CML MESSENGER SHUTTLE
COMPACT PHOTO DENSITY
COMPENSATED NEUTRON LOG

Weatherford®

COMPANY	SANDRIDGE ENERGY
WELL	HAZEL 3120 1-24H
FIELD	SIX MOONS EAST
PROVINCE/COUNTY	COMMANCHE
COUNTRY/STATE	USA /KANSAS
LOCATION	SHL: 2310' FSL & 660' FEL OF THE SE/4
	BHL: 3760' FNL & 660' FEL OF THE SE/4

SEC	TWP	RGE	Other Services
24	31S	20W	MAI

API Number 15-033-21684-01
Permit Number

Permanent Datum G.L., Elevation 2042 feet
Log Measured From DF
Drilling Measured From DF @ 21 FEET

Elevations:	feet
KB	2063.00
DF	2062.00
GL	2042.00

Date	25-FEB-2013			
Run Number	ONE			
Service Order	3539541			
Depth Driller	10773.00	feet		
Depth Logger	10773.00	feet		
First Reading	10699.00	feet		
Last Reading	4950.00	feet		
Casing Driller	5512.00	feet		
Casing Logger	5512.00	inches		
Bit Size	6.125			
Hole Fluid Type	WATER	lb/USg		
Density / Viscosity	8.40 lb/USg	28.00 CP		
PH / Fluid Loss	9.50	9.50		
Sample Source	FLOWLINE			
Rm @ Measured Temp	0.68 @ 71.0	ohm-m		
Rmf @ Measured Temp	0.54 @ 71.0	ohm-m		
Rmc @ Measured Temp	0.82 @ 71.0	ohm-m		
Source Rmf / Rmc	CALC	CALC		
Rm @ BHT	0.37 @131.0	ohm-m		
Time Since Circulation	1 HOUR			
Max Recorded Temp	131.00	deg F		
Equipment / Base	18077	OKC		
Recorded By	M. JOHNSON		S. TOTTEY	
Witnessed By	J. HILEMAN			
AFE #/ S.O.	DC12601		3539541	

BOREHOLE RECORD

Last Edited: 25-FEB-2013 04:33

Bit Size inches	Depth From feet	Depth To feet
13.375	0.00	1022.00
8.750	1022.00	5512.00
6.125	5512.00	10773.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	9.625	0.00	1022.00	36.00
INTERMED	7.000	0.00	5512.00	26.00

REMARKS

LOGGED WITH WLS VER 13.04.8492 SOFTWARE

WELL LOGGED USING MESSENGER METHOD OF DEPLOYMENT, AND MEMORY LOGGING SYSTEM

HARDWARE: MAI: ISA STANDOFF BELOW
MPD: 4"PROFILE PLATE, MIS-A SINGLE SPRING DECENTRALIZER BELOW
MDN: MISD DOUBLE SPRING DECENTRALIZER RAN ABOVE

2.71 G/CC DENSITY MATRIX USED TOCALCULATE POROSITY
ALL INTERVALS LOGGED AND SCALED PER CUSTOMER REQUEST

DRILL PIPE DEPTH DURING DEPLOYMENT - 10652
LOGGING TOOL DEPTH AFTER DEPLOYMENT: 10735

4.5" CASING USED TO CALCULATE AHV

SERVICE ORDER # 3539541
RIG: LARIAT 45

OPERATORS: M. SLOBODKIN

5 INCH MAIN PASS

Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 25-FEB-2013 04:42
Filename: C:\DATA_13_04_8492\SANDRIDGE (HAZEL 3120 1-24H)\HAZEL RTAP DEPTH.dta
Recorded on 25-FEB-2013 04:14
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

Timing Marks
every 60.0 sec

Density Caliper
inches
4 9 14

MGS Gamma Ray
API
0 75 150
150 225 300

MGS Gamma Ray
API
0 75 150
150 225 300

Bit Size
inches
4 9 14

Depth In Feet

HVI every 10 cu ft

Annular Integral every 10 cu ft

Replay Scale 1:240

Limestone Neutron Por.
percent
30 20 10 0 -10

Limestone Neutron Por.
percent
30 20 10 0 -10
70 60 50 40 30

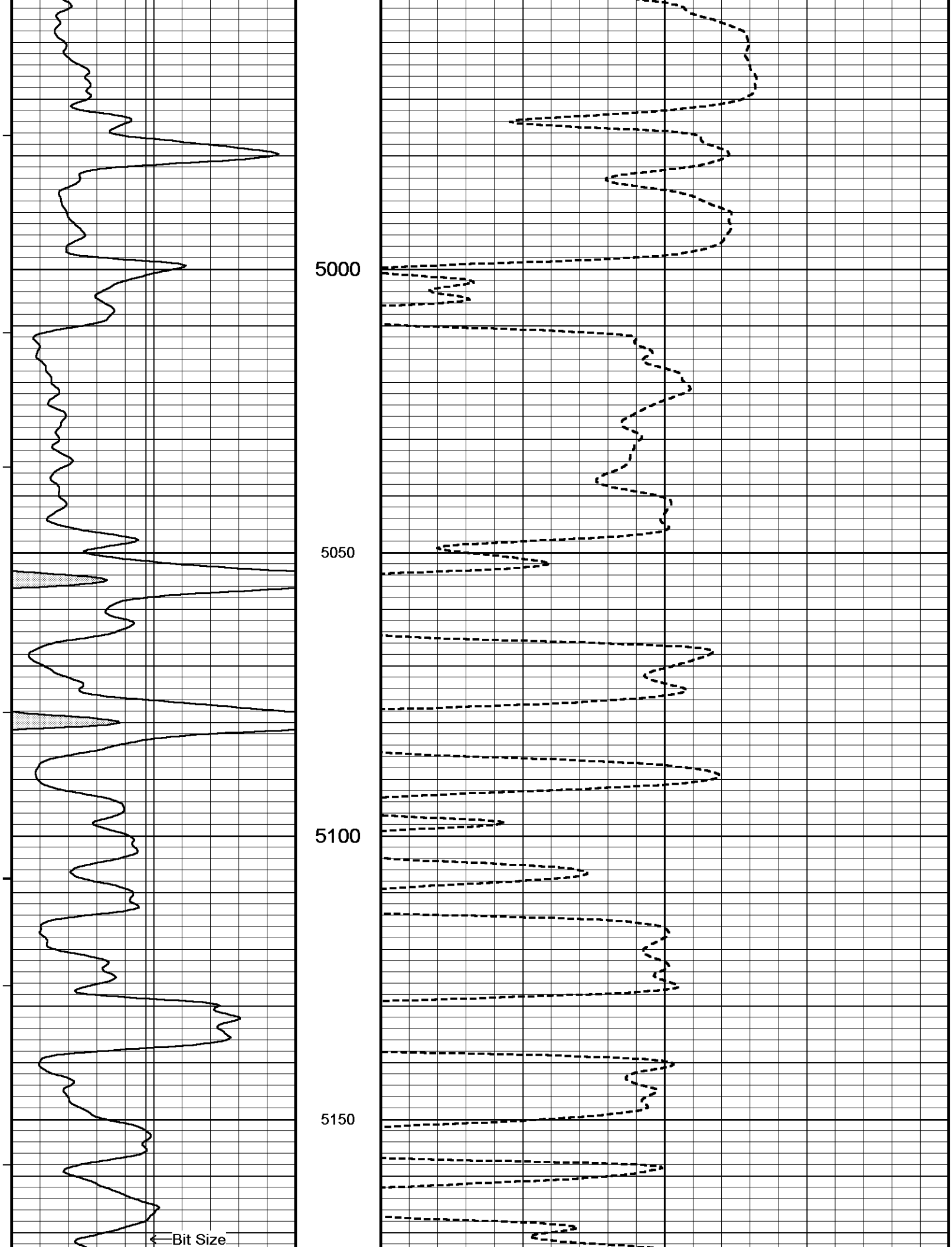
Limestone Density Por.
percent
30 20 10 0 -10

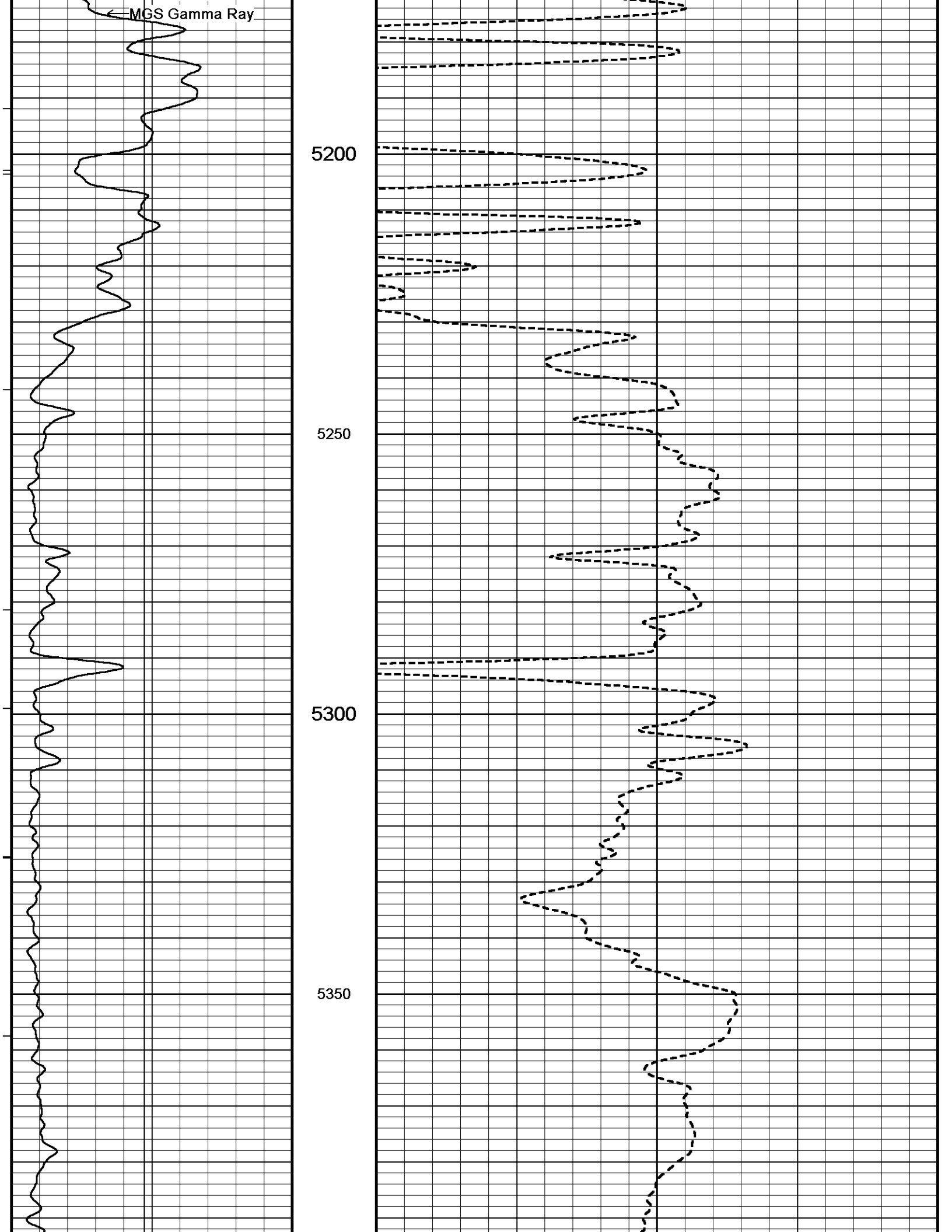
PE
barns/electron
0 5 10

Density Correction
grams/cc
-0.50 0 0.50

4900

4950


5000
5050
5100
5150
⟵Bit Size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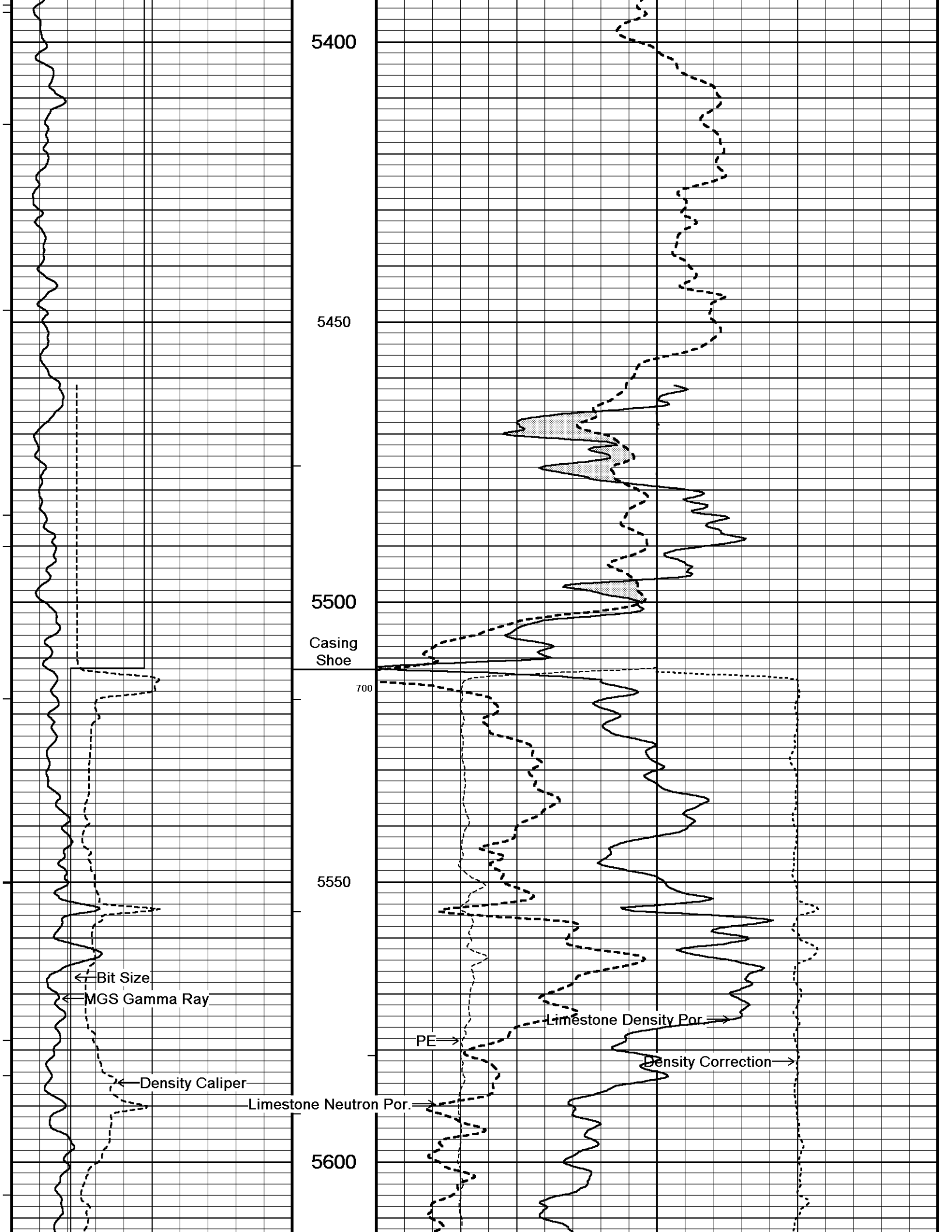
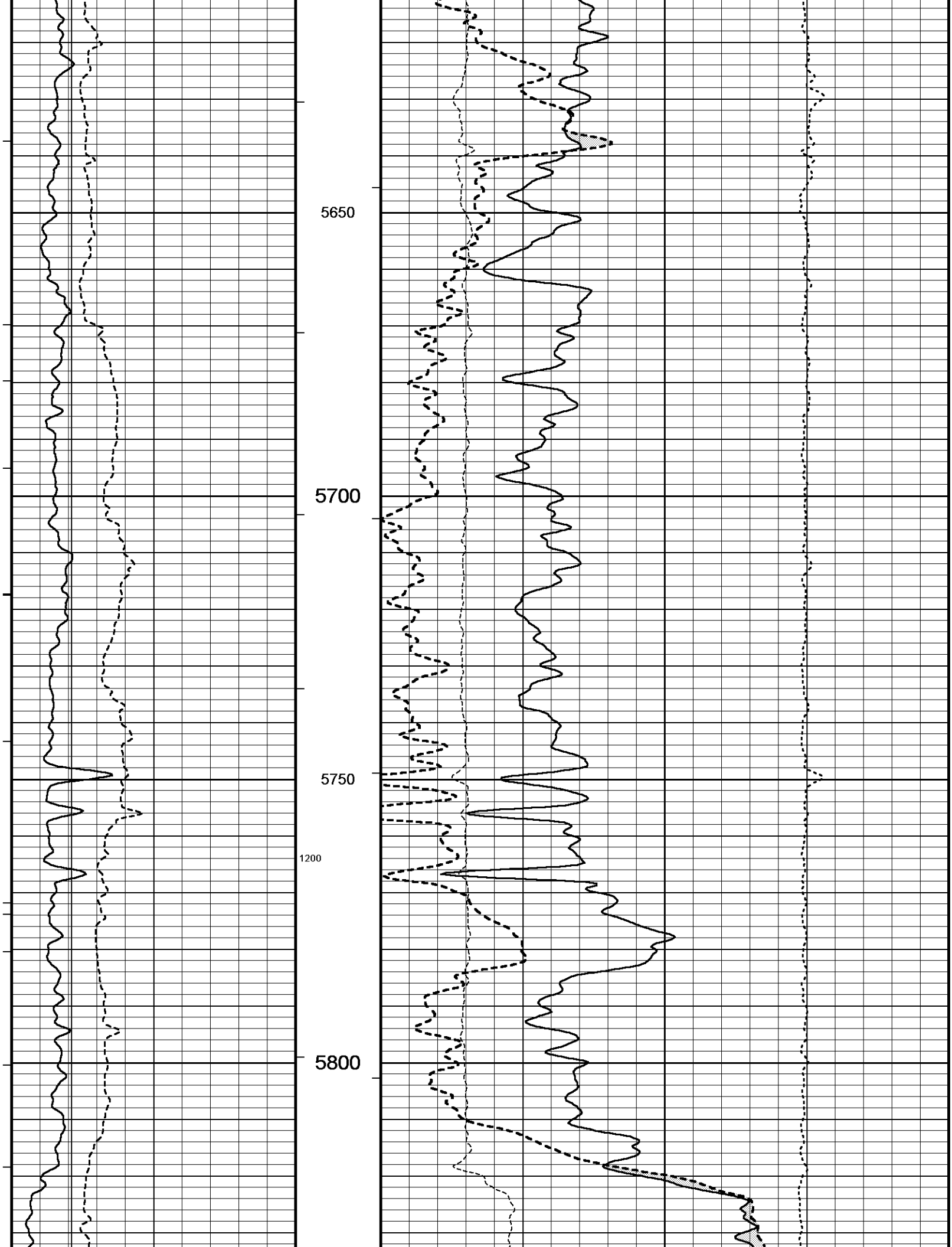
5200
5250
5300
5350


5400
5450
5500
Casing
Shoe
700
5550
5600
Bit Size
MGS Gamma Ray
Density Caliper
Limestone Neutron Por.
PE
Limestone Density Por.
Density Correction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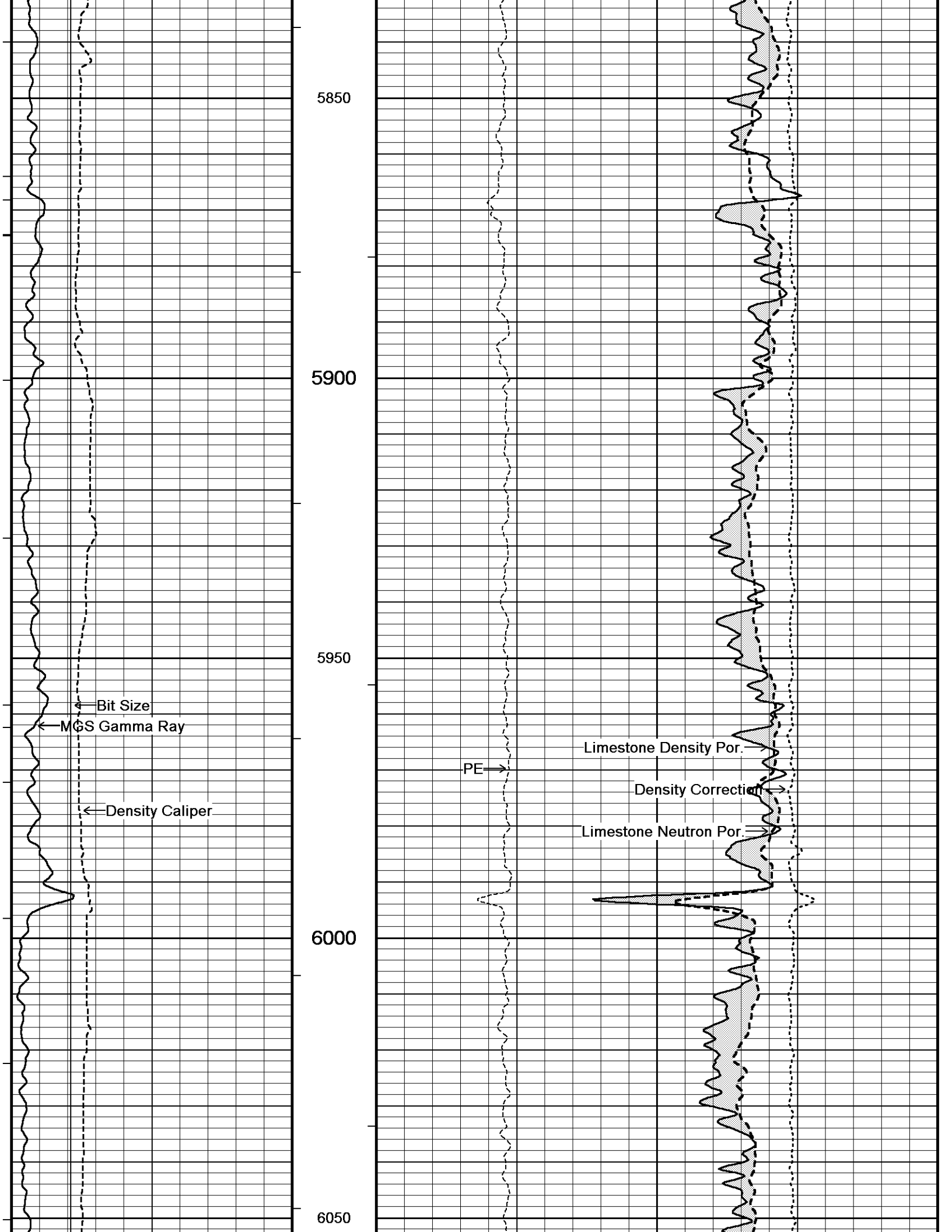
5700
5750
1200
5800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5900
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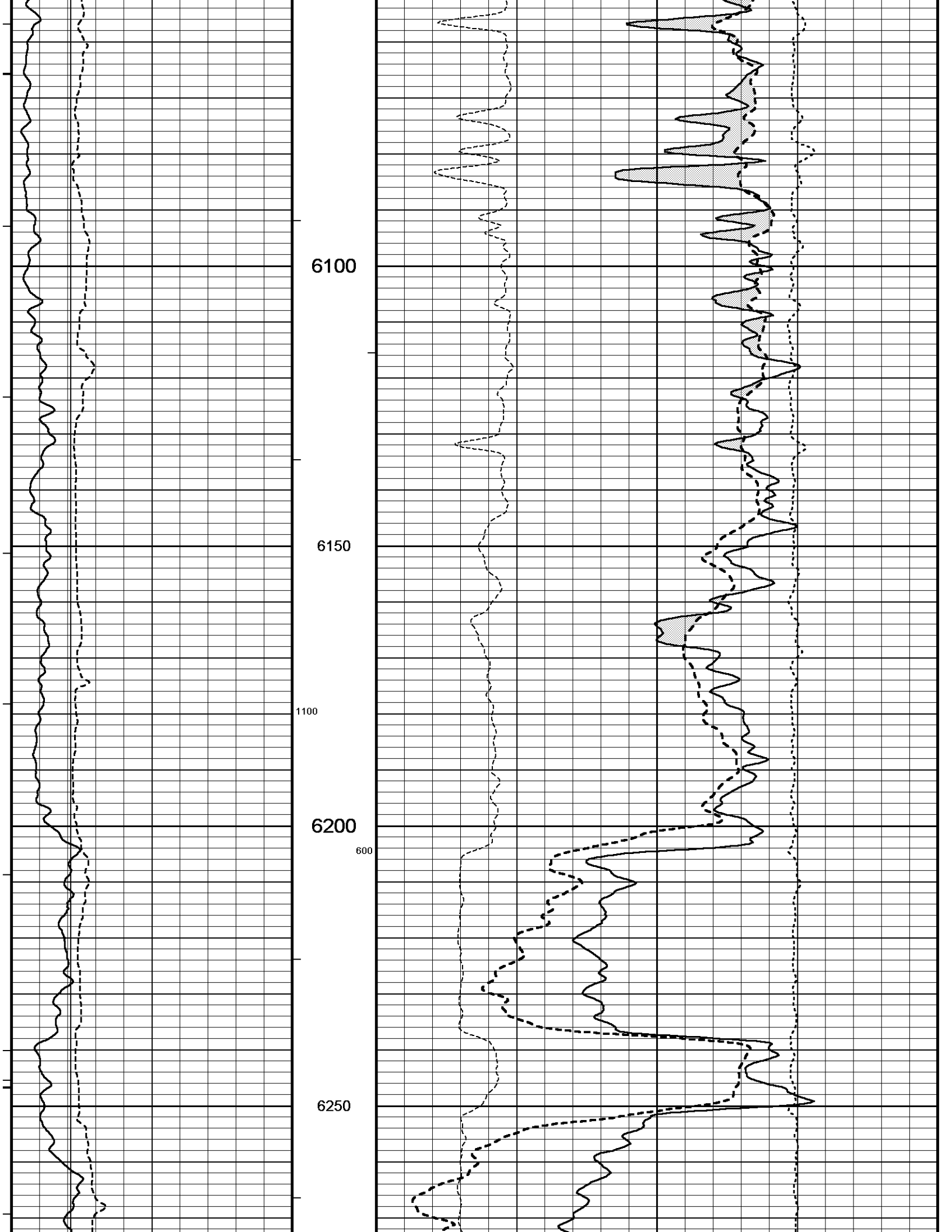
6000
6050
Bit Size
MCS Gamma Ray
Density Caliper
PE
Limestone Density Por.
Density Correction
Limestone Neutron Por.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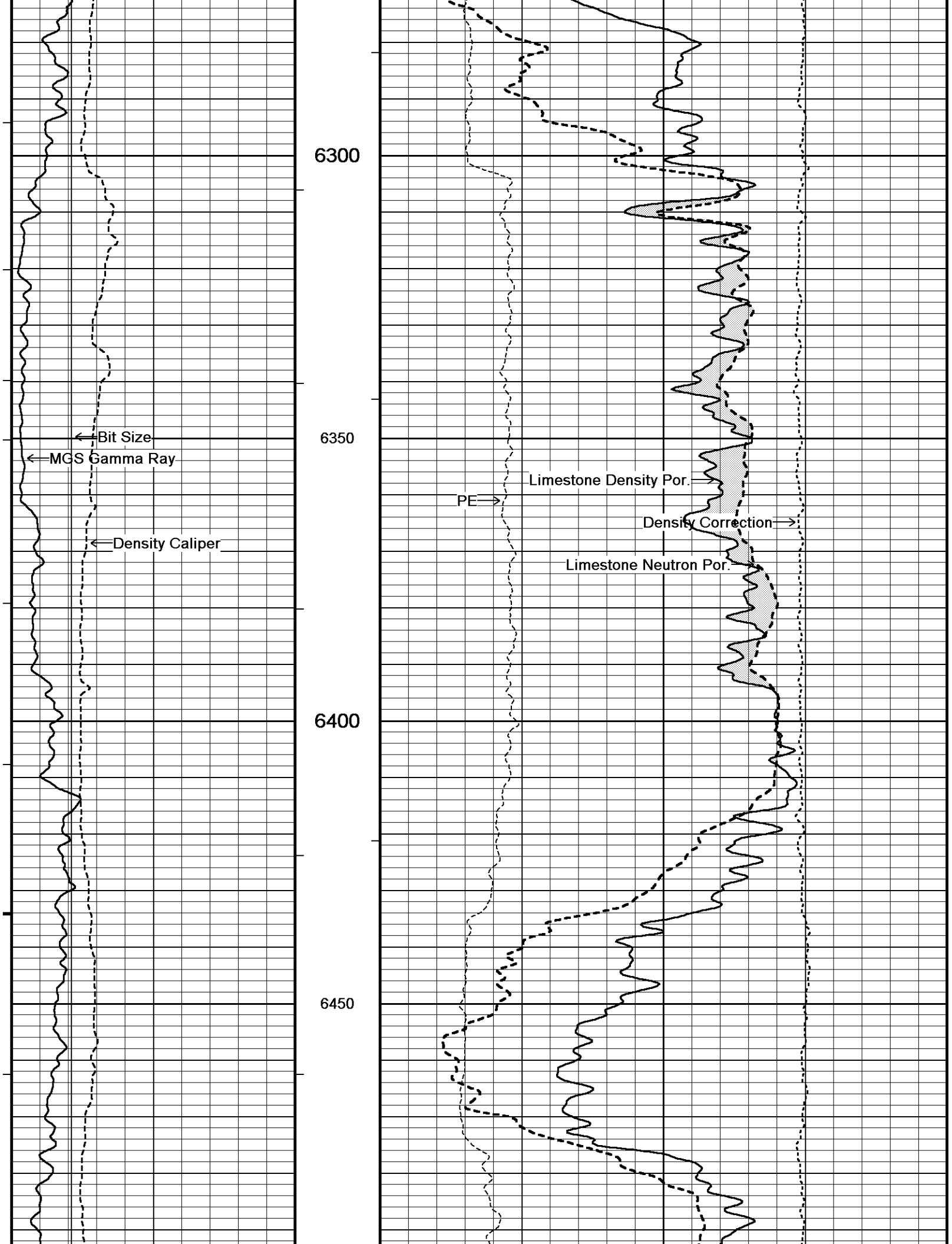
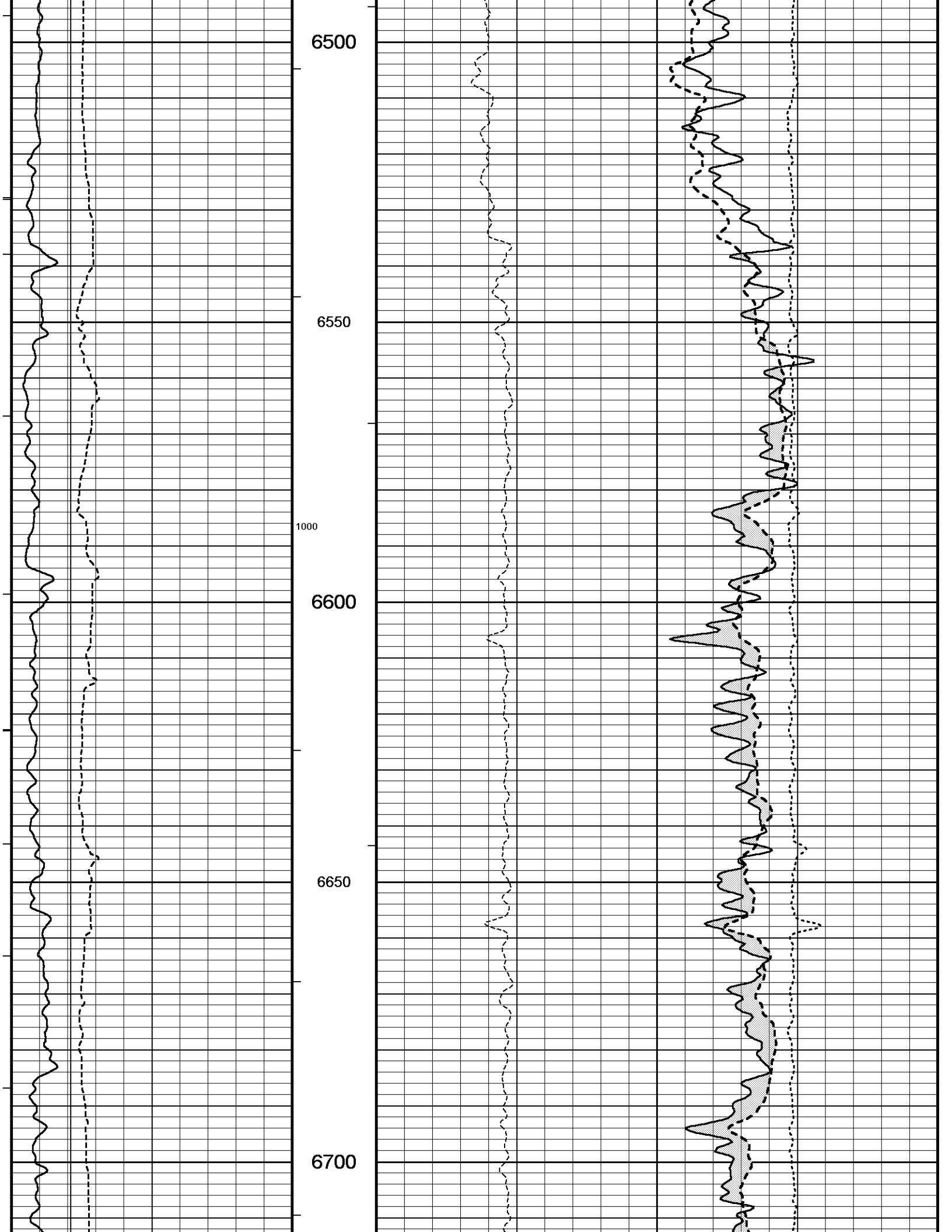
6150
1100
6200
600
6250


6300
6350
6400
6450
Bit Size
MGS Gamma Ray
Density Caliper
Limestone Density Por.
PE
Density Correction
Limestone Neutron Por.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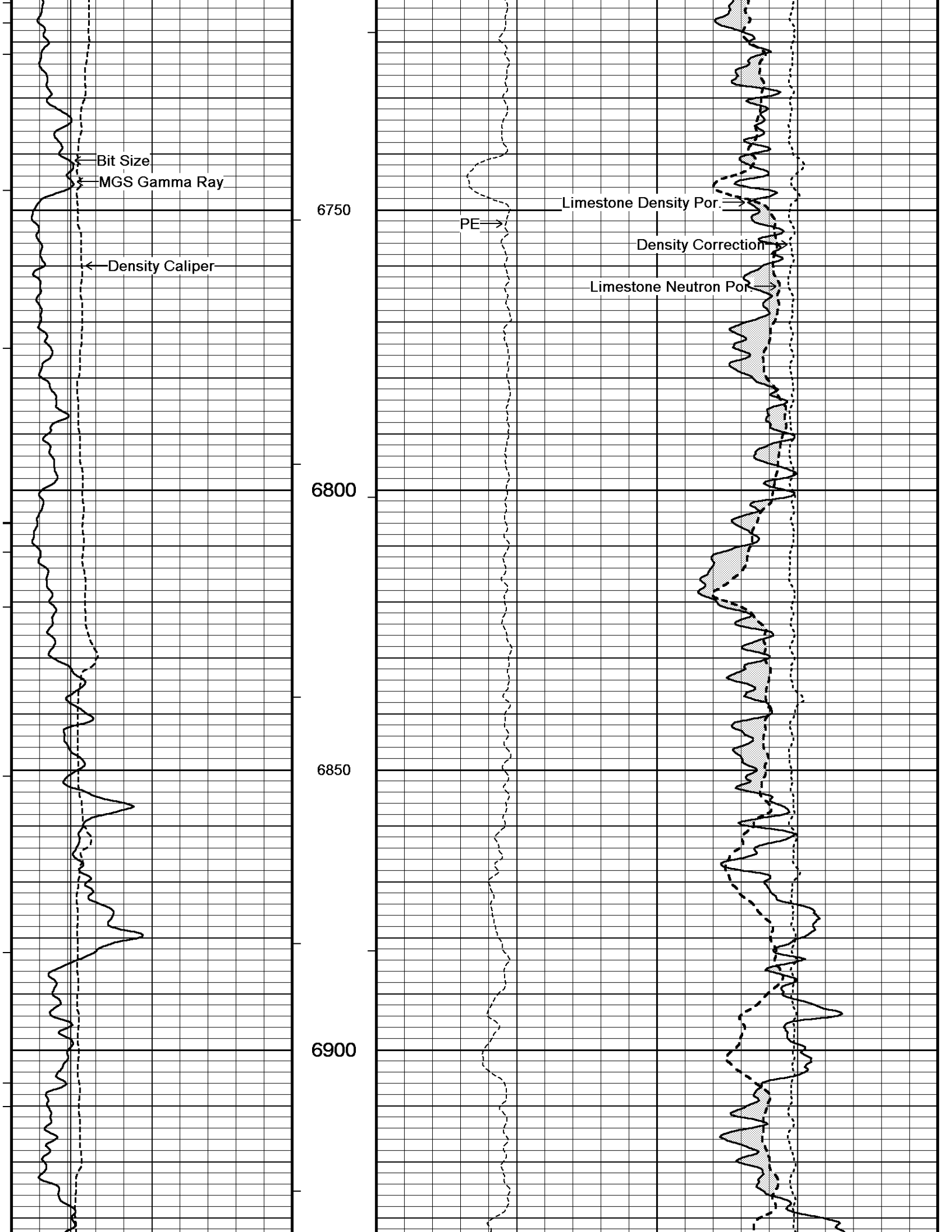
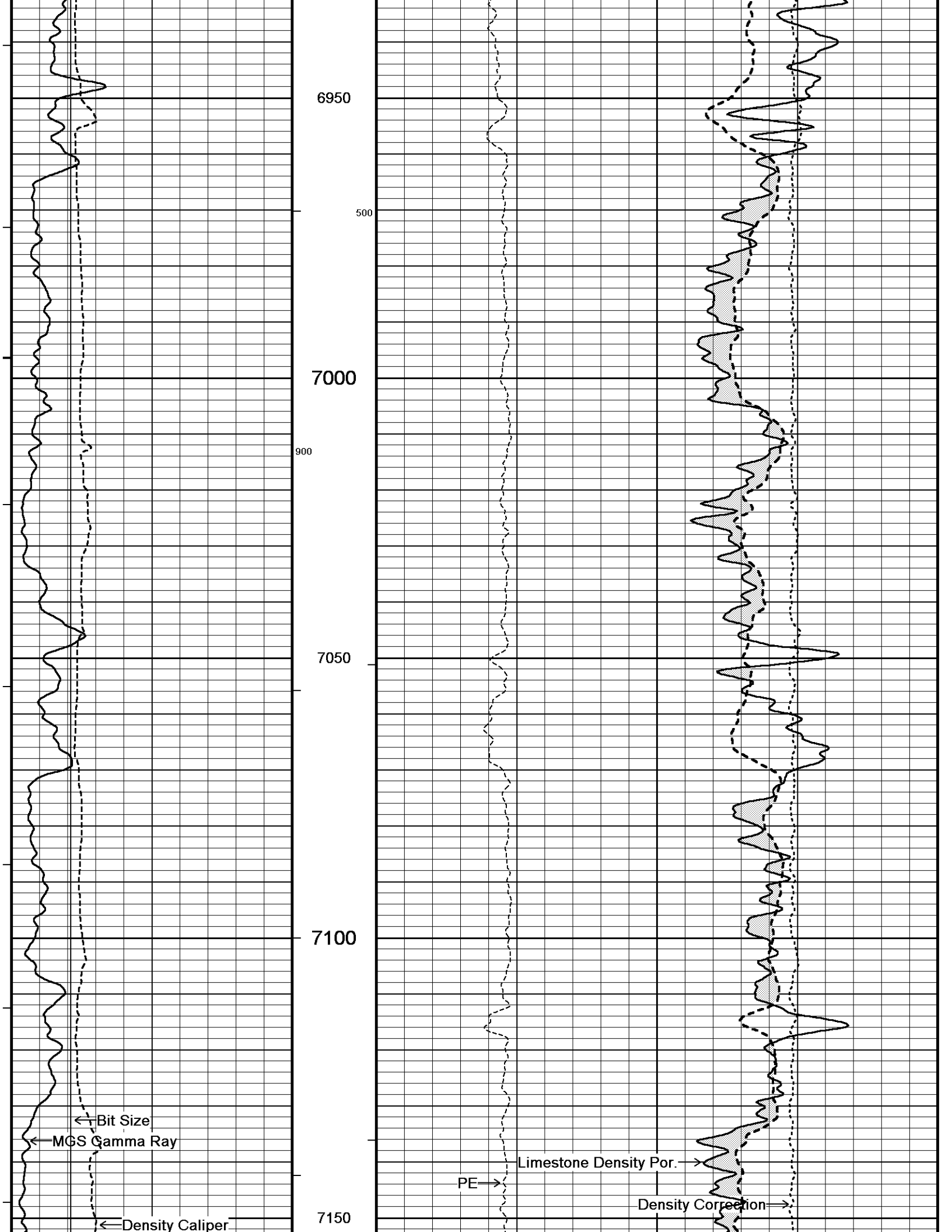
6550
1000
6600
6650
6700


Bit Size
MGS Gamma Ray
Density Caliper
6750
6800
6850
6900
PE
Limestone Density Por.
Density Correction
Limestone Neutron Por.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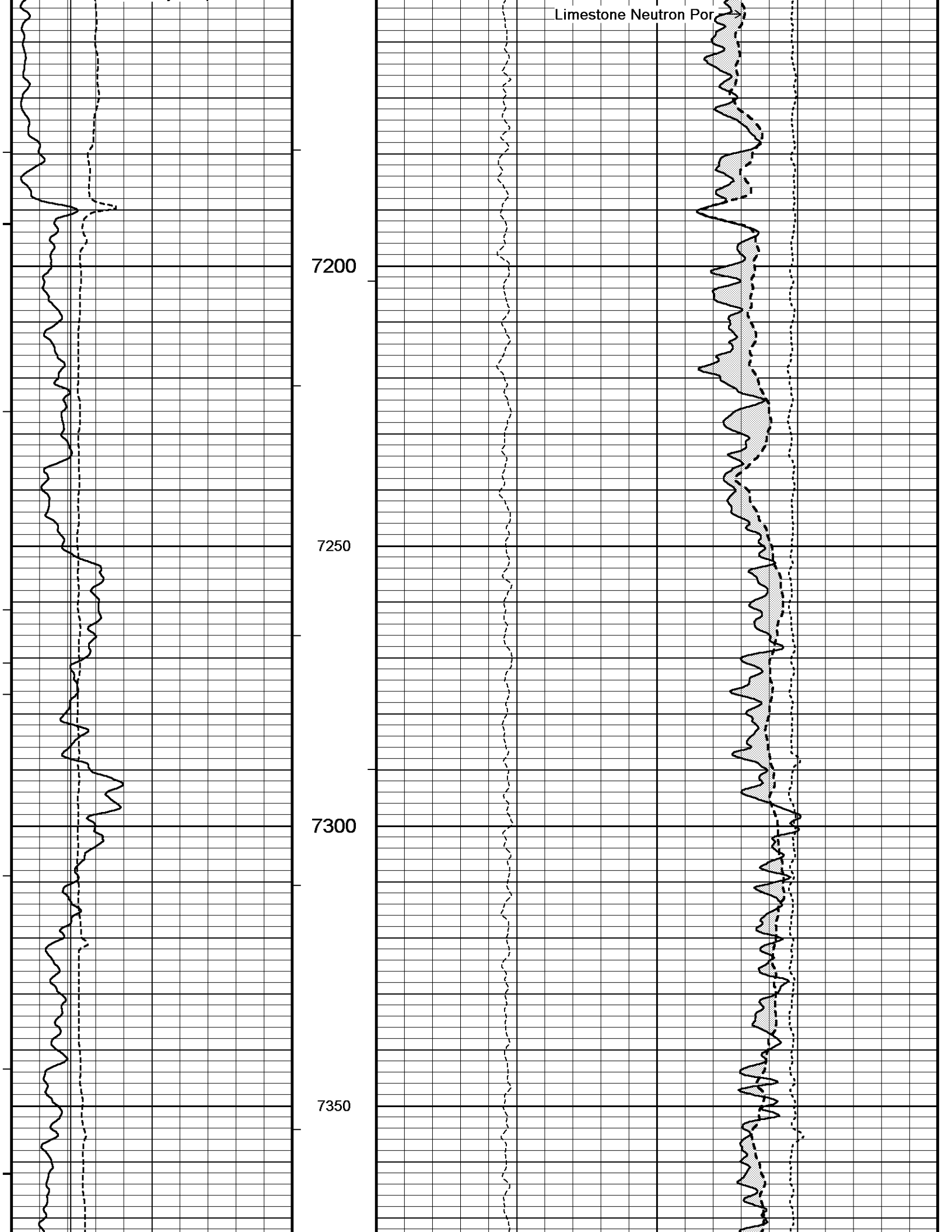
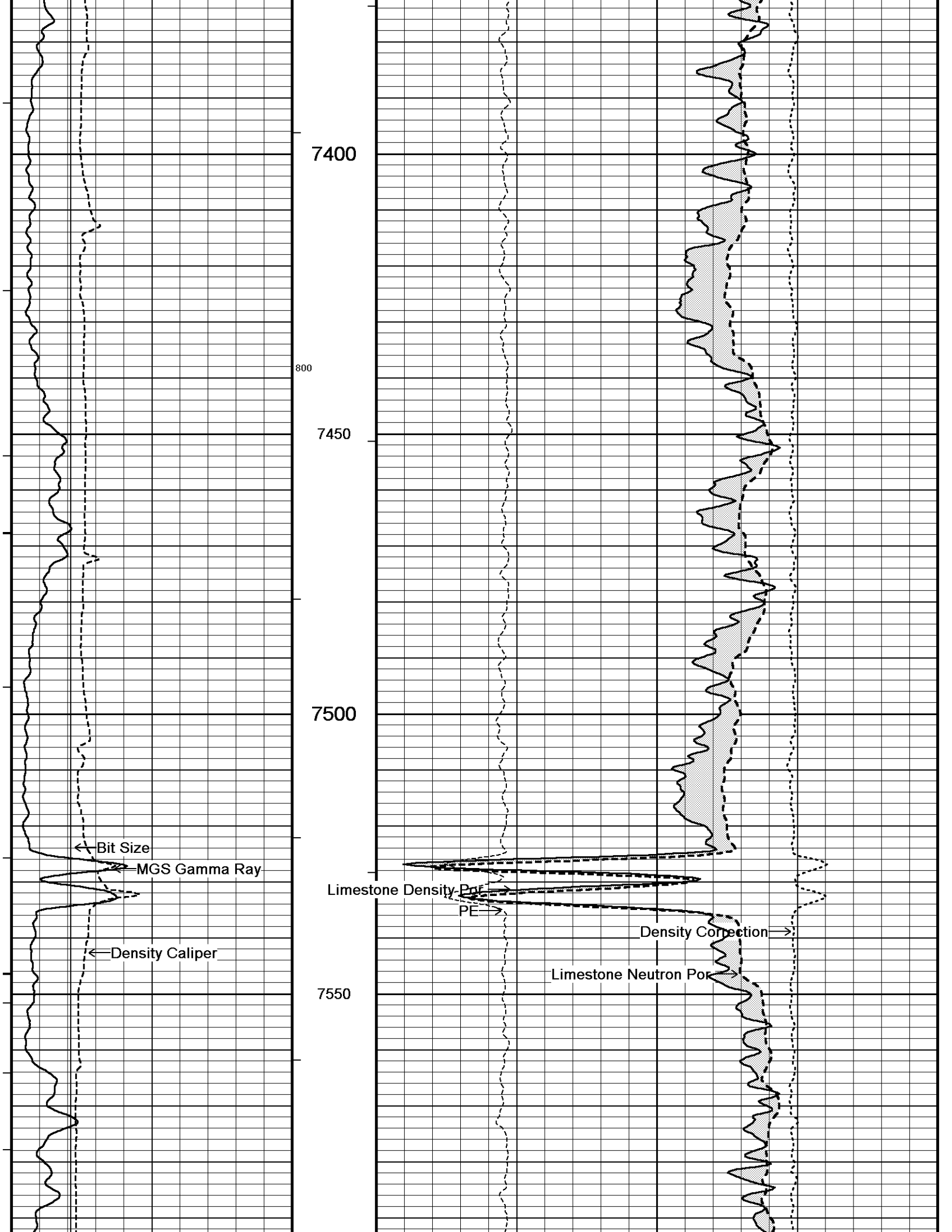
500
7000
900
7050
7100
7150
Bit Size
MGS Gamma Ray
Density Caliper
PE
Limestone Density Por.
Density Correction


Limestone Neutron Por
7200
7250
7300
7350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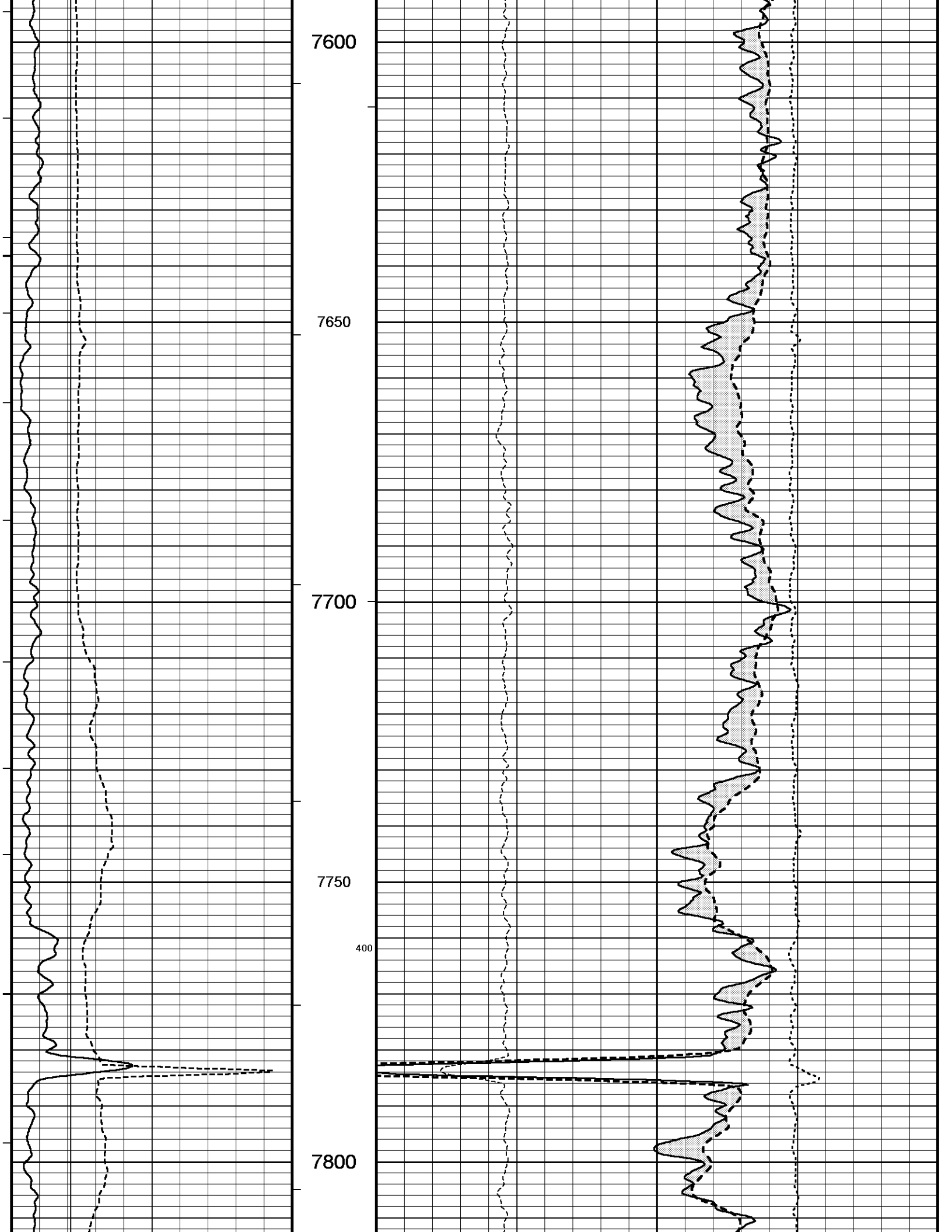
800
7450
7500
7550
Bit Size
MGS Gamma Ray
Density Caliper
Limestone Density Por
PE
Density Correction
Limestone Neutron Por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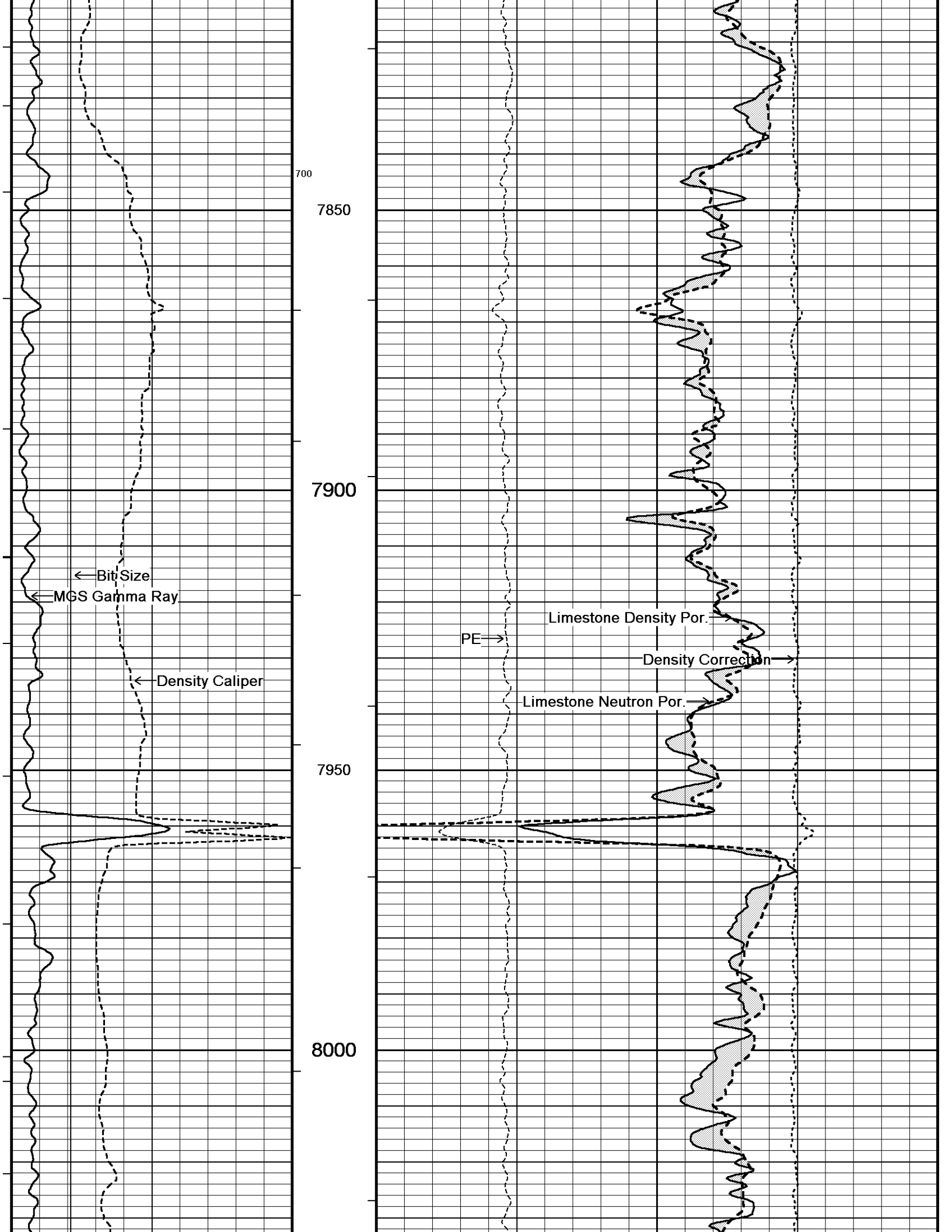
7650
7700
7750
400
7800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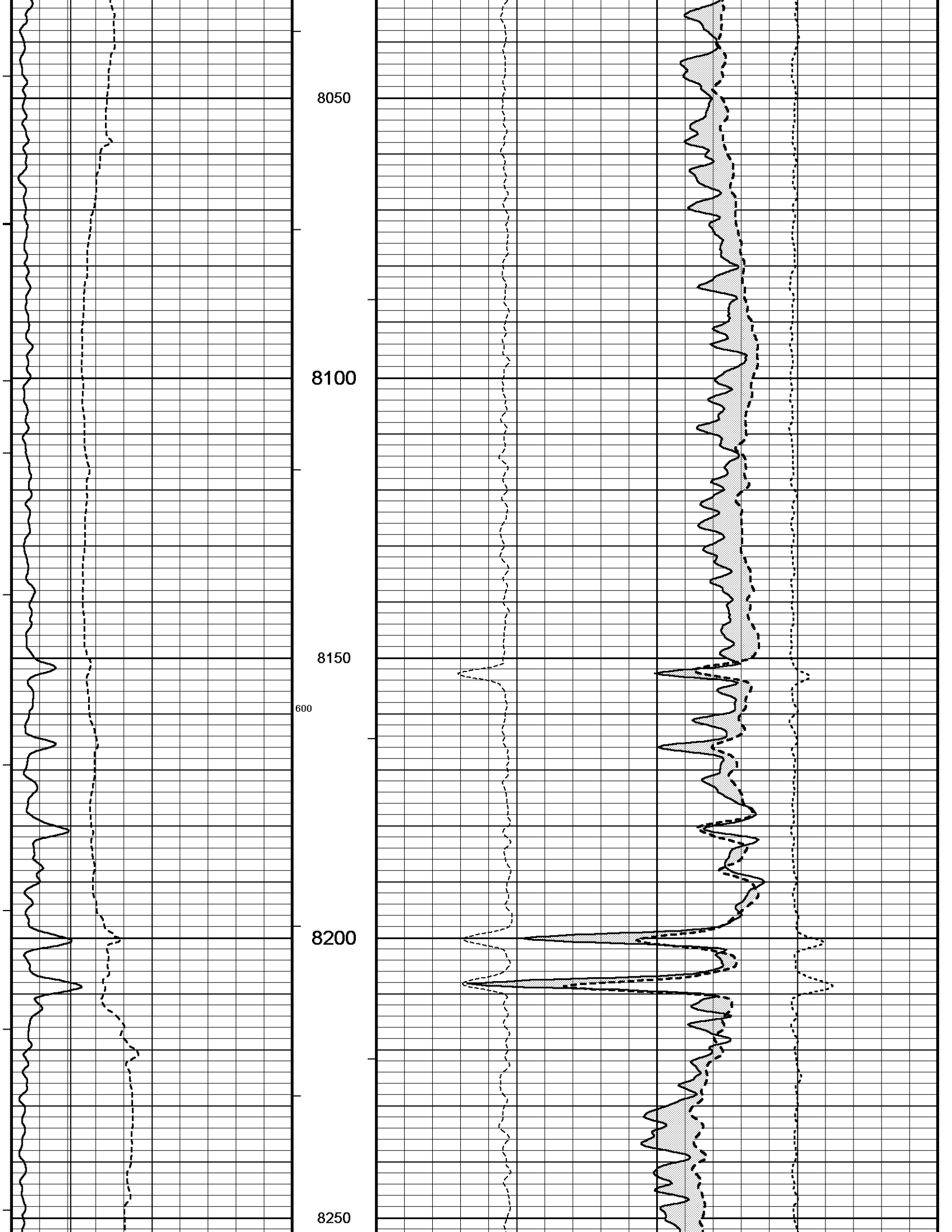
7850
7900
7950
8000
Bit Size
MGS Gamma Ray
Density Caliper
PE
Limestone Density Por.
Density Correction
Limestone Neutron Por.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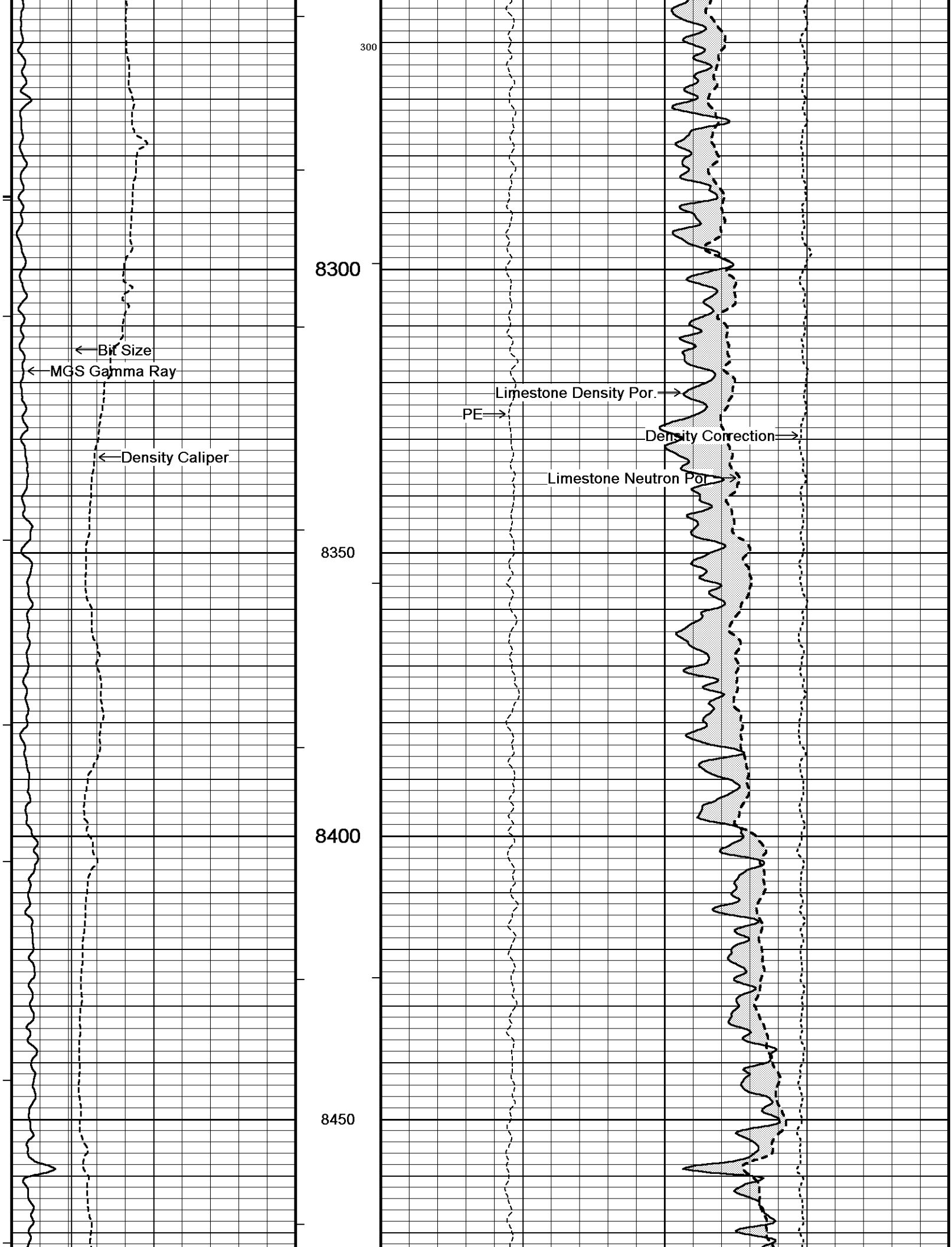
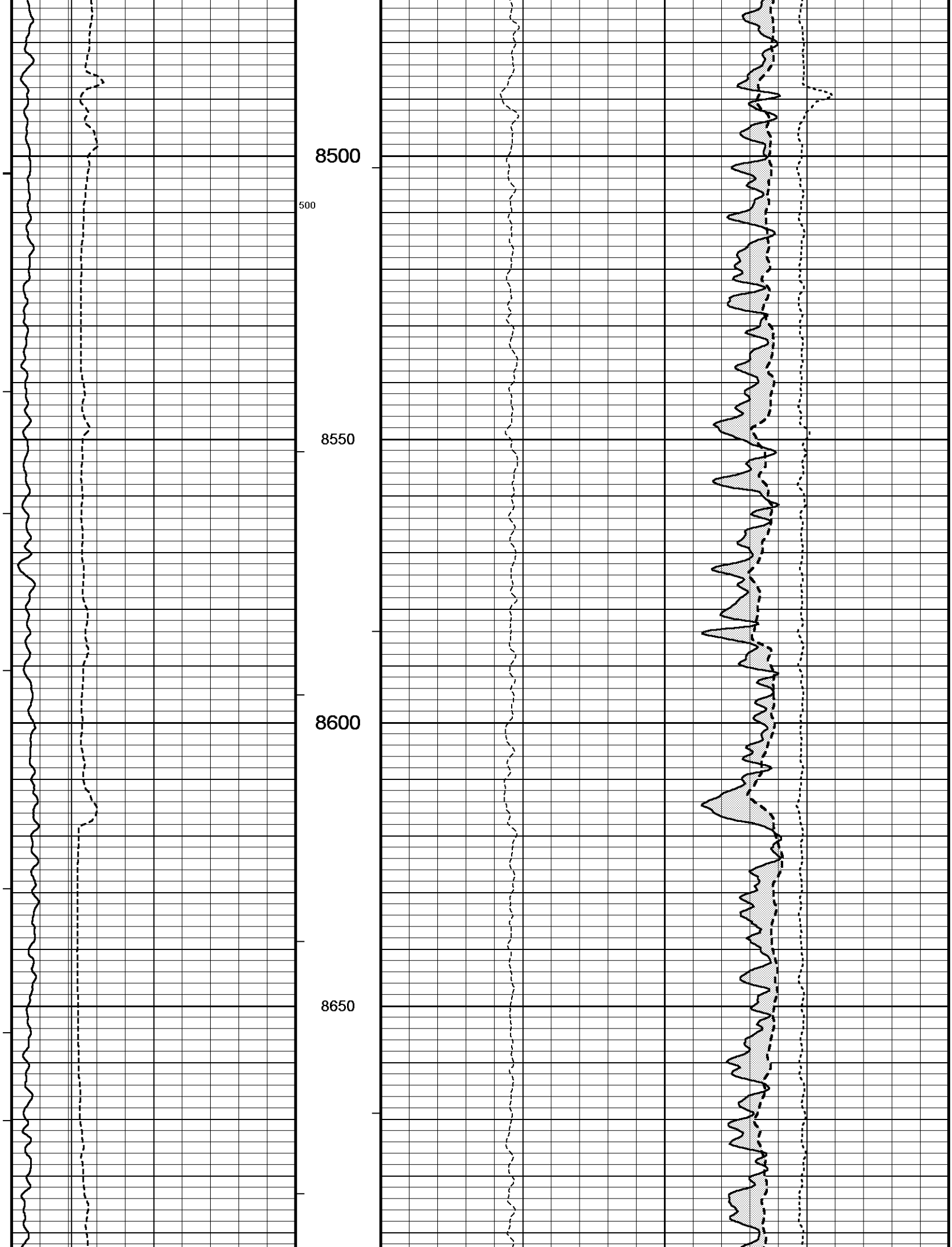
8100
8150
600
8200
8250


300
8300
8350
8400
8450
Bit Size
MGS Gamma Ray
Density Caliper
Limestone Density Por.
PE
Density Correction
Limestone Neutron Por.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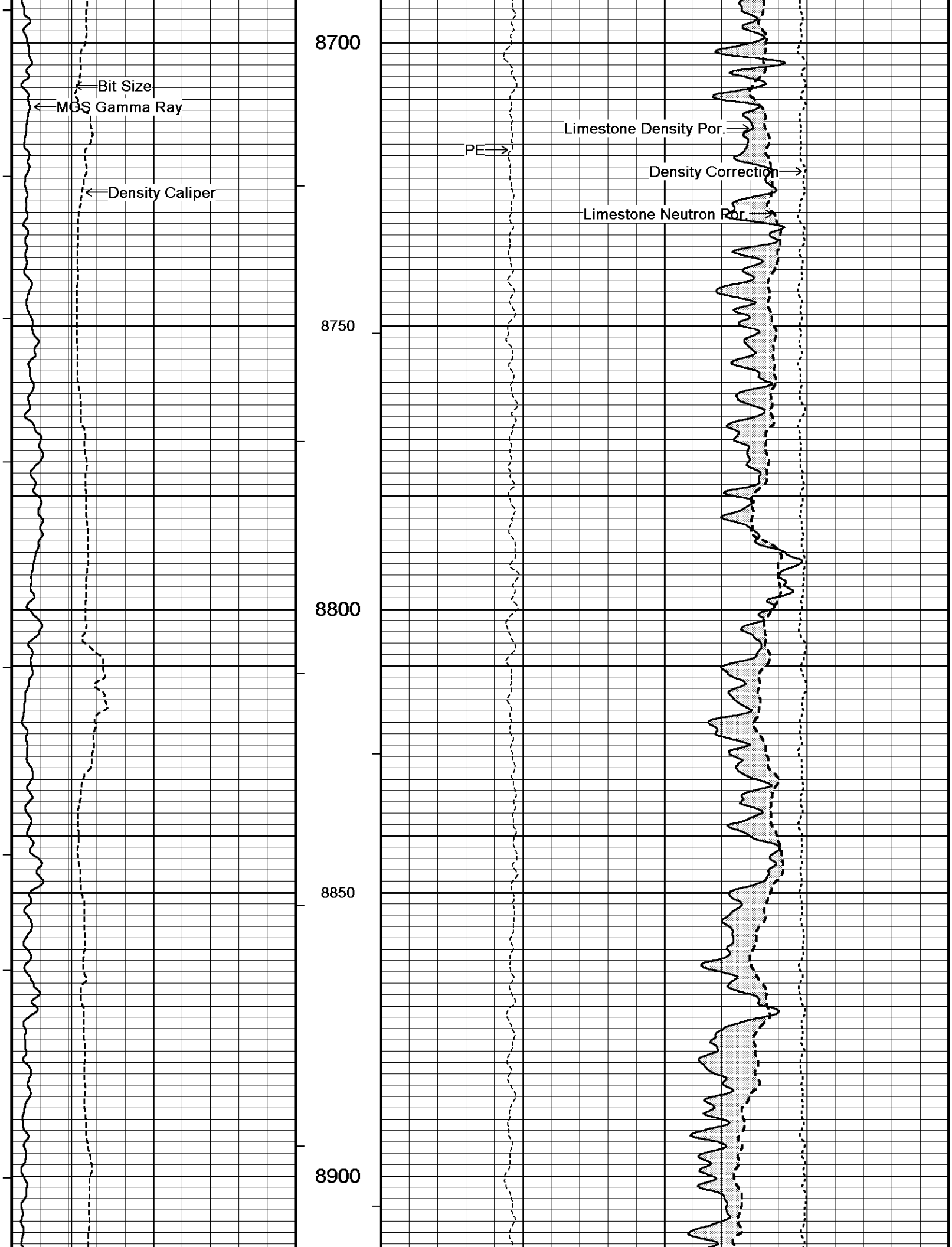
500
8550
8600
8650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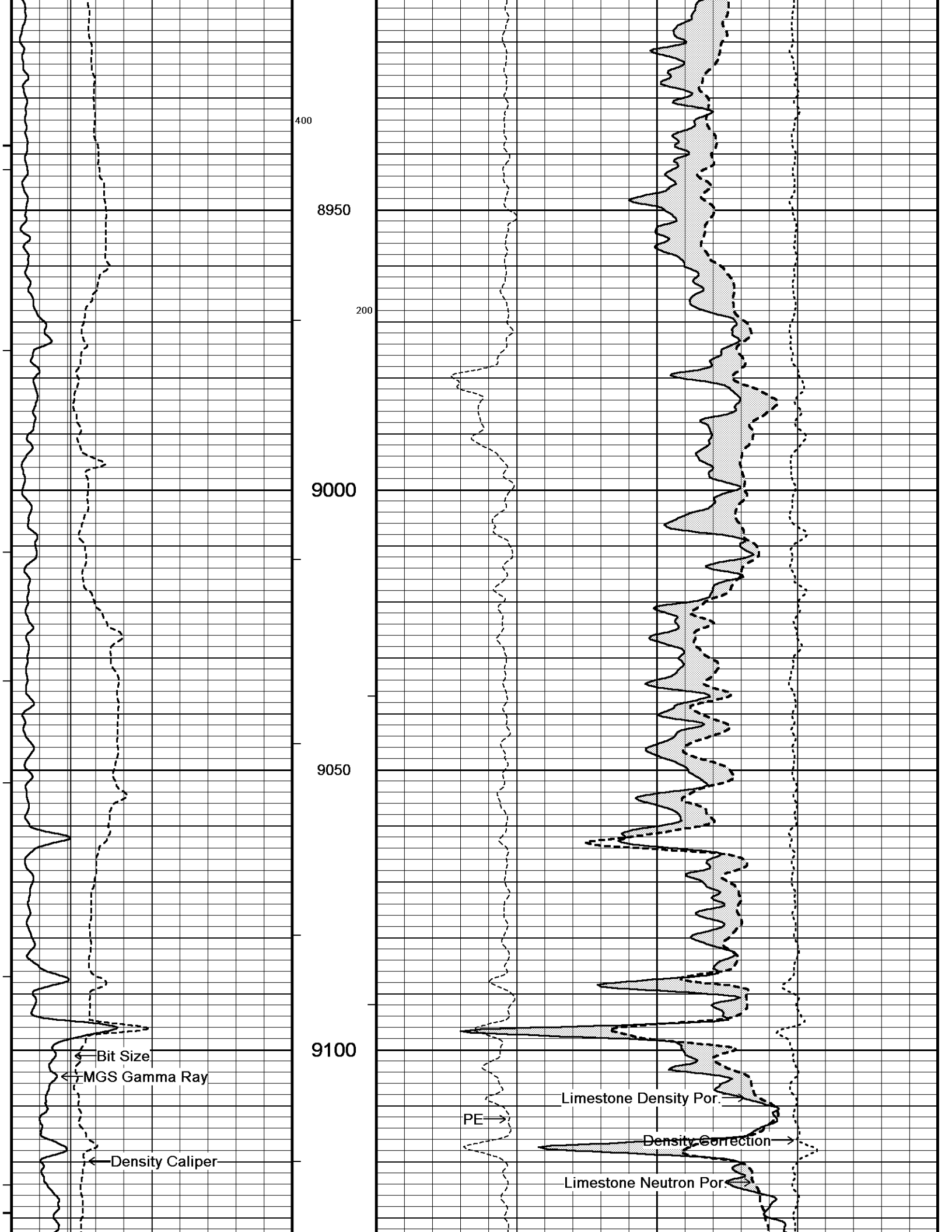
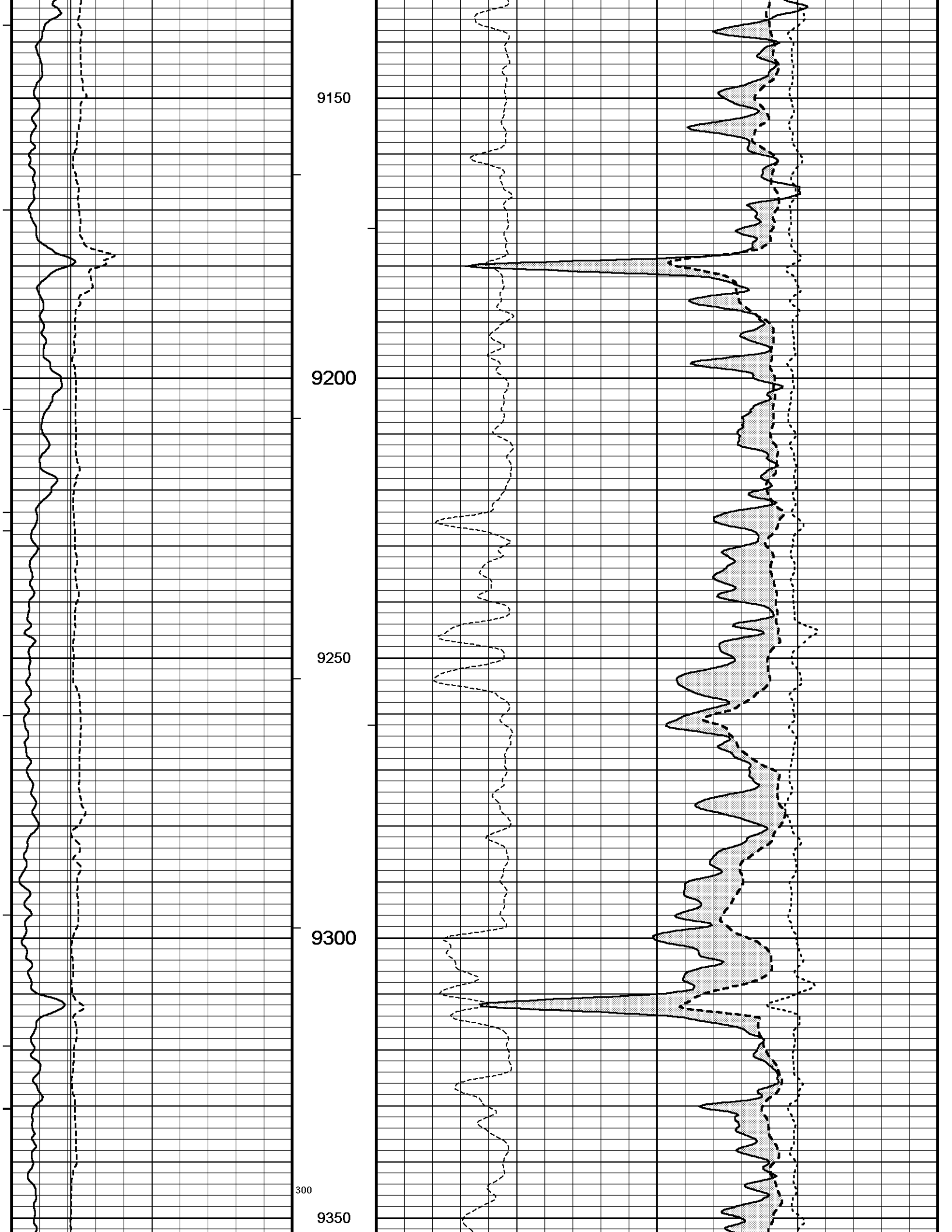
8750
8800
8850
8900
Bit Size
MGS Gamma Ray
Density Caliper
PE
Limestone Density Por.
Density Correction
Limestone Neutron Por.


400
8950
200
9000
9050
9100
Bit Size
MGS Gamma Ray
Density Caliper
PE
Limestone Density Por
Density Correction
Limestone Neutron Por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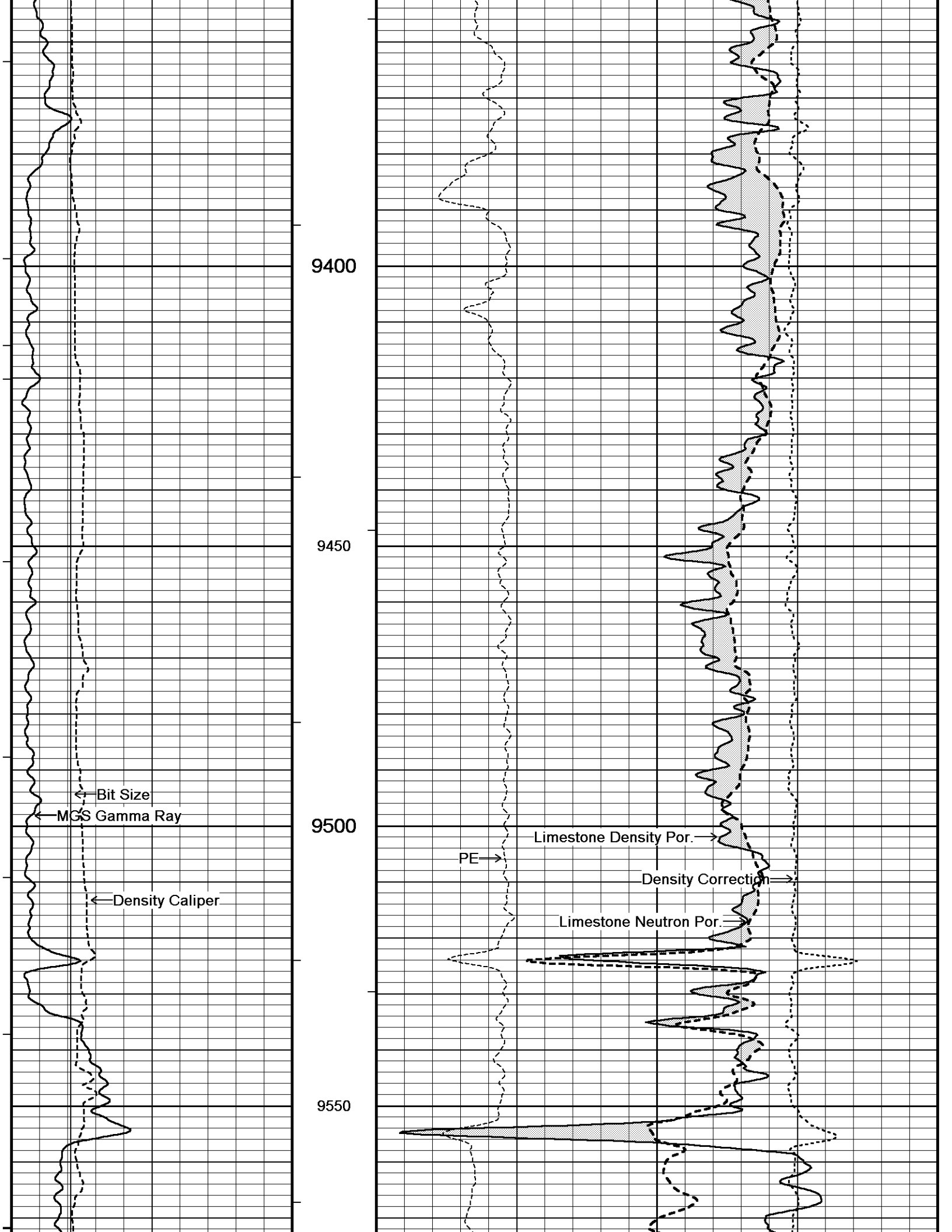
9200
9250
9300
300
9350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Bit Size
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Density Caliper
PE
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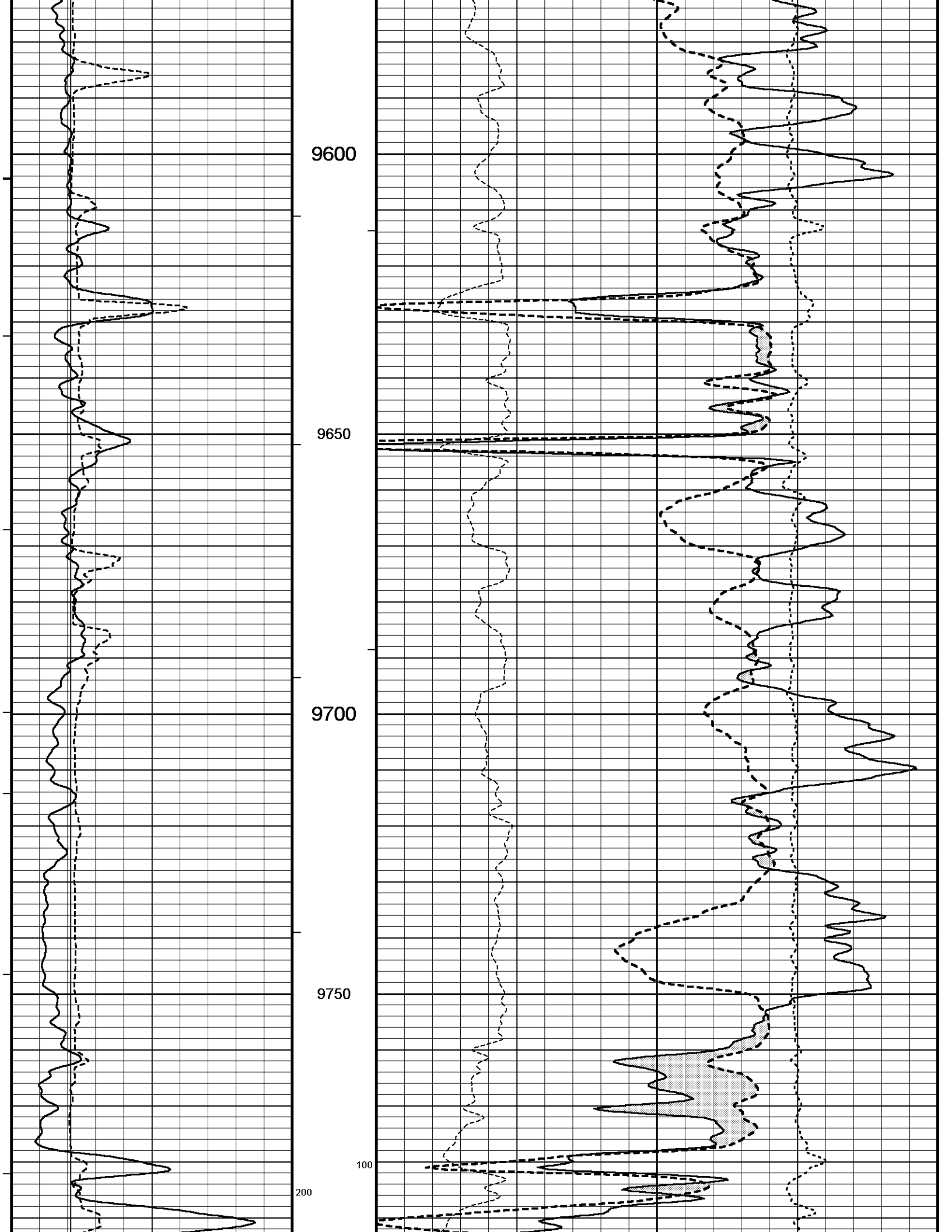
Density Correction
Limestone Neutron Por.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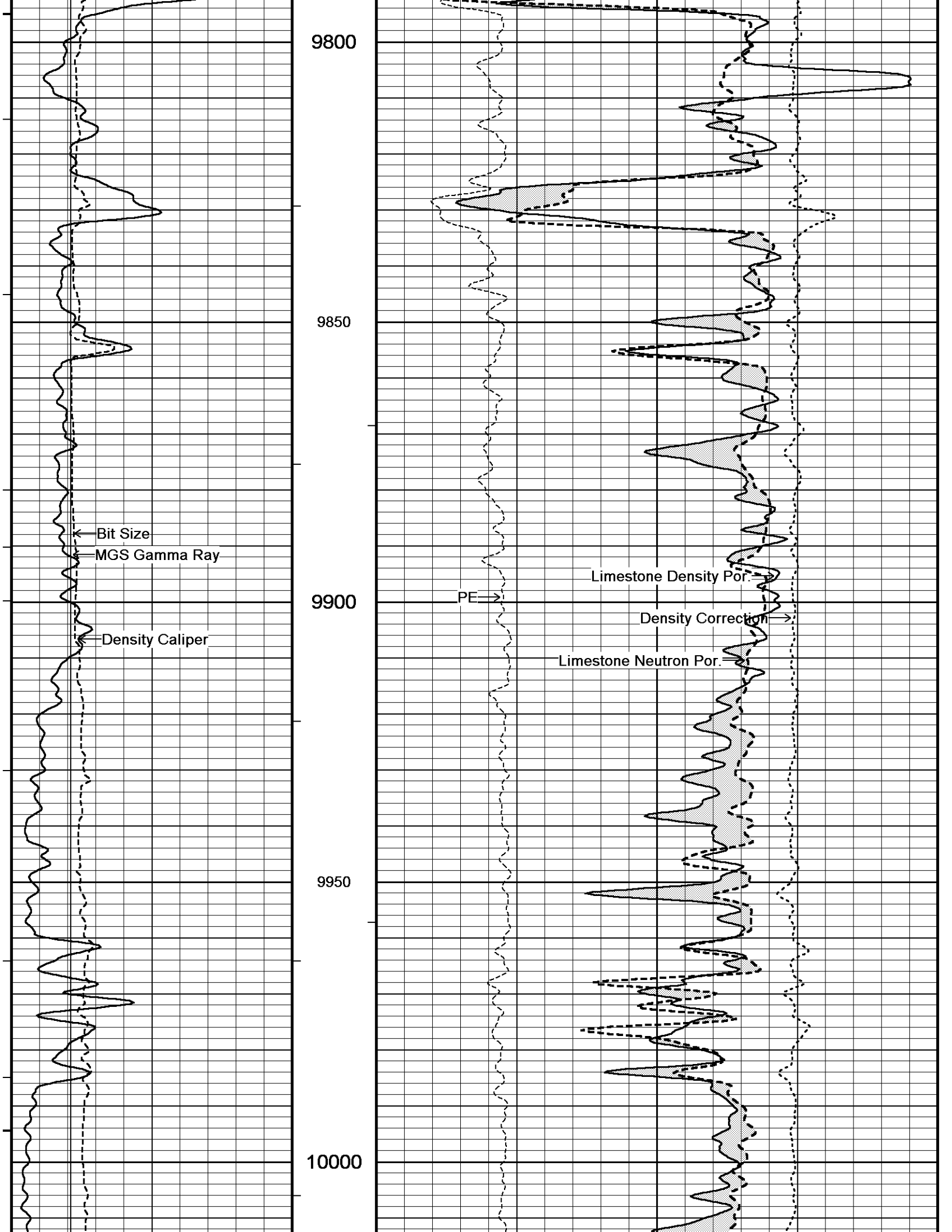
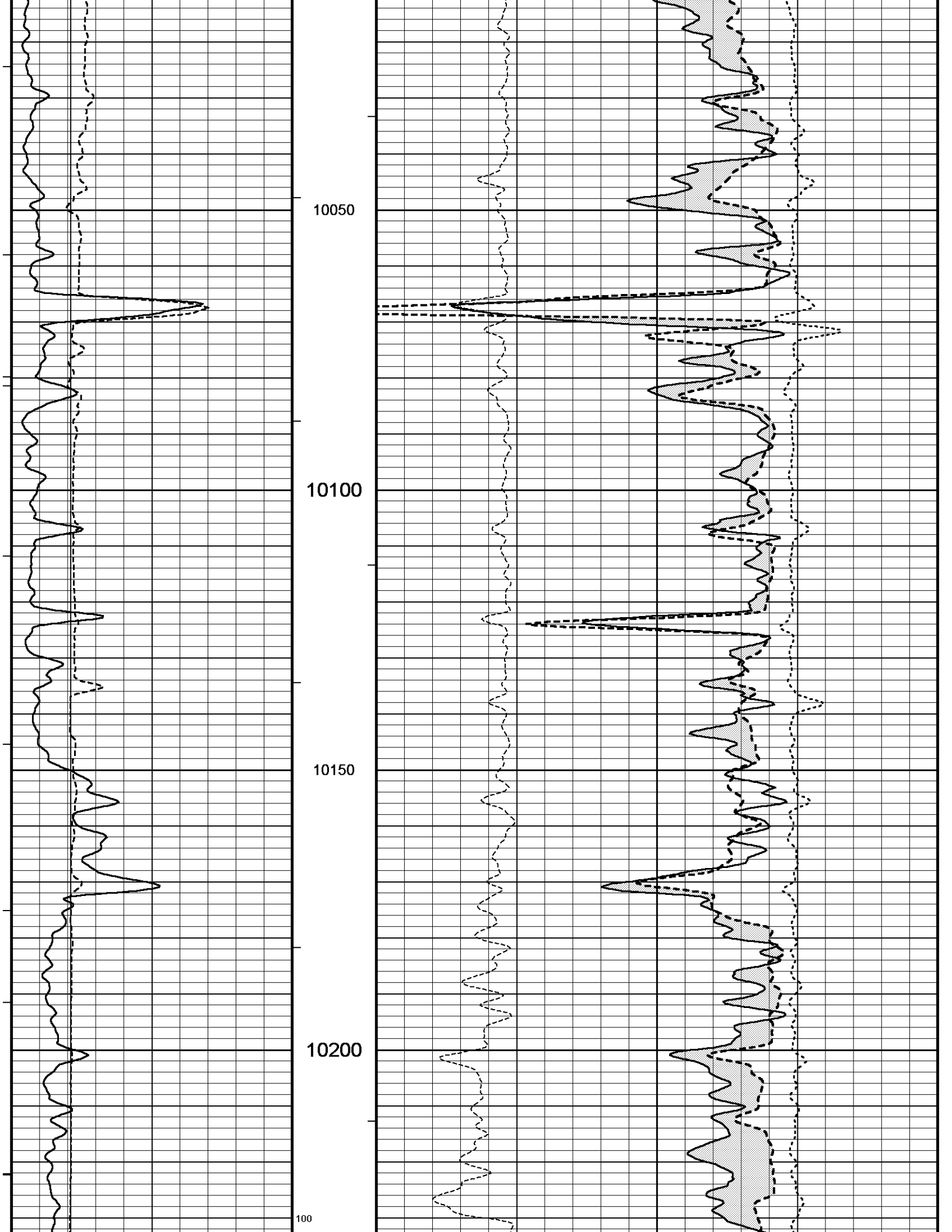
9650
9700
9750
100
200


9800
9850
9900
9950
10000
Bit Size
MGS Gamma Ray
Density Caliper
PE
Limestone Density Por.
Density Correction
Limestone Neutron Por.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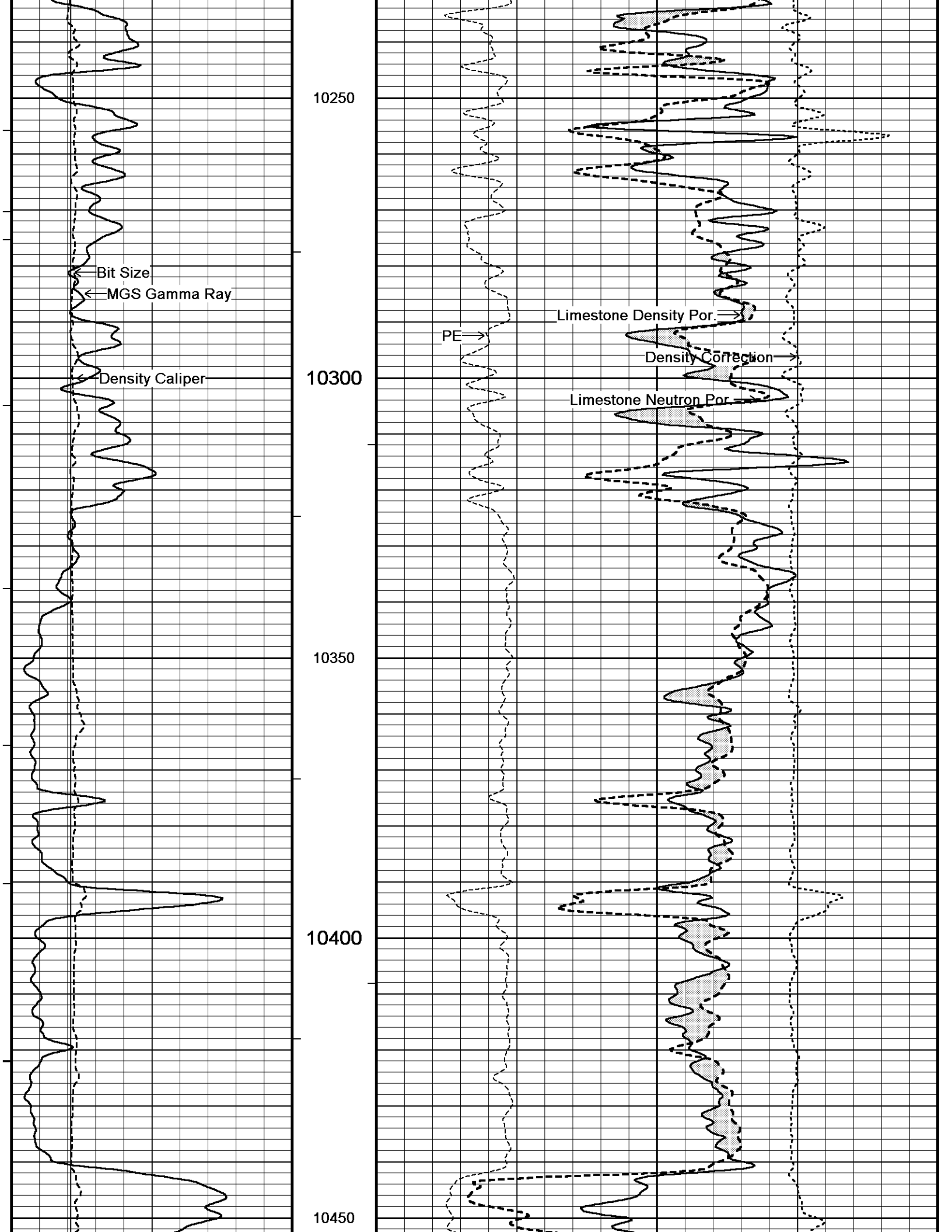
10100
10150
10200
100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10350
10400
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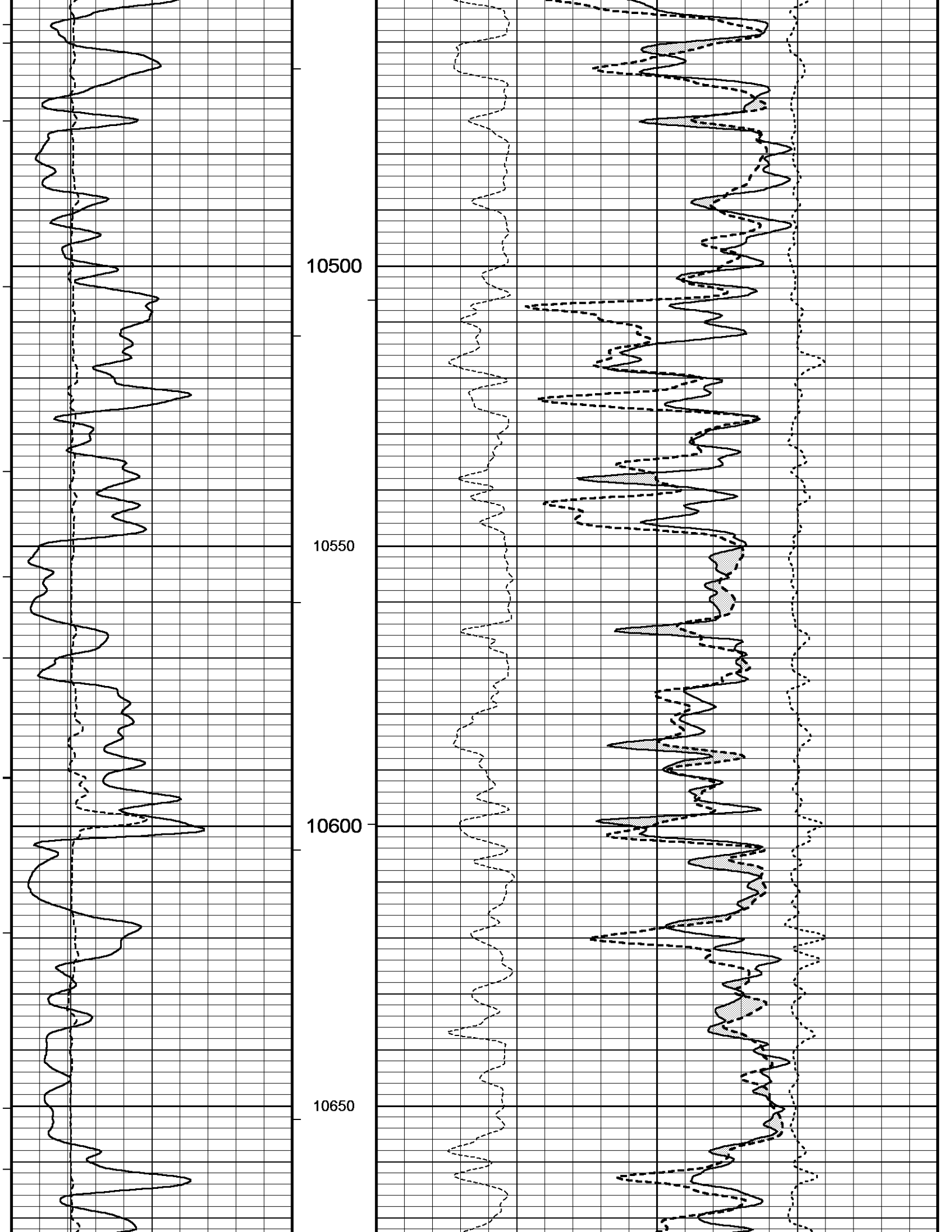
Bit Size
MGS Gamma Ray
Density Caliper
PE
Limestone Density Por
Density Correction
Limestone Neutron Por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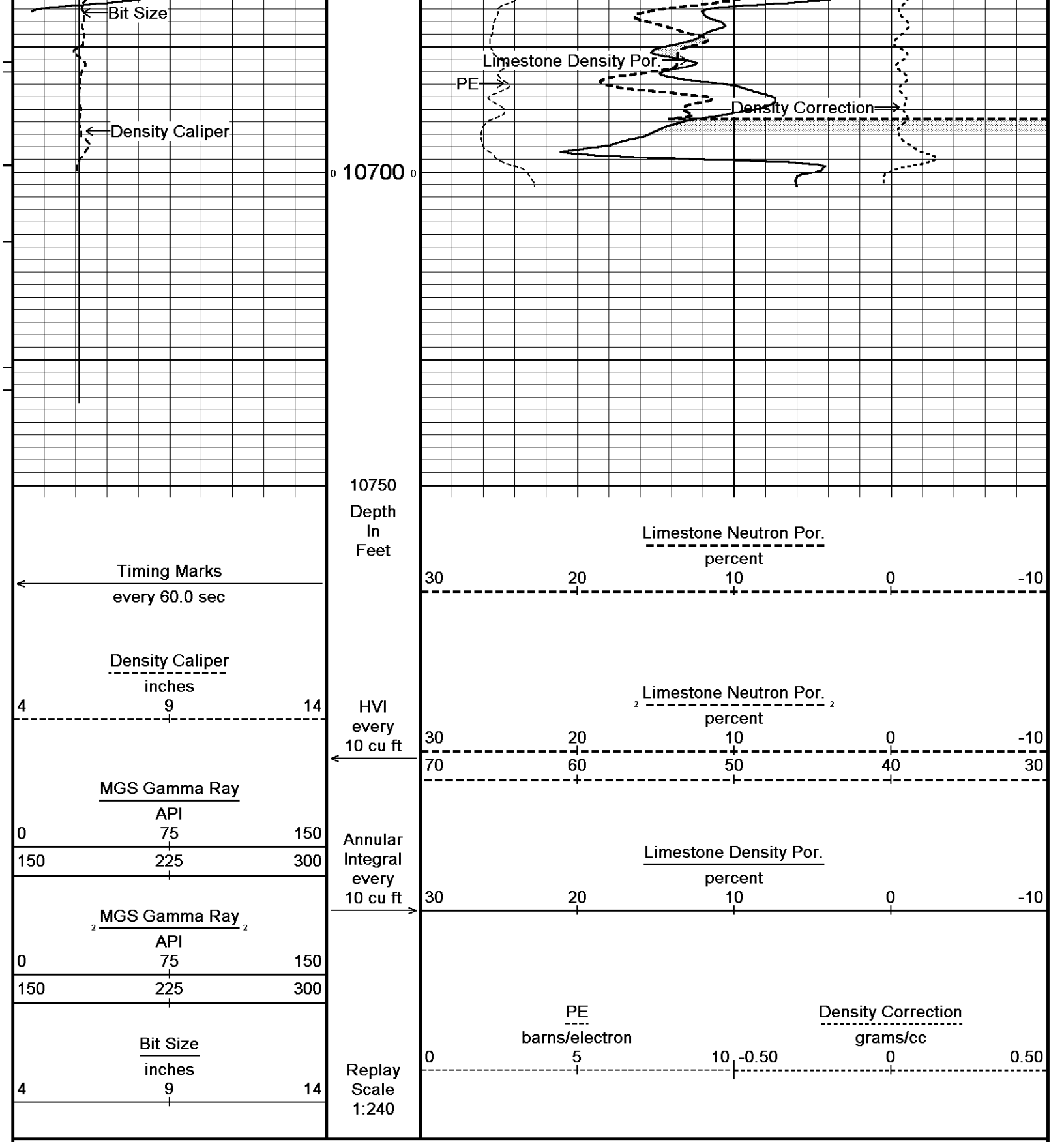
10550
10600
10650

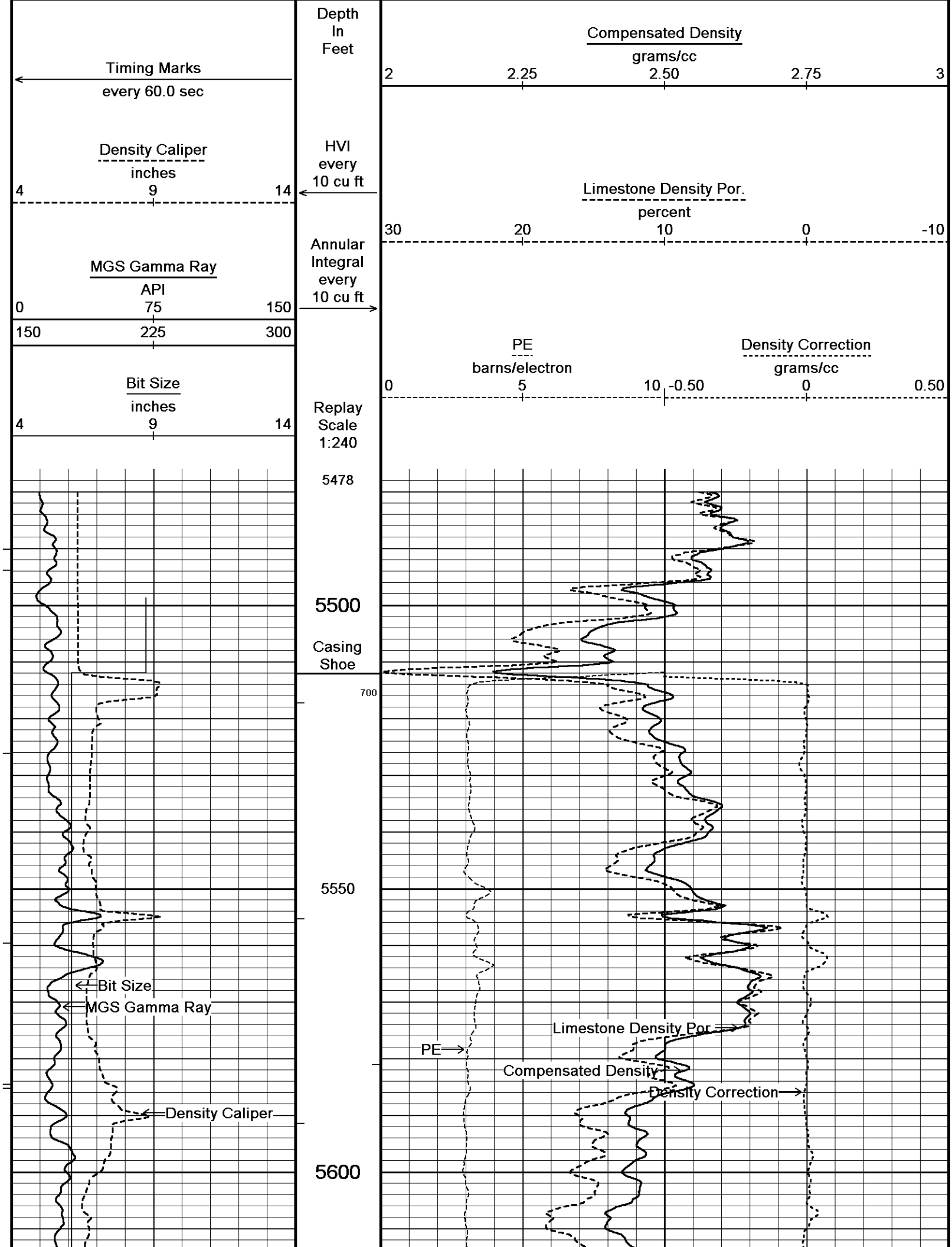


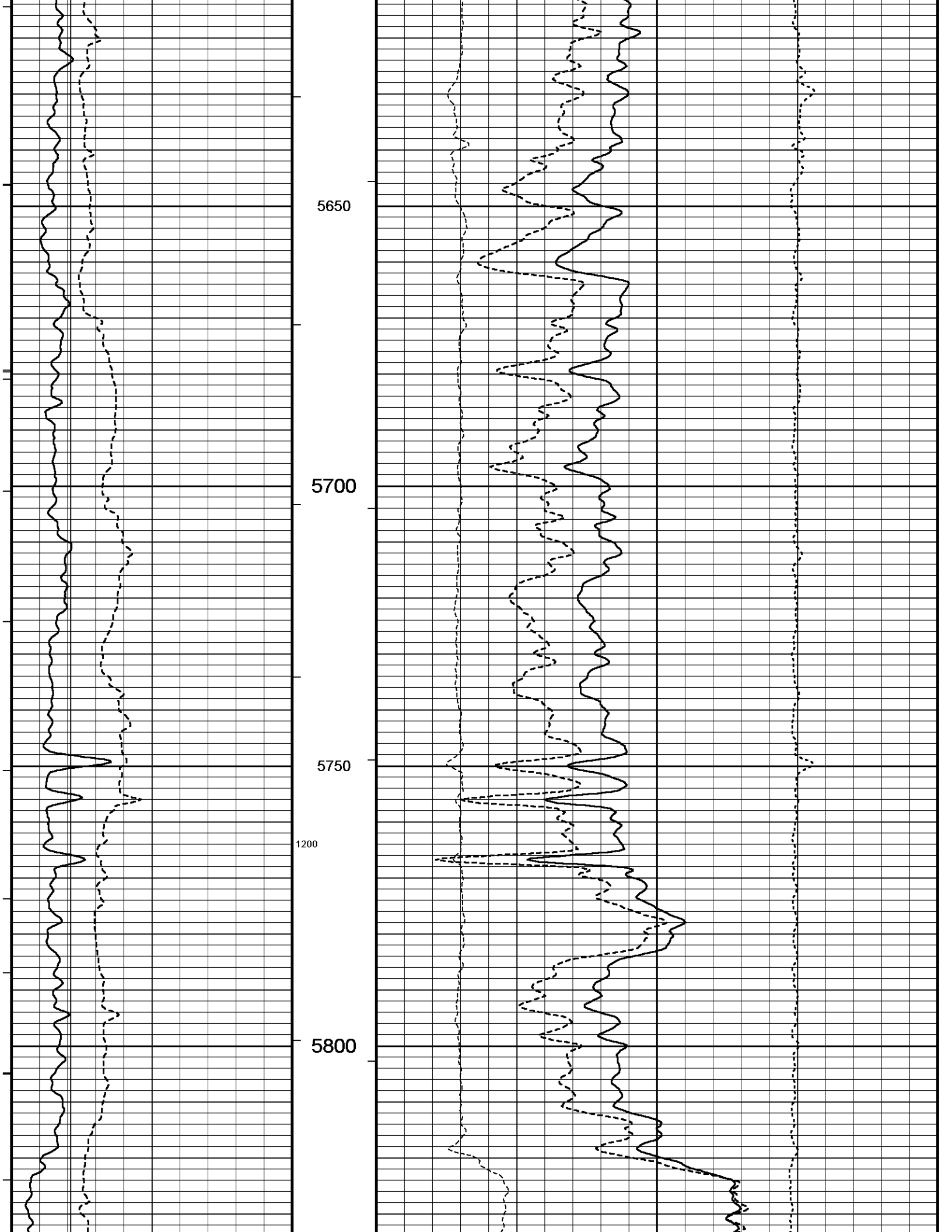
Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 25-FEB-2013 04:42
Filename: C:\DATA_13_04_8492\SANDRIDGE (HAZEL 3120 1-24H)\HAZEL RTAP DEPTH.dta
Recorded on 25-FEB-2013 04:14
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

5 INCH MAIN PASS

5 INCH BULK DENSITY

Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 25-FEB-2013 04:42
Filename: C:\DATA_13_04_8492\SANDRIDGE (HAZEL 3120 1-24H)\HAZEL RTAP DEPTH.dta
Recorded on 25-FEB-2013 04:14
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492


Timing Marks
every 60.0 sec
Density Caliper
inches
4
9
14
MGS Gamma Ray
API
0
75
150
150
225
300
Bit Size
inches
4
9
14
Depth
In
Feet
HVI
every
10 cu ft
Annular
Integral
every
10 cu ft
Replay
Scale
1:240
5478
5500
Casing
Shoe
700
5550
5600
Compensated Density
grams/cc
2
2.25
2.50
2.75
3
Limestone Density Por.
percent
30
20
10
0
-10
PE
barns/electron
0
5
10
Density Correction
grams/cc
-0.50
0
0.50
Bit Size
MGS Gamma Ray
Density Caliper
PE
Limestone Density Por
Compensated Density
Density Correction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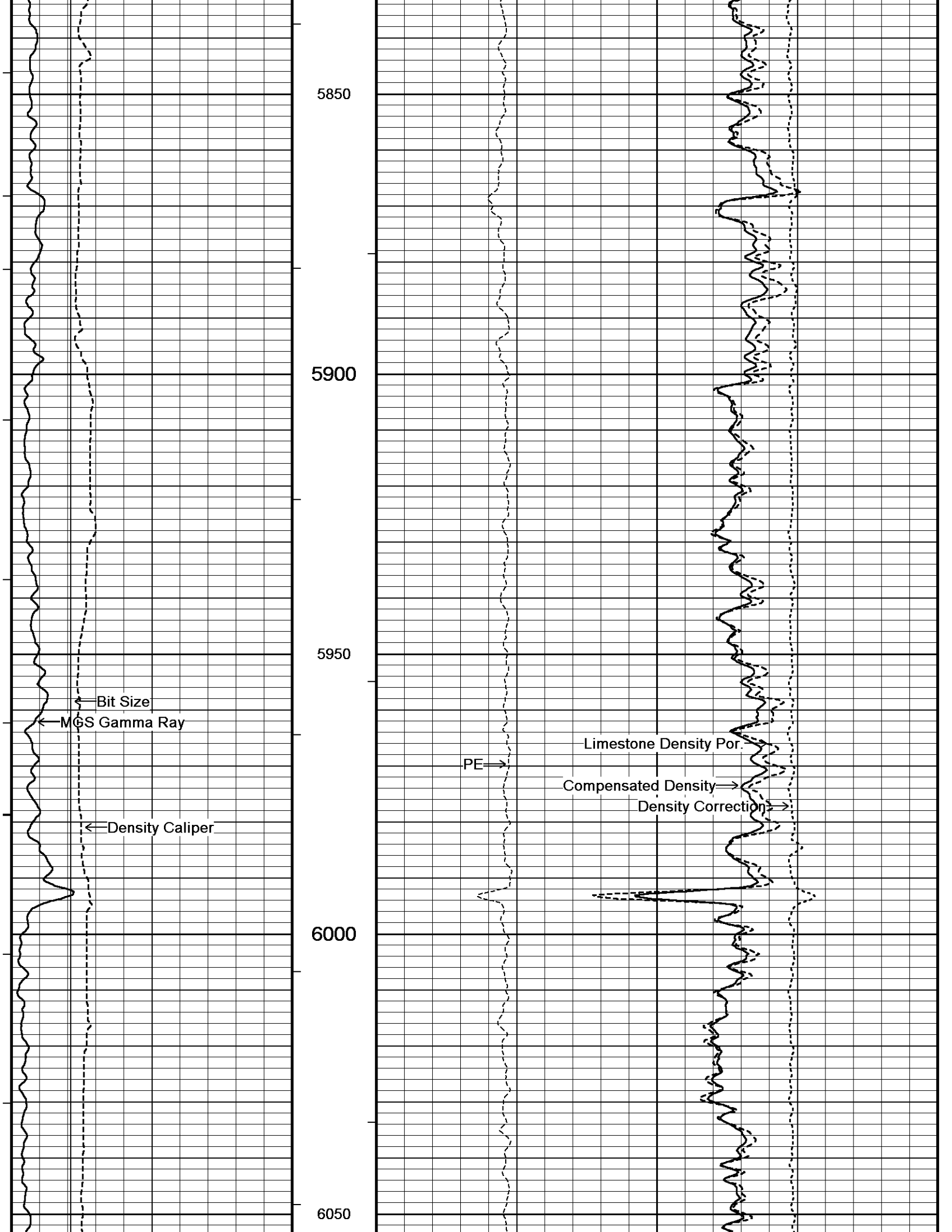
5700
5750
1200
5800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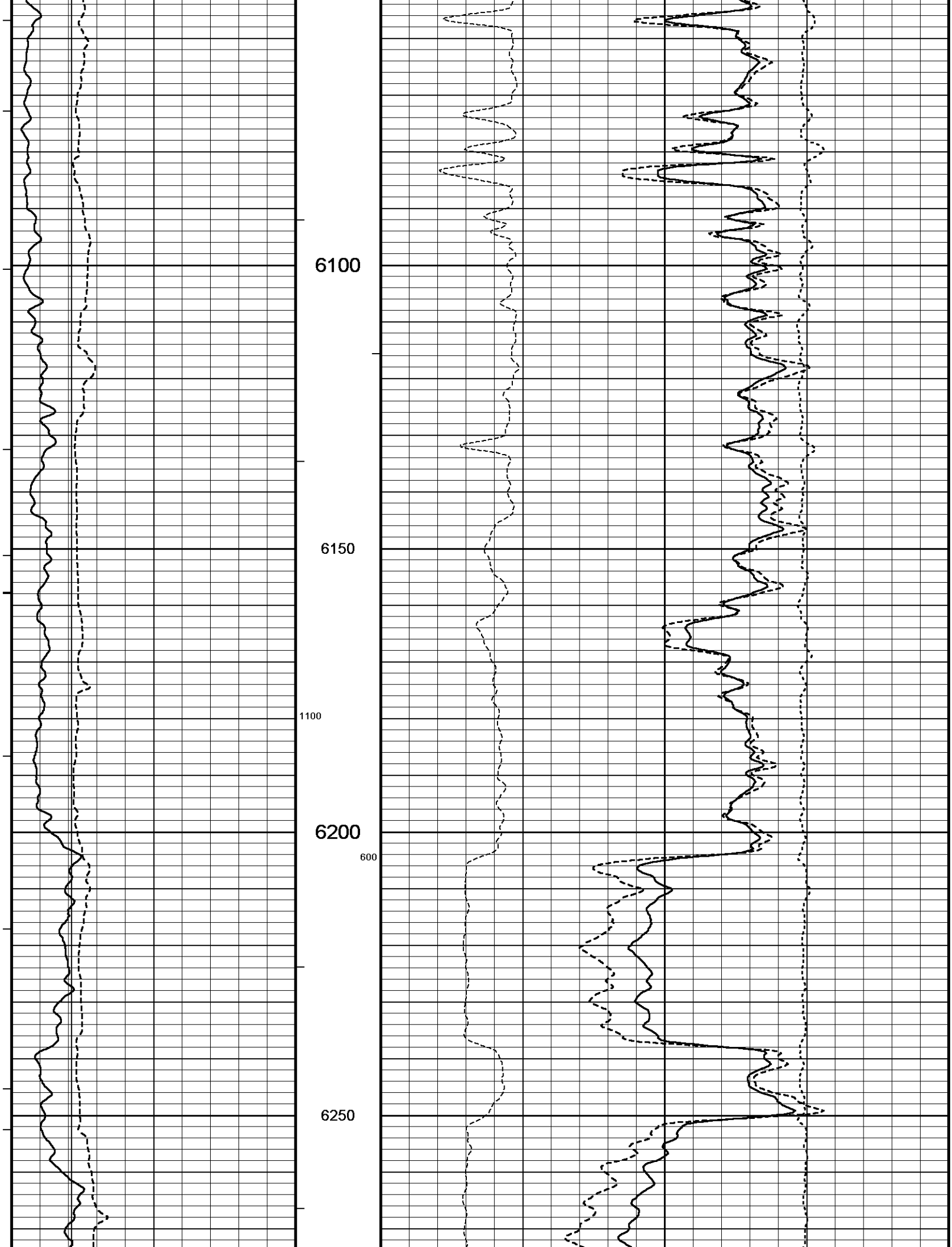
5950
6000
6050
Bit Size
MGS Gamma Ray
Density Caliper
PE
Limestone Density Por.
Compensated Density
Density Correction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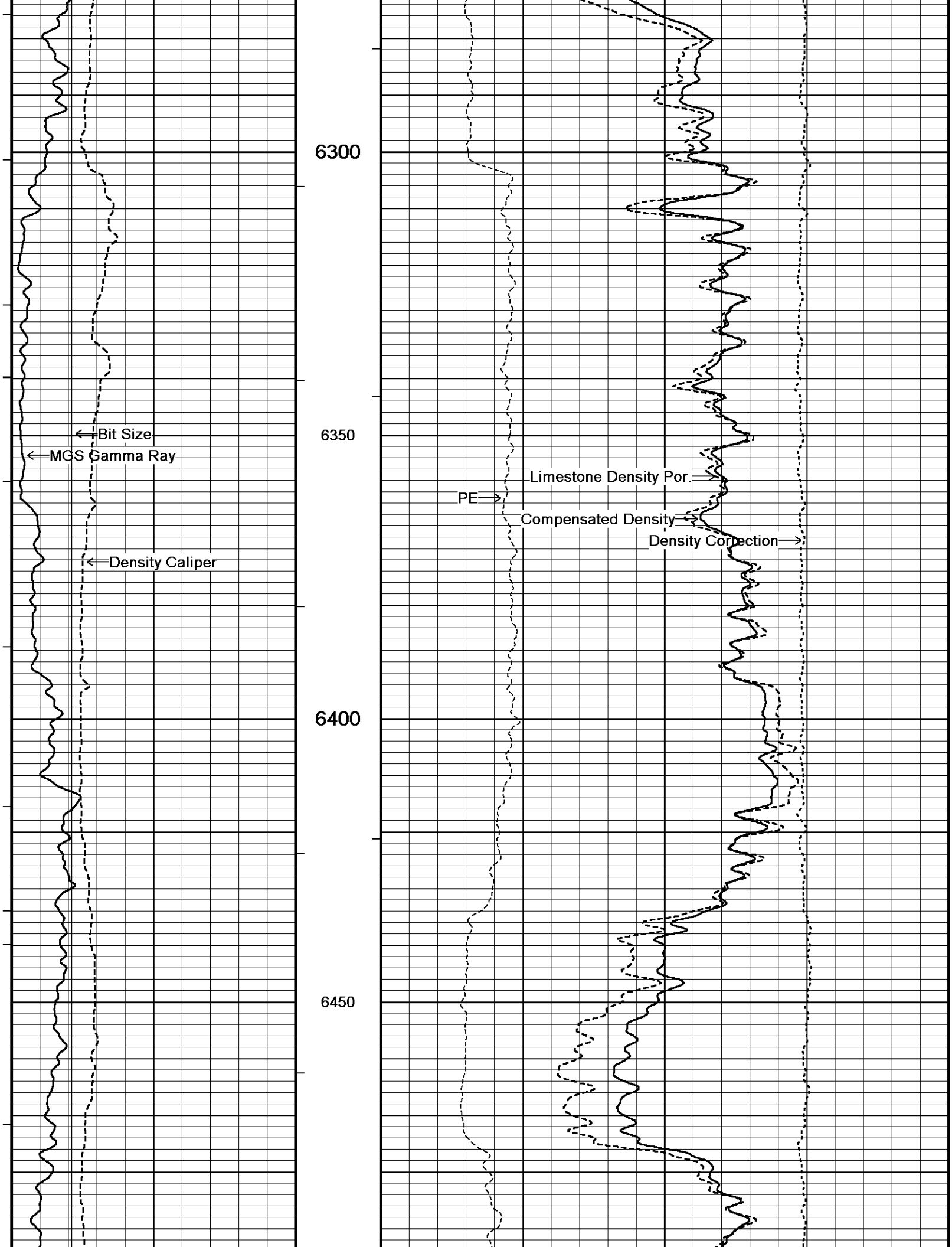
6150
1100
6200
600
6250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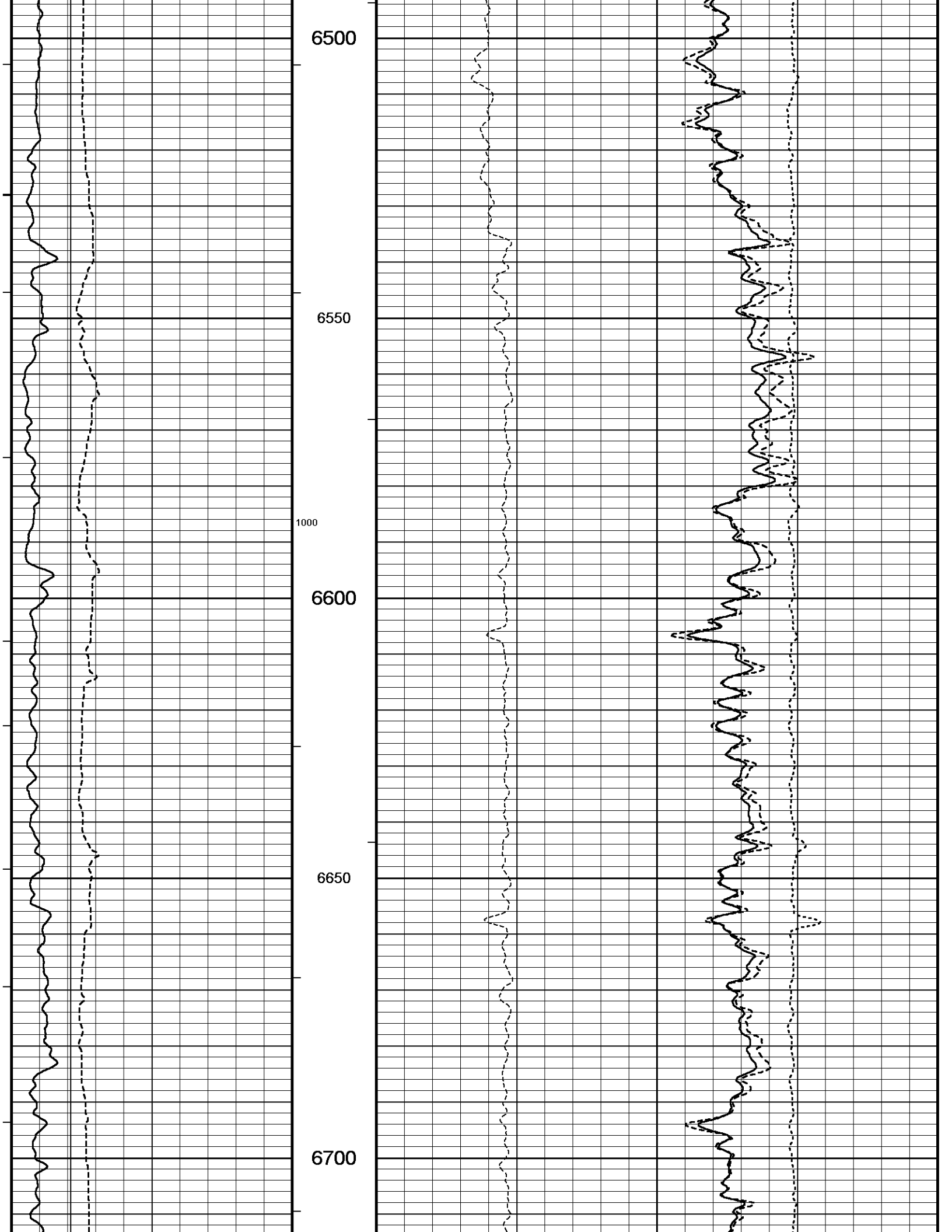
6350
6400
6450
Bit Size
MGS Gamma Ray
Density Caliper
Limestone Density Por.
PE
Compensated Density
Density Correction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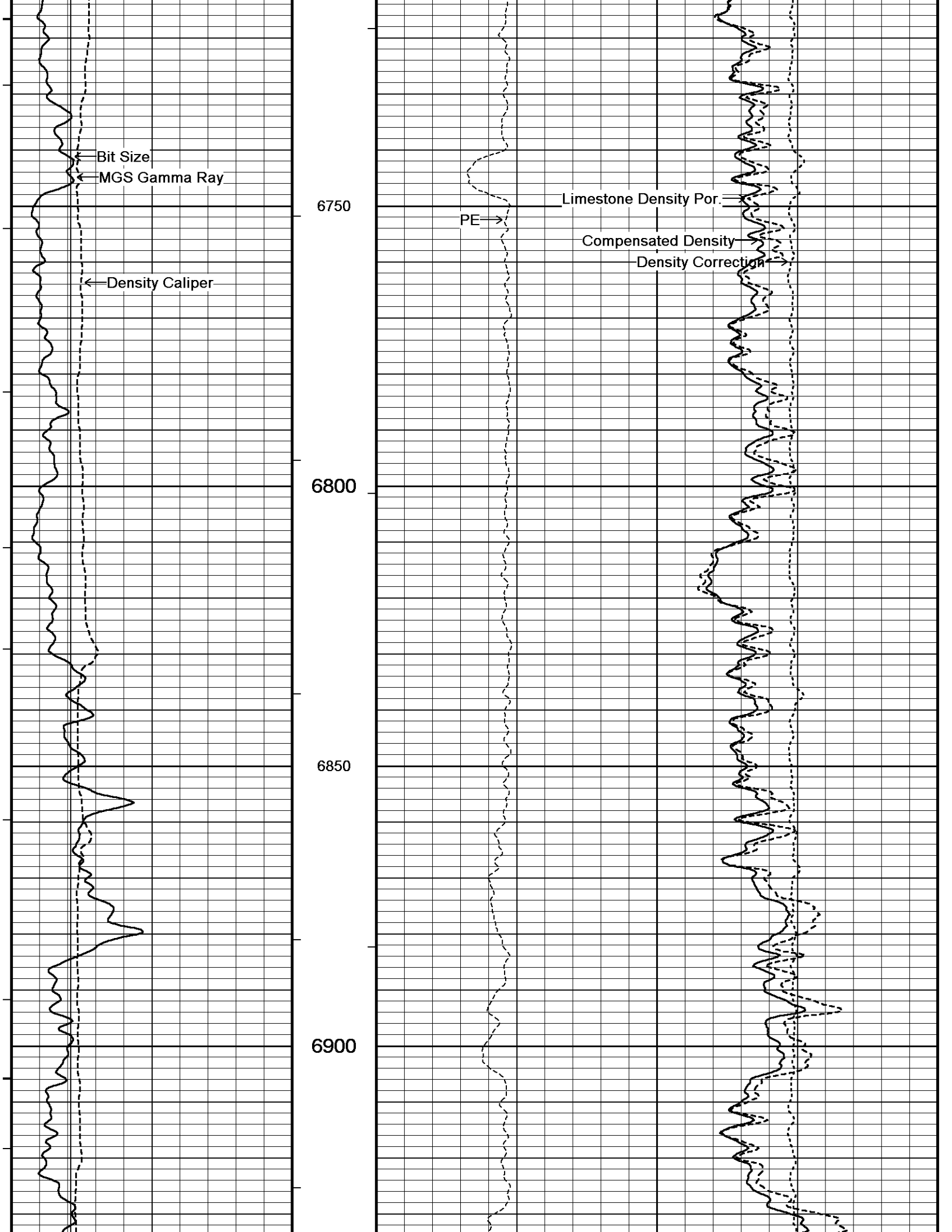
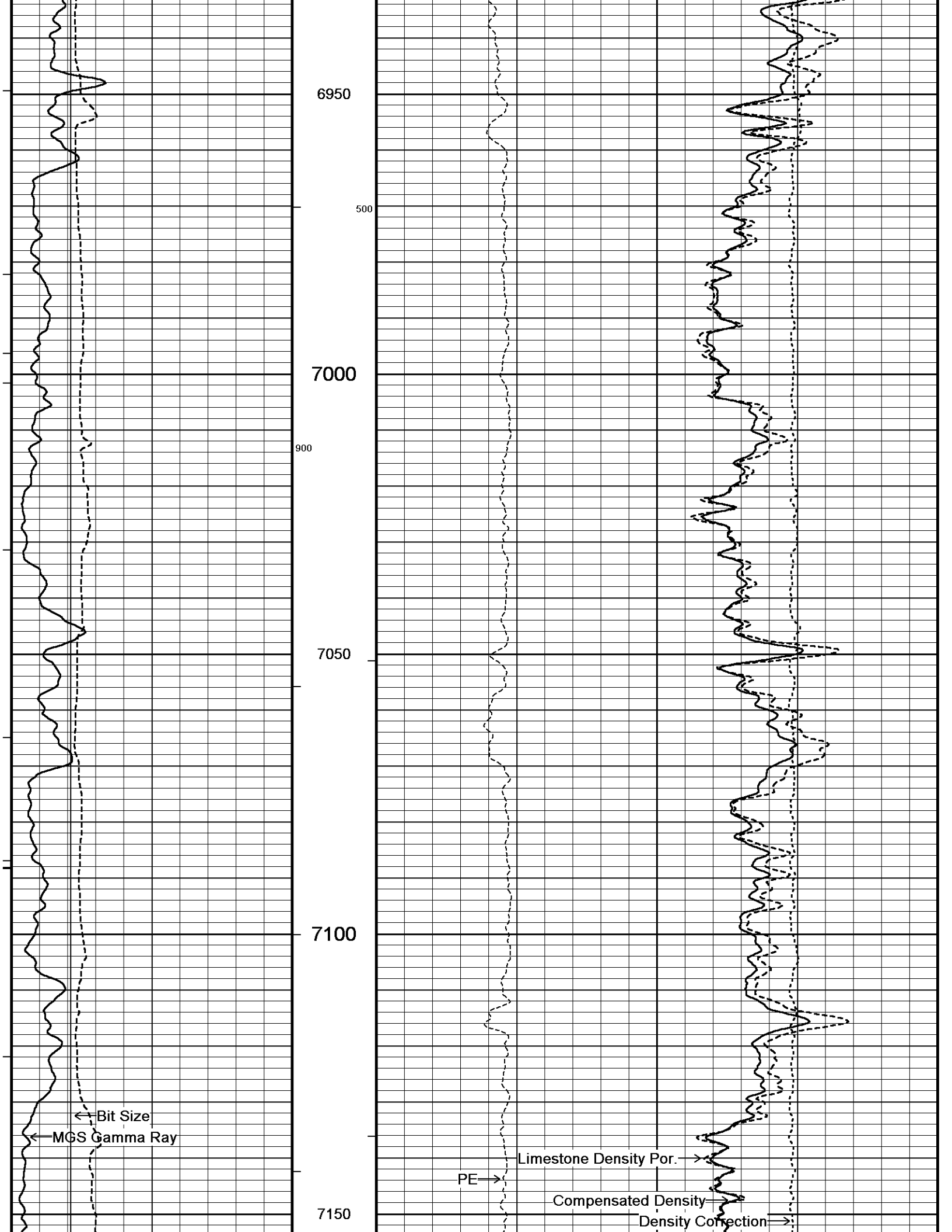
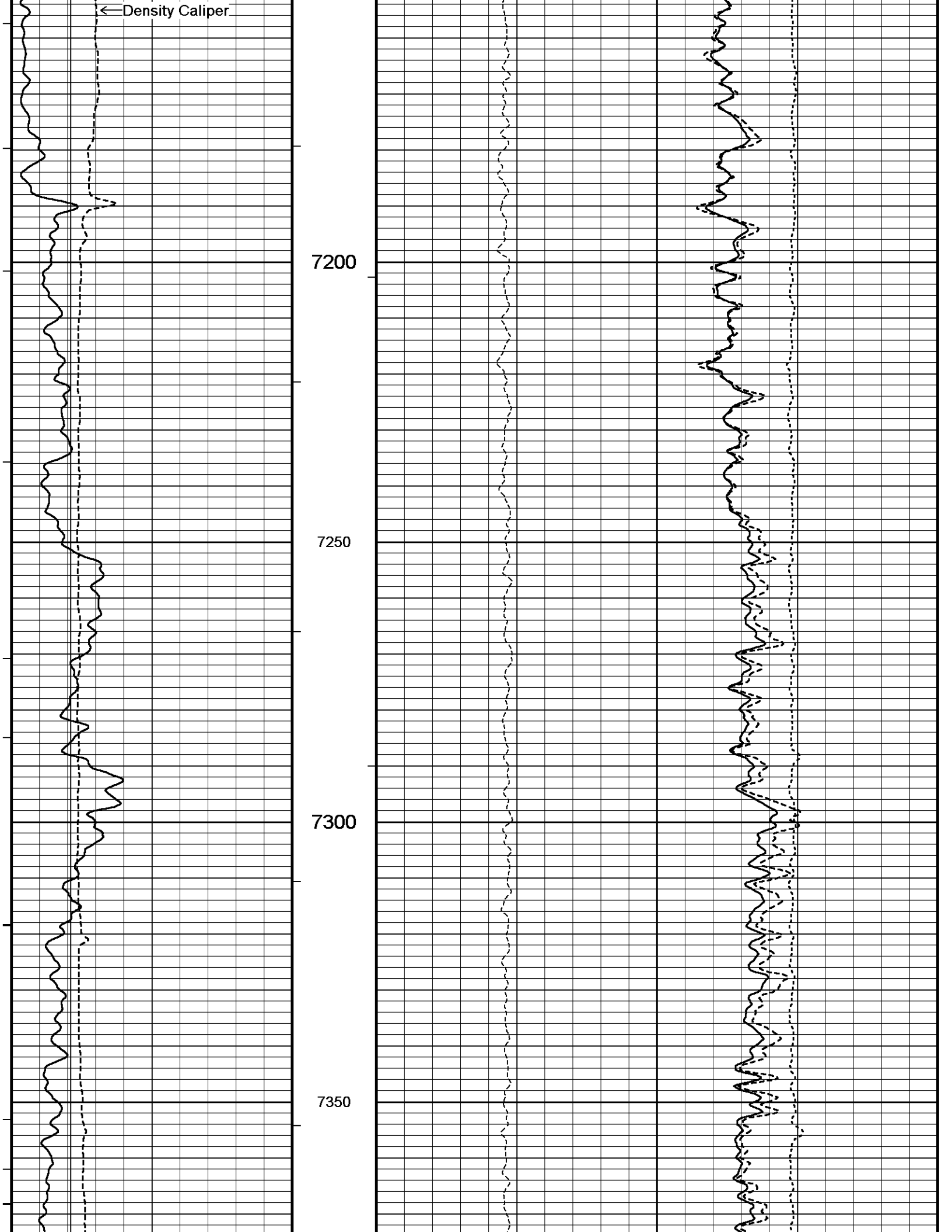
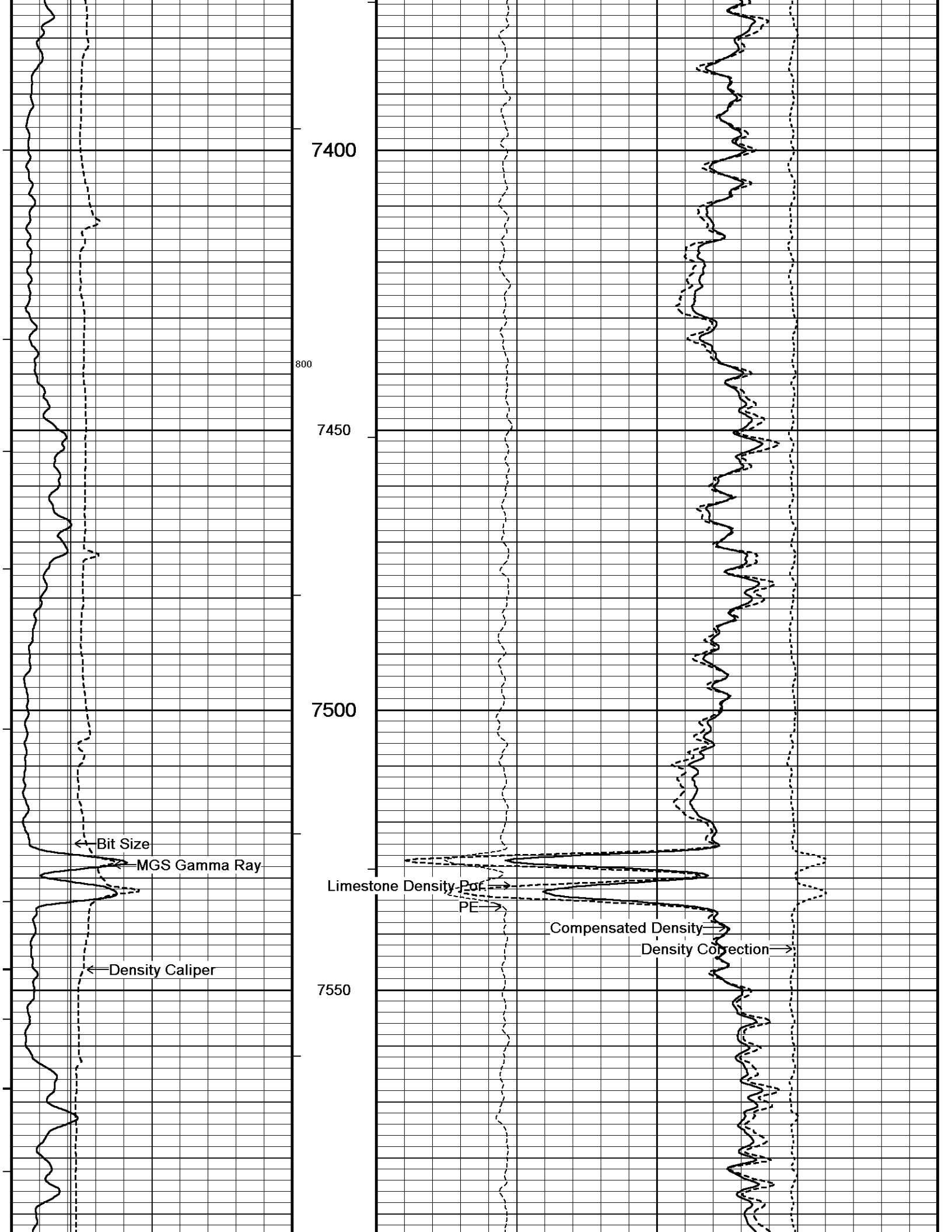
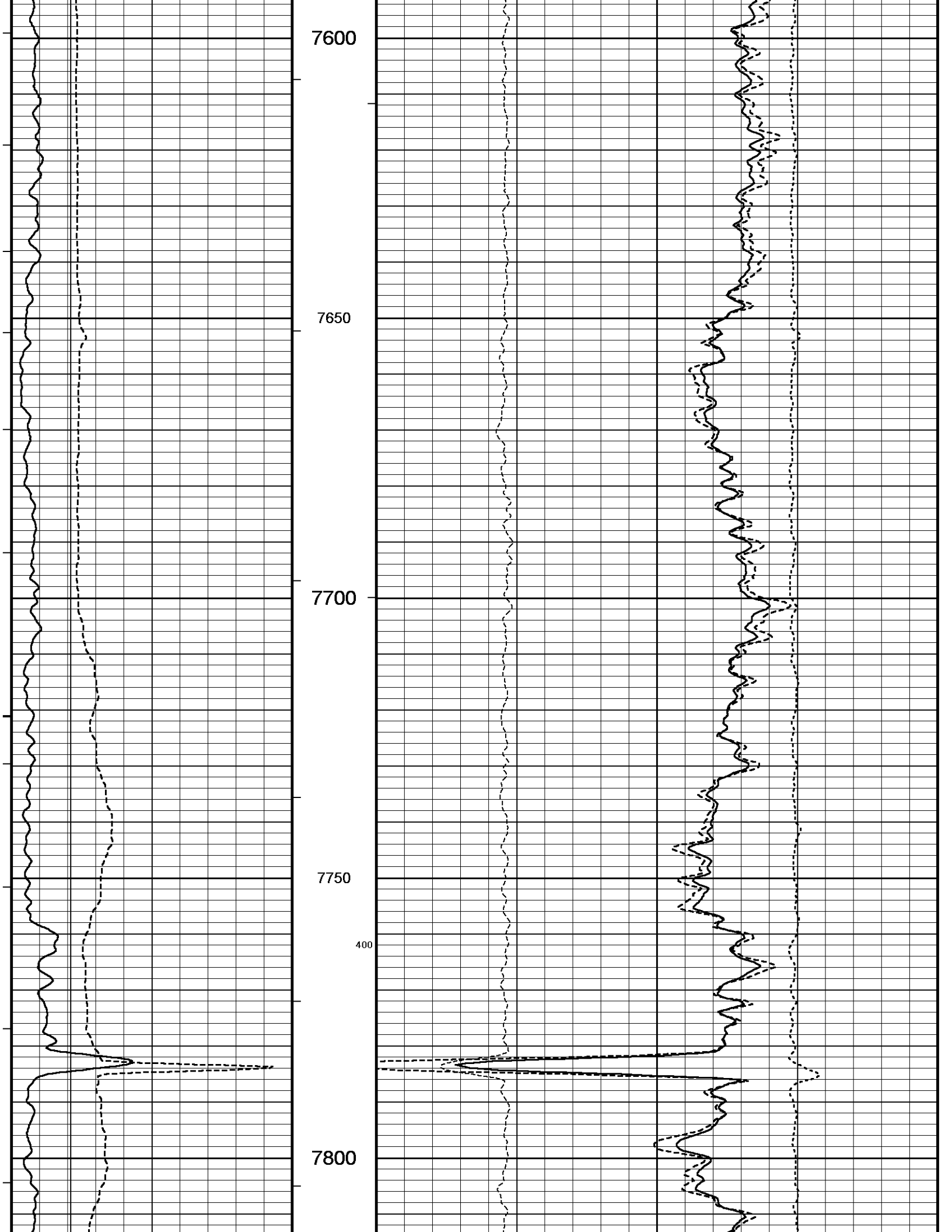
6550
1000
6600
6650
6700


Bit Size
MGS Gamma Ray
Density Caliper
6750
6800
6850
6900
PE
Limestone Density Por.
Compensated Density
Density Correction


6950
500
7000
900
7050
7100
7150
Bit Size
MGS Gamma Ray
PE
Limestone Density Por.
Compensated Density
Density Correction


←Density Caliper
7200
7250
7300
7350


7400
800
7450
7500
7550
Bit Size
MGS Gamma Ray
Density Caliper
Limestone Density Por
PE
Compensated Density
Density Correction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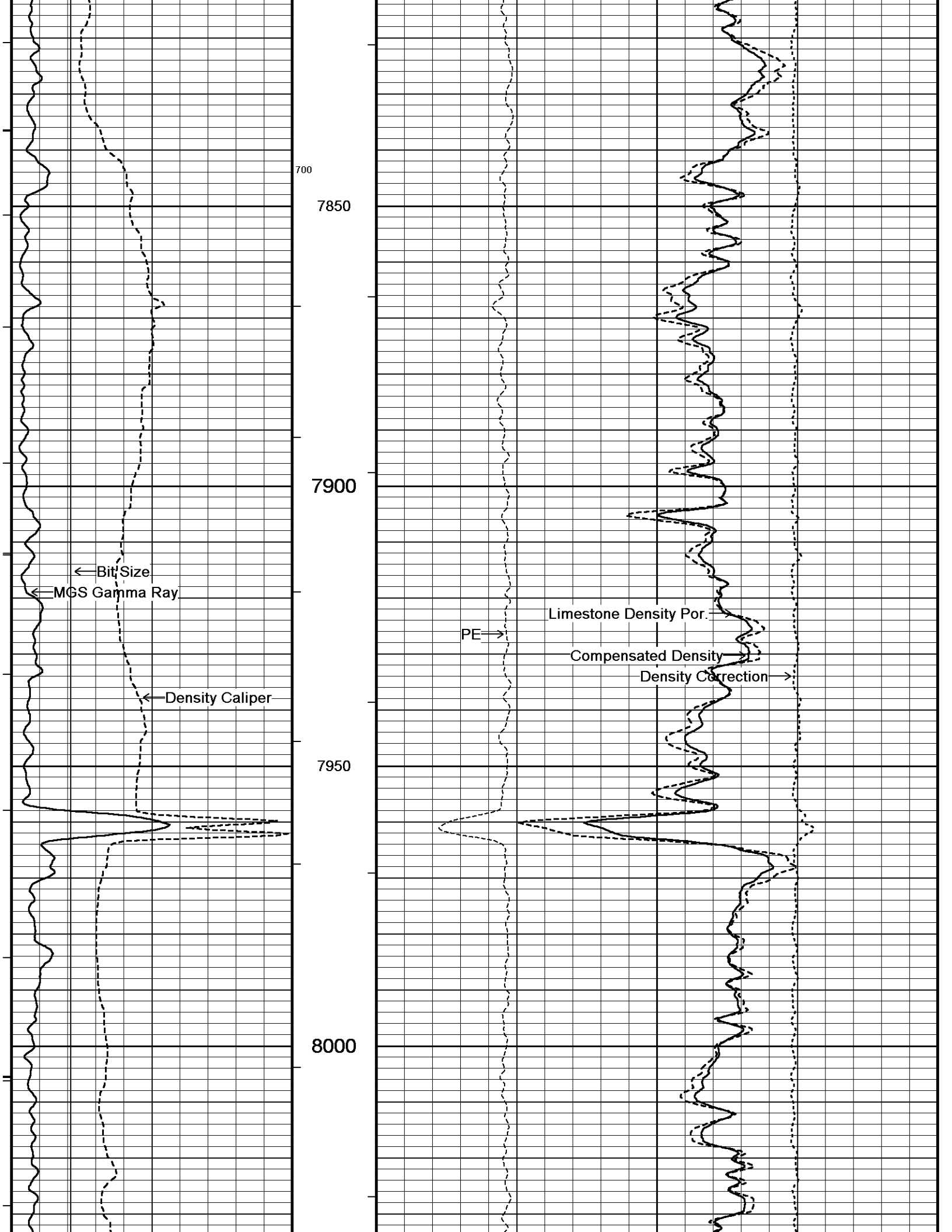
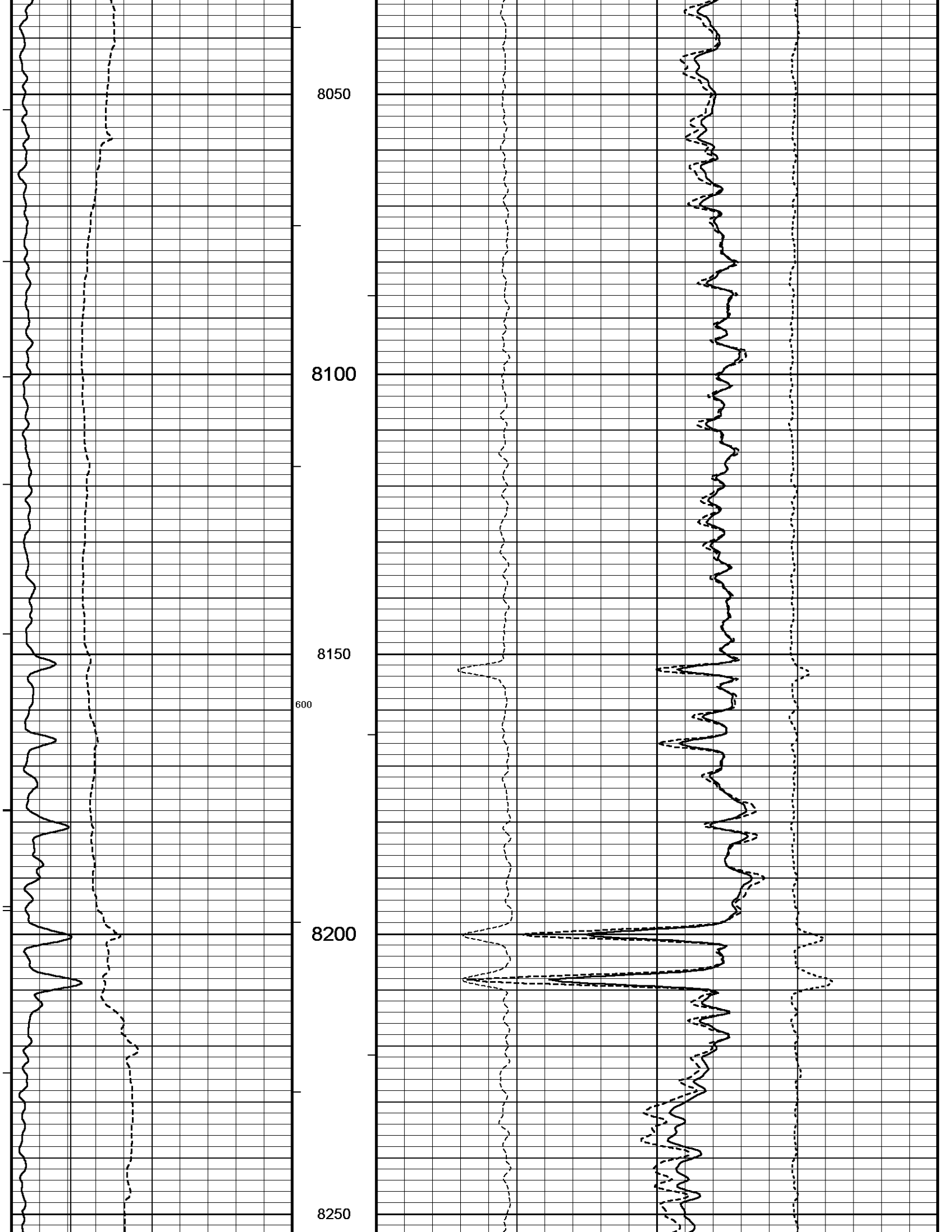
7650
7700
7750
400
7800


700
7850
7900
7950
8000
←Bit Size
←MGS Gamma Ray
←Density Caliper
PE→
Limestone Density Por.→
Compensated Density→
Density Correction→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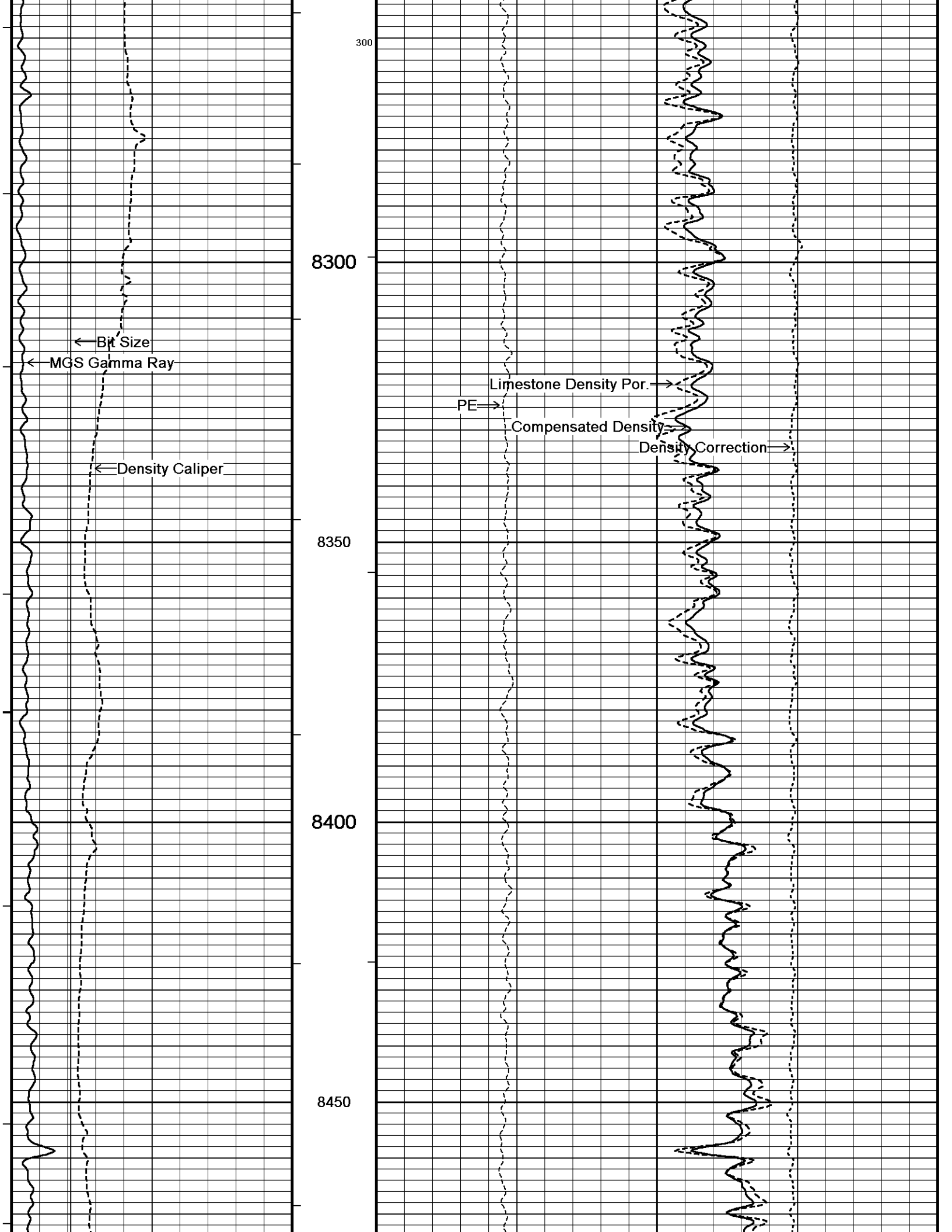
8100
8150
600
8200
8250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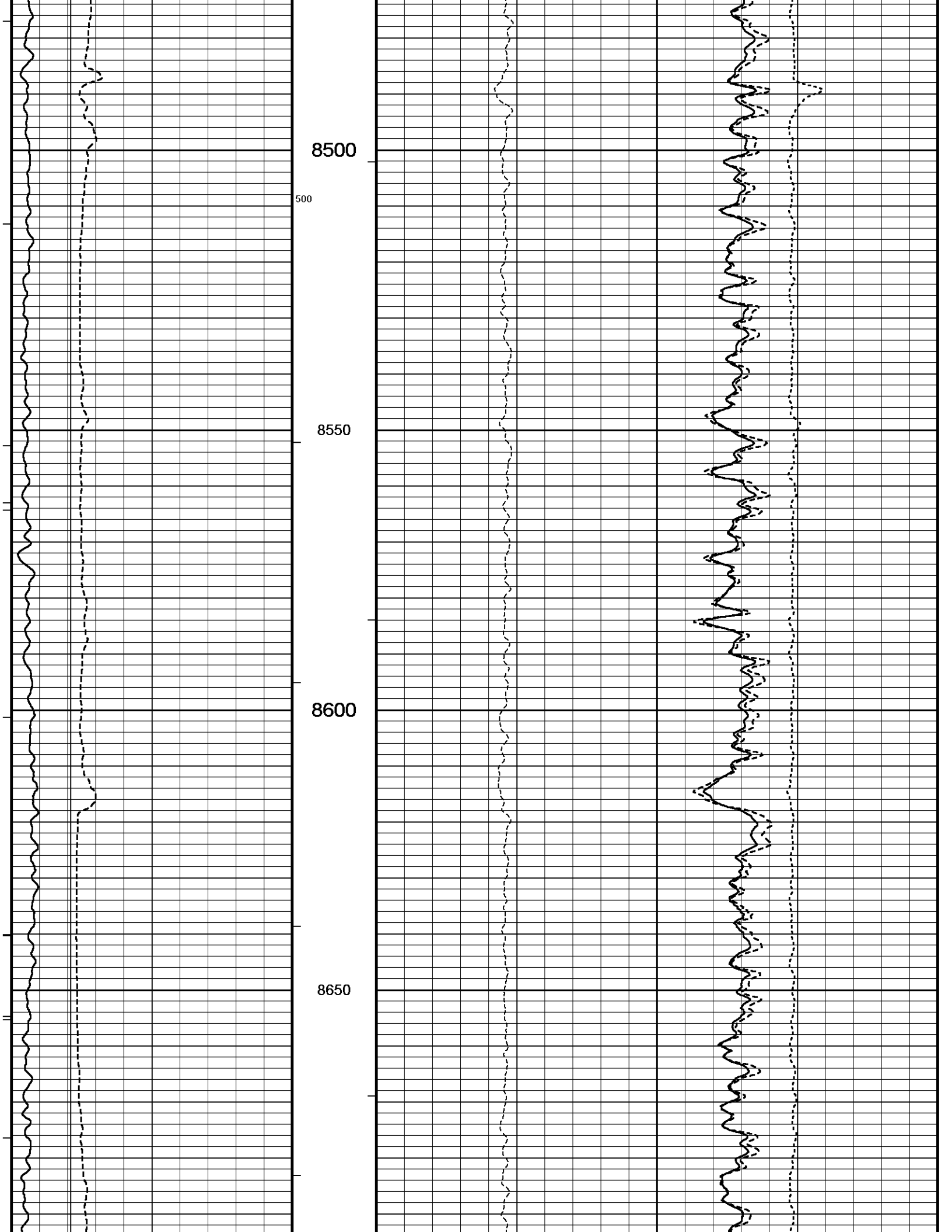
8400
8450
Bit Size
MGS Gamma Ray
Density Caliper
Limestone Density Por.
PE
Compensated Density
Density Correction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500
8550
8600
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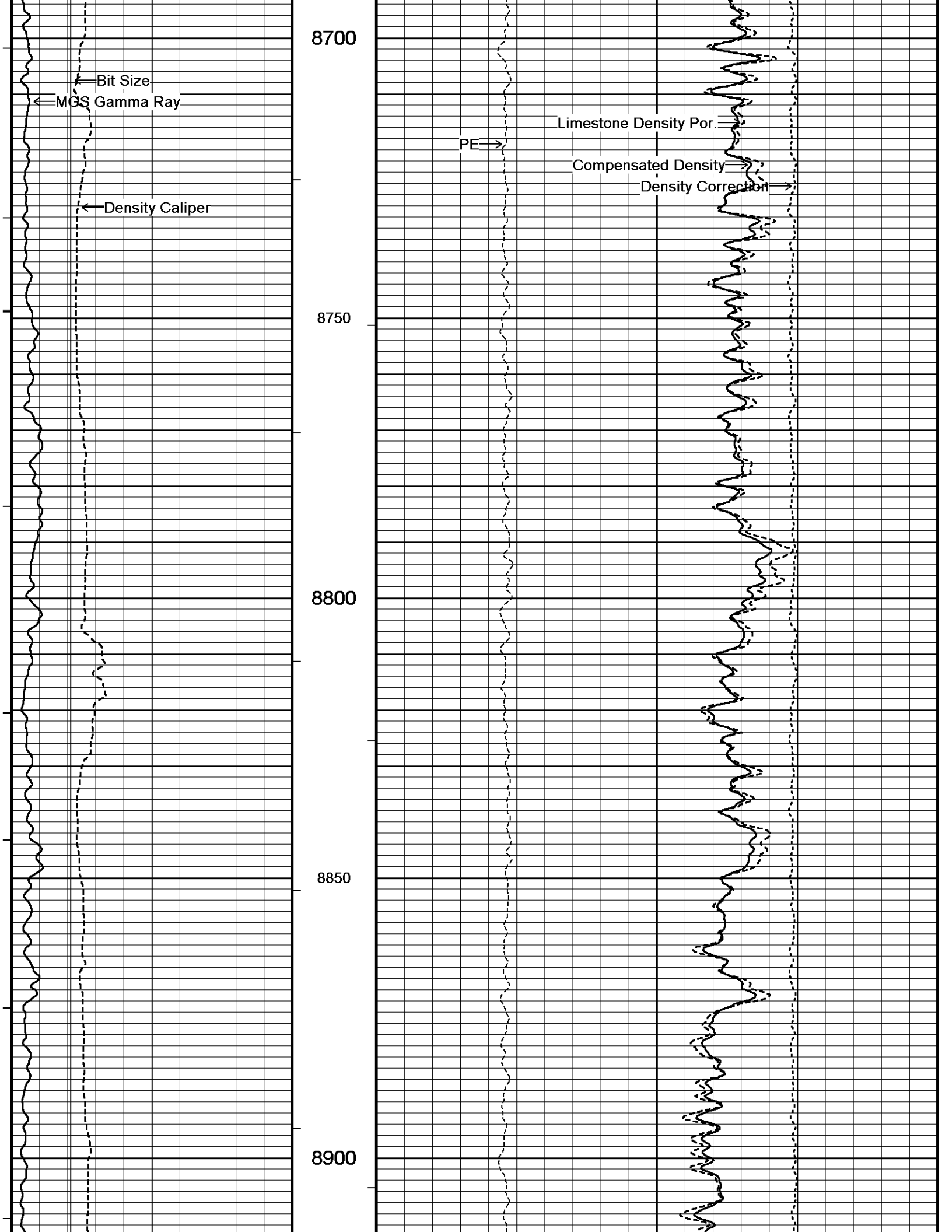
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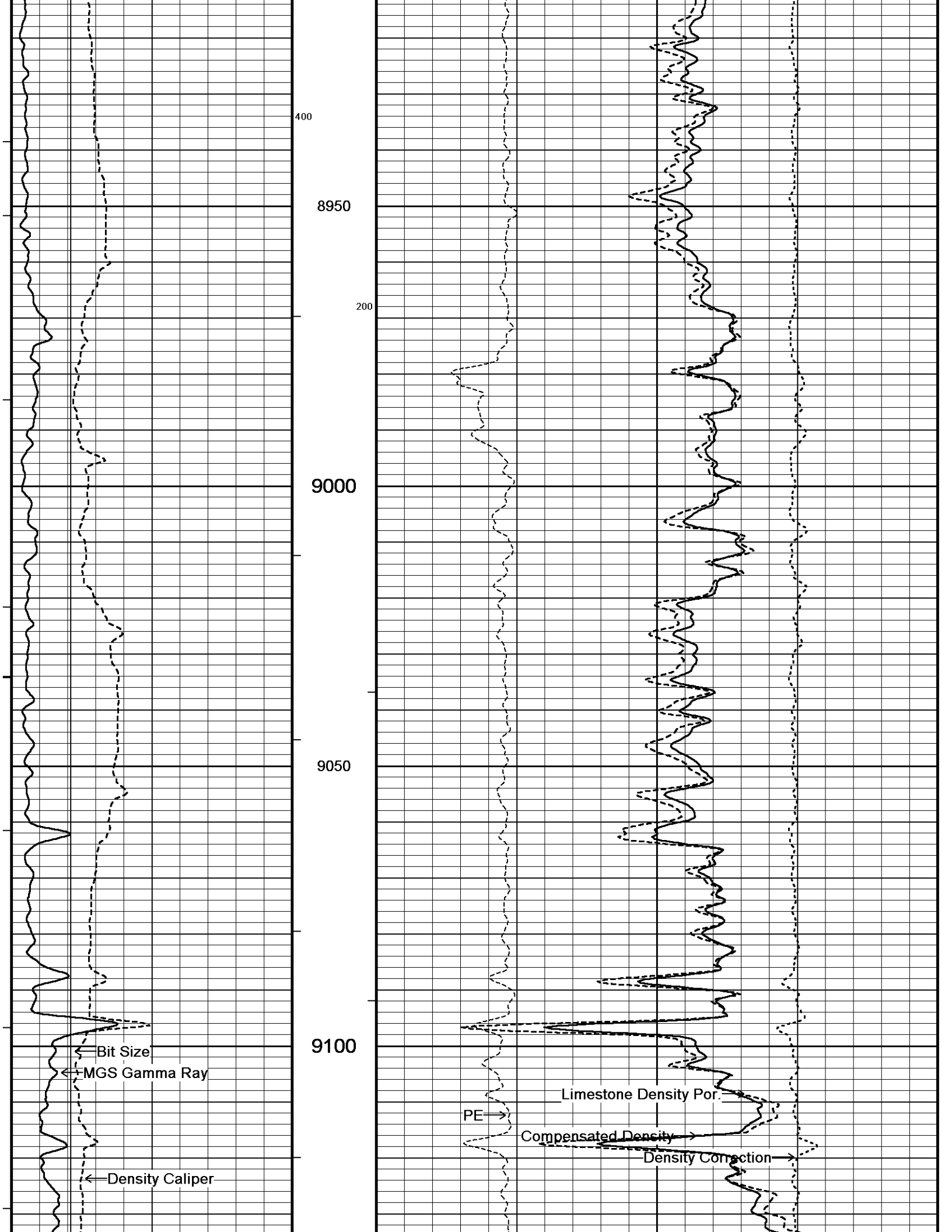
8800
8850
8900
Bit Size
MGS Gamma Ray
Density Caliper
PE
Limestone Density Por.
Compensated Density
Density Correction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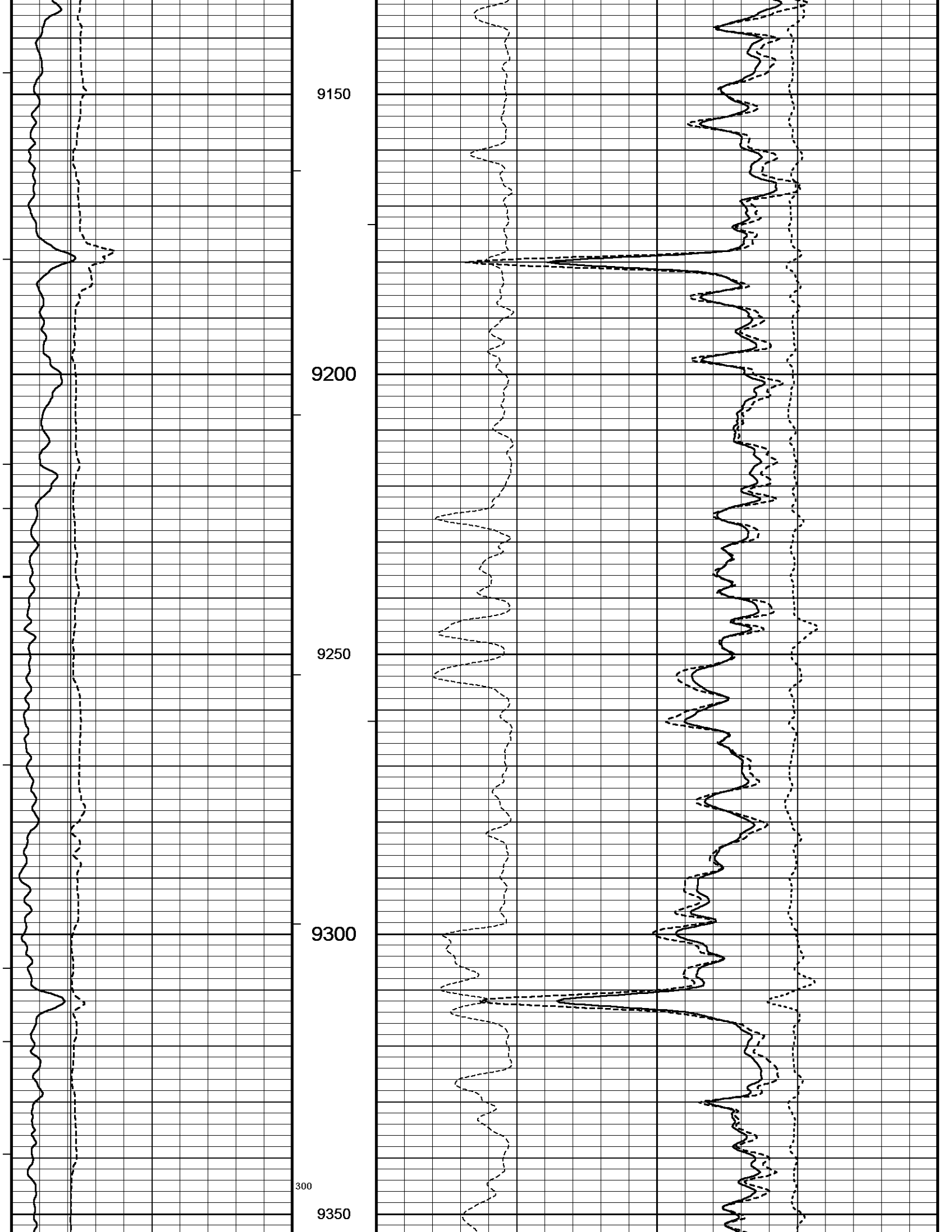
200
9000
9050
9100
Bit Size
MGS Gamma Ray
Density Caliper
Limestone Density Por.
PE
Compensated Density
Density Correction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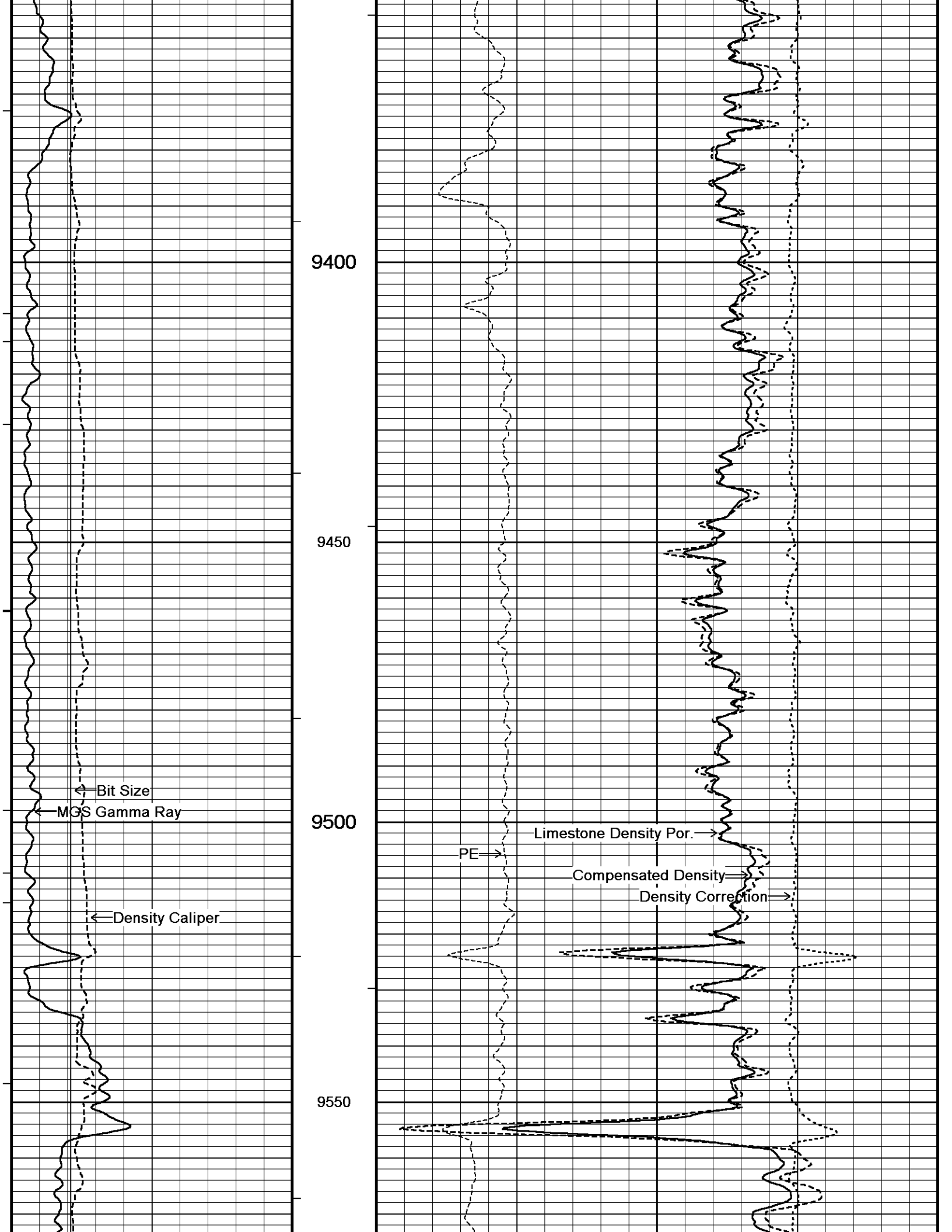
9300
300
9350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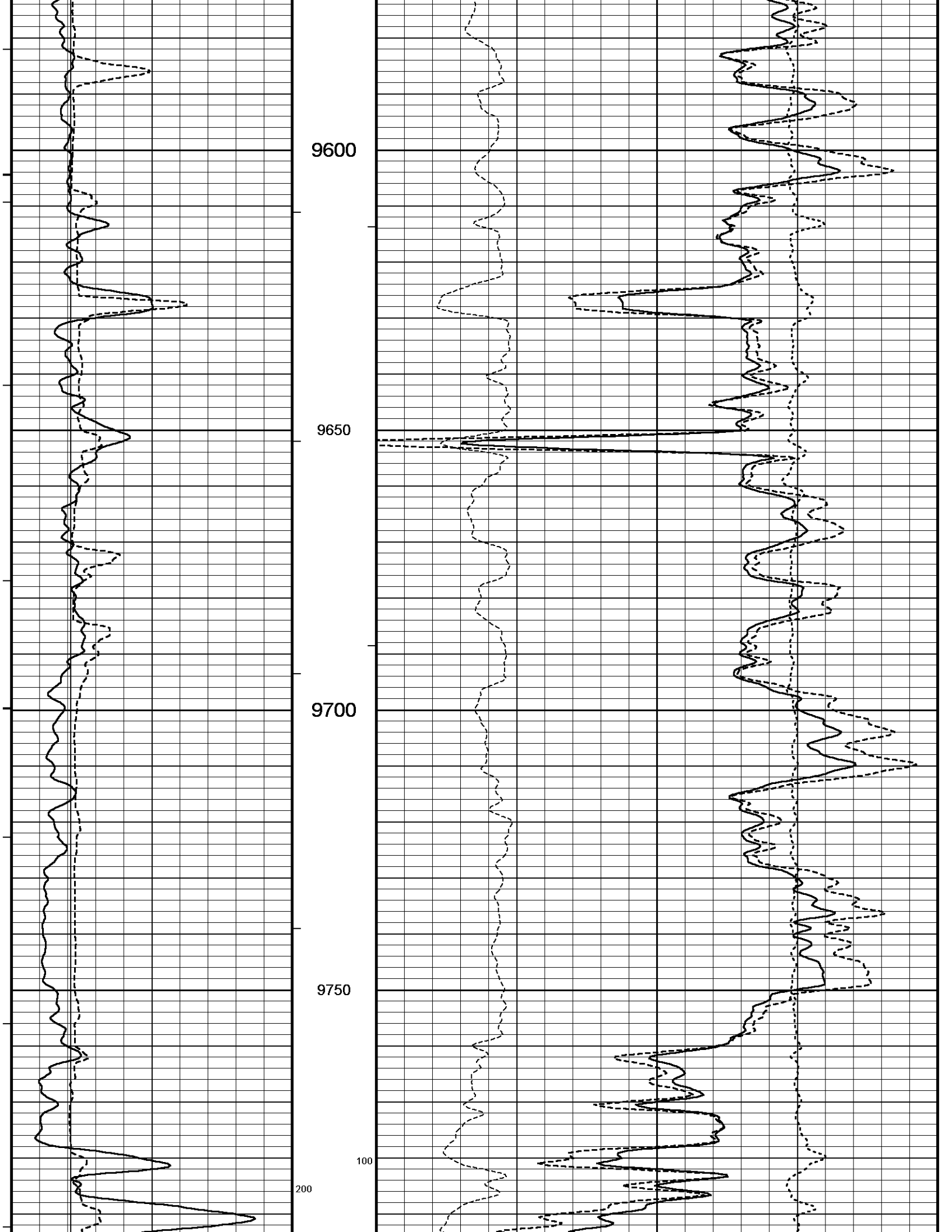
Bit Size
MGS Gamma Ray
Density Caliper
PE
Limestone Density Por.
Compensated Density
Density Correction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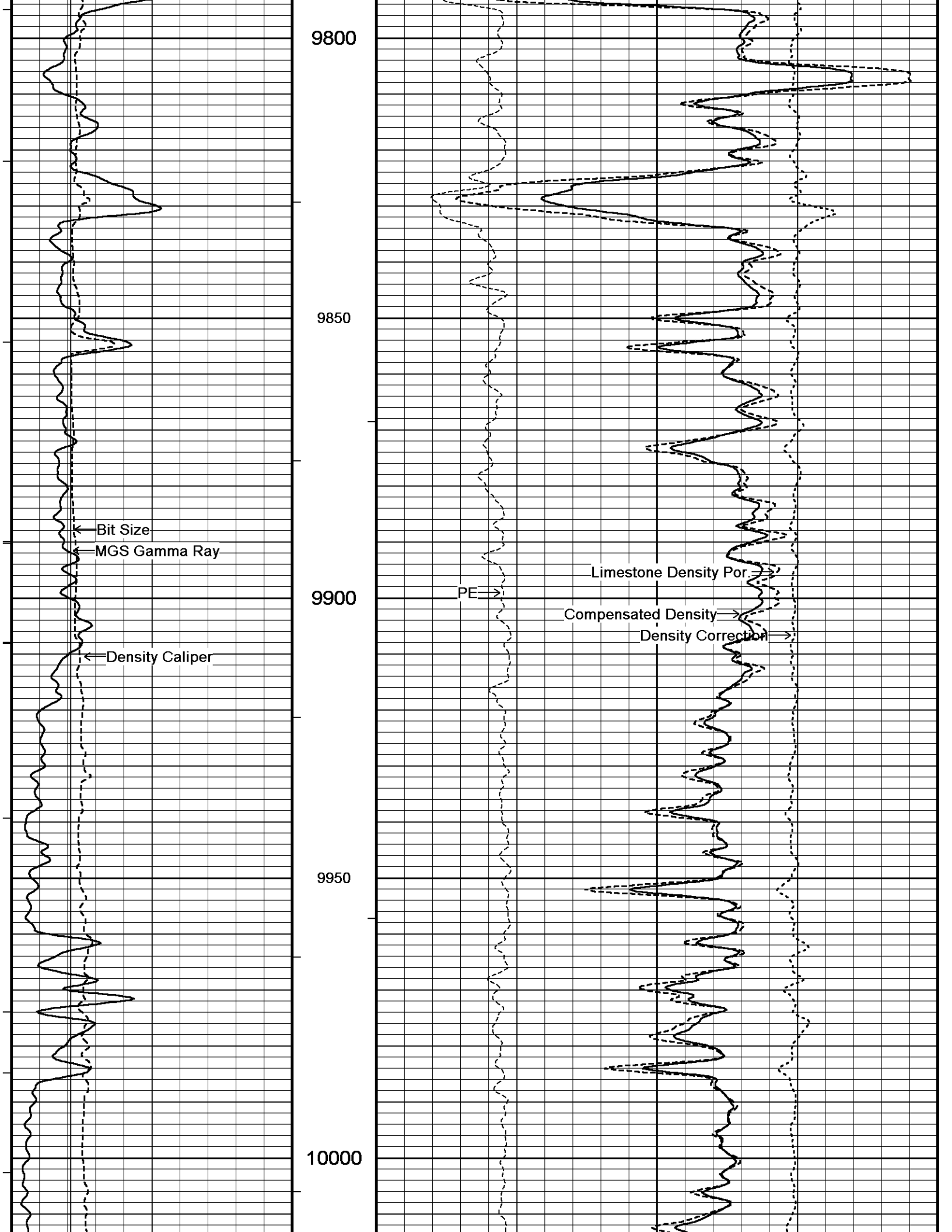
9650
9700
9750
100
200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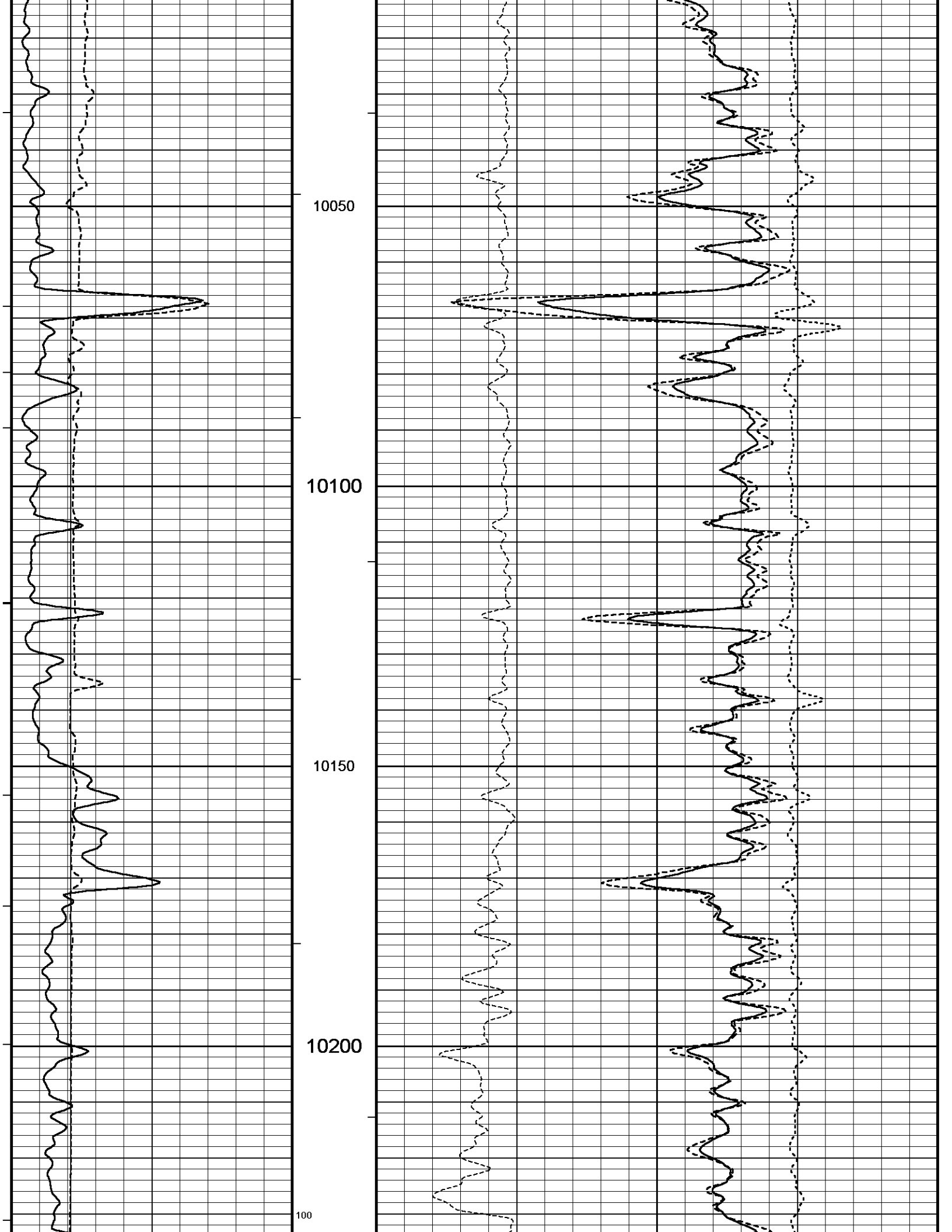
9850
9900
9950
10000
Bit Size
MGS Gamma Ray
Density Caliper
PE
Limestone Density Por.
Compensated Density
Density Correction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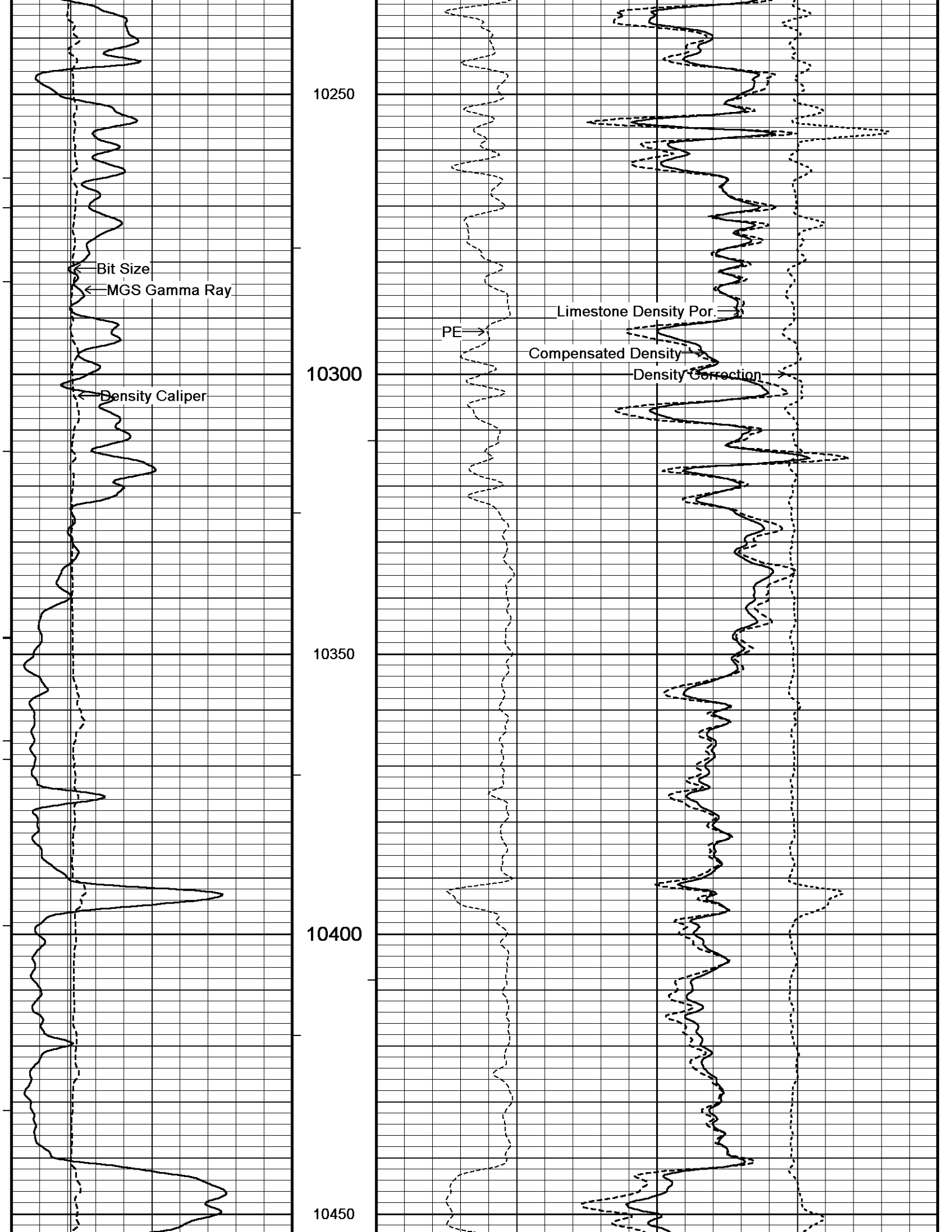
10100
10150
10200
100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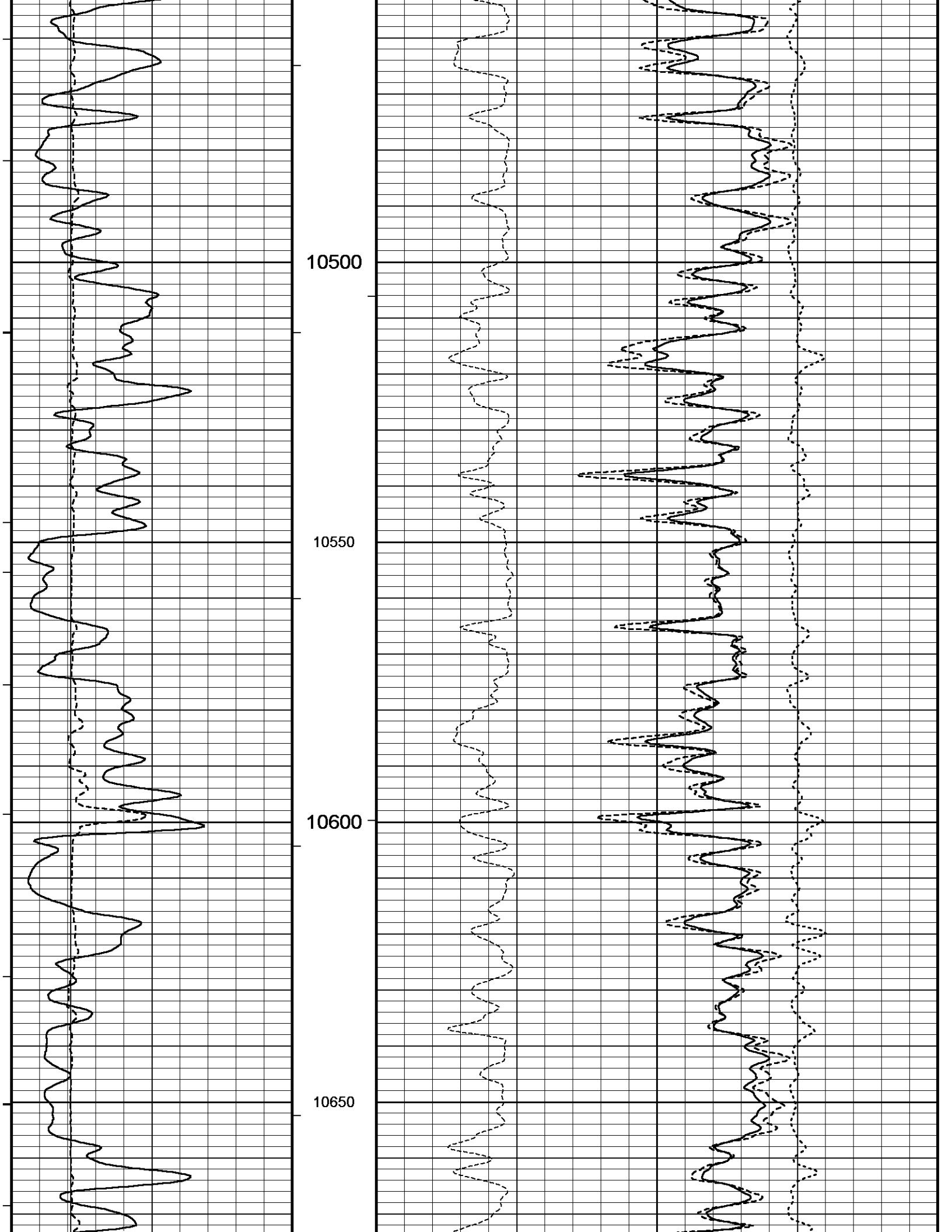
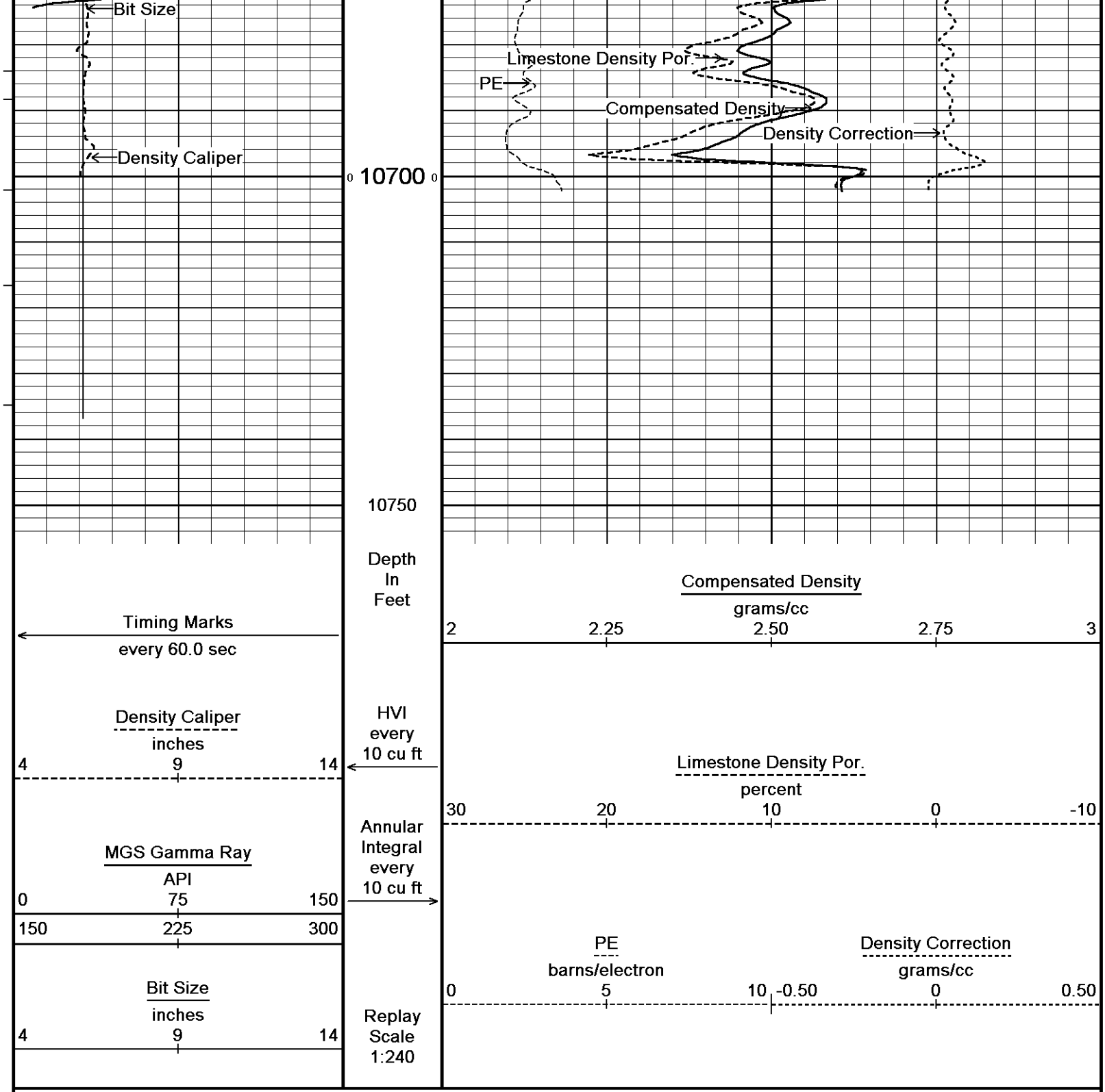
10400
10450
Bit Size
MGS Gamma Ray
Density Caliper
PE
Limestone Density Por.
Compensated Density
Density Correction


10500
10550
10600
10650



Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 25-FEB-2013 04:42
Filename: C:\DATA_13_04_8492\SANDRIDGE (HAZEL 3120 1-24H)\HAZEL RTAP DEPTH.dta
Recorded on 25-FEB-2013 04:14
System Versions: Processed with 13.04.8492 Plotted with 13.04.8492

5 INCH BULK DENSITY

BEFORE SURVEY CALIBRATION

C:\DATA_13_04_8492\SANDRIDGE (HAZEL 3120 1-24H)\Legacy.dta

General Constants All 000

Last Edited on 21-FEB-2013,04:55

General Parameters

Mud Resistivity	1000.000	ohm-metres
Mud Resistivity Temperature	75.000	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	5.500	inches
Caliper for Differential Caliper	Density Caliper	

Rwa Parameters

Porosity used	Base Density Porosity	
Resistivity used	Deep Induction	
RWA Constant A	0.610	
RWA Constant M	2.150	

SP Calibration MGS-C.J 142

Field Calibration on 18-JAN-2013,11:54

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

High Resolution Temperature Calibration MGS-C.J 142

Field Calibration on 18-JAN-2013,11:54

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

High Resolution Temperature Constants MGS-C.J 142

Last Edited on 18-JAN-2013,11:54

Pre-filter Length	11

Gamma Calibration MGS-C.J 142

Field Calibration on 24-FEB-2013 00:00

	Measured	Calibrated (API)
Background	41	28
Calibrator (Gross)	1071	724
Calibrator (Net)	1029	696

Gamma Constants MGS-C.J 142

Last Edited on 31-JAN-2013,15:26

Gamma Calibrator Number	036	
Mud Density	1.02	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl	0.00	kppm

Neutron Calibration MDN-B.J 391

Base Calibration on 04-FEB-2013 09:37
Field Check on 24-FEB-2013 00:07

Base Calibration

	Measured		Calibrated (cps)	
	Near	Far	Near	Far
	3127	94	3714	110
Ratio	33.324		33.764	

Field Calibrator at Base

	Calibrated (cps)	
	2292	3445
Ratio	0.665	

Field Check

	Calibrated (cps)	
	2085	3126
Ratio	0.667	

Neutron Constants MDN-B.J 391

Last Edited on 24-FEB-2013,00:02

Neutron Source Id	N1055	
Neutron Jig Number	N639	
Epithermal Neutron	No	
Caliper Source for Processing	Bit Size	
Stand-off	0.00	inches
Mud Density	1.02	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	Constant Value	
Temperature	20.00	degrees F
Mud Salinity	4.40	kppm
Salinity Correction	Not Applied	
Formation Fluid Salinity Source	None	
Formation Fluid Salinity	N/A	kppm
Barite Mud Correction	Not Applied	

FE Calibration MFE-A.A 134

Base Calibration on 06-JAN-2013,21:47
Field Check on 23-FEB-2013 23:43

Base Calibration

	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	972.5	126.8
Base Check		279.1
Field Check		279.1

FE Constants MFE-A.A 134

Last Edited on 23-FEB-2013,23:42

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-A.A 170

Field Calibration on 14-JAN-2013,12:49

	Measured	Calibrated(Deg F)
Lower	0.00	10.00
Upper	100.00	100.00

High Resolution Temperature Constants MAI-A.A 170

Last Edited on 18-FEB-2013,09:48

Pre-filter Length	11

Induction Calibration MAI-A.A 170

Base Calibration on 02-FEB-2012 17:42
Field Check on 23-FEB-2013 23:50

Base Calibration

Test Loop Calibration	Measured		Calibrated (mmho/m)	
Channel	Low	High	Low	High
1	17.7	487.1	9.3	966.2
2	6.2	384.7	7.6	821.4
3	3.7	266.1	5.2	566.0
4	2.2	136.5	2.6	279.2
Array Temperature		72.1	Deg F	

Channel	Base Check (mmho/m)		Field Check (mmho/m)		
	Low	High	Low	High	
1	0.0	0.0	10.3	3752.9	
2	0.0	0.0	29.9	3530.6	
3	0.0	0.0	27.6	2998.0	
4	0.0	0.0	18.8	2043.4	
Deep			15.6	1905.7	
Medium			41.5	3982.5	
Shallow			46.4	5293.0	
Array Temperature	0.0		38.1		Deg F

Induction Constants MAI-A.A 170

Last Edited on 23-FEB-2013,23:48

Induction Model	VECTAR	
Caliper for Borehole Corr.	Bit Size	
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 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	0.0000	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	

Strain Gauge Constants MMS-E.B 133

Last Edited on 07-DEC-2012,11:16

Atmospheric Pressure	14.70	psi
Serial Number	241946	
Calibration Date	09-JUL-08	
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	0.069	0.073	0.062	0.063	0.042	0.042	0.021	0.021
3000.0	5.240	5.253	5.235	5.245	5.219	5.228	5.199	5.209
6000.0	10.422	10.442	10.421	10.439	10.408	10.425	10.388	10.406
9000.0	15.616	15.637	15.619	15.638	15.609	15.627	15.593	15.610
12000.0	20.827	20.839	20.834	20.843	20.828	20.838	20.815	20.823
15000.0	26.051		26.060		26.056		26.046	

MMS Parameters MMS-E.B 133

Last Edited on 24-FEB-2013 00:46

Logging Parameters

Firmware Version	2v40	
Caliper Open On	MAI	
Caliper Open Delay		minutes
Caliper Closed On	Unknown	
Caliper Closed Delay	N/A	minutes
Sample Rate	1.00	seconds
Use Deep Sleep	No	
Delay Deep Sleep	N/A	
Deep Sleep Wake Time	N/A	minutes
Deep Sleep Wake on Temperature	N/A	
Deep Sleep Wake Temperature	N/A	degrees C
Deep Sleep Wake on Pressure	N/A	
Deep Sleep Wake Pressure	N/A	psi
MMI Pad Pressure	0.0	

Release Parameters

Pulse Duration Base Level	10.0	seconds
Pulse Duration Transition Time	60.0	seconds
Pulse Duration Status Pulse From	20.0	seconds

Pulse Duration Caliper Close From	145.0	seconds
Pulse Duration Caliper Open From	150.0	seconds
Pulse Duration Release Pulse From	215.0	seconds
Pulse Duration Release Pulse To	280.0	seconds
Pulse Release Duration	240.0	seconds
Pulse Discriminator Pressure Band	19312.0	seconds
Pulse Pressure Discriminator	44271.0	seconds
Use Negative Pulsing	No	
Good Status Reply Open Hole	65535.0	seconds
Good Status Reply Cased Hole	20.0	seconds
Bad Status Reply	60.0	seconds
Status Pulse To	80.0	seconds
Caliper Close To		seconds
Caliper Open To	210.0	seconds

Configuration

MMS,MGS,MDN,MPD,MPD,MFE,MAI

Photo Density Calibration MPD-C.J 394

Base Calibration on 04-FEB-2013 11:05
Field Check on 23-FEB-2013 23:48

Density Calibration

Base Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	52280	25673	59869	31110
Reference 2	21633	2514	24557	2522

Field Check at Base

1060.0	1299.4

Field Check

1065.5	1295.6

PE Calibration

Base Calibration	Measured			Calibrated
	WS	WH	Ratio	Ratio
Background	190	940		
Reference 1	21271	52102	0.412	0.369
Reference 2	6006	21507	0.283	0.271

Field Check at Base

190.1	939.9

Field Check

190.3	945.1

Density Constants MPD-C.J 394

Last Edited on 20-JAN-2013,18:20

Density Source Id	236	
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	1.02	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	

Caliper Calibration MPD-C.J 394

Base Calibration on 04-FEB-2013 10:49
Field Calibration on 24-FEB-2013 00:09

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	17044	4.02
2	25296	6.00
3	33704	8.03
4	42177	10.02
5	51088	12.01
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
5.96	6.00

DOWNHOLE EQUIPMENT

C:\DATA_13_04_8492\SANDRIDGE (HAZEL 3120 1-24H)\Legacy.dta

Shuttle Running Tool 3.5")
SRT-A.A 69 LG: 6.62 ft WT: 37.5 lb OD: 2.52 in

MBS-F.A 200v Compact Battery Sub
MBS-F.A 131 LG: 10.61 ft WT: 70.5 lb OD: 2.24 in

Compact Memory Sub E.B
MMS-E.B 133 LG: 5.20 ft WT: 37.5 lb OD: 2.24 in

Compact Tool Isolator sub.
MTI-B.A 76 LG: 1.54 ft WT: 13.2 lb OD: 2.24 in

Compact Short Gamma
MGS-C.J 142 LG: 3.41 ft WT: 24.3 lb OD: 2.24 in

Compact Collar Locator
MCL-B.J 63 LG: 3.17 ft WT: 26.5 lb OD: 2.24 in

SKJ-E.B Compact Knuckle Joint
SKJ-E.B 472 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

SHA-J.A Compact Swivel Head Adaptor
SHA-J.A 451 LG: 2.30 ft WT: 22.0 lb OD: 2.24 in

MIS-D.A Compact Inline Bowspring sub
MIS-D.A 435 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in

Compact Neutron
MDN-B.J 391 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

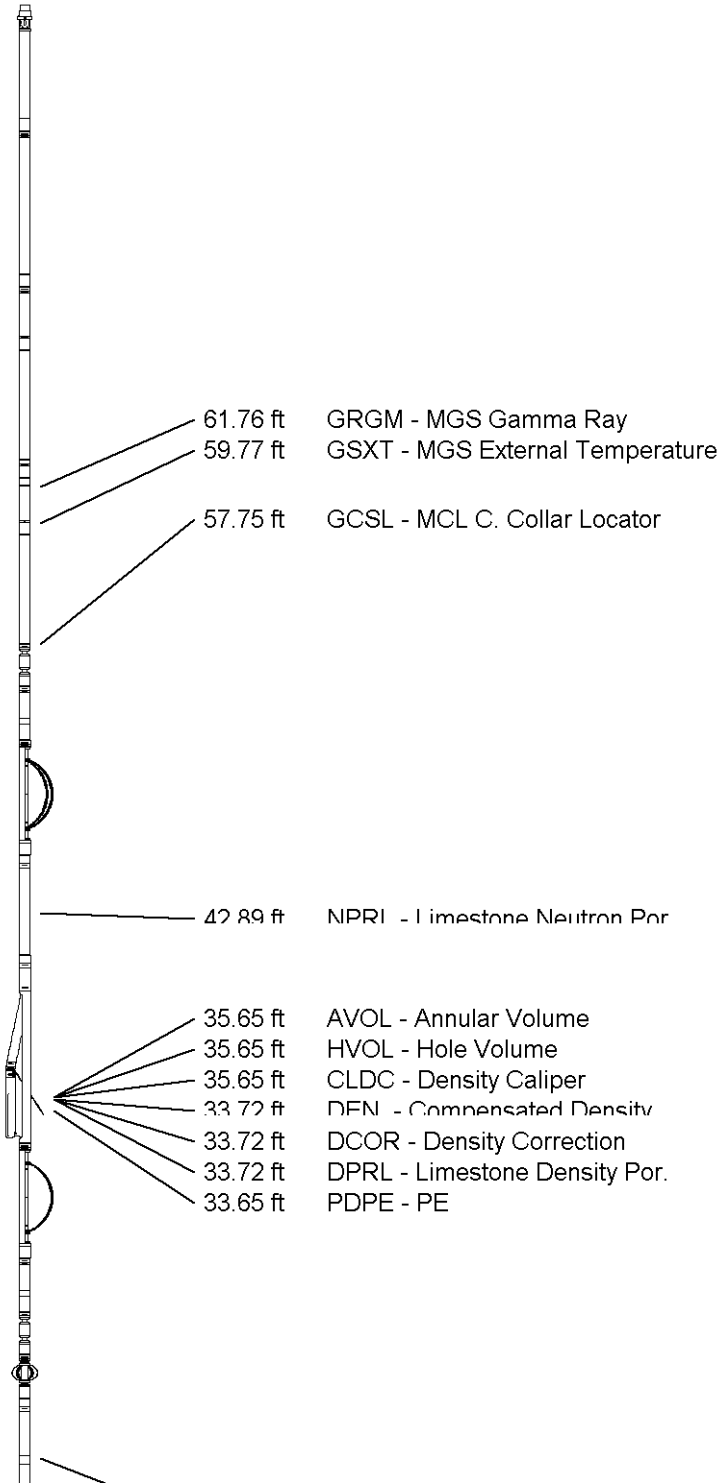
Compact Density/Caliper
MPD-C.J 394 LG: 9.59 ft WT: 90.4 lb OD: 2.24 in

MIS-D.B Compact Inline Bowspring sub
MIS-D.B 607 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in

SHA-H Compact Swivel Head Adaptor
SHA-H 167 LG: 2.30 ft WT: 22.0 lb OD: 2.24 in

SKJ-E.B Compact Knuckle Joint
SKJ-E.B 479 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

MIS-E.B Compact Inline Standoff sub
MIS-E.B 578 LG: 2.14 ft WT: 15.4 lb OD: 2.24 in

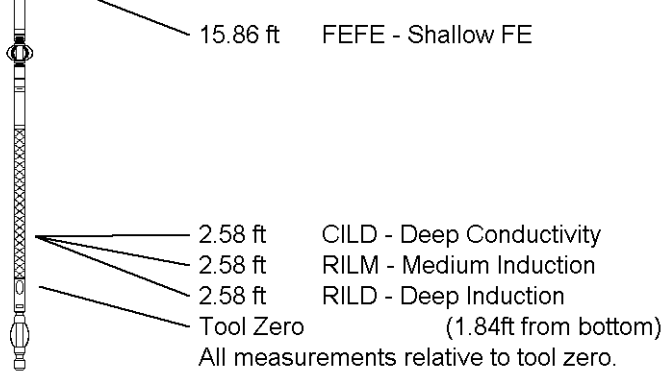


Compact Focussed Electric
MFE-A.A 134 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

MIS-E.B Compact Inline Standoff sub
MIS-E.B 596 LG: 2.14 ft WT: 15.4 lb OD: 2.24 in

Compact Induction
MAI-A.A 170 LG: 12.52 ft WT: 48.5 lb OD: 2.24 in

Total Length: 88.36 ft Weight: 637.1 lb



COMPANY	SANDRIDGE ENERGY
WELL	HAZEL 3120 1-24H
FIELD	SIX MOONS EAST
PROVINCE/COUNTY	COMMANCHE
COUNTRY/STATE	USA /KANSAS

Elevation Kelly Bushing	2063.00	feet	First Reading	10699.00	feet
Elevation Drill Floor	2062.00	feet	Depth Driller	10773.00	feet
Elevation Ground Level	2042.00	feet	Depth Logger	10773.00	feet

Weatherford®

CML MESSENGER SHUTTLE
COMPACT PHOTO DENSITY
COMPENSATED NEUTRON LOG