



Weatherford[®]

**COMPACT PHOTO DENSITY
COMPENSATED NEUTRON
MICRORESISTIVITY LOG**

COMPANY		O'BRIEN ENERGY RESOURCES CORP.	
WELL		COLTON #1-33	
FIELD		NOVINGER	
PROVINCE/COUNTY		MEADE	
COUNTRY/STATE		U.S.A. / KANSAS	
LOCATION		1887' FSL & 1887' FEL	
SEC	TWP	RGE	Other Services
33	33S	30W	MAI/MFE
API Number		15-119-21345	
Permit Number			
Permanent Datum GL, Elevation 2701 feet			Elevations:
Log Measured From KB			KB 2712.00
Drilling Measured From KB			DF 2711.00
			GL 2701.00
Date	05-AUG-2013		
Run Number	ONE		
Service Order	3539956		
Depth Driller	6400.00		feet
Depth Logger	6398.00		feet
First Reading	6379.00		feet
Last Reading	4000.00		feet
Casing Driller	1500.00		feet
Casing Logger	1499.00		feet
Bit Size	7.875		inches
Hole Fluid Type	CHEMICAL		
Density / Viscosity	9.15 lb/USg		52.00 CP
PH / Fluid Loss	9.50		8.40 ml/30Min
Sample Source	MUDPIT		
Rm @ Measured Temp	0.93 @103.0		ohm-m
Rmf @ Measured Temp	0.74 @103.0		ohm-m
Rmc @ Measured Temp	1.12 @103.0		ohm-m
Source Rmf / Rmc	CALC	CALC	
Rm @ BHT	0.73 @132.0		ohm-m
Time Since Circulation	5 HOURS		
Max Recorded Temp	132.00		deg F
Equipment / Base	13096		LIB
Recorded By	ADAM SILL		
Witnessed By	PETER DEBENHAM		ROGER PEARSON
JOB #	LB13-222		

BOREHOLE RECORD					Last Edited: 05-AUG-2013 09:03
Bit Size inches		Depth From feet		Depth To feet	
7.875		1500.00		6400.00	
CASING RECORD					
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft	
SURFACE	8.625	0.00	1500.00	24.00	

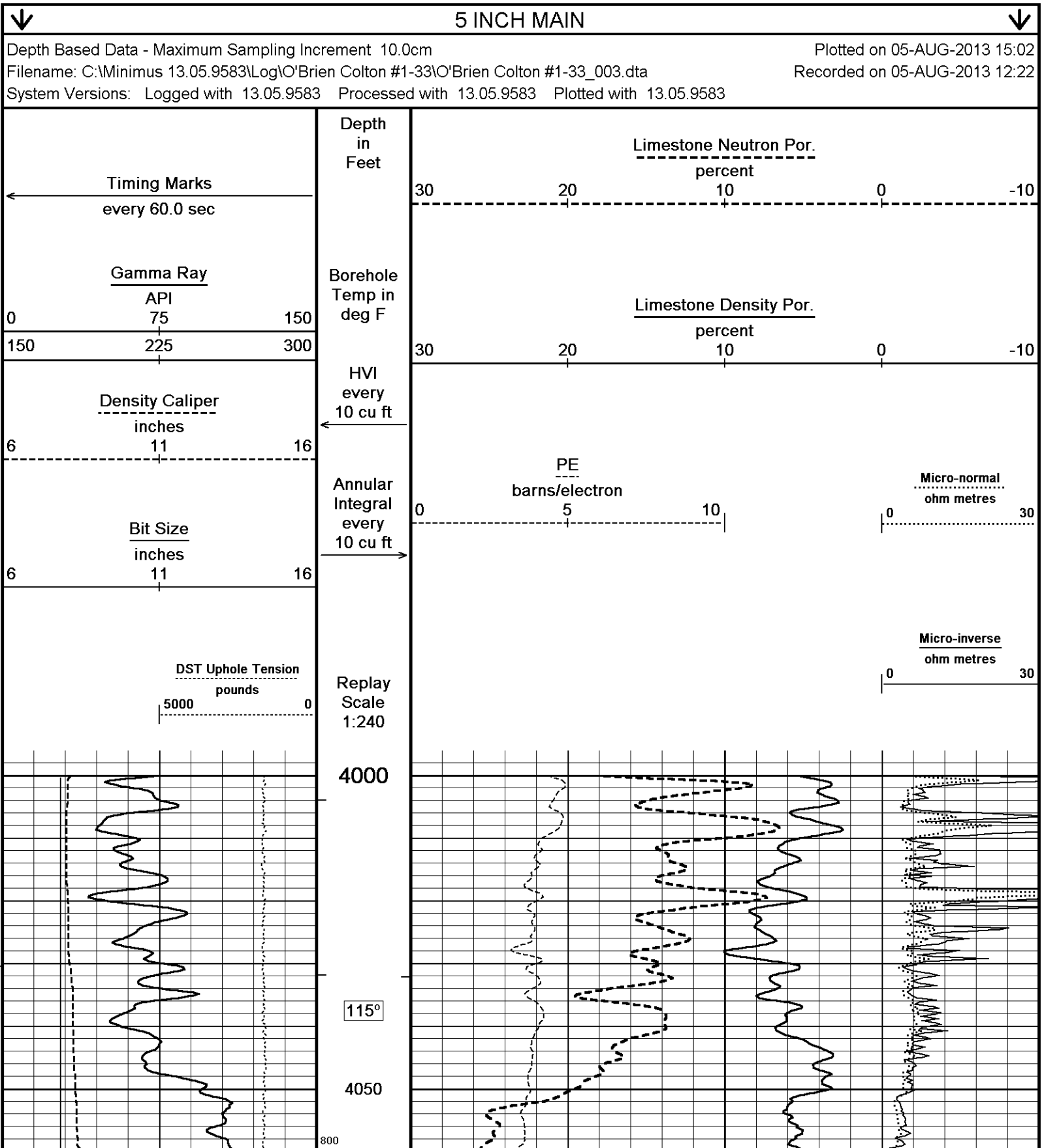
REMARKS
- SOFTWARE ISSUE: WLS 13.05.9583.
- MCG, MML, MDN, MPD, MFE, MAI RUN IN COMBINATION. - HARDWARE: DUAL BOWSPRING USED ON MDN. 0.5 INCH STANDOFF USED ON MFE. 0.5 INCH STANDOFF USED ON MAI.
- 2.71 G/CC LIMESTONE DENSITY MATRIX USED TO CALCULATE POROSITY.
- BOREHOLE RUGOSITY, TIGHT PULLS, AND WASHOUTS WILL AFFECT DATA QUALITY.
- ALL INTERVALS LOGGED AND SCALED PER CUSTOMER'S REQUEST.
- TOTAL HOLE VOLUME FROM TD TO SURFACE CASING: 1840 CU. FT.
- ANNULAR HOLE VOLUME WITH 4.5 INCH CASING FROM TD TO 4000 FEET: 560 CU. FT.
- RIG: DUKE #6

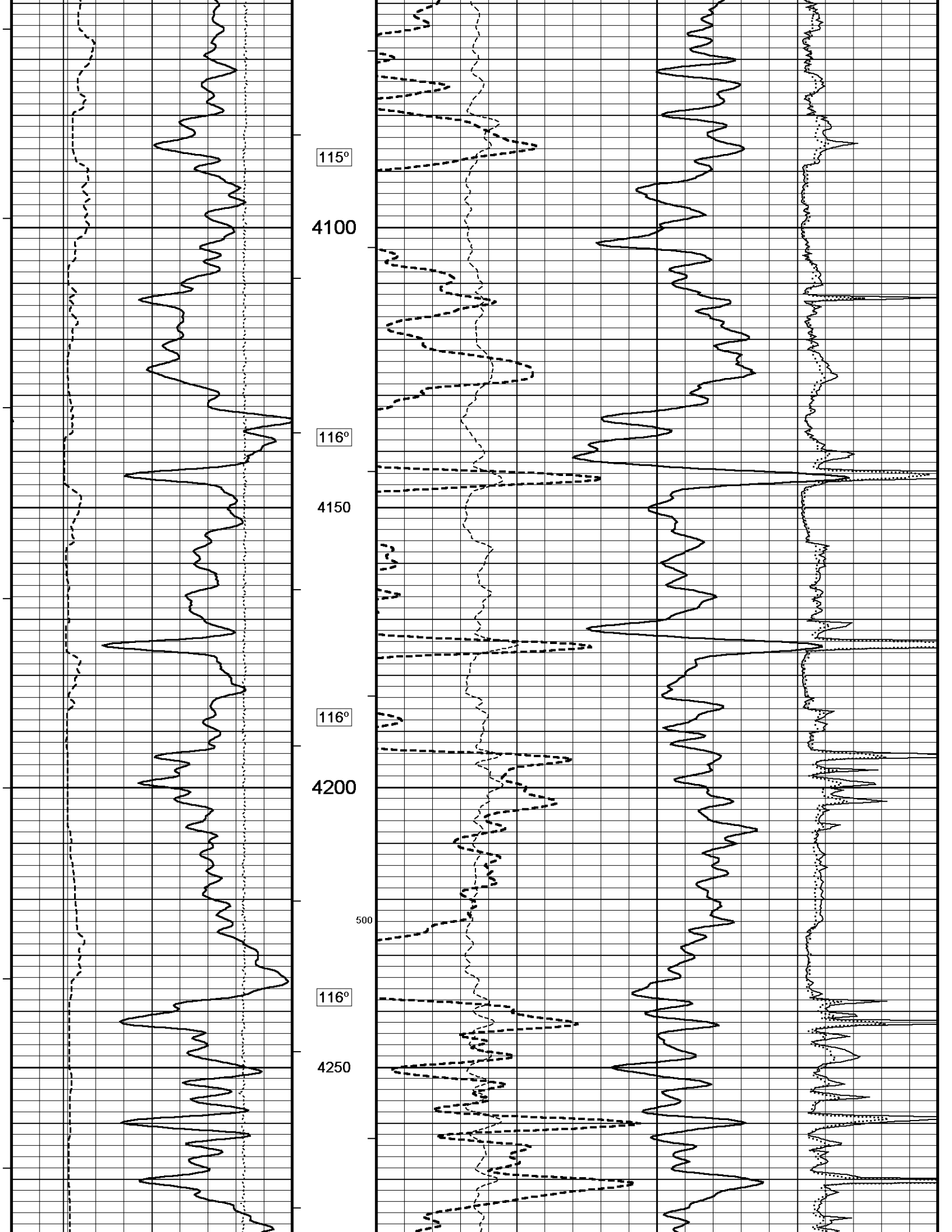
RIQ: DORE %C.

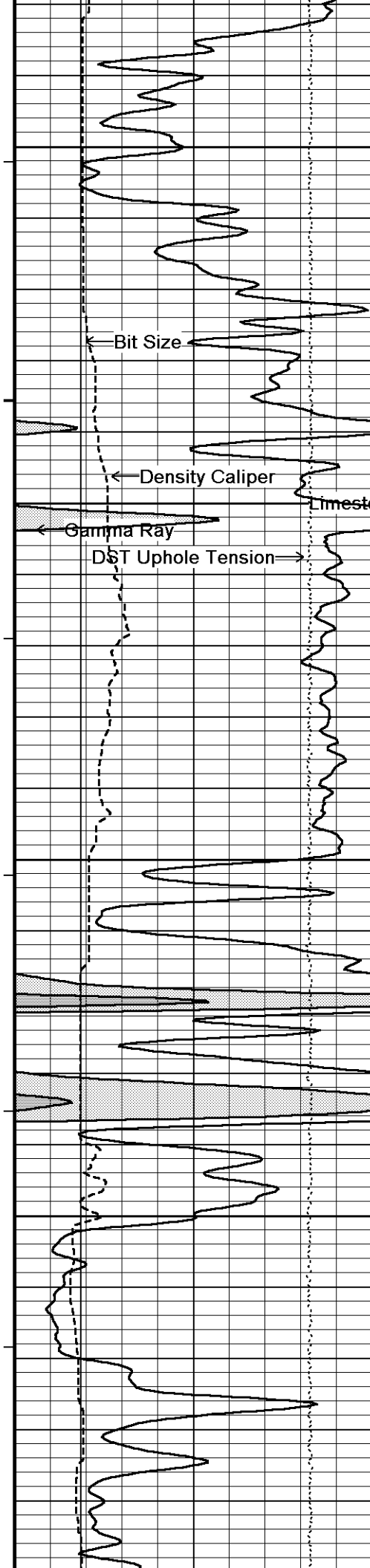
- ENGINEER: A. SILL.

- OPERATOR(S): N. ADAME.

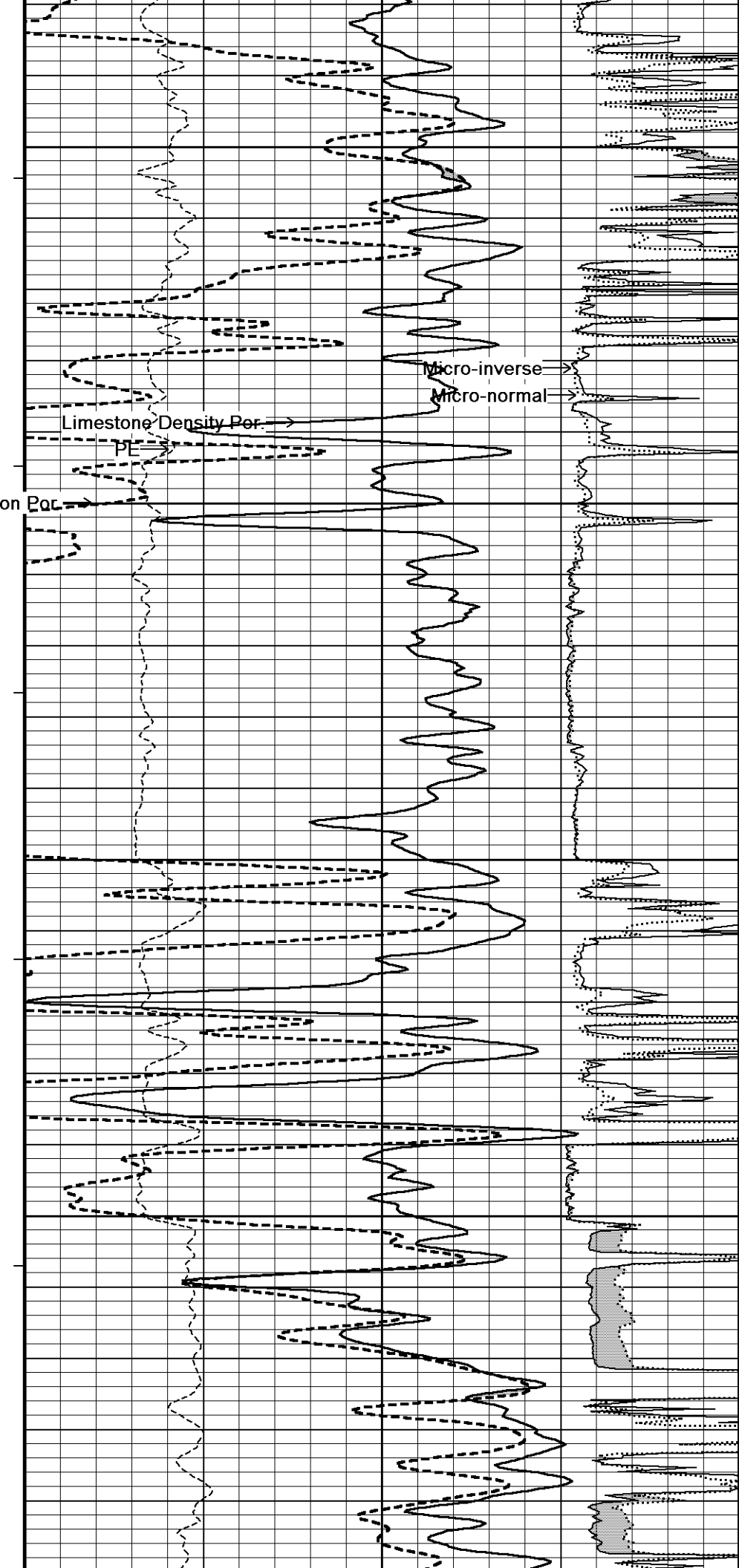
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not, guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, costs, 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.

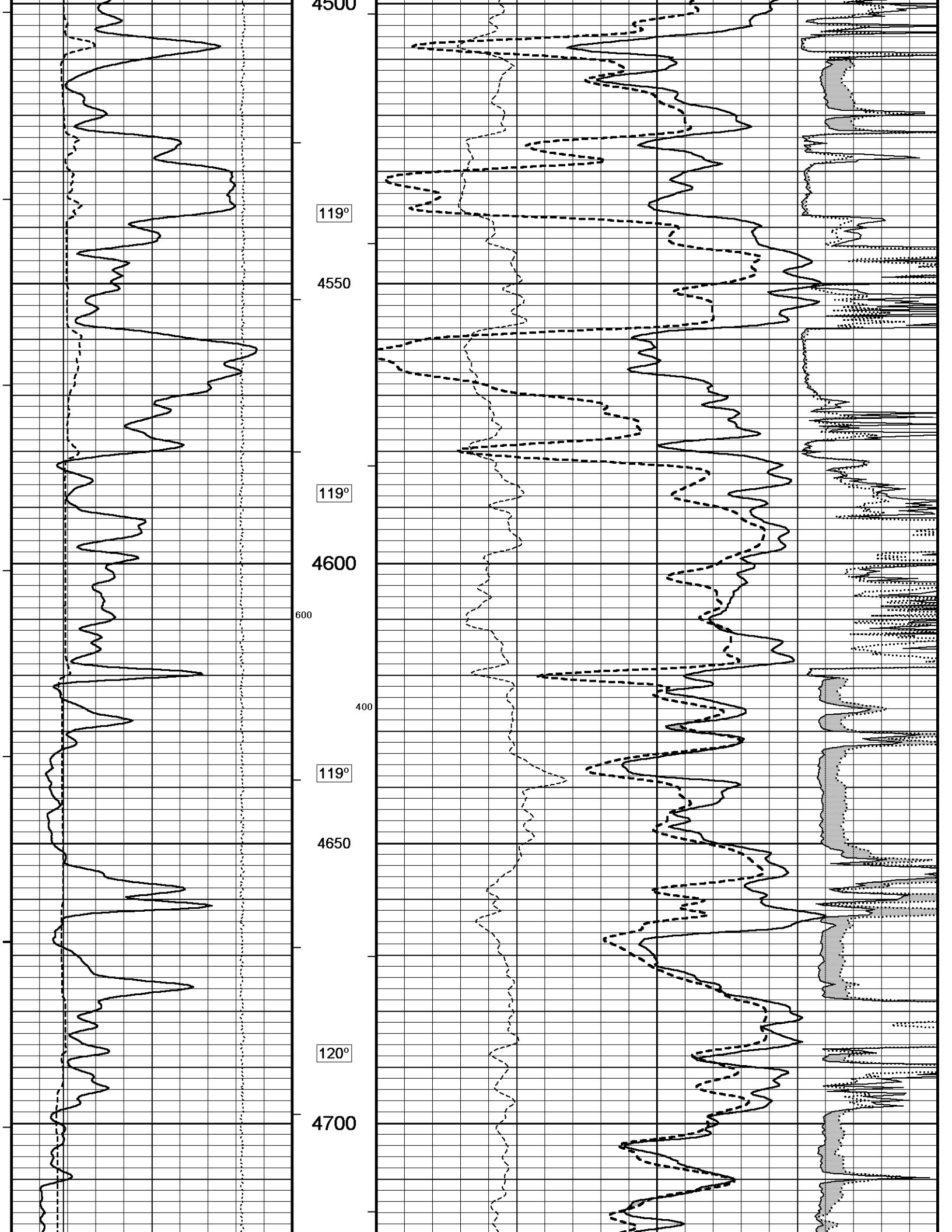


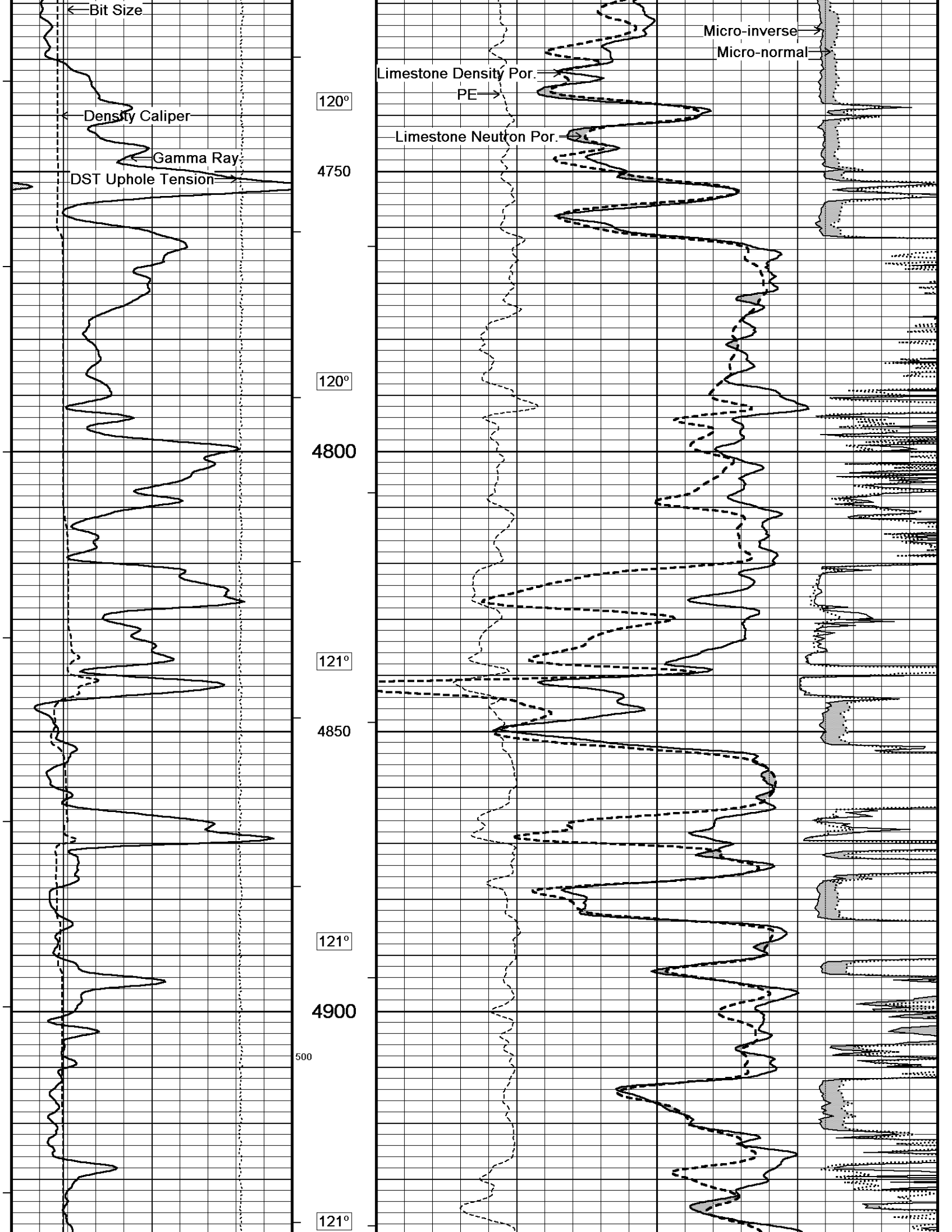


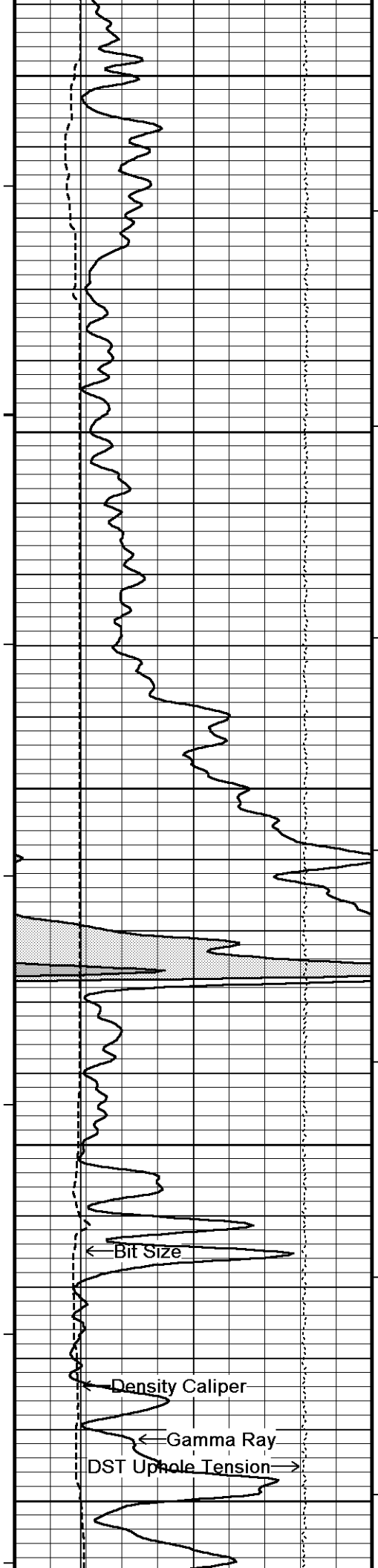


117°
4300
700
117°
118°
4400
118°
4450
118°
4500

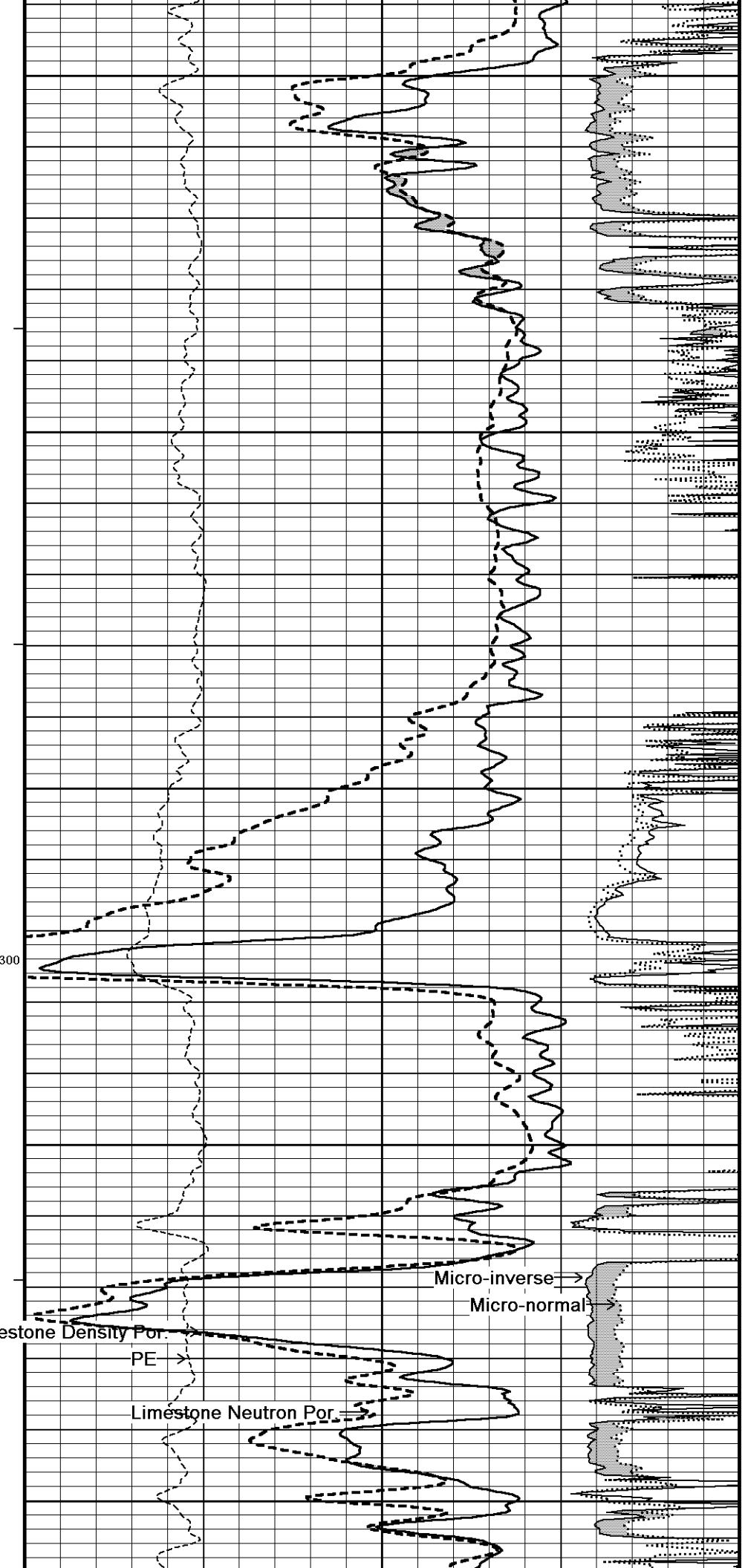


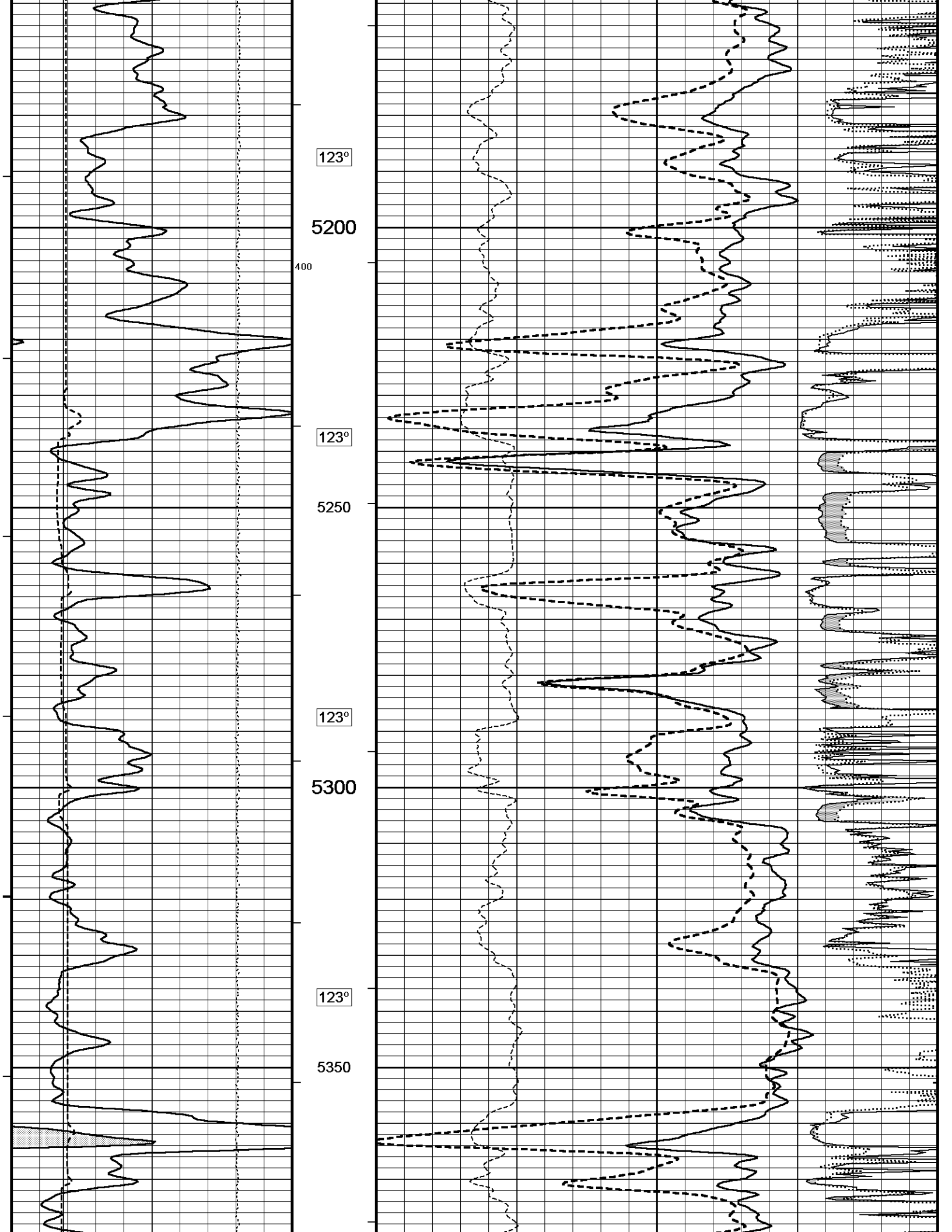


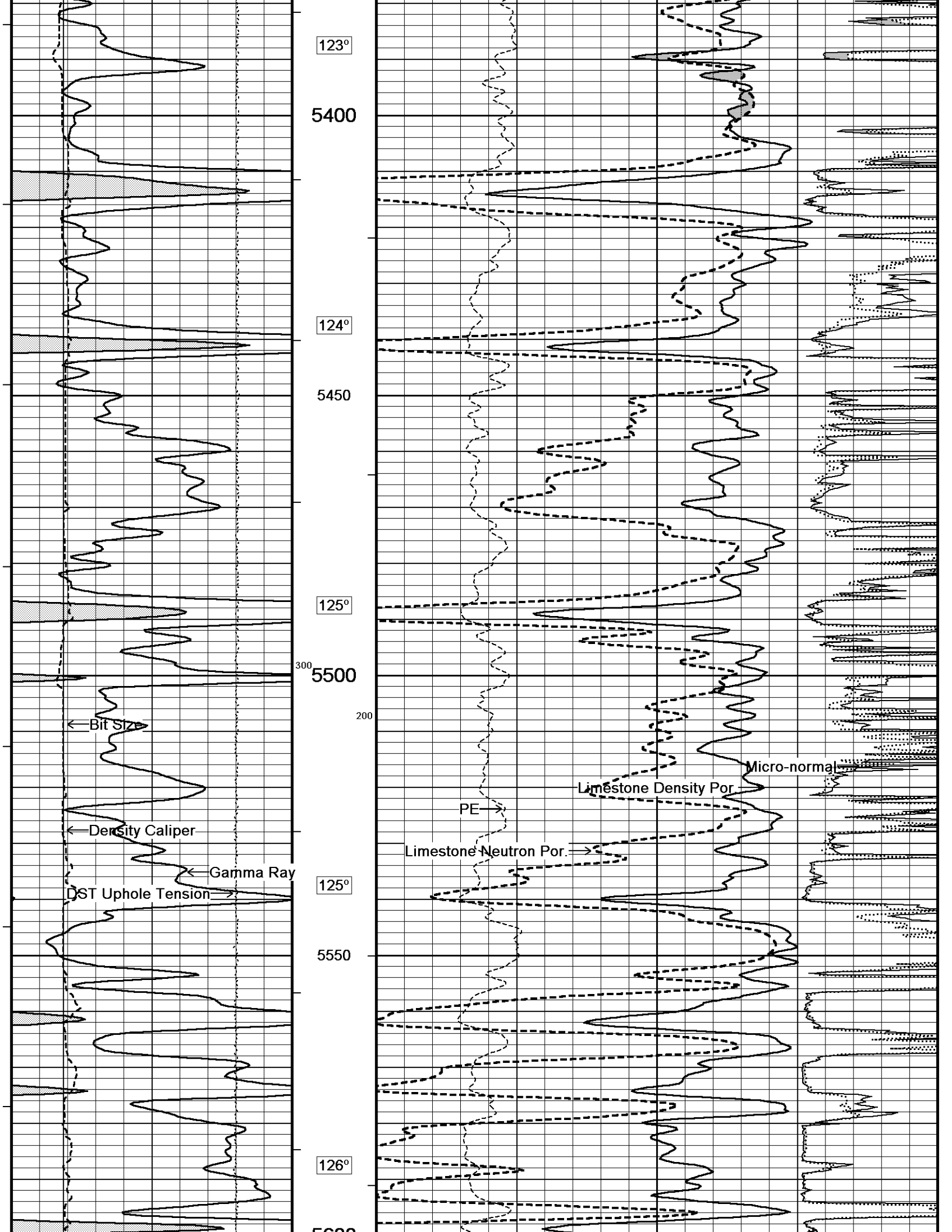


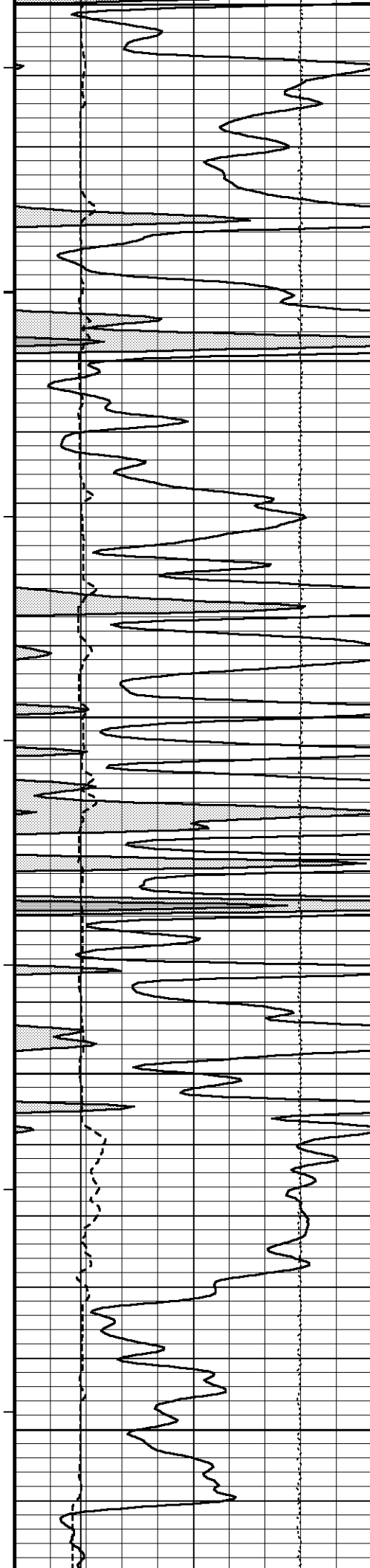


4950
121°
5000
121°
5050
300
122°
5100
123°
5150

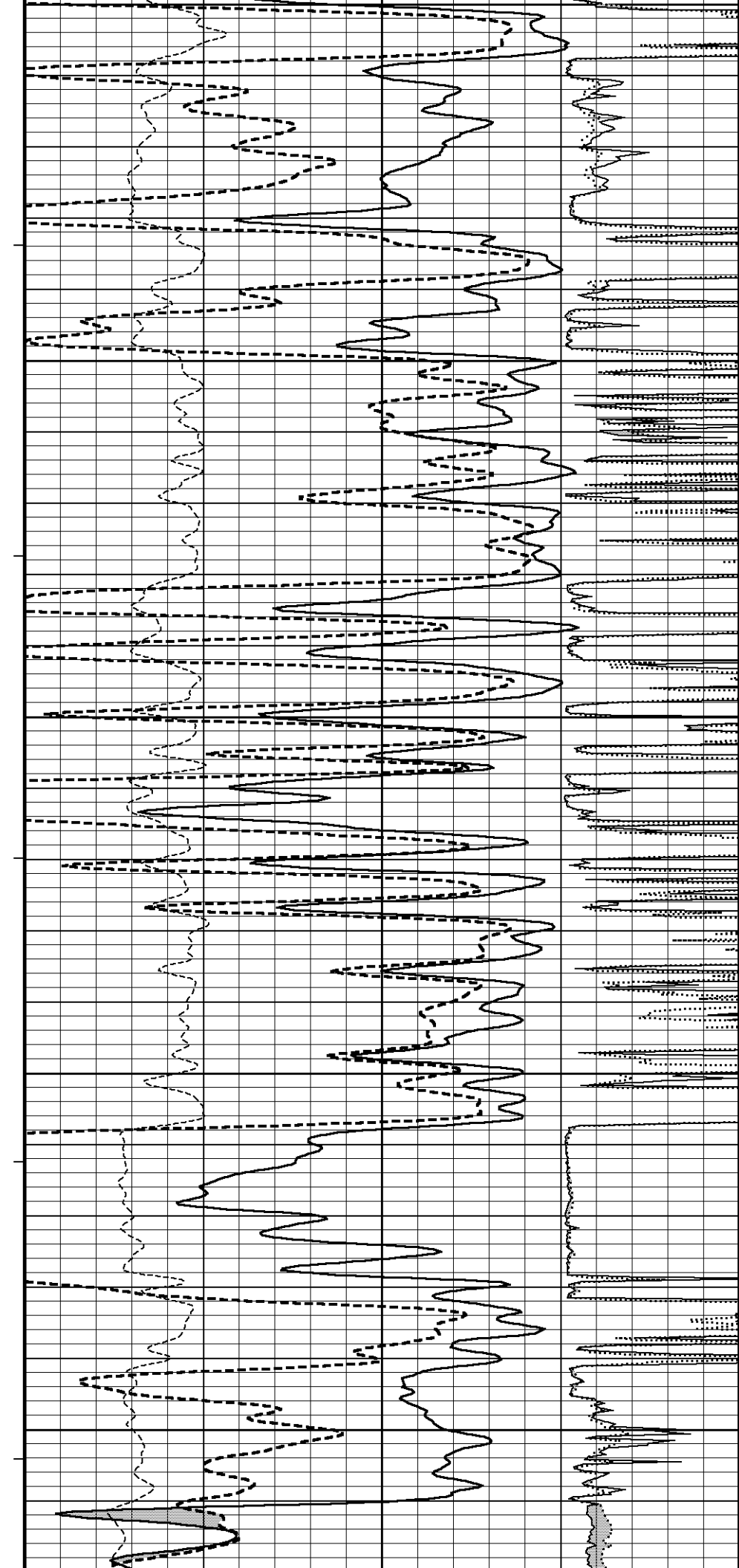


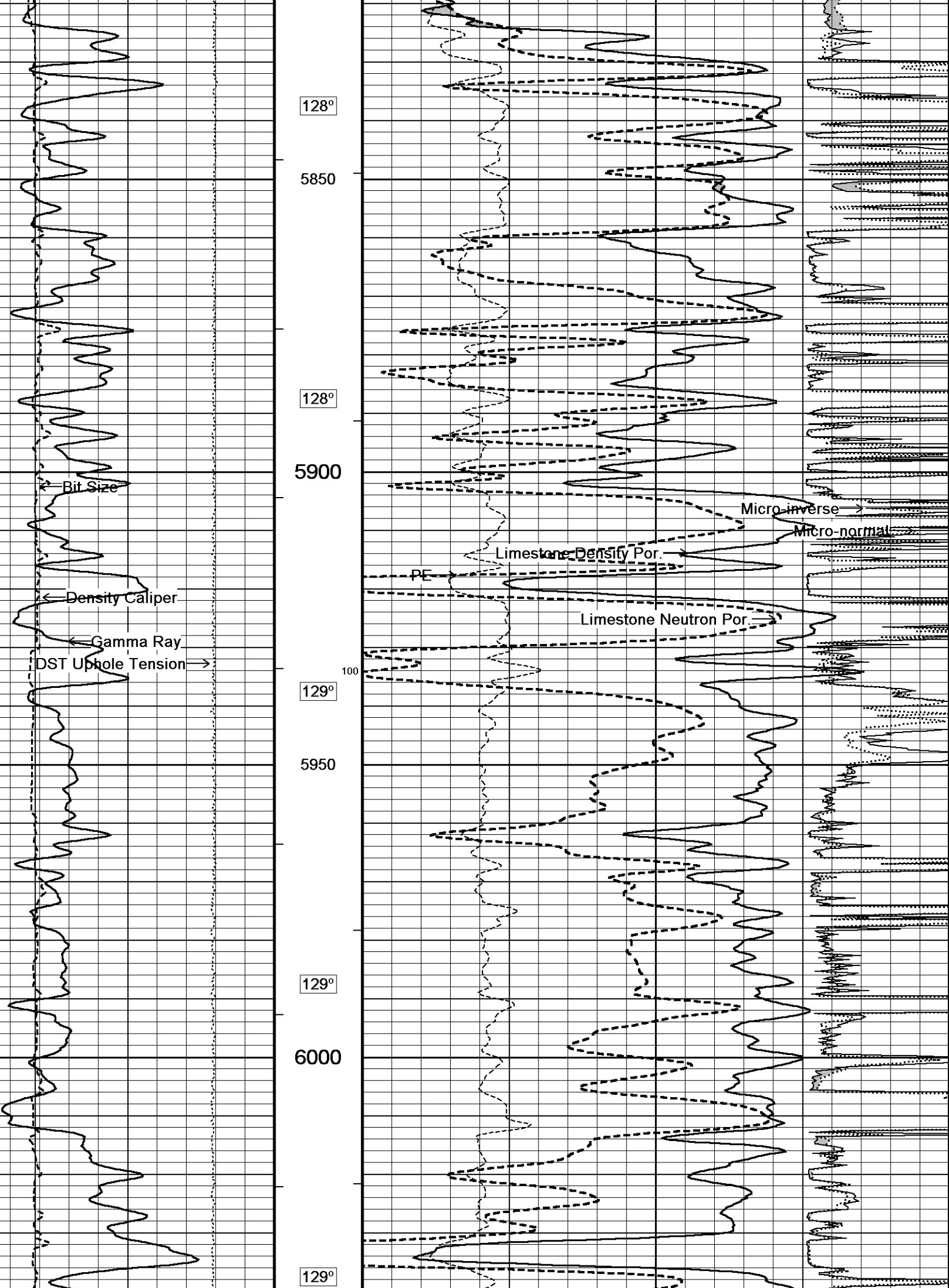


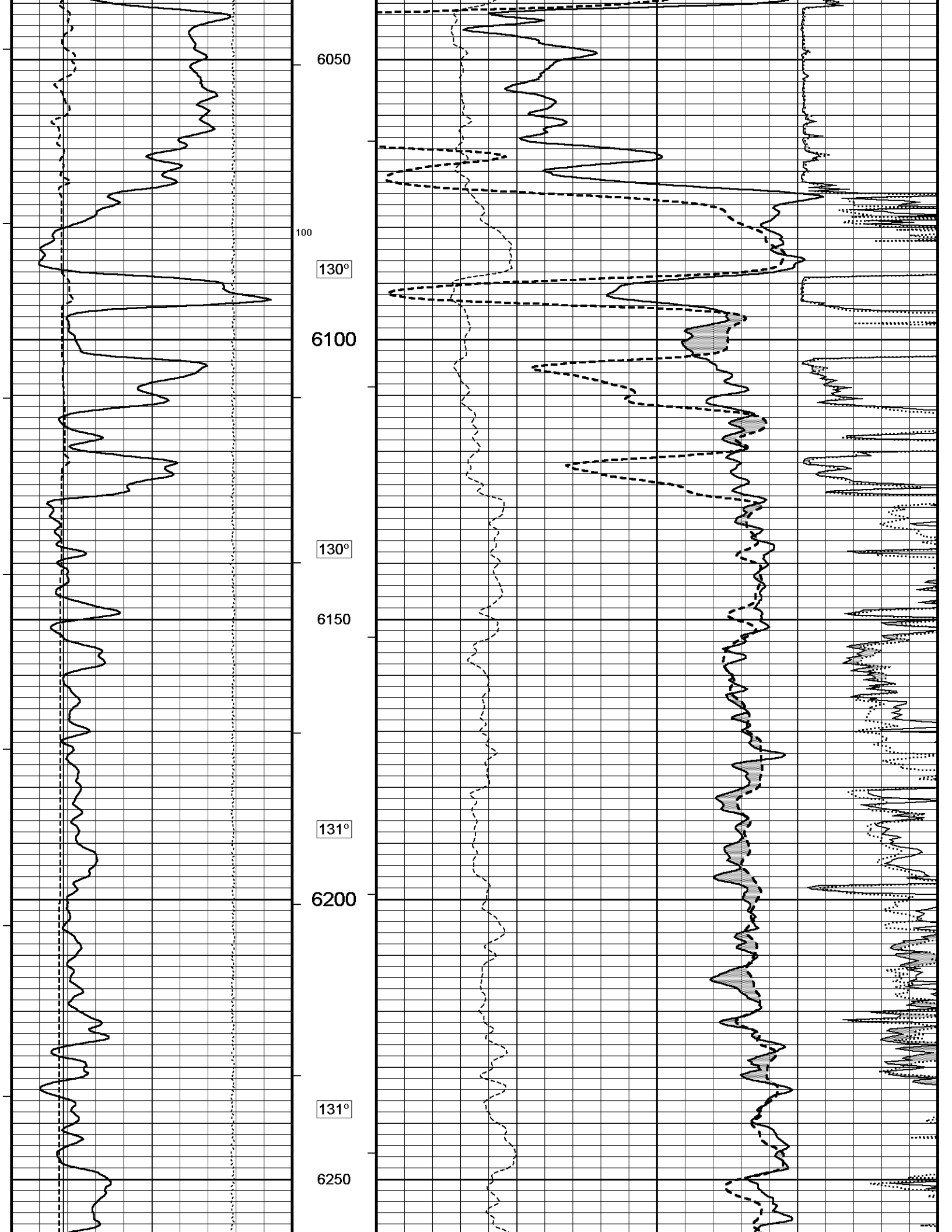


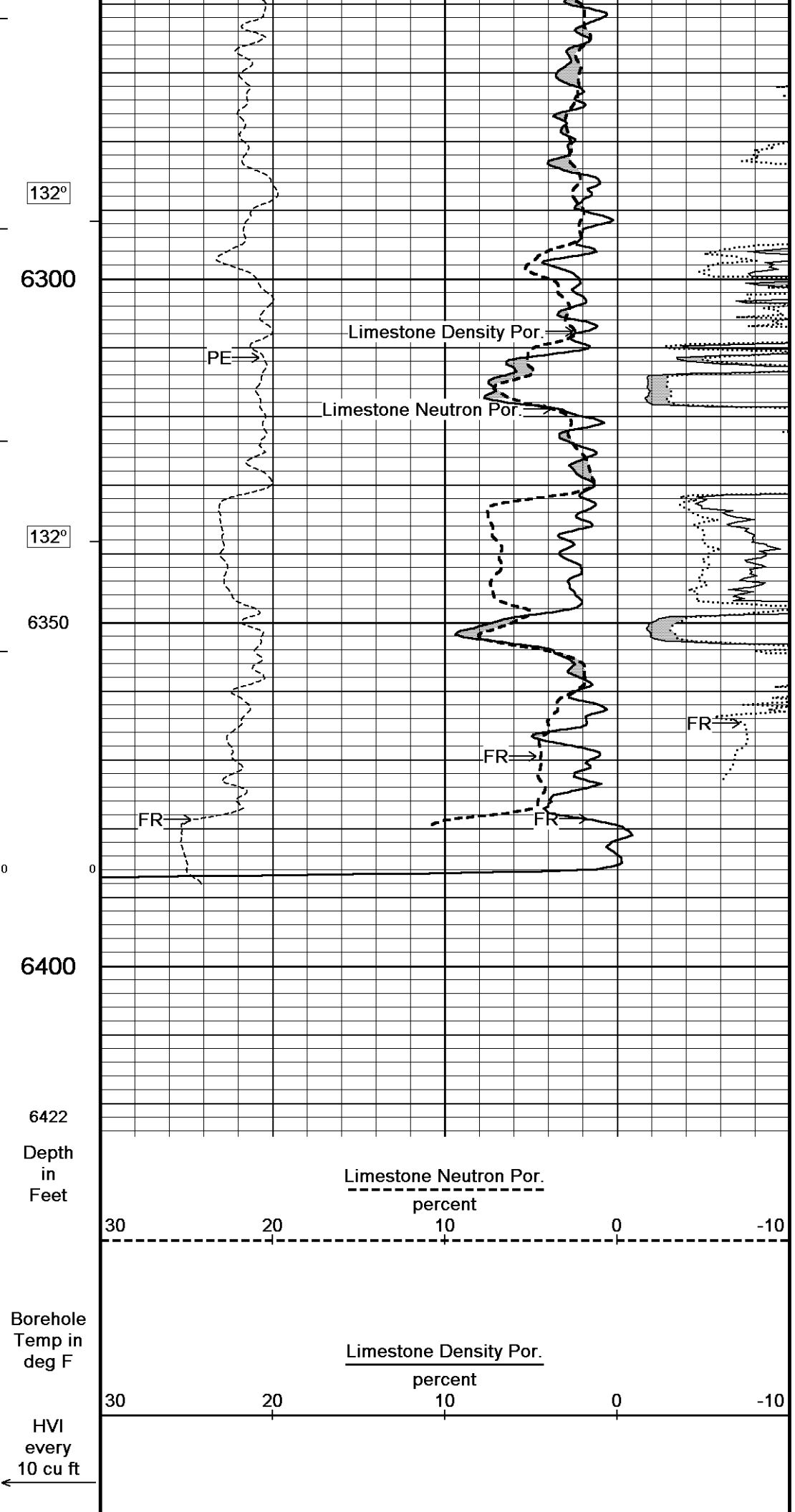
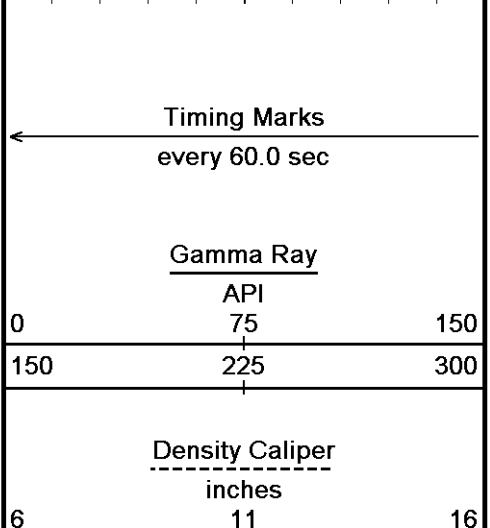
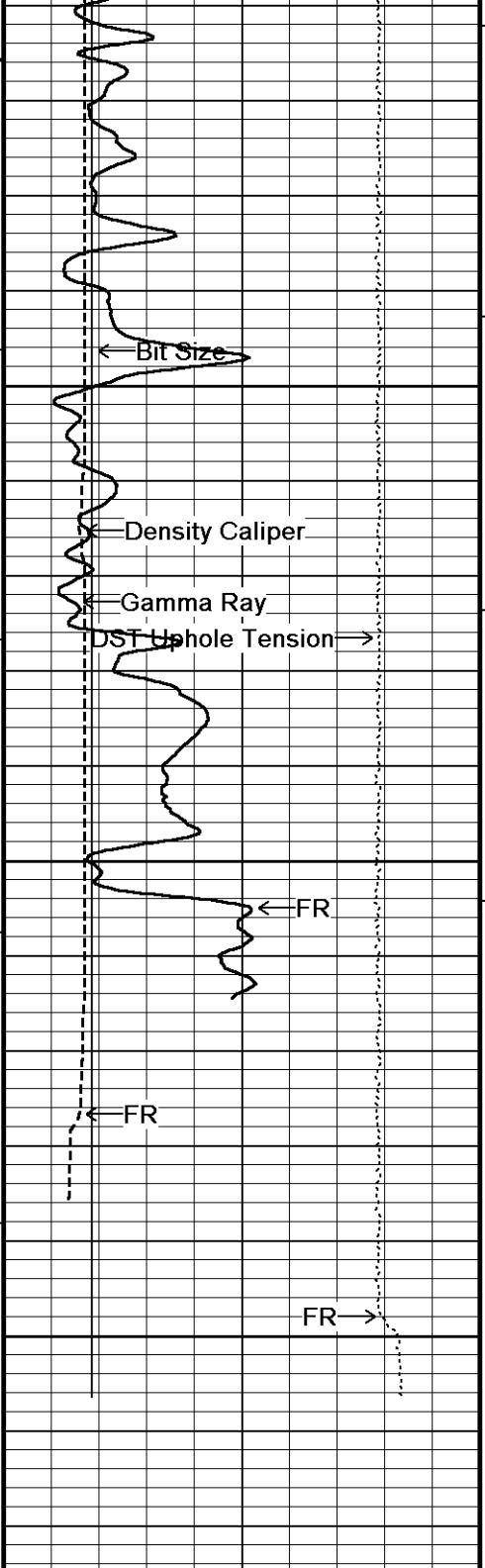


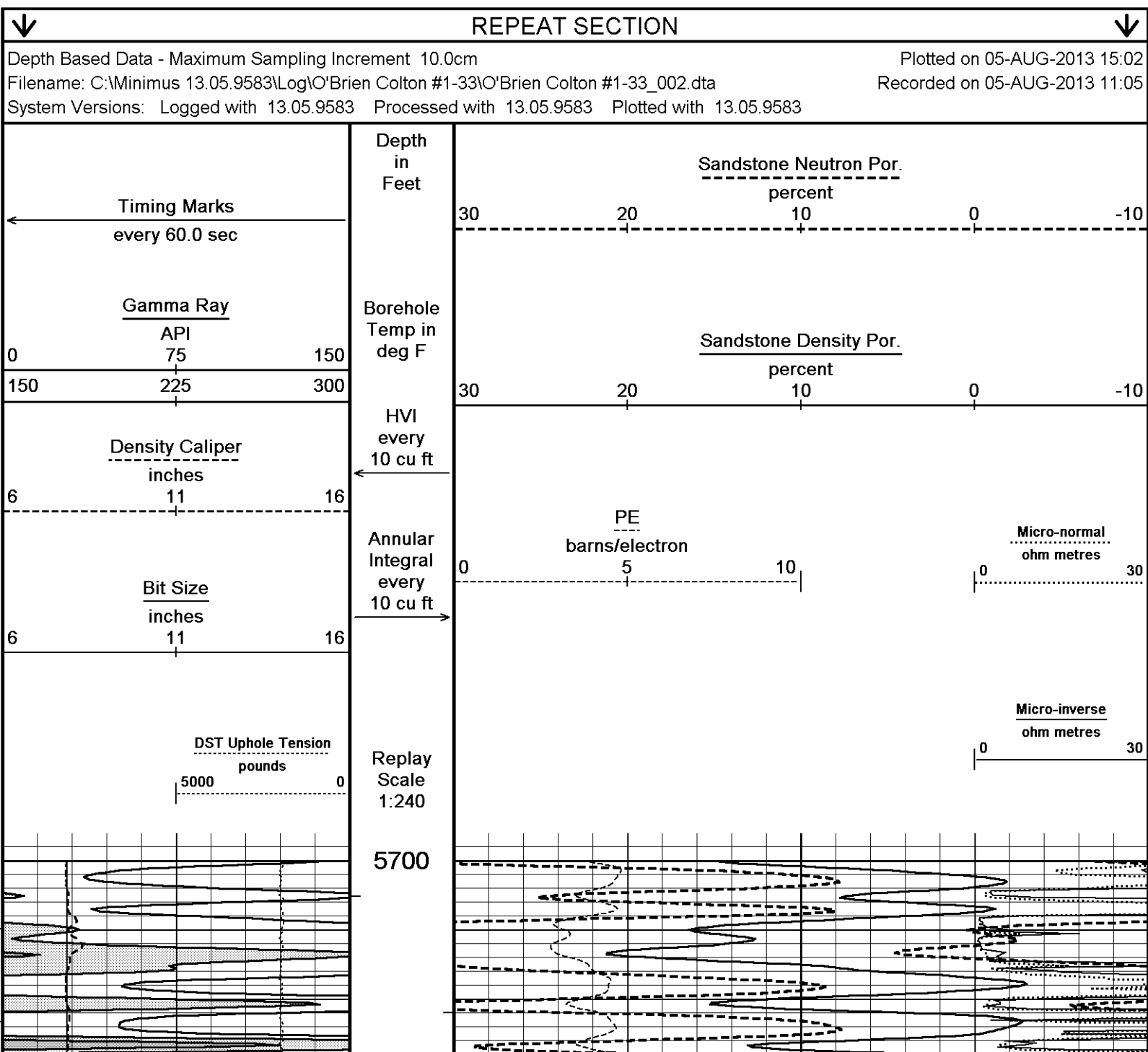
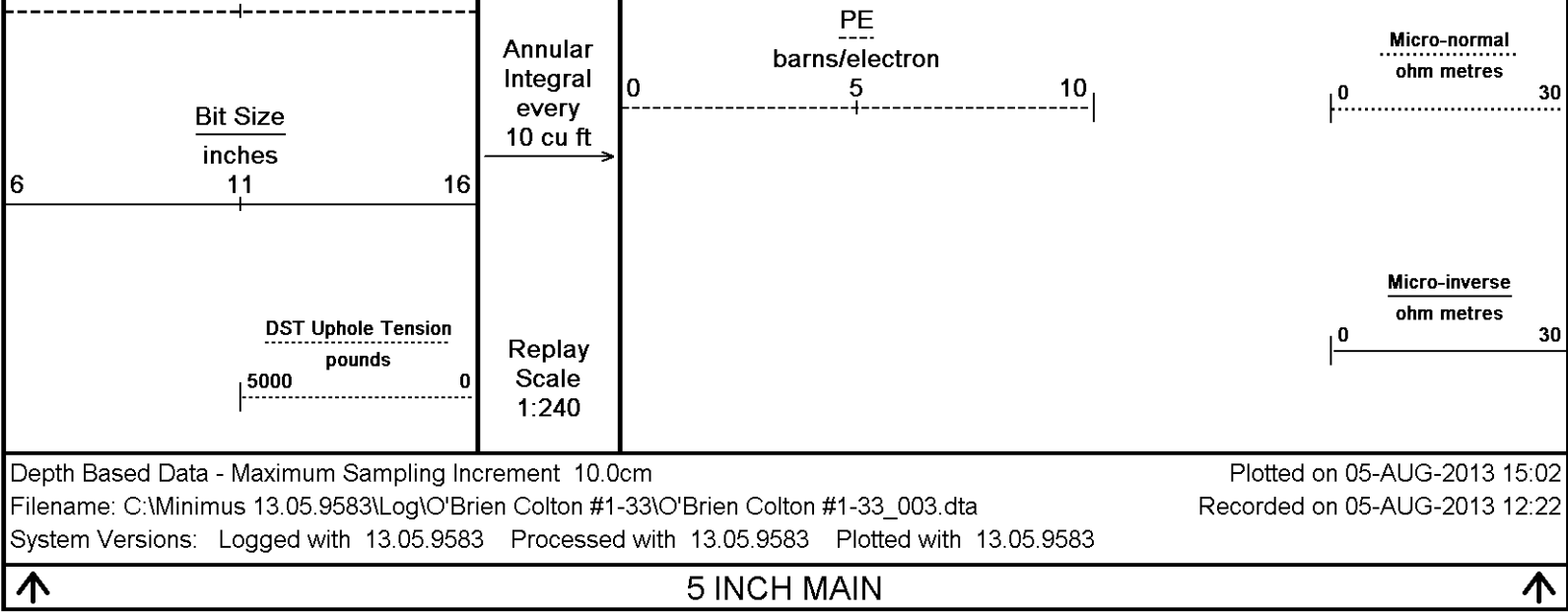
5600
126°
5650
127°
5700
127°
5750
200 128°
5800

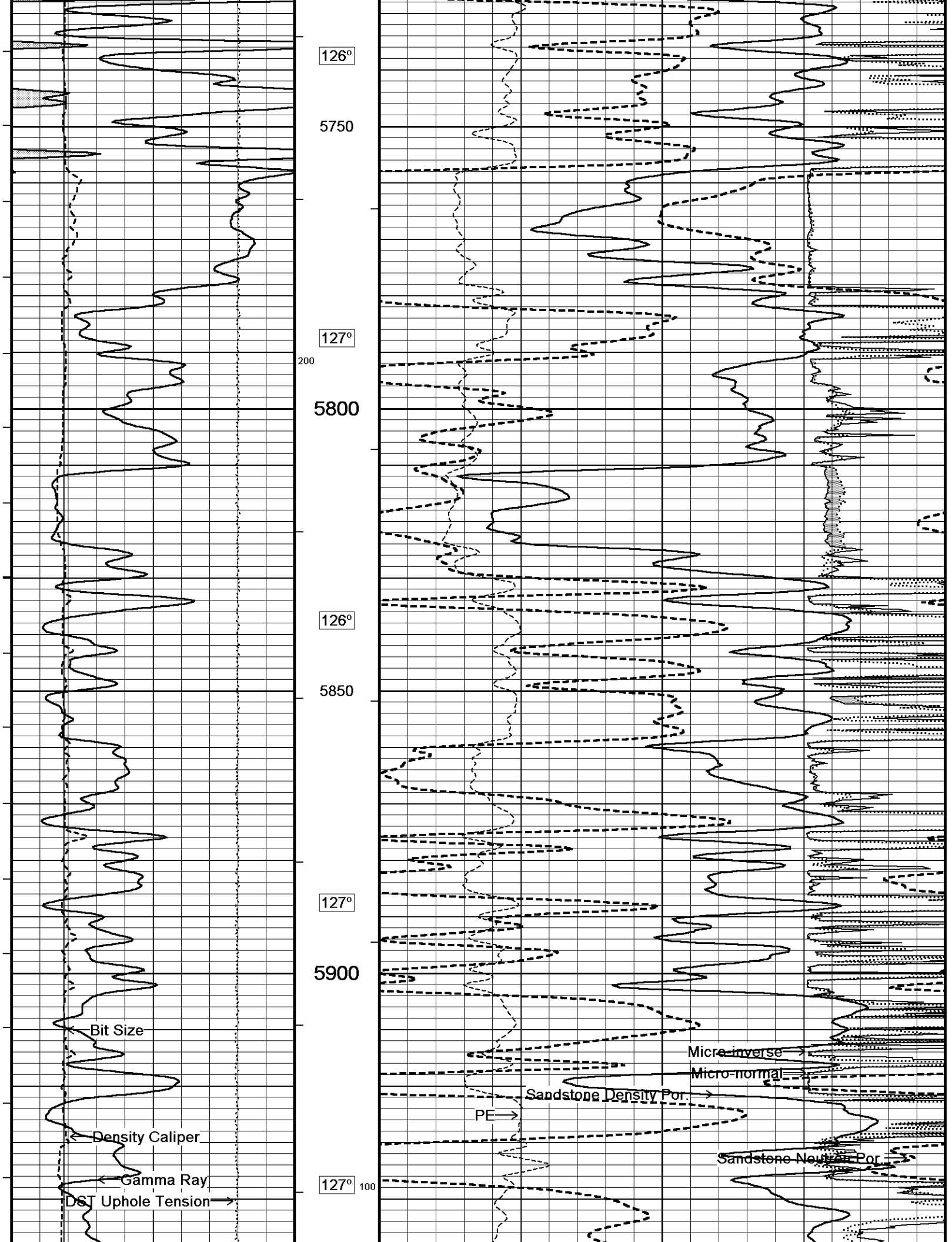


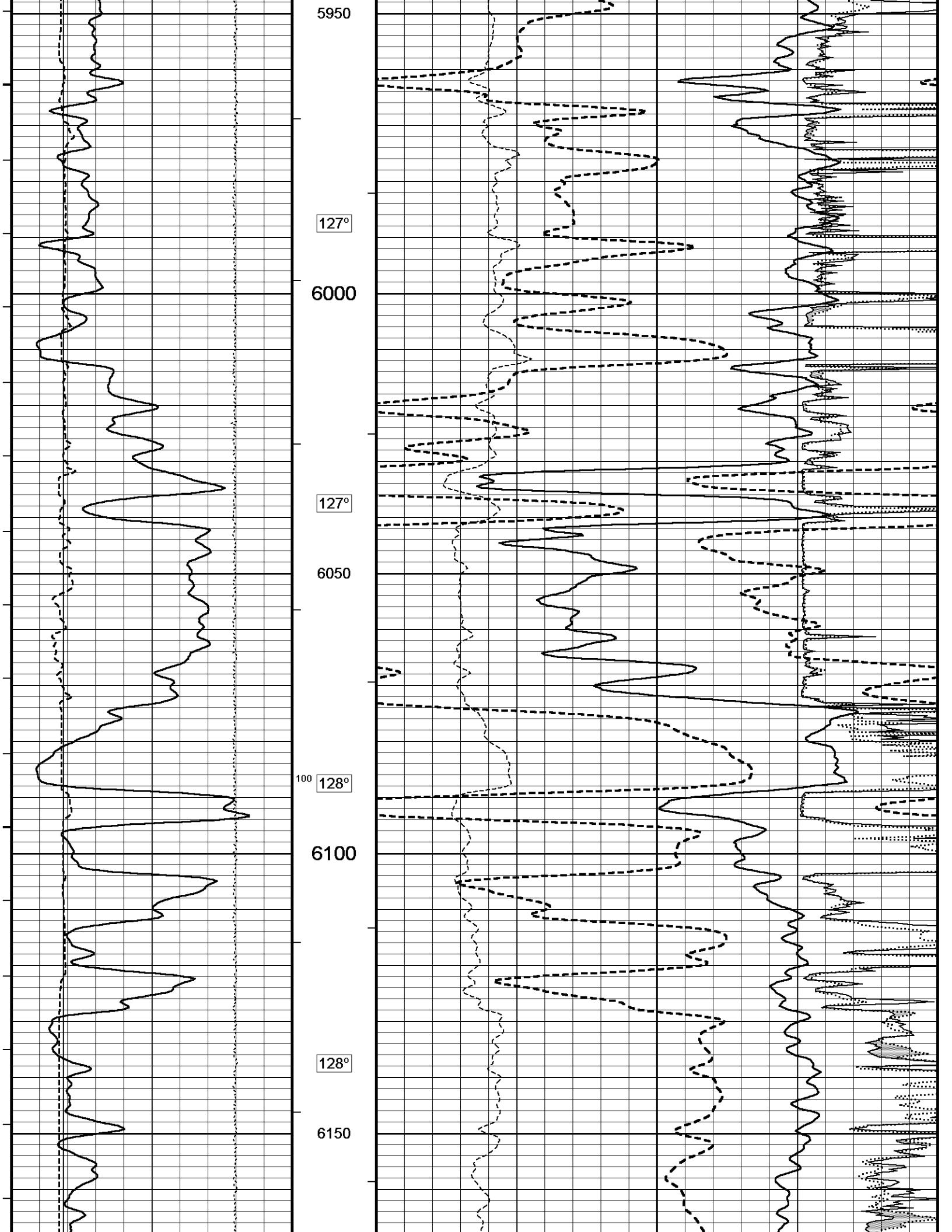


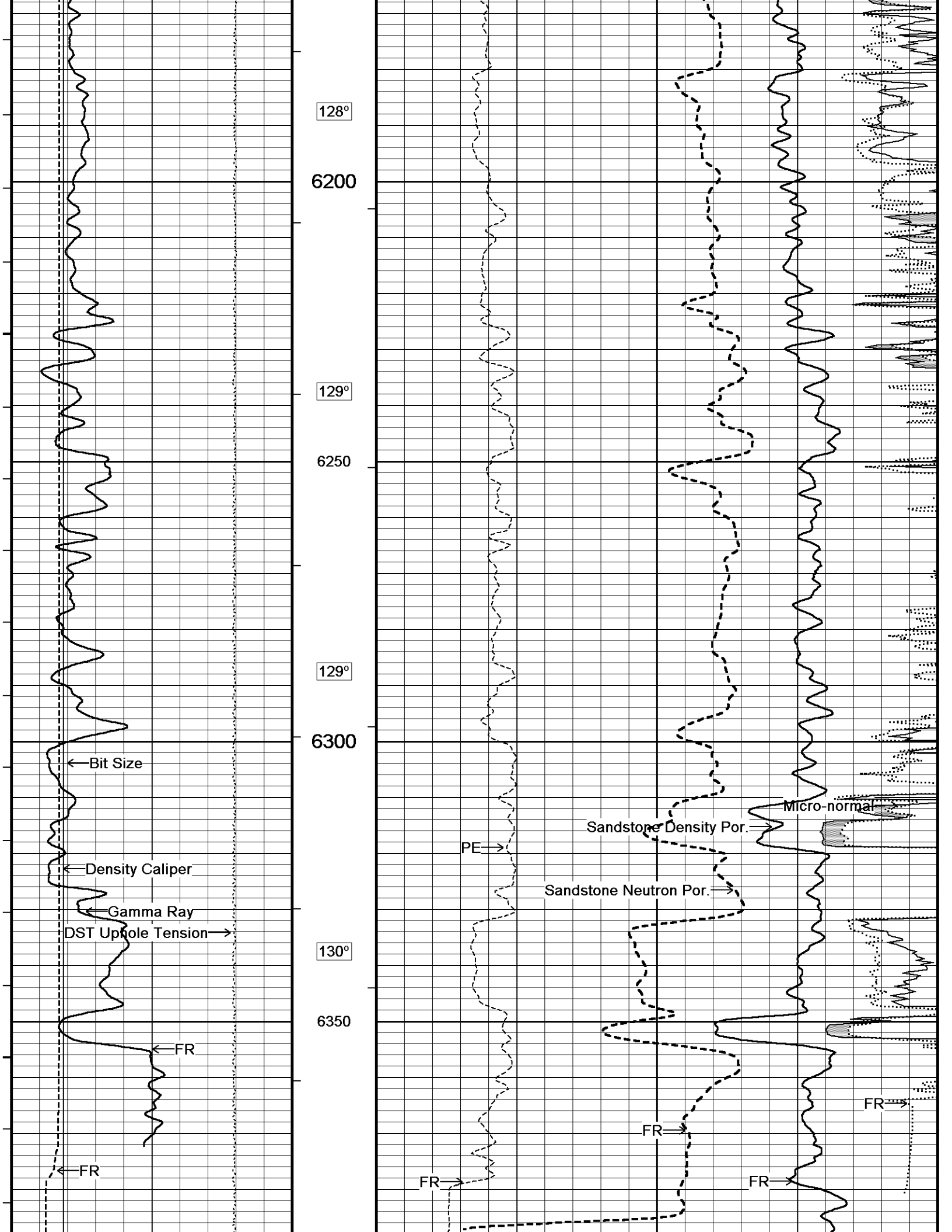


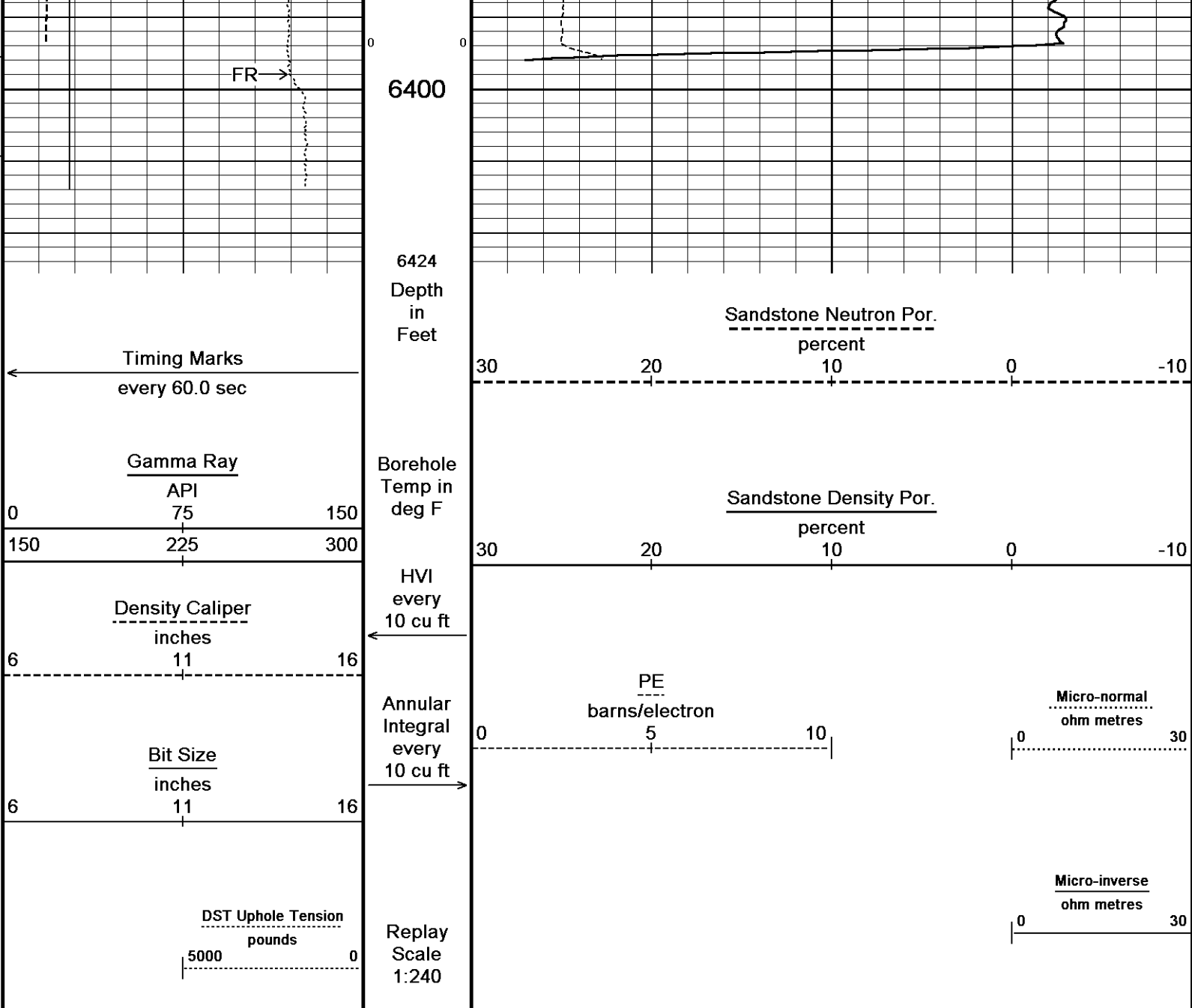










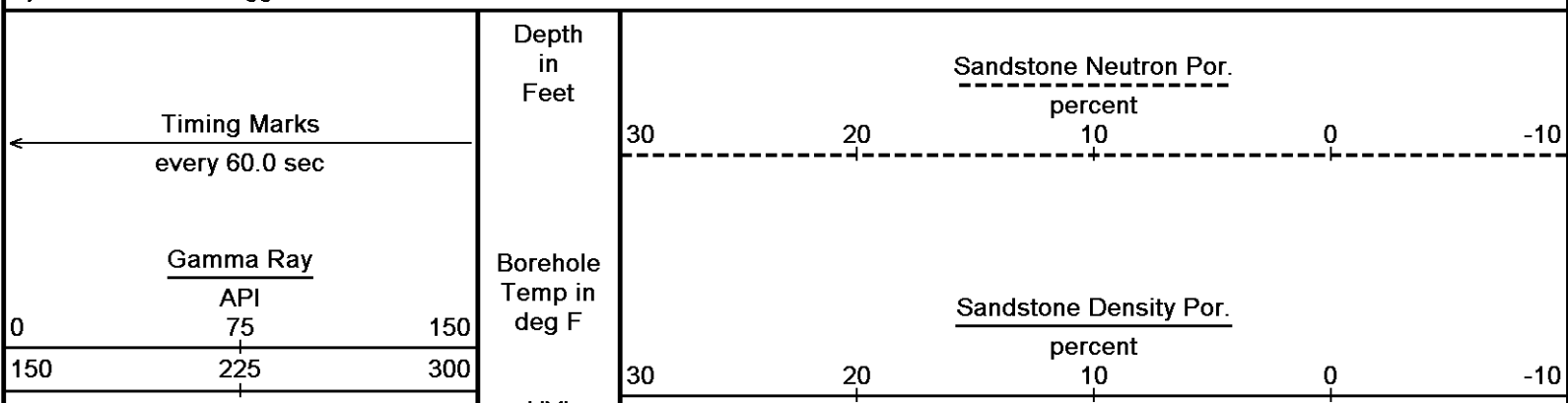


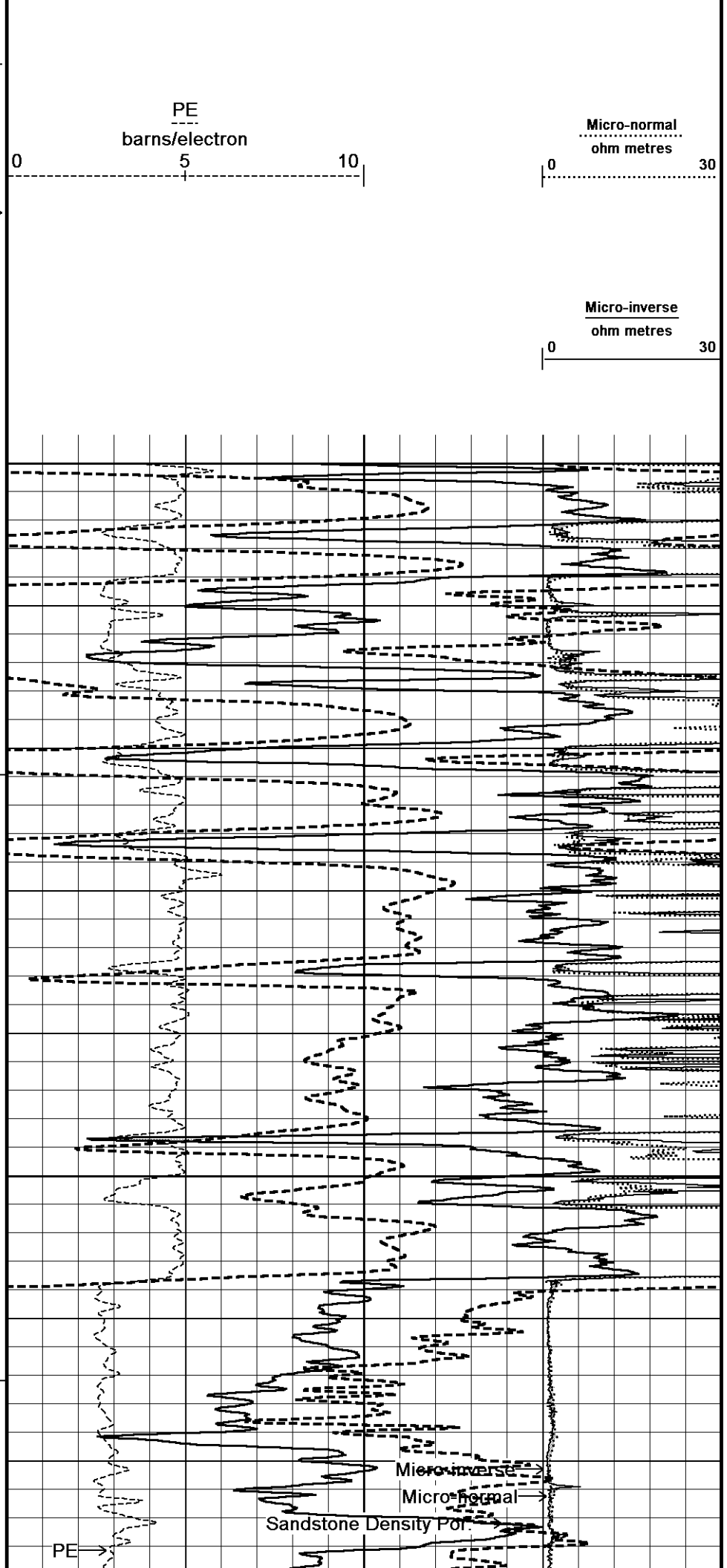
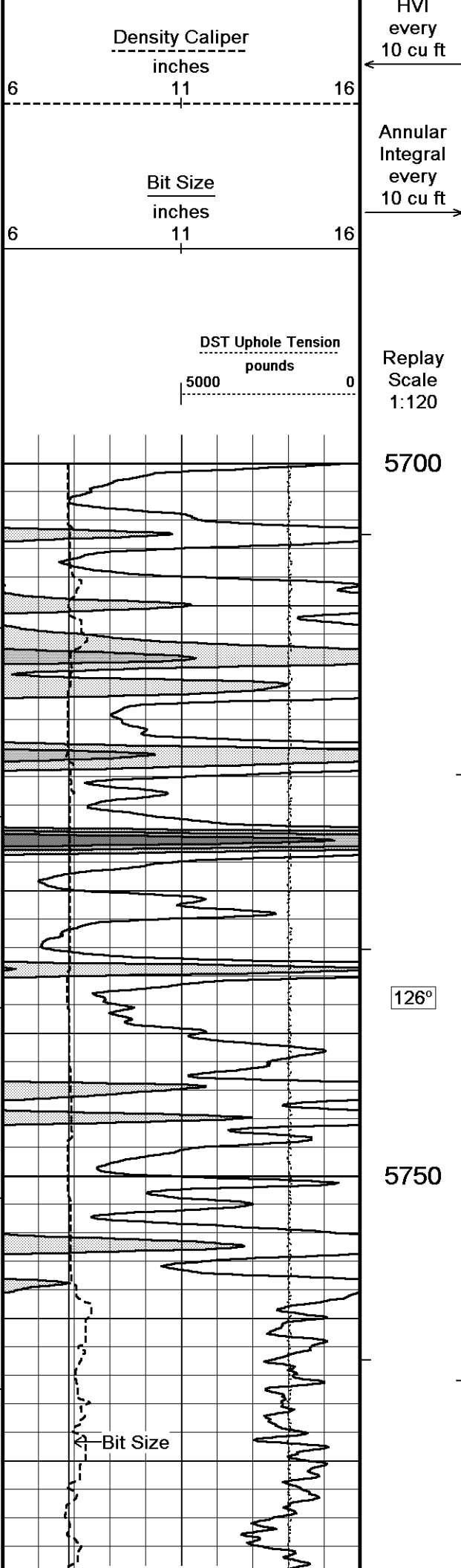
Depth Based Data - Maximum Sampling Increment 10.0cm Plotted on 05-AUG-2013 15:02
Filename: C:\Minimus 13.05.9583\Log\O'Brien Colton #1-33\O'Brien Colton #1-33_002.dta Recorded on 05-AUG-2013 11:05
System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583

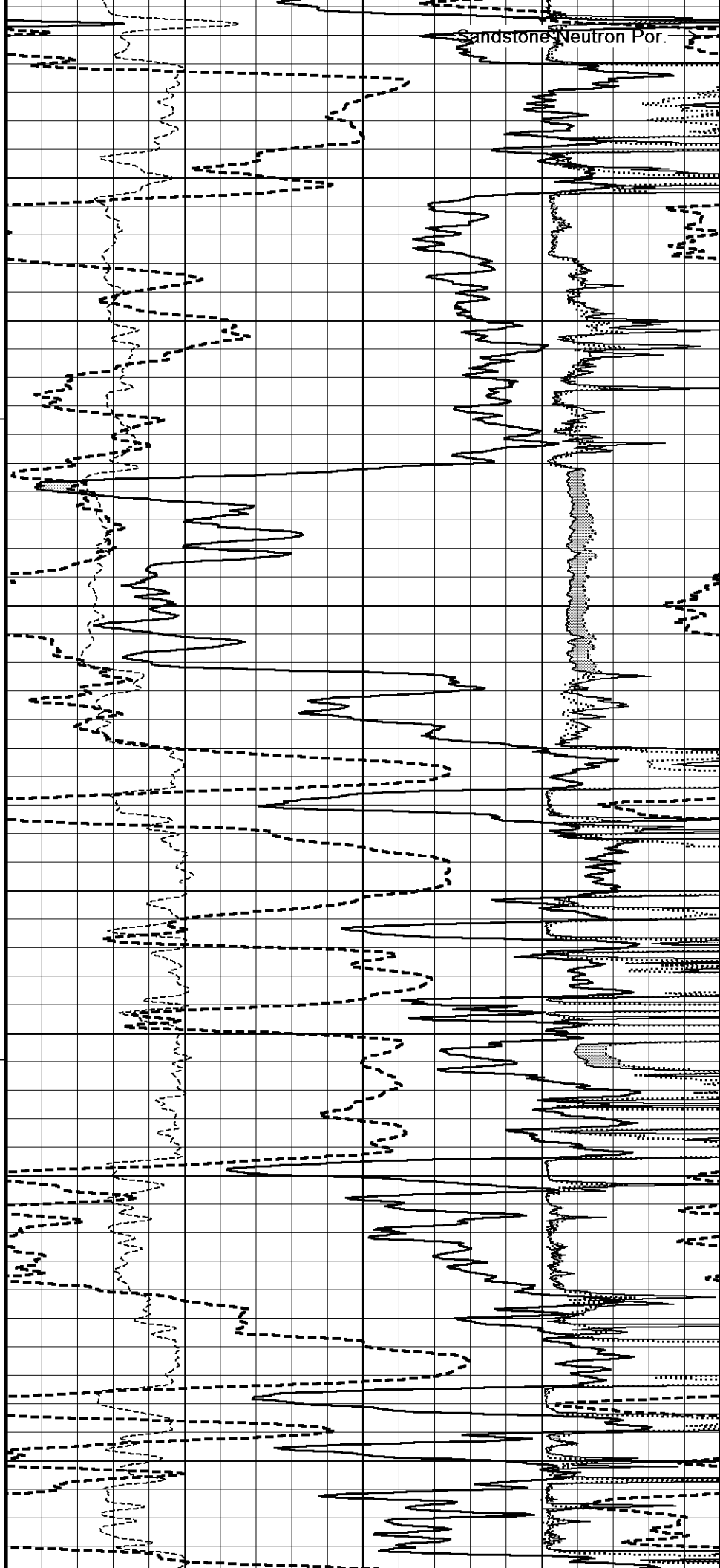
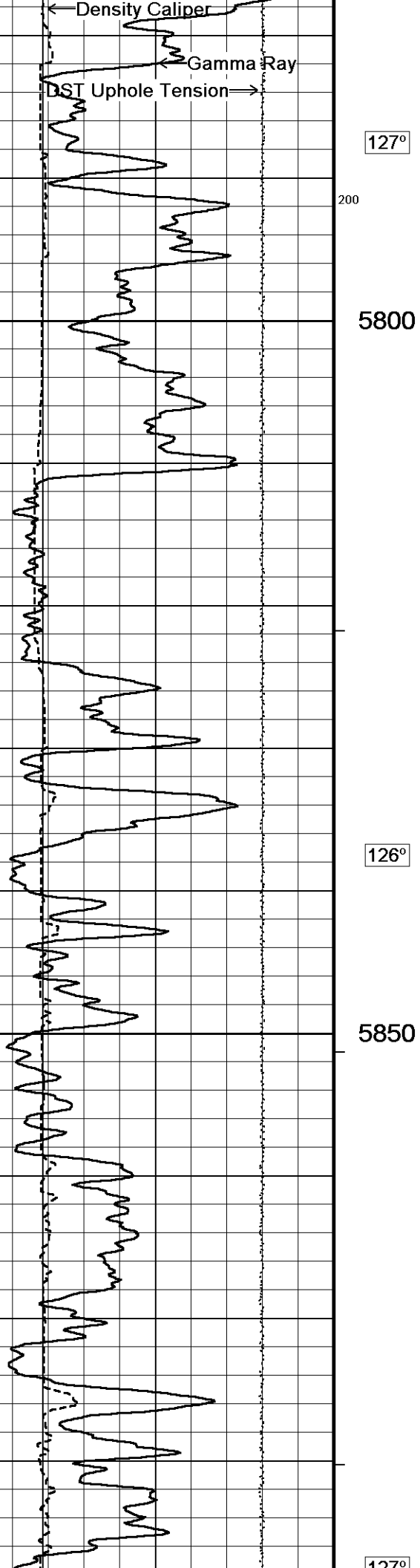
↑ REPEAT SECTION ↑

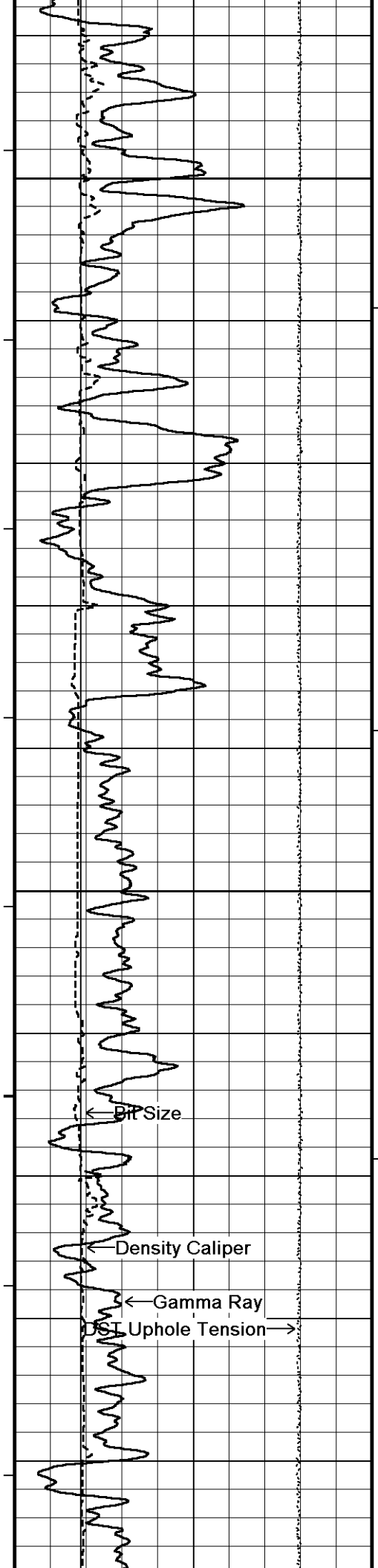
↓ 10 INCH HI-RES ↓

Depth Based Data - Maximum Sampling Increment 2.5cm Plotted on 05-AUG-2013 15:02
Filename: C:\Minimus 13.05.9583\Log\O'Brien Colton #1-33\O'Brien Colton #1-33_001.dta Recorded on 05-AUG-2013 11:05
System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583









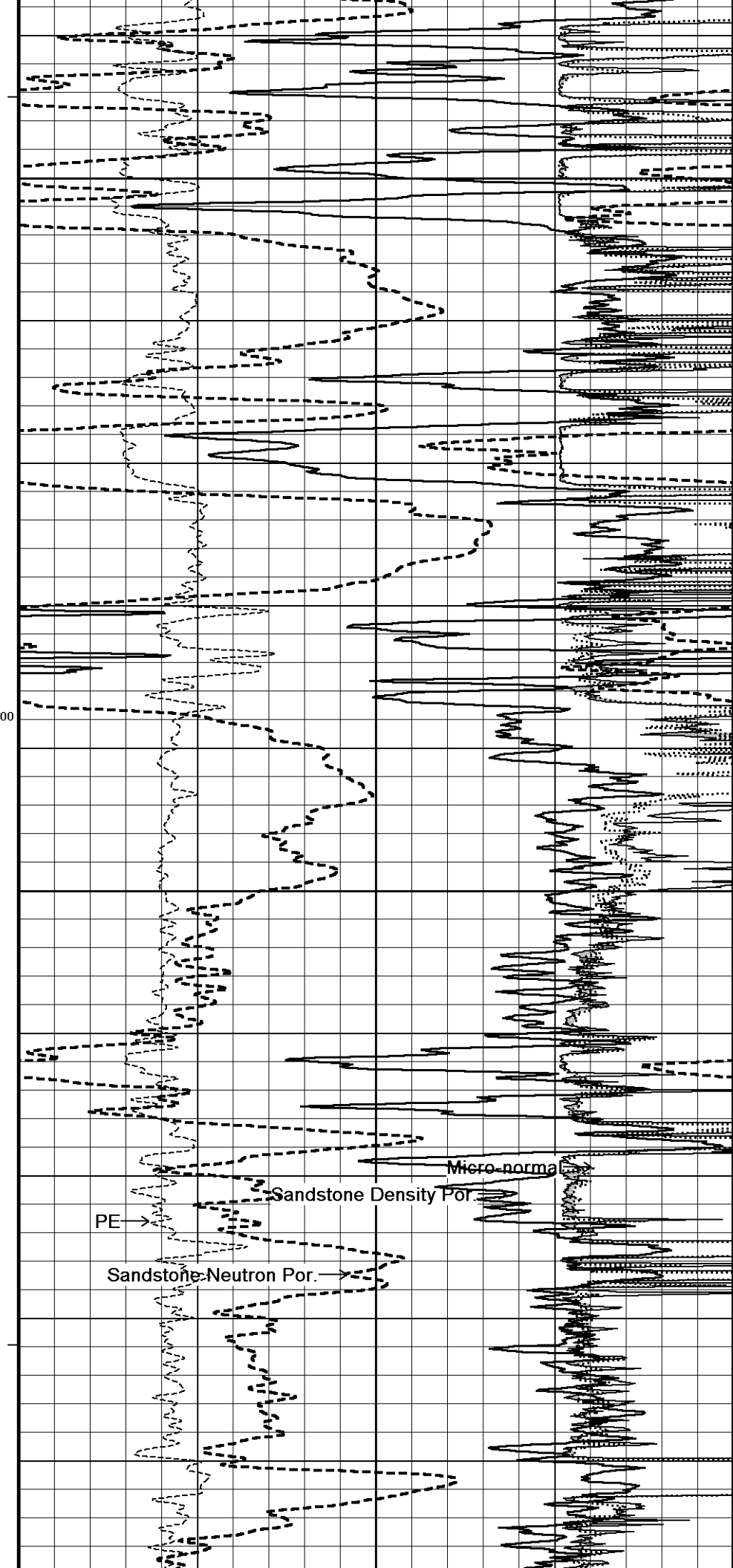
127°

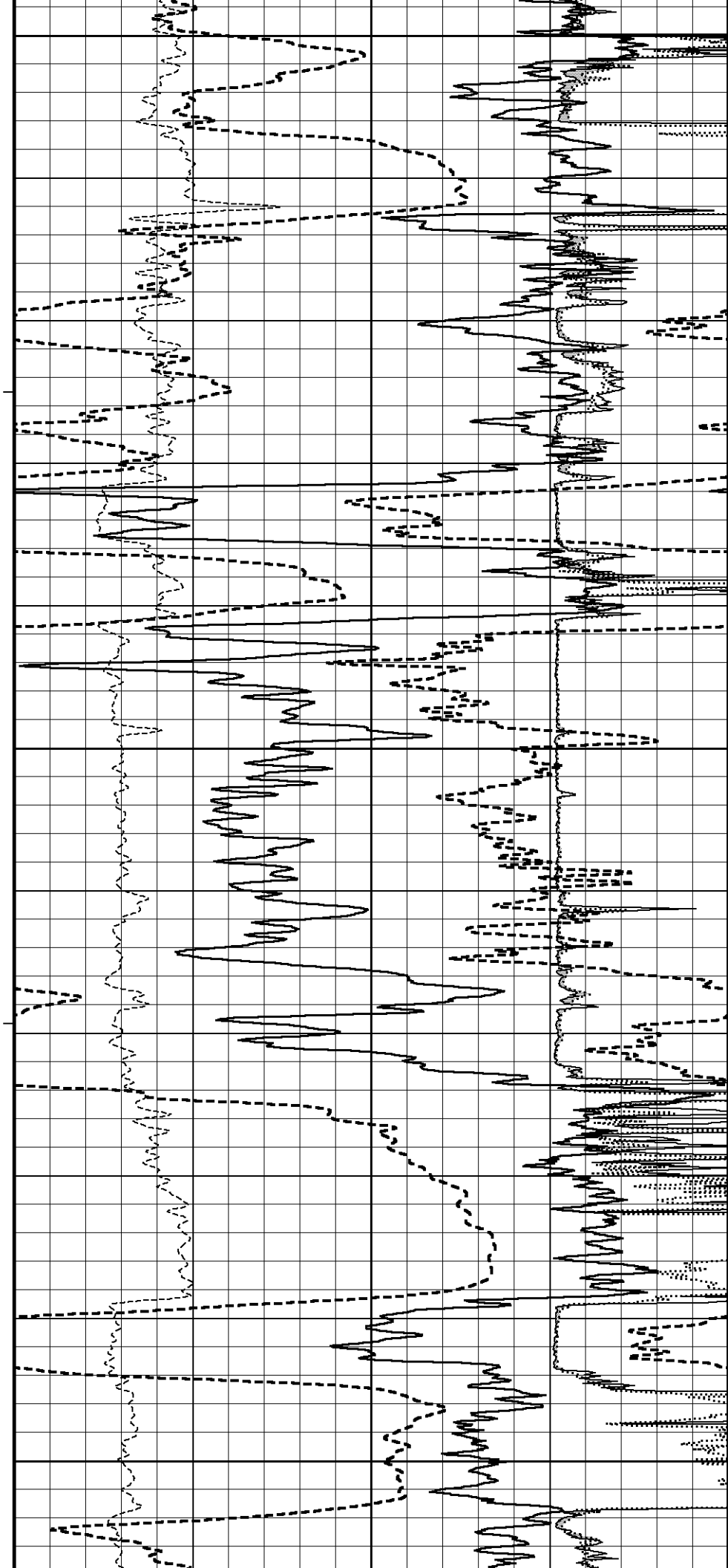
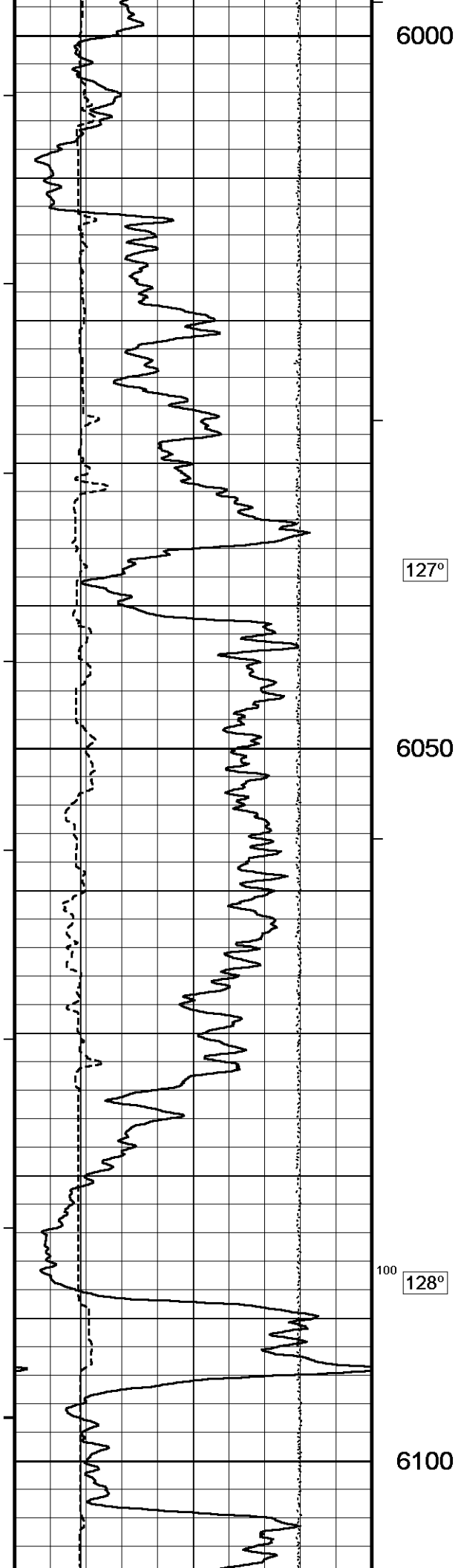
5900

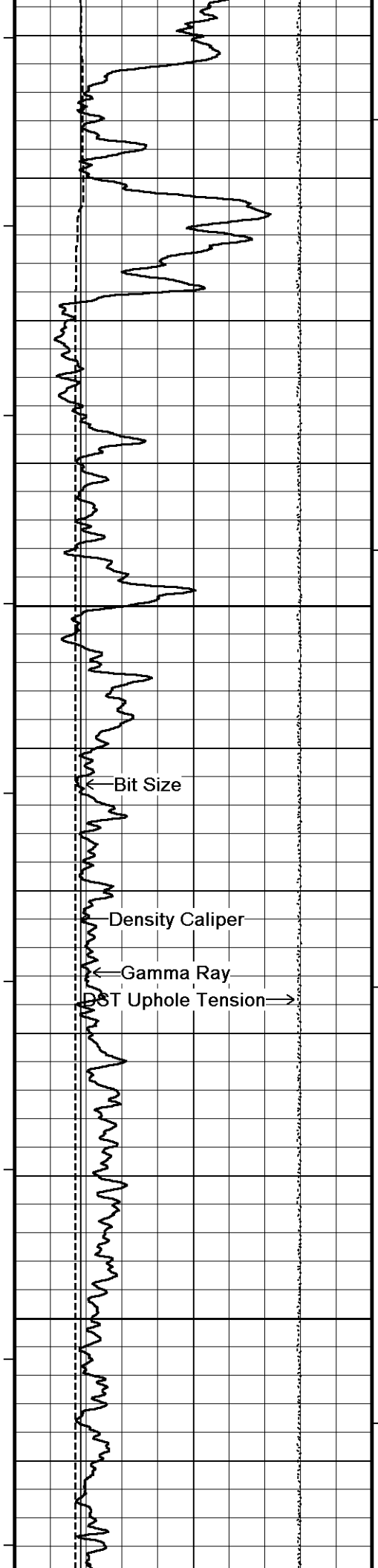
127° 100

5950

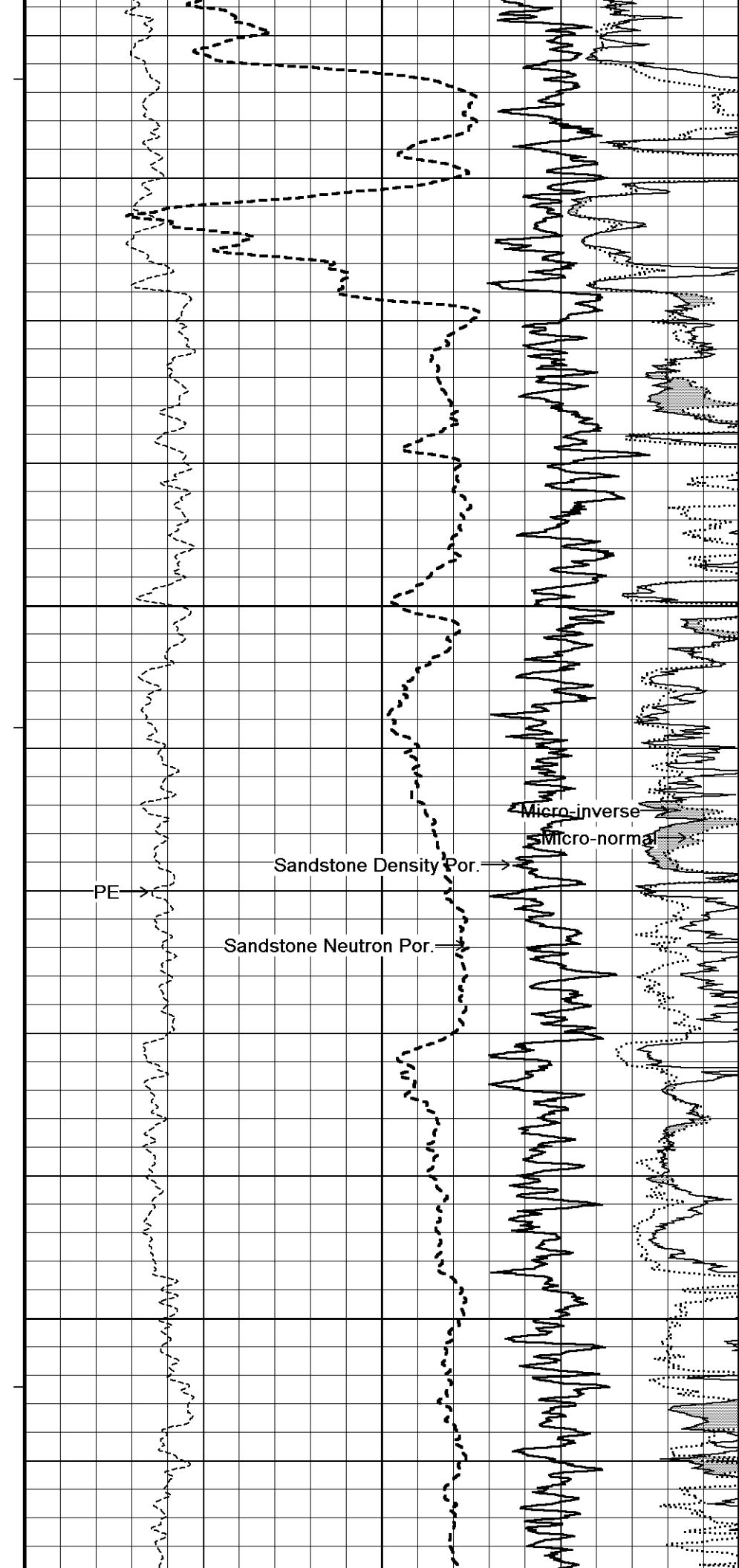
127°

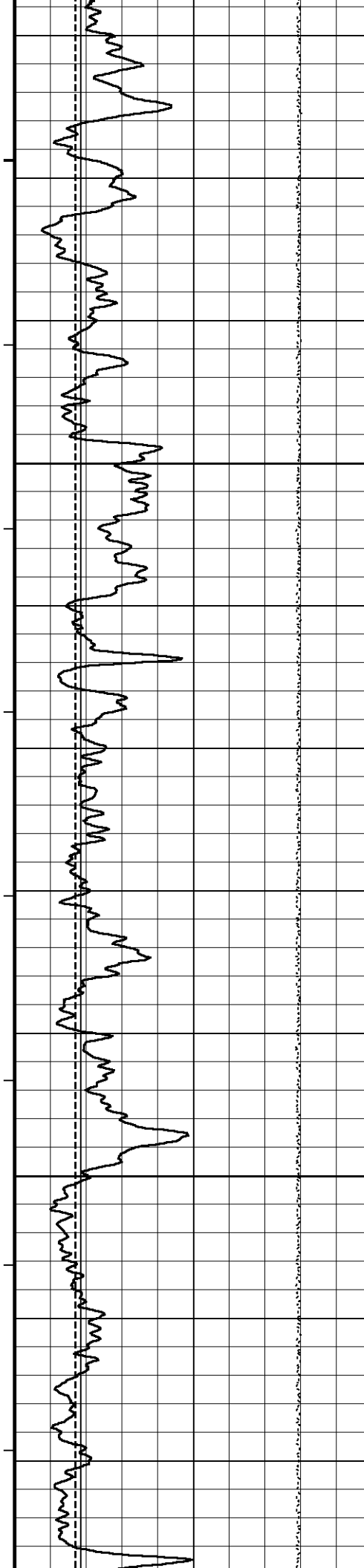






128°
6150
128°
6200



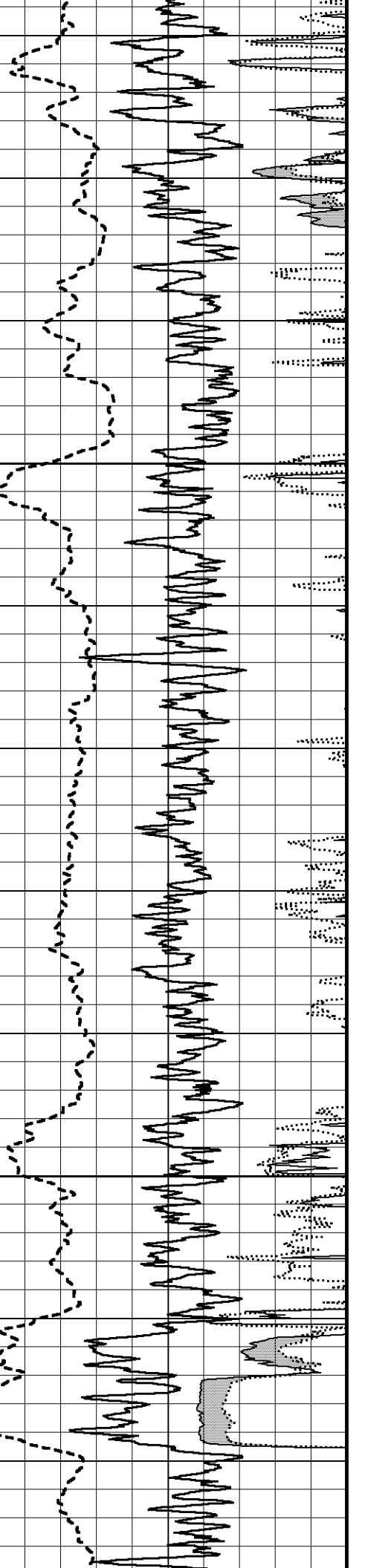
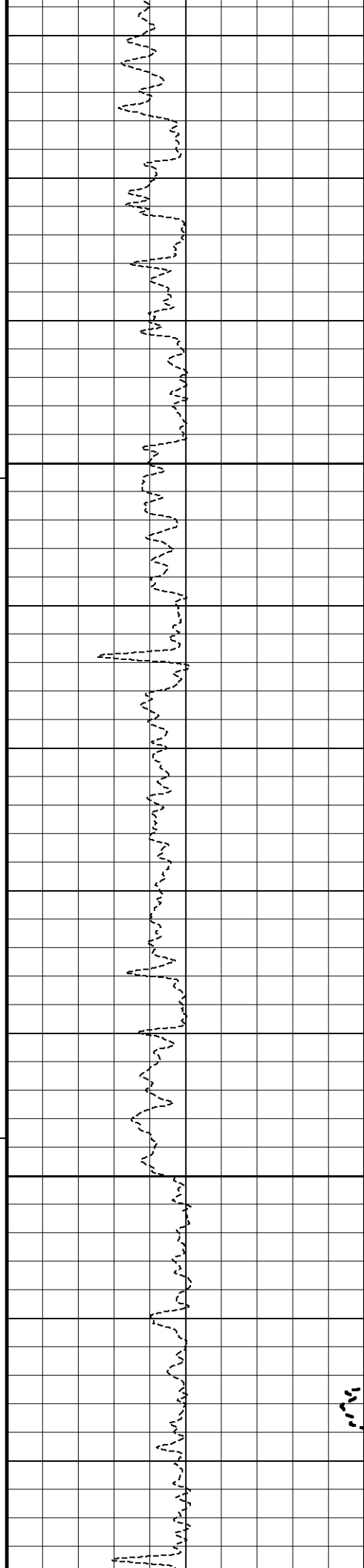


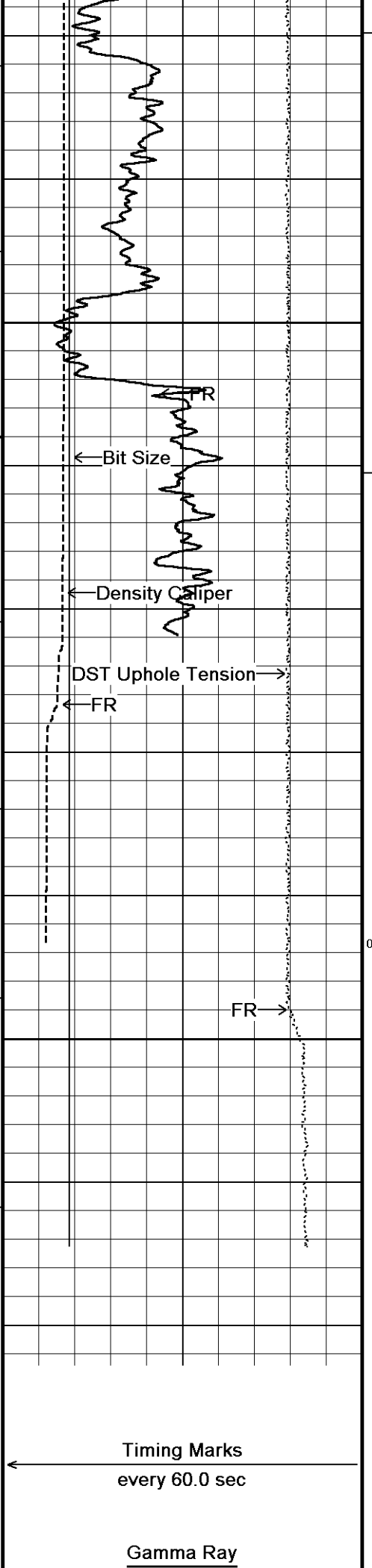
129°

6250

129°

6300



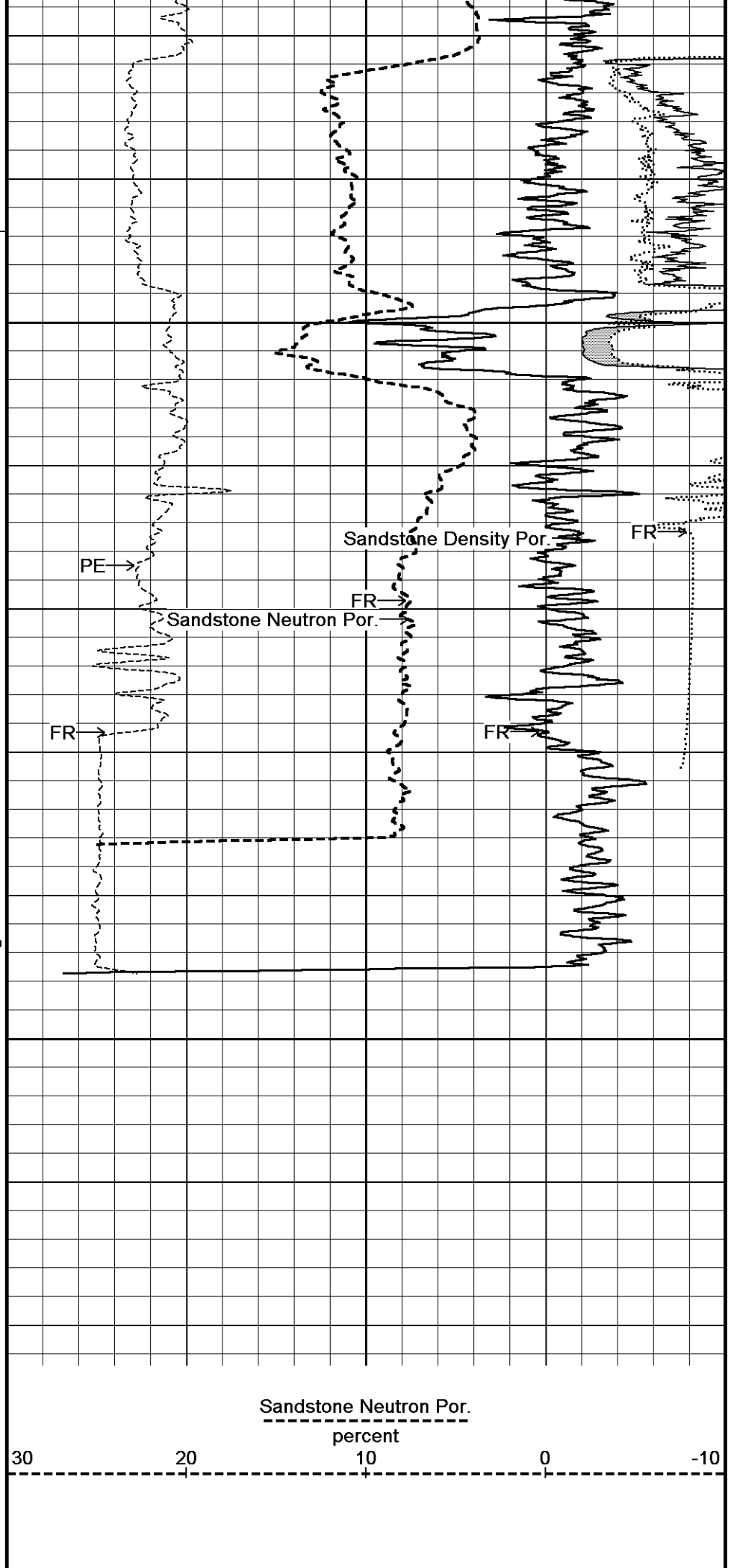


130°

6350

6400

6422
Depth
in
Feet

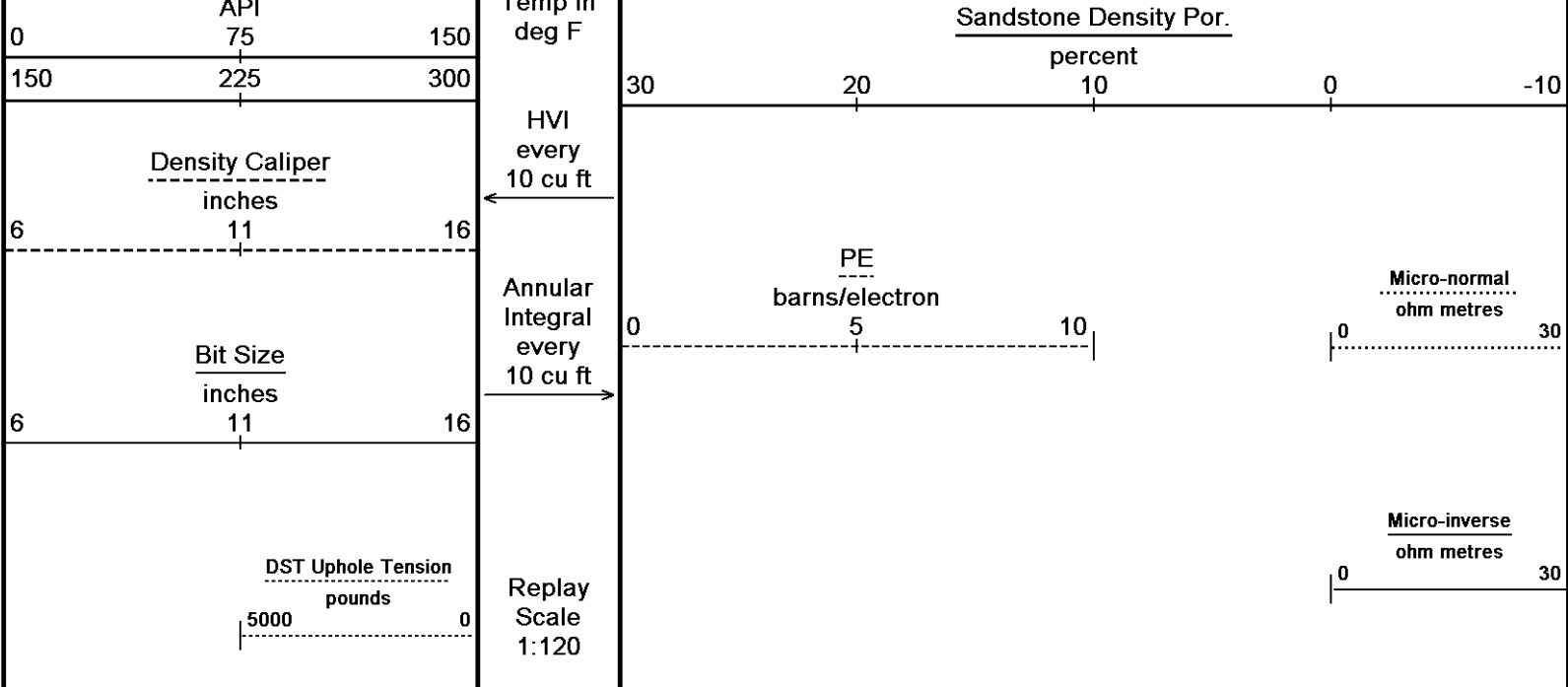


Sandstone Density Por.

Sandstone Neutron Por.

Sandstone Neutron Por.
percent

30 20 10 0 -10



Depth Based Data - Maximum Sampling Increment 2.5cm

Plotted on 05-AUG-2013 15:02

Filename: C:\Minimus 13.05.9583\Log\O'Brien Colton #1-33\O'Brien Colton #1-33_001.dta

Recorded on 05-AUG-2013 11:05

System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583

↑

10 INCH HI-RES

↑

↓

5 INCH MAIN

↓

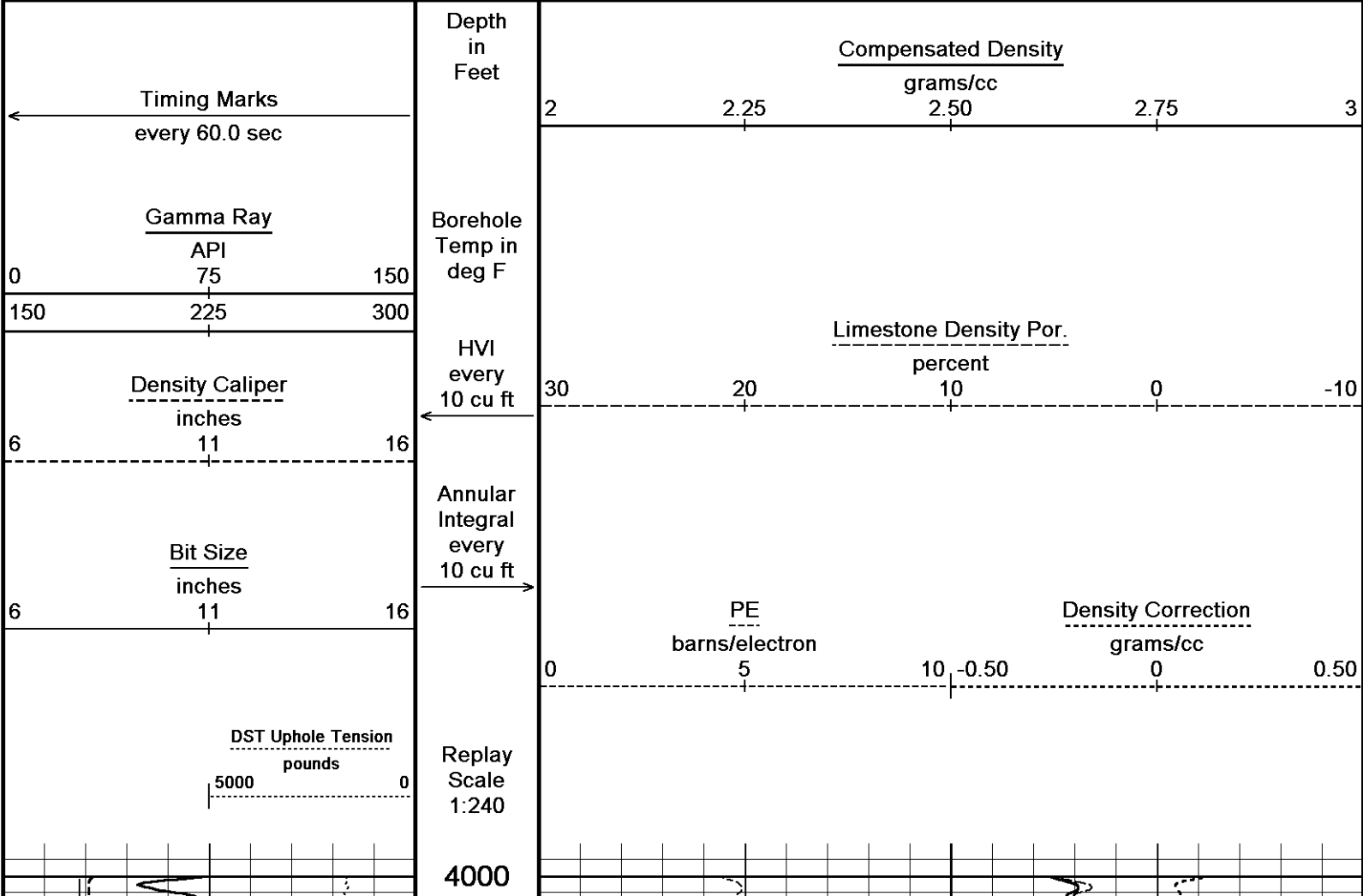
Depth Based Data - Maximum Sampling Increment 10.0cm

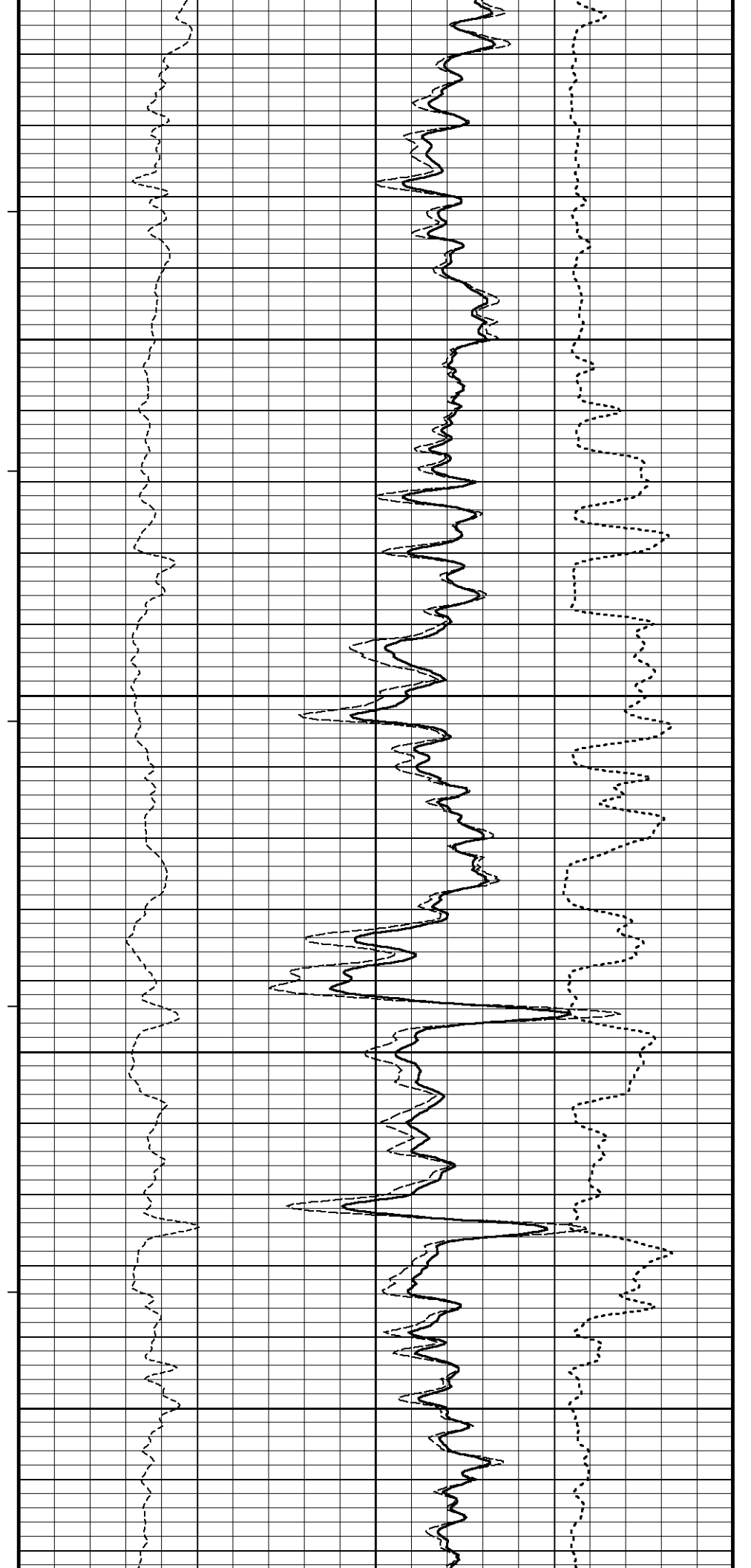
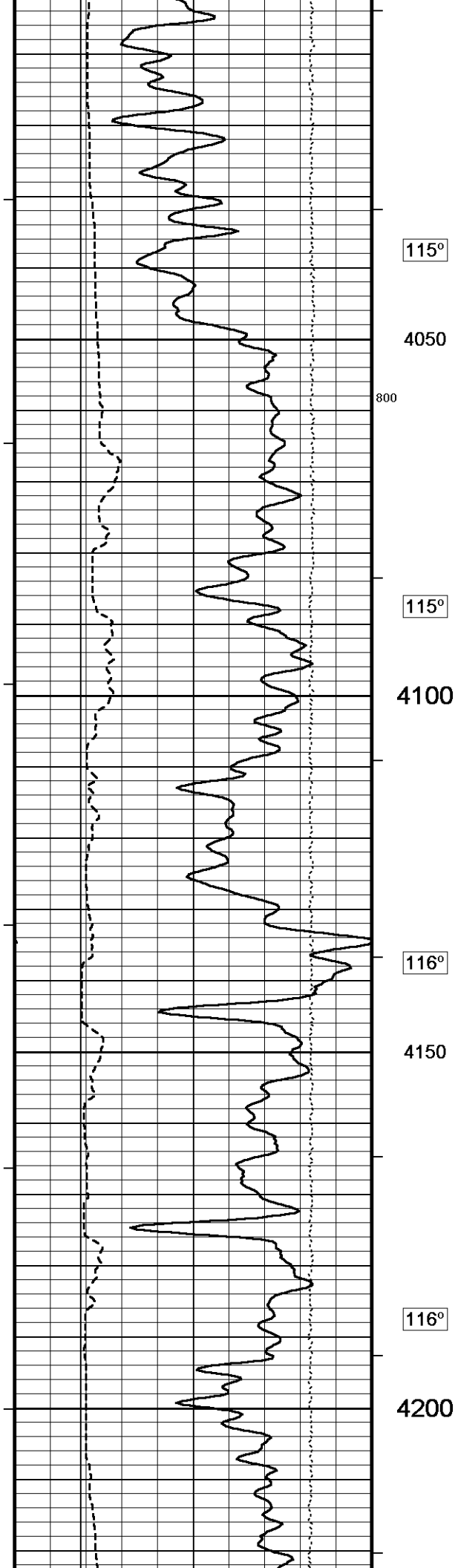
Plotted on 05-AUG-2013 15:02

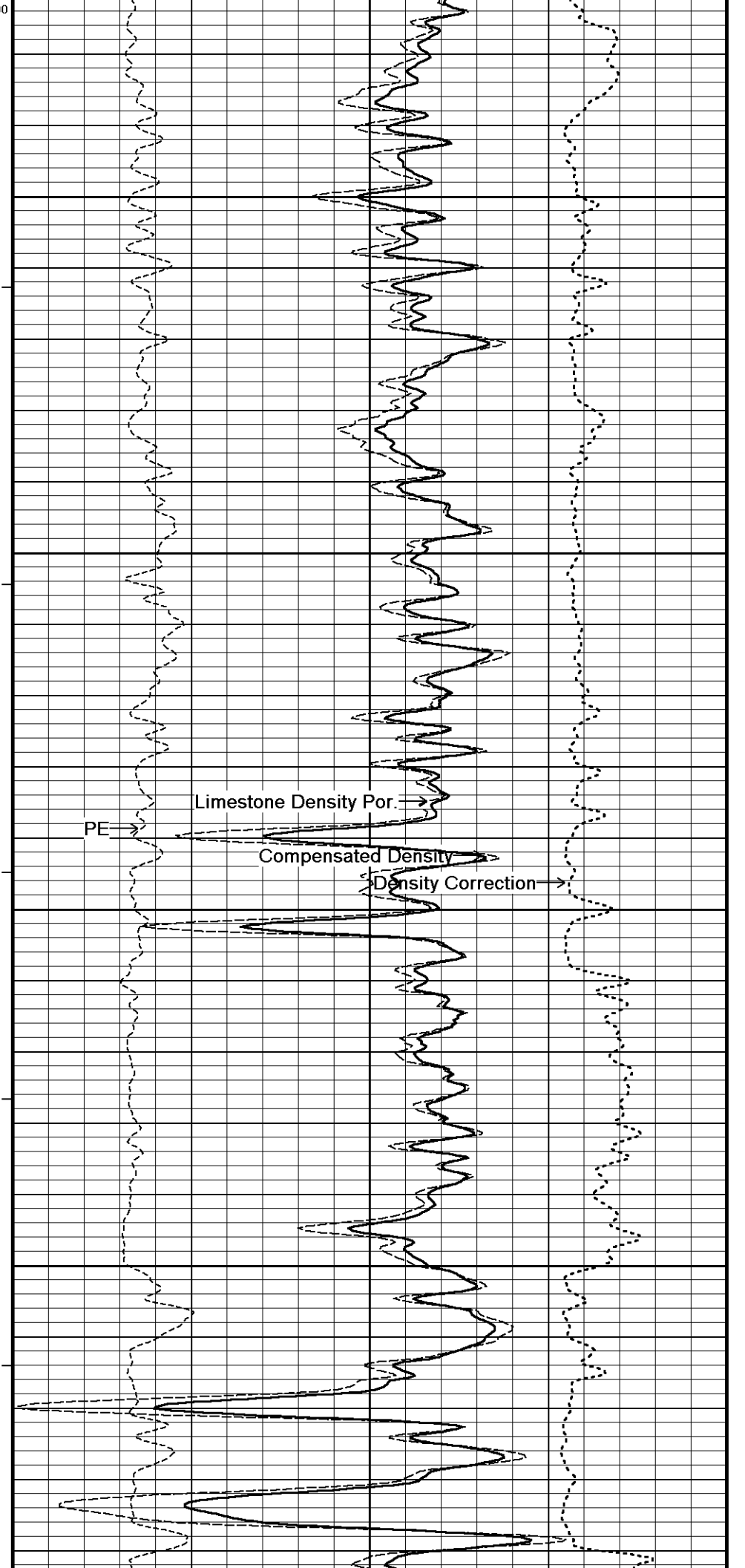
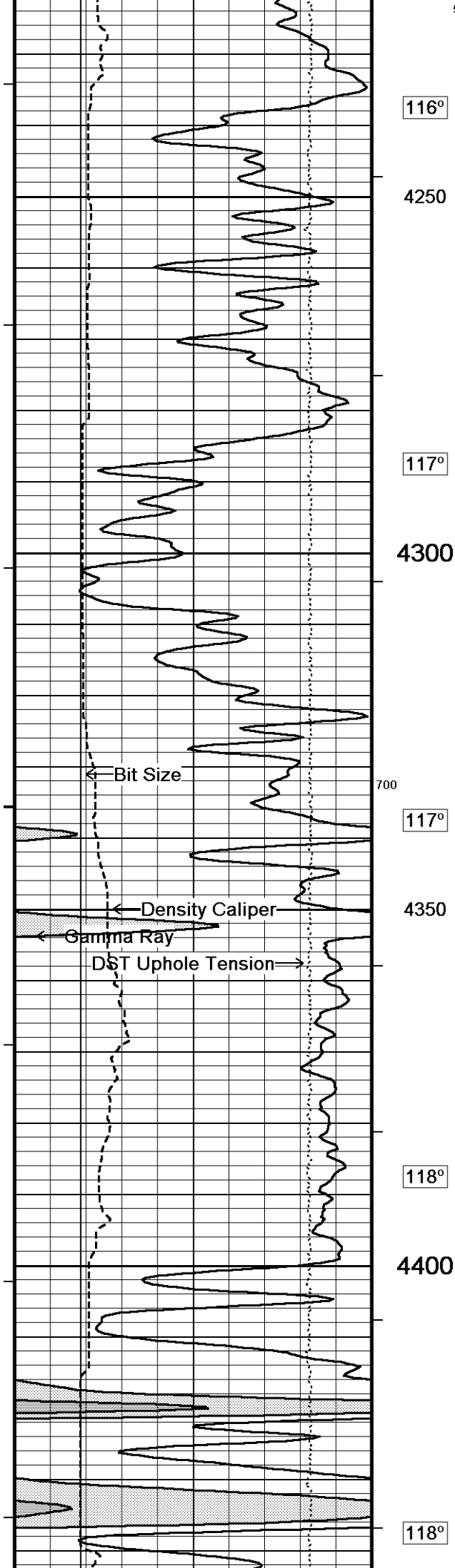
Filename: C:\Minimus 13.05.9583\Log\O'Brien Colton #1-33\O'Brien Colton #1-33_003.dta

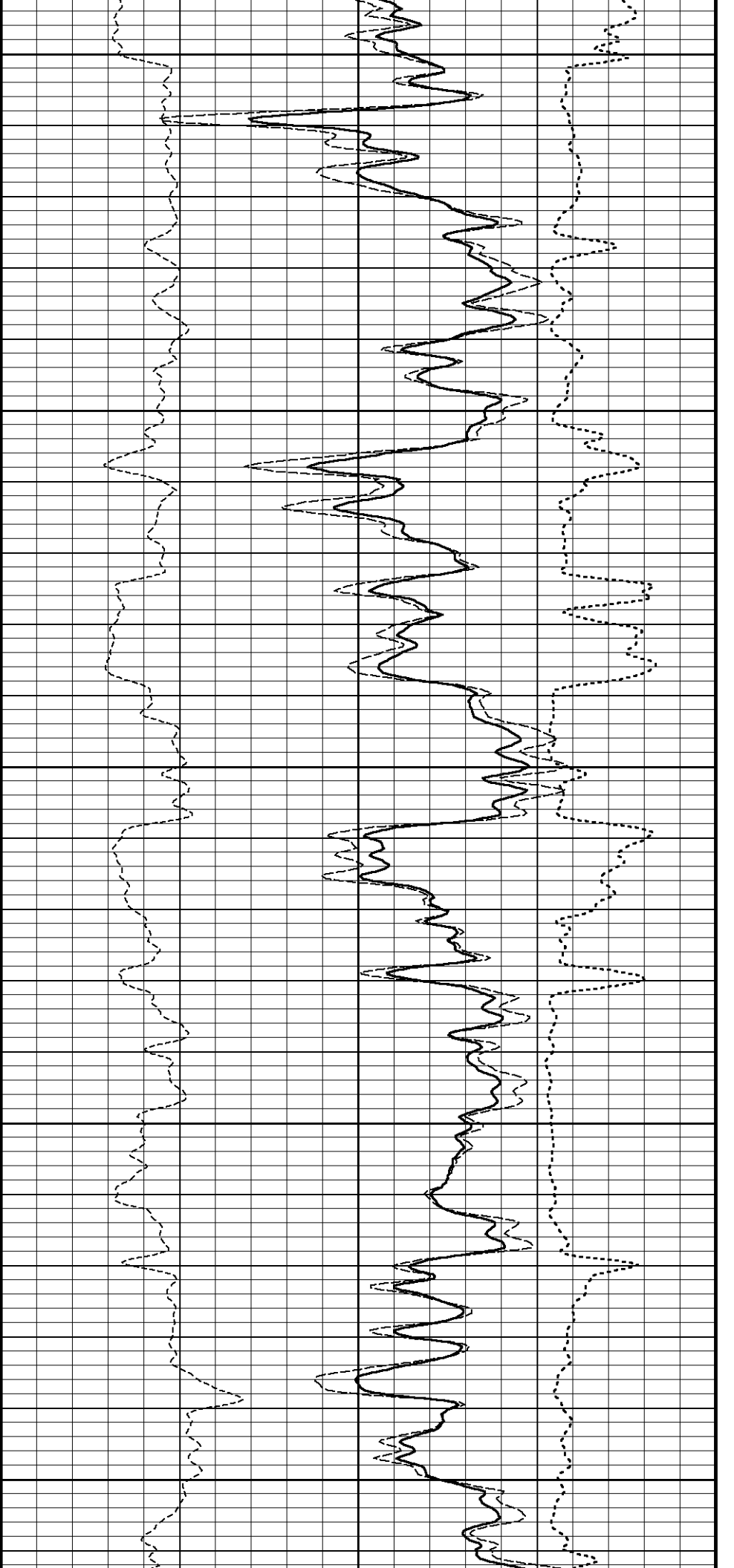
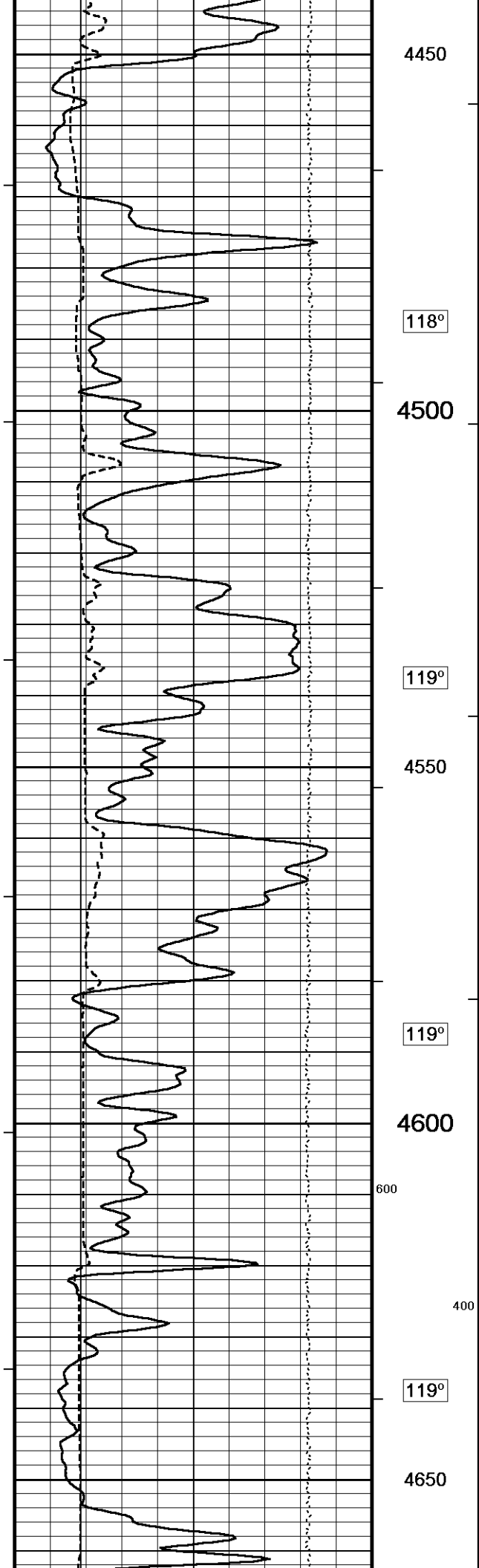
Recorded on 05-AUG-2013 12:22

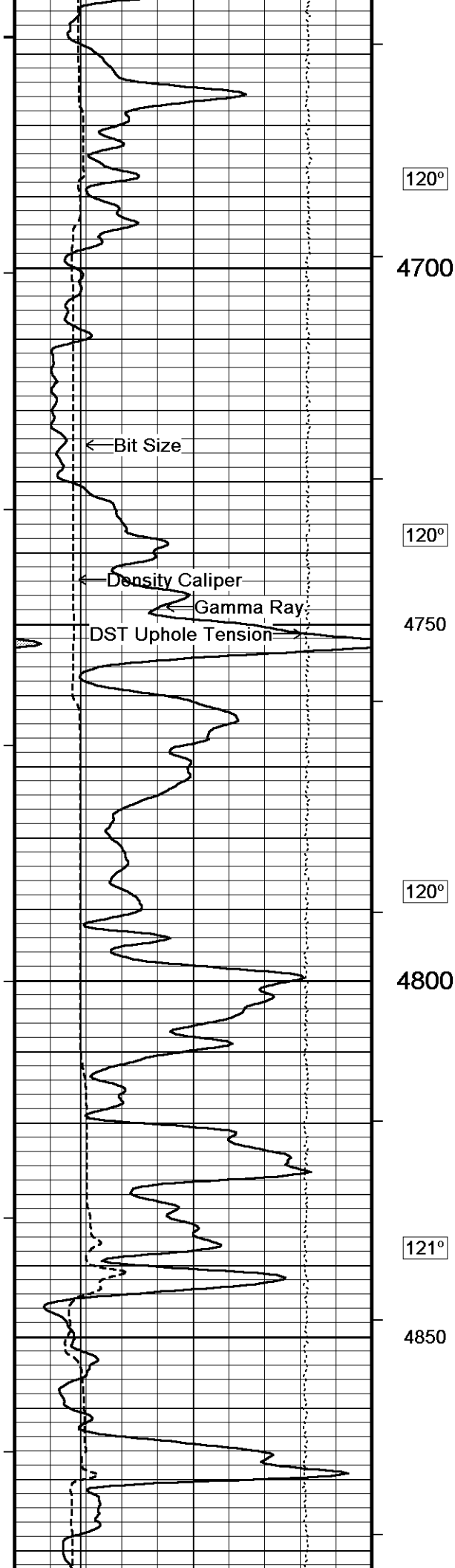
System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583











120°

4700

120°

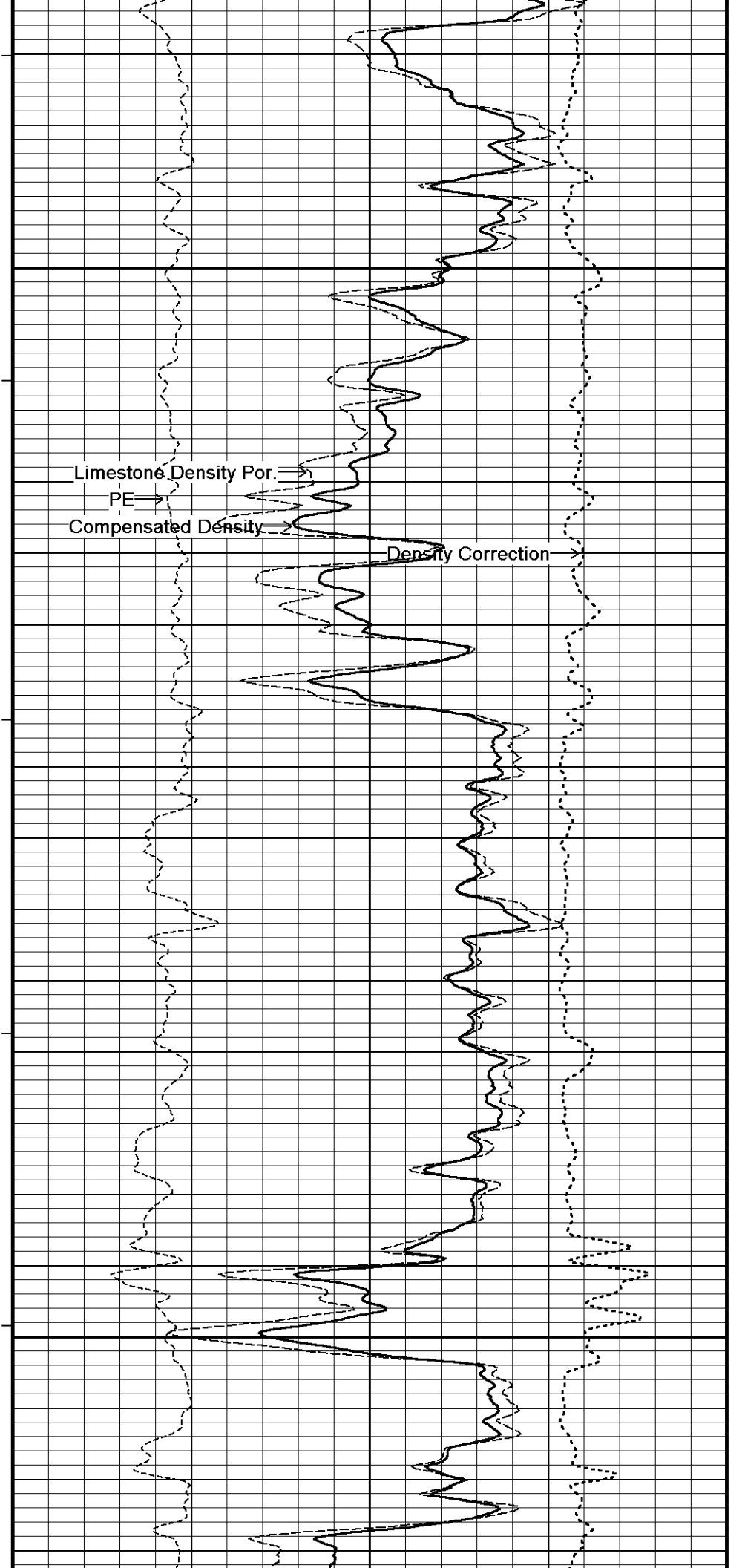
4750

120°

4800

121°

4850

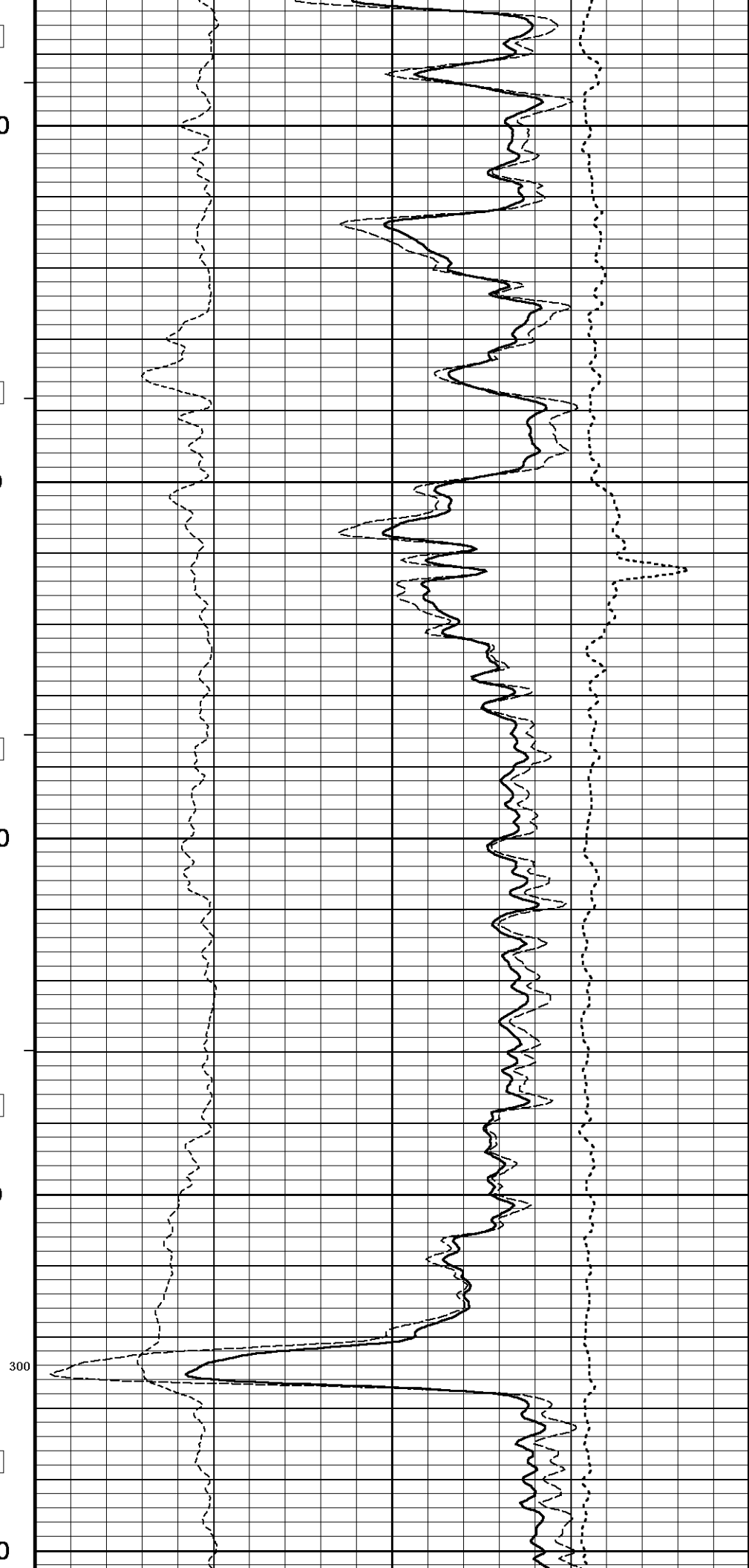
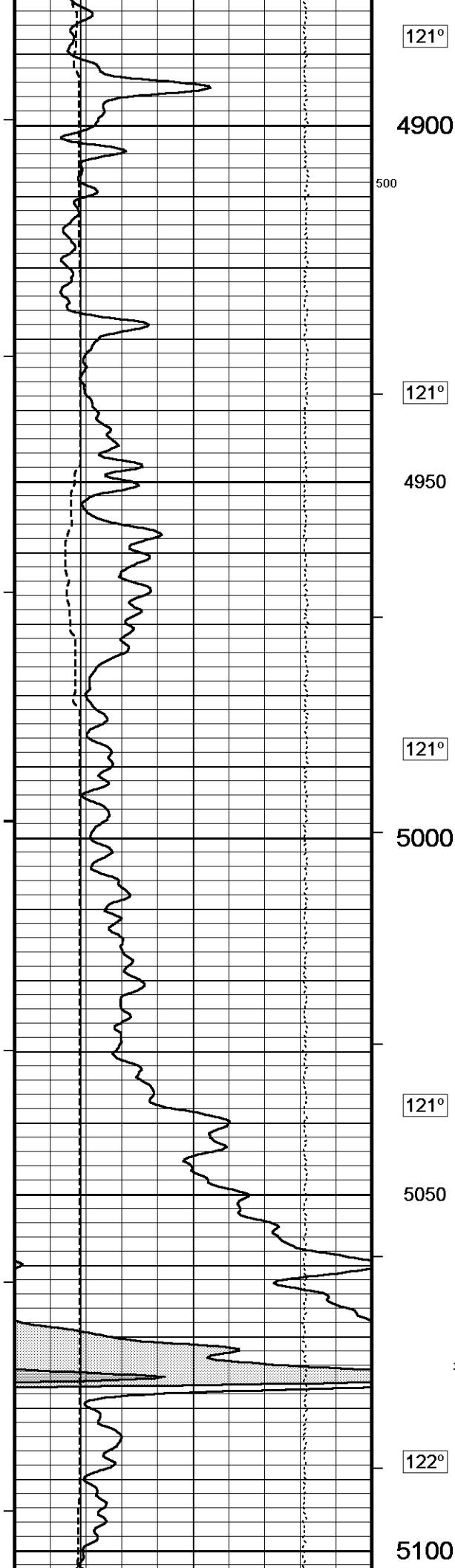


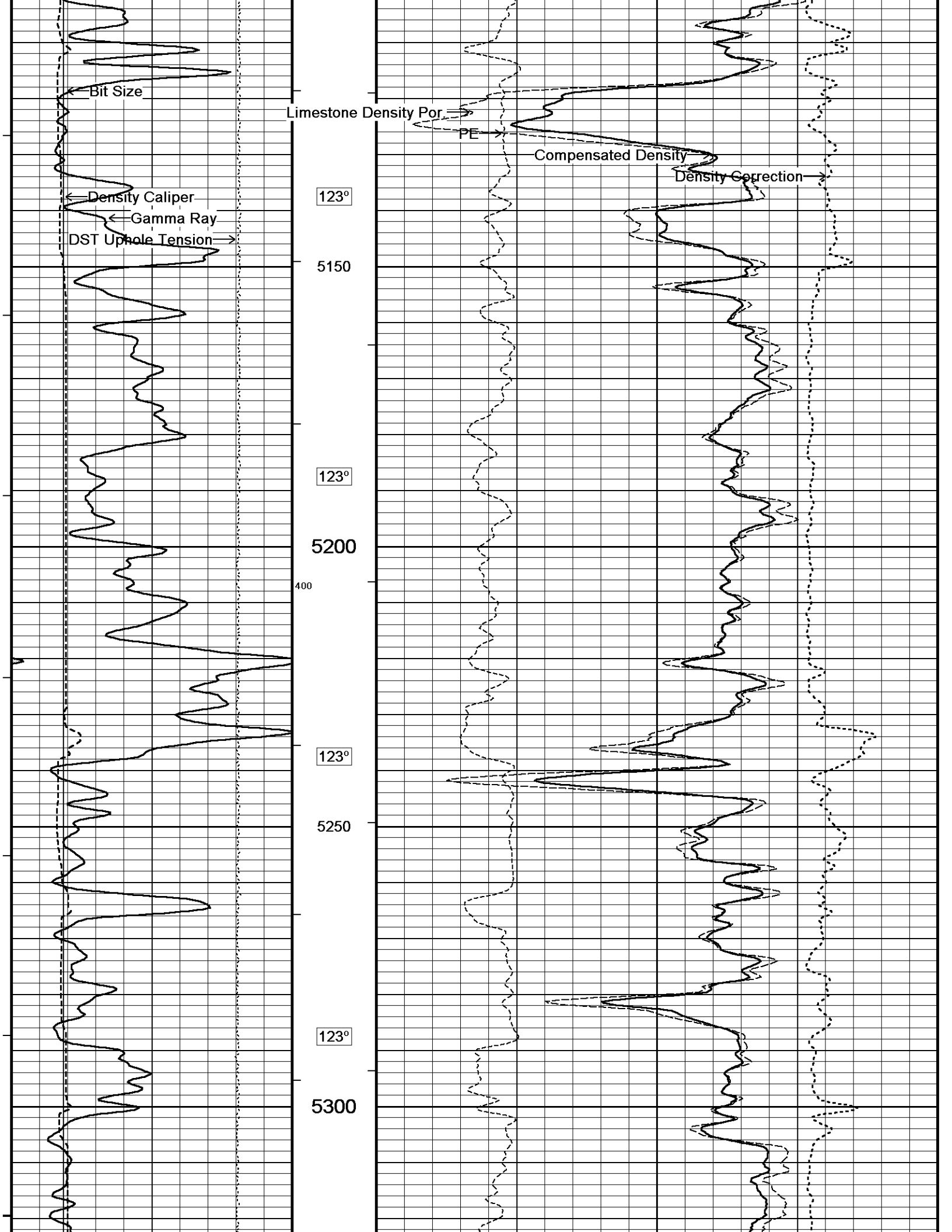
Limestone Density Por.

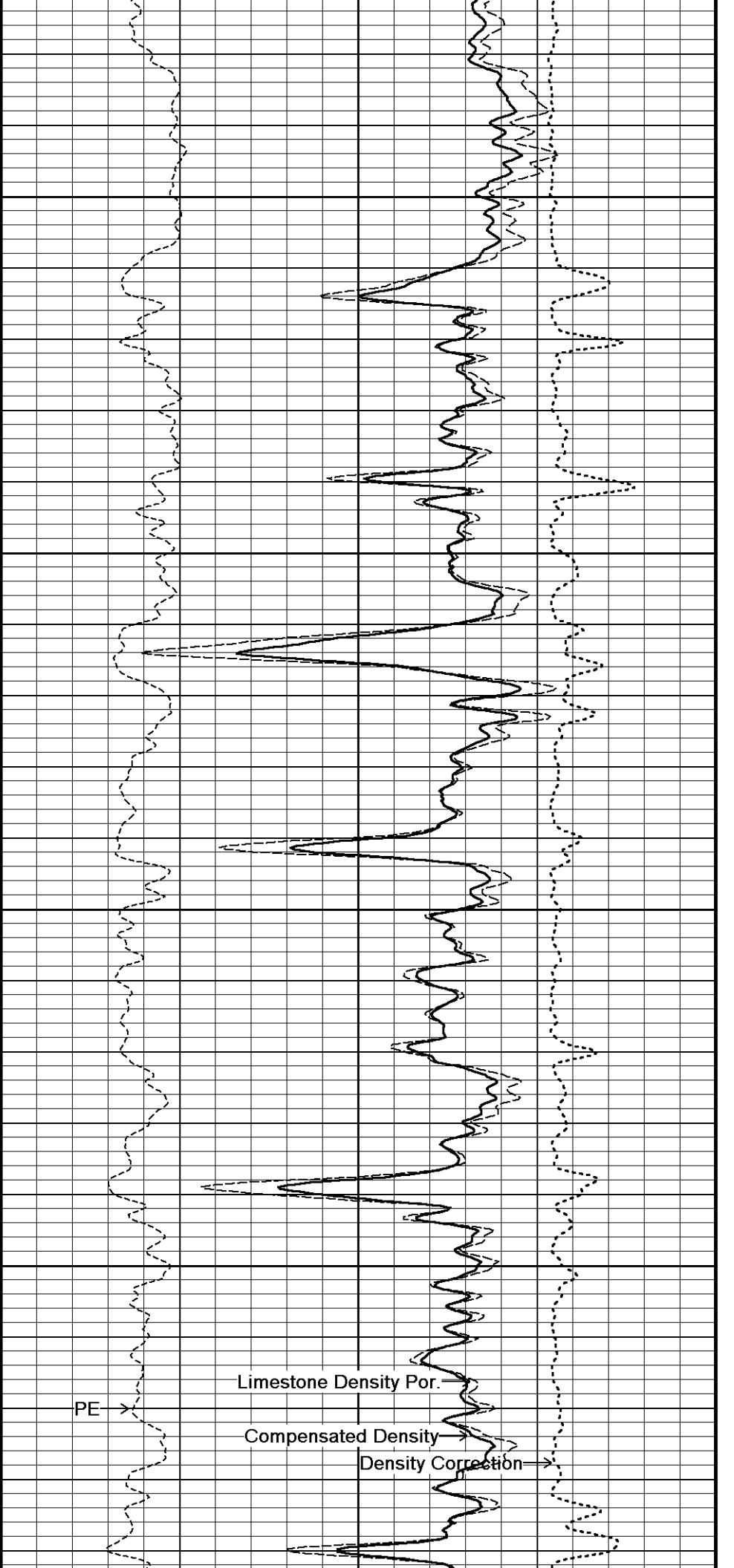
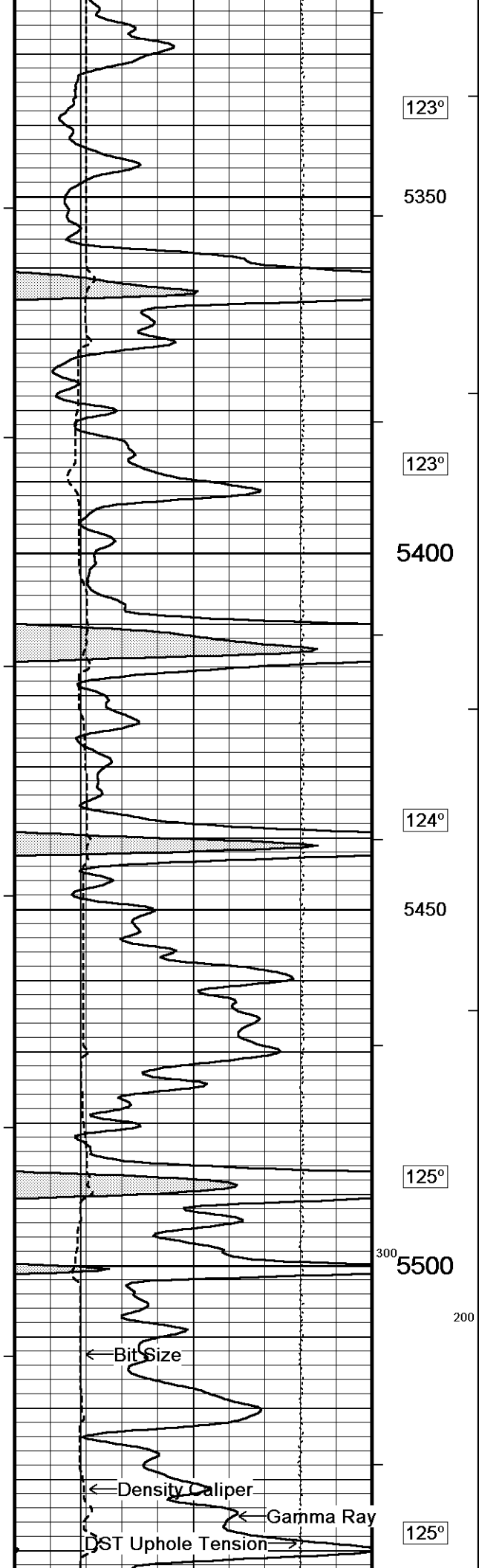
PE

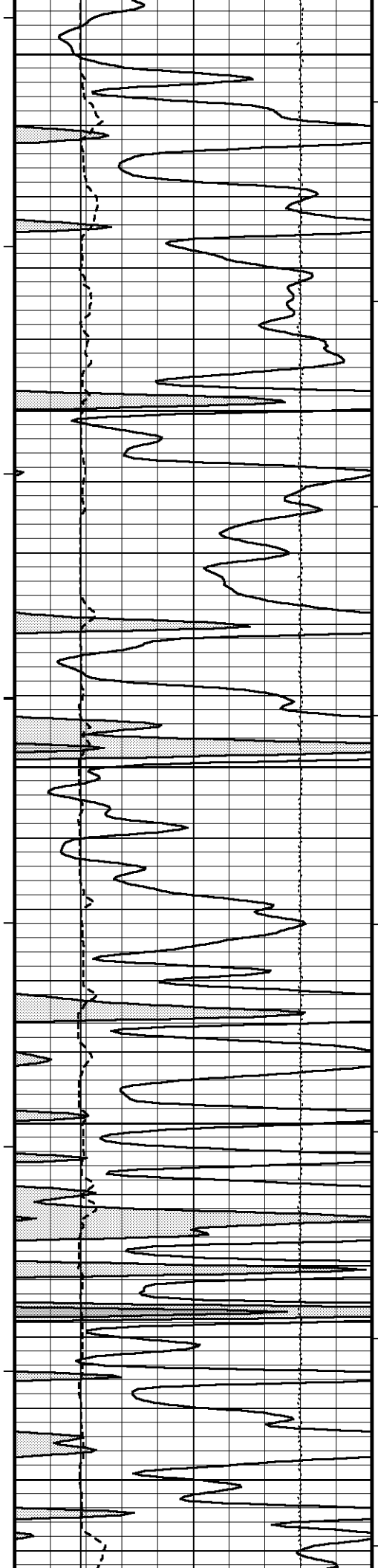
Compensated Density

Density Correction









5550

126°

5600

126°

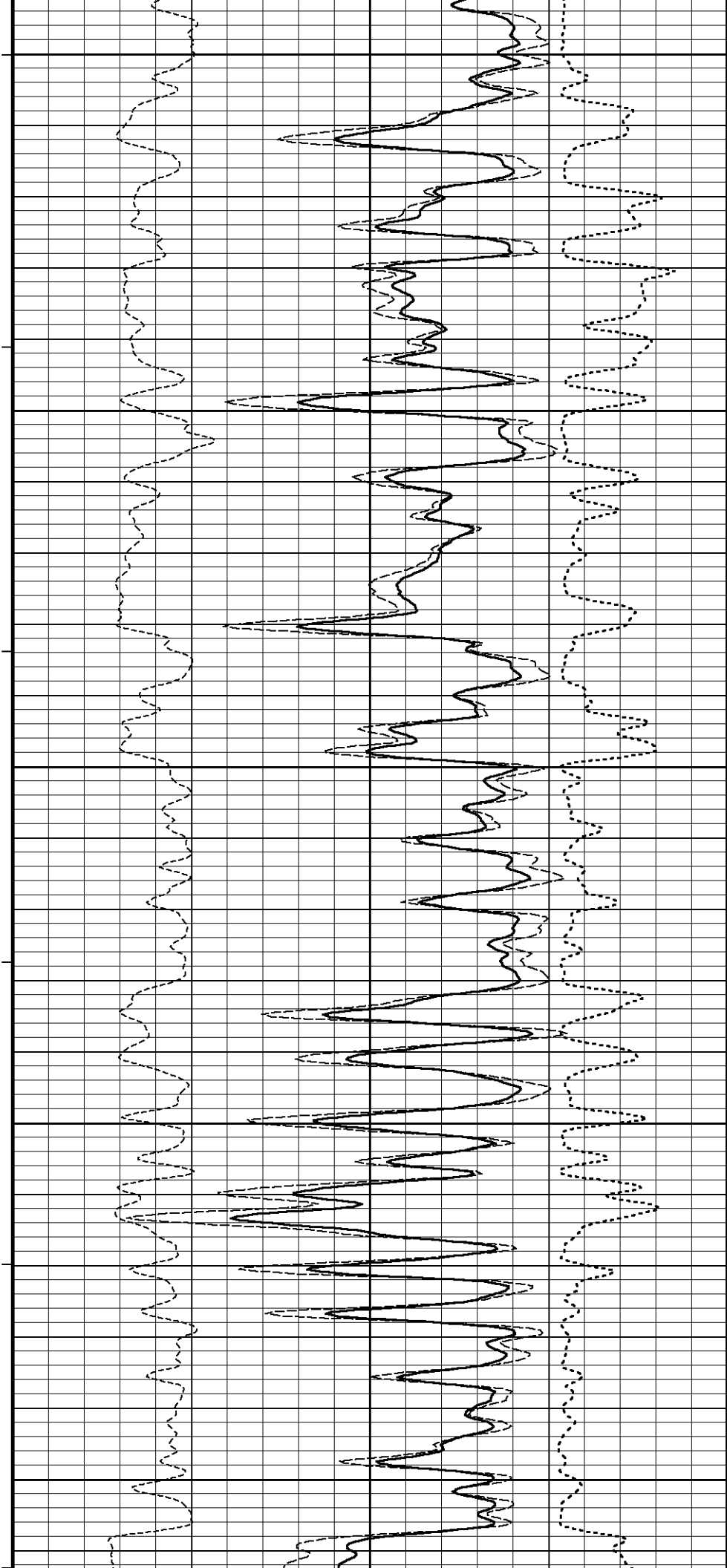
5650

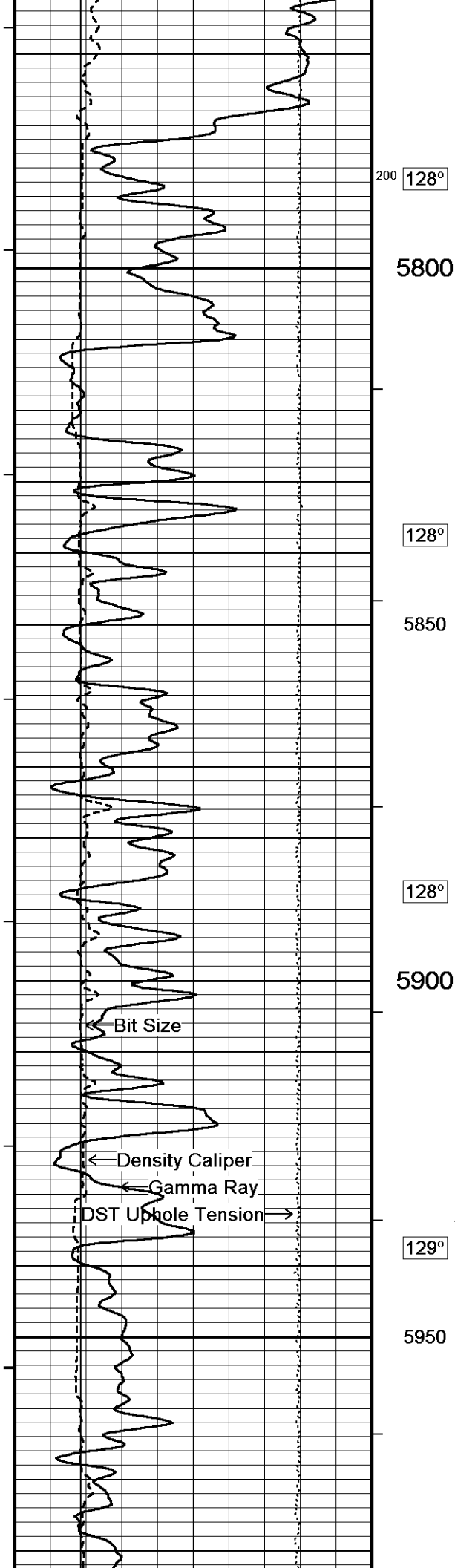
127°

5700

127°

5750





200 128°

5800

128°

5850

128°

5900

Bit Size

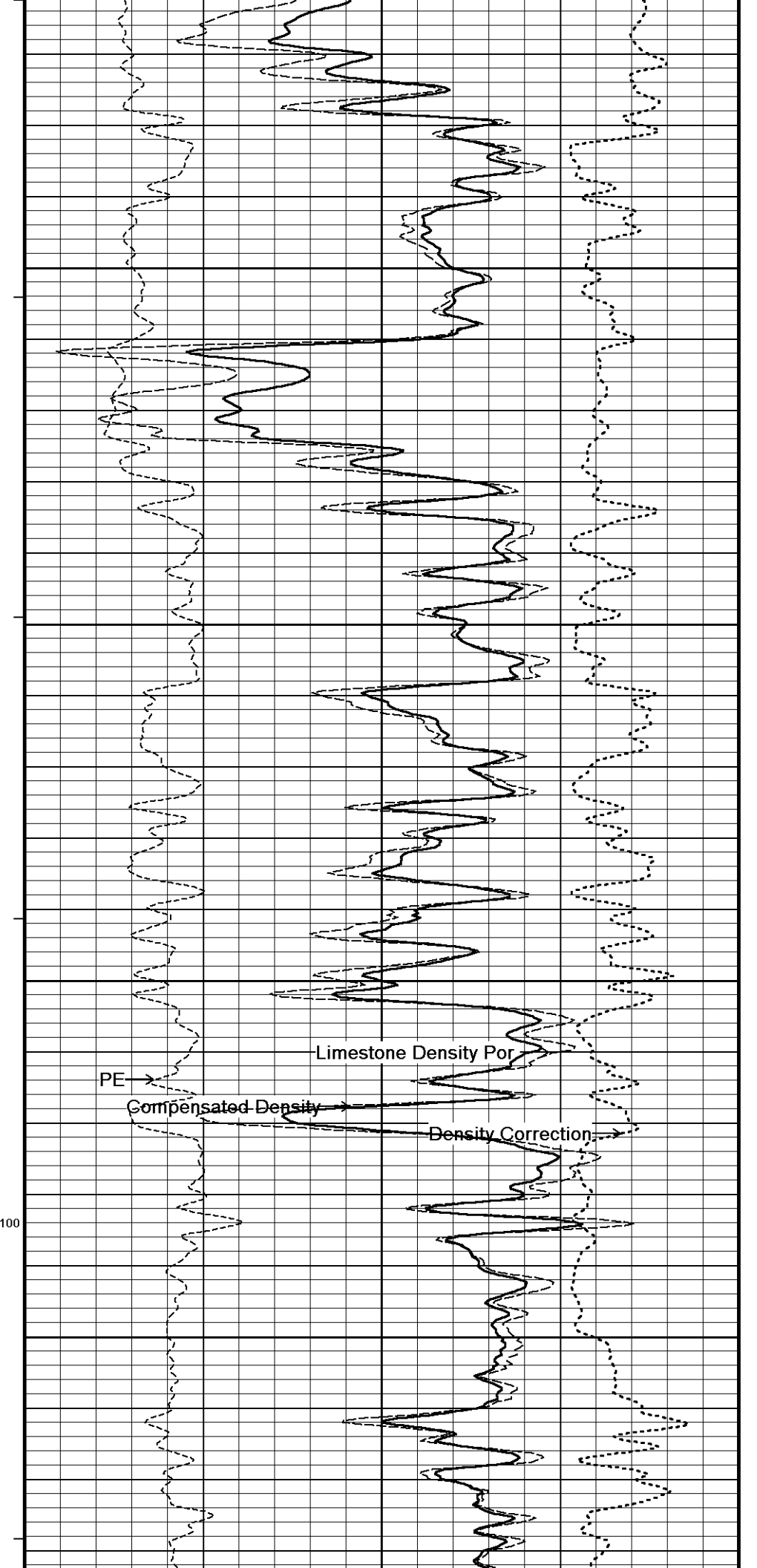
Density Caliper

Gamma Ray

DST Up-hole Tension

129°

5950



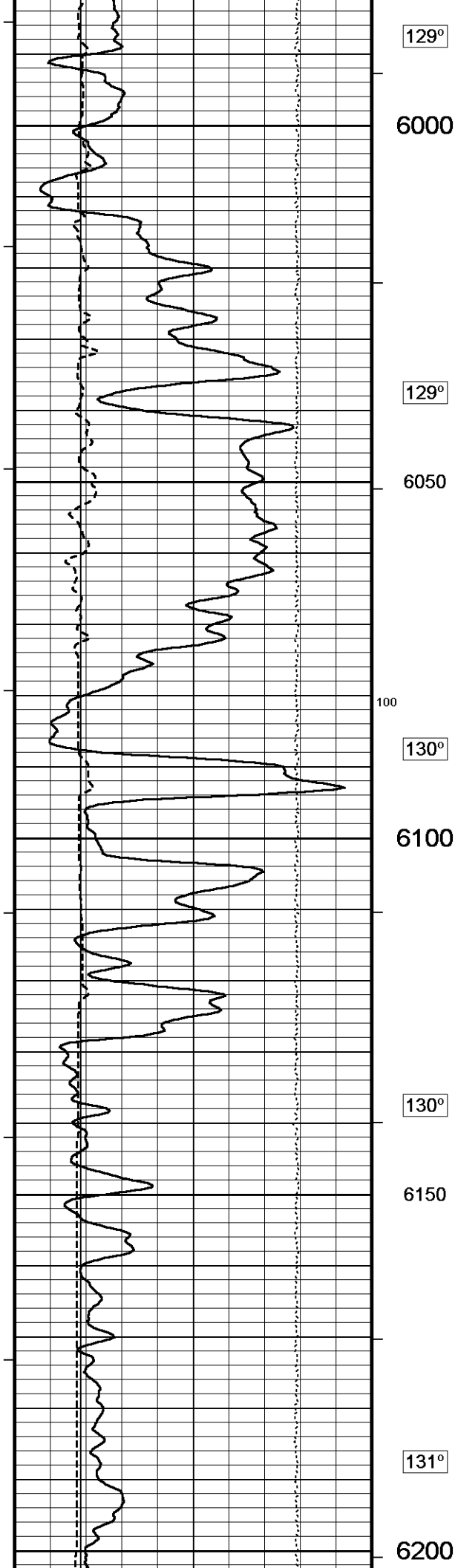
PE

Limestone Density Por

Compensated Density

Density Correction

100



129°

6000

129°

6050

100

130°

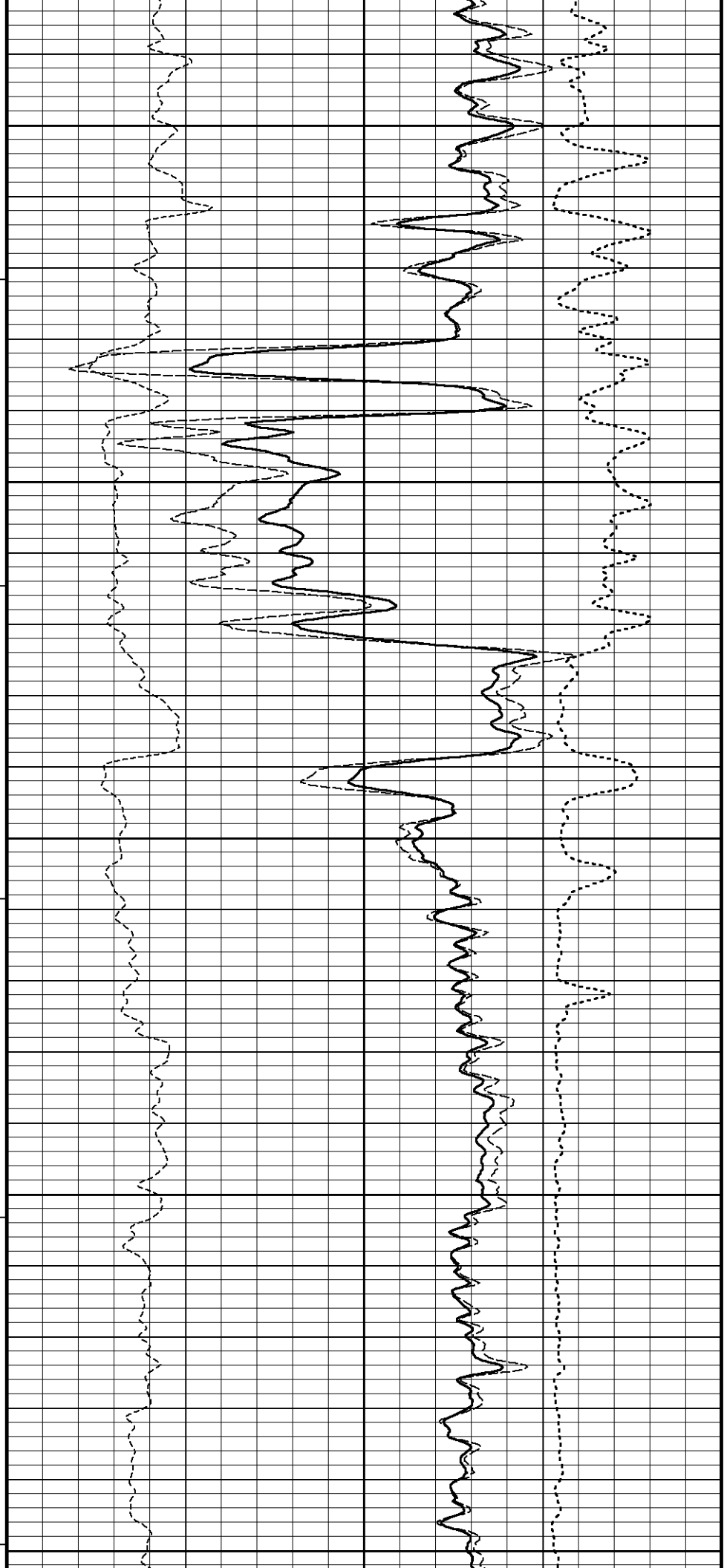
6100

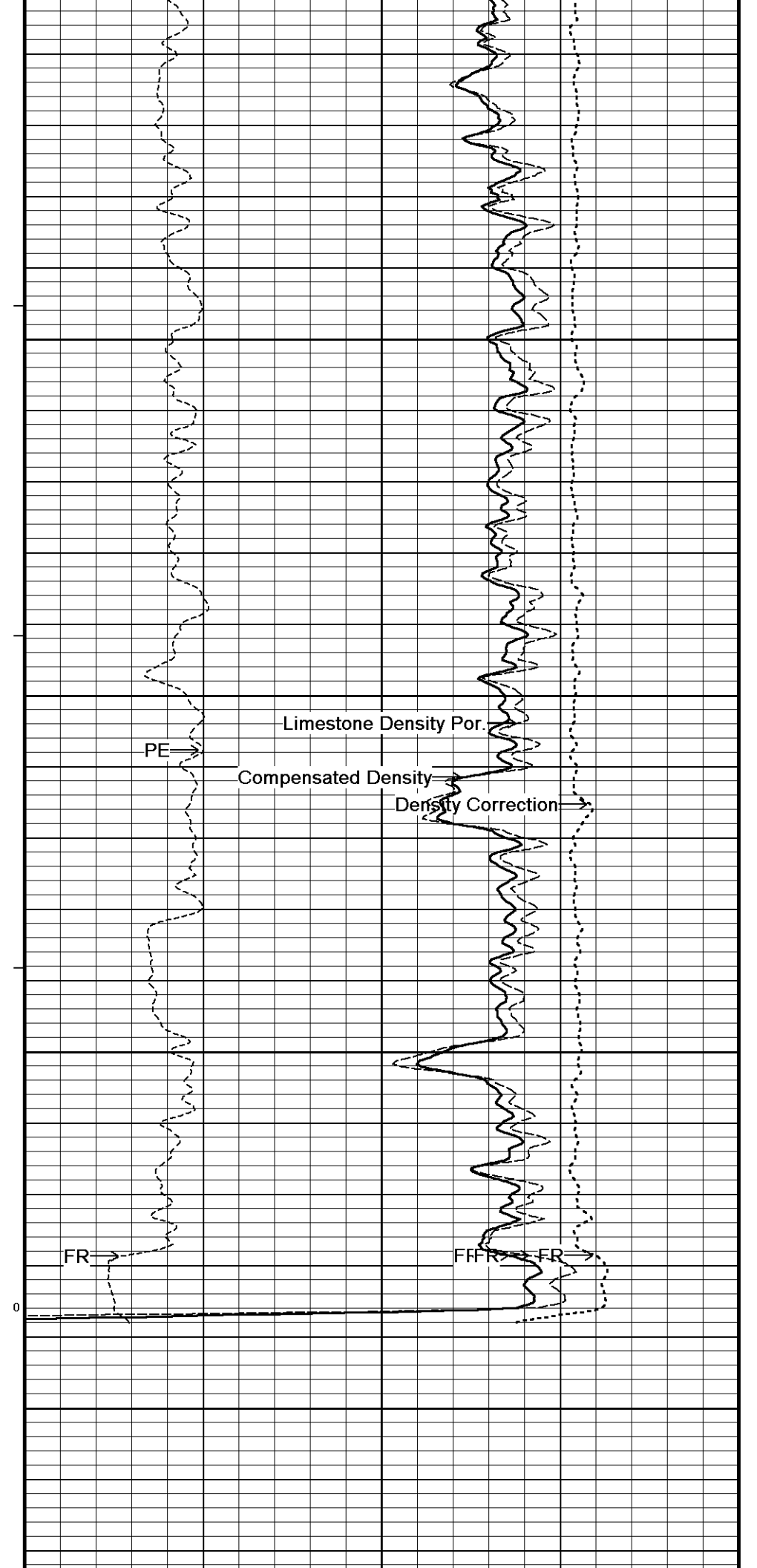
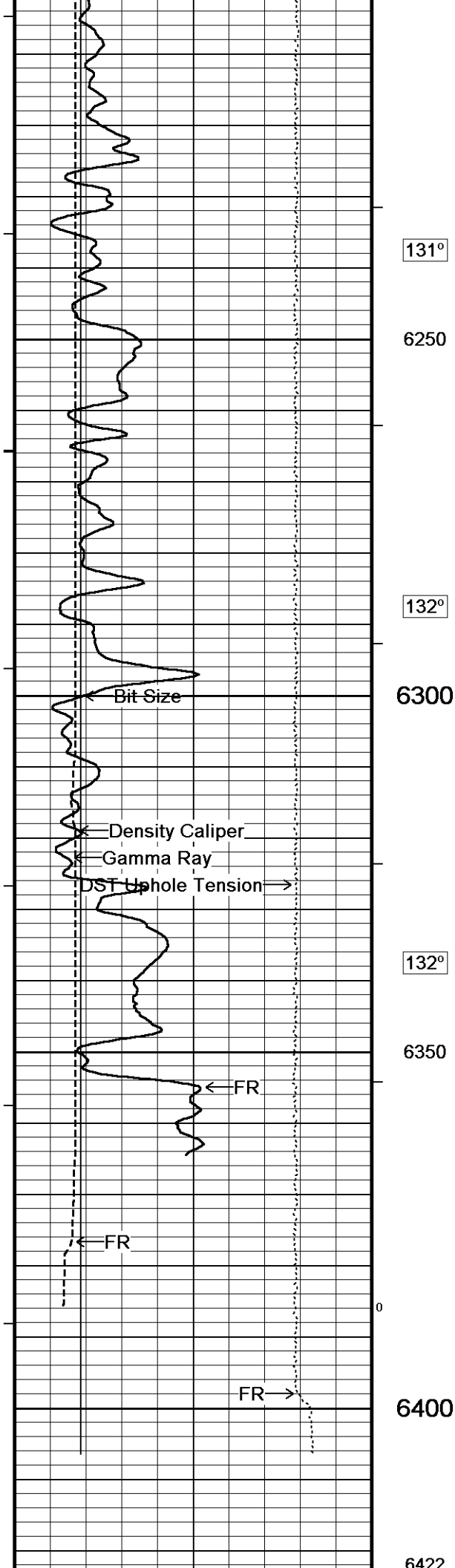
130°

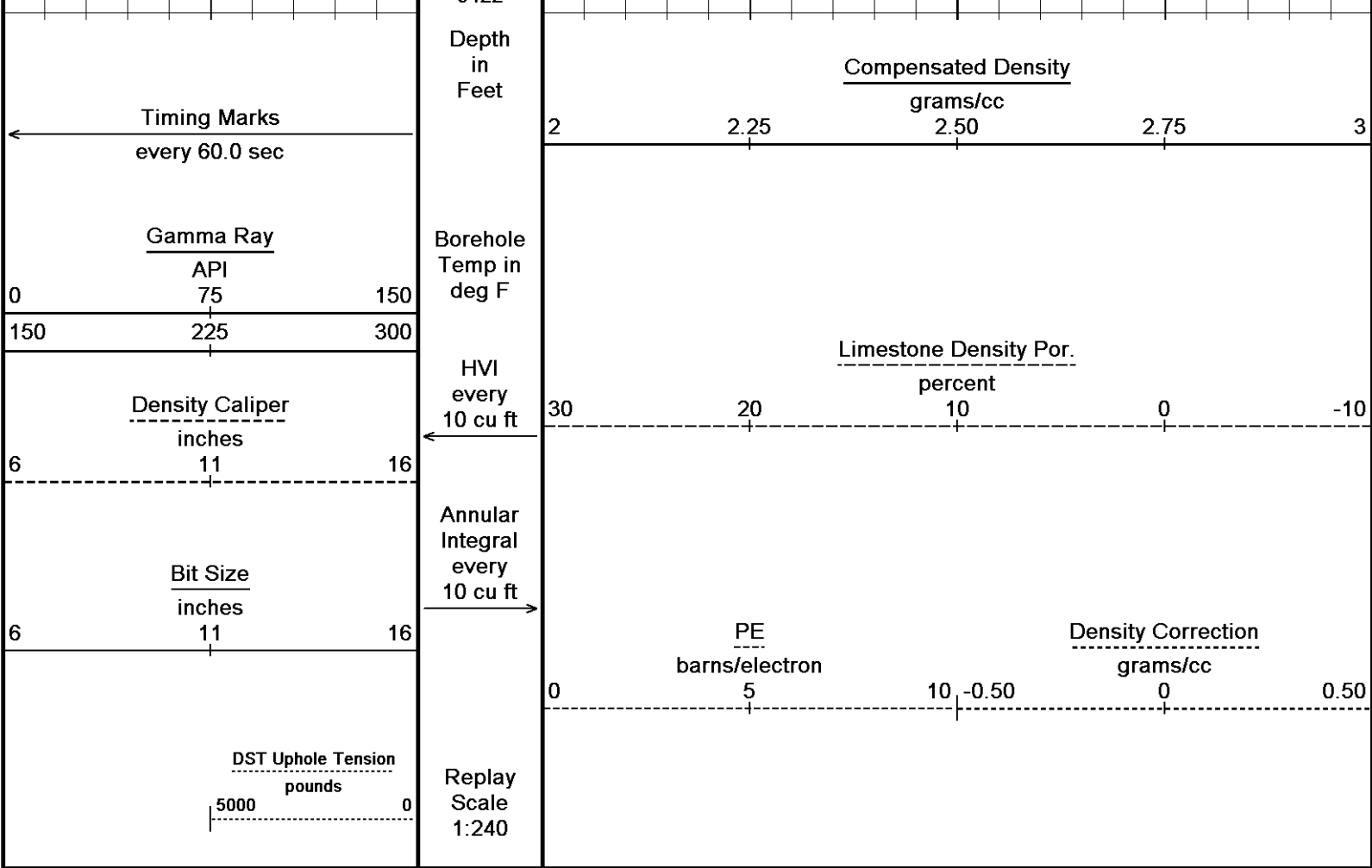
6150

131°

6200



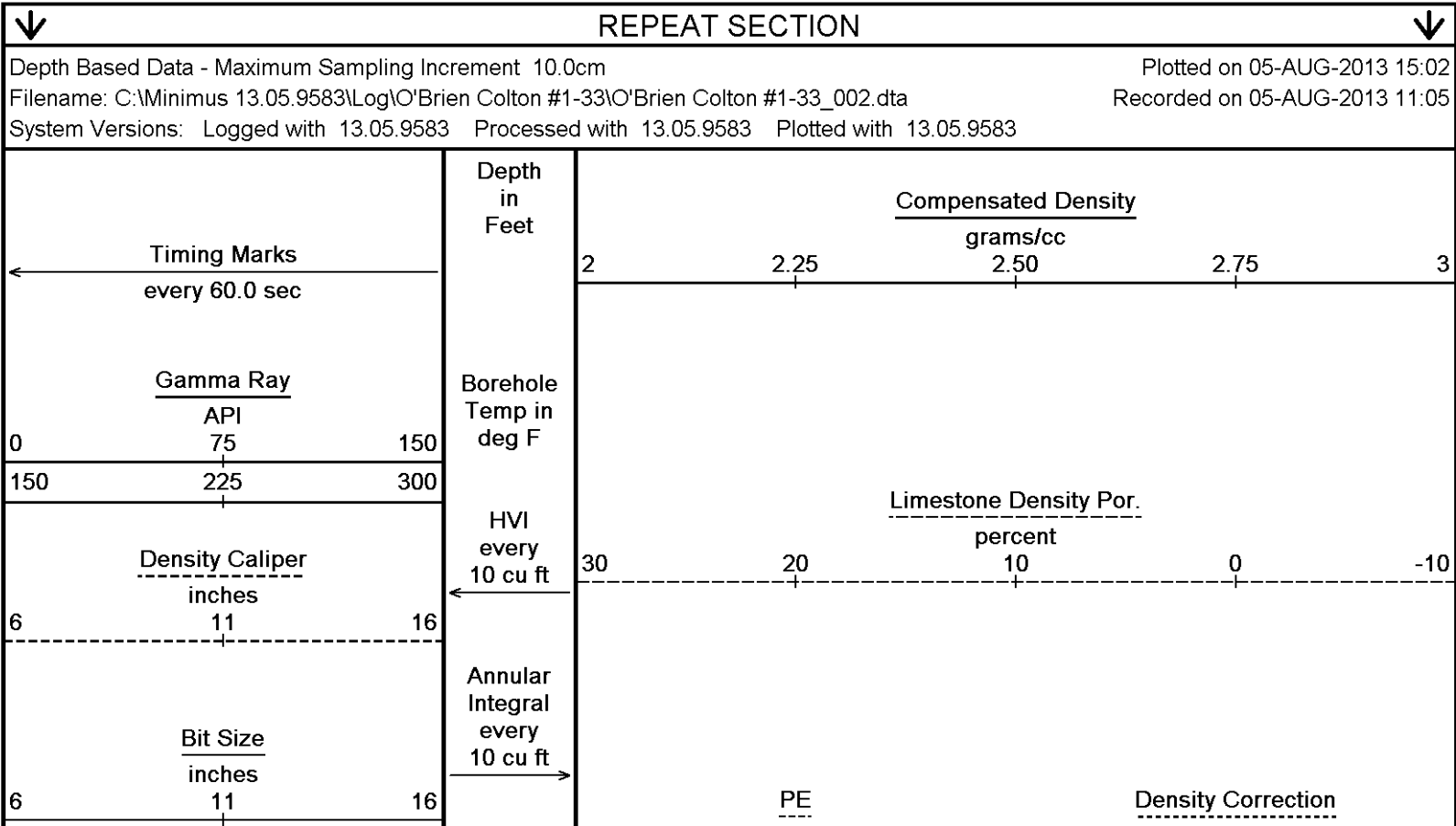




Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 13.05.9583\Log\O'Brien Colton #1-33\O'Brien Colton #1-33_003.dta
System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583

Plotted on 05-AUG-2013 15:02
Recorded on 05-AUG-2013 12:22

↑ 5 INCH MAIN ↑



DST Uphole Tension
pounds
5000 0

Replay
Scale
1:240

5700

126°

5750

127°

200

5800

126°

5850

127°

barns/electron

grams/cc

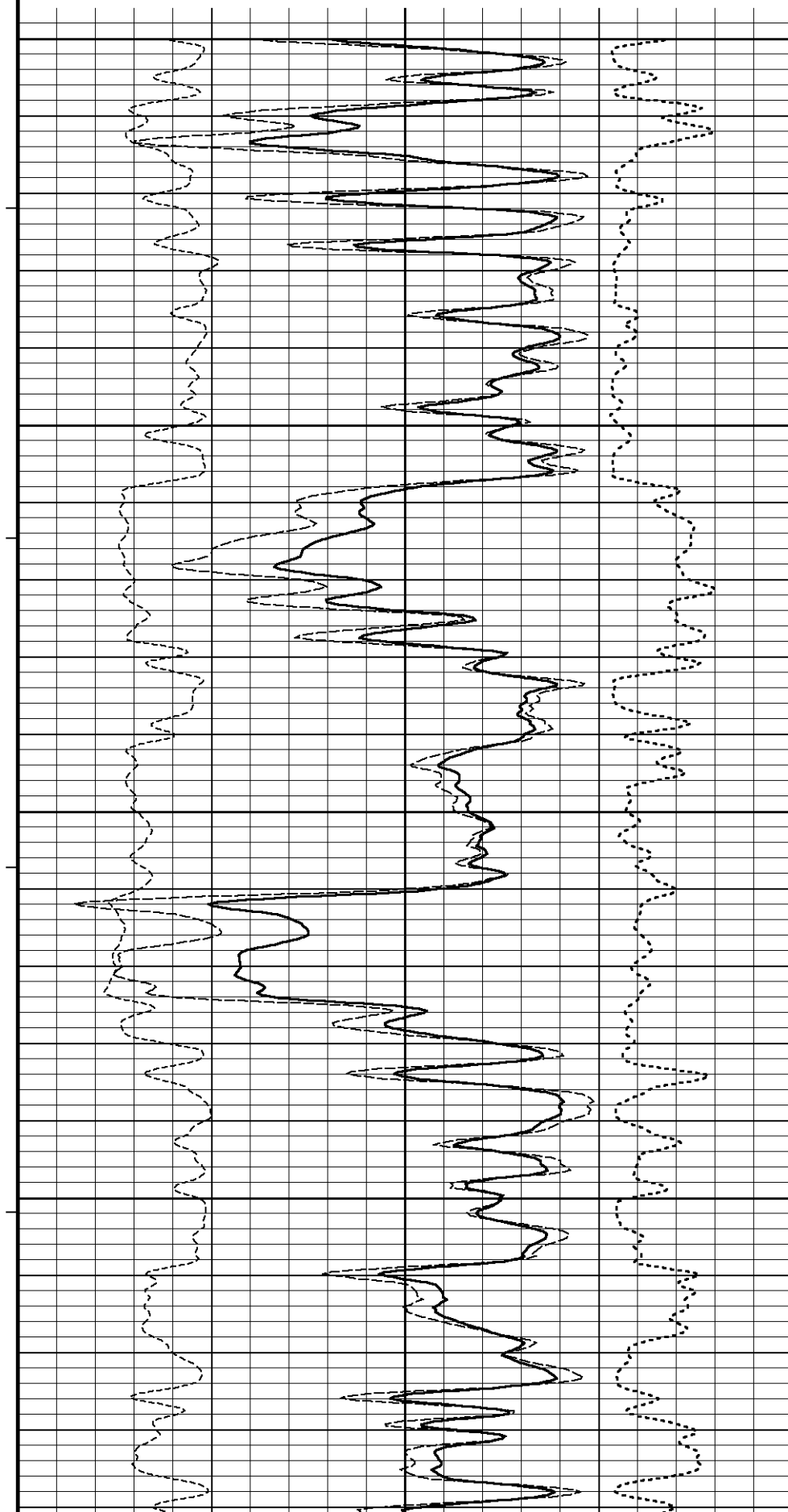
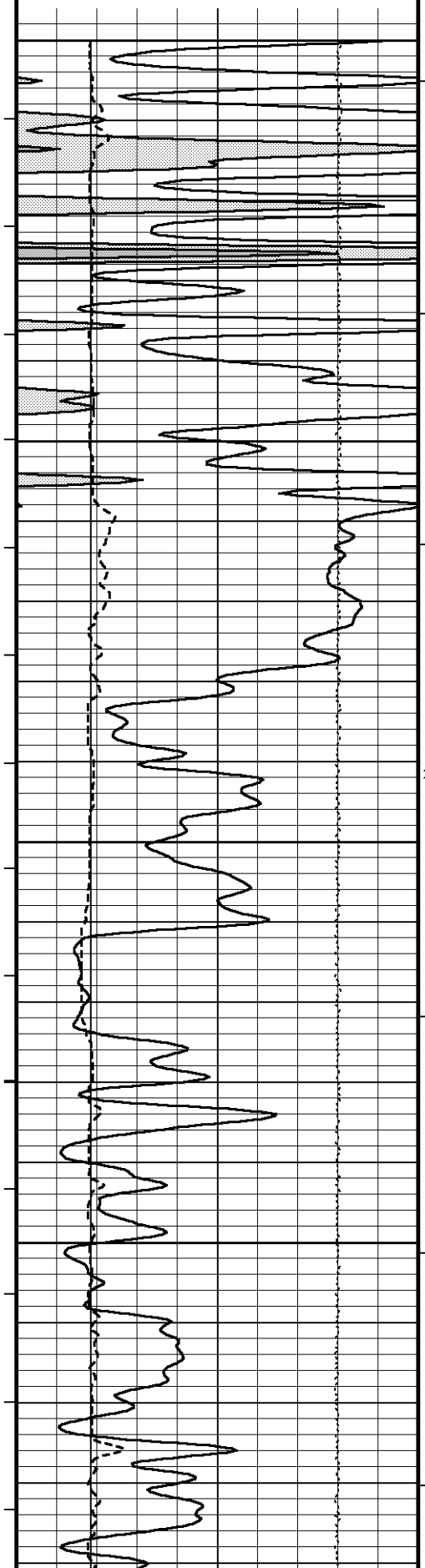
0

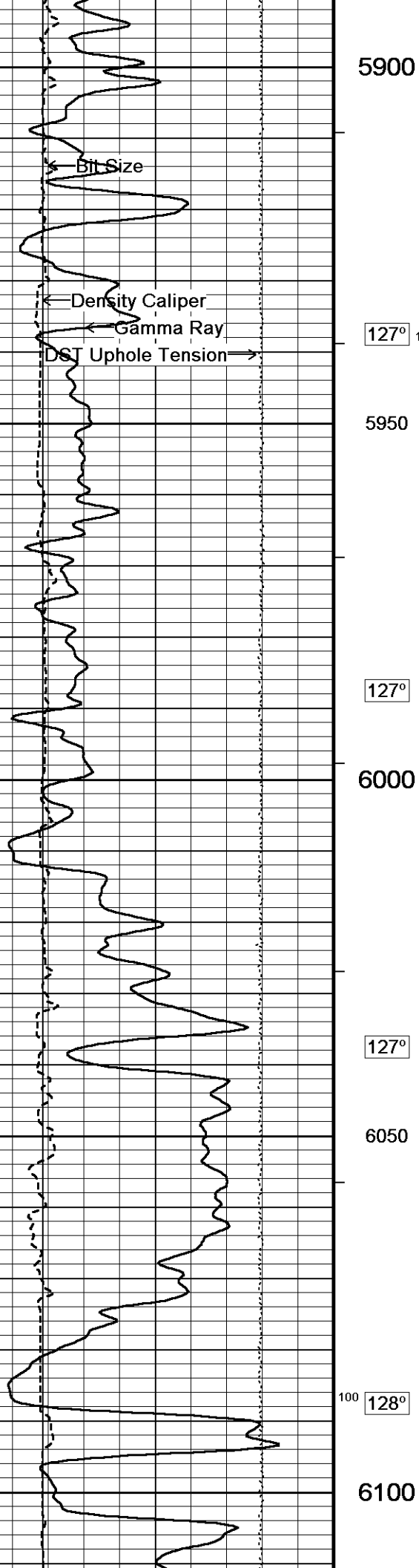
5

10 -0.50

0

0.50





5900

127° 100

5950

127°

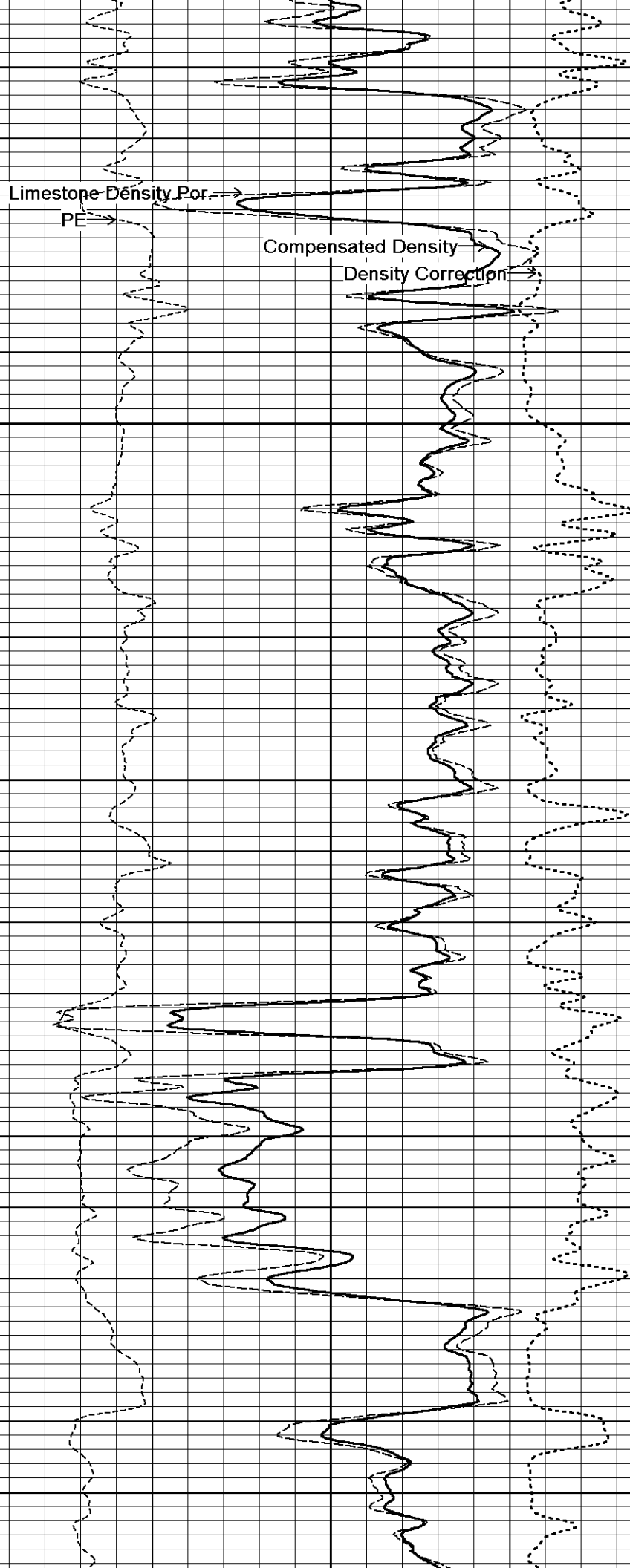
6000

127°

6050

100 128°

6100

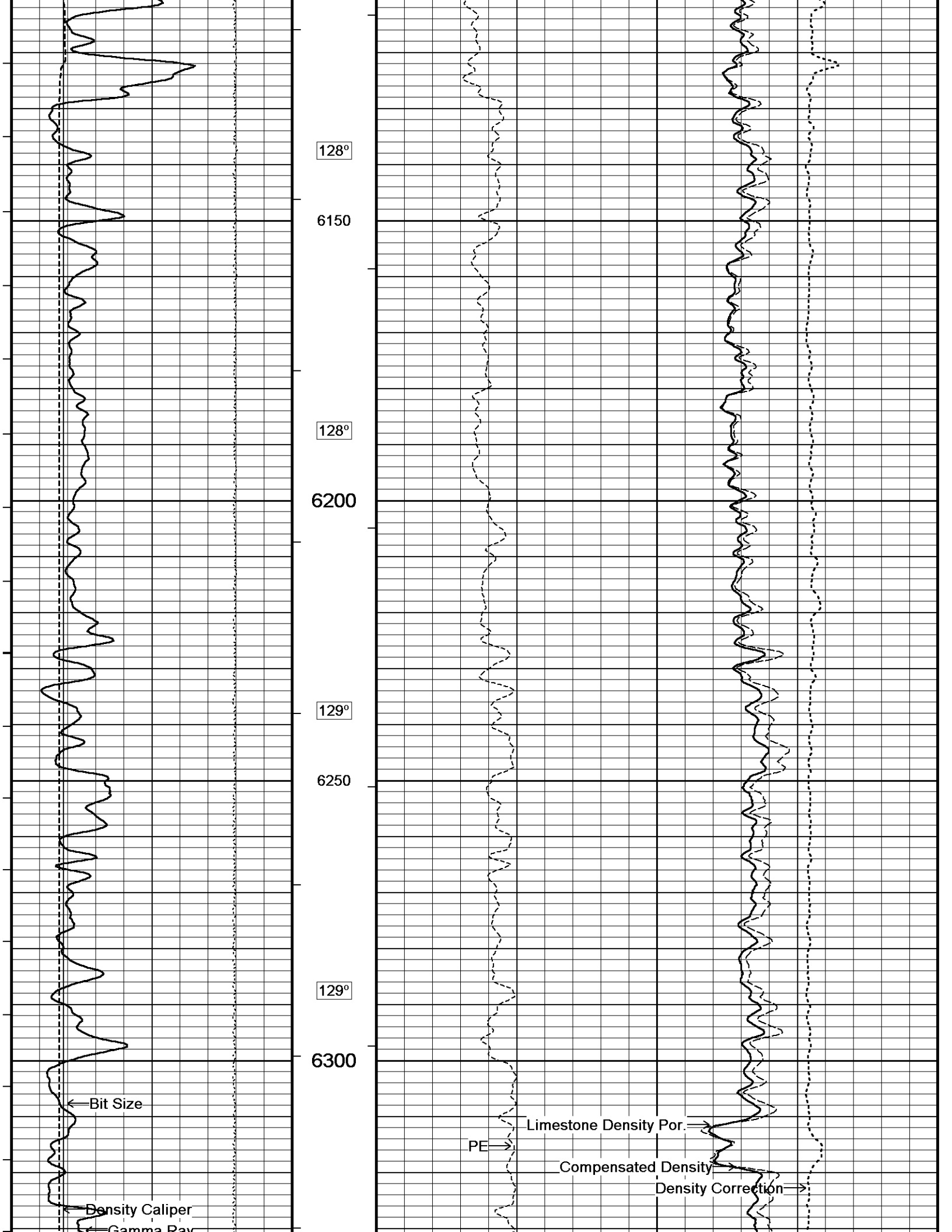


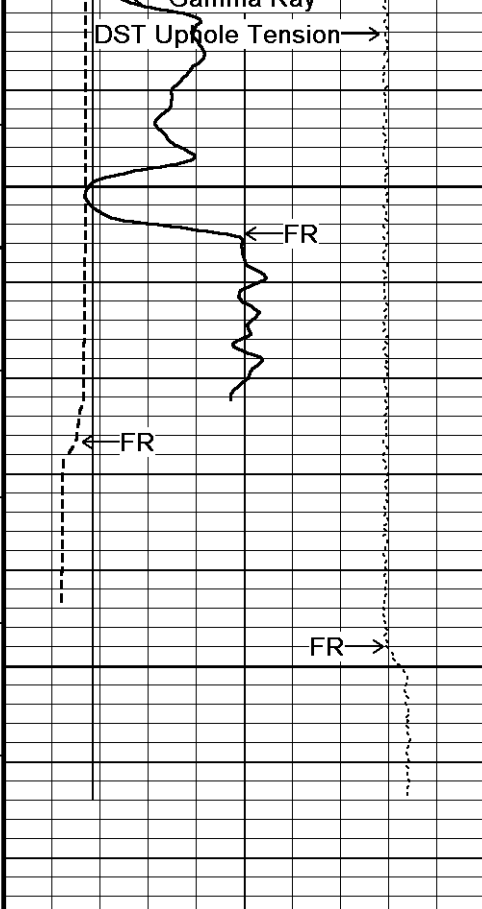
Limestone Density Por

PE

Compensated Density

Density Correction





130°

6350

6400

6424

Depth
in
Feet

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150
150 225 300

Density Caliper
inches
6 11 16

Bit Size
inches
6 11 16

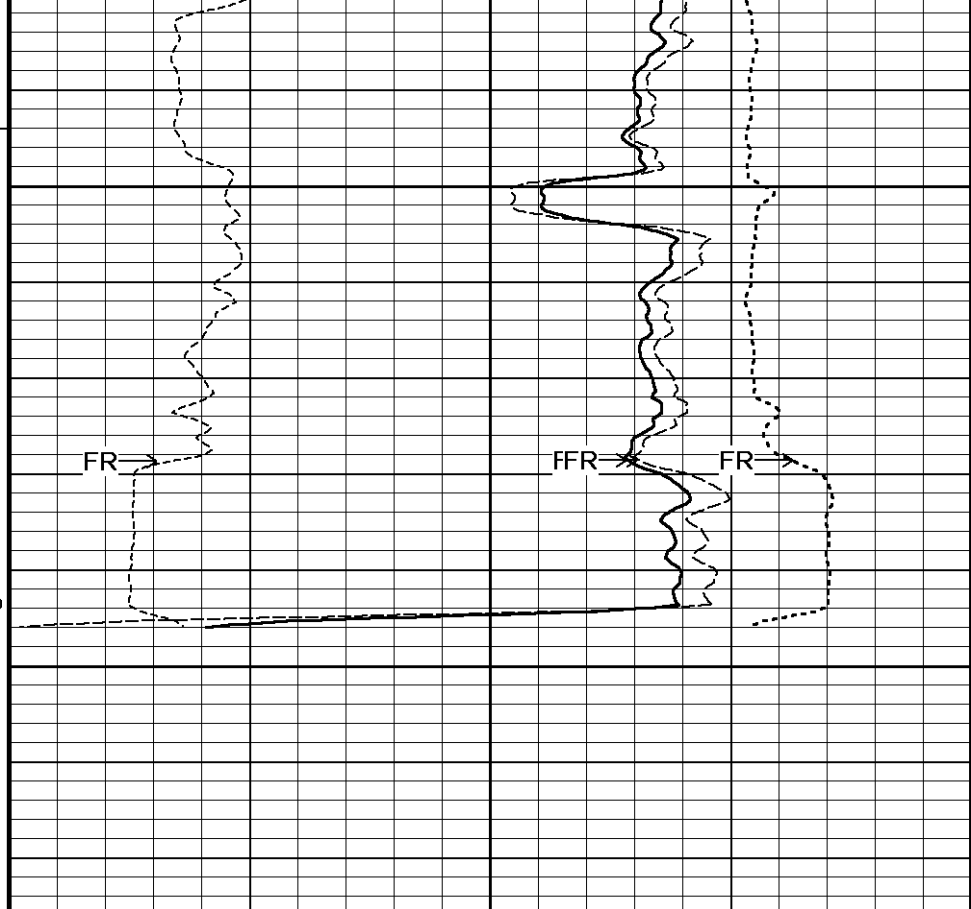
DST Uphole Tension
pounds
5000 0

Borehole
Temp in
deg F

HVI
every
10 cu ft

Annular
Integral
every
10 cu ft

Replay
Scale
1:240



2 2.25 2.50 2.75 3

30 20 10 0 -10

0 5 10 -0.50 0 0.50

Depth Based Data - Maximum Sampling Increment 10.0cm
 Filename: C:\Minimus 13.05.9583\Log\O'Brien Colton #1-33\O'Brien Colton #1-33_002.dta
 System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583
 Plotted on 05-AUG-2013 15:02
 Recorded on 05-AUG-2013 11:05

↑ REPEAT SECTION ↑

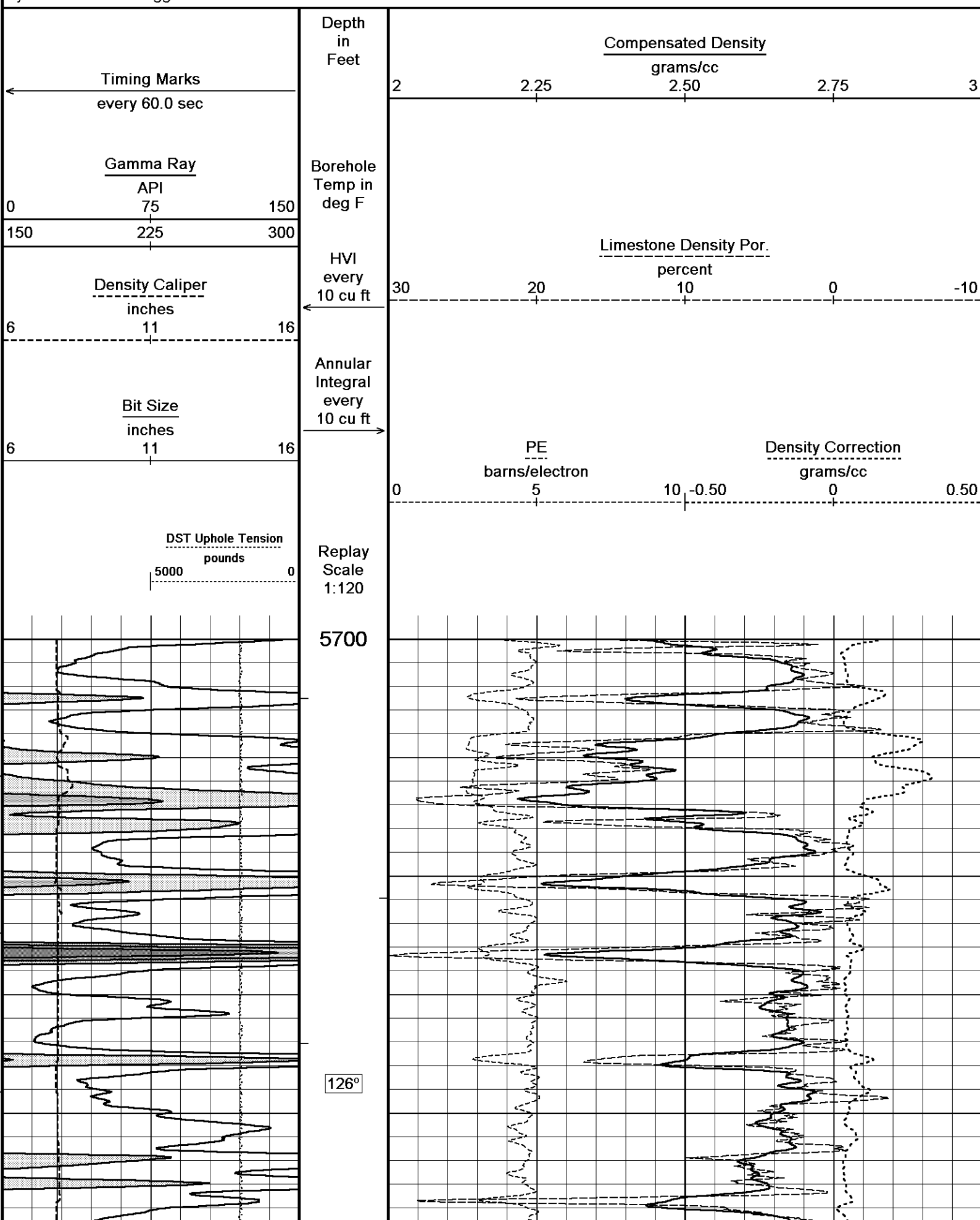
Depth Based Data - Maximum Sampling Increment 2.5cm

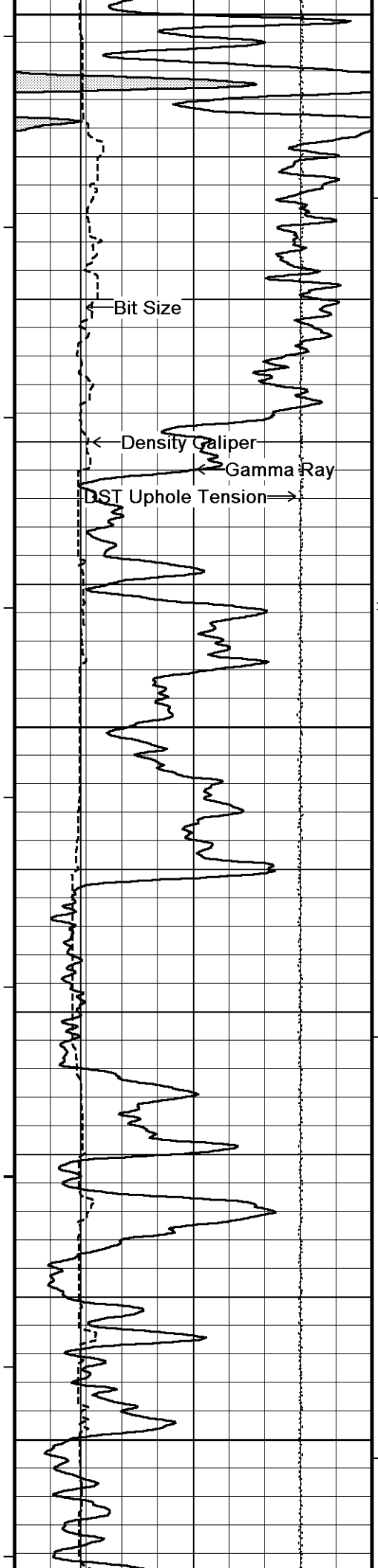
Plotted on 05-AUG-2013 15:02

Filename: C:\Minimus 13.05.9583\Log\O'Brien Colton #1-33\O'Brien Colton #1-33_001.dta

Recorded on 05-AUG-2013 11:05

System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583





5750

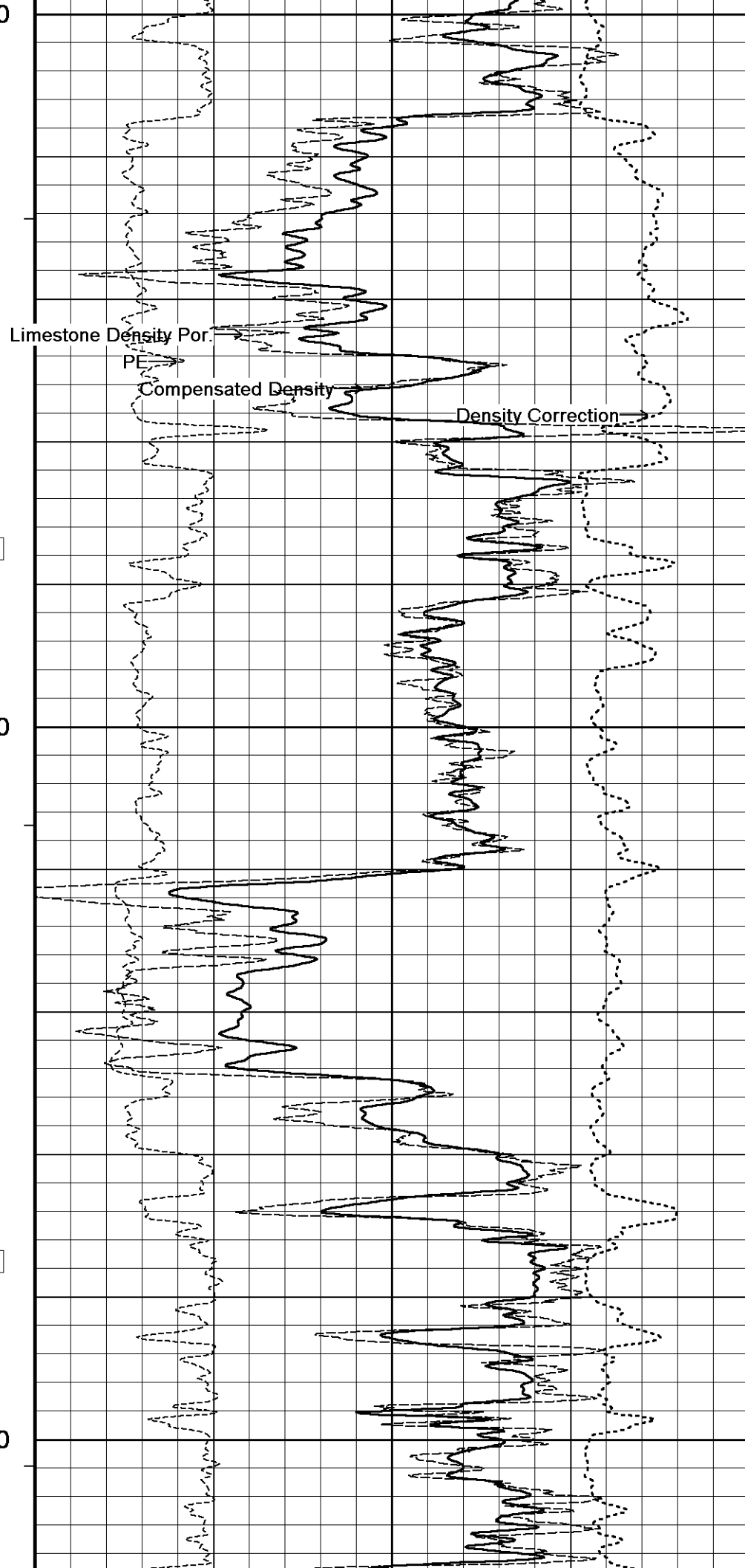
127°

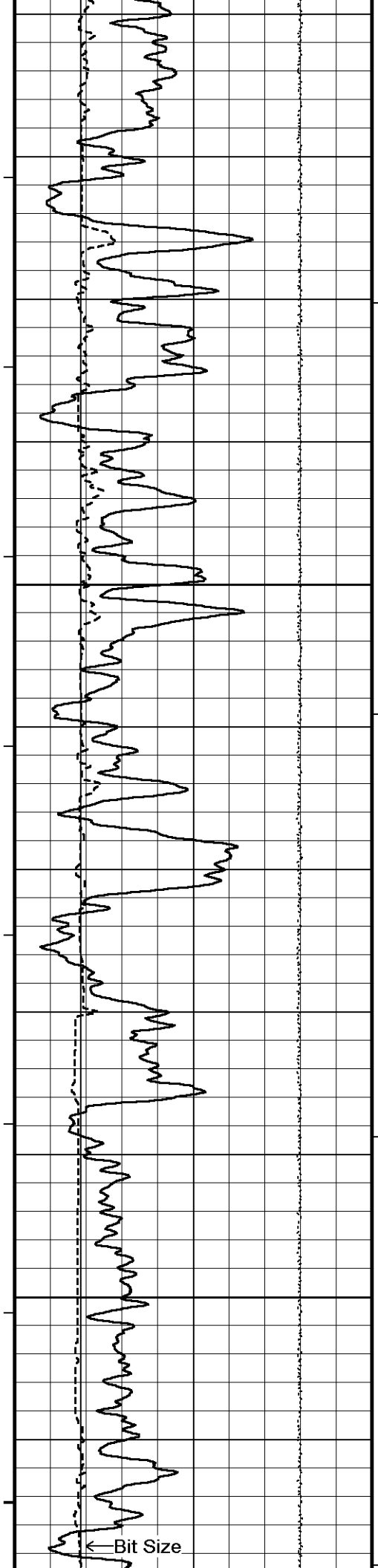
200

5800

126°

5850



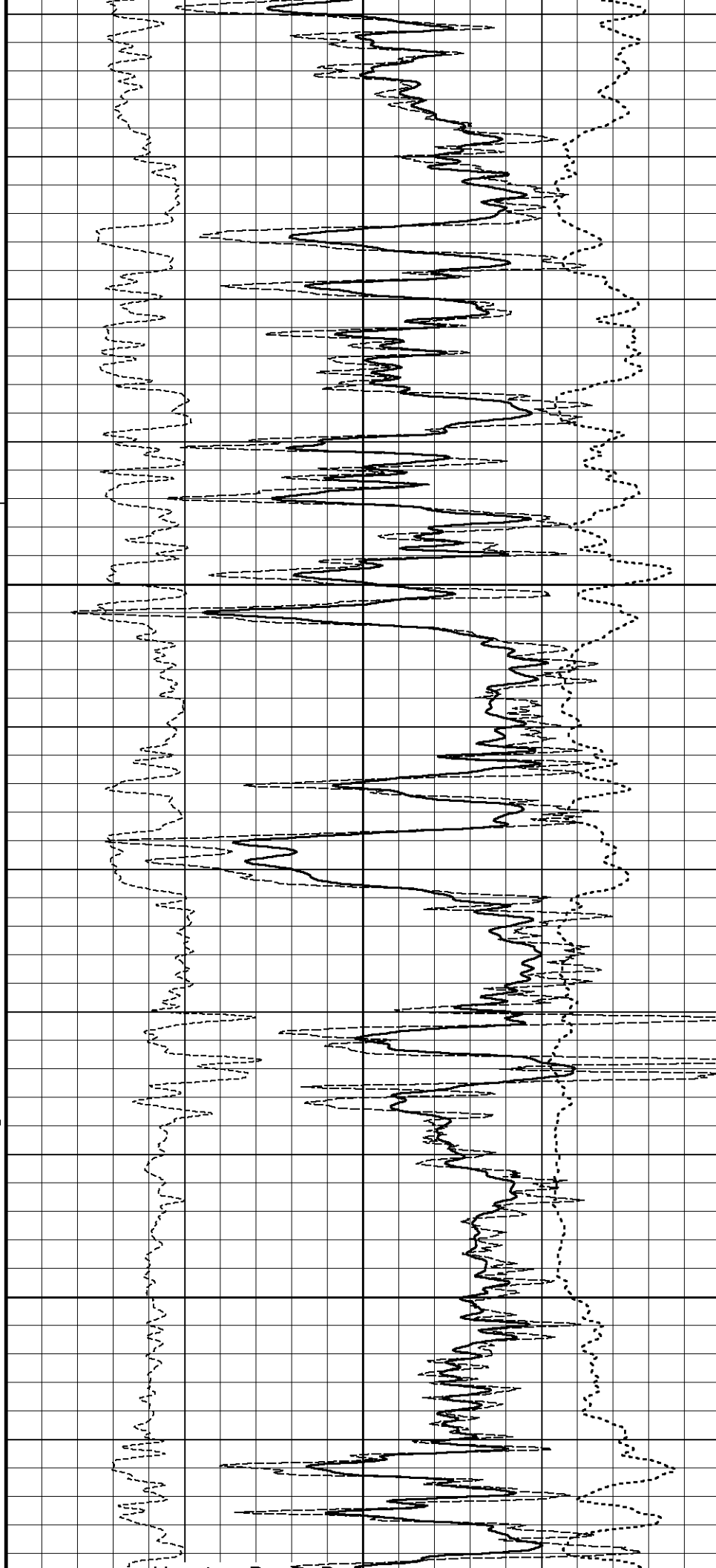


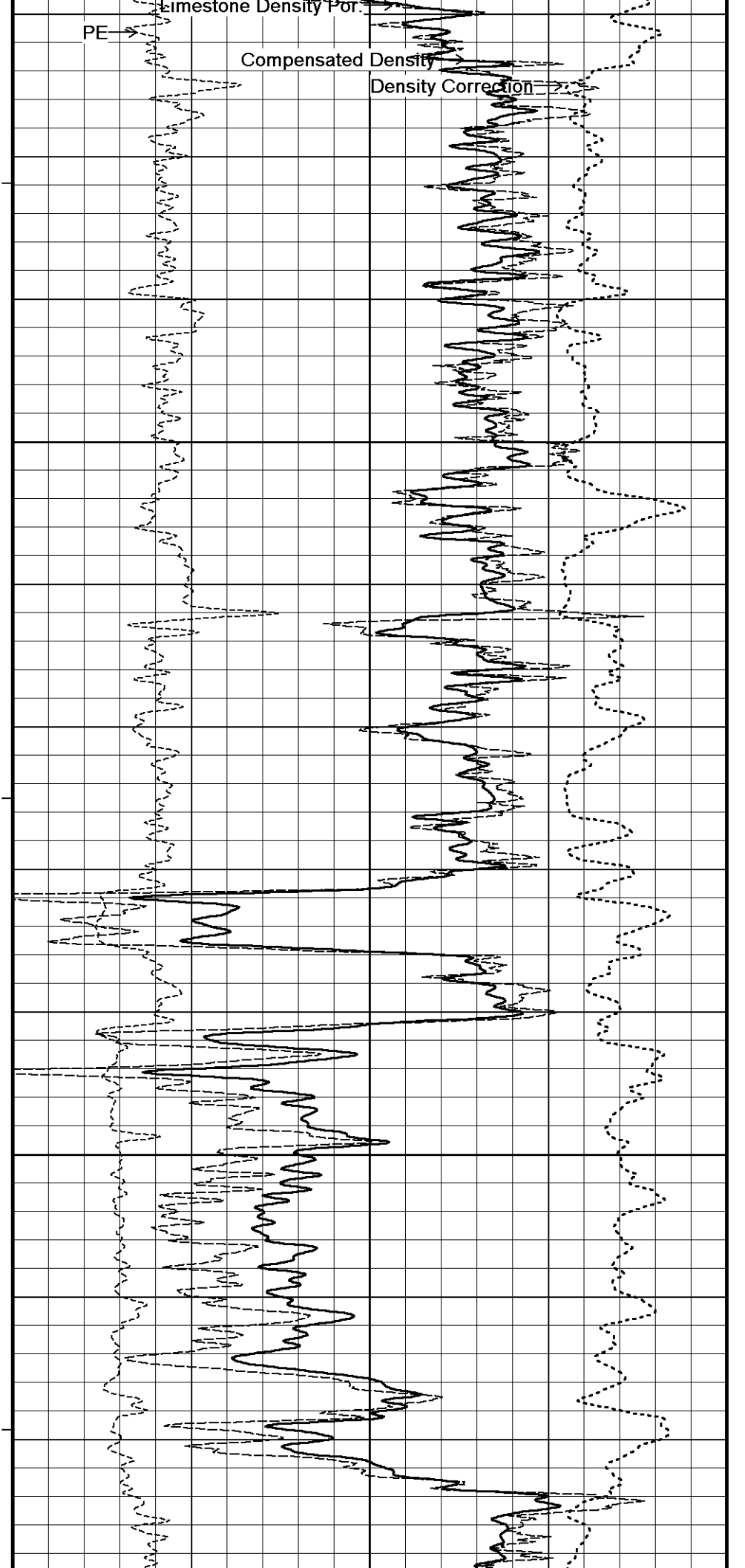
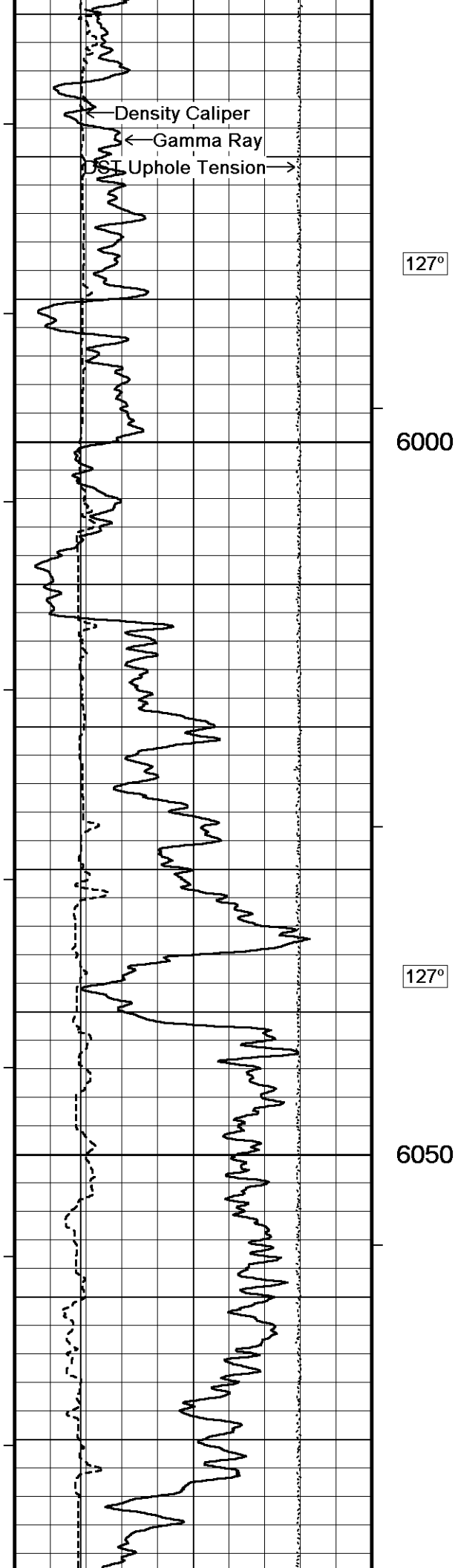
127°

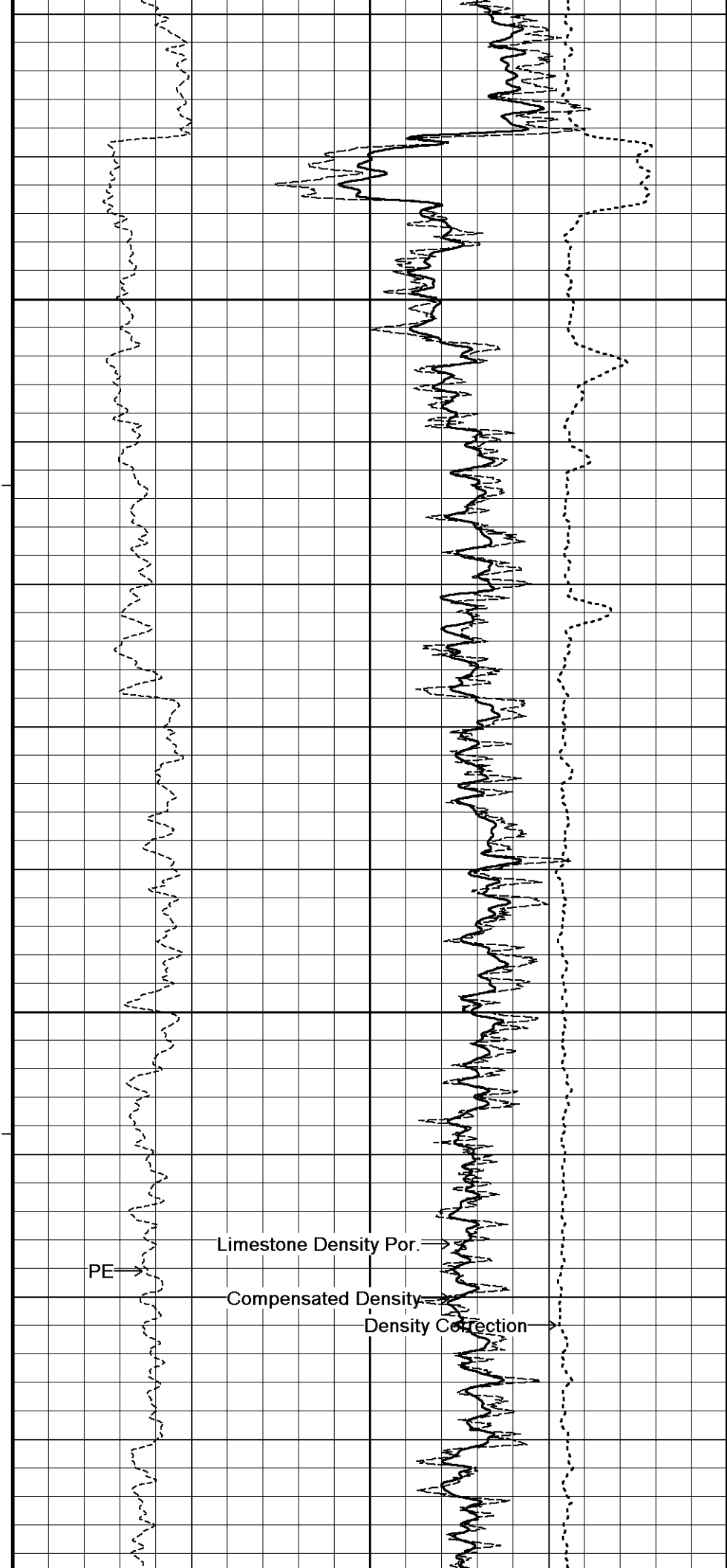
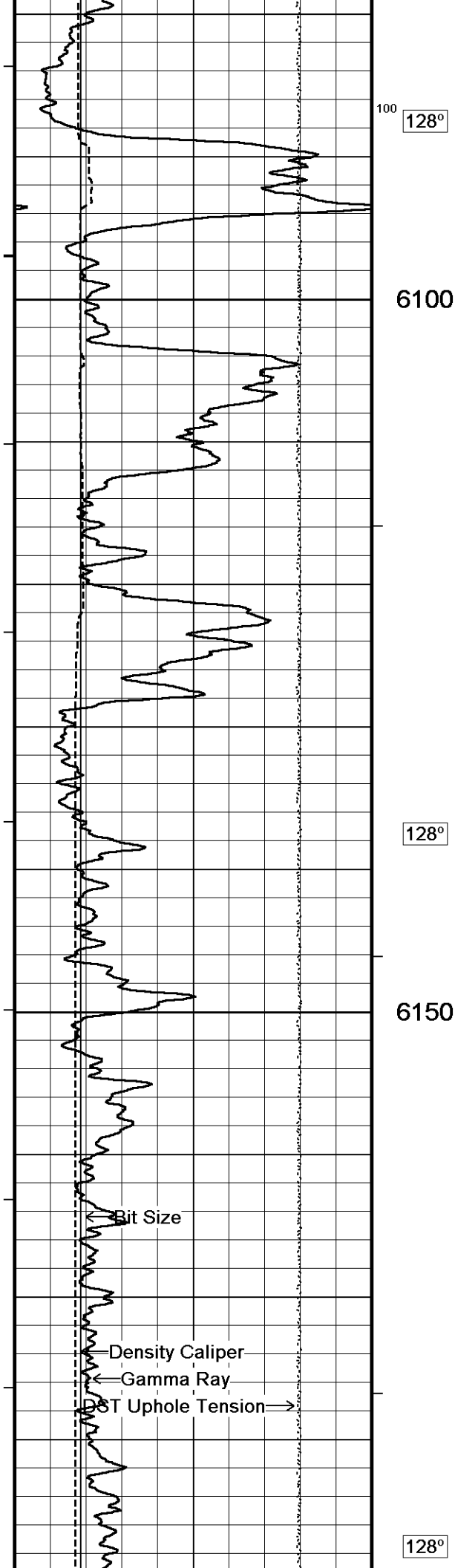
5900

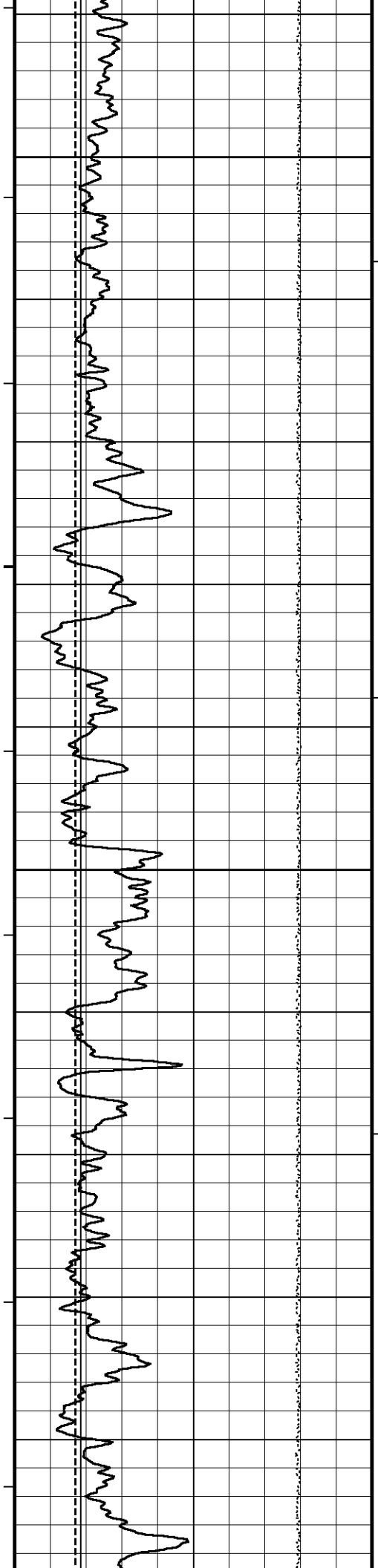
127° 100

5950







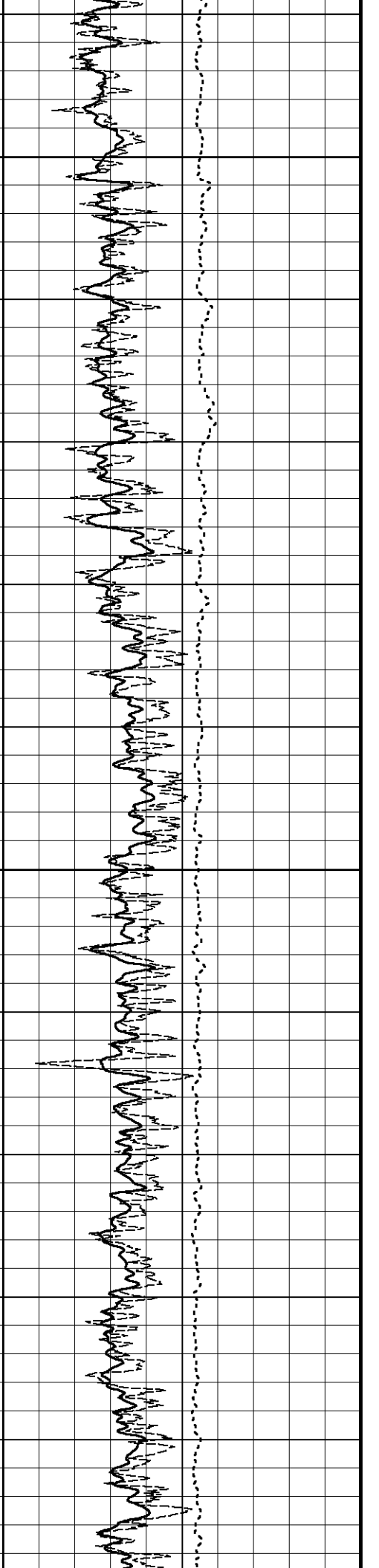
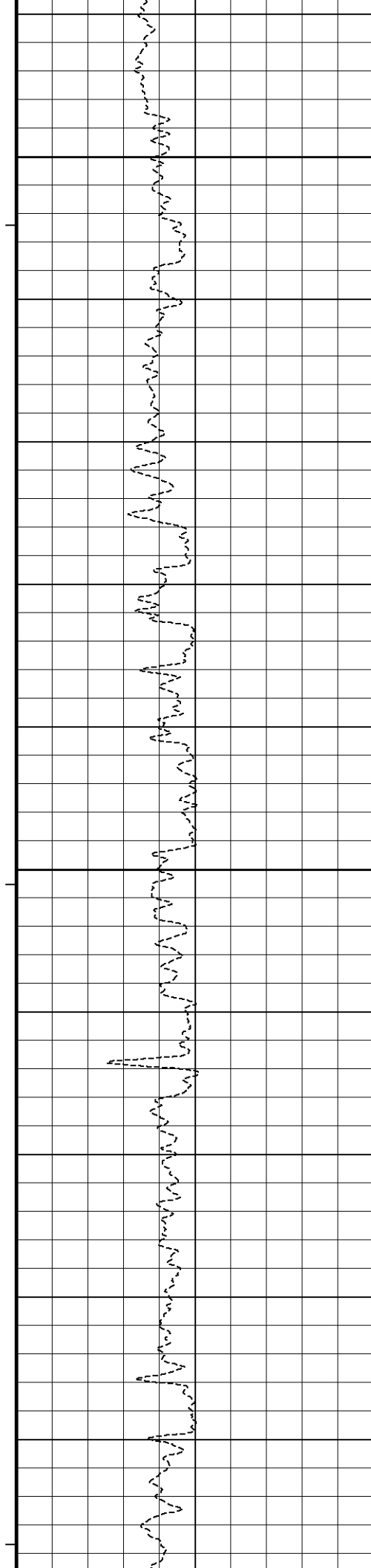


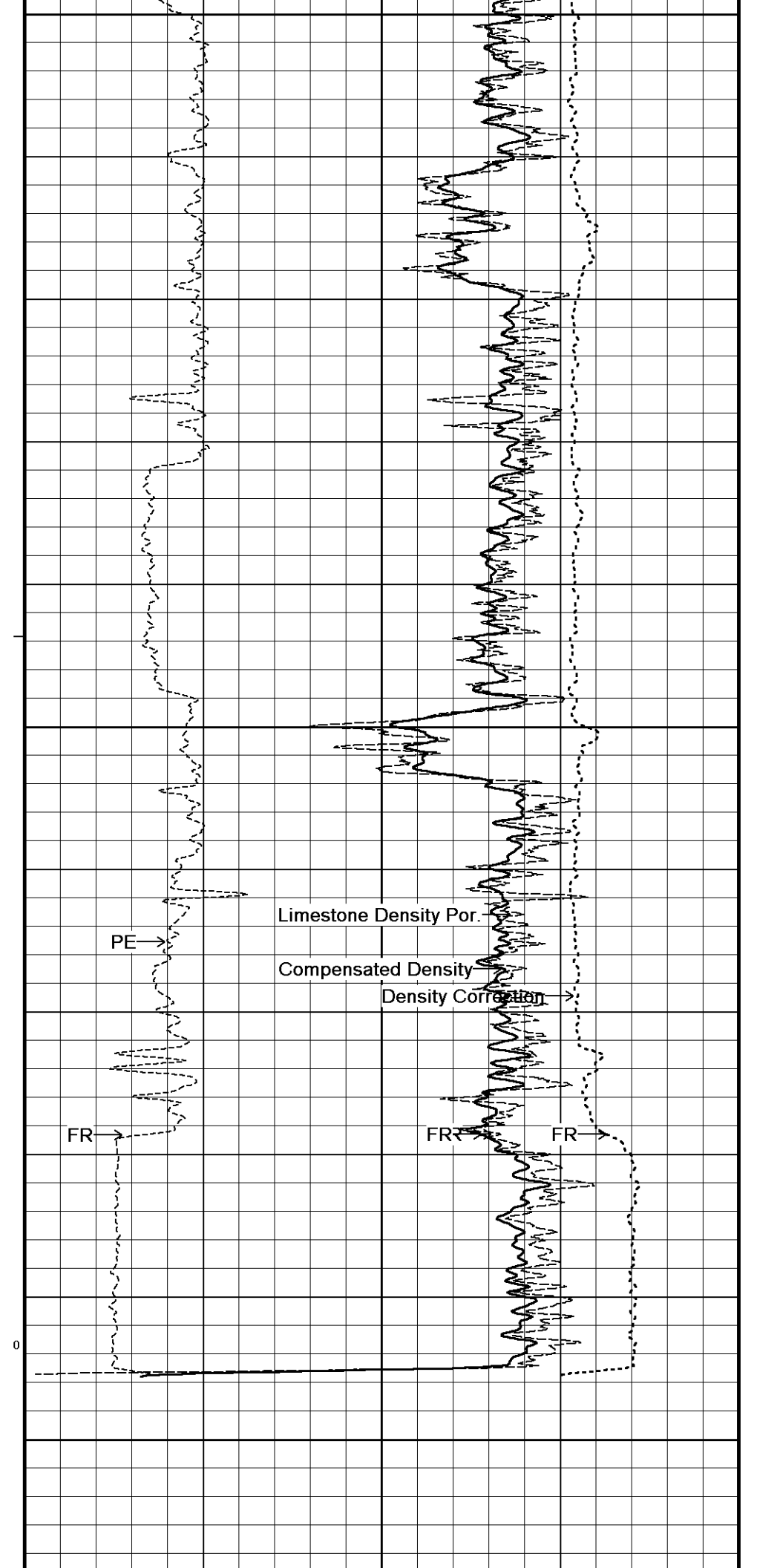
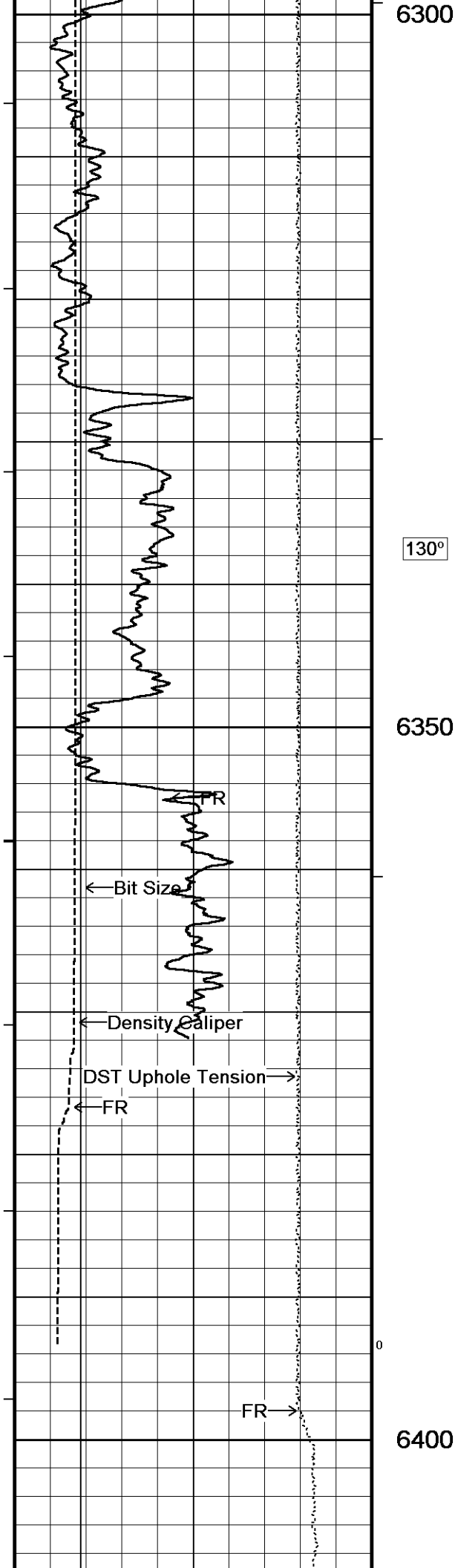
6200

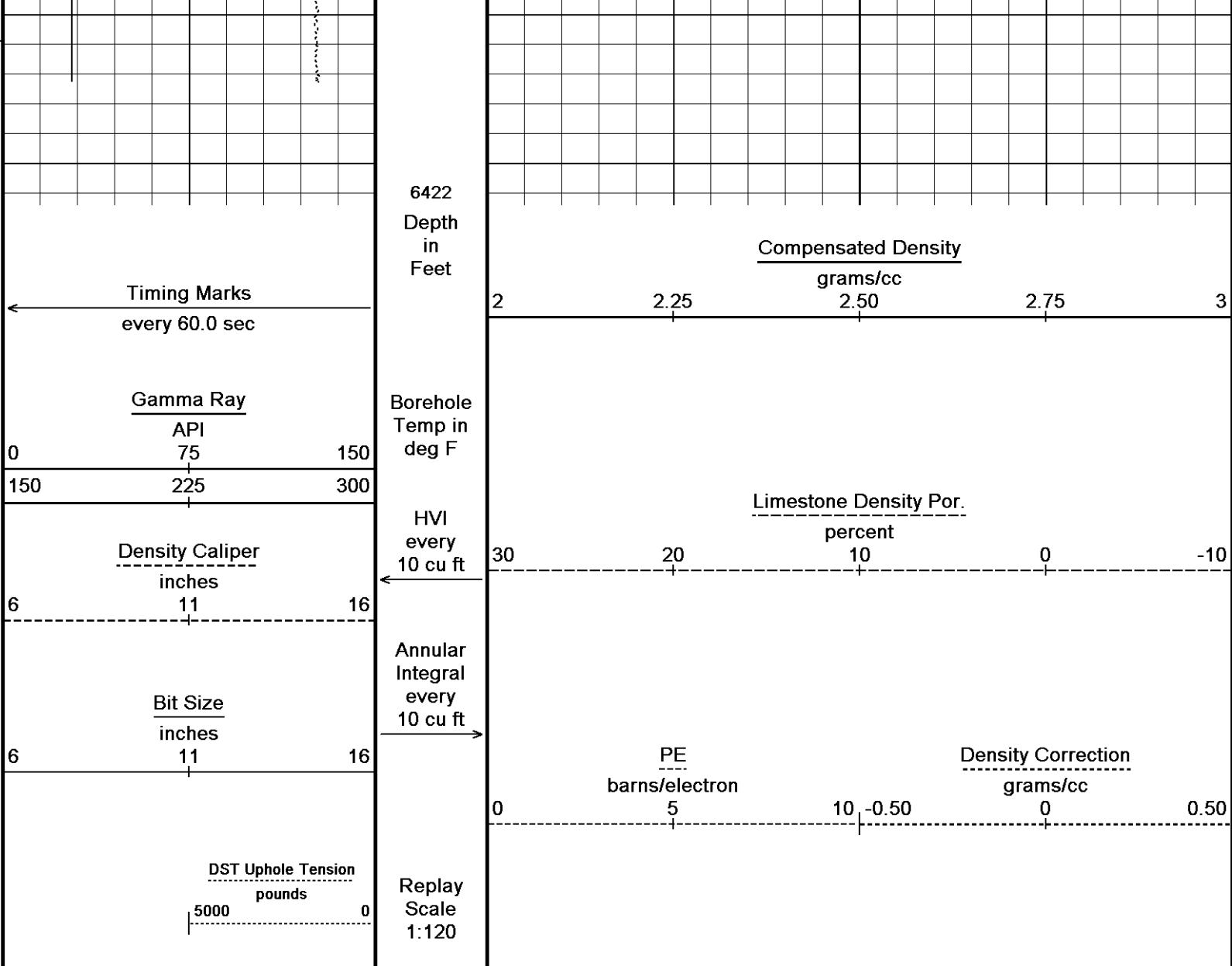
129°

6250

129°







Depth Based Data - Maximum Sampling Increment 2.5cm
Filename: C:\Minimus 13.05.9583\Log\O'Brien Colton #1-33\O'Brien Colton #1-33_001.dta
System Versions: Logged with 13.05.9583 Processed with 13.05.9583 Plotted with 13.05.9583

10 INCH HI-RES

BEFORE SURVEY CALIBRATION		
C:\Minimus 13.05.9583\Log\O'Brien Colton #1-33\O'Brien Colton #1-33_002.dta		
General Constants All 000		Last Edited on 05-AUG-2013,10:30
General Parameters		
Mud Resistivity	0.930	ohm-metres
Mud Resistivity Temperature	103.000	degrees F
Water Level	0.000	feet
Borehole Fluid Processing	Wet Hole	
Hole/Annular Volume and Differential Caliper Parameters		
HVOL Method	Single Caliper	
HVOL Caliper 1	Density Caliper	
HVOL Caliper 2	N/A	
Annular Volume Diameter	4.500	inches
Caliper for Differential Caliper	Density Caliper	
Rwa Parameters		
Porosity used	Base Density Porosity	
Resistivity used	Array Ind. Six Res Rt	

RWA Constant A	1.000		
RWA Constant M	2.000		
SW/APOR Tool Source	0.000		
Down-hole Tension Calibration SMS 0			
			Field Calibration on 04-AUG-2013 18:05
Reading No	Measured	Calibrated (lbs)	
1	13735.13	0.00	
2	14289.75	471.00	
Gamma Calibration MCG-B 39			
	Measured	Calibrated (API)	Field Calibration on 04-AUG-2013 10:53
Background	64	43	
Calibrator (Gross)	1141	768	
Calibrator (Net)	1077	725	
Gamma Constants MCG-B 39			
			Last Edited on 05-AUG-2013,09:22
Gamma Calibrator Number	GRC38		
Mud Density	1.10	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 MCG-B 39			
	Measured	Calibrated (mV)	Field Calibration on 30-JUL-2013,09:41
Reference 1	105.8	100.0	
Reference 2	-94.3	-100.0	
High Resolution Temperature Calibration MCG-B 39			
	Measured	Calibrated(Deg F)	Field Calibration on 30-JUL-2013,09:41
Lower	50.00	50.00	
Upper	75.00	75.00	
High Resolution Temperature Constants MCG-B 39			
			Last Edited on 30-JUL-2013,09:41
Pre-filter Length	11		
Caliper Calibration MML-A 3			
			Base Calibration on 05-JUN-2013 15:43
			Field Calibration on 04-AUG-2013 10:46
Base Calibration			
Reading No	Measured	Calibrator Size (in)	
1	14624	5.98	
2	17958	7.97	
3	21263	9.86	
4	25213	11.92	
5	0	0.00	
6	N/A	N/A	
Field Calibration			
	Measured Caliper (in)	Actual Caliper (in)	
	6.15	5.98	
Micro Normal and Micro Inverse Calibration MML-A 3			
			Base Calibration on 05-JUN-2013 15:36
			Field Check on 04-AUG-2013 10:47
Base Calibration			
	Measured	Calibrated (ohm-m)	
Channel	Resistor 1 Resistor 2	Resistor 1 Resistor 2	
Micro Normal	12.2 60.2	5.0 25.0	
Micro Inverse	15.7 78.3	5.0 25.0	
Channel	Base Check (ohm-m)	Field Check (ohm-m)	
Micro Normal	63.0	63.0	
Micro Inverse	48.2	48.2	
Micro Normal and Micro Inverse Constants MML-A 3			
			Last Edited on 05-AUG-2013,09:22
Pad Type	8-12 in Soft Rubber Inflatable 006-9011-159		
Micro Normal K Factor	1.0000		
Micro Inverse K Factor	1.0000		

Micro Inverse K Factor	1.0000			
Standoff Offset	N/A			inches
Neutron Calibration MDN-A.B 66				Base Calibration on 31-JUL-2013 10:25 Field Check on 04-AUG-2013 10:58
Base Calibration				
	Measured		Calibrated (cps)	
	Near	Far	Near	Far
	3180	99	3714	110
Ratio	32.180		33.764	
Field Calibrator at Base				
			Calibrated (cps)	
			1617	2323
Ratio			0.696	
Field Check				
			Calibrated (cps)	
			1624	2337
Ratio			0.697	

Neutron Constants MDN-A.B 66			Last Edited on 05-AUG-2013,09:22	
Neutron Source Id	P0204NN			
Neutron Jig Number	5824NE			
Epithermal Neutron	No			
Caliper Source for Processing	Density Caliper			
Stand-off	0.00	inches		
Mud Density	1.00	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	68.00	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 353		Base Calibration on 22-MAY-2013 08:22 Field Check on 04-AUG-2013 10:23	
Base Calibration			
	Measured	Calibrated (ohm-m)	
Reference 1	0.0	0.0	
Reference 2	964.9	126.8	
Base Check		280.9	
Field Check		280.8	

FE Constants MFE-B.J 353			Last Edited on 05-AUG-2013,09:22	
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.		MCG External Temperature		
Stand-off		0.5		inches

Induction Calibration MAI-A.A 167				Base Calibration on 19-APR-2013,13:41	
				Field Check on 04-AUG-2013 10:21	
Base Calibration					
Test Loop Calibration		Measured		Calibrated (mmho/m)	
Channel	Low	High		Low	High
1	17.3	474.2		9.3	966.2
2	6.3	388.4		7.6	821.4
3	3.3	259.4		5.2	566.0
4	1.9	133.0		2.6	279.2
Array Temperature		76.8	Deg F		

Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1			13.4	3838.7
2			29.7	3476.3
3			29.2	3052.4
4			19.8	2081.3
Deep			18.7	2048.6
Medium			42.3	3990.3
Shallow			43.1	5053.2
Array Temperature			78.6	Deg F

Induction Constants MAI-A.A 167			Last Edited on 05-AUG-2013,09:22	
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		8.0000		
Stand-off Fin Angle		60.00	degrees	
Stand-off Fin Width		0.5000	inches	
Borehole Corr. Rm Source		Temperature Corr		
Temp. for Rm Corr.		MCG 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-A.A 167			Field Calibration on 30-JUL-2013,09:41
	Measured	Calibrated(Deg F)	
Lower	50.00	50.00	
Upper	75.00	75.00	

High Resolution Temperature Constants MAI-A.A 167		Last Edited on 30-JUL-2013,09:41	
Pre-filter Length	11		

Caliper Calibration MPD-B 64			Base Calibration on 04-AUG-2013 10:37
			Field Calibration on 04-AUG-2013 10:38
Base Calibration			
Reading No	Measured	Calibrator Size (in)	
1	15388	3.99	
2	24325	5.98	
3	32740	7.97	
4	41178	9.86	
5	50491	11.92	
6	N/A	N/A	

Field Calibration

Measured Caliper (in)
6.00Actual Caliper (in)
5.98

Photo Density Calibration MPD-B 64

Base Calibration on 10-JUL-2013 10:09
Field Check on 04-AUG-2013 10:44

Density Calibration

Base Calibration

Measured

Calibrated (sdu)

Near

Far

Near

Far

Reference 1

60252

33858

59556

30836

Reference 2

25108

2914

24941

2541

Field Check at Base

1163.0

1342.8

Field Check

1165.2

1346.7

PE Calibration

Base Calibration

WS

Measured

WH

Ratio

Calibrated

Ratio

Background

211

1034

Reference 1

22924

60048

0.385

0.371

Reference 2

6861

24971

0.278

0.272

Field Check at Base

210.7

1033.8

Field Check

211.1

1036.7

Density Constants MPD-B 64

Last Edited on 05-AUG-2013,09:22

Density Source Id

18235B

Nylon Calibrator Number

DNCE695

Aluminium Calibrator Number

DACD698

Density Shoe Profile

8 inch

Caliper Source for Processing

Density Caliper

PE Correction to Density

Not Applied

Mud Density

1.10

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 (m)

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

DOWNHOLE EQUIPMENT

C:\Minimus 13.05.9583\Log\O'Brien Colton #1-33\O'Brien Colton #1-33_002.dta

3/8" Triple Cone Cable Head (MCB C A)

MCB-C.A 5 LG: 1.58 ft WT: 15.4 lb OD: 2.24 in

Compact Comms Gamma

MCG-B 39 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in



42.87 ft

GRGC - Gamma Ray

39.96 ft

CGXT - MCG External Temperature

Compact Micro-log

MML-A 3 LG: 7.97 ft WT: 81.6 lb OD: 2.24 in

Compact Neutron

MDN-A.B 66 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Density/Caliper

MPD-B 64 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

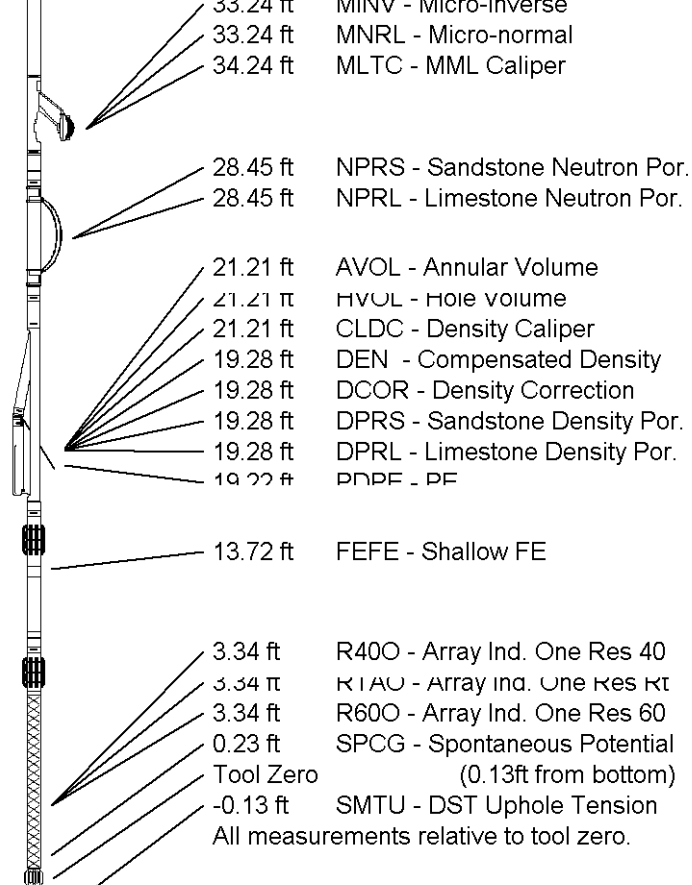
Compact Focussed Electric

MFE-B.J 353 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

Compact Induction

MAI-A.A 167 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 49.73 ft Weight: 399.0 lb

**COMPANY****O'BRIEN ENERGY RESOURCES CORP.****WELL****COLTON #1-33****FIELD****NOVINGER****PROVINCE/COUNTY****MEADE****COUNTRY/STATE****U.S.A. / KANSAS**

Elevation Kelly Bushing	2712.00	feet
Elevation Drill Floor	2711.00	feet
Elevation Ground Level	2701.00	feet

First Reading	6379.00	feet
Depth Driller	6400.00	feet
Depth Logger	6398.00	feet

**Weatherford®**

COMPACT PHOTO DENSITY
COMPENSATED NEUTRON
MICRORESISTIVITY LOG