



Weatherford®

**DUAL SPACED NEUTRON
PHOTO DENSITY
LOG**

COMPANY	Caerus Oil & Gas		
WELL	Puckett 32A-26		
FIELD	Grand Valley		
PROVINCE/COUNTY	Garfield		
COUNTRY/STATE	U.S.A. / Colorado		
LOCATION	888' FNL & 1387' FEL		
SEC 26	TWP 06S	RGE 97W	Other Services
Latitude	39.498803 ARRAY INDUCTION		
Longitude	-108.182969		
API Number			
Permanent Datum GL, Elevation 8396 feet			Elevations: feet
Log Measured From KB			KB 8426.00
Drilling Measured From KB@11FT			DF 8396.00
Date	29-JAN-2017		
Run Number	ONE		
Service Order	7884-172911215		
Depth Driller	9032.00	feet	
Depth Logger	9003.00	feet	
First Reading	9003.00	feet	
Last Reading	2498.00	feet	
Casing Driller	2535.00	feet	
Casing Logger	2498.00	feet	
Bit Size	8.750	inches	
Hole Fluid Type	WBM		
Density / Viscosity	9.00 g/cc	61.00 CP	
PH / Fluid Loss	9.50	6.80 ml/30Min	
Sample Source	Flow Tube		
Rm @ Measured Temp	1.803 @ 82.0	ohm-m	
Rmf @ Measured Temp	1.442 @ 82.0	ohm-m	
Rmc @ Measured Temp	2.164 @ 82.0	ohm-m	
Source Rmf / Rmc	CALC	CALC	
Rm @ BHT	0.78 @194.0	ohm-m	
Time Since Circulation	6 Hours		
Max Recorded Temp	194.00	deg F	
Equipment / Base	13174	CASPER	
Recorded By	Miles Wilkins		
Witnessed By	Boyd Cottam		

BOREHOLE RECORD					Last Edited: 30-JAN-2017 13:31
Bit Size inches		Depth From feet		Depth To feet	
8.750		2535.00		9032.00	
CASING RECORD					
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft	
SURFACE	9.625	0.00	2535.00	36.00	

REMARKS	
SOFTWARE VERSION: 16.03.1458 TOOLS: MTA, SHA, MCG, SKJ, MDN, MPD, MVC, SKJ, MIS-E, SKJ, MIS-D, MLC, MBN, MIS-D, MDM, MRD, MTD, SKJ, MIS-D, MFE, MAI RUN IN COMBINATION	
HARDWARE: MDN: DUAL BOWSPRING MPD: 8 INCH PROFILE PLATE MDM: CENTRALIZER MTD: CENTRALIZER MAI: .IN LINE CENTRALIZER	
LOGGER T.D. IS DEEPEST DEPTH REACHED BY LOGGING TOOLS DUE TO HOLE CONDITIONS	
ALL INTERVALS LOGGED AND SCALED PER CUSTOMER'S REQUEST.	
TIGHT PULLS, BOREHOLE SIZE, AND RUGOSITY WILL AFFECT REPEATABILITY AND DATA QUALITY.	
FLUID LEVEL IS LOW IN HOLE DUE TO LOSS OF FLUID TO FORMATION. ALSO FOAM IN WELL EFFECTED CROSS DIPOLE READINGS	

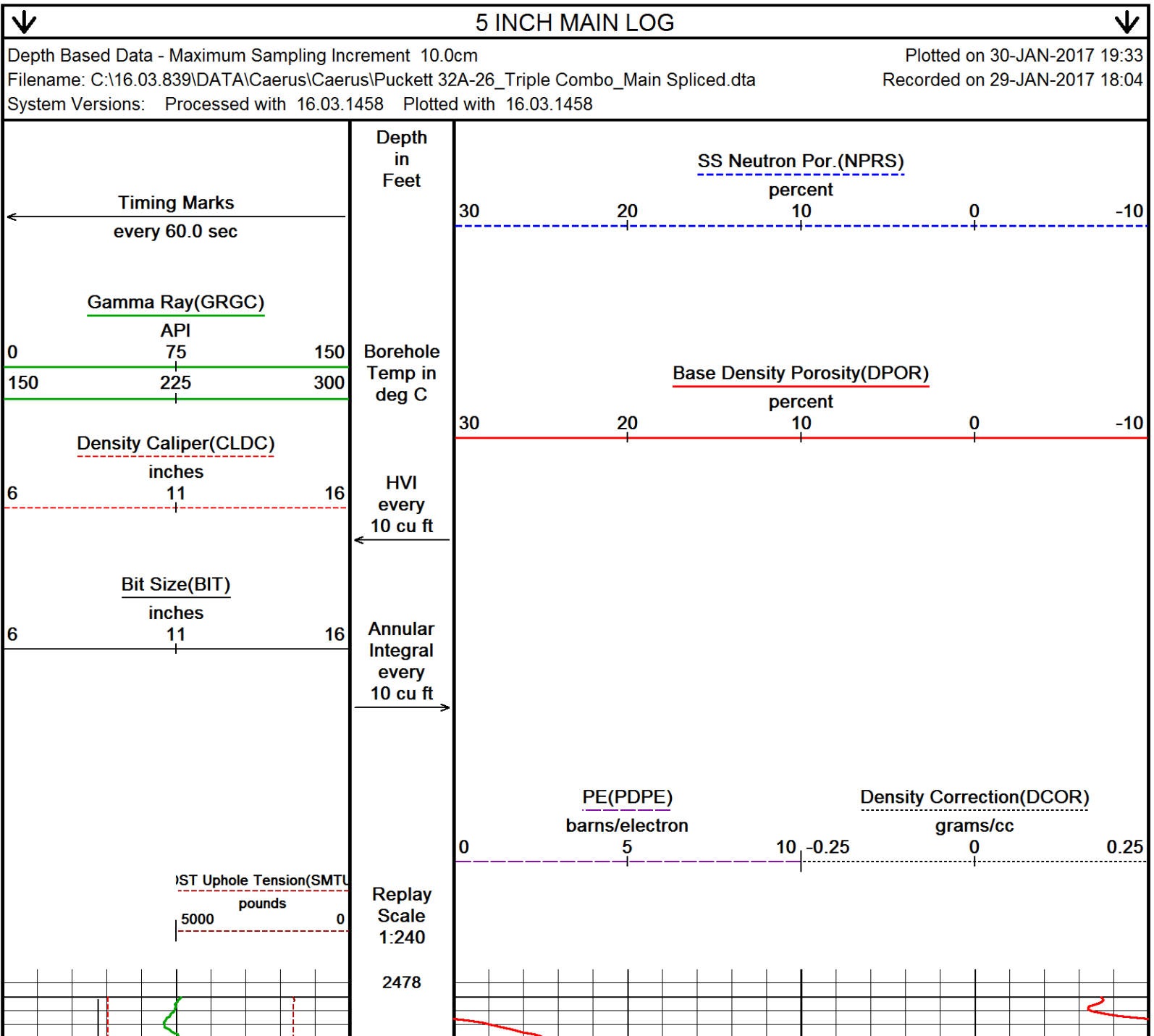
READING:

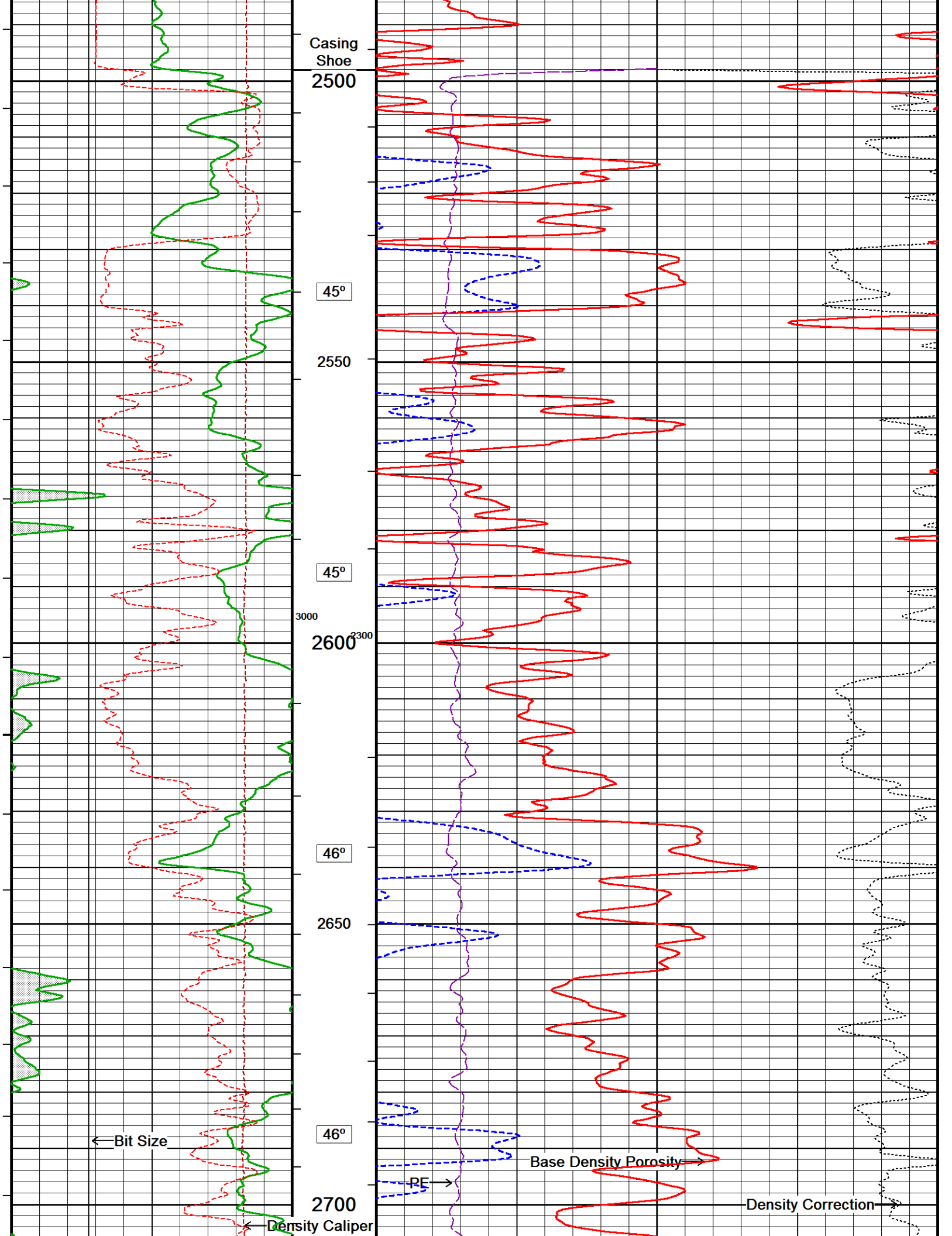
TOTAL HOLE VOLUME FROM TD TO SURFACE CASING = 3080 CU.FT.

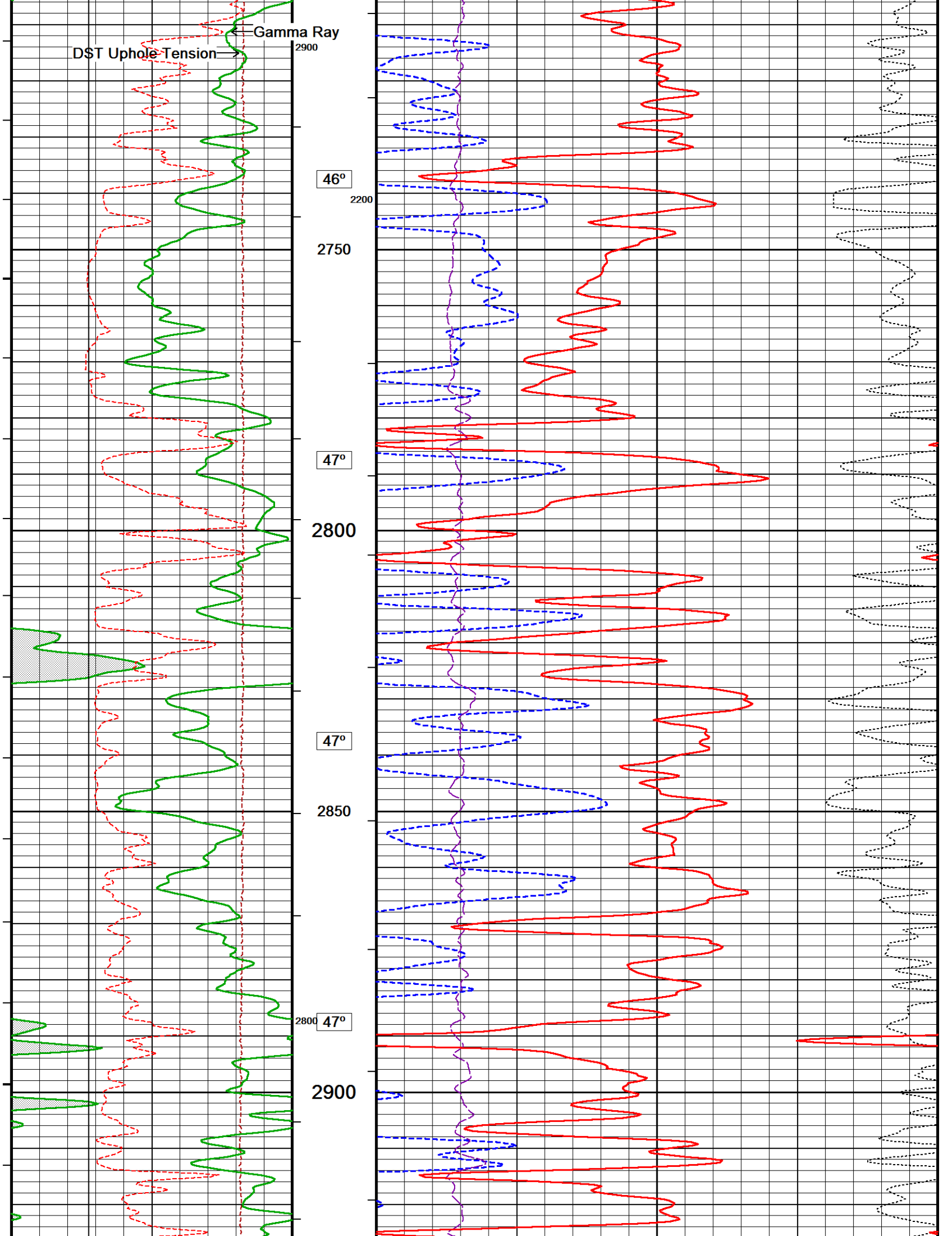
ANNULAR VOLUME FROM TD SURFACE CASING = 2368 CU.FT.

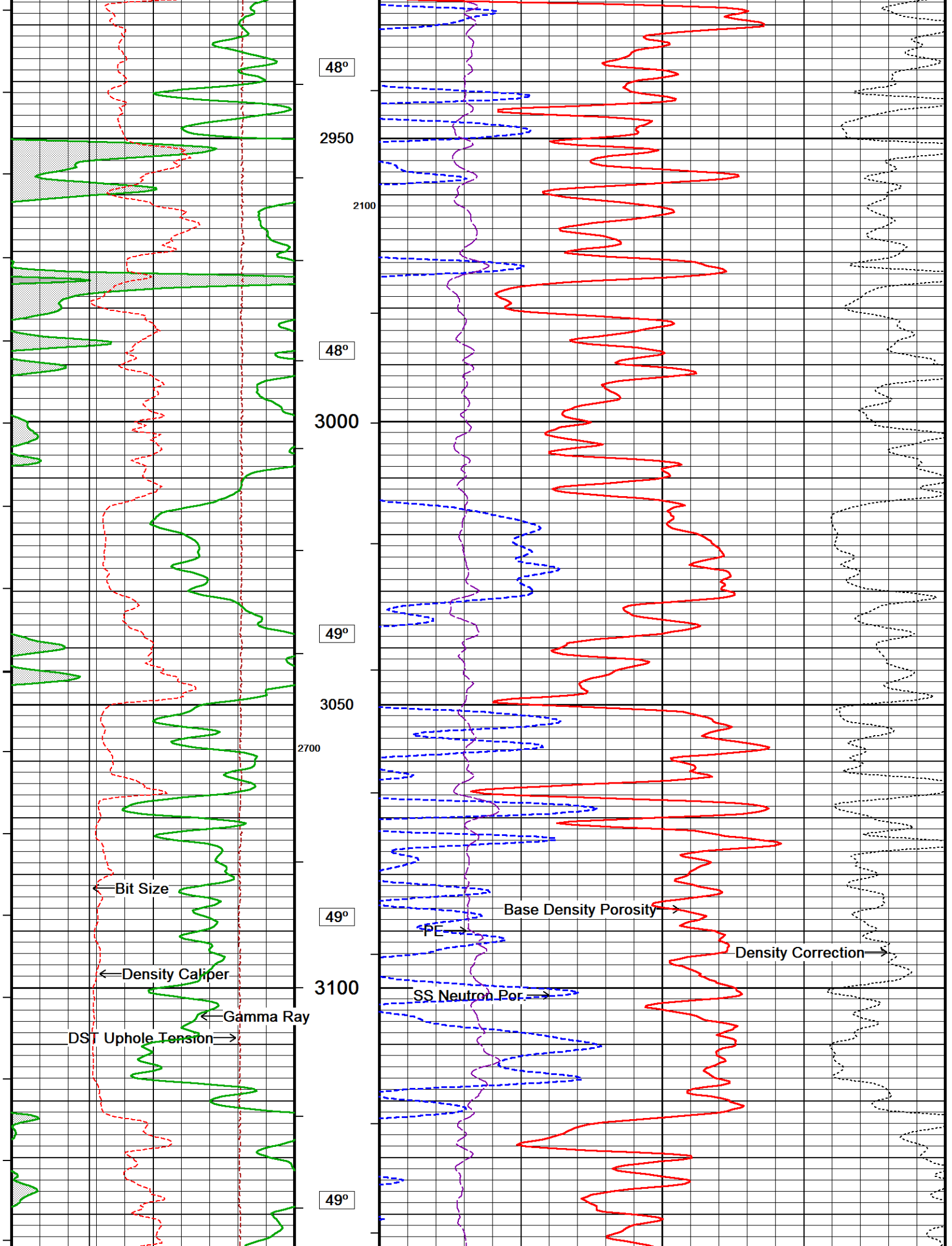
RIG: HP 330

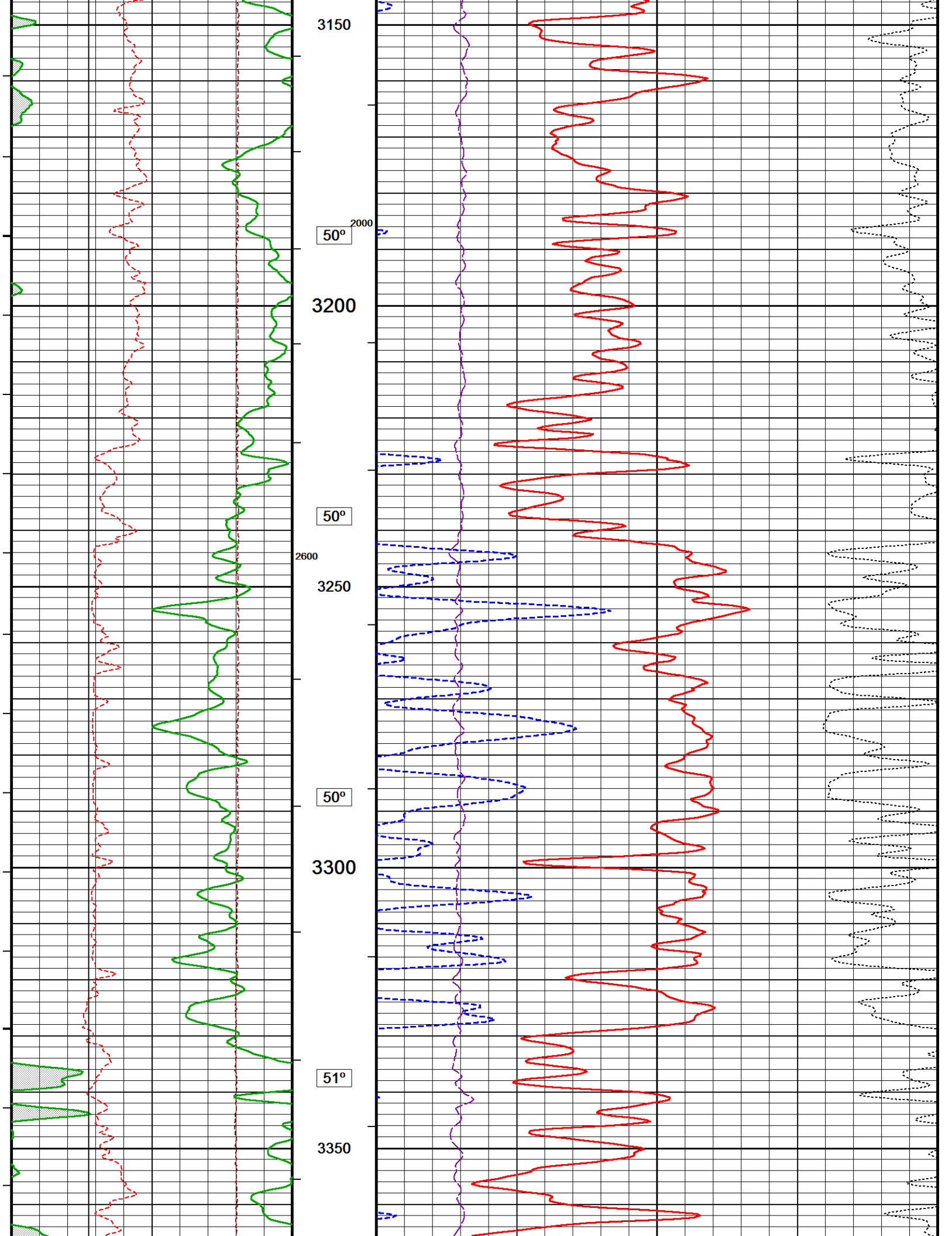
In interpreting, communicating or providing information and/or making recommendations, either written or oral, as to logs or test or other data, type or amount of material, or Work or other service to be furnished, or manner of performance, or in predicting results to be obtained, the Contractor will give the Company the benefit of the Contractor's best judgment based on its experience and will perform all such Work in a good and workmanlike manner. Any interpretation of test or other data, and any recommendation or reservoir description based upon such interpretations, are opinions based upon inferences from measurements and empirical relationships and assumptions, which inferences and assumptions are not infallible, and with respect to which professional engineers and analysts may differ. ACCORDINGLY ANY INTERPRETATION OR RECOMMENDATION RESULTING FROM THE SERVICES WILL BE AT THE SOLE RISK OF THE COMPANY, AND THE CONTRACTOR CANNOT AND DOES NOT WARRANT THE ACCURACY, CORRECTNESS OR COMPLETENESS OF ANY SUCH INTERPRETATION OR RECOMMENDATION, WHICH INTERPRETATIONS AND RECOMMENDATIONS SHOULD NOT, THEREFORE, UNDER ANY CIRCUMSTANCES BE RELIED UPON AS THE SOLE OR MAIN BASIS FOR ANY DRILLING, COMPLETION, WELL TREATMENT, PRODUCTION OR FINANCIAL DECISION, OR ANY PROCEDURE INVOLVING ANY RISK TO THE SAFETY OF ANY DRILLING ACTIVITY, DRILLING RIG OR ITS CREW OR ANY OTHER INDIVIDUAL. THE COMPANY HAS FULL RESPONSIBILITY FOR ALL DECISIONS CONCERNING THE SERVICES.

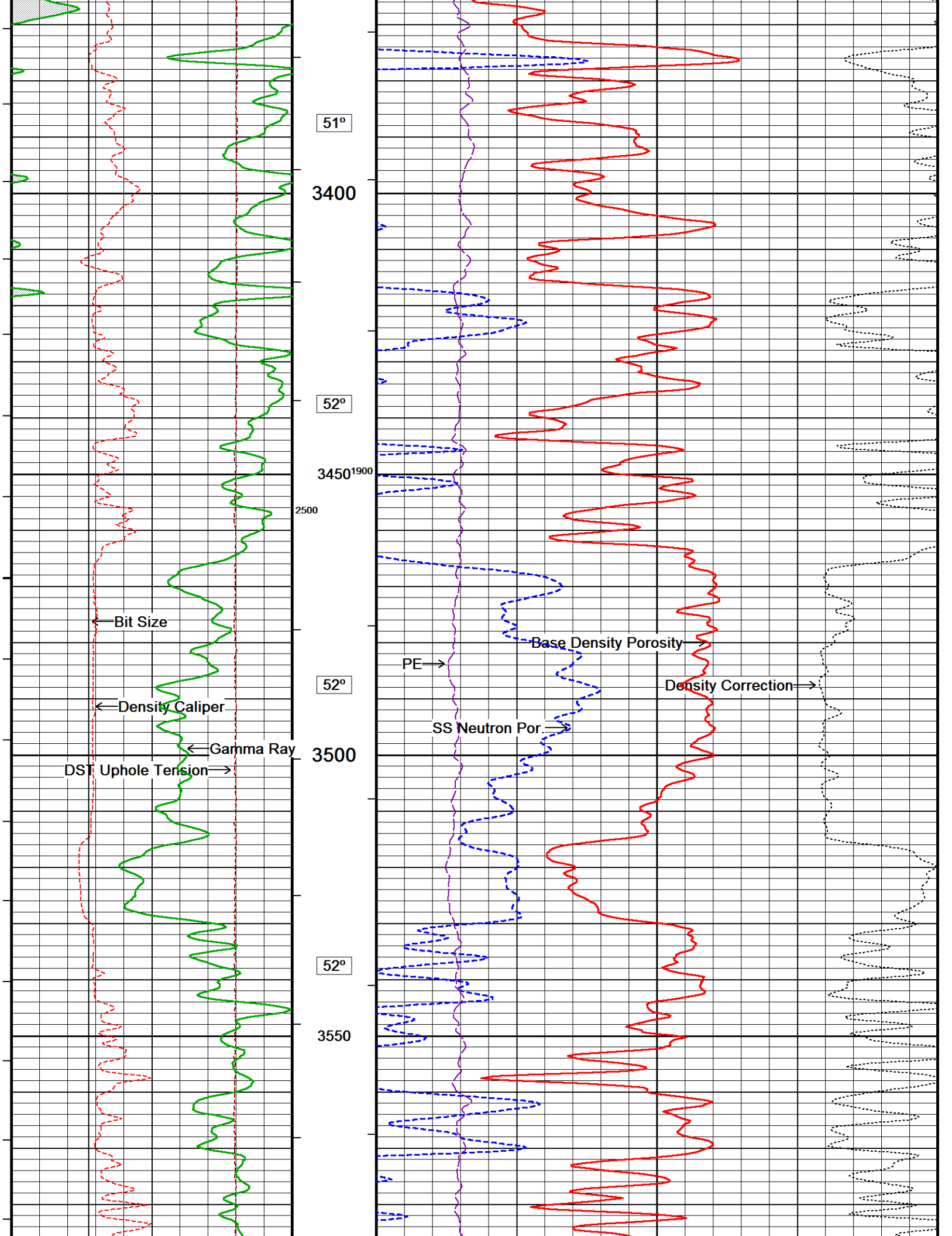


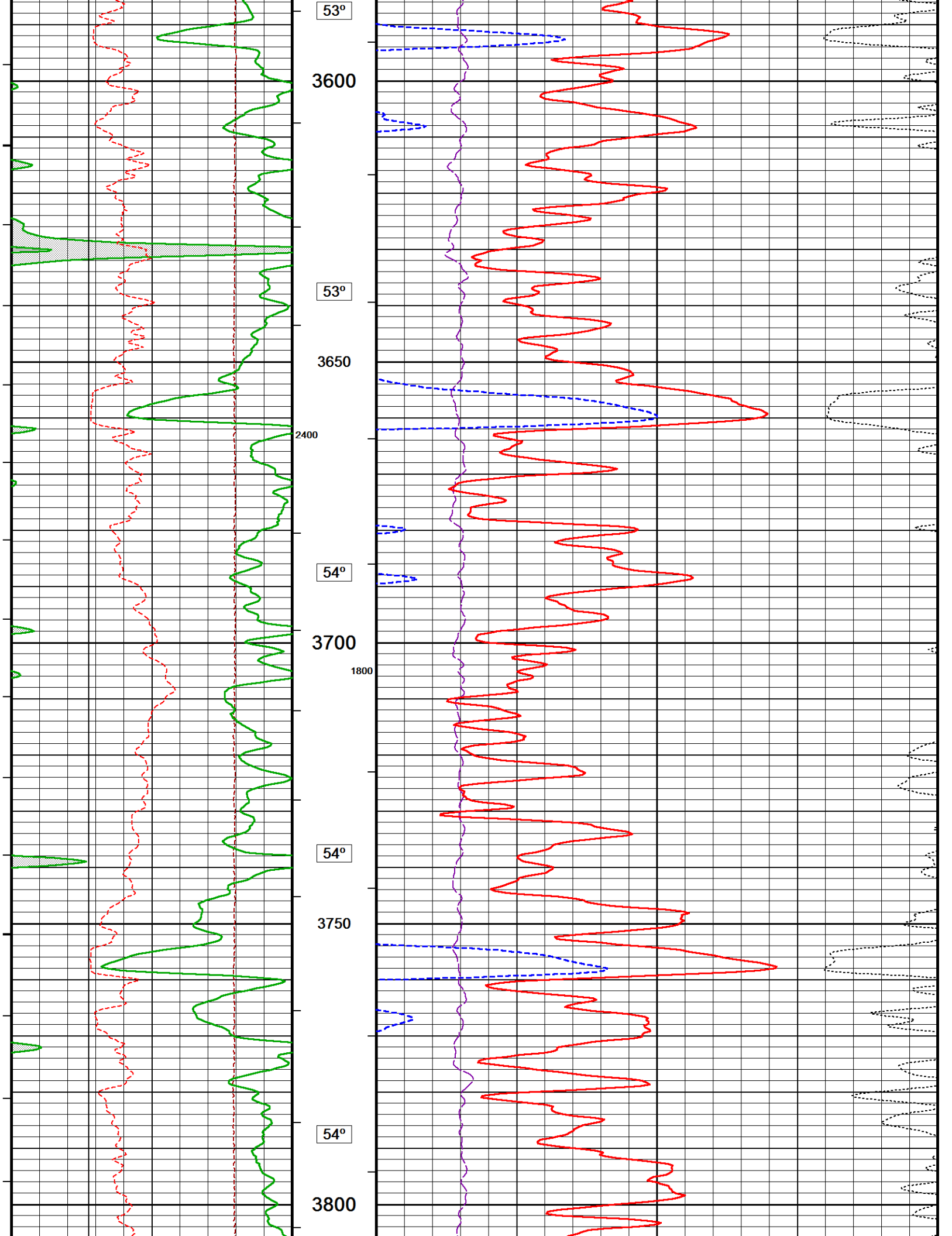


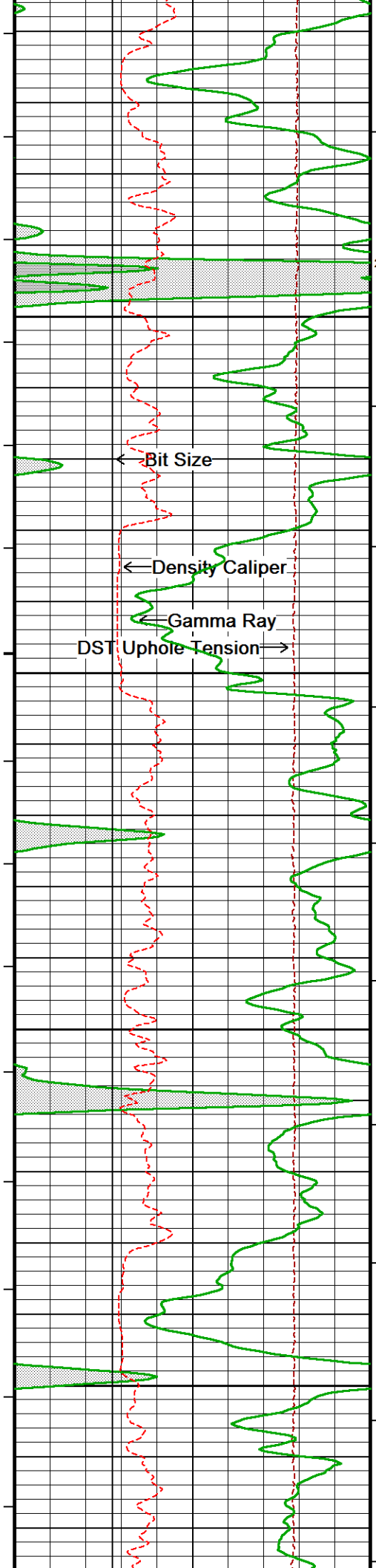












55°

2300

3850

Bit Size

Density Caliper

Gamma Ray

DST Uphole Tension

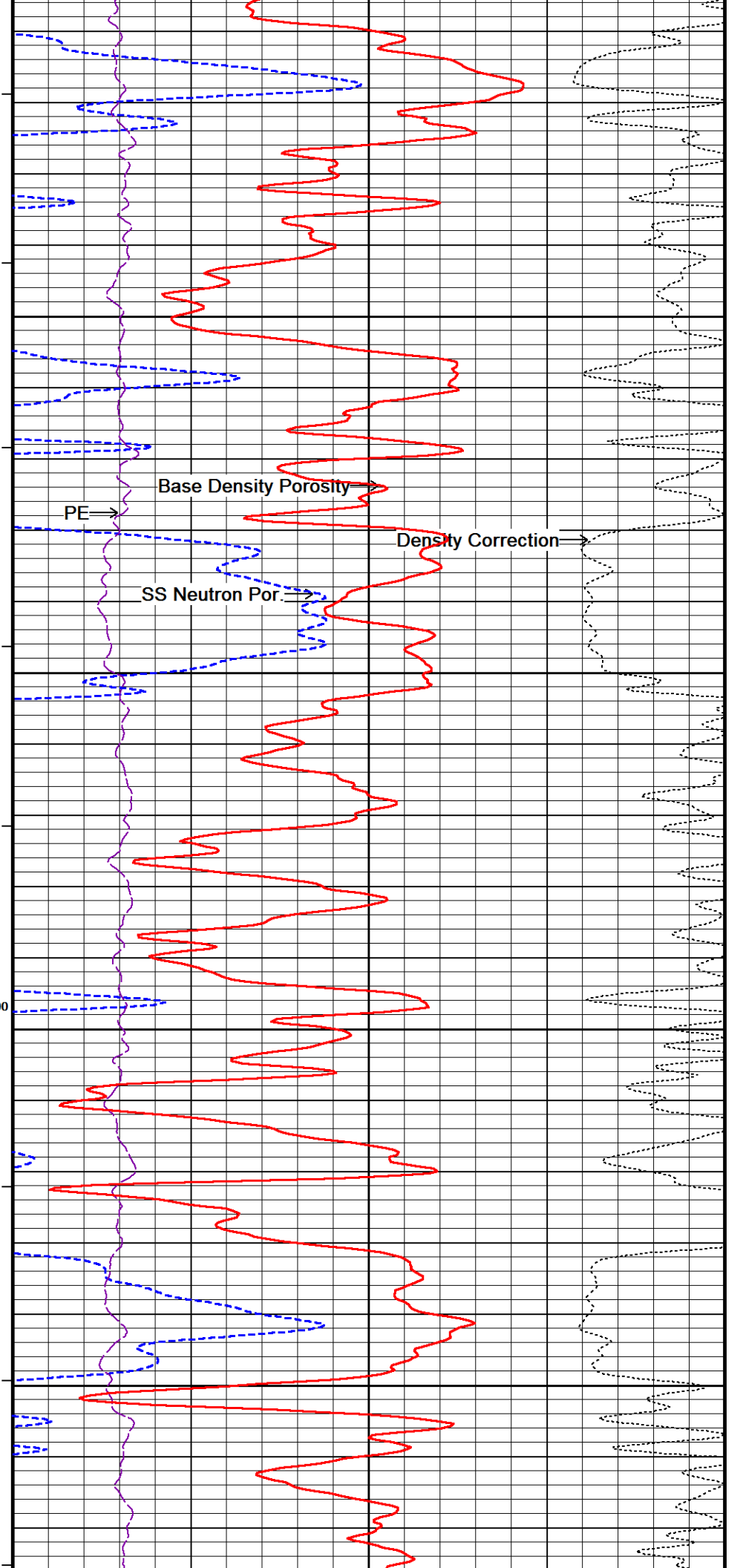
3900

55°

3950

56°

4000

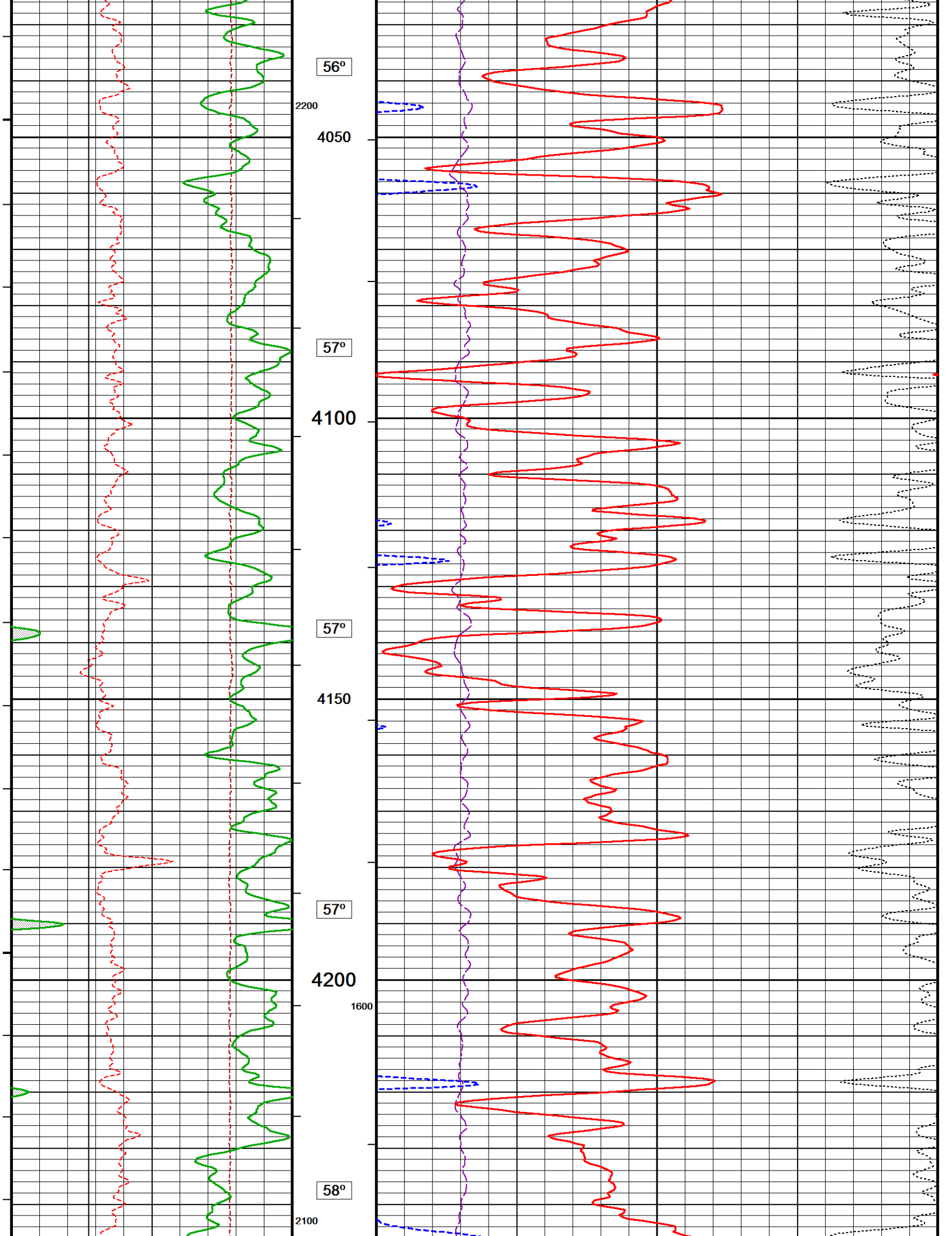


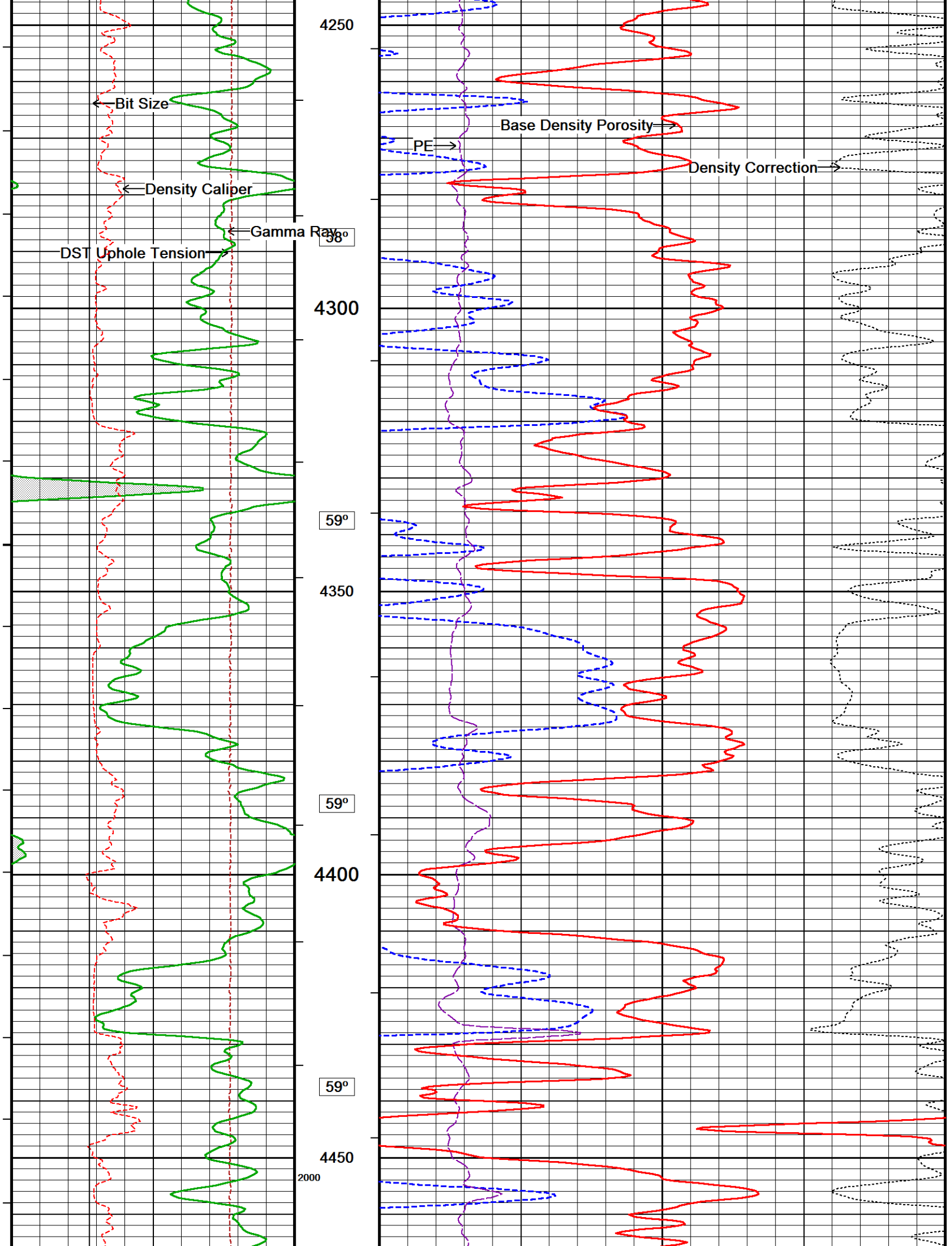
PE

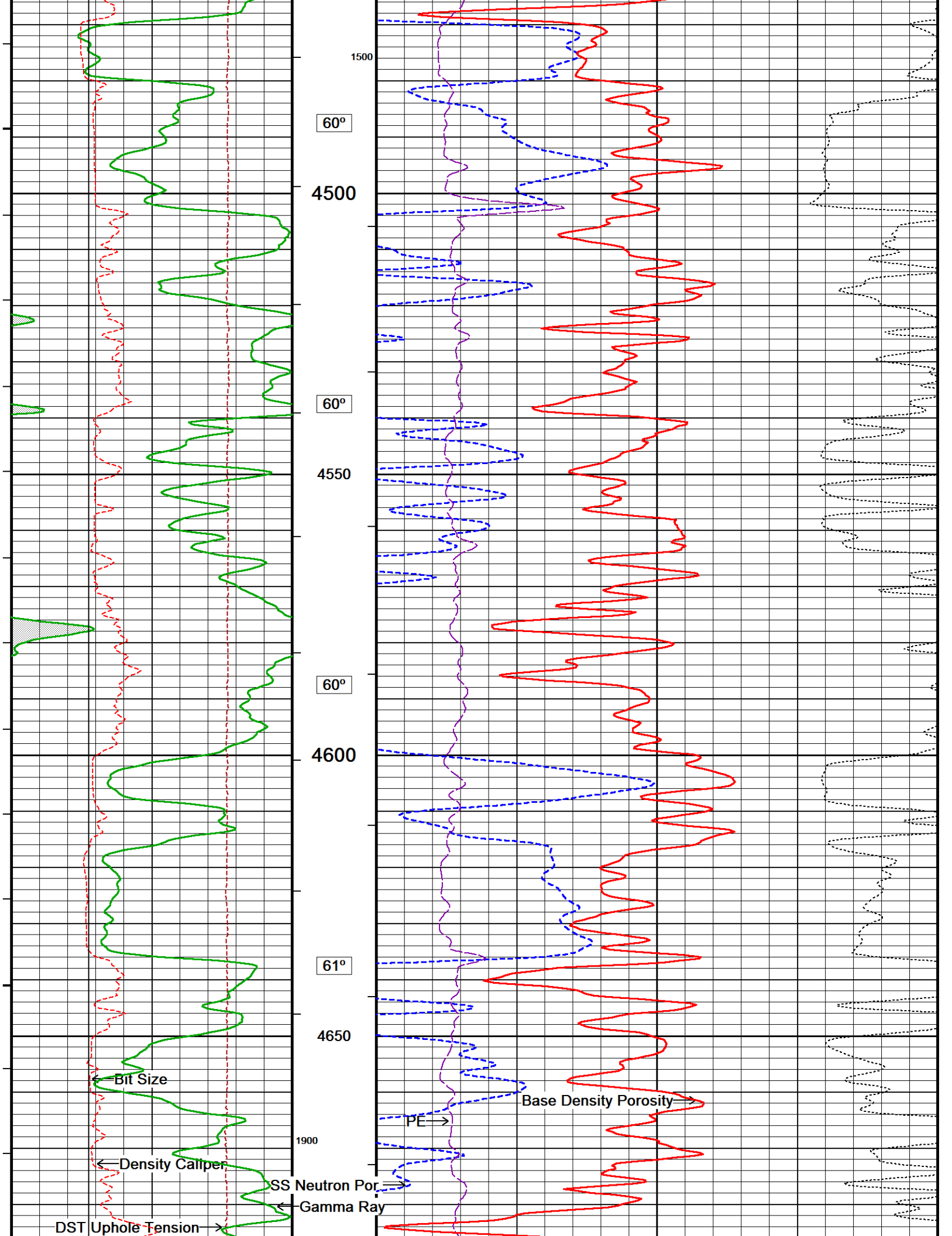
Base Density Porosity

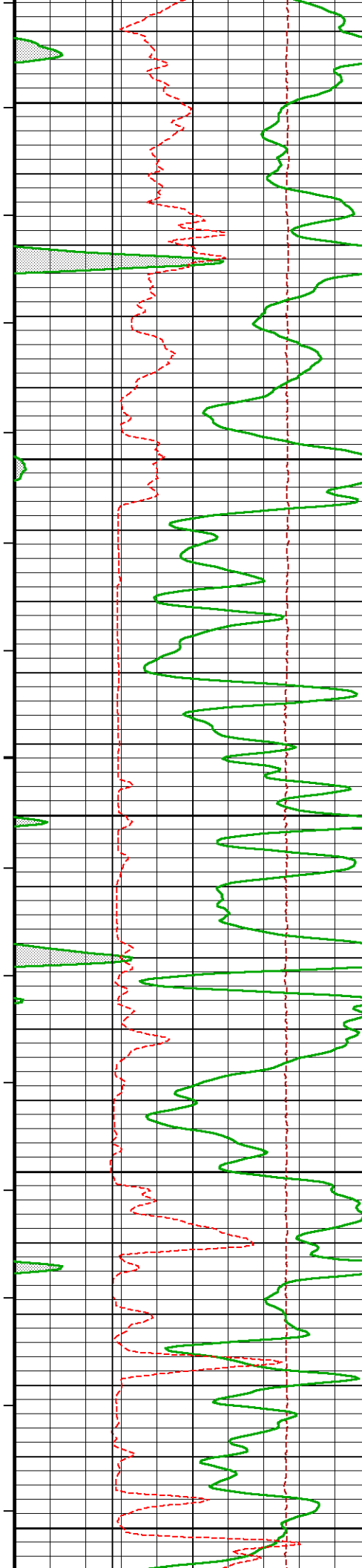
SS Neutron Por.

Density Correction

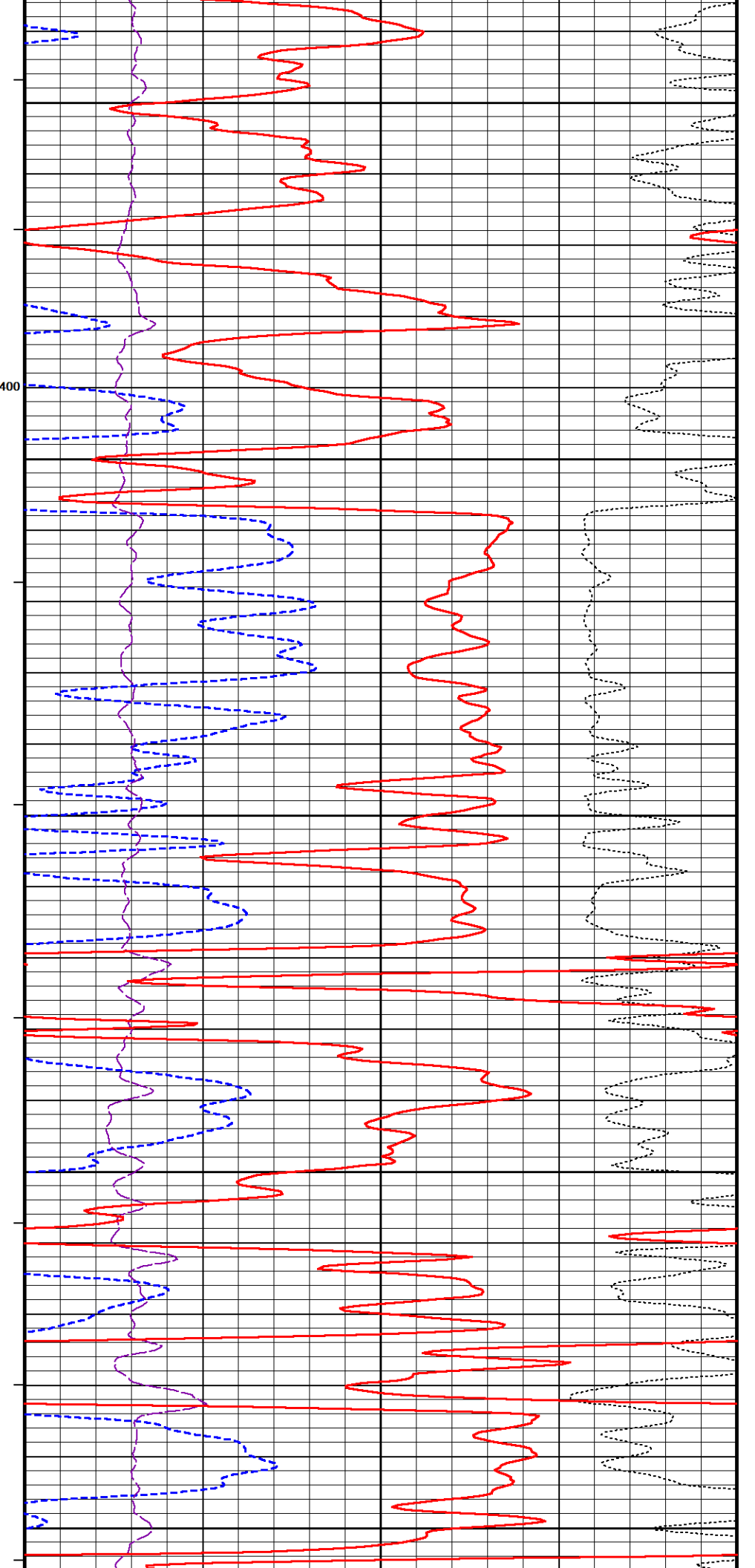


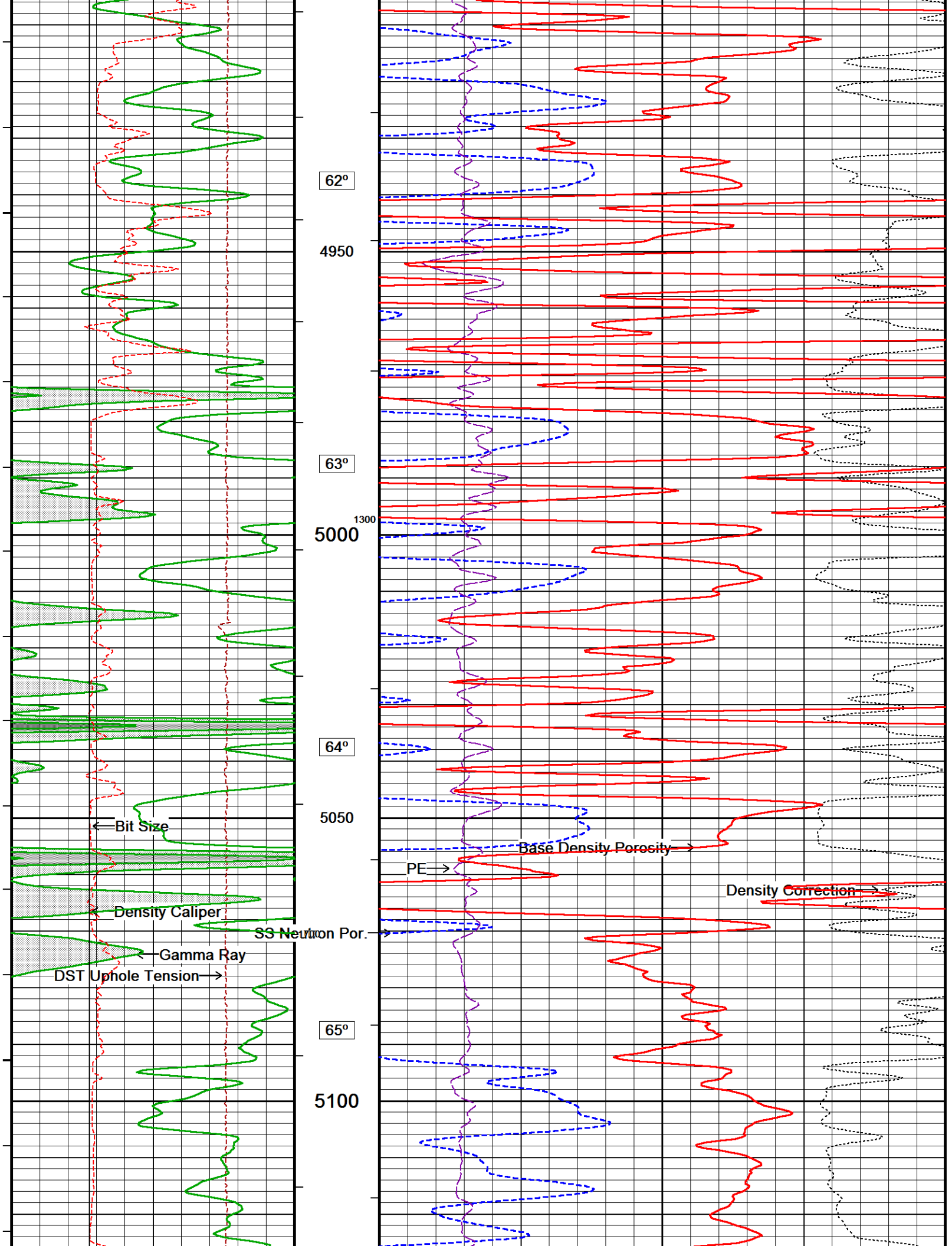


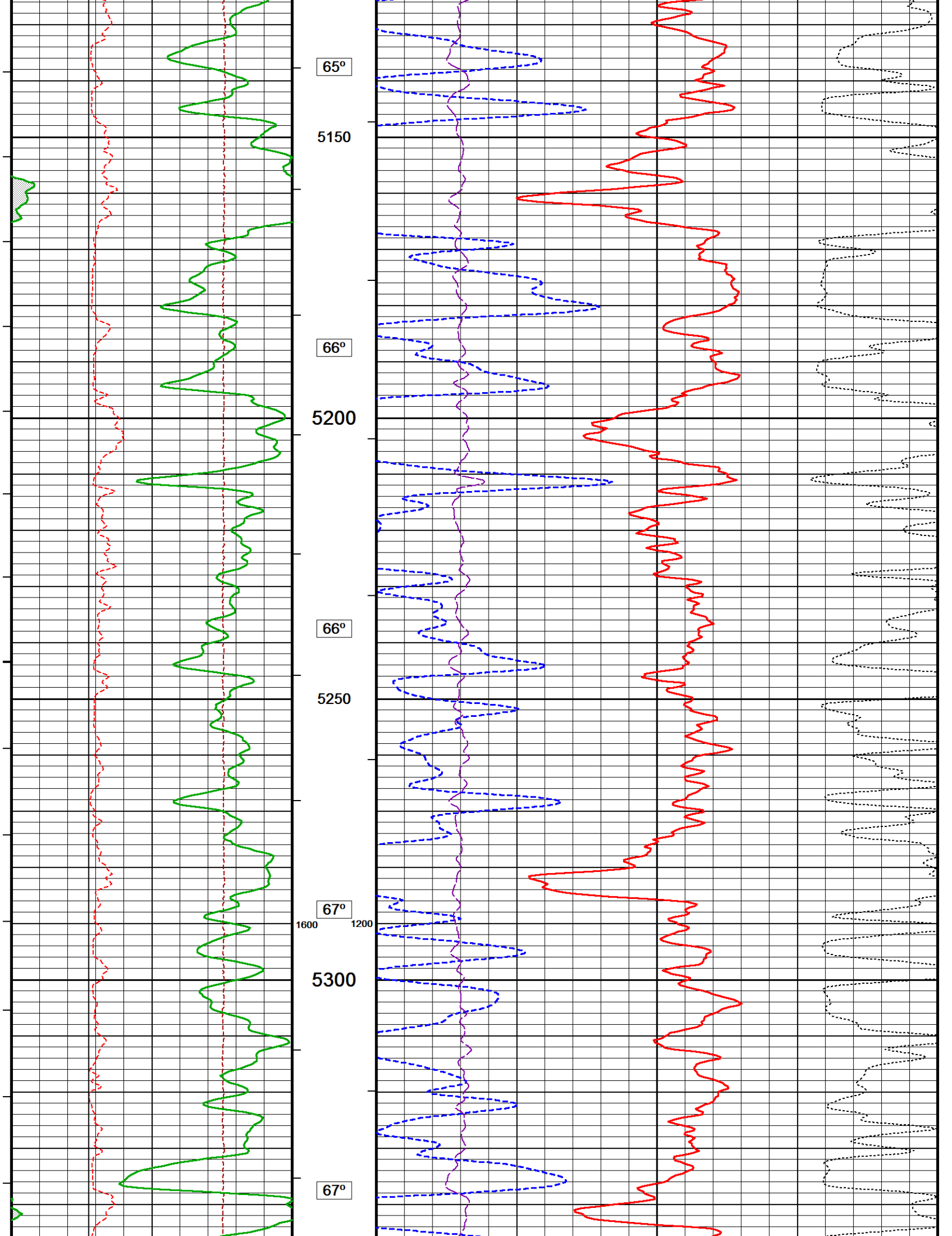


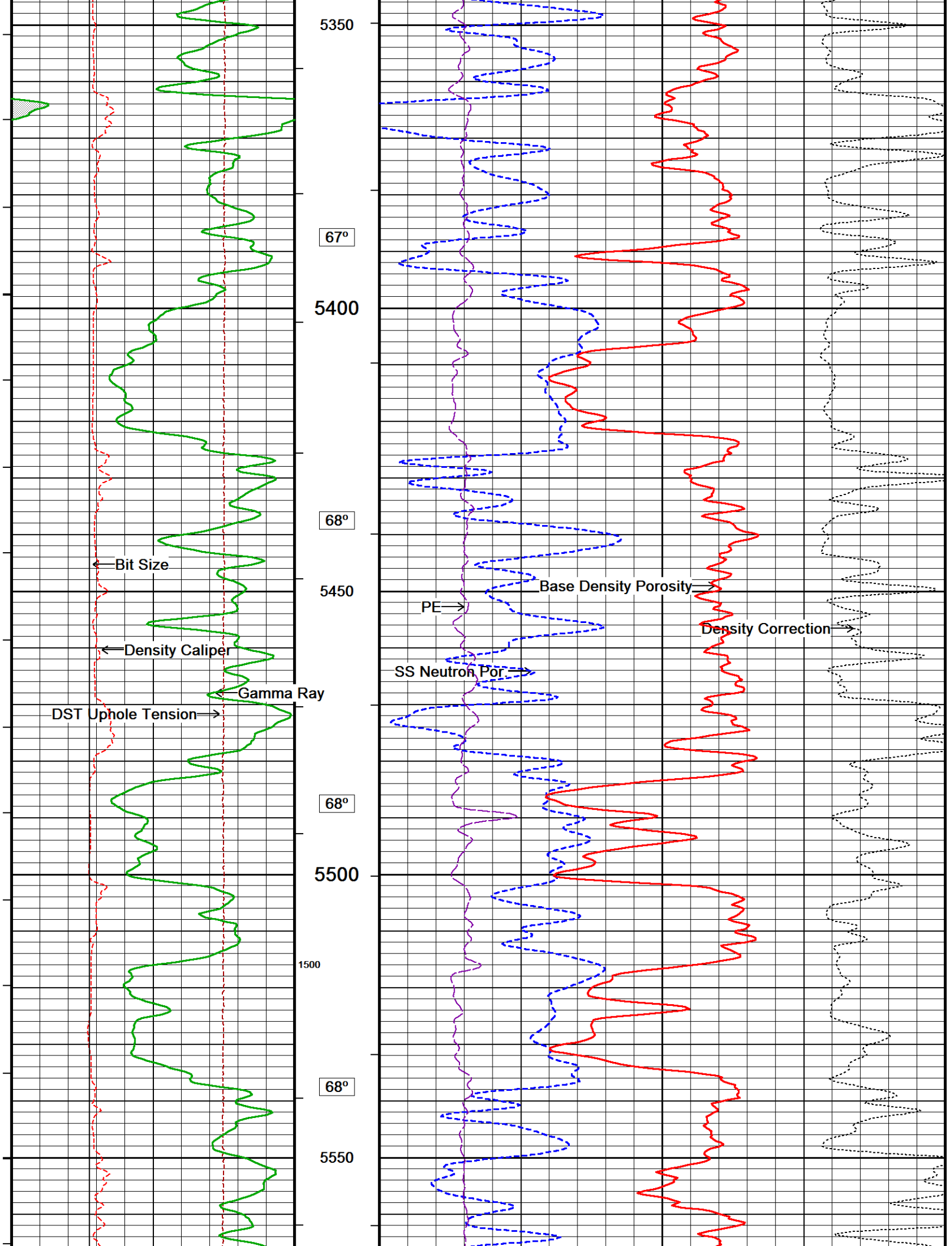


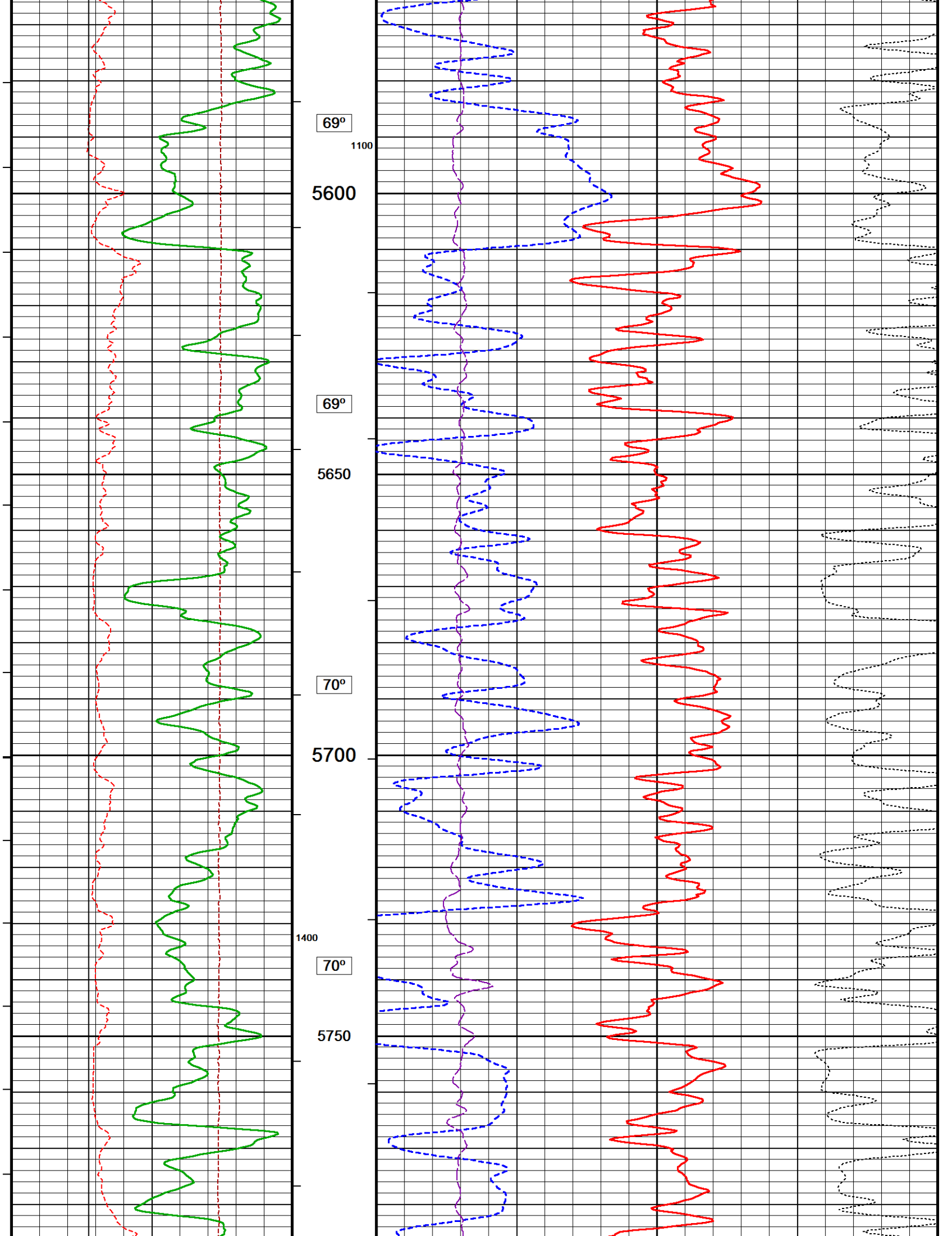
61°
4700
61°
4750
62°
4800
62°
4850
1800
62°
4900

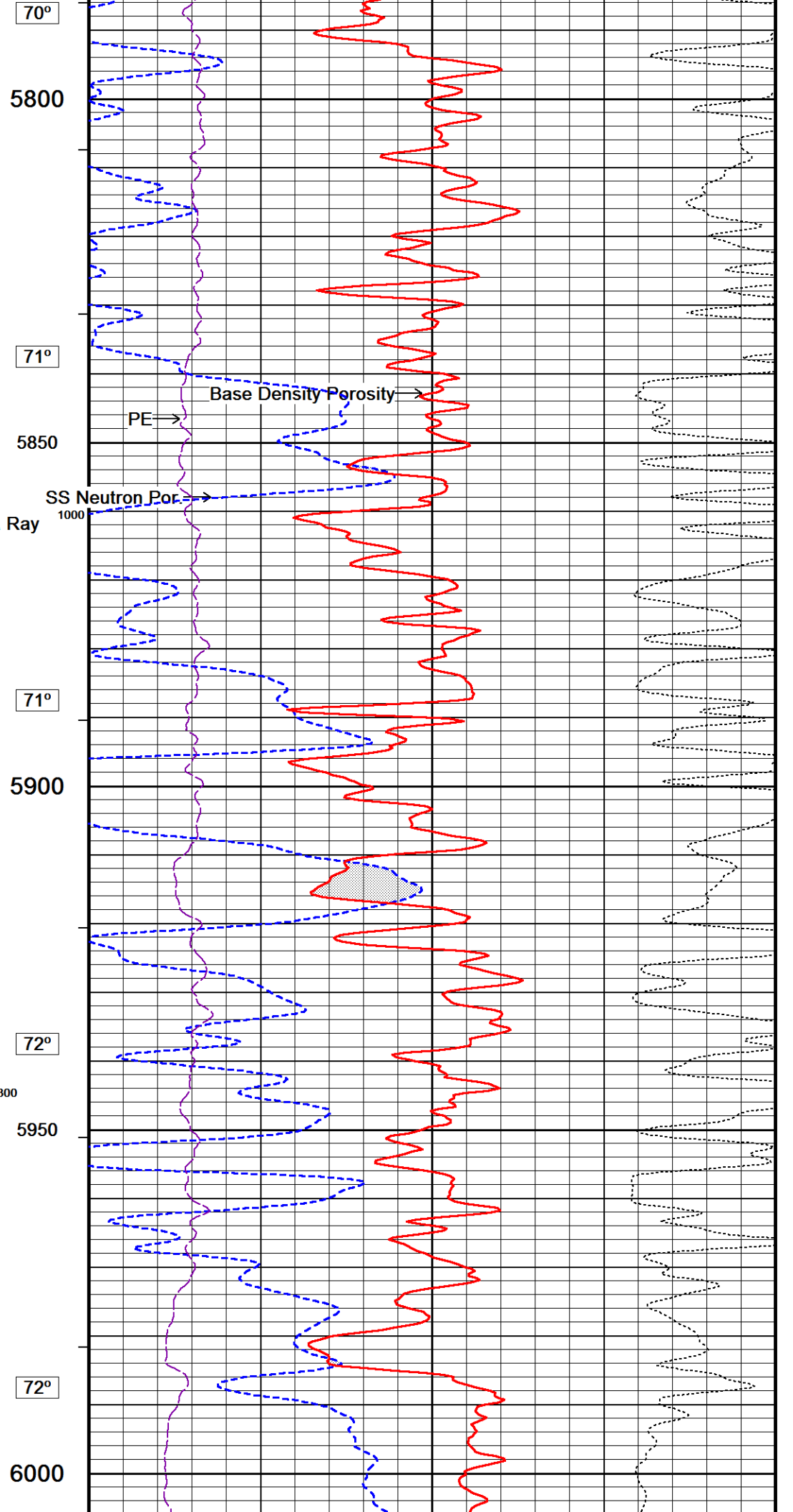
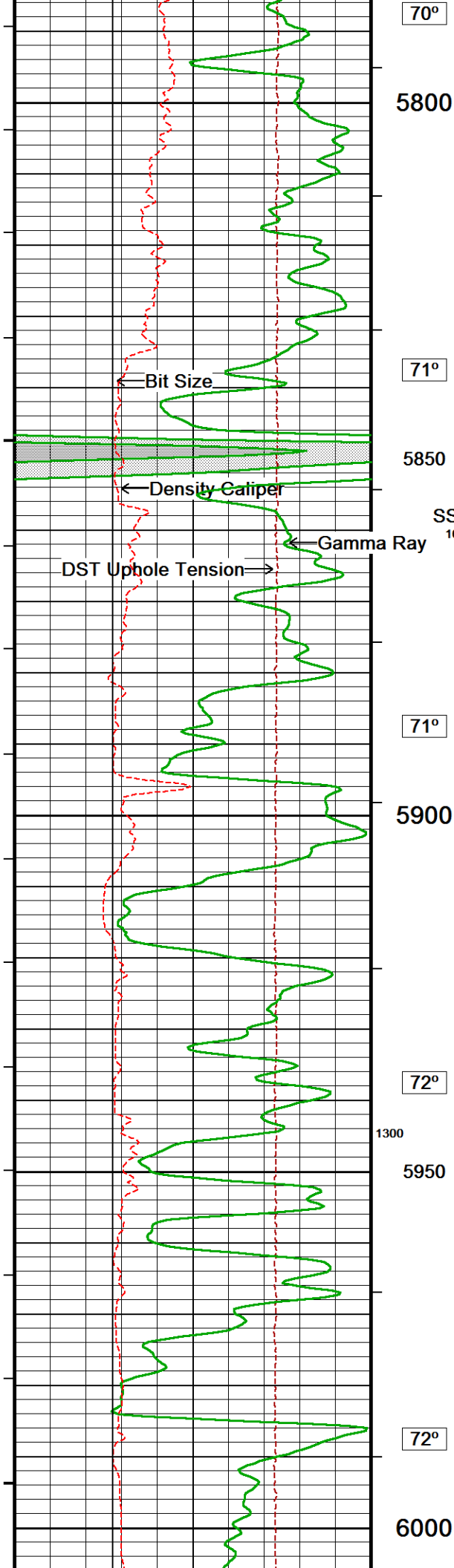


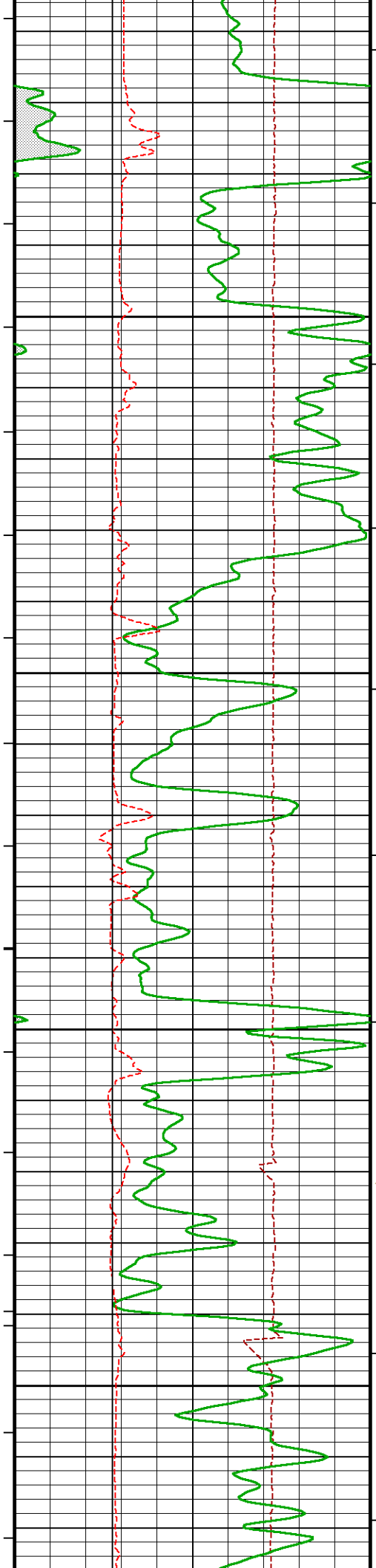












73°

6050

73°

6100

73°

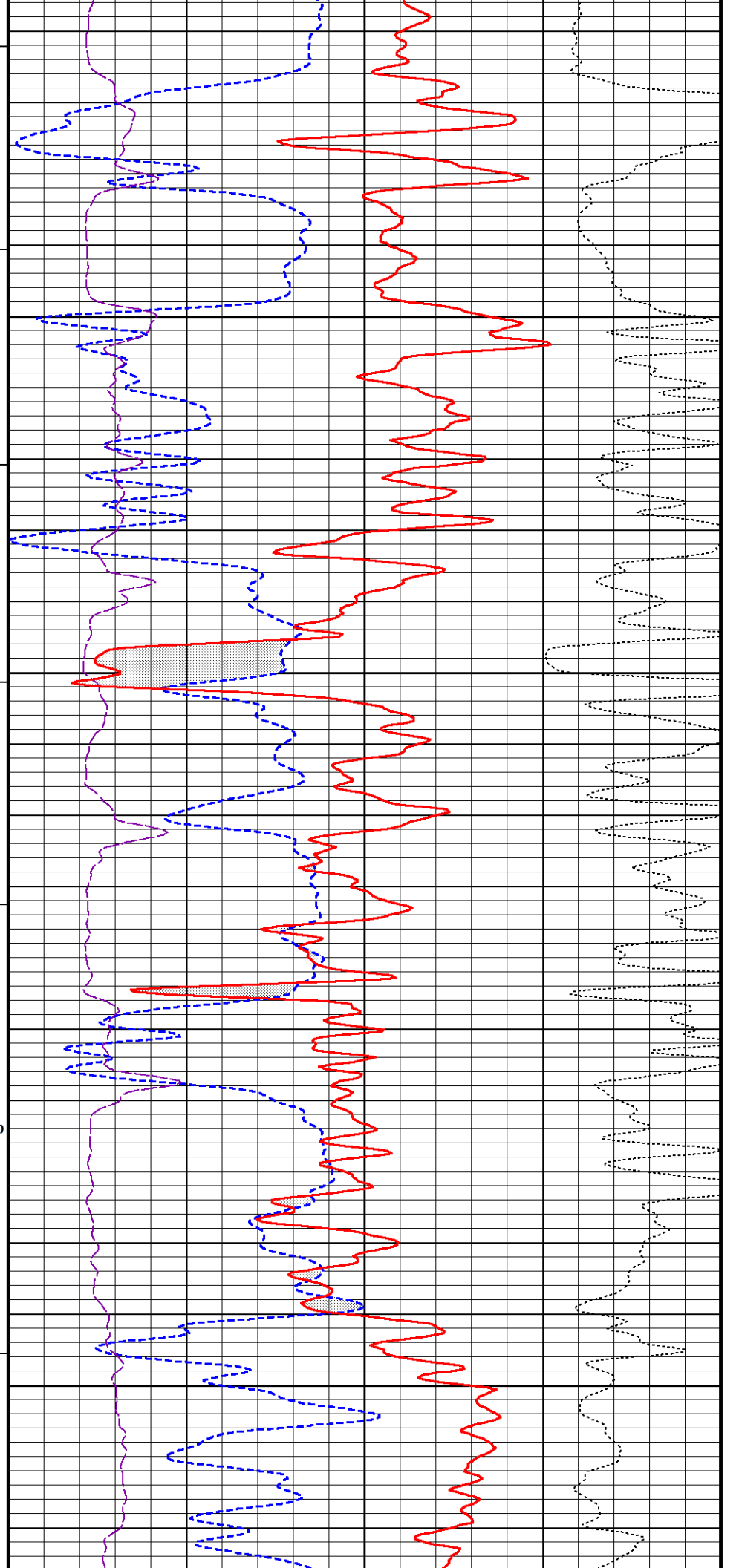
6150

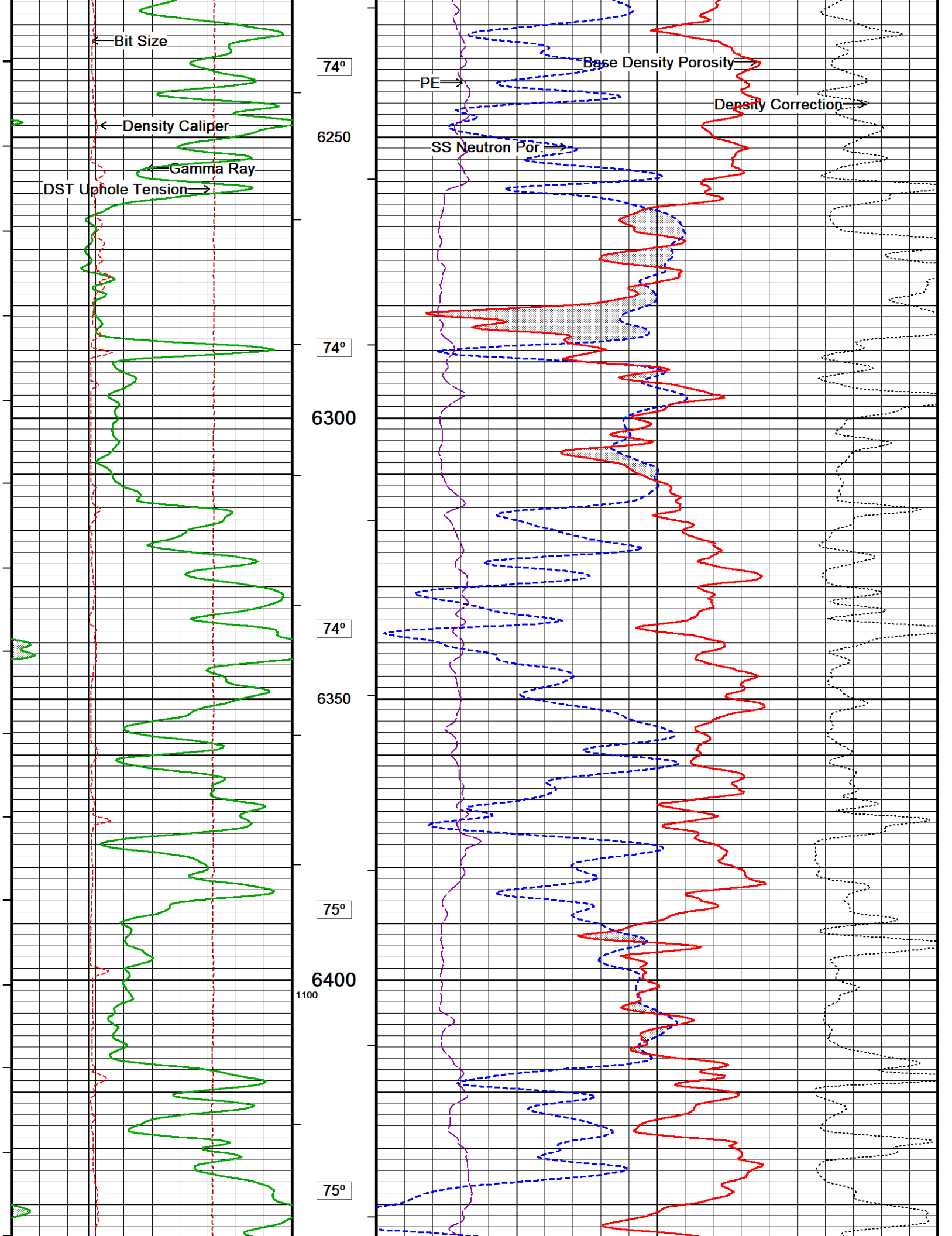
900

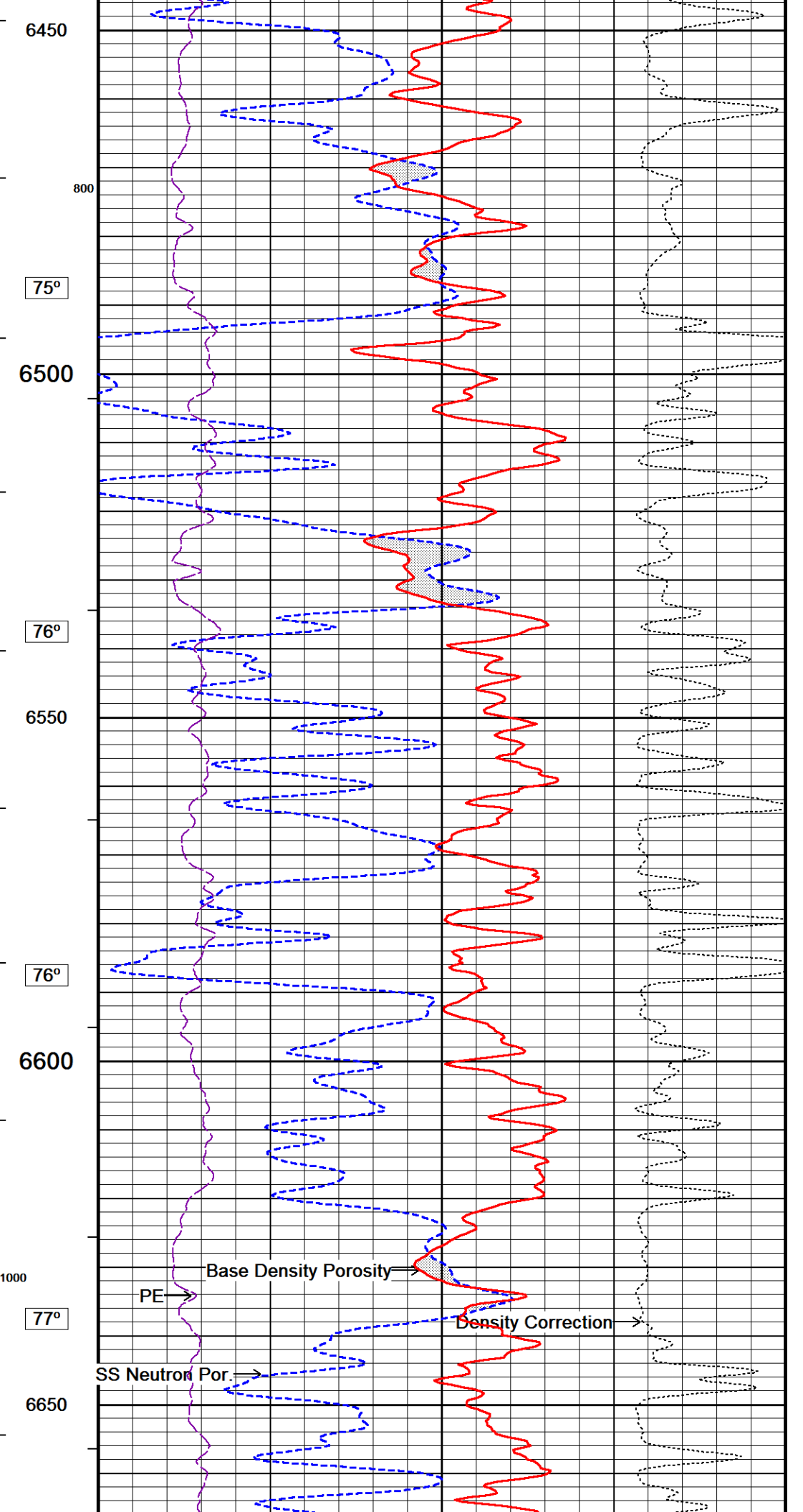
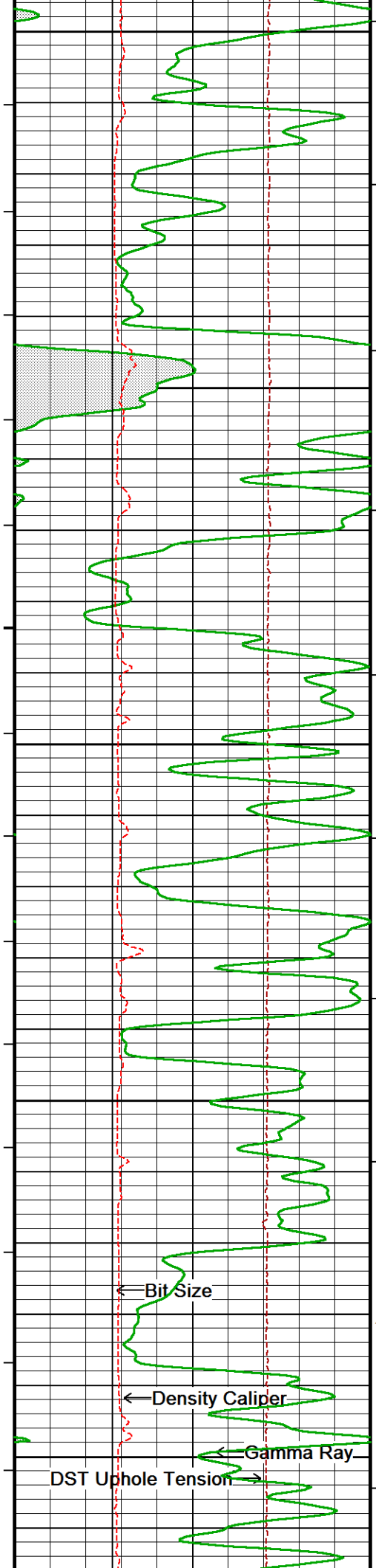
1200

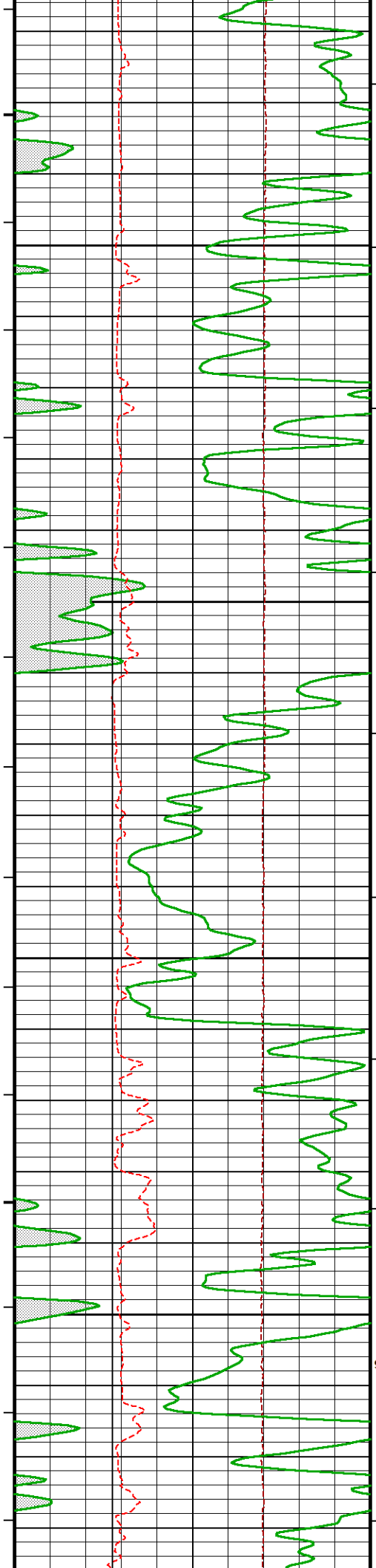
73°

6200

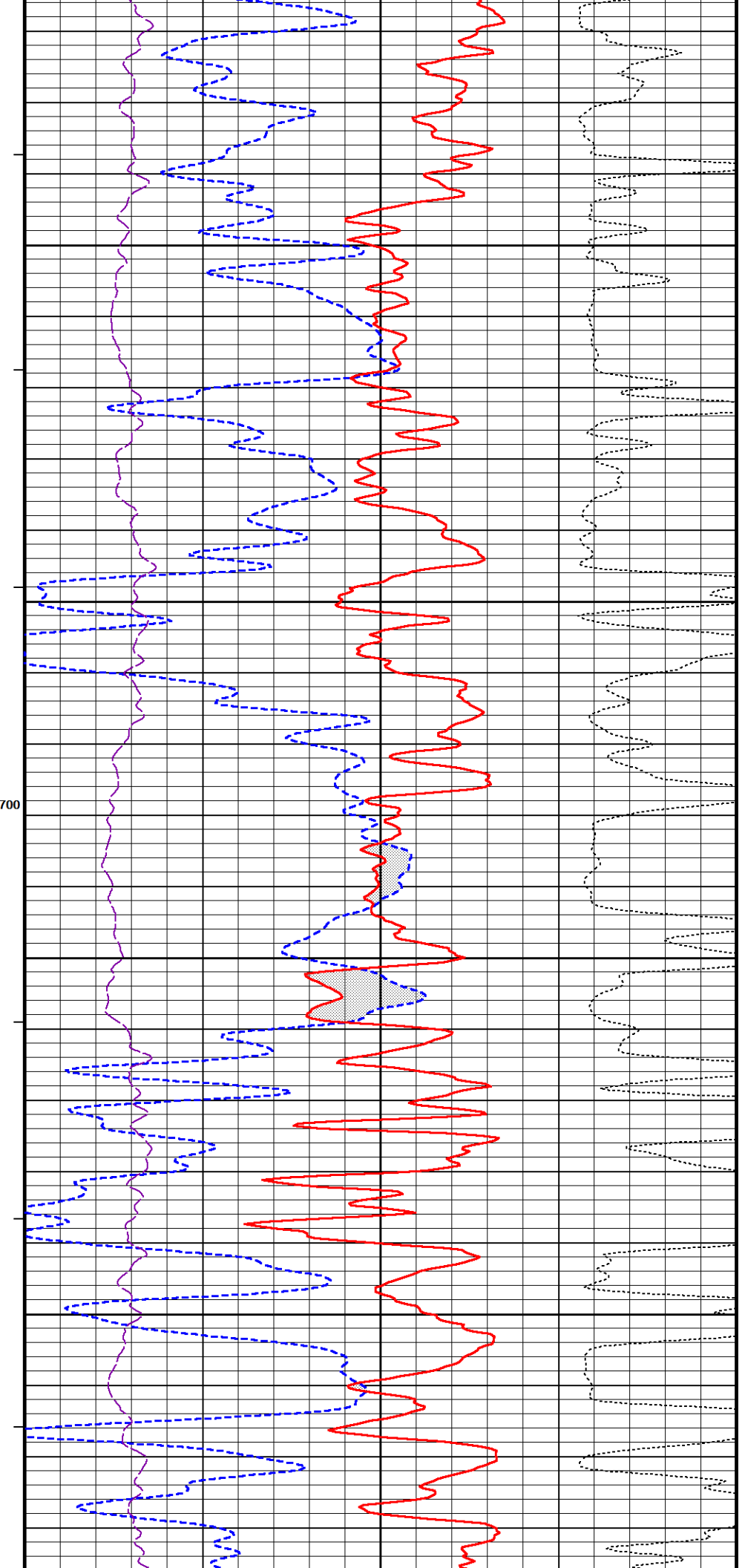


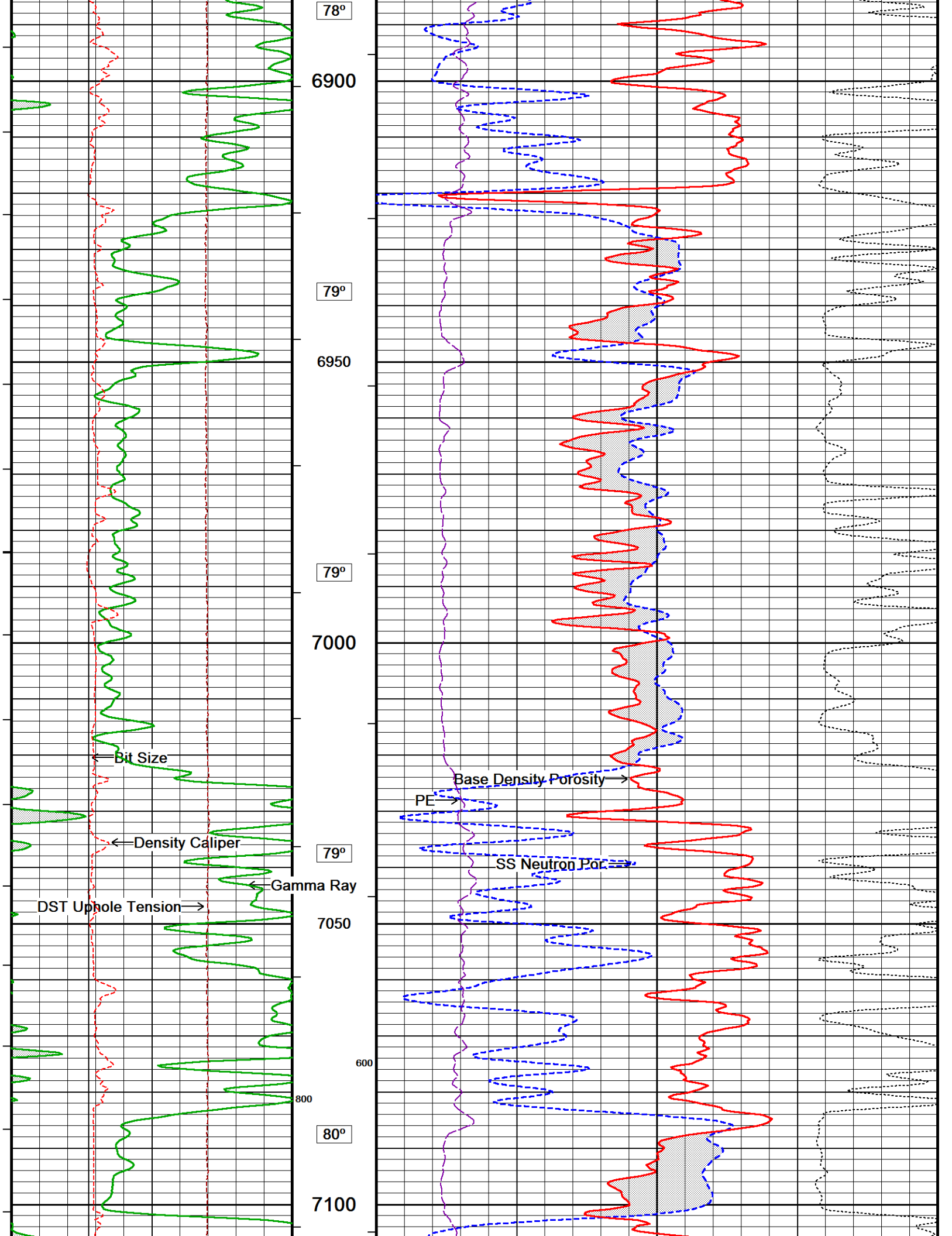


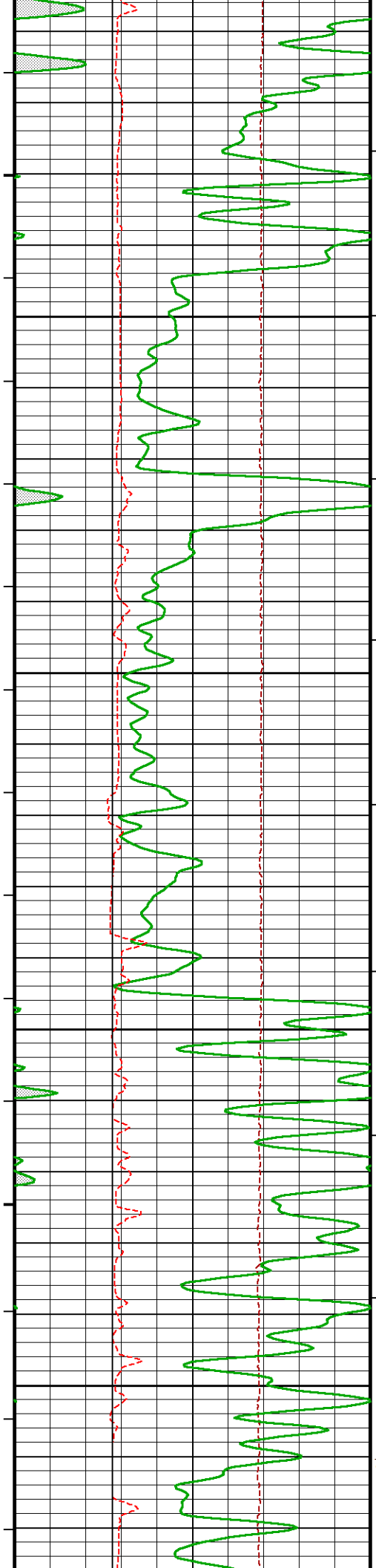




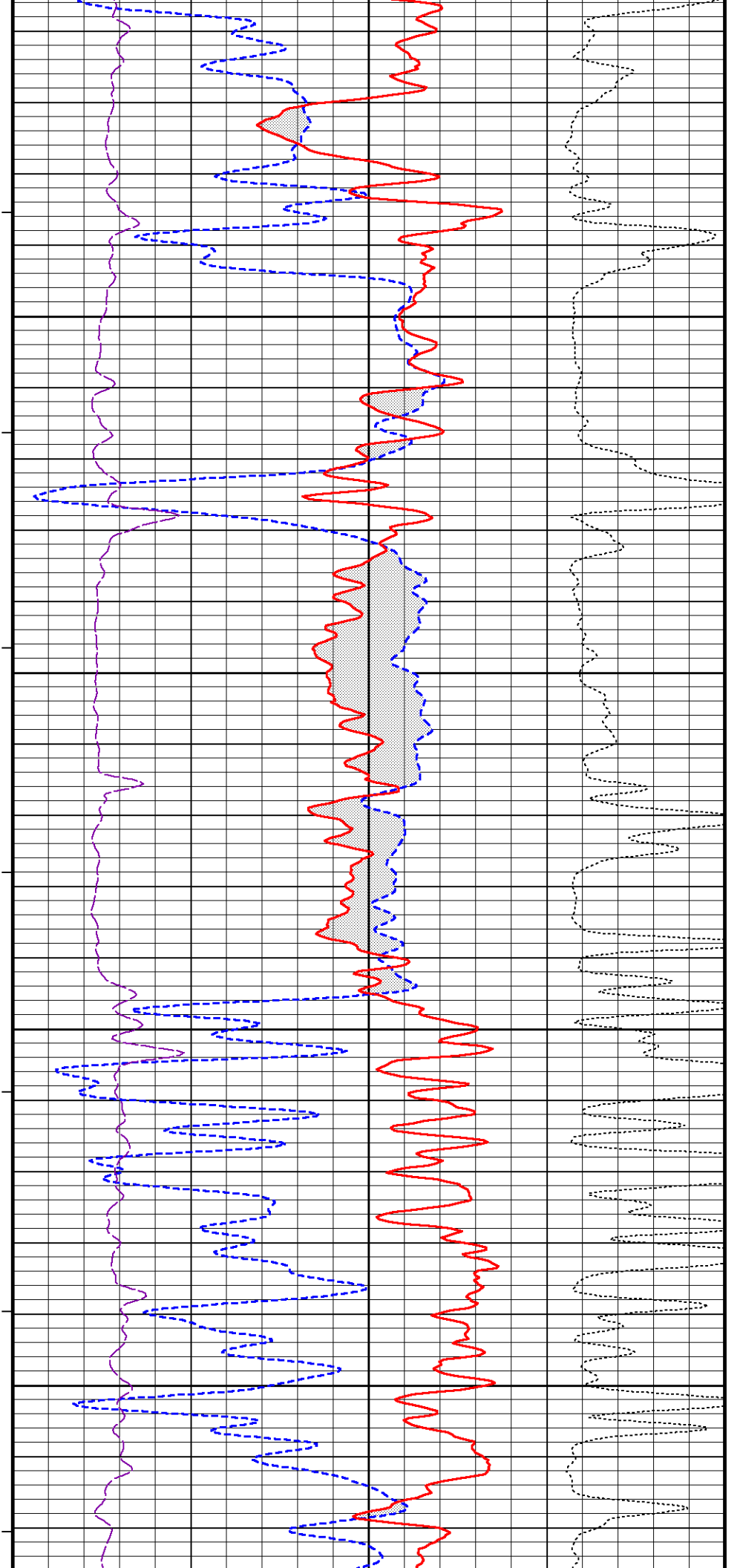
77°
6700
77°
6750
700
78°
6800
78°
6850
900

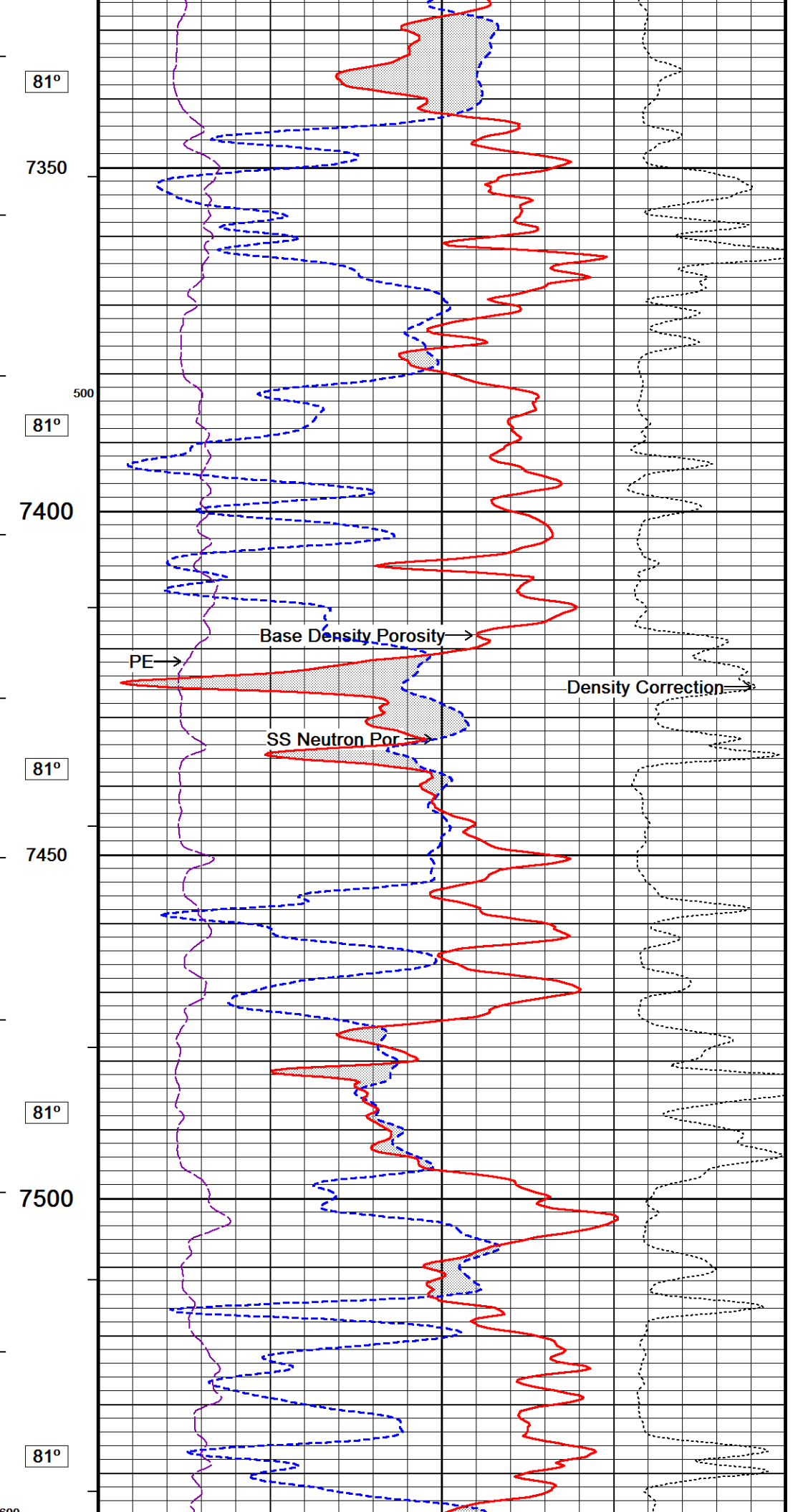
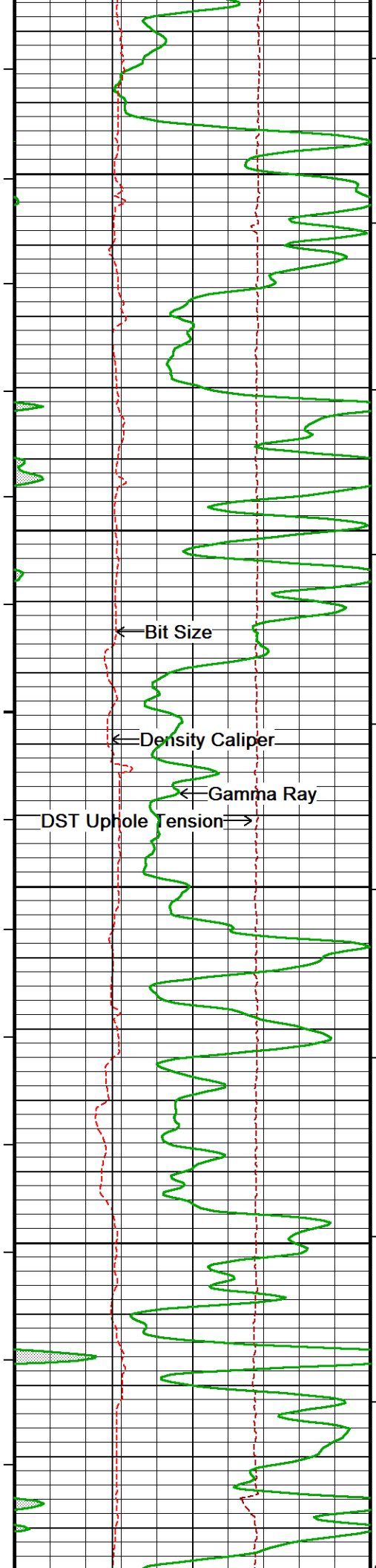


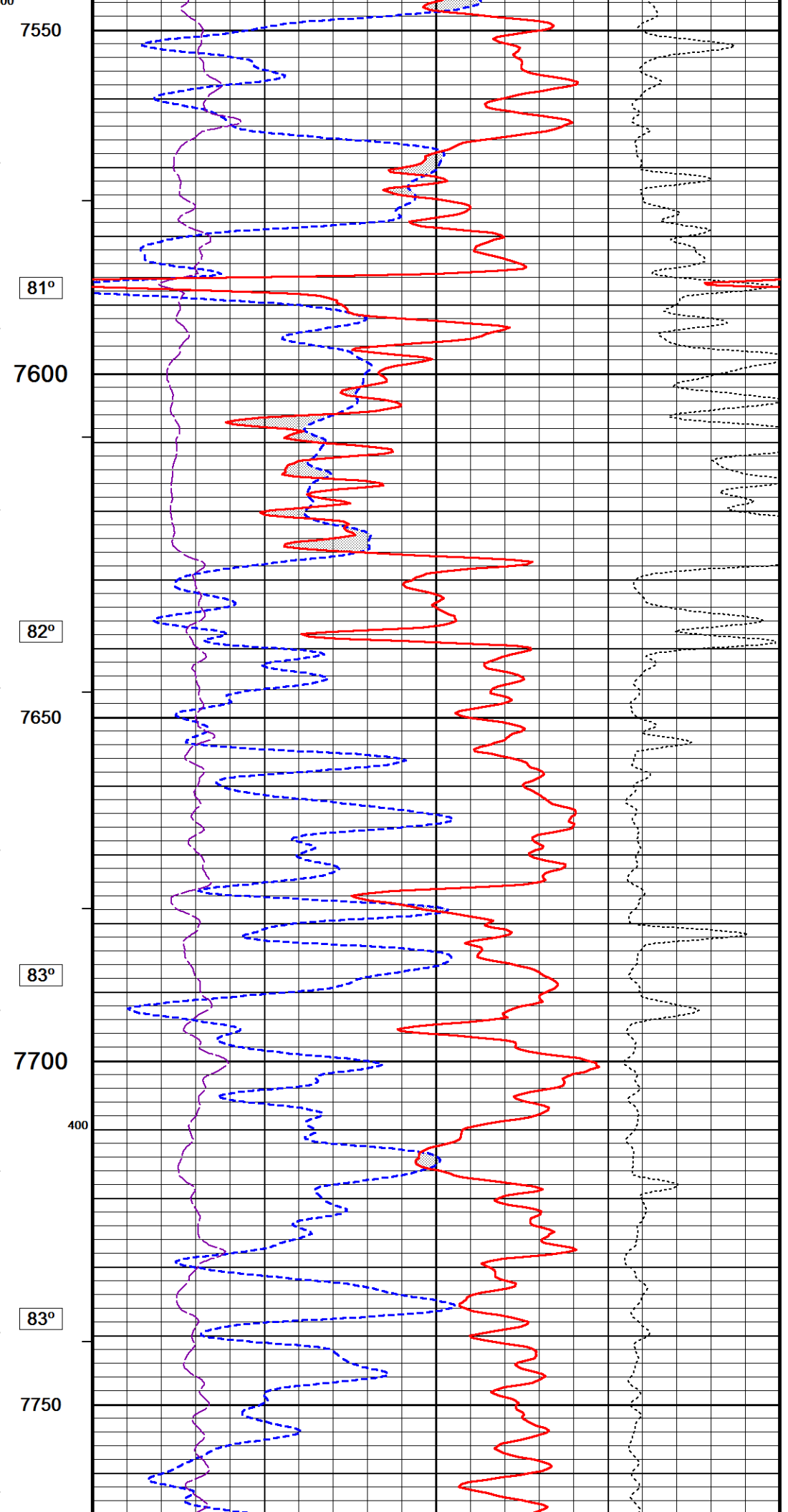
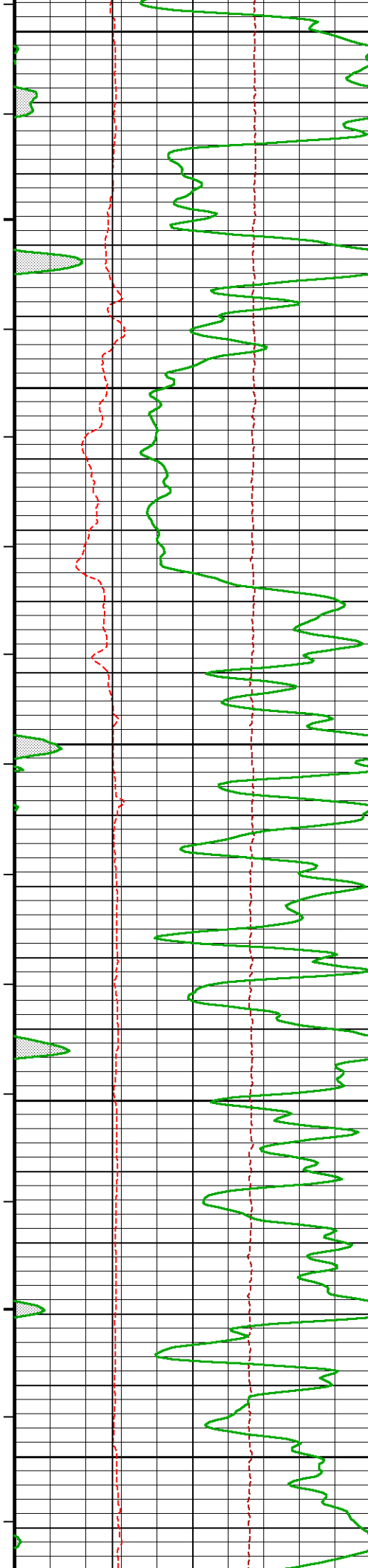


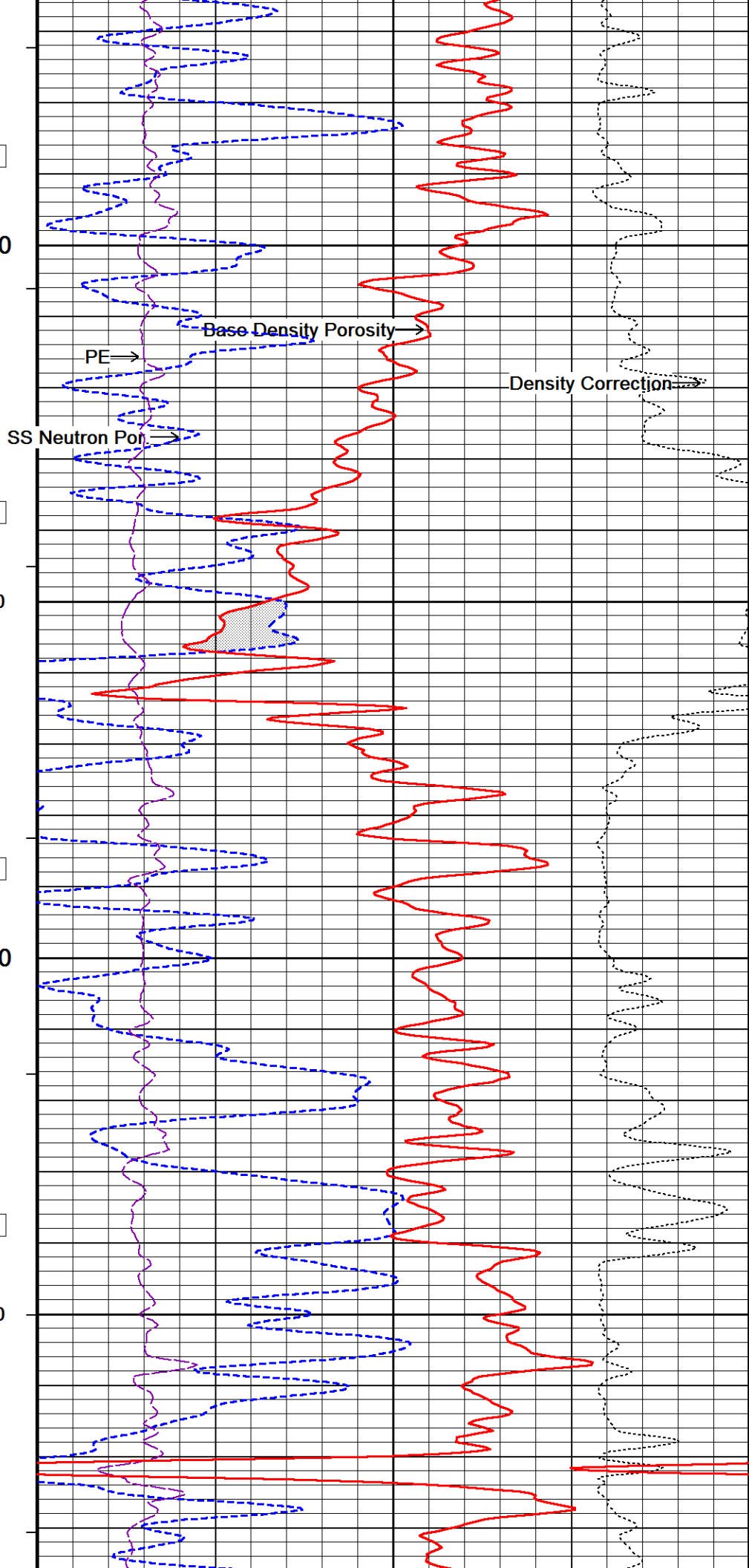
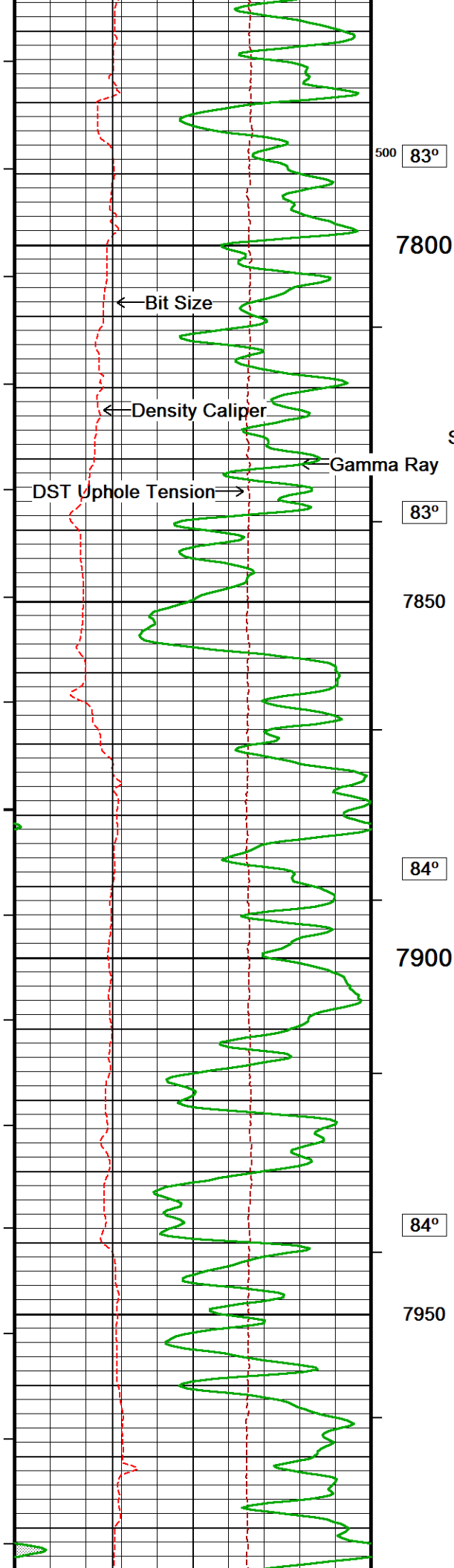


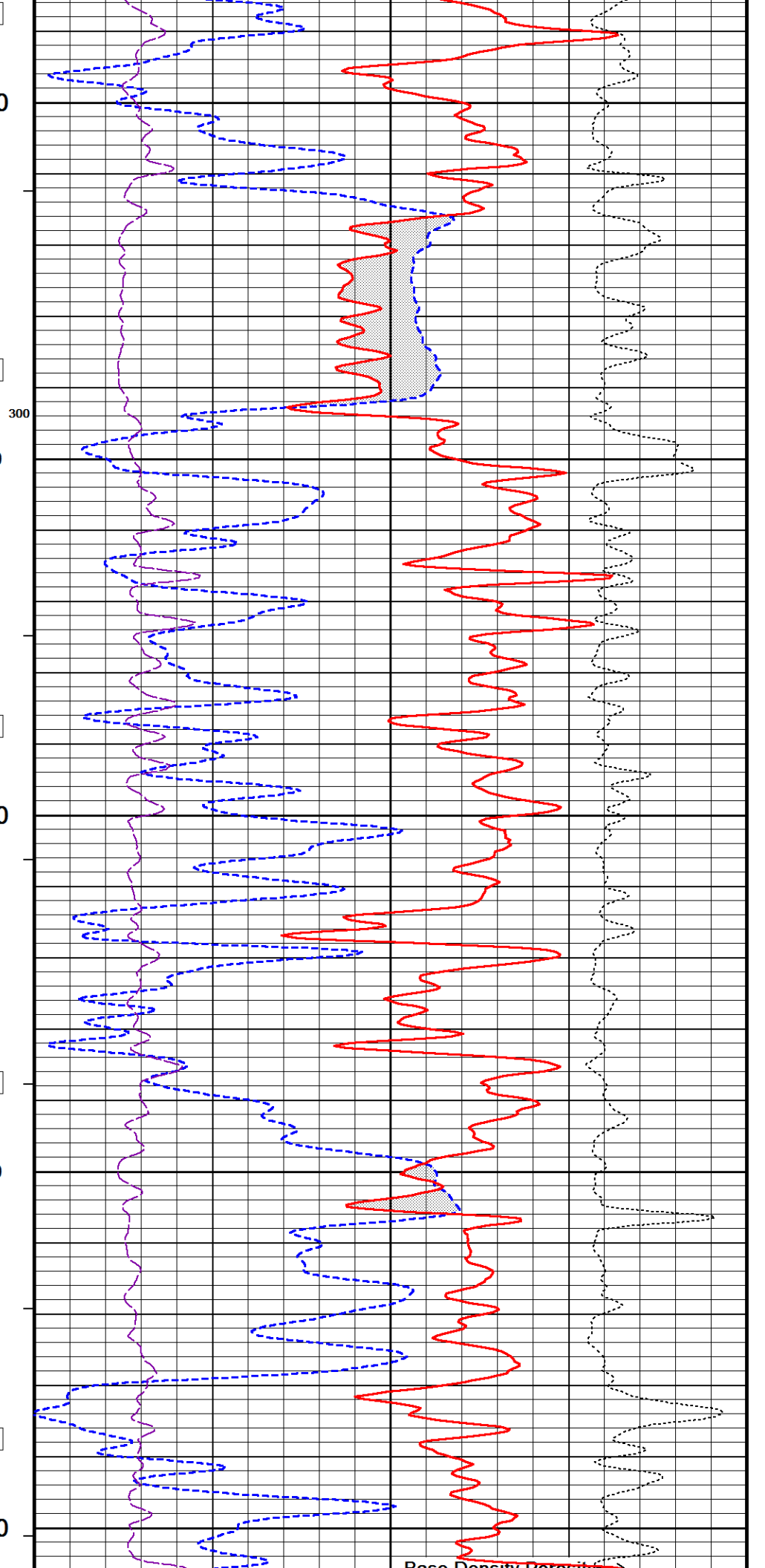
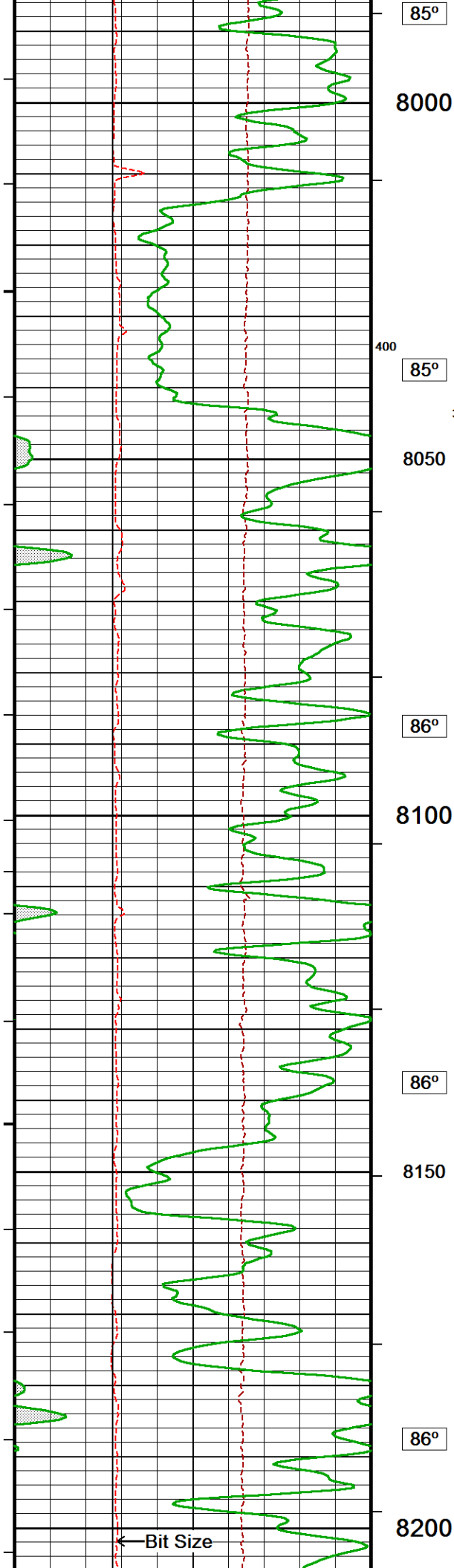
80°
7150
80°
7200
80°
7250
80°
7300
700

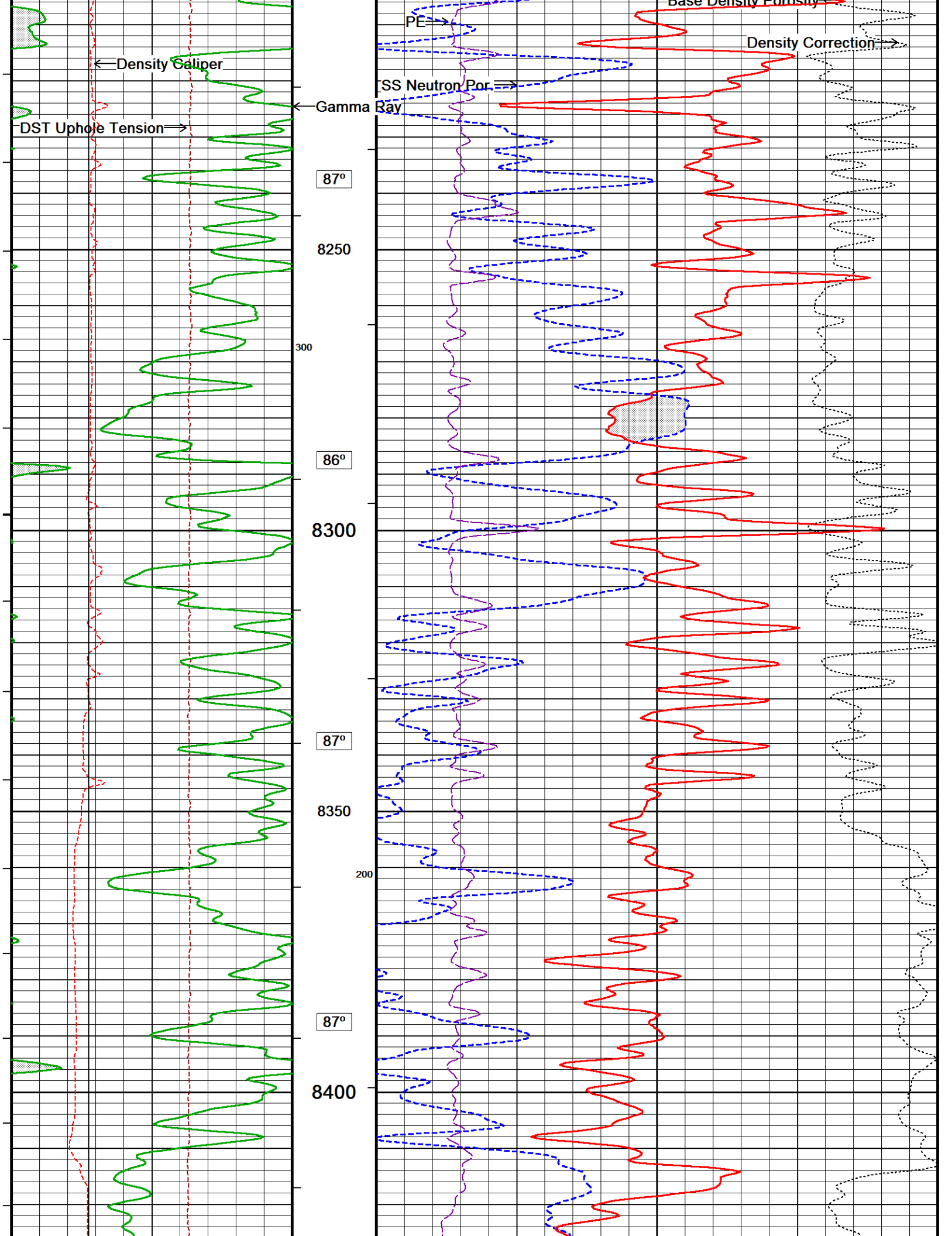


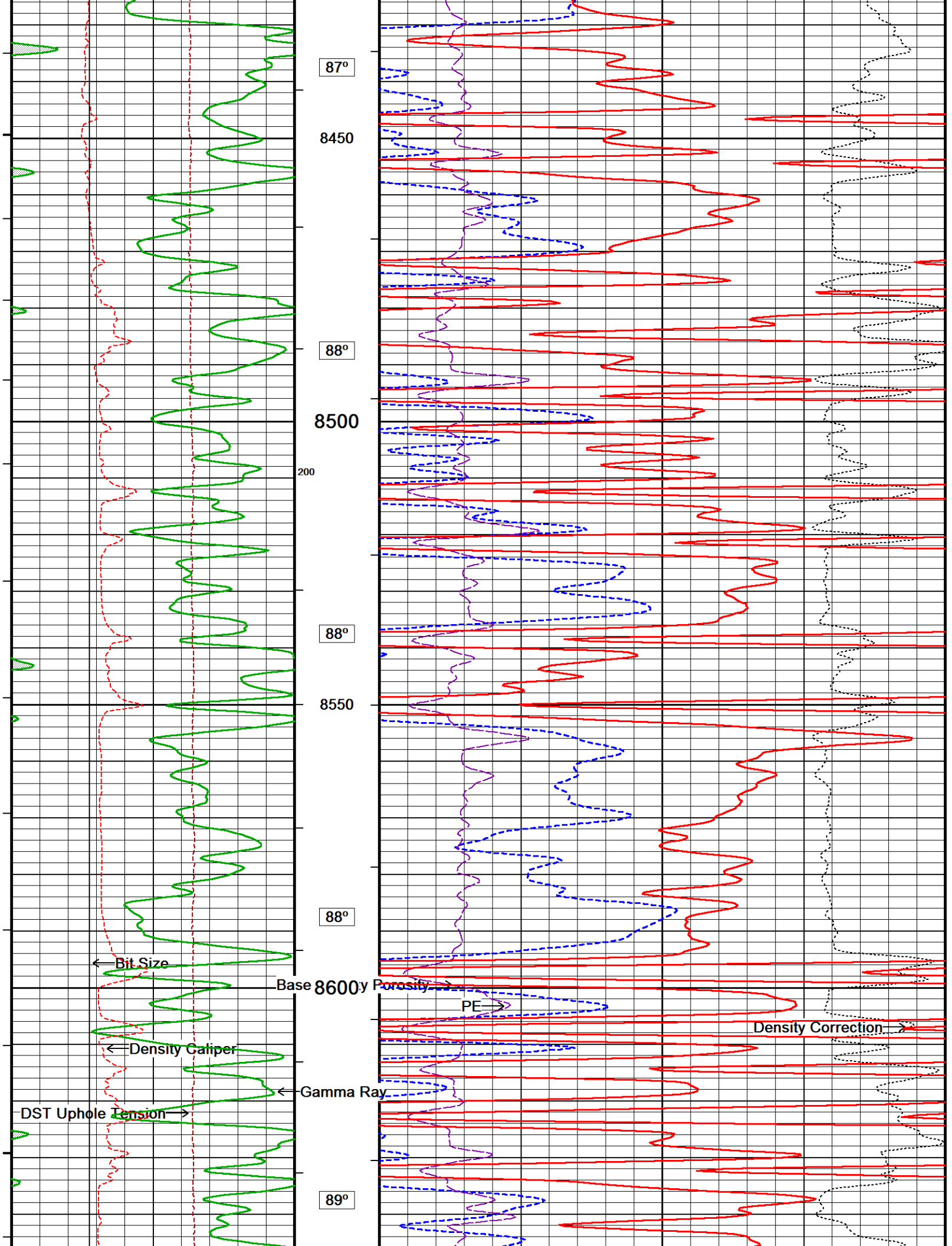


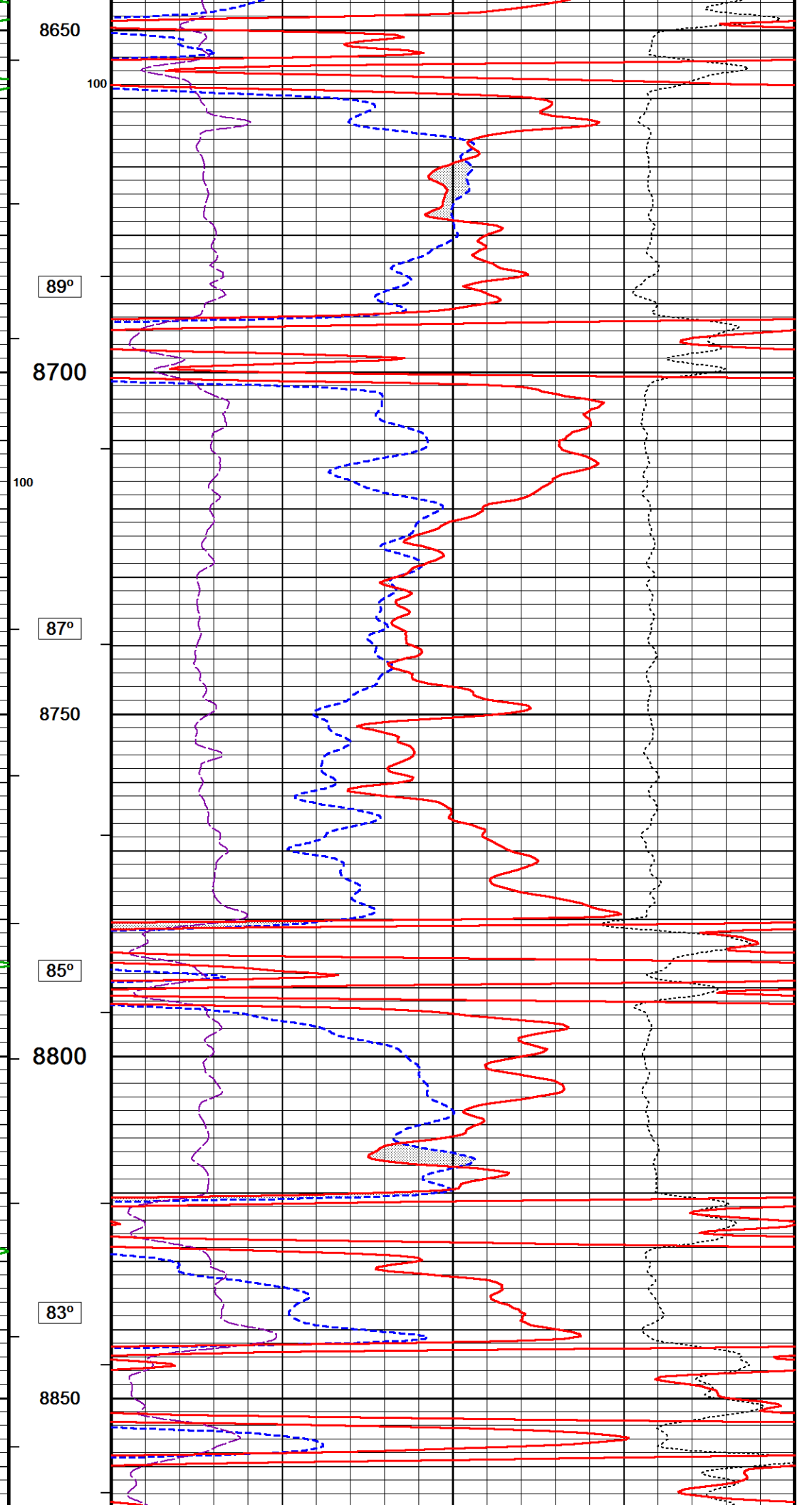
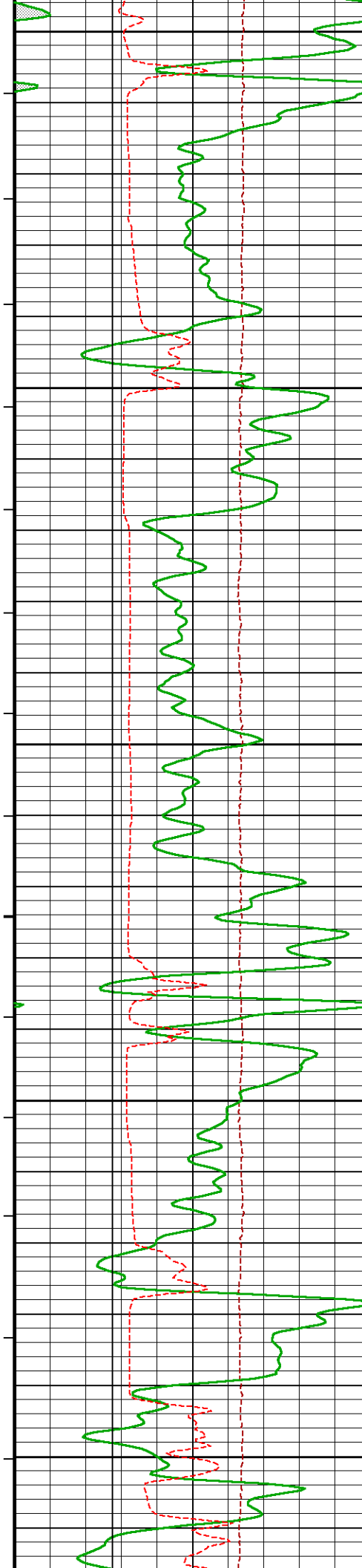


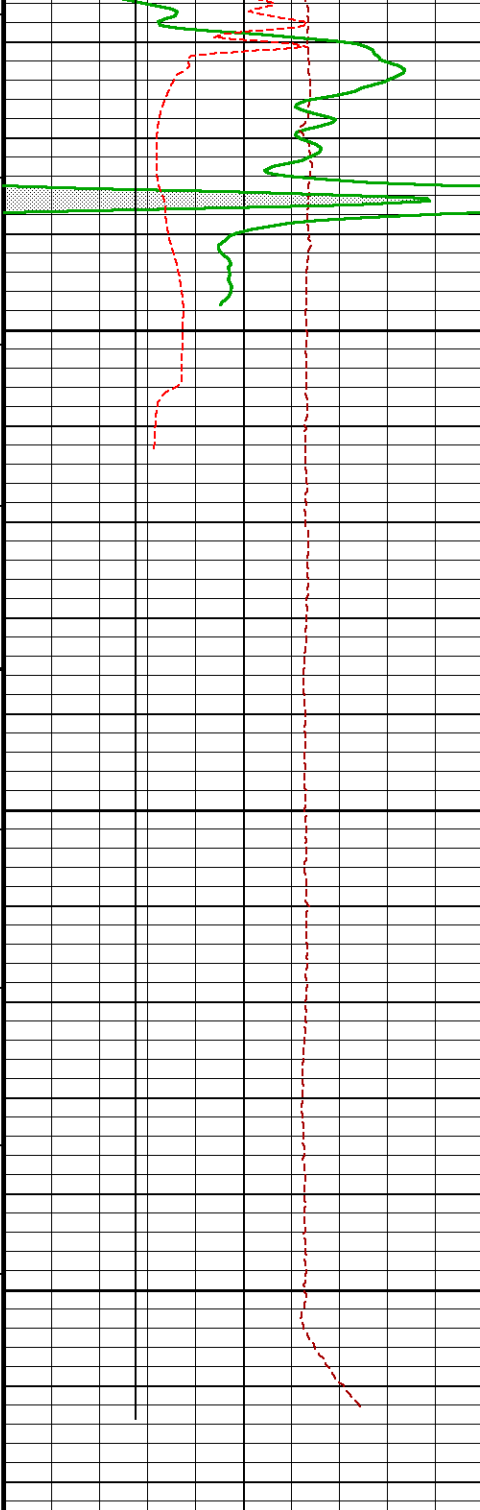












87°

8900

8950

9000

Depth
in
Feet

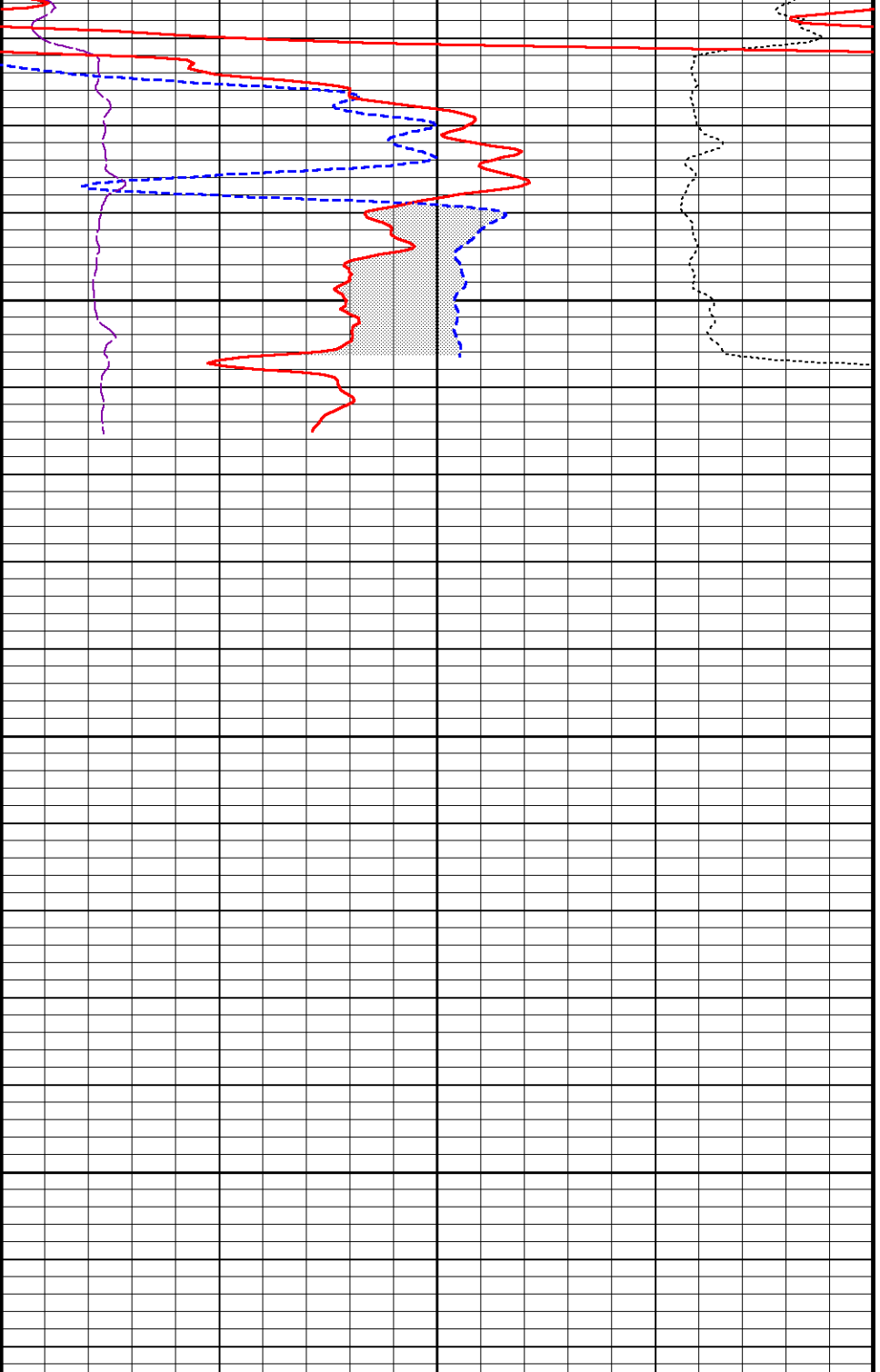
← Timing Marks
every 60.0 sec

Gamma Ray (GRGC)
API
0 75 150
150 225 300

Density Caliper (CLDC)
inches
6 11 16

Borehole
Temp in
deg C

HVI
every
10 cu ft
←

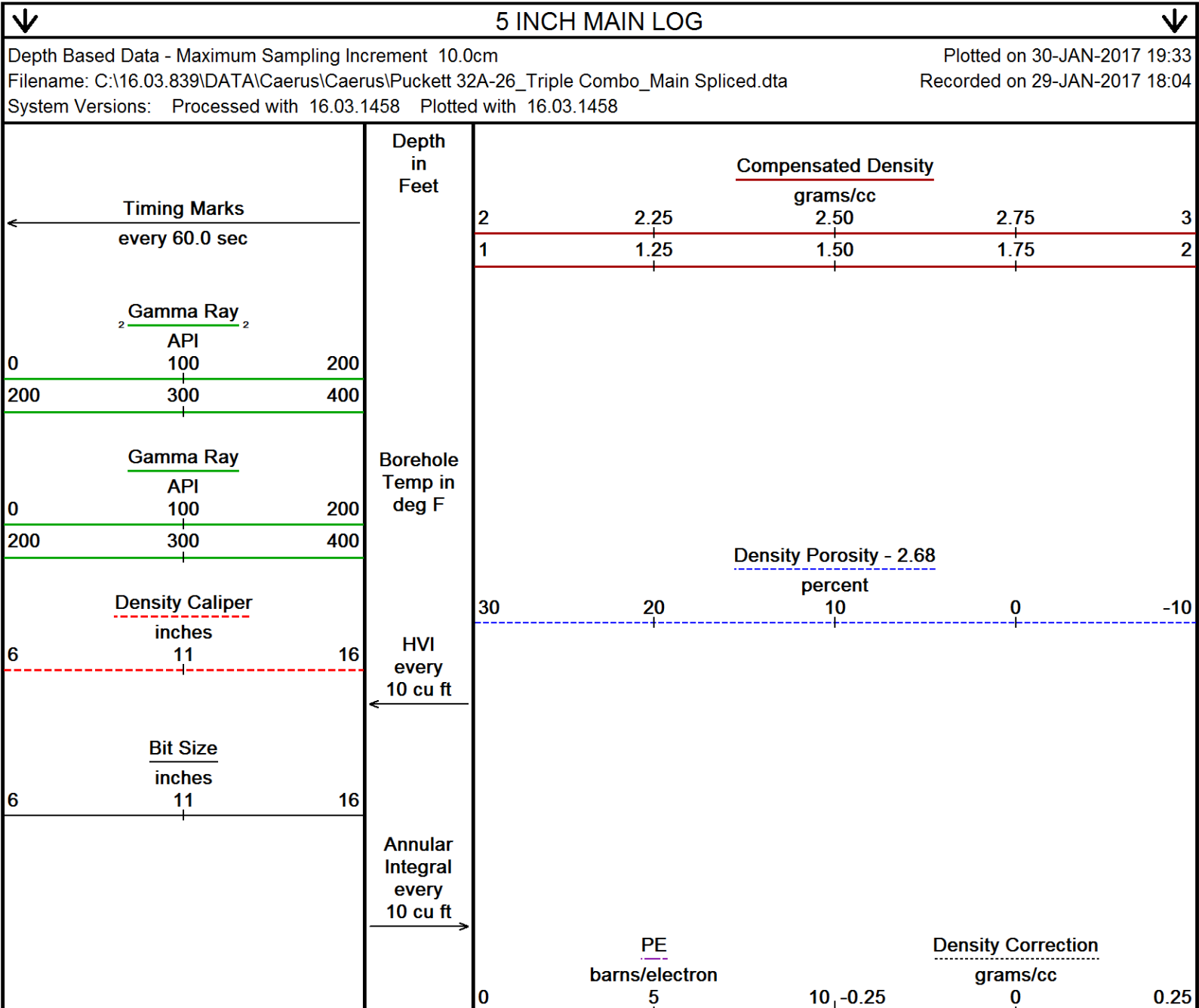
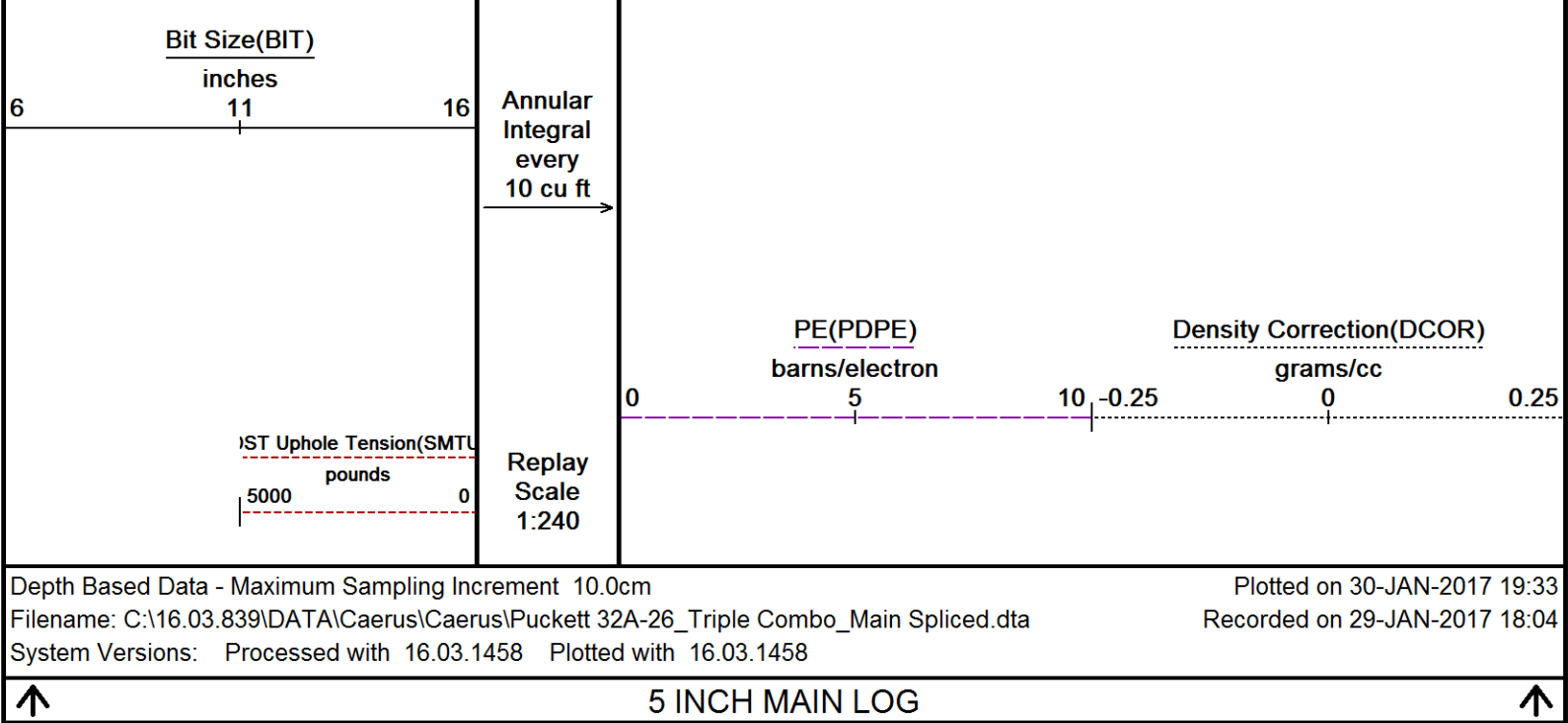


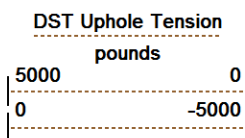
SS Neutron Por. (NPRS)
percent

30 20 10 0 -10

Base Density Porosity (DPOR)
percent

30 20 10 0 -10





Replay
Scale
1:240

2478

Casing
Shoe

2500

113°

2550

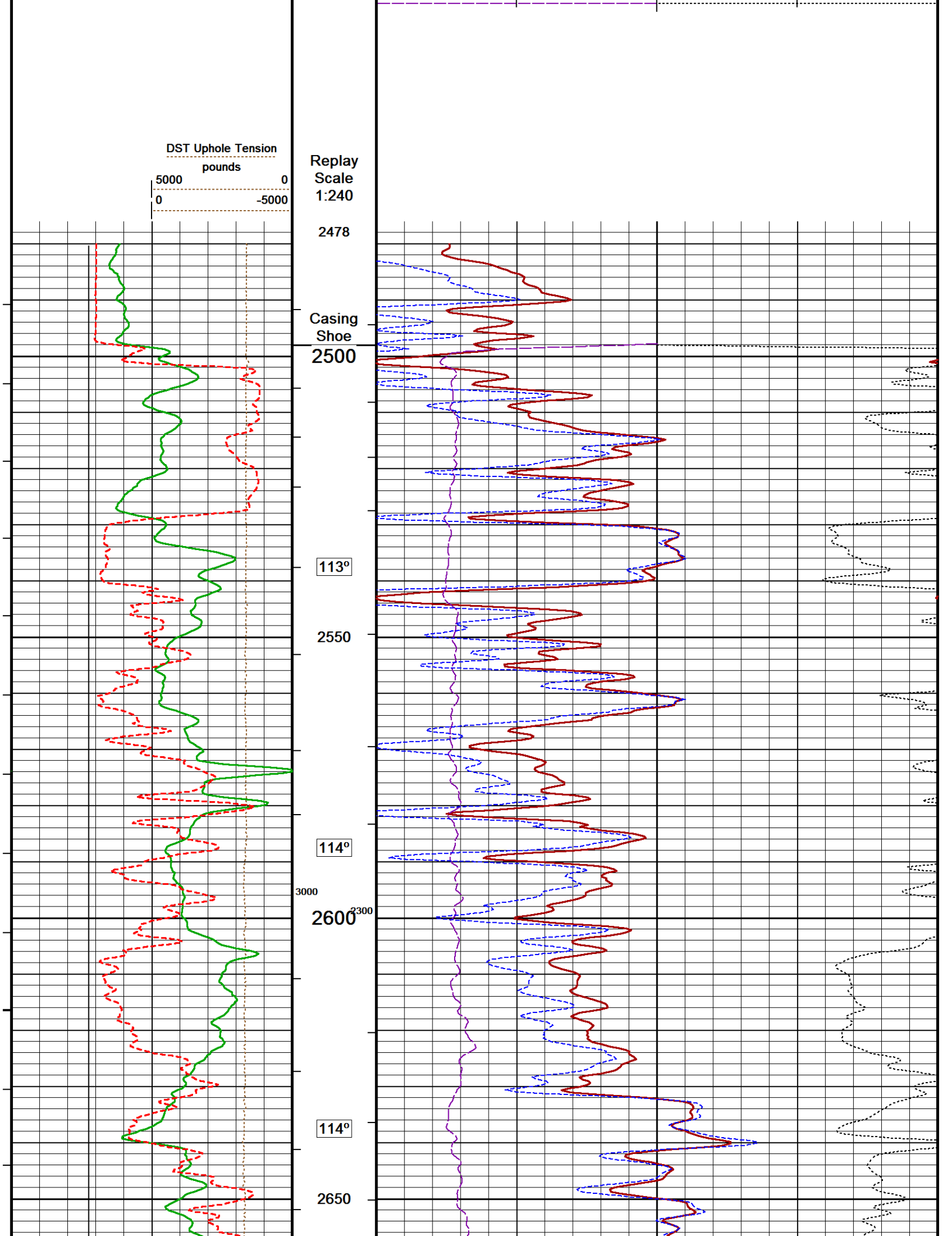
114°

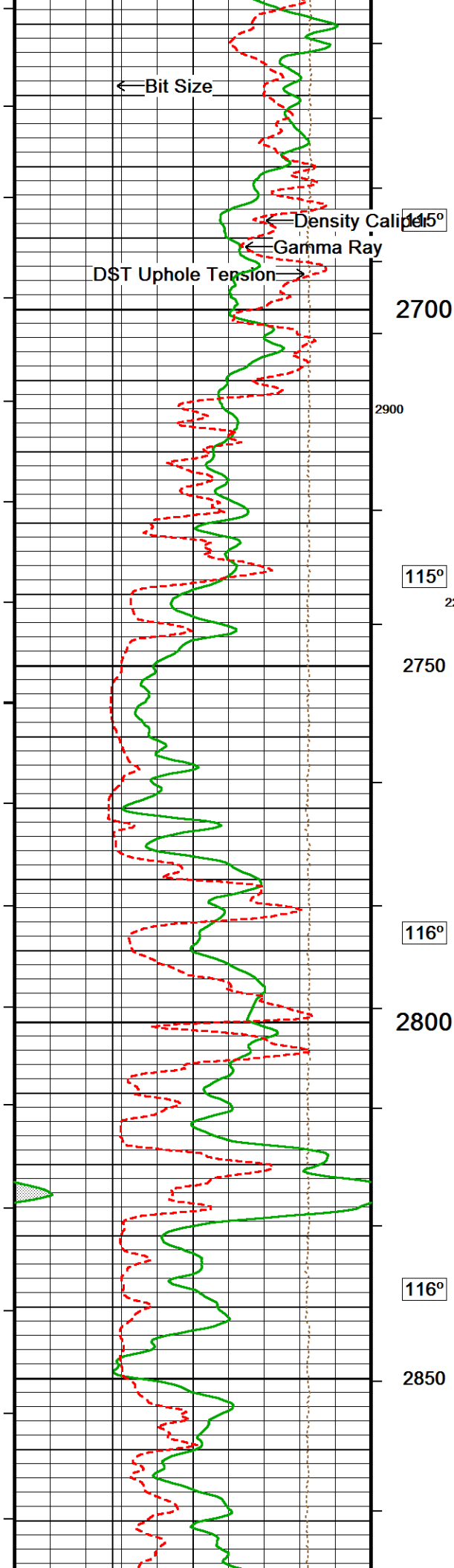
3000

2600²³⁰⁰

114°

2650





115°

2700

2900

115°

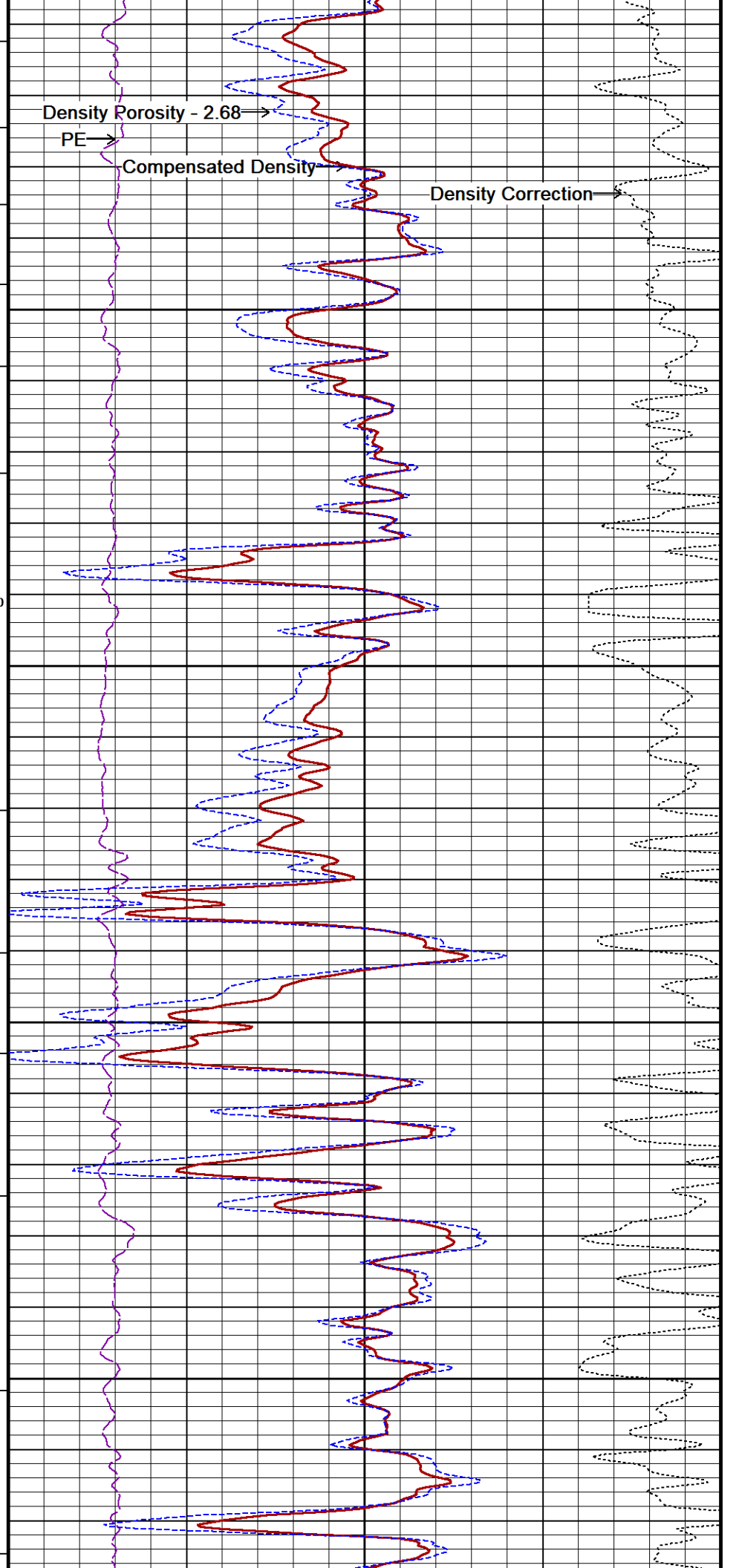
2750

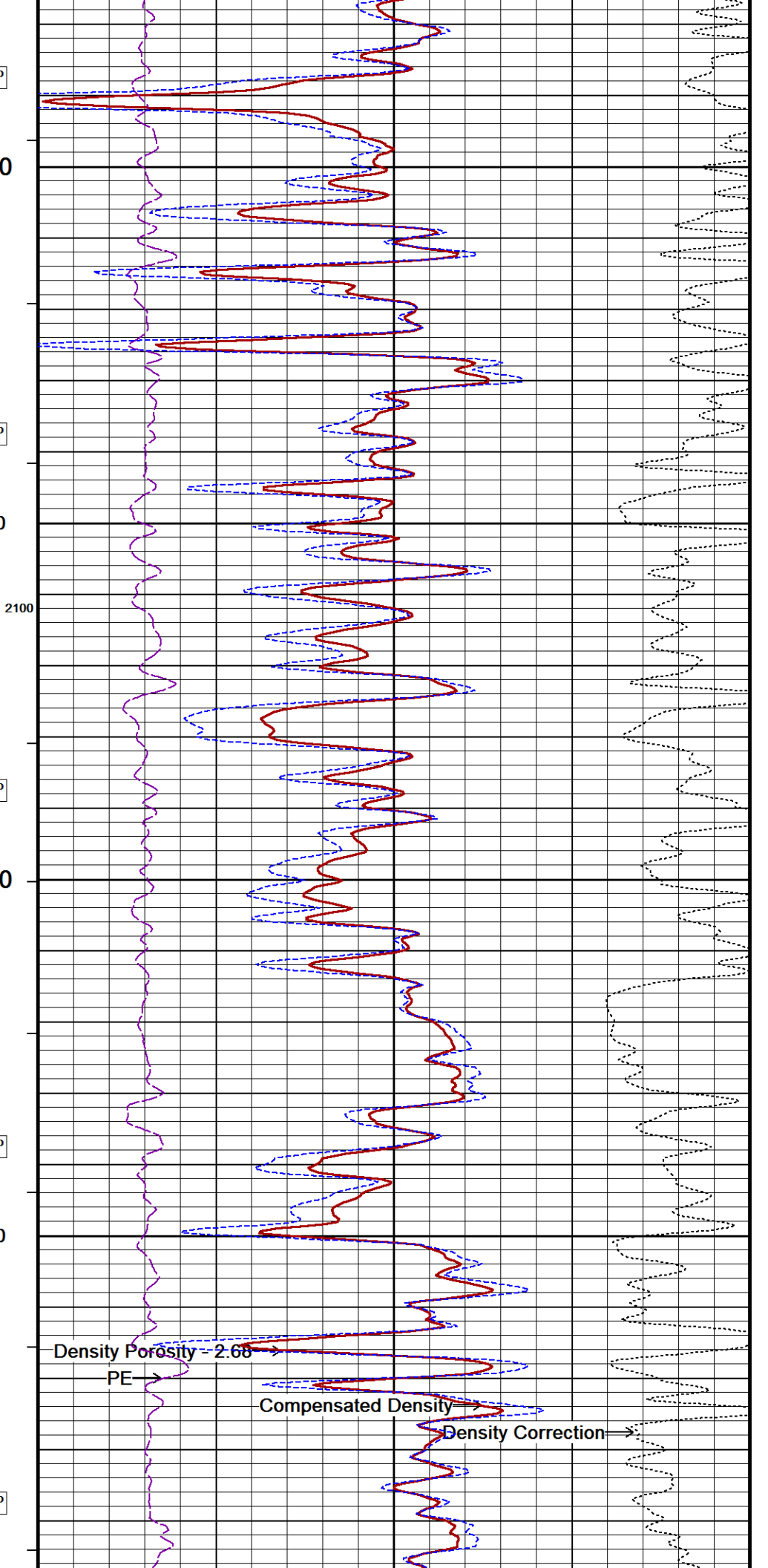
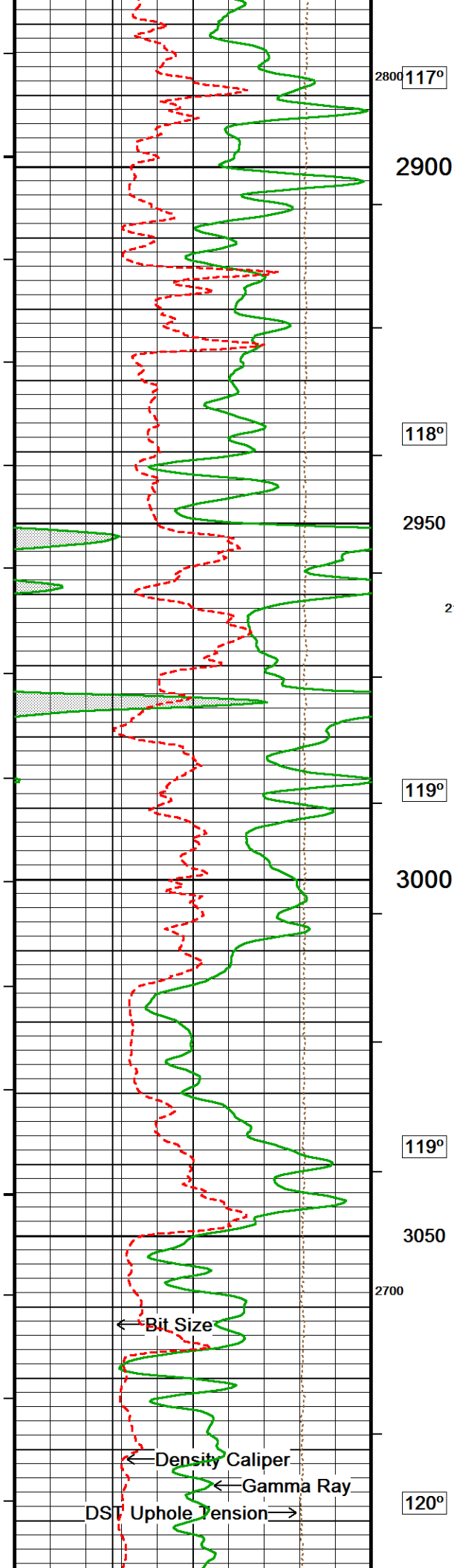
116°

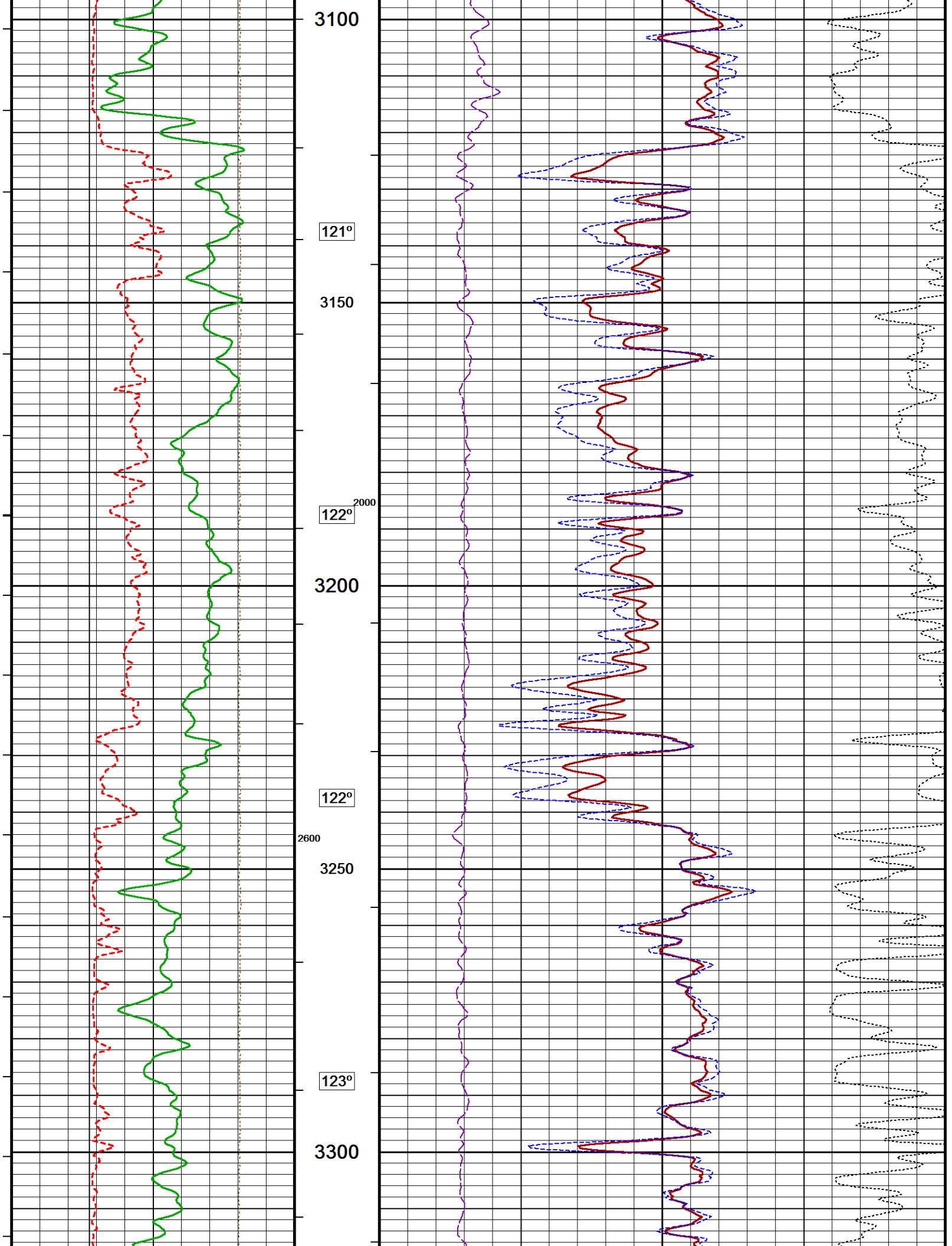
2800

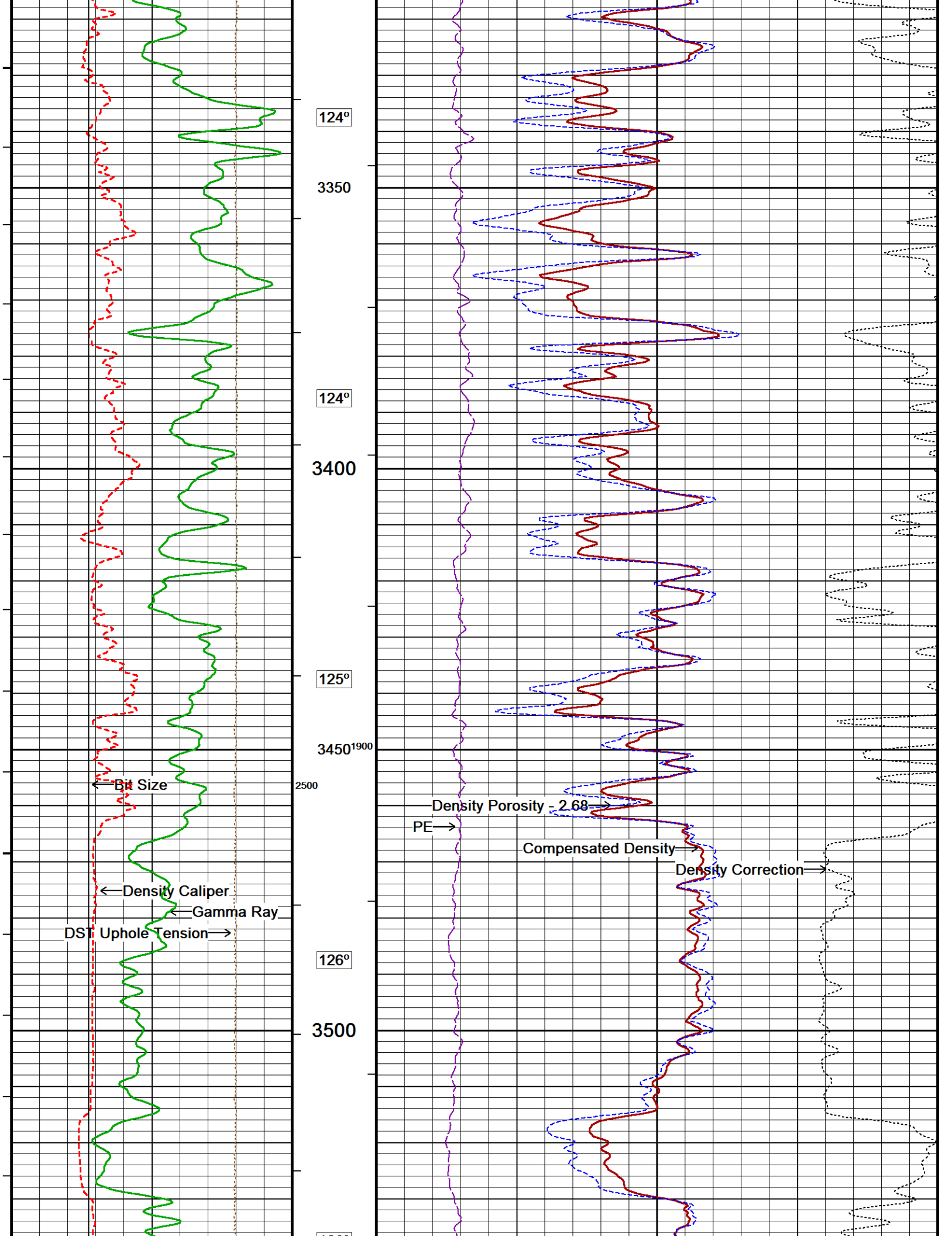
116°

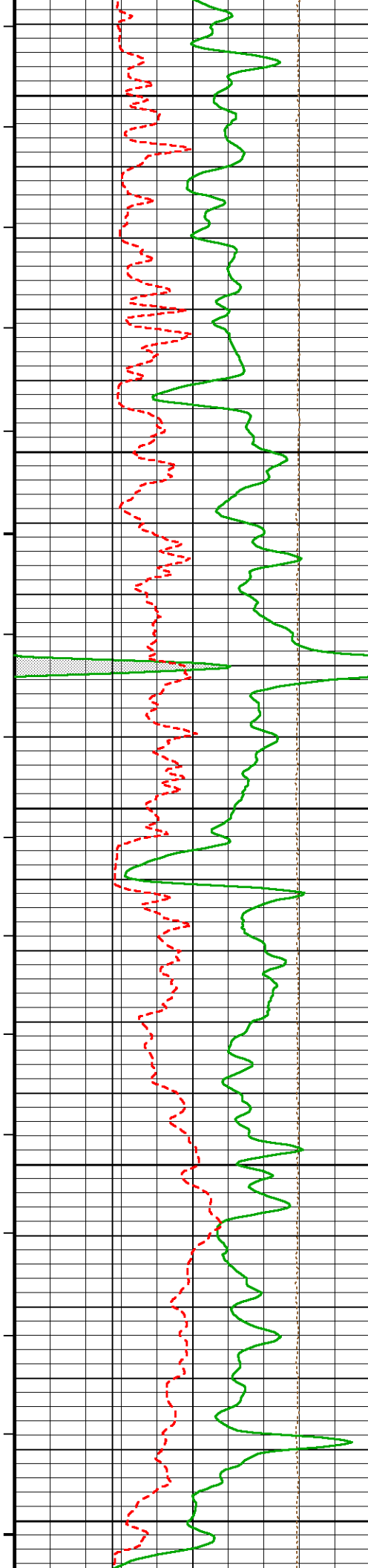
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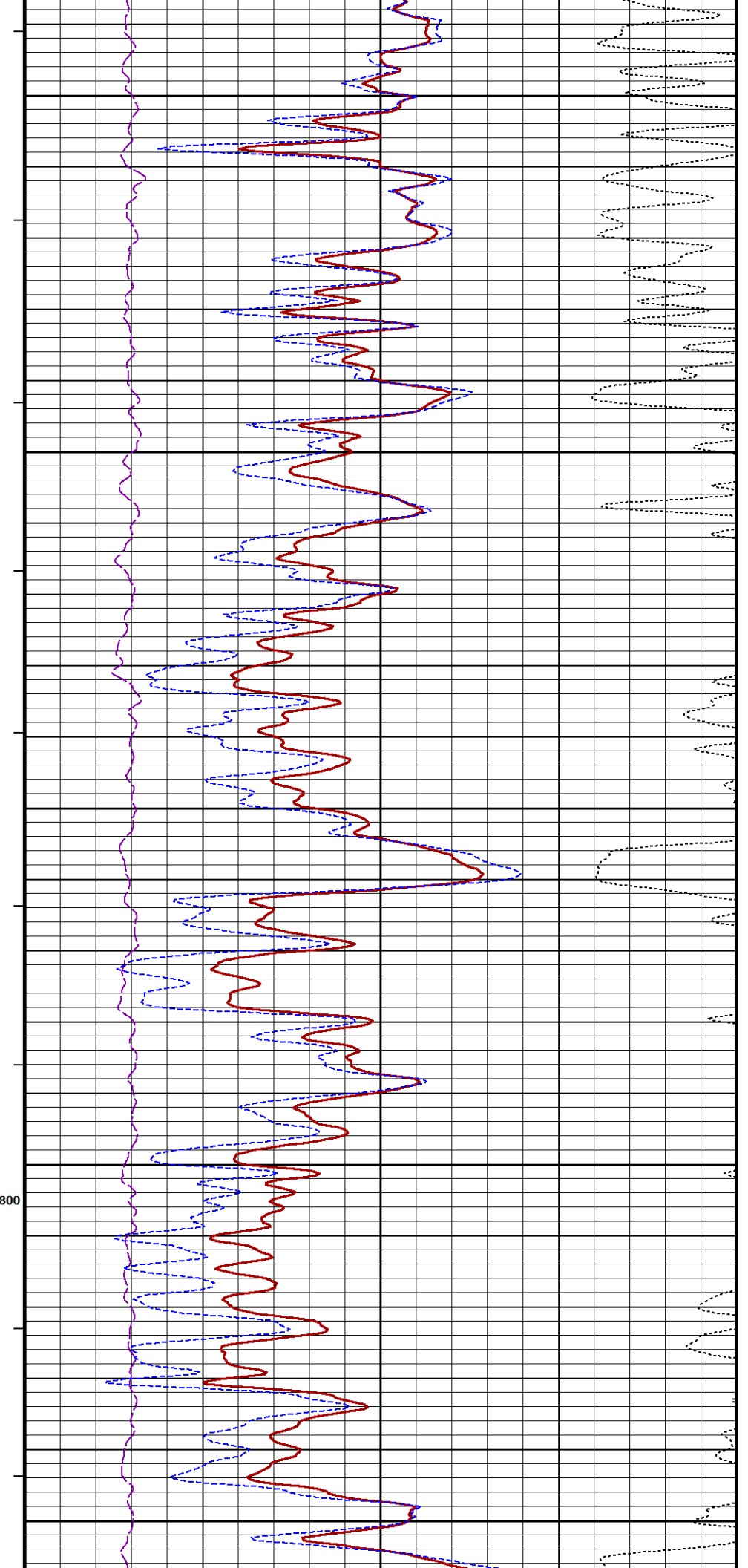


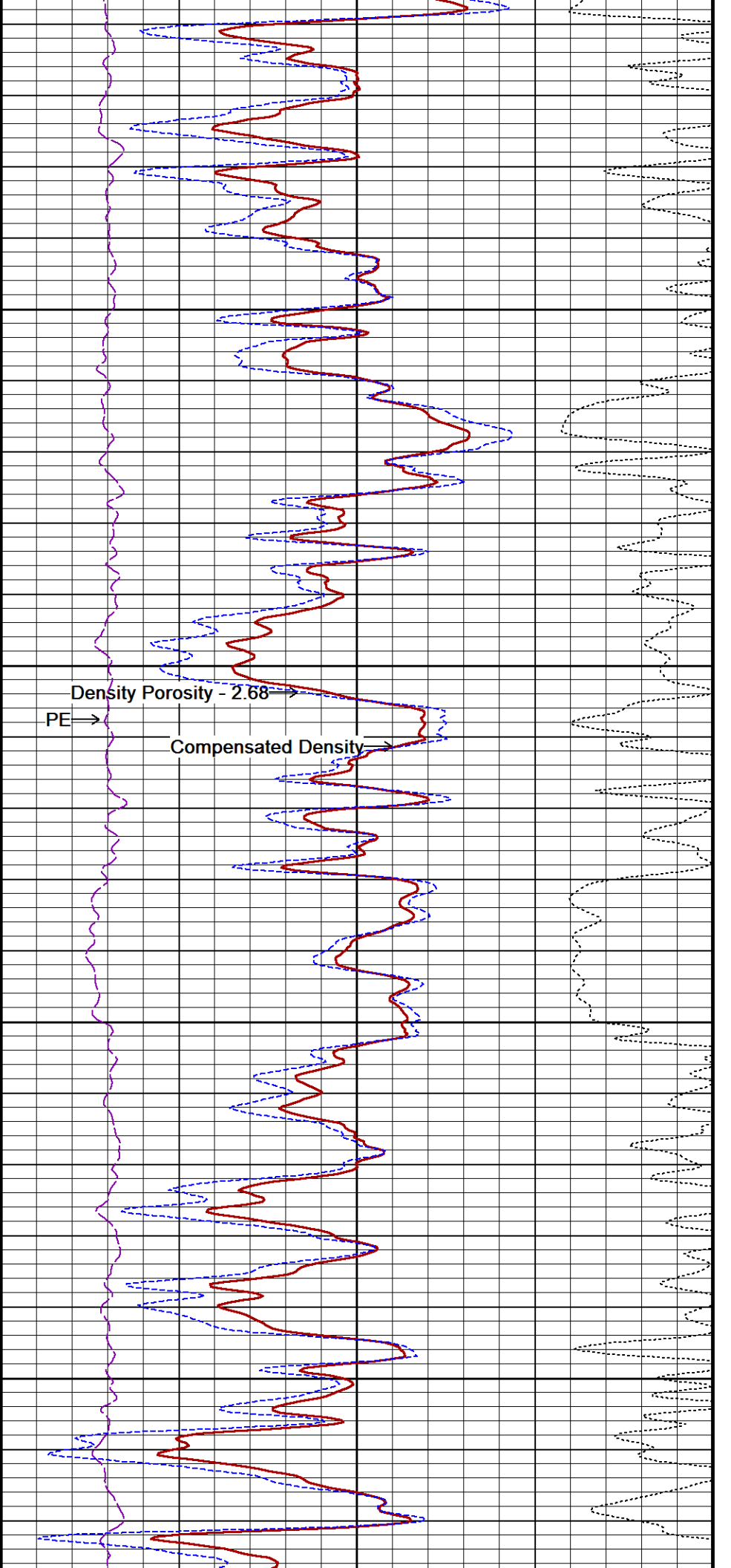
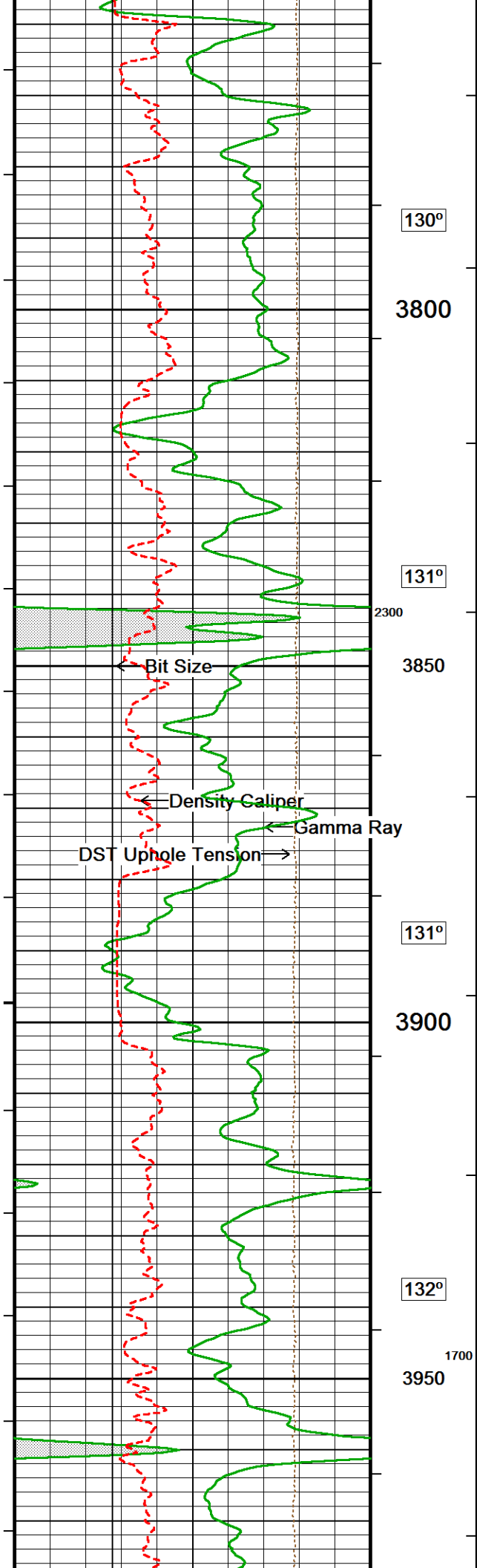


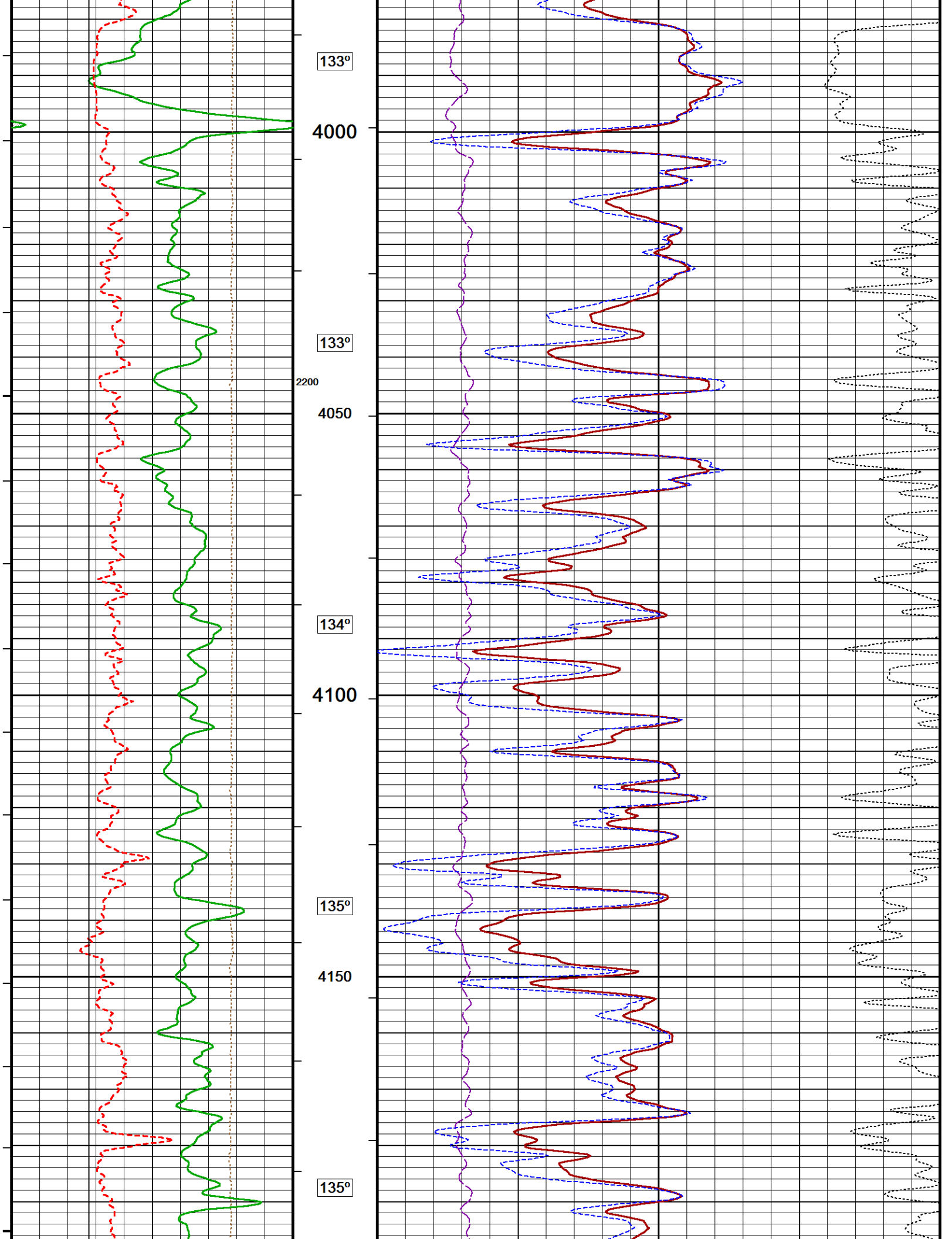


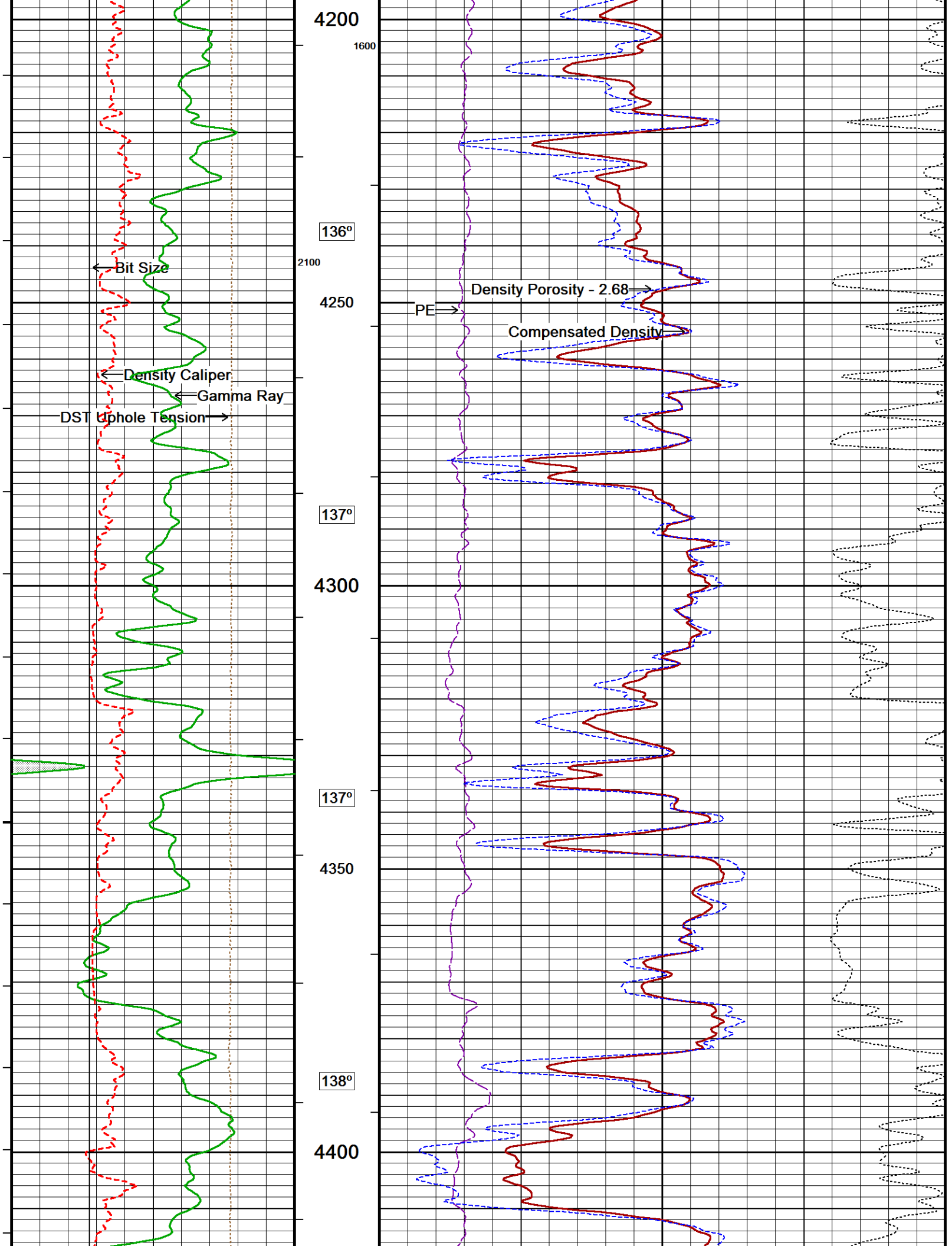


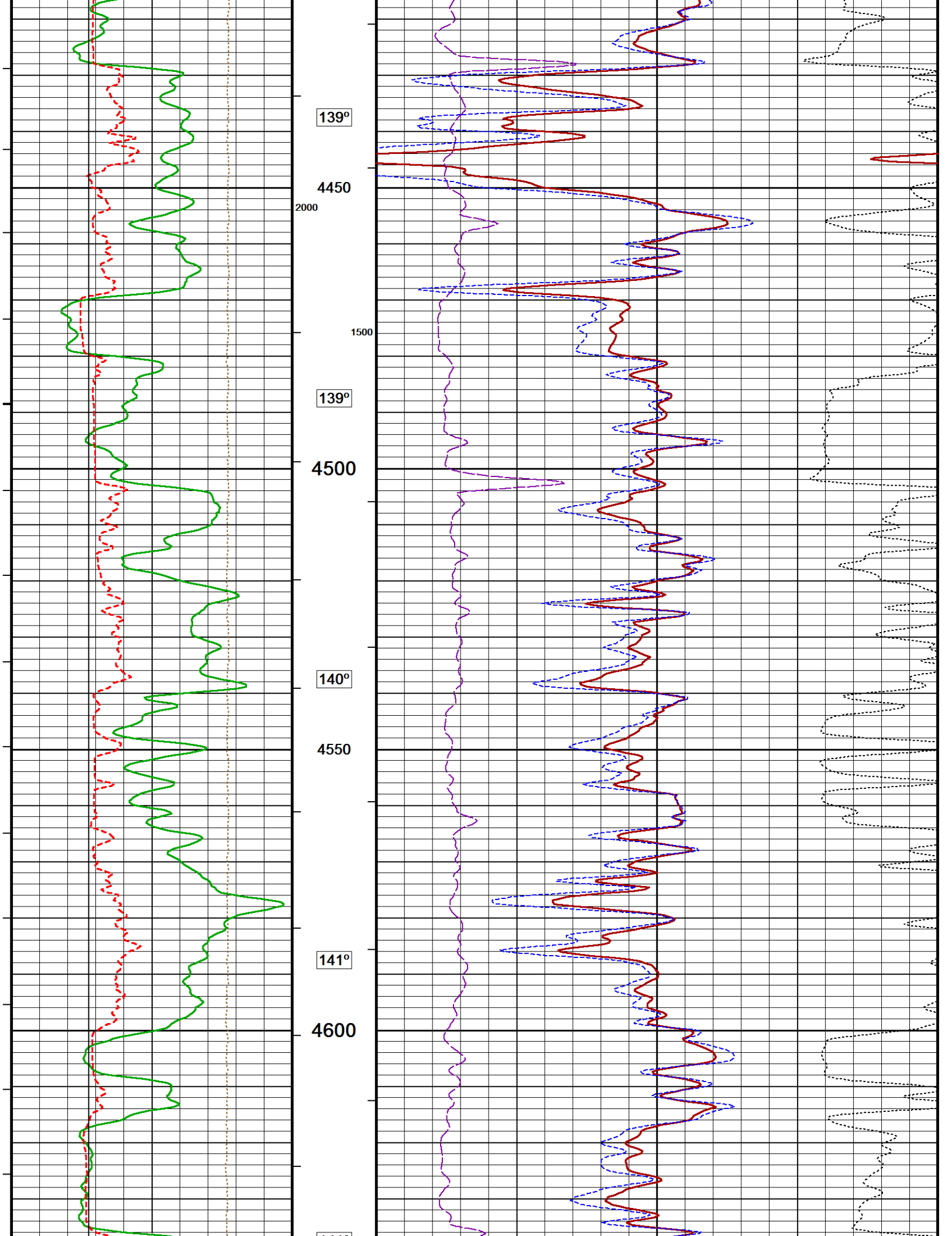
126°
3550
127°
3600
128°
3650
2400
129°
3700
1800
129°
3750

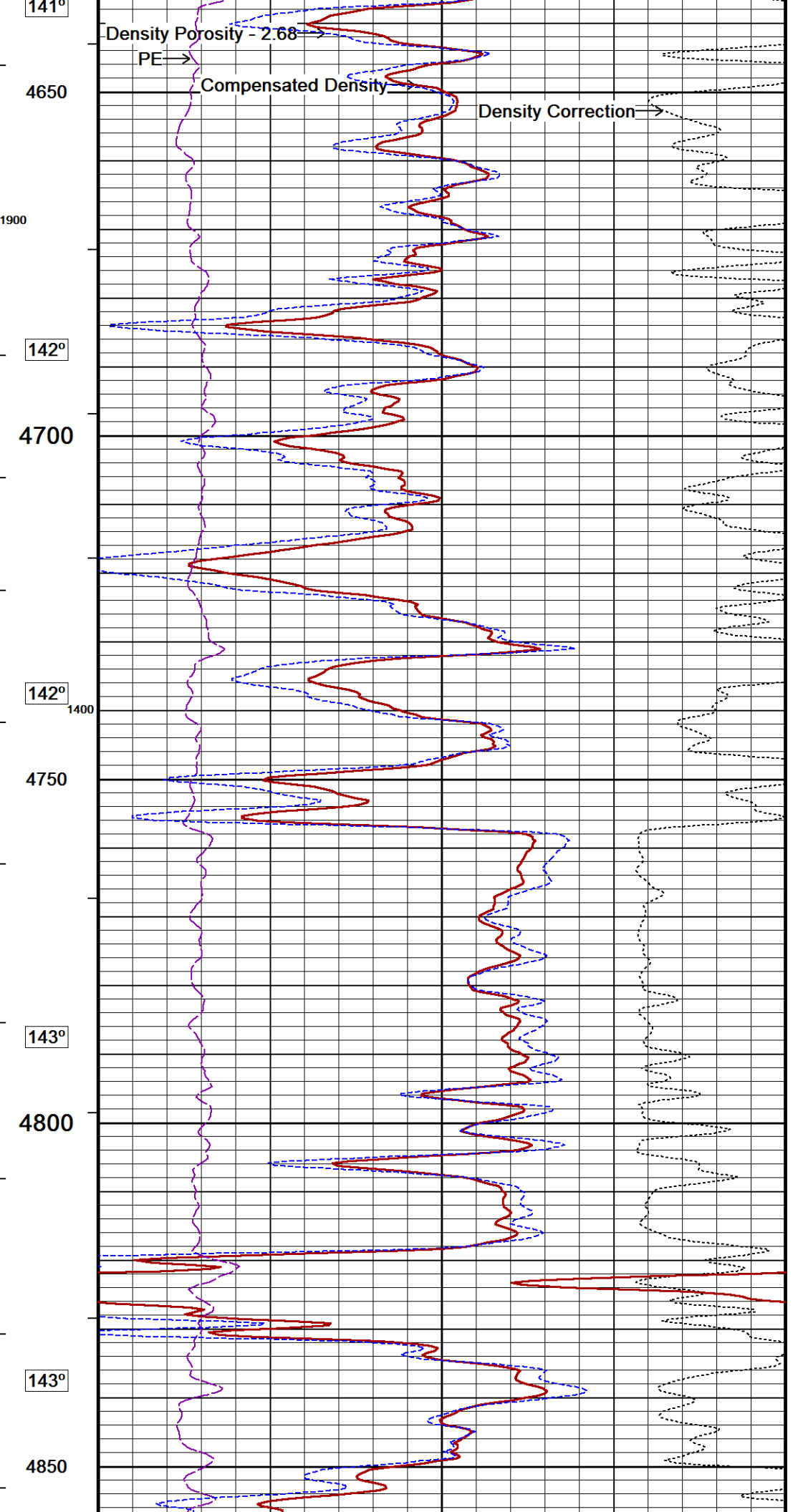
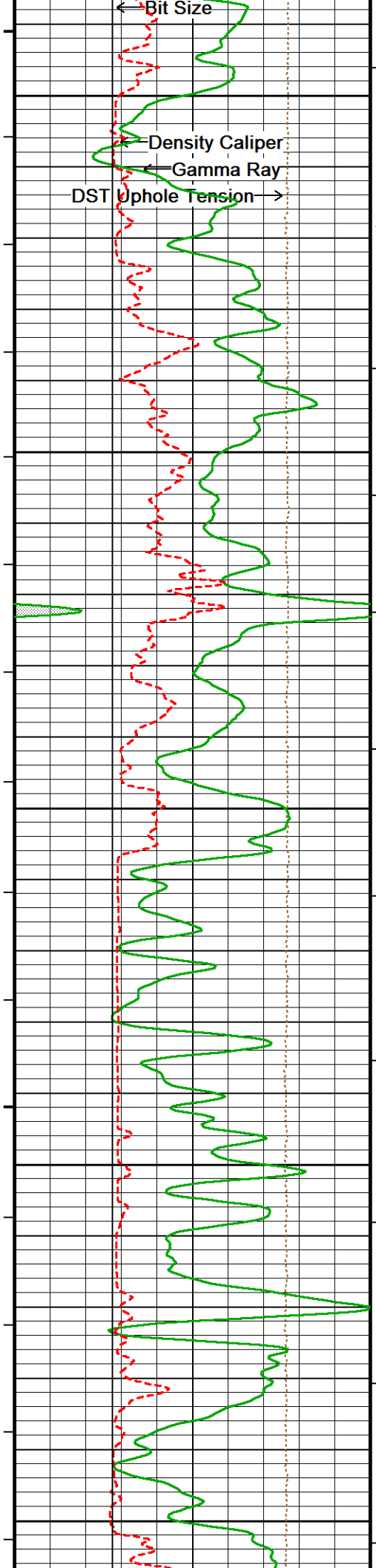


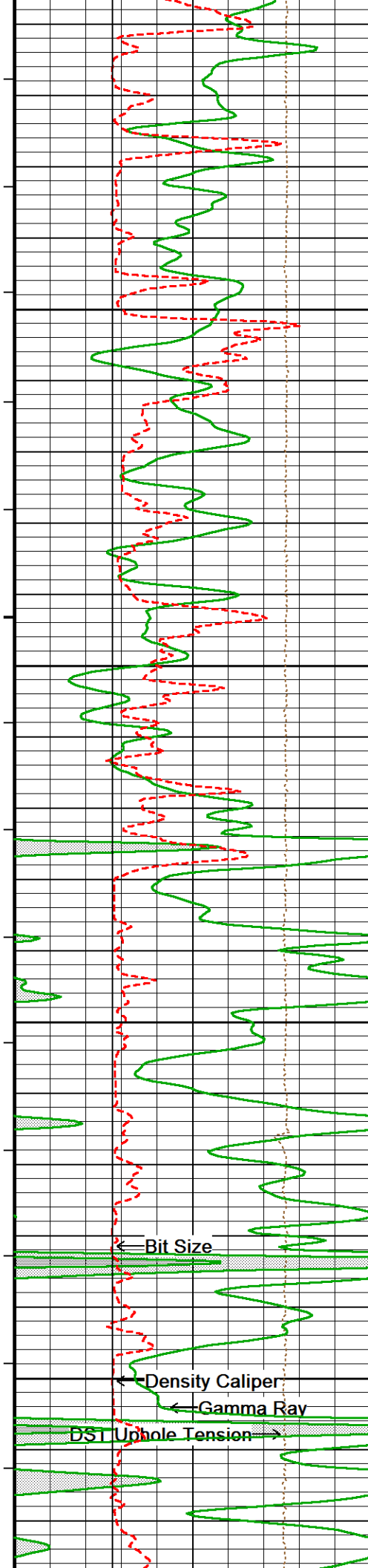




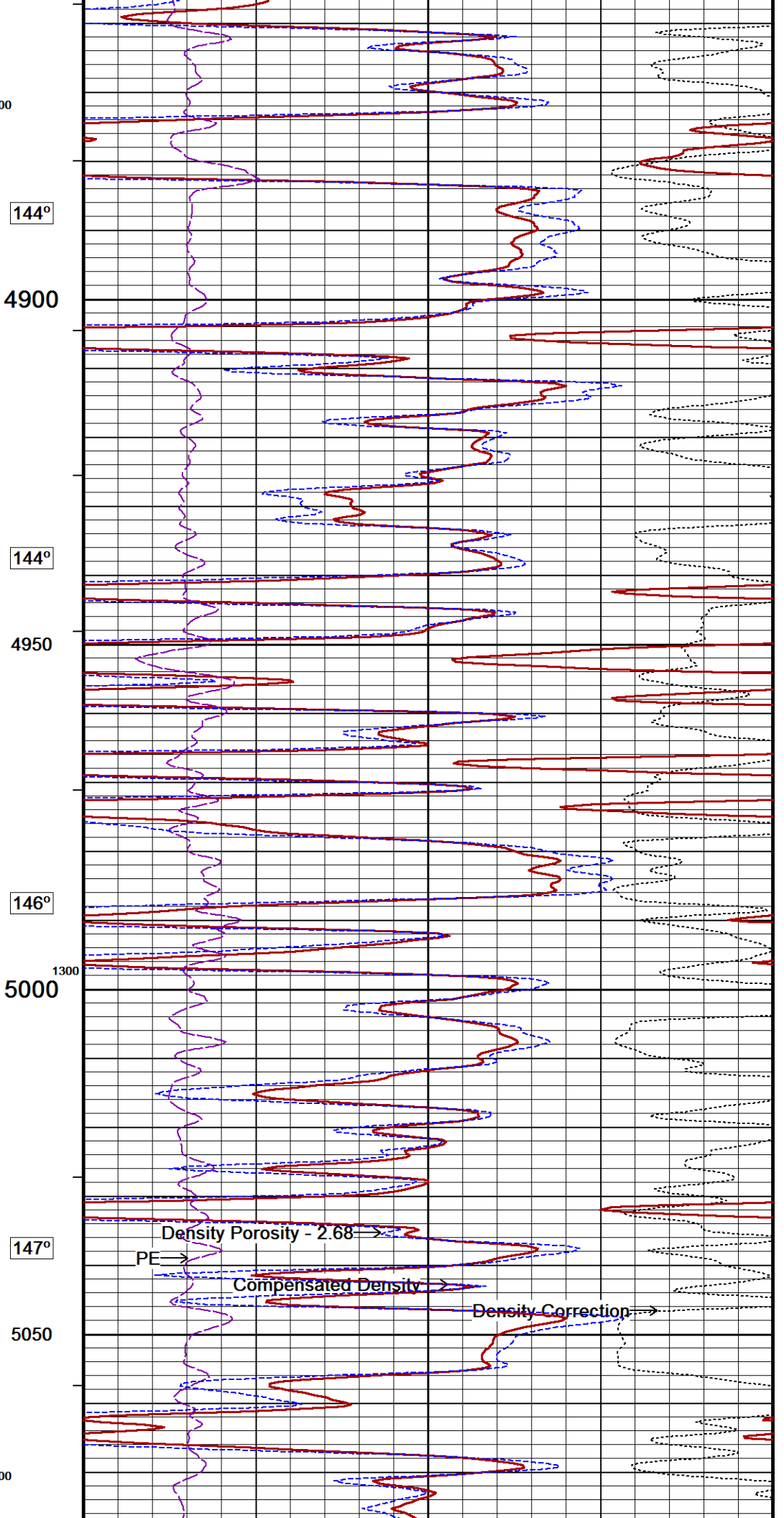




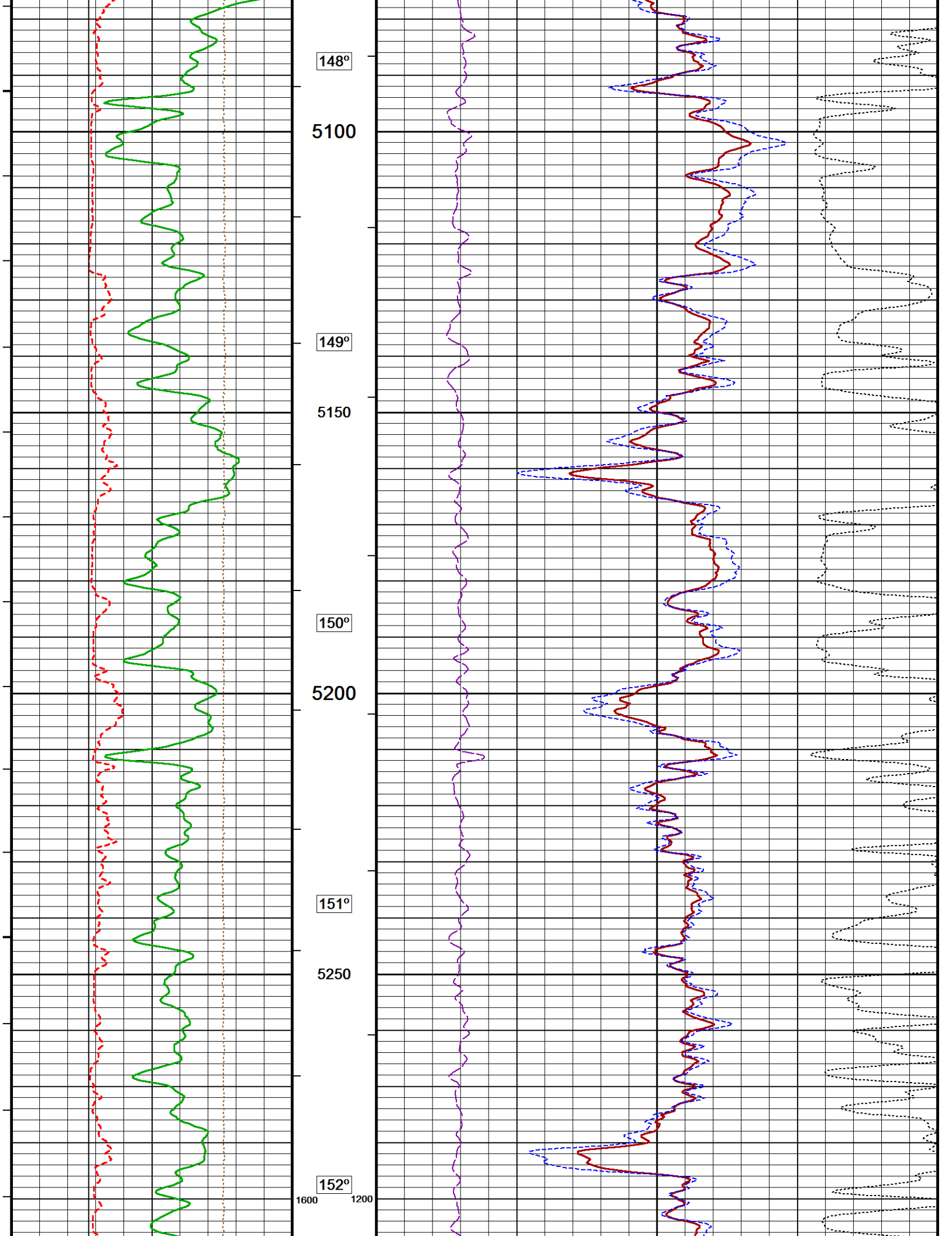


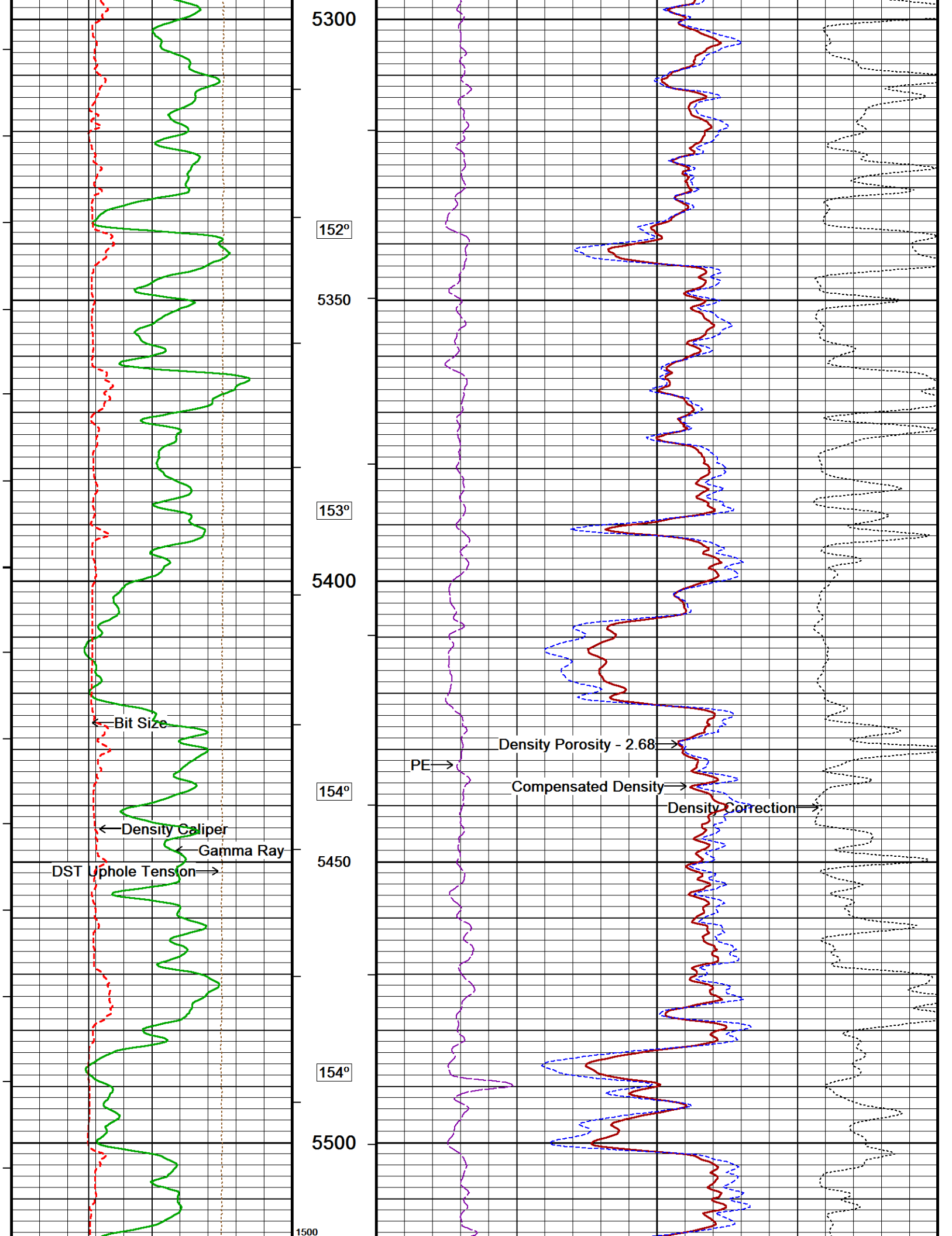


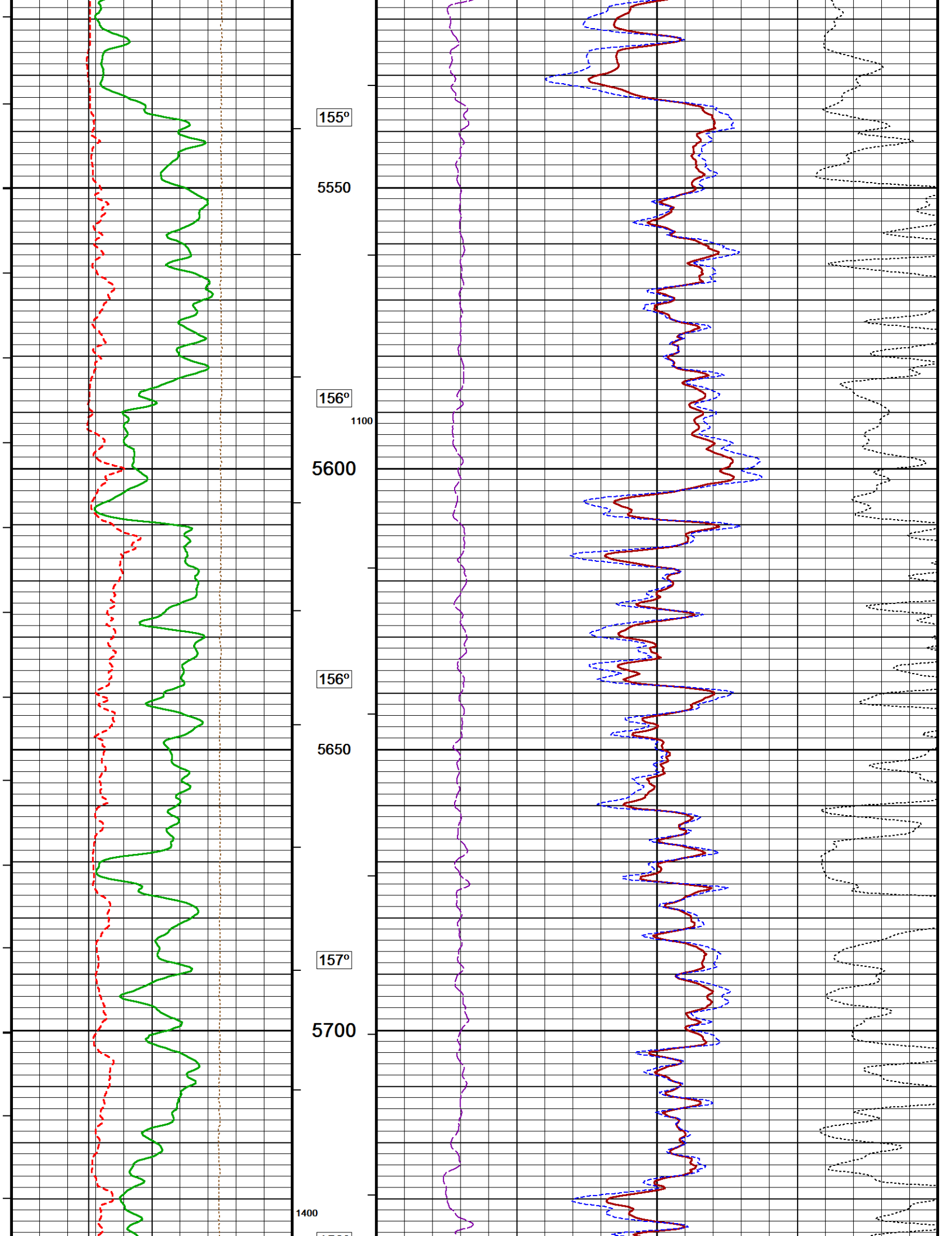
1800
144°
4900
144°
4950
146°
5000
1300
147°
5050
1700

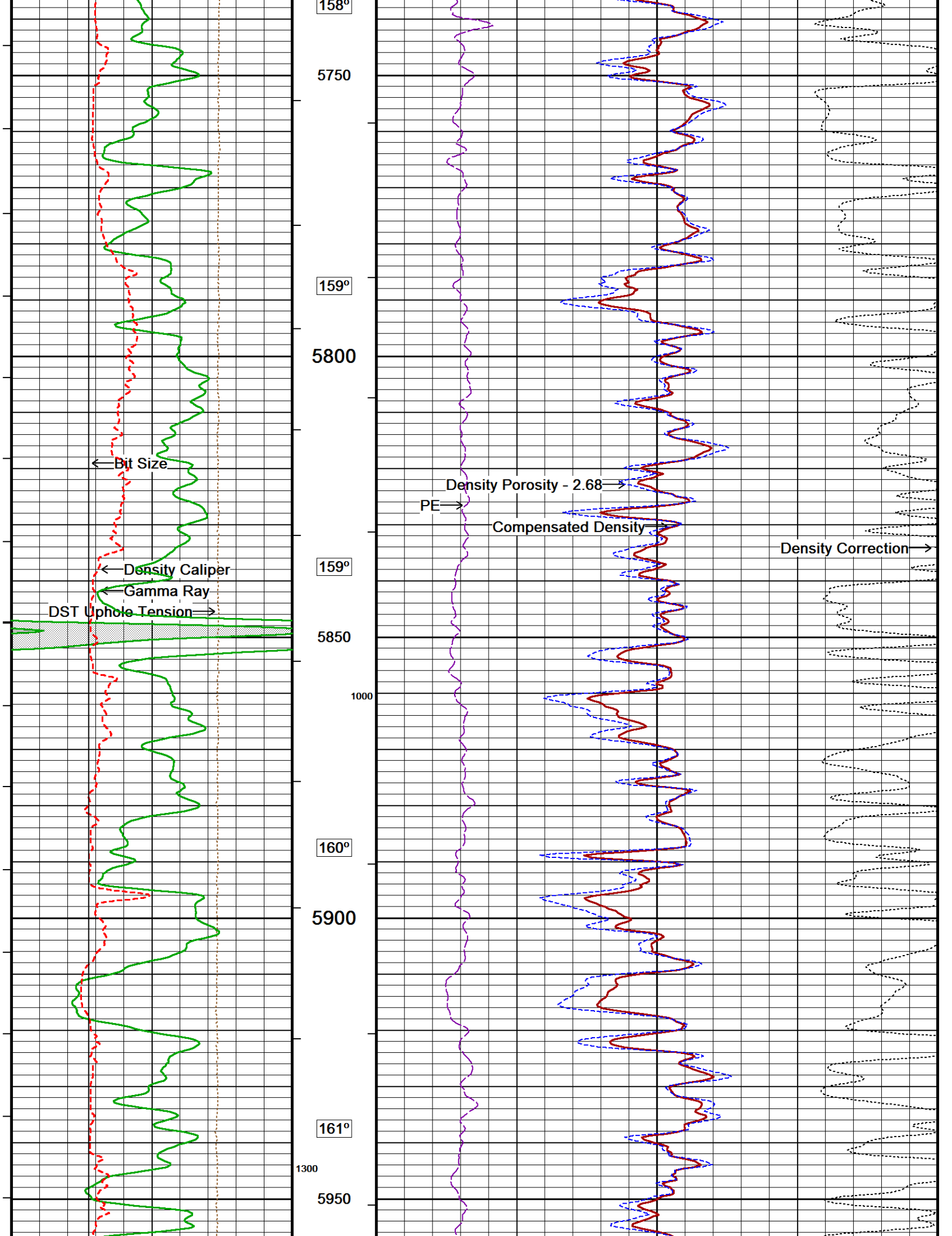


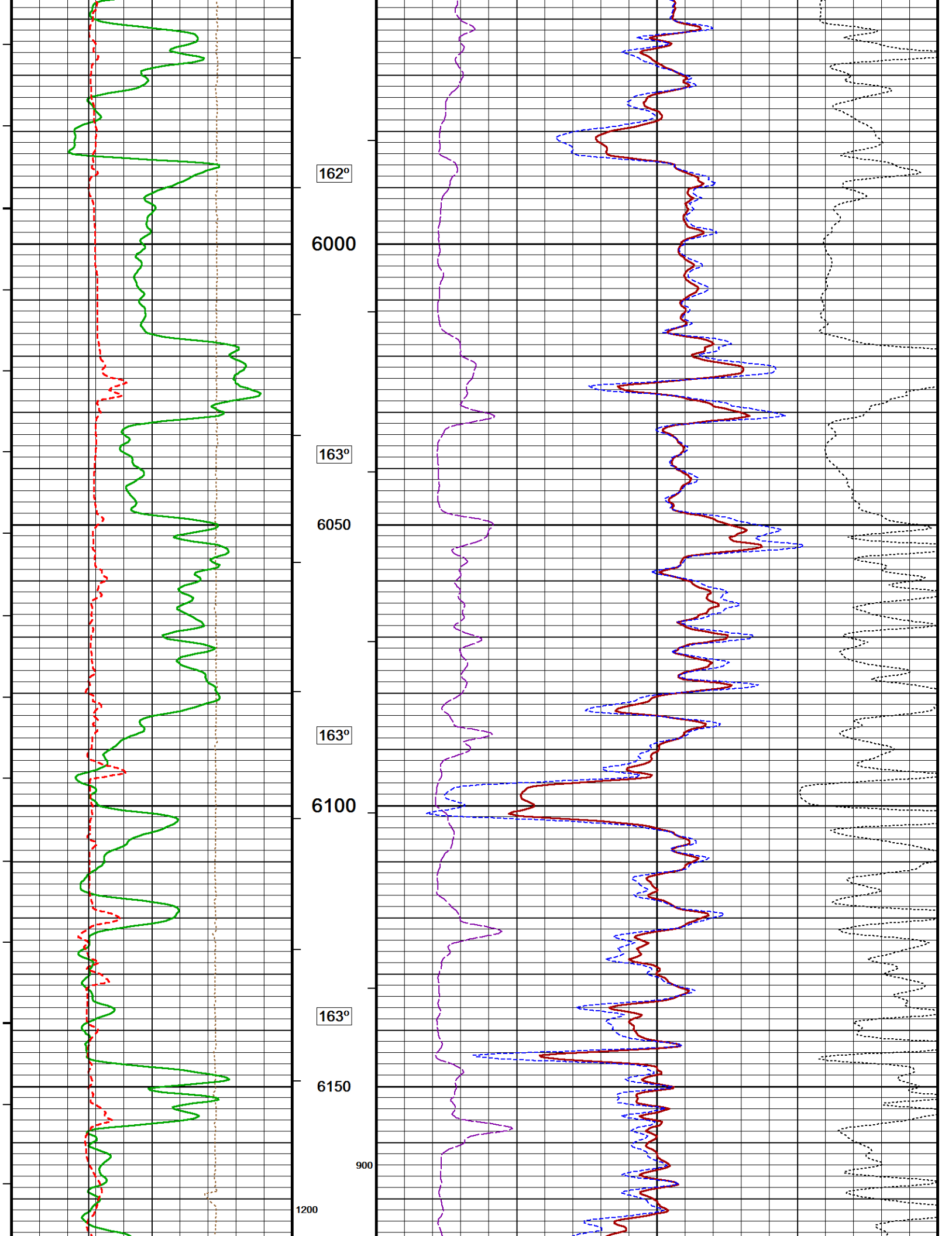
Density Porosity - 2.68 →
PE →
Compensated Density →
Density Correction →

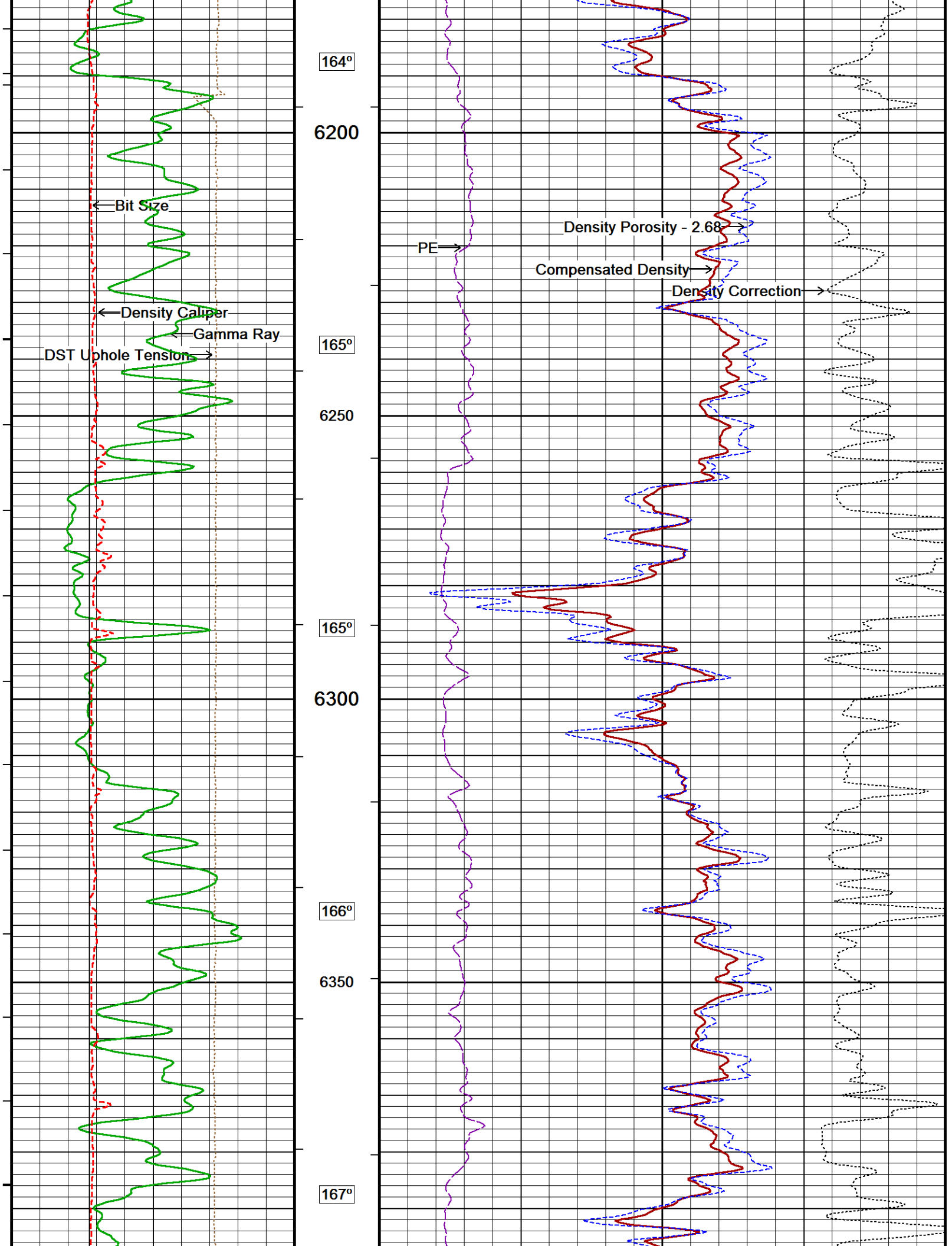


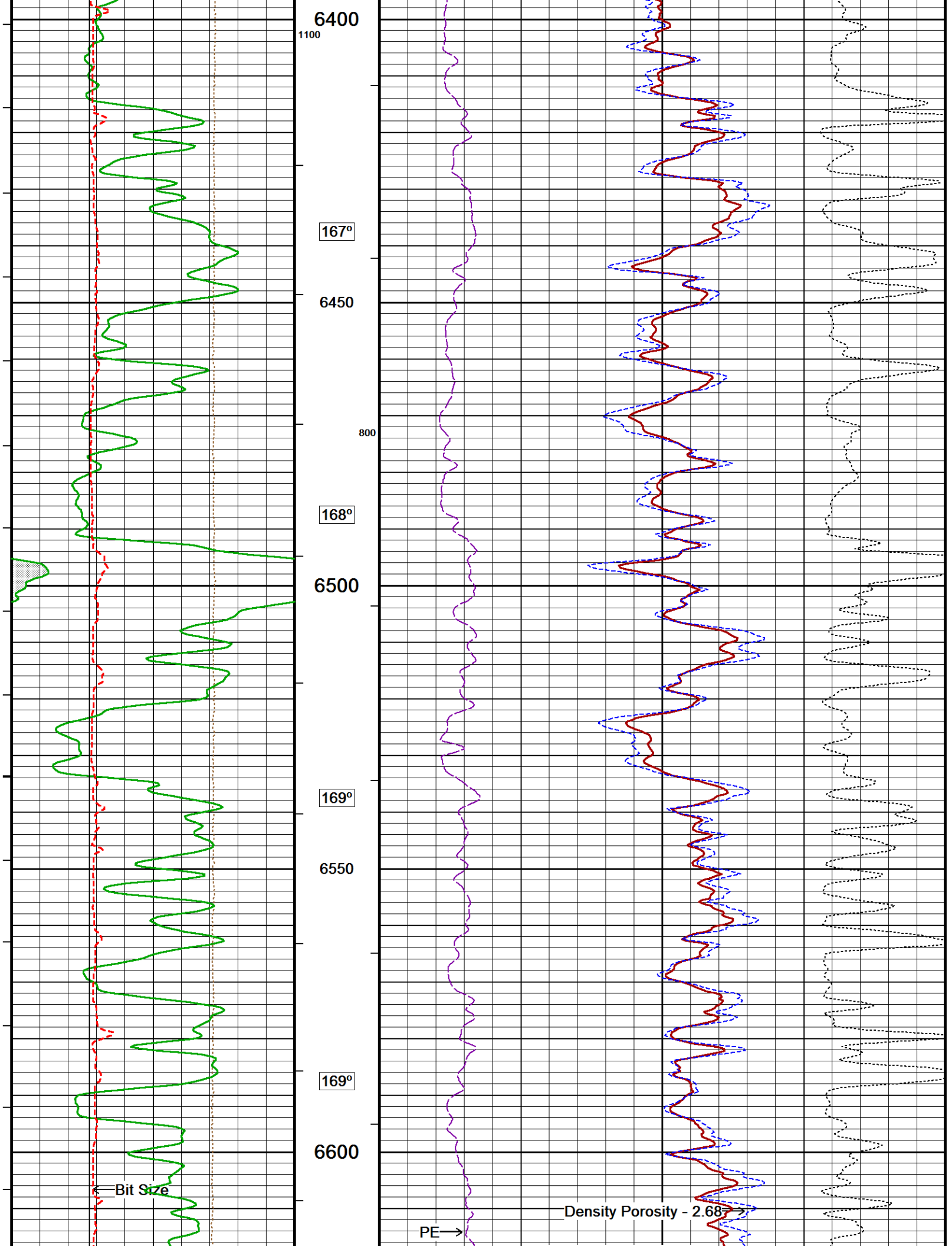


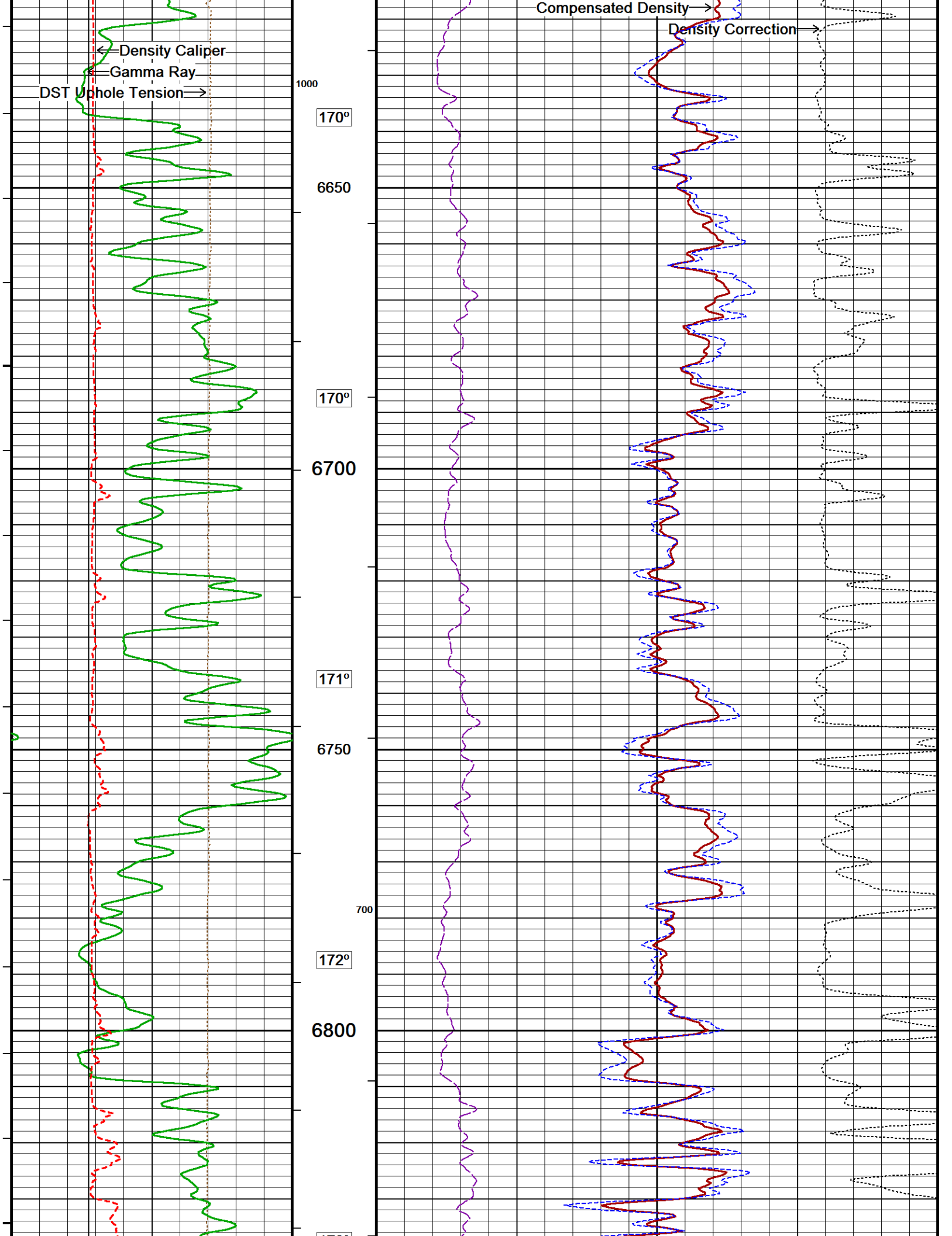


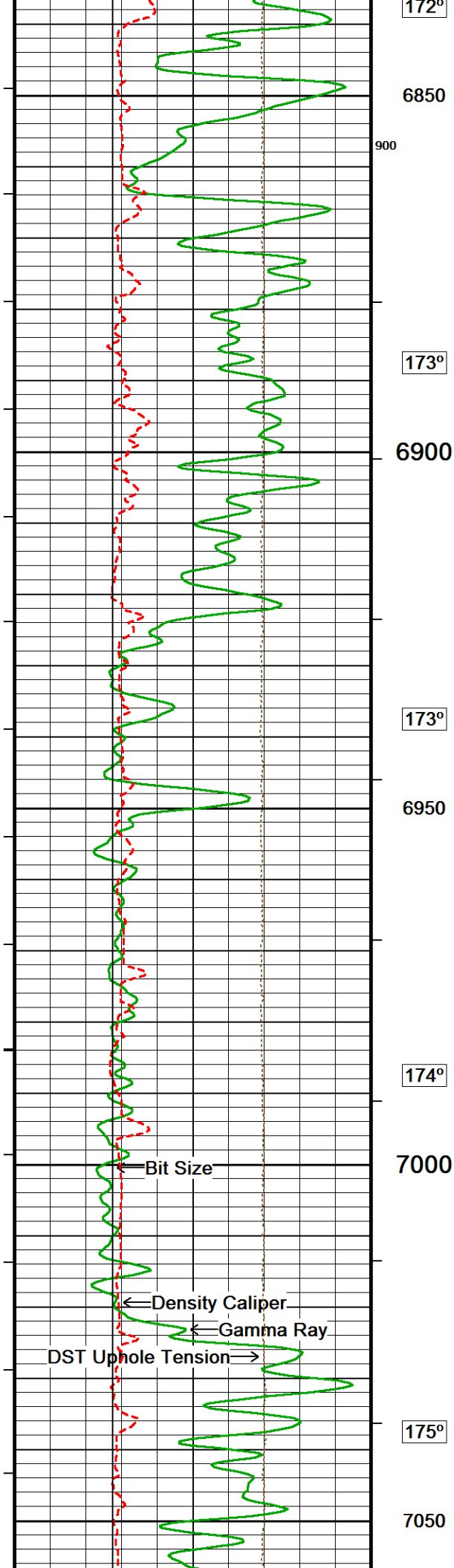




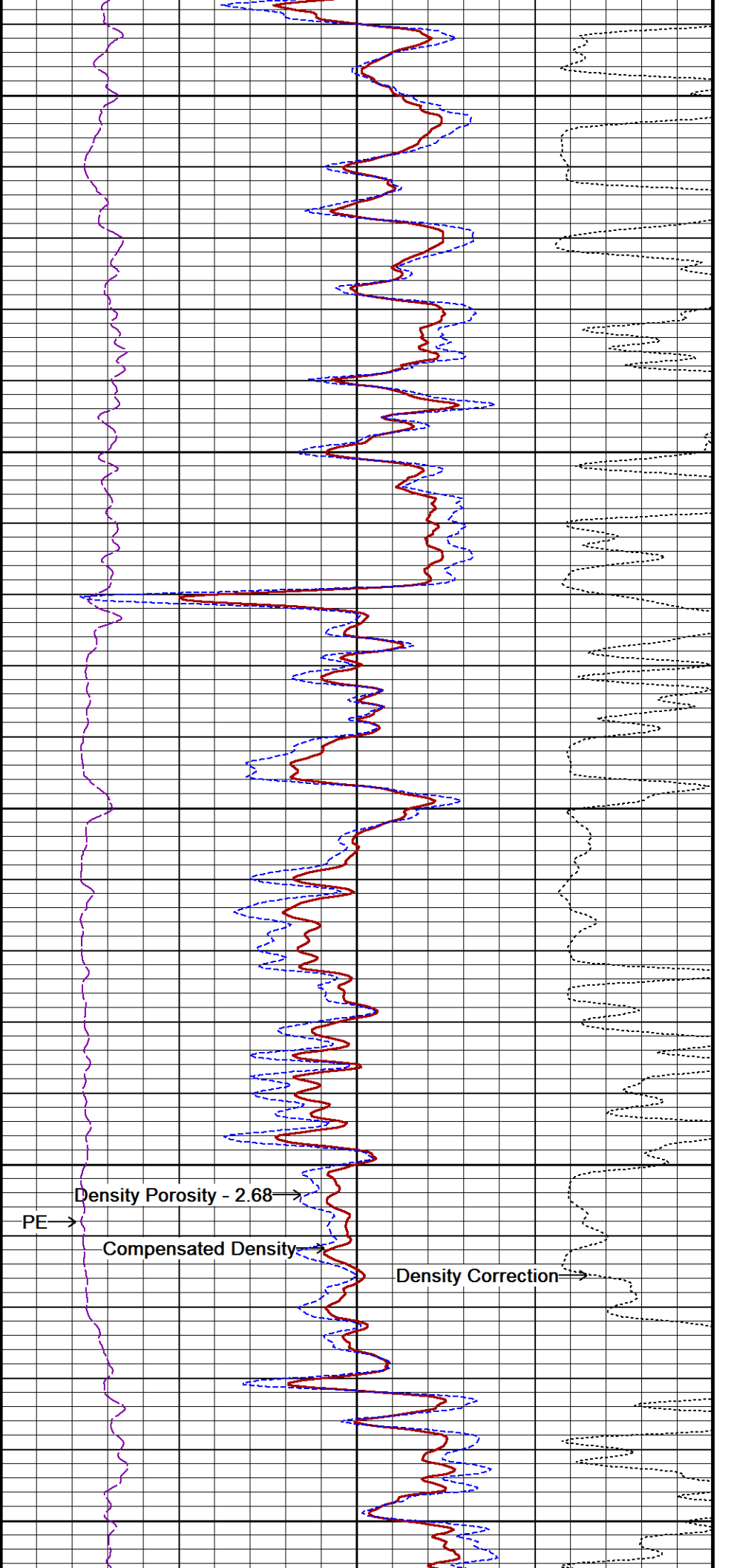




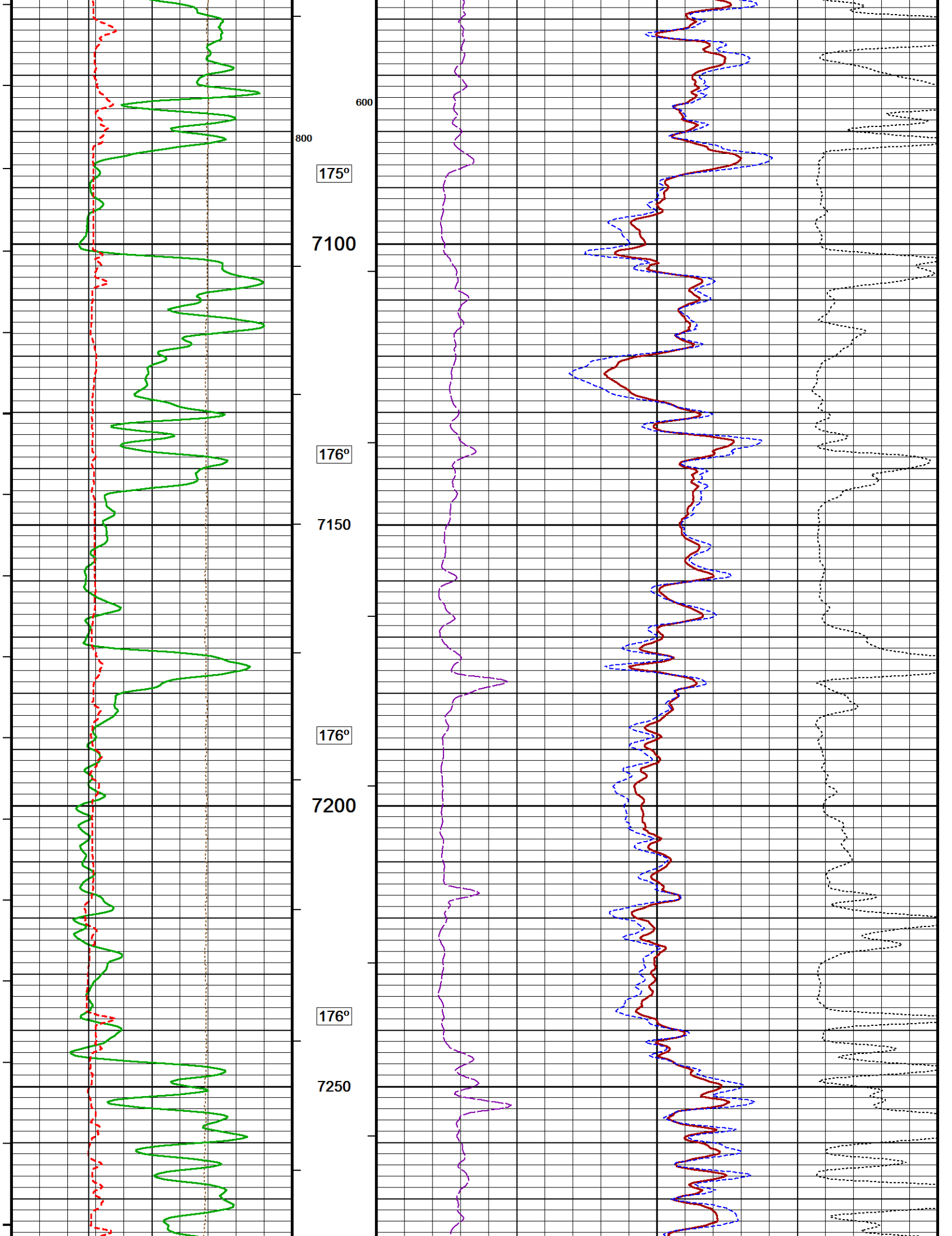


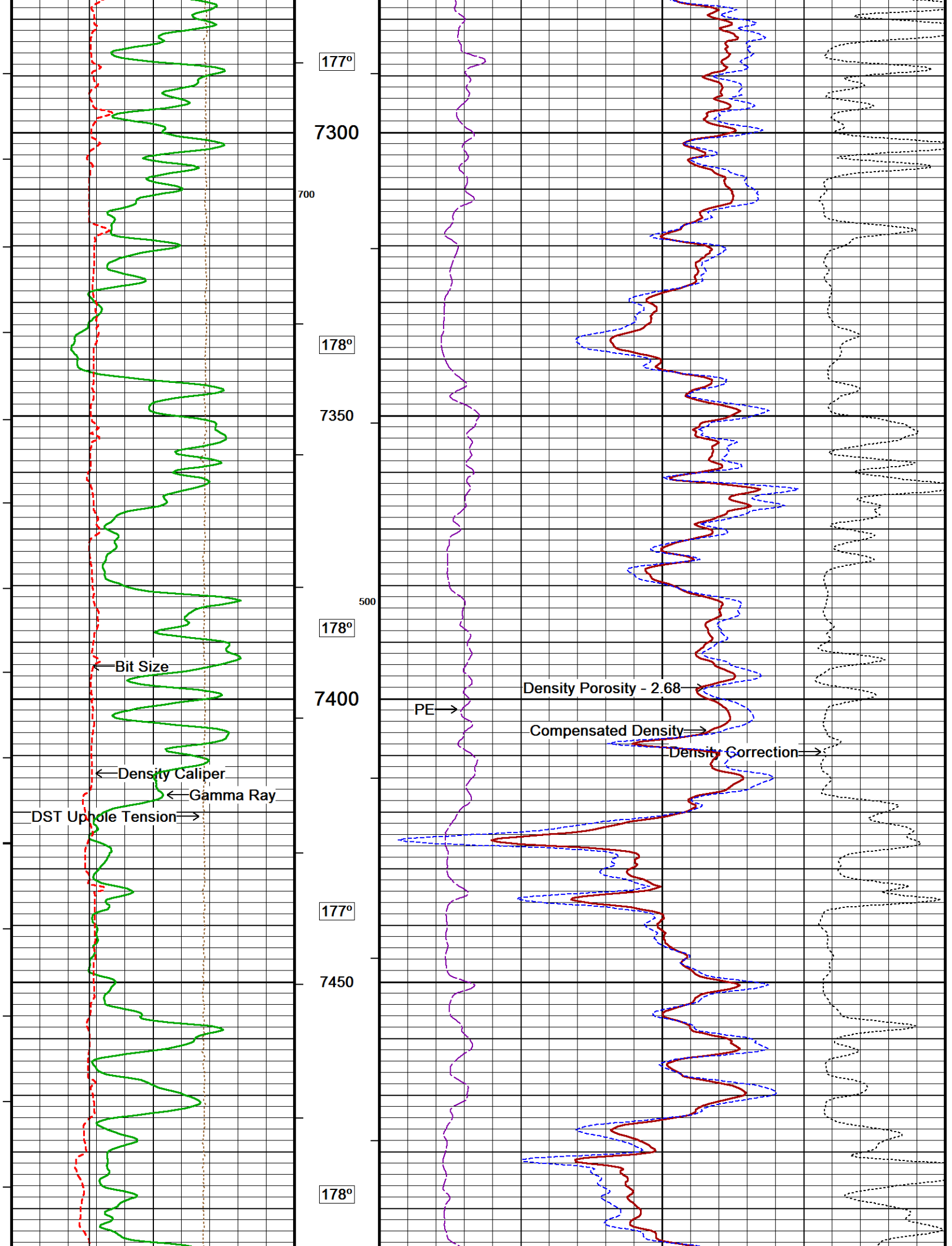


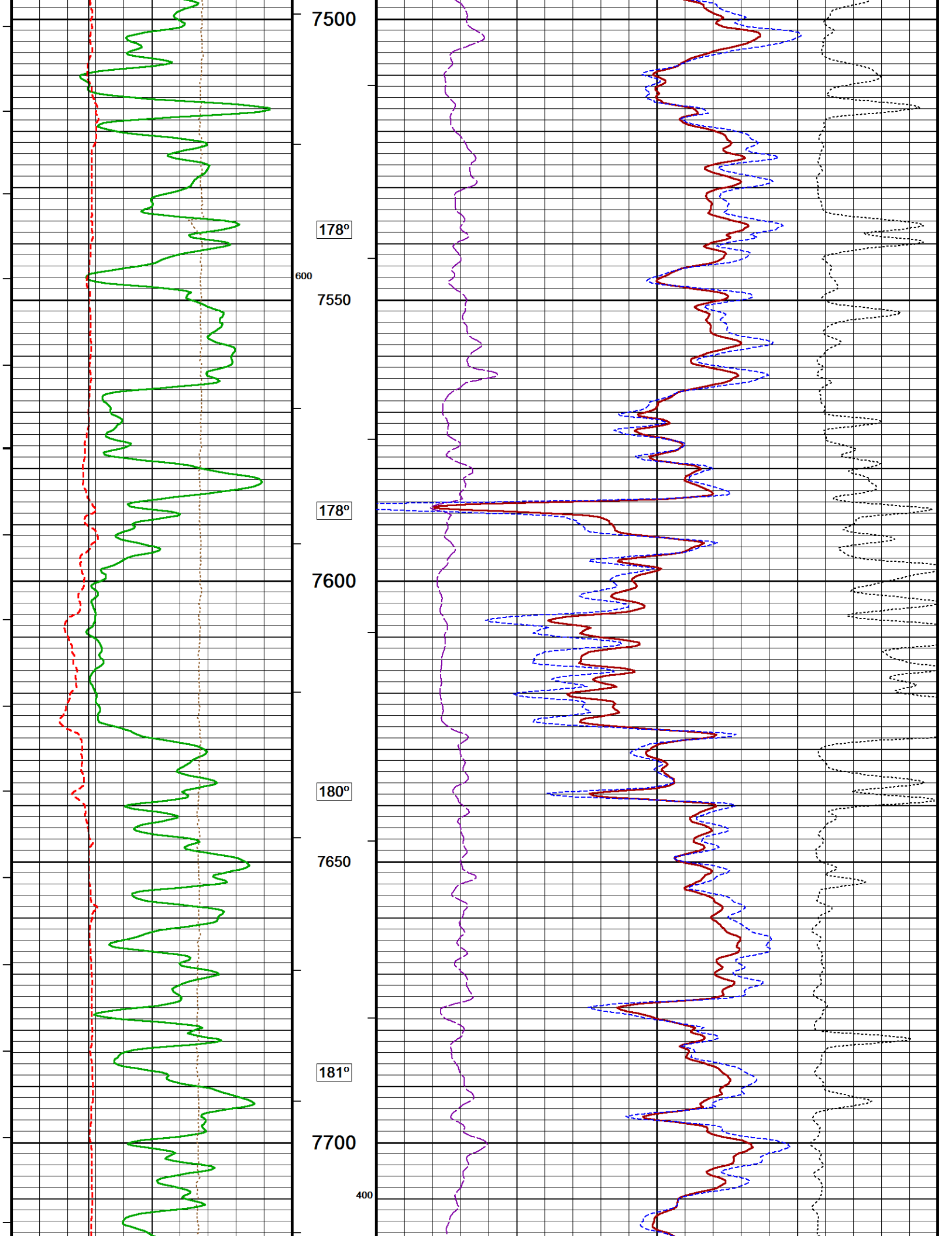
172°
6850
900
173°
6900
173°
6950
174°
7000
175°
7050

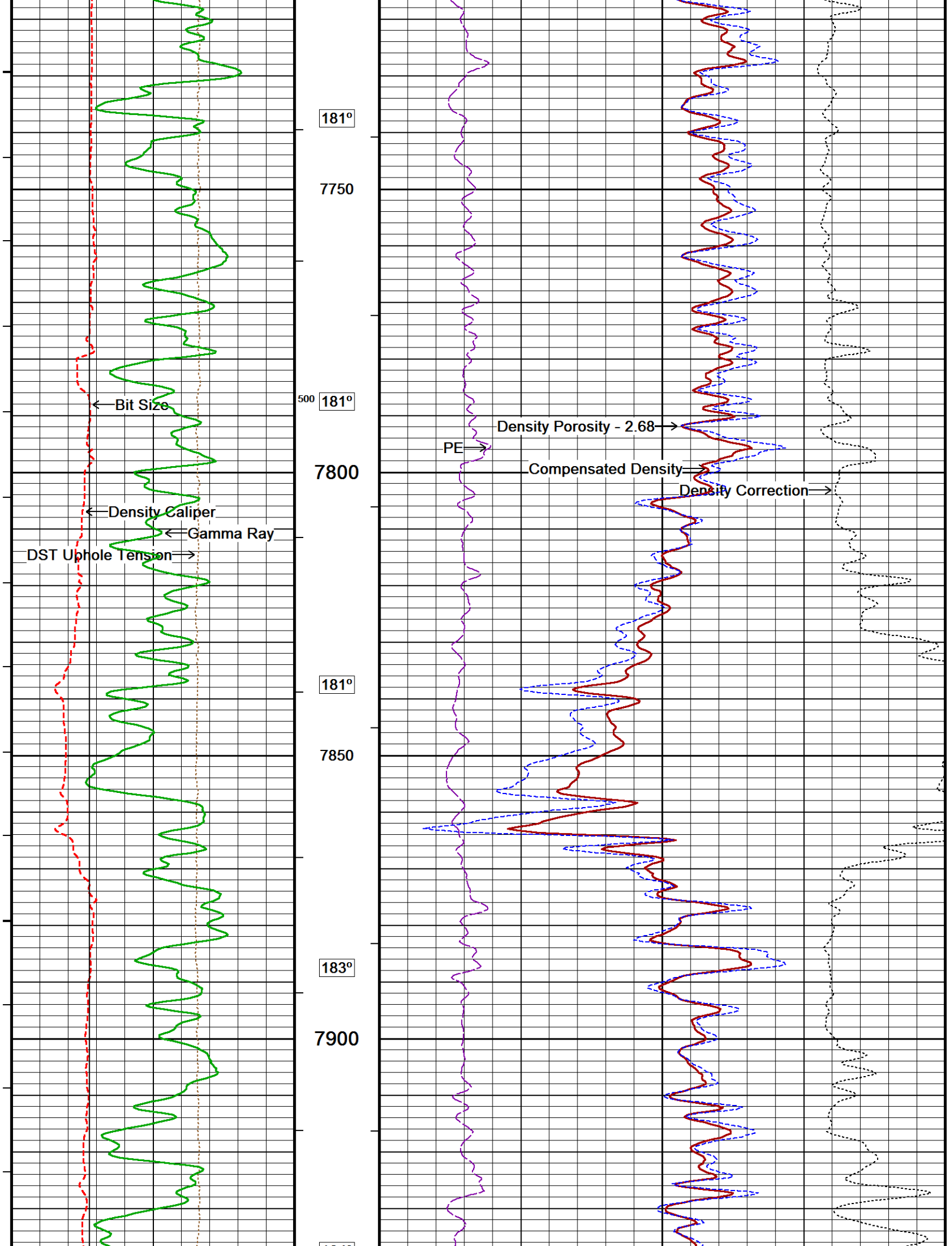


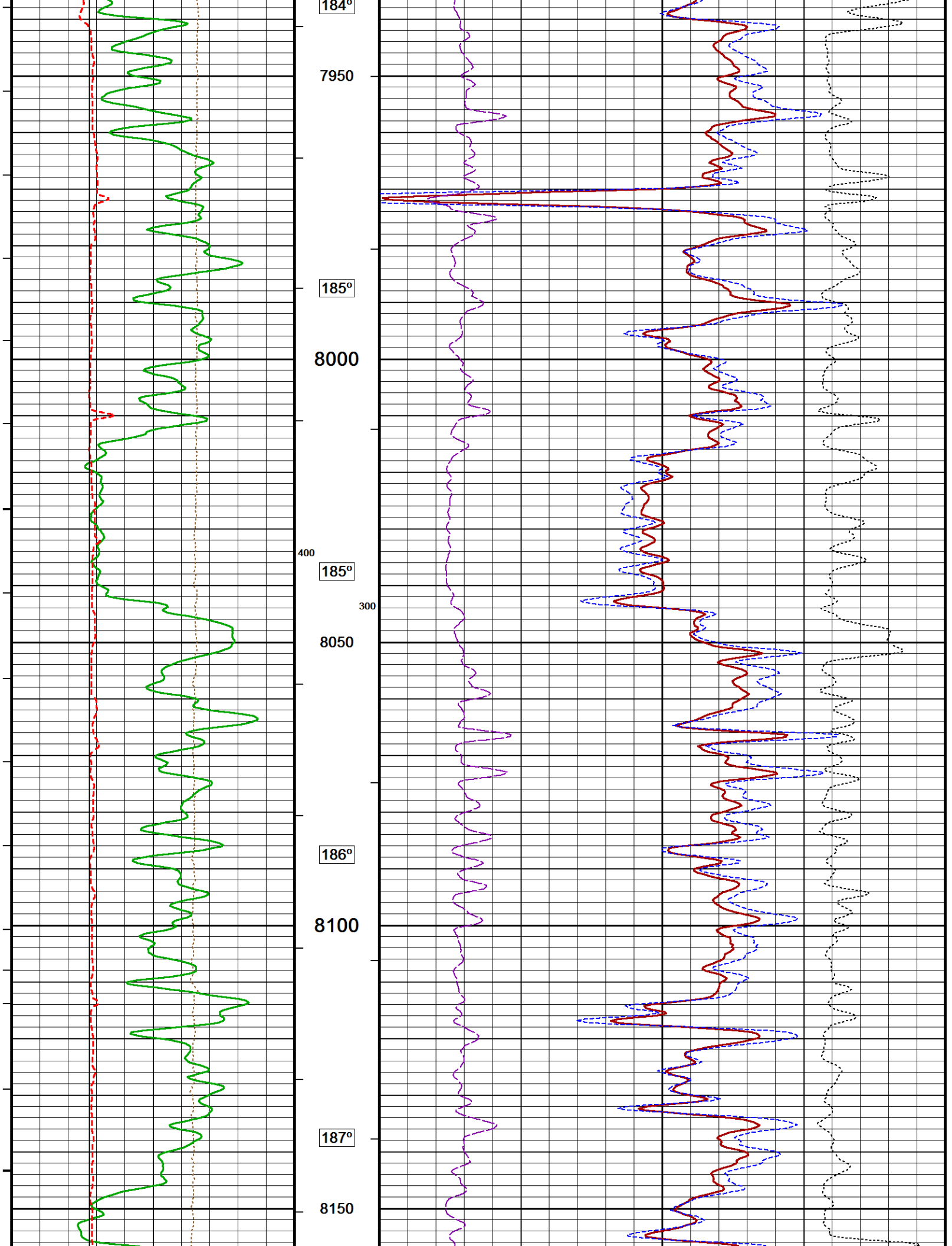
Density Porosity - 2.68
PE
Compensated Density
Density Correction

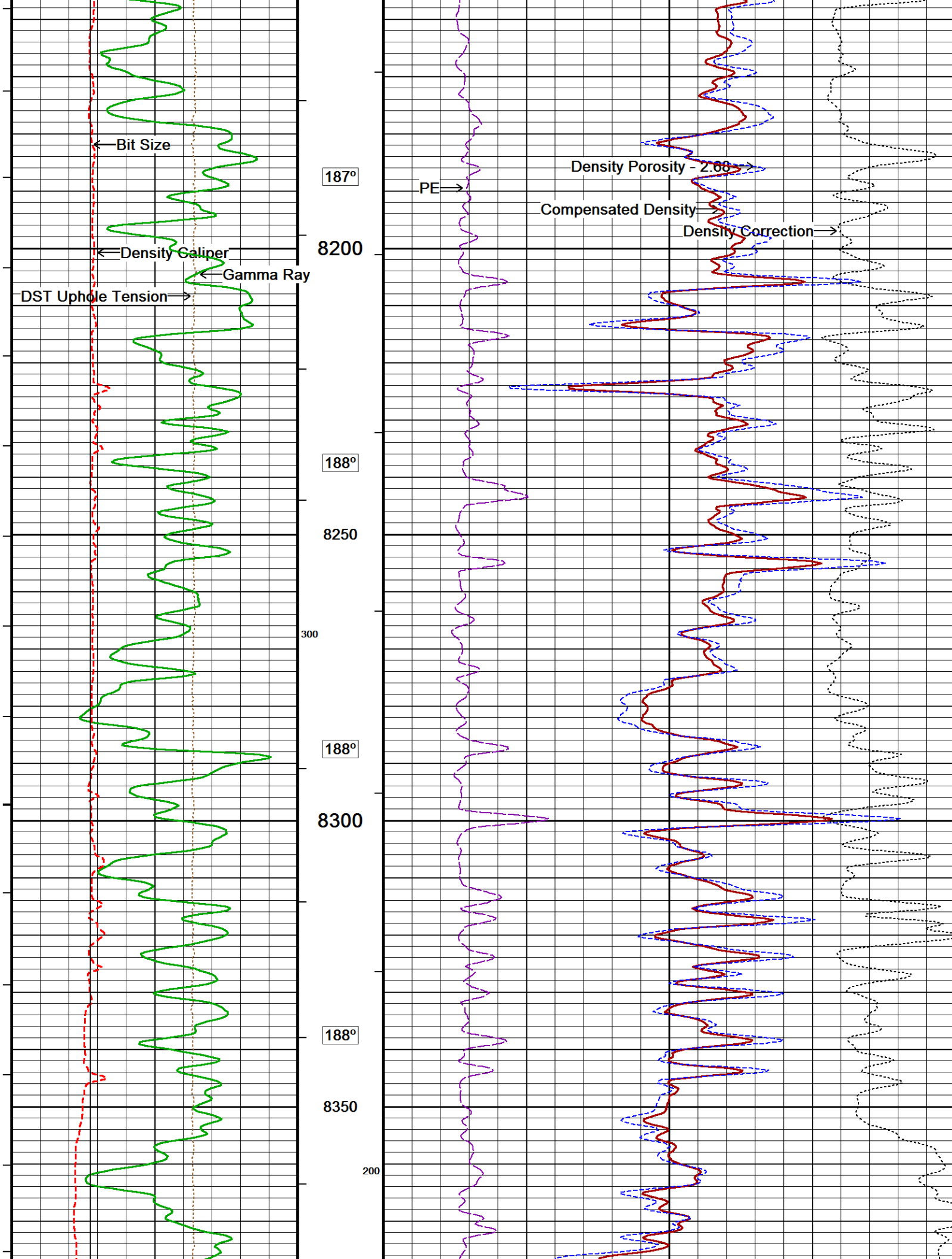


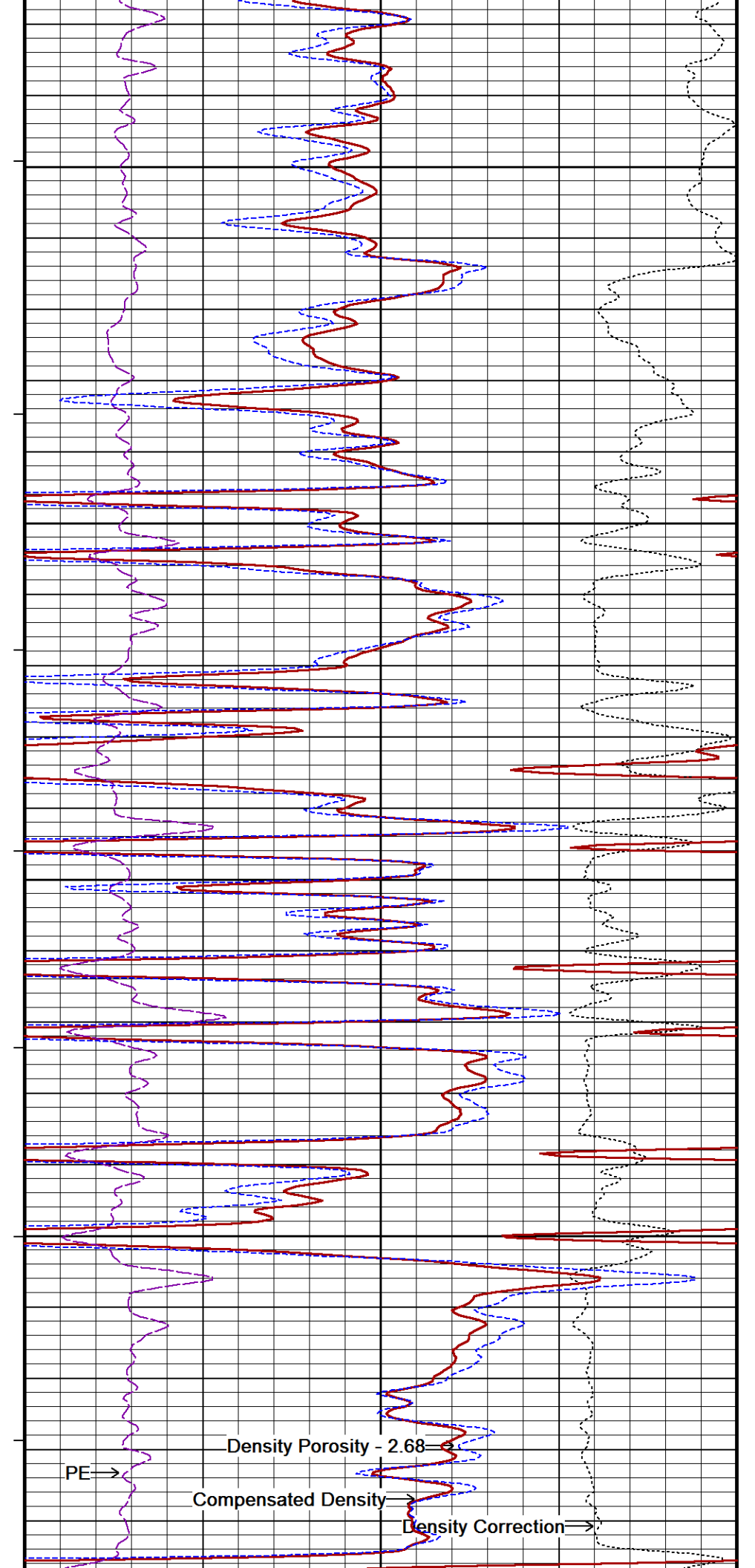
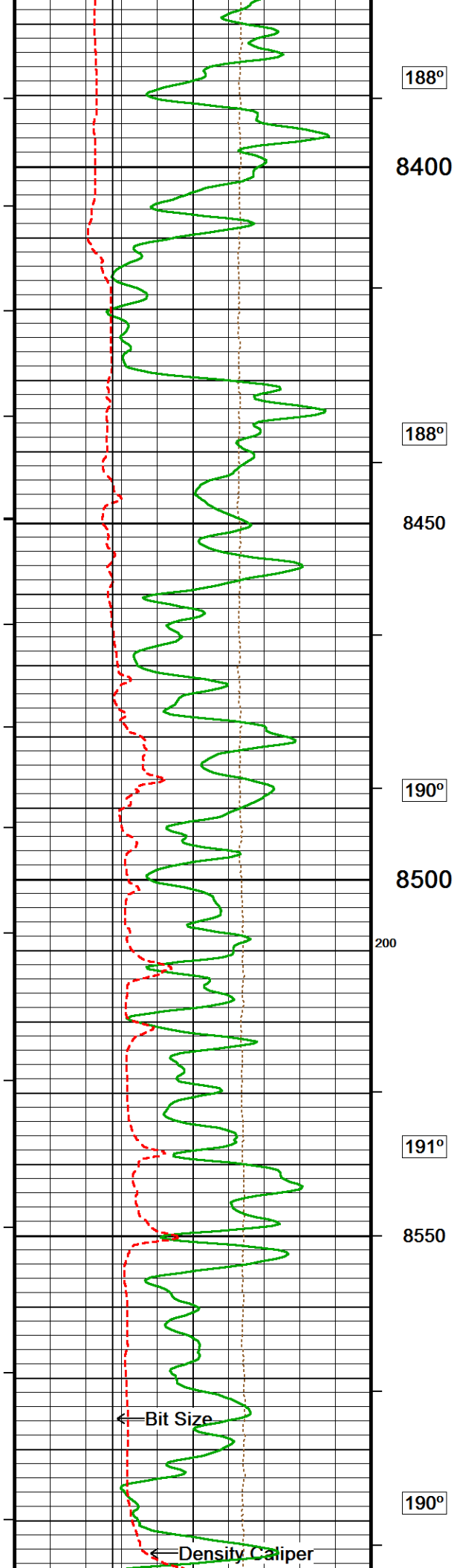


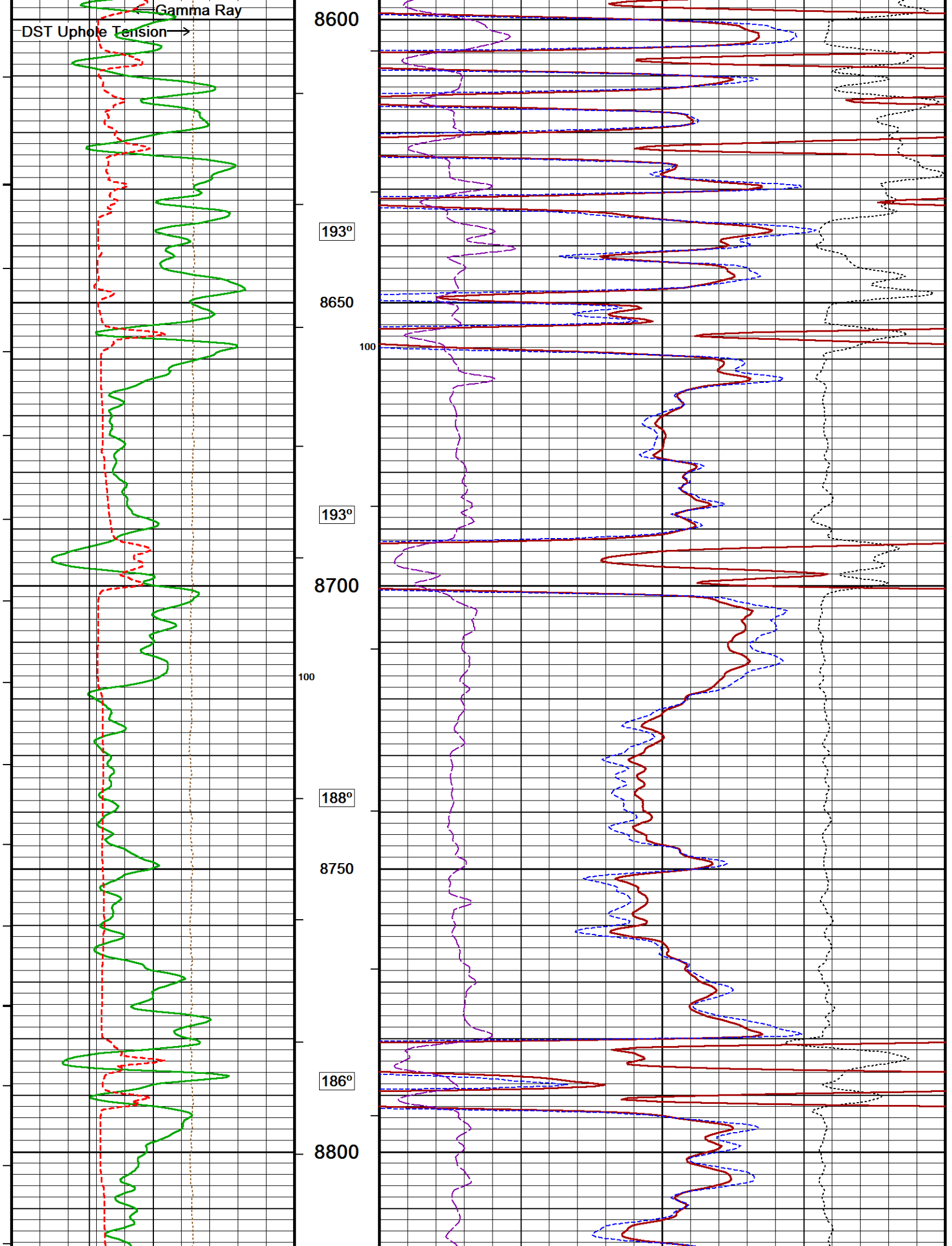


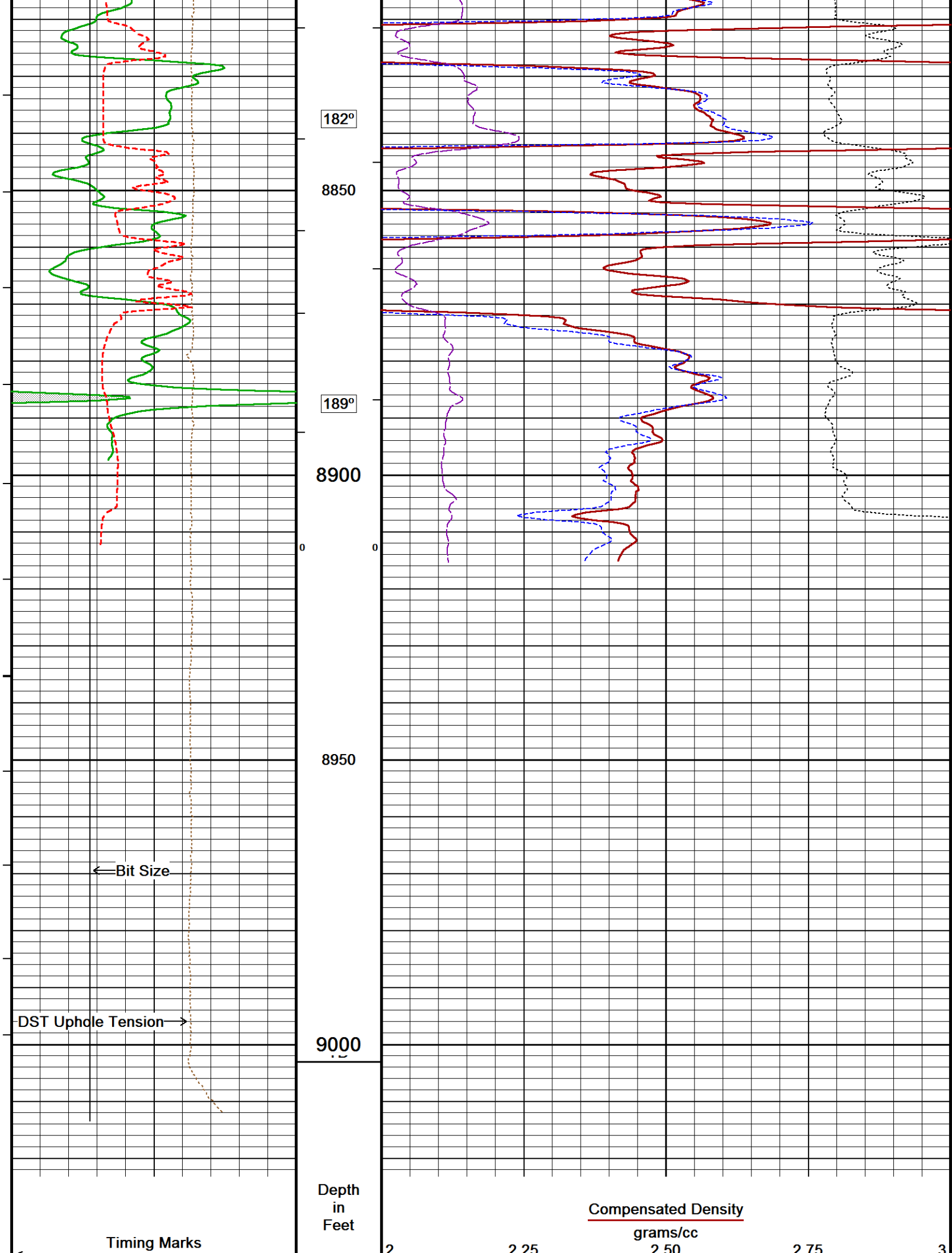


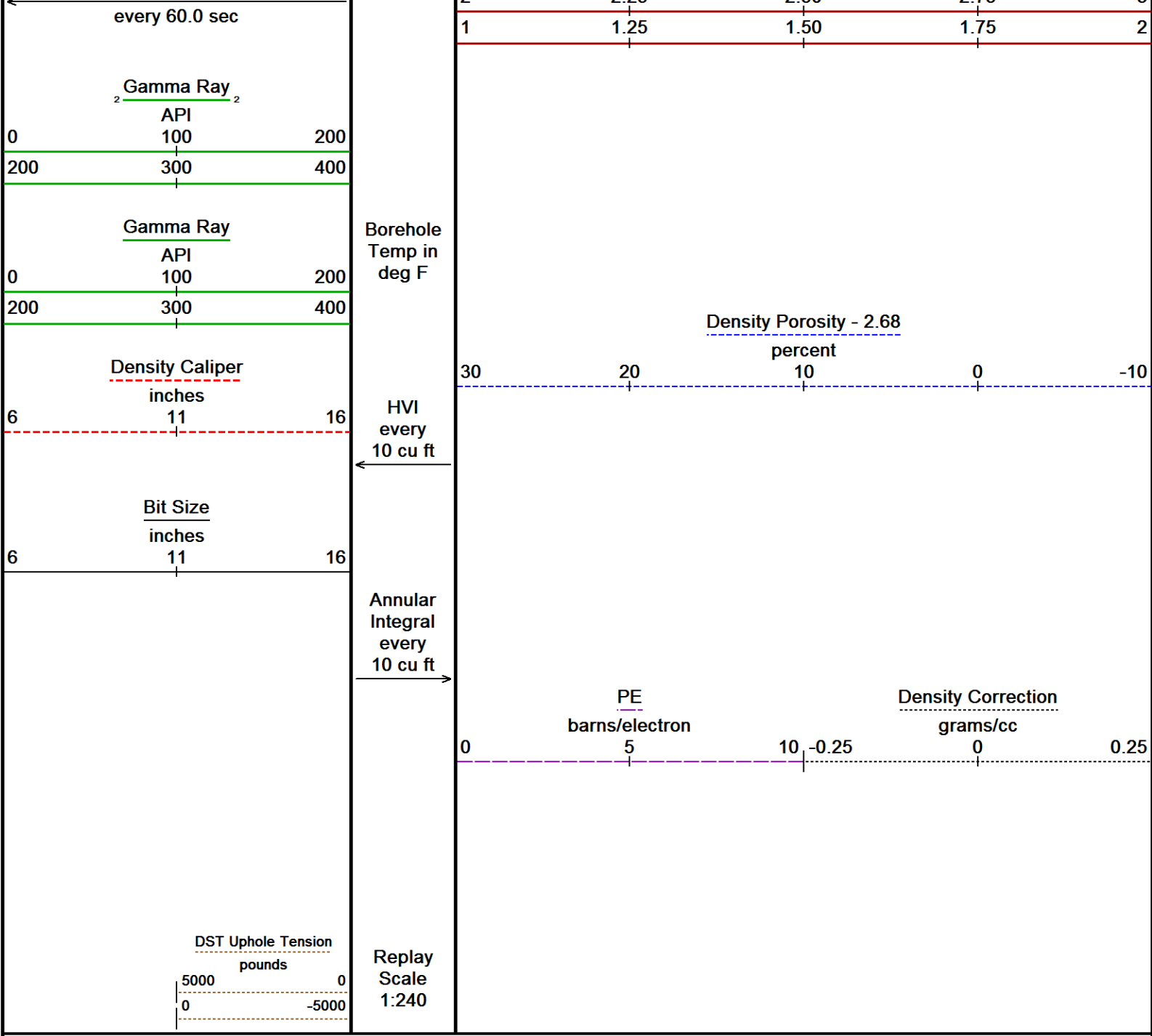












Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\16.03.839\DATA\Caerus\Caerus\Puckett 32A-26_Triple Combo_Main Spliced.dta
System Versions: Processed with 16.03.1458 Plotted with 16.03.1458

5 INCH MAIN LOG

BEFORE SURVEY CALIBRATION		
C:\16.03.839\DATA\Caerus\Caerus\Puckett 32A-26_Triple Combo_Main Spliced.dta		
General Constants All 000		Last Edited on 29-JAN-2017,19:46
General Parameters		
Mud Resistivity	1.803	ohm-metres
Mud Resistivity Temperature	82.000	degrees F
Water Level	0.000	feet
Borehole Fluid 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

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	0.620	
RWA Constant M	2.150	
SW/APOR Tool Source	0.000	
High Resolution Temperature Calibration MCG-E.A 514		
	Measured	Calibrated(Deg F)
Lower	32.00	32.00
Upper	100.00	100.00
High Resolution Temperature Constants MCG-E.A 514		
Pre-filter Length	11	
Gamma Calibration MCG-E.A 514		
	Measured	Calibrated (API)
Background	44	29
Calibrator (Gross)	983	655
Calibrator (Net)	940	626
Gamma Calibration Tolerances MCG-E.A 514		
Ratio	1.501	Counts/API
	1.40 1.475 1.55	
Gamma Constants MCG-E.A 514		
Gamma Calibrator Number	GRC 51	
GRC-M Calibrator Jig in Use?	NO	
Inactive Background Jig in Use?	NO	
Mud Density	1.08	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Potassium Equivalence	Chloride	
K Mud Concentration	0.00	%
Magnetometer Parameters MBN-C.J 146		
Date Of Last Magnetometer Calibration	22-MAR-2015,13:57	
	X Magnetometer	Y Magnetometer
Slope	-1.000000	1.000728
Offset	-0.017225	0.018340
		Z Magnetometer
		1.002803
		0.035281
Magnetometer Constants MBN-C.J 146		
Magnetometer Calibrator Number	000	
Navigation Constants MBN-C.J 146		
Magnetic Declination	9.73	degrees East
Accelerometer Parameters MBN-C.J 146		
Date Of Last Accelerometer Calibration	20-MAR-2015,16:34	
	X Accelerometer	Y Accelerometer
Slope	-1.113362	-1.103172
Offset	-0.004743	0.003596
		Z Accelerometer
		-1.099380
		-0.005586
Accelerometer Constants MBN-C.J 146		
Accelerometer Calibrator Number	000	
Accelerometer Temperature Characterisation		
X Accelerometer		
Serial Number	1013	
Calibration Date	12-Feb-2011	
	B0	B1
Bias(α)	0.00000e+000	-9.33042e-006
		B2
		-5.43613e-009
		B3
		3.26808e-010

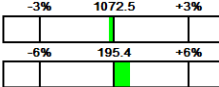
Scale Factor(mA/g)	3.00000e+000	2.57435e-004	3.69697e-007	7.37279e-010
Y Accelerometer				
Serial Number	1109			
Calibration Date	04-Jul-2011			
	B0	B1	B2	B3
Bias(g)	0.00000e+000	1.07571e-005	-7.01503e-009	9.36978e-011
	SF0	SF1	SF2	SF3
Scale Factor(mA/g)	3.00000e+000	2.76402e-004	2.92956e-007	6.97968e-010
Z Accelerometer				
Serial Number	1087			
Calibration Date	07-May-2011			
	B0	B1	B2	B3
Bias(g)	0.00000e+000	7.29157e-006	2.12028e-008	9.77407e-011
	SF0	SF1	SF2	SF3
Scale Factor(mA/g)	3.00000e+000	2.71055e-004	2.46581e-007	1.04581e-009


Caliper Calibration MPD-C.J 379			Base Calibration on 28-DEC-2016 09:58	
			Field Calibration on 29-JAN-2017 11:34	
Base Calibration				
Reading No		Measured	Calibrator Size (in)	
1		15600	3.99	
2		24262	5.96	
3		32944	7.96	
4		41133	9.85	
5		50275	11.88	
6		N/A	N/A	
Field Calibration				
		Measured Caliper (in)	Actual Caliper (in)	
		7.88	7.96	

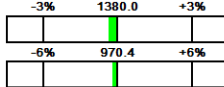
Caliper Calibration Tolerances MPD-C.J 379				
Long Arm Field Cal.	7.88	<div> <div>7.56</div> <div>7.96</div> <div>8.36</div> </div>	in	


Photo Density Calibration MPD-C.J 379					Base Calibration on 17-JAN-2017 15:44	
					Field Check on 29-JAN-2017 11:44	
Density Calibration						
Base Calibration		Measured		Calibrated (sdu)		
		Near	Far	Near	Far	
	Background	1073	1380			
	Reference 1	50367	23803	59443	30683	
	Reference 2	20635	2447	24540	2525	
Field Check at Base						
		1072.5	1380.0			
Field Check						
		1070.3	1374.9			
PE Calibration						
Base Calibration		Measured		Calibrated		
	WS	WH	Ratio	Ratio		
	Background	195	970			
	Reference 1	20669	50210	0.416	0.372	
	Reference 2	5838	20526	0.289	0.271	
Field Check at Base						
		195.4	970.4			
Field Check						
		198.0	966.3			

Photo Density Calibration Tolerances MPD-C.J 379				
Near Density Ratio	2.52	<div> <div>-5%</div> <div>2.52</div> <div>+5%</div> </div>	Far Density Ratio	21.02
PE Calibration	0.116	<div> <div>0.089</div> <div>0.110</div> <div>0.131</div> </div>		<div> <div>-5%</div> <div>21.00</div> <div>+5%</div> </div>

Near Den. Field Check 1070.3 

PE WS Field Check 198.0 

Far Den. Field Check 1374.9 

PE WH Field Check 966.3 

Density Constants MPD-C.J 379

Last Edited on 30-JAN-2017,13:23

Density Source Id	P21136B	
Nylon Calibrator Number	DNCE 652	
Aluminium Calibrator Number	DACC 631	
Density Shoe Profile	8 inch	
Caliper Source for Processing	Density Caliper	
PE Correction to Density	Not Applied	
Mud Density	1.08	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	
Precision Enhanced Density Processing	Not Applied	
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	
0.00	0.00	

DOWNHOLE EQUIPMENT

C:\16.03.839\DATA\Caerus\Caerus\Puckett 32A-26_Triple Combo_Main Spliced.dta

Cablehead, 11 pin
CBH-CA 226 LG: 2.40 ft WT: 24.3 lb OD: 2.244 in

11C-11B Compact Tool Adaptor
MTA-K.A 334 LG: 1.53 ft WT: 13.2 lb OD: 2.240 in

Compact Swivel Head Adaptor
SHA-J.B 588 LG: 2.30 ft WT: 22.0 lb OD: 2.244 in

Compact Comms Gamma
MCG-E.A 514 LG: 8.70 ft WT: 63.9 lb OD: 2.244 in

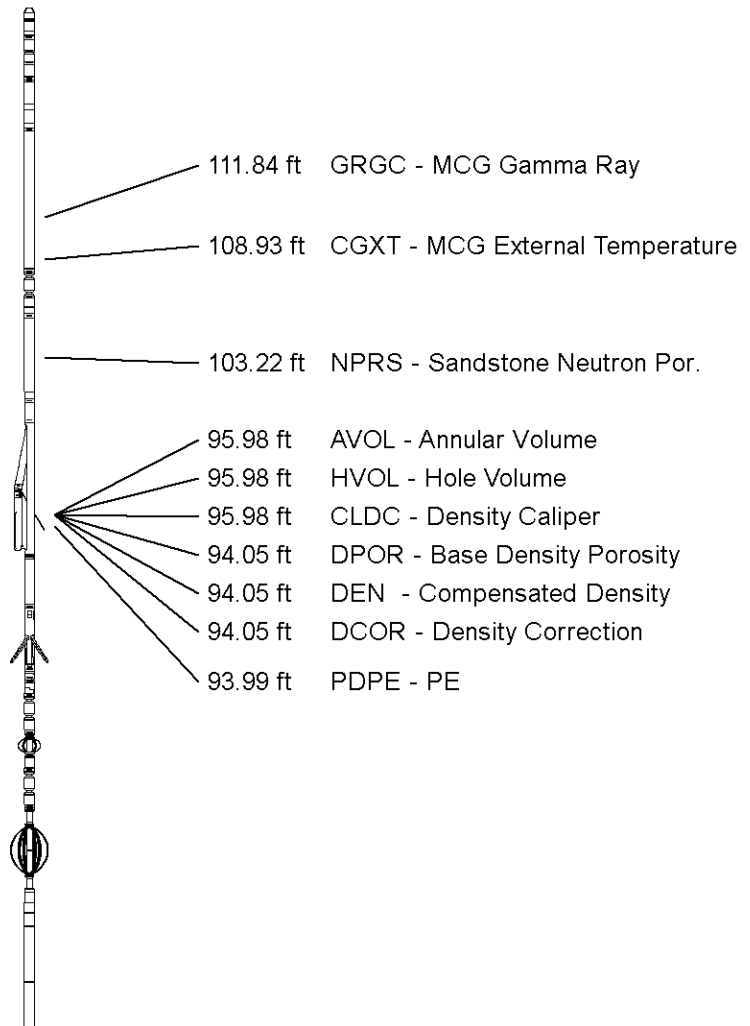
Compact Knuckle Joint
SKJ-E.B 534 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in

Compact Neutron
MDN-B.J 427 LG: 5.04 ft WT: 50.7 lb OD: 2.244 in

Compact Density/Caliper
MPD-C.J 379 LG: 9.59 ft WT: 90.4 lb OD: 2.449 in

Compact Vee Arm Caliper
MVC-A.A 141 LG: 8.06 ft WT: 61.7 lb OD: 2.244 in

Compact Knuckle Joint
SKJ-E.B 612 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in



Compact Inline Standoff sub
MIS-E.B 785 LG: 2.14 ft WT: 15.4 lb OD: 2.244 in

Compact Knuckle Joint
SKJ-E.B 533 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in

Compact Inline Bowspring sub
MIS-D.B 731 LG: 5.70 ft WT: 33.1 lb OD: 2.240 in

Compact Linker (MCL-C.A)
MLK-E.A 118 LG: 3.17 ft WT: 26.5 lb OD: 2.240 in

Compact Navigation
MBN-C.J 146 LG: 11.81 ft WT: 70.5 lb OD: 2.244 in

Compact Inline Bowspring sub
MIS-D.B 723 LG: 5.70 ft WT: 33.1 lb OD: 2.240 in

Compact Dipole Memory
MDM-C.A 212 LG: 4.48 ft WT: 39.7 lb OD: 2.244 in

Compact Dipole Receiver
MRD-C.A 212 LG: 8.89 ft WT: 88.2 lb OD: 2.244 in

Compact Dipole Transmitter
MTD-C.A 212 LG: 12.63 ft WT: 110.2 lb OD: 2.244 in

Compact Knuckle Joint
SKJ-E.B 588 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in

Compact Inline Bowspring sub
MIS-D.B 735 LG: 5.70 ft WT: 33.1 lb OD: 2.240 in

Compact Focussed Electric
MFE-C.A 404 LG: 6.05 ft WT: 48.5 lb OD: 2.244 in

Compact Induction
MAI-B.J 363 LG: 14.76 ft WT: 48.5 lb OD: 2.240 in

Total Length: 127.30 ft Weight: 970.0 lb



13.91 ft FEFE - Shallow FE

3.34 ft R400 - Array Ind. One Res 40

3.34 ft R300 - Array Ind. One Res 30

3.34 ft R200 - Array Ind. One Res 20

3.34 ft RTAO - Array Ind. One Res Rt

3.34 ft R850 - Array Ind. One Res 85

3.34 ft R600 - Array Ind. One Res 60

0.23 ft SPCG - Spontaneous Potential


Tool Zero (4.09ft from bottom)

-4.09 ft SMTU - DST Uphole Tension

All measurements relative to tool zero.

COMPANY
WELL
FIELD

Caerus Oil & Gas
Puckett 32A-26
Grand Valley

FIELD		Grand valley			
PROVINCE/COUNTY		Garfield			
COUNTRY/STATE		U.S.A. / Colorado			
Elevation Kelly Bushing	8426	feet	First Reading	9003.00	feet
Elevation Drill Floor		feet	Depth Driller	9032.00	feet
Elevation Ground Level	8396	feet	Depth Logger	9003.00	feet
<div><div><div>DUAL SPACED NEUTRON PHOTO DENSITY LOG</div><div>Weatherford®</div></div></div>					