



Weatherford
180

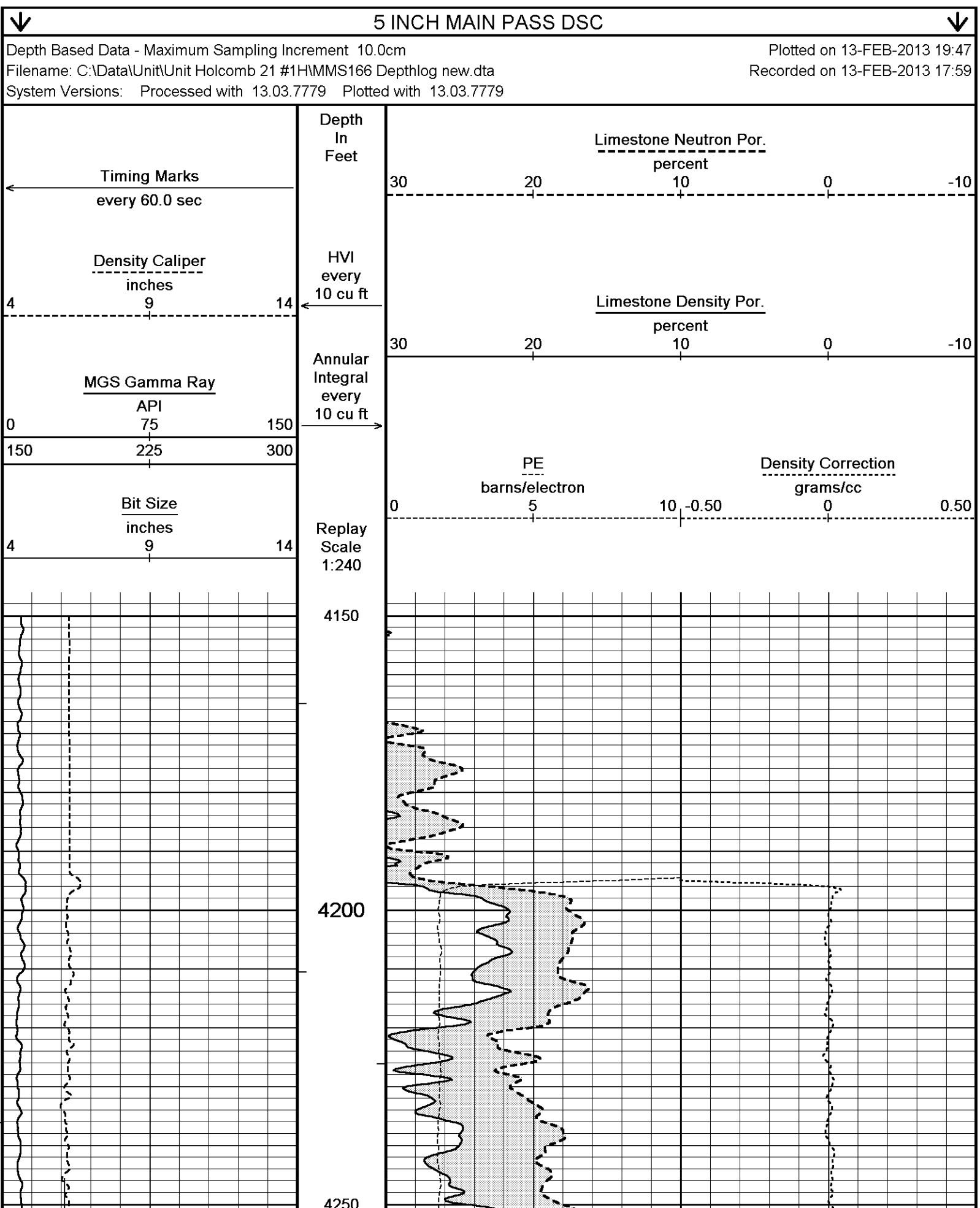
**CML WELL SHUTTLE
COMPENSATED PHOTO-DENSITY
COMPENSATED NEUTRON LOG**

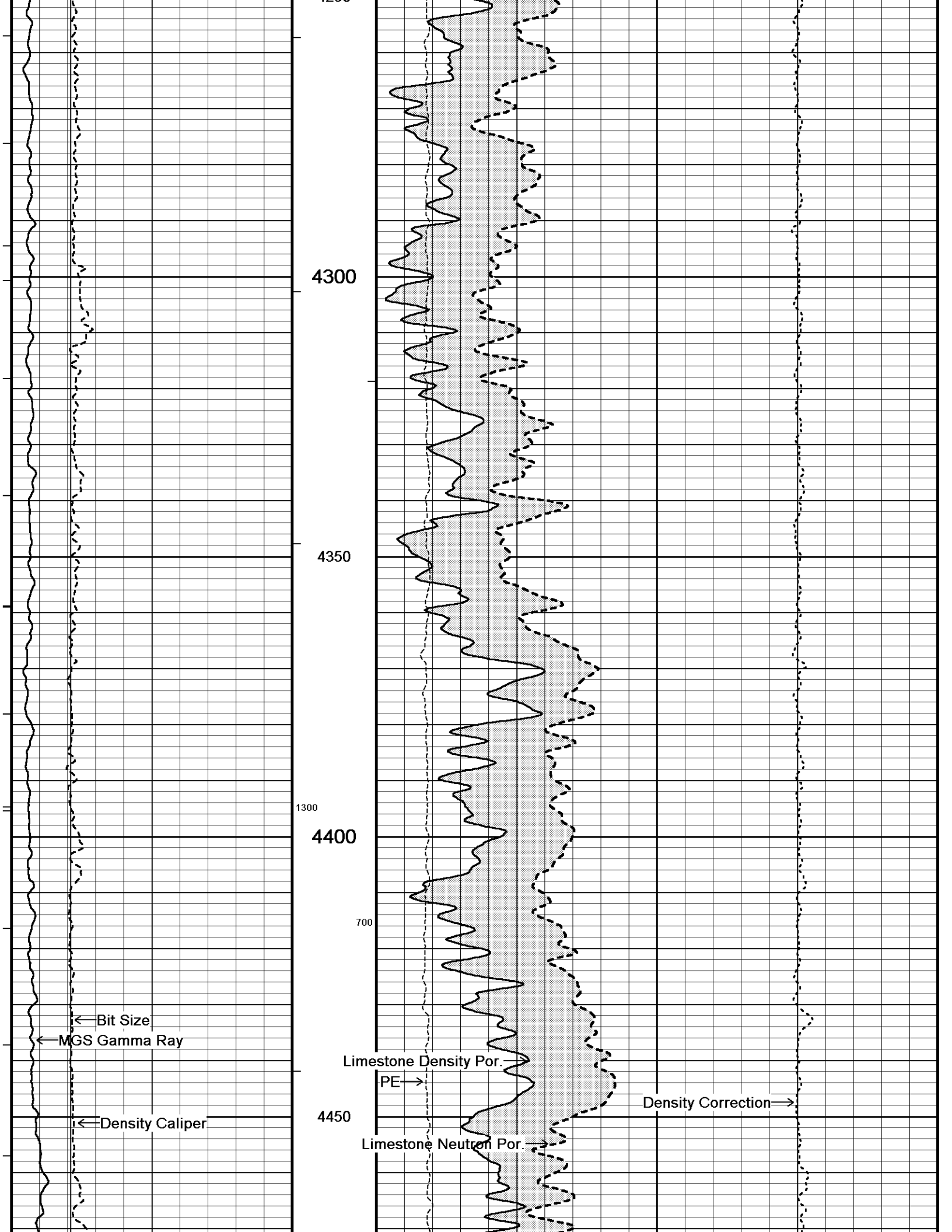
COMPANY	UNIT PETROLEUM		
WELL	HOLCOMB 21-1H		
FIELD	PLEVNA SOUTH		
PROVINCE/COUNTY	RENO		
COUNTRY/STATE	USA / KANSAS		
LOCATION	1570' FNL & 660' FWL N2 N2 SW SW		
SEC	TWP	RGE	Other Services
21	24	9W	MAI
API Number	15-155-21626-01		CMI
Permit Number			
Permanent Datum G.L., Elevation 1681 feet			Elevations:
Log Measured From KB			KB 1695.00
Drilling Measured From K.B.			DF 1695.00
			GL 1681.00
Date	13-FEB-2013		
Run Number	ONE		
Depth Driller	10053.00		feet
Depth Logger	10030.00		feet
First Reading	9960.00		feet
Last Reading	4194.00		feet
Casing Driller	4186.00		feet
Casing Logger	4194.00		feet
Bit Size	6.125		inches
Hole Fluid Type	WATER		
Density / Viscosity	8.50 lb/USg	27.00 CP	
PH / Fluid Loss	8.50	90.00 ml/30Min	
Sample Source	FLOWLINE		
Rm @ Measured Temp	1.40 @ 77.0		ohm-m
Rmf @ Measured Temp	1.12 @ 77.0		ohm-m
Rmc @ Measured Temp	1.68 @ 77.0		ohm-m
Source Rmf / Rmc	CALC	CALC	
Rm @ BHT	0.86 @ 124.0		ohm-m
Time Since Circulation	1 HOUR		
Max Recorded Temp	124.00	deg F	
Equipment Name	COMPACT		
Equipment / Base	18064	OKC	
Recorded By	C. GRIFFIN		
Witnessed By	R. WILSON		
S.O.#/AFE	3539589 / 1300500		

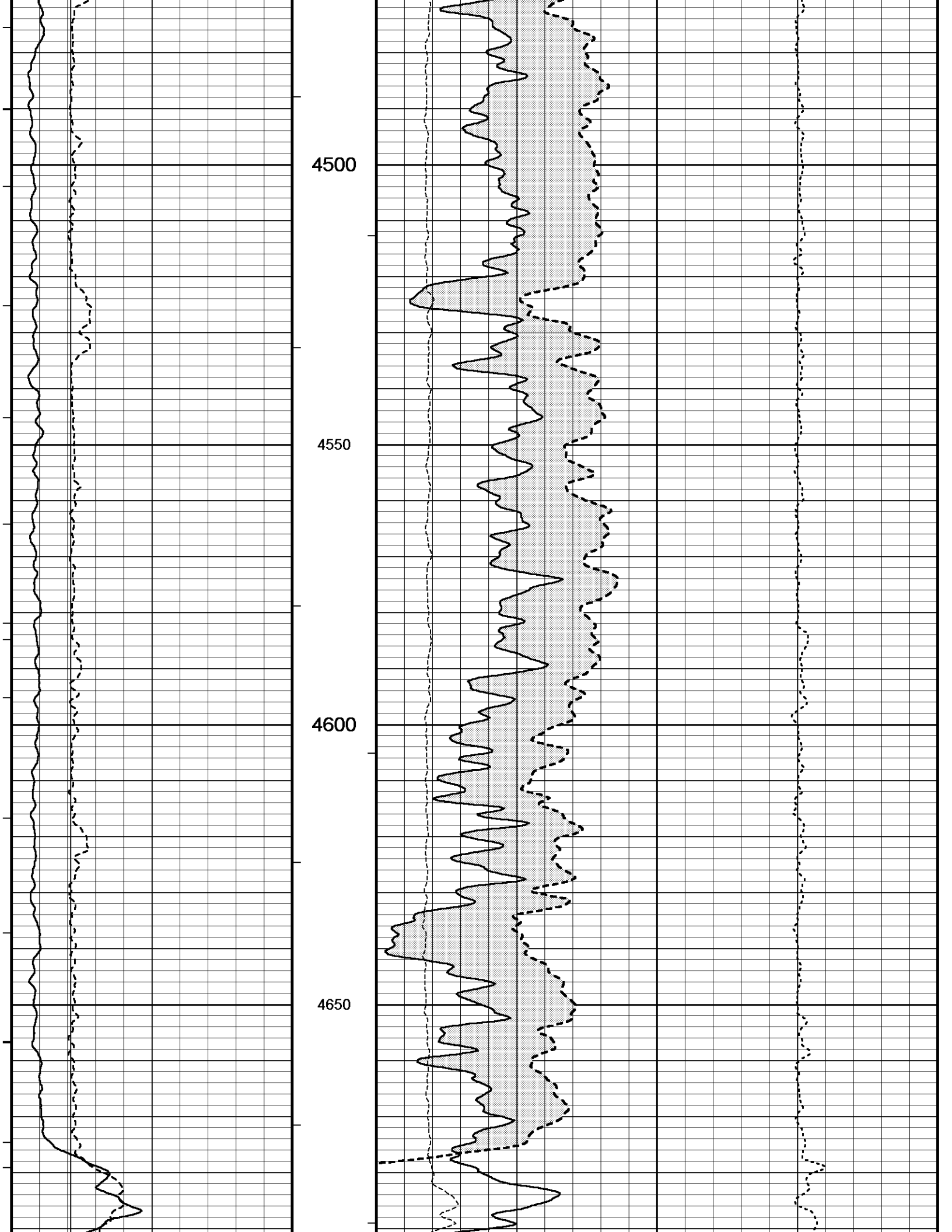
BOREHOLE RECORD			Last Edited: 13-FEB-2013 15:32	
Bit Size inches	Depth From feet		Depth To feet	
6.125	4186.00		10053.00	
CASING RECORD				
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
INTERMED	7.000	0.00	4186.00	26.00
INTERMED	9.625	0.00	1536.00	36.00

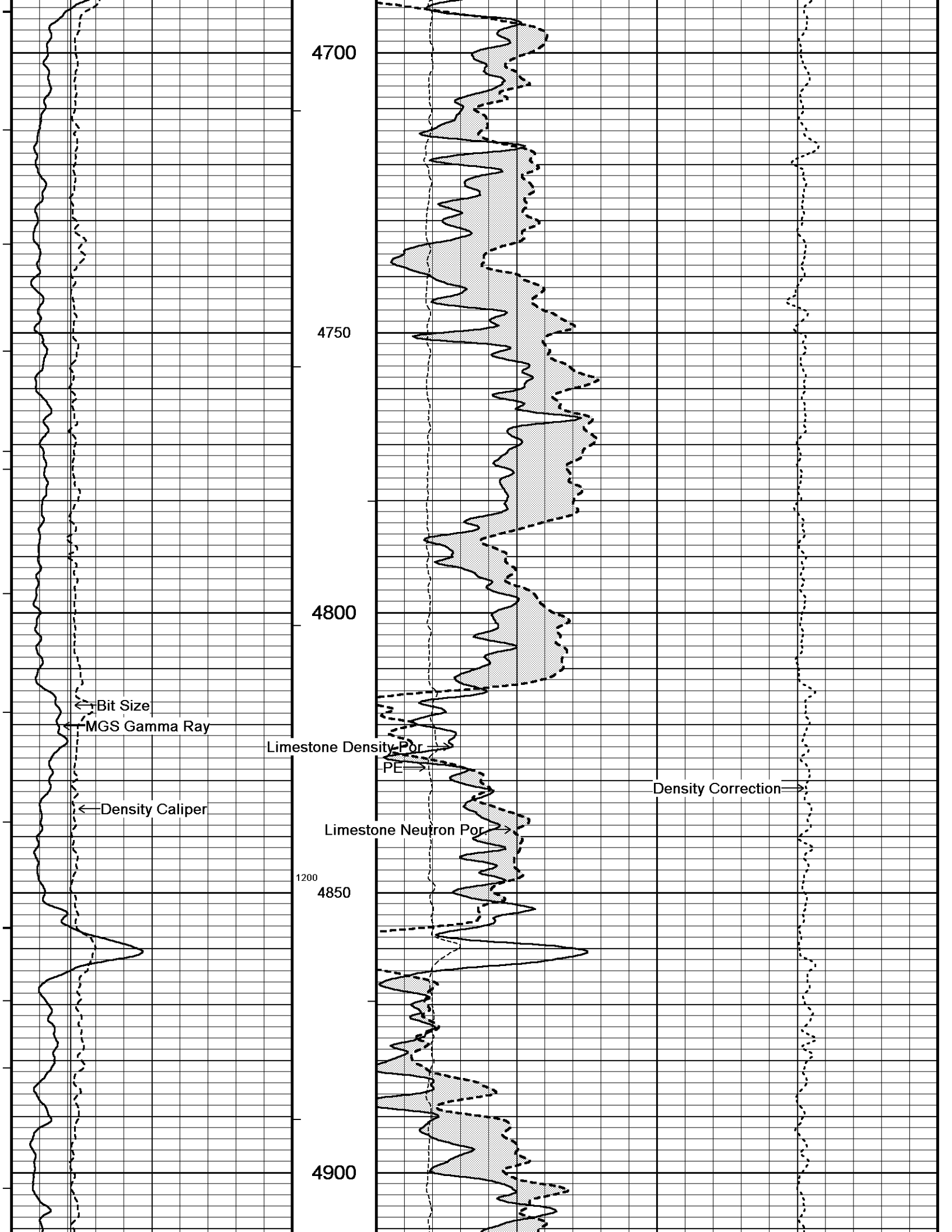
REMARKS
WLS SOFTWARE VERSION 13.03. USED. TOOLS RUN ON DRILLPIPE USING COMPACT WELL SHUTTLE DEPLOYMENT TECHNIQUE. DEPTH MEASURED USING ADVANTAGE RIG DEPTH CORRECTED TO PIPE TALLY. TOOLS DEPLOYED WITH MULE SHOE SITTING AT 9929FT. AFTER DEPLOYMENT LOGGING TOOL WAS AT 10030 FT. TIGHT SECTIONS PRESENT DOWNHOLE WILL AFFECT CALIPER AND IMAGE READINGS 4.5 " PRODUCTION CASING USED TO CALCULATE ANNULAR HOLE VOLUMES. OPERATORS: S. WORLEY, P. BURGER RIG: UNIT 331

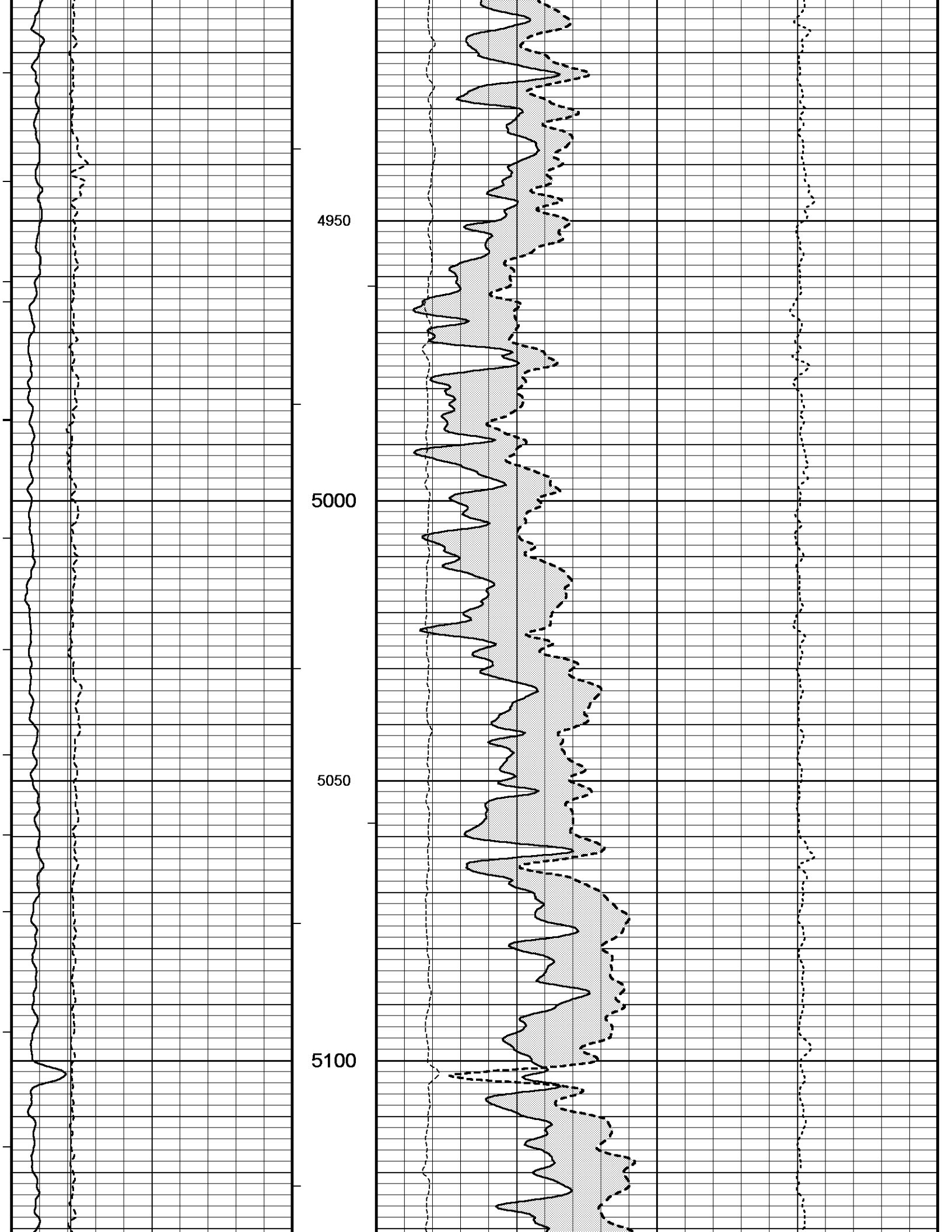
or correctness of any interpretations, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions in our price schedule.

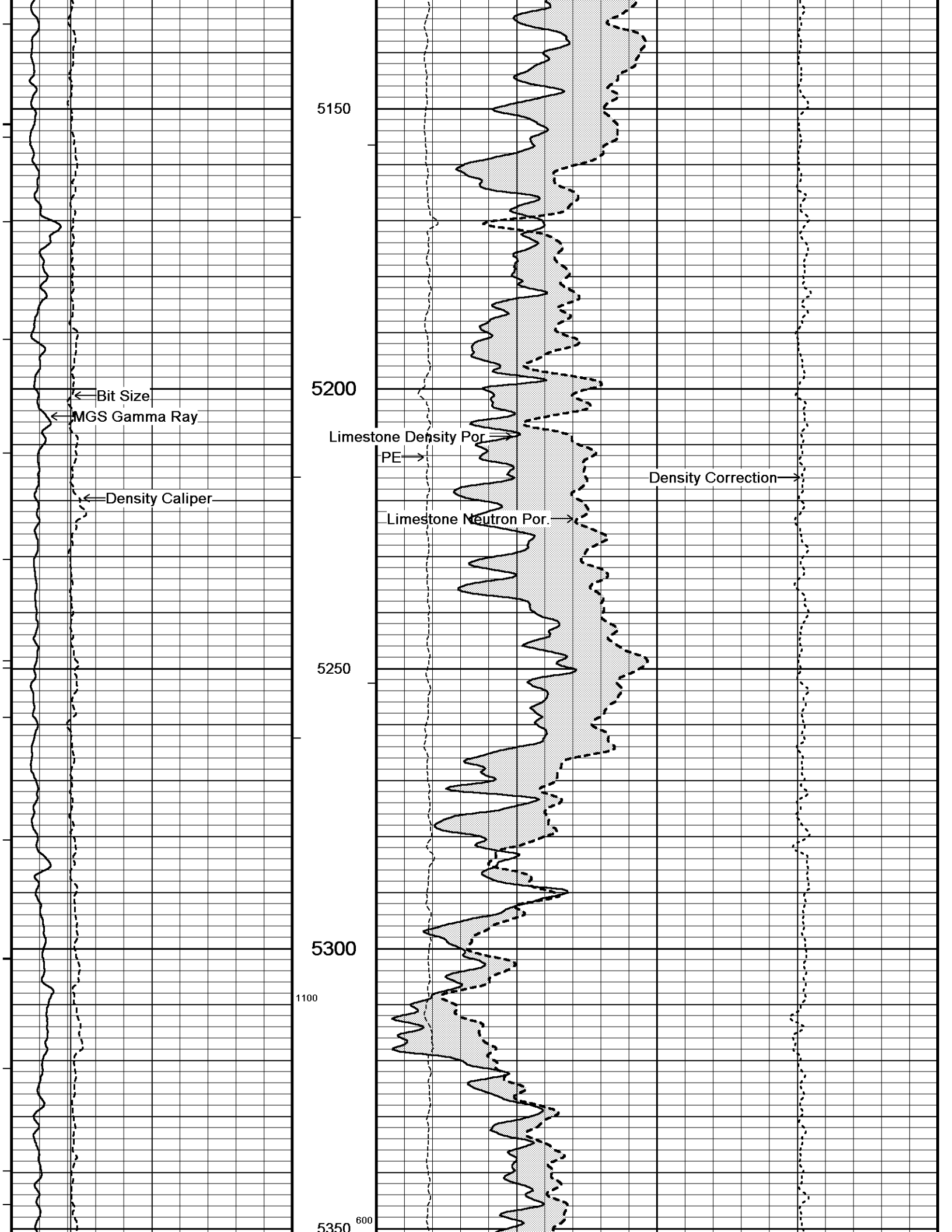


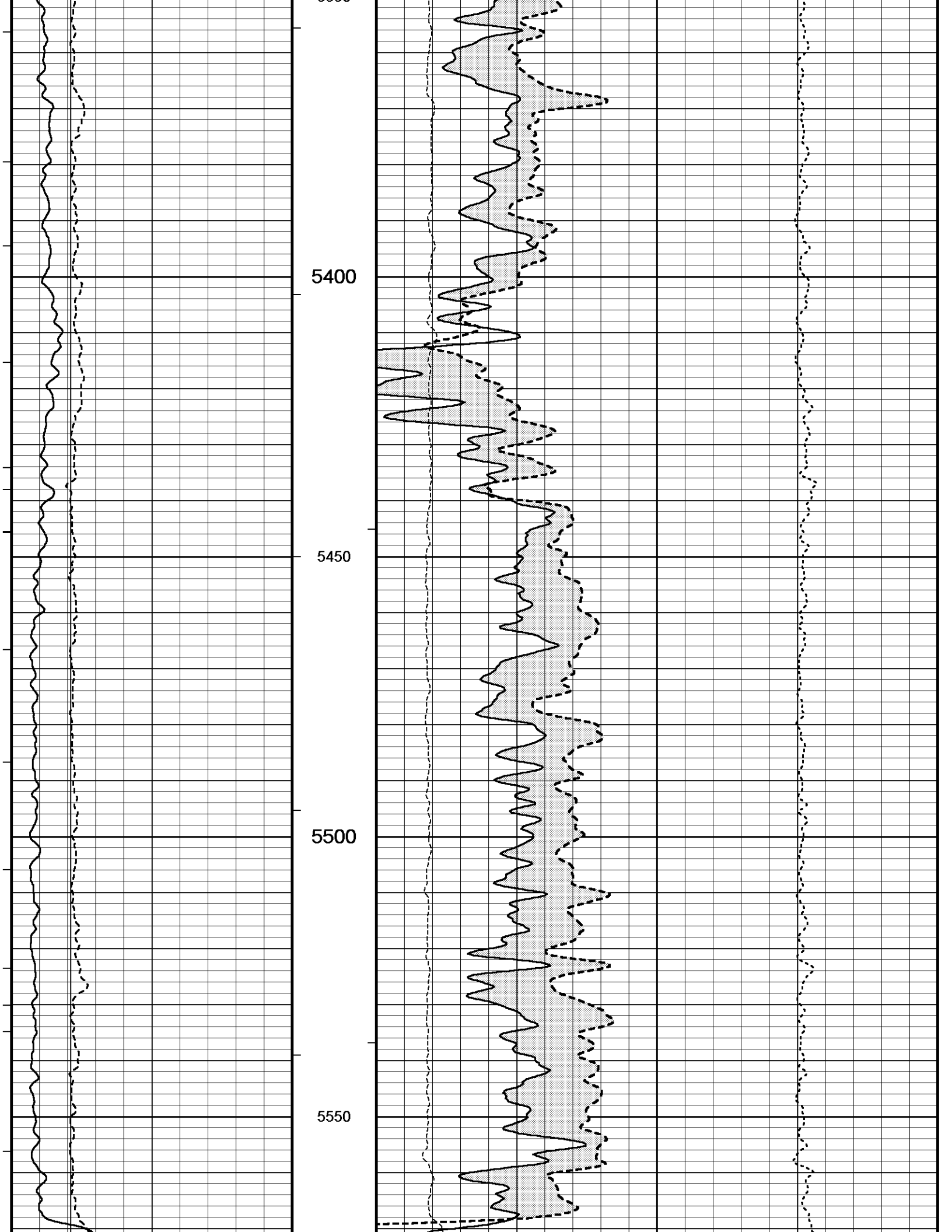


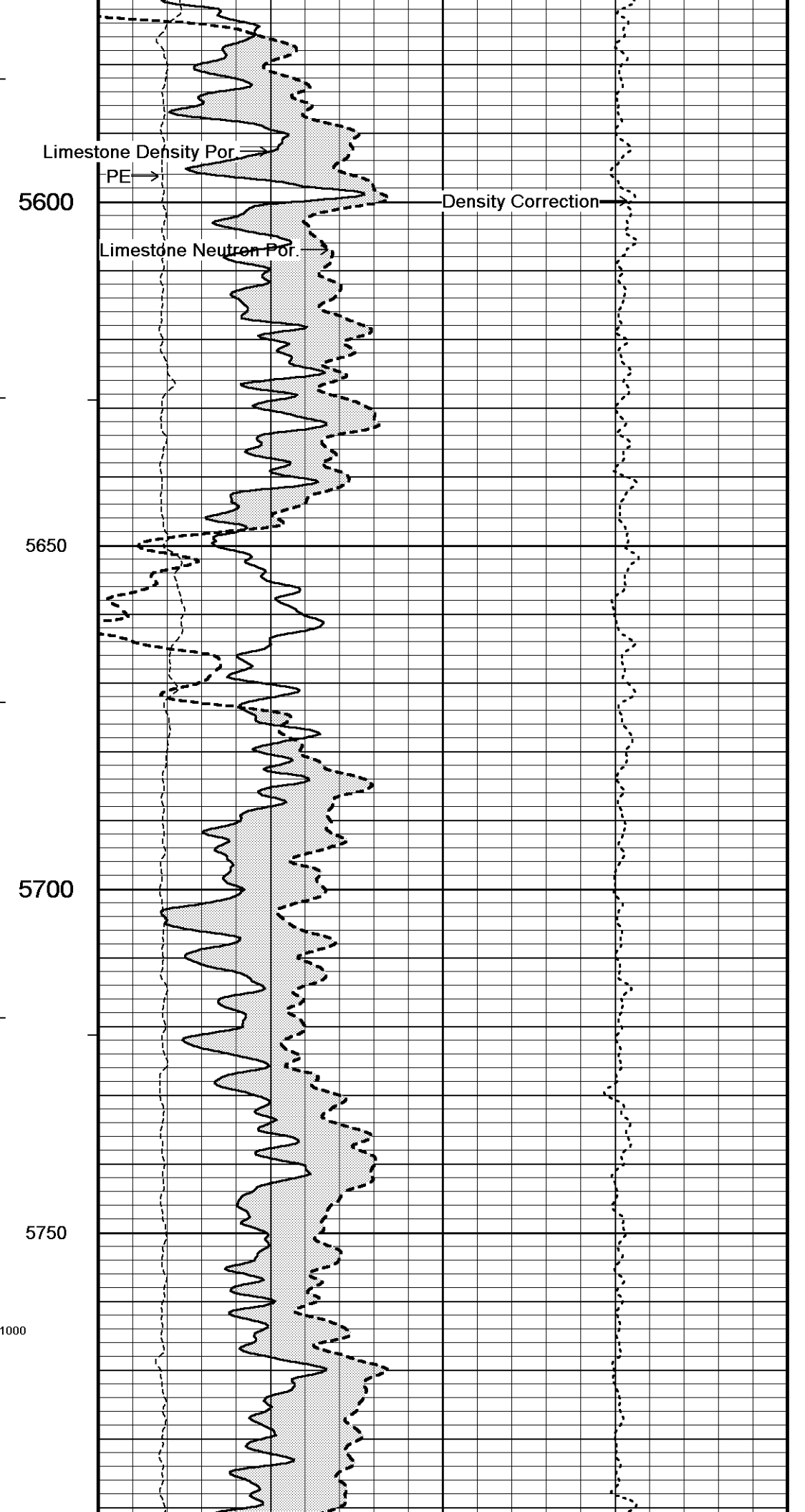
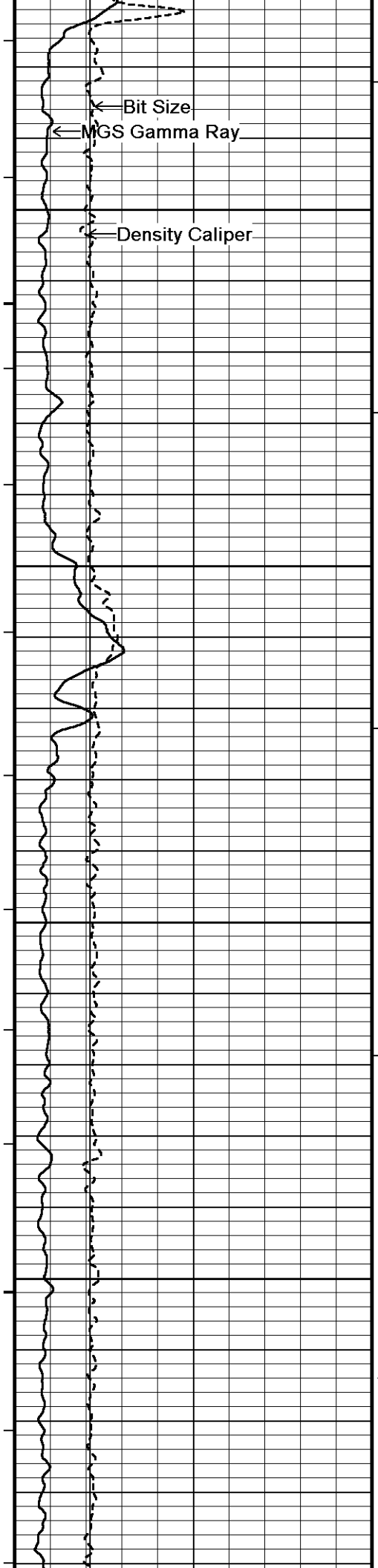


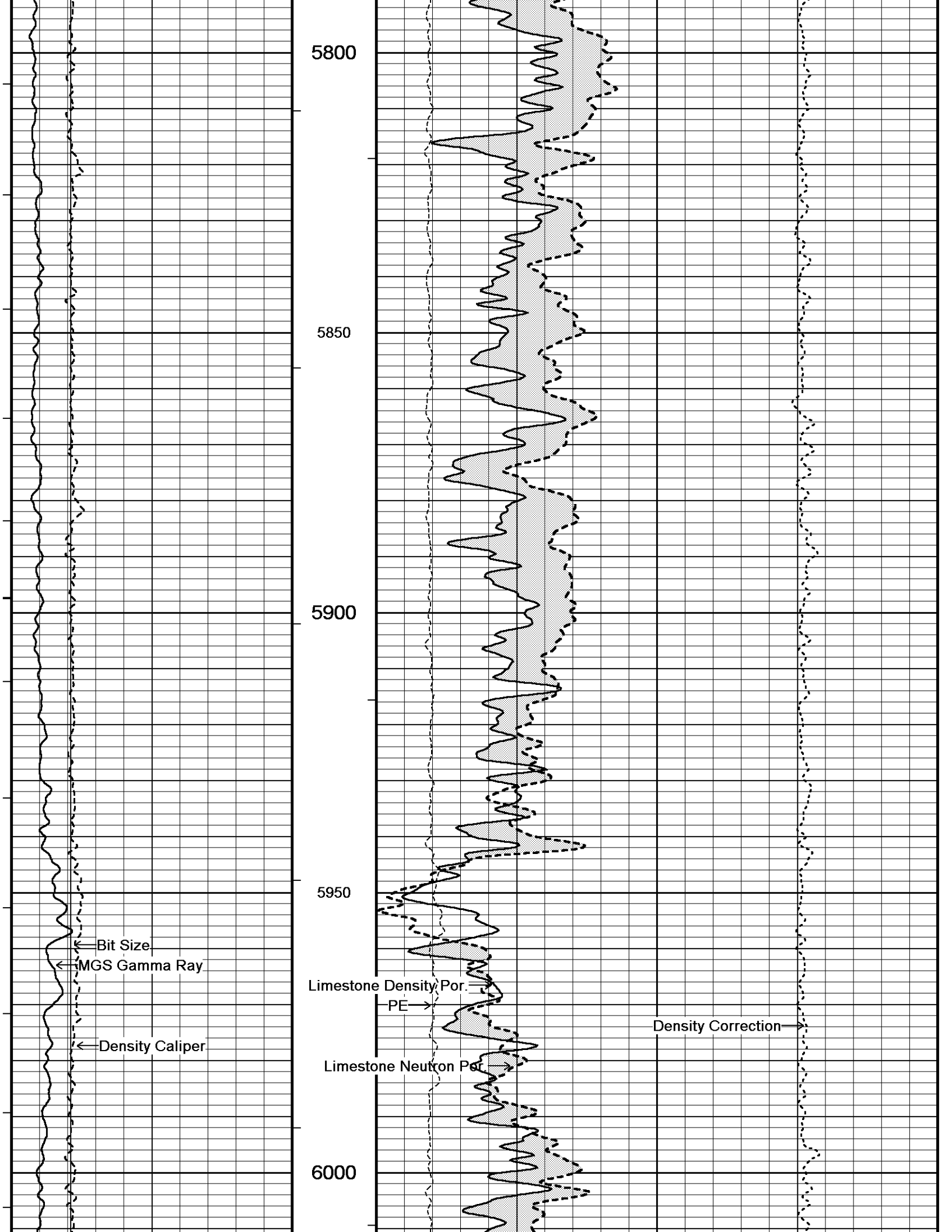


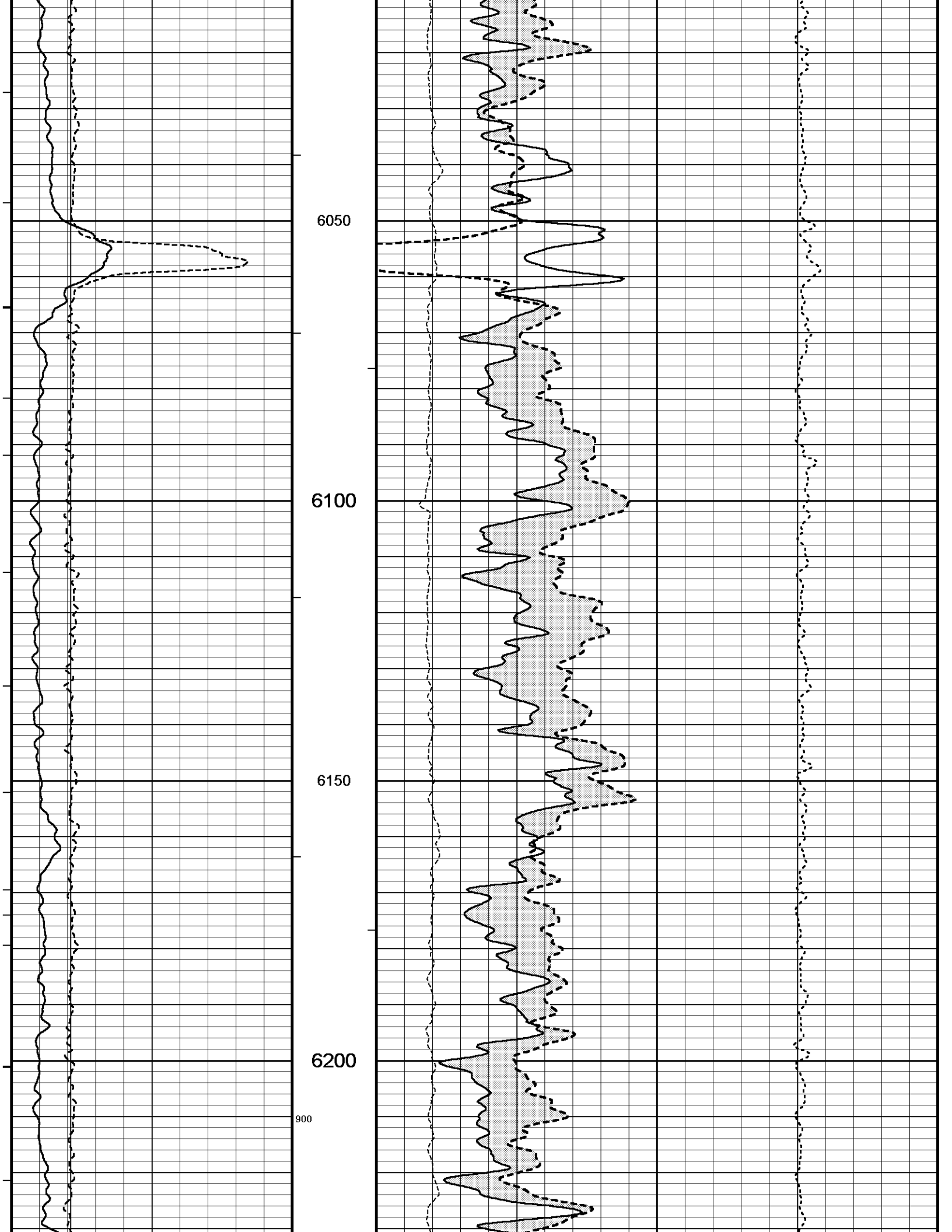


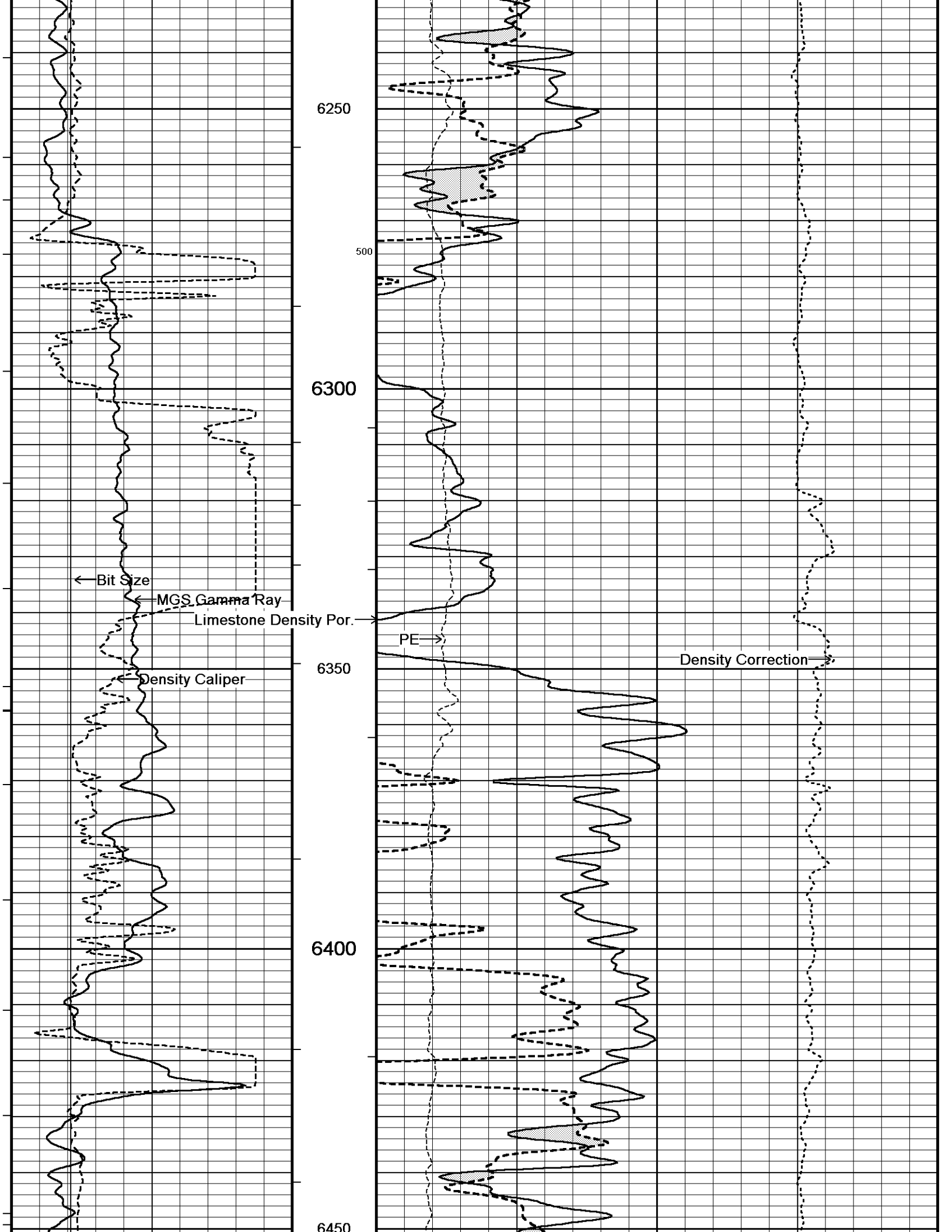


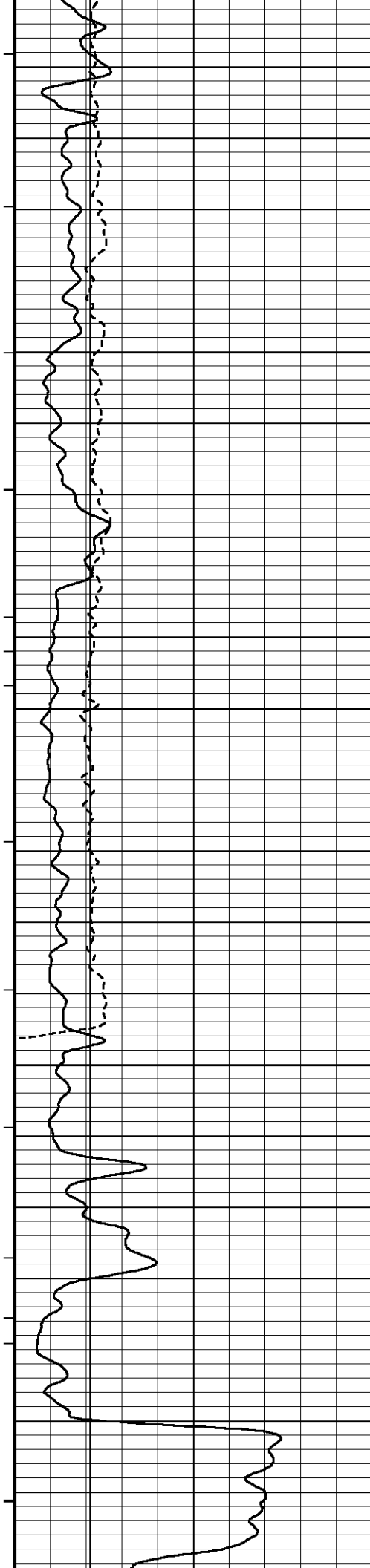




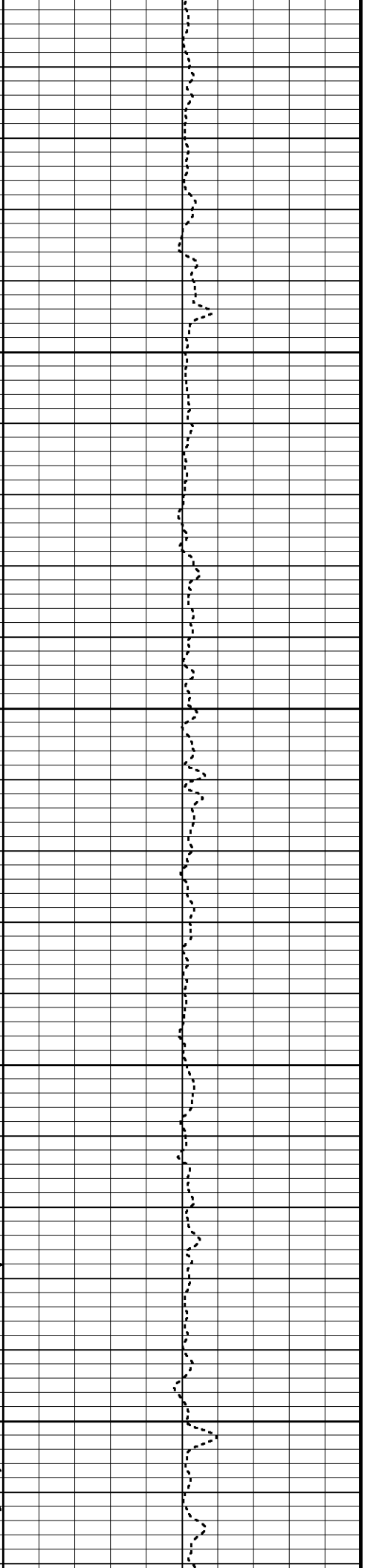
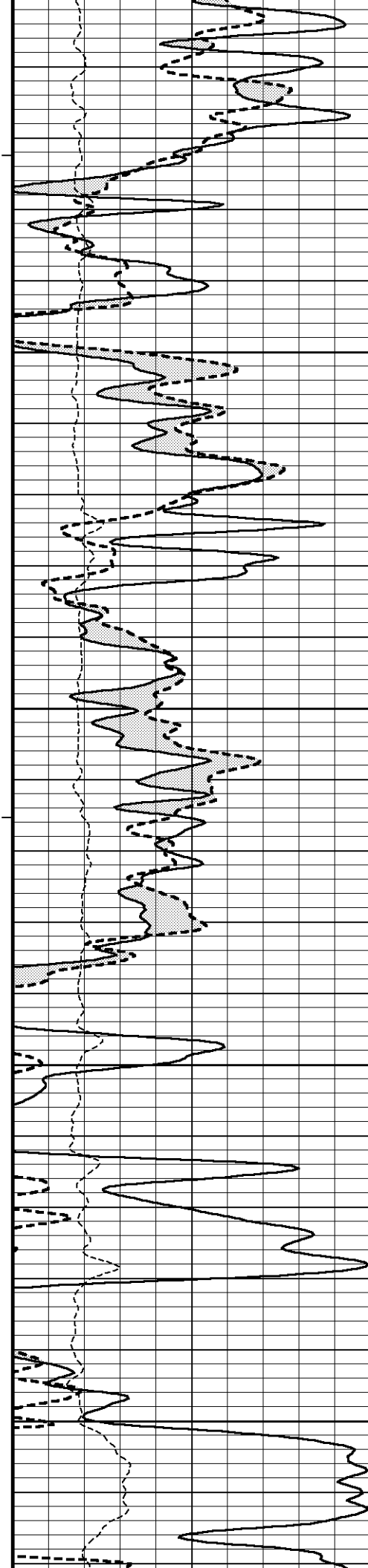


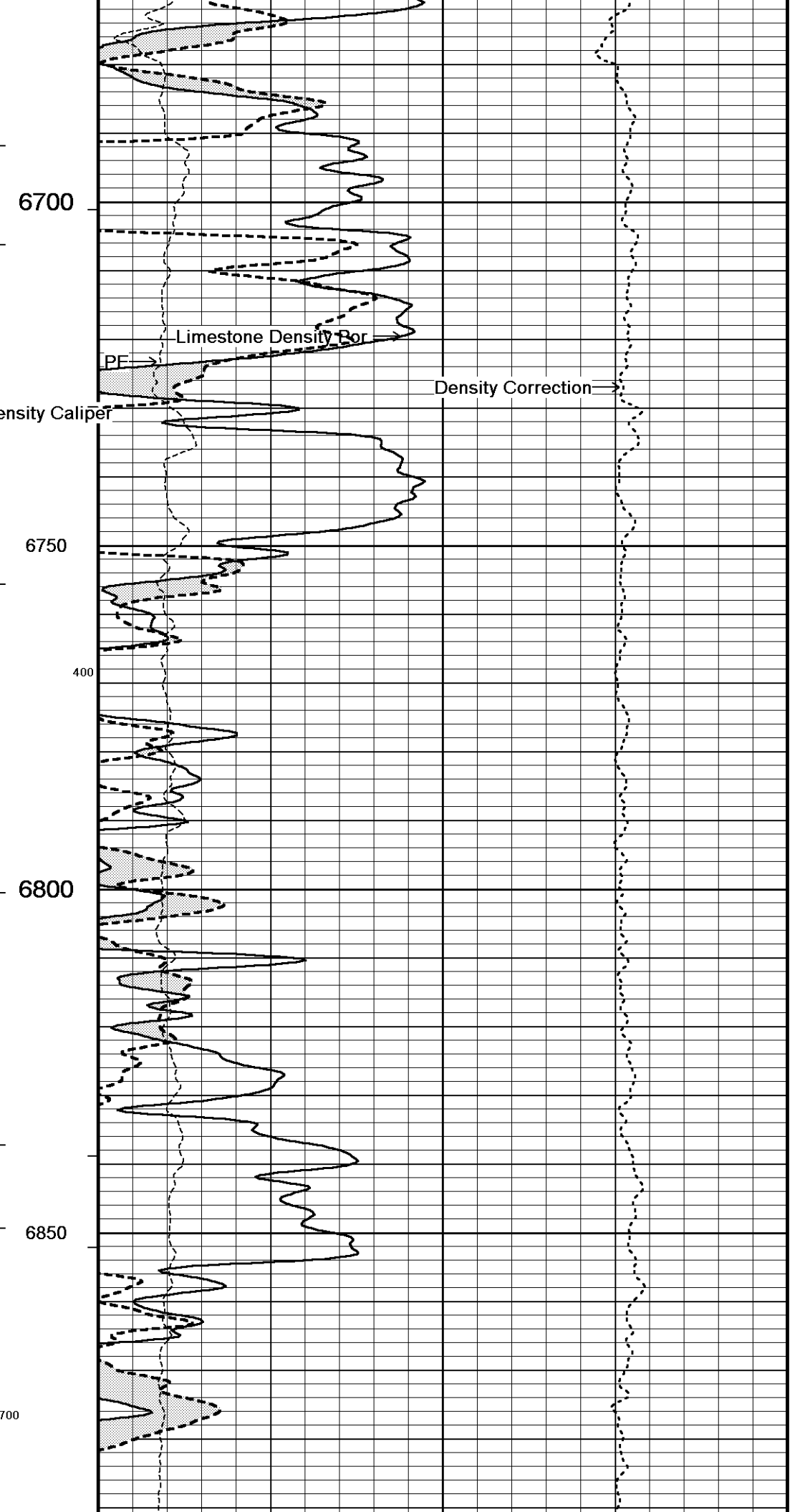
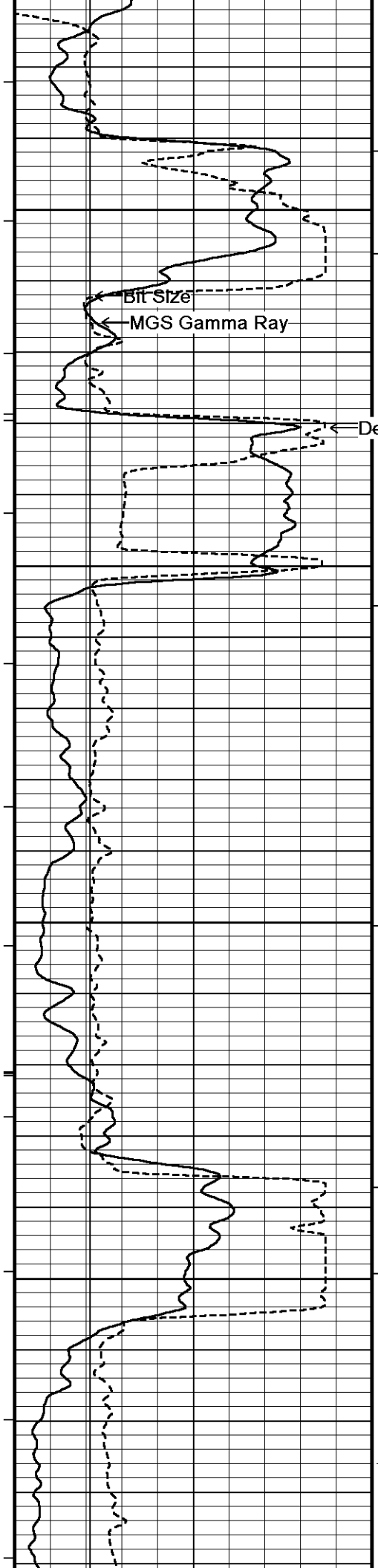






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Bit Size

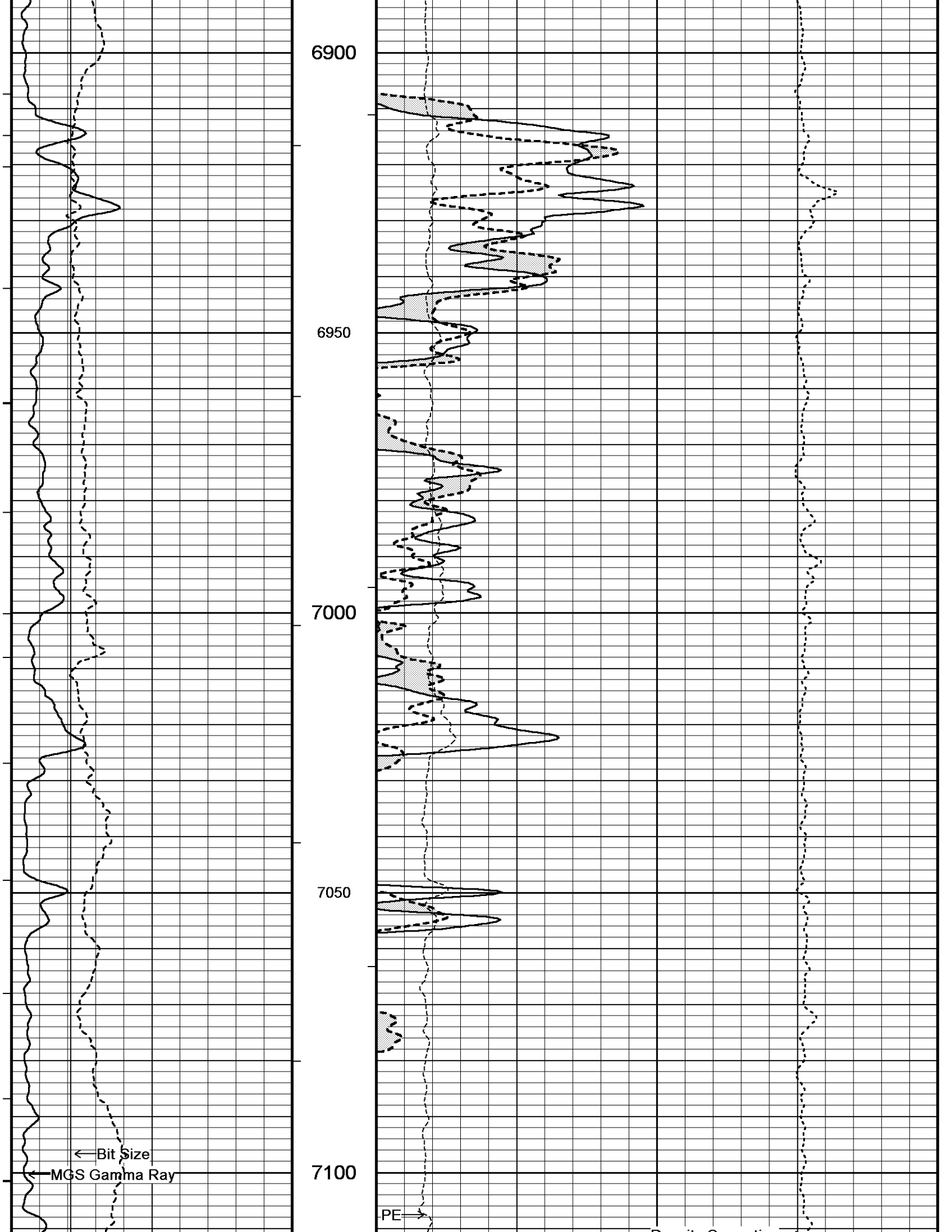
MGS Gamma Ray

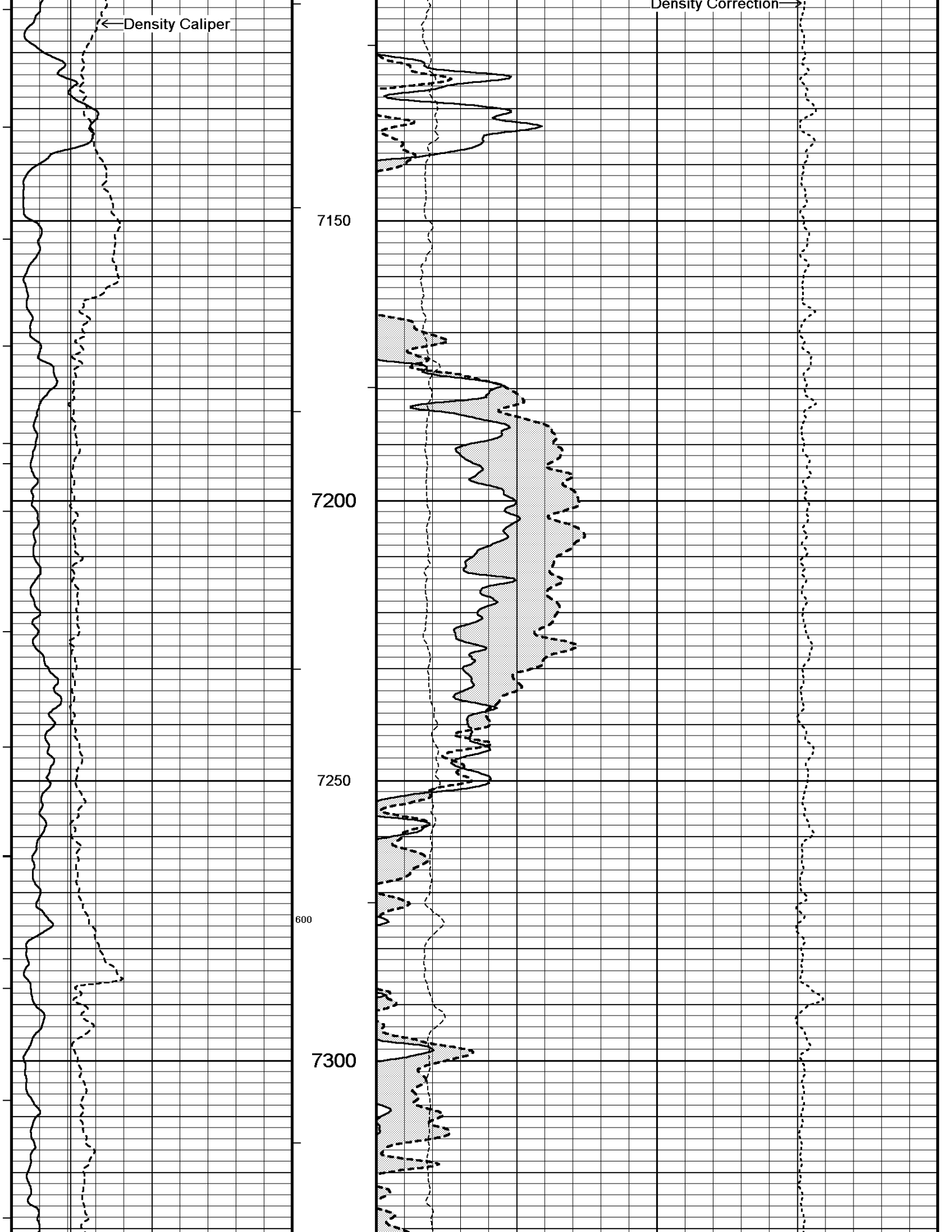
Density Caliper

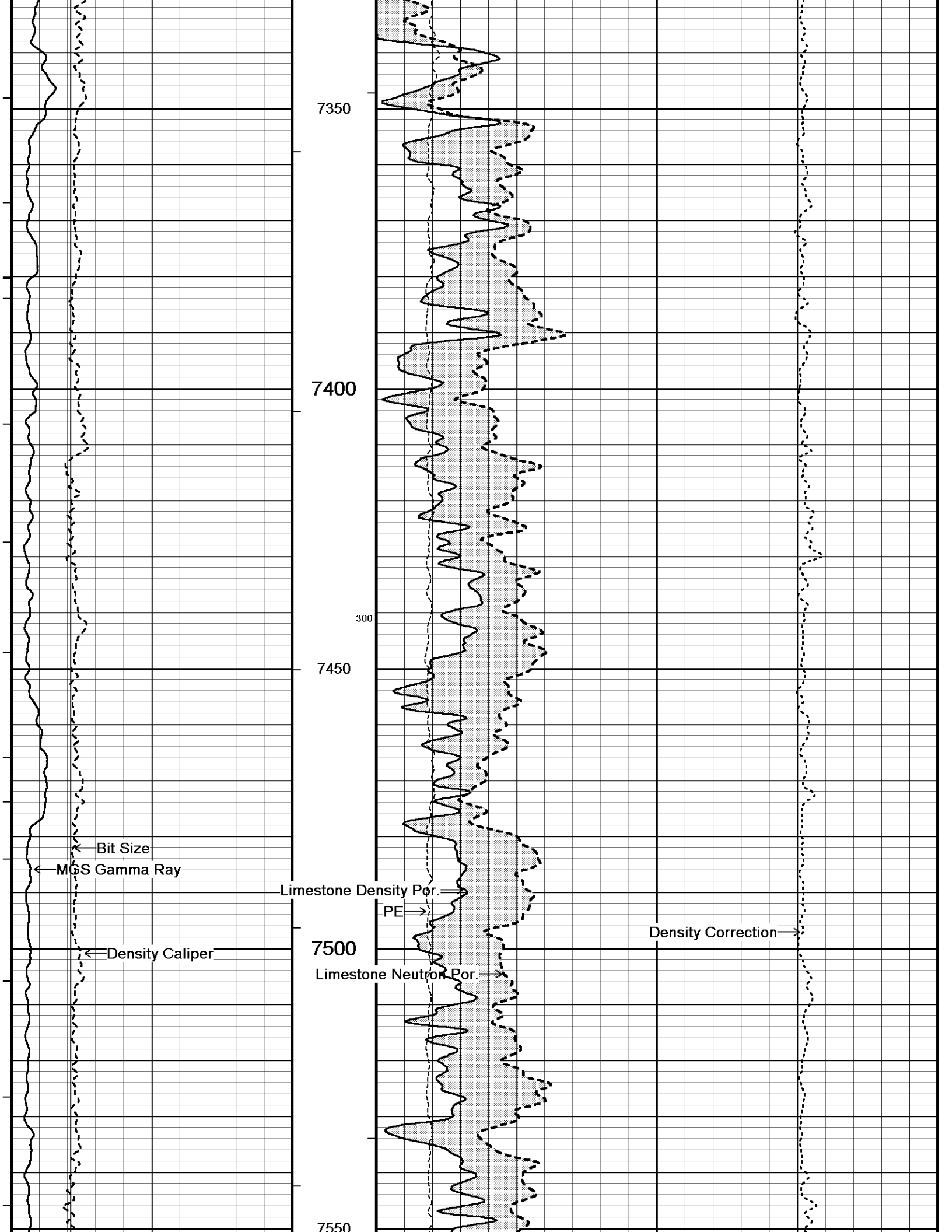
PF

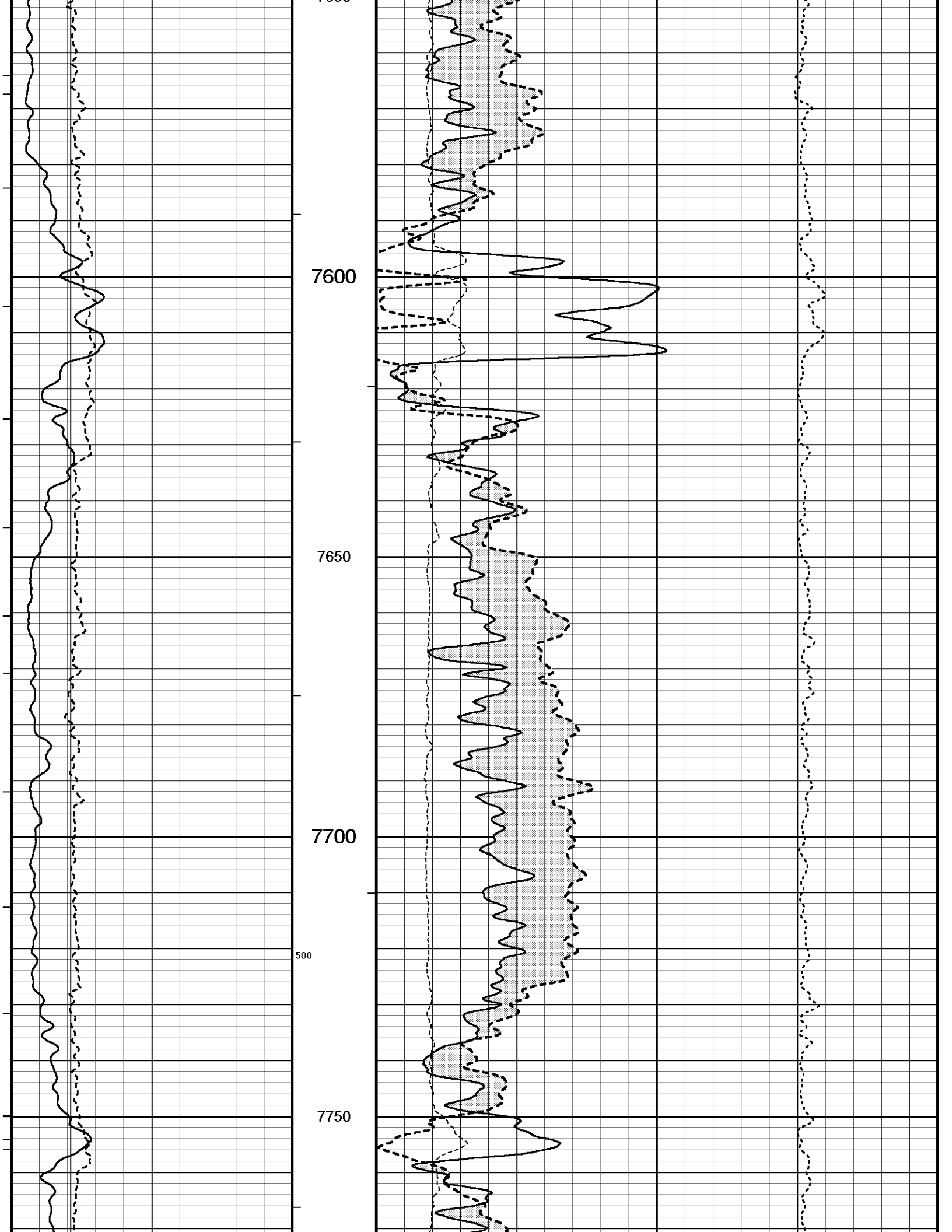
Limestone Density Log

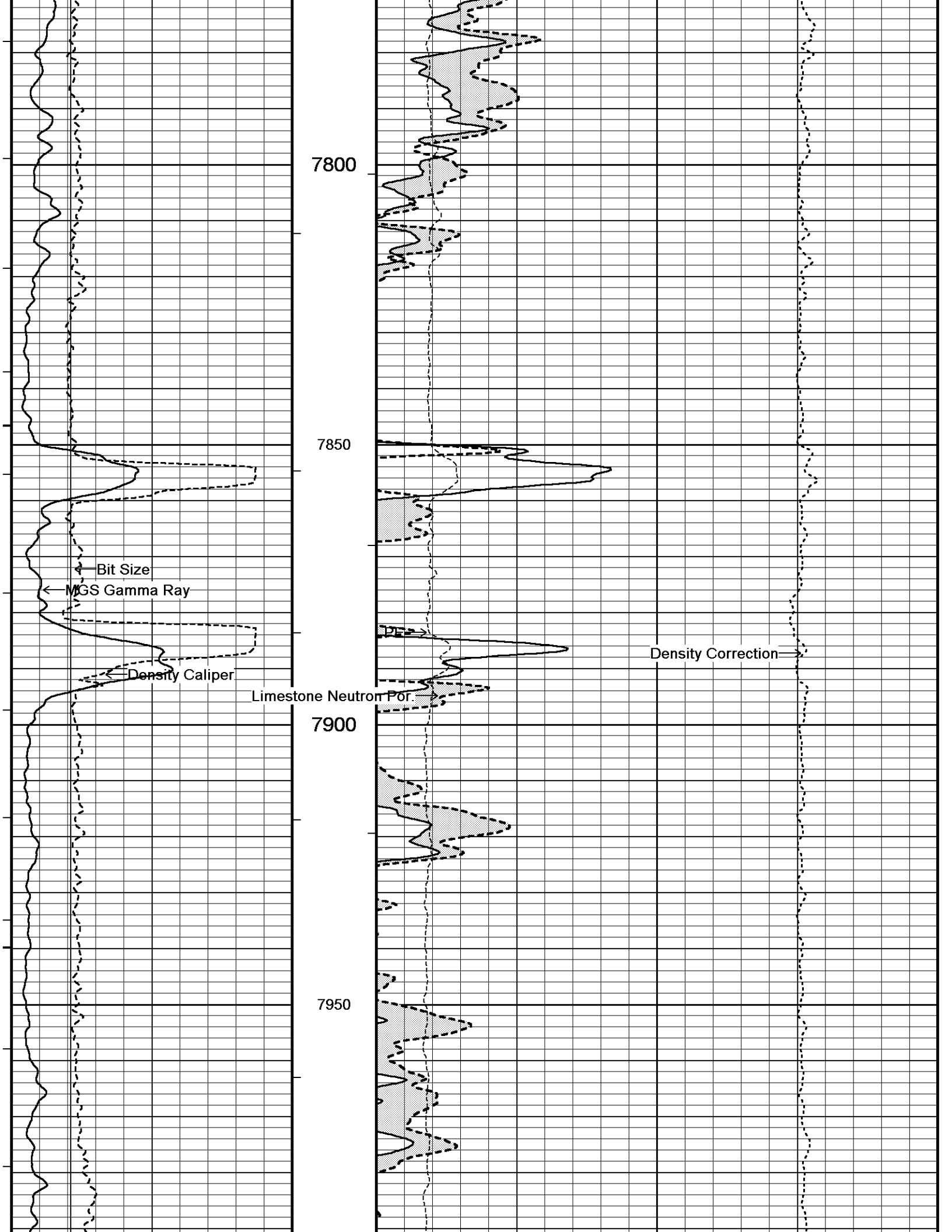
Density Correction

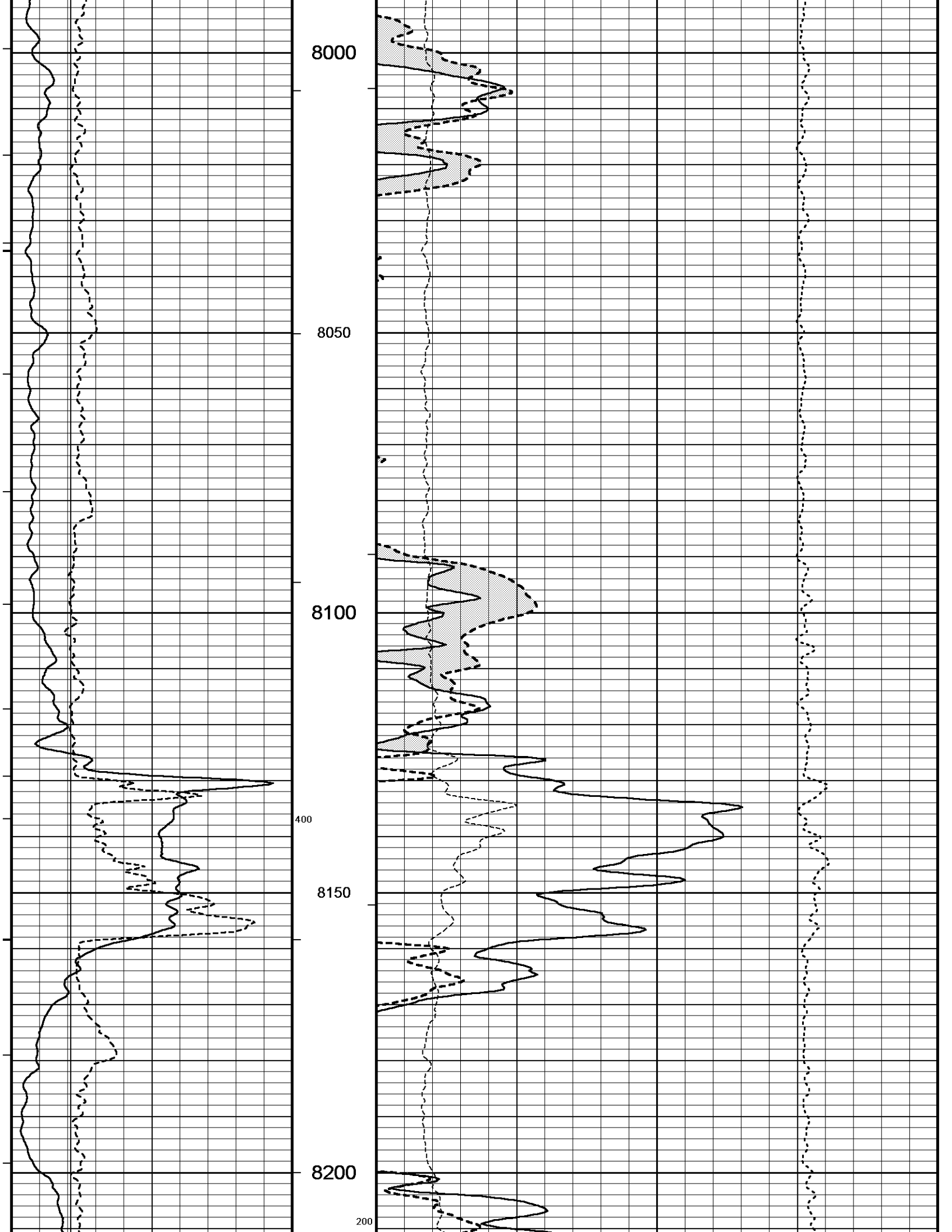


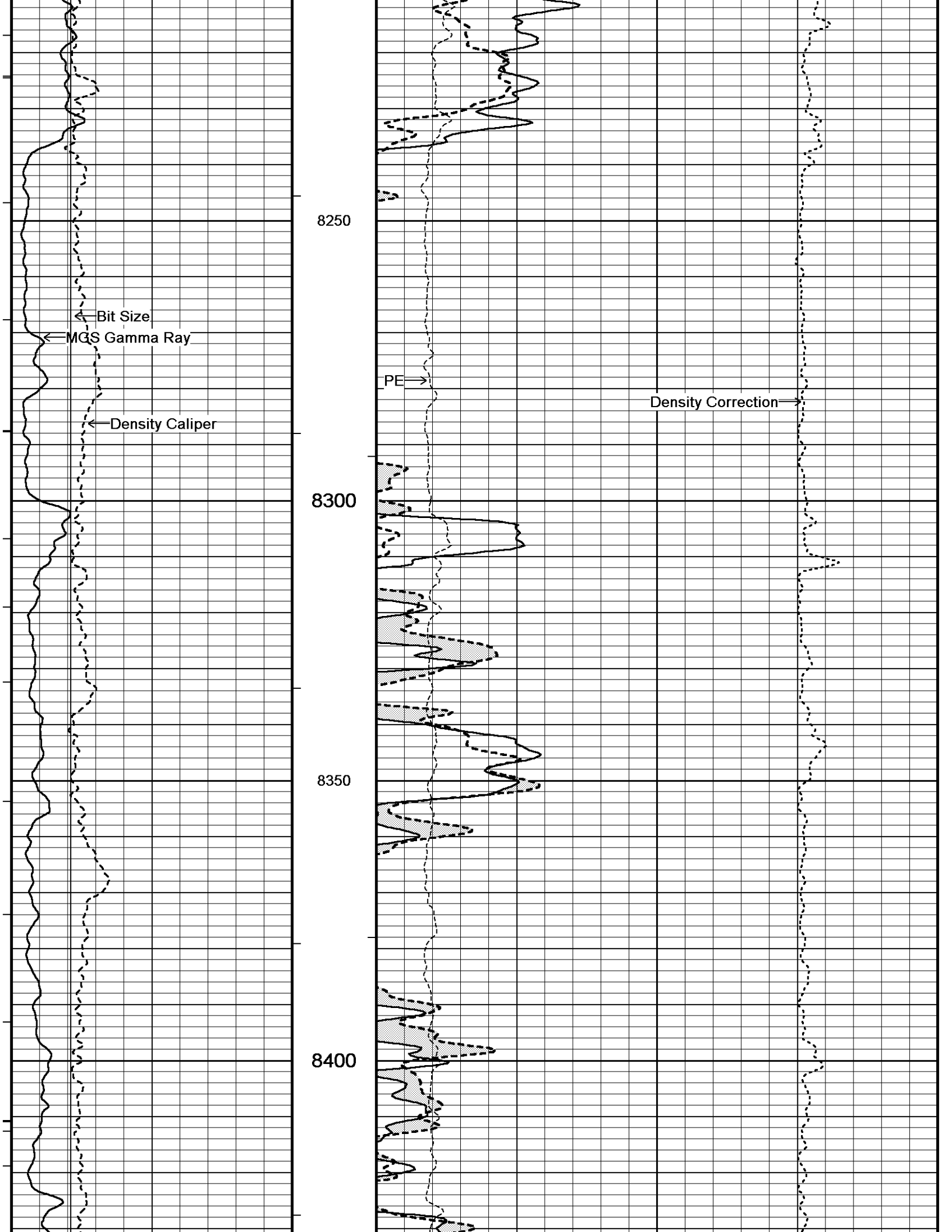


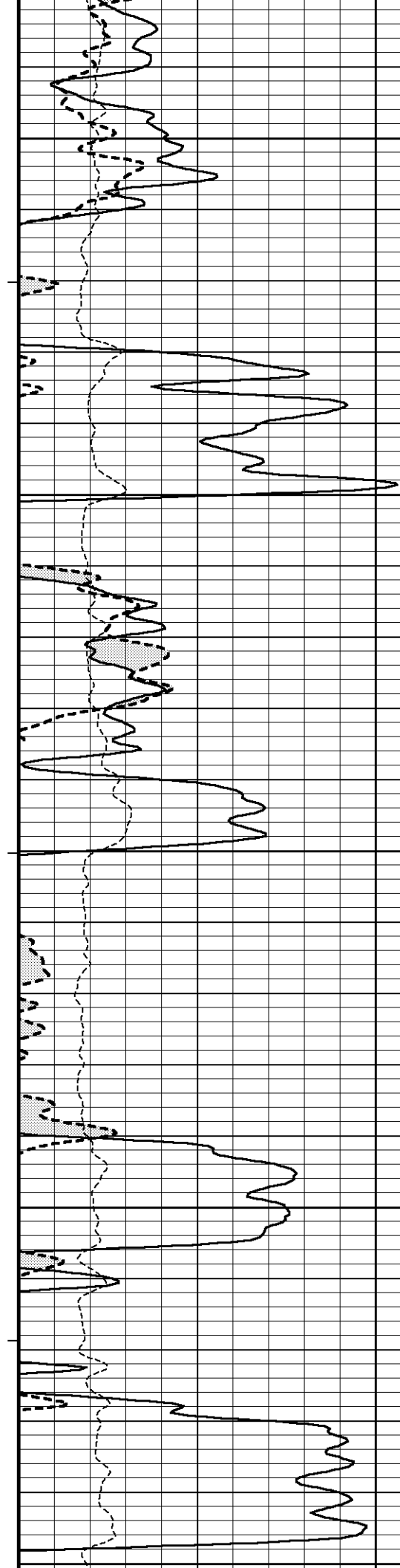
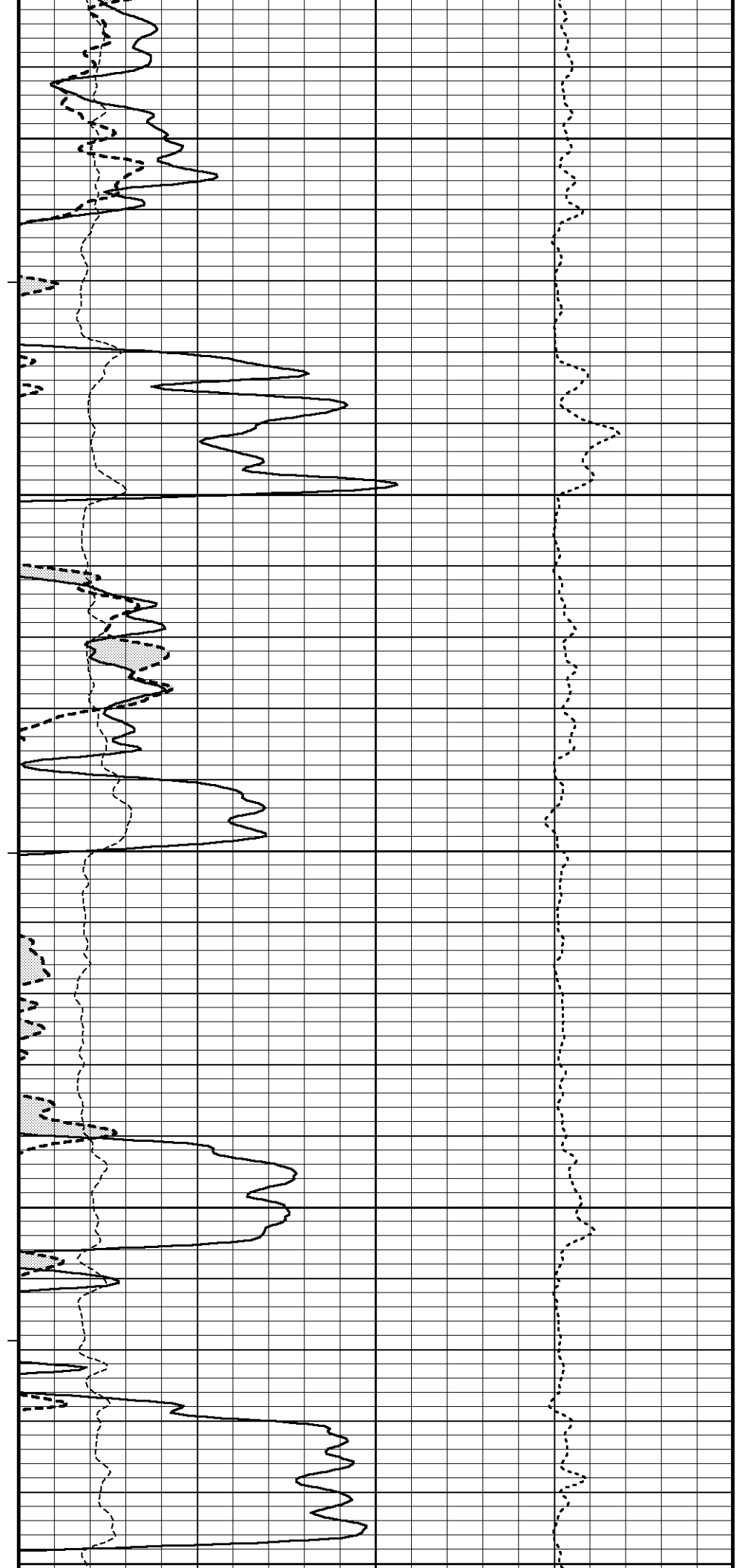
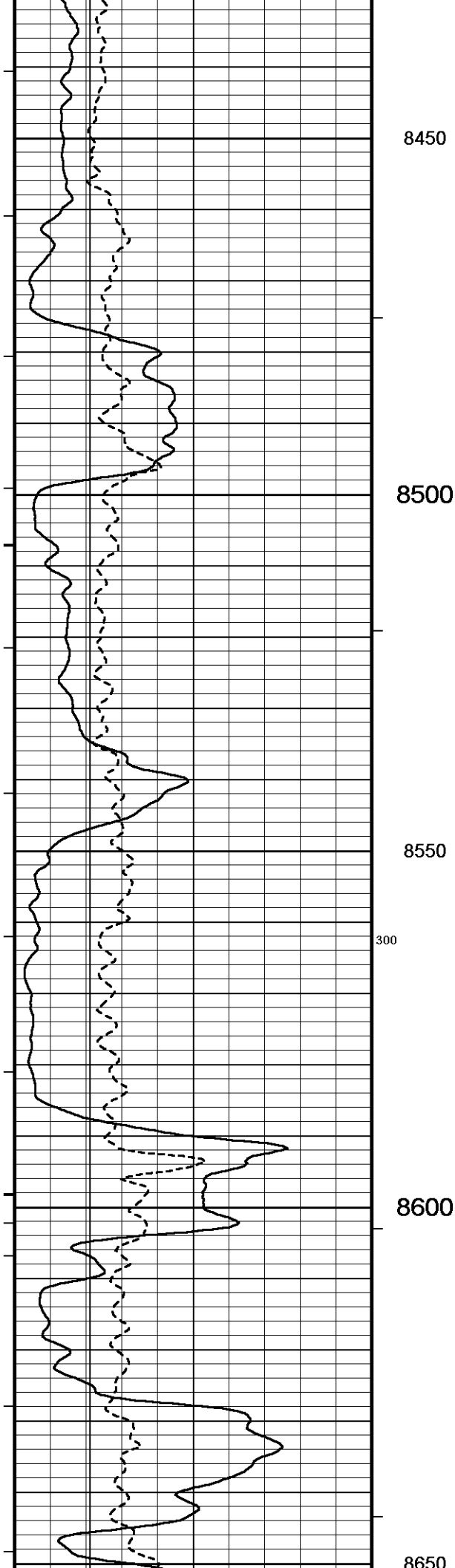


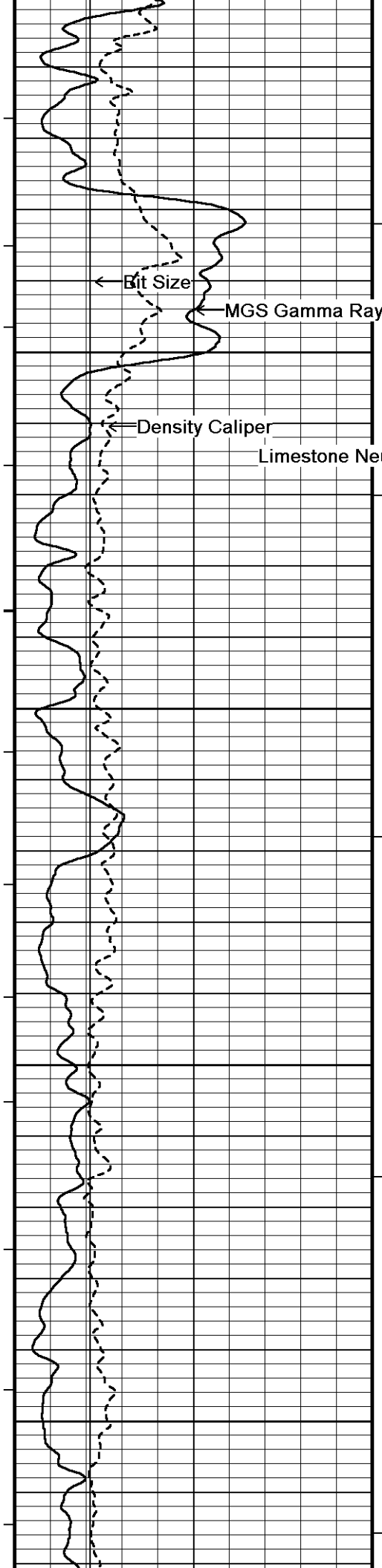




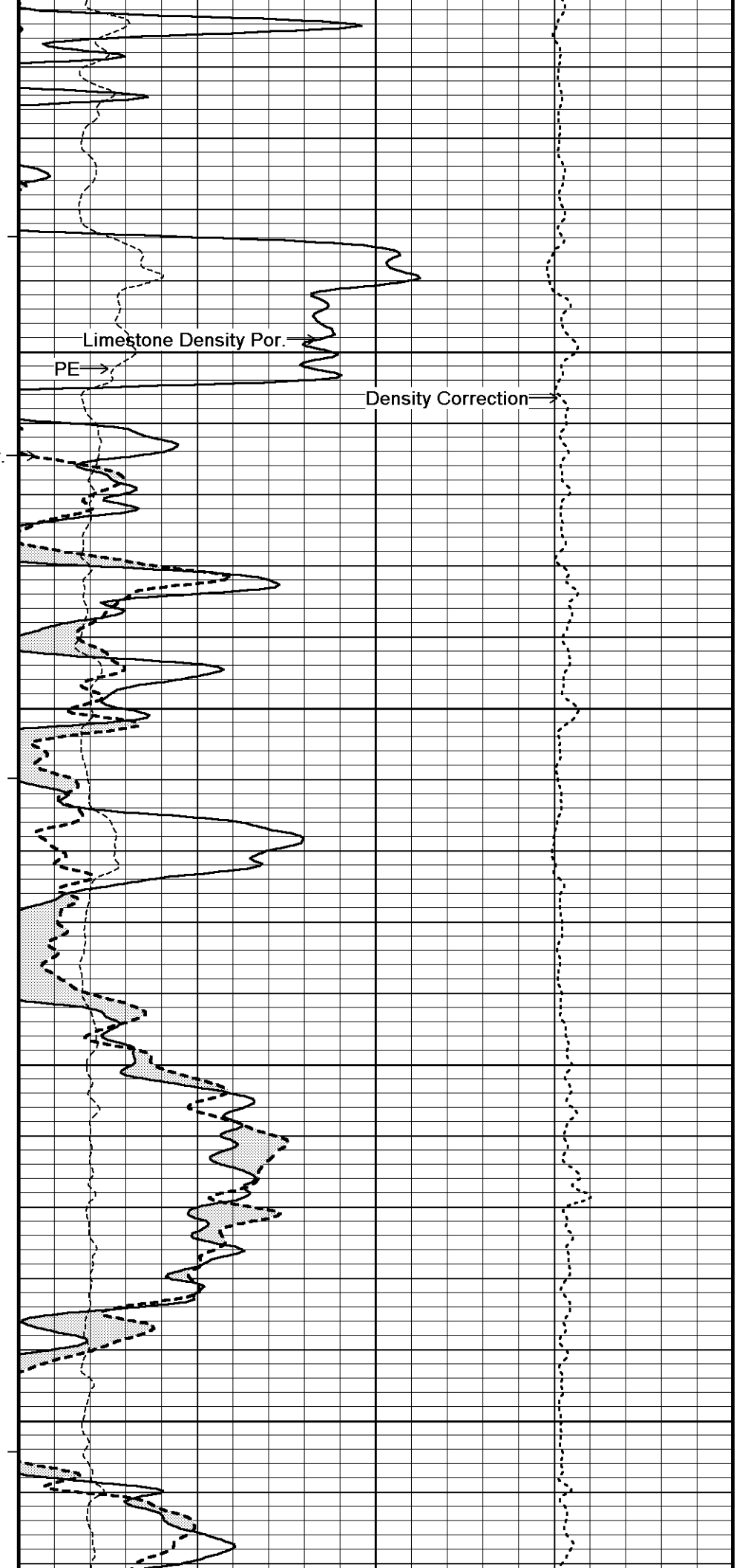


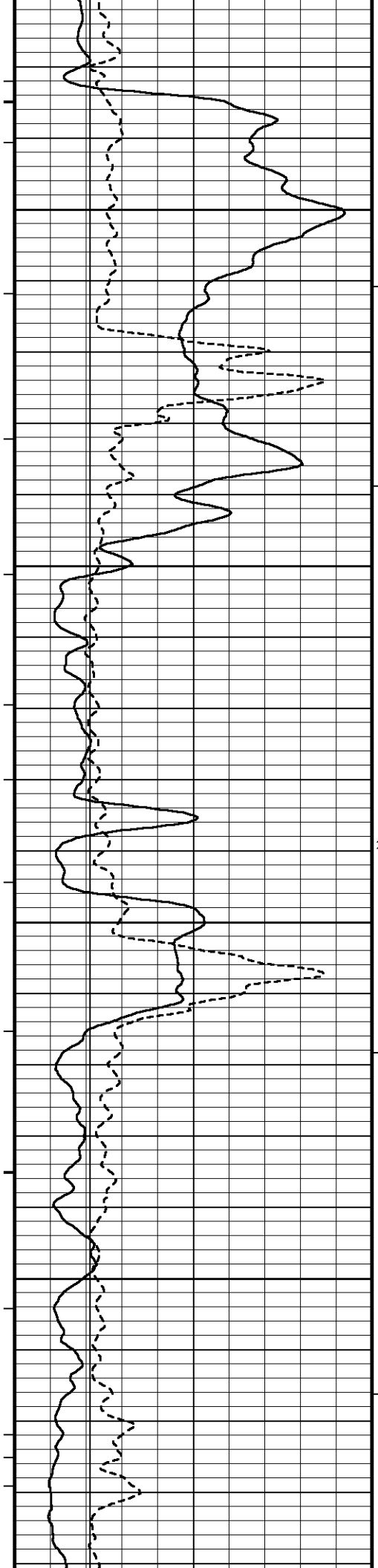




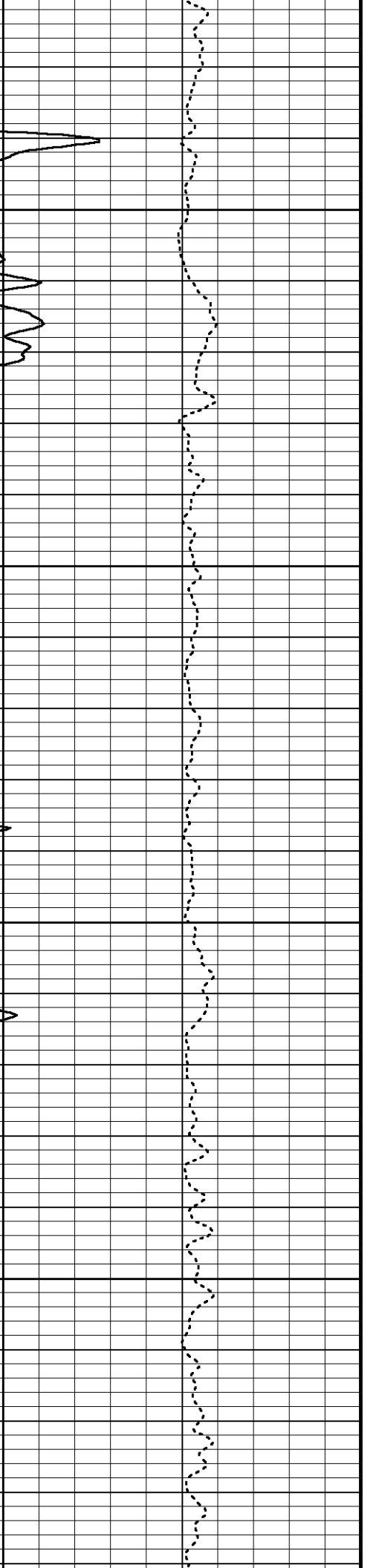
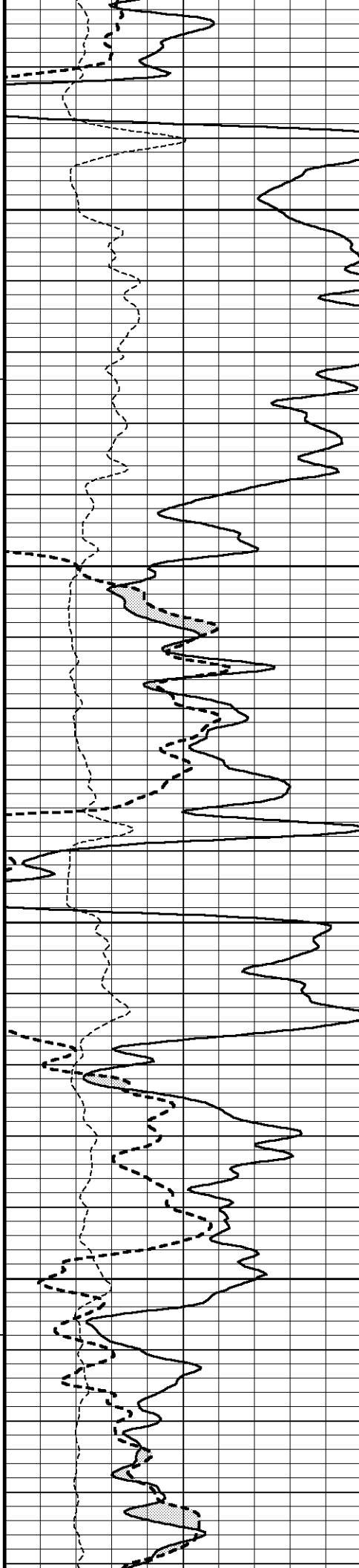


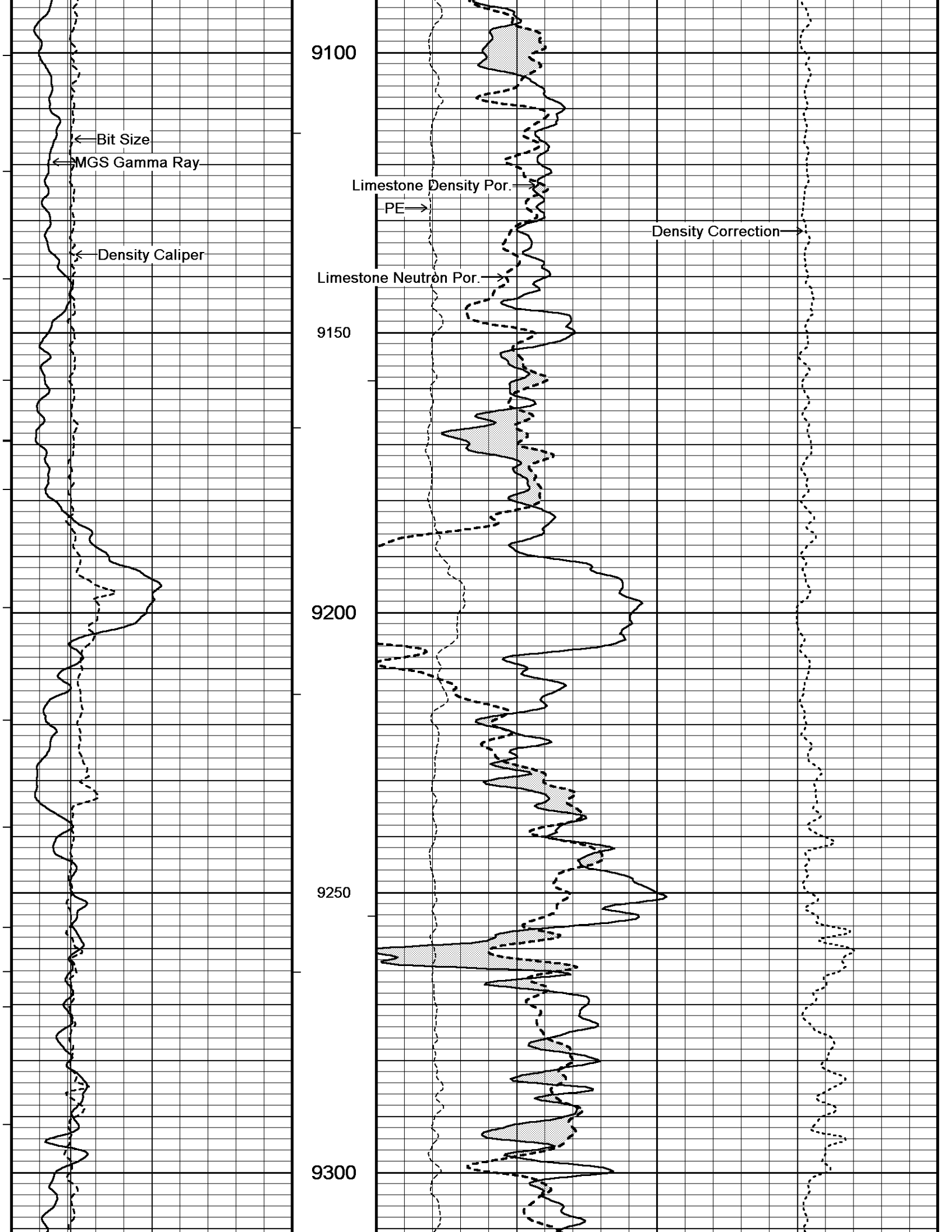
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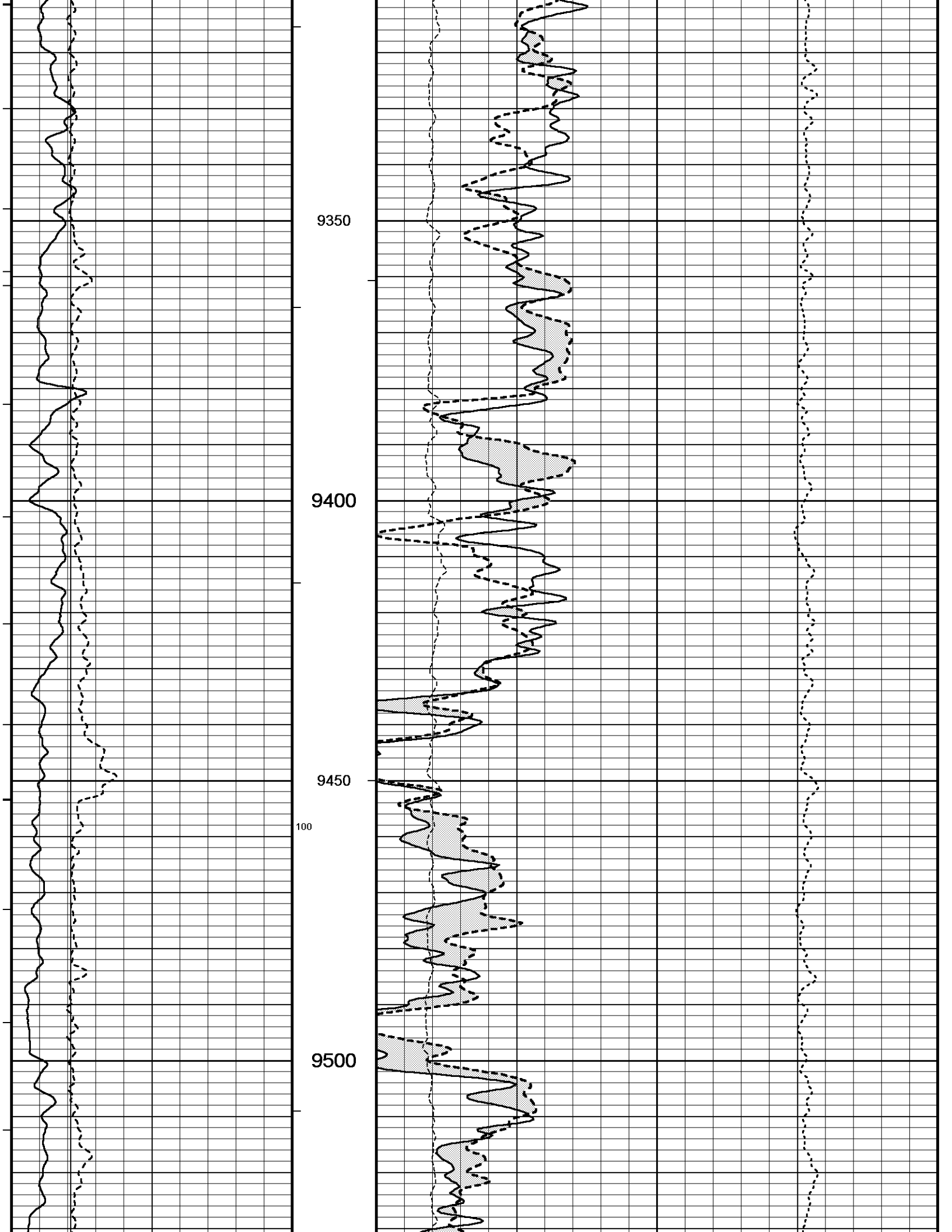


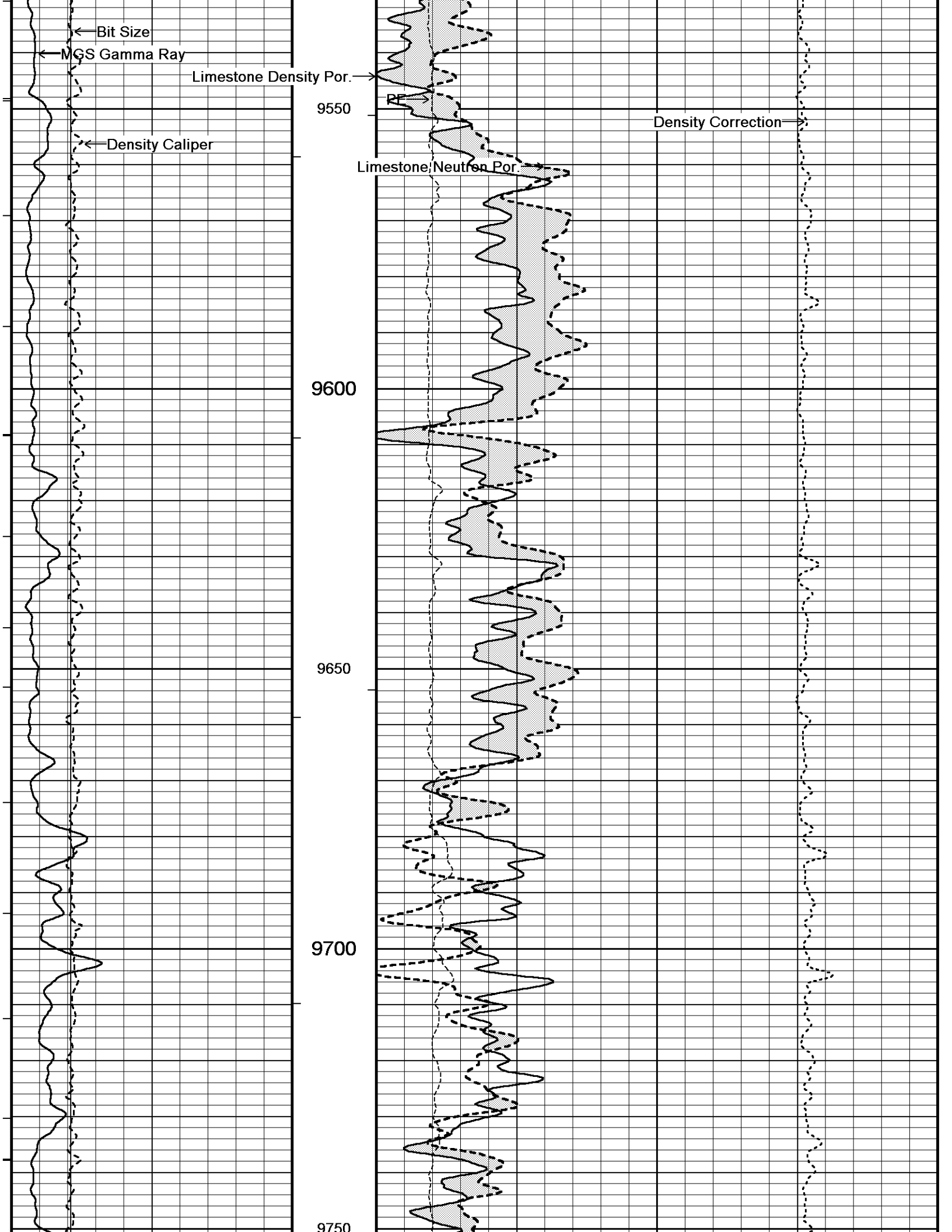


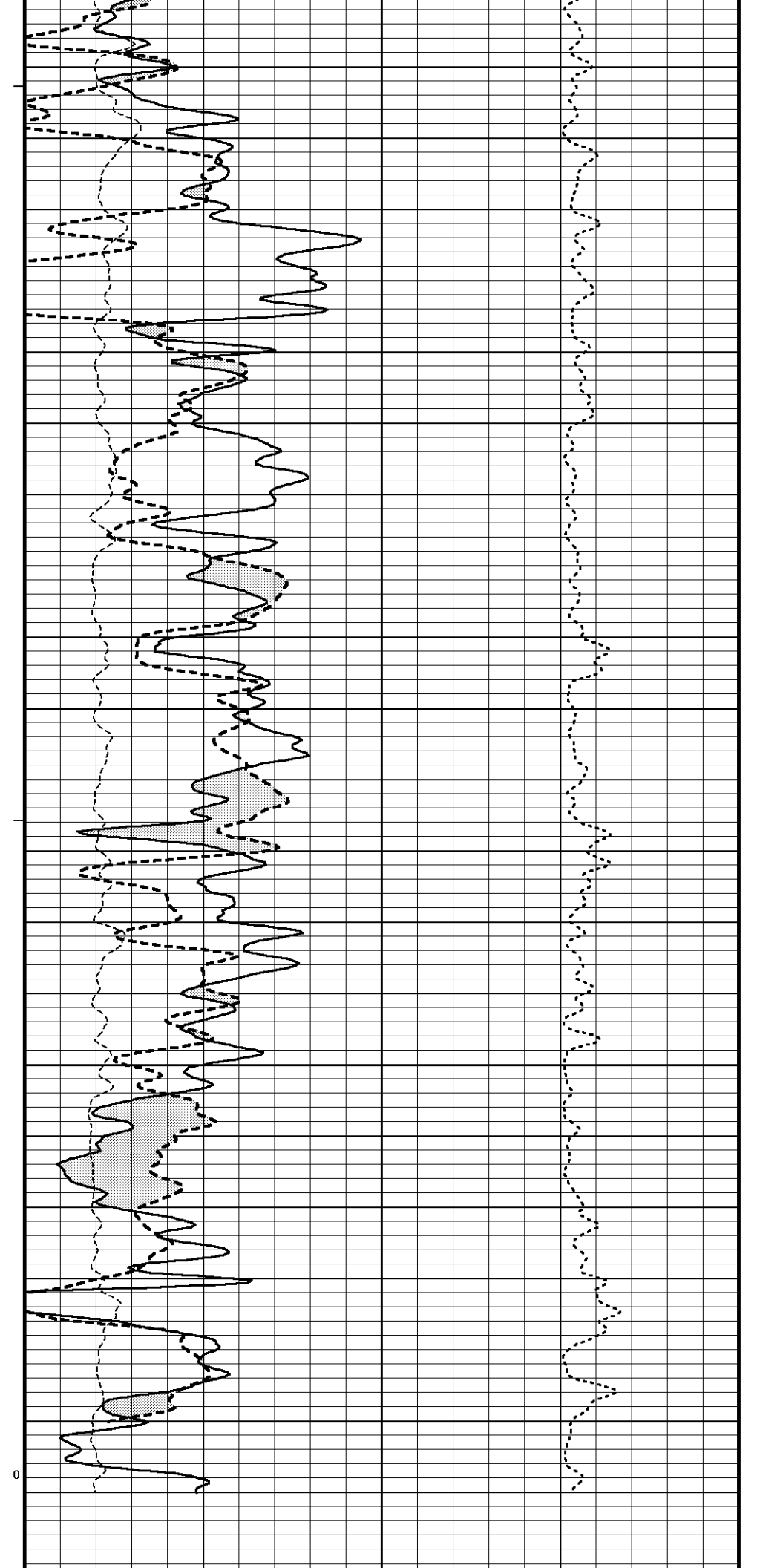
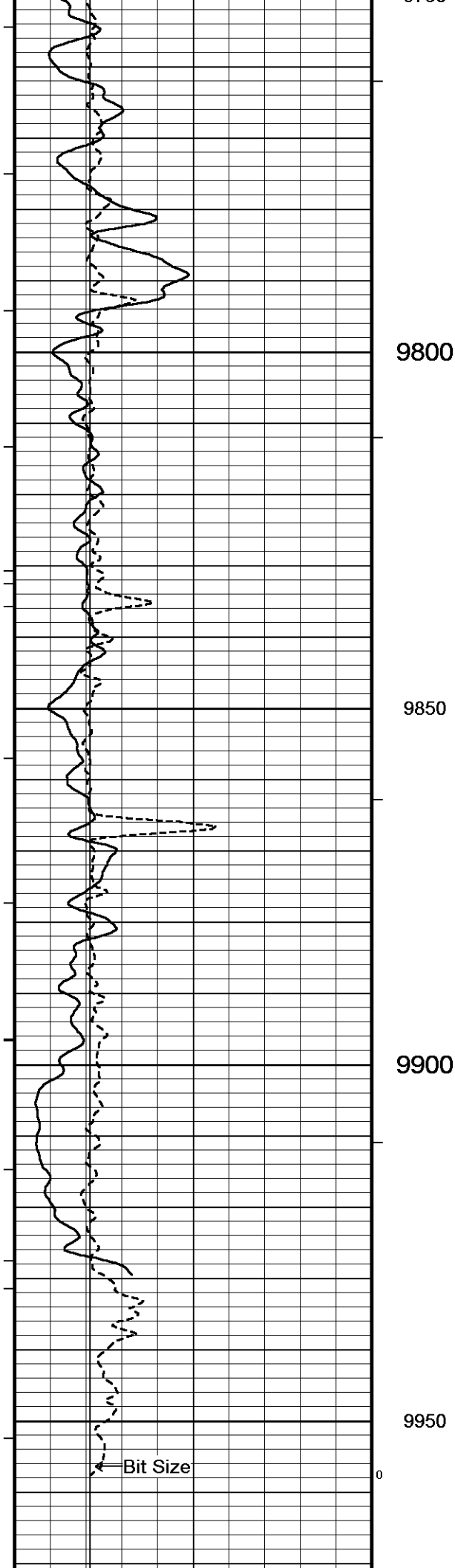
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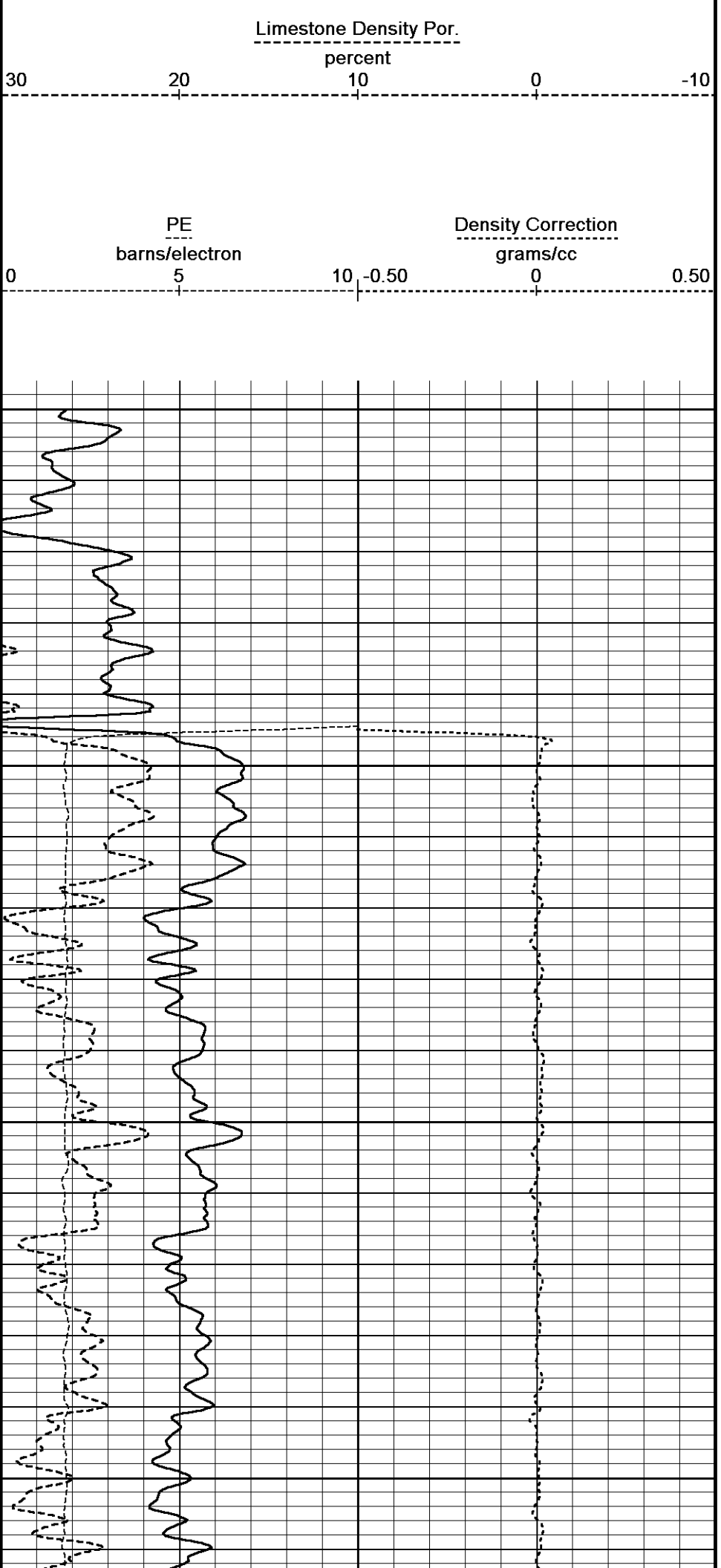
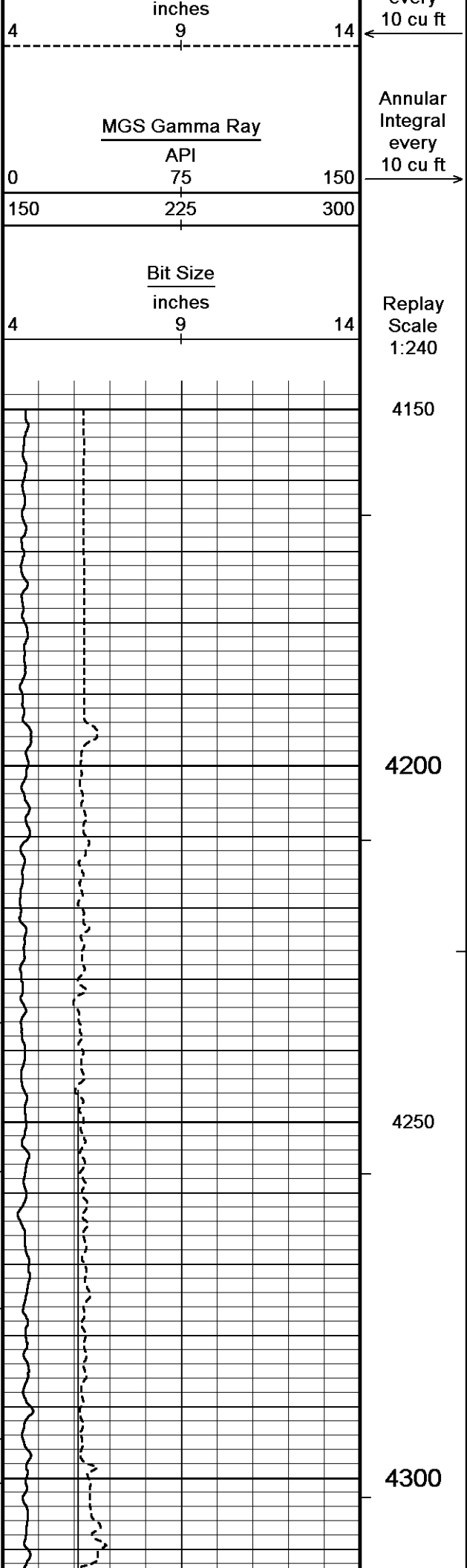


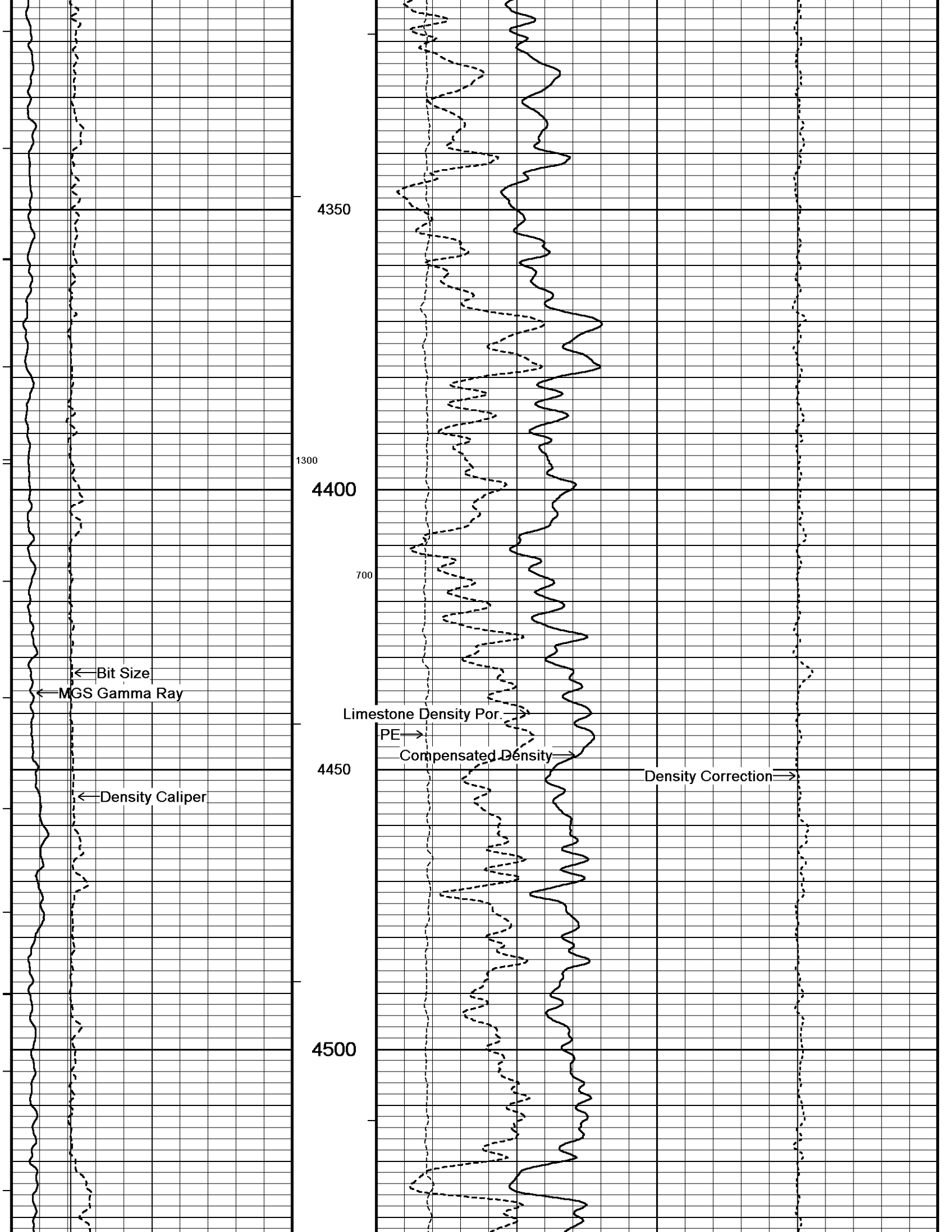


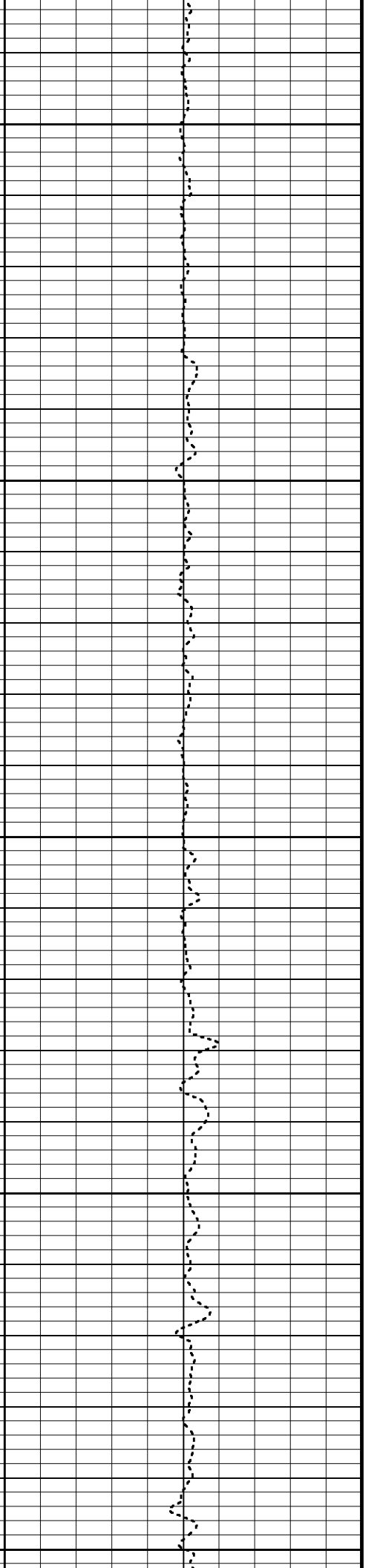
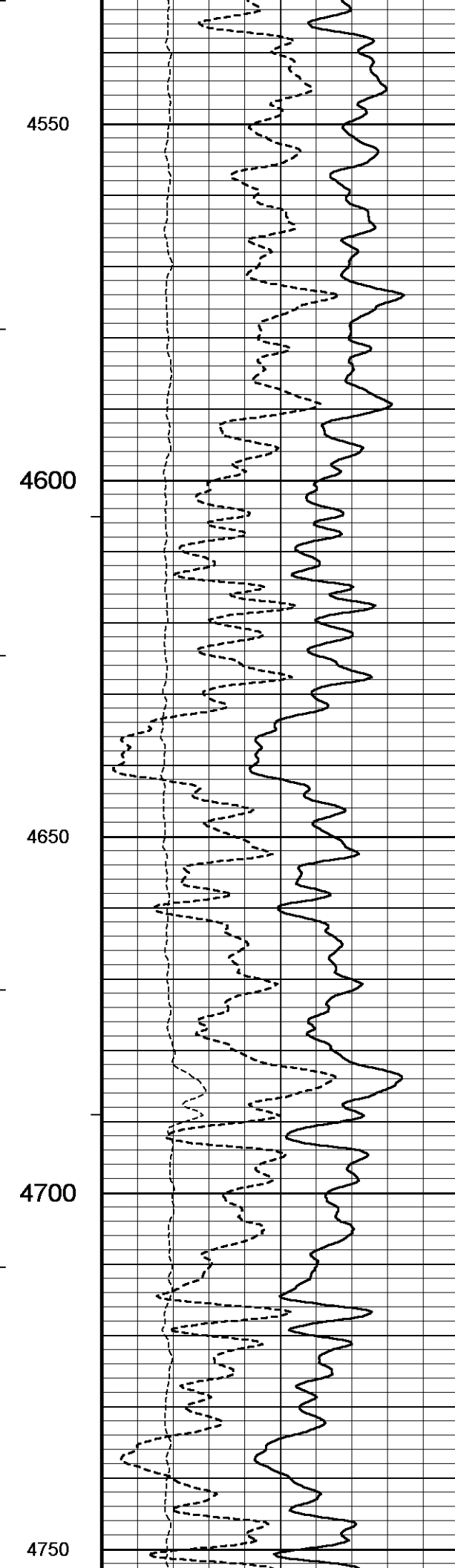
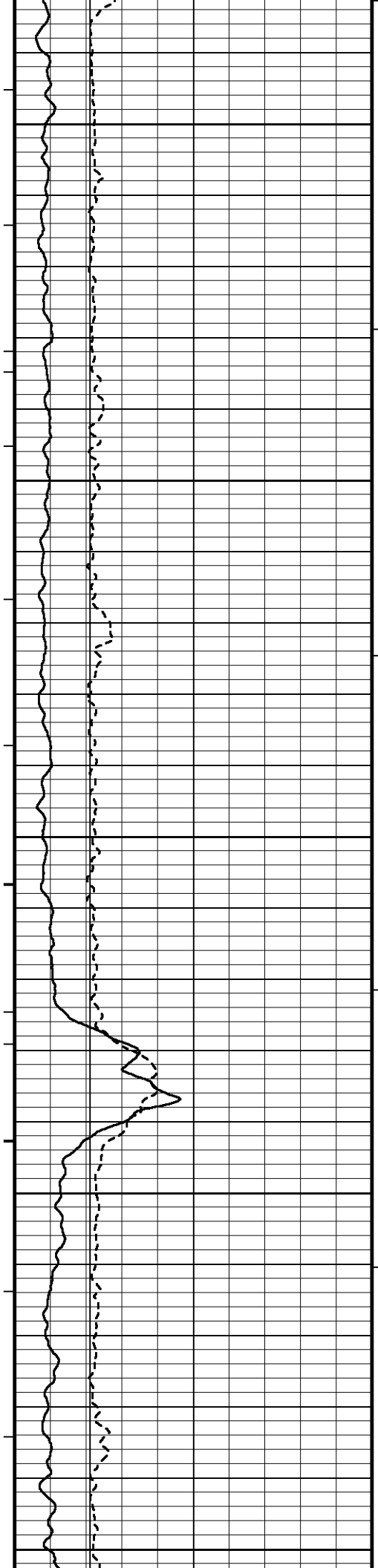


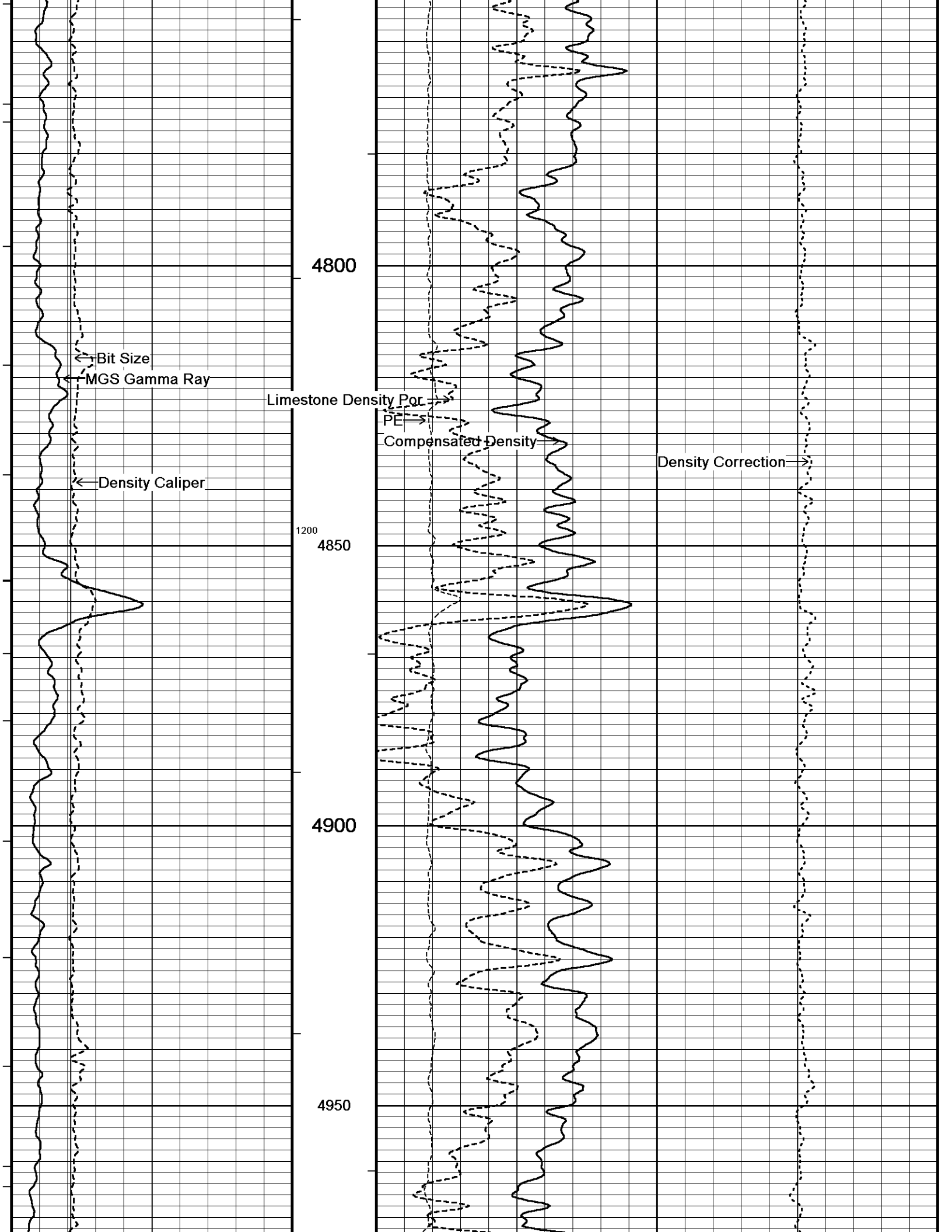


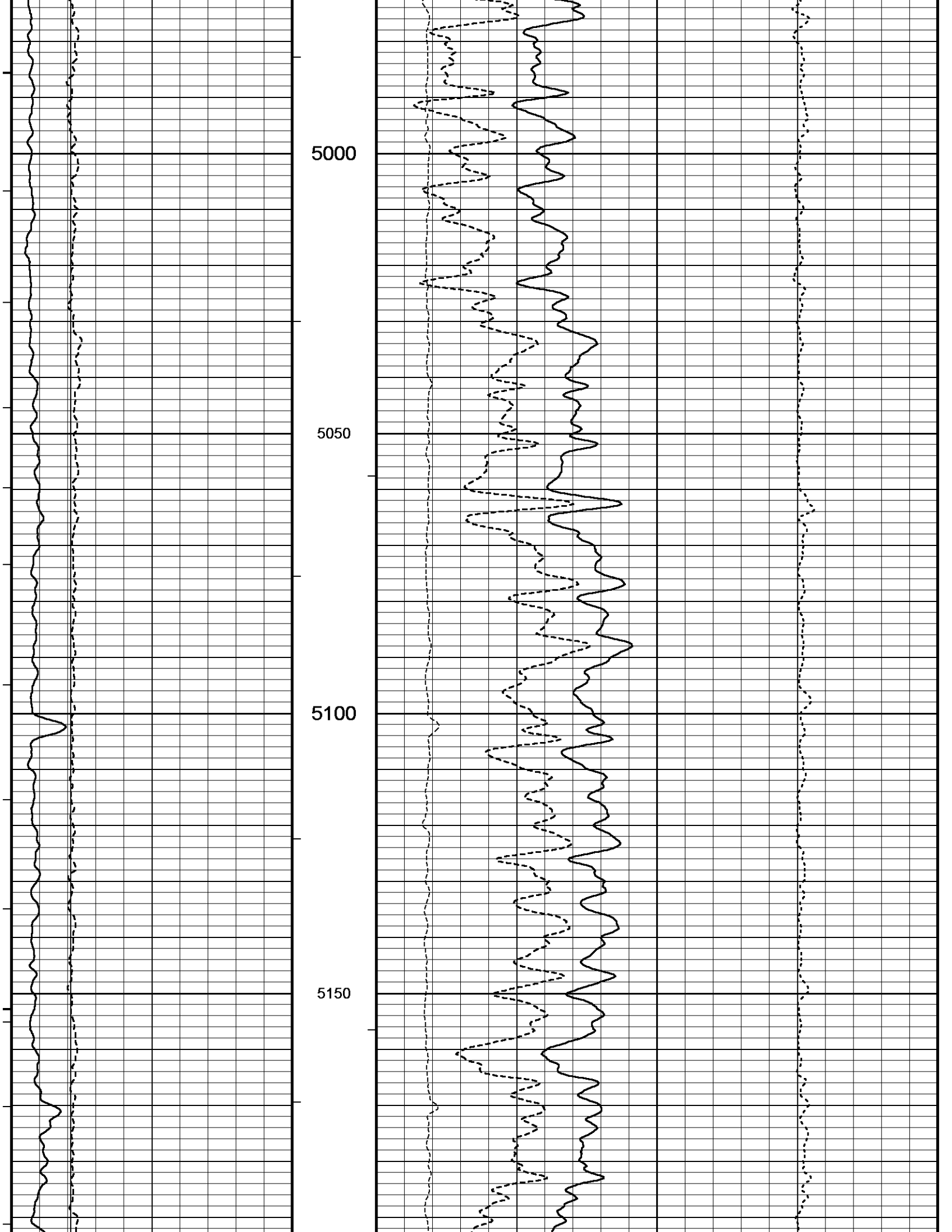


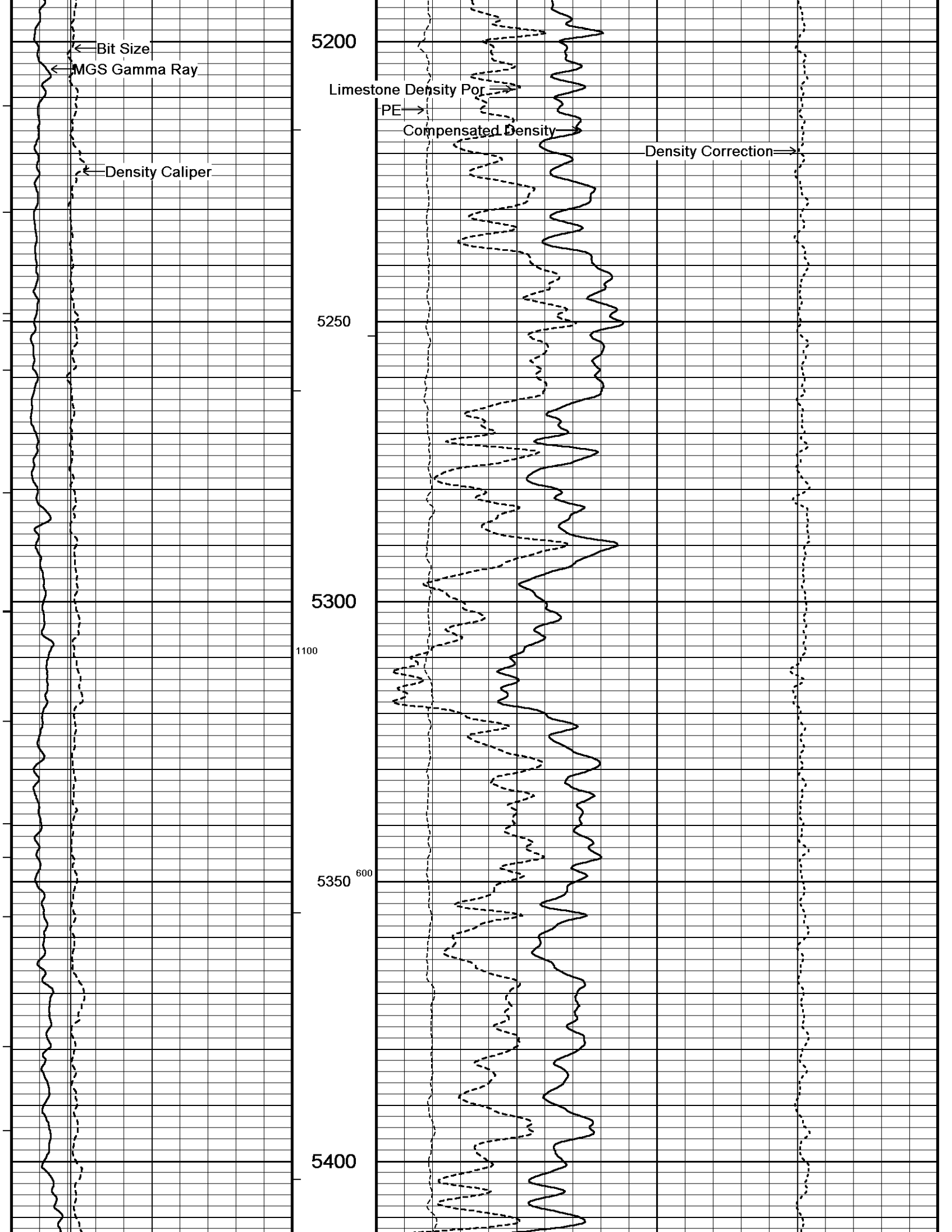


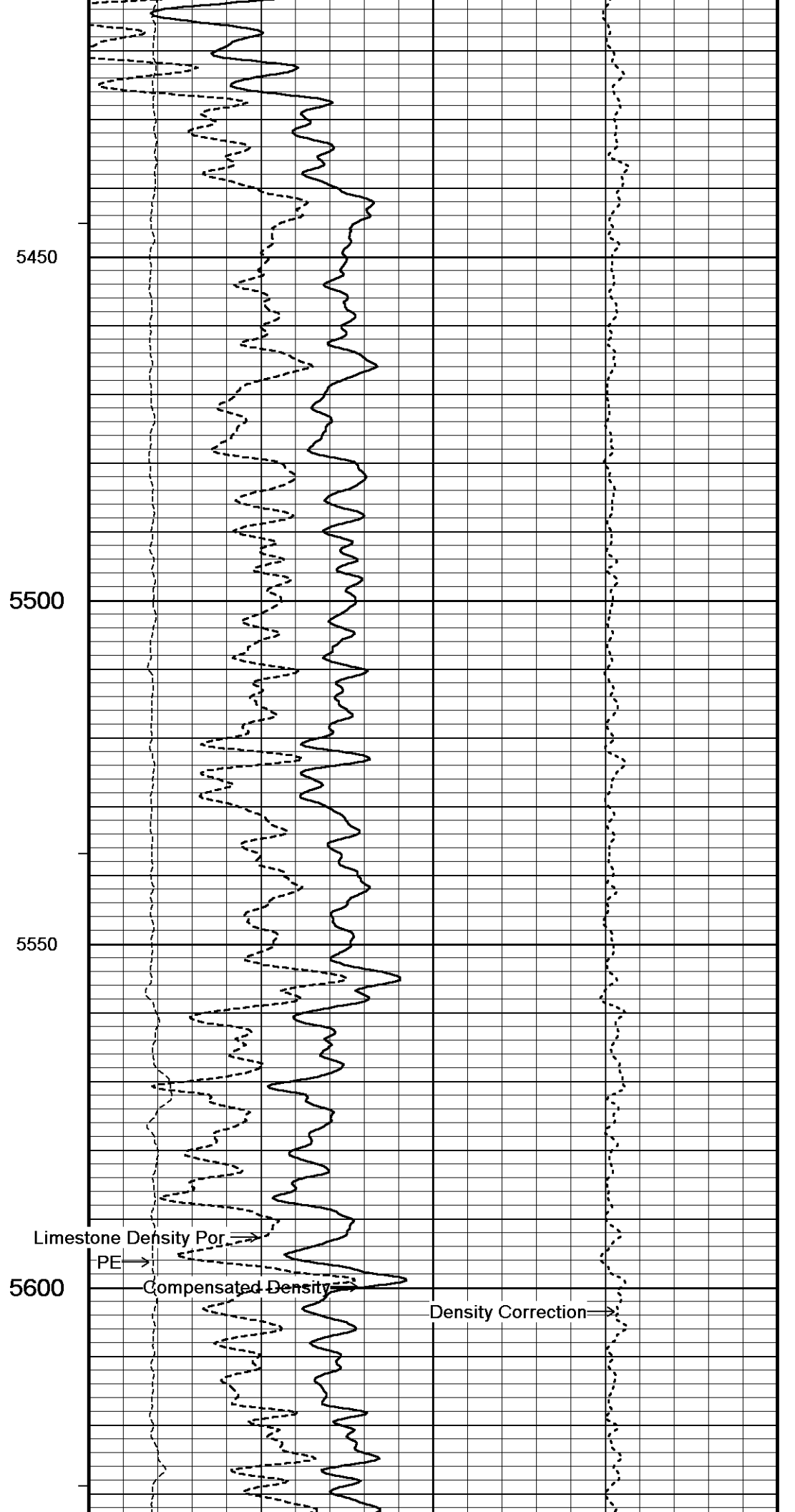
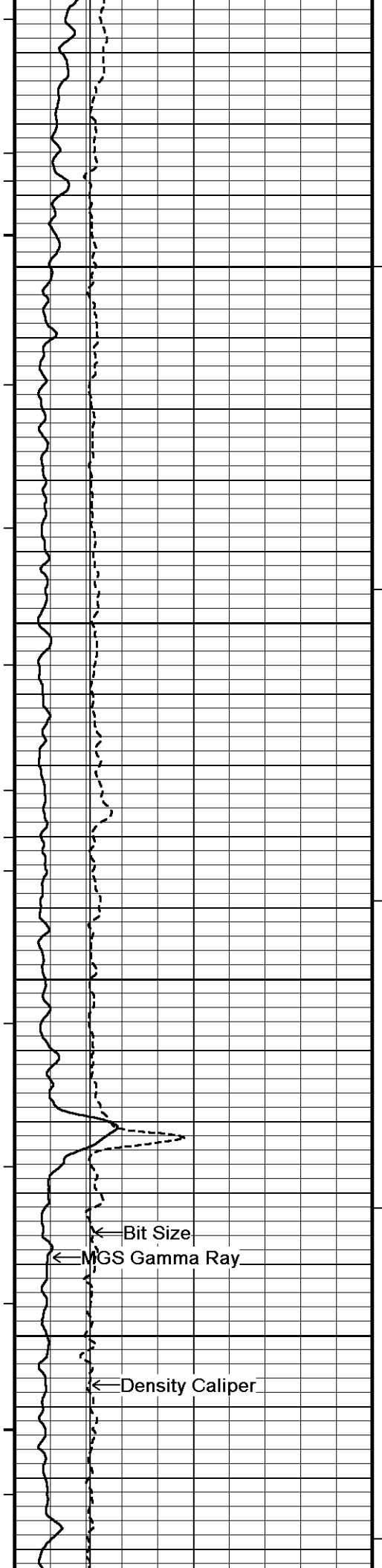










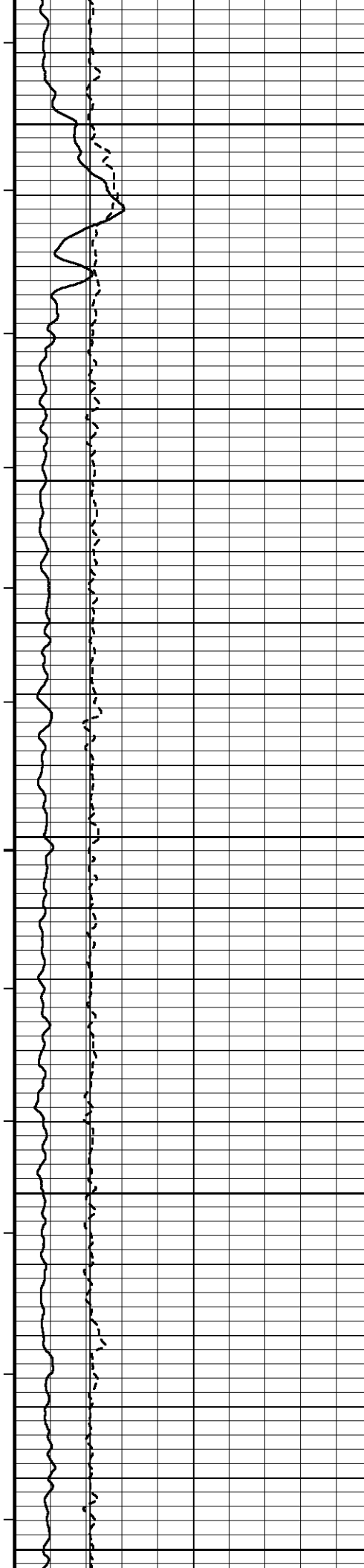


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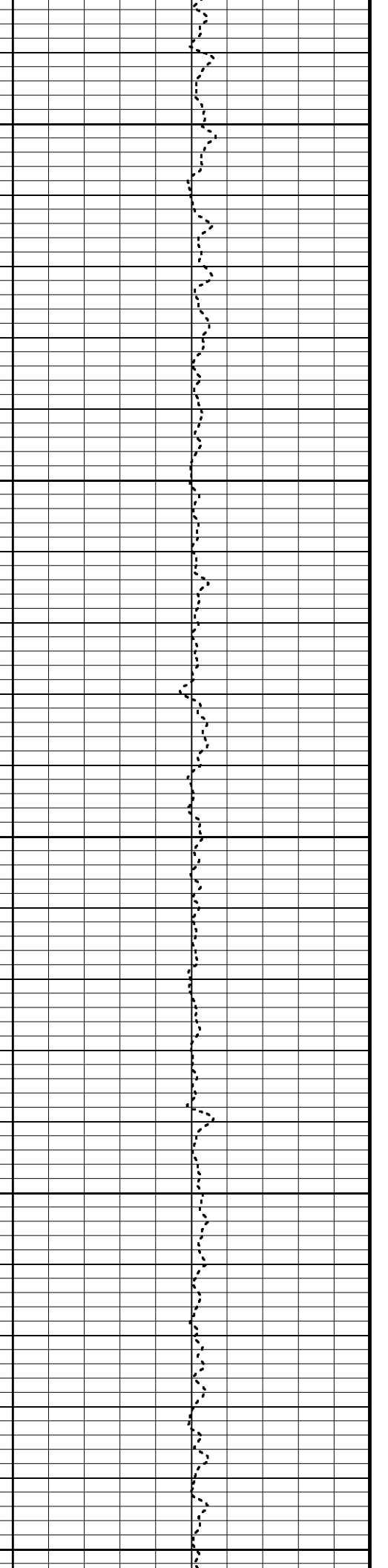
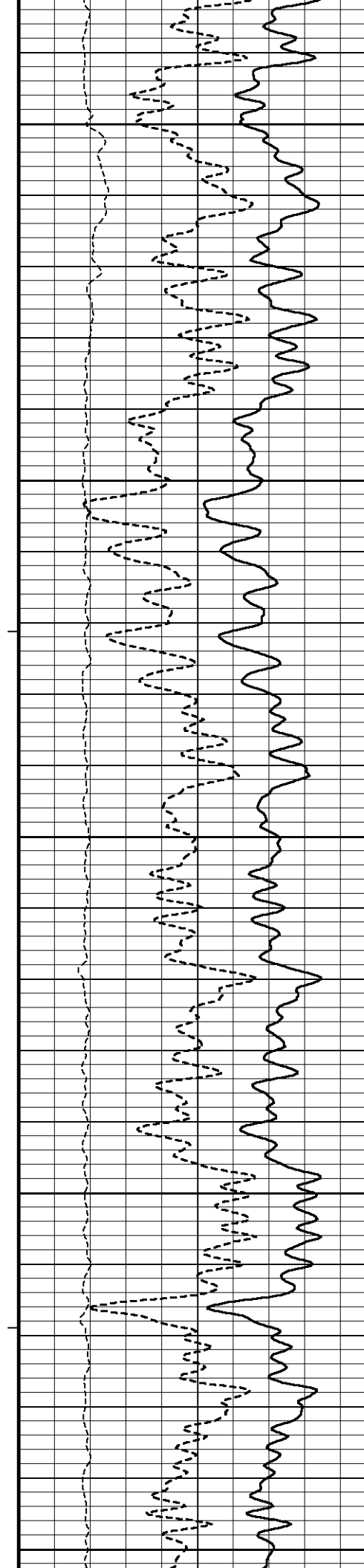
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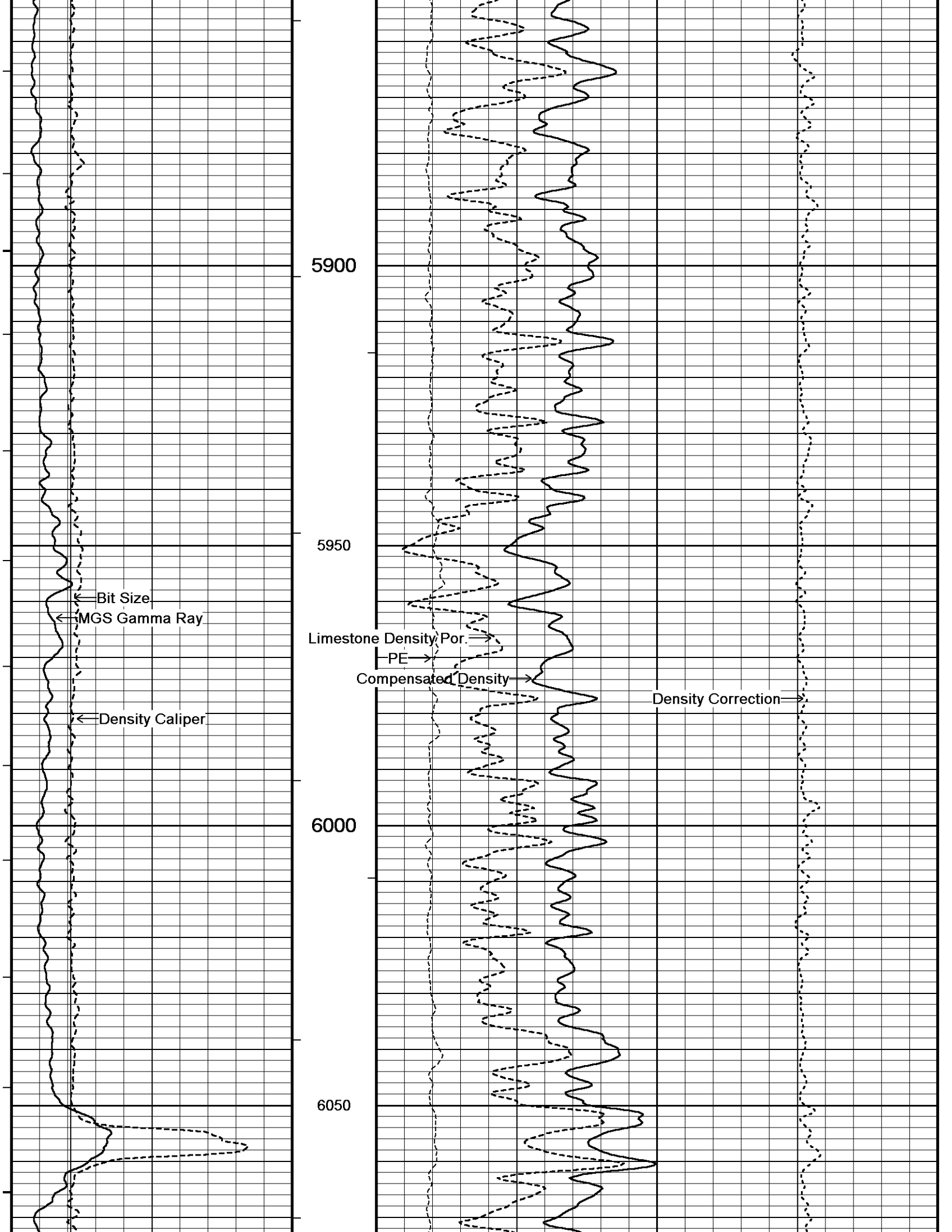
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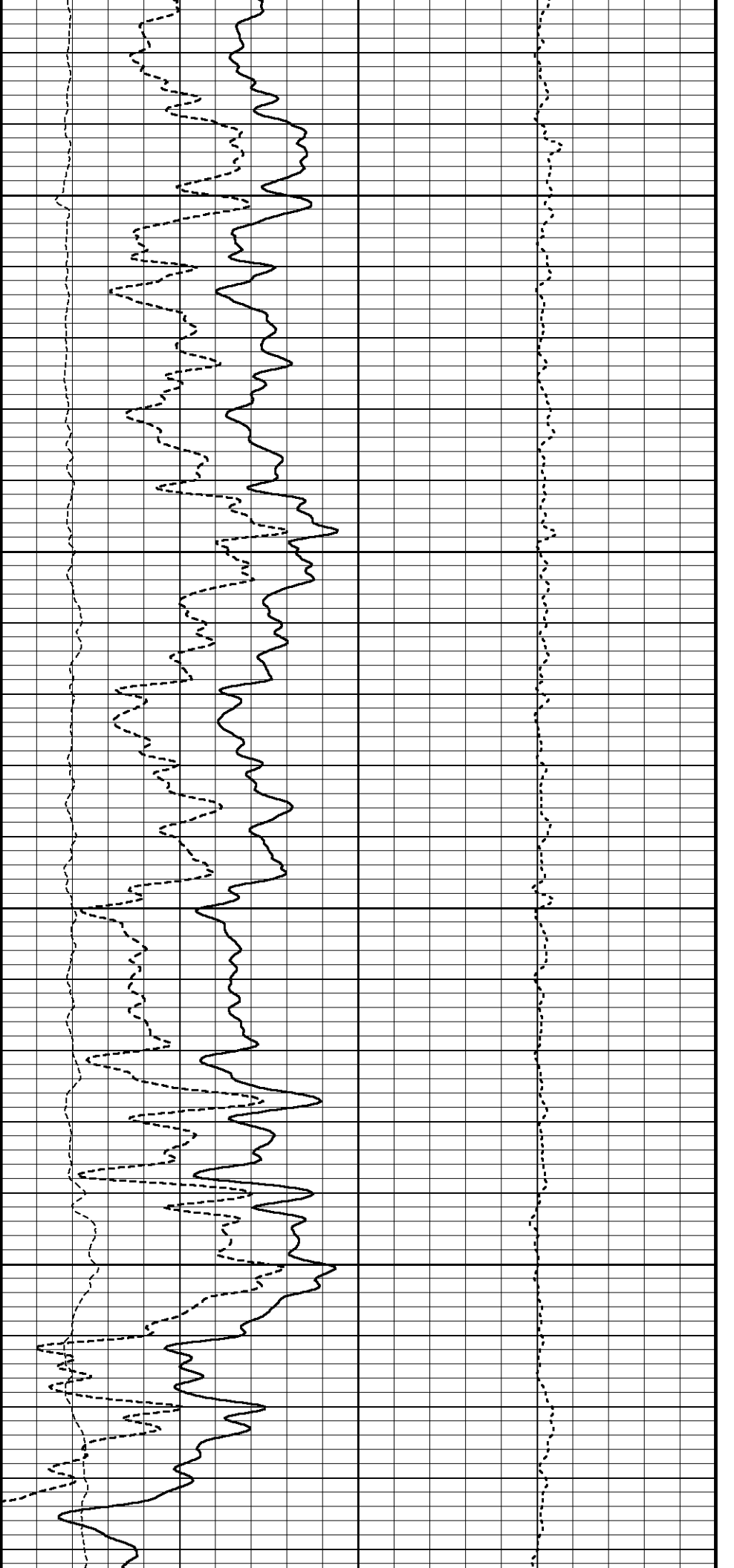
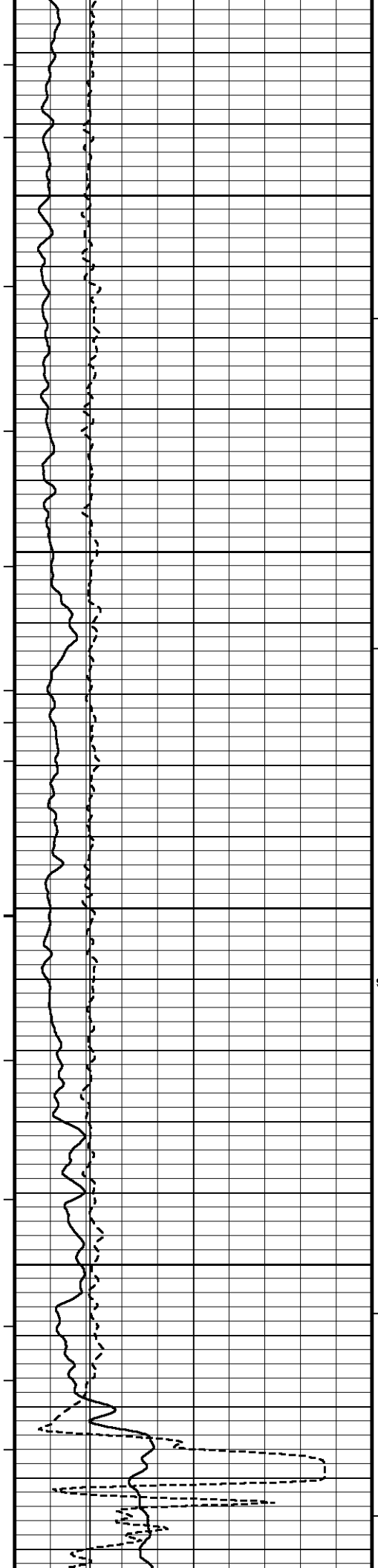
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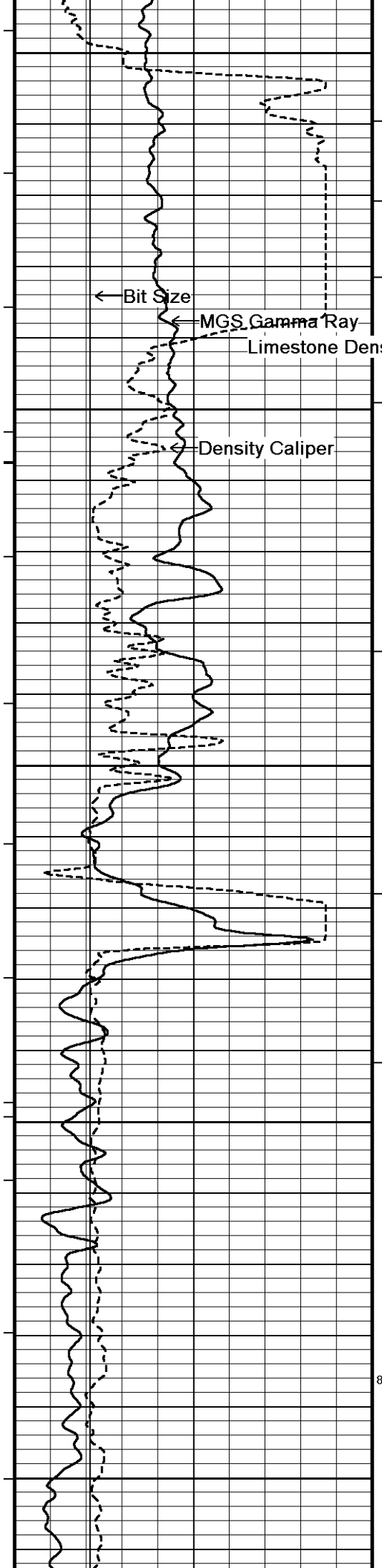
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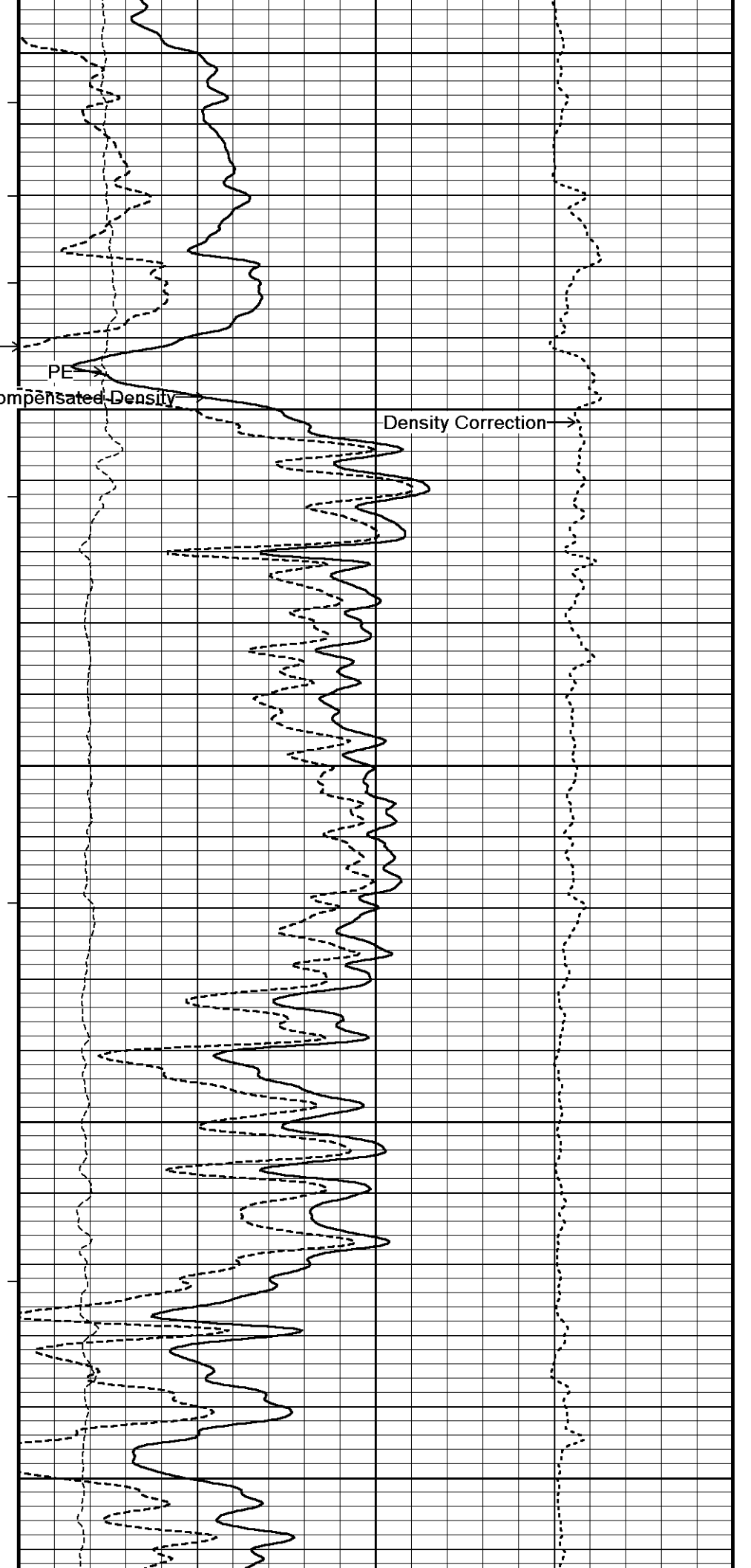
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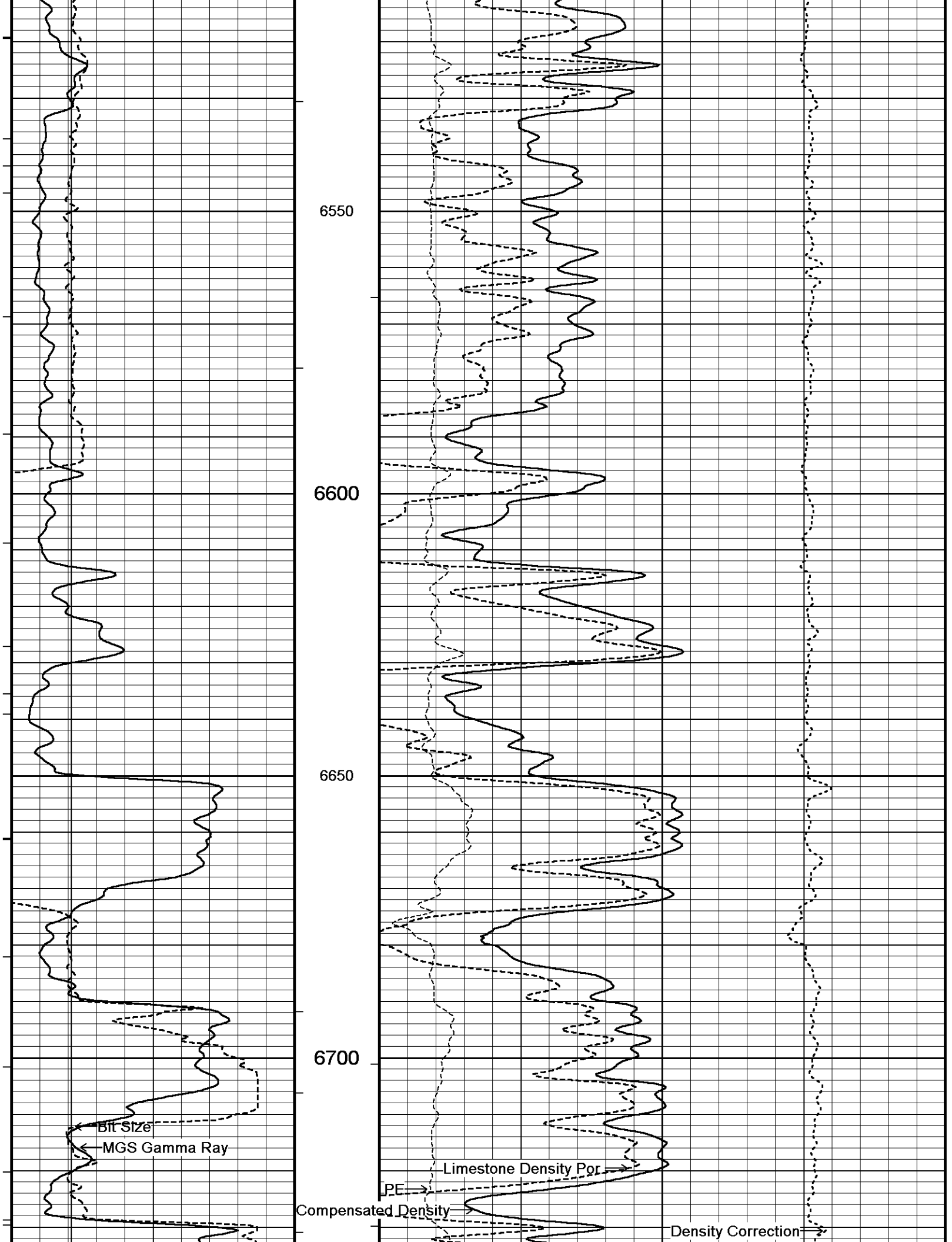
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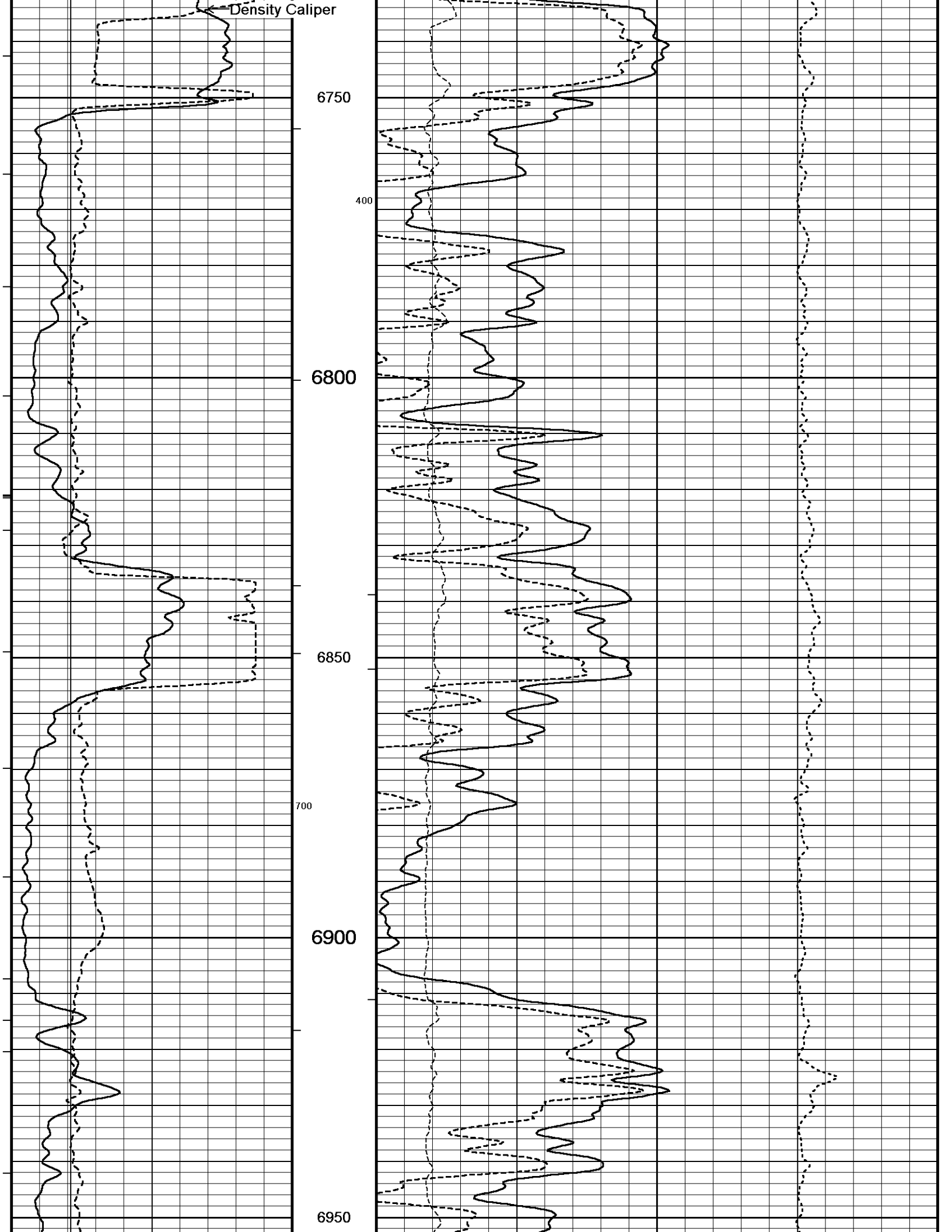
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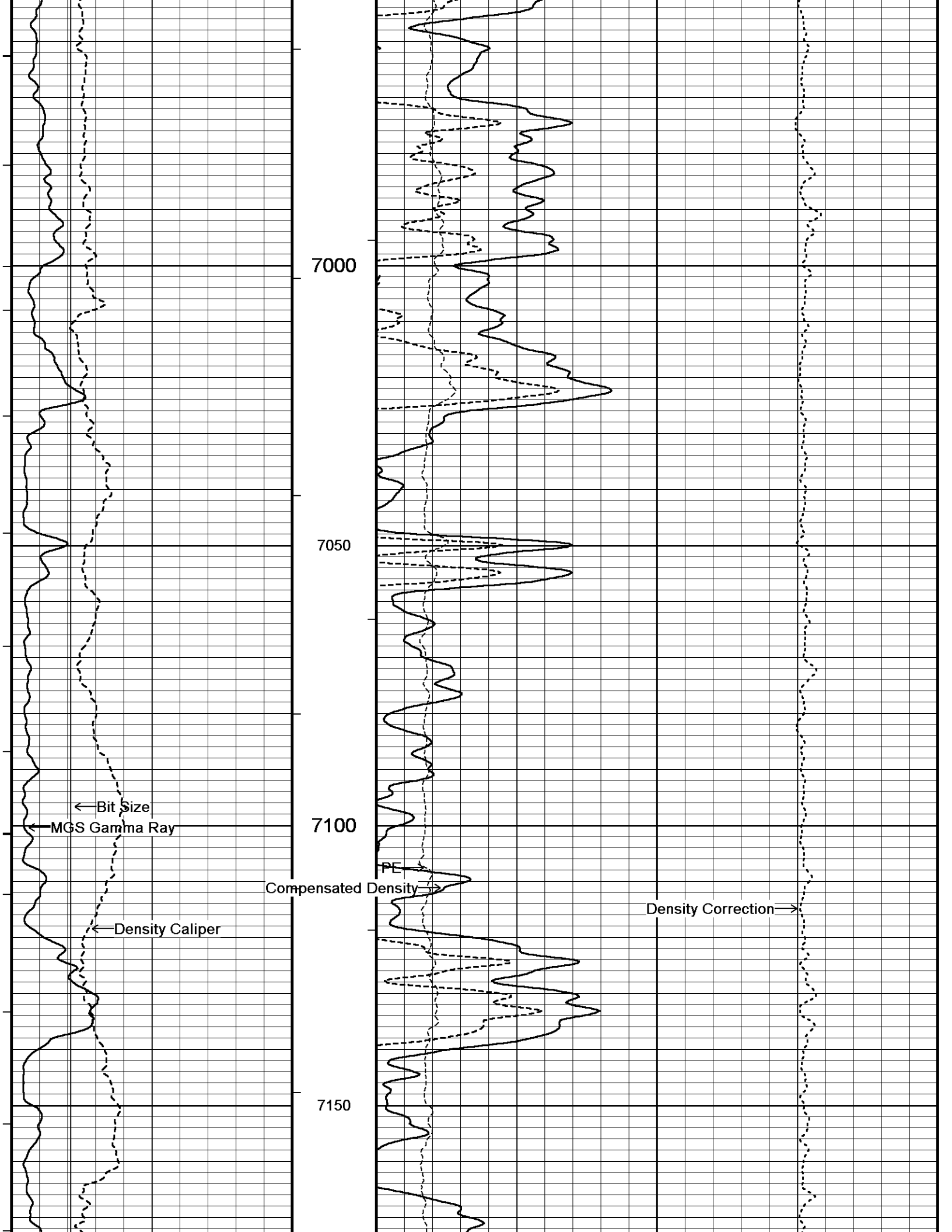
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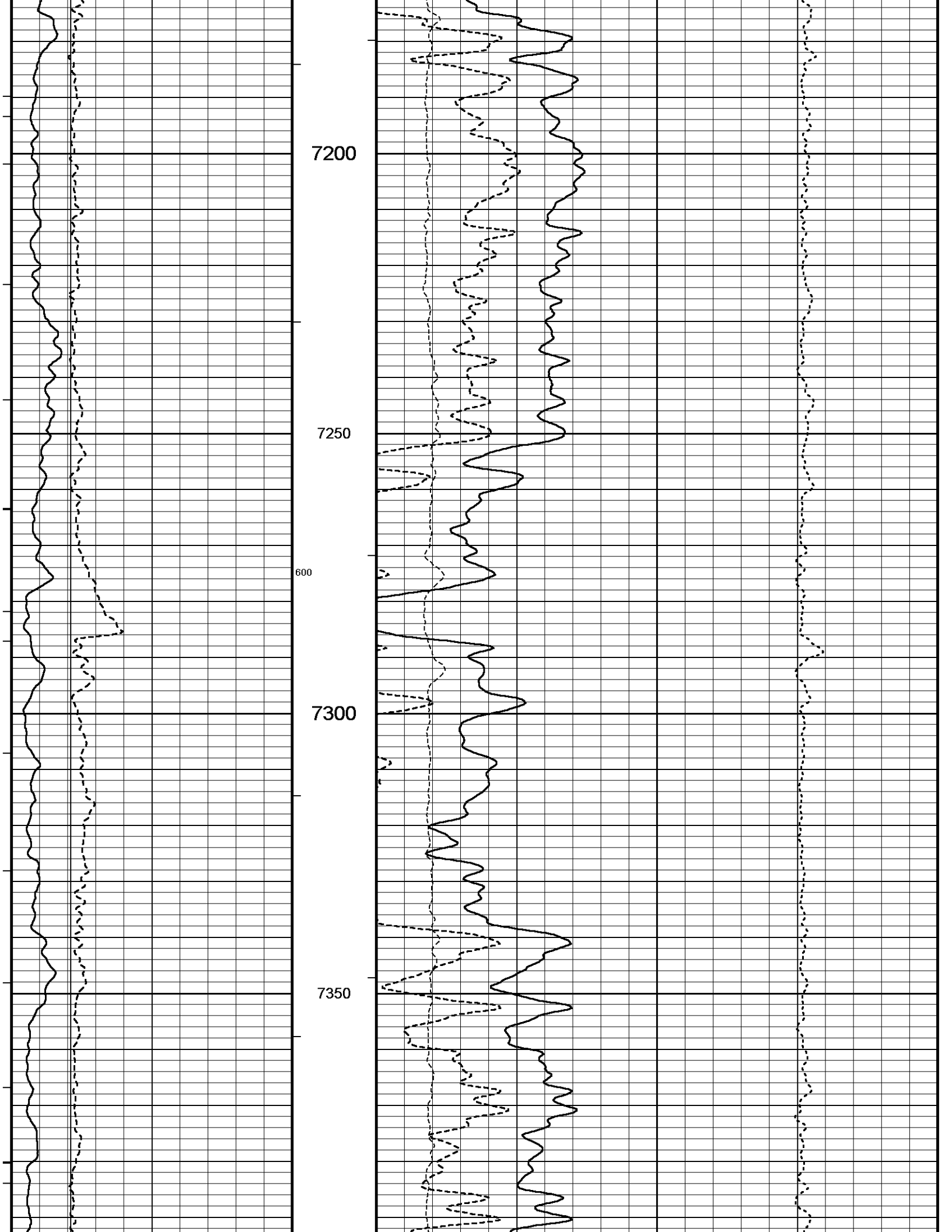
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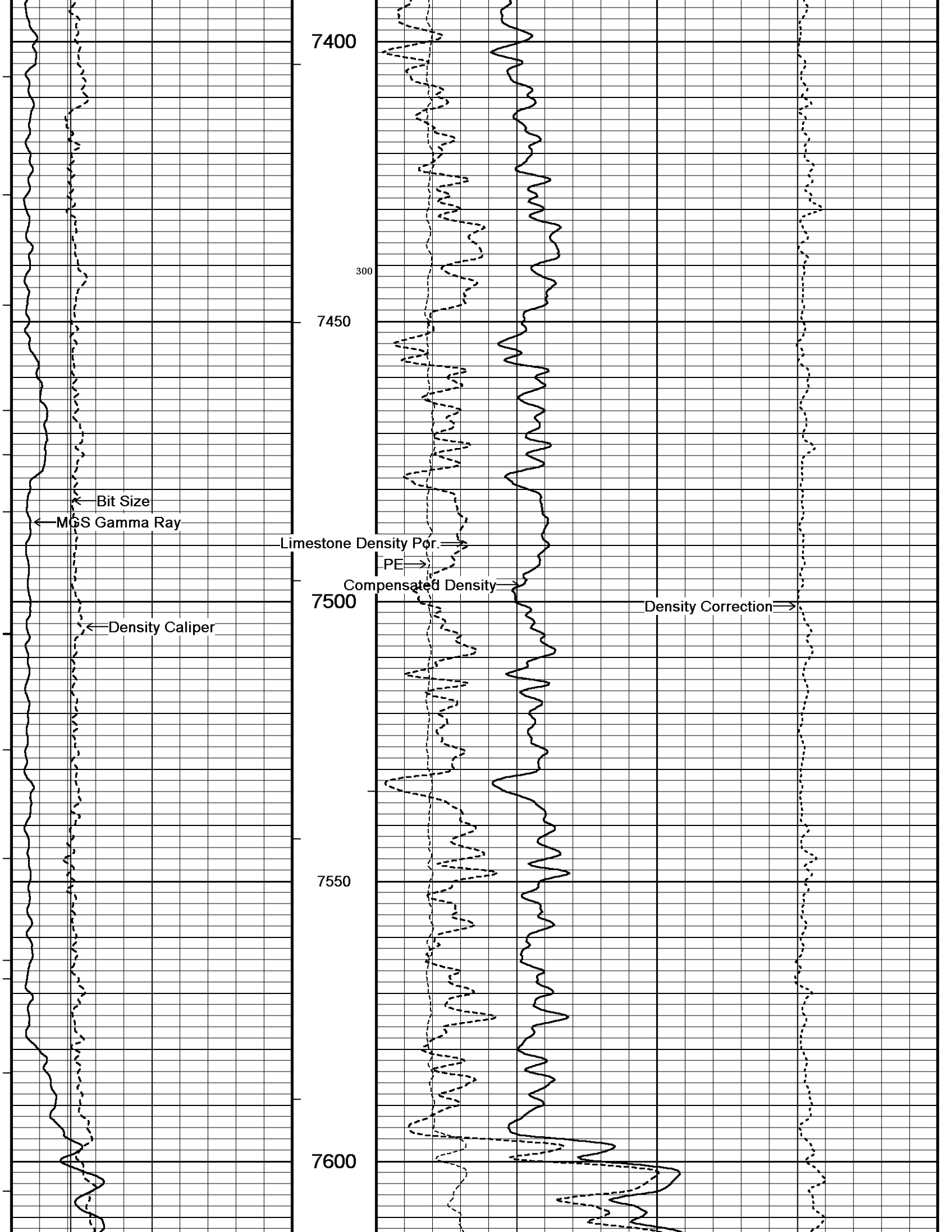


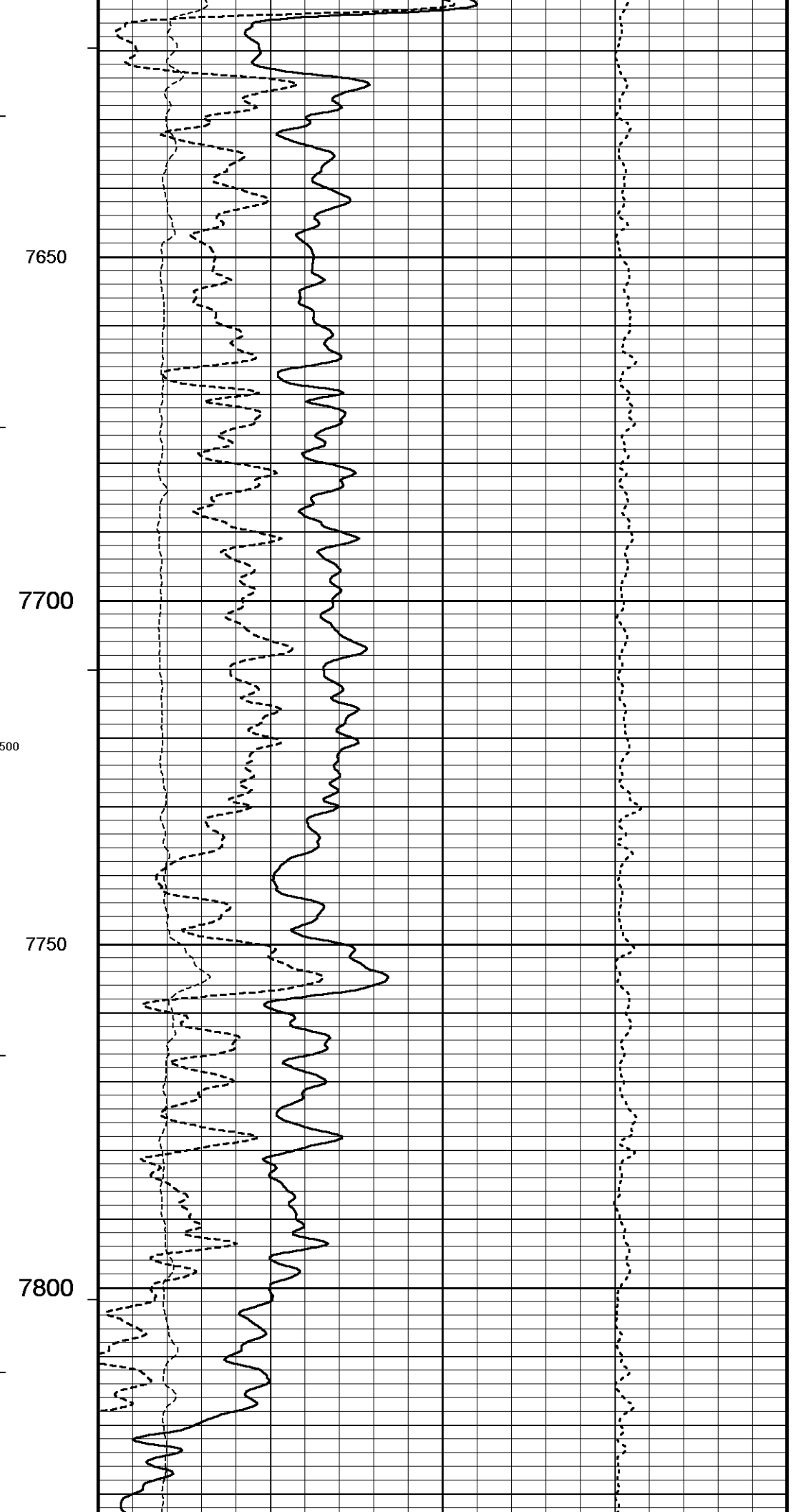
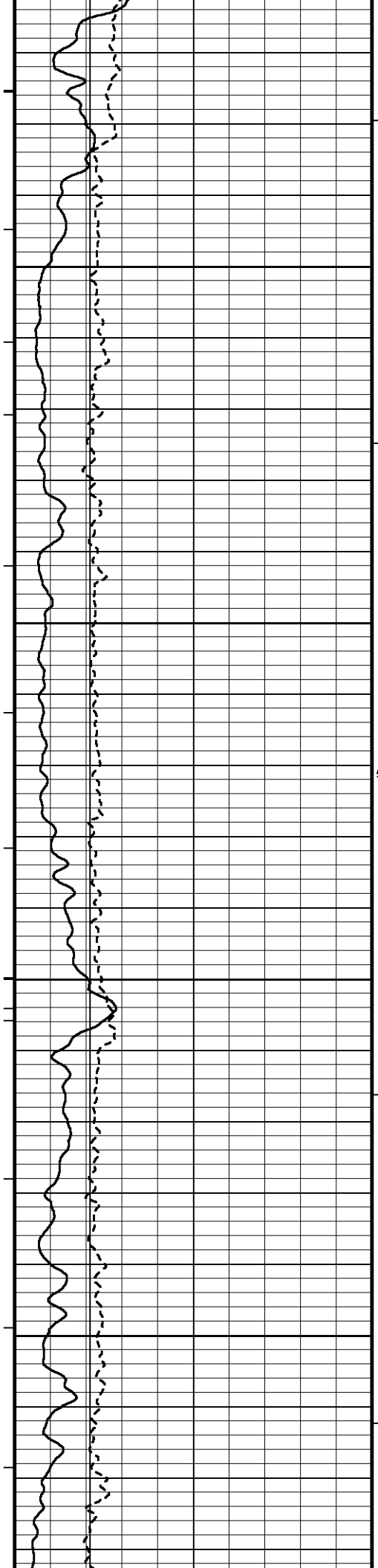


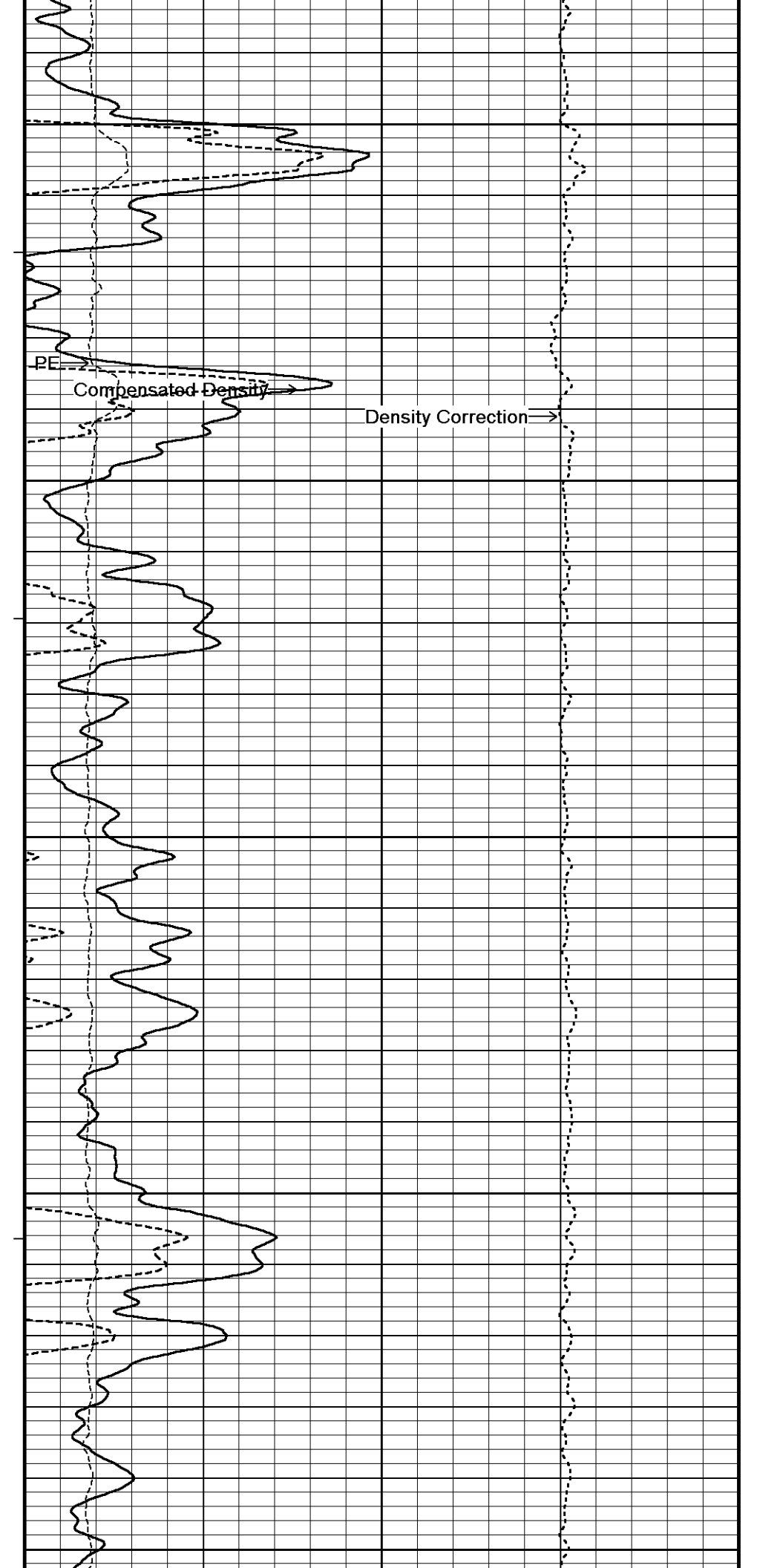
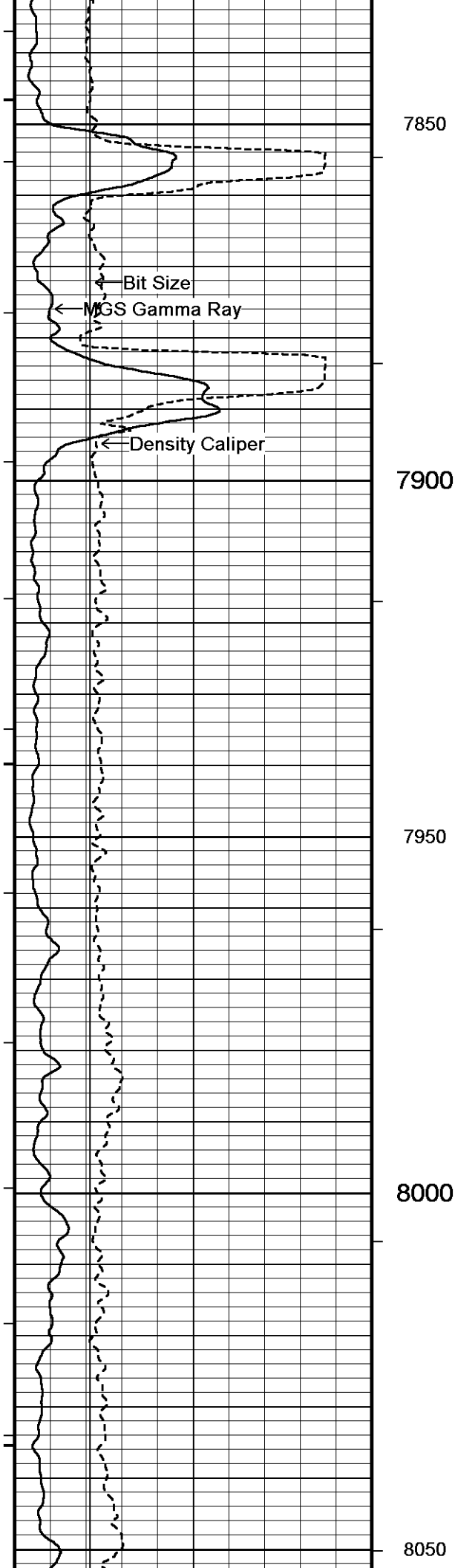


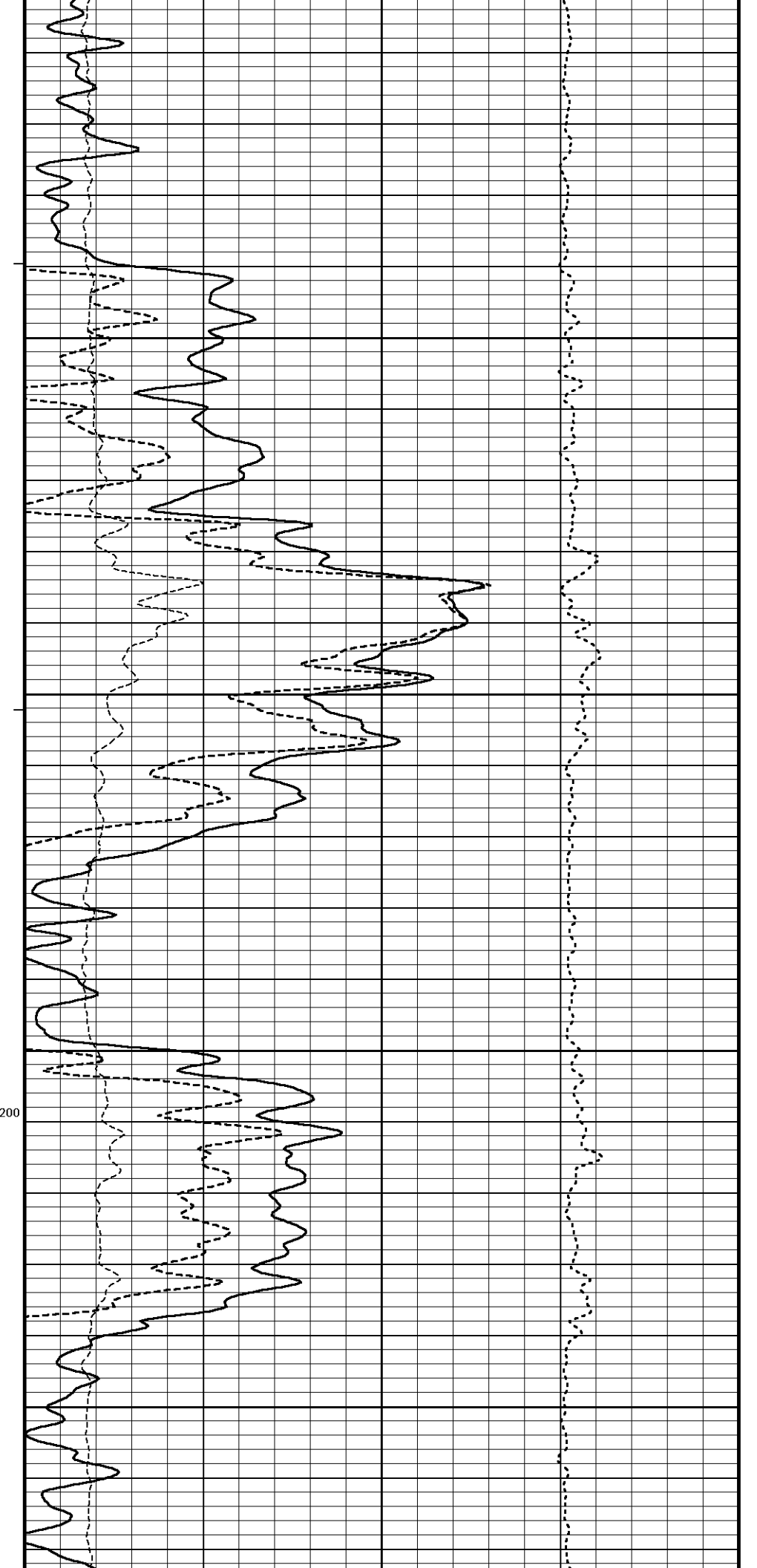
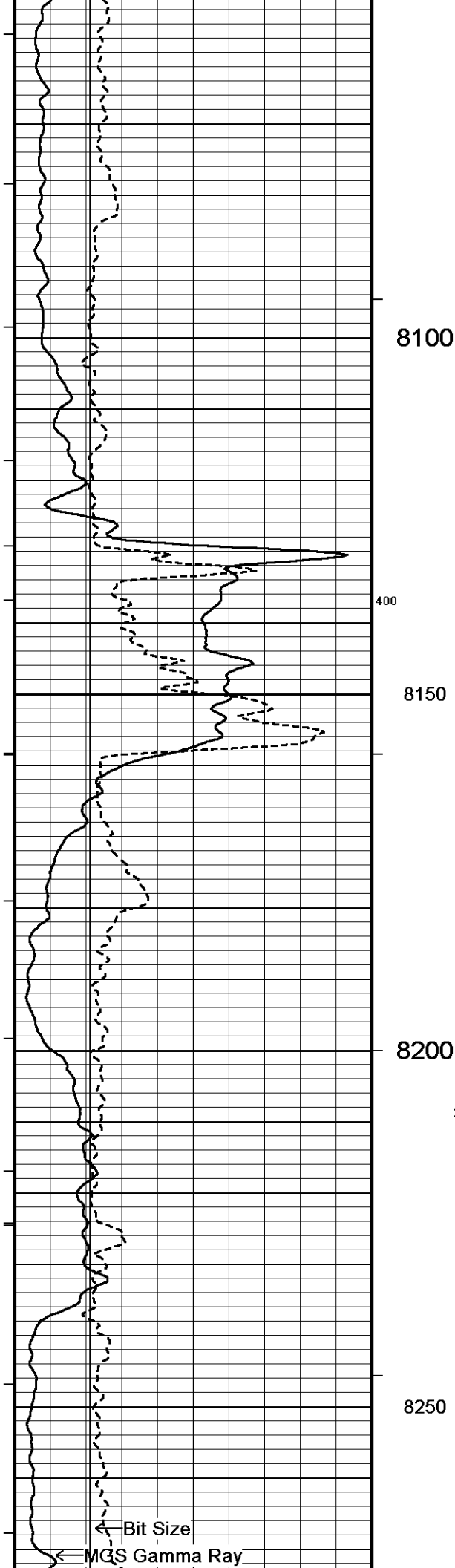


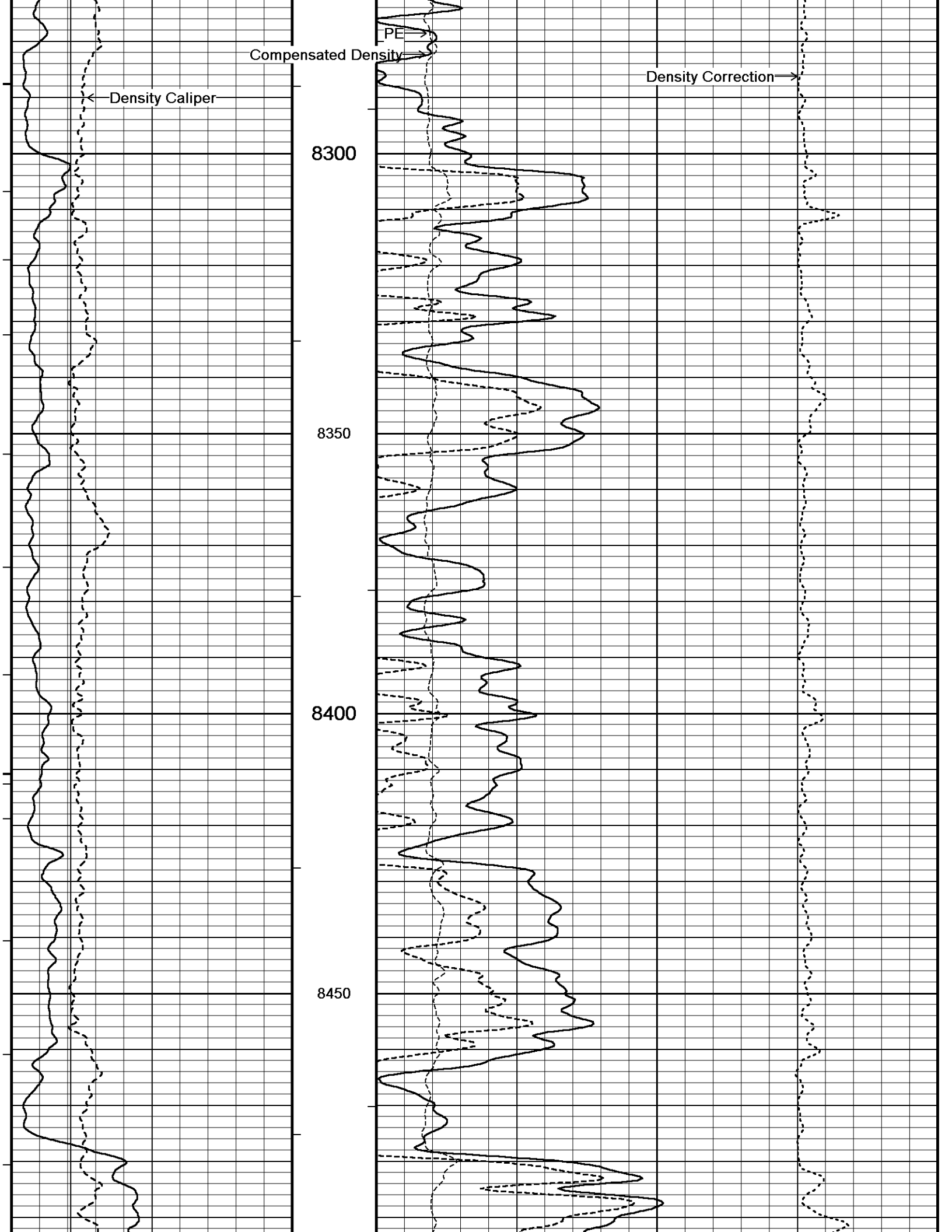


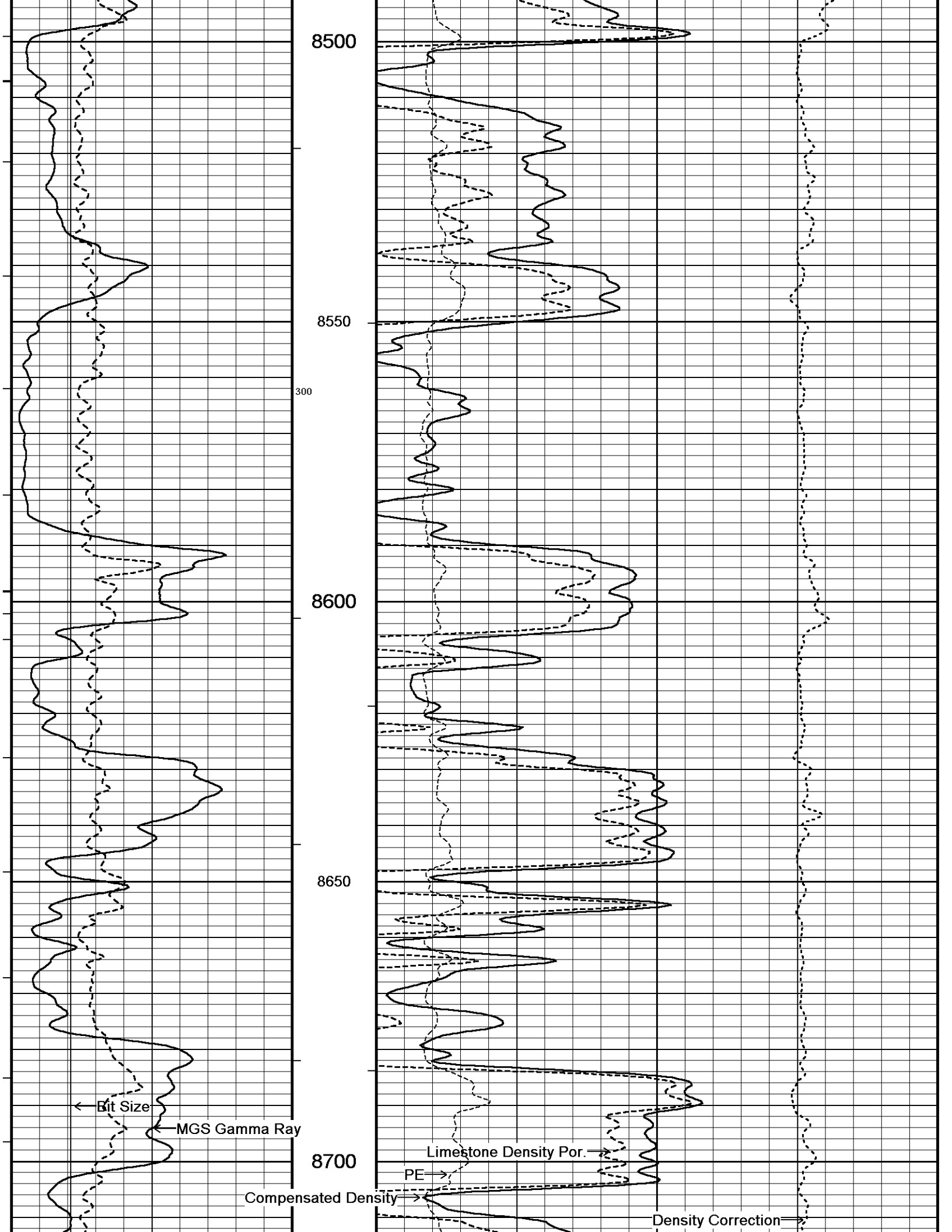


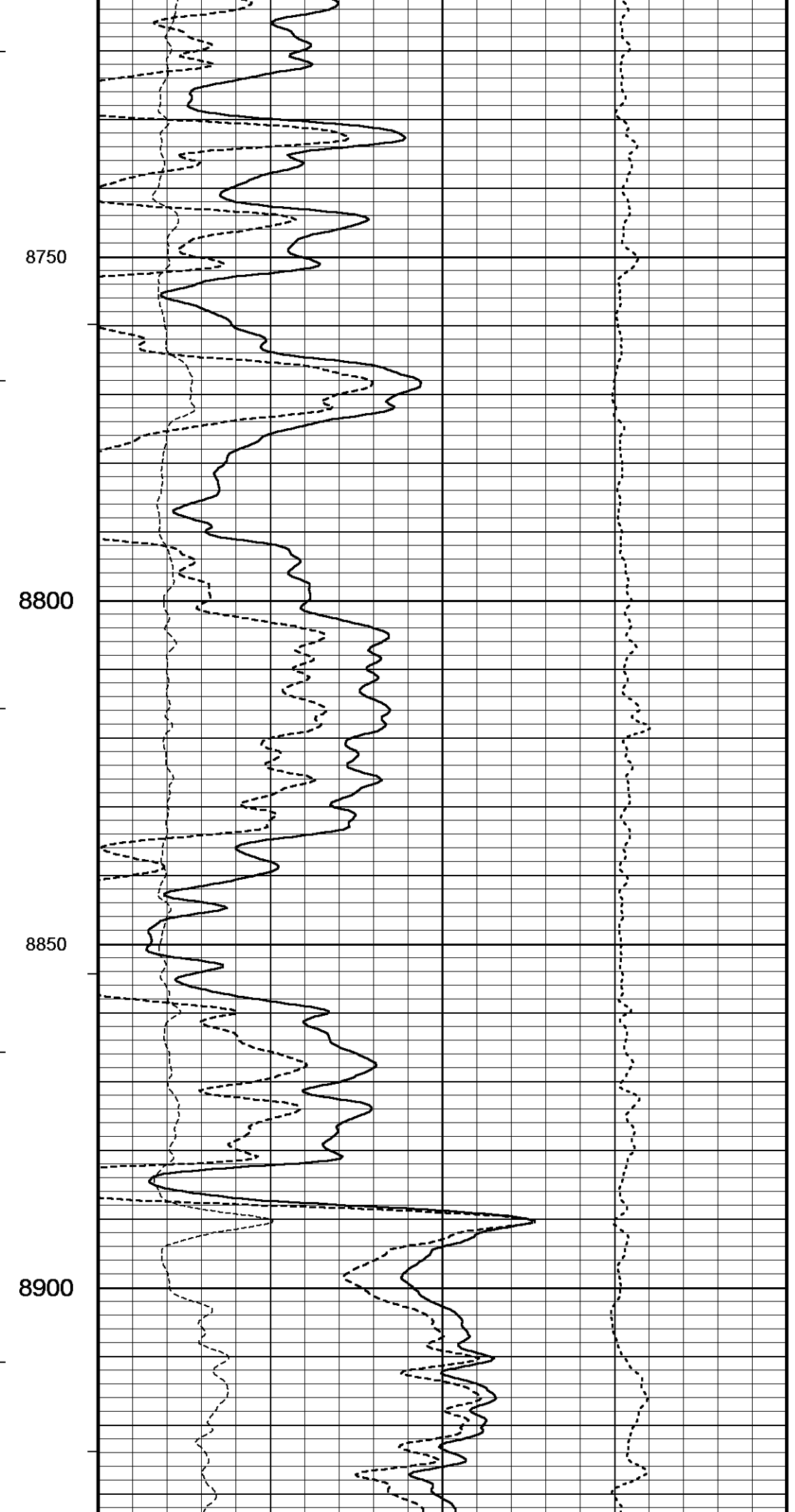
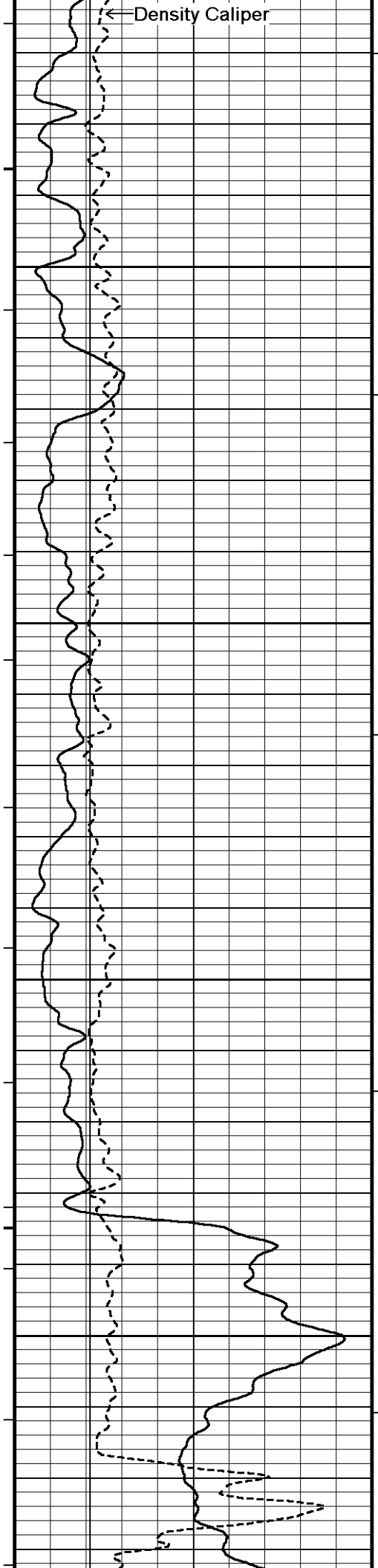


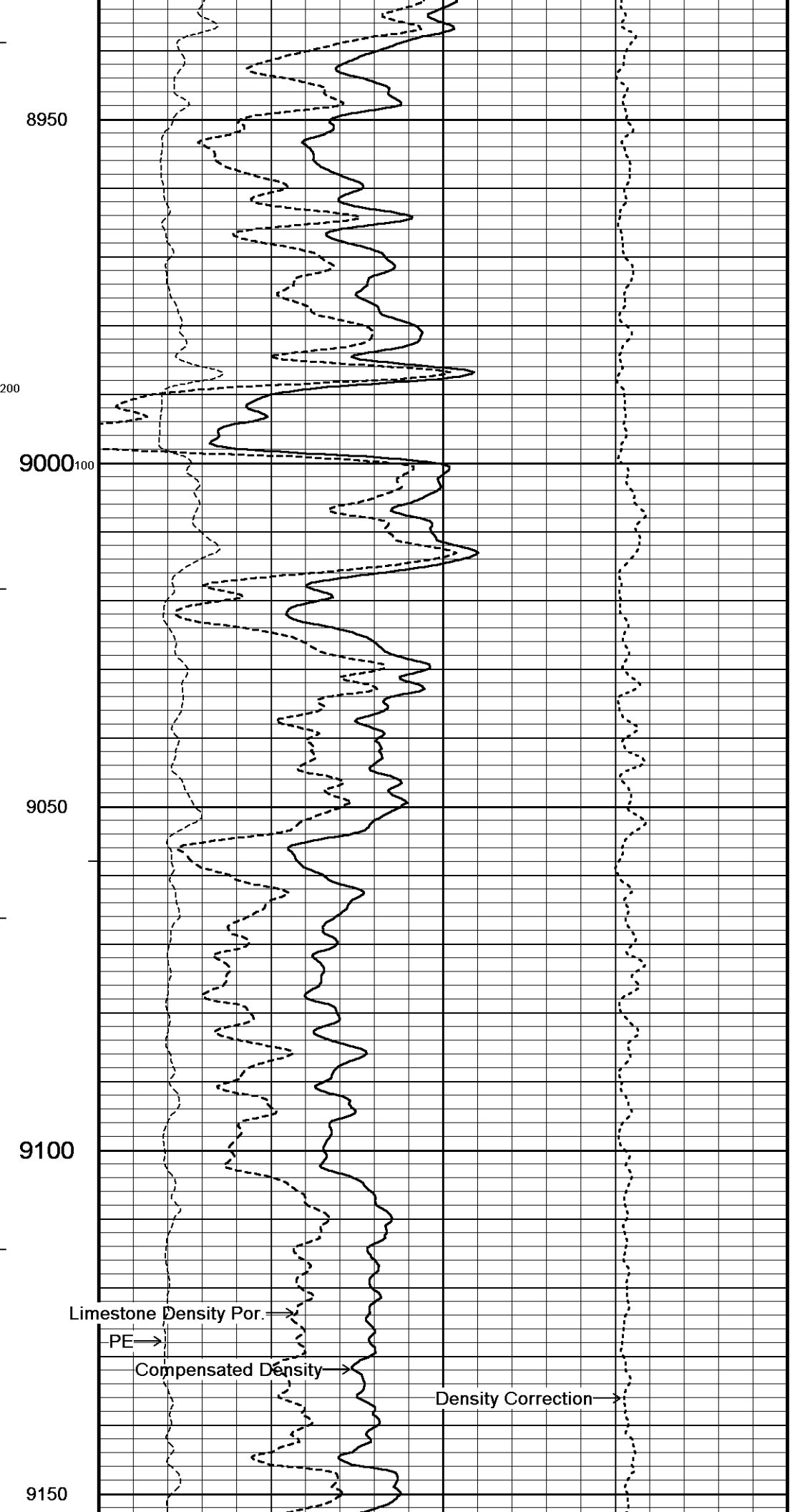
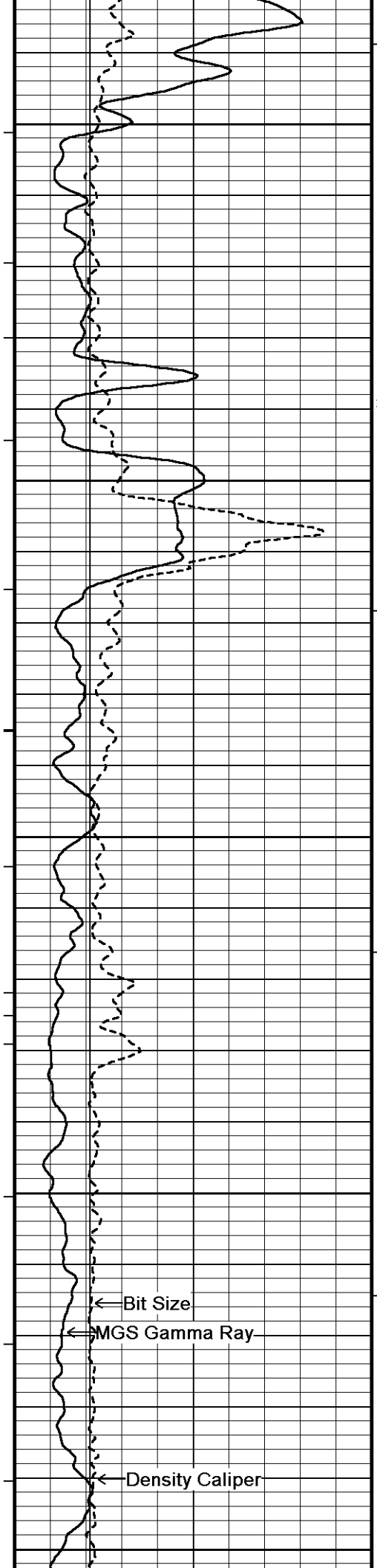


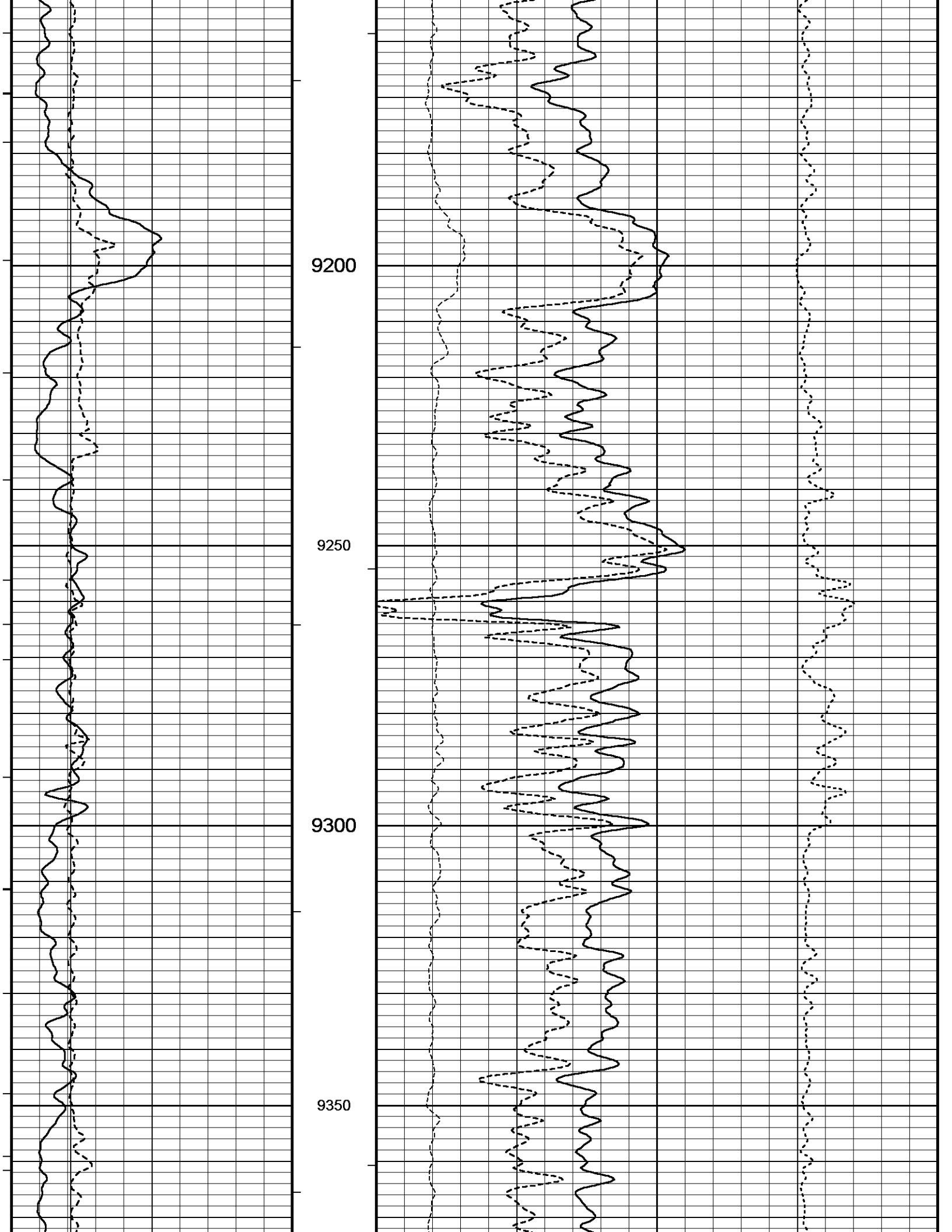


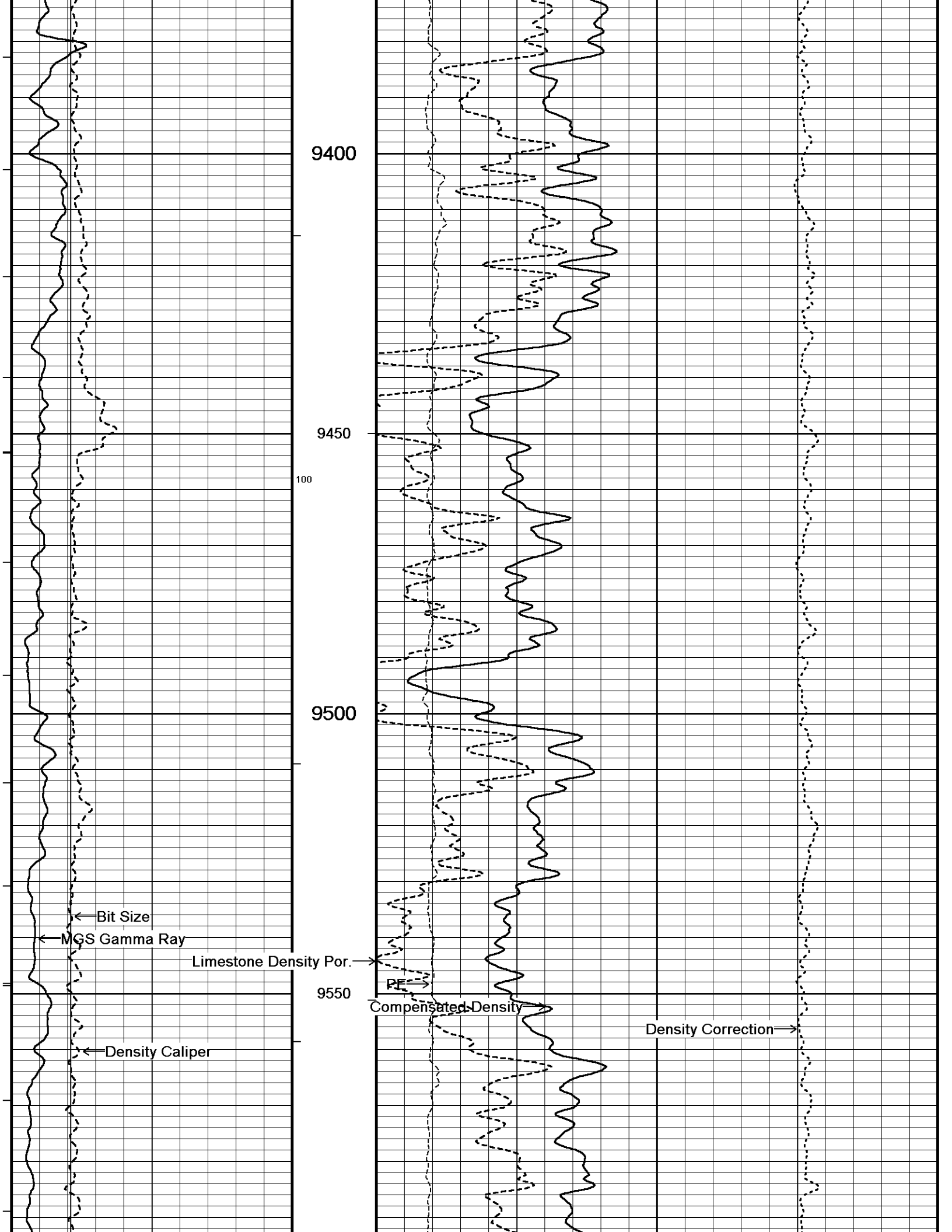


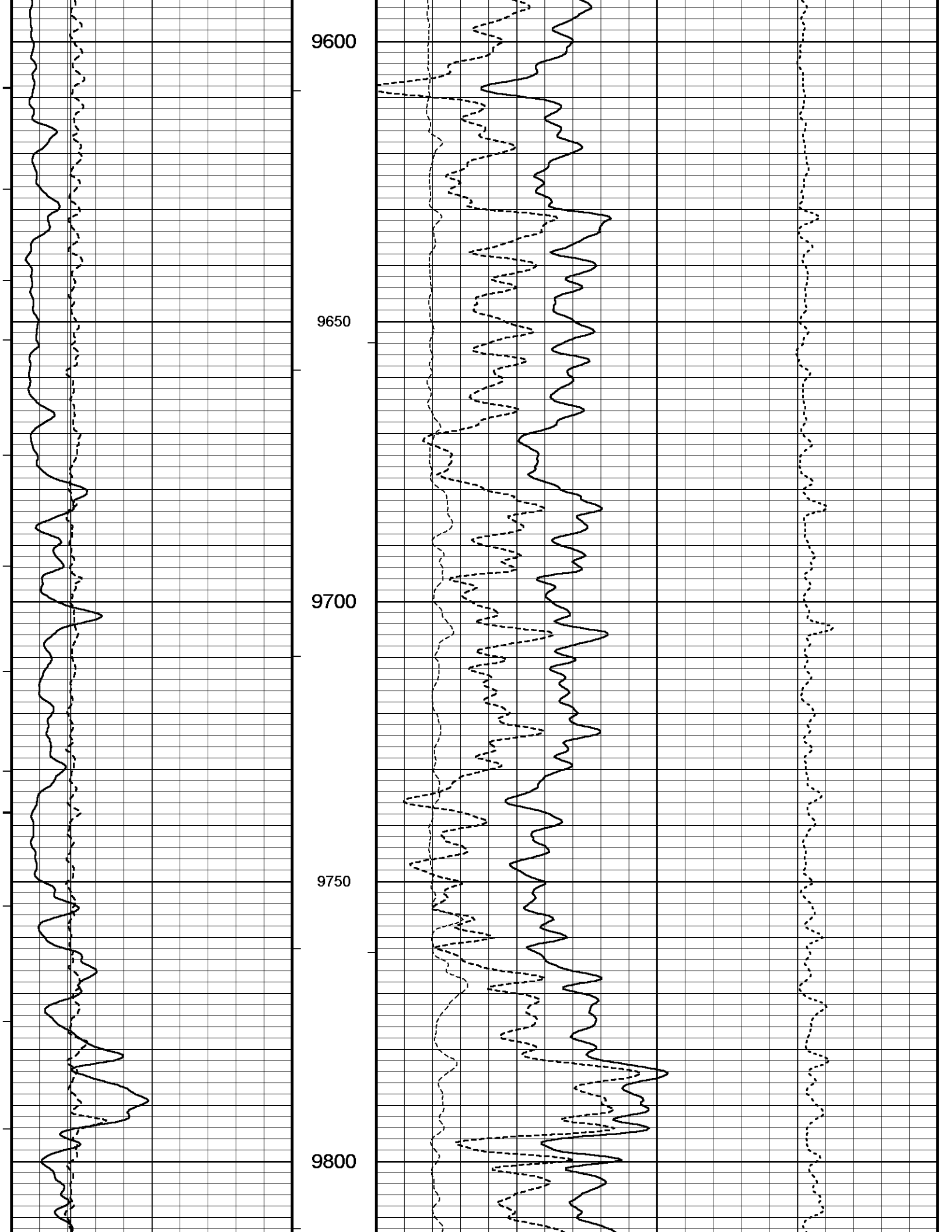


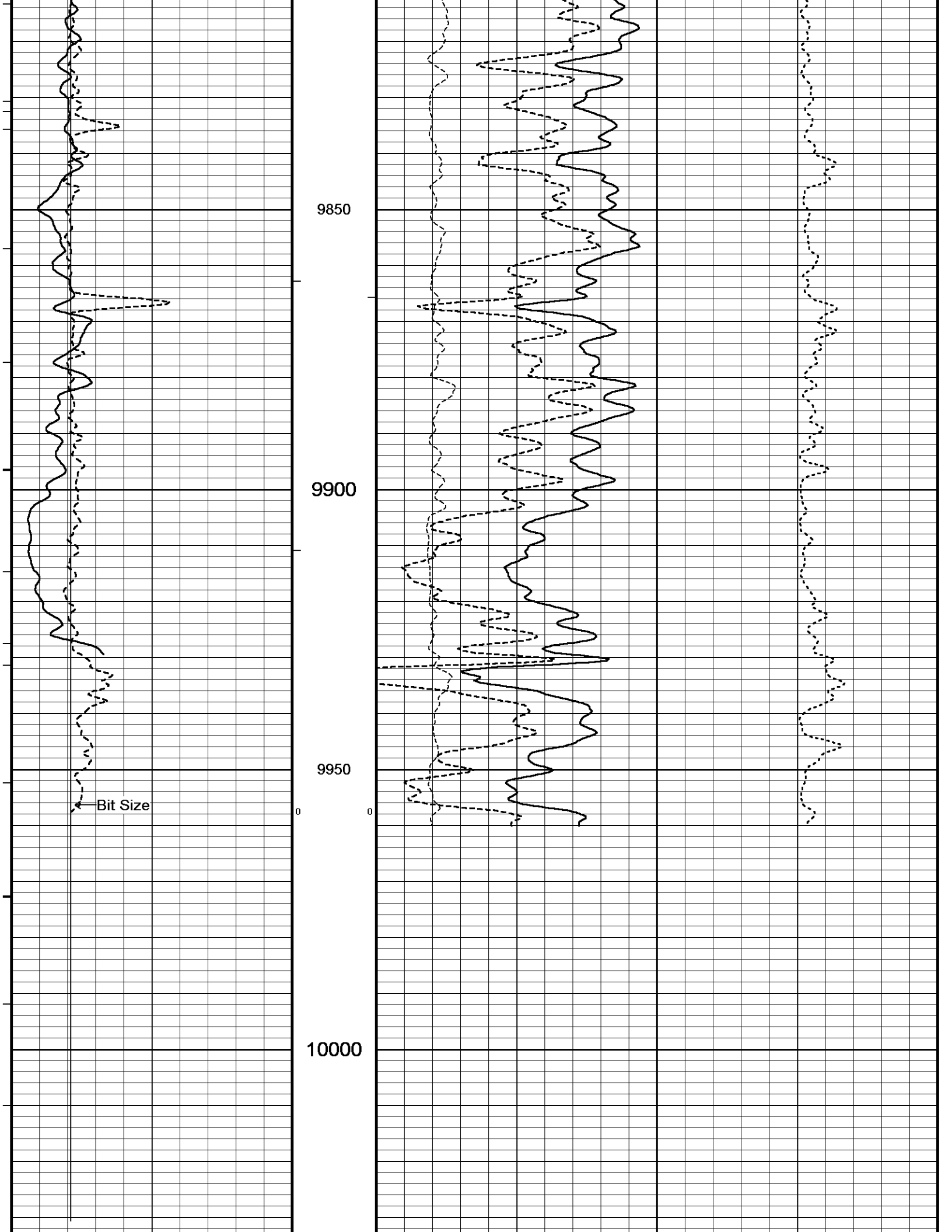


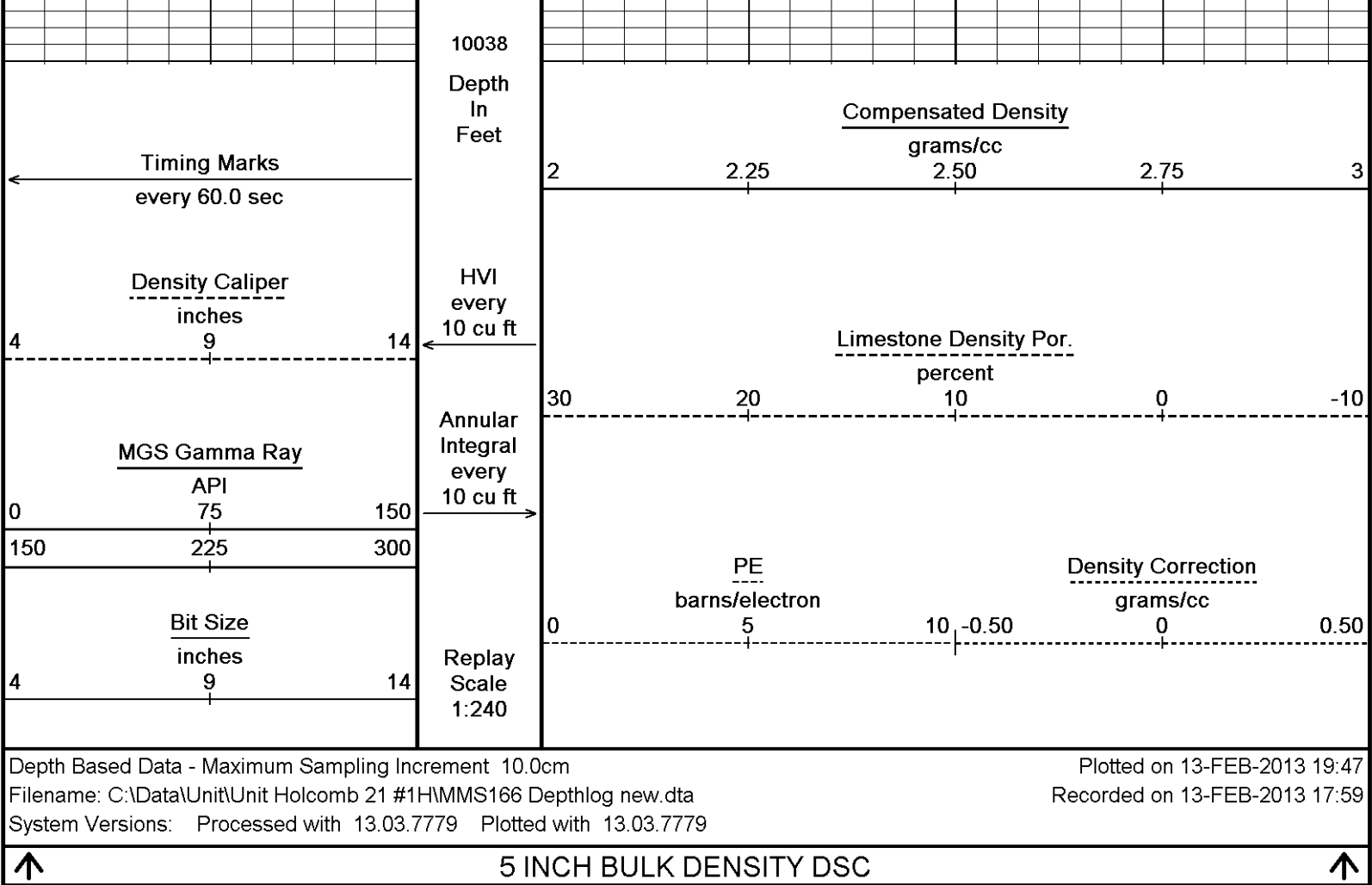












BEFORE SURVEY CALIBRATION			
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General Constants All 000		Last Edited on 13-FEB-2013,19:32	
General Parameters			
Mud Resistivity	1.400	ohm-metres	
Mud Resistivity Temperature	77.000	degrees F	
Water Level	0.000	feet	
Density/Neutron Processing	Wet Hole		
Hole/Annular Volume and Differential Caliper Parameters			
HVOL Method	Single Caliper		
HVOL Caliper 1	Density Caliper		
HVOL Caliper 2	N/A		
Annular Volume Diameter	4.500	inches	
Caliper for Differential Caliper	Density Caliper		
Rwa Parameters			
Porosity used	Base Density Porosity		
Resistivity used	Array Ind. One Res Rt		
RWA Constant A	0.610		
RWA Constant M	2.150		
Down-hole Tension Calibration SMS 0		Field Calibration on 05-SEP-2012,13:01	
Reading No	Measured	Calibrated (lbs)	
1	15152.07	0.00	
2	18386.74	2000.00	
Strain Gauge Constants MMS-E.B 166		Last Edited on 30-JAN-2013,09:56	
Atmospheric Pressure	14.70	psi	
Serial Number	262005		
Calibration Date	04-Jan-2011		

Base Check Date								
Dead Weight Serial Number		0						
Dead Weight Gravitational Correction		1.0						
Temperature	75.0		150.0		250.0		350.0 degrees F	
Pressure psia	Inc.	Dec.	Inc.	Dec.	Inc.	Dec.	Inc.	Dec.
0.0	0.096	0.097	0.113	0.113	0.129	0.129	0.138	0.139
3000.0	5.275	5.280	5.290	5.294	5.303	5.306	5.307	5.310
6000.0	10.464	10.472	10.478	10.485	10.488	10.494	10.487	10.494
9000.0	15.664	15.672	15.676	15.684	15.683	15.691	15.679	15.687
12000.0	20.876	20.882	20.888	20.893	20.892	20.898	20.885	20.890
15000.0	26.101		26.111		26.114		26.103	

Temperature Source	N/A	degrees F	
Mud Salinity	0.00	kppm	
Salinity Correction	Not Applied		
Formation Fluid Salinity Source	None		
Formation Fluid Salinity	N/A	kppm	
Barite Mud Correction	Not Applied		
Navigation Constants MIE-A.A 209			Last Edited on
Magnetic Declination	0.00	degrees	East
Imager Pad Check MIE-A.A 209			Field Check on
Pad 1	Pad Not Tested	Pad 5	Pad Not Tested
Pad 2	Pad Not Tested	Pad 6	Pad Not Tested
Pad 3	Pad Not Tested	Pad 7	Pad Not Tested
Pad 4	Pad Not Tested	Pad 8	Pad Not Tested
Compact Micro Imager Constants MIE-A.A 209			Last Edited on 12-FEB-2013,10:40
Sonde Configuration	Imager Mode		
Arm-Pad Kit	Normal Pads (12.25 in)		
Arm-Pad Kit Serial Number	N/A		
Centre Pad 1 Rotational Offset	0.00	degrees	
Image/Borehole Ovality Reference	Azimuth of Pad 1		
Non Active Buttons	Omit		
Search Angle	0.00	degrees	
Correlation Interval	3.28	feet	
Correlation Step	1.64	feet	
Current Offset	0.0000	mAmp	
Squasher Start	0.0500	mAmp	
Image Processing	Enabled		
Magnetometer Parameters MIE-A.A 209			
Date Of Last Magnetometer Calibration	26-NOV-2010,12:01		
	X Magnetometer	Y Magnetometer	Z Magnetometer
Slope	-1.000000	-1.001951	-1.007691
Offset	0.007782	-0.016800	0.011730
Magnetometer Constants MIE-A.A 209			Last Edited on
Magnetometer Calibrator Number	000		
Accelerometer Parameters MIE-A.A 209			
Date Of Last Accelerometer Calibration	25-NOV-2010,12:19		
	X Accelerometer	Y Accelerometer	Z Accelerometer
Slope	-1.113214	-1.109979	-1.101653
Offset	0.005467	0.005399	0.010368
Accelerometer Constants MIE-A.A 209			Last Edited on 25-NOV-2010,12:25
Accelerometer Calibrator Number	000		
Accelerometer Temperature Characterisation			
X Accelerometer			
Serial Number	826		
Calibration Date	01-Jan-1998		
	B0	B1	B2
Bias(g)	0.00000e+000	2.32377e-005	-1.87334e-008
	SF0	SF1	SF2
Scale Factor(mA/g)	3.00000e+000	2.71389e-004	4.55326e-007
			4.58364e-010
Y Accelerometer			
Serial Number	617		
Calibration Date	11-May-2008		
	B0	B1	B2
Bias(g)	0.00000e+000	1.76675e-005	6.93464e-010
	SF0	SF1	SF2
Scale Factor(mA/g)	3.00000e+000	2.56882e-004	5.72598e-007
			2.37496e-010

Z Accelerometer	844			
Serial Number	01-Jan-1998			
Calibration Date	B0	B1	B2	B3
Bias(g)	0.00000e+000	-1.21769e-005	-1.46867e-008	-6.44015e-011
	SF0	SF1	SF2	SF3
Scale Factor(mA/g)	3.00000e+000	2.73539e-004	4.65657e-007	2.88996e-010

Caliper Calibration MIE-A.A 209				Base Calibration on 20-JUL-2012 05:31	
				Field Calibration on	
Base Calibration					
Reading No	Pads 1-5 Meas.	Pads 3-7 Meas.	Calibrator Size (in)		
1	26963	26793	5.96		
2	36961	37191	7.97		
3	46401	44863	9.84		
4	58072	58409	11.91		
5	0	0	0.00		
Reading No	Pad 2 Meas.	Pad 4 Meas.	Pad 6 Meas.	Pad 8 Meas.	Calibrator Size (in)
1	24829	25688	24937	24692	5.96
2	33487	34230	33721	33433	7.97
3	40559	41186	42962	42856	9.84
4	51771	52426	51758	51697	11.91
5	0	0	0	0	0.00
Field Calibration					
	Measured	Measured	Actual		
	Pads 1-5 Caliper(in)	Pads 3-7 Caliper(in)	Caliper(in)		
	0.00	0.00	0.00		
	Measured	Measured	Measured	Measured	Actual
	Pad 2 Caliper(in)	Pad 4 Caliper(in)	Pad 6 Caliper(in)	Pad 8 Caliper(in)	Caliper(in)
	0.00	0.00	0.00	0.00	0.00

Caliper Constants MIE-A.A 209			Last Edited on 25-NOV-2010,07:57		
Caliper Difference for BRKT	0.120	inches			

High Resolution Temperature Calibration MAI-C.A 427			Field Calibration on 07-FEB-2013,10:52		
	Measured	Calibrated(Deg F)			
Lower	10.00	10.00			
Upper	100.00	100.00			

High Resolution Temperature Constants MAI-C.A 427		Last Edited on 07-FEB-2013,10:51	
Pre-filter Length	11		

Induction Calibration MAI-C.A 427					Base Calibration on 27-JAN-2013,14:35	
					Field Check on 12-FEB-2013 10:40	
Base Calibration						
Test Loop Calibration		Measured		Calibrated (mmho/m)		
Channel	Low	High	Low	High		
1	14.4	434.9	9.3	966.2		
2	5.8	355.4	7.6	821.4		
3	2.7	244.4	5.2	566.0		
4	1.8	129.3	2.6	279.2		
Array Temperature		22.9		Deg F		
Channel	Base Check (mmho/m)		Field Check (mmho/m)			
	Low	High	Low	High		
1			17.2	4141.7		
2			32.0	3771.6		
3			31.4	3210.4		
4			20.1	2124.7		
Deep			19.6	2020.0		
Medium			46.0	4289.6		
Shallow			47.2	5681.2		
Array Temperature				37.3	Deg F	

Induction Constants MAI-C.A 427			Last Edited on 13-FEB-2013,18:08		
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Induction Model	D+AD WPM				
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Induction Model	RDAP-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.	MGS External Temperature		
Squasher Start	0.0020	mhos/metre	
Squasher Offset	N/A	mhos/metre	

Borehole Normalisation			
DRM1	0.0000	DRC1	0.0000
DRM2	0.0000	DRC2	0.0000
MRM1	0.0000	MRC1	0.0000
MRM2	0.0000	MRC2	0.0000
SRM1	0.0000	SRC1	0.0000
SRM2	0.0000	SRC2	0.0000

Calibration Site Corrections			
Channel 1	0.00	mmhos/metre	
Channel 2	0.00	mmhos/metre	
Channel 3	0.00	mmhos/metre	
Channel 4	0.00	mmhos/metre	

Apparent Porosity and Water Saturation Constants			
Archie Constant (A)	1.00		
Cementation Exponent (M)	2.00		
Saturation Exponent (N)	2.00		
Saturation of Water for Apor	100.00	percent	
Resistivity of Water for Apor and Sw	0.05	ohm-m	
Resistivity of Mud Filtrate for Sw	0.00	ohm-m	
Source for Rt	0.00		
Source for Rxo	0.00		

Photo Density Calibration MPD-D.A 471

Base Calibration on 04-FEB-2013 13:31
Field Check on 12-FEB-2013 10:45

Density Calibration				
Base Calibration		Measured		Calibrated (sdu)
	Near	Far	Near	Far
Reference 1	54416	27473	59869	31110
Reference 2	22802	2732	24557	2522
Field Check at Base				
	1278.8	1479.3		
Field Check				
	1280.0	1469.0		

PE Calibration				
Base Calibration		Measured		Calibrated
	WS	WH	Ratio	Ratio
Background	247	1133		
Reference 1	24125	54197	0.450	0.369
Reference 2	7025	22646	0.315	0.271
Field Check at Base				
	247.3	1133.4		
Field Check				
	243.9	1132.6		

Density Constants MPD-D.A 471

Last Edited on 09-FEB-2013,12:47

Density Source Id	243
Nylon Calibrator Number	633
Aluminium Calibrator Number	633
Density Shoe Profile	4 inch

Caliper Source for Processing	Density Caliper	
PE Correction to Density	Not Applied	
Mud Density	1.01	gm/cc
Mud Density Z/A Multiplier	1.11	
Mud Filtrate Density	1.00	gm/cc
Dry Hole Mud Filtrate Density	1.00	gm/cc
DNCT	0.00	gm/cc
CRCT	0.00	gm/cc
Density Z/A Correction	Hybrid	
Matrix Density (gm/cc)	Depth (ft)	
2.71	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	

Caliper Calibration MPD-D.A 471

Base Calibration on 04-FEB-2013 23:20

Field Calibration on 09-FEB-2013 07:48

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	19168	3.99
2	28887	5.97
3	38925	7.99
4	48364	9.86
5	59511	11.93
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
5.92	5.96

DOWNHOLE EQUIPMENT

C:\Data\Unit\Unit Holcomb 21 #1H\MMMS166 Depthlog new.dta

Shuttle Running Tool 3.5")
SRT-A.A 40 LG: 6.62 ft WT: 37.5 lb OD: 2.52 in

MBS-G.A 200v Compact Battery Sub
MBS-G.A 135 LG: 17.06 ft WT: 123.5 lb OD: 2.24 in

Compact Memory Sub E.B
MMS-E.B 166 LG: 5.20 ft WT: 37.5 lb OD: 2.24 in

Compact Tool Isolator sub.
MTI-B.A 63 LG: 1.54 ft WT: 13.2 lb OD: 2.24 in

Compact Short Gamma
MGS-C.J 133 LG: 3.41 ft WT: 24.3 lb OD: 2.24 in

Compact Collar Locator
MCL-B.J 72 LG: 3.17 ft WT: 26.5 lb OD: 2.24 in

SKJ-E.B Compact Knuckle Joint
SKJ-E.B 458 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

SHA-J.A Compact Swivel Head Adaptor
SHA-J.A 432 LG: 2.30 ft WT: 22.0 lb OD: 2.24 in

MIS-A.A Compact Inline Bowspring sub
MIS-A.A 247 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in



Compact Neutron
MDN-B.J 423 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Density/Caliper
MPD-D.A 471 LG: 9.59 ft WT: 90.4 lb OD: 2.24 in

MIS-D.A Compact Inline Bowspring sub
MIS-D.A 315 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in

SHA-J.B Compact Swivel Head Adaptor
SHA-J.B 595 LG: 2.30 ft WT: 22.0 lb OD: 2.24 in

SKJ-E.B Compact Knuckle Joint
SKJ-E.B 477 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

MIS-D.A Compact Inline Bowspring sub
MIS-D.A 333 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in

Compact MMI Memory Section
MIM-A.A 157 LG: 4.65 ft WT: 26.5 lb OD: 2.24 in

Compact MMI Electrode Section
MIE-A.A 209 LG: 13.96 ft WT: 99.2 lb OD: 4.09 in

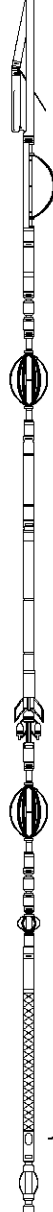
MIS-D.B Compact Inline Bowspring sub
MIS-D.B 606 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in

SKJ-D.A Compact Knuckle Joint
SKJ-D.A 209 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

MIS-E.A Compact Inline Standoff sub
MIS-E.A 336 LG: 2.14 ft WT: 15.4 lb OD: 2.24 in

Compact Induction
MAI-C.A 427 LG: 12.52 ft WT: 48.5 lb OD: 2.24 in

Total Length: 118.79 ft Weight: 842.2 lb



23.05 ft IECY - MIE Caliper Y
23.05 ft IECX - MIE Caliper X
22.54 ft IAP1 - Azimuth of Reference
22.54 ft IMGR - MMI Image

Tool Zero (1.84ft from bottom)
All measurements relative to tool zero.

COMPANY	UNIT PETROLEUM
WELL	HOLCOMB 21-1H
FIELD	PLEVNA SOUTH
PROVINCE/COUNTY	RENO
COUNTRY/STATE	USA / KANSAS

Elevation Kelly Bushing	1695.00	feet	First Reading	9960.00	feet
Elevation Drill Floor	1695.00	feet	Depth Driller	10053.00	feet
Elevation Ground Level	1681.00	feet	Depth Logger	10030.00	feet



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CML WELL SHUTTLE
COMPENSATED PHOTO-DENSITY
COMPENSATED NEUTRON LOG

