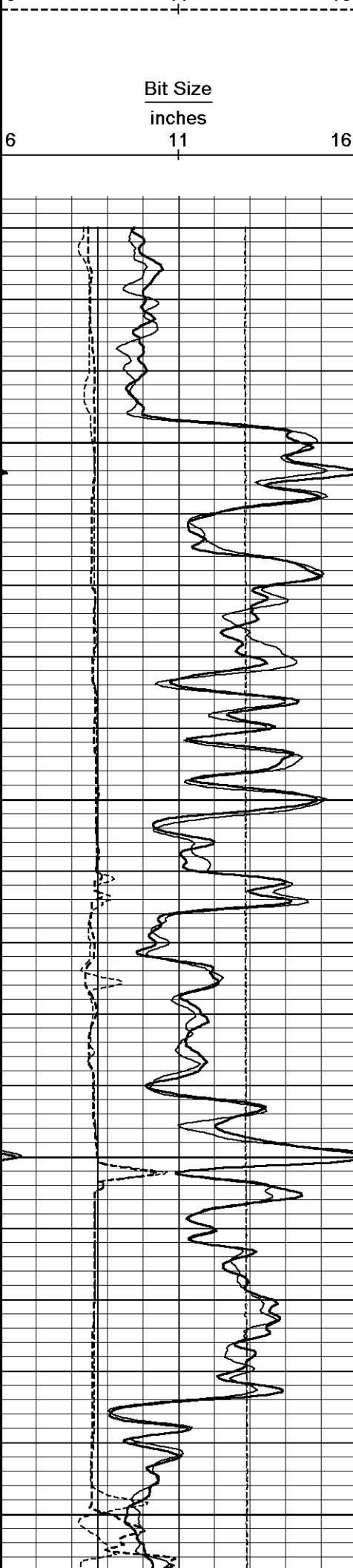












Replay
Scale
1:240

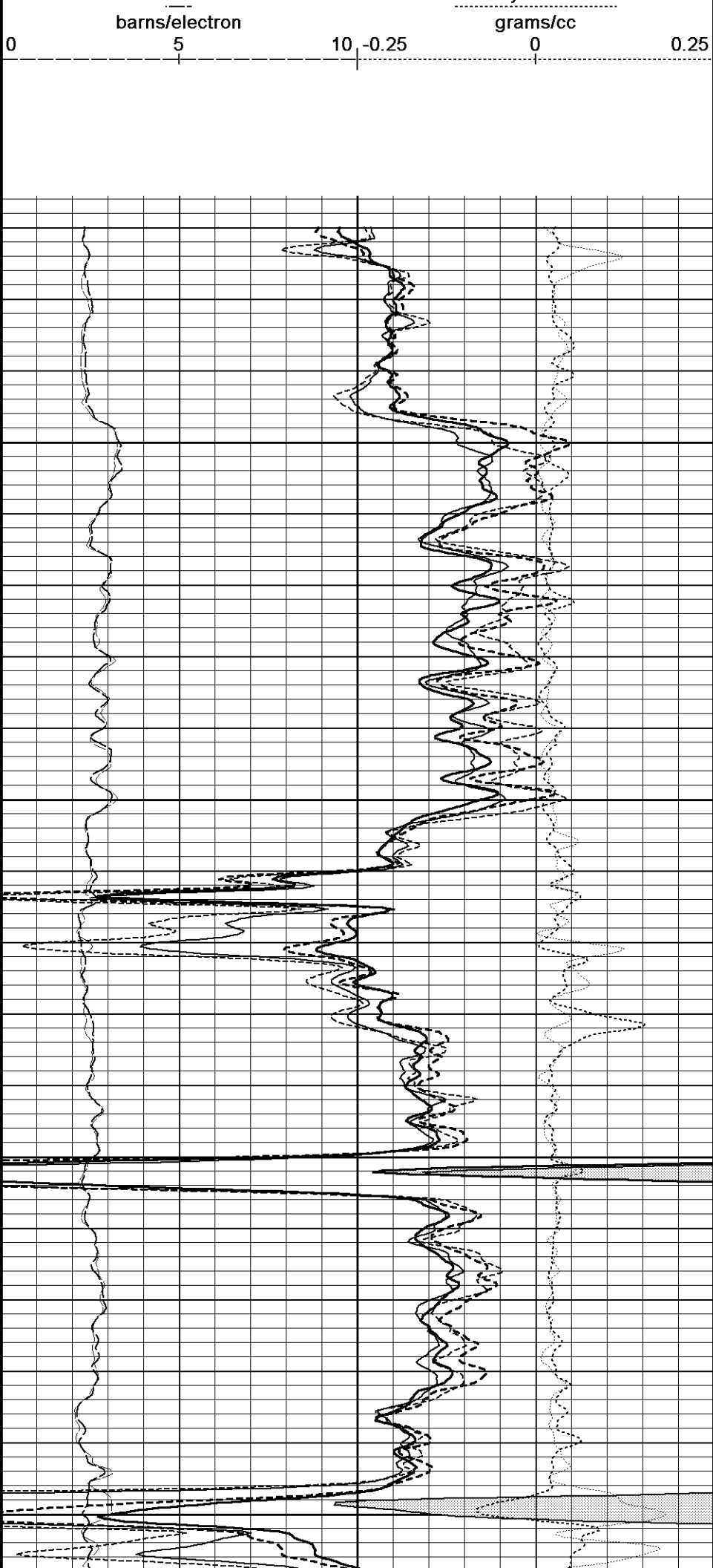
10718

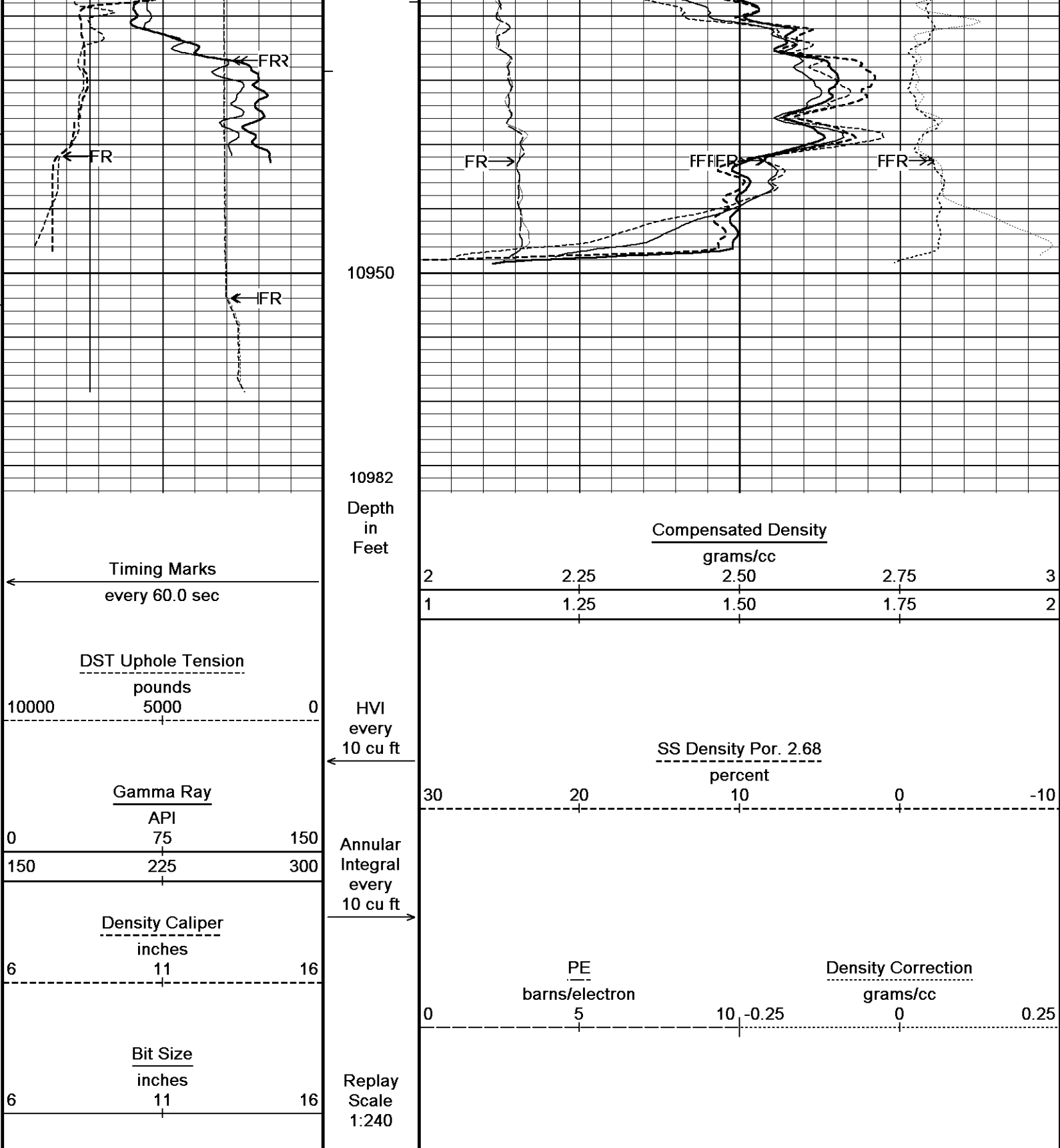
10750

10800

10850

10900





Depth Based Data - Maximum Sampling Increment 10.0cm

Filename: C:\DOCUME~1\pateljc\LOCALS~1\Temp\Weatherford PreView\0\Main_splice.dta

Filename: C:\DOCUME~1\pateljc\LOCALS~1\Temp\Weatherford PreView\0\Lower_Repeat.dta

System Versions: Plotted with 8.01.0091

Plotted on 16-JUL-2008 21:23

Recorded on 16-JUL-2008 13:51

Recorded on 16-JUL-2008 13:36

↑ OVERLAY ↑

BEFORE SURVEY CALIBRATION

C:\DOCUME~1\pateljc\LOCALS~1\Temp\Weatherford PreView\0\Main_splice.dta

General Constants: All 000

Last Edited on 15 JUL 2008 13:00

General Parameters

Mud Resistivity	1.560	ohm-metres
Mud Resistivity Temperature	99.700	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	Deep Induction	
RWA Constant A	0.610	
RWA Constant M	2.150	

Down-hole Tension Calibration SMS 000

Field Calibration on 18-JUN-2008 19:09

Reading No	Measured	Calibrated (lbs)
1	13912.78	0.00
2	14946.50	348.30

High Resolution Temperature Calibration MCG 054

Field Calibration on 15-JUL-2008,11:02

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

High Resolution Temperature Constants MCG 054

Pre-filter Length	11
-------------------	----

SP Calibration MCG 054

Field Calibration on 15-JUL-2008,11:02

	Measured	Calibrated (mV)
Reference 1	103.6	100.0
Reference 2	-97.1	-100.0

Gamma Calibration MCG 054

Field Calibration on 15-JUL-2008,11:02

	Measured	Calibrated (API)
Background	90	62
Calibrator (Gross)	1004	688
Calibrator (Net)	914	626

Gamma Constants MCG 054

Last Edited on 16-JUL-2008,16:26

Gamma Calibrator Number	GRC-005	
Mud Density	1.00	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl	0.00	kppm

Neutron Calibration MDN 015

Base Calibration on 10-JUL-2008 17:44

Field Check on 15-JUL-2008,11:02

Base Calibration

	Measured		Calibrated (cps)	
	Near	Far	Near	Far
Ratio	3210	98	3714	110
	32.816		33.764	

Field Calibrator at Base

	Calibrated (cps)	
Ratio	1501	2201
	0.682	

Field Check

	Calibrated (cps)	
Ratio	1506	2214
	0.680	

Neutron Constants MDN 015

Last Edited on 11-FEB-2008 11:29

Neutron Source Id	755	
Neutron Jig Number	6532	
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	0.00	kppm
Formation Fluid Salinity Source	None	
Formation Fluid Salinity	0.00	kppm
Barite Mud Correction	Not Applied	

Caliper Calibration MPD 157

Base Calibration on 10-JUL-2008 16:28
Field Calibration on 15-JUL-2008,14:33

Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	16466	4.00
2	24721	5.96
3	32576	7.98
4	40600	9.86
5	49646	11.88
6	N/A	N/A
Field Calibration		
	Measured Caliper (in)	Actual Caliper (in)
	7.98	7.98

Photo Density Calibration MPD 157

Base Calibration on 10-JUL-2008 16:15
Field Check on 15-JUL-2008,14:48

Density Calibration				
Base Calibration				
		Measured	Calibrated (sdu)	
		Near	Far	
Reference 1	57825	30744	59841	31066
Reference 2	23371	2664	24669	2507
Field Check at Base				
	1081.3	1302.6		
Field Check				
	1081.3	1302.6		
PE Calibration				
Base Calibration				
	WS	Measured	Calibrated	
		WH	Ratio	Ratio
Background	195	956		
Reference 1	21613	57624	0.378	0.377
Reference 2	6173	23233	0.268	0.270
Field Check at Base				
	194.7	955.6		
Field Check				
	194.7	955.6		

Density Constants MPD 157

Last Edited on 15-JUL-2008,14:33

Density Source Id	271	
Nylon Calibrator Number	626	
Aluminium/Fe Calibrator Number	626	
Density Shoe Profile	4 inch	
Caliper Source for Processing	Density Caliper	
PE Correction to Density	Not Applied	
Mud Density	1.15	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	Advanced	
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	

FE Calibration MFE 085

Base Calibration on 10-JUL-2008 16:43

Field Check on 15-JUL-2008 13:05

Base Calibration

	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	966.7	126.8
Base Check		280.6
Field Check		280.5

FE Constants MFE 085

Last Edited on 11-JUL-2008,03:03

Caliper Source for FE correction	Density Caliper
Rm Source for FE correction	Temperature Corr
Temp. for Rm Corr.	MCG External Temperature
Stand-off	1.0 inches

Induction Calibration MAI 116

Base Calibration on 10-MAR-2008 21:32

Field Check on 15-JUL-2008 13:07

Base Calibration

Test Loop Calibration	Measured		Calibrated (mmho/m)	
Channel	Low	High	Low	High
1	17.2	484.7	9.3	966.2
2	5.5	385.3	7.6	821.4
3	3.0	257.2	5.2	566.0
4	1.7	131.5	2.6	279.2

Array Temperature 62.2 Deg F

Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1	12.3	3763.4	14.8	3762.2
2	30.9	3505.3	32.1	3504.1
3	29.5	3085.6	30.4	3085.1
4	20.1	2106.3	20.6	2105.8
Deep	17.9	2060.3	18.5	2060.4
Medium	43.5	4056.4	44.4	4055.7
Shallow	46.3	5104.6	48.0	5102.1

Array Temperature 66.2 98.8 Deg F

Induction Constants MAI 116

Last Edited on 15-JUL-2008,11:03

Induction Model	ENHANCED
Caliper for Borehole Corr.	Density Caliper
Hole Size for Borehole Correction	N/A inches
Stand-off	1.00 inches
Number of Fins on Stand-off	6.0000
Stand-off Fin Width	0.5000 inches
Borehole Corr. Rm Source	Temperature Corr
Temp. for Rm Corr.	MCG External Temperature
Squasher Start	0.0050 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

High Resolution Temperature Calibration MAI 116

Field Calibration on 10-JUL-2008,16:36

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

High Resolution Temperature Constants MAI 116

Last Edited on 18-APR-2006,08:59

Pre-filter Length 11

AFTER SURVEY CALIBRATION

C:\DOCUME~1\pateljc\LOCALS~1\Temp\Weatherford PreView\0\Main_splice.dta

Gamma Check MCG 054

Field Calibration on 15-JUL-2008,11:02
After Survey Check on 16-JUL-2008 16:34

	Before (API)	After (API)
Background	62	60
Calibrator (Gross)	688	686
Calibrator (Net)	626	626

Neutron Check MDN 015

Before Survey Check on 15-JUL-2008,11:02
After Survey Check on 16-JUL-2008 16:48

Near (cps)		Far (cps)	
Before	After	Before	After
1506	1497	2214	2207
Ratio			
Before	After		
0.680	0.678		

Photo Density Check MPD 157

Before Survey Check on 15-JUL-2008,14:48
After Survey Check on 16-JUL-2008 15:48

Density Check

Near		Far	
Before	After	Before	After
1081.3	1081.6	1302.6	1301.2

PE Check

	Before	After
WS	194.7	192.3
WH	955.6	956.6

FE Check MFE 085

Before Survey Check 15-JUL-2008 13:05
After Survey Check on 16-JUL-2008 15:49

Before (ohm-m)	After (ohm-m)
280.5	280.8

Induction Check MAI 116

Before Survey Check on 15-JUL-2008 13:07
After Survey Check on 16-JUL-2008 15:51

Channel	Before Survey (mmho/m)		After Survey (mmho/m)	
	Low	High	Low	High
1	14.8	3762.2	14.7	3761.1
2	32.1	3504.1	32.1	3503.3

3	30.4	3085.1	30.4	3084.3
4	20.6	2105.8	20.6	2105.4
Deep	18.5	2060.4	18.5	2059.8
Medium	44.4	4055.7	44.5	4054.6
Shallow	48.0	5102.1	48.0	5101.1
Array Temperature		98.8	96.4	Deg F

DOWNHOLE EQUIPMENT

C:\DOCUME~1\patelj\LOCALS~1\Temp\Weatherford PreView\0\Main_splice.dta

SHA-J.A Compact Swivel Head Adaptor

SHA 285 Length: 2.30 ft Weight: 22.0 lb

Compact Gamma

MCG 54 Length: 8.70 ft Weight: 63.9 lb

Compact Neutron

MDN 15 Length: 5.04 ft Weight: 50.7 lb

Compact Density/Caliper

MPD 157 Length: 9.59 ft Weight: 90.4 lb

SKJ-E.A Compact Knuckle Joint

SKJ 143 Length: 2.17 ft Weight: 24.3 lb

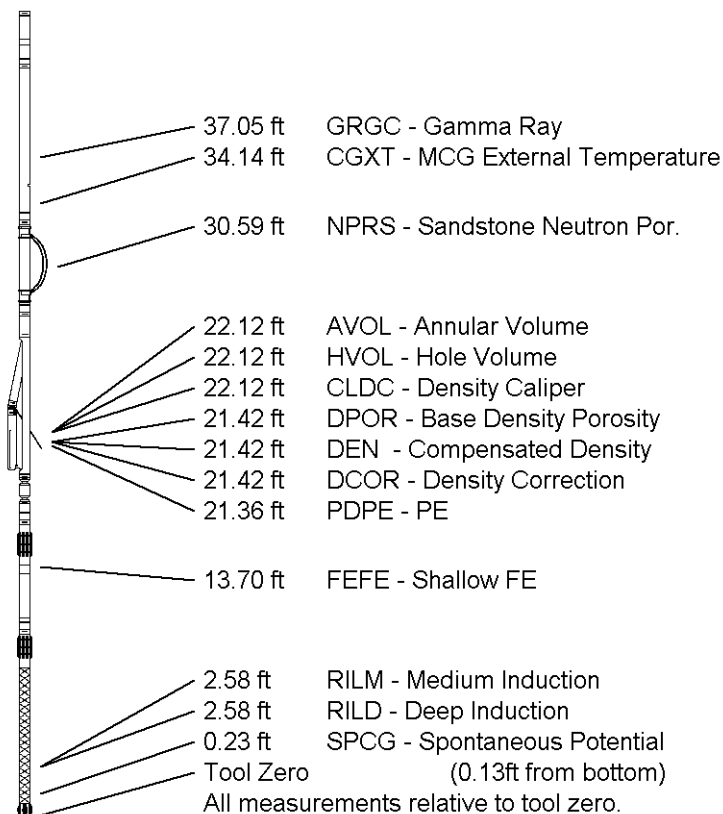
Compact Focussed Electric

MFE 85 Length: 6.03 ft Weight: 48.5 lb

Compact Induction

MAI 116 Length: 10.81 ft Weight: 48.5 lb

Total Length: 44.64 ft Weight: 348.3 lb



COMPANY WHITING OIL & GAS
WELL BOIES #B-19P-O3
FIELD SULPHUR CREEK
PROVINCE/COUNTY RIO BLANCO
COUNTRY/STATE U.S.A. / COLORADO

Elevation Kelly Bushing	6278.00	feet	First Reading	10933.00	feet
Elevation Drill Floor	6277.00	feet	Depth Driller	10930.00	feet
Elevation Ground Level	6248.00	feet	Depth Logger	10954.00	feet



Weatherford®

**COMPENSATED PHOTO DENSITY
 COMPENSATED DUAL NEUTRON
 LOG**