



Weatherford®

**MEASURED DEPTH
COMPENSATED PHOTO DENSITY
COMPENSATED DUAL NEUTRON LOG**

COMPANY				WHITTING OIL AND GAS CORPORATION			
WELL				RAZOR 21C-0908			
FIELD				REDTAIL			
PROVINCE/COUNTY				WELD			
COUNTRY/STATE				U.S.A. / COLORADO			
LOCATION				329' FNL & 1098' FWL			
SEC 21	TWP 10N	RGE 58W	Other Services				
			MICRO IMAGER				
API Number			05-123-39523		SPECTRAL GAMMA		
Permanent Datum G.L., Elevation 4844 feet					Elevations:		
Log Measured From KB					KB		
Drilling Measured From K.B. @ 17 FEET					DF		
Date	17-AUG-2014				GL		
Run Number	ONE						
Service Order	4725-95388534						
Depth Driller	14236.00				feet		
Depth Logger	14236.00				feet		
First Reading	14148.00				feet		
Last Reading	6209.00				feet		
Casing Driller	6213.00				feet		
Casing Logger	6209.00				feet		
Bit Size	6.000				inches		
Hole Fluid Type	WBM						
Density / Viscosity	9.50		lb/USg		38.00		type in
PH / Fluid Loss	9.00				6.40		ml/30Min
Sample Source	FLOWLINE						
Rm @ Measured Temp	0.92 @ 81.0				ohm-m		
Rmf @ Measured Temp	0.74 @ 81.0				ohm-m		
Rmc @ Measured Temp	1.10 @ 81.0				ohm-m		
Source Rmf / Rmc	CALC				CALC		
Rm @ BHT	0.34 @224.0				ohm-m		
Time Since Circulation	1 HOUR						
Max Recorded Temp	224.00				deg F		
Equipment / Base	18086				Casper		
Recorded By	K. SALLER						
Witnessed By	P. BUCKNAM				GEOLOGIST		
WSL	B. MILLER				WSL		

BOREHOLE RECORD			Last Edited: 17-AUG-2014 16:28	
Bit Size inches	Depth From feet		Depth To feet	
6.000	6213.00		14236.00	
CASING RECORD				
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
INTERMED	7.000	1704.00	6213.00	29.00
SURFACE	9.625	0.00	1704.00	40.00

REMARKS
LOGGED WITH WLS 14.01.3220
LOGGED USING MESSENGER SHUTTLE METHOD OF DEPLOYMENT
HARDWARE: MDN: MIS-A SINGLE BOWSPRING USED ABOVE MDN MPD: 4INCH PROFILE PLATE USED, MIS-A SINGLE BOWSPRING USED BELOW MPD CMI: OVER BODY BASKET AND MIS-D BASKETS PLACED ABOVE AND BELOW FOR CENTRALIZATION SGS: RAN BELOW CMI. ECCENTRALIZED WITH SKJ.
2.71 G/CC DENSITY MATRIX USED TO CALCULATE POROSITY
ALL INTERVALS LOGGED AND SCALED PER CUSTOMER'S REQUEST
LONGITUDE: -103.871036 LATITUDE: 40.830142

DRILL PIPE DEPTH DURING DEPLOYMENT: 14,112 FEET
LOGGING TOOL DEPTH AFTER DEPLOYMENT: 14,216 FEET

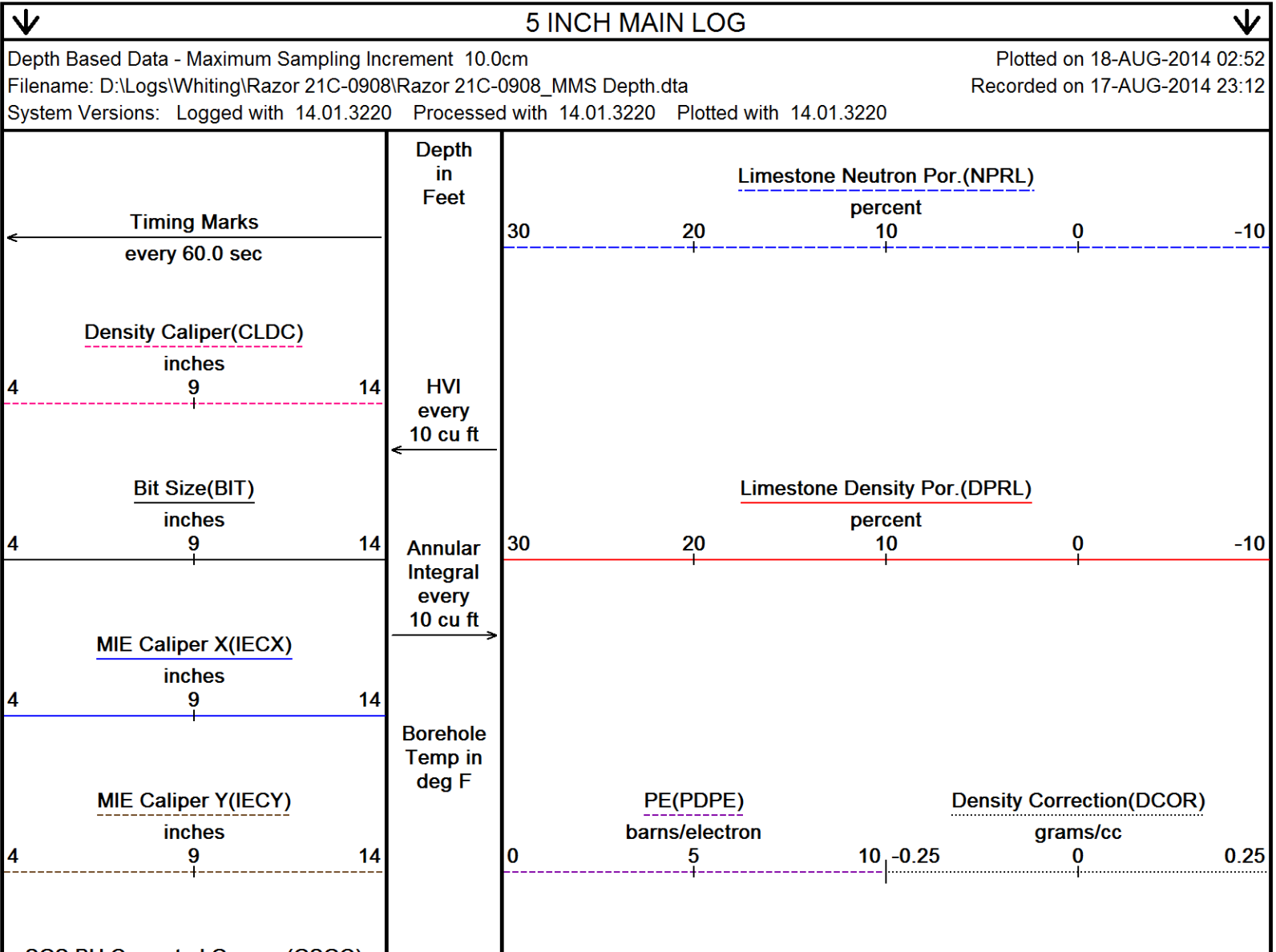
ROTATED LAST 23 STANDS DOWN AT 15RPM TO REACH TD - EXCESSIVE STICK/SLIP SEEN WHEN NOT ROTATING
ROTATING 15RPM FOR FIRST 1500FT WHILE LOGGING DUE TO EXCESSIVE STICK/SLIP OFF BOTTOM IN ATTEMPT TO IMPROVE
MICRO-IMAGER DATA.

ANNULAR HOLE VOLUME FROM TD TO 7"-29# CASING AT 6209 FEET = 675 CUBIC FEET.
TOTAL HOLE VOLUME FROM TD TO 7"-29# CASING AT 6209 FEET = 1560 CUBIC FEET.

OPERATORS: S.LANDON, J. GERDES

RIG:CADE 23

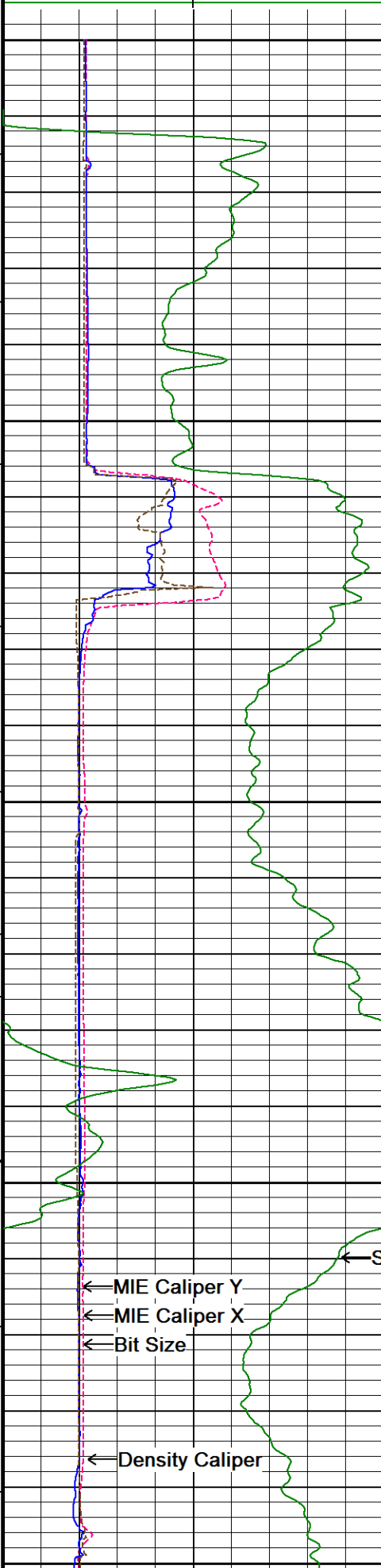
In interpreting, communicating or providing information and/or making recommendations, either written or oral, as to logs or test or other data, type or amount of material, or Work or other service to be furnished, or manner of performance, or in predicting results to be obtained, the Contractor will 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.



SGS BH Corrected Gamma(GSGC)

API		
0	75	150
150	225	300

Replay
Scale
1:240



6150

209°

6200
Casing
Shoe

209°

6250

209°

6300

← SGS BH Corrected Gamma

← MIE Caliper Y

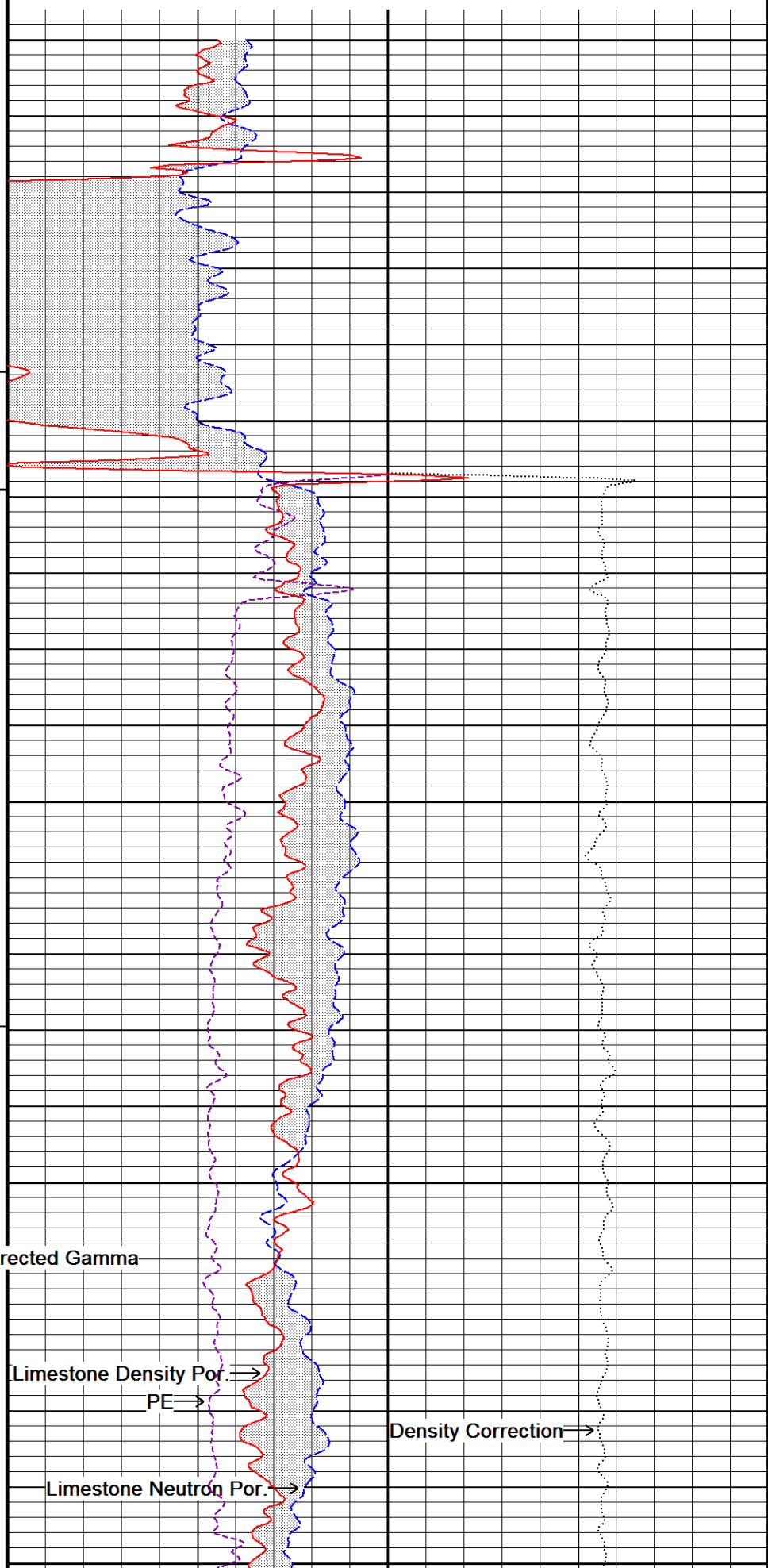
← MIE Caliper X

← Bit Size

← Density Caliper

209°

6350

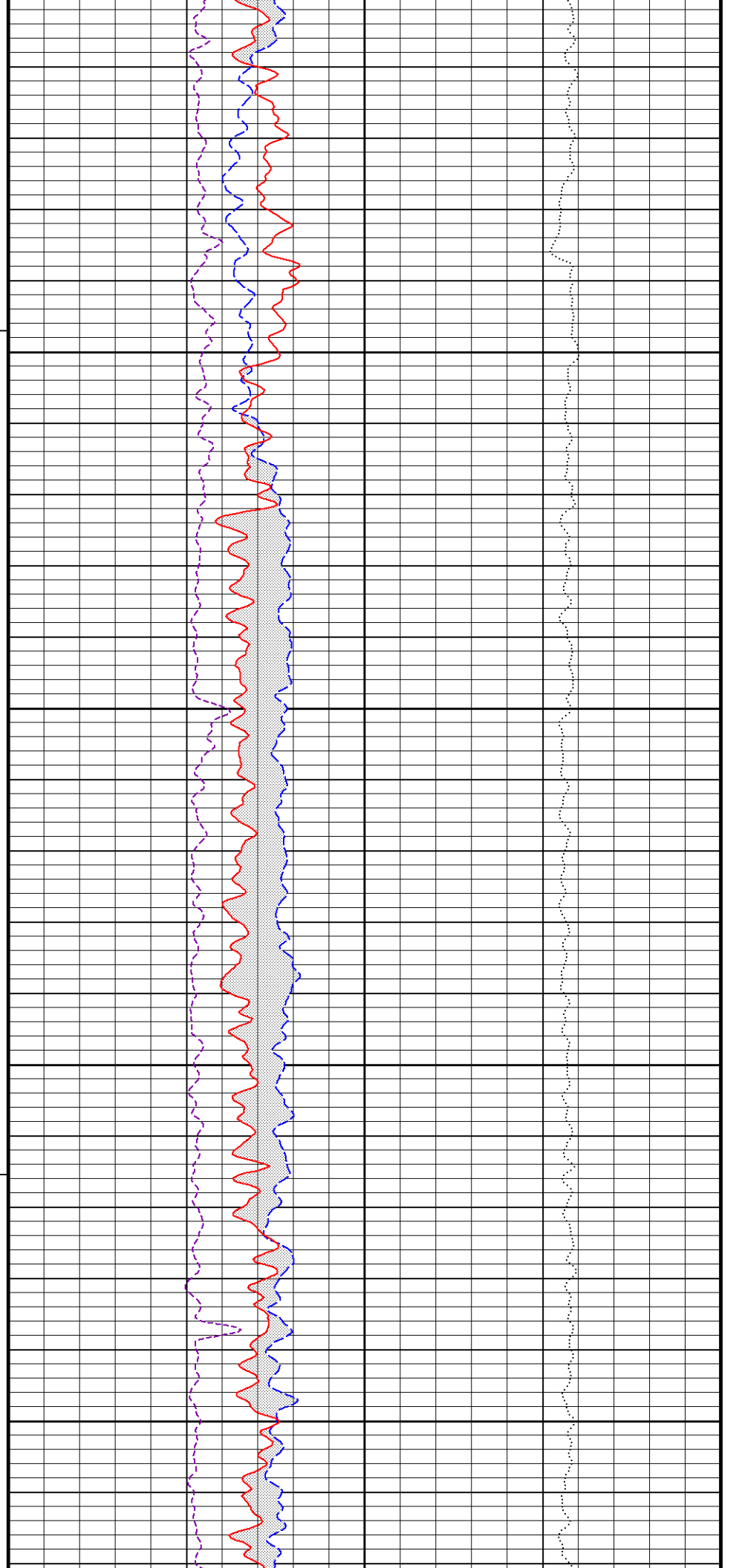
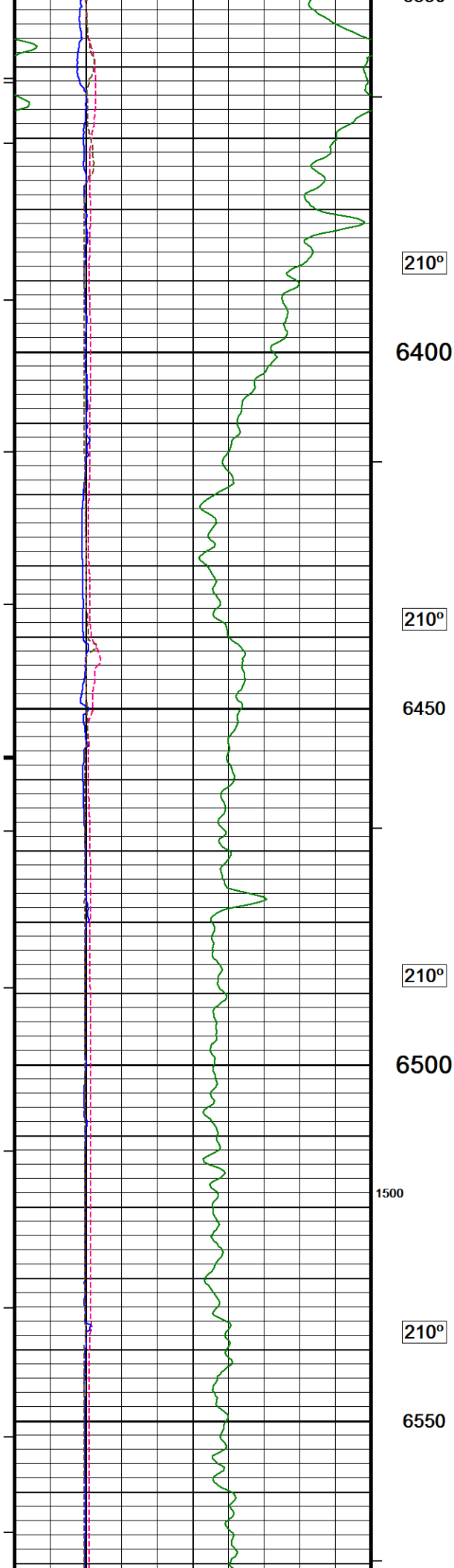


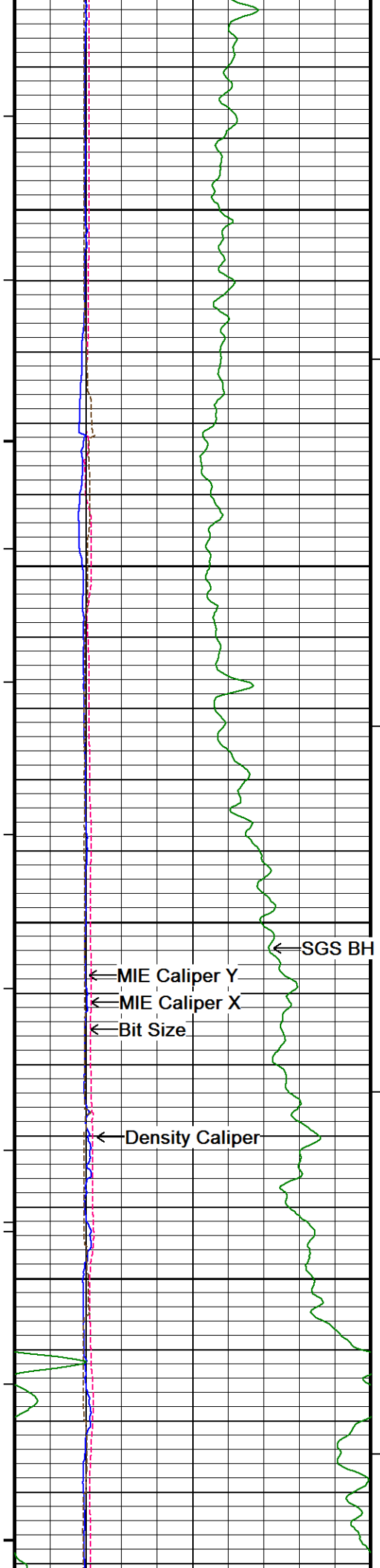
Limestone Density Por. →

PE →

Density Correction →

Limestone Neutron Por. →





211°

6600

211°

6650

211°

6700

211°

6750

211°

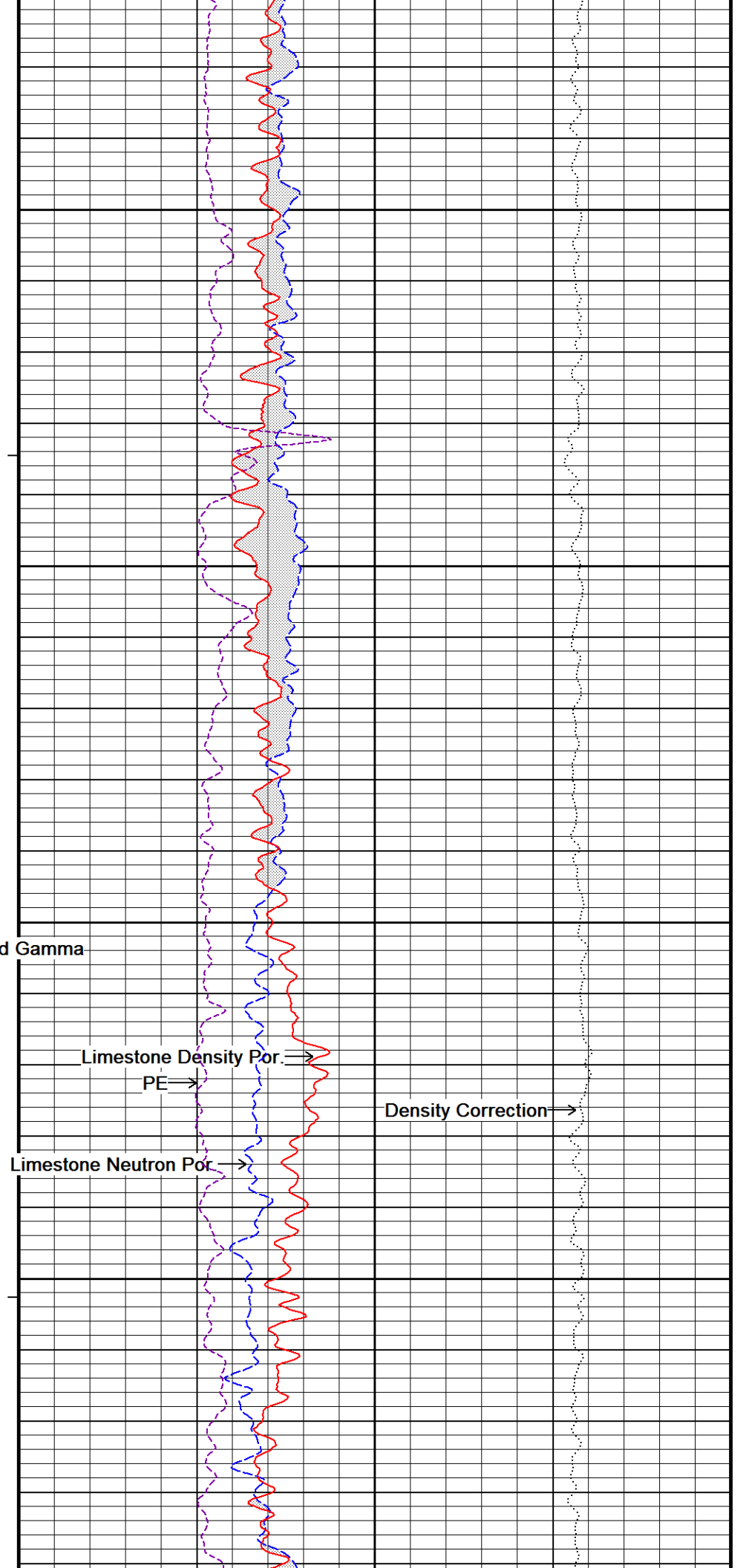
← SGS BH Corrected Gamma

← MIE Caliper Y

← MIE Caliper X

← Bit Size

← Density Caliper

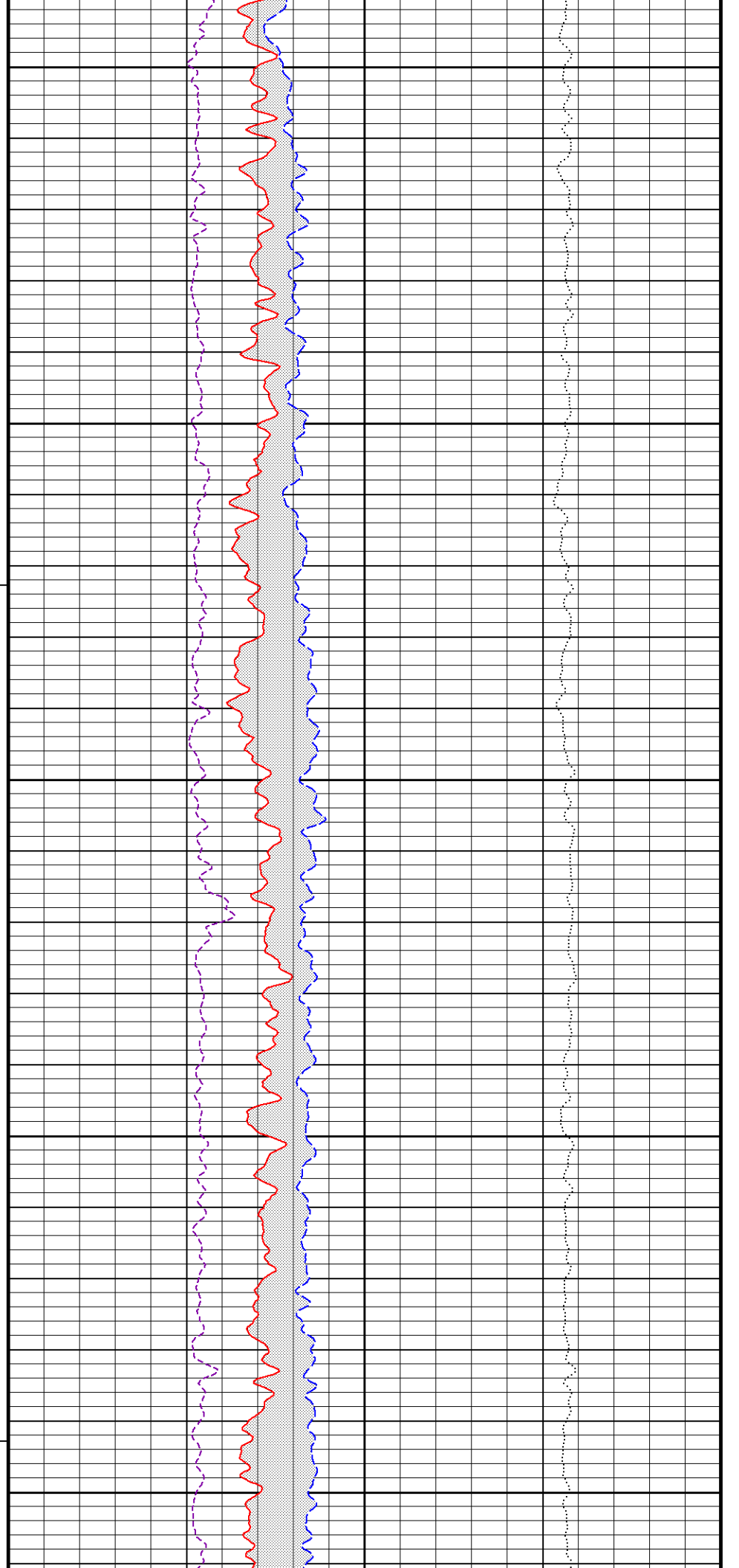
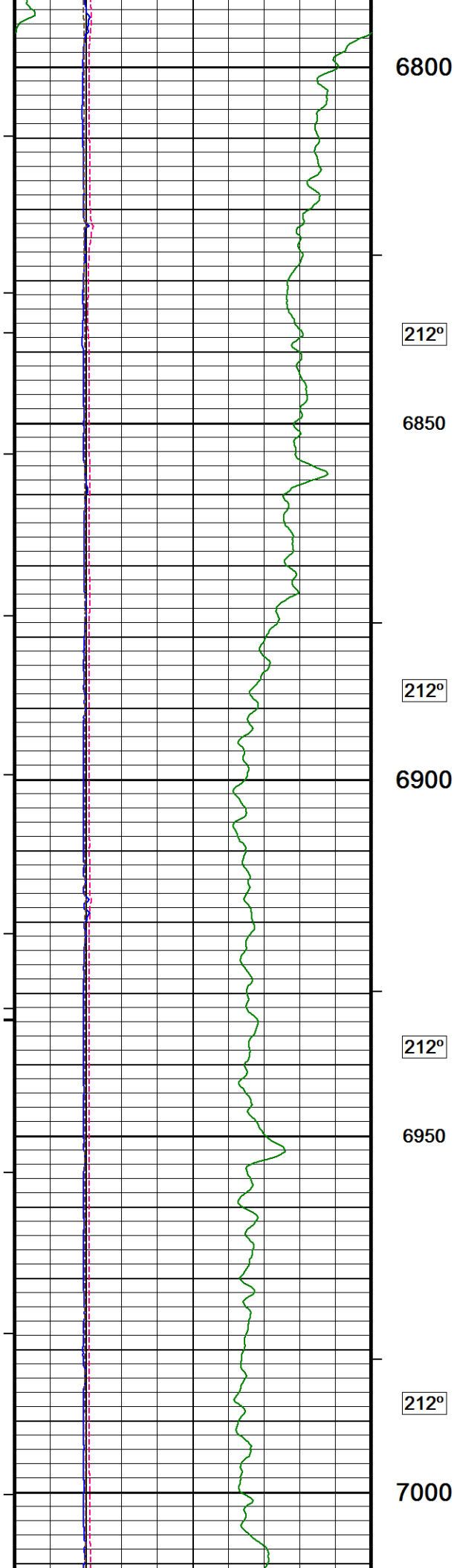


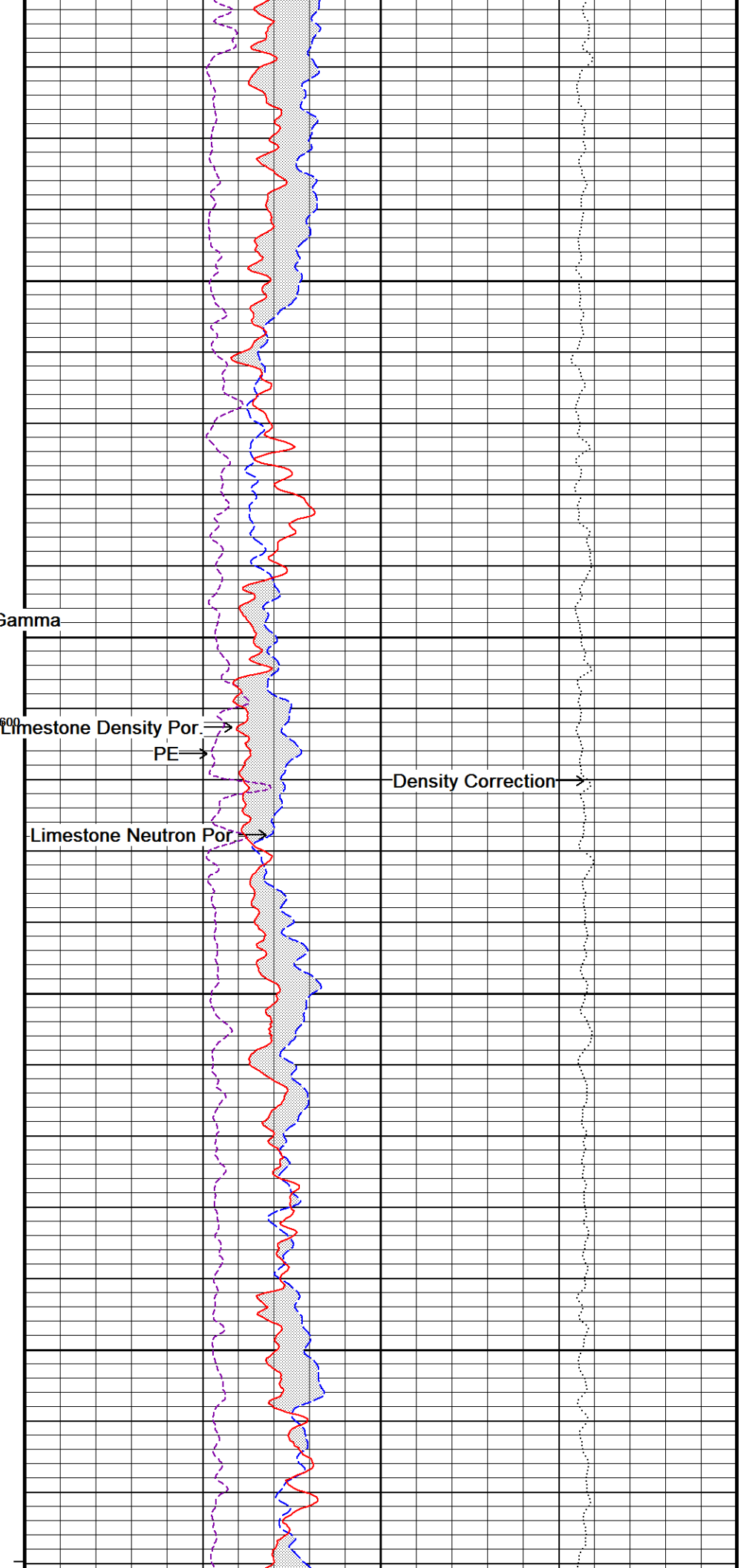
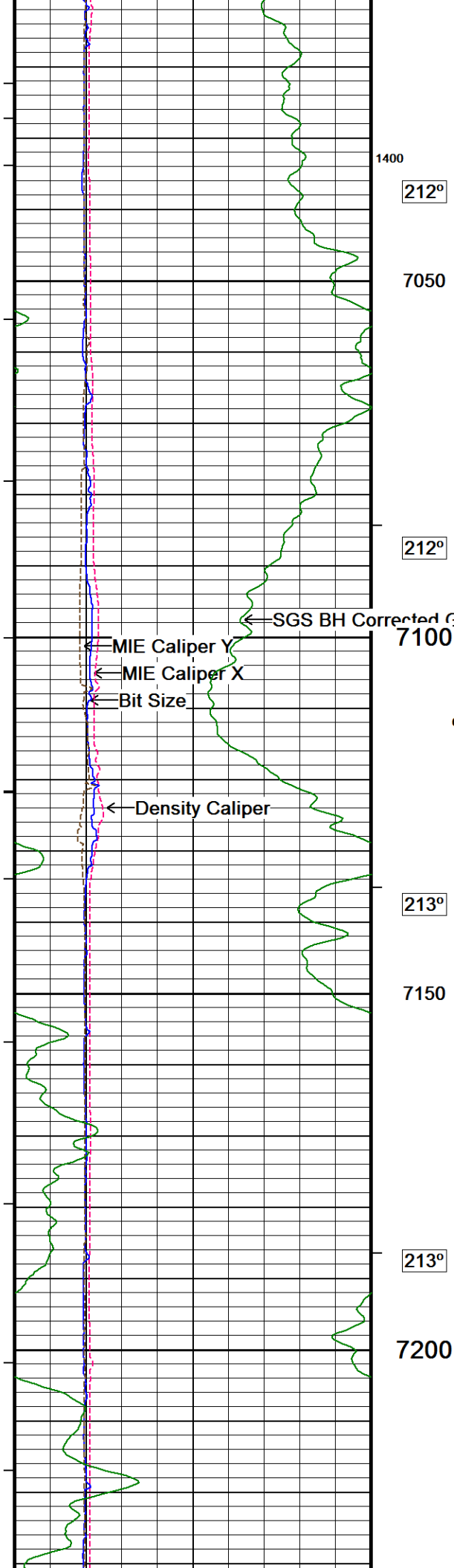
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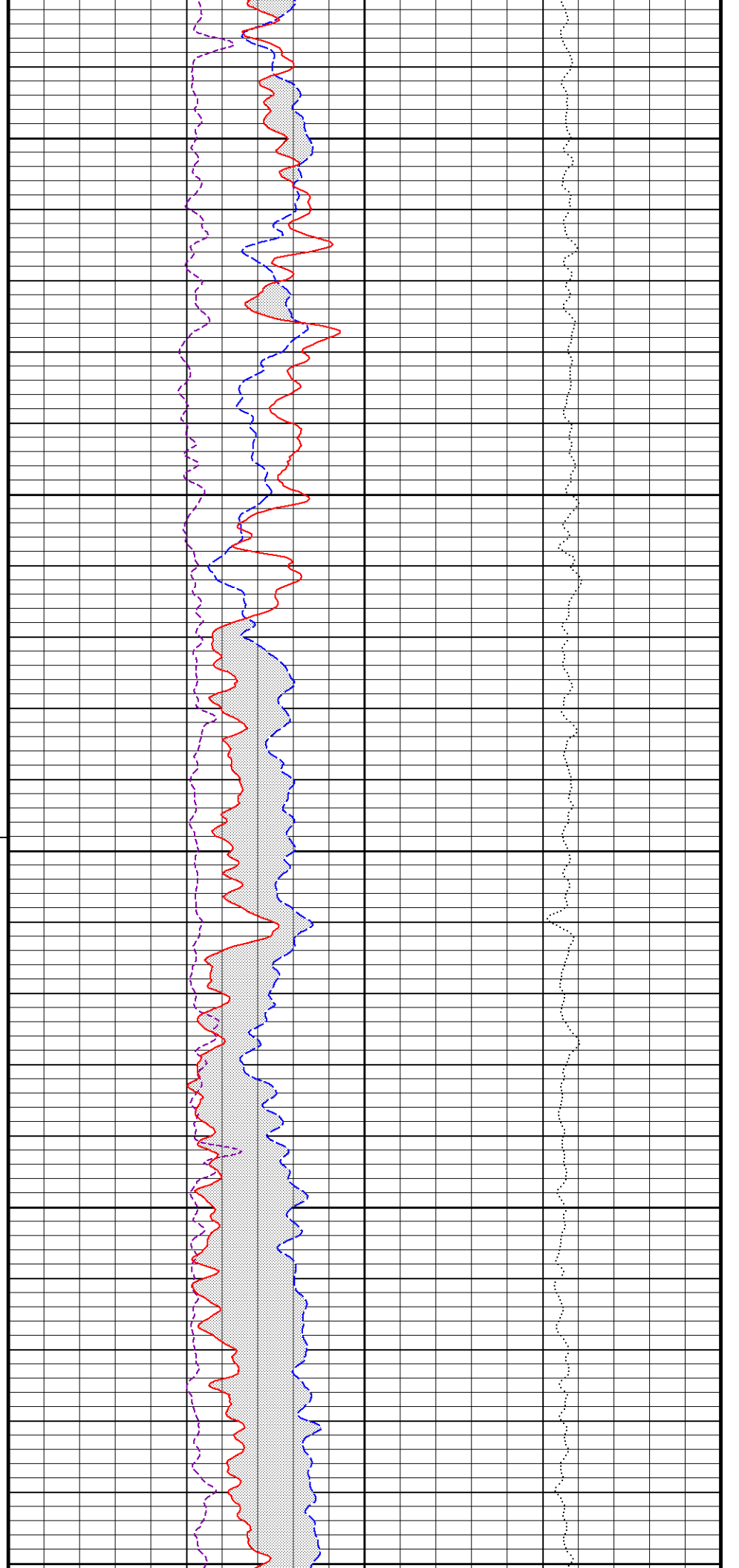
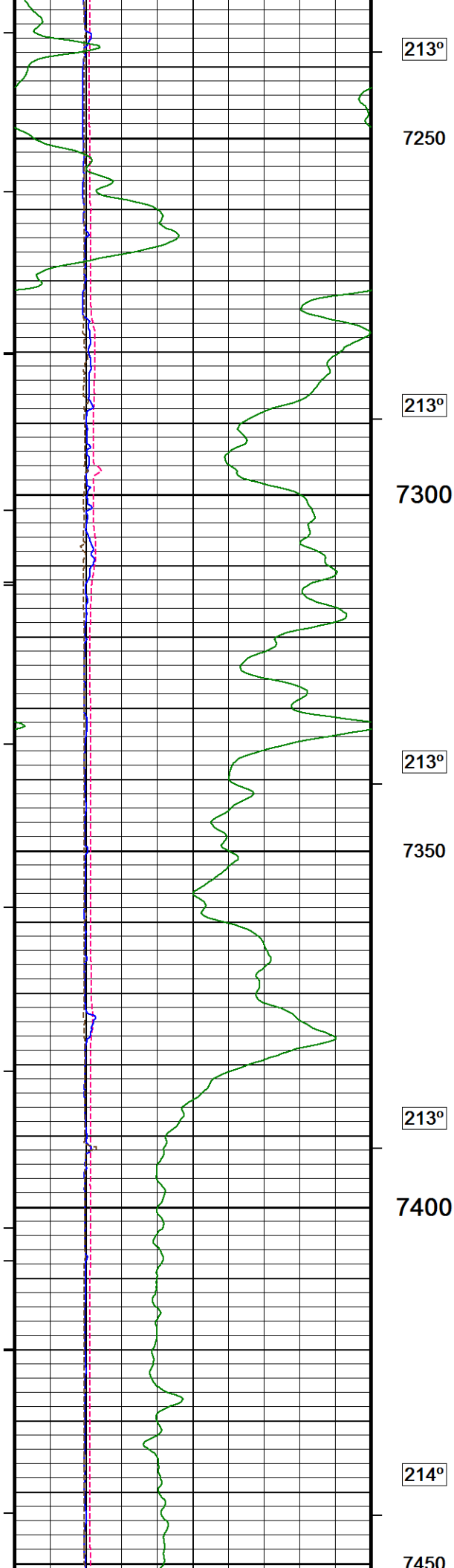
PE →

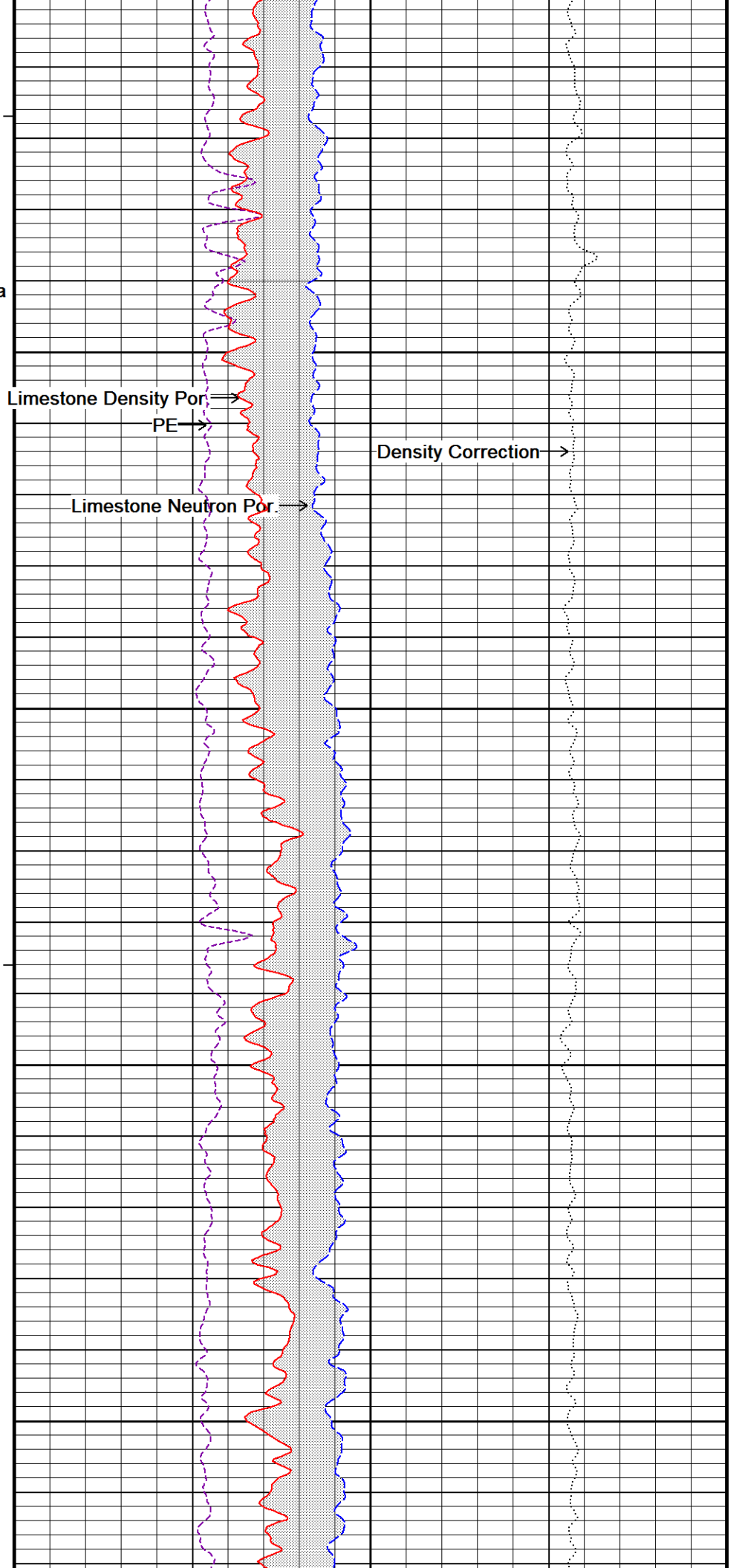
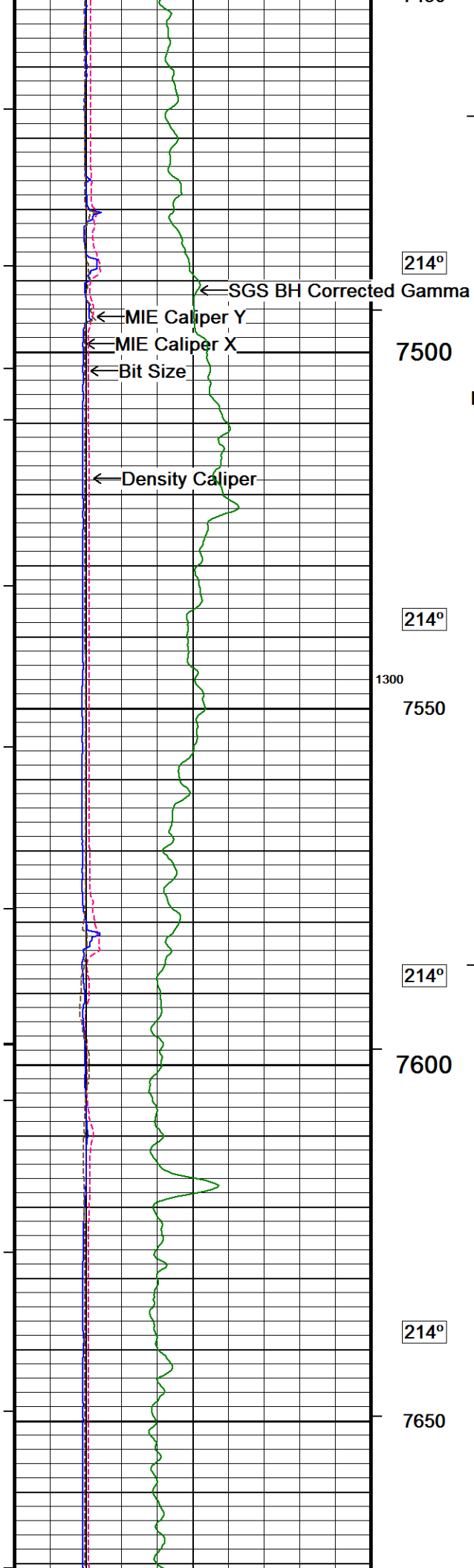
Limestone Neutron Por. →

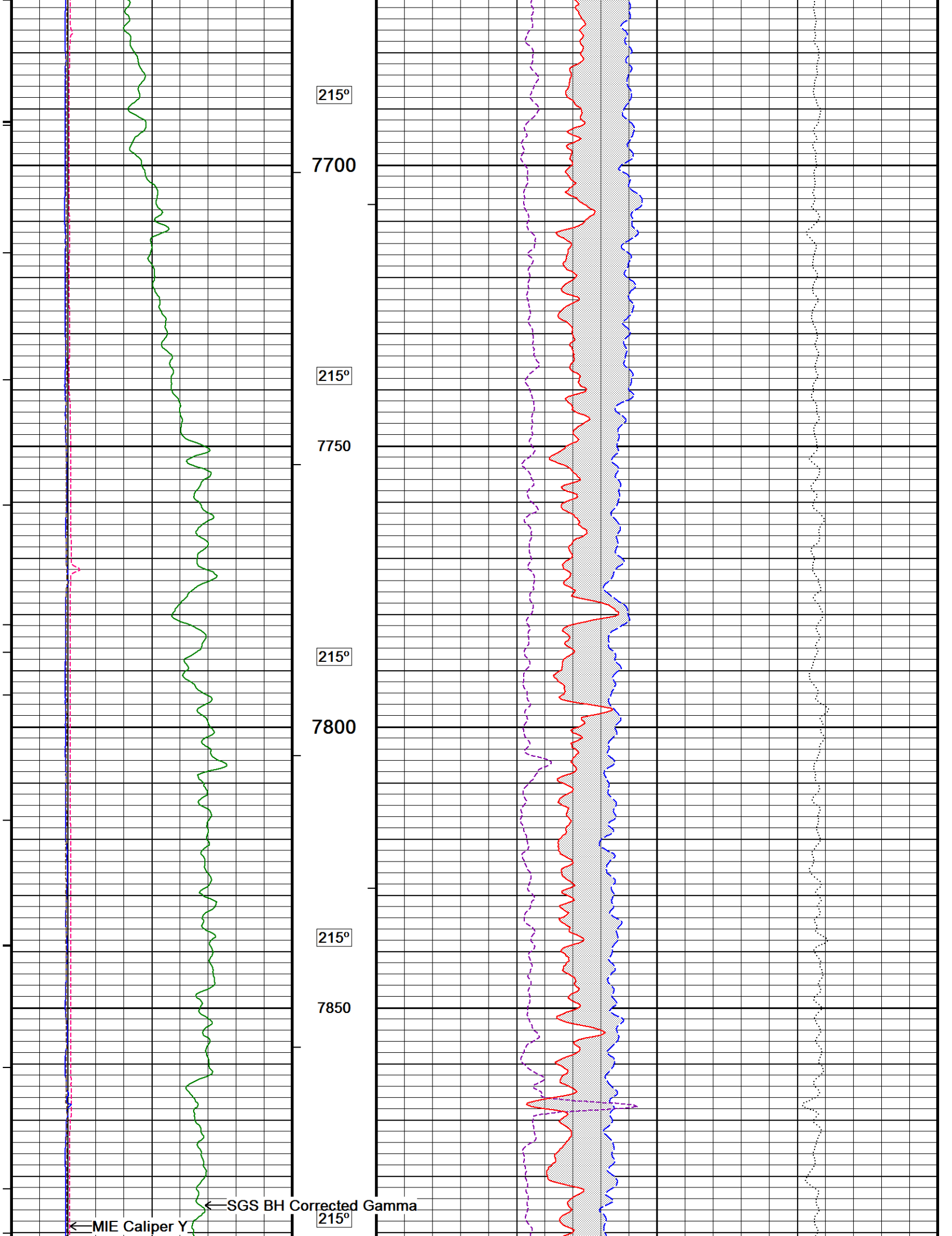
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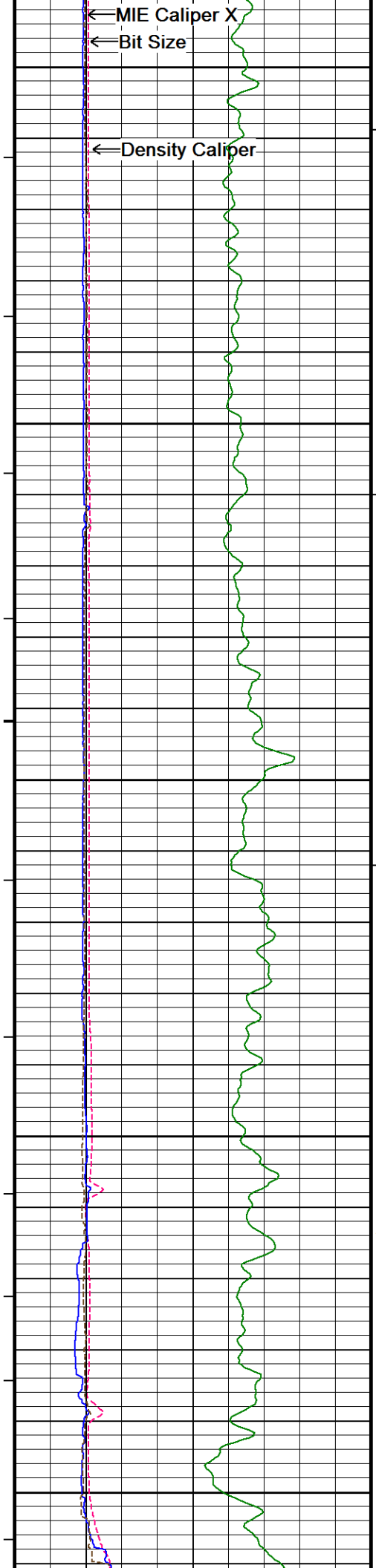




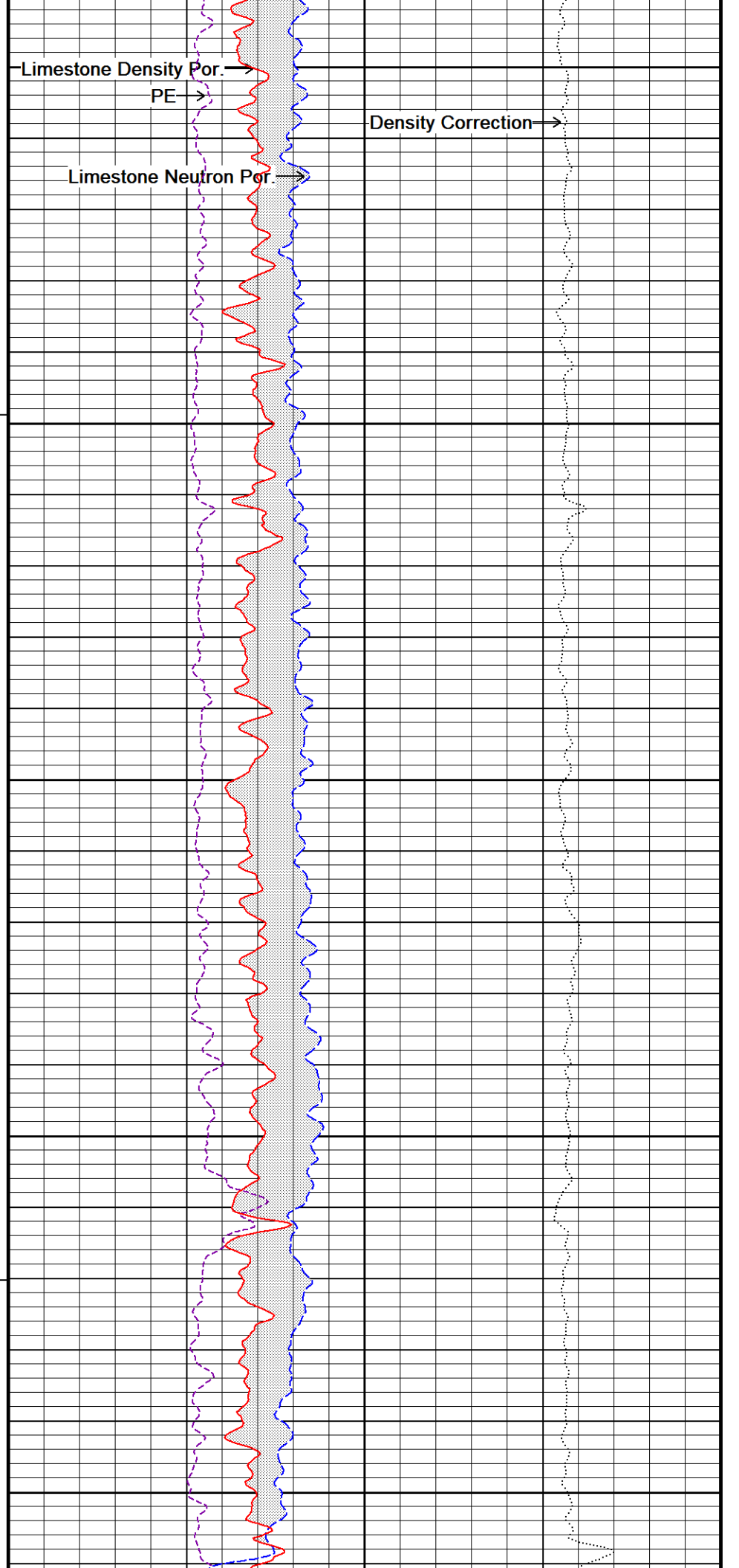


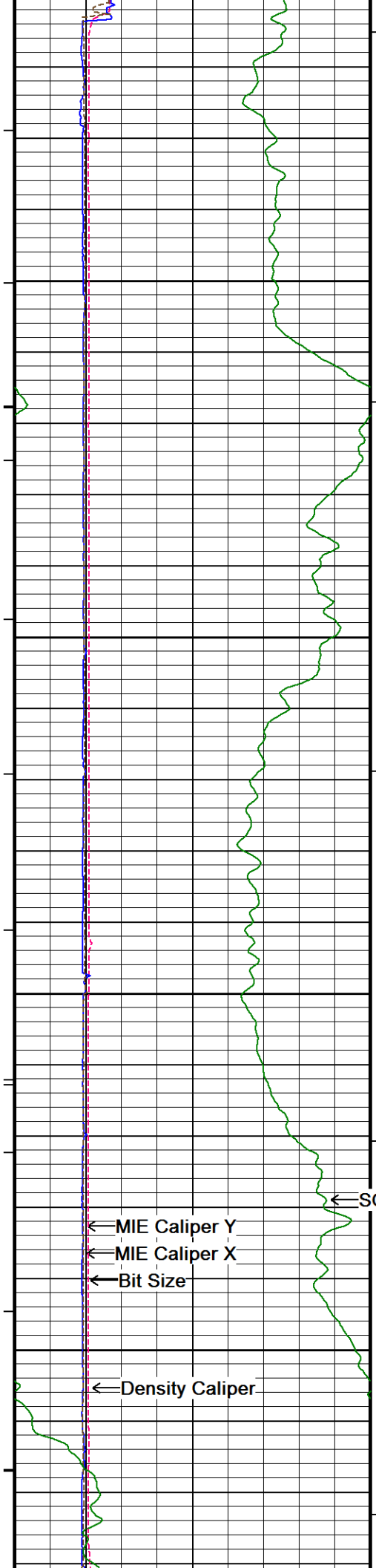






7900
215°
7950
215°
8000
215°
8050
1200
215°
8100





216°

8150

216°

8200

216°

8250

← SGS BH Corrected Gamma

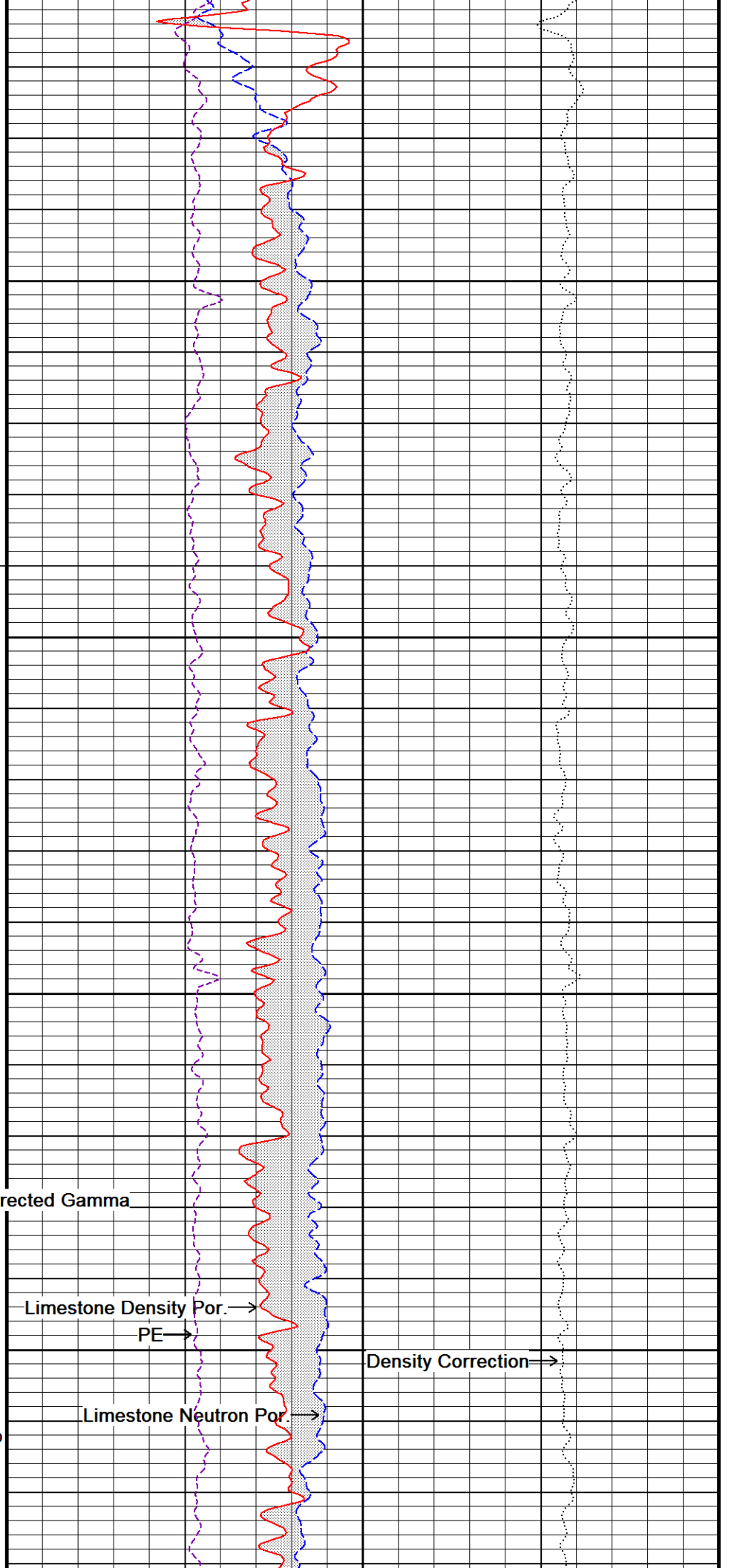
216°

← MIE Caliper Y
← MIE Caliper X
← Bit Size

8300

← Density Caliper

500

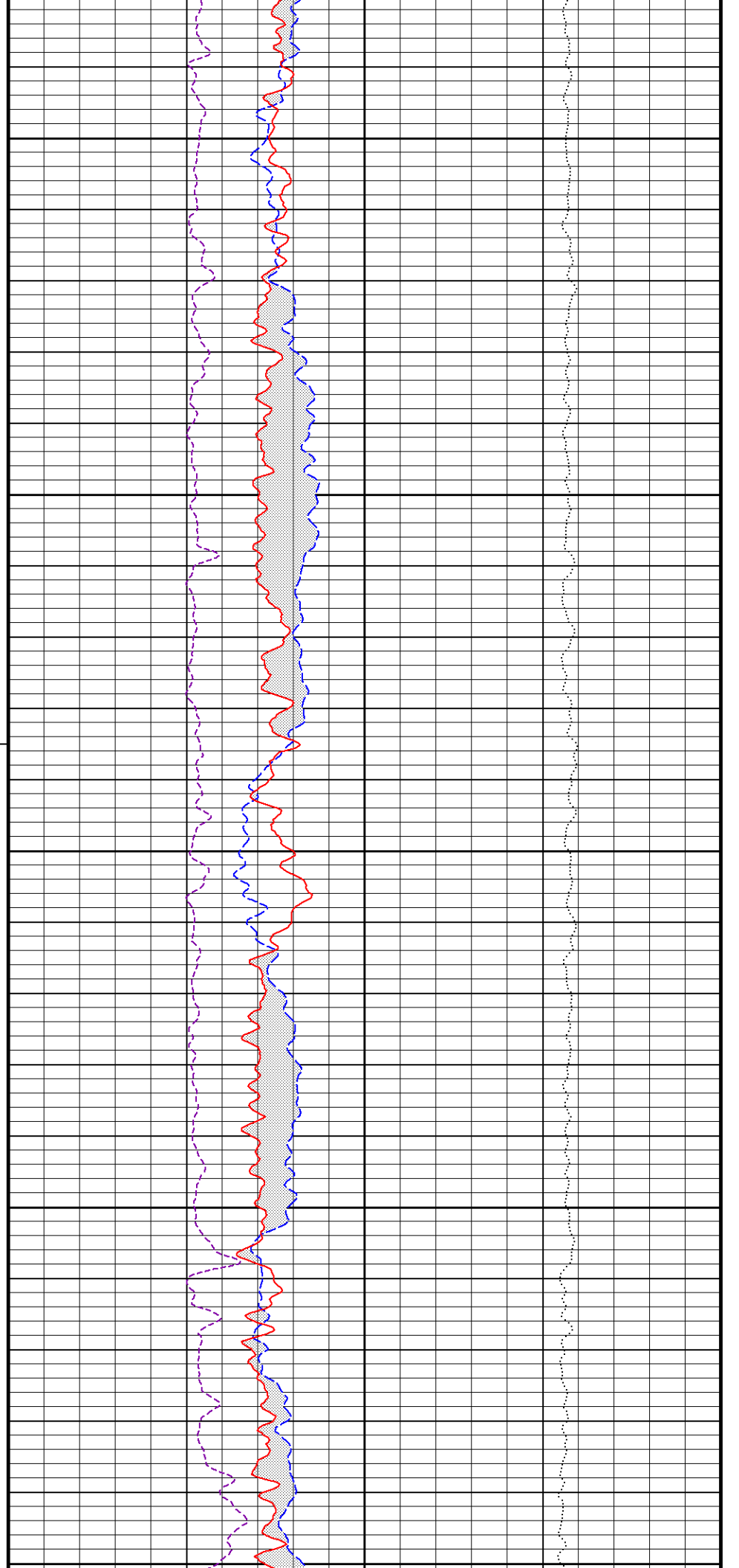
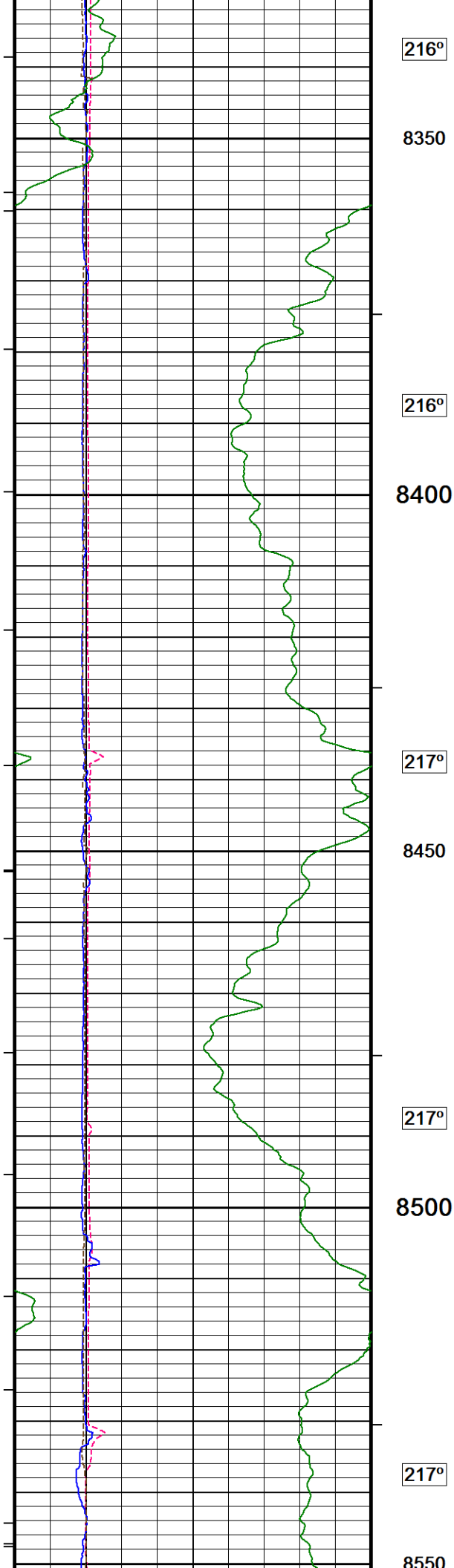


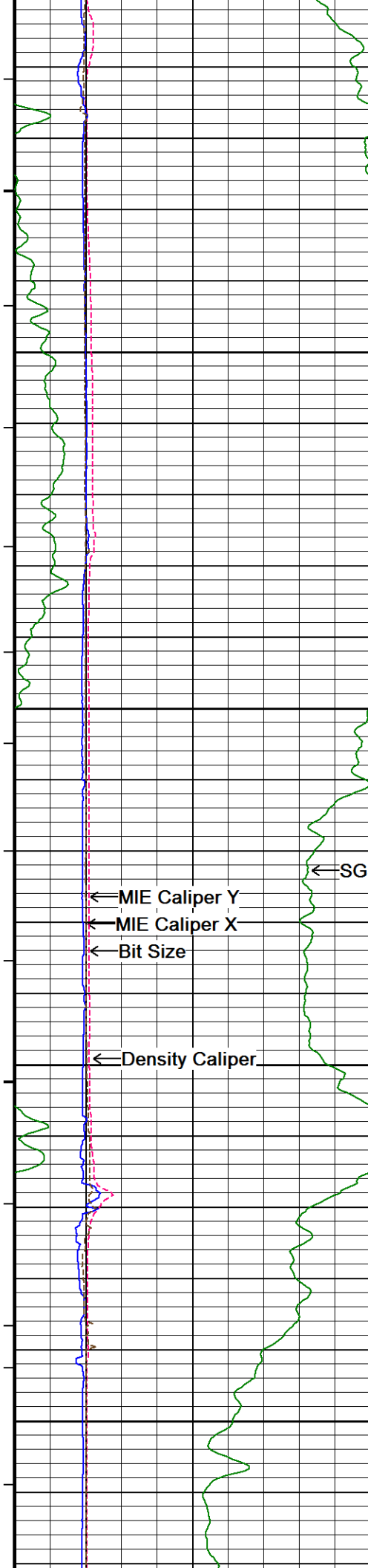
Limestone Density Por. →

PE →

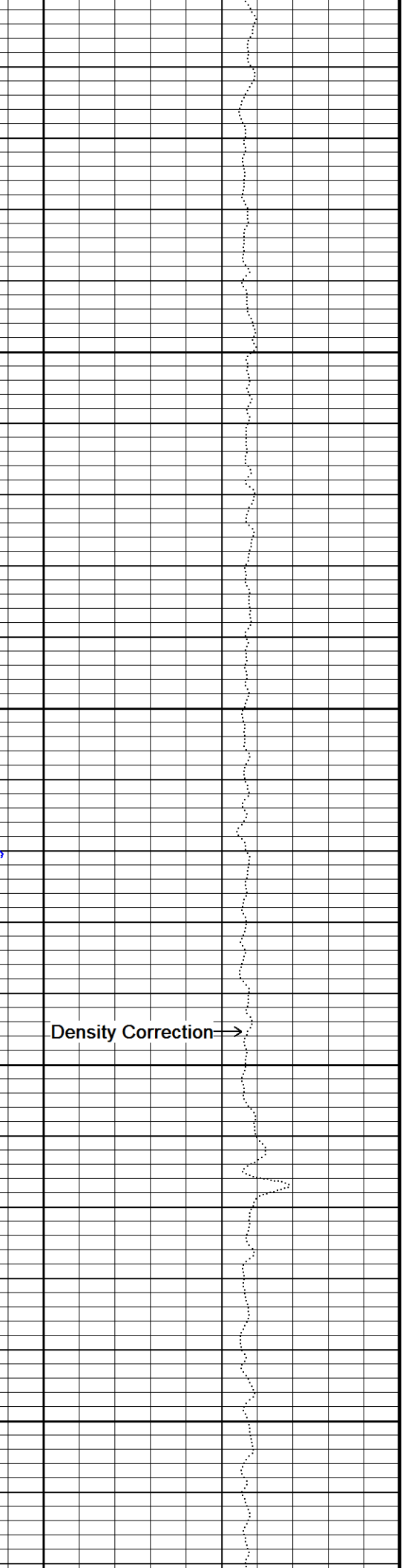
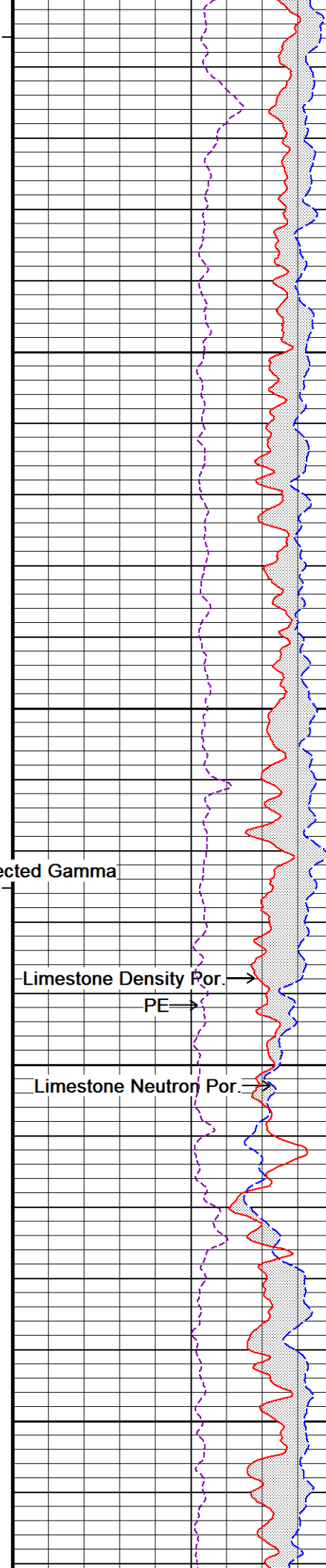
Limestone Neutron Por. →

Density Correction →





1100
217°
8600
217°
8650
217°
8700
217°
8750



←SGS BH Corrected Gamma

←MIE Caliper Y
←MIE Caliper X
← Bit Size

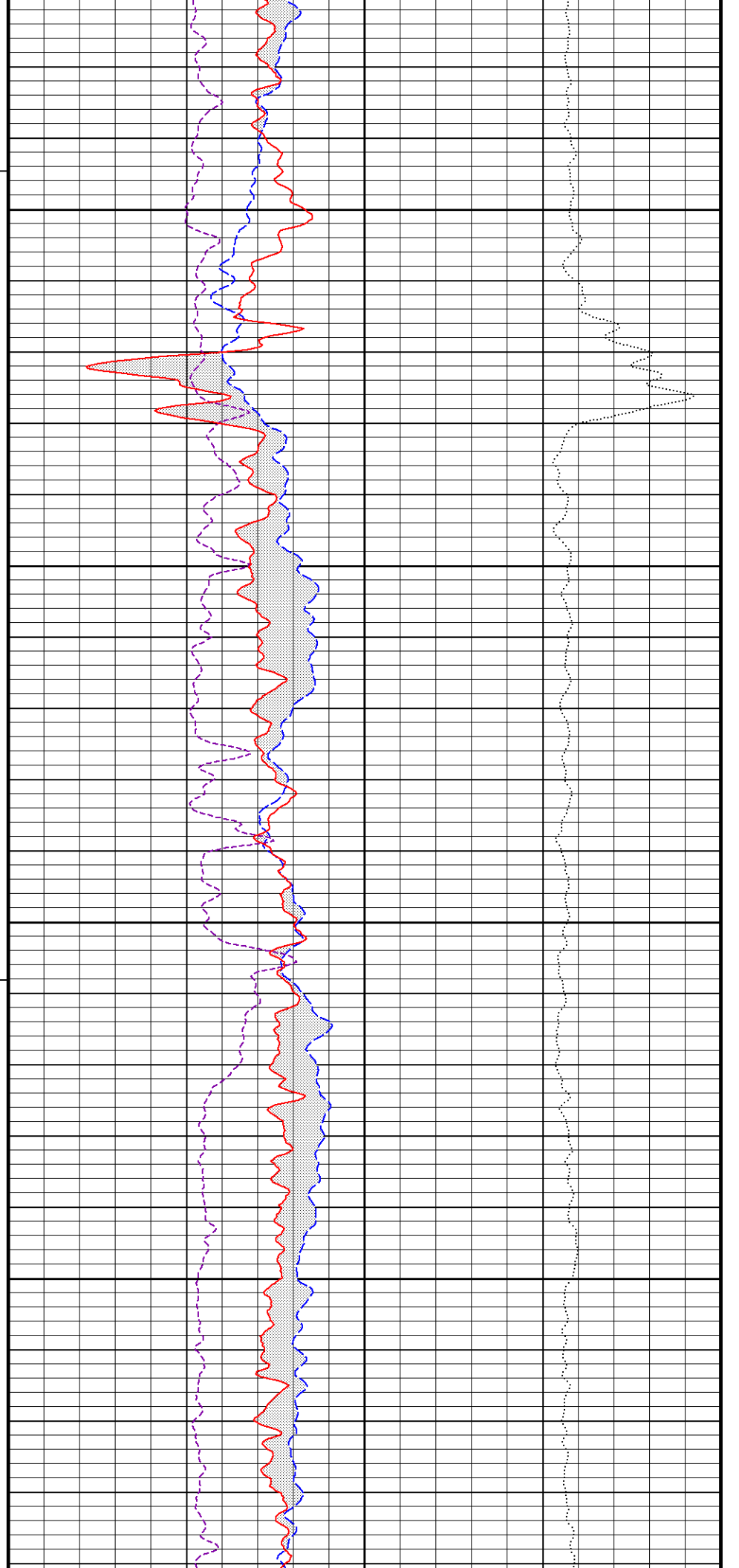
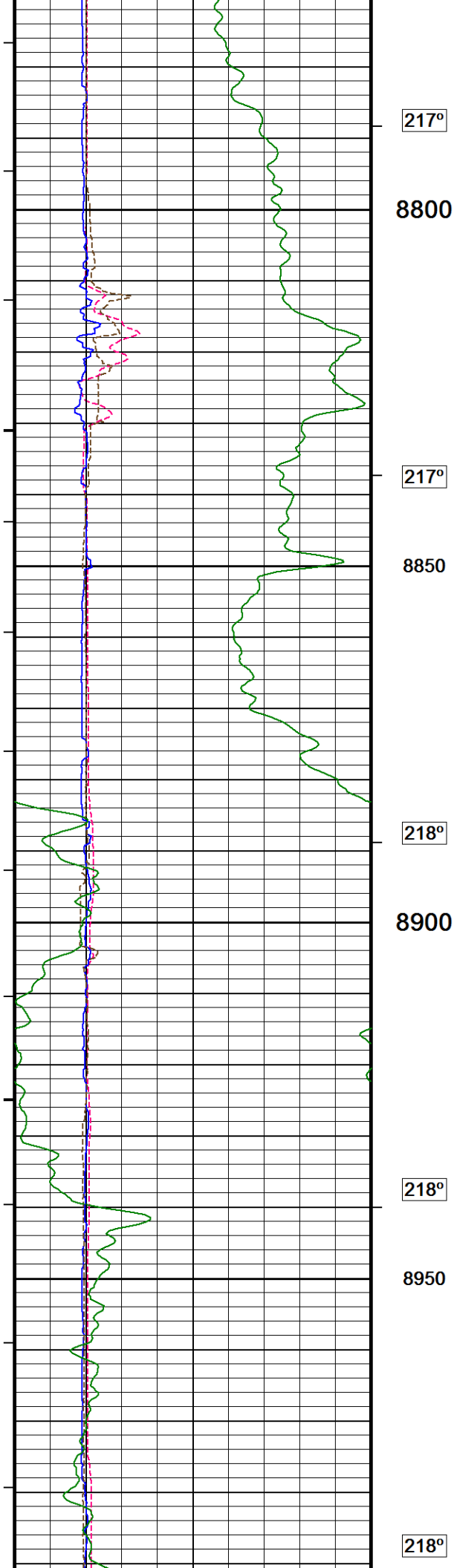
←Density Caliper

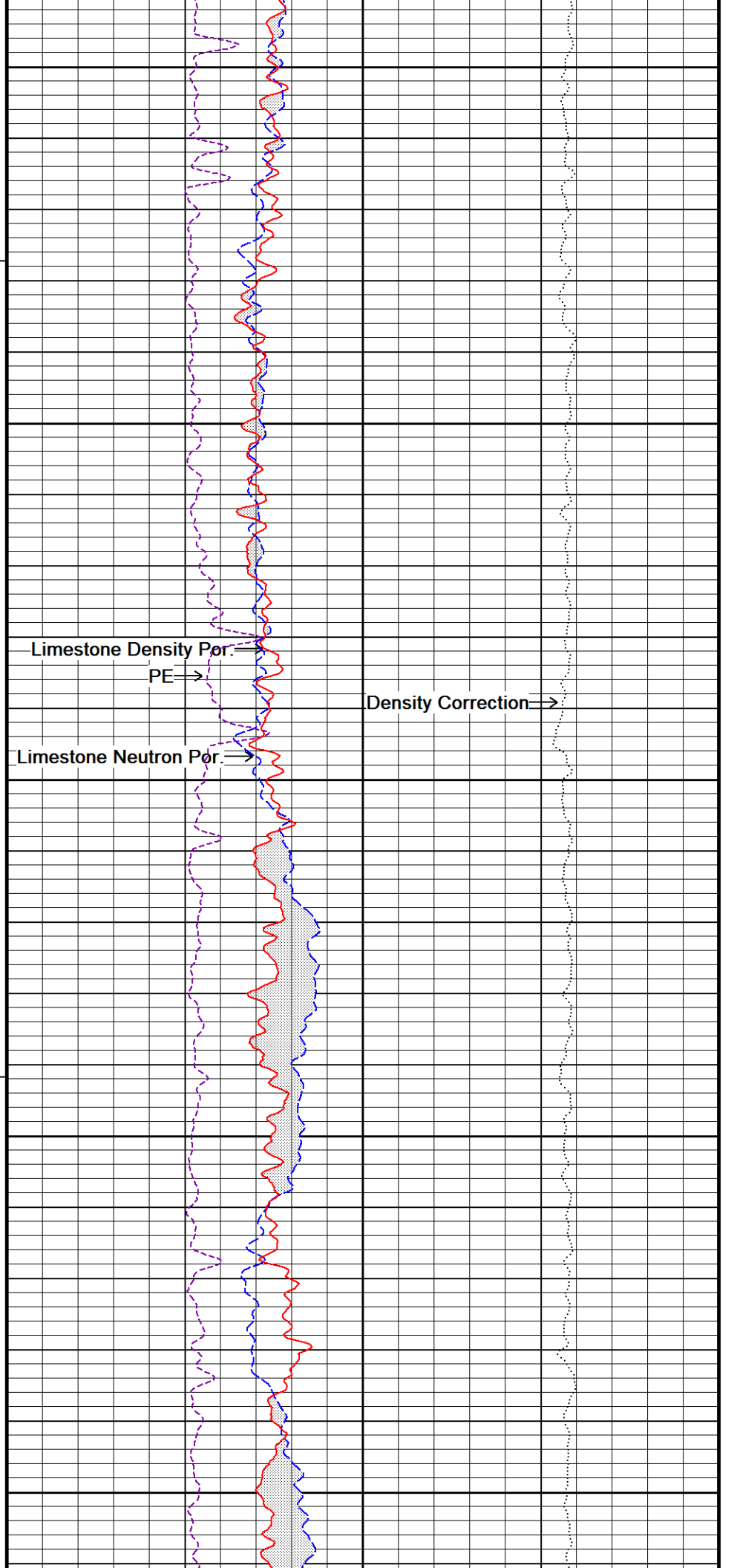
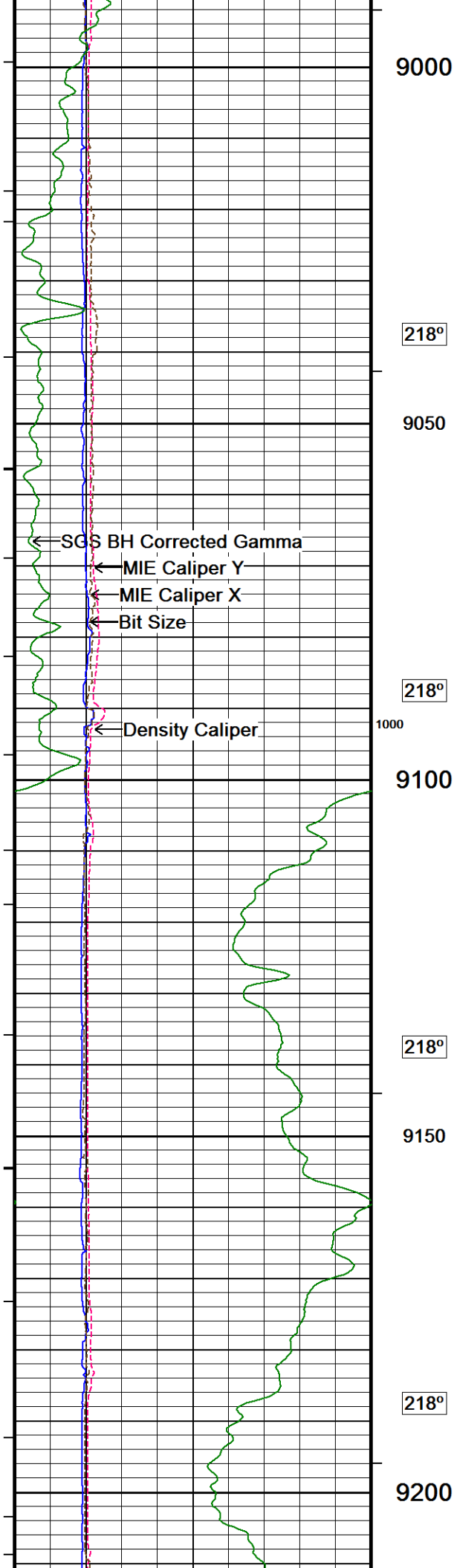
Limestone Density Por. →

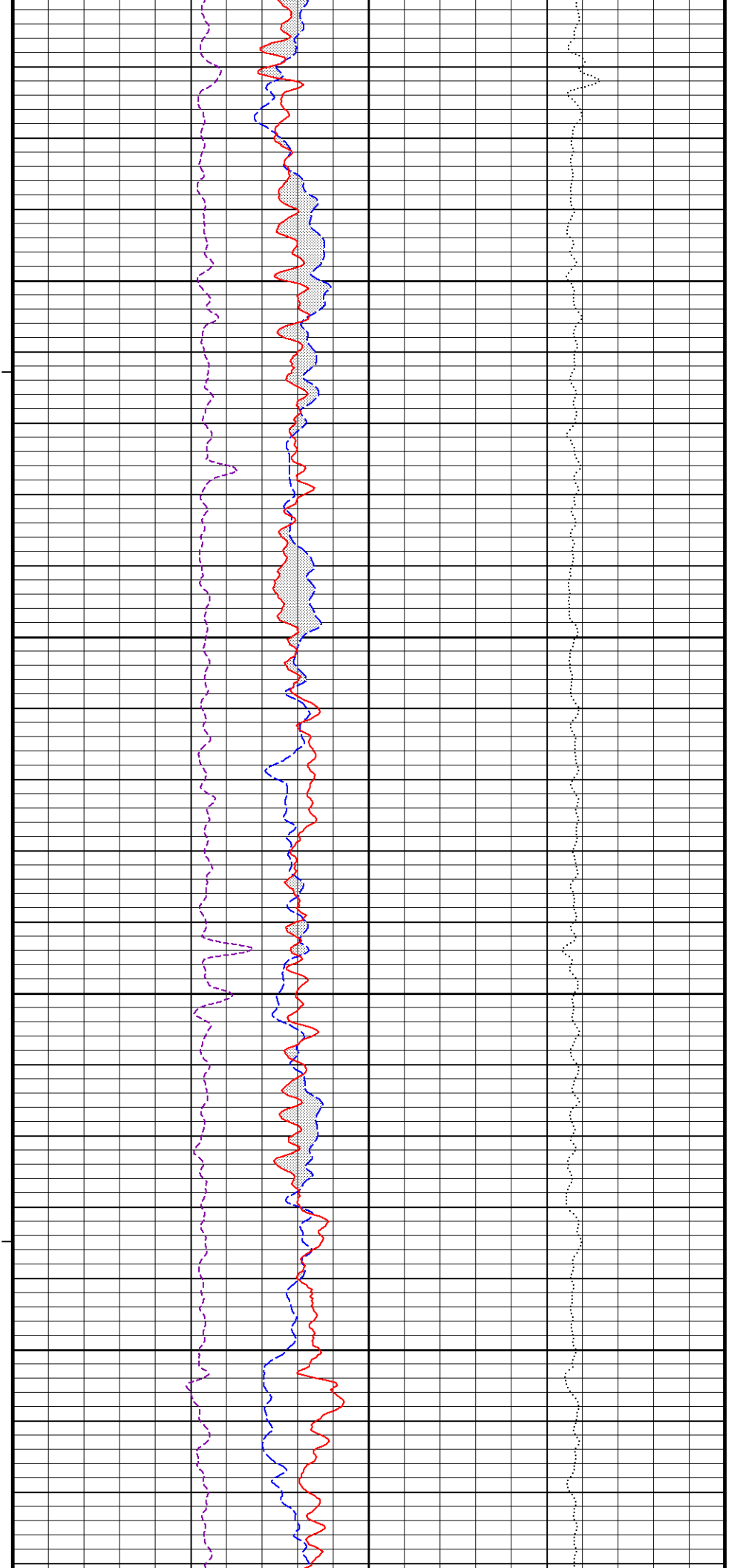
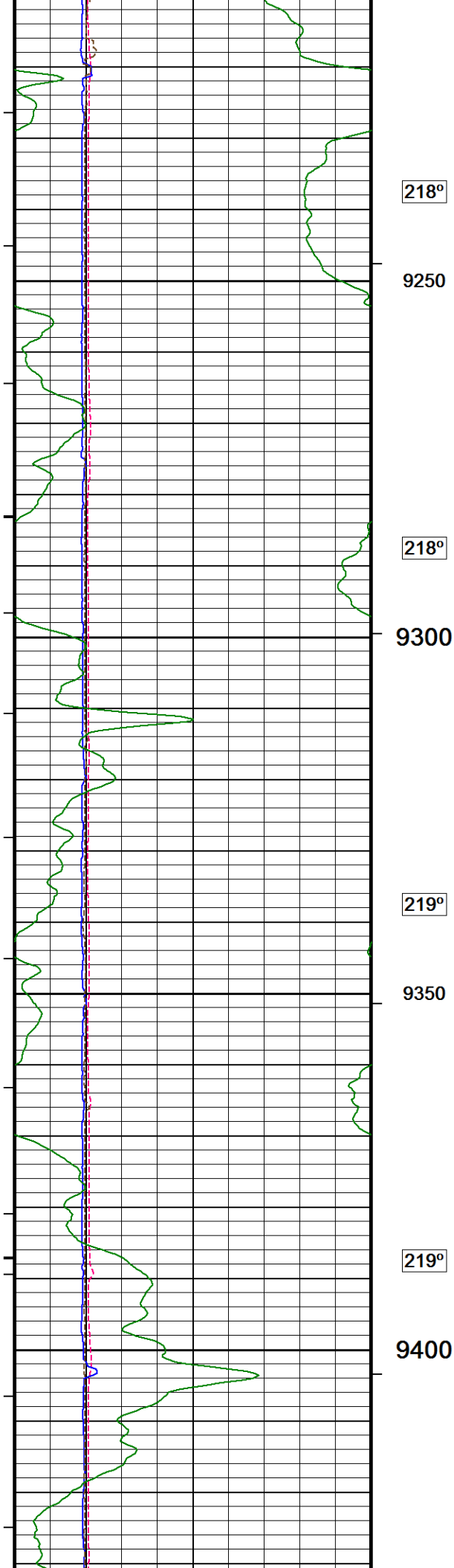
PE →

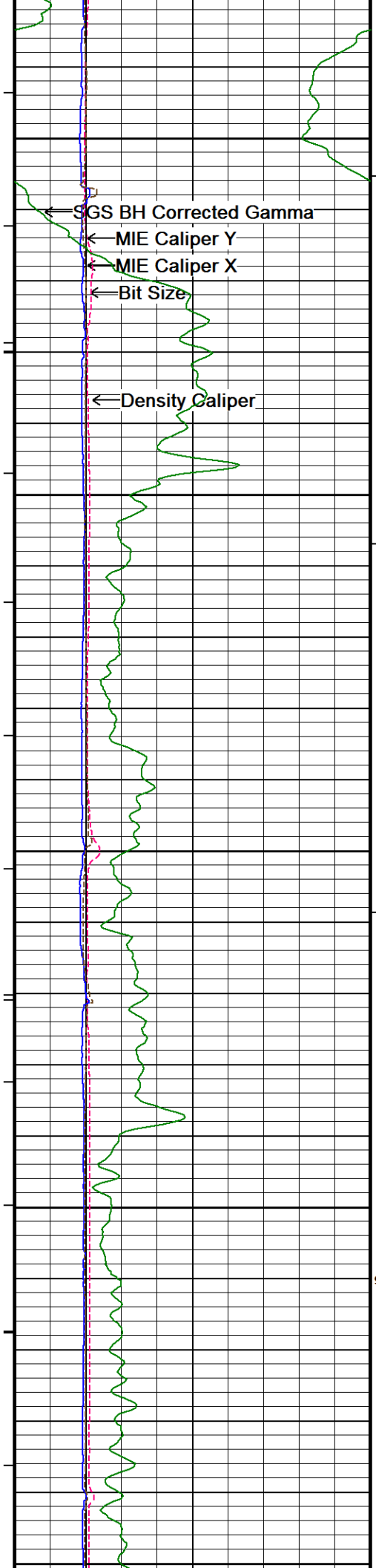
Density Correction →

Limestone Neutron Por. →

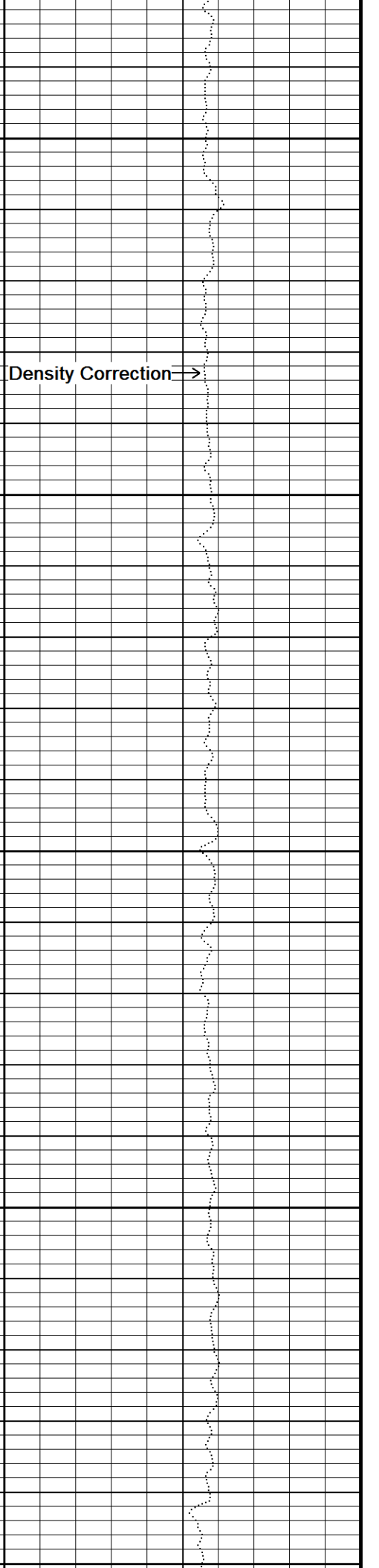
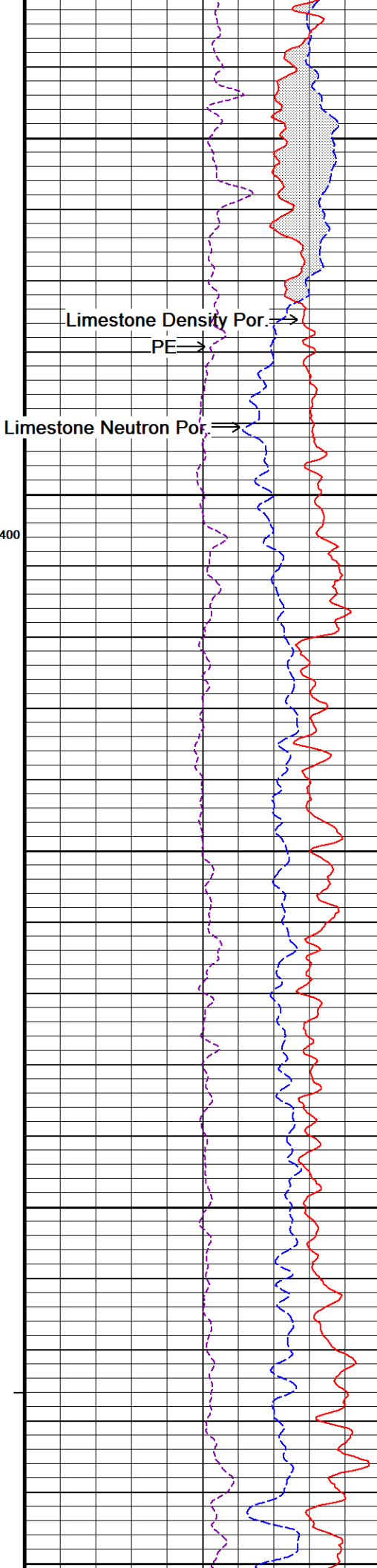


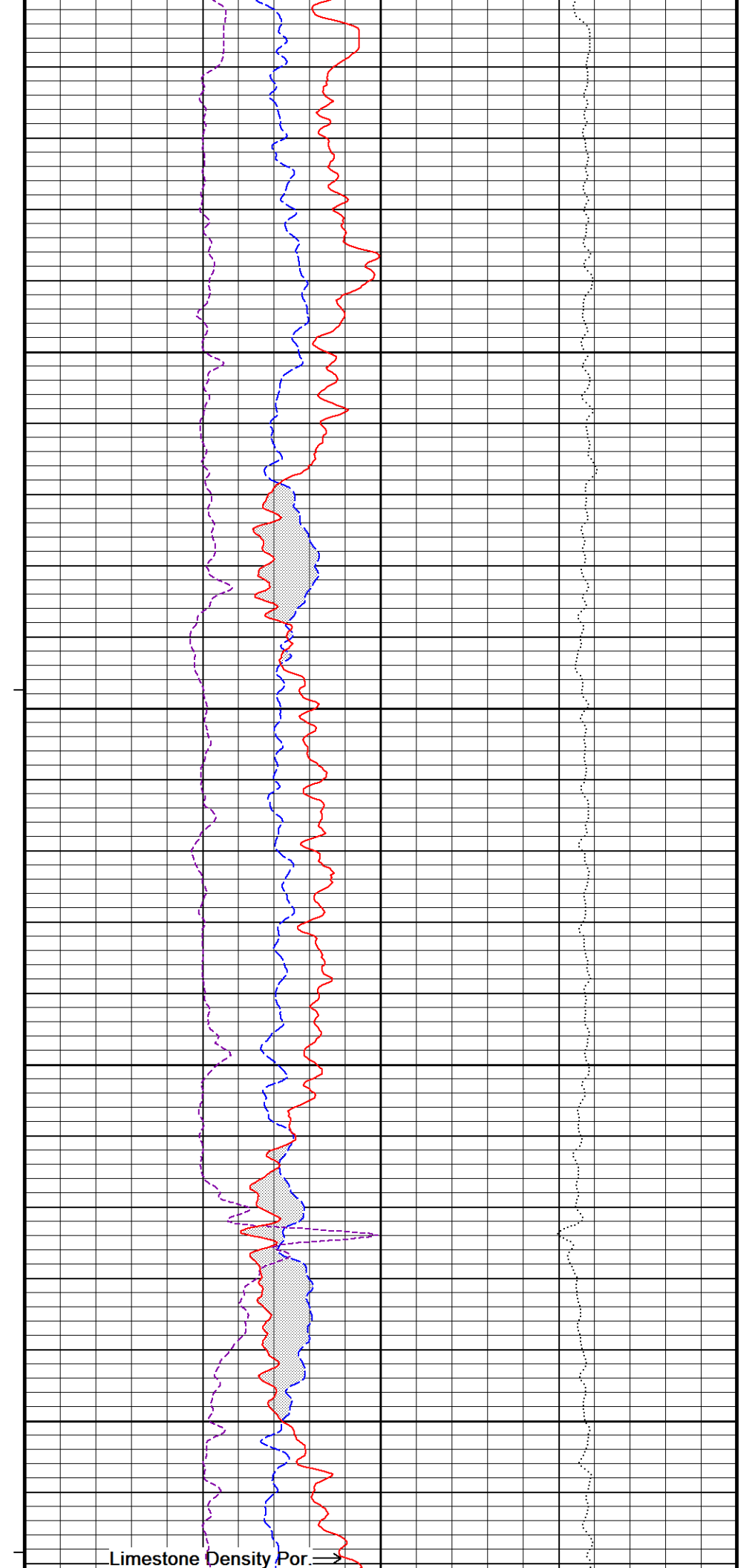
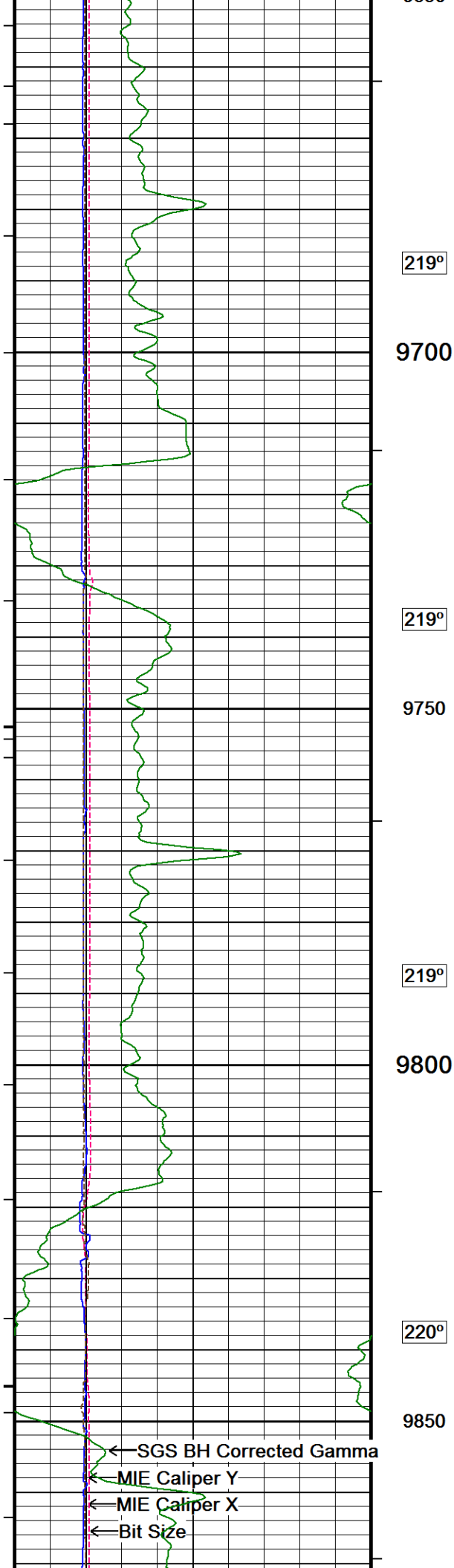


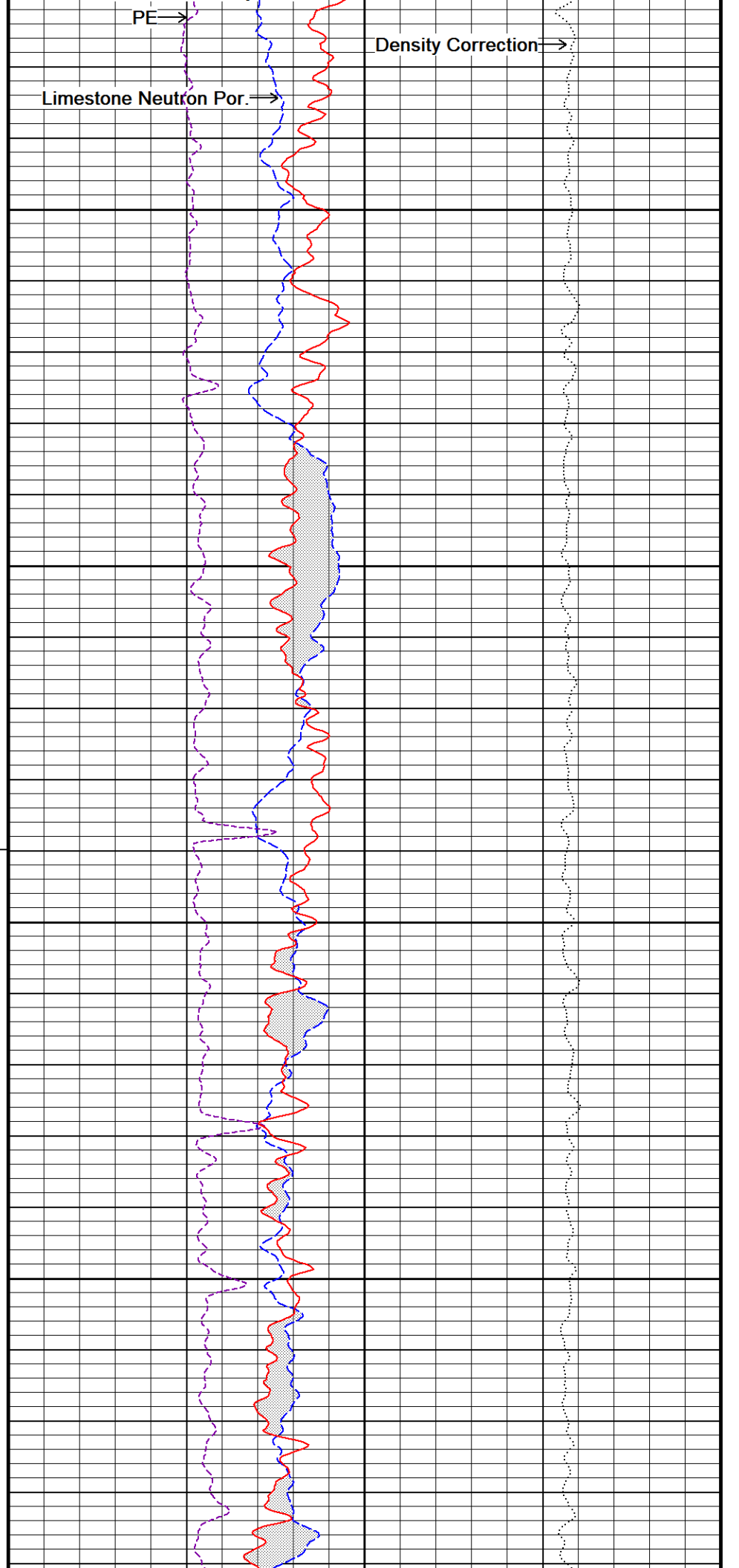
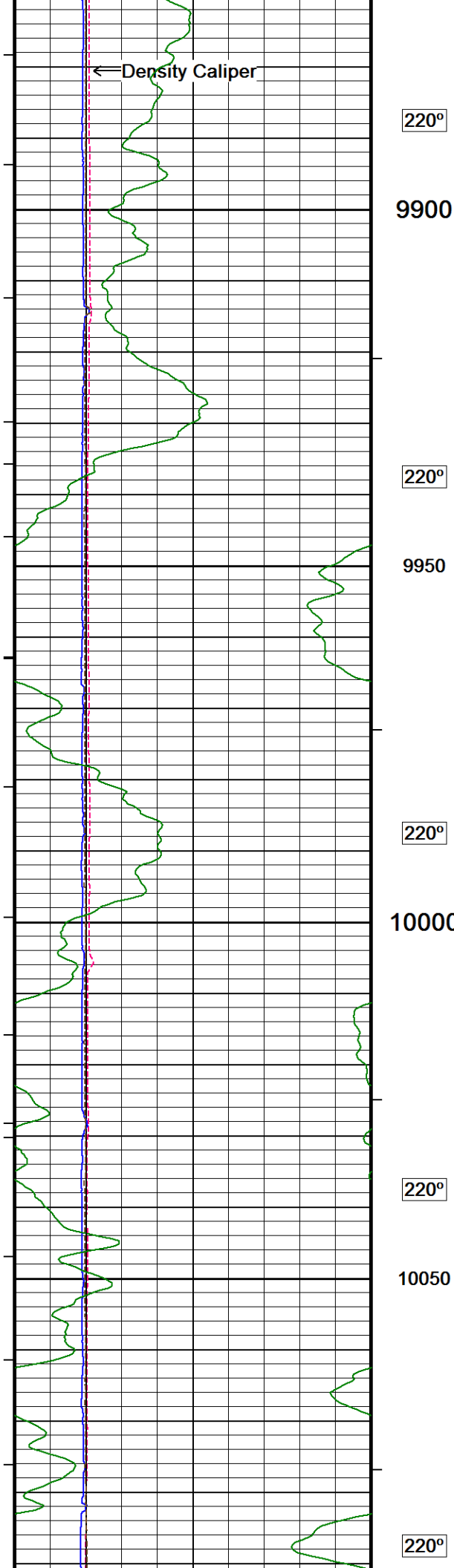


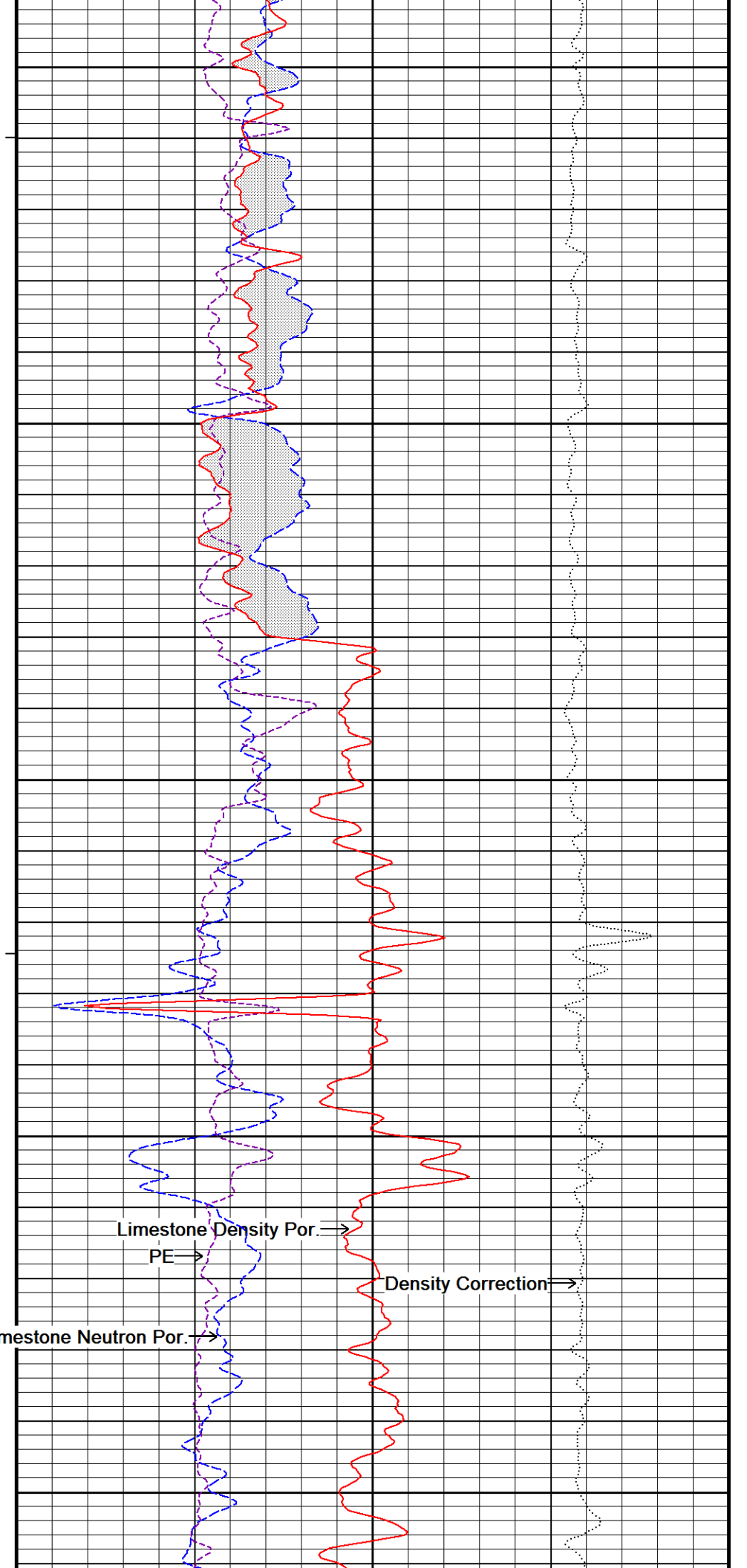
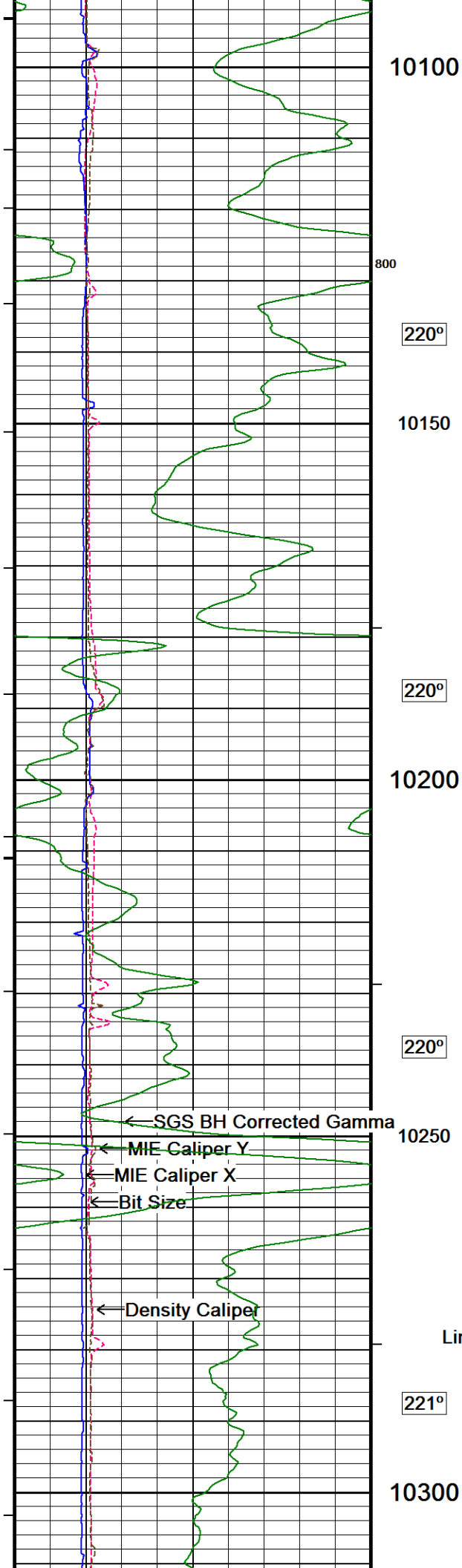


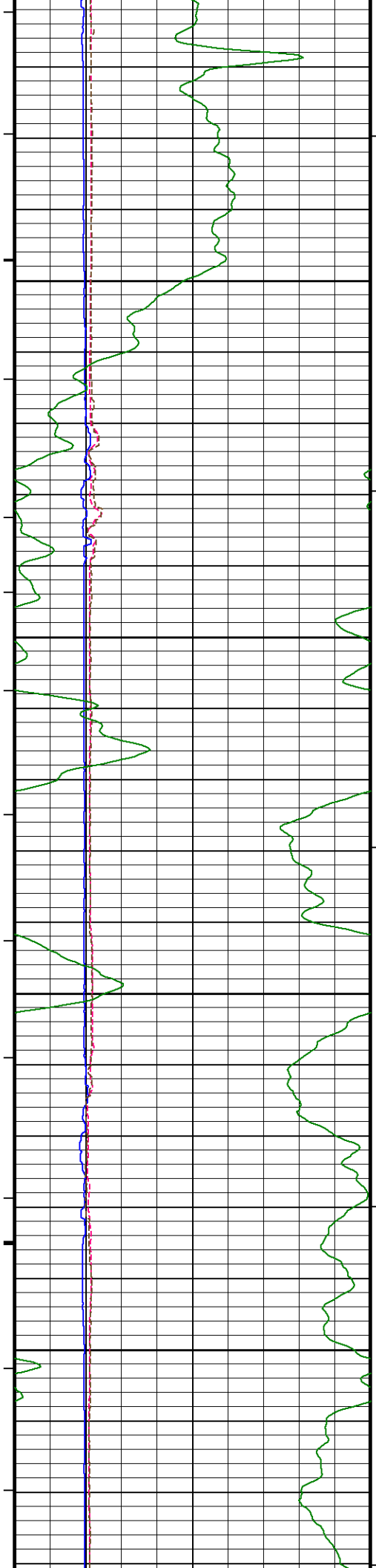
219°
9450
219°
9500
400
219°
9550
219°
9600
900
219°
9650



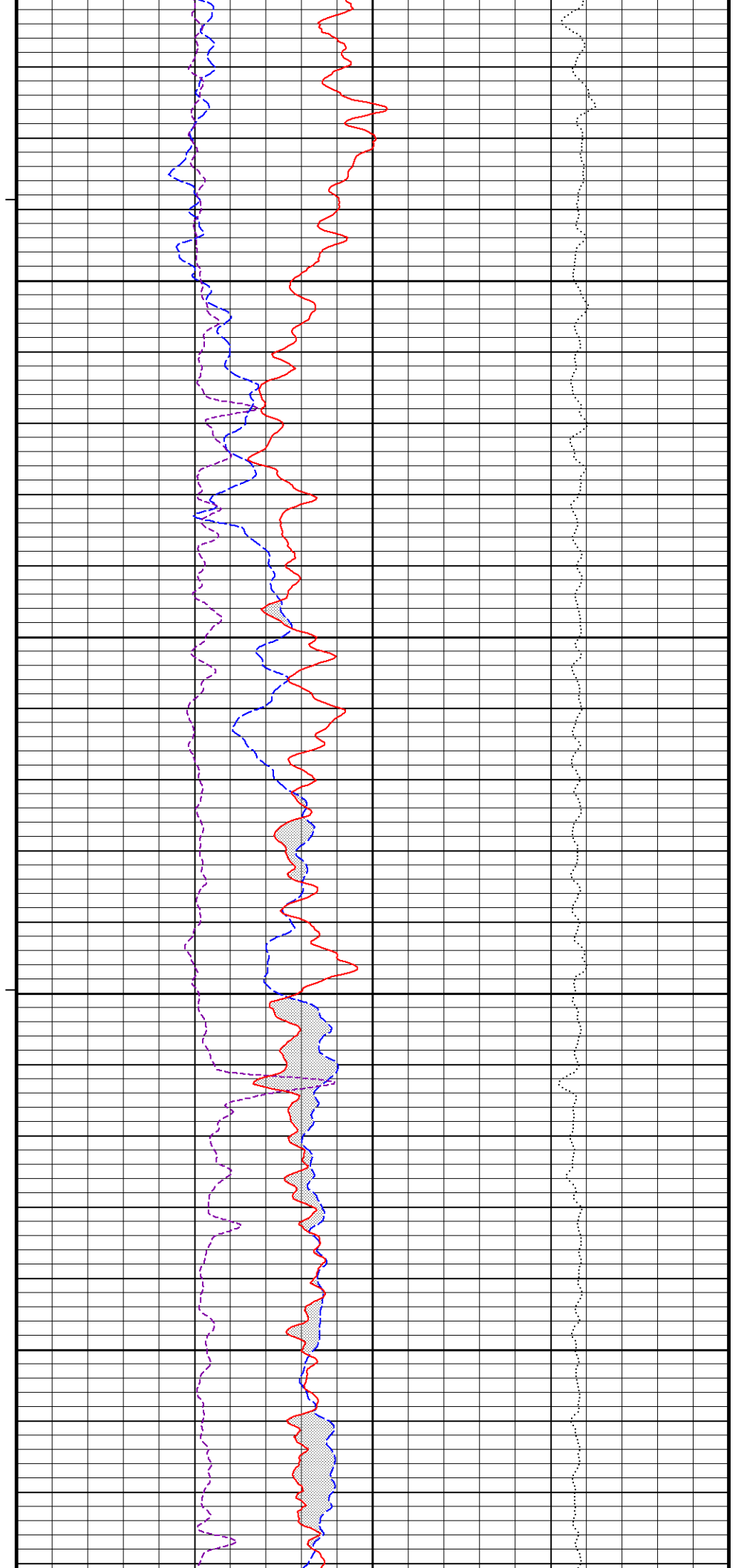


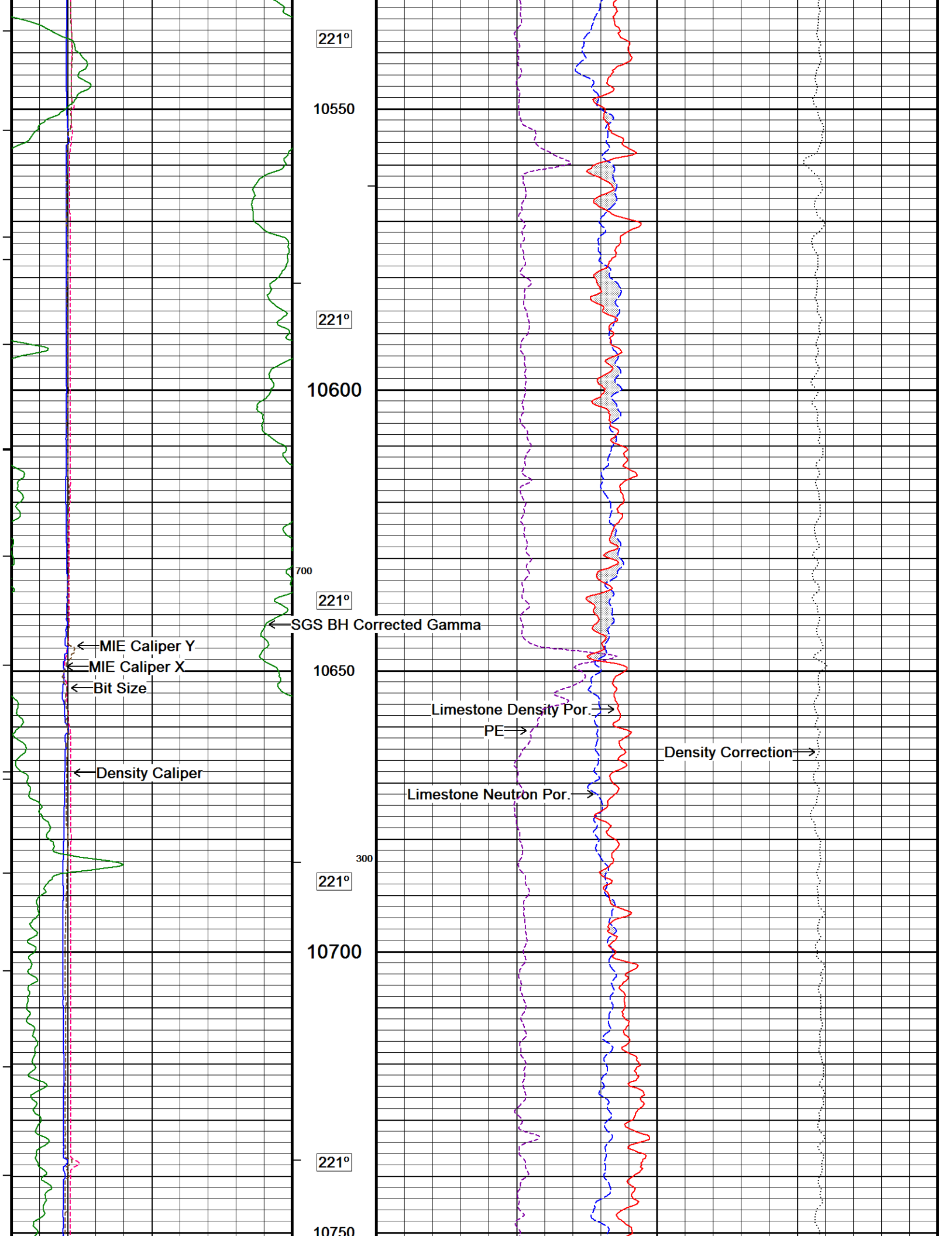


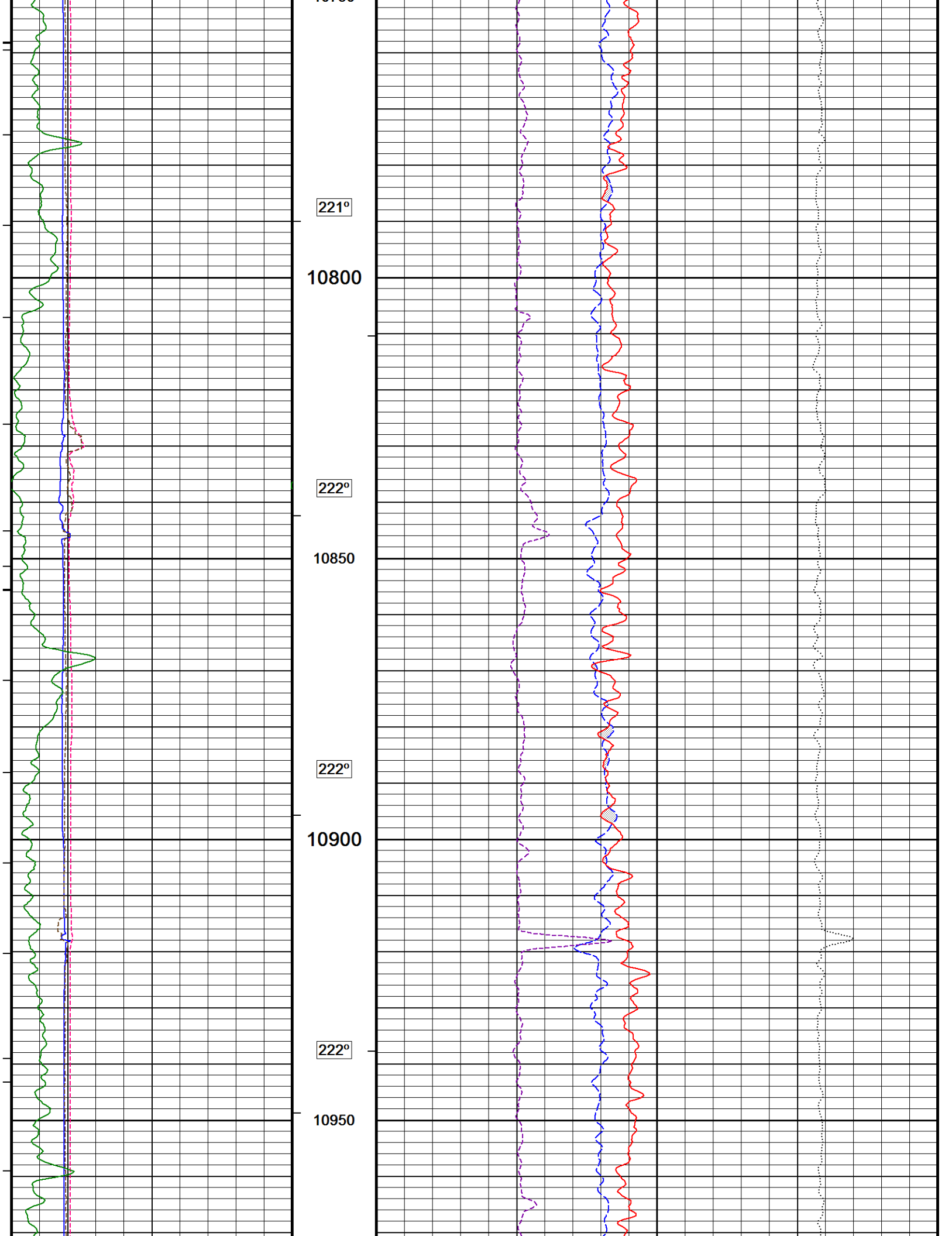


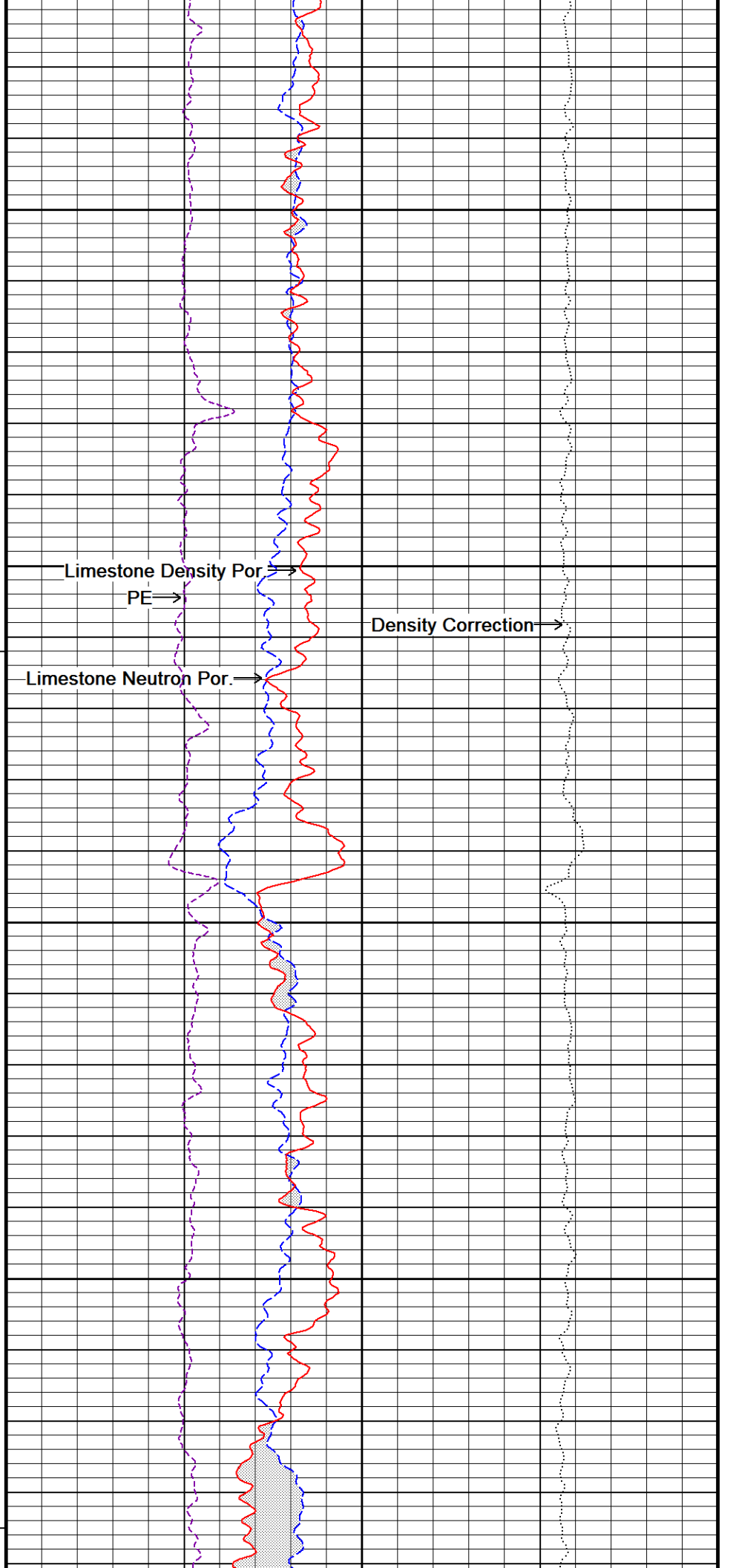
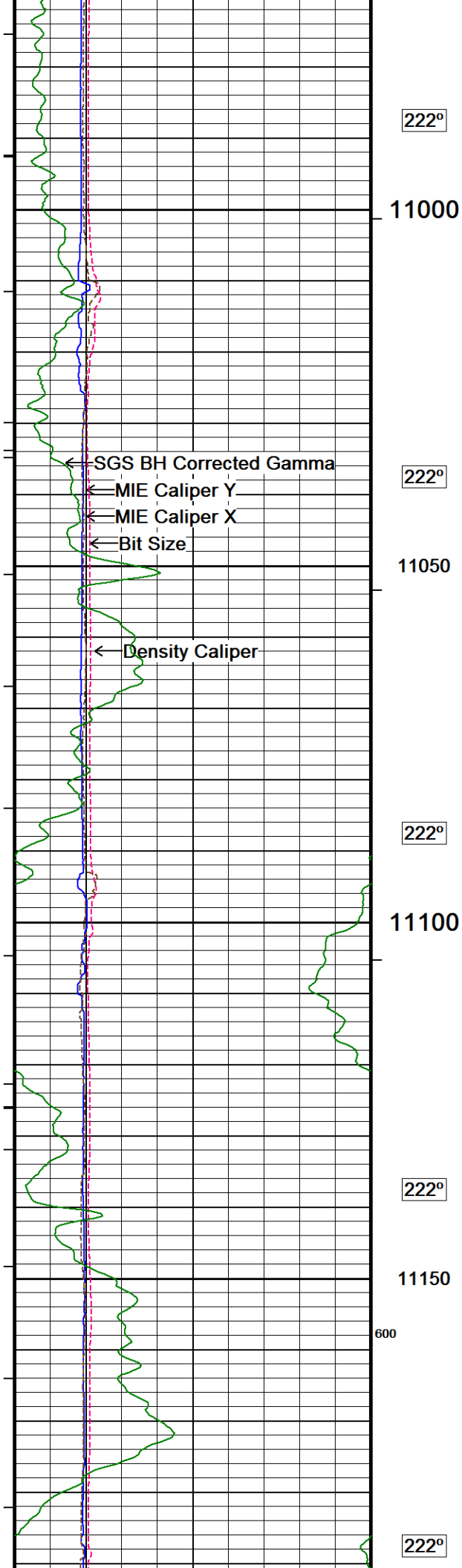


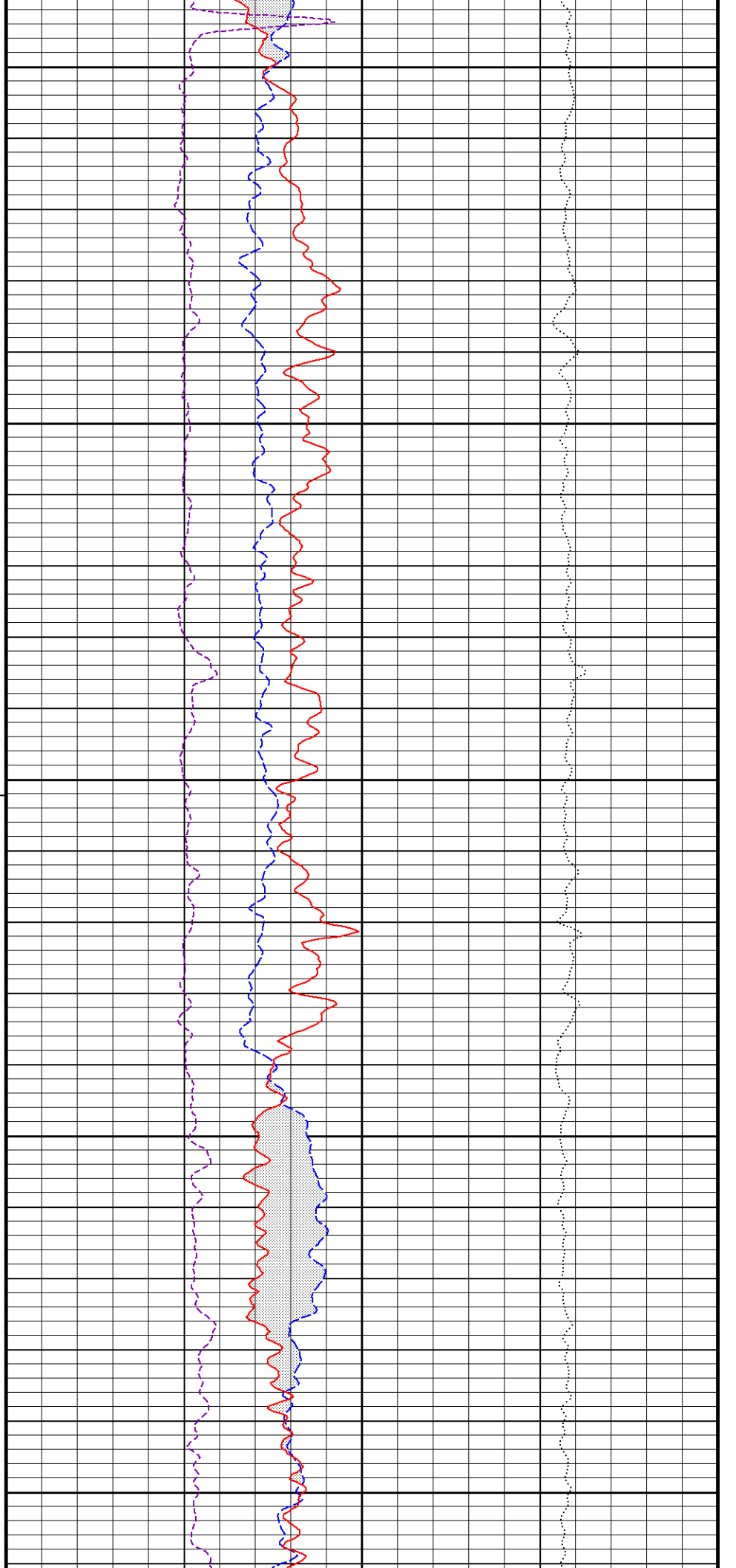
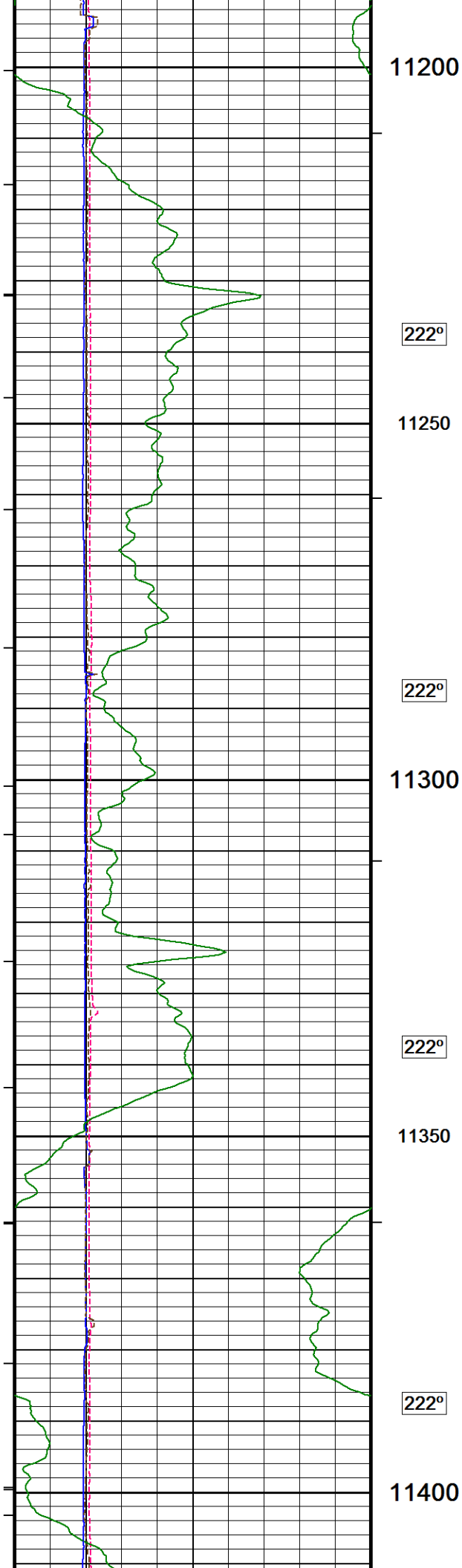
221°
10350
221°
10400
221°
10450
221°
10500

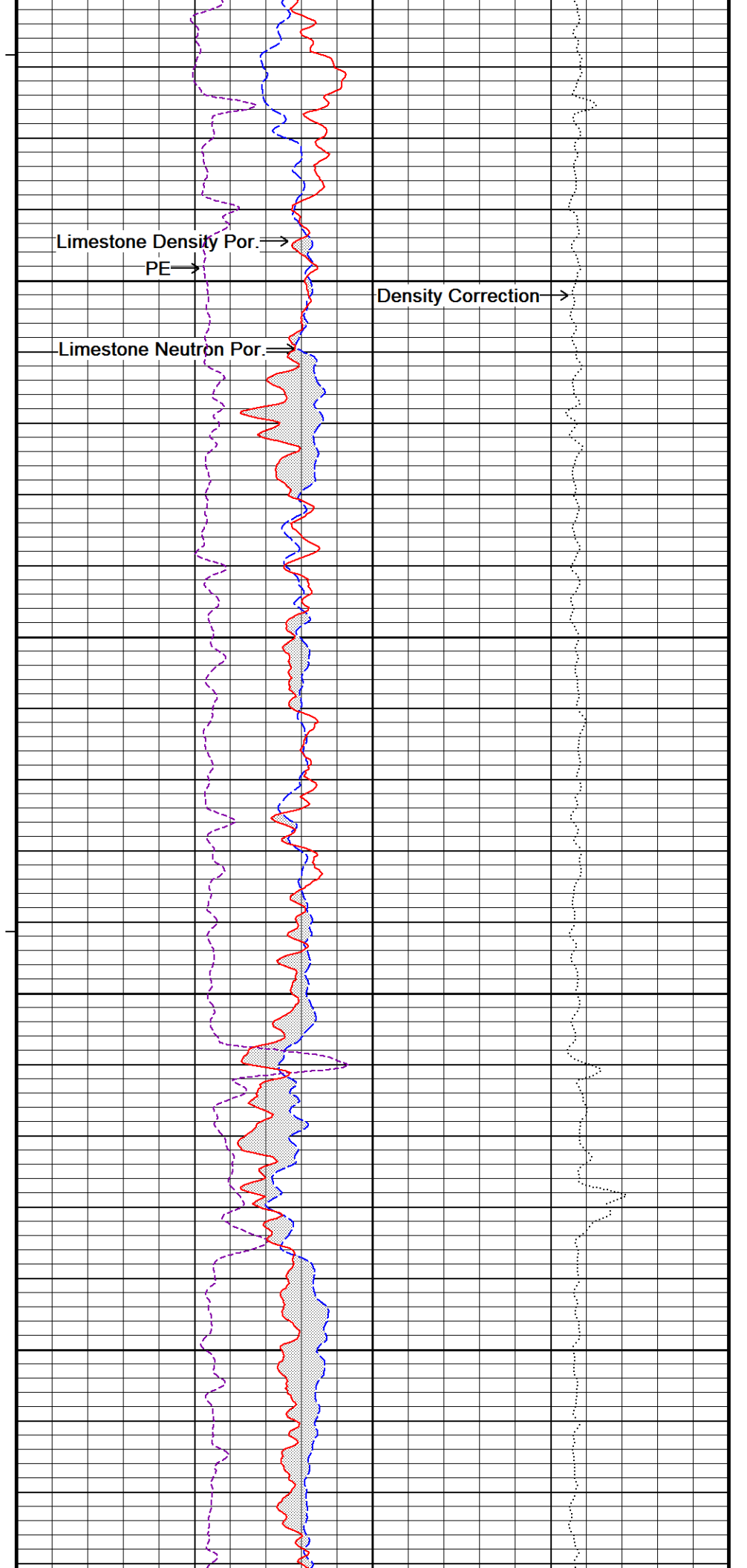
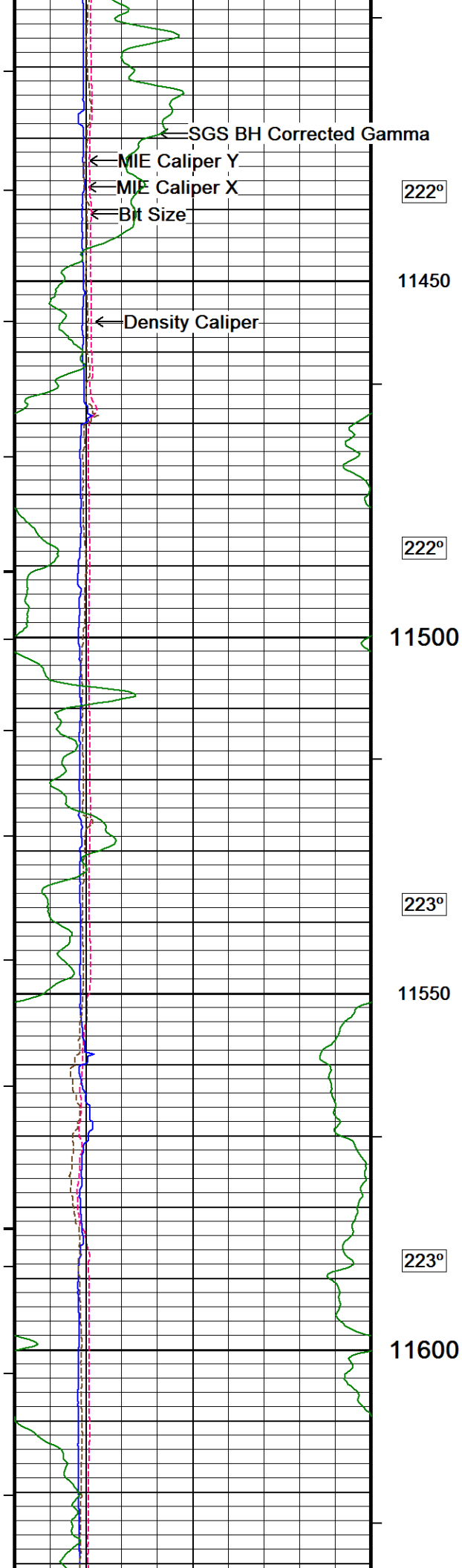


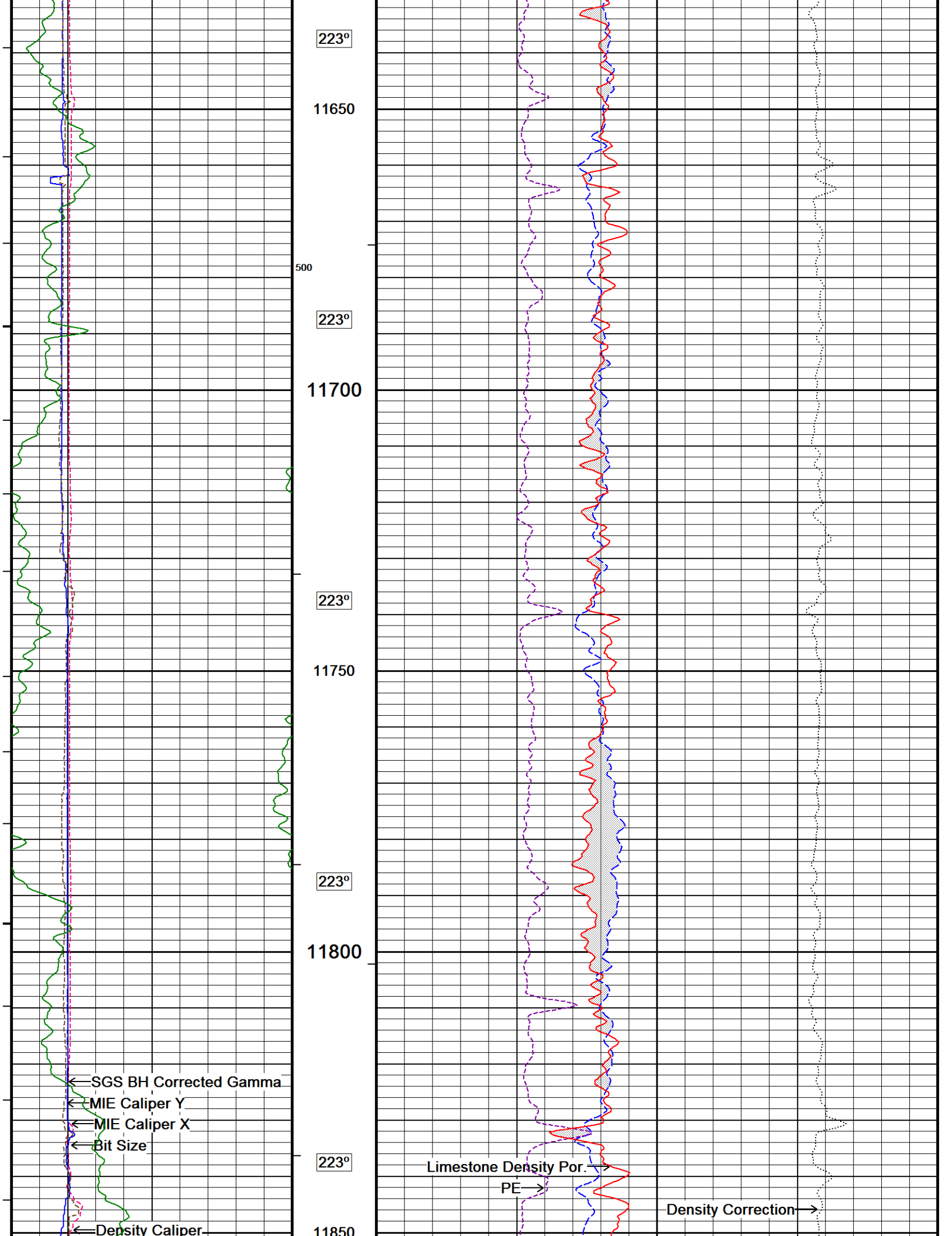


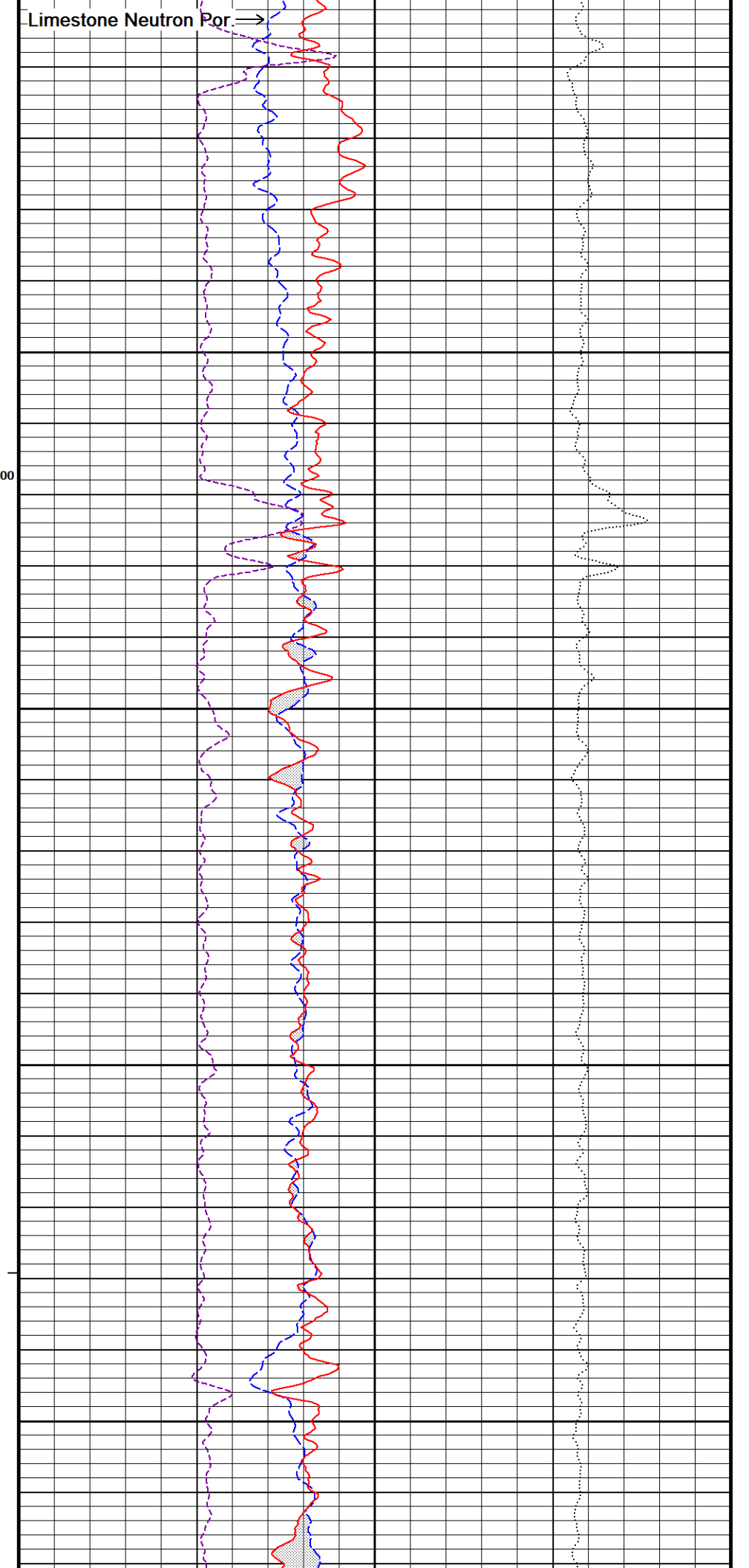
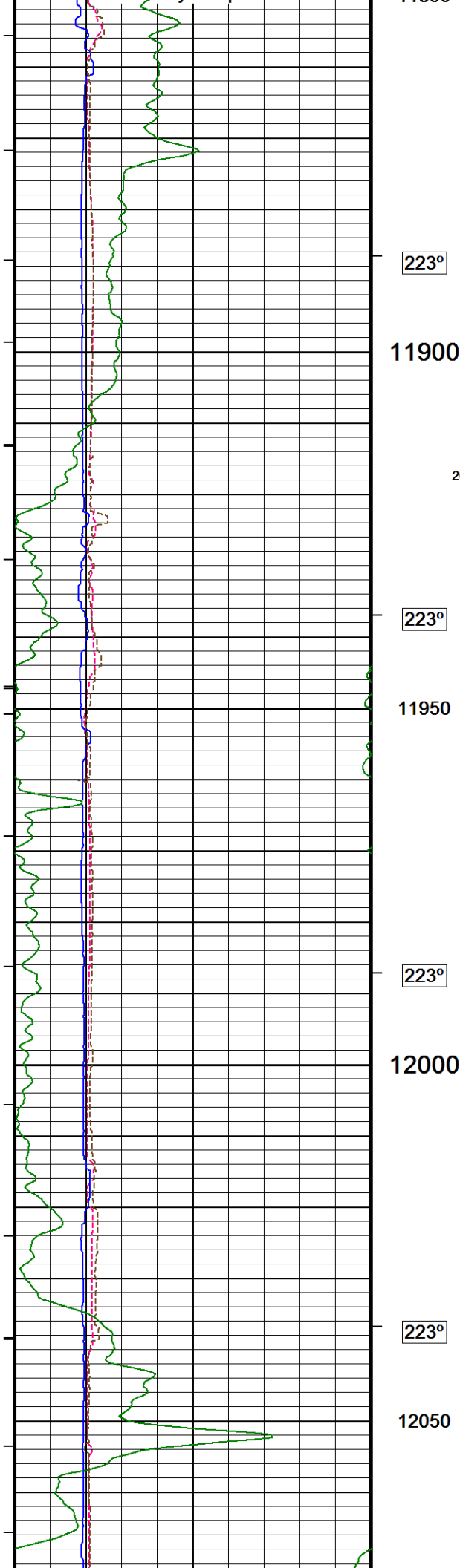


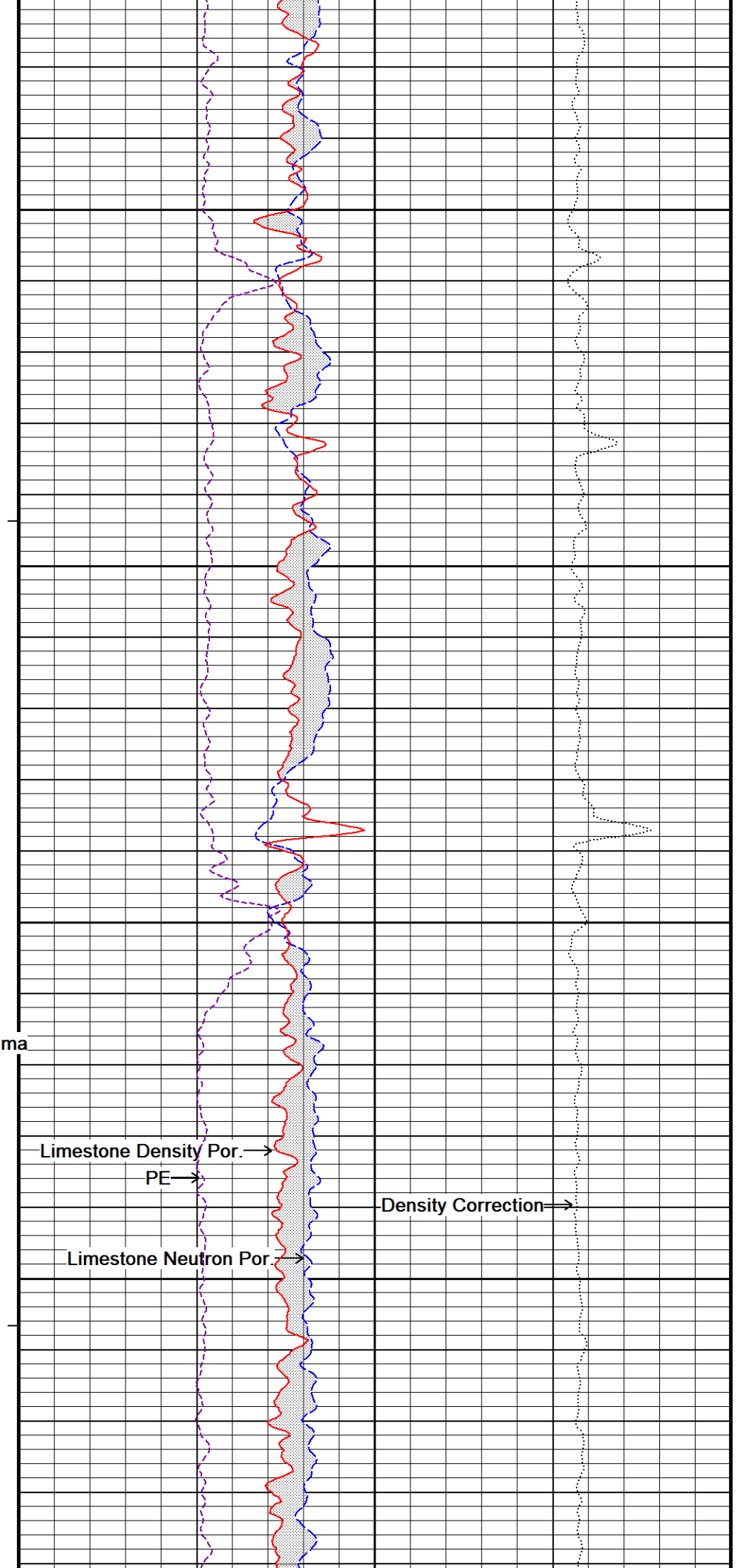
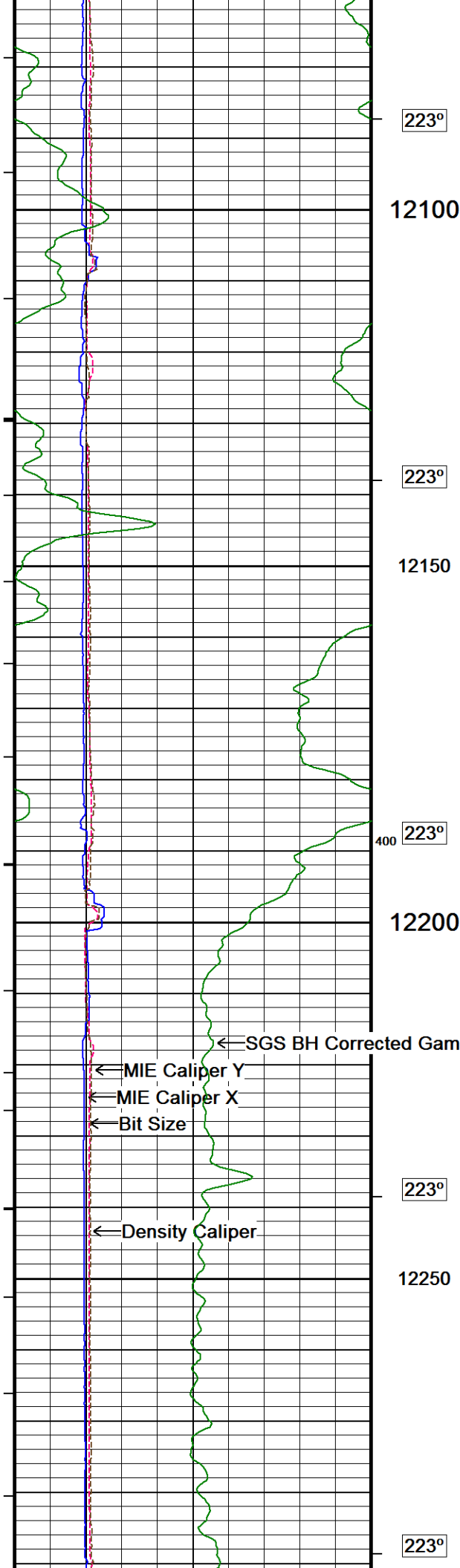


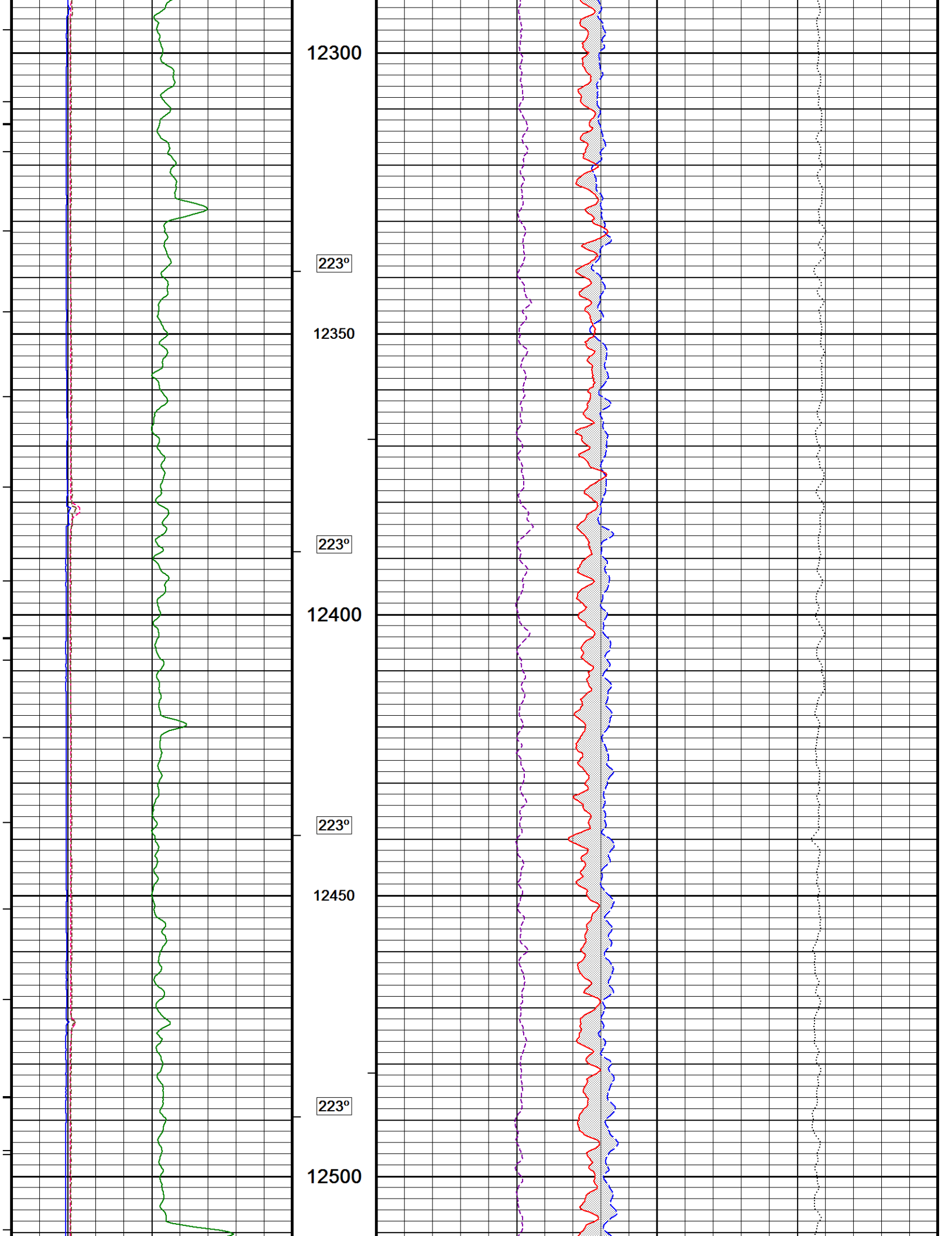


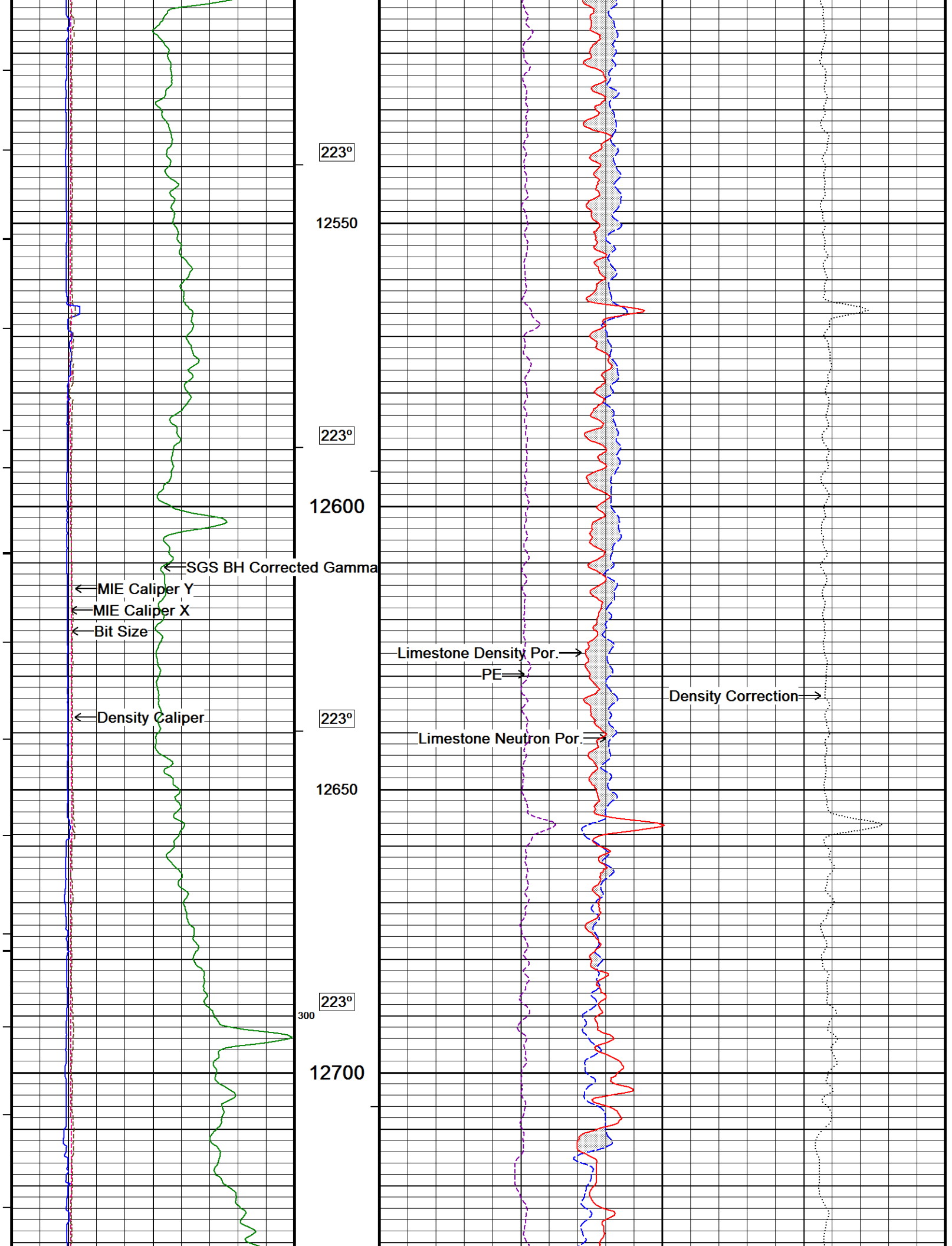


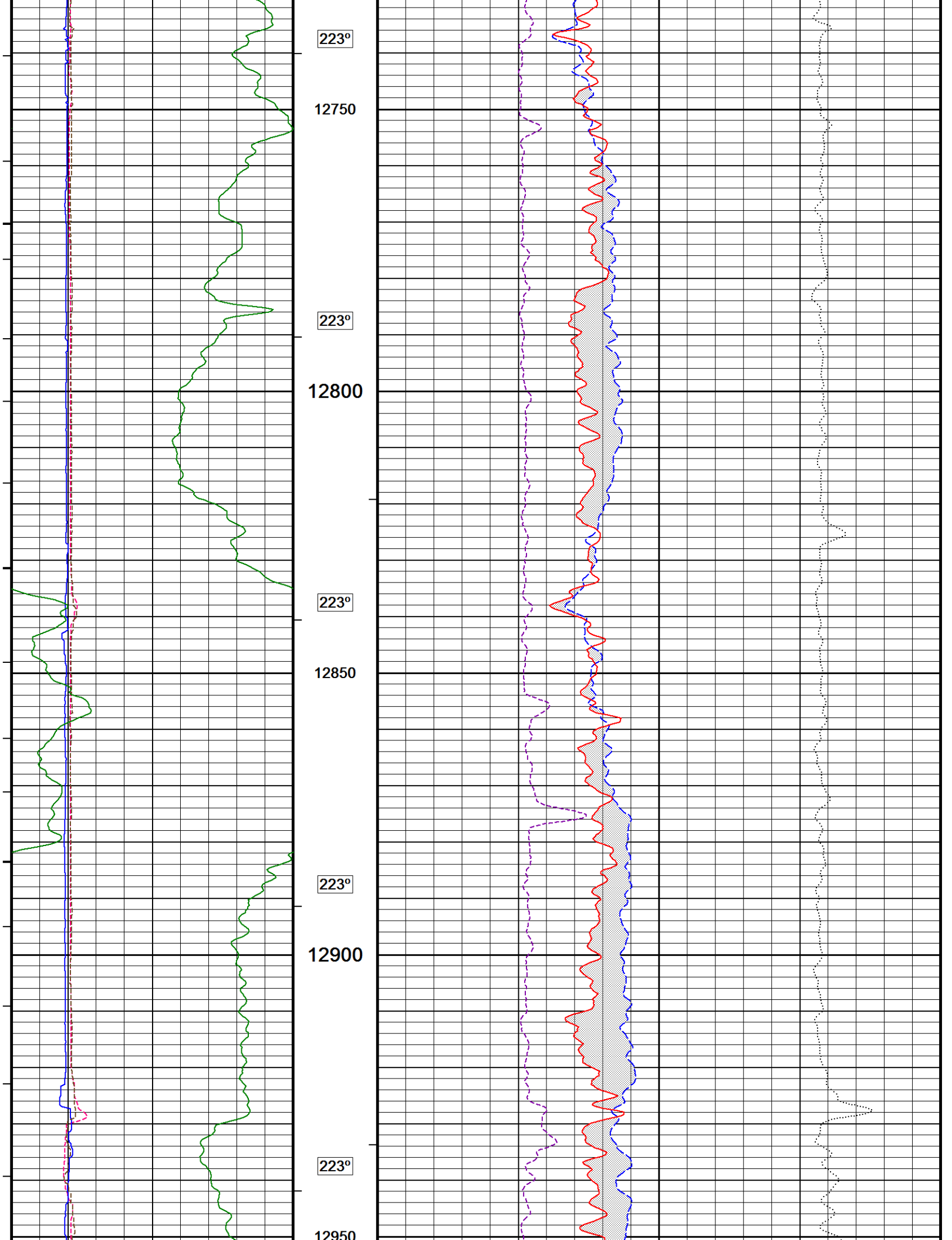


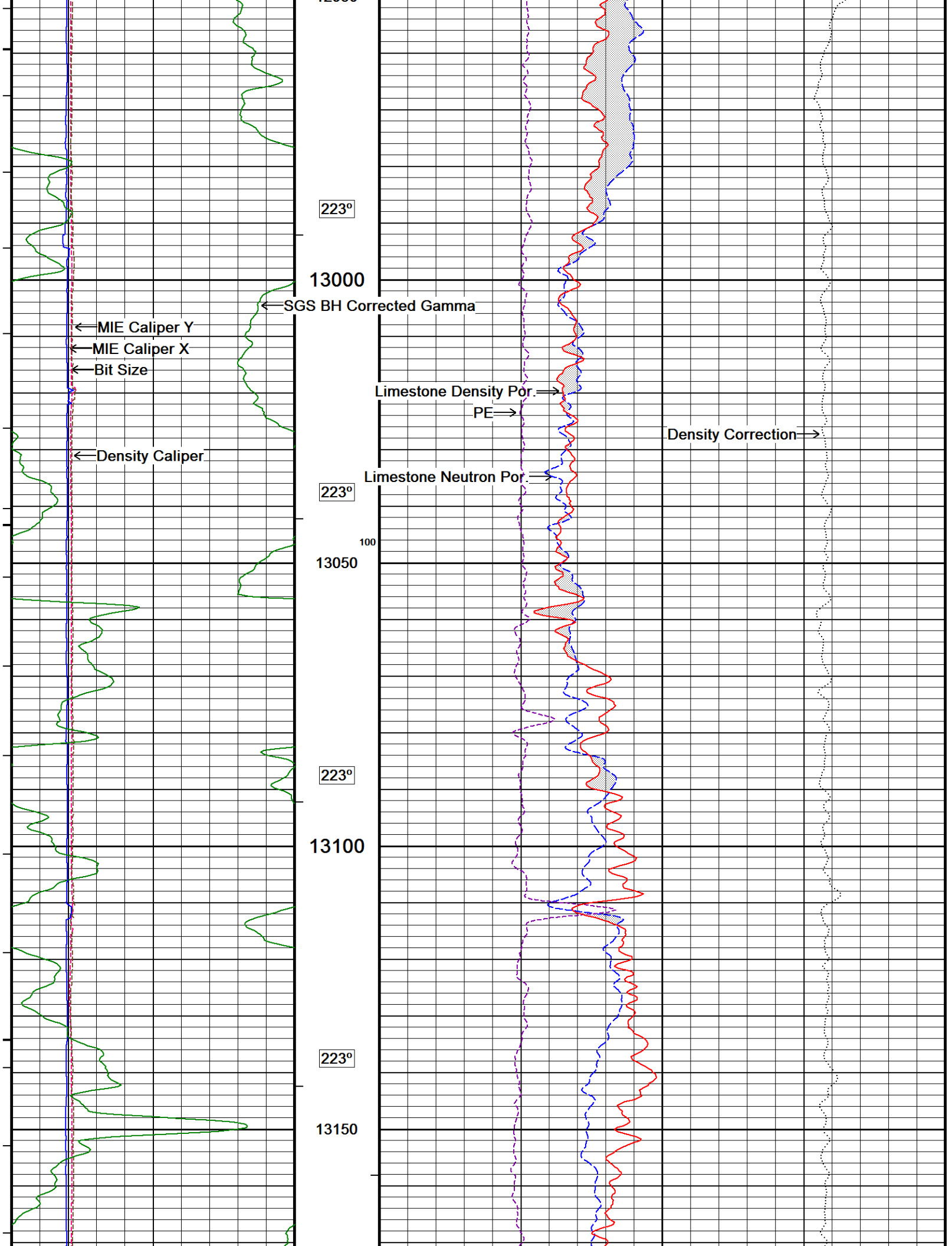


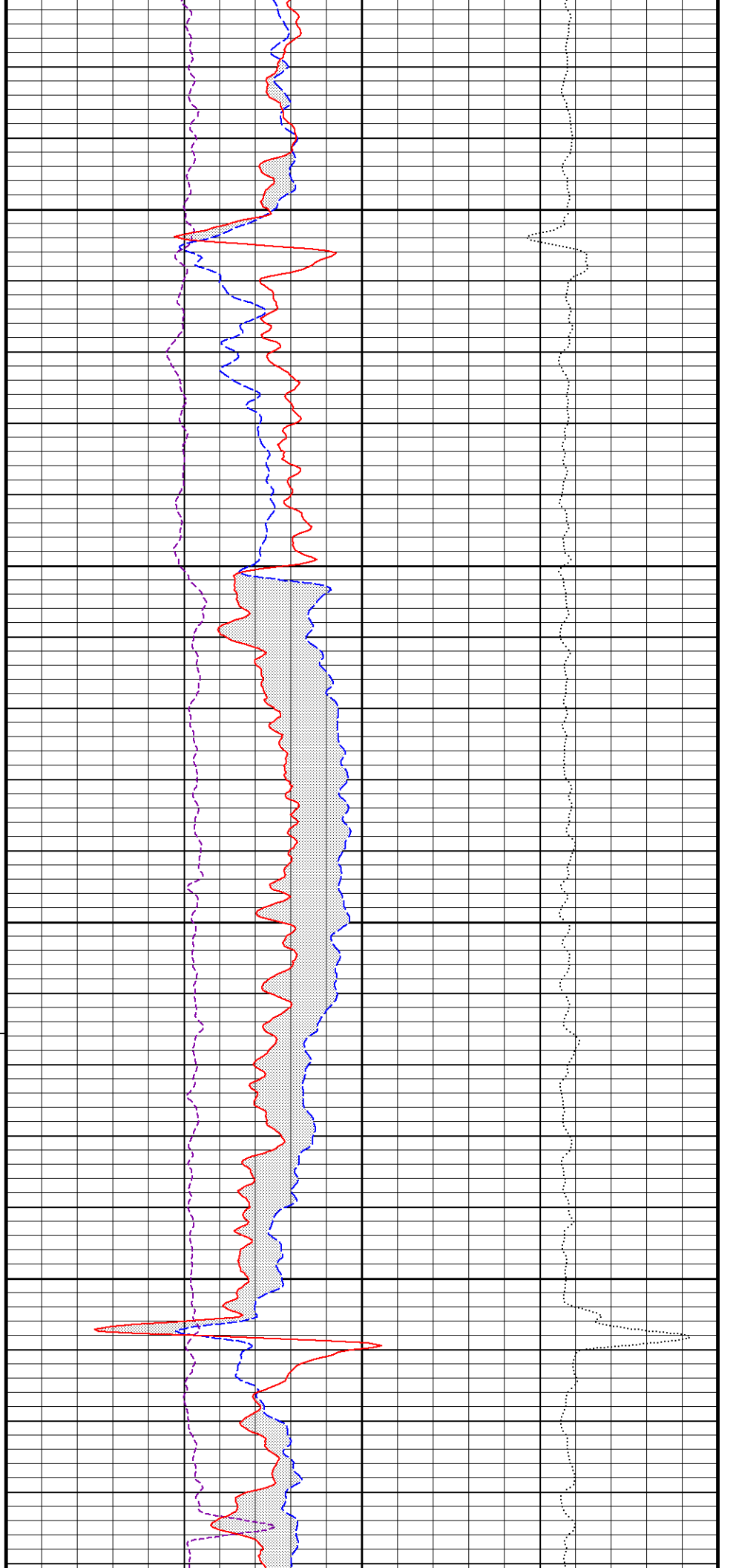
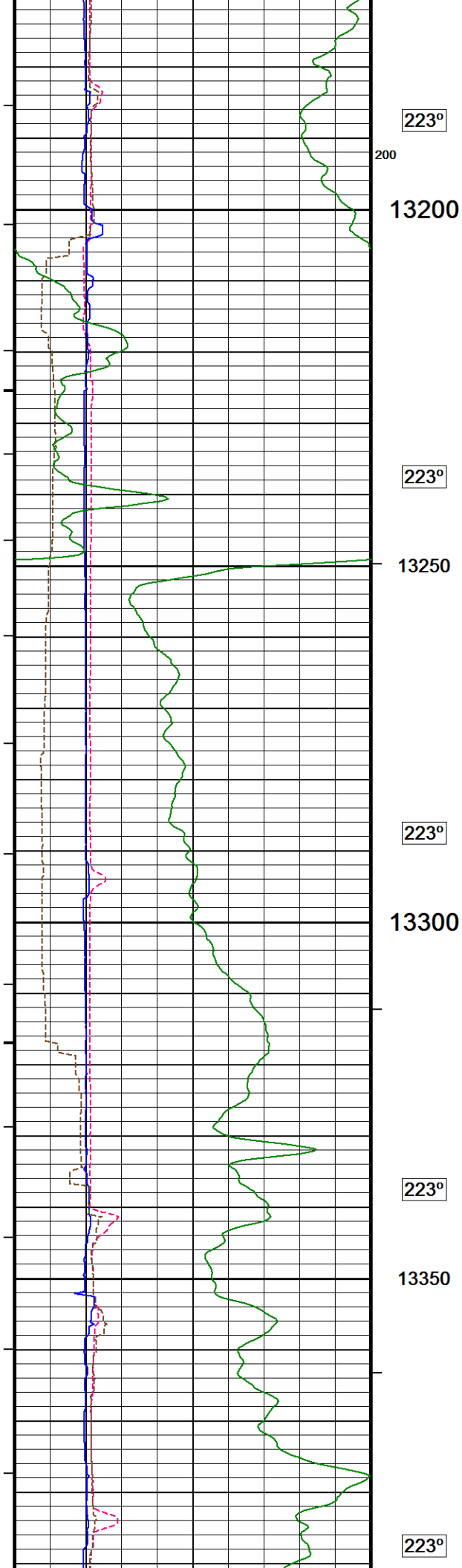


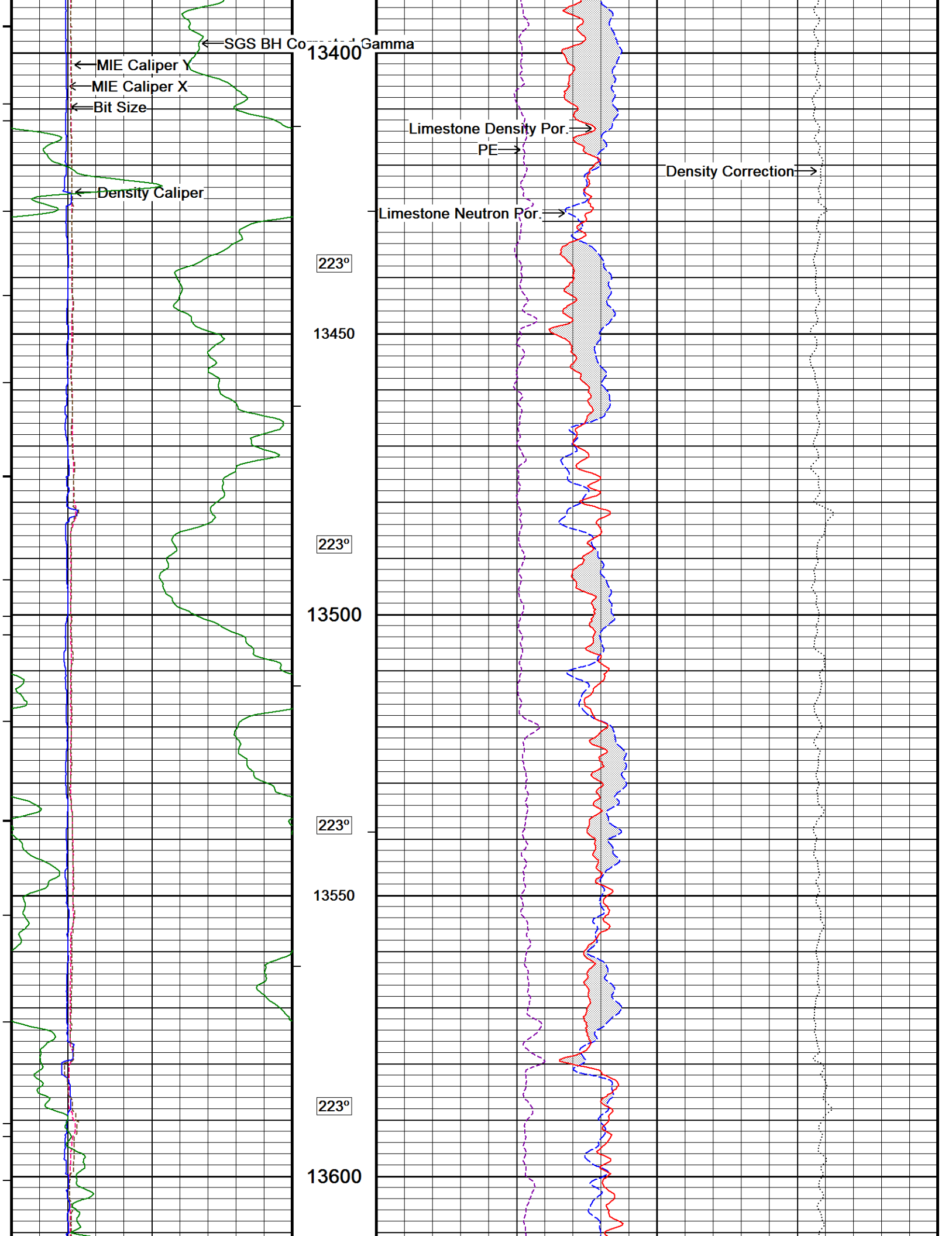


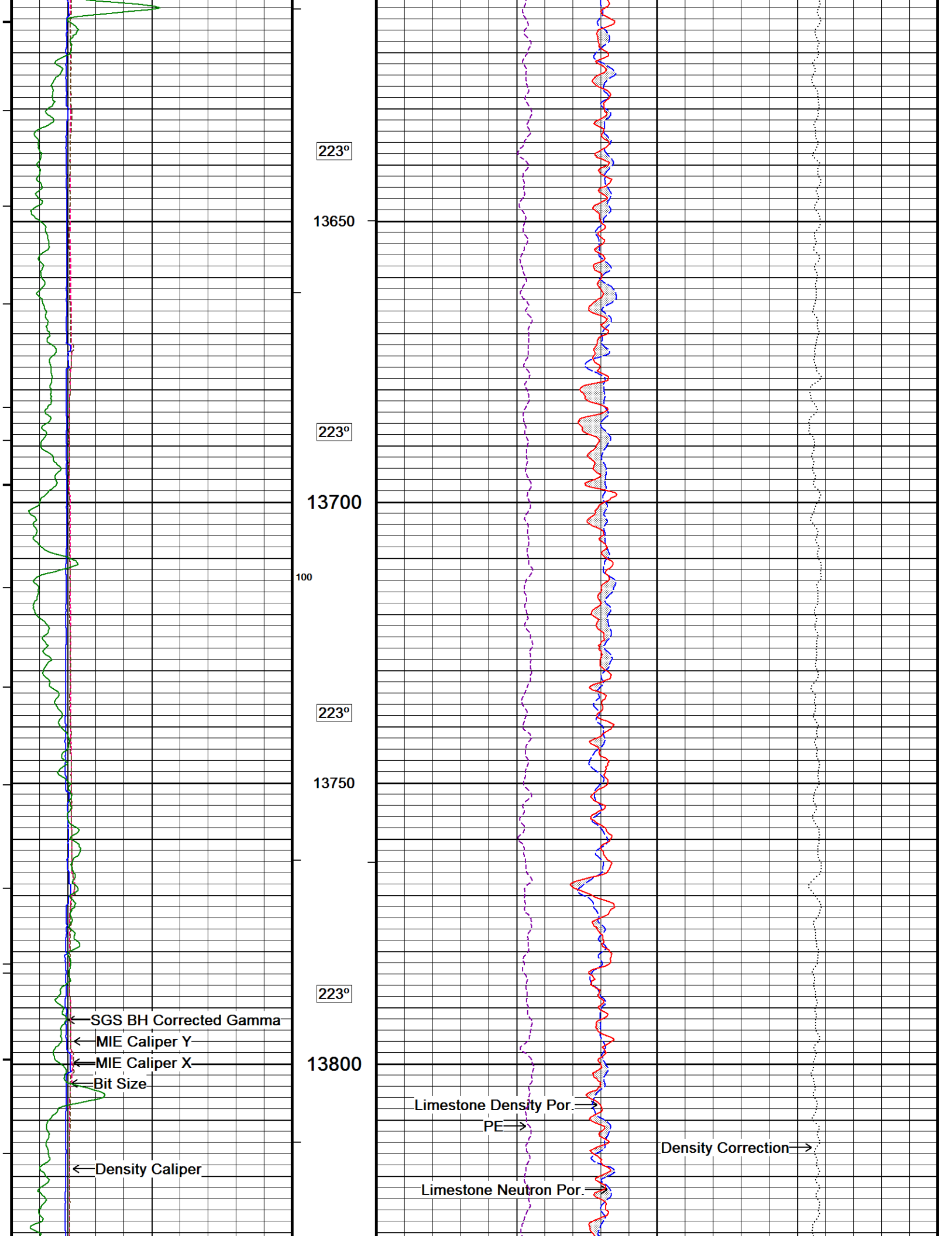


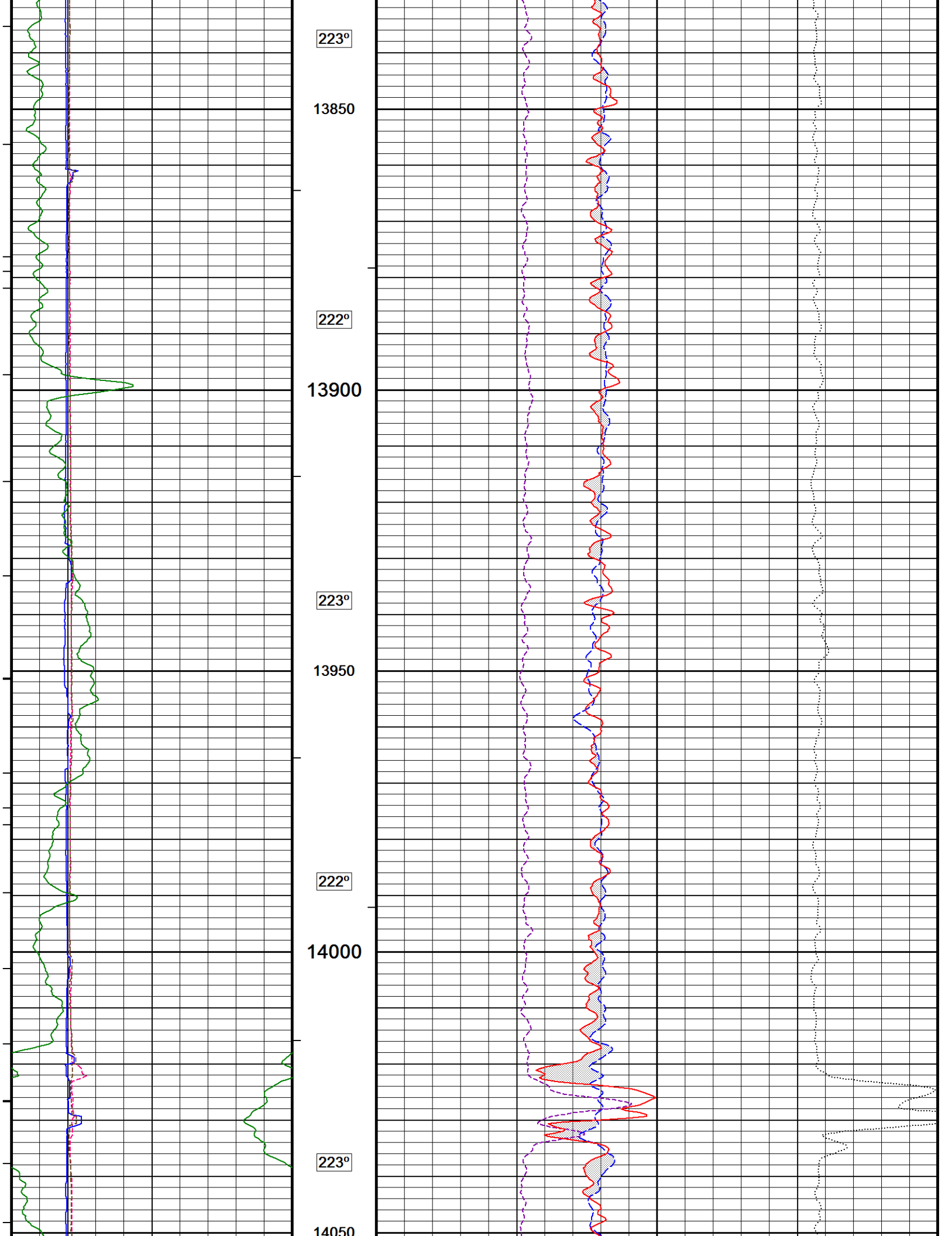


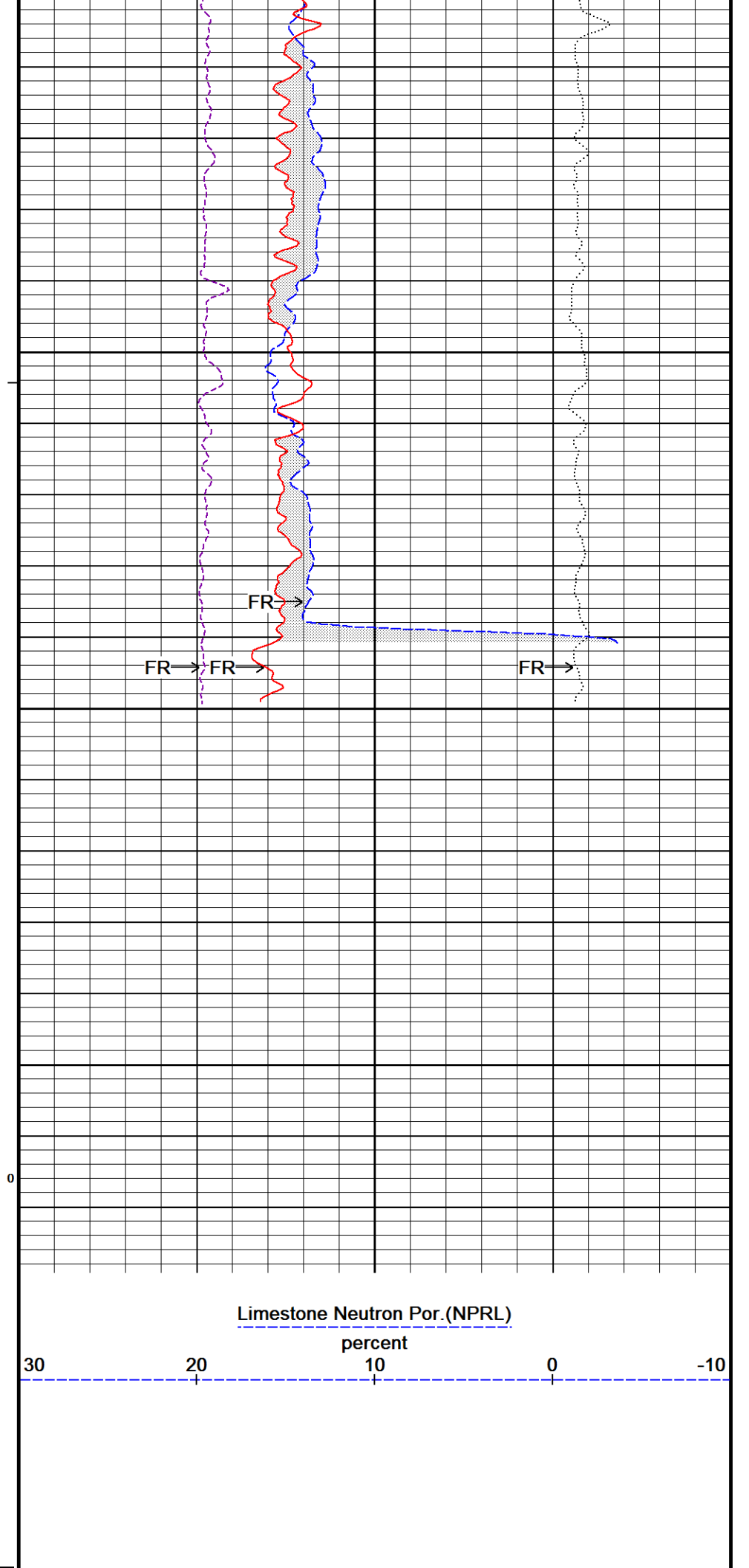
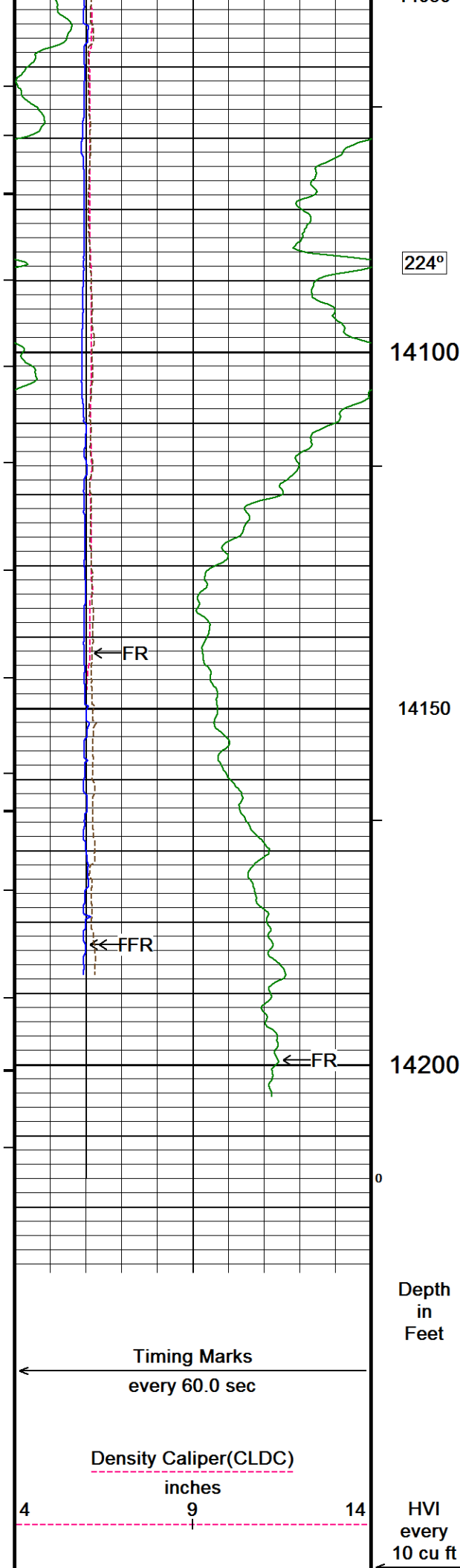


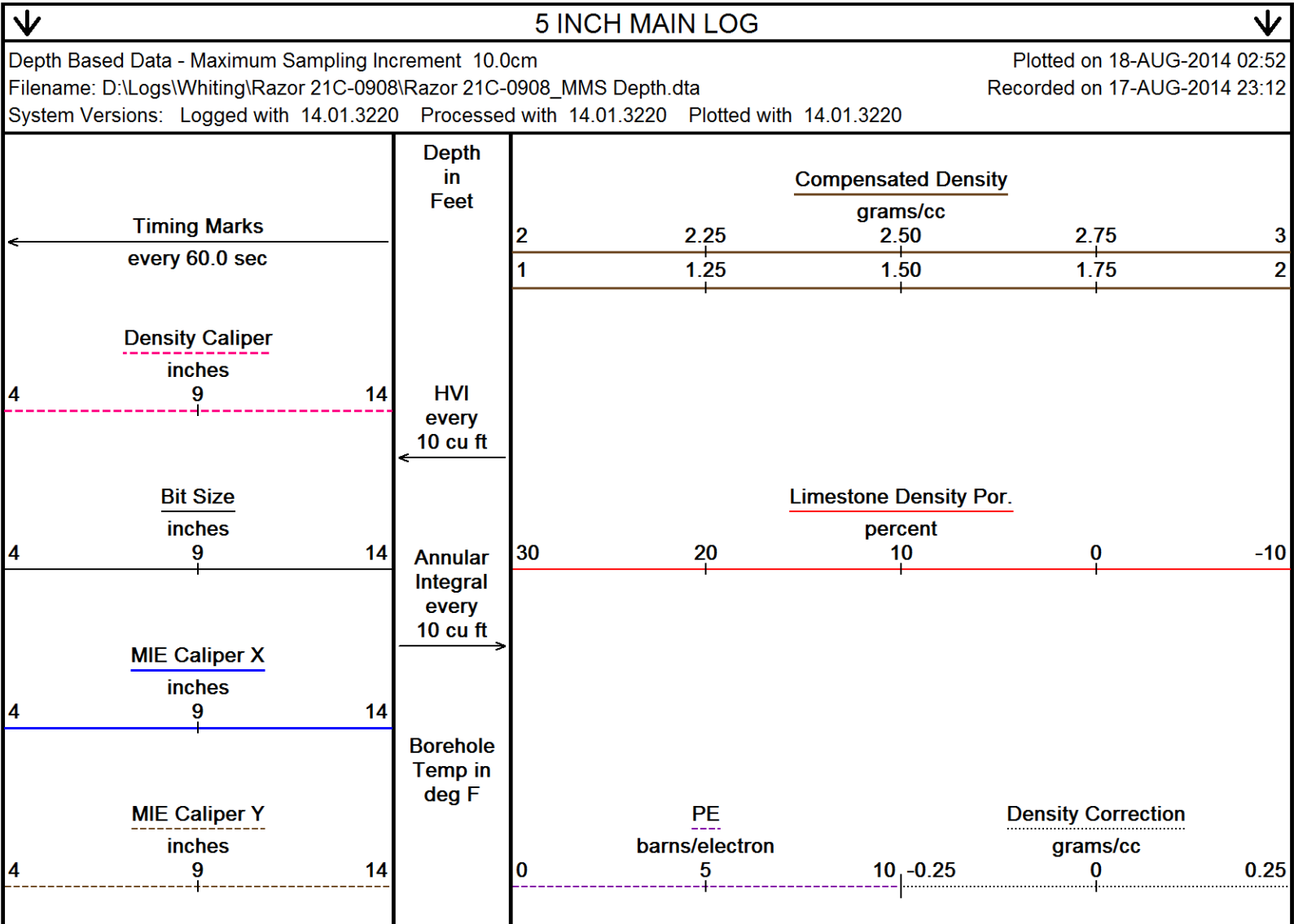
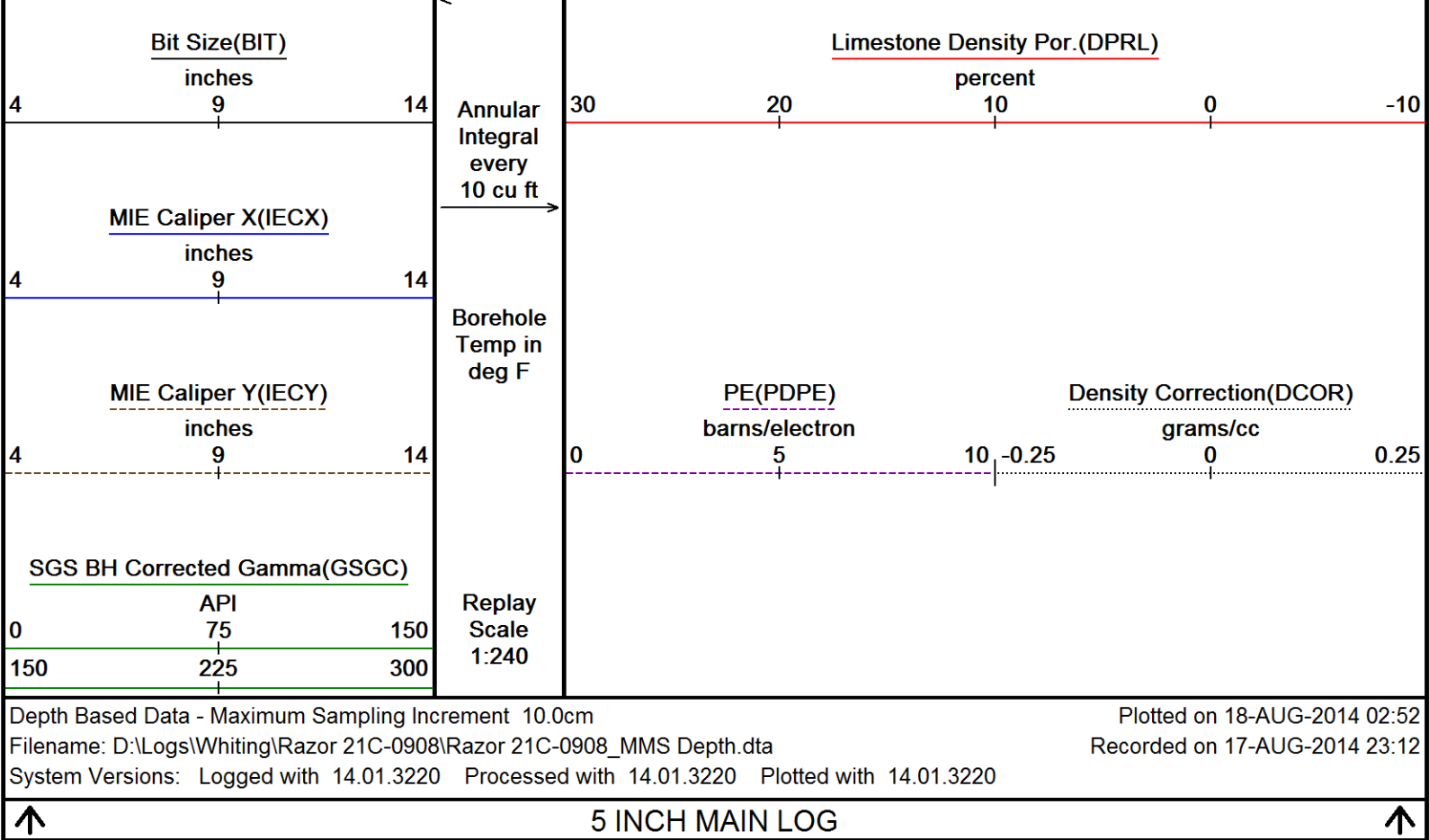


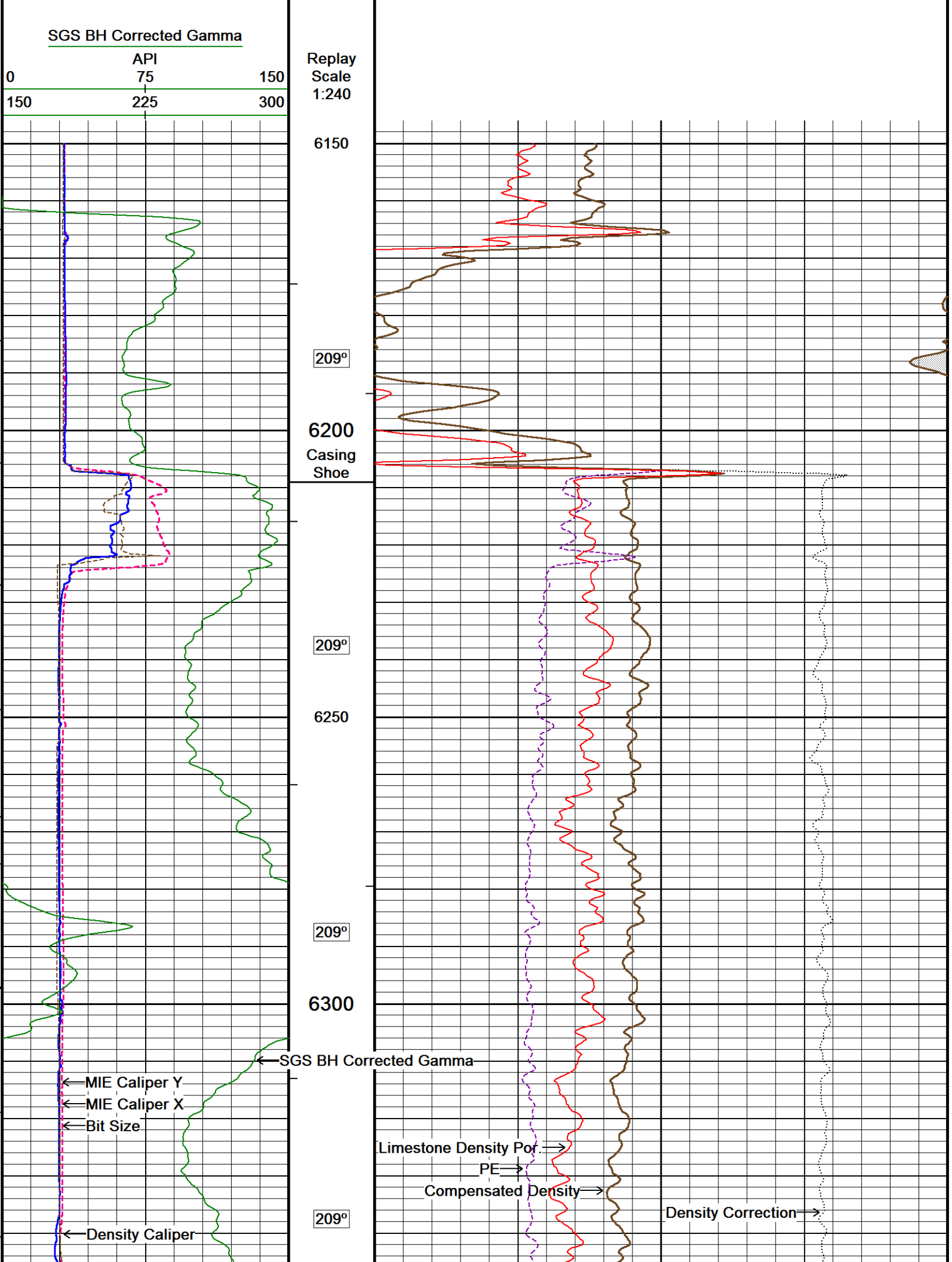


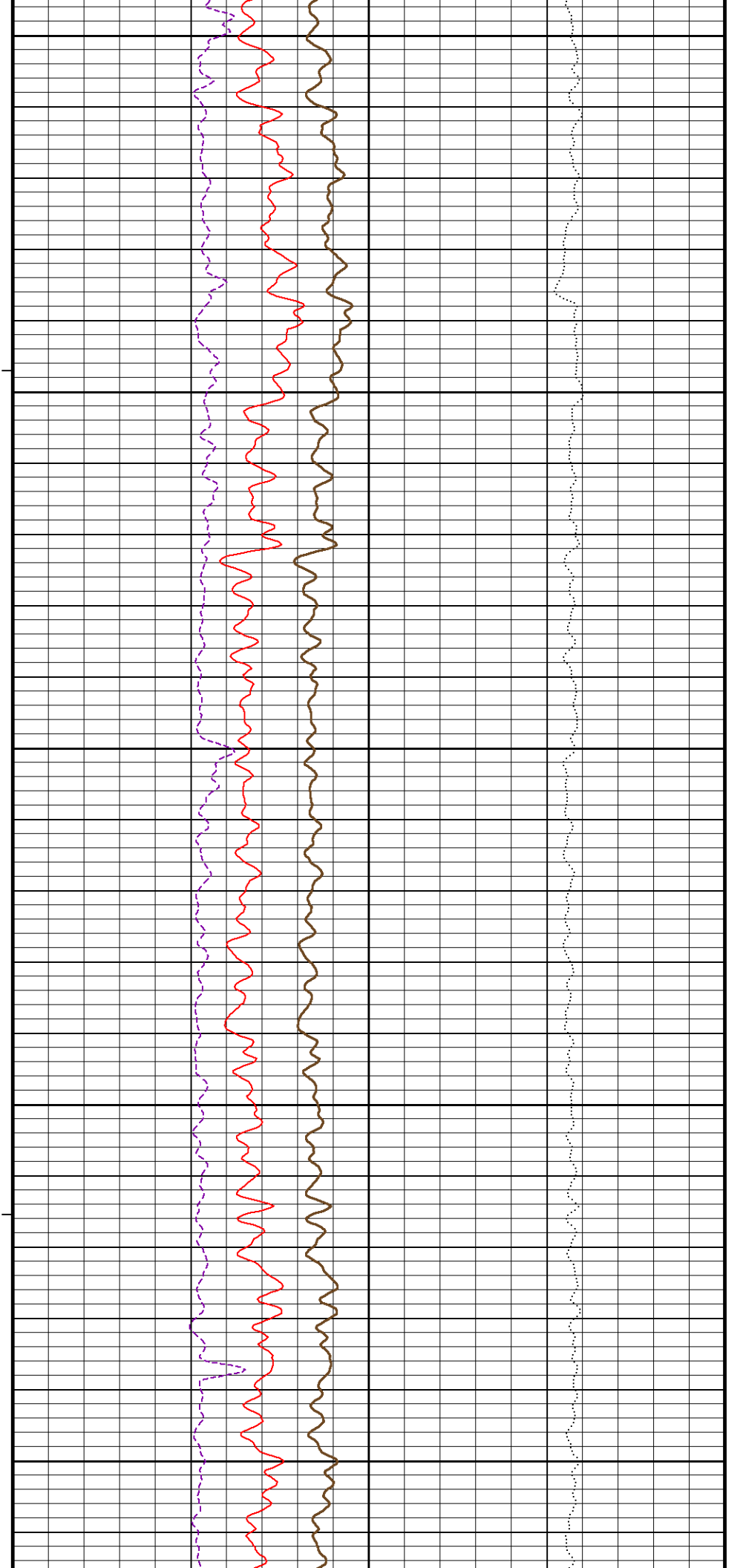
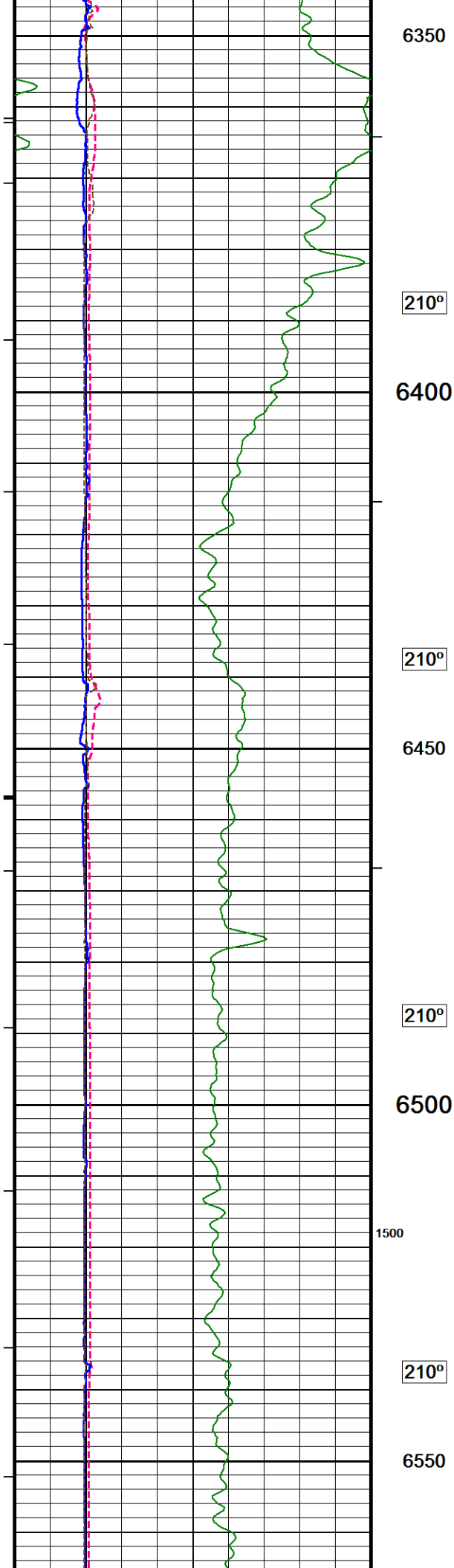


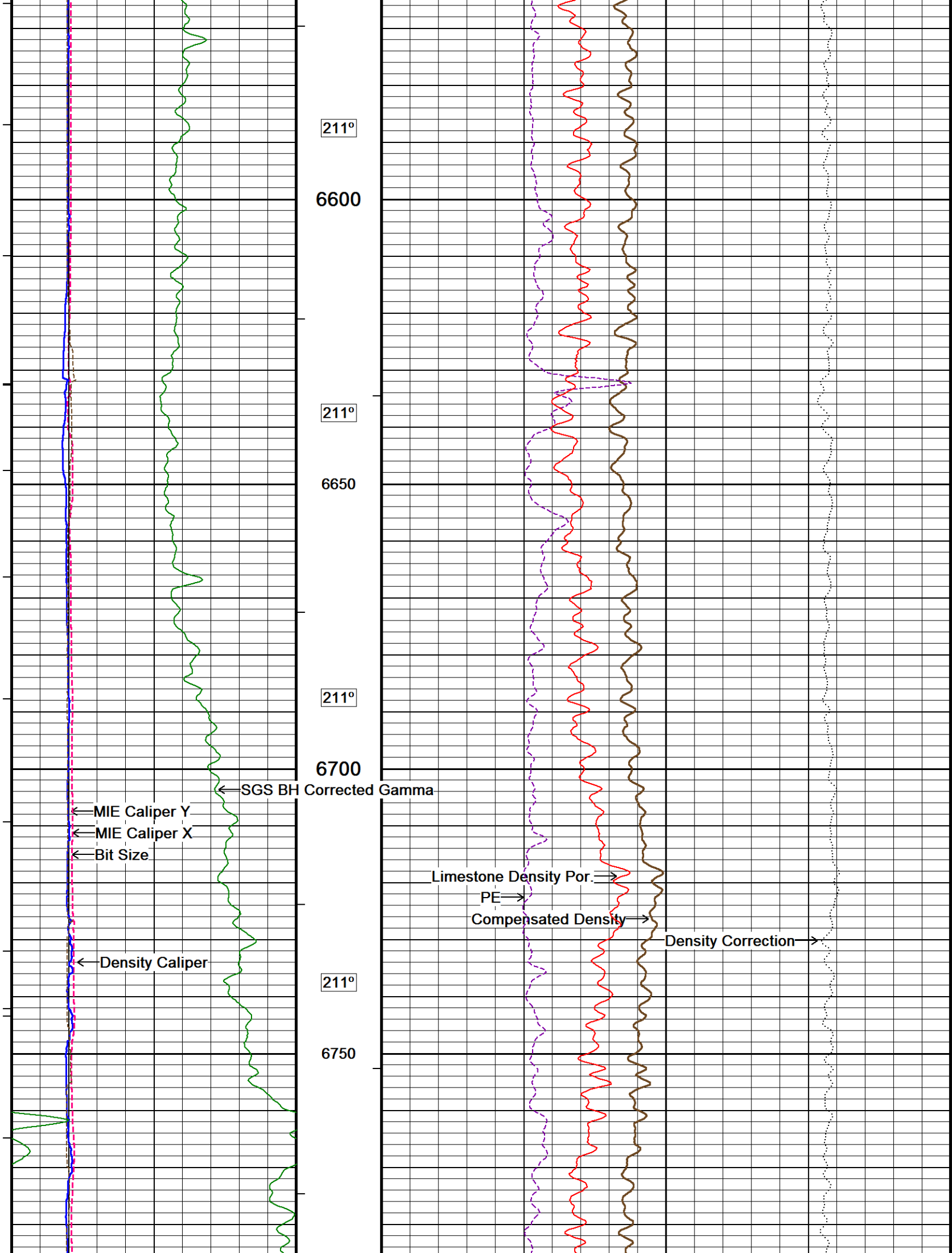


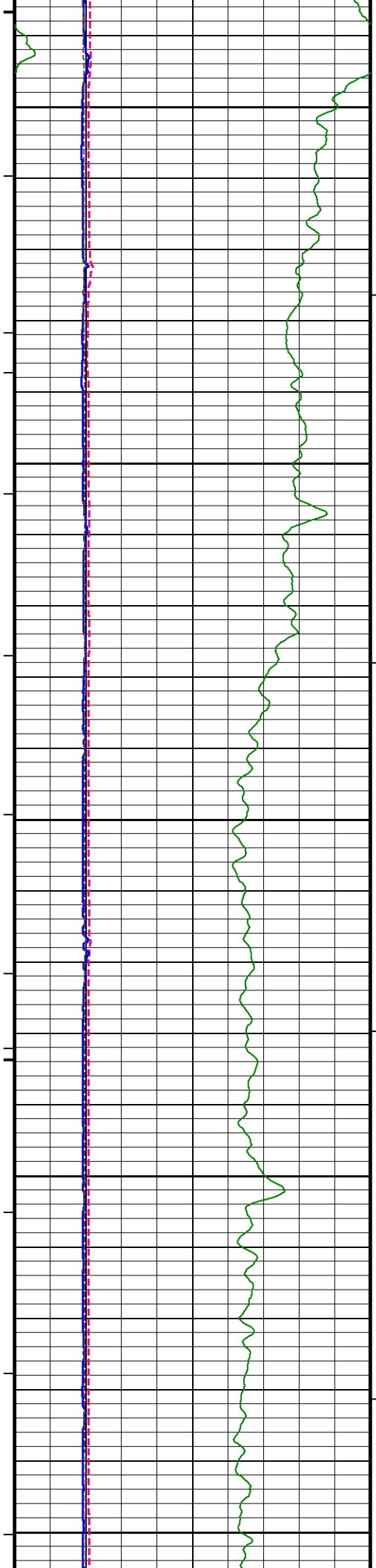












211°

6800

212°

6850

212°

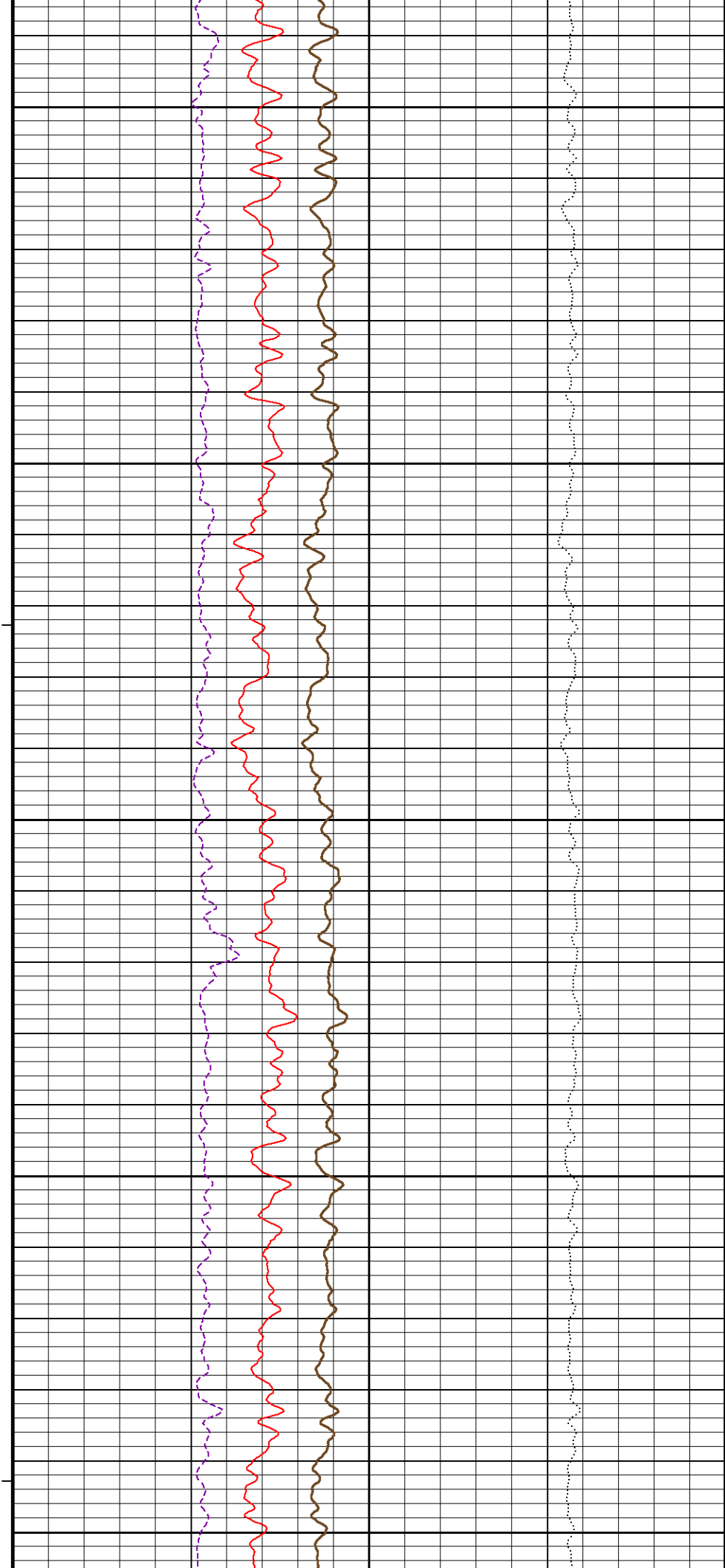
6900

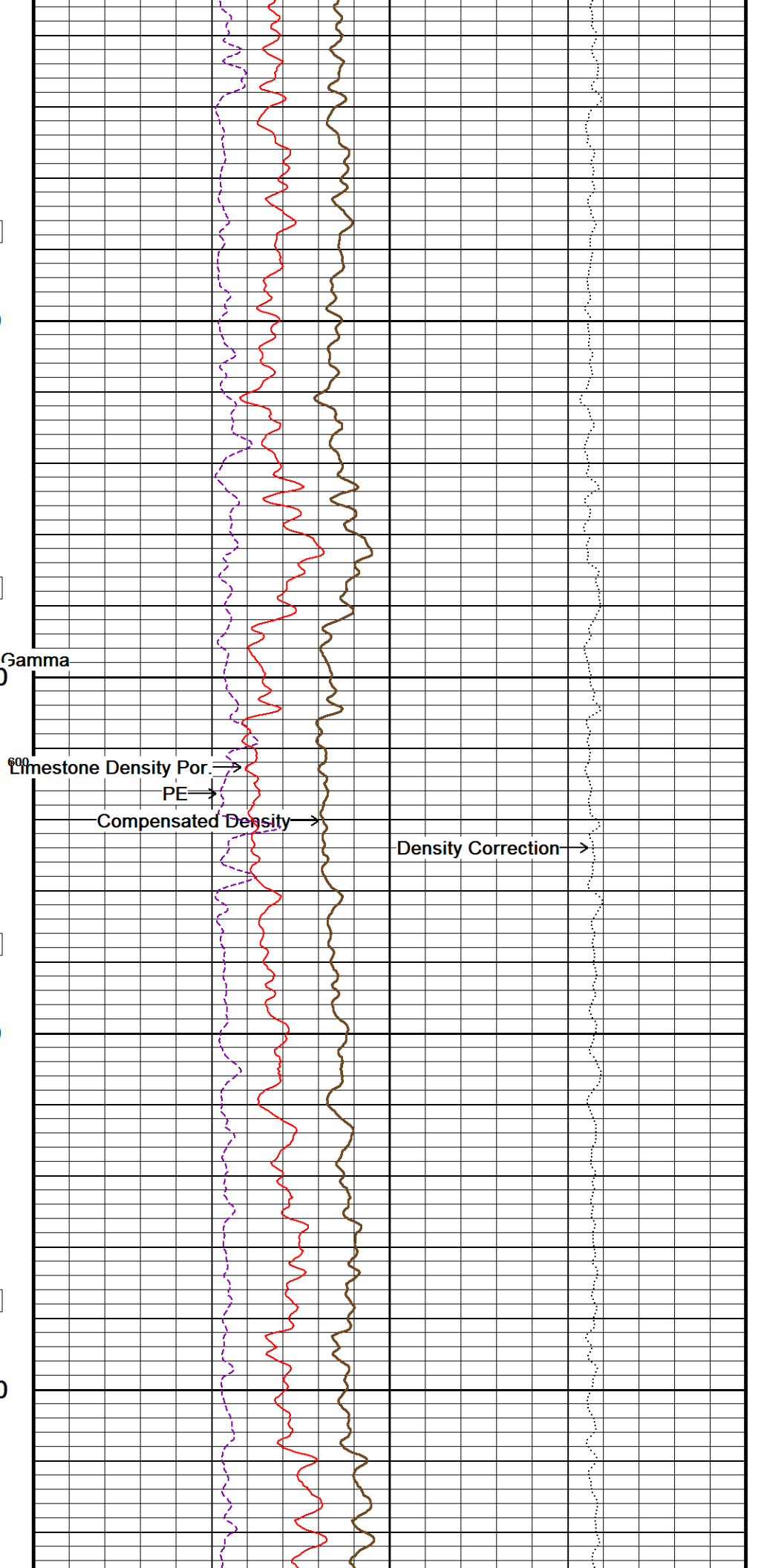
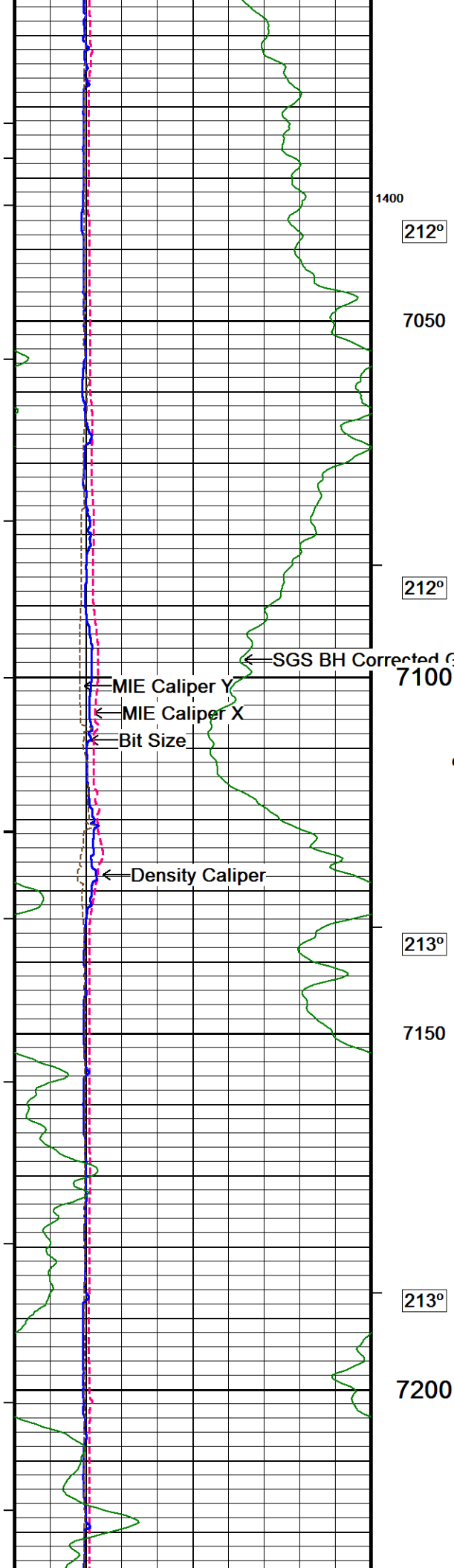
212°

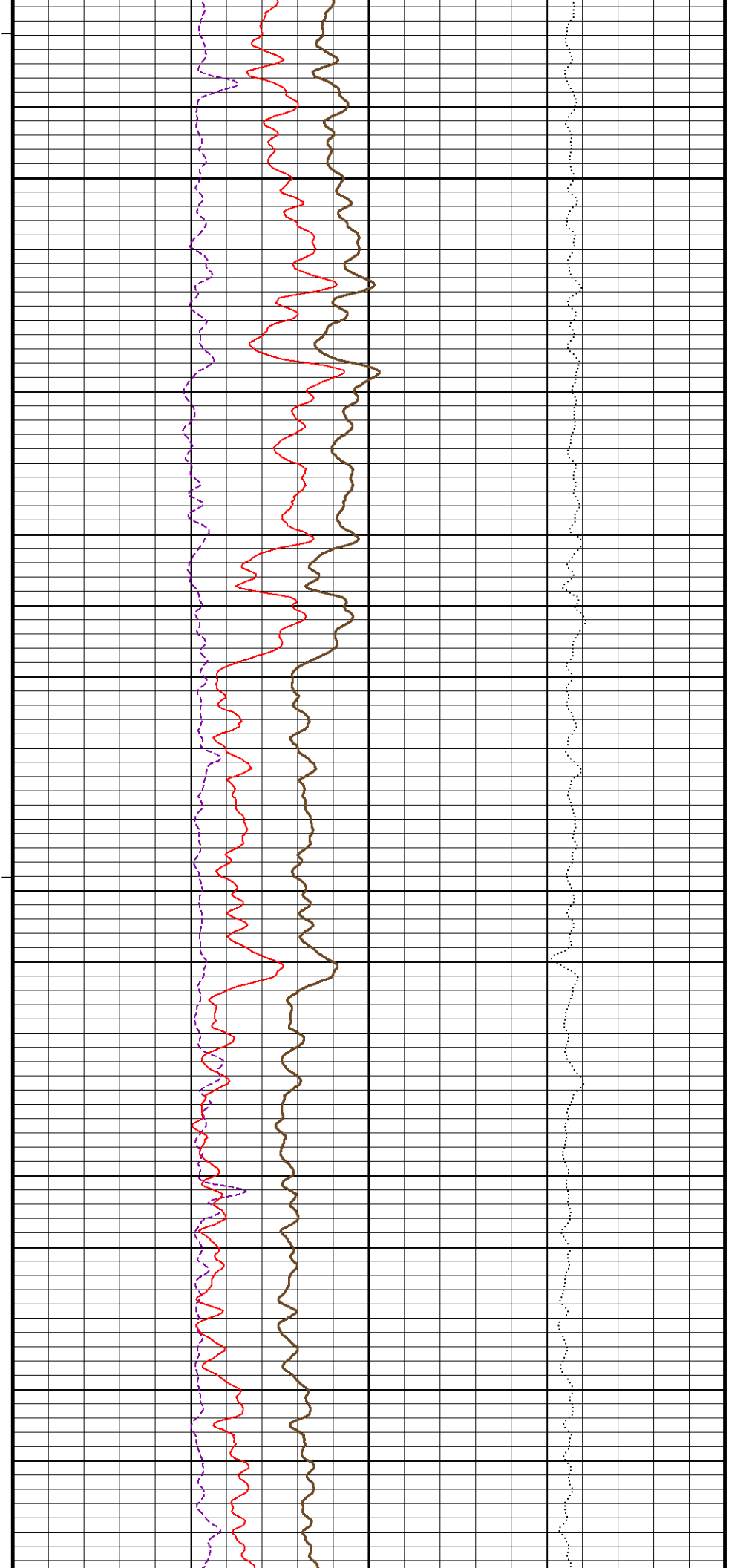
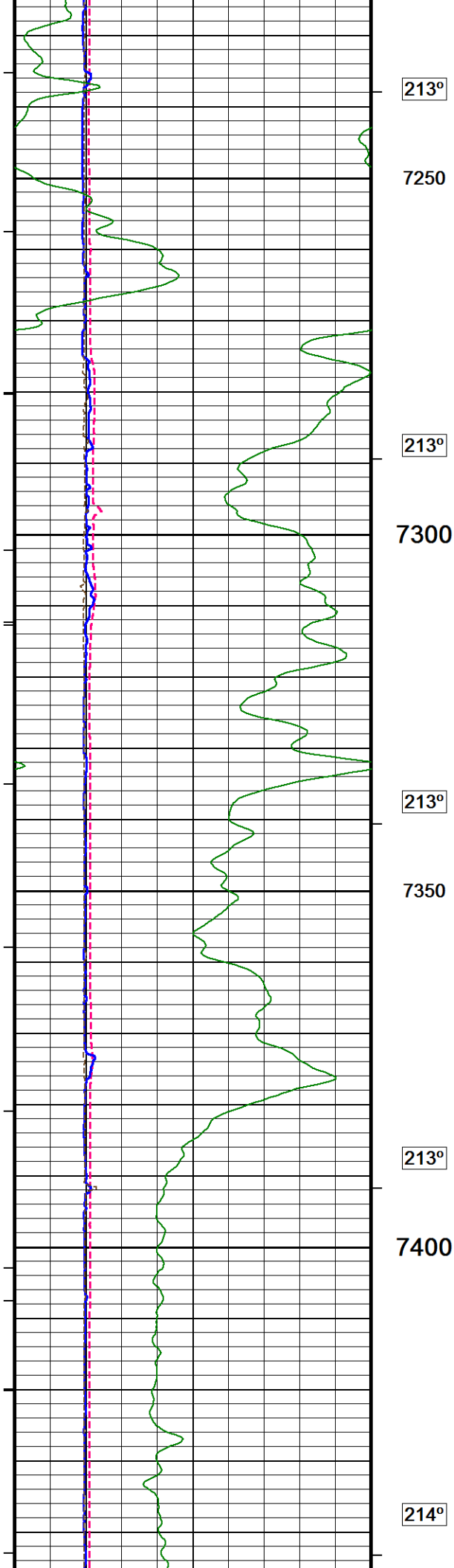
6950

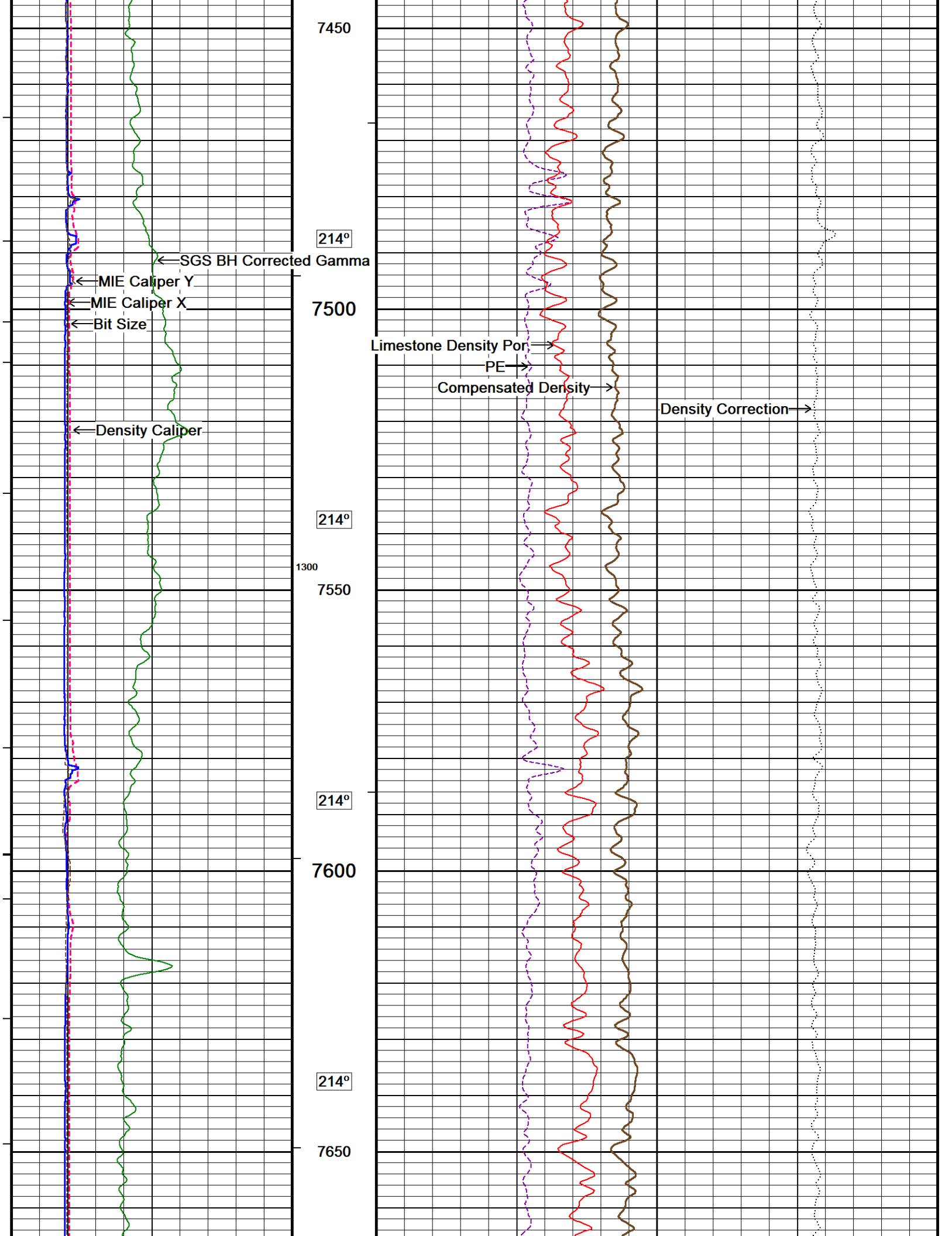
212°

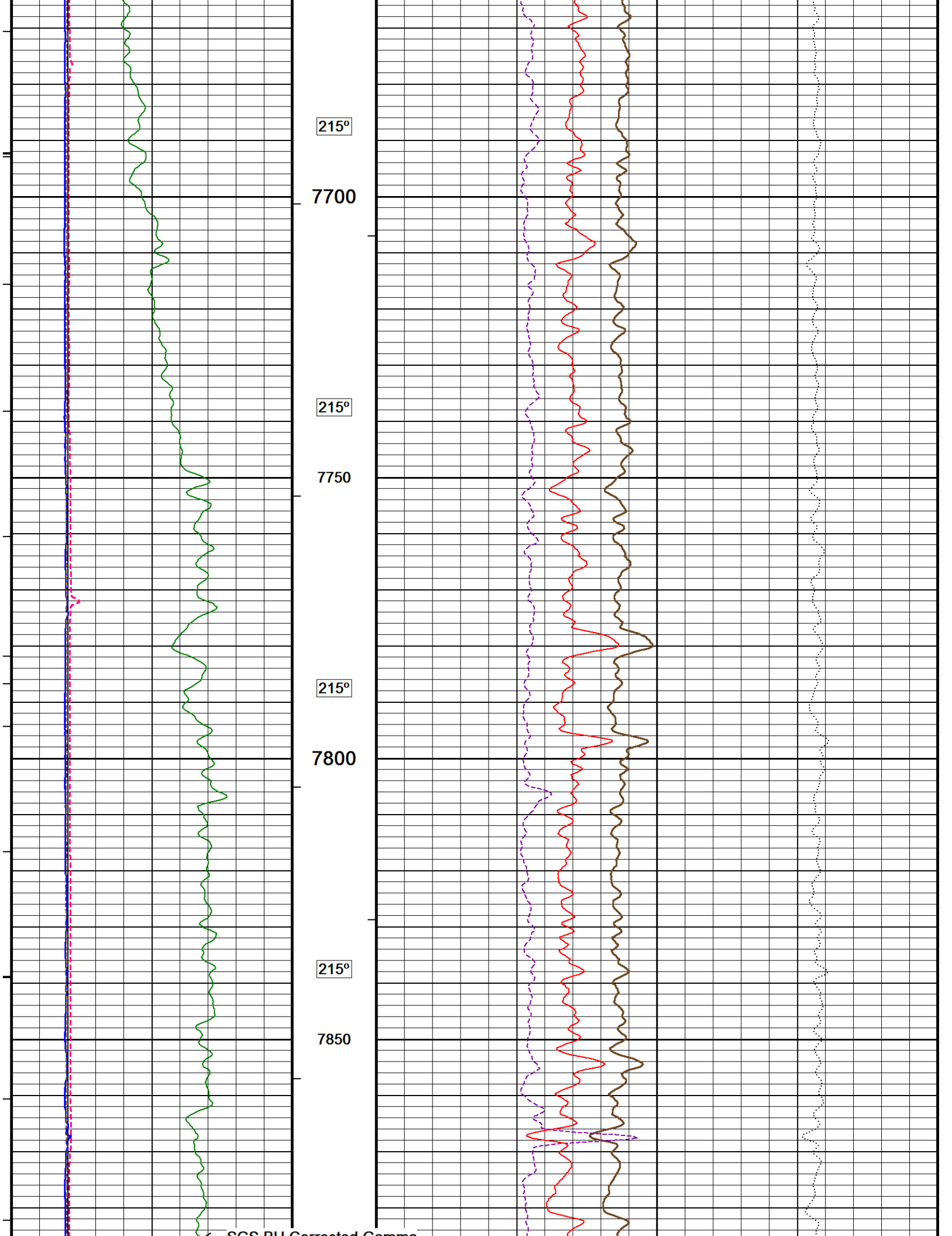
7000

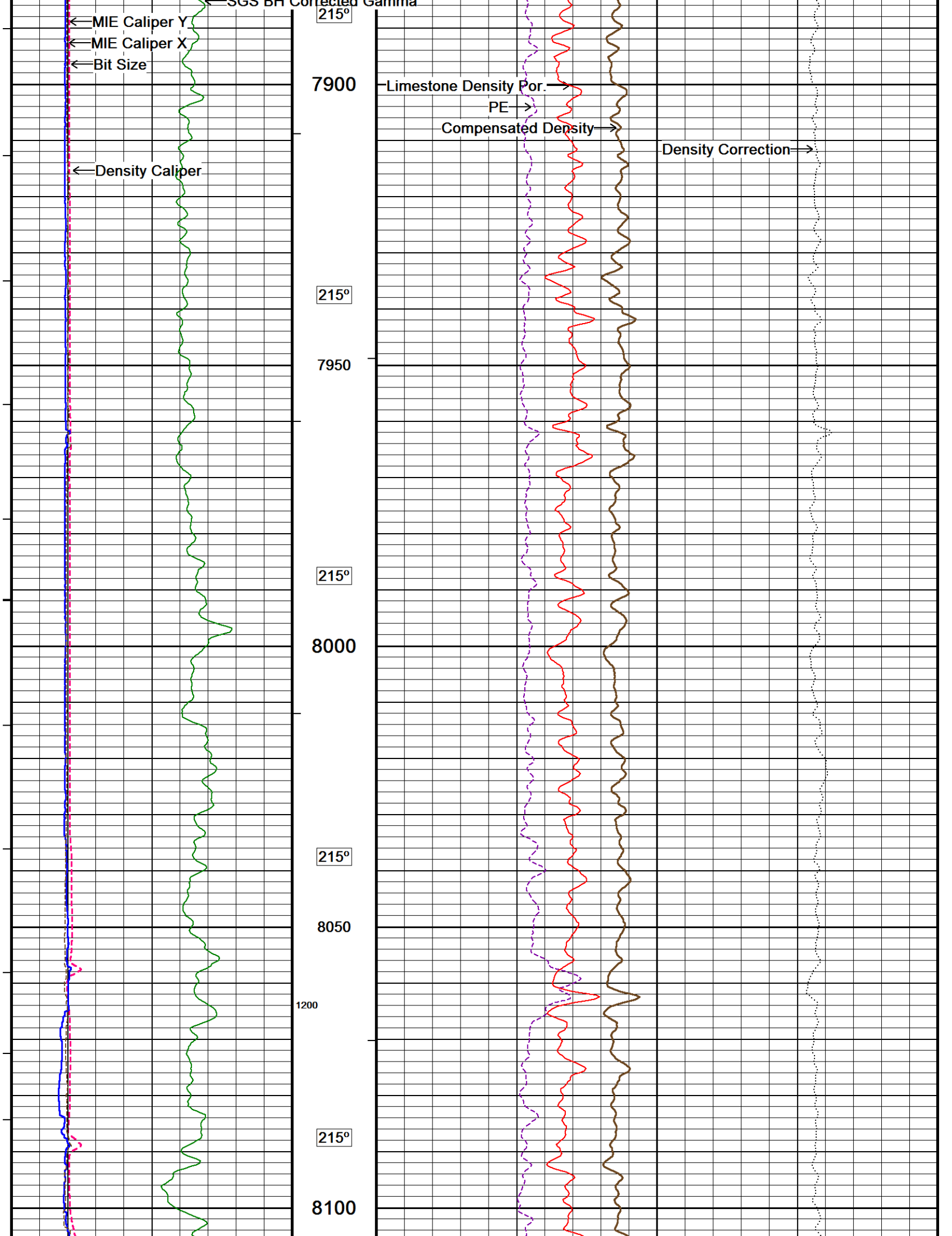


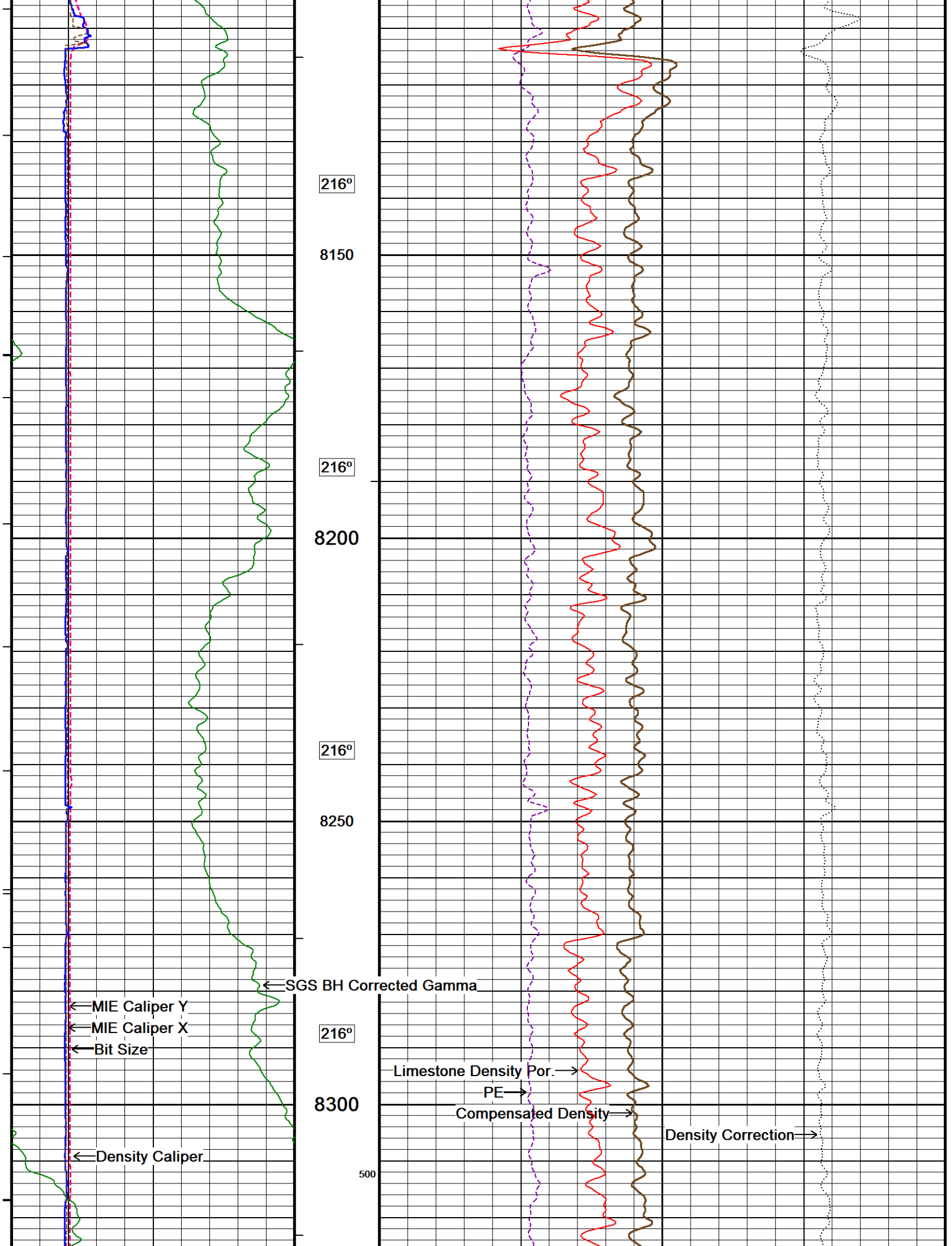


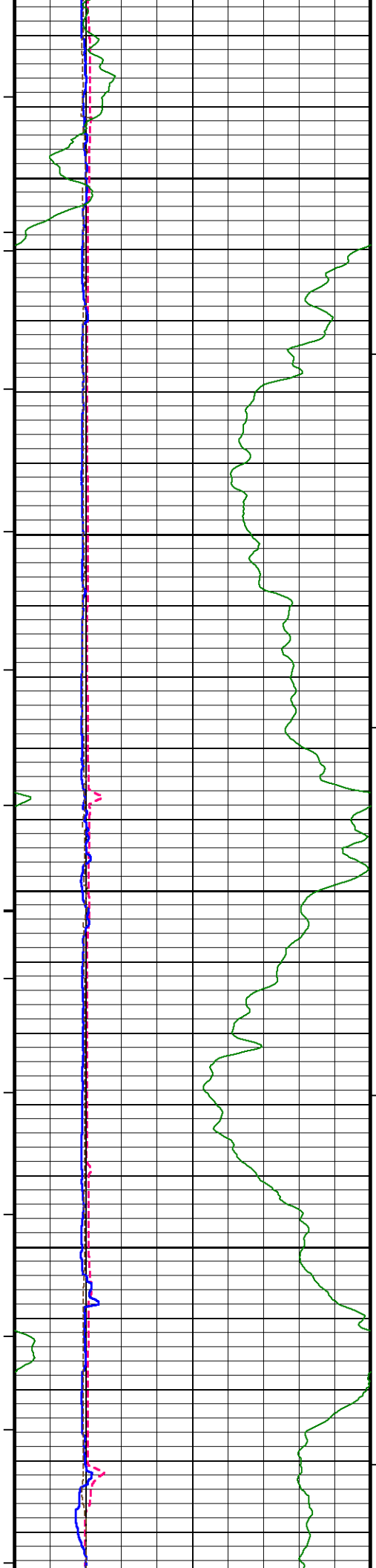












216°

8350

216°

8400

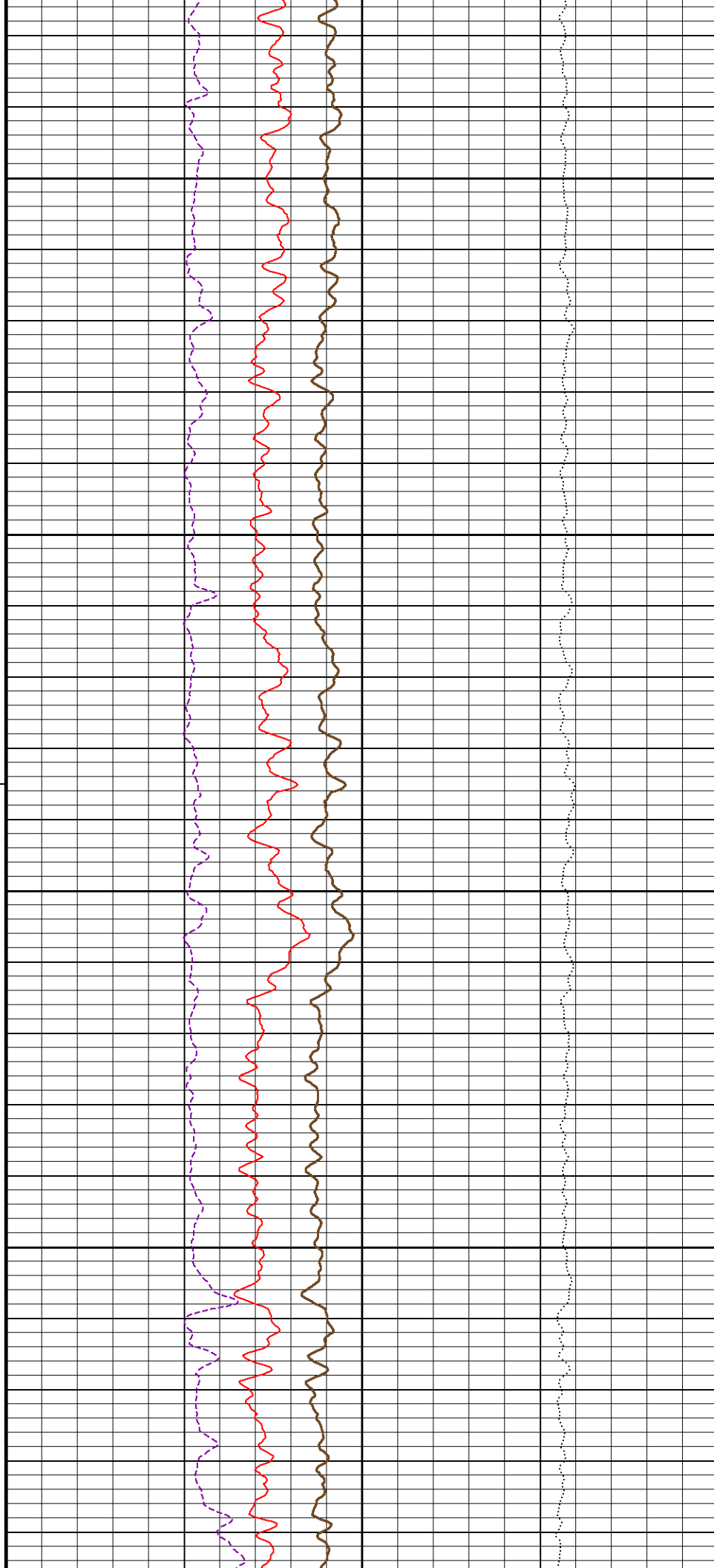
217°

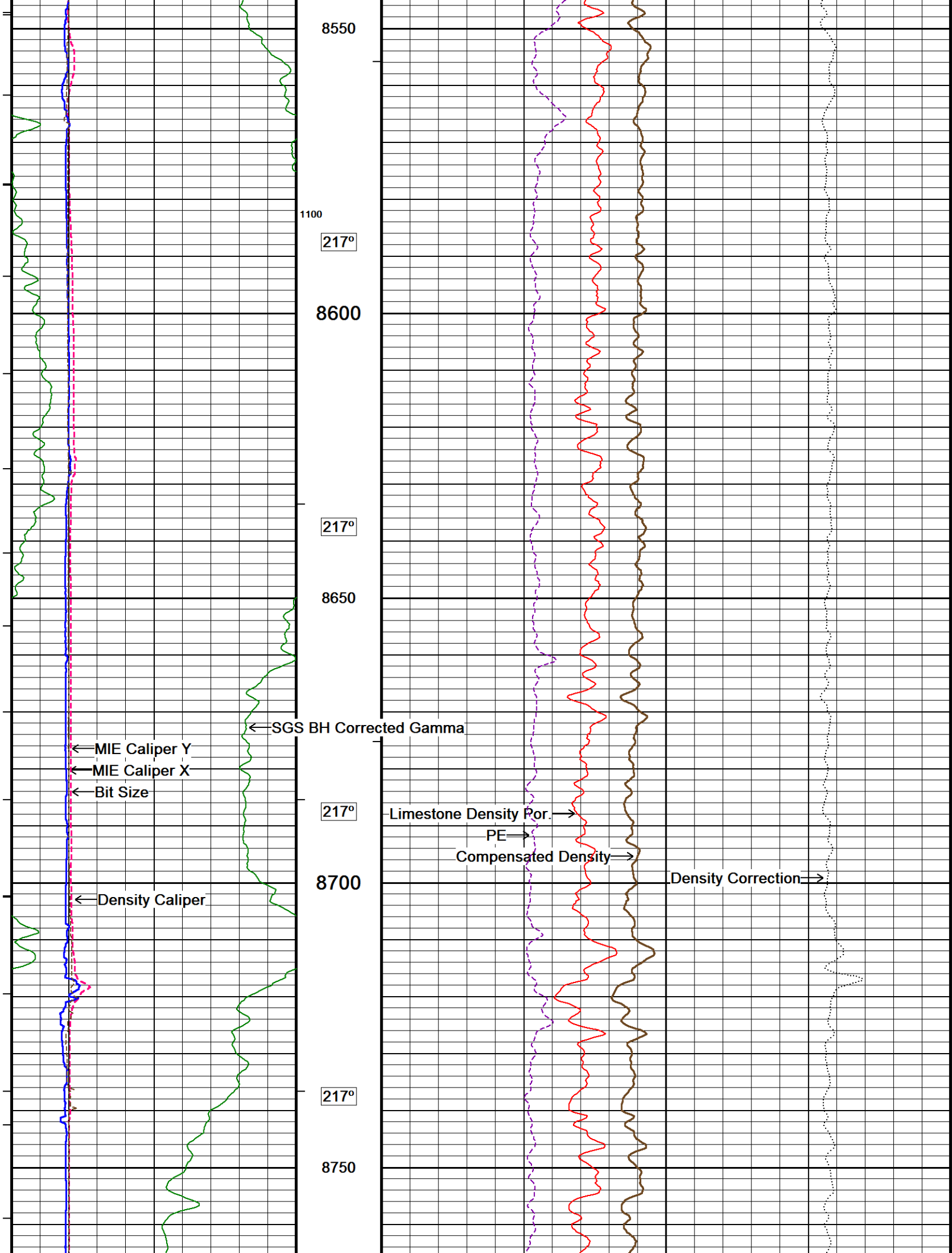
8450

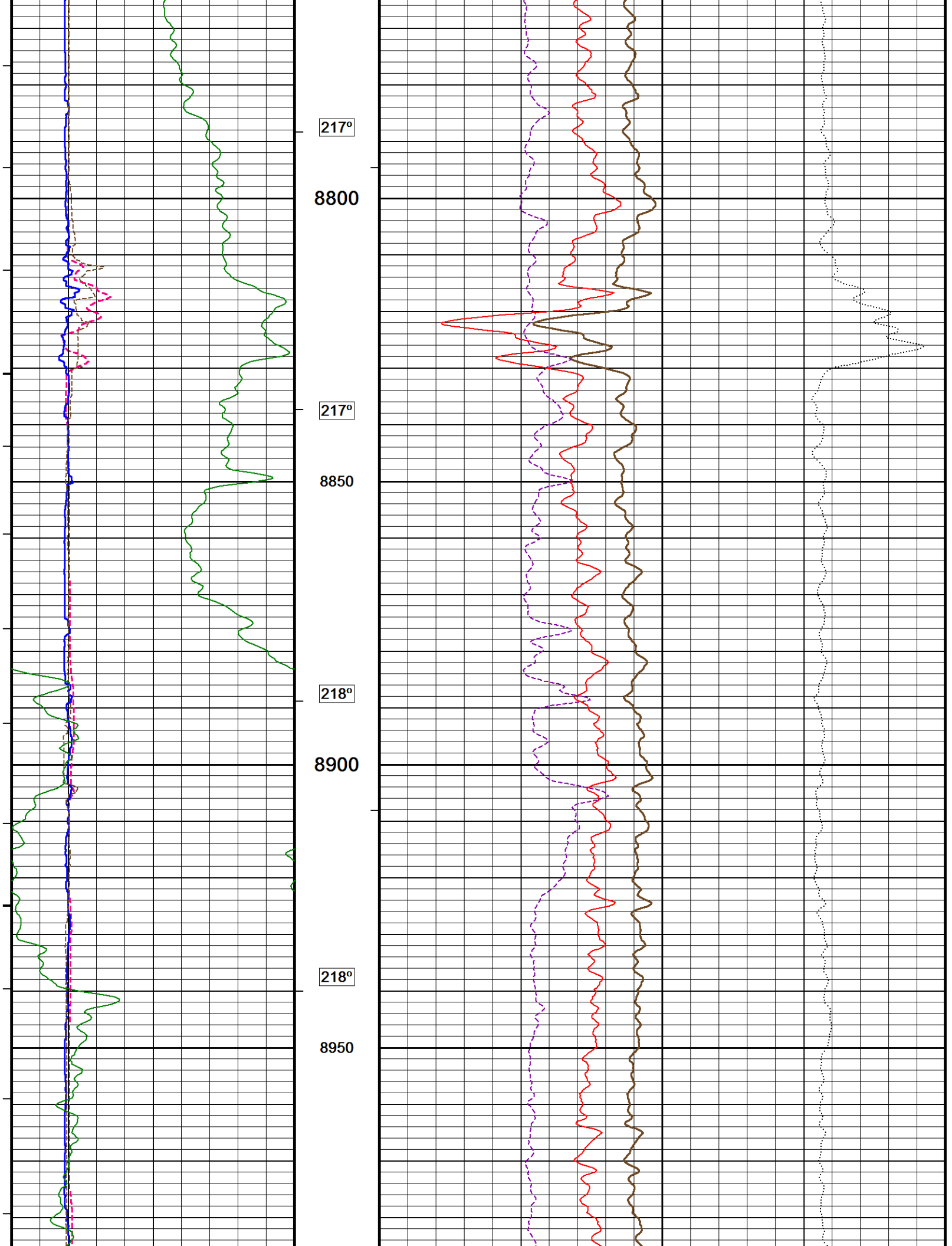
217°

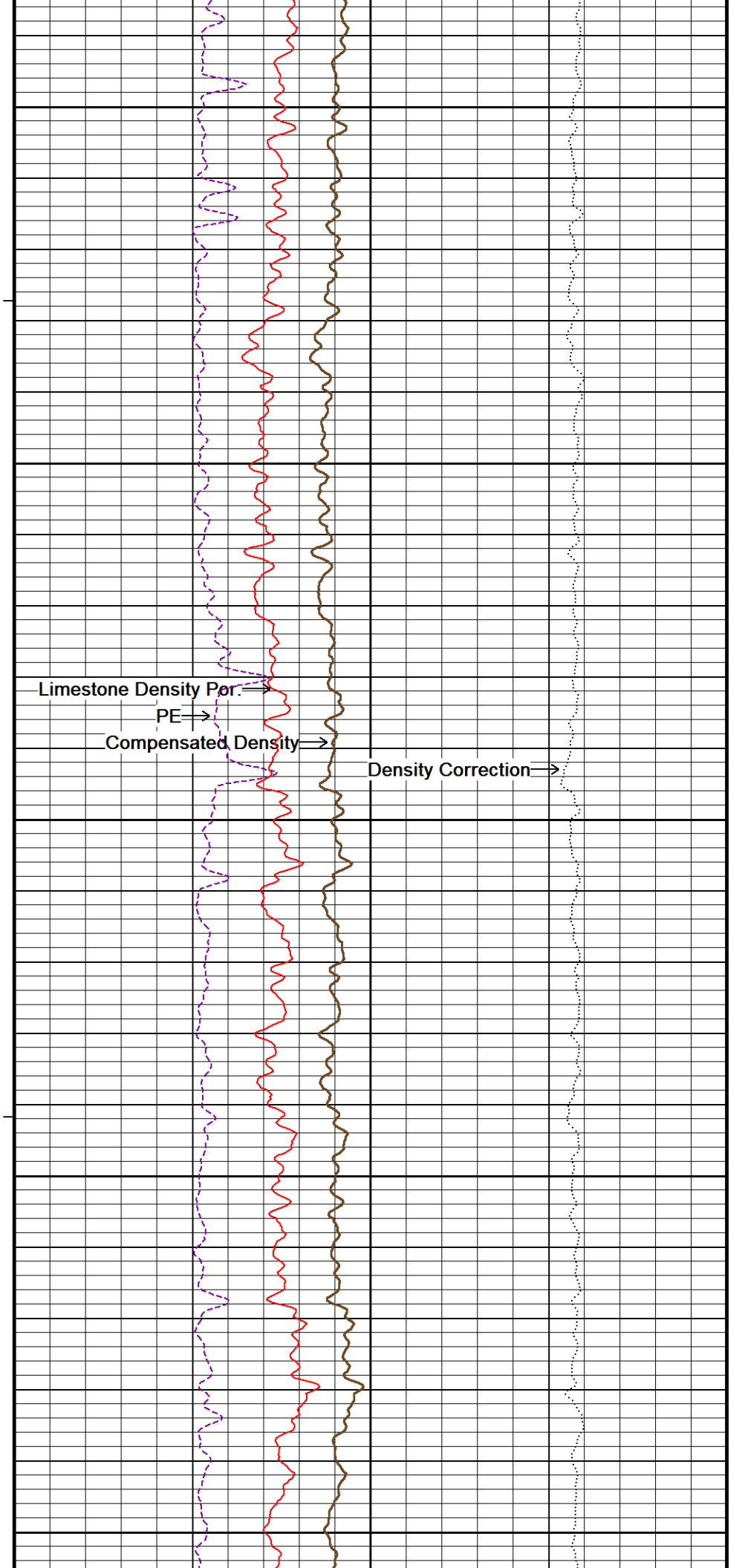
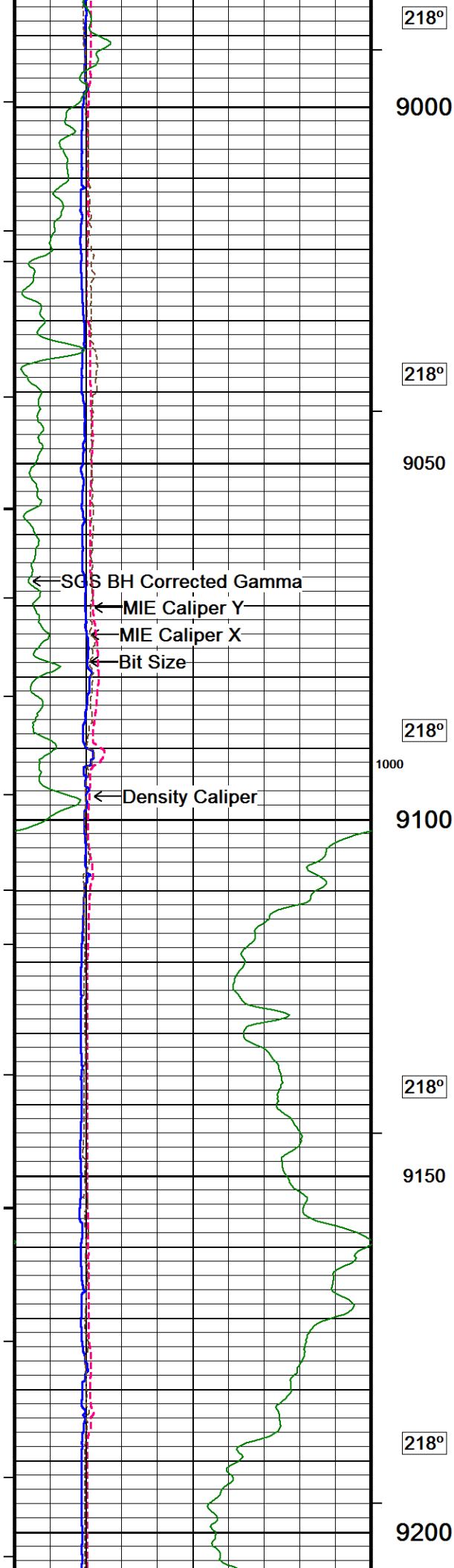
8500

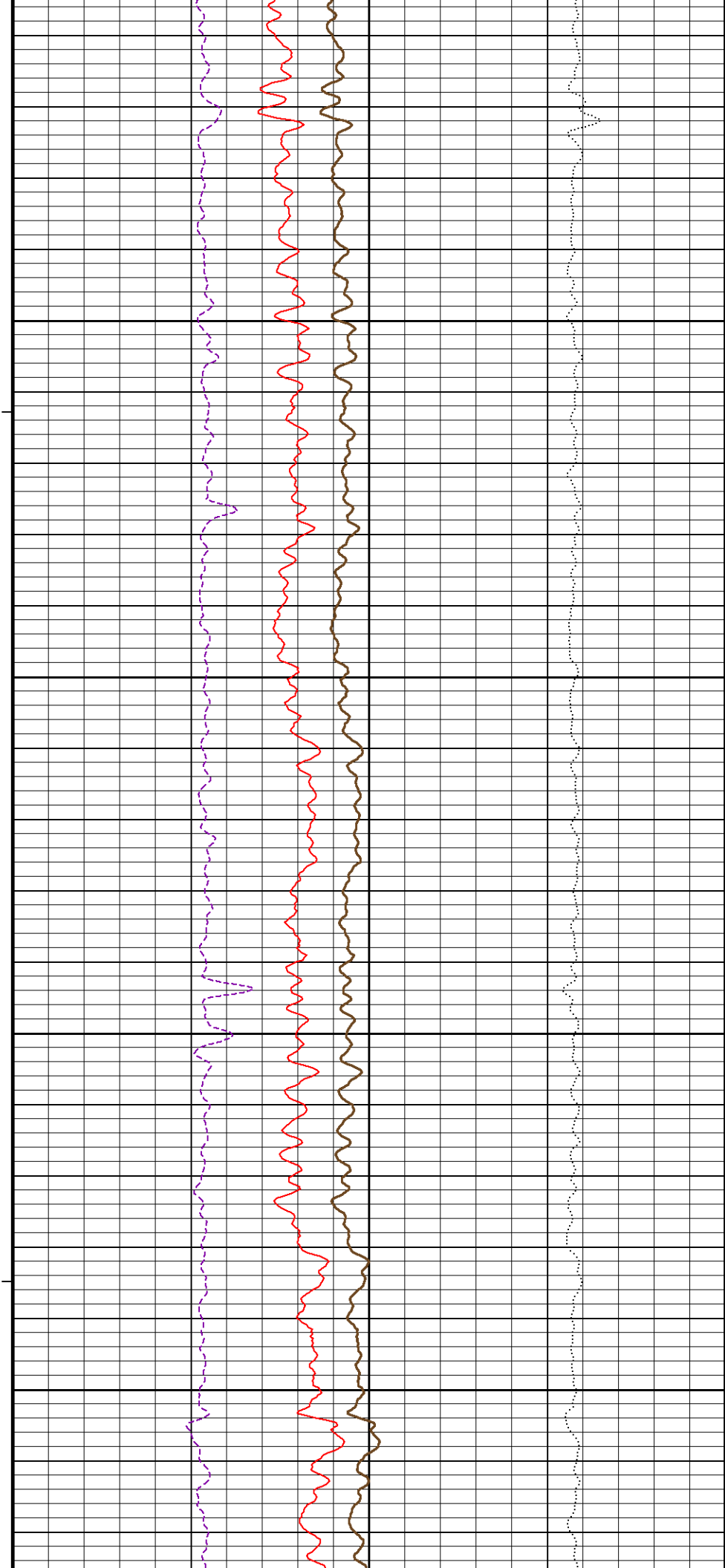
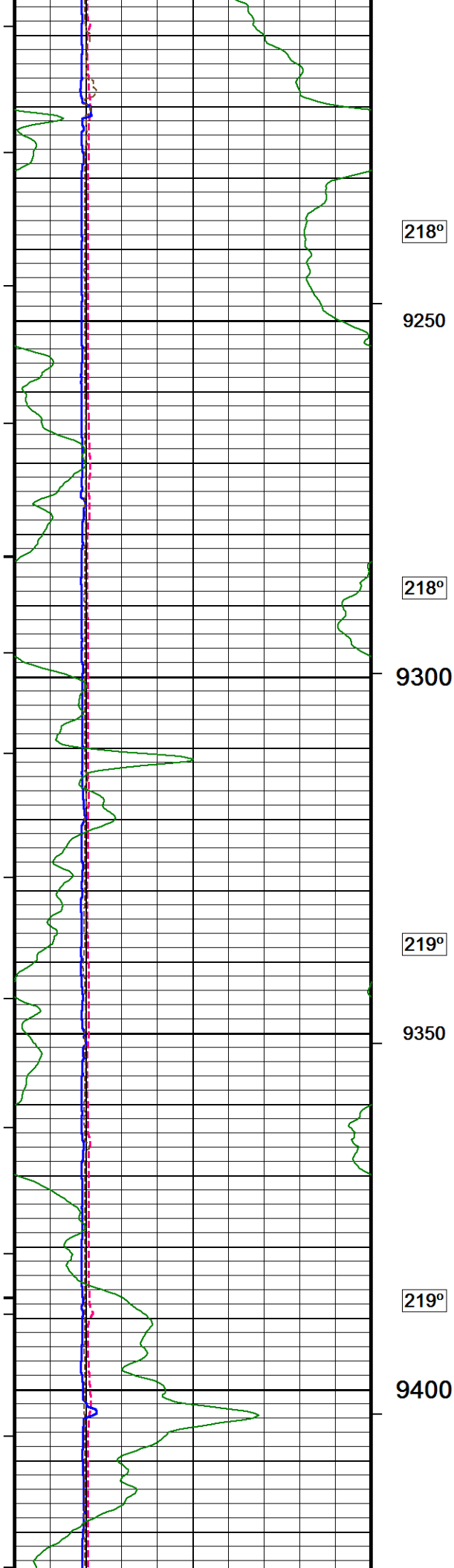
217°

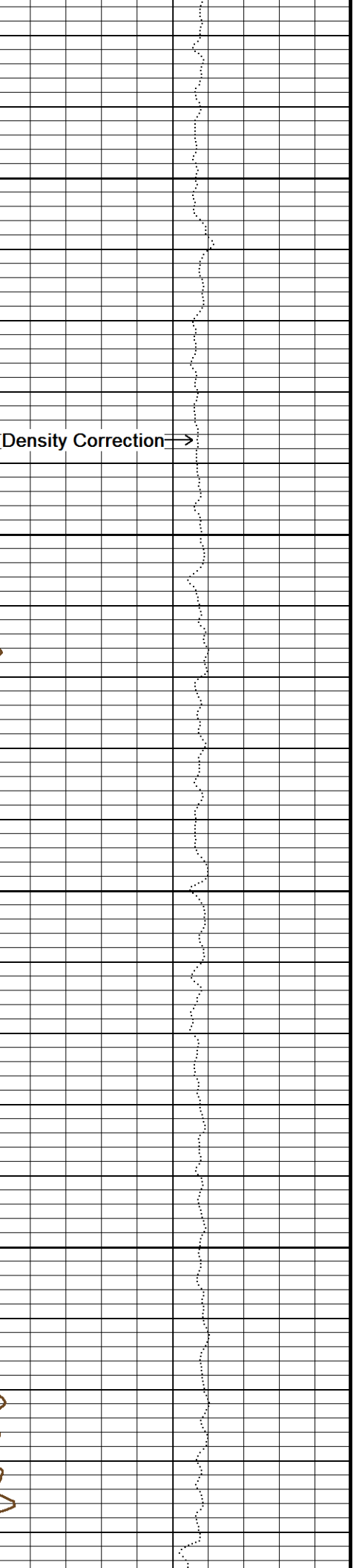
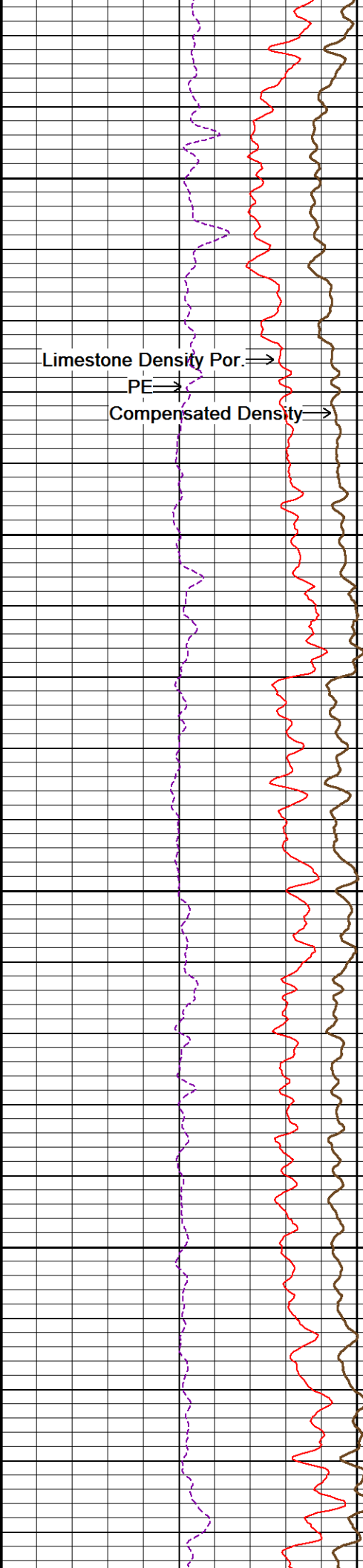
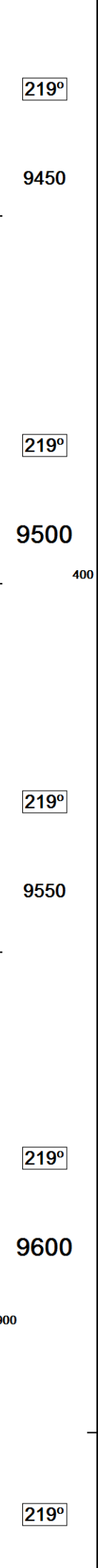
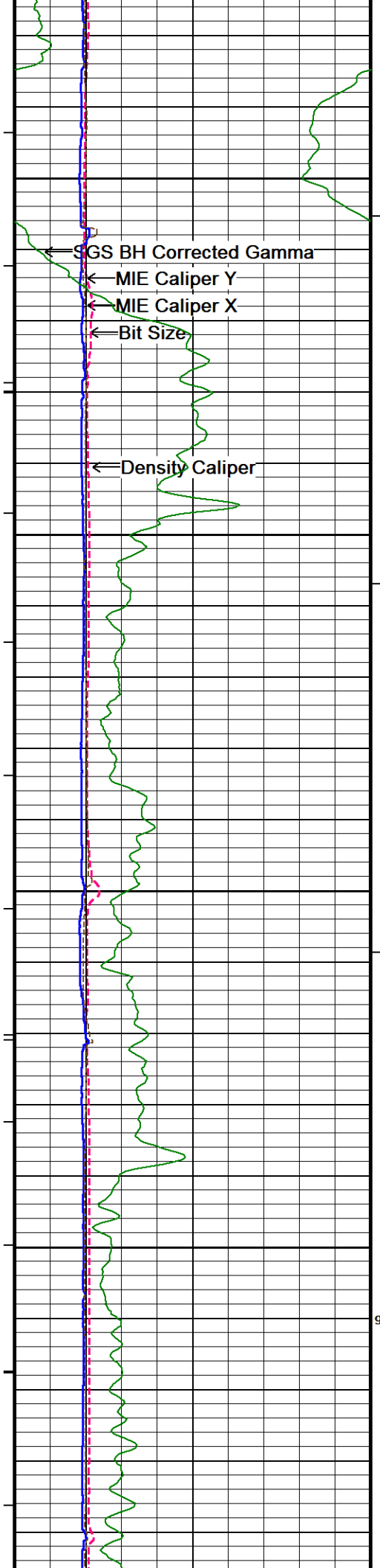


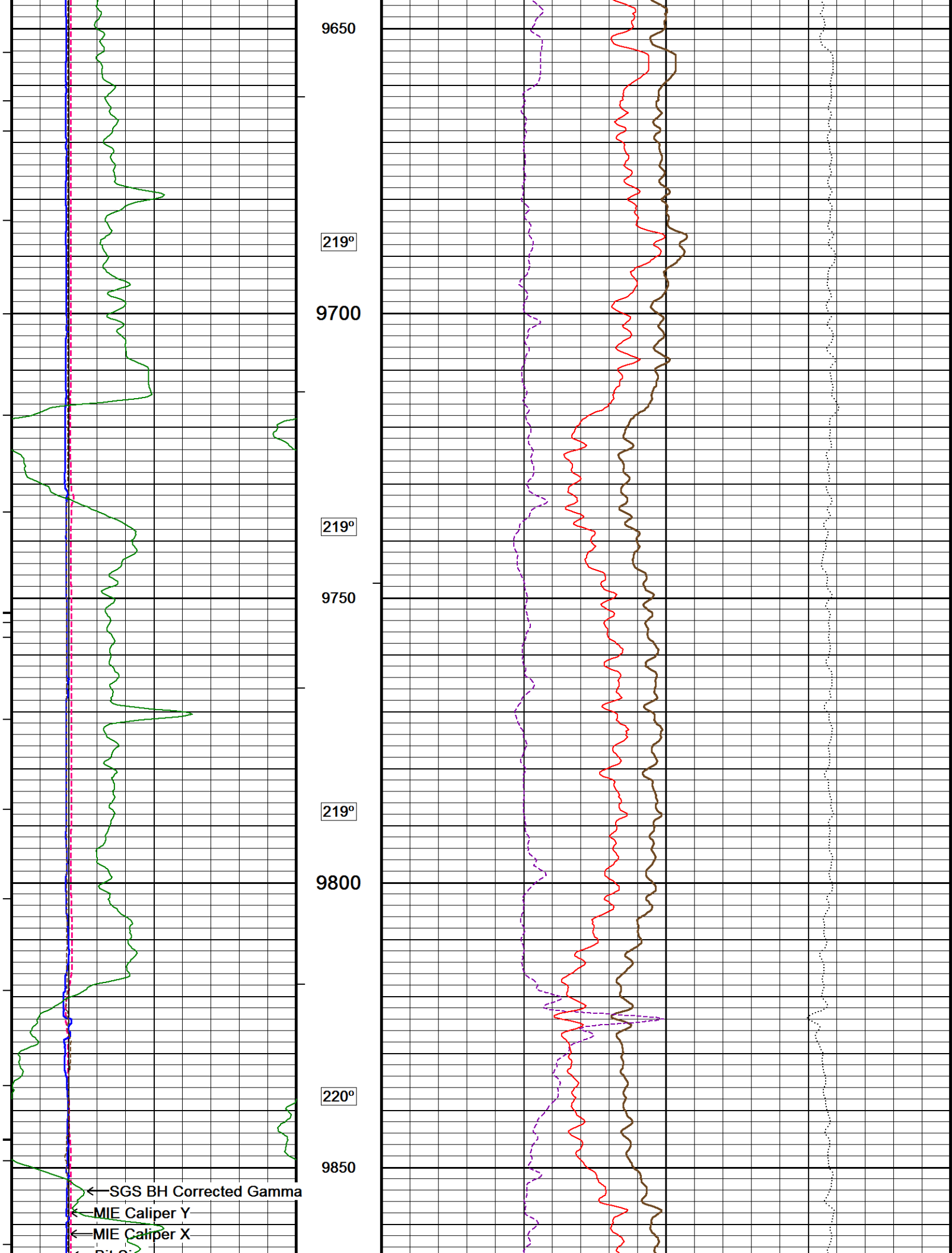


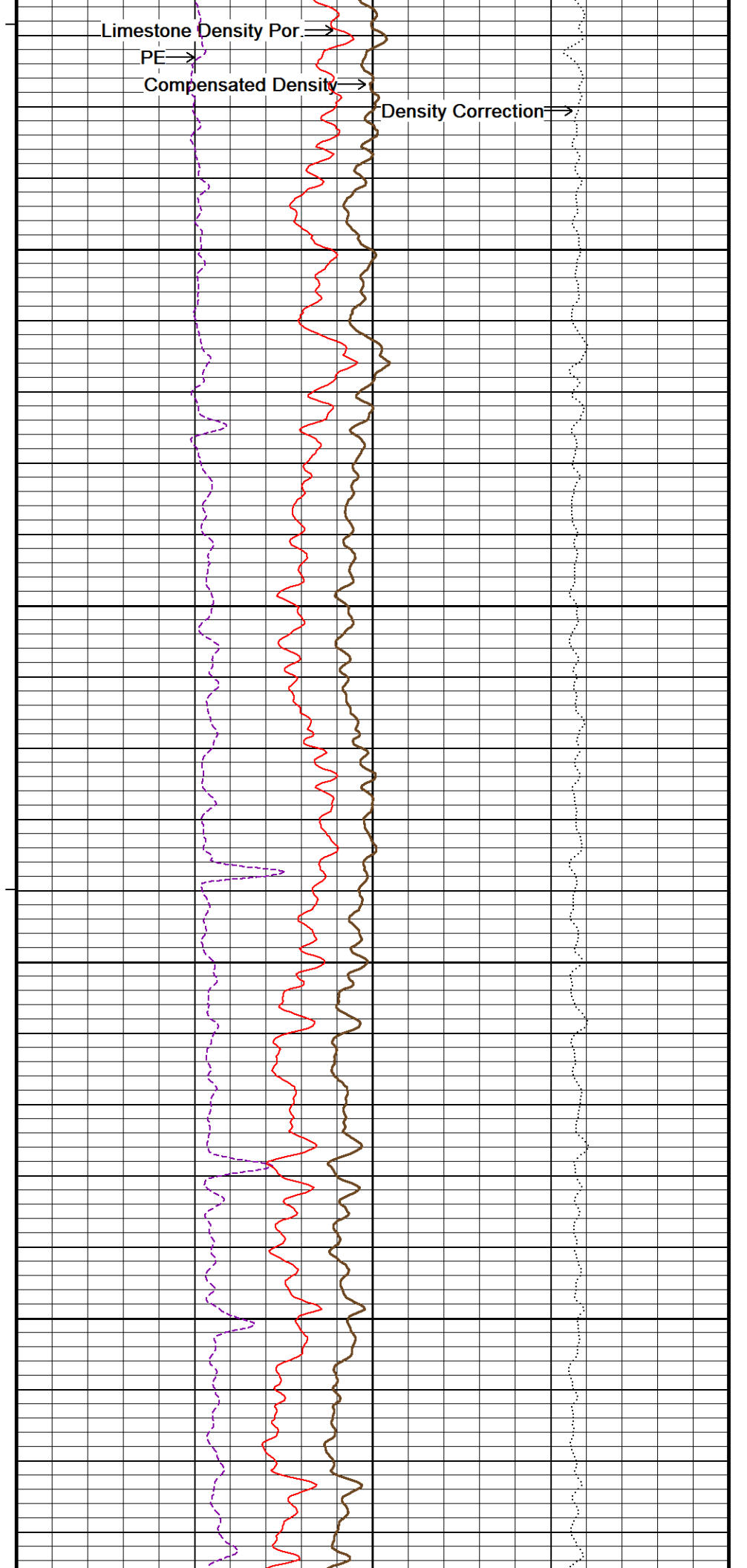
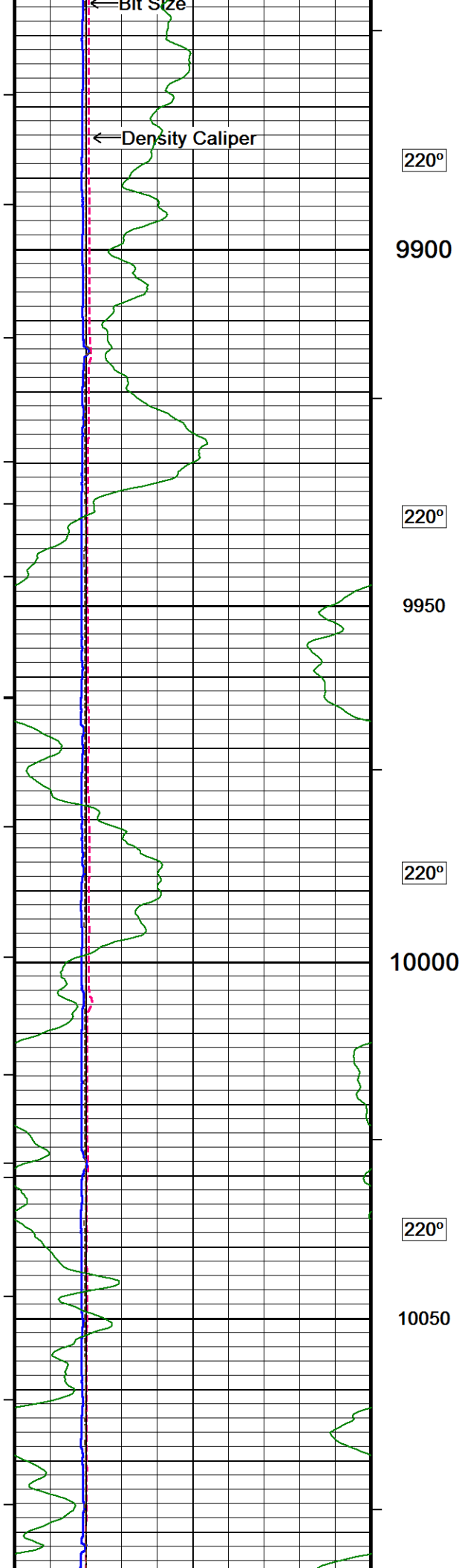


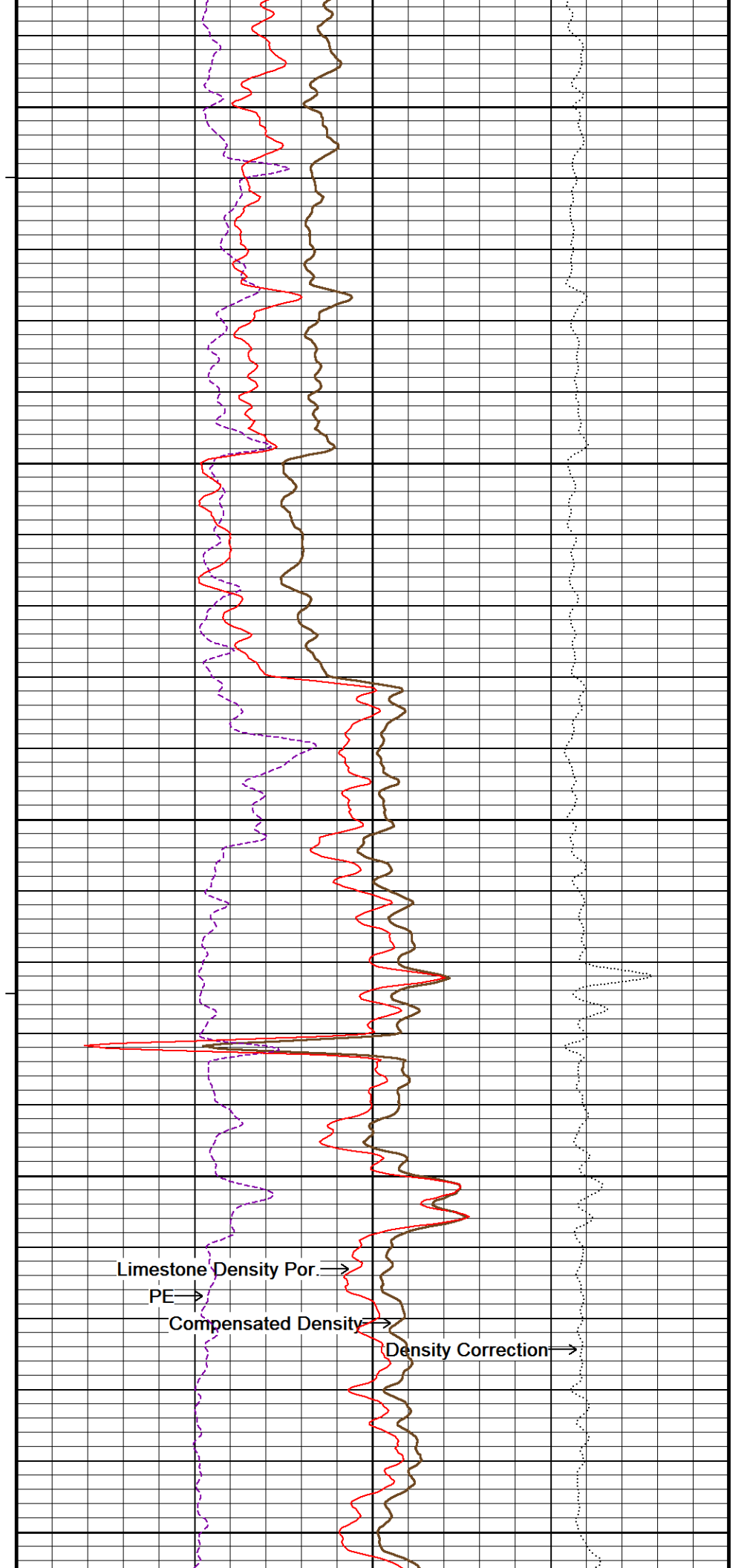
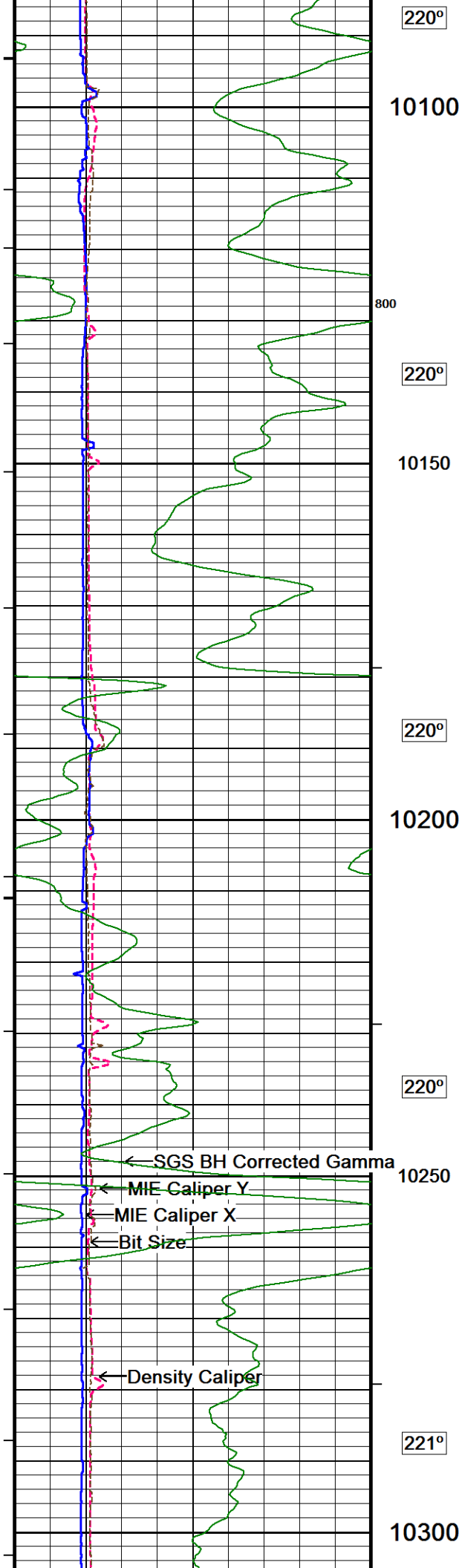


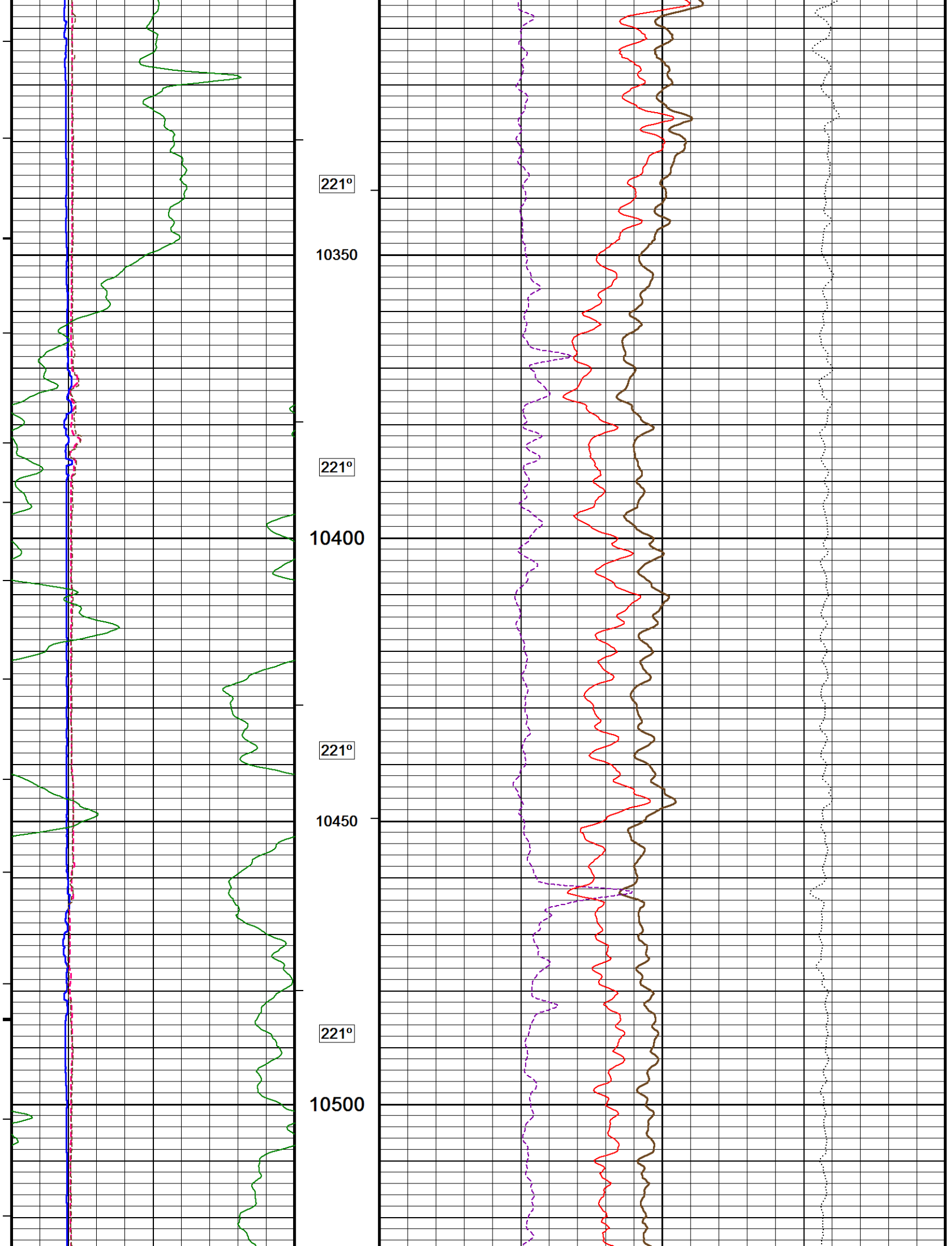


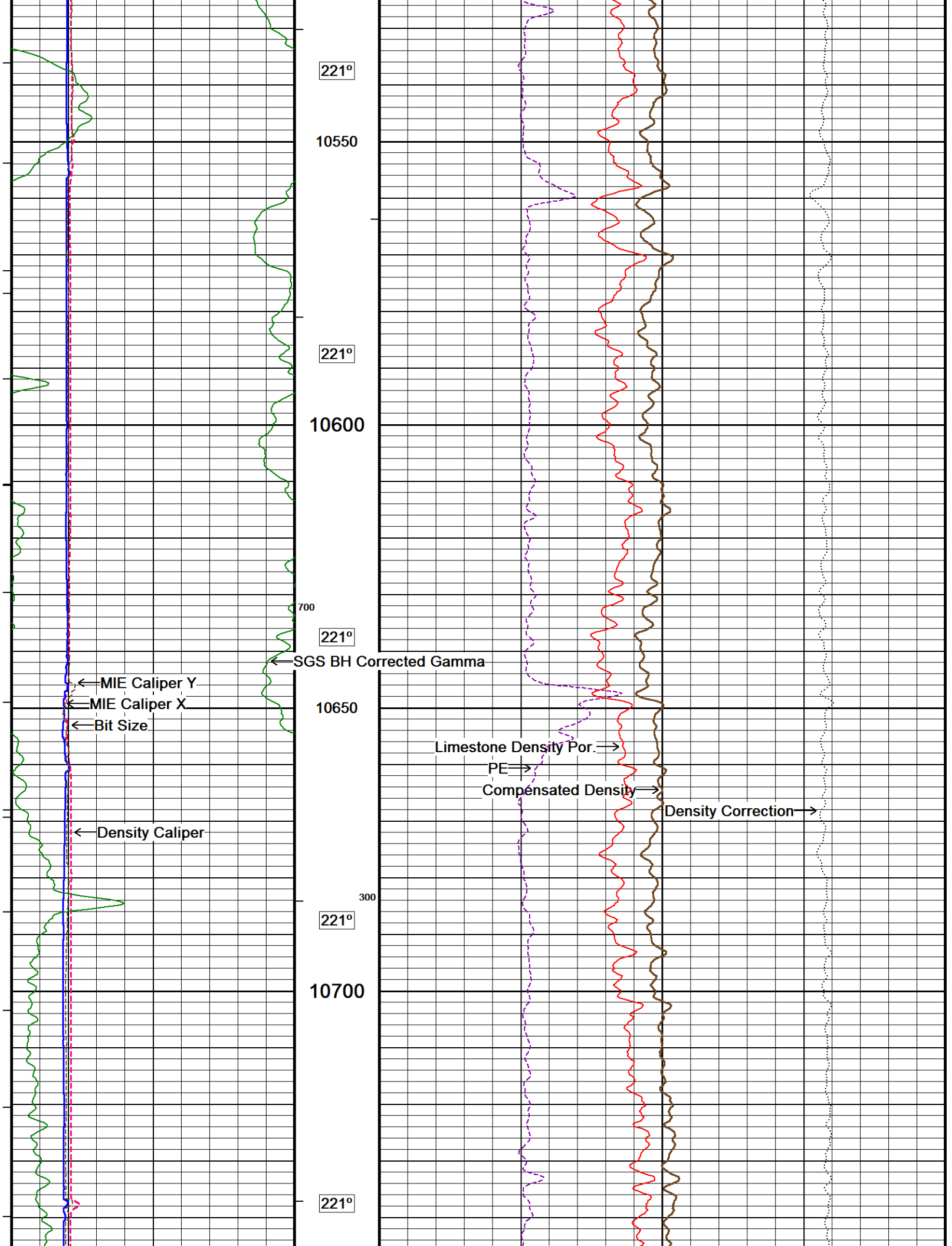


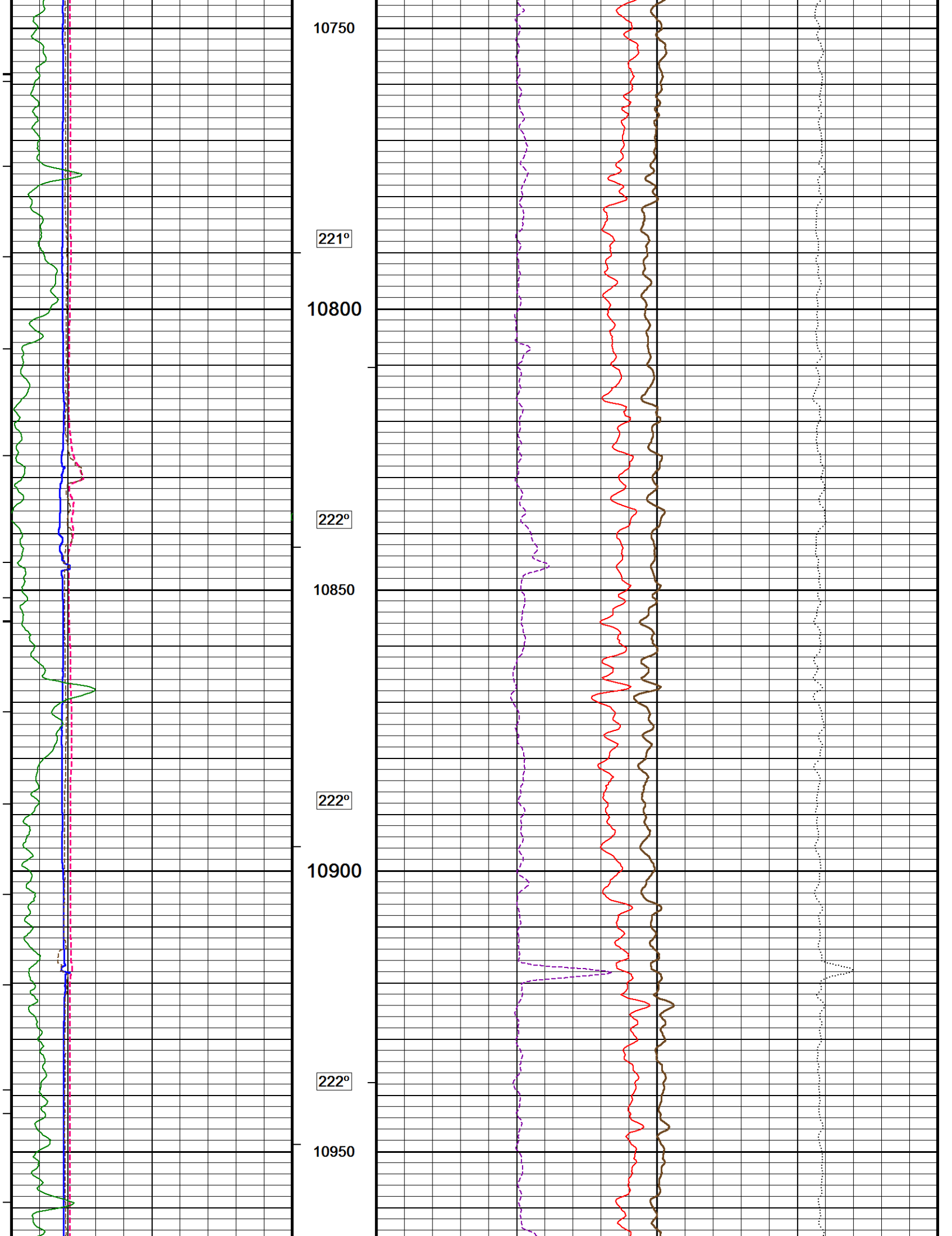


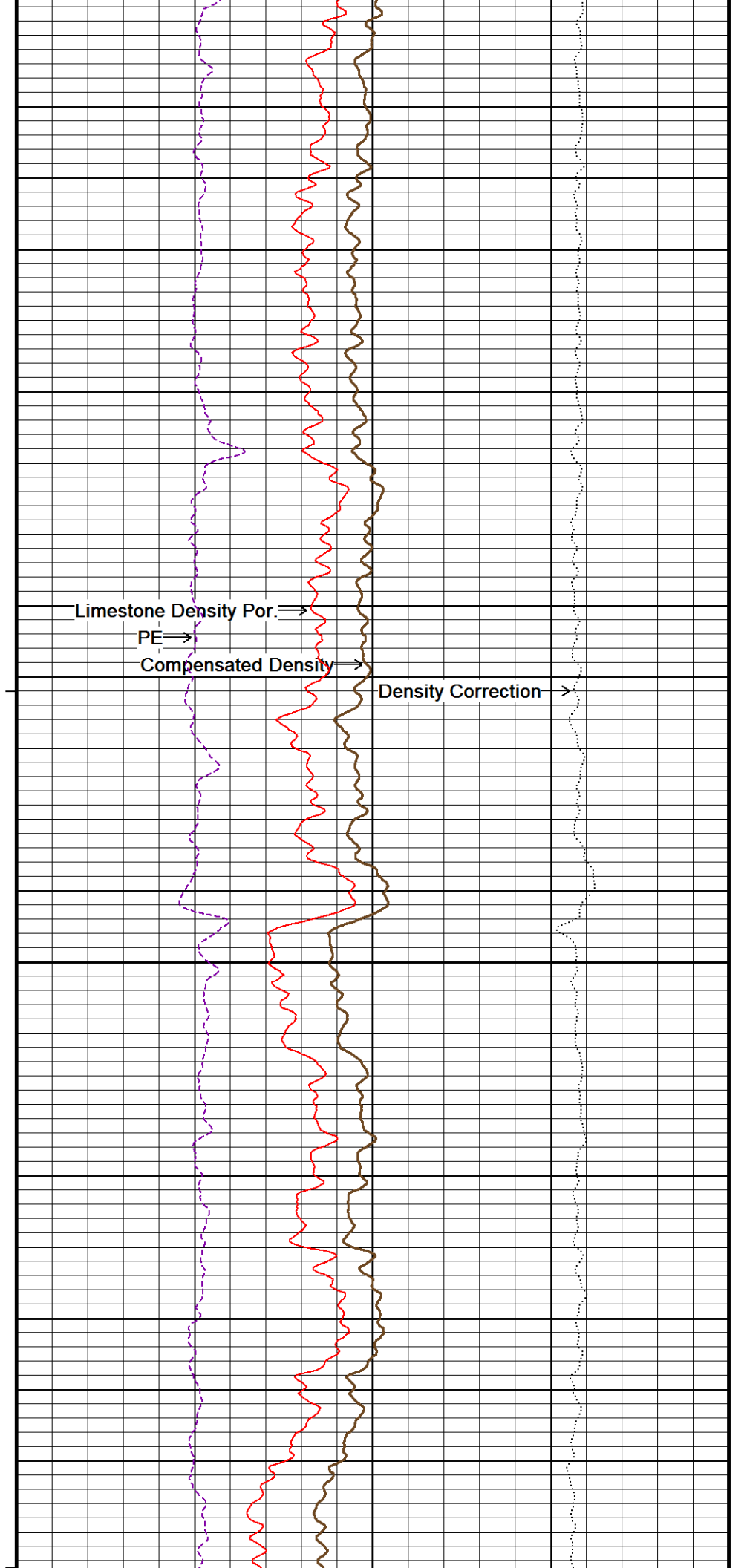
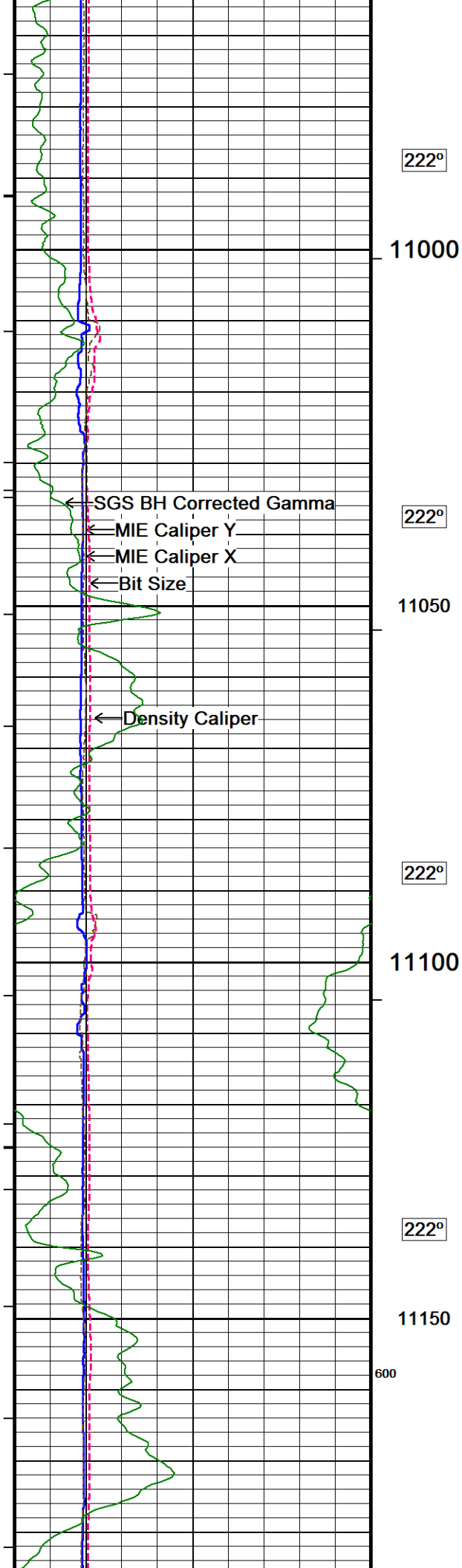


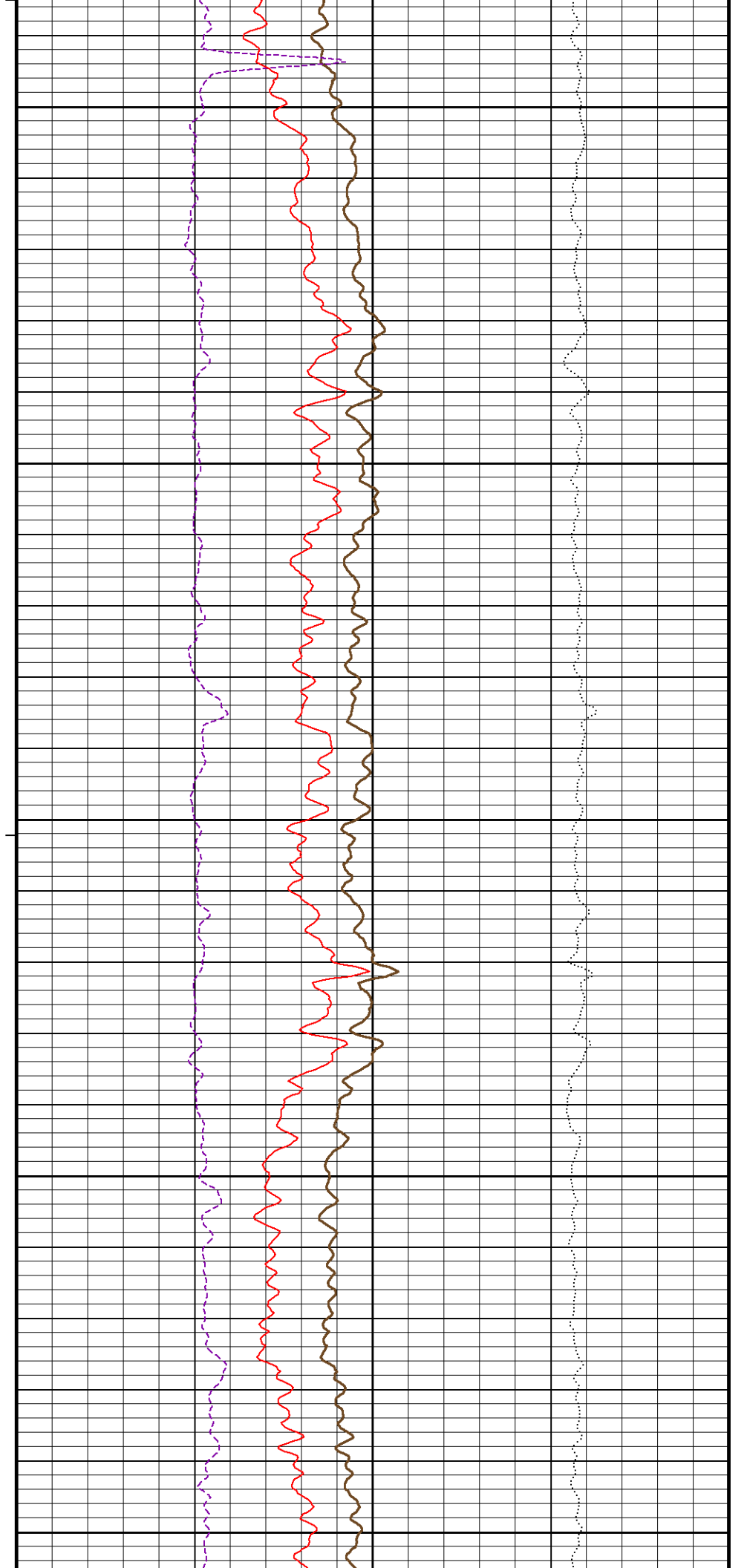
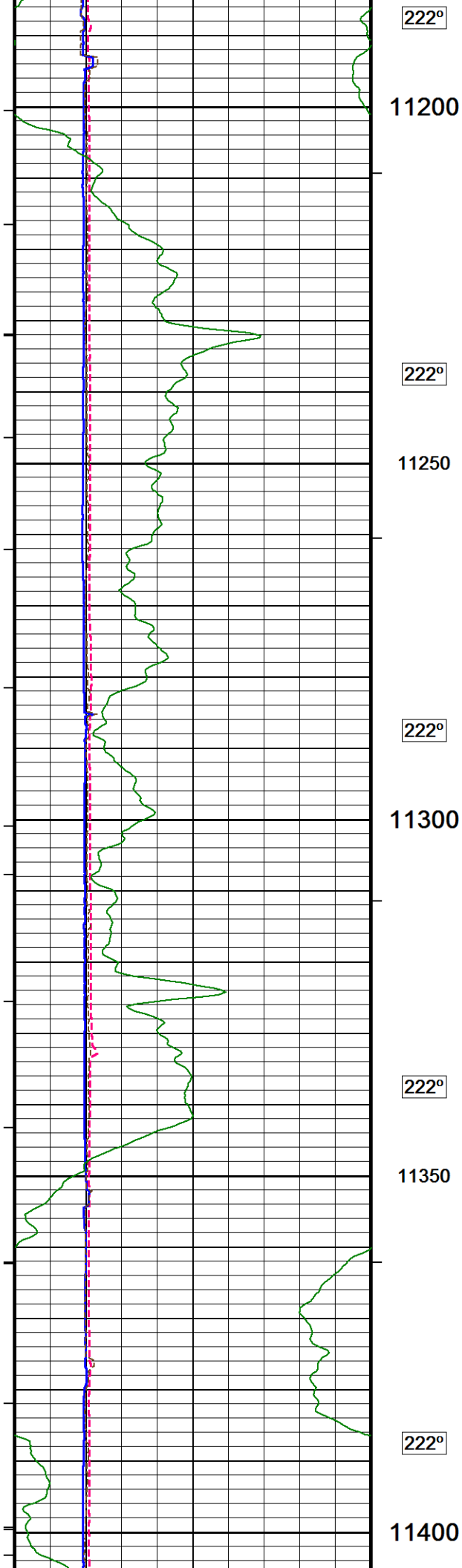


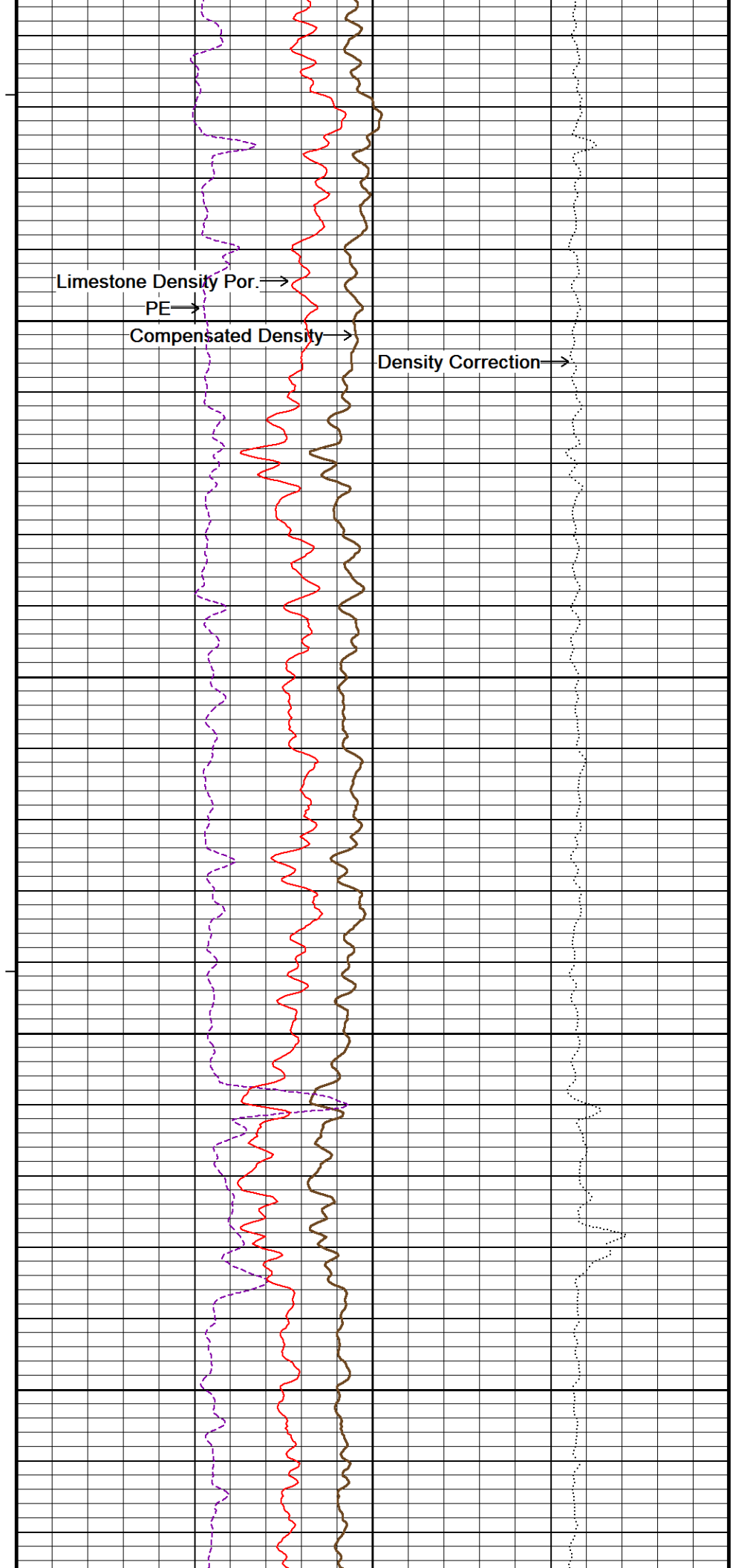
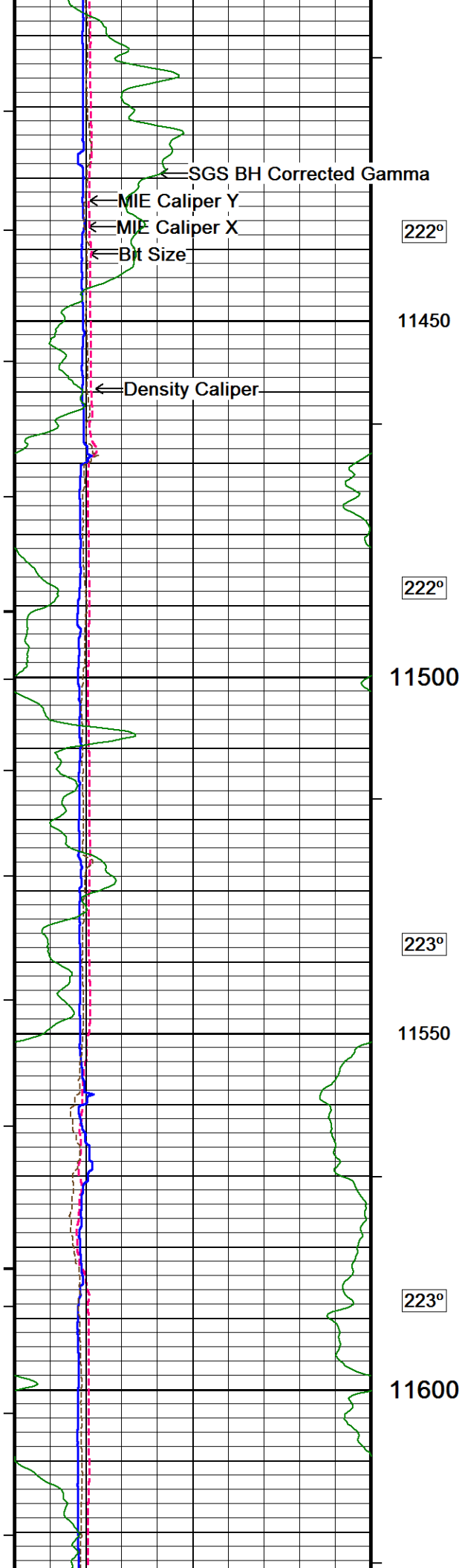


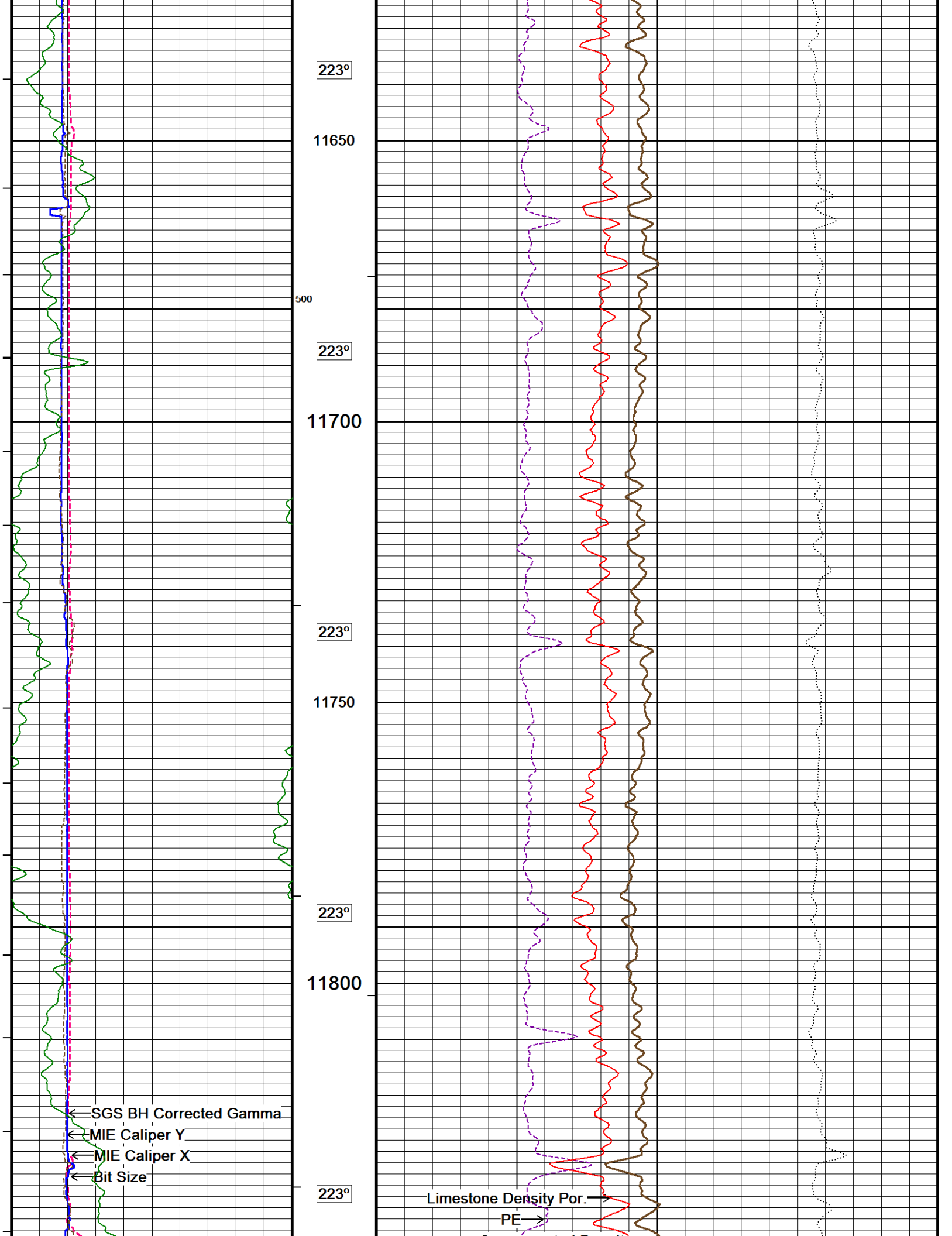


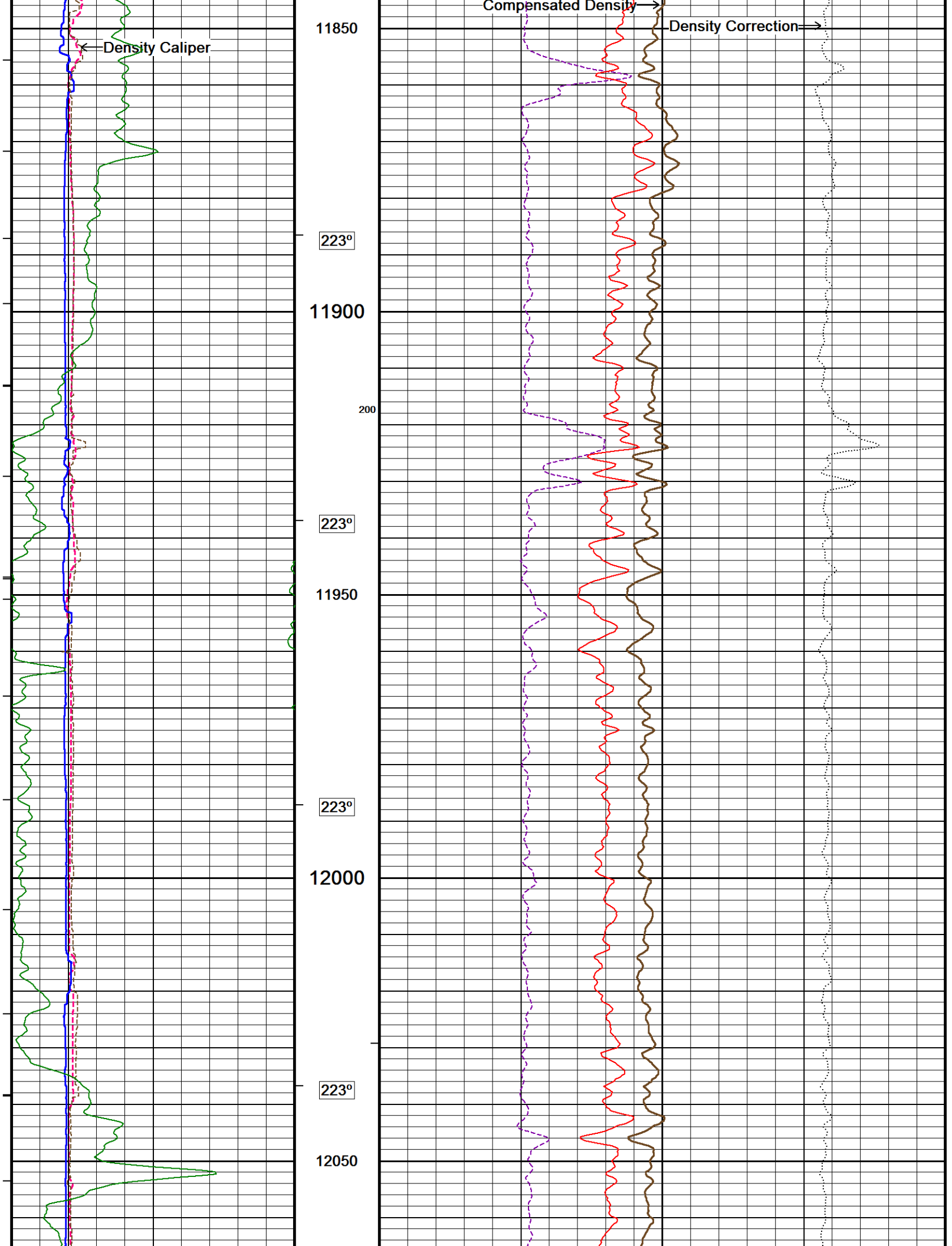


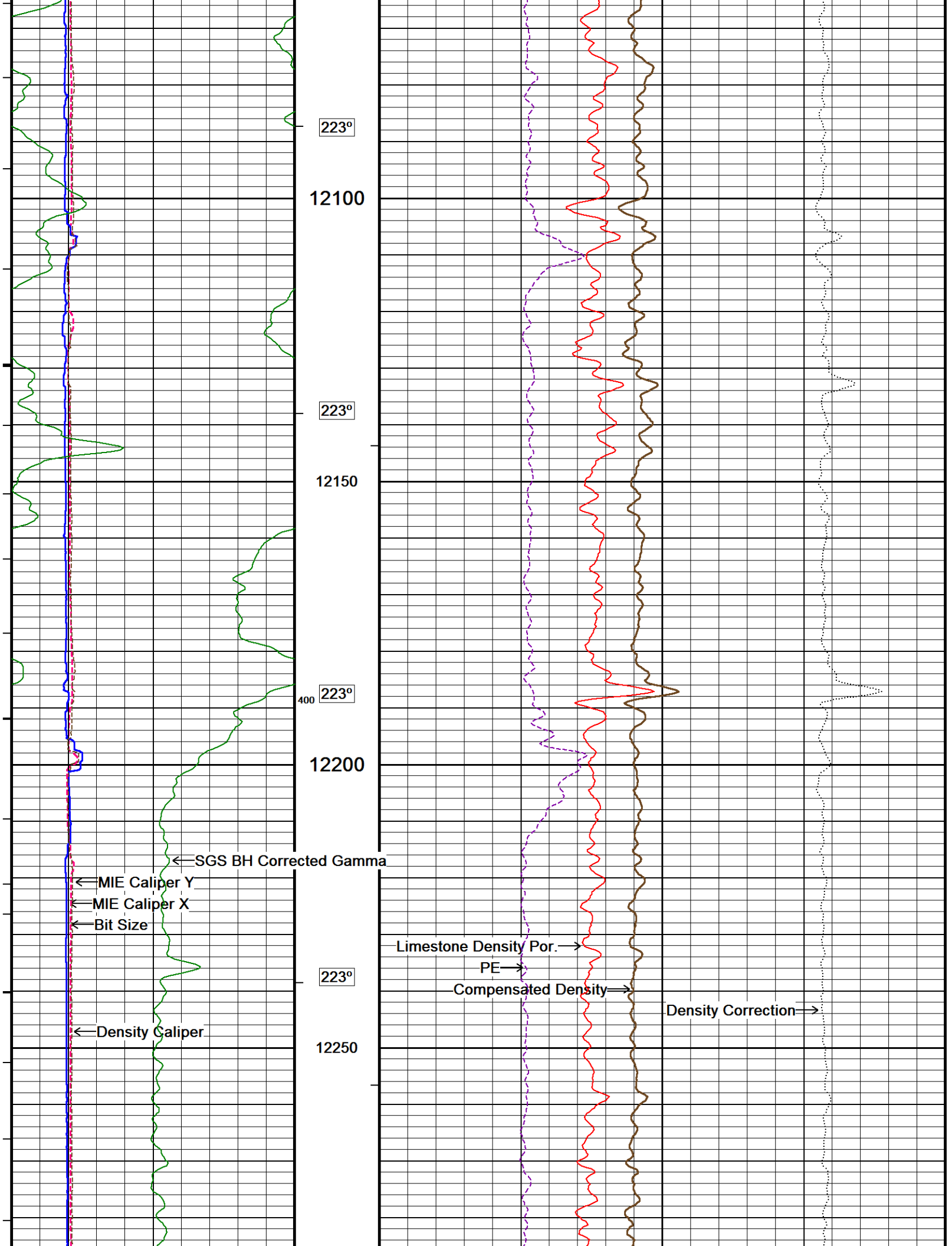


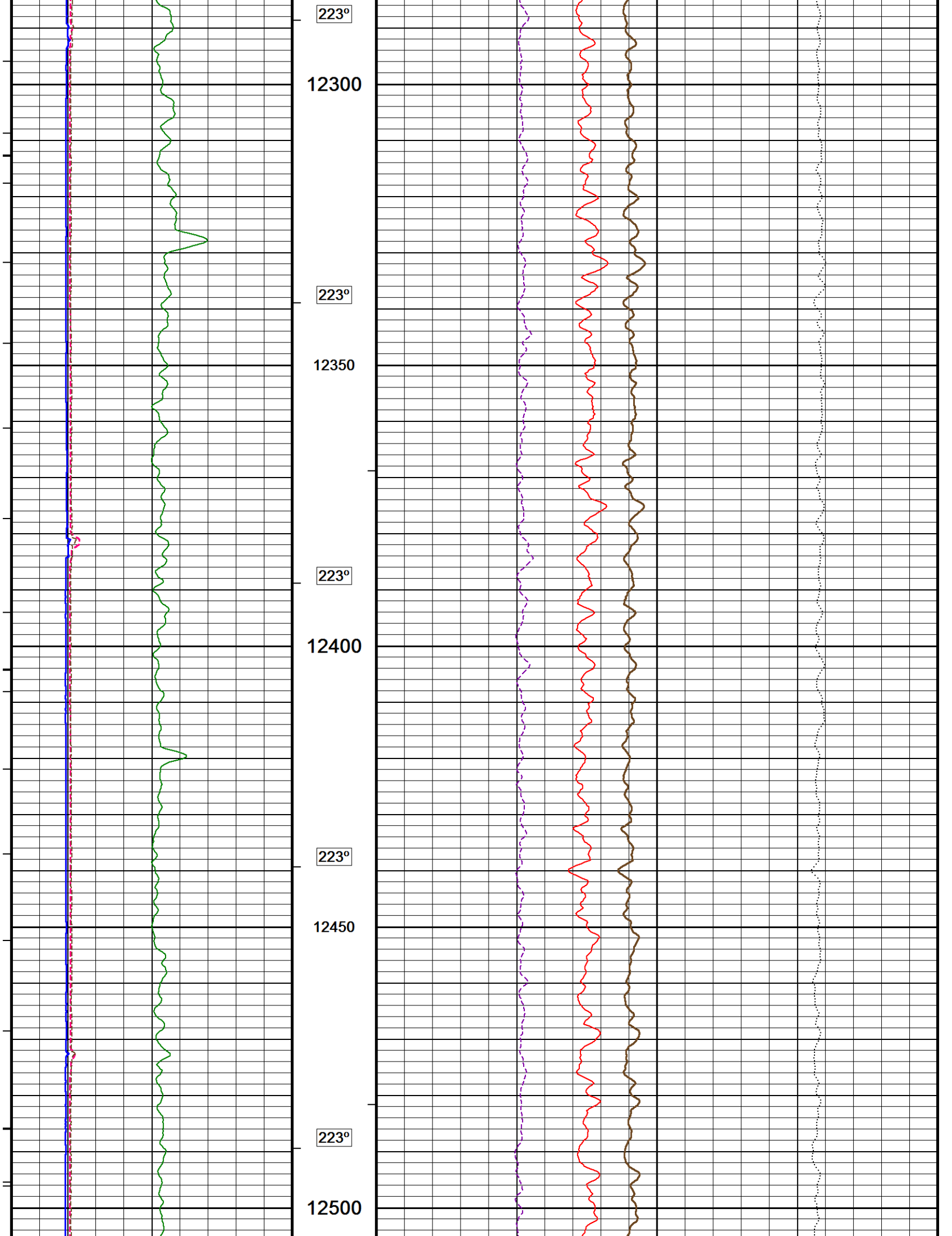


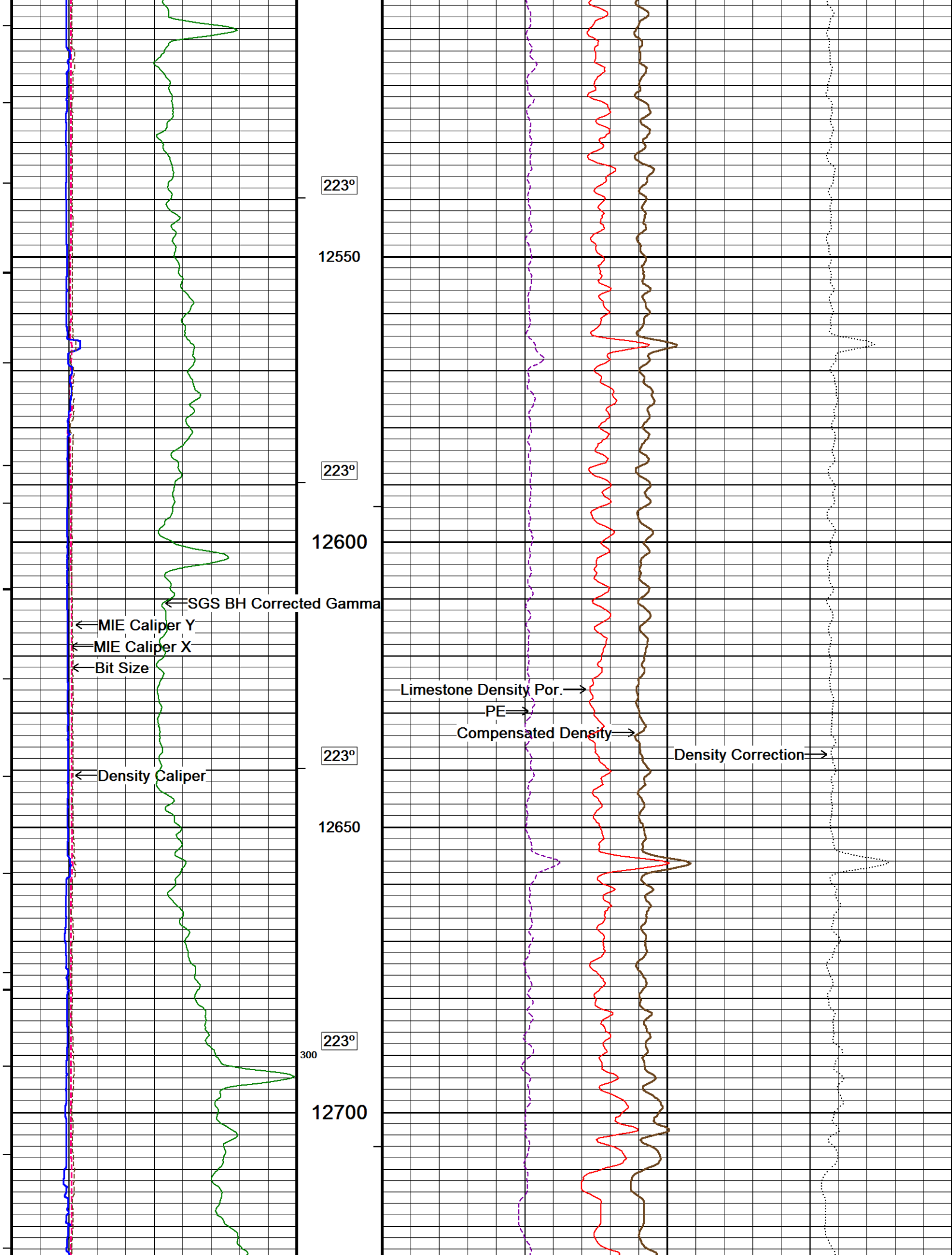


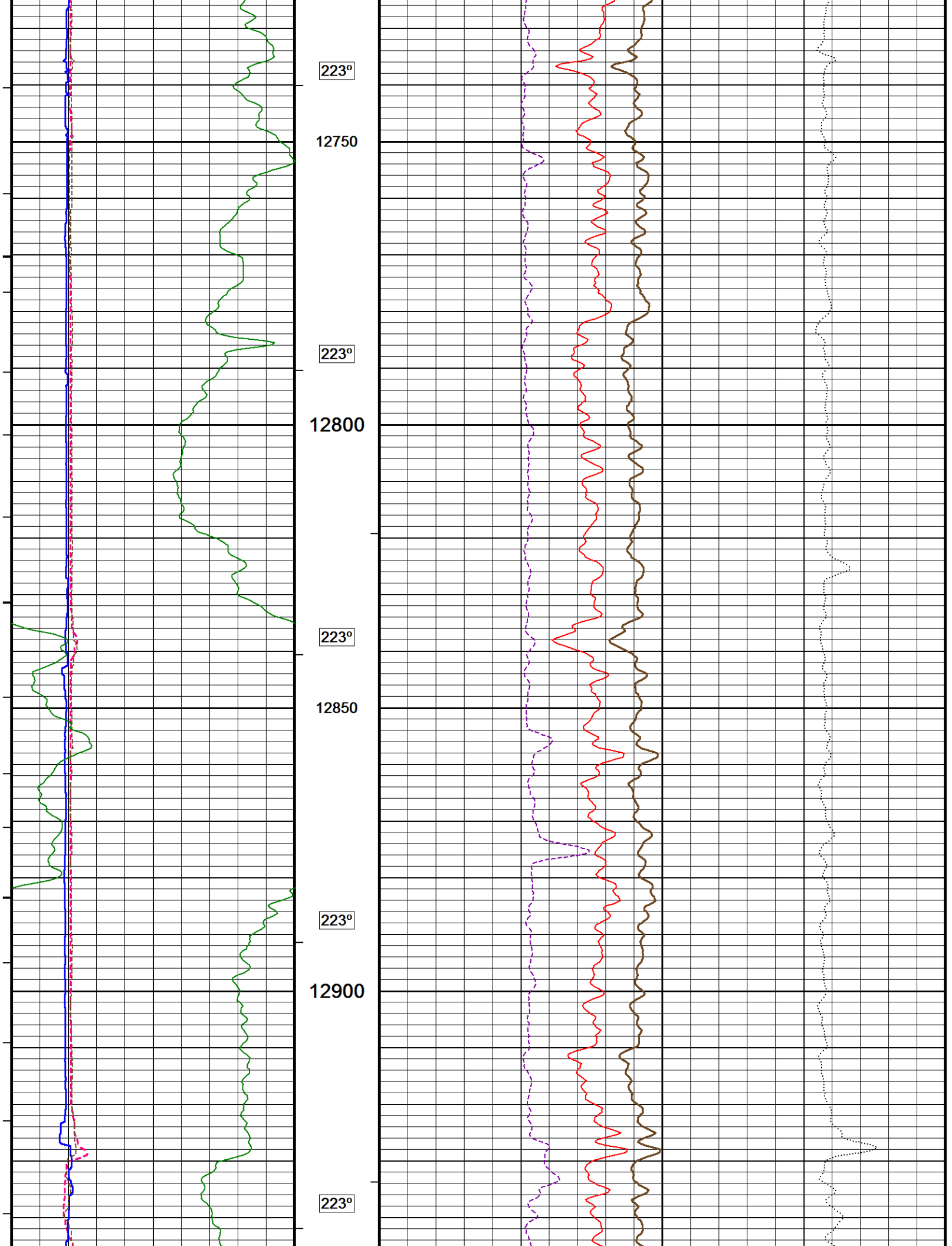


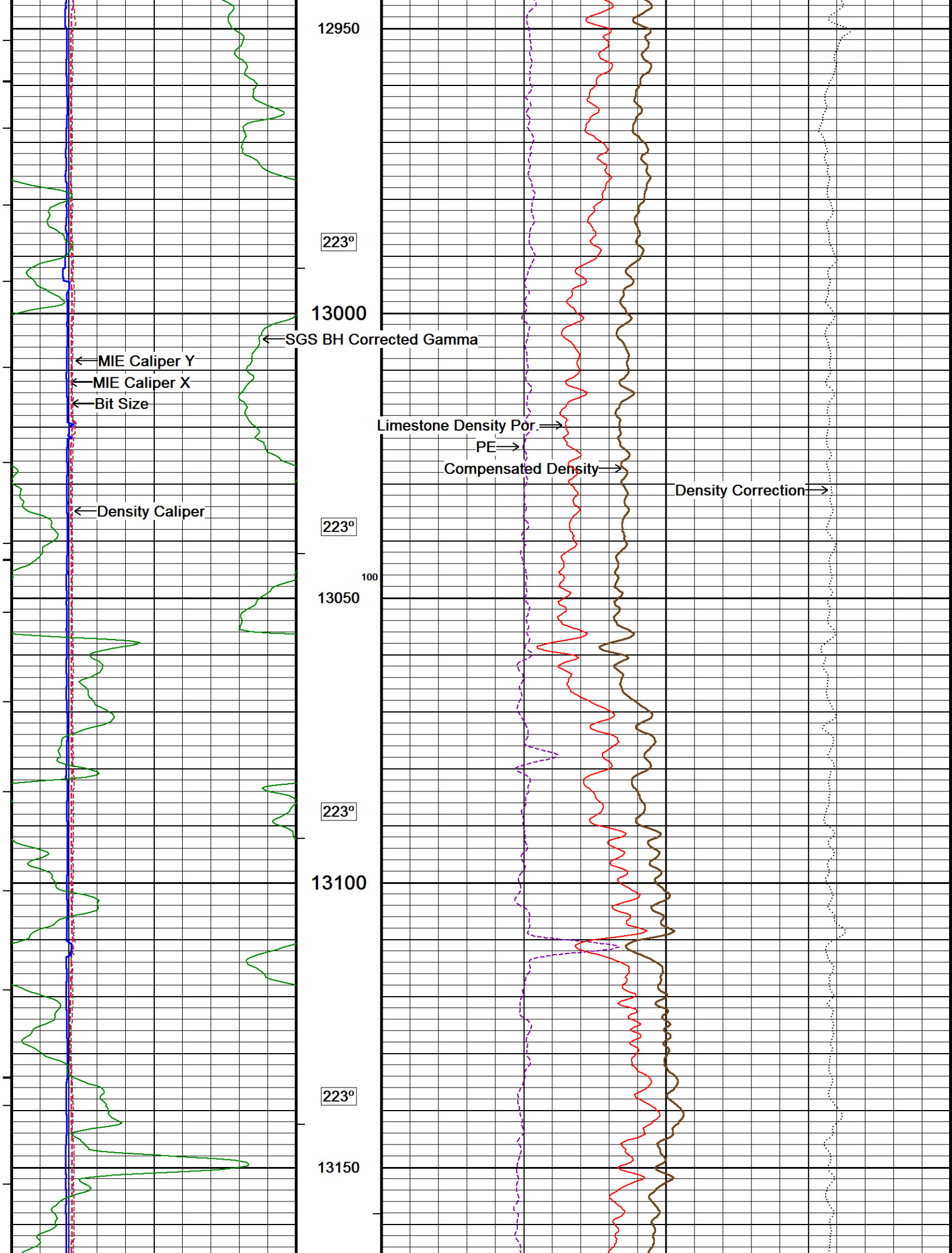


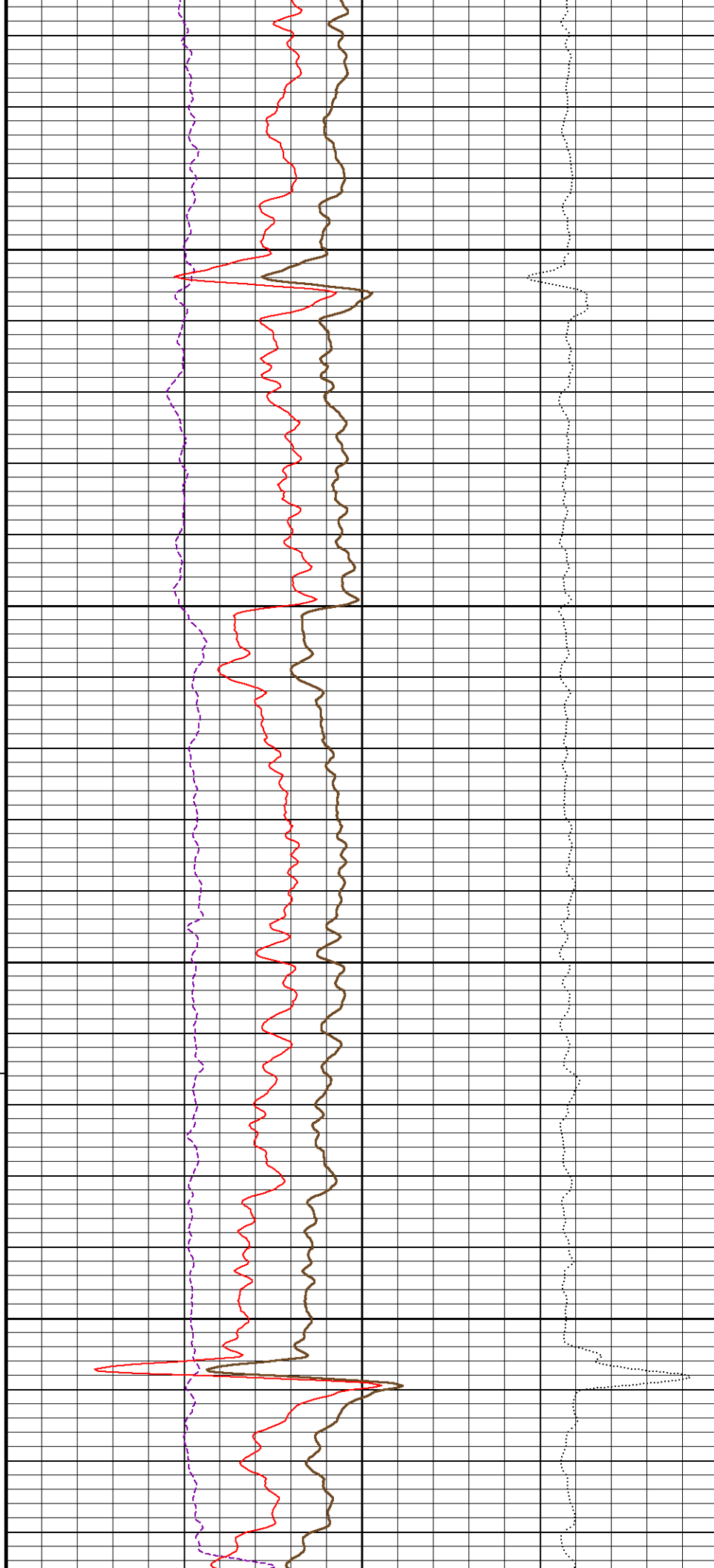
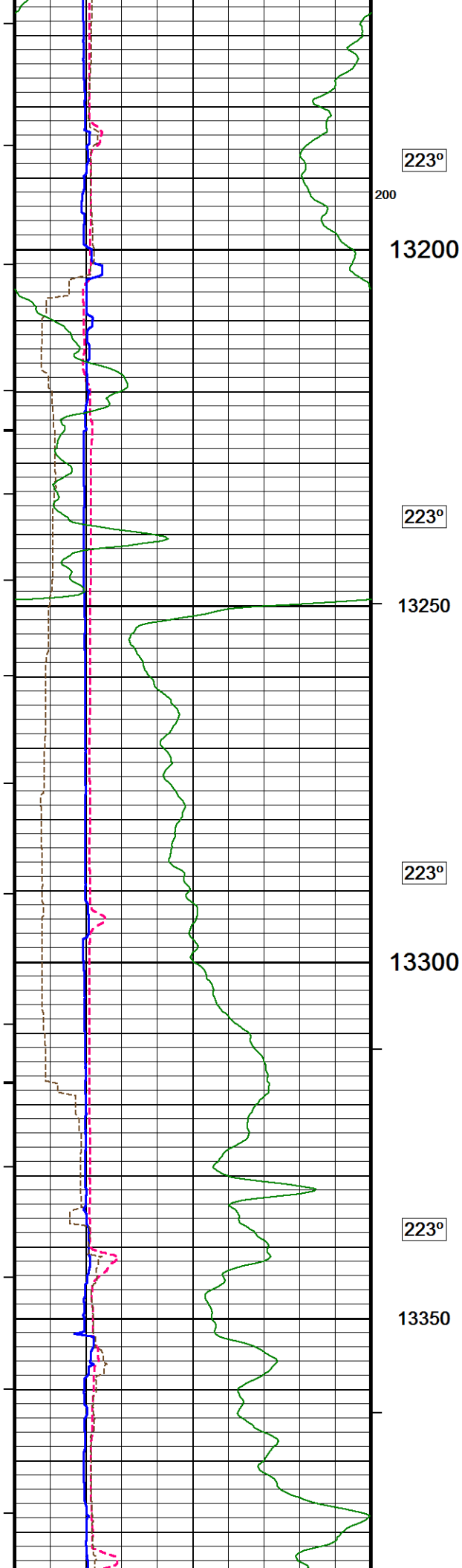


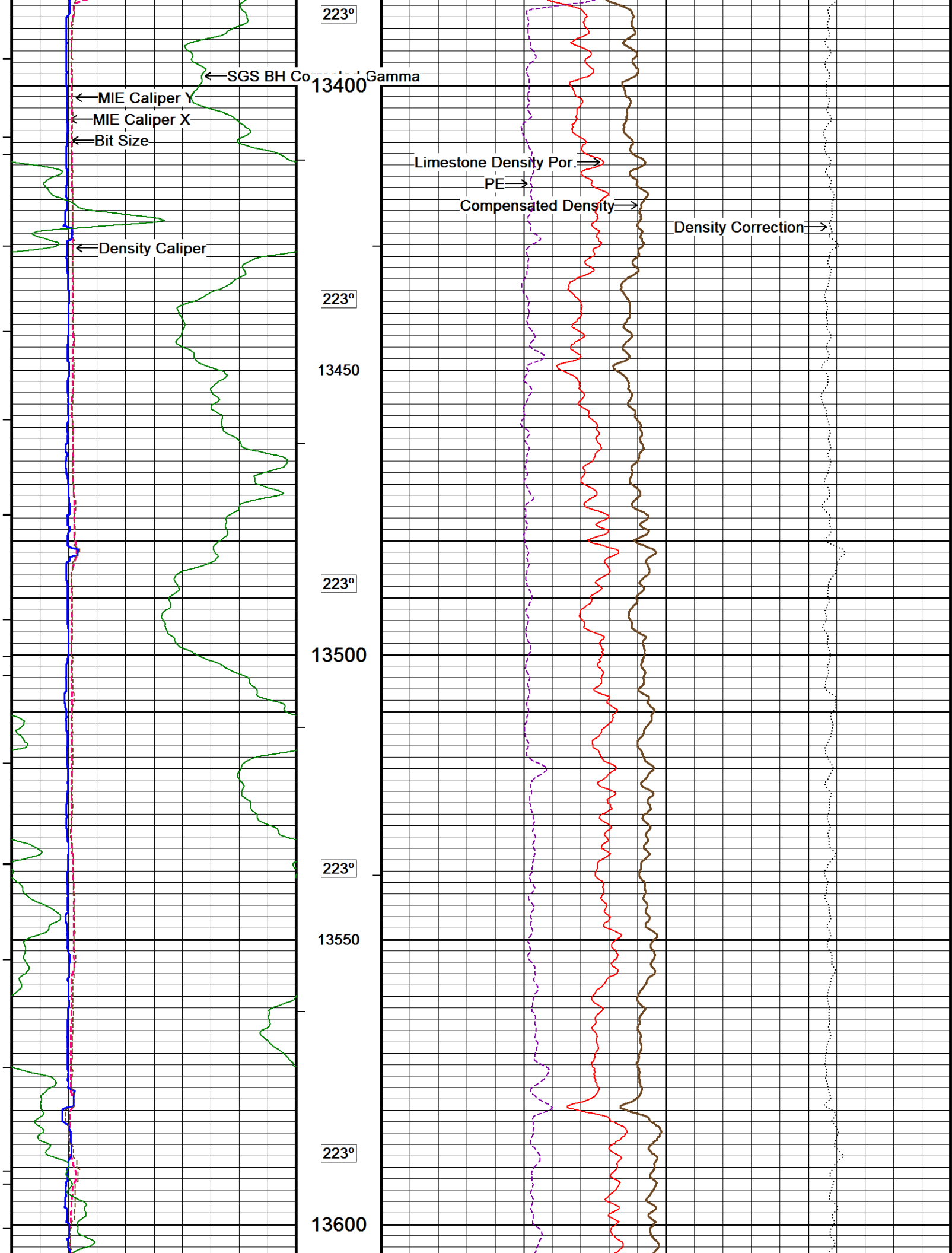


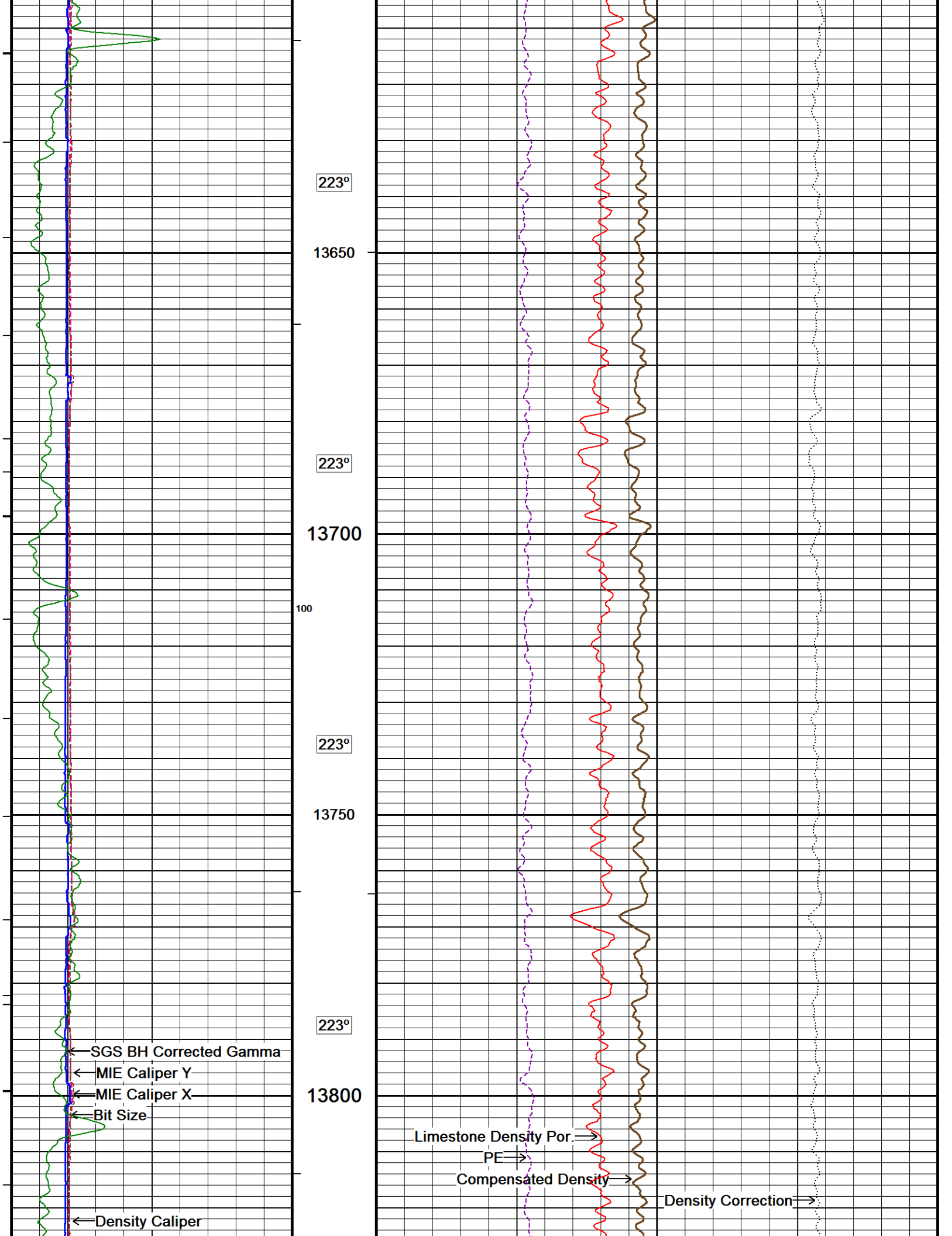


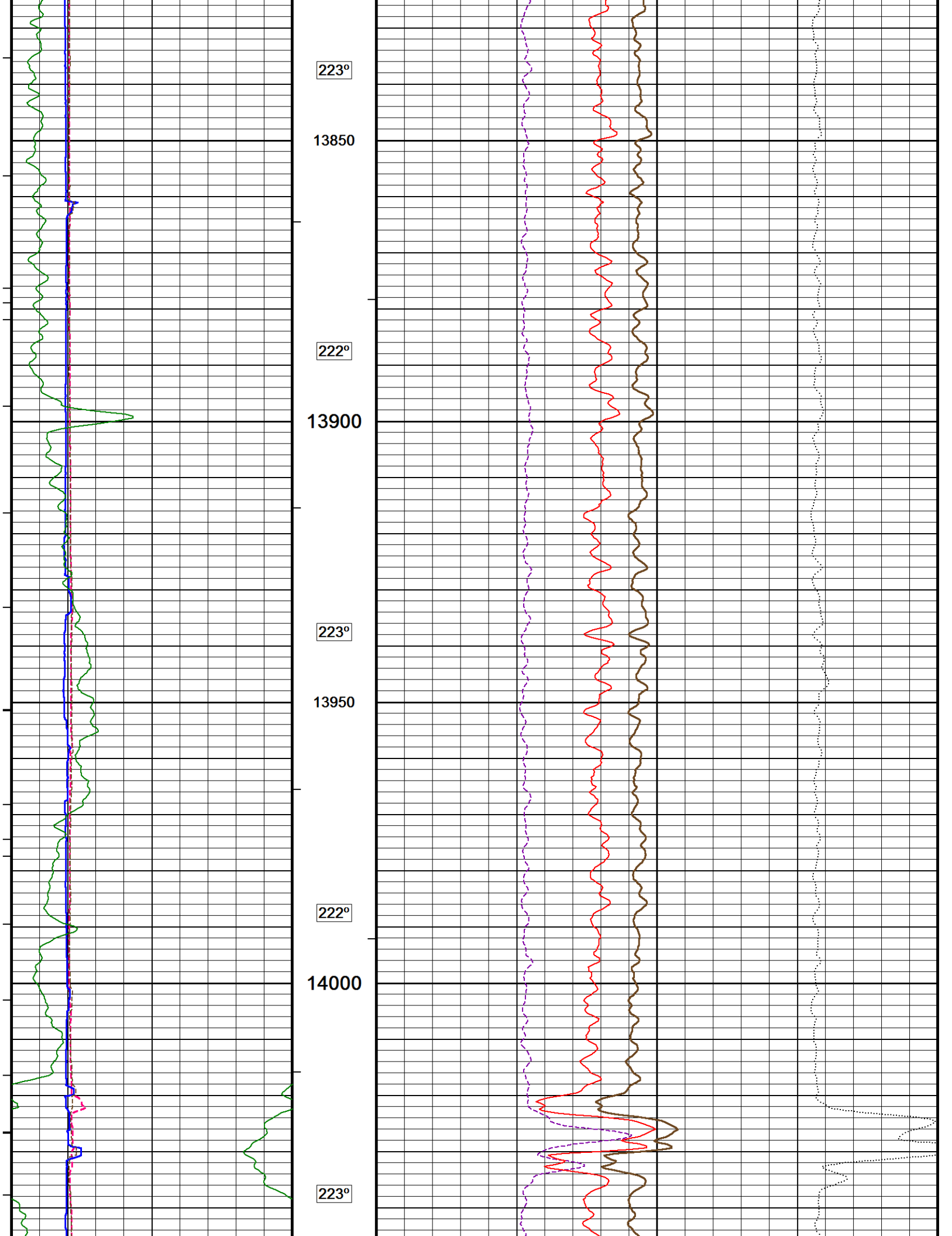


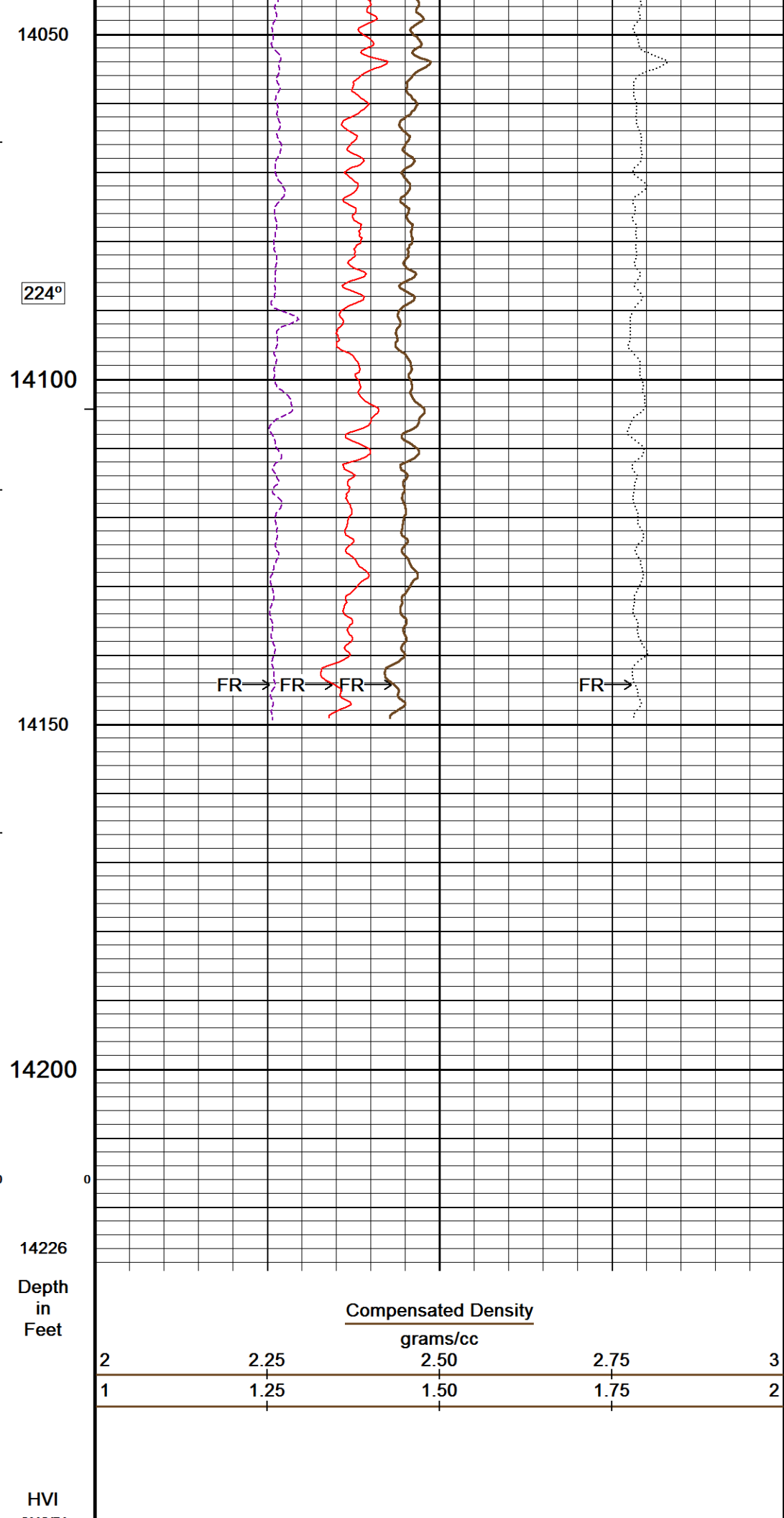
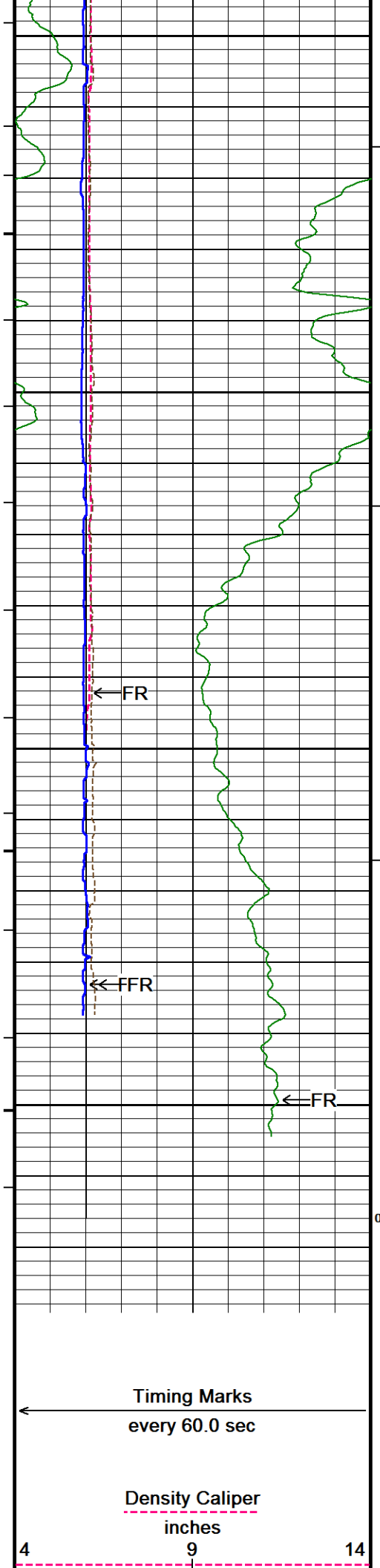


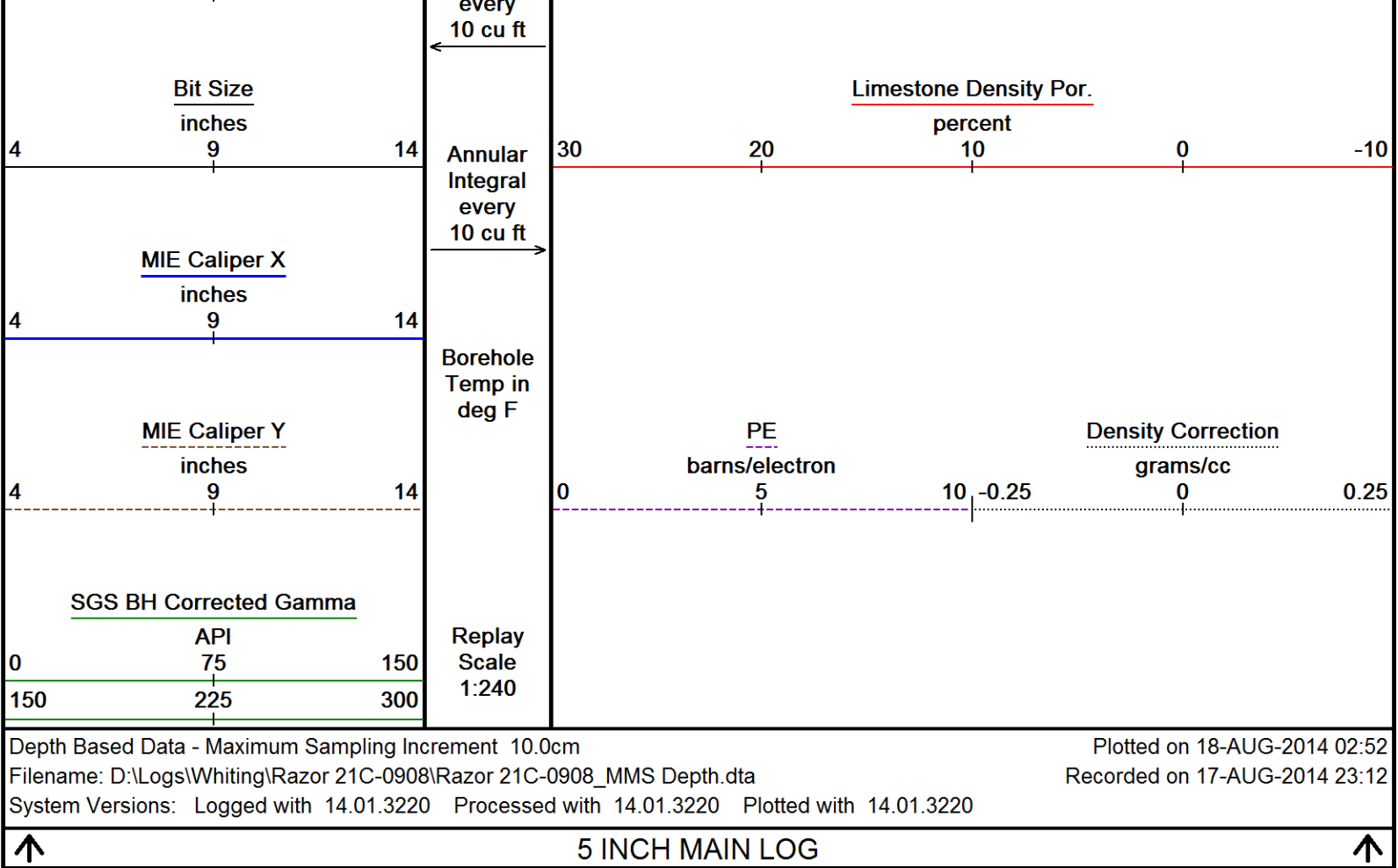












BEFORE SURVEY CALIBRATION				D:\Logs\Whiting\Razor 21C-0908\Razor 21C-0908_MMS Depth.dta
General Constants All 000			Last Edited on 17-AUG-2014,17:03	
General Parameters				
Mud Resistivity	0.920	ohm-metres		
Mud Resistivity Temperature	81.000	degrees F		
Water Level	0.000	feet		
Borehole Fluid Processing	Wet Hole			
Hole/Annular Volume and Differential Caliper Parameters				
HVOL Method	XY Caliper			
HVOL Caliper 1	MIE Diam. X Armswing			
HVOL Caliper 2	MIE Diam. Y Armswing			
Annular Volume Diameter	4.500	inches		
Caliper for Differential Caliper	MIE Diam. X Armswing			
Rwa Parameters				
Porosity used	Base Density Porosity			
Resistivity used	Array Ind. Four Res Rt			
RWA Constant A	0.610			
RWA Constant M	2.150			
SW/APOR Tool Source	0.000			
Down-hole Tension Calibration SMS 0			Field Calibration on 03-MAR-2014 17:38	
Reading No	Measured	Calibrated (lbs)		
1	15344.12	0.00		
2	16163.79	590.00		
Strain Gauge Constants MMS-F.A 248			Last Edited on	
Atmospheric Pressure	14.70	psi		
Serial Number	0			
Calibration Date	000000000000			

Base Check Date								
Dead Weight Serial Number	0							
Dead Weight Gravitational Correction	1.0							
Temperature	75.0		150.0		250.0		350.0	
Pressure psia	Inc.	Dec.	Inc.	Dec.	Inc.	Dec.	Inc.	Dec.
0.0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2000.0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4000.0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6000.0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8000.0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10000.0	0.000		0.000		0.000		0.000	

MMS Parameters MMS-F.A 248

Last Edited on 16-AUG-2014 17:23

Logging Parameters

Firmware Version	2v52	
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	Yes	
Delay Deep Sleep	No	
Deep Sleep Wake Time	360.0	minutes
Deep Sleep Wake on Temperature	No	
Deep Sleep Wake Temperature	N/A	degrees C
Deep Sleep Wake on Pressure	No	
Deep Sleep Wake Pressure	N/A	psi
MMI Pad Pressure	8.0	

Release Parameters

Pulse Duration Base Level	5.0	seconds
Pulse Duration Transition Time	30.0	seconds
Pulse Duration Status Pulse From	10.0	seconds
Pulse Duration Caliper Close From	72.0	seconds
Pulse Duration Caliper Open From	75.0	seconds
Pulse Duration Release Pulse From	107.0	seconds
Pulse Duration Release Pulse To	140.0	seconds
Pulse Release Duration	120.0	seconds
Pulse Discriminator Pressure Band	171.0	seconds
Pulse Pressure Discriminator	382.0	seconds
Use Negative Pulsing	No	
Good Status Reply Open Hole	65535.0	seconds
Good Status Reply Cased Hole	10.0	seconds
Bad Status Reply	30.0	seconds
Status Pulse To	40.0	seconds
Caliper Close To		seconds
Caliper Open To	105.0	seconds

Configuration

MMS,MGS,MDN,MPD,MPD,MIM,MIE,SGS,MAI

Gamma Calibration MGS-D.A 218

Field Calibration on 16-AUG-2014 08:49

	Measured	Calibrated (API)
Background	177	104
Calibrator (Gross)	1075	632
Calibrator (Net)	898	528

Gamma Constants MGS-D.A 218

Last Edited on 17-AUG-2014,17:02

Gamma Calibrator Number	224	
Mud Density	1.14	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl		kppm
K Mud Type	Chloride	
K Mud Concentration	0.00	%

SP Calibration MGS-D A 218

Field Calibration MGS-D.A 218		Measured	Calibrated (mV)	Field Calibration on 10-AUG-2014,17:45
Reference 1		-100.0	-100.0	
Reference 2		100.0	100.0	
High Resolution Temperature Calibration MGS-D.A 218				Field Calibration on 10-AUG-2014,17:44
		Measured	Calibrated(Deg F)	
Lower		30.00	30.00	
Upper		200.00	200.00	
High Resolution Temperature Constants MGS-D.A 218				Last Edited on 16-AUG-2014,08:30
Pre-filter Length		11		
Neutron Calibration MDN-B.J 427				Base Calibration on 13-AUG-2014 10:23 Field Check on 16-AUG-2014 08:30
Base Calibration				
		Measured	Calibrated (cps)	
	Near	Far	Near	Far
	2972	91	3714	110
Ratio		32.769		33.764
Field Calibrator at Base				
			Calibrated (cps)	
			2227	3272
Ratio				0.681
Field Check				
			Calibrated (cps)	
			2206	3271
Ratio				0.674
Neutron Constants MDN-B.J 427				Last Edited on 17-AUG-2014,17:01
Neutron Source Id		P44385B		
Neutron Jig Number		NJ6628		
Air Hole Processing		Modified Ratio		
Caliper Source for Processing		Density Caliper		
Stand-off		0.00	inches	
Mud Density		1.00	gm/cc	
Limestone Sigma		7.10	cu	
Sandstone Sigma		7.00	cu	
Dolomite Sigma		4.70	cu	
Formation Pressure Source		None		
Formation Pressure		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		
Imager Pad Check MIE-A.A 125				Field Check on 28-JUL-2014 14:37
Pad 1	20/20 Buttons Verified	Pad 5	20/20 Buttons Verified	
Pad 2	24/24 Buttons Verified	Pad 6	24/24 Buttons Verified	
Pad 3	20/20 Buttons Verified	Pad 7	20/20 Buttons Verified	
Pad 4	24/24 Buttons Verified	Pad 8	24/24 Buttons Verified	
Compact Micro Imager Constants MIE-A.A 125				Last Edited on 17-JAN-2014,11:21
Sonde Configuration		Imager Mode		
Arm-Pad Kit		Normal Pads (12.25 in)		
Arm-Pad Kit Serial Number				
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	

Navigation Constants MIE-A.A 125

Last Edited on 14-AUG-2014,09:06

Magnetic Declination	0.00	degrees	East
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Magnetometer Parameters MIE-A.A 125

Date Of Last Magnetometer Calibration	21-MAY-2014,15:53		
	X Magnetometer	Y Magnetometer	Z Magnetometer
Slope	-1.000000	-0.998397	-0.988599
Offset	0.012919	-0.017168	0.009969

Magnetometer Constants MIE-A.A 125

Last Edited on

Magnetometer Calibrator Number	000
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Accelerometer Parameters MIE-A.A 125

Date Of Last Accelerometer Calibration	21-MAY-2014,10:10		
	X Accelerometer	Y Accelerometer	Z Accelerometer
Slope	-1.108385	-1.106299	-1.113631
Offset	0.004188	-0.002654	-0.003372

Accelerometer Constants MIE-A.A 125

Last Edited on 14-AUG-2014,09:06

Accelerometer Calibrator Number	000
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Accelerometer Temperature Characterisation

X Accelerometer

Serial Number	867			
Calibration Date	25-Jun-2009			
	B0	B1	B2	B3
Bias(g)	0.00000e+000	8.88300e-006	1.42920e-008	-7.14234e-011
	SF0	SF1	SF2	SF3
Scale Factor(mA/g)	3.00000e+000	2.84901e-004	3.65464e-007	1.00140e-009

Y Accelerometer

Serial Number	898			
Calibration Date	12-Apr-2010			
	B0	B1	B2	B3
Bias(g)	0.00000e+000	3.09504e-006	-4.17750e-009	1.00603e-010
	SF0	SF1	SF2	SF3
Scale Factor(mA/g)	3.00000e+000	2.73446e-004	3.06615e-007	8.00001e-010

Z Accelerometer

Serial Number	883			
Calibration Date	10-Apr-2010			
	B0	B1	B2	B3
Bias(g)	0.00000e+000	8.19055e-006	-3.32398e-008	7.38691e-011
	SF0	SF1	SF2	SF3
Scale Factor(mA/g)	3.00000e+000	2.68615e-004	3.36203e-007	6.38362e-010

Caliper Calibration MIE-A.A 125

Base Calibration on 16-AUG-2014 08:59

Field Calibration on 16-AUG-2014 09:01

Base Calibration

Reading No	Pads 1-5 Meas.	Pads 3-7 Meas.	Calibrator Size (in)
1	26465	26635	5.96
2	36695	36908	7.98
3	46259	46323	9.86
4	56815	56947	11.88
5	0	0	0.00

Reading No	Pad 2 Meas.	Pad 4 Meas.	Pad 6 Meas.	Pad 8 Meas.	Calibrator Size (in)
1	25558	24202	23467	23520	5.96
2	34403	32772	31600	31991	7.98
3	42799	40867	39342	39899	9.86
4	52565	50298	48043	49174	11.88
5	0	0	0	0	0.00

Field Calibration

Measured	Measured	Actual
Pads 1-5 Caliper(in)	Pads 3-7 Caliper(in)	Caliper(in)
5.96	5.96	5.96

	5.94	5.92	5.96	
	Measured Pad 2 Caliper(in) 2.97	Measured Pad 4 Caliper(in) 2.97	Measured Pad 6 Caliper(in) 3.04	Measured Pad 8 Caliper(in) 3.00
				Actual Caliper(in) 5.96
Caliper Constants MIE-A.A 125				Last Edited on 06-MAR-2012 18:40
Caliper Difference for BRKT		0.120	inches	
Induction Calibration MAI-B.J 434				Base Calibration on 24-JAN-2012,20:11 Field Check on 16-AUG-2014 08:15
Base Calibration				
Test Loop Calibration		Measured	Calibrated (mmho/m)	
Channel	Low	High	Low	High
1	14.7	442.4	9.3	966.2
2	5.0	355.7	7.6	821.4
3	3.2	250.0	5.2	566.0
4	1.6	129.2	2.6	279.2
Array Temperature		23.6	Deg F	
Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1	0.0	0.0	19.1	4104.9
2	0.0	0.0	34.6	3792.3
3	0.0	0.0	30.1	3170.7
4	0.0	0.0	20.7	2139.8
Deep	0.0	0.0	16.9	1970.7
Medium	0.0	0.0	44.0	4227.4
Shallow	0.0	0.0	54.2	5755.3
Array Temperature		0.0	75.8	Deg F
Induction Constants MAI-B.J 434				Last Edited on 17-AUG-2014,16:53
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		1.0000	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		

High Resolution Temperature Calibration MAI-B.J 434			Field Calibration on 24-JAN-2012,20:11	
	Measured	Calibrated(Deg C)		
Lower	10.00	10.00		
Upper	100.00	100.00		
High Resolution Temperature Constants MAI-B.J 434			Last Edited on	
Pre-filter Length	11			
Photo Density Calibration MPD-C.J 377			Base Calibration on 23-JUL-2014 18:54 Field Check on 16-AUG-2014 08:19	
Density Calibration				
Base Calibration		Measured	Calibrated (sdu)	
	Near	Far	Near	Far
Background	1315	1528		
Reference 1	52972	28114	59443	30683
Reference 2	21695	2761	25113	2508
Field Check at Base				
	1314.8	1528.4		
Field Check				
	1320.4	1539.3		
PE Calibration				
Base Calibration		Measured	Calibrated	
	WS	WH	Ratio	Ratio
Background	245	1175		
Reference 1	20955	52770	0.401	0.372
Reference 2	5969	21550	0.281	0.268
Field Check at Base				
	244.9	1175.4		
Field Check				
	243.7	1182.7		
Density Constants MPD-C.J 377			Last Edited on 17-AUG-2014,17:01	
Density Source Id		P44264B		
Nylon Calibrator Number		652		
Aluminium Calibrator Number		659		
Density Shoe Profile		4 inch		
Caliper Source for Processing		Density Caliper		
PE Correction to Density		Not Applied		
Mud Density		1.14	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		
0.00		0.00		
Caliper Calibration MPD-C.J 377				
Base Calibration on 24-JUL-2014 19:38 Field Calibration on 16-AUG-2014 08:23				
Base Calibration		Measured	Calibrator Size (in)	
Reading No				
1		15841	4.00	
2		23887	5.96	
3		32305	7.98	
4		40224	9.96	

4	40384	9.86
5	49264	11.88
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
5.88	5.96

Spectral Gamma Calibration	SGS-E.J 135	Base Calibration on 08-AUG-2014 11:18
		Field Calibration on 13-AUG-2014 17:30

Base Calibration

Potassium Calibrator

	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Background	112.6	38.0	4.5	1.6	2.6
Calibrator (Gross)	232.7	123.4	29.3	1.6	2.8
Calibrator (Net)	120.2	85.4	24.8	-0.0	0.2

Concentrations	K %	U ppm	Th ppm
	5.9	0.0	0.0

Uranium Calibrator

	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Background	112.6	38.0	4.5	1.6	2.6
Calibrator (Gross)	545.3	195.5	17.1	12.0	5.8
Calibrator (Net)	432.7	157.4	12.6	10.4	3.2

Concentrations	K %	U ppm	Th ppm
	0.0	16.6	0.0

Thorium Calibrator

	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Background	112.6	38.0	4.5	1.6	2.6
Calibrator (Gross)	414.4	155.6	11.9	6.8	17.5
Calibrator (Net)	301.8	117.5	7.4	5.1	15.0

Concentrations	K %	U ppm	Th ppm
	0.0	0.0	44.7

Mixture Calibrator

	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Background	112.6	38.0	4.5	1.6	2.6
Calibrator (Gross)	889.9	367.2	48.9	14.7	20.2
Calibrator (Net)	777.4	329.2	44.4	13.1	17.6

Field Calibration

Gamma Ray

	Measured	Calibrated (API)
Background	171	35
Calibrator (Gross)	1361	275
Calibrator (Net)	1189	240

Mixture Calibrator

	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Background	111.9	41.1	4.9	1.7	3.3
Calibrator (Gross)	892.2	374.0	49.1	15.8	21.4
Calibrator (Net)	780.3	333.0	44.2	14.0	18.1

Spectral Gamma Constants	SGS-E.J 135	Last Edited on 17-AUG-2014,17:00
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Background Calibrator Number	440	
Mixture Calibrator Number	450	
Potassium Calibrator Number	500	
Uranium Calibrator Number	506	
Thorium Calibrator Number	503	
Mud Density	1.14	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl		kppm
K Mud Type	Chloride	
K Mud Concentration	0.00	%

DOWNHOLE EQUIPMENT

D:\Logs\Whiting\Razor 21C-0908\Razor 21C-0908_MMS Depth.dta

Shuttle Running Tool 3.5"
SRT-A.A 68 LG: 6.62 ft WT: 37.5 lb OD: 2.520 in

Compact Linker 200V STD
MLK-A 1 LG: 8.53 ft WT: 30.9 lb OD: 2.240 in

Compact Linker 400V EXT
MLK-A 2 LG: 14.23 ft WT: 30.9 lb OD: 2.240 in

MIS-E.A Compact Inline Standoff sub
MIS-E.A 183 LG: 2.14 ft WT: 15.4 lb OD: 2.244 in

SHA-J.B Compact Swivel Head Adaptor
SHA-J.B 677 LG: 2.30 ft WT: 22.0 lb OD: 2.244 in

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

MBS-F.A 200v Compact Battery Sub
MBS-F.A 63 LG: 17.06 ft WT: 123.5 lb OD: 2.240 in

Compact Memory Sub F.A
MMS-F.A 248 LG: 5.20 ft WT: 37.5 lb OD: 2.244 in

Compact Tool Isolator sub.
MTI-C.A 99 LG: 1.54 ft WT: 13.2 lb OD: 2.244 in

Compact Short Gamma
MGS-D.A 218 LG: 3.41 ft WT: 24.3 lb OD: 2.244 in

Compact Collar Locator
MCL-B.J 51 LG: 3.17 ft WT: 26.5 lb OD: 2.244 in

SKJ-E.B Compact Knuckle Joint
SKJ-E.B 597 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in

SHA-J.B Compact Swivel Head Adaptor
SHA-J.B 678 LG: 2.30 ft WT: 22.0 lb OD: 2.244 in

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

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

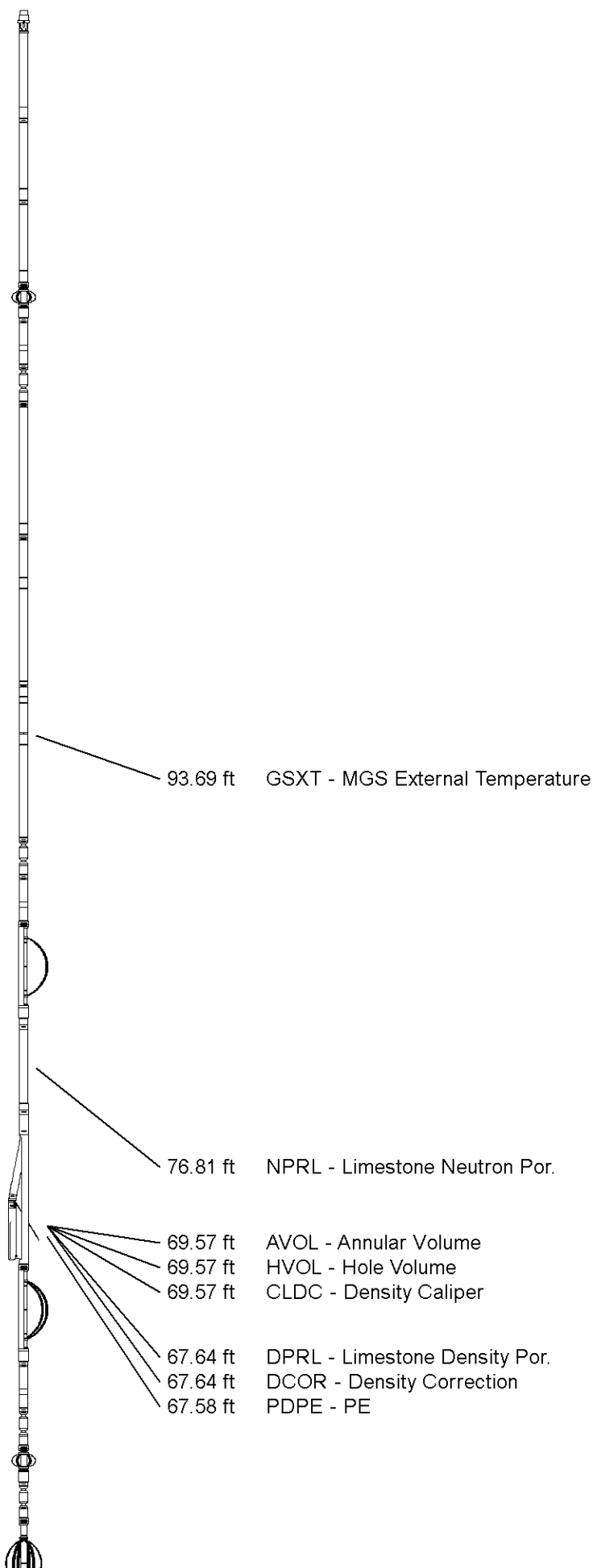
Compact Density/Caliper
MPD-C.J 377 LG: 9.59 ft WT: 90.4 lb OD: 2.244 in

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

SHA-J.B Compact Swivel Head Adaptor
SHA-J.B 589 LG: 2.30 ft WT: 22.0 lb OD: 2.244 in

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

MIS-E.B Compact Inline Standoff sub
MIS-E.B 183 LG: 2.14 ft WT: 15.4 lb OD: 2.244 in



MIS-E.B 693 LG: 2.14 ft WT: 15.4 lb OD: 2.244 in

SKJ-E.A Compact Knuckle Joint

SKJ-E.A 244 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in

MIS-D.A Compact Inline Bowspring sub

MIS-D.A 437 LG: 5.70 ft WT: 33.1 lb OD: 2.240 in

Compact MMI Memory Section

MIM-A.A 125 LG: 4.65 ft WT: 26.5 lb OD: 2.244 in

Compact MMI Electrode Section

MIE-A.A 125 LG: 13.96 ft WT: 99.2 lb OD: 4.094 in

MIS-D.B Compact Inline Bowspring sub

MIS-D.B 654 LG: 5.70 ft WT: 33.1 lb OD: 2.240 in

SKJ-E.A Compact Knuckle Joint

SKJ-E.A 245 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in

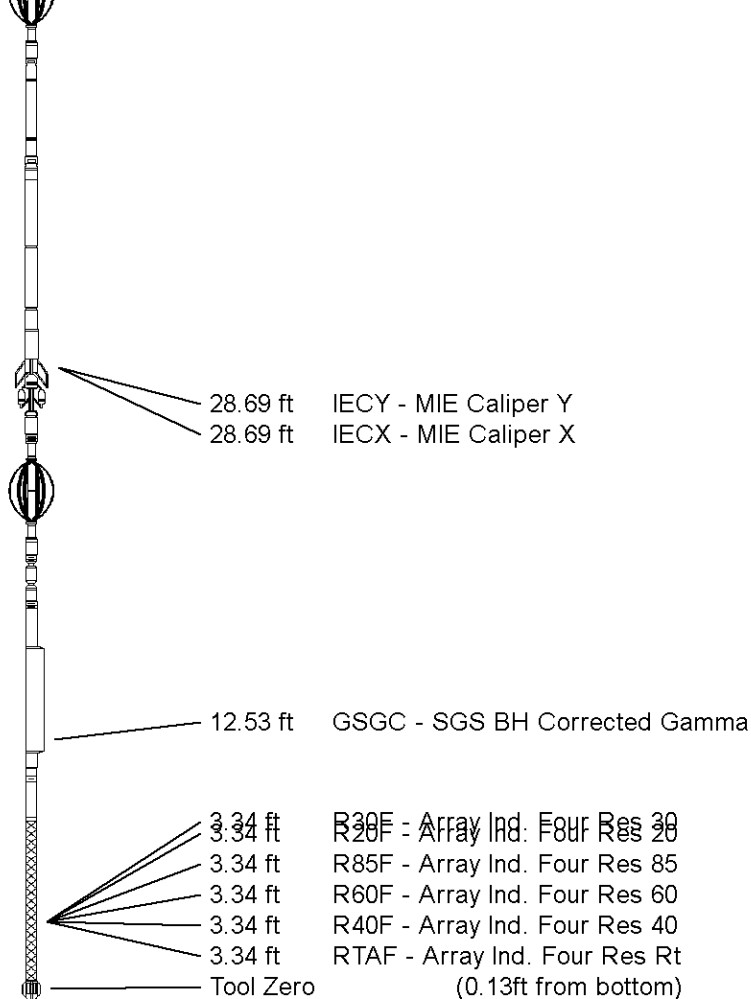
Spectral Gamma Ray Sub

SGS-E.J 135 LG: 7.78 ft WT: 105.8 lb OD: 3.543 in

Compact Induction

MAI-B.J 434 LG: 10.81 ft WT: 48.5 lb OD: 2.244 in

Total Length: 156.38 ft Weight: 1095.7 lb



COMPANY

WHITING OIL AND GAS CORPORATION

WELL

RAZOR 21C-0908

FIELD

REDTAIL

PROVINCE/COUNTY

WELD

COUNTRY/STATE

U.S.A. / COLORADO

Elevation Kelly Bushing 4861.00 feet

Elevation Drill Floor 4861.00 feet

Elevation Ground Level 4844.00 feet

First Reading 14148.00 feet

Depth Driller 14236.00 feet

Depth Logger 14236.00 feet



Weatherford®

MEASURED DEPTH

COMPENSATED PHOTO DENSITY

COMPENSATED DUAL NEUTRON LOG