



Weatherford[®]

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

COMPANY SANDRIDGE EXPLORATION & PRODUCTION
WELL TURNER 3406 5-7H
FIELD WILD CREEK NORTH
PROVINCE/COUNTY HARPER
COUNTRY/STATE USA / KANSAS
LOCATION 250' FSL & 1980' FEL

SEC 7 TWP 34S RGE 6W Other Services MAI
API Number 15-077-21918-01
Permit Number
Permanent Datum G.L., Elevation 1309 feet
Log Measured From KB
Drilling Measured From K.B.

Elevations: feet
KB 1327.00
DF 1327.00
GL 1309.00

Date	12-MAY-2013
Run Number	ONE
Depth Driller	8973.00 feet
Depth Logger	8949.00 feet
First Reading	8916.00 feet
Last Reading	3500.00 feet
Casing Driller	5317.00 feet
Casing Logger	5317.00 feet
Bit Size	6.125 inches
Hole Fluid Type	WATER
Density / Viscosity	8.35 lb/USg 27.00 CP
PH / Fluid Loss	9.00 60.00 ml/30Min
Sample Source	FLOWLINE
Rm @ Measured Temp	3.50 @ 73.8 ohm-m
Rmf @ Measured Temp	2.80 @ 73.8 ohm-m
Rmc @ Measured Temp	4.20 @ 73.8 ohm-m
Source Rmf / Rmc	CALC CALC
Rm @ BHT	1.76 @ 146.0 ohm-m
Time Since Circulation	1 HOUR
Max Recorded Temp	146.00 deg F
Equipment Name	COMPACT
Equipment / Base	18064 OKC
Recorded By	C. GRIFFIN
Witnessed By	M. HALE
S.O.#/AFE	3540433 / DC12711

BOREHOLE RECORD			Last Edited: 12-MAY-2013 14:43
Bit Size inches	Depth From feet	Depth To feet	
6.125	5317.00	8973.00	
CASING RECORD			
Type	Size inches	Depth From feet	Shoe Depth feet
INTERMED	7.000	0.00	5317.00
Weight pounds/ft			
			26.00

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 8868 FT.
 AFTER DEPLOYMENT LOGGING TOOL WAS AT 8949 FT.
 4.5 " PRODUCTION CASING USED TO CALCULATE ANNULAR HOLE VOLUMES.
 OPERATORS: P. BURGER, G. GARCIA
 RIG: LARIAT 39

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.

5 INCH MAIN PASS DSC

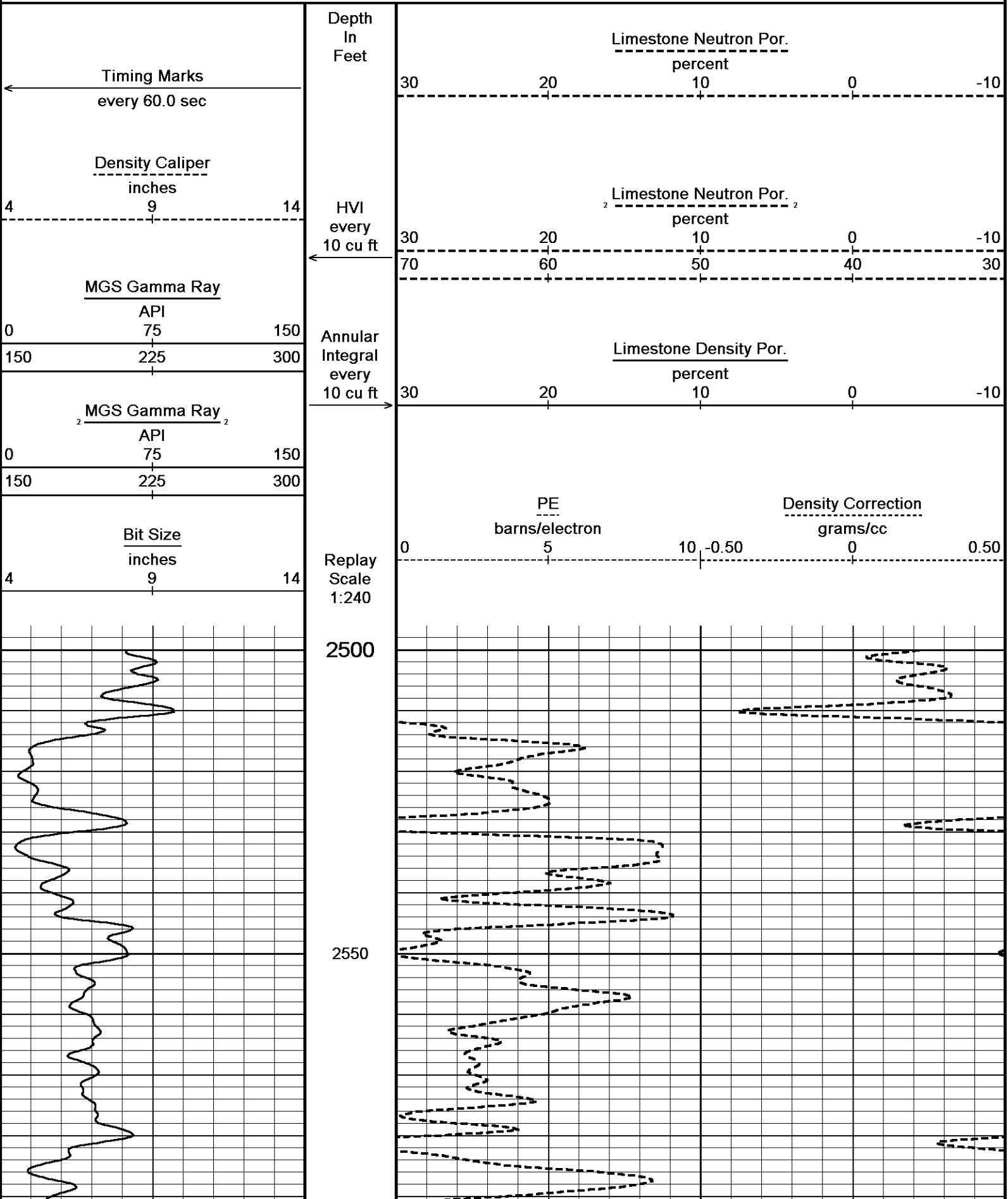
Depth Based Data - Maximum Sampling Increment 10.0cm

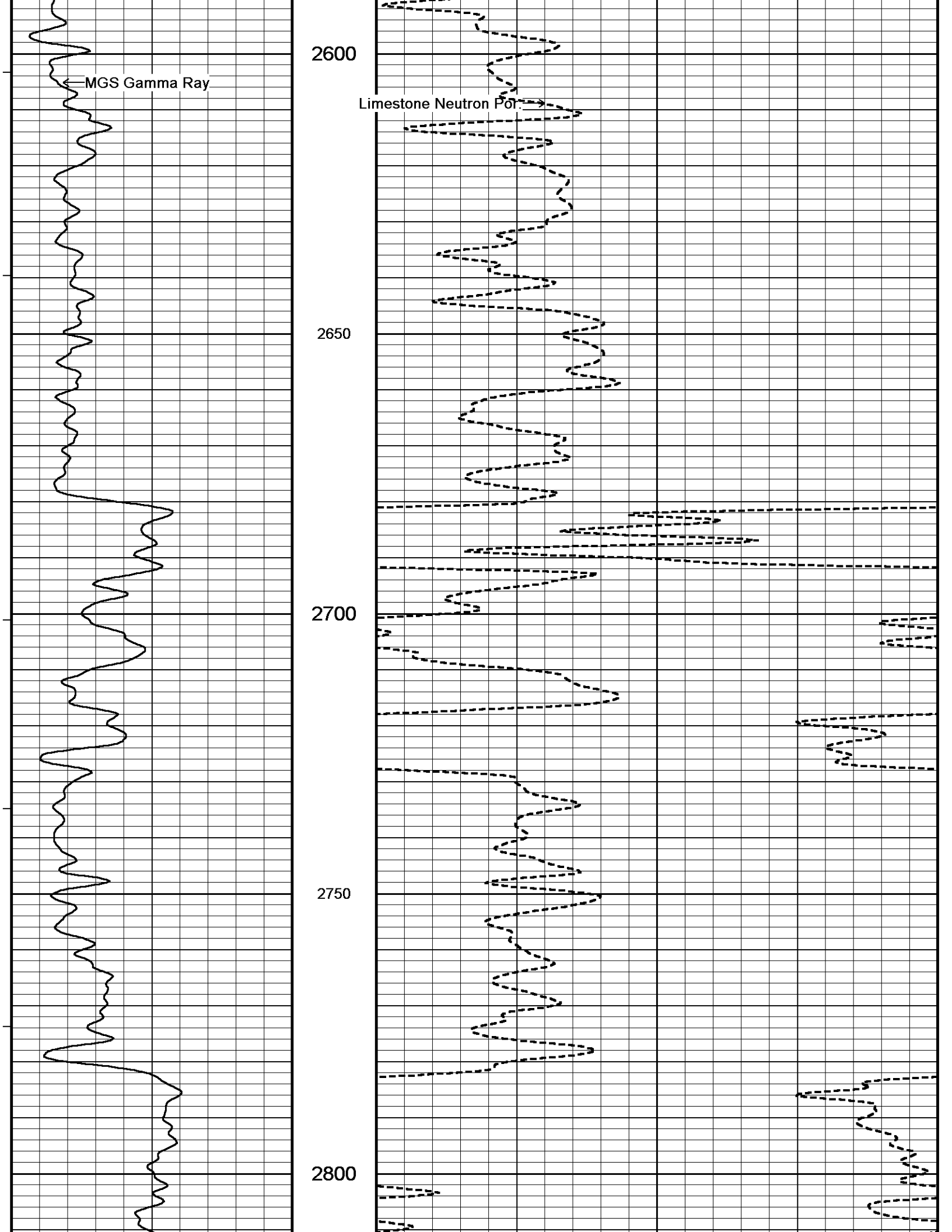
Plotted on 12-MAY-2013 14:50

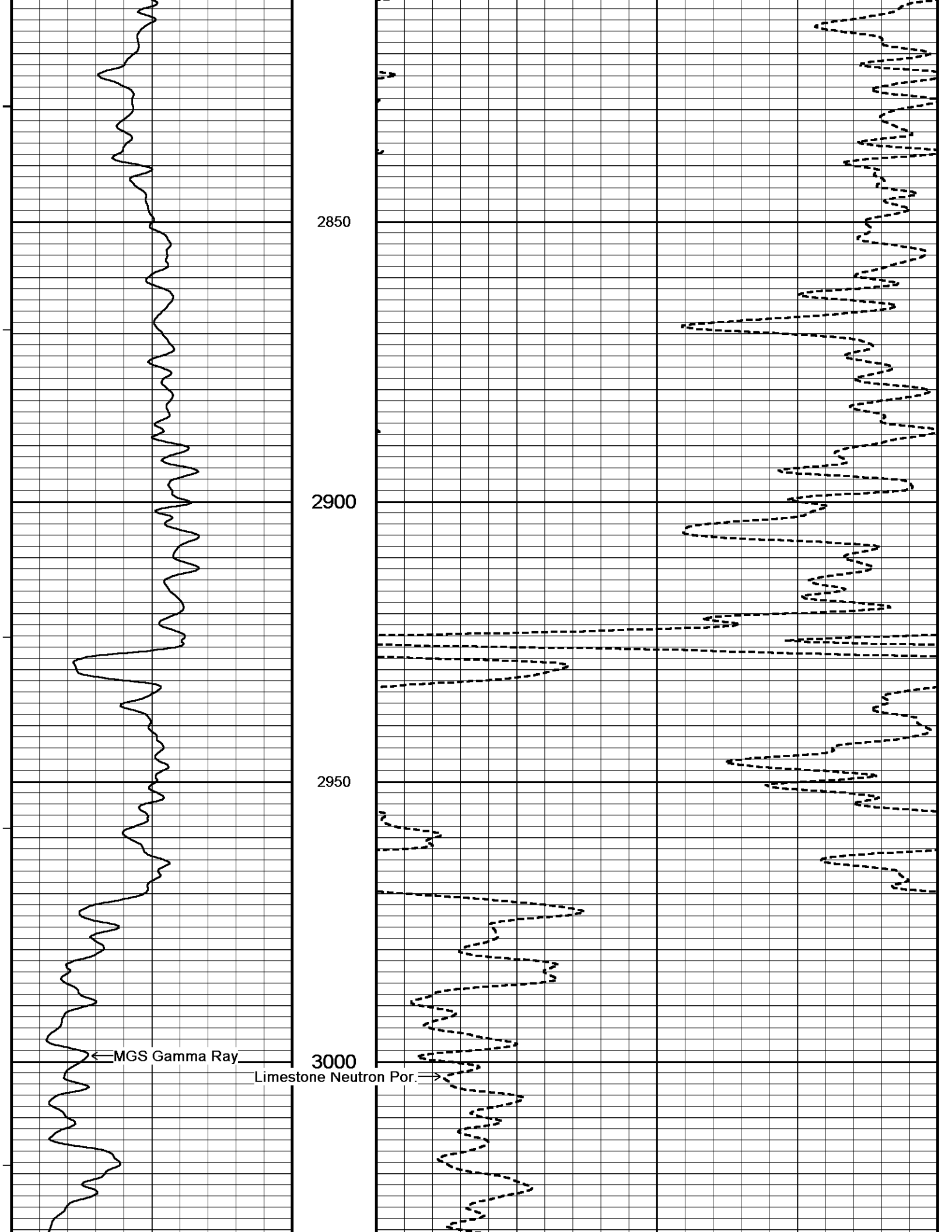
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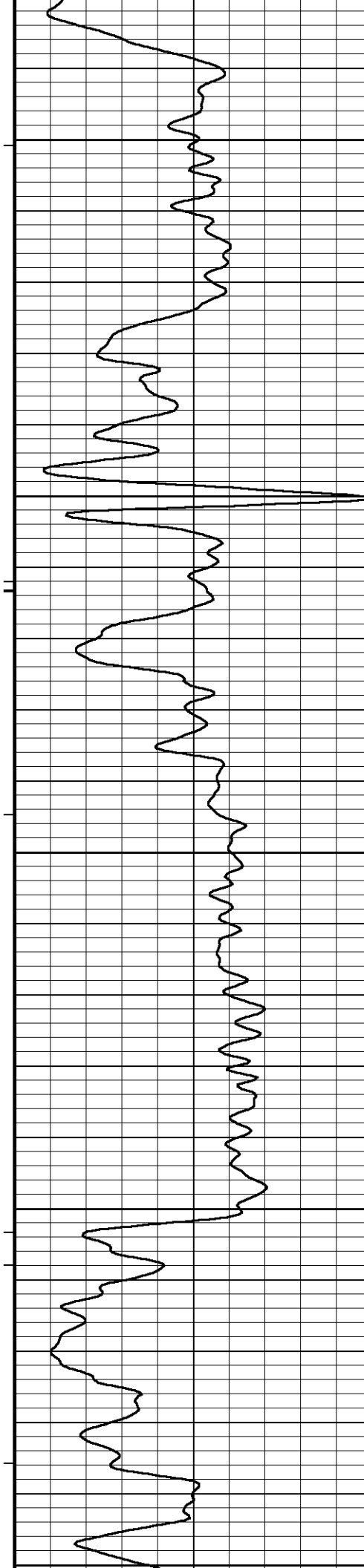
Recorded on 12-MAY-2013 14:25

System Versions: Processed with 13.03.7779 Plotted with 13.03.7779









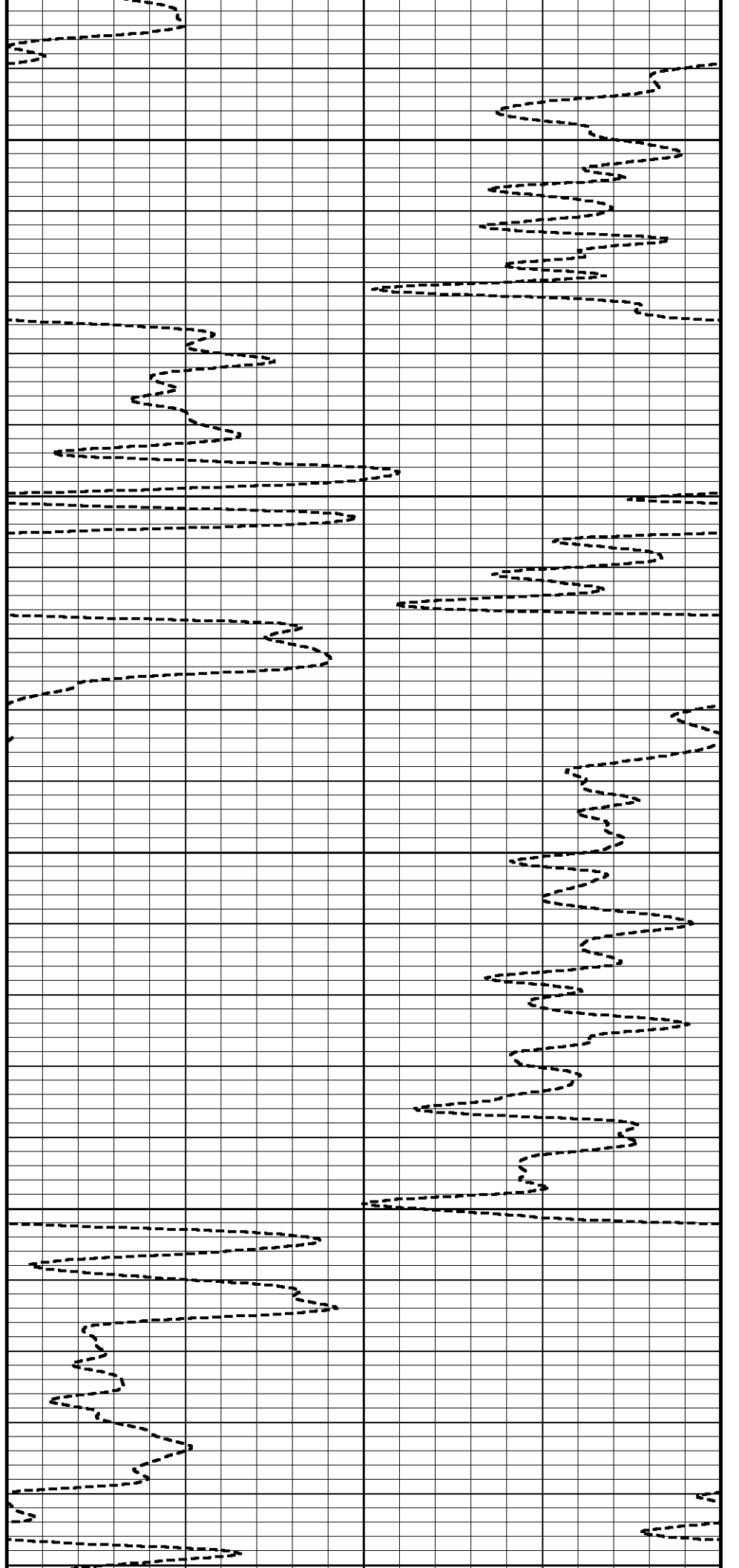
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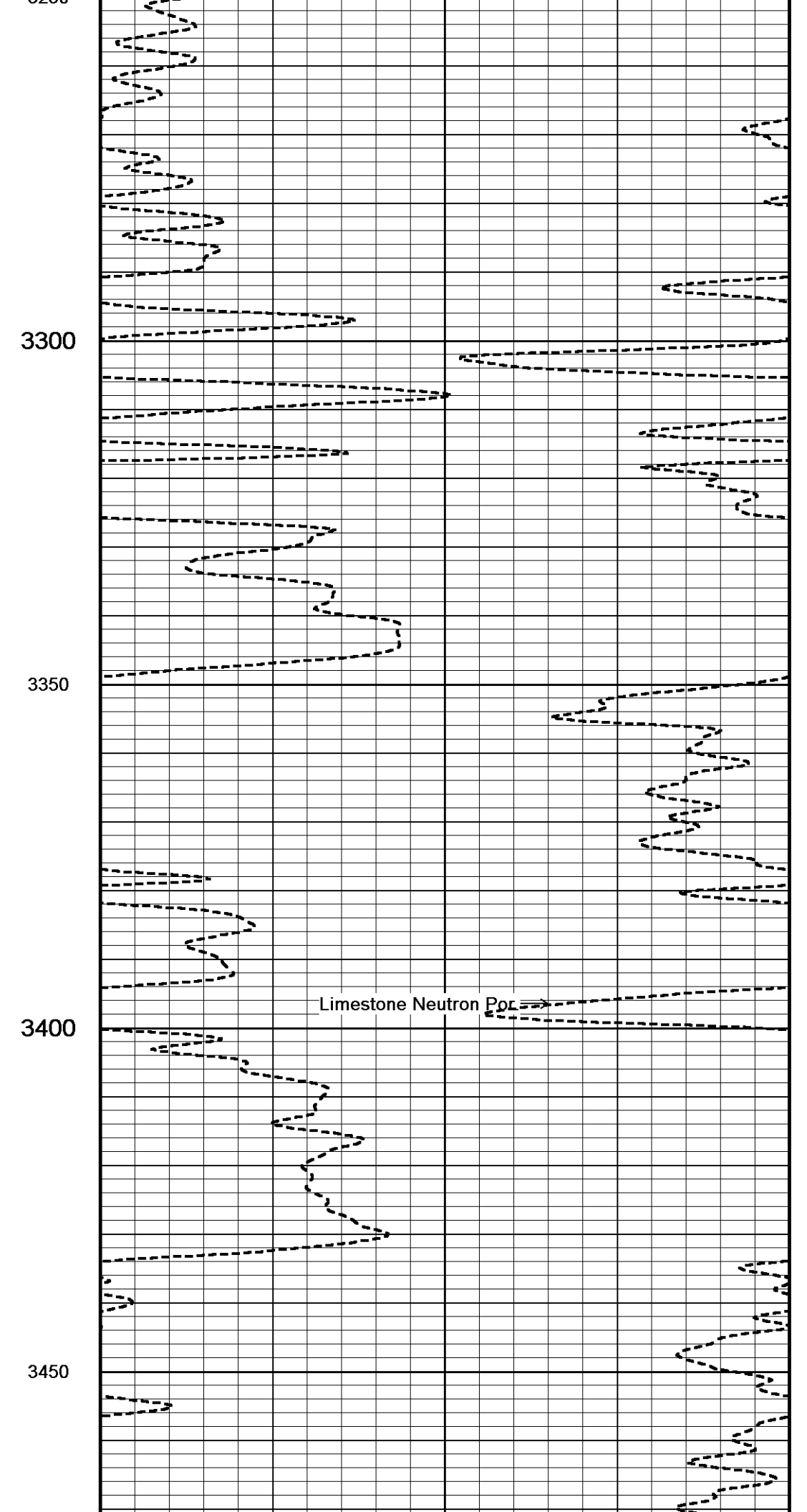
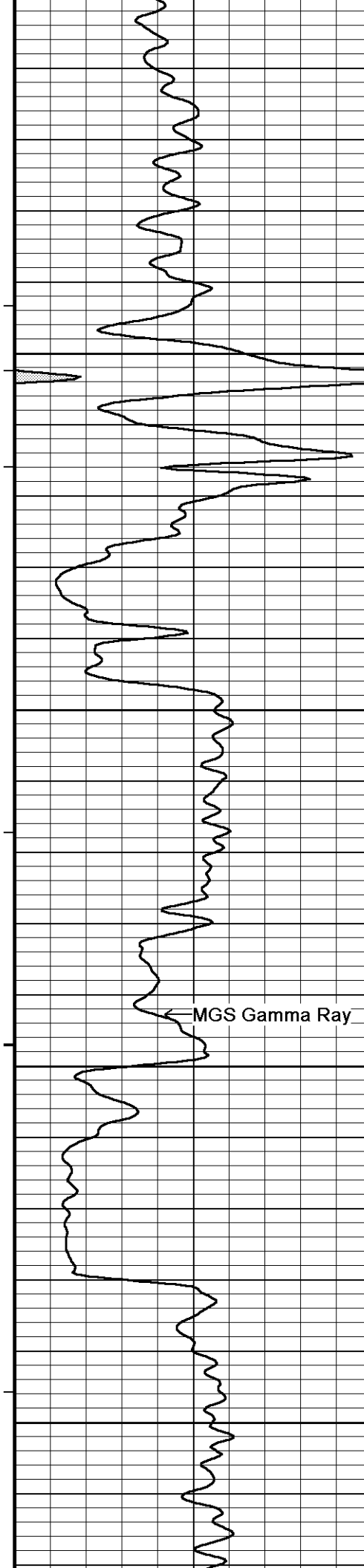
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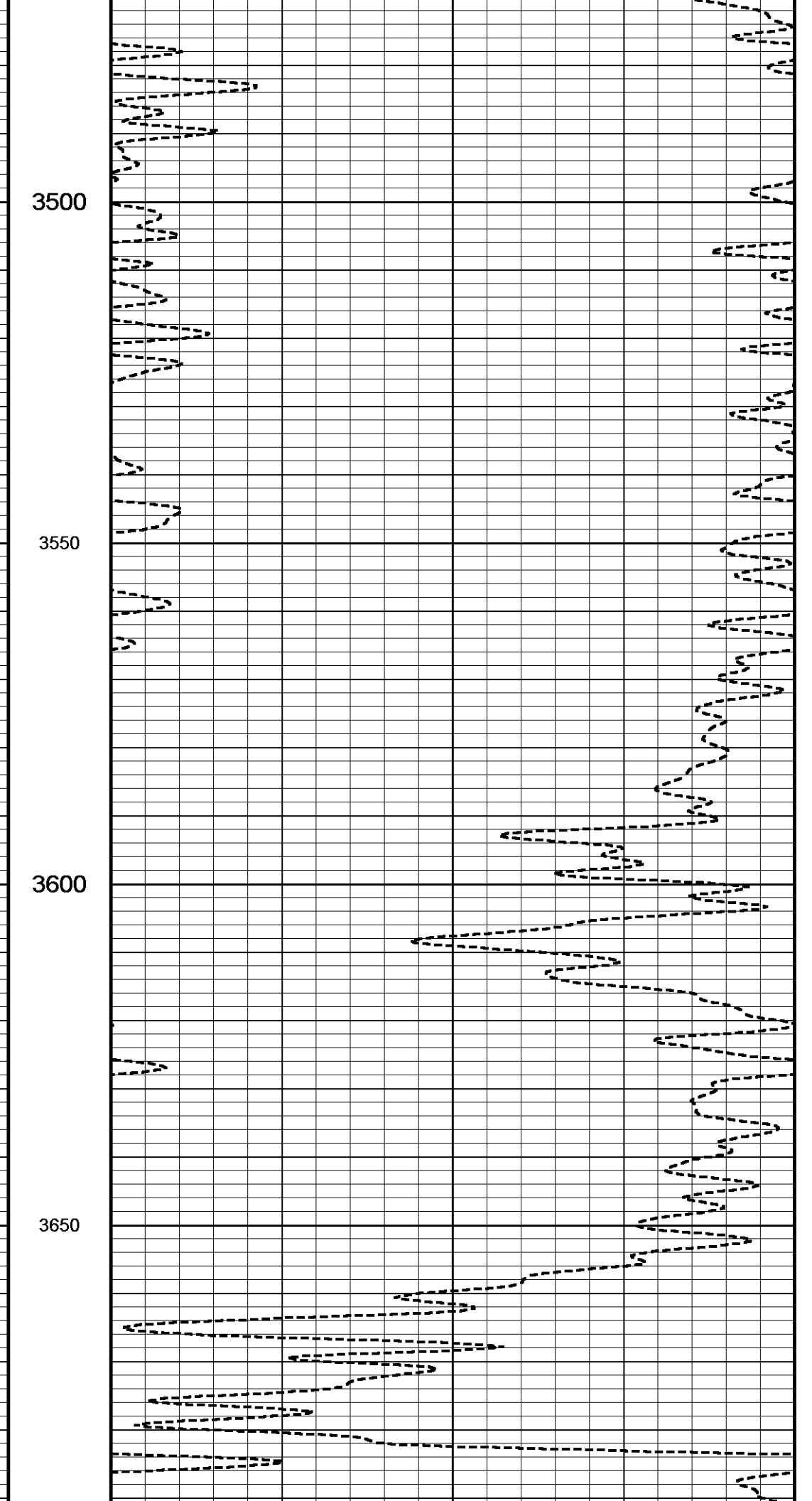
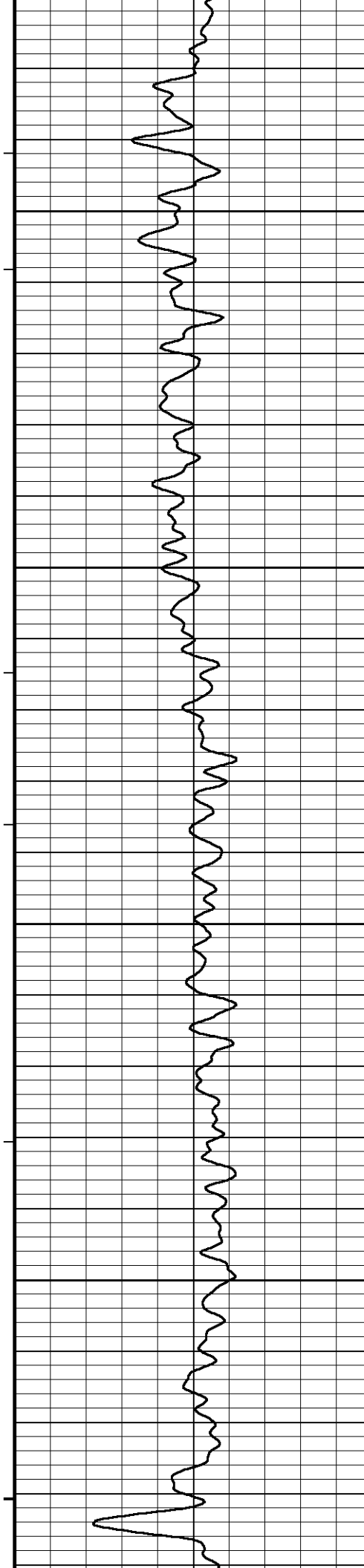
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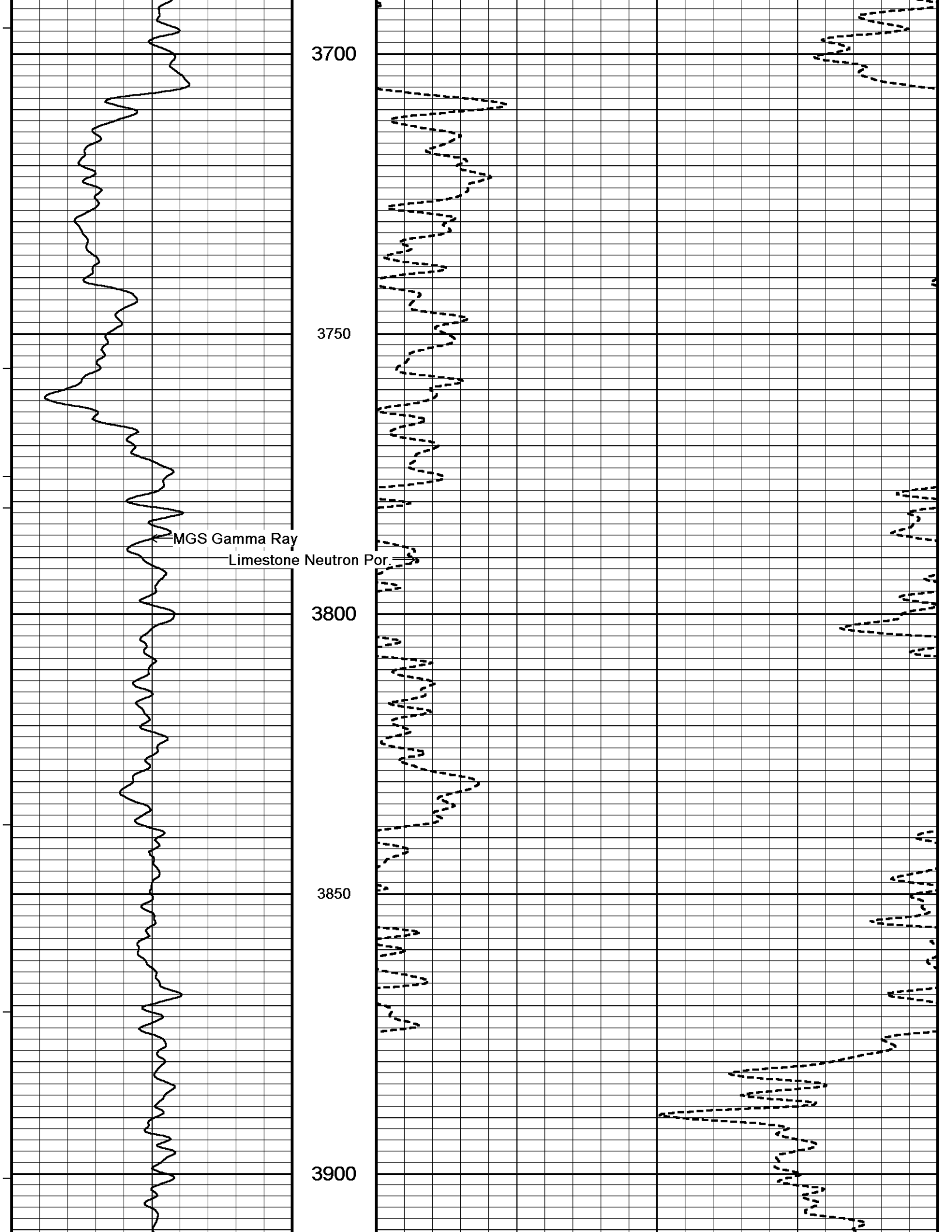
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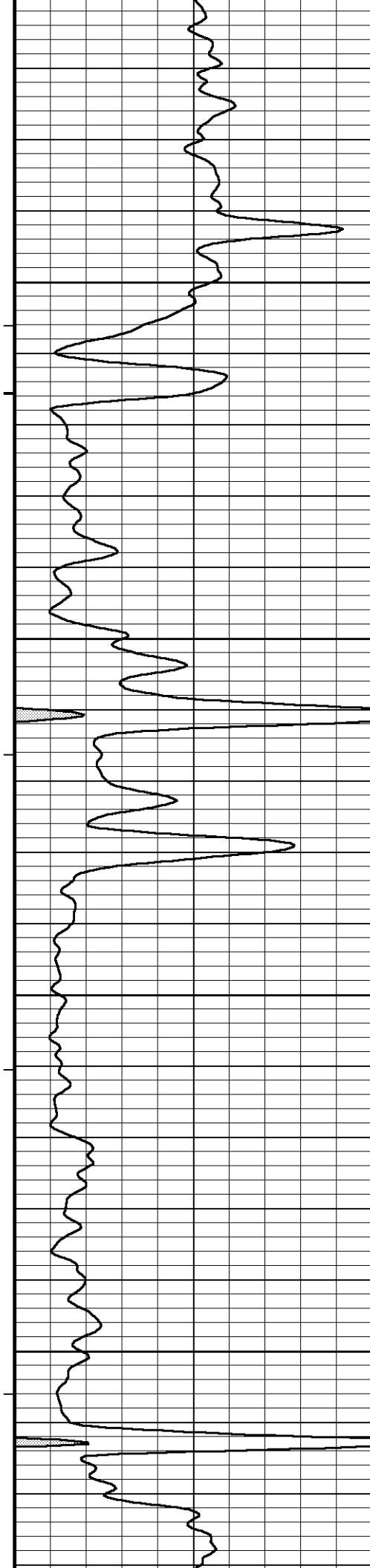
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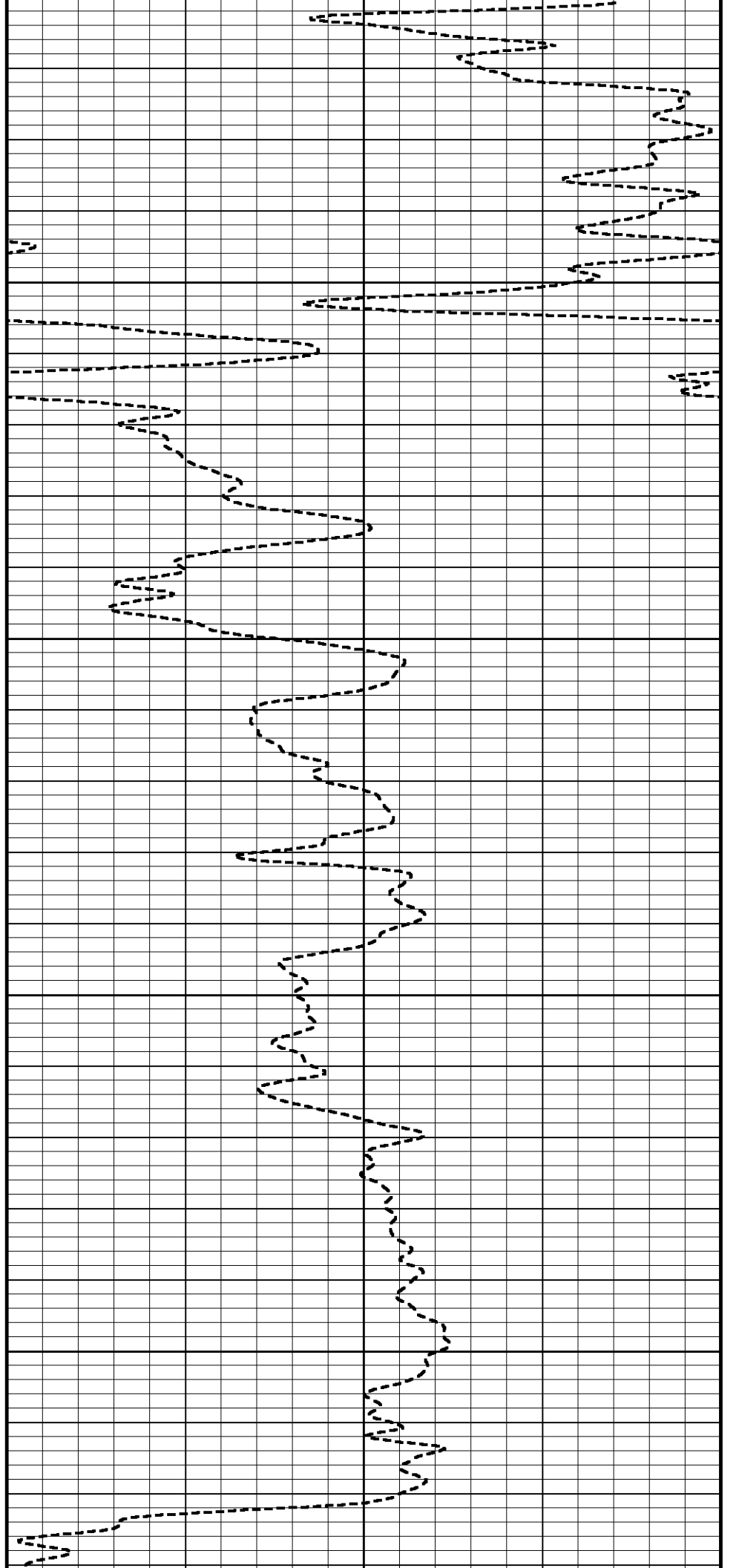


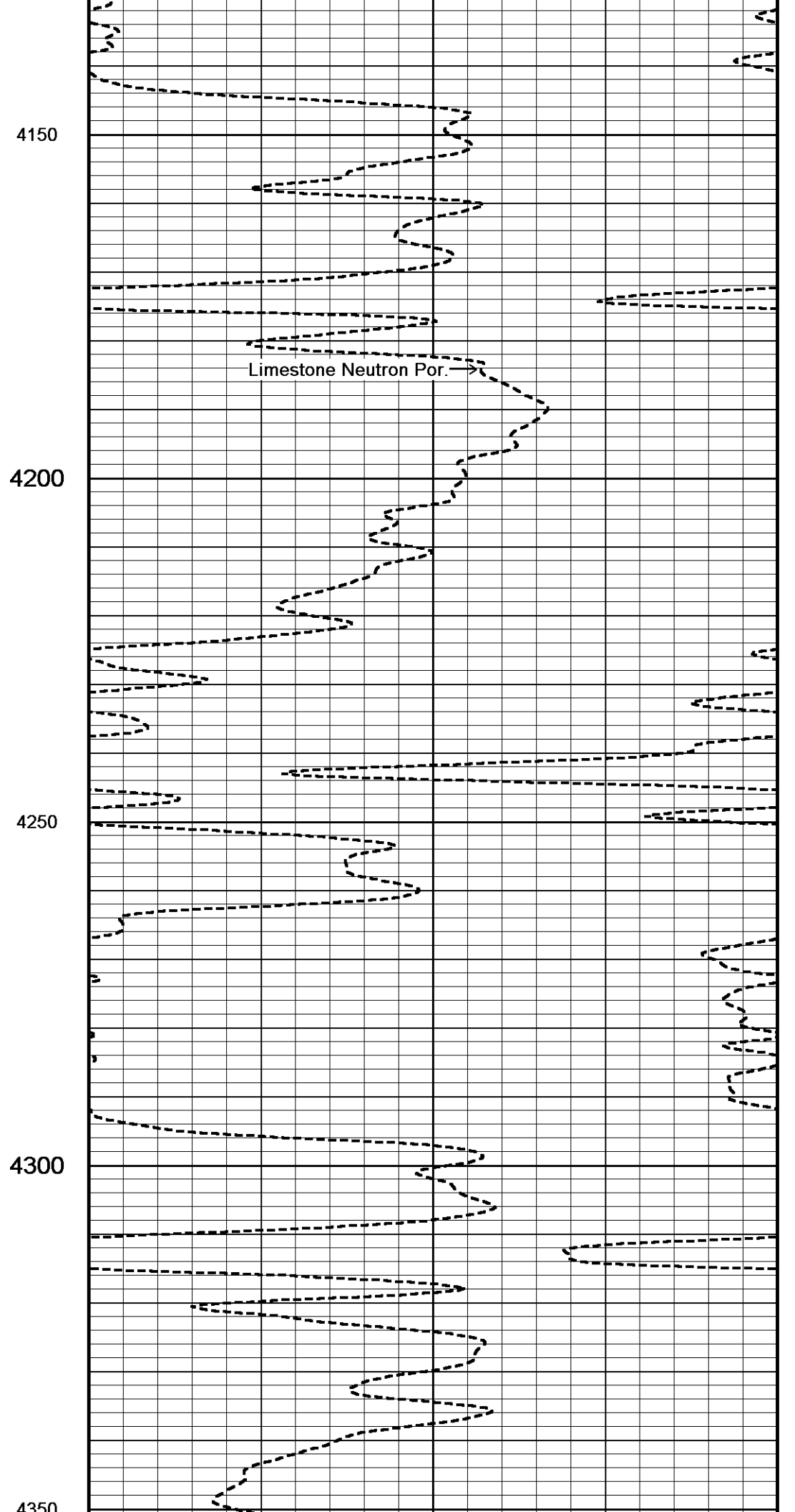
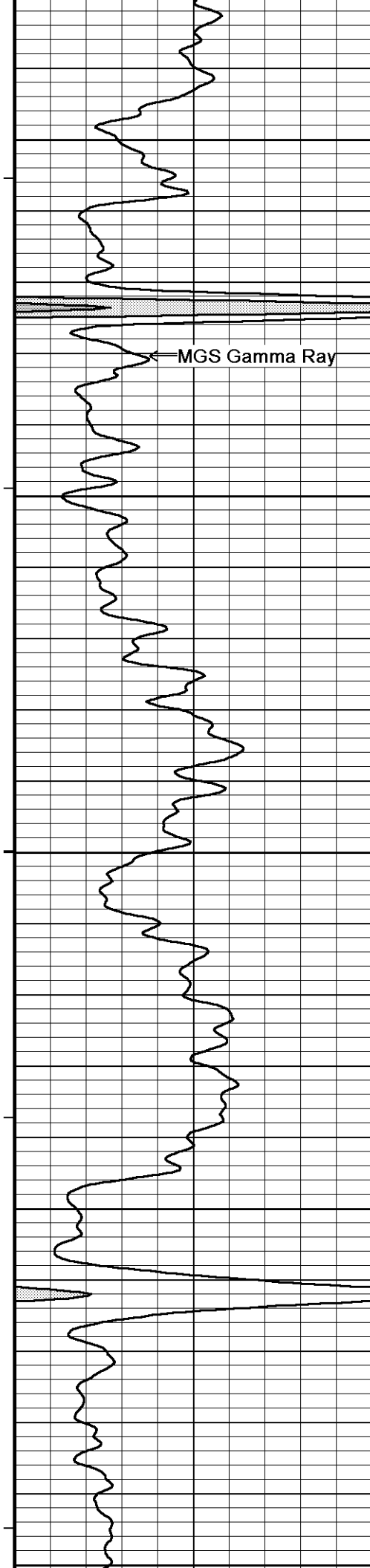
3950

4000

4050

4100





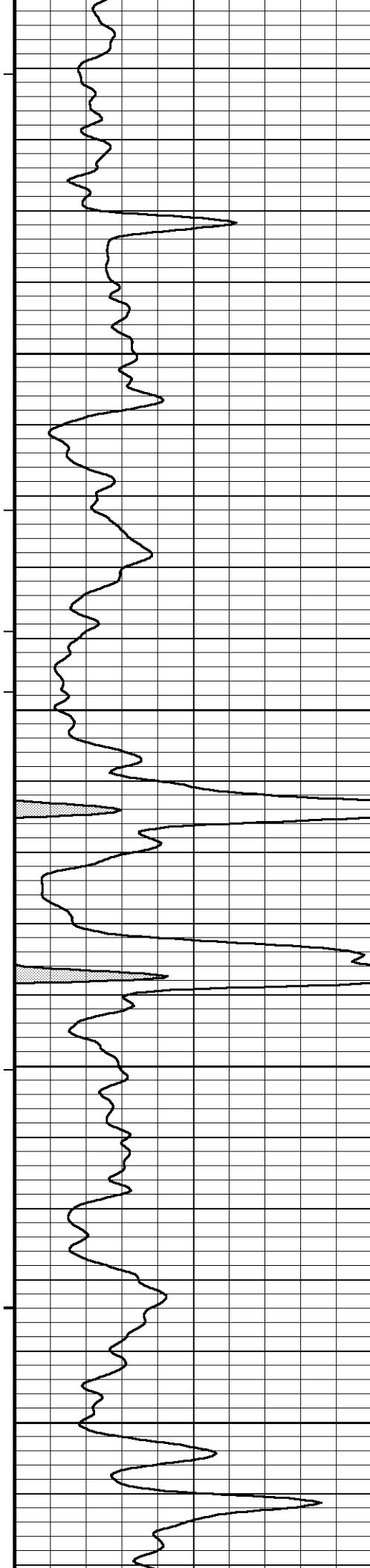
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4200

4250

4300

4350



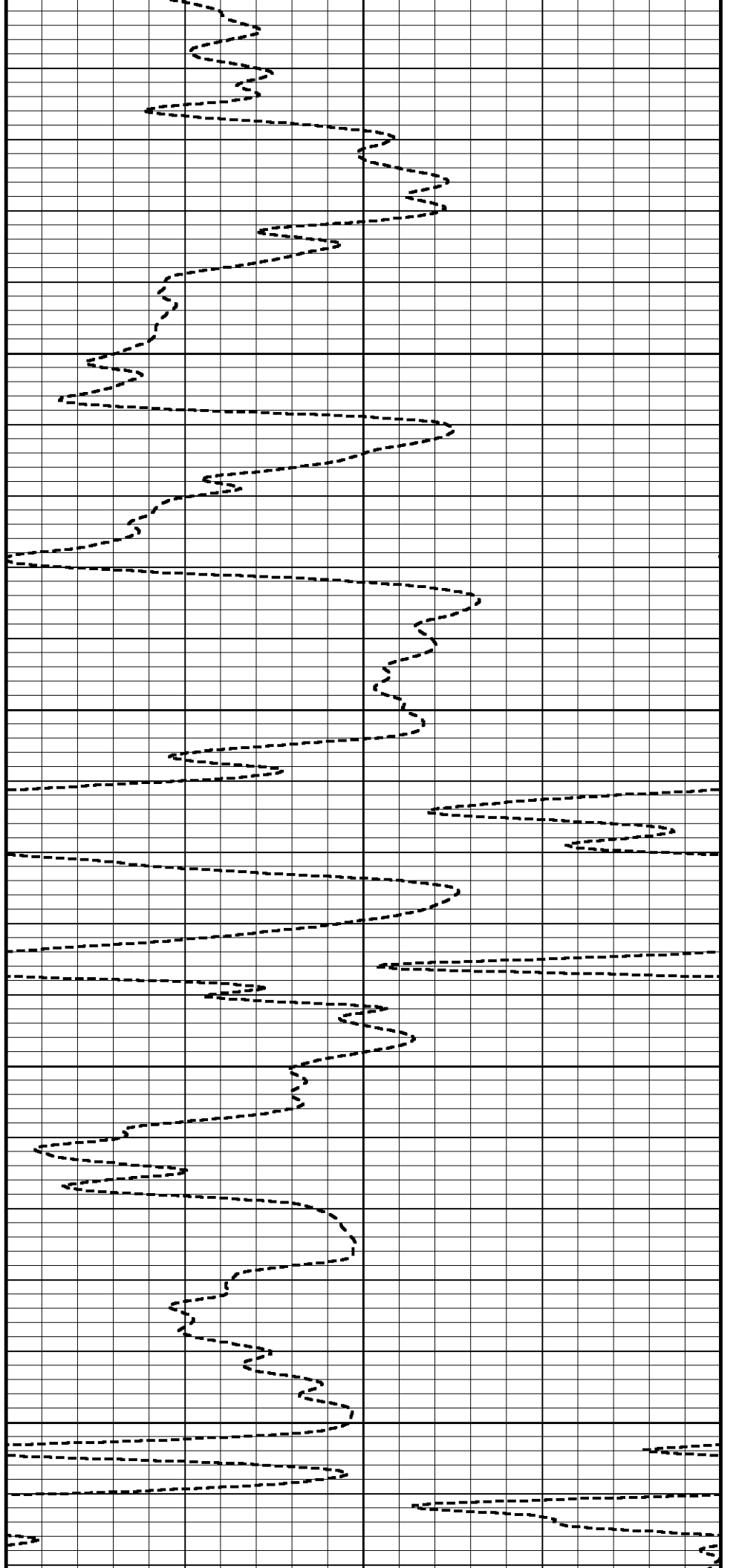
4550

4400

4450

4500

4550



← MGS Gamma Ray

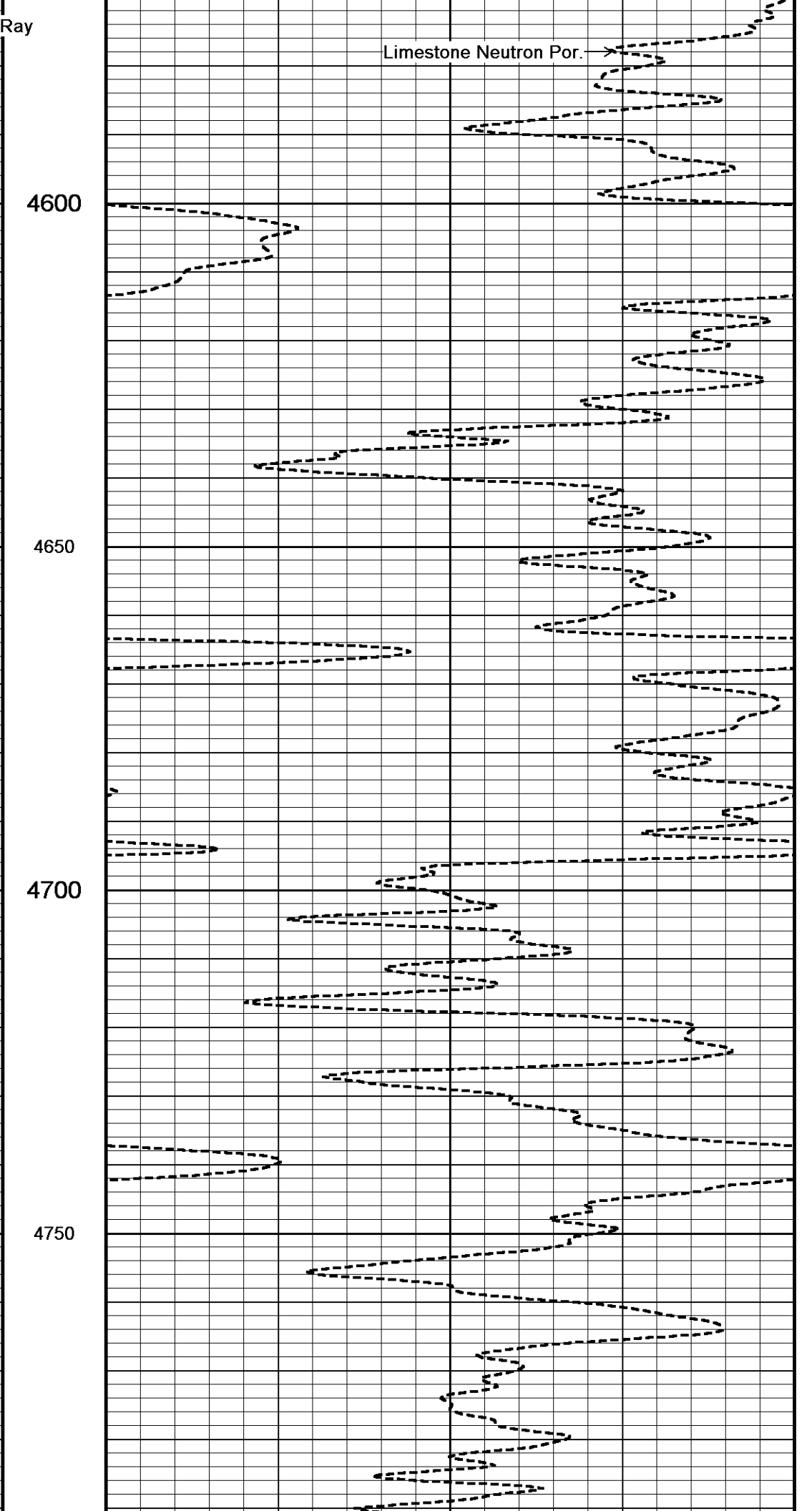
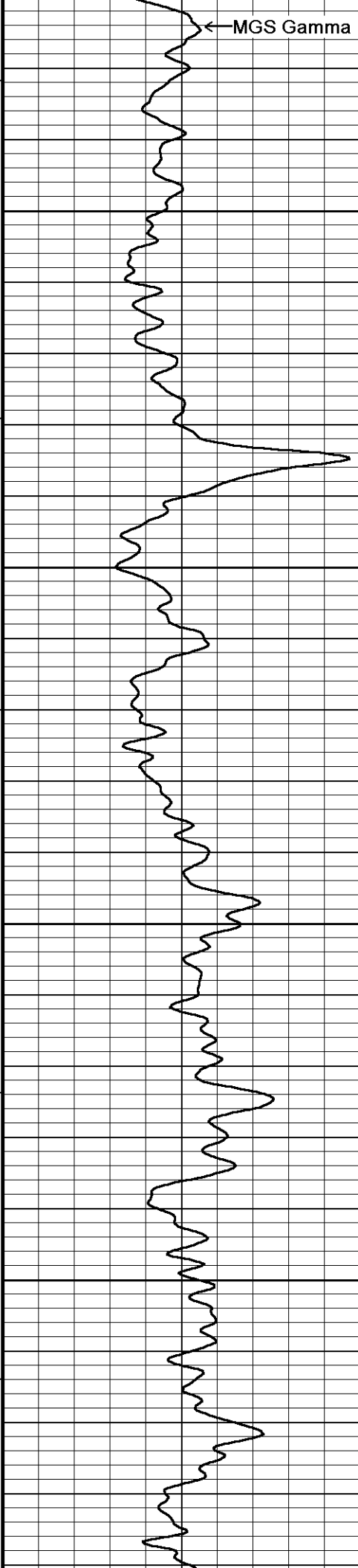
Limestone Neutron Por. →

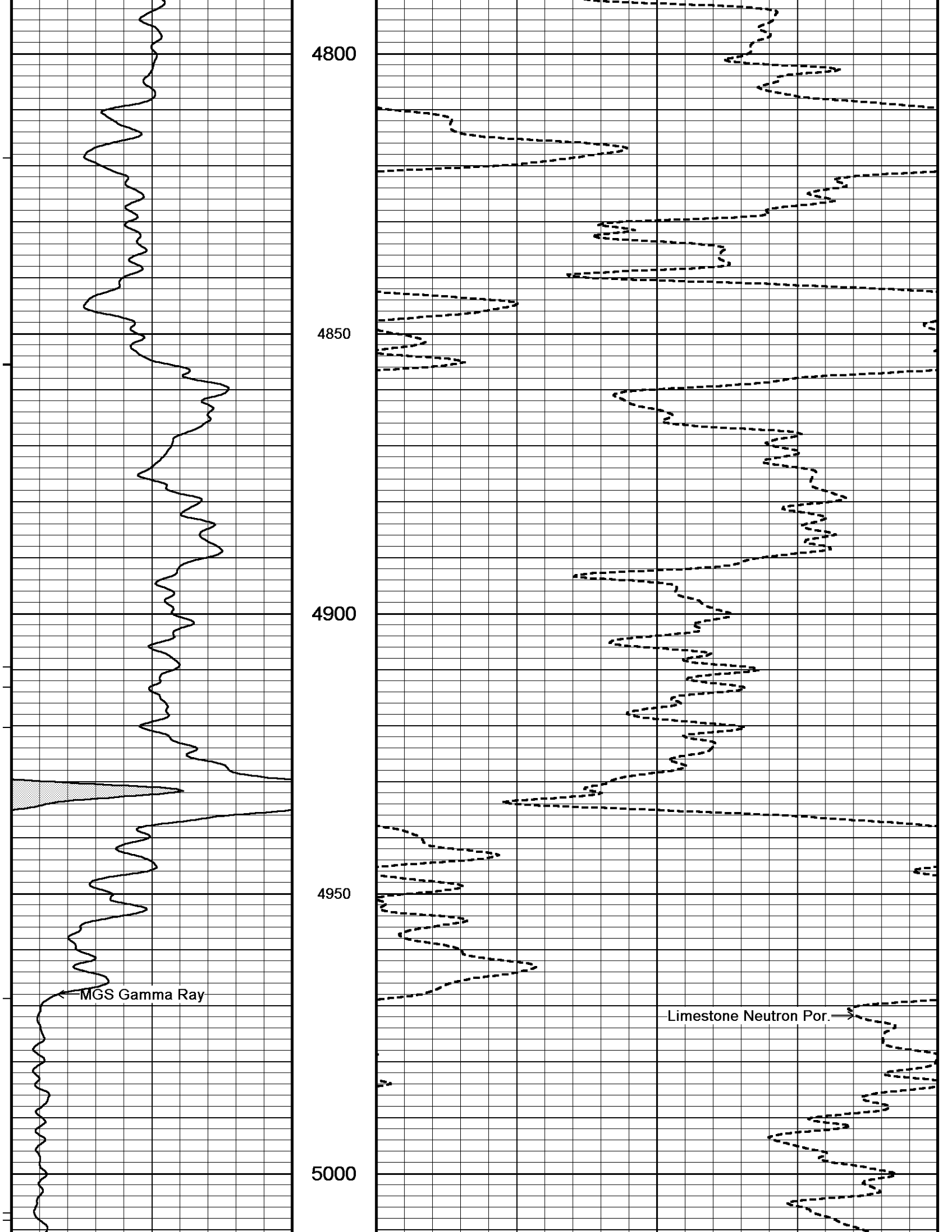
4600

4650

4700

4750





4800

4850

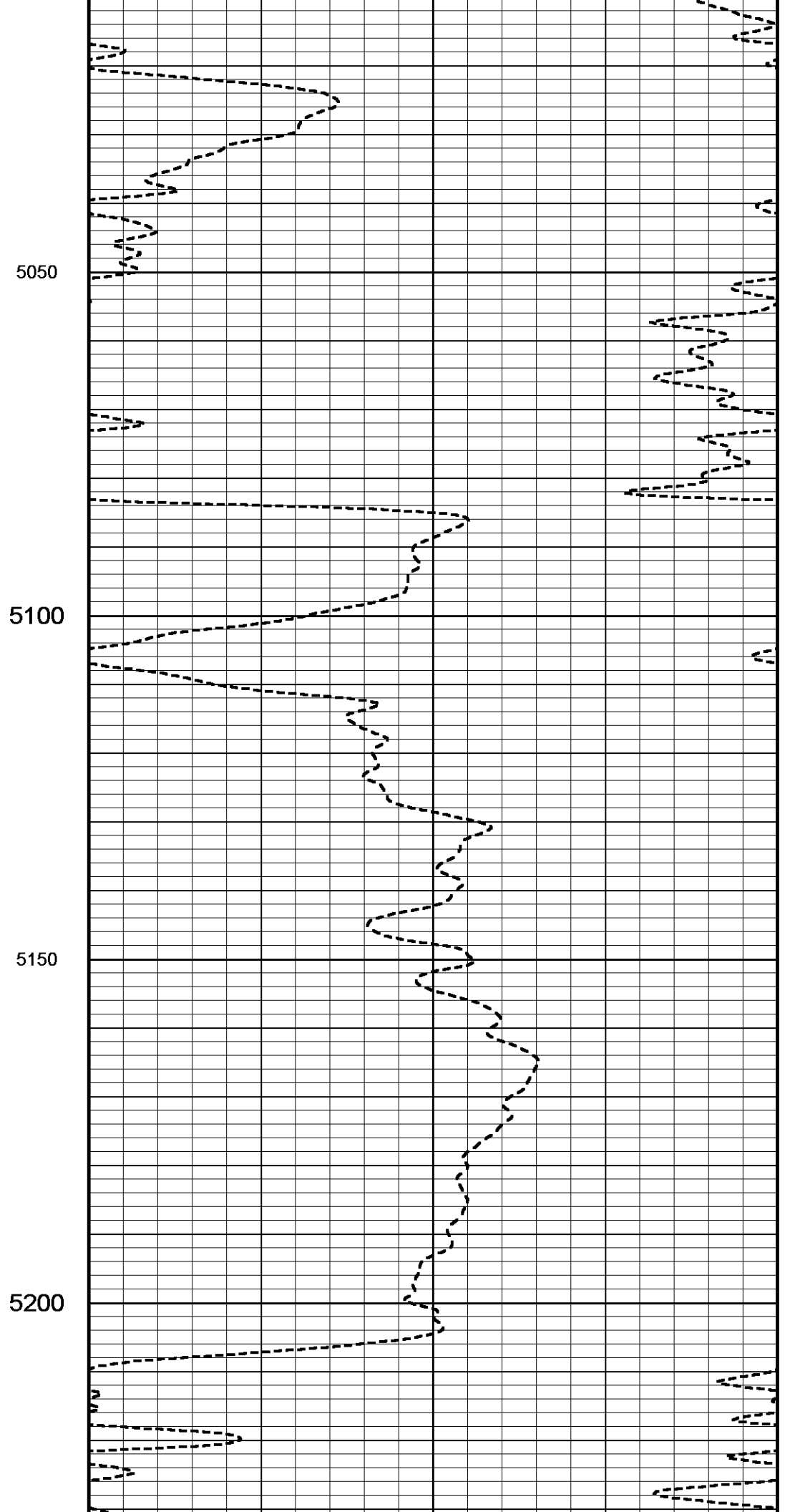
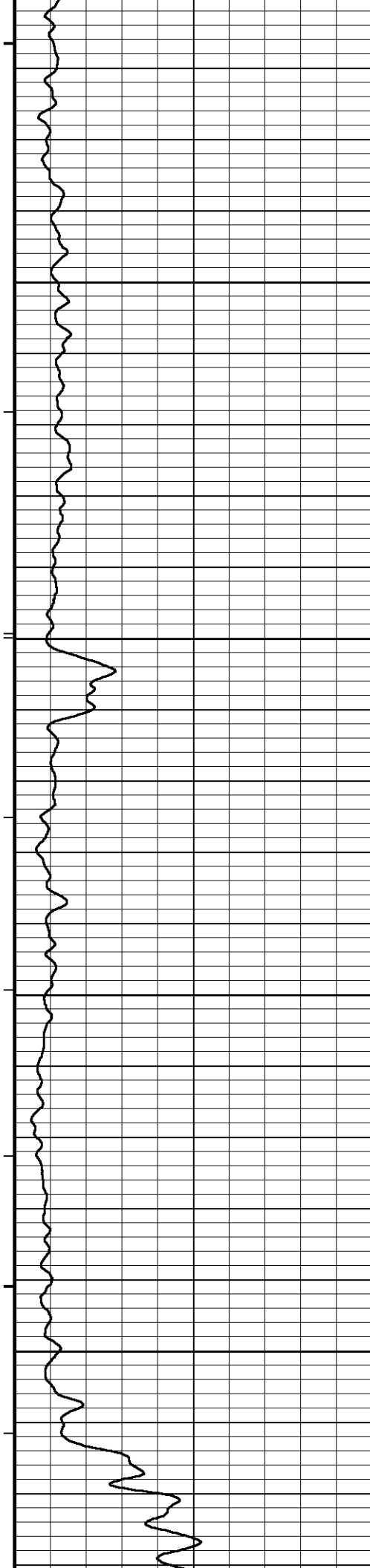
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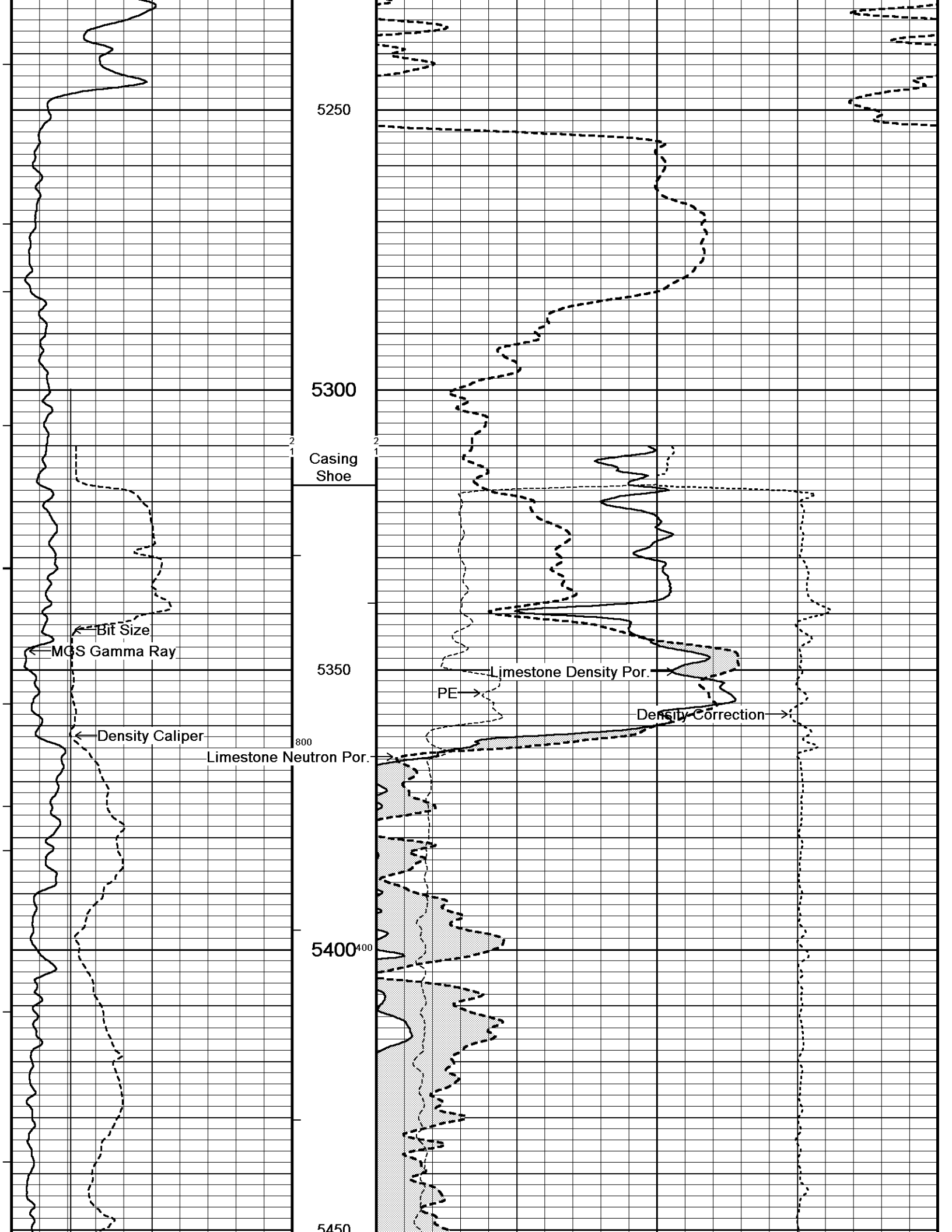
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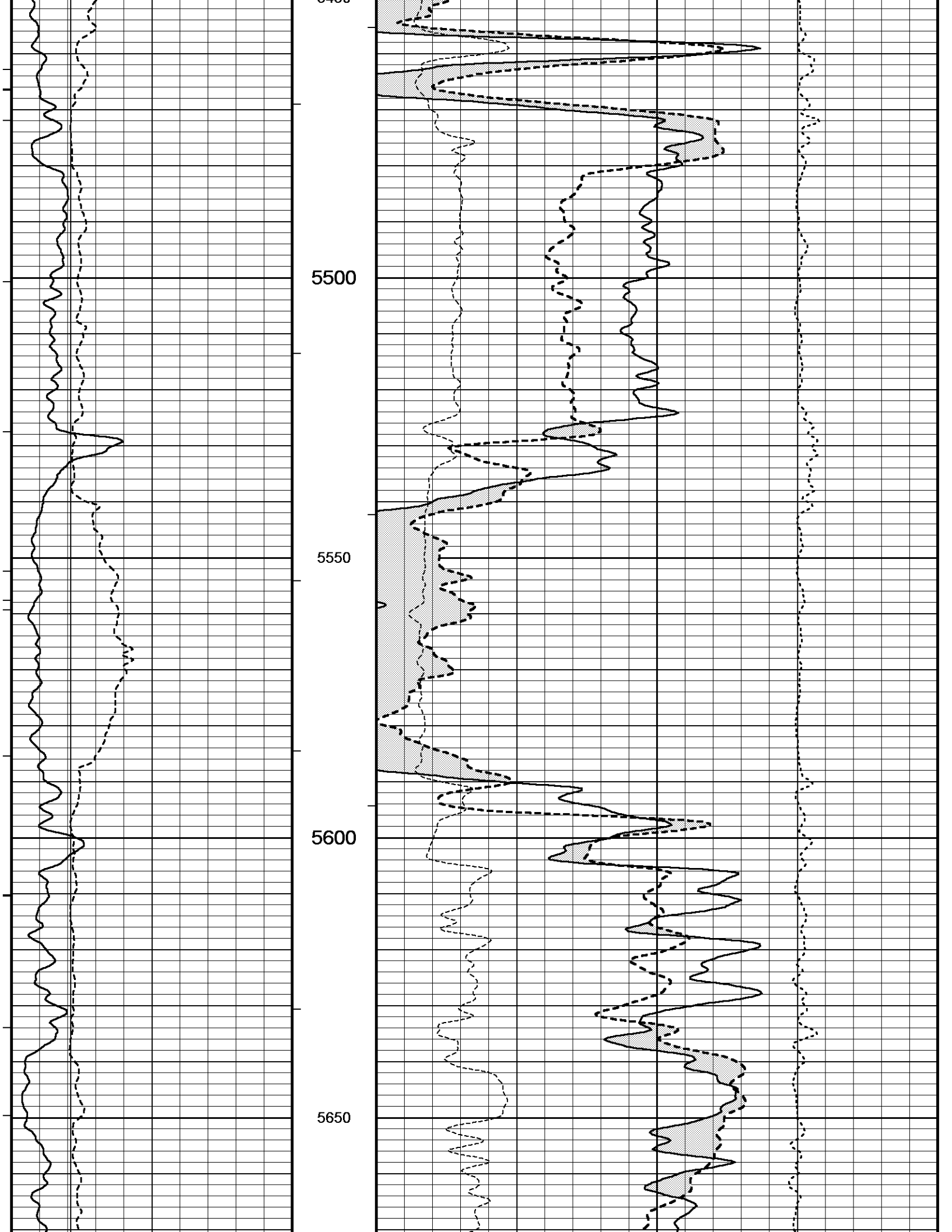
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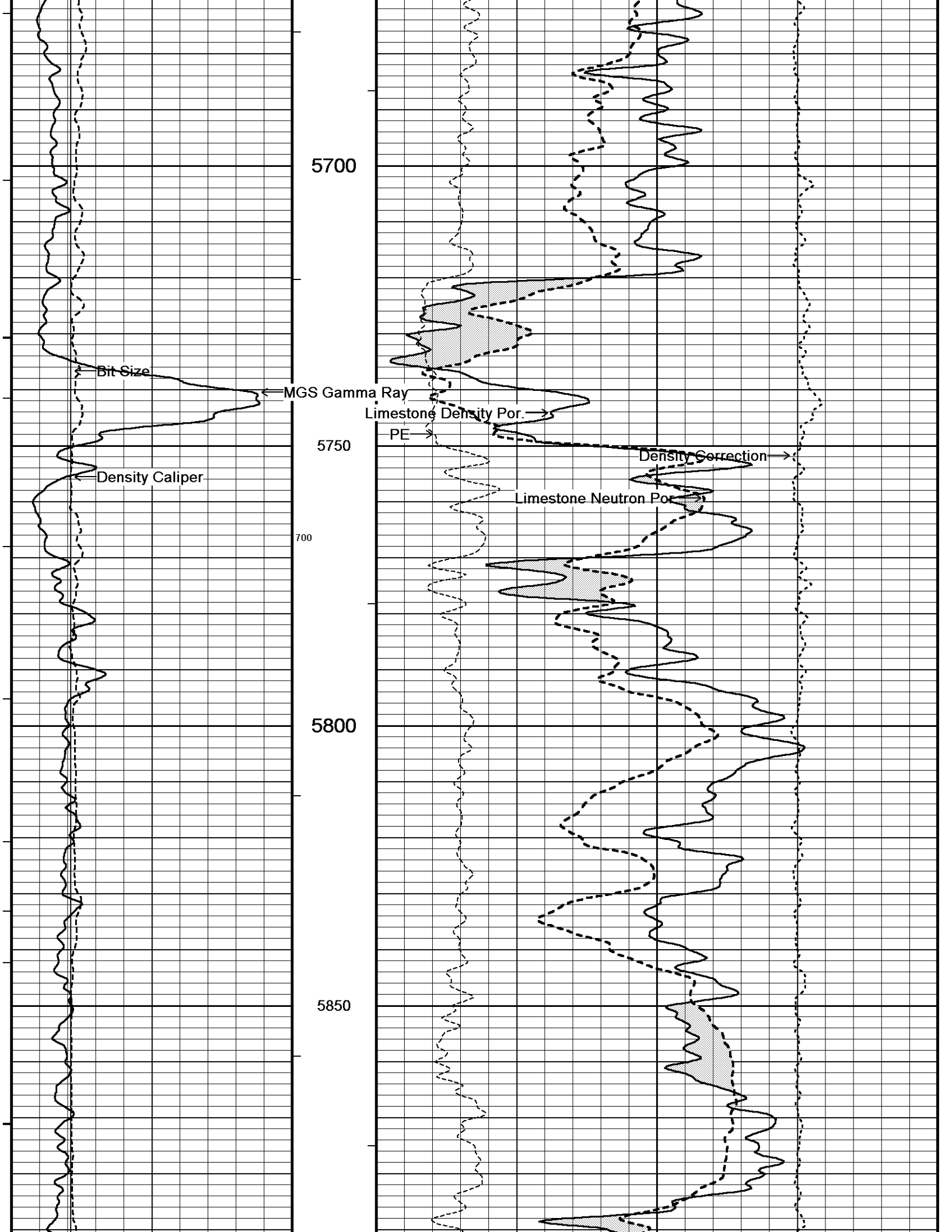
MGS Gamma Ray

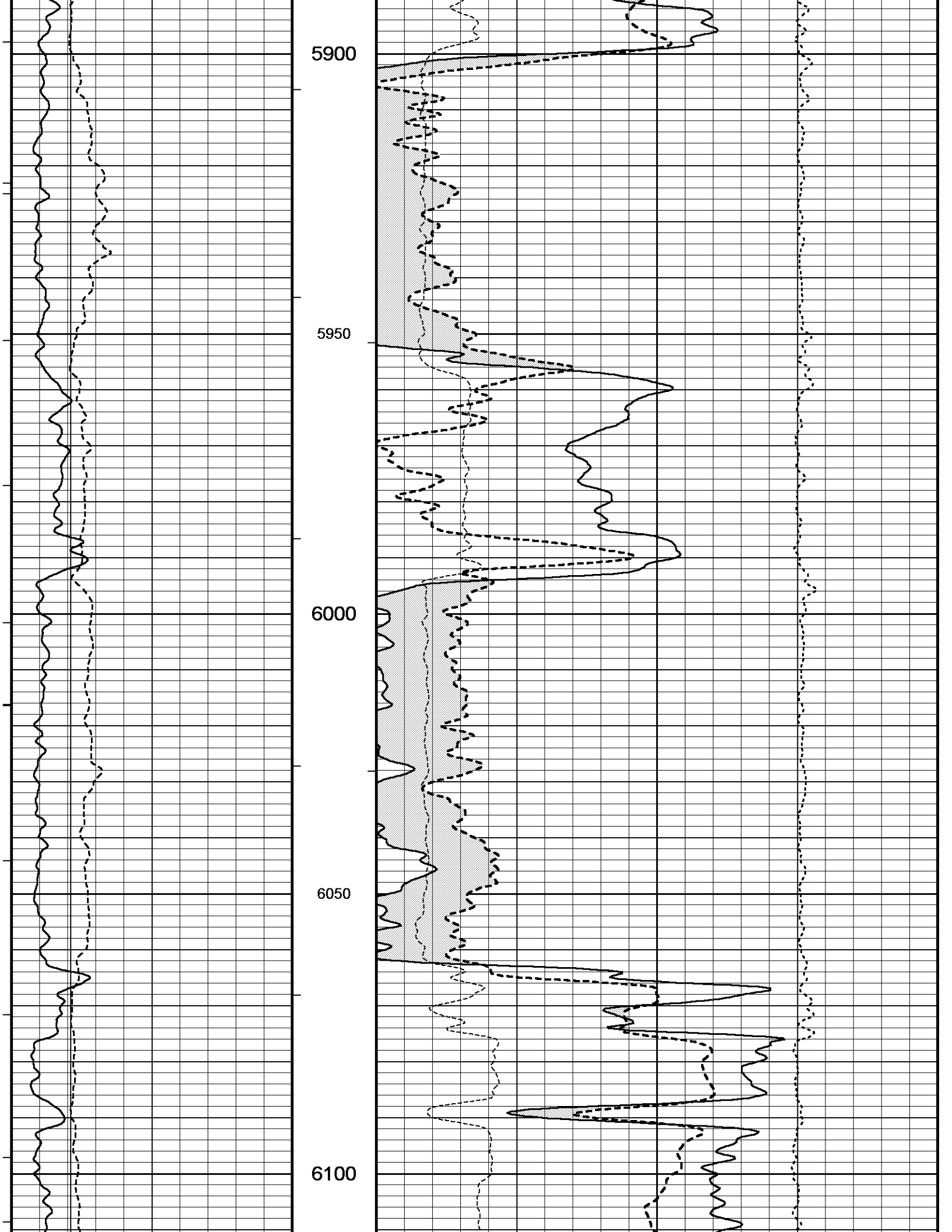
Limestone Neutron Por.

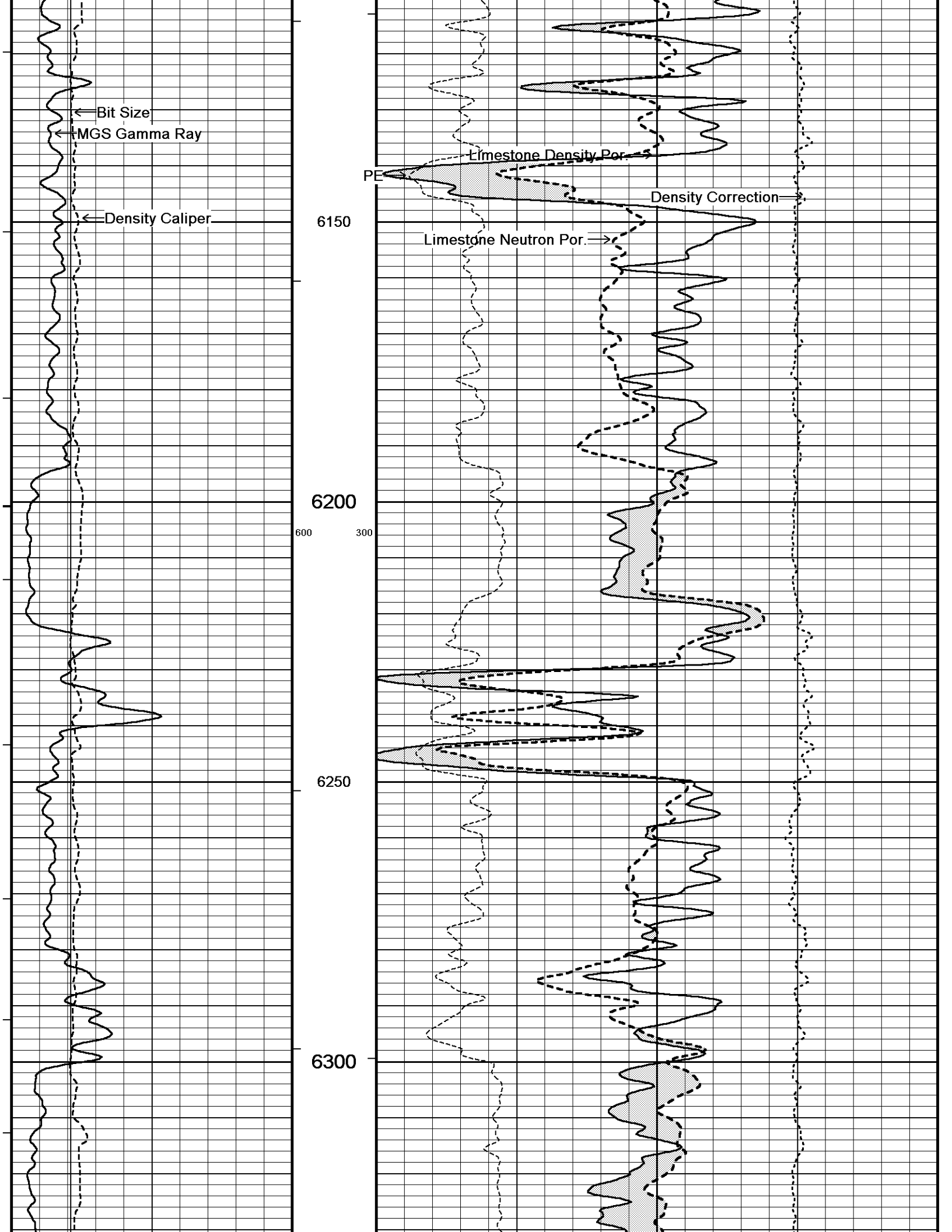


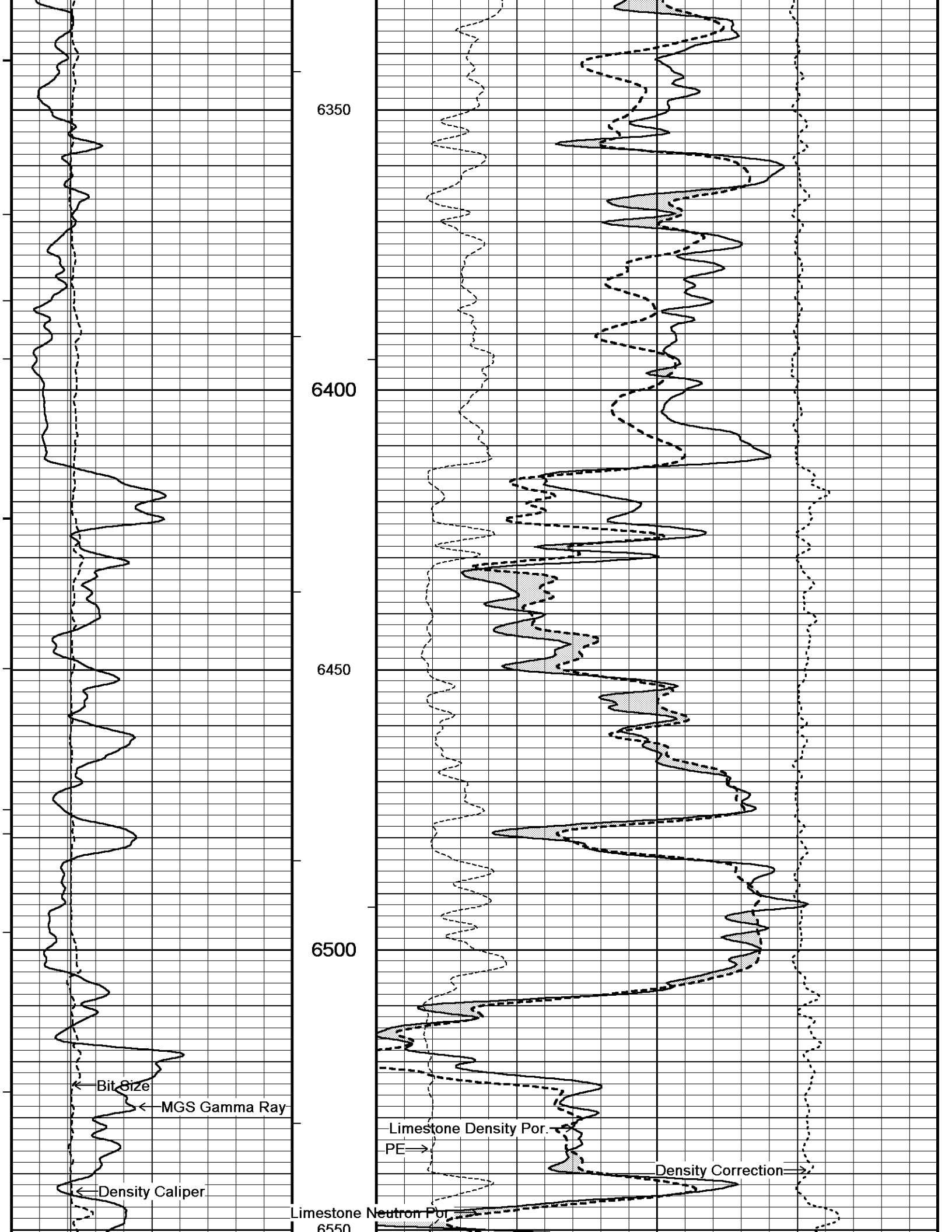


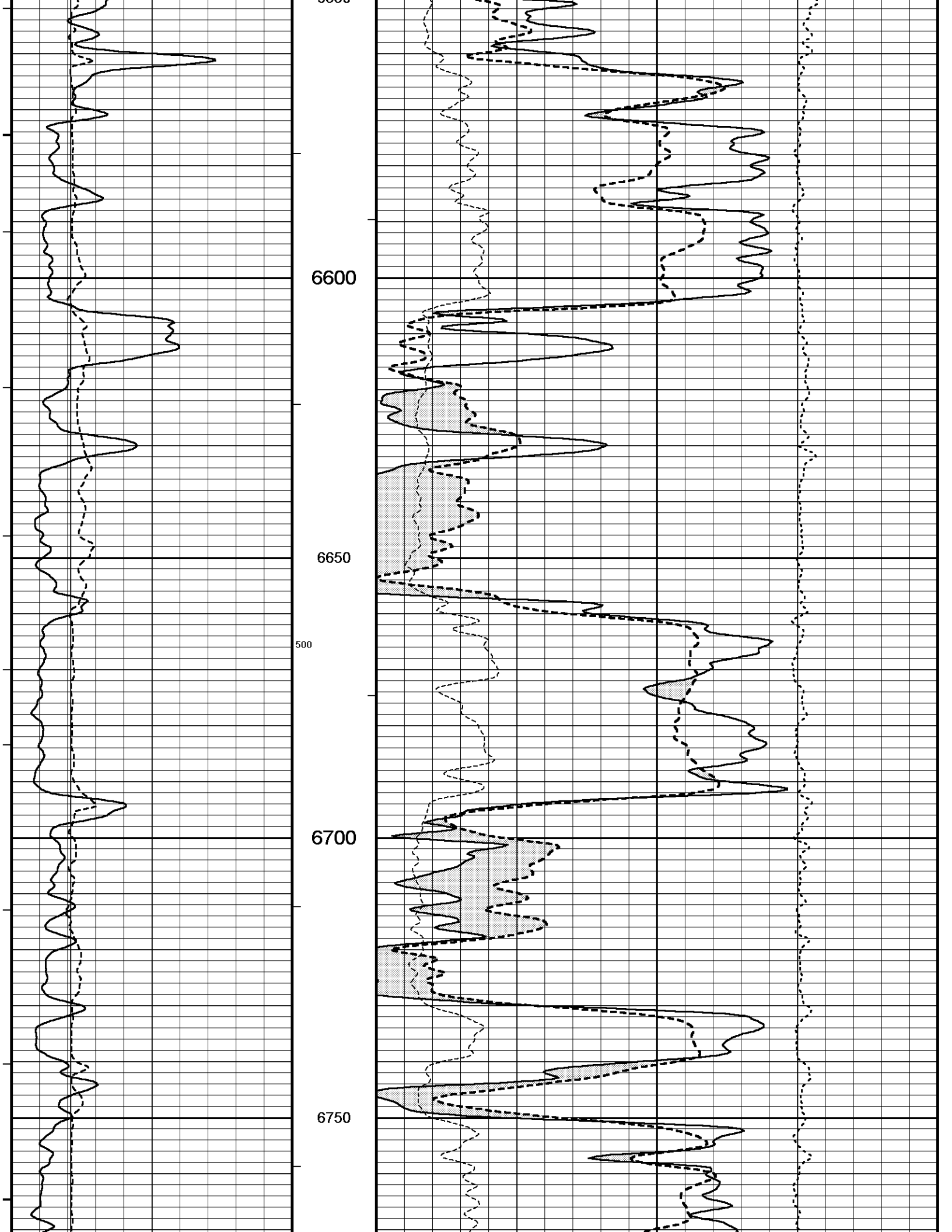


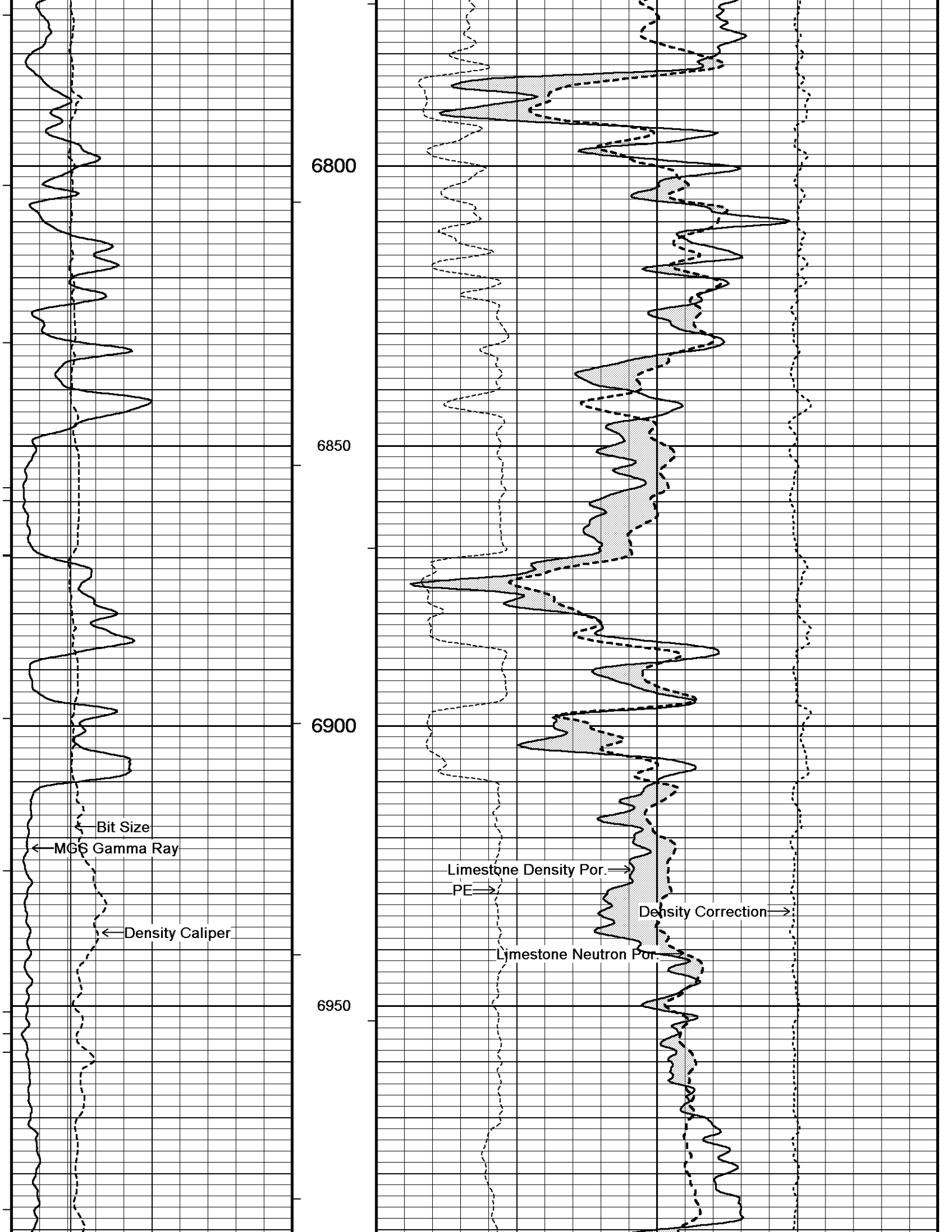












6800

6850

6900

6950

← Bit Size

← MGS Gamma Ray

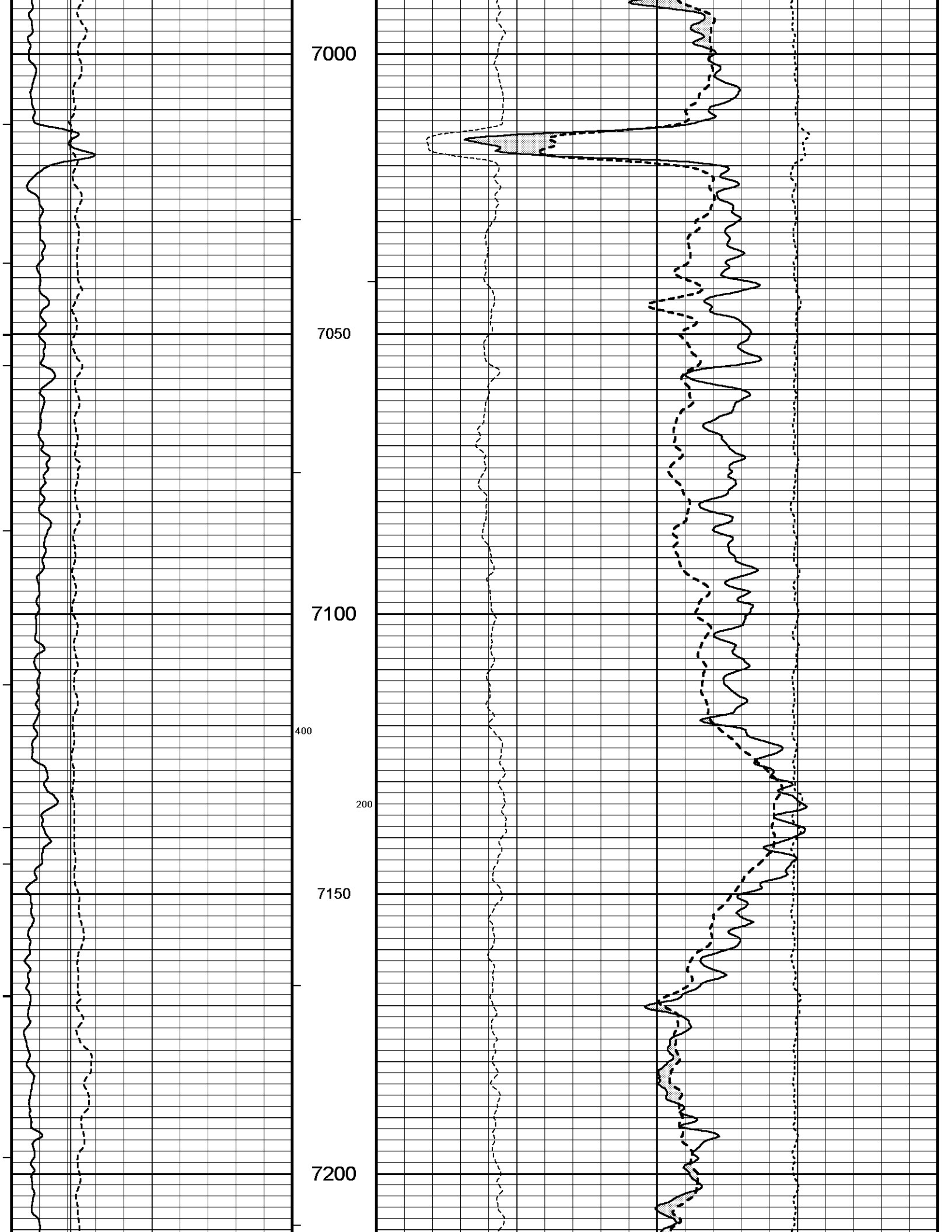
← Density Caliper

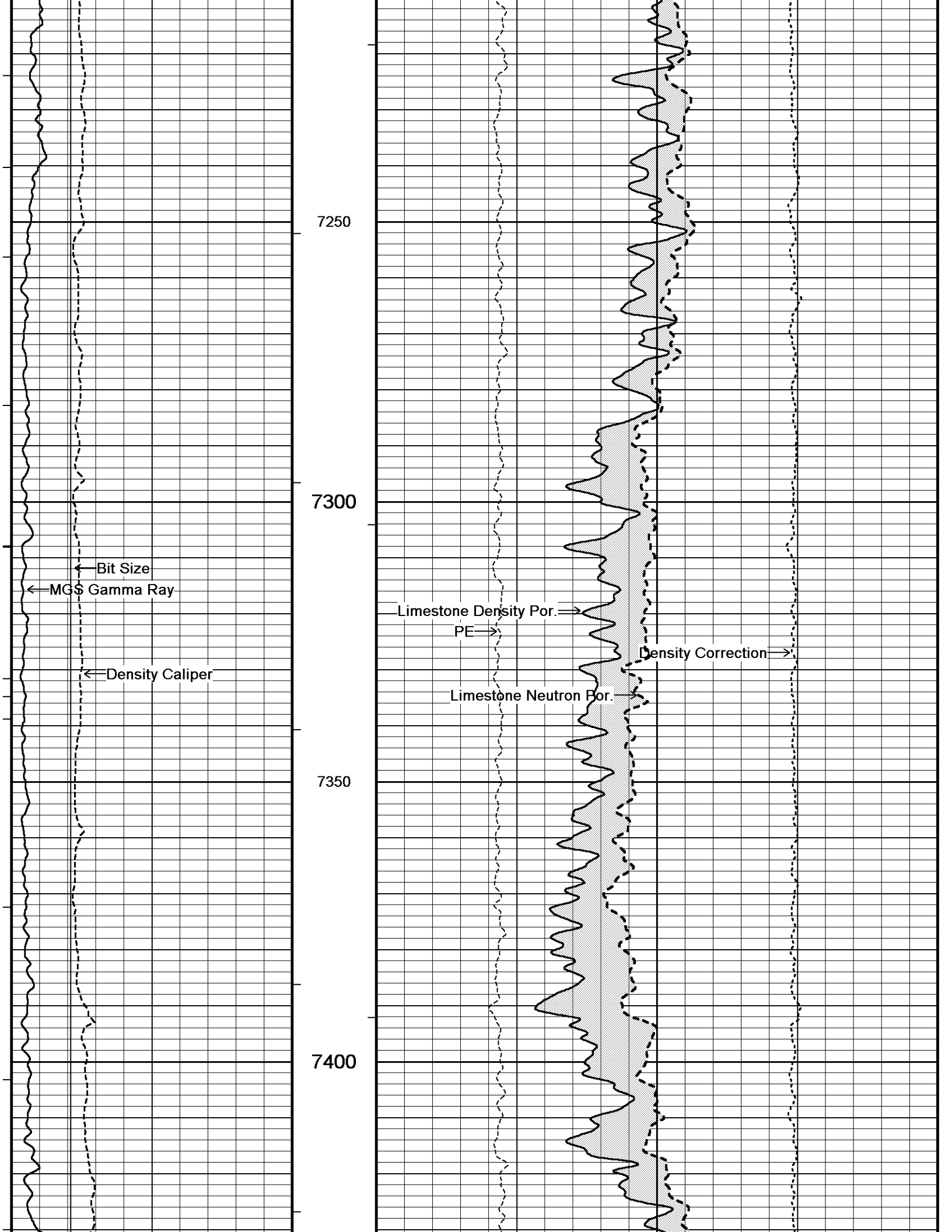
Limestone Density Por. →

PE →

Limestone Neutron Por. →

Density Correction →





7250

7300

7350

7400

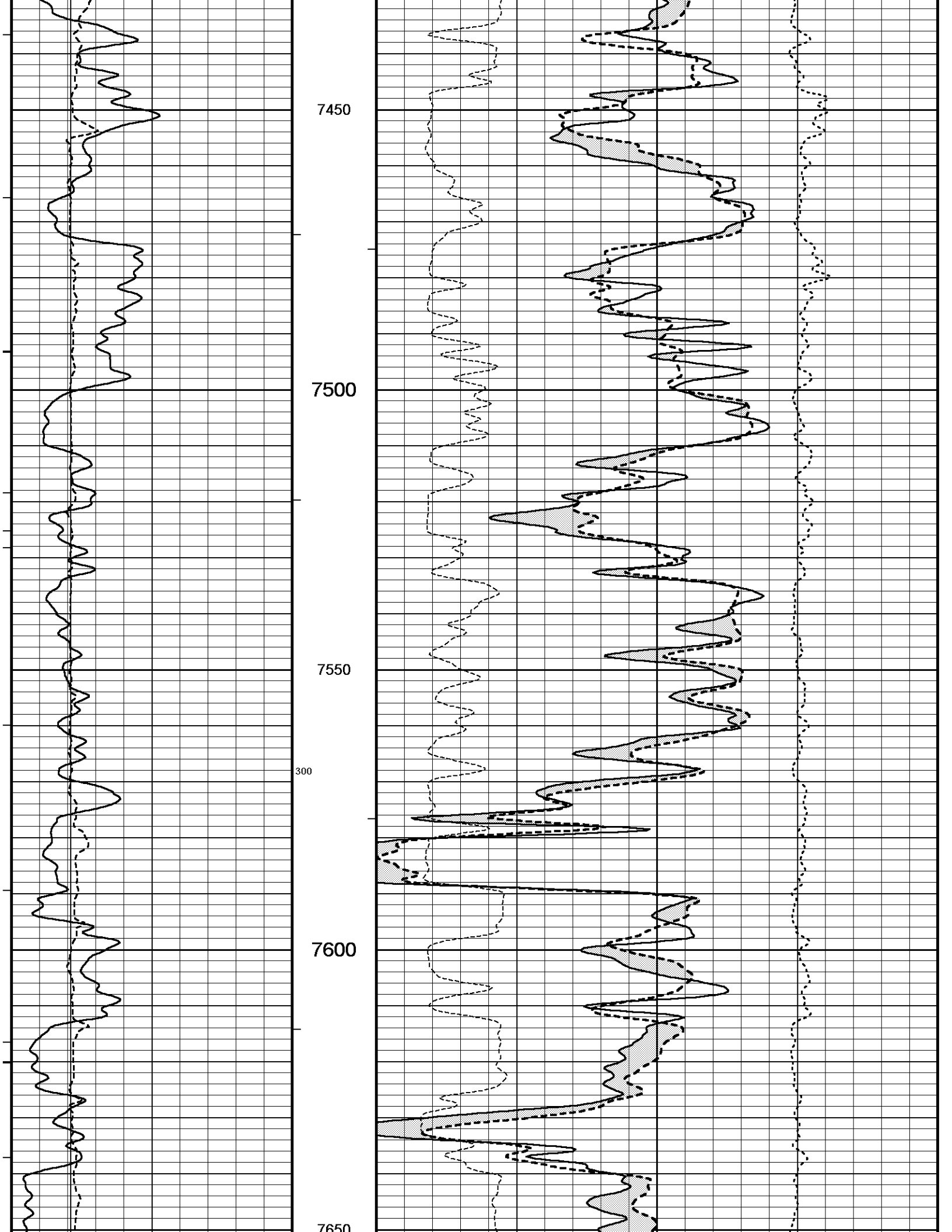
← Bit Size
← MGS Gamma Ray

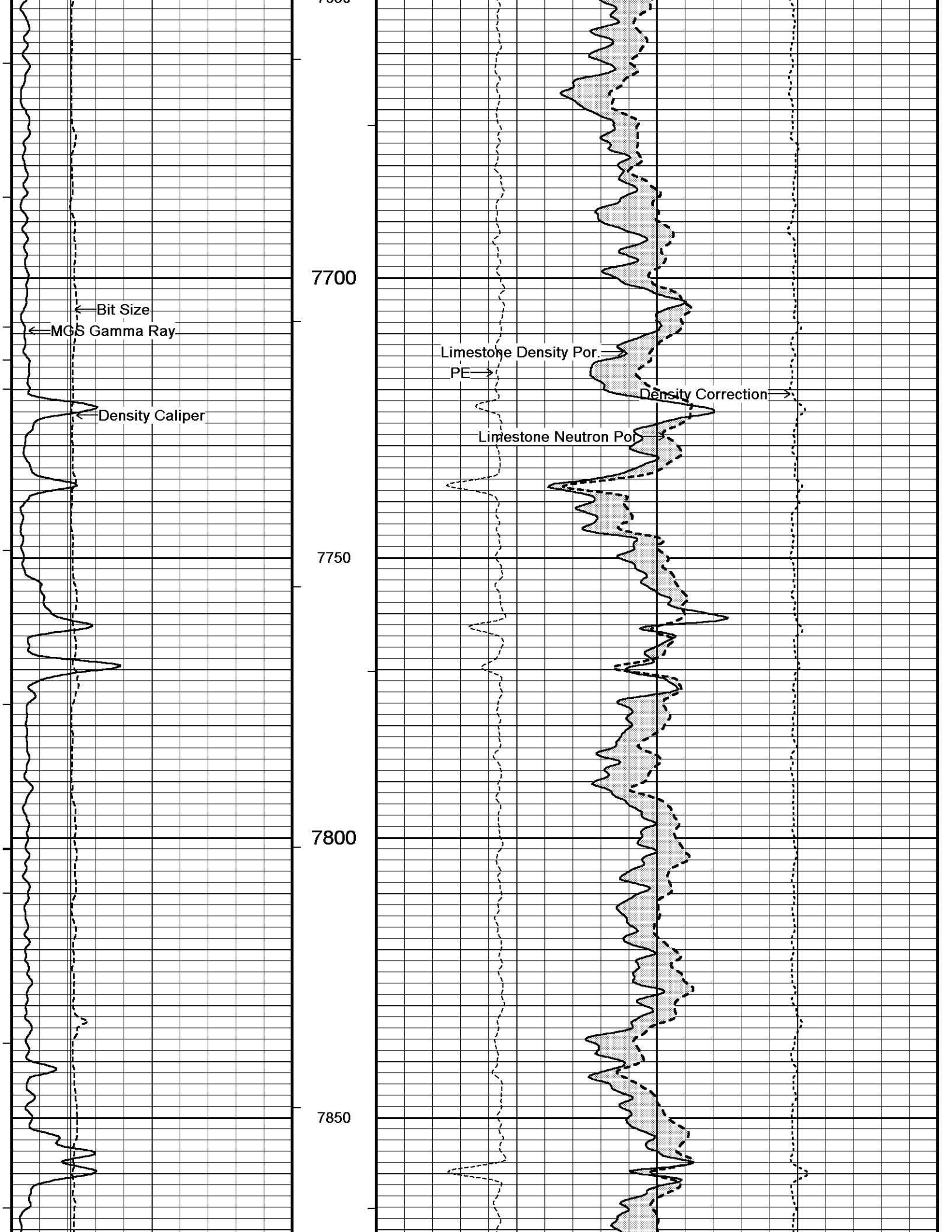
← Density Caliper

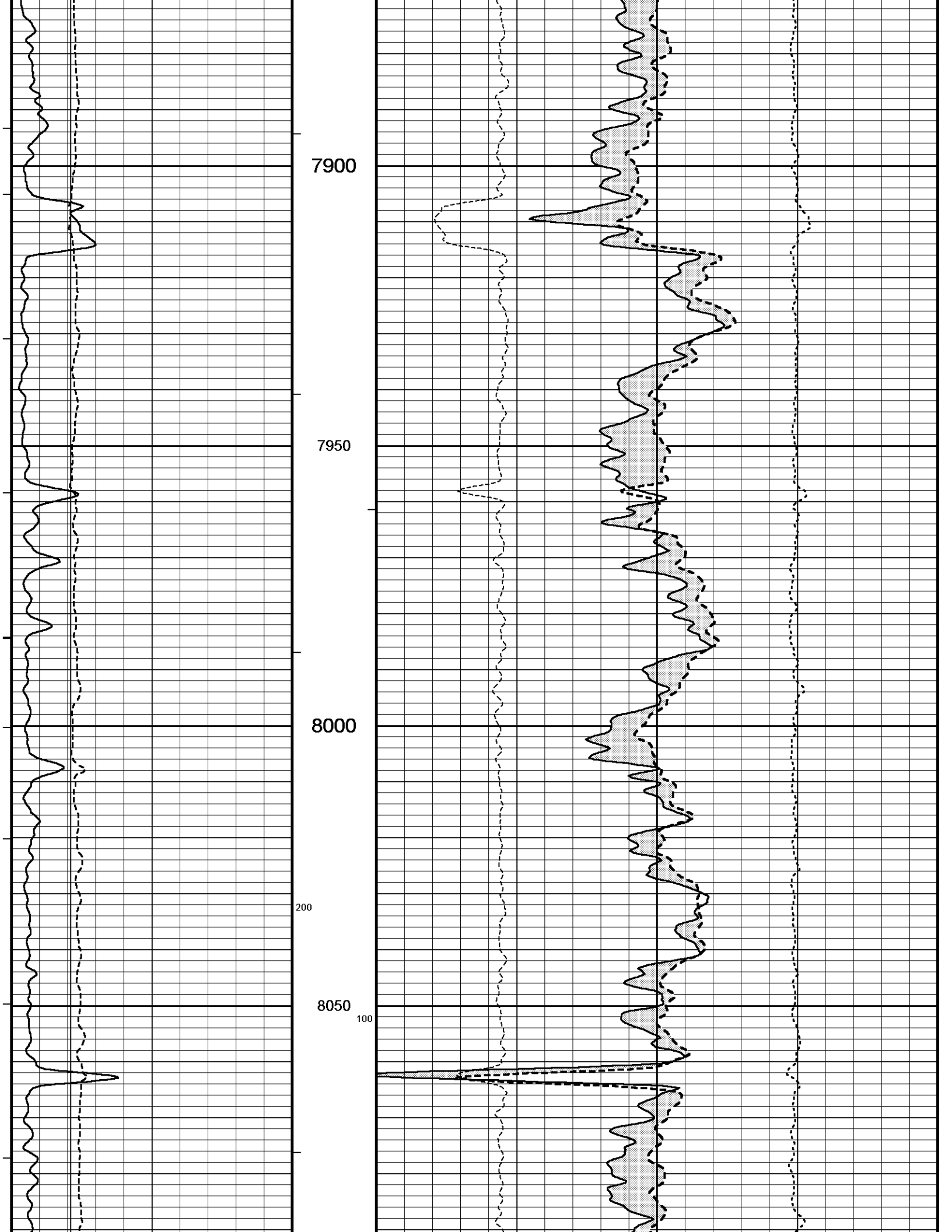
Limestone Density Por. ⇒
PE ⇒

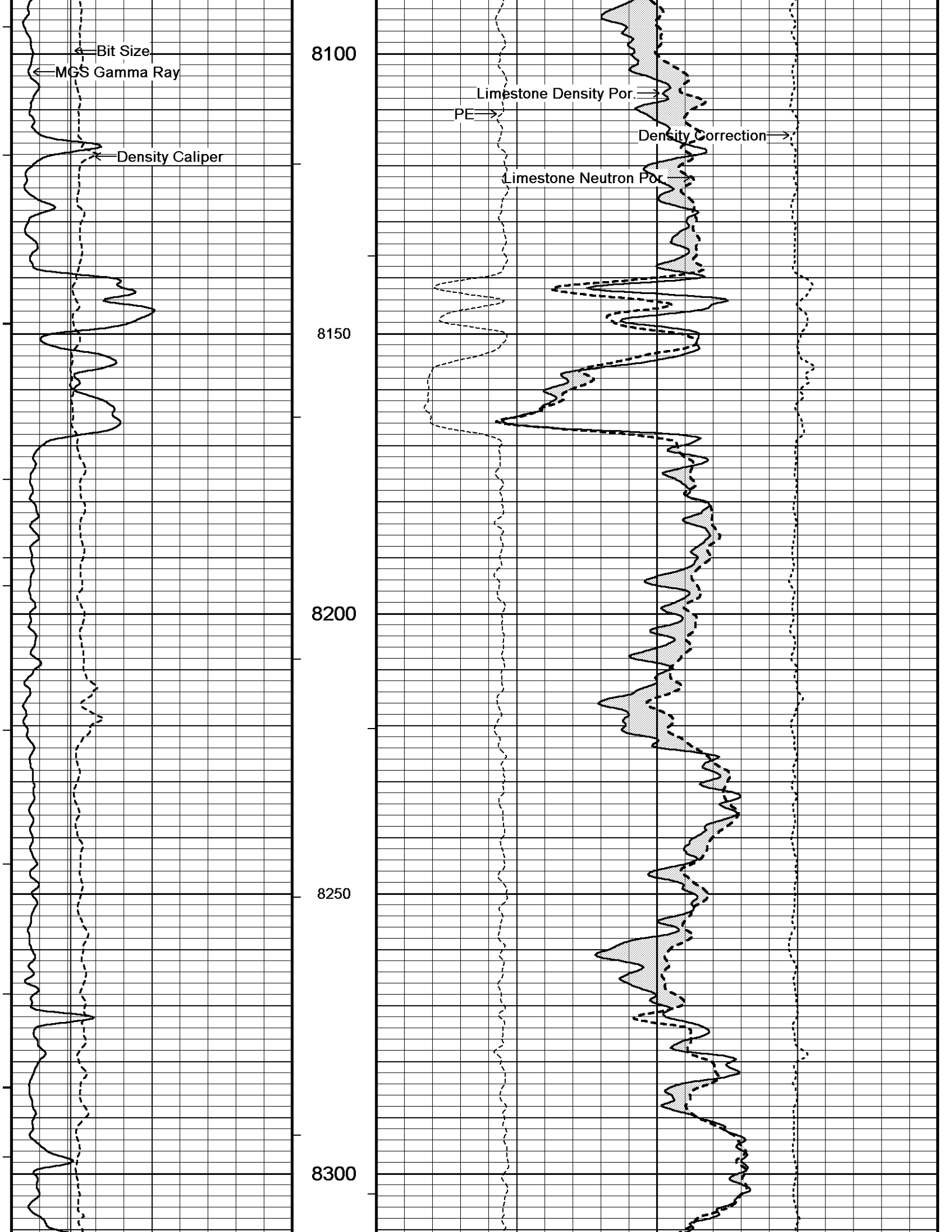
Limestone Neutron Por. ⇒

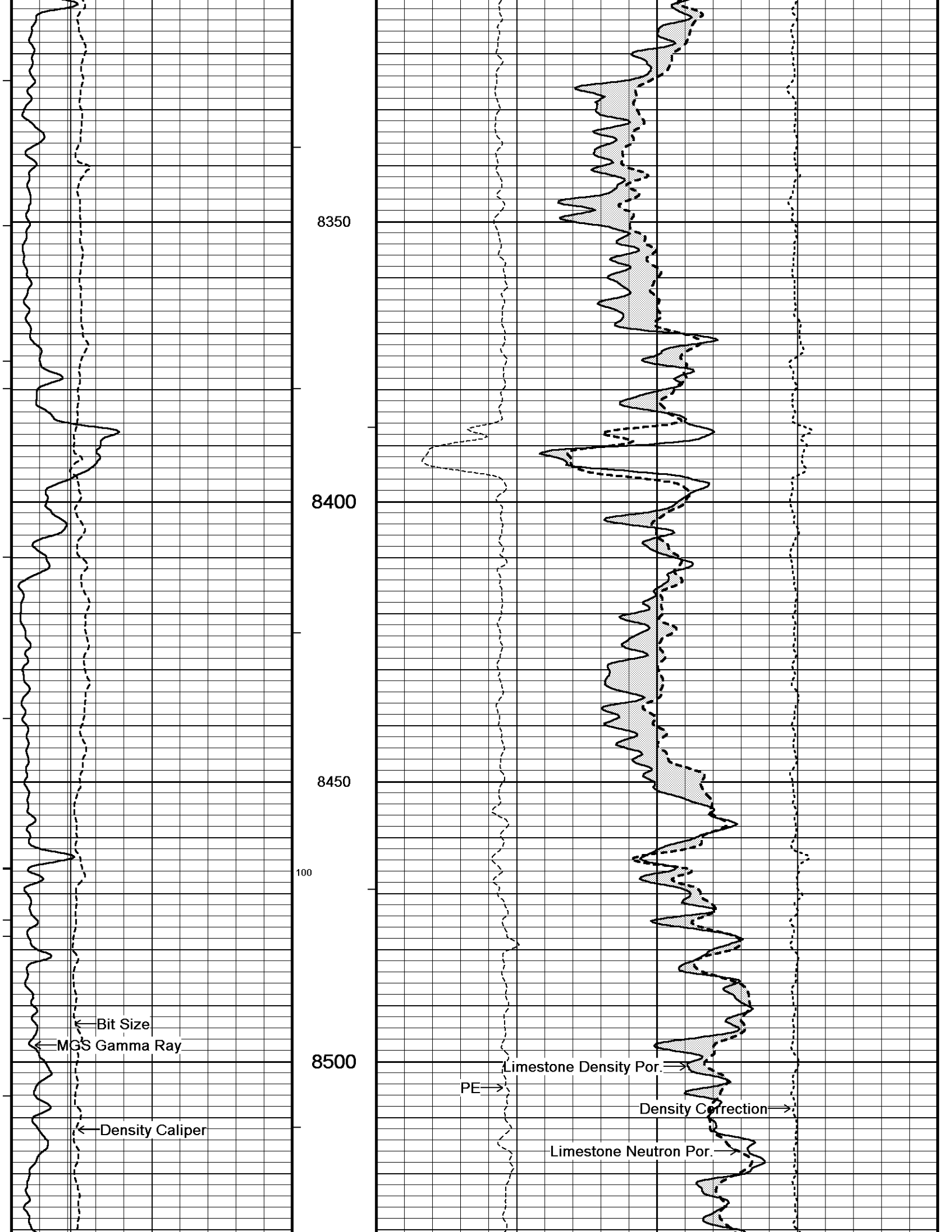
Density Correction ⇒

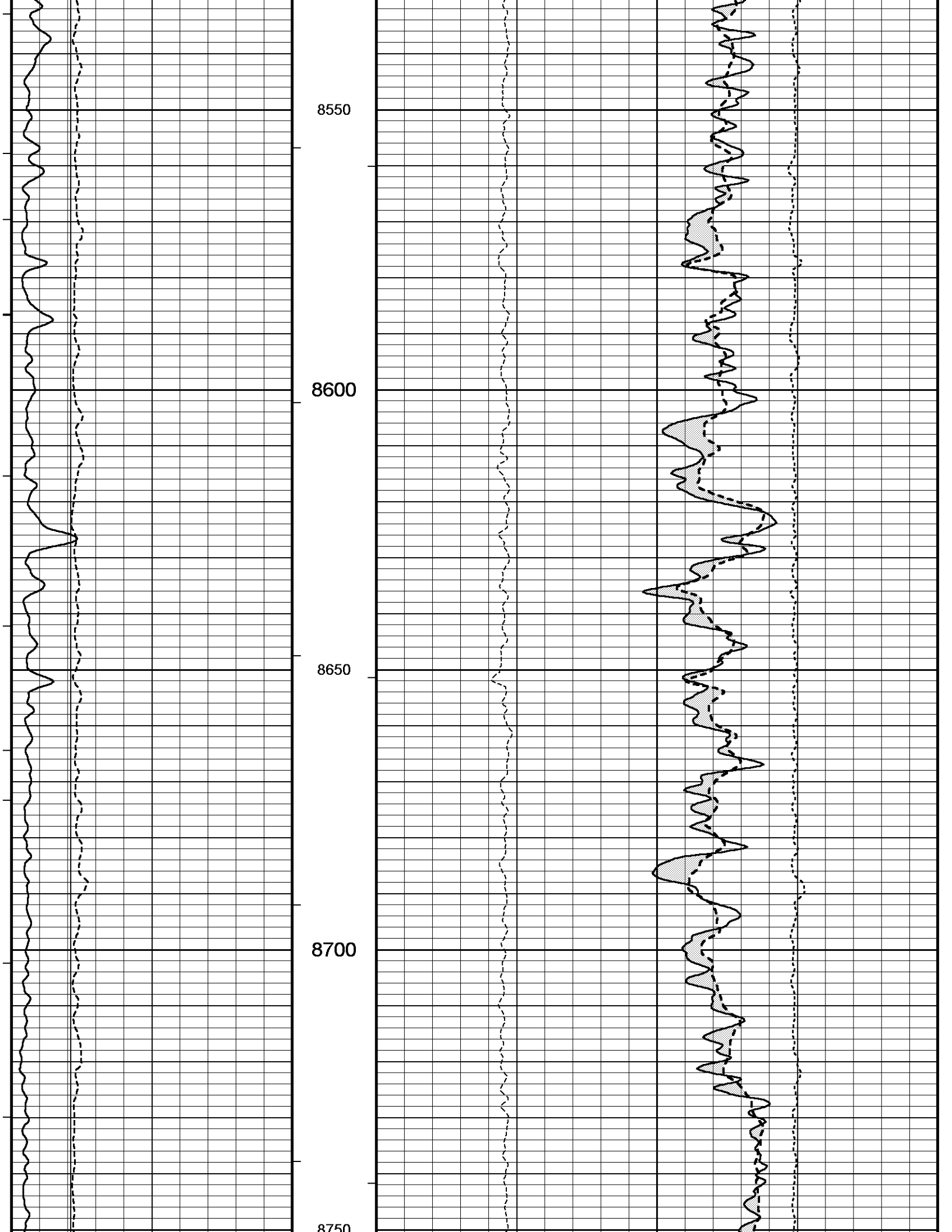


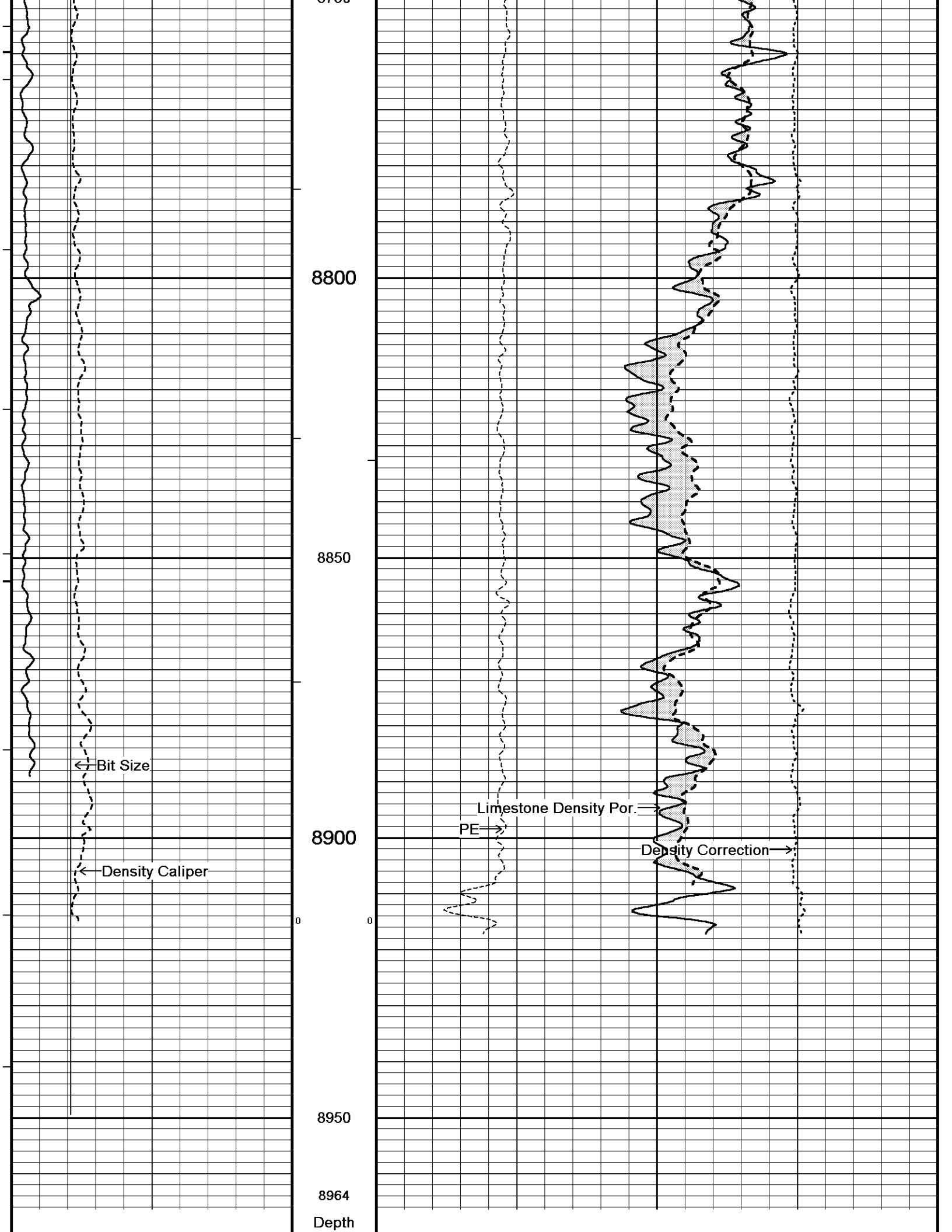












8750

8800

8850

8900

8950

8964

Depth

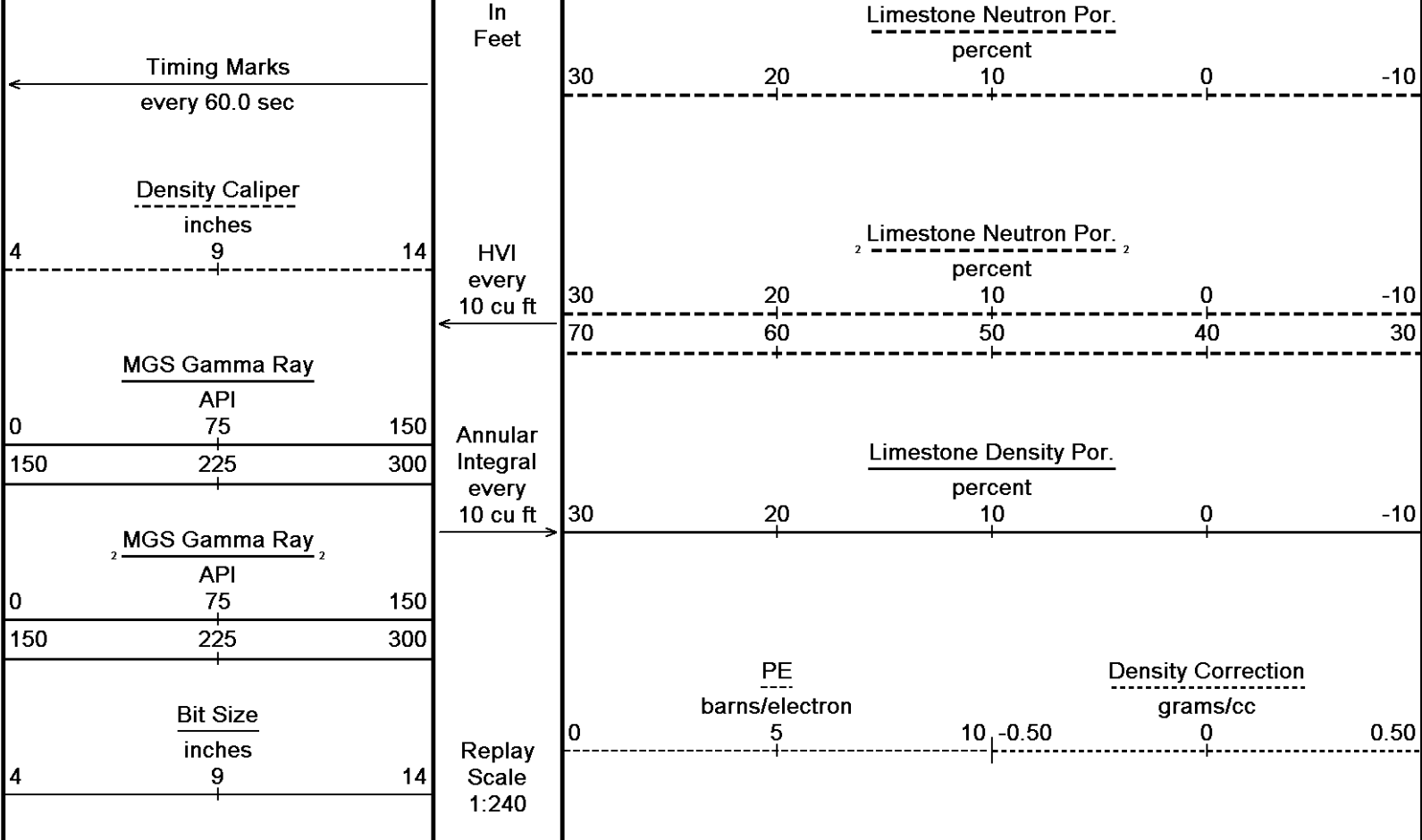
← Bit Size

← Density Caliper

Limestone Density Por. →

PE →

Density Correction →

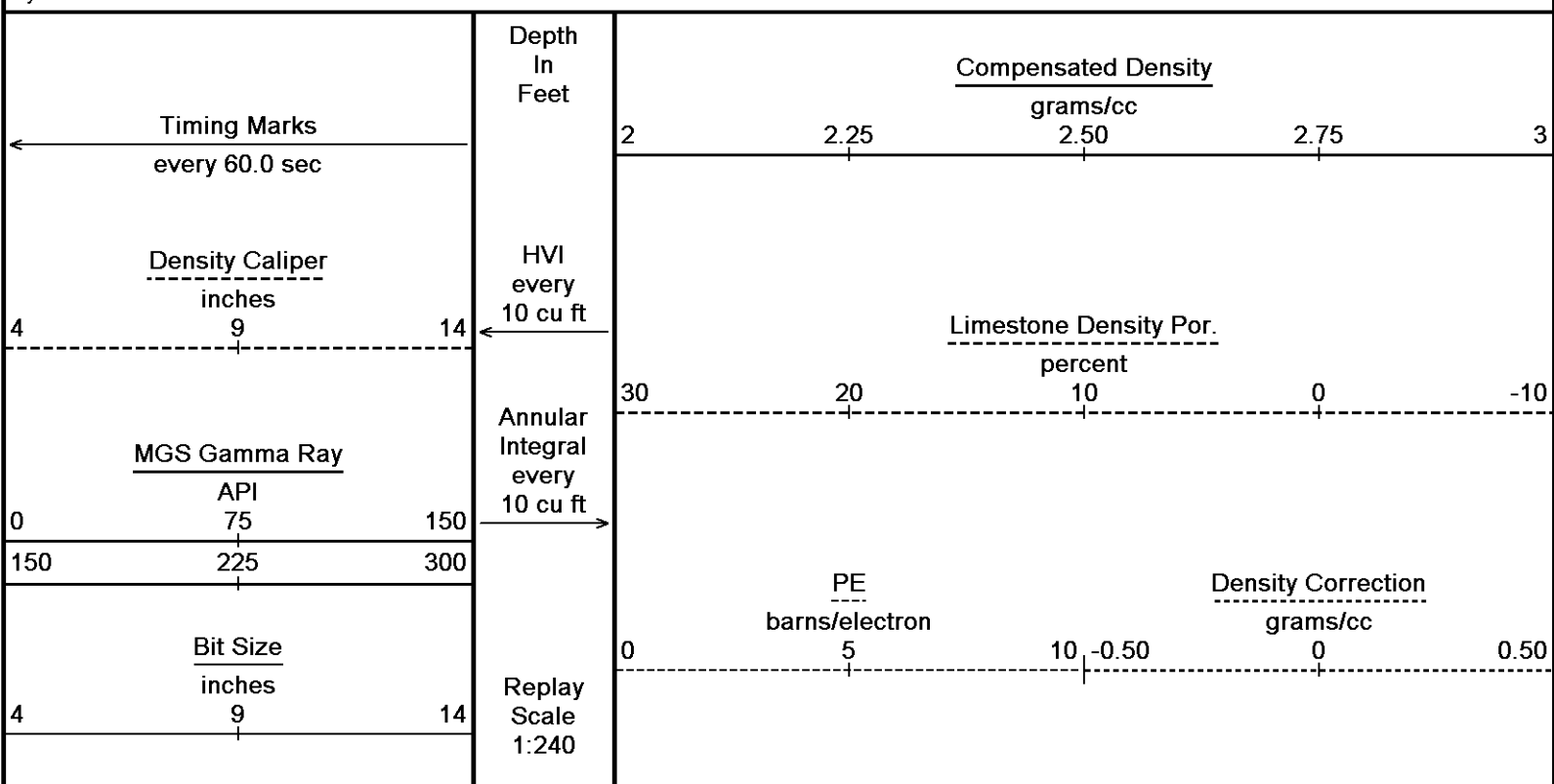


Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 12-MAY-2013 14:50
 Filename: C:\Data\Sandridge\Sandridge Turner 3406 5-7H\mms166 Depthlog.dta Recorded on 12-MAY-2013 14:25
 System Versions: Processed with 13.03.7779 Plotted with 13.03.7779

↑ **5 INCH MAIN PASS DSC** ↑

↓ **5 INCH BULK DENSITY DSC** ↓

Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 12-MAY-2013 14:50
 Filename: C:\Data\Sandridge\Sandridge Turner 3406 5-7H\mms166 Depthlog.dta Recorded on 12-MAY-2013 14:25
 System Versions: Processed with 13.03.7779 Plotted with 13.03.7779



5300

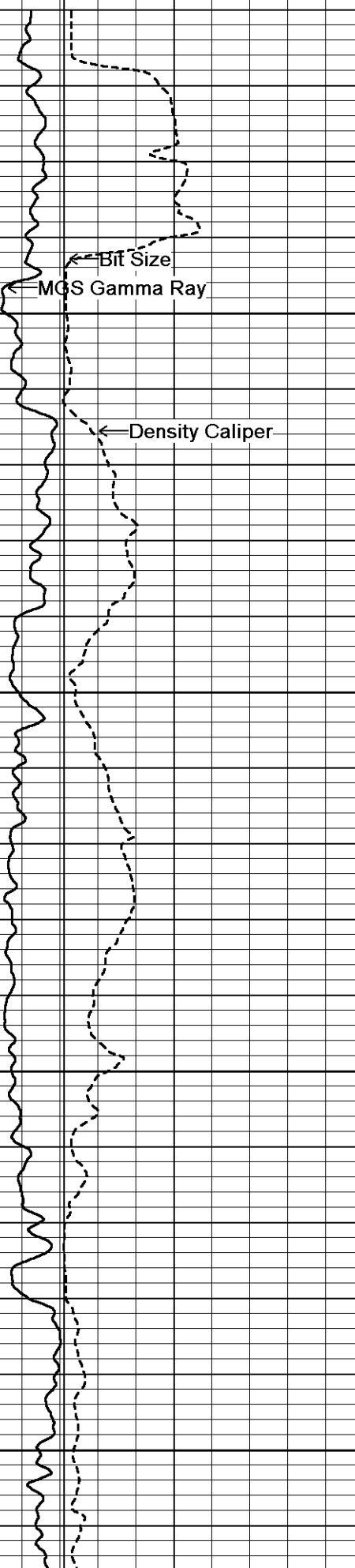
Casing
Shoe

5350

5400⁴⁰⁰

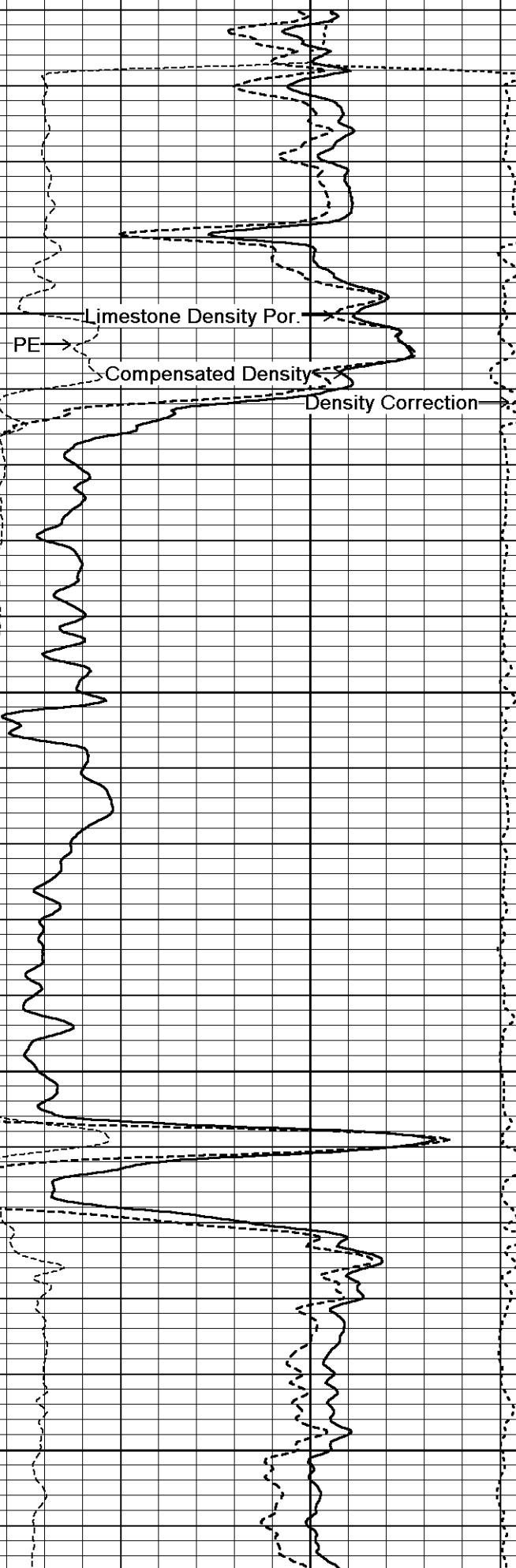
5450

5500

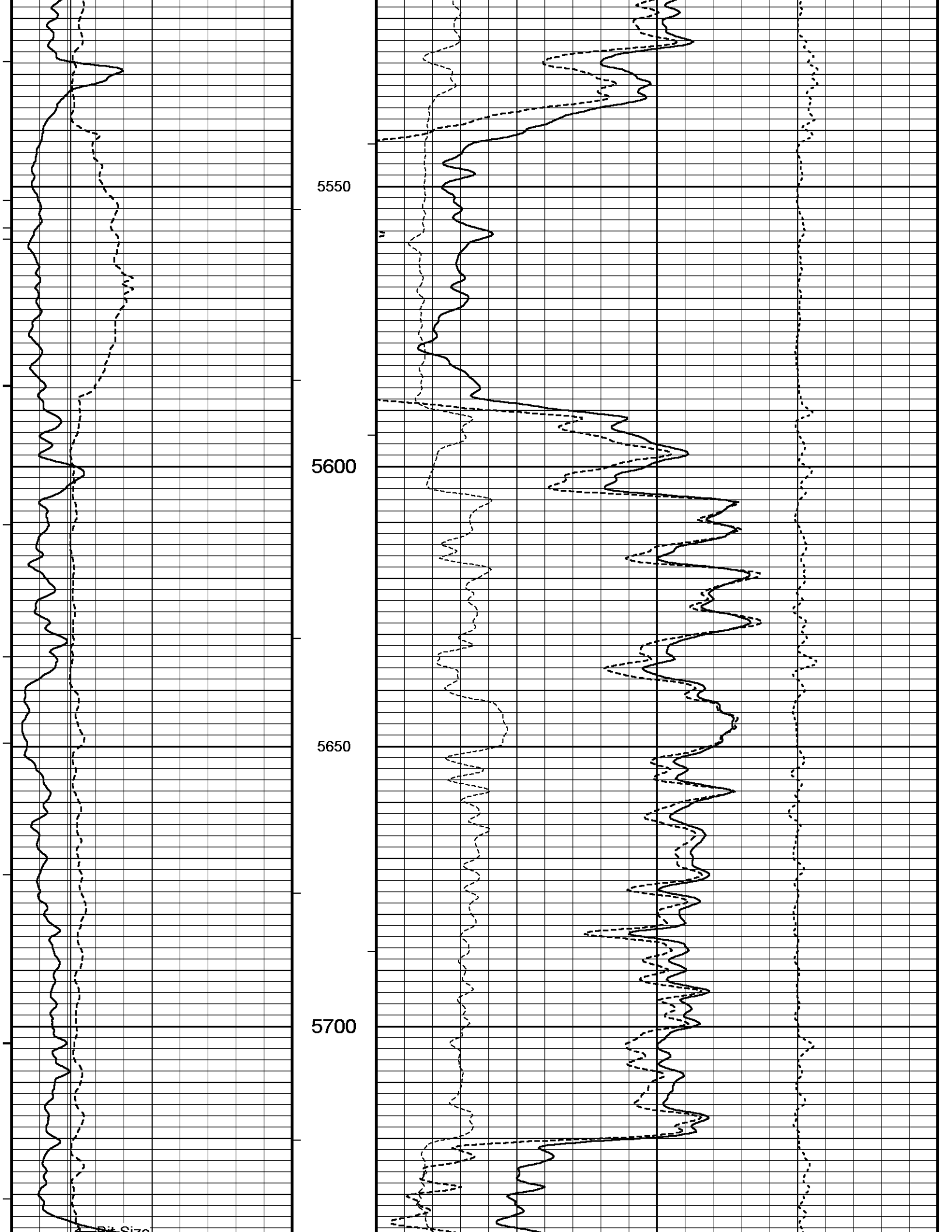


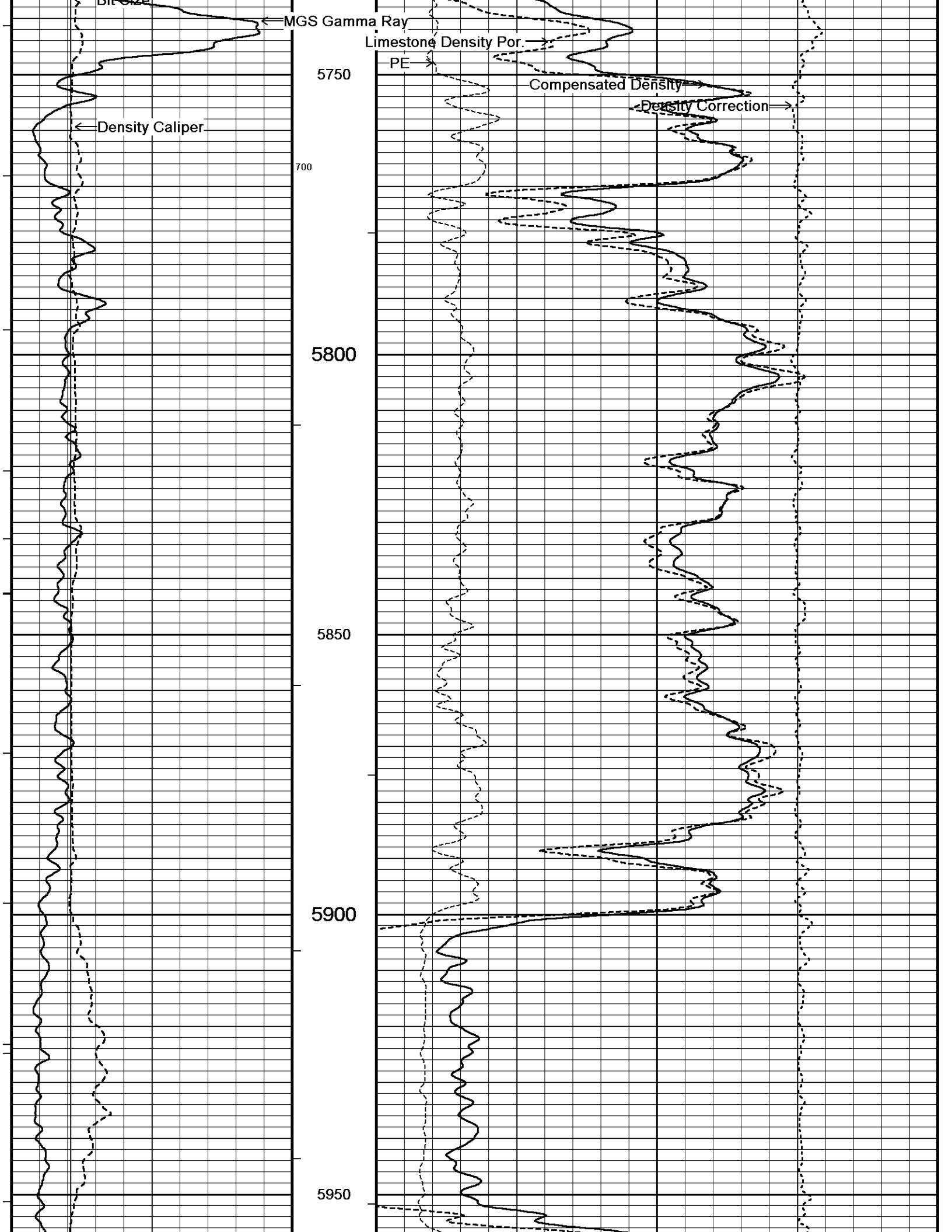
← Bit Size
← MGS Gamma Ray

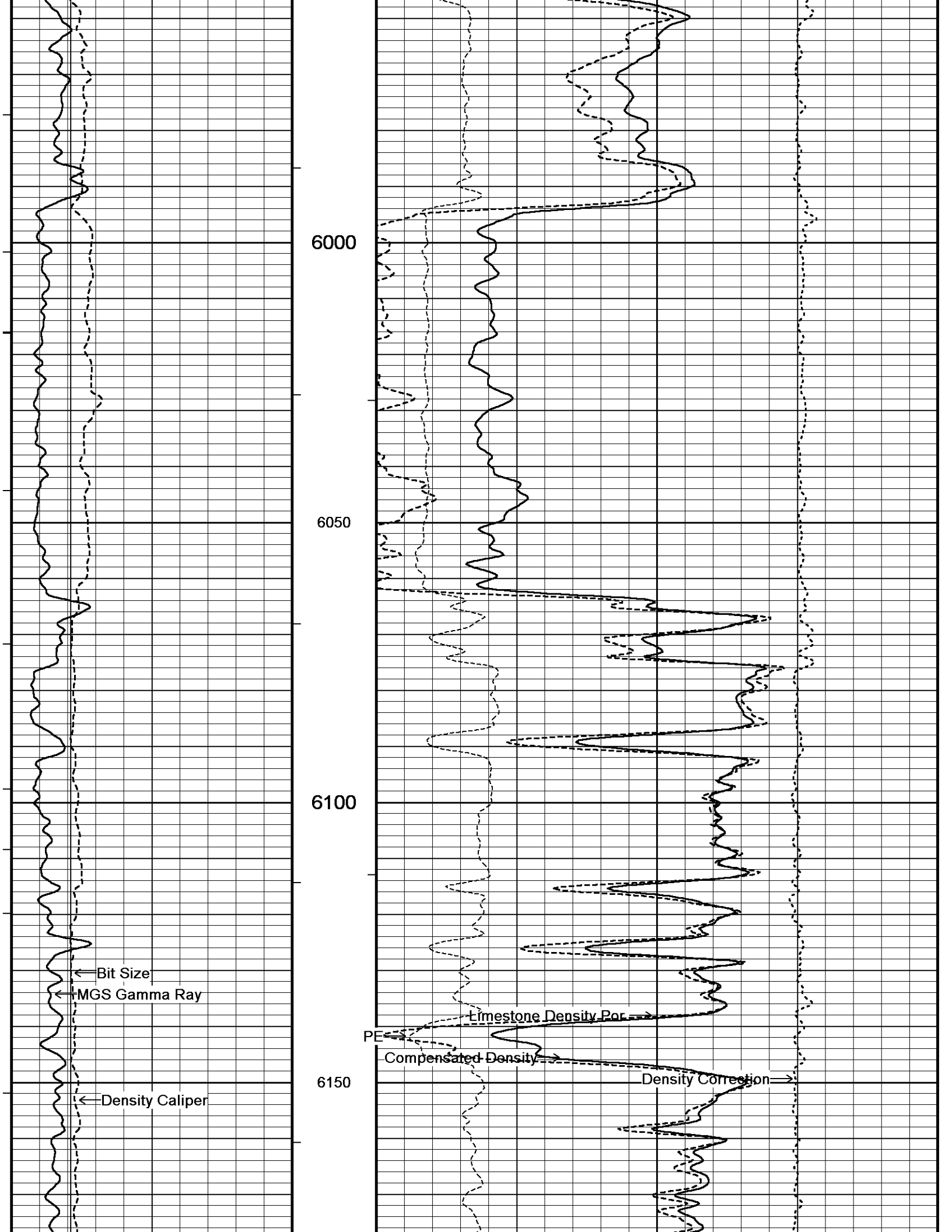
← Density Caliper

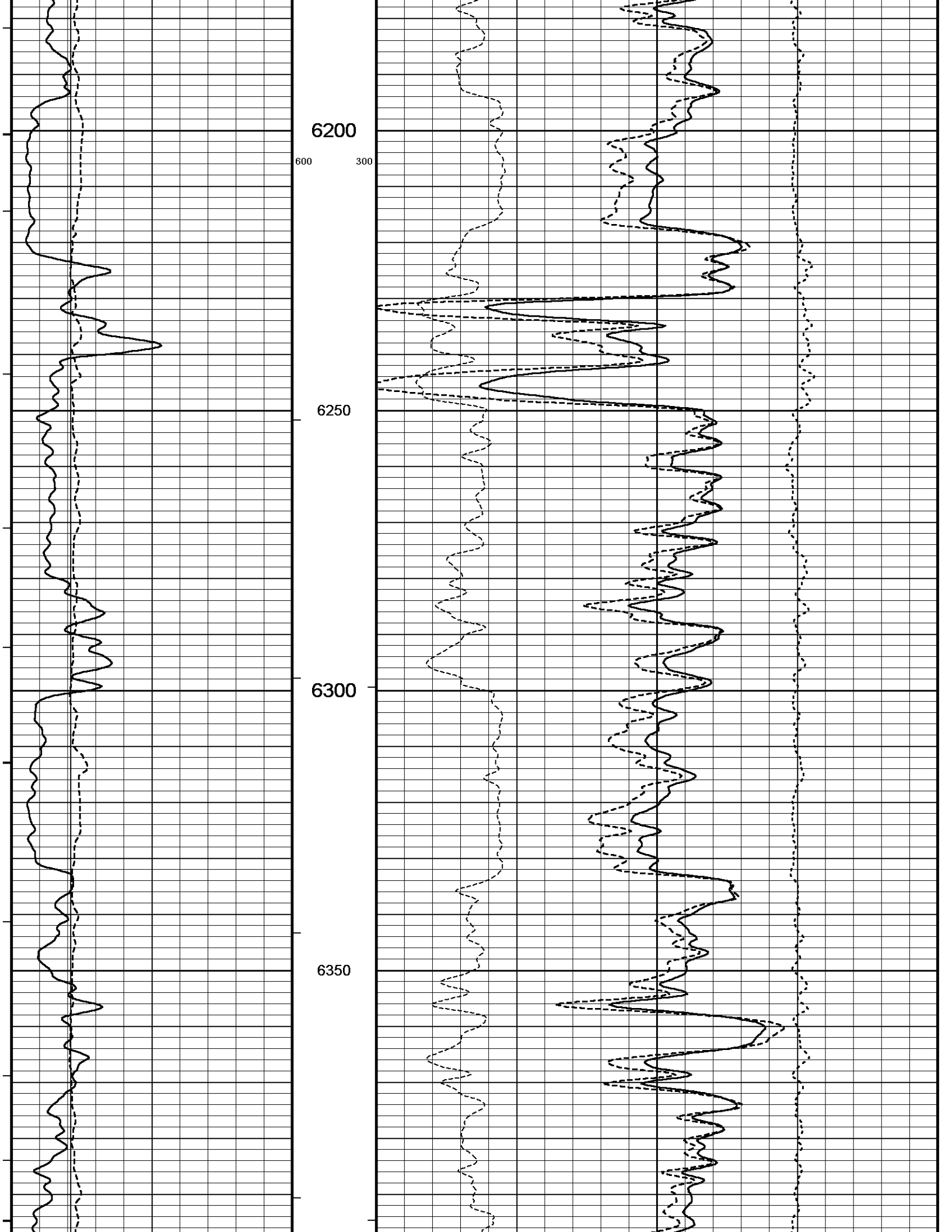


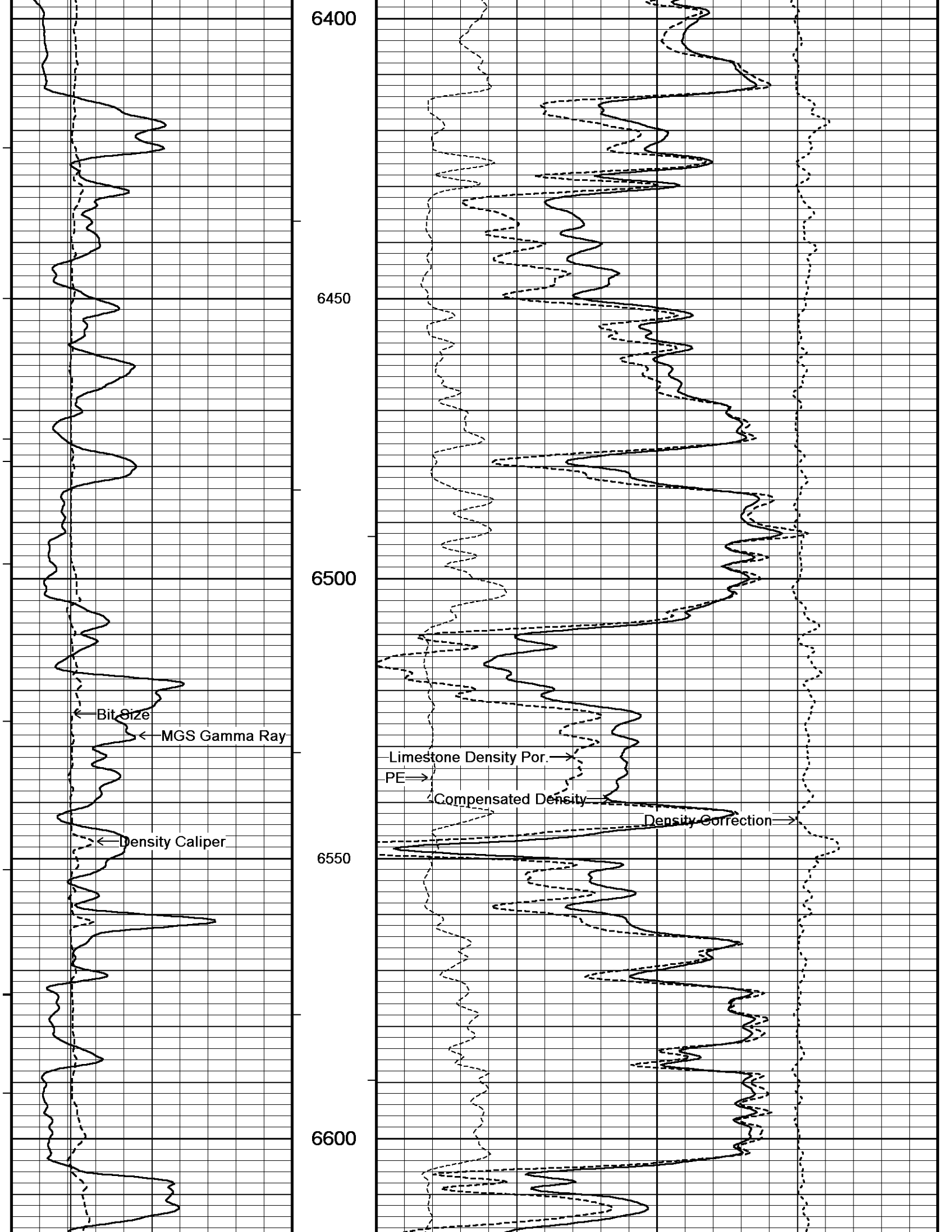
← Limestone Density Por.
PE →
← Compensated Density
← Density Correction

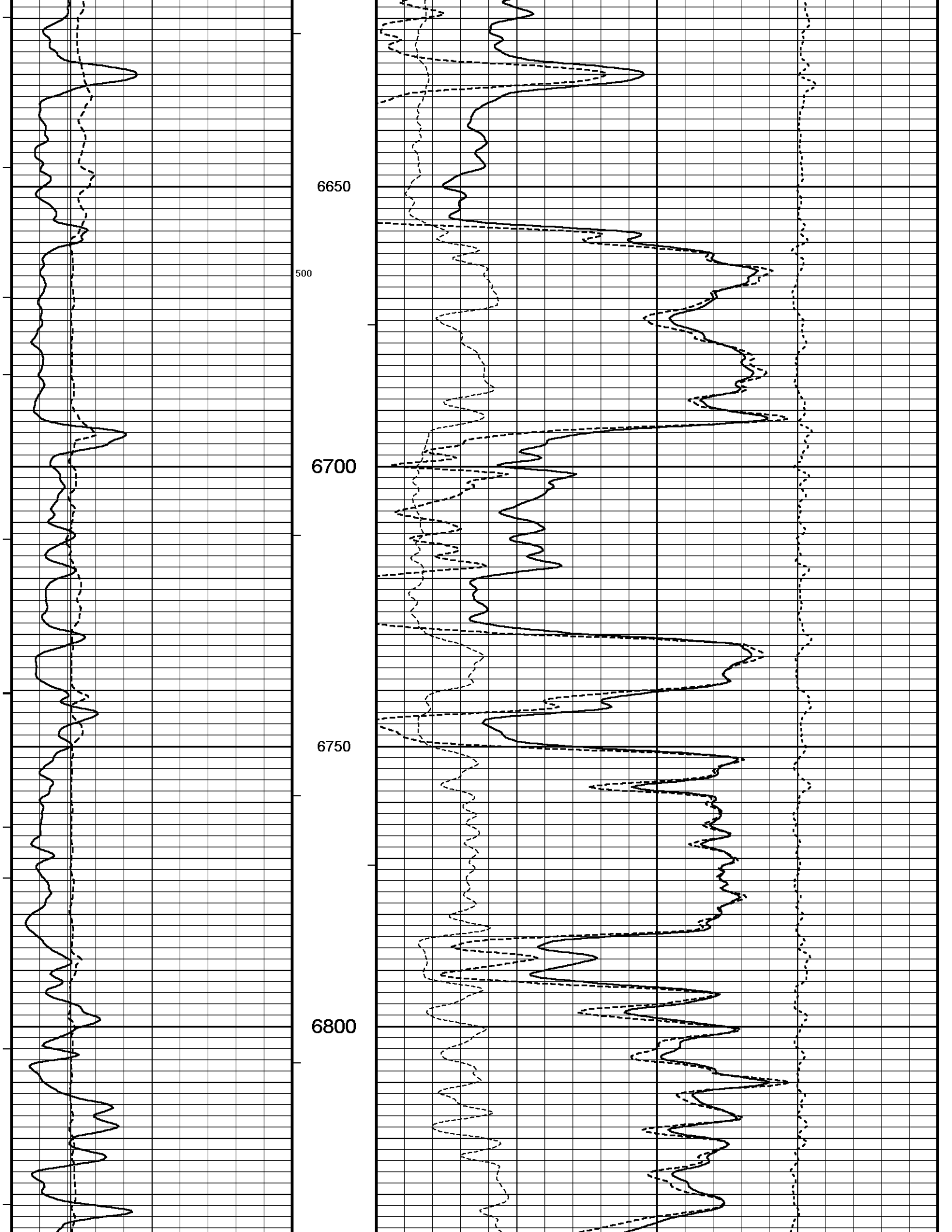


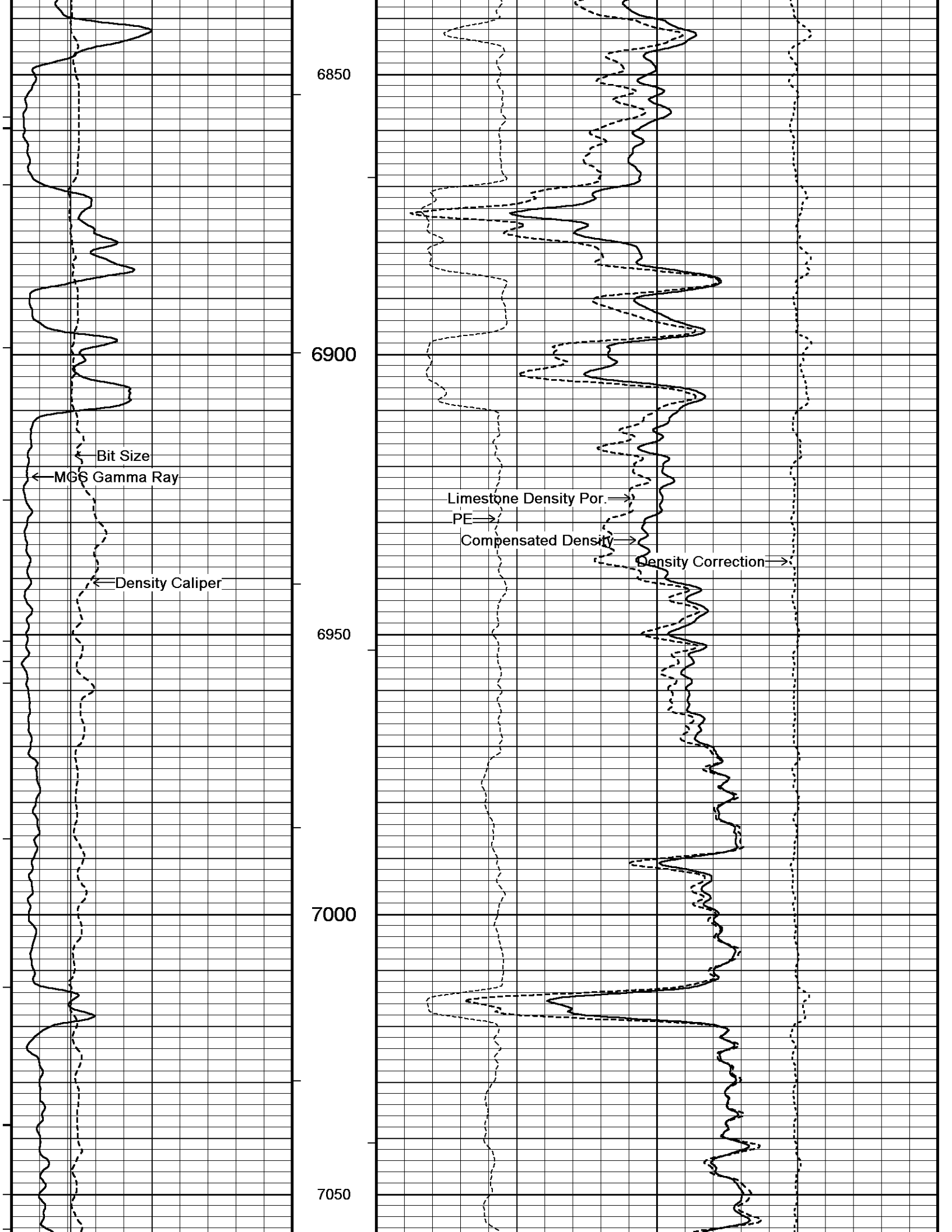


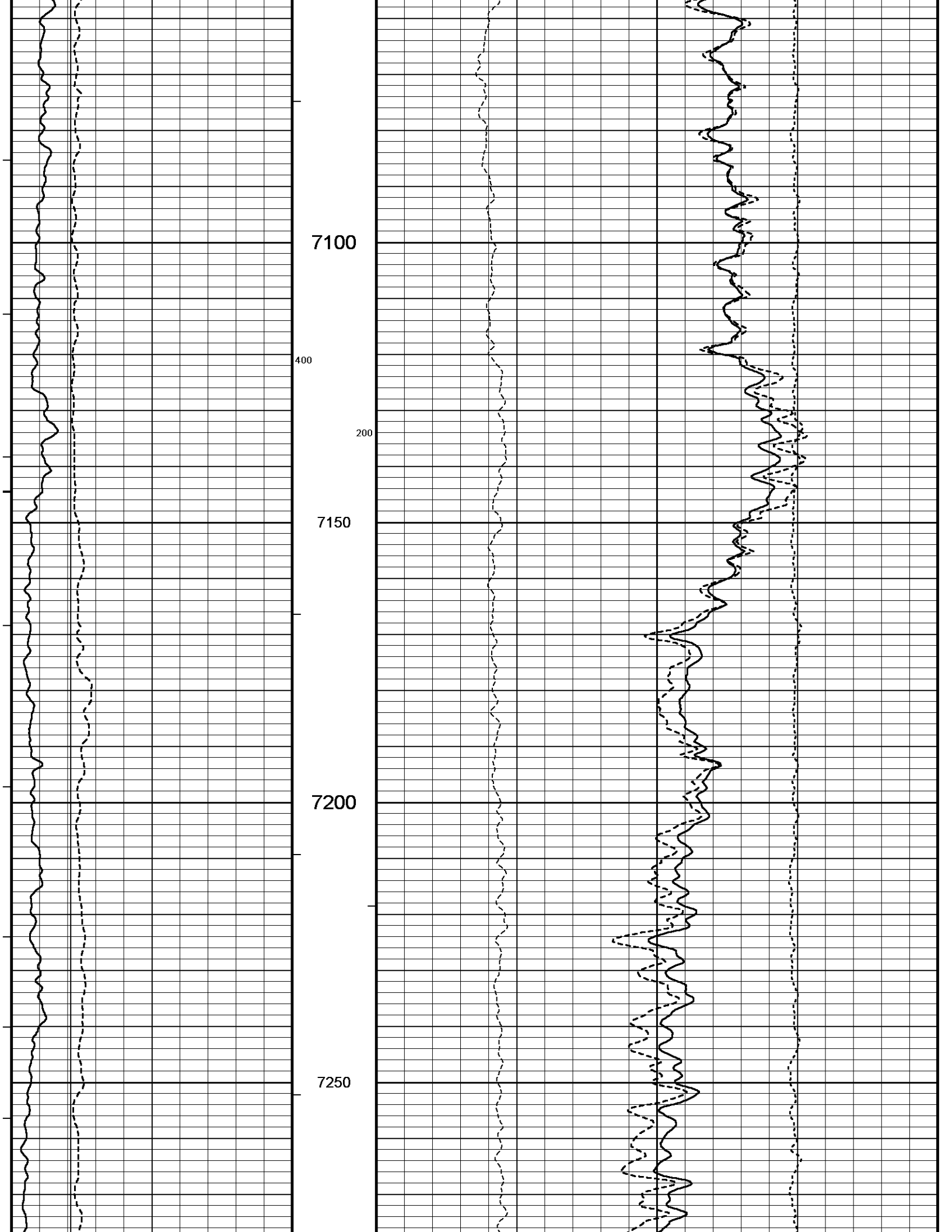


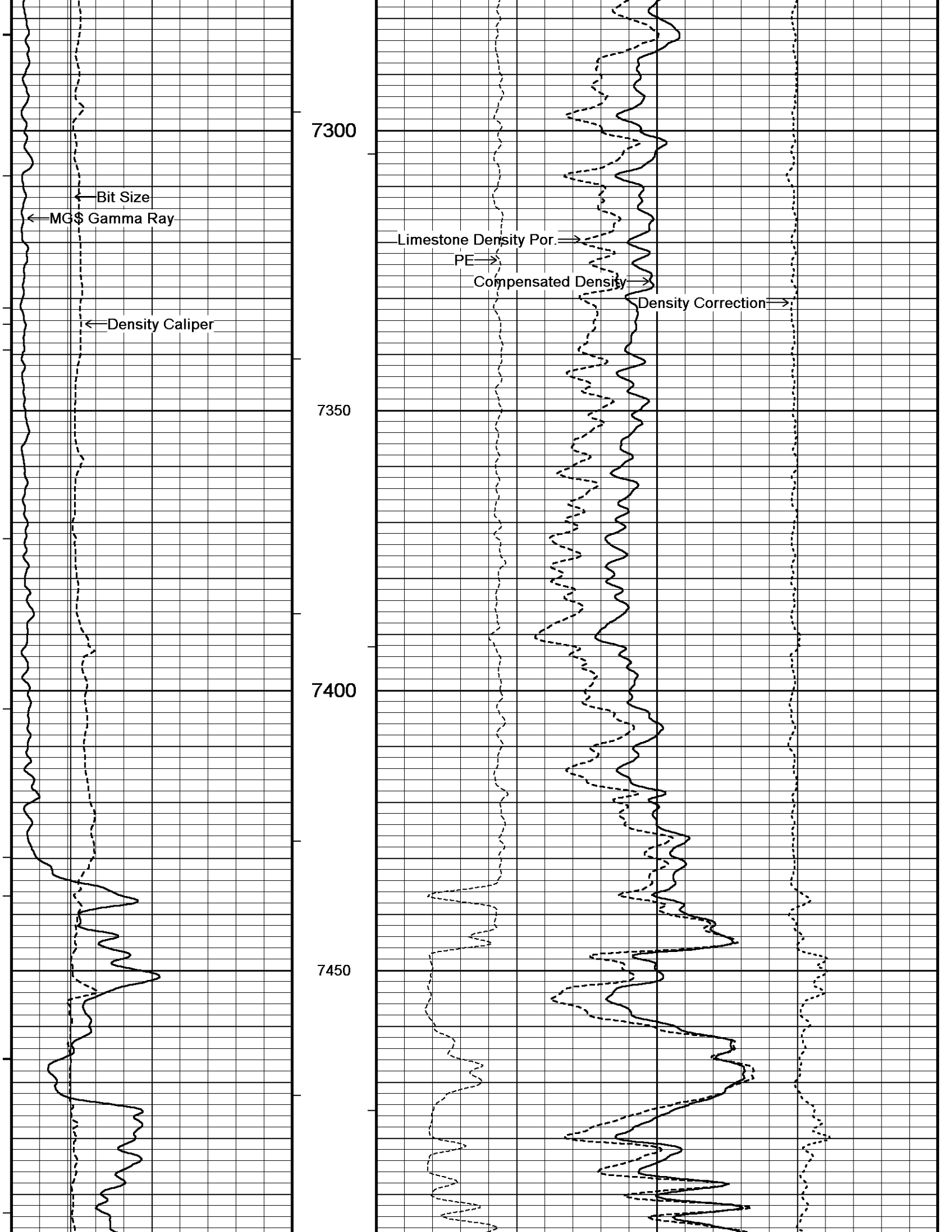


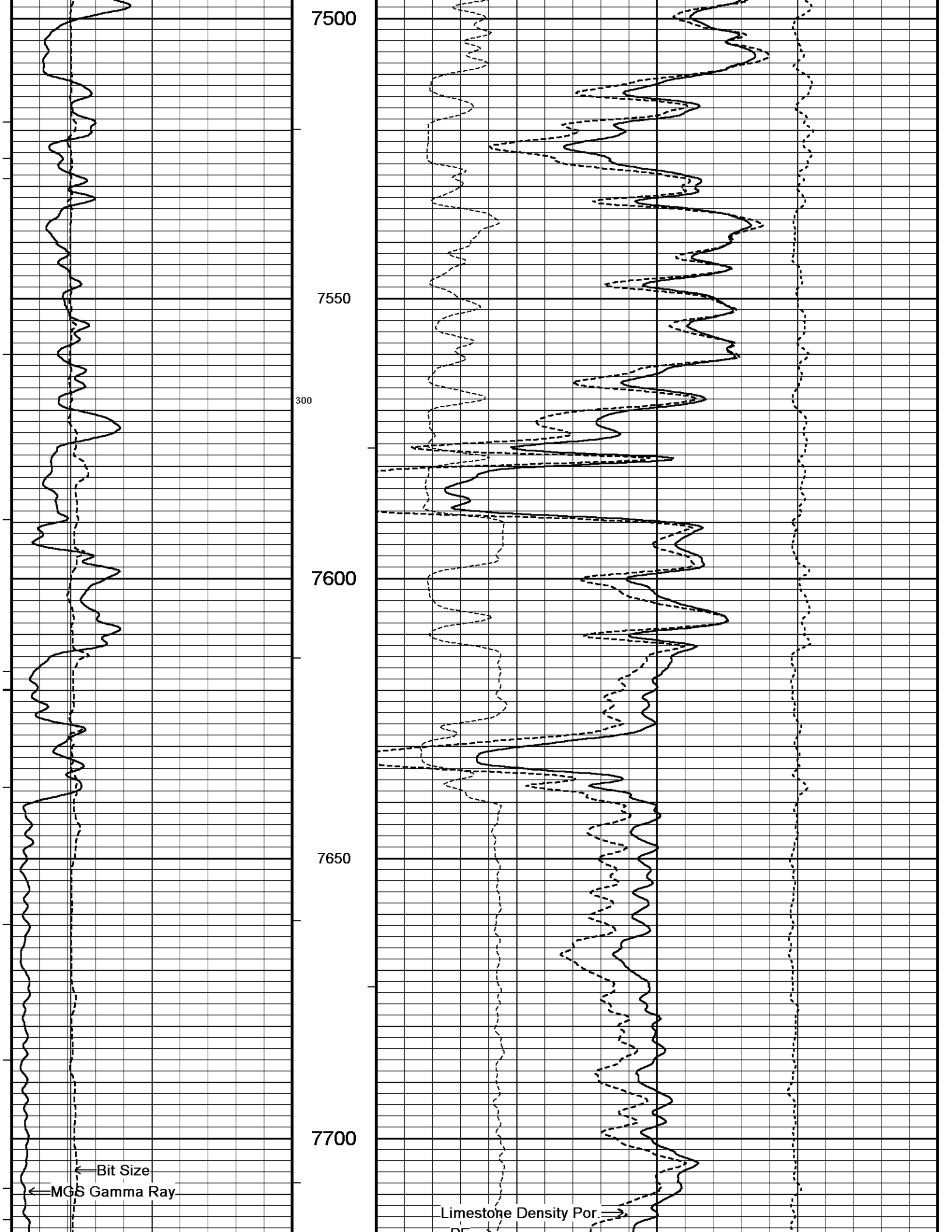


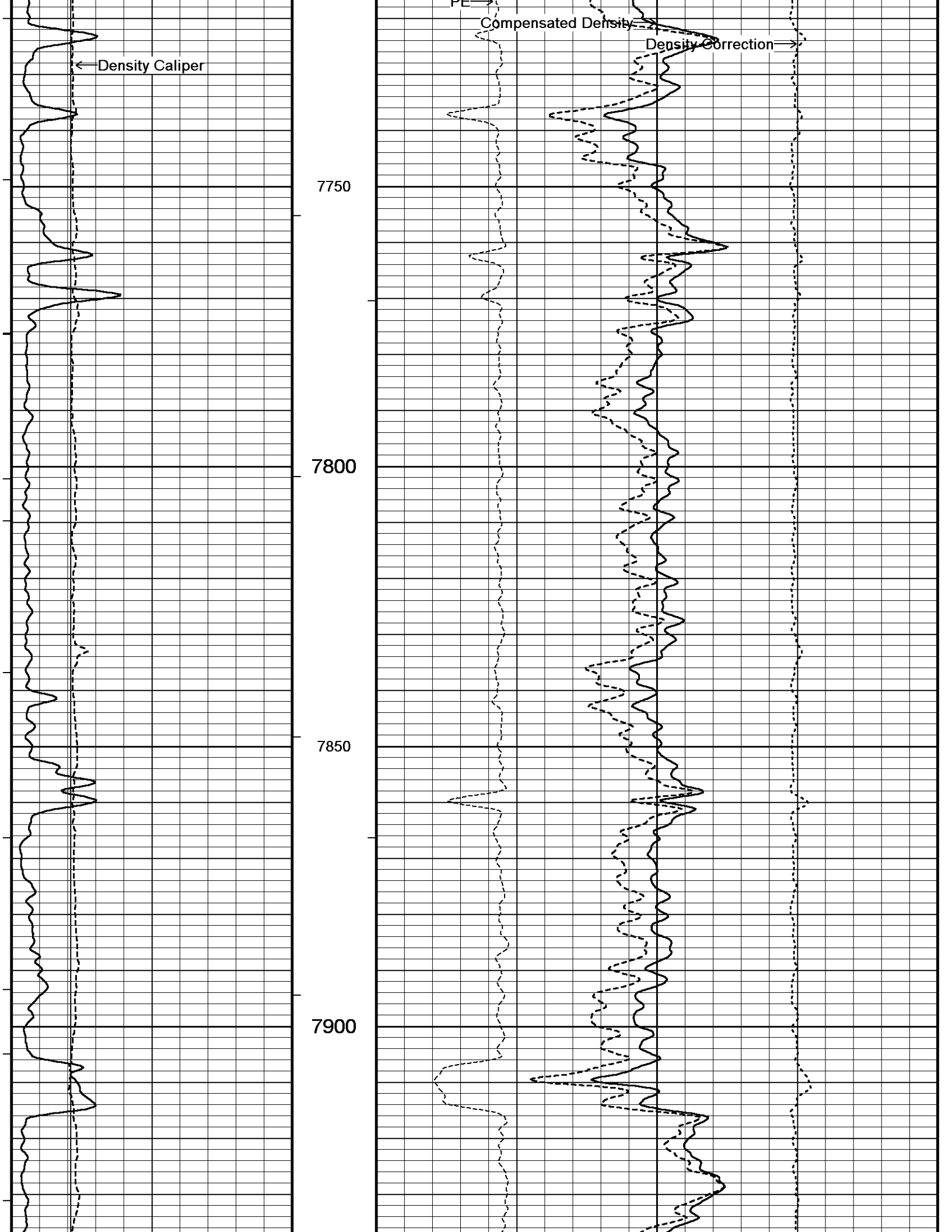


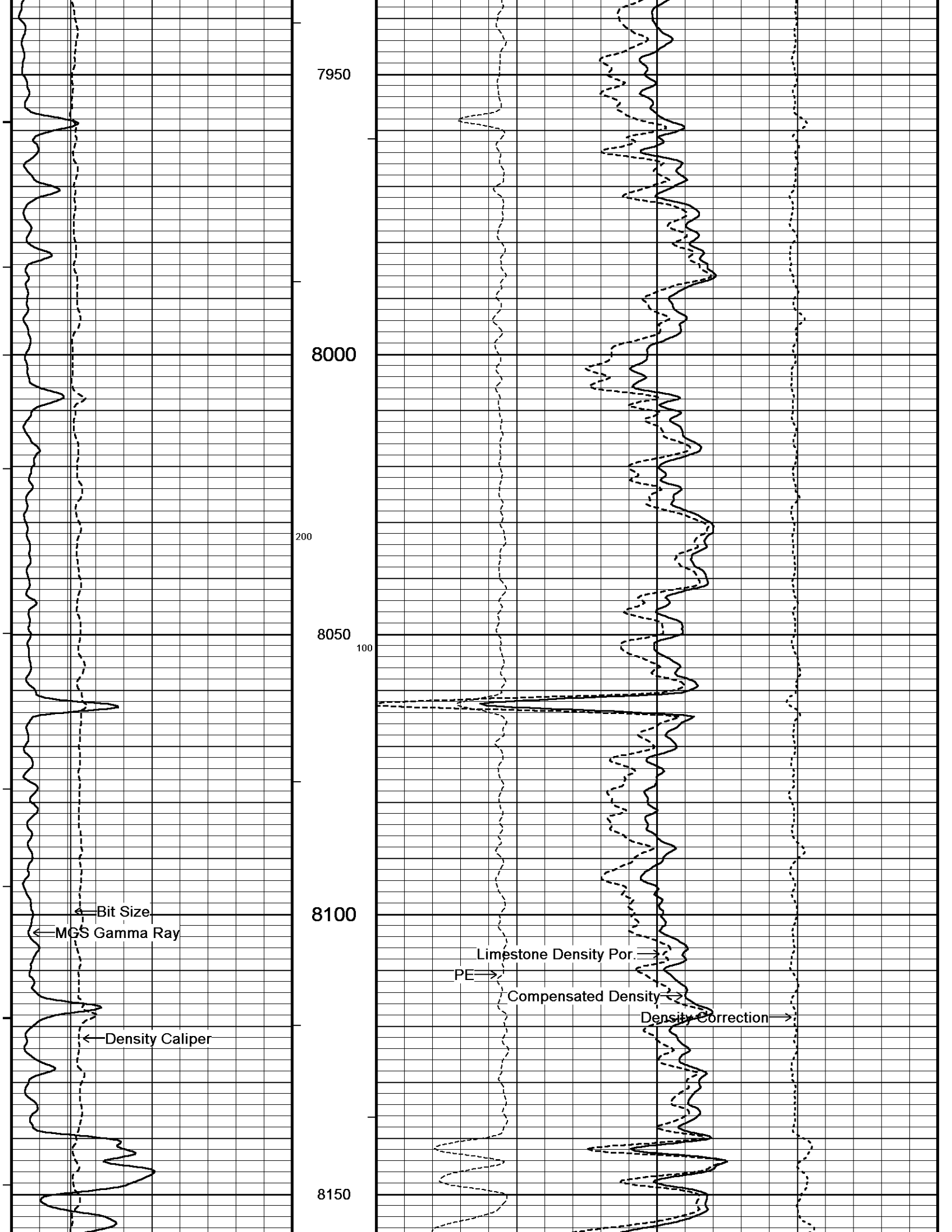


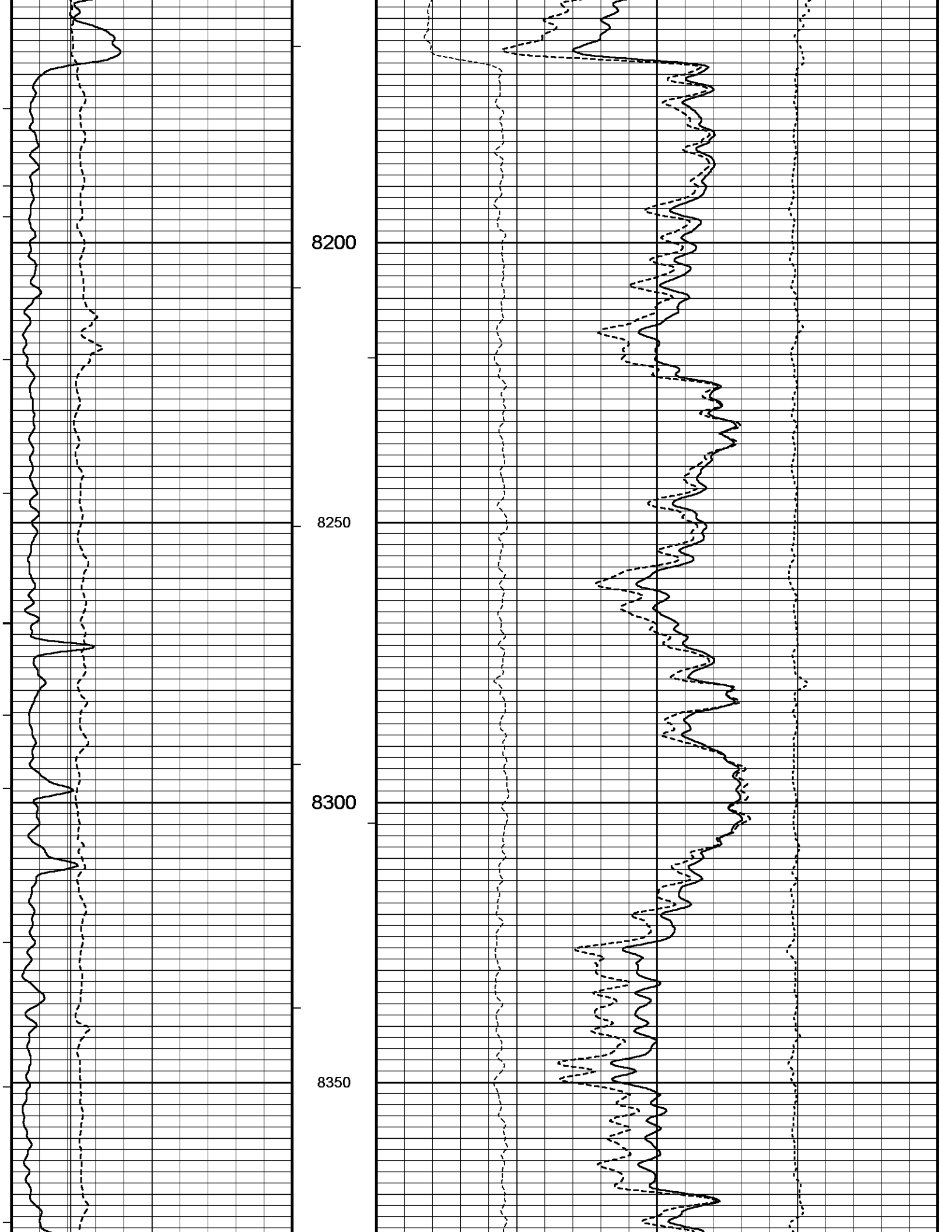


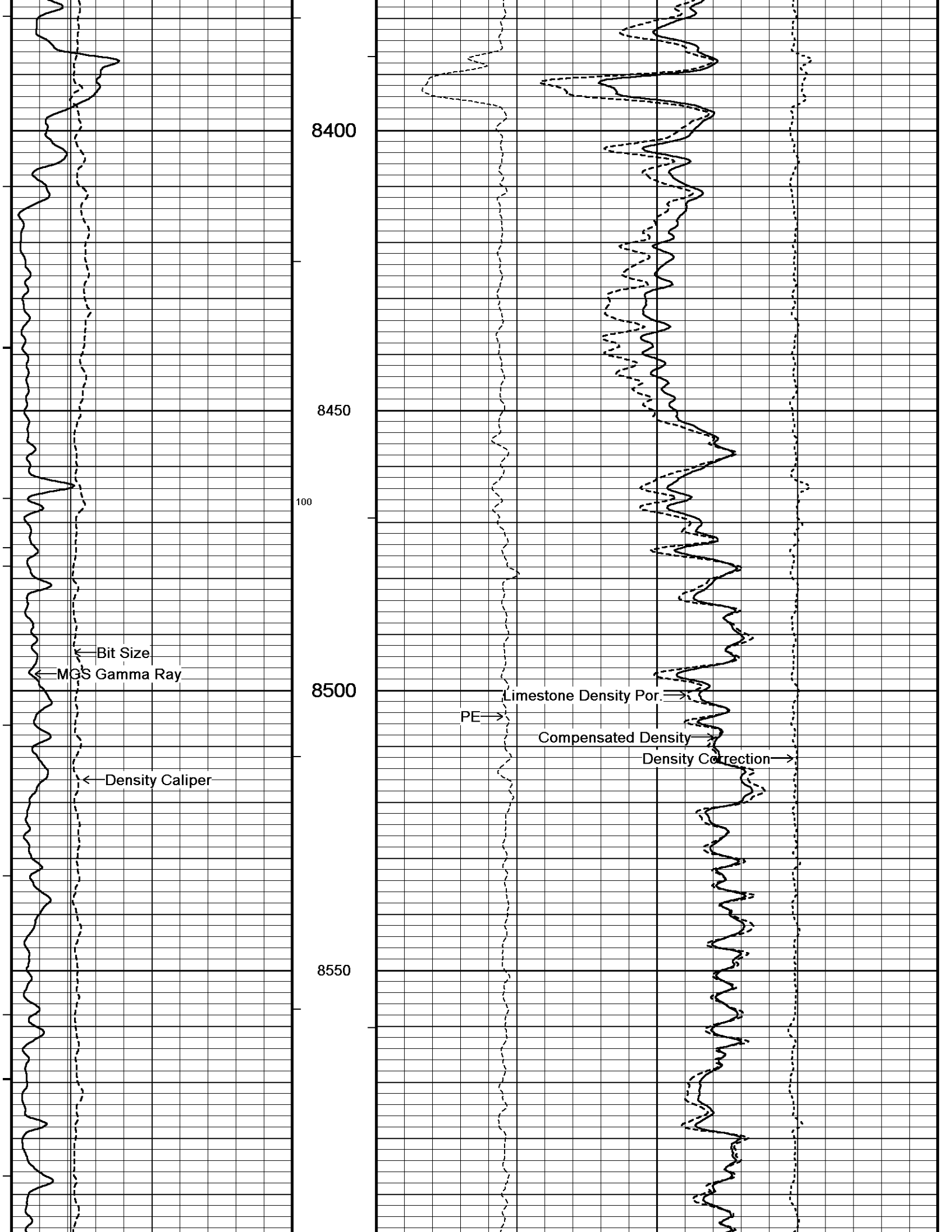


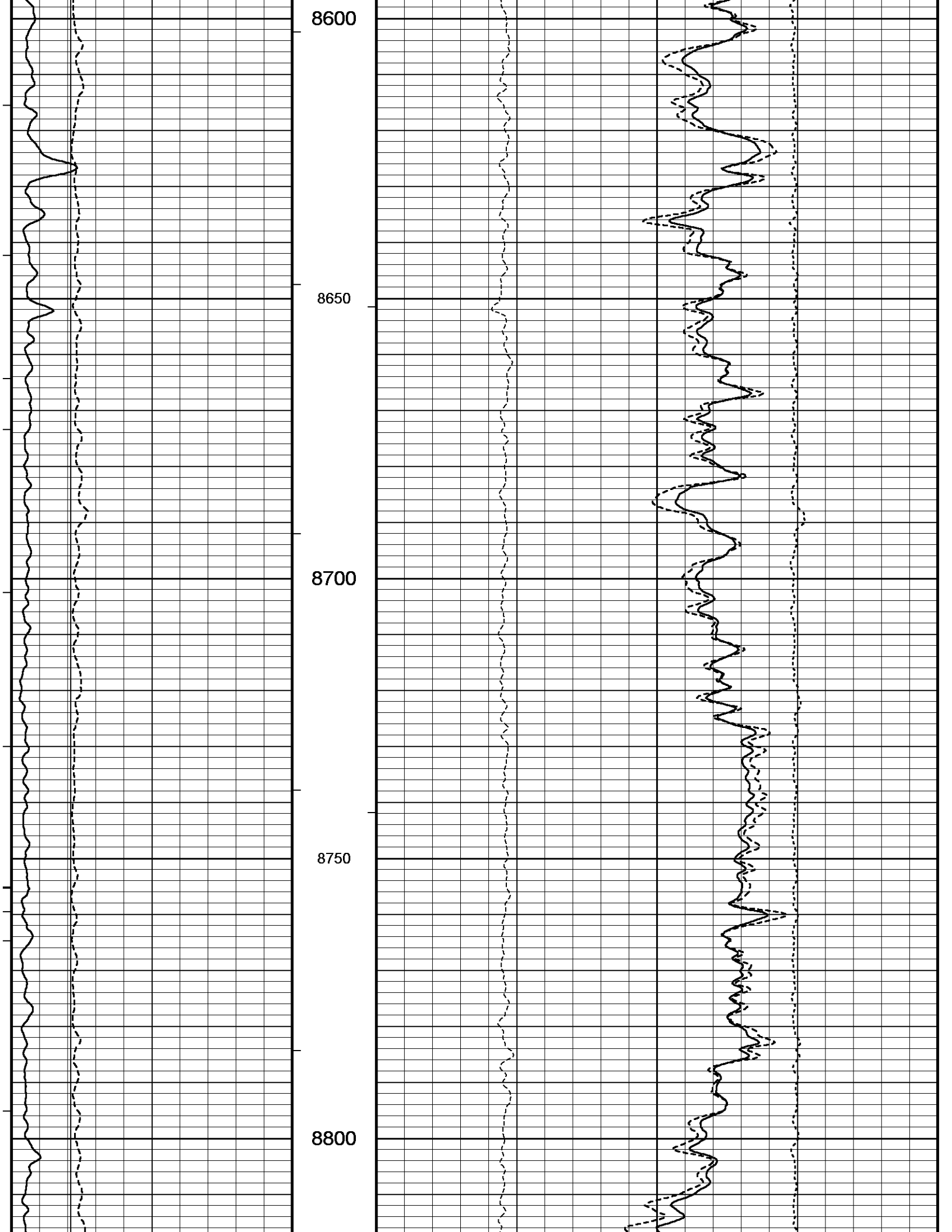


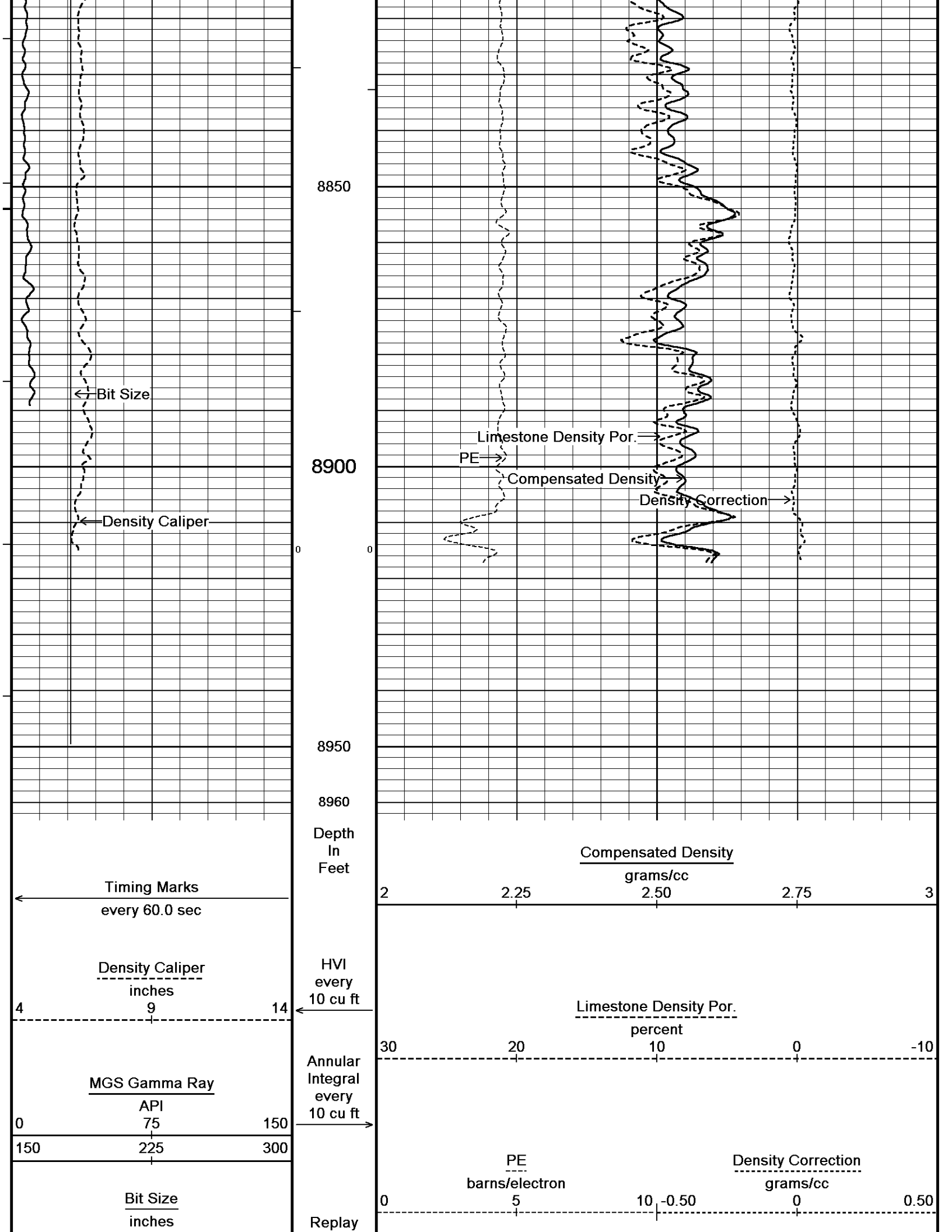












Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 12-MAY-2013 14:50
 Filename: C:\Data\Sandridge\Sandridge Turner 3406 5-7H\mms166 Depthlog.dta Recorded on 12-MAY-2013 14:25
 System Versions: Processed with 13.03.7779 Plotted with 13.03.7779

5 INCH BULK DENSITY DSC

BEFORE SURVEY CALIBRATION

C:\Data\Sandridge\Sandridge Turner 3406 5-7H\mms166 Depthlog.dta

General Constants All 000 Last Edited on 12-MAY-2013,08:16

General Parameters
 Mud Resistivity 3.500 ohm-metres
 Mud Resistivity Temperature 73.800 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	

Gamma Calibration MGS-C.J 133 Field Calibration on 07-MAY-2013 09:32

	Measured	Calibrated (API)
Background	39	27
Calibrator (Gross)	1866	1288
Calibrator (Net)	1827	1261

Gamma Constants MGS-C.J 133 Last Edited on 12-MAY-2013,14:33

Gamma Calibrator Number 46
 Mud Density 1.00 gm/cc
 Caliper Source for Processing Density Caliper
 Tool Position Eccentred
 Concentration of KCl 0.00 kppm

SP Calibration MGS-C.J 133

Field Calibration on 07-FEB-2013,10:52

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

High Resolution Temperature Calibration MGS-C.J 133

Field Calibration on 09-FEB-2013,12:46

	Measured	Calibrated(Deg F)
Lower	0.00	0.00
Upper	0.00	0.00

High Resolution Temperature Constants MGS-C.J 133

Last Edited on 20-MAR-2013,13:25

Pre-filter Length 11

Neutron Calibration MDN-B.J 423

Base Calibration on 04-APR-2013 11:20

Field Check on 10-MAY-2013 08:26

Base Calibration		Measured		Calibrated (cps)	
	Near	Far	Near	Far	
	2823	85	3714	110	
Ratio	33.061		33.764		
Field Calibrator at Base				Calibrated (cps)	
			2263	3348	
Ratio			0.676		
Field Check				Calibrated (cps)	
			1325	1977	
Ratio					

Neutron Constants MDN-B.J 423

Last Edited on 10-MAY-2013,08:22

Neutron Source Id	000	
Neutron Jig Number	000	
Epithermal Neutron	No	
Caliper Source for Processing	Density Caliper	
Stand-off	0.00	inches
Mud Density	0.99	gm/cc
Limestone Sigma	7.10	cu
Sandstone Sigma	4.26	cu
Dolomite Sigma	4.70	cu
Formation Pressure Source	None	
Formation Pressure	N/A	kpsi
Temperature Source	None	
Temperature	N/A	degrees F
Mud Salinity	0.00	kppm
Salinity Correction	Not Applied	
Formation Fluid Salinity Source	None	
Formation Fluid Salinity	N/A	kppm
Barite Mud Correction	Not Applied	

FE Calibration MFE-B.J 328

Base Calibration on 30-APR-2013 09:19

Field Check on

Base Calibration		Measured		Calibrated (ohm-m)	
		0.0		0.0	
Reference 1					
Reference 2		964.0		126.8	
Base Check				279.3	
Field Check					

FE Constants MFE-B.J 328

Last Edited on 07-MAY-2013,09:10

Running Mode	No Sleeve	
MFE K Factor	0.1268	
Caliper Source for FE correction	Density Caliper	
Caliper Value for FE correction	N/A	inches
Rm Source for FE correction	Temperature Corr	
Temp. for Rm Corr.	MGS External Temperature	

Stand-off 0.5 inches

High Resolution Temperature Calibration MAI-B.J 392

Field Calibration on 23-APR-2013,20:26

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

High Resolution Temperature Constants MAI-B.J 392

Last Edited on 23-APR-2013,20:26

Pre-filter Length 11

Induction Calibration MAI-B.J 392

Base Calibration on 23-APR-2013,20:27
Field Check on 10-MAY-2013 08:36

Base Calibration

Test Loop Calibration

Channel	Measured		Calibrated (mmho/m)	
	Low	High	Low	High
1	15.4	450.7	9.3	966.2
2	5.4	363.0	7.6	821.4
3	3.4	248.8	5.2	566.0
4	2.1	125.2	2.6	279.2

Array Temperature 24.2 Deg F

Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1			14.7	4025.1
2			31.4	3711.3
3			28.3	3181.0
4			19.4	2210.6
Deep			16.2	2093.8
Medium			41.7	4157.1
Shallow			48.6	5467.4

Array Temperature 60.6 Deg F

Induction Constants MAI-B.J 392

Last Edited on 12-MAY-2013,14:32

Induction Model	RtAP-WBM	
Caliper for Borehole Corr.	Density Caliper	
Hole Size for Borehole Correction	N/A	inches
Tool Centred	No	
Stand-off Type	Fins	
Stand-off	0.50	inches
Number of Fins on Stand-off	6.0000	
Stand-off Fin Angle	60.00	degrees
Stand-off Fin Width	0.5000	inches
Borehole Corr. Rm Source	Constant Value	
Temp. for Rm Corr.	N/A	
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

Resistivity of Mud Filtrate for CW 0.00
 Source for Rt 0.00
 Source for Rxo 0.00

Photo Density Calibration MPD-D.A 471

Base Calibration on 04-APR-2013 10:25
 Field Check on 10-MAY-2013 08:30

Density Calibration	Base Calibration	Measured		Calibrated (sdu)	
		Near	Far	Near	Far
	Reference 1	56599	28433	59494	30754
	Reference 2	23789	2739	26390	2598
Field Check at Base		1276.2	1466.6		
Field Check		1268.9	1467.7		

PE Calibration	Base Calibration	Measured			Calibrated Ratio
		WS	WH	Ratio	
	Background	245	1147		
	Reference 1	25303	56390	0.454	0.367
	Reference 2	7527	23646	0.324	0.270
Field Check at Base		244.7	1146.5		
Field Check		243.6	1137.8		

Density Constants MPD-D.A 471

Last Edited on 12-MAY-2013,14:33

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	1.00	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 10-MAY-2013 08:32

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)
		5.71	5.97

DOWNHOLE EQUIPMENT

C:\Data\Sandridge\Sandridge Turner 3406 5-7H\mms166 Depthlog.dta

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

MBS-F.A 200v Compact Battery Sub
 MBS-F.A 112 LG: 10.61 ft WT: 70.5 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

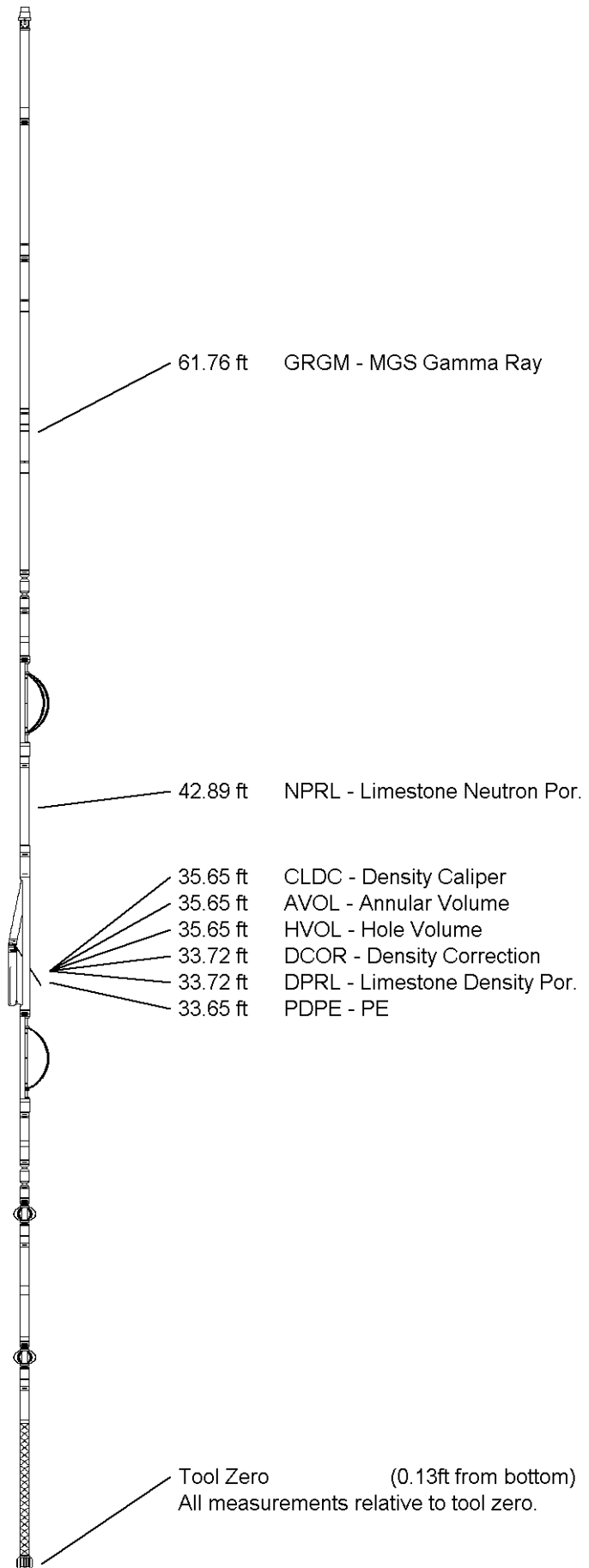
MIS-B Compact Inline Standoff sub
 MIS-B 102 LG: 2.14 ft WT: 15.4 lb OD: 2.24 in

Compact Focussed Electric
 MFE-B.J 328 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

MIS-E.B Compact Inline Standoff sub
 MIS-E.B 565 LG: 2.14 ft WT: 15.4 lb OD: 2.24 in

Compact Induction
 MAI-B.J 392 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 86.65 ft Weight: 637.1 lb



COMPANY SANDRIDGE EXPLORATION & PRODUCTION
WELL TURNER 3406 5-7H
FIELD WILD CREEK NORTH
PROVINCE/COUNTY HARPER
COUNTRY/STATE USA / KANSAS

Elevation Kelly Bushing	1327.00	feet	First Reading	8916.00	feet
Elevation Drill Floor	1327.00	feet	Depth Driller	8973.00	feet
Elevation Ground Level	1309.00	feet	Depth Logger	8949.00	feet



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COMPENSATED PHOTO-DENSITY
COMPENSATED NEUTRON LOG