



Weatherford[®]

**COMPACT PHOTO DENSITY
COMPENSATED NEUTRON
MICRORESISTIVITY LOG**

COMPANY			SHAKESPEARE OIL CO., INC.		
WELL			CHURCH OF GOD #2-27		
FIELD			PENCE		
PROVINCE/COUNTY			SCOTT		
COUNTRY/STATE			U.S.A. / KANSAS		
LOCATION			2305' FNL & 50' FEL		
PERMIT NUMBER			NE SE SE NE		
SEC 27	TWP 16S	RGE 34W	Other Services		
Latitude	38.635216355		MA/IMFE		
Longitude	101.054556971				
API Number	15-171-21086				
Permanent Datum Gl, Elevation 3119 feet					
Log Measured From KB					
Drilling Measured From KB @ 10 FEET					
Date	18-SEP-2014				
Run Number	ONE				
Service Order	7960-98252230				
Depth Driller	4890.00		feet		
Depth Logger	4883.00		feet		
First Reading	3800.00		feet		
Last Reading	4863.78		feet		
Casing Driller	268.00		feet		
Casing Logger	263.00		feet		
Bit Size	7.875		inches		
Hole Fluid Type	WBM				
Density / Viscosity	9.20	lb/USg	54.00	CP	
PH / Fluid Loss	11.00		8.80	ml/30Min	
Sample Source	MUDPIT				
Rm @ Measured Temp	0.60 @ 75.0		ohm-m		
Rmf @ Measured Temp	0.48 @ 75.0		ohm-m		
Rmc @ Measured Temp	0.72 @ 75.0		ohm-m		
Source Rmf / Rmc	CALC		CALC		
Rm @ BHT	0.41 @111.0		ohm-m		
Time Since Circulation	4 HOURS				
Max Recorded Temp	112.00		deg F		
Equipment / Base	13096		LIB		
Recorded By	DEREK CARTER		JAKE HINES		
Witnessed By	TIM PRIEST				
IOB #	LB14-282				

BOREHOLE RECORD					Last Edited: 18-SEP-2014 13:24
Bit Size inches		Depth From feet		Depth To feet	
7.875		268.00		4890.00	
CASING RECORD					
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft	
SURFACE	8.625	0.00	268.00	24.00	

REMARKS
- SOFTWARE ISSUE: WLS 13.08.2113
- TOOL STRING: MCG, MML, MDN, MPD, MFE, MAI RUN IN COMBINATION
- HARDWARE: MDN: DUAL BOWSPRING ECCENTRALIZER MFE: 1 X 0.5 INCH STANDOFF MAI: 2 X 0.5 INCH STANDOFF
- 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: 2140 CU. FT.
- ANNUAL HOLE VOLUME WITH 5.5 INCH CASING FROM TD TO 3800 FT: 200 CU. FT.

- SERVICE ORDER # 7960-98252230

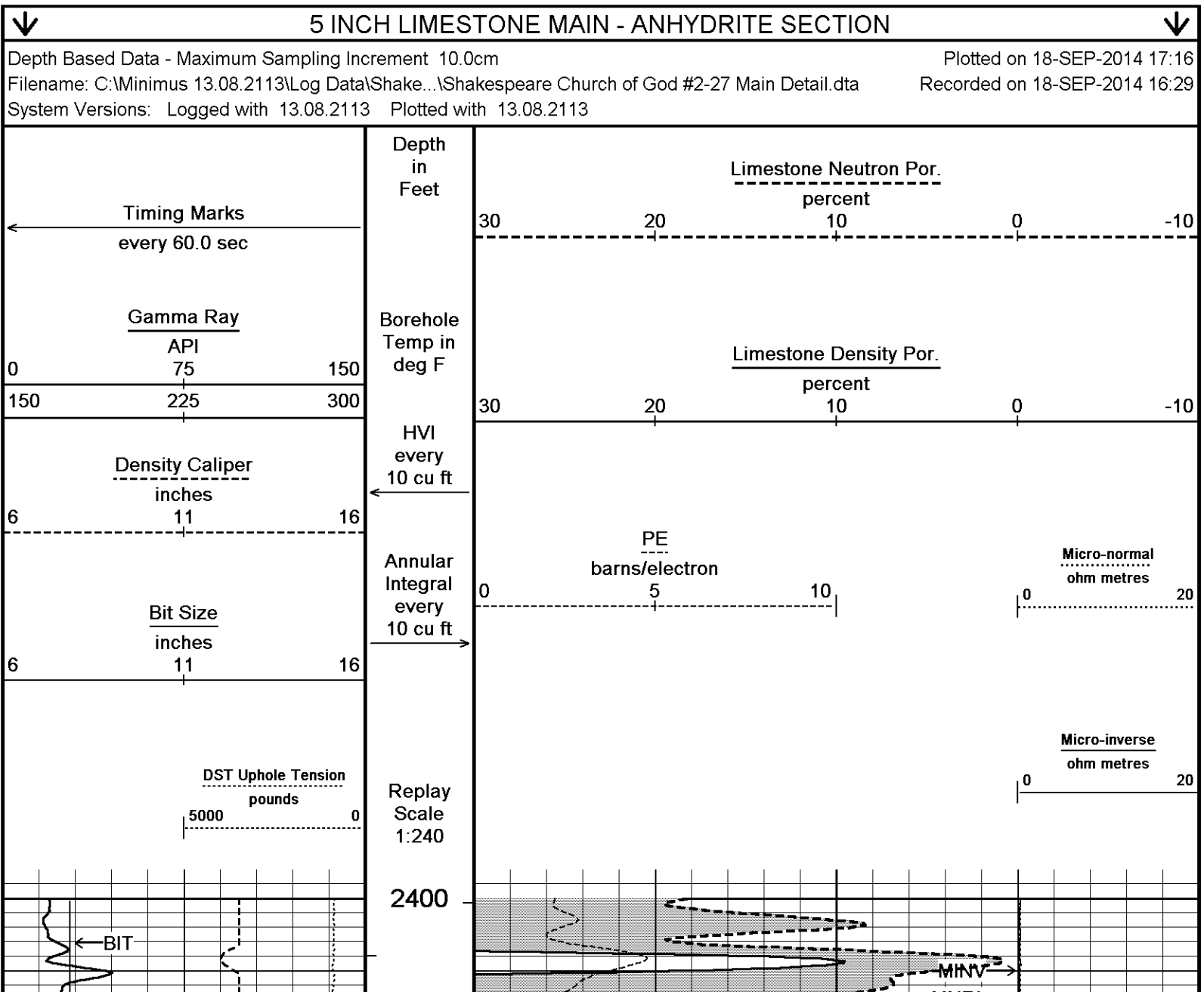
- RIG: H.D. DRILLING #2

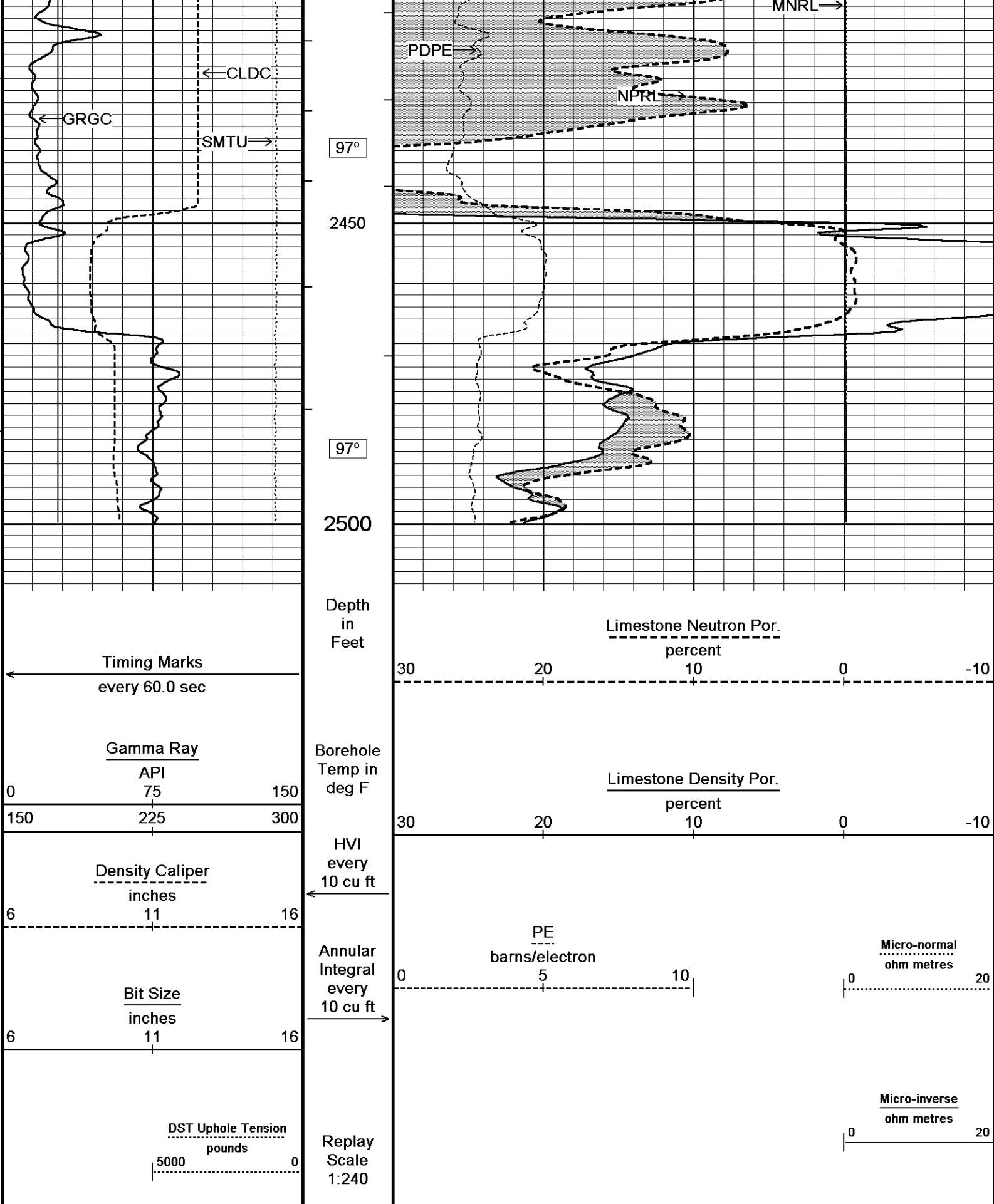
- ENGINEER: DEREK CARTER

- JUNIOR FIELD ENGINEER: JAKE HINES

- OPERATORS: CARLOS RAMIREZ

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.





Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 13.08.2113\Log Data\Shake...\Shakespeare Church of God #2-27 Main Detail.dta
System Versions: Logged with 13.08.2113 Plotted with 13.08.2113
Plotted on 18-SEP-2014 17:16
Recorded on 18-SEP-2014 16:29

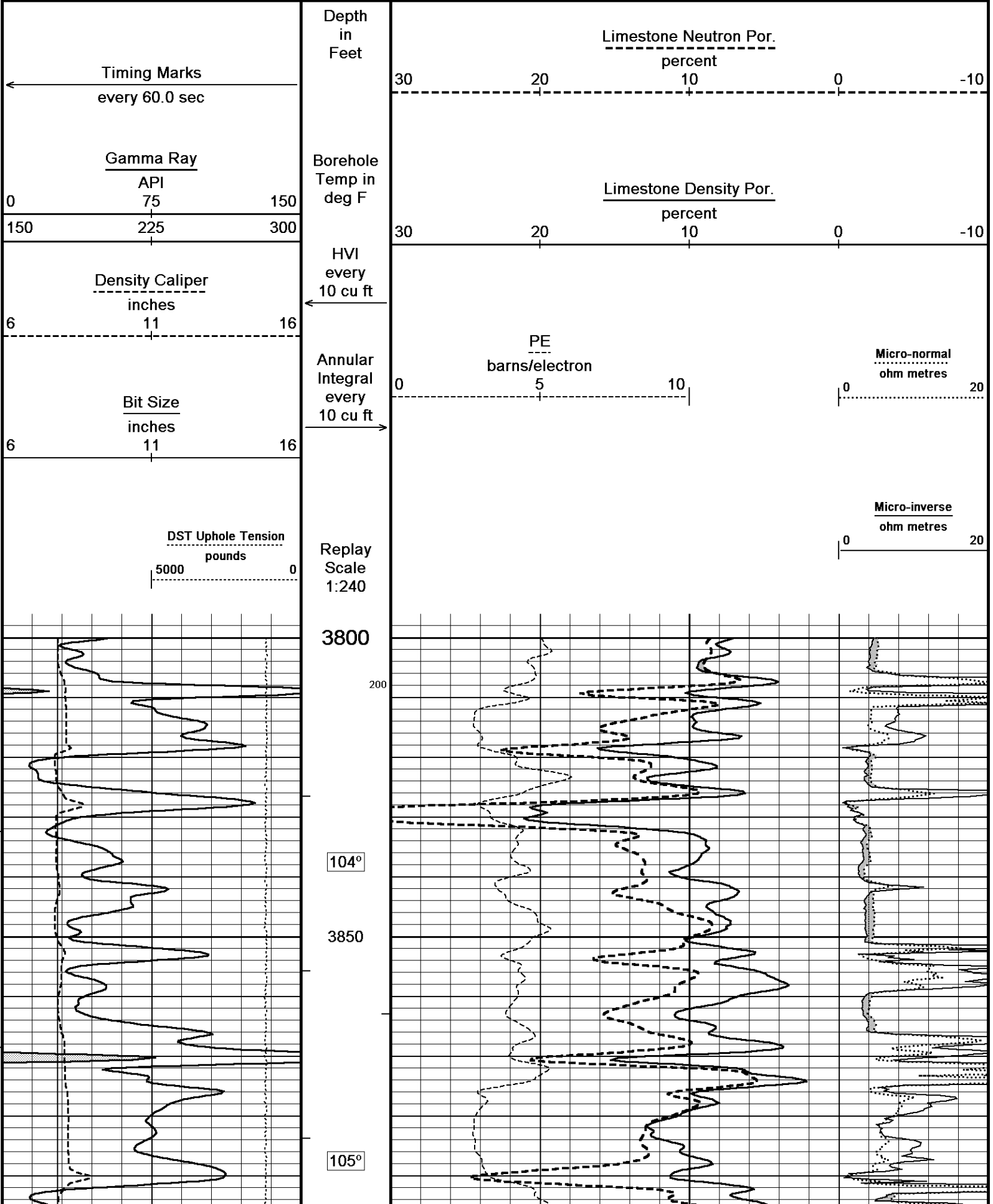
Depth Based Data - Maximum Sampling Increment 10.0cm

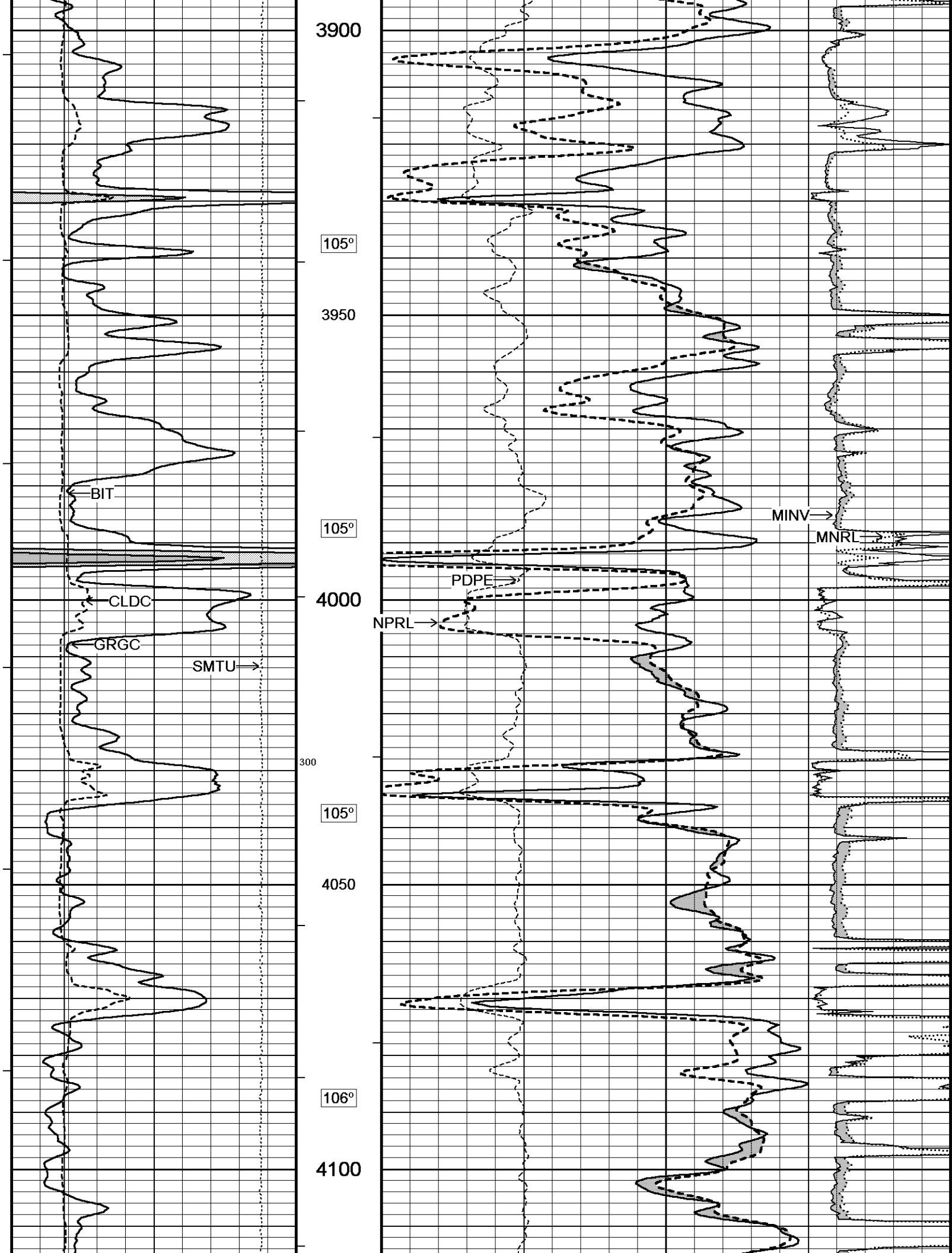
Plotted on 18-SEP-2014 17:16

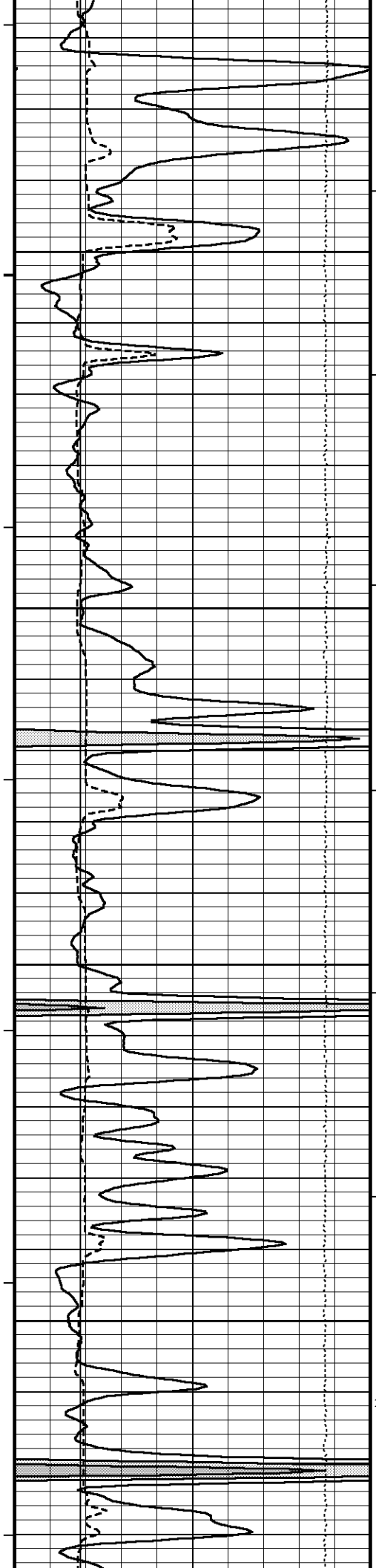
Filename: C:\Minimus 13.08.2113\Log Data\Shake...\Shakespeare Church of God #2-27 Main Detail.dta

Recorded on 18-SEP-2014 16:29

System Versions: Logged with 13.08.2113 Plotted with 13.08.2113







106°

4150

106°

4200

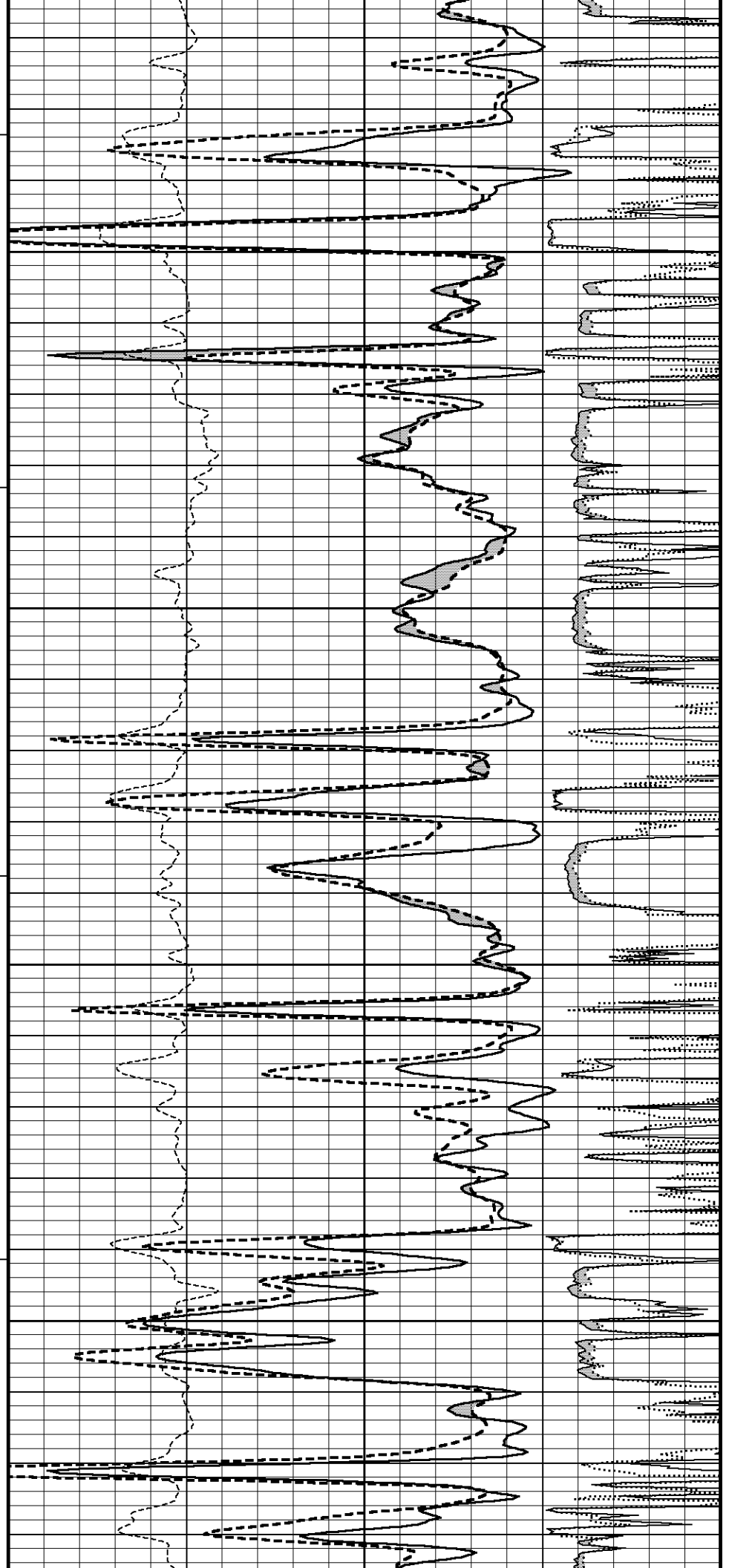
106°

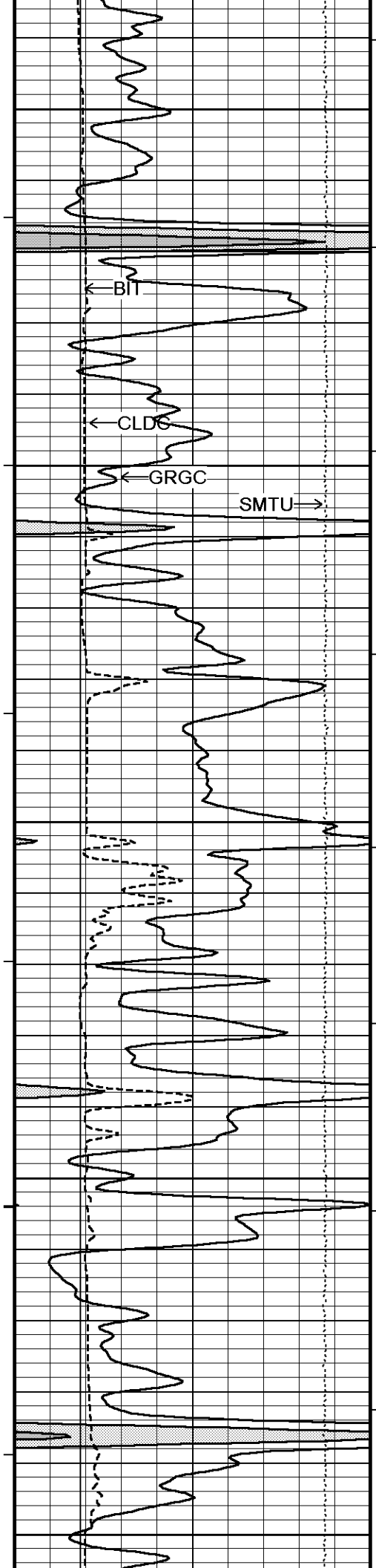
4250

107°

4300

200





107°

4350

107°

4400

107°

4450

108°

4500

109°

4550

100

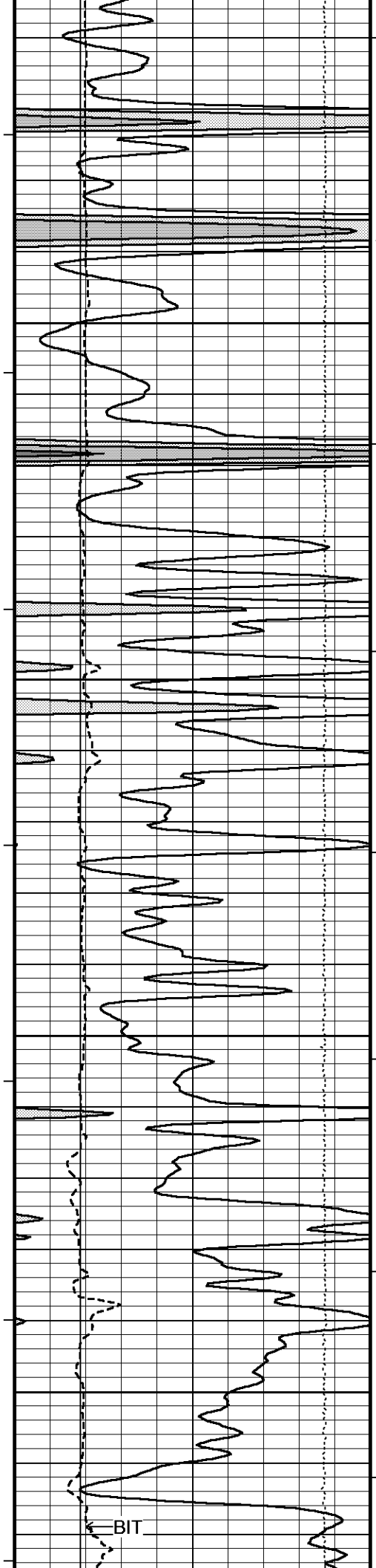
PDPE →

DPRL →

NPRL →

MINV →

MNRI →



109°

4600

109°

4650

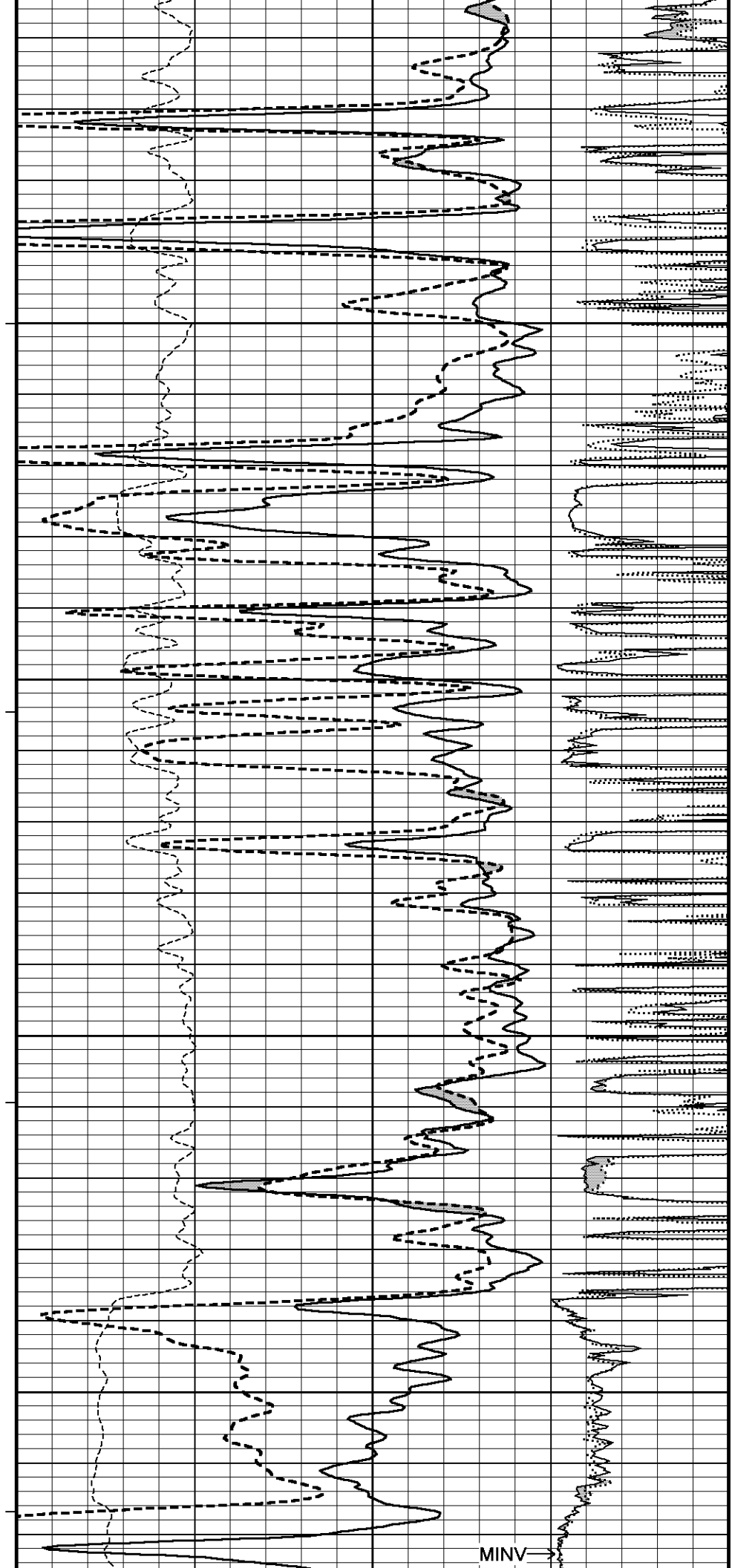
110°

4700

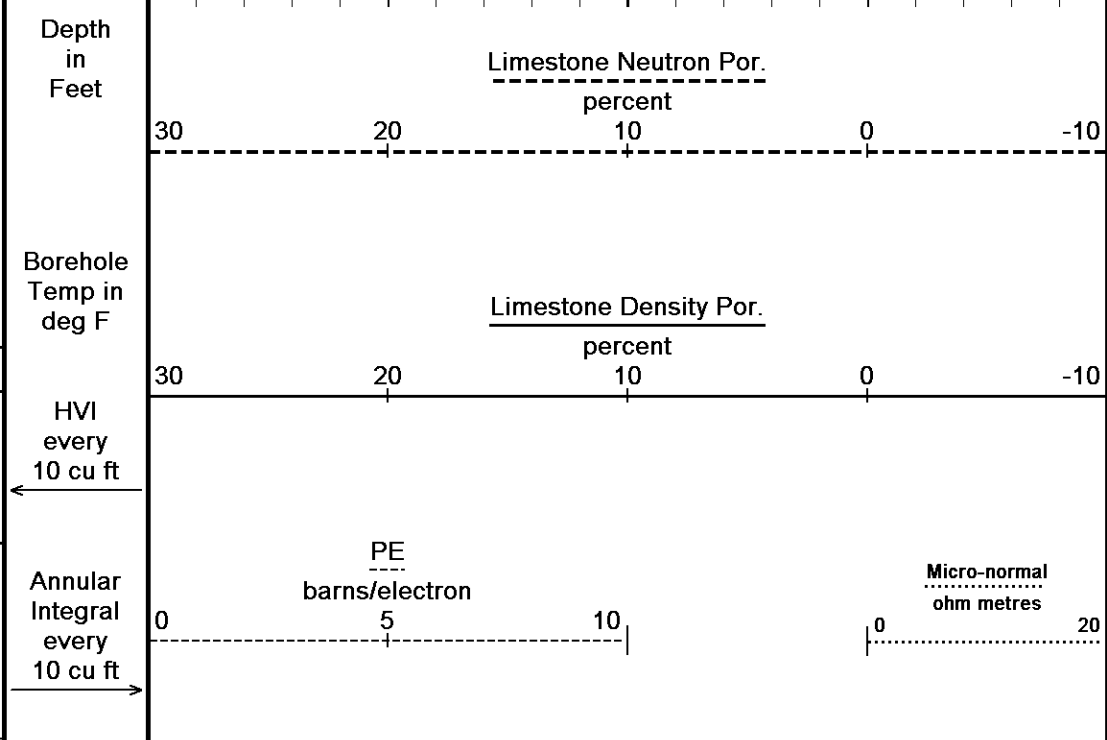
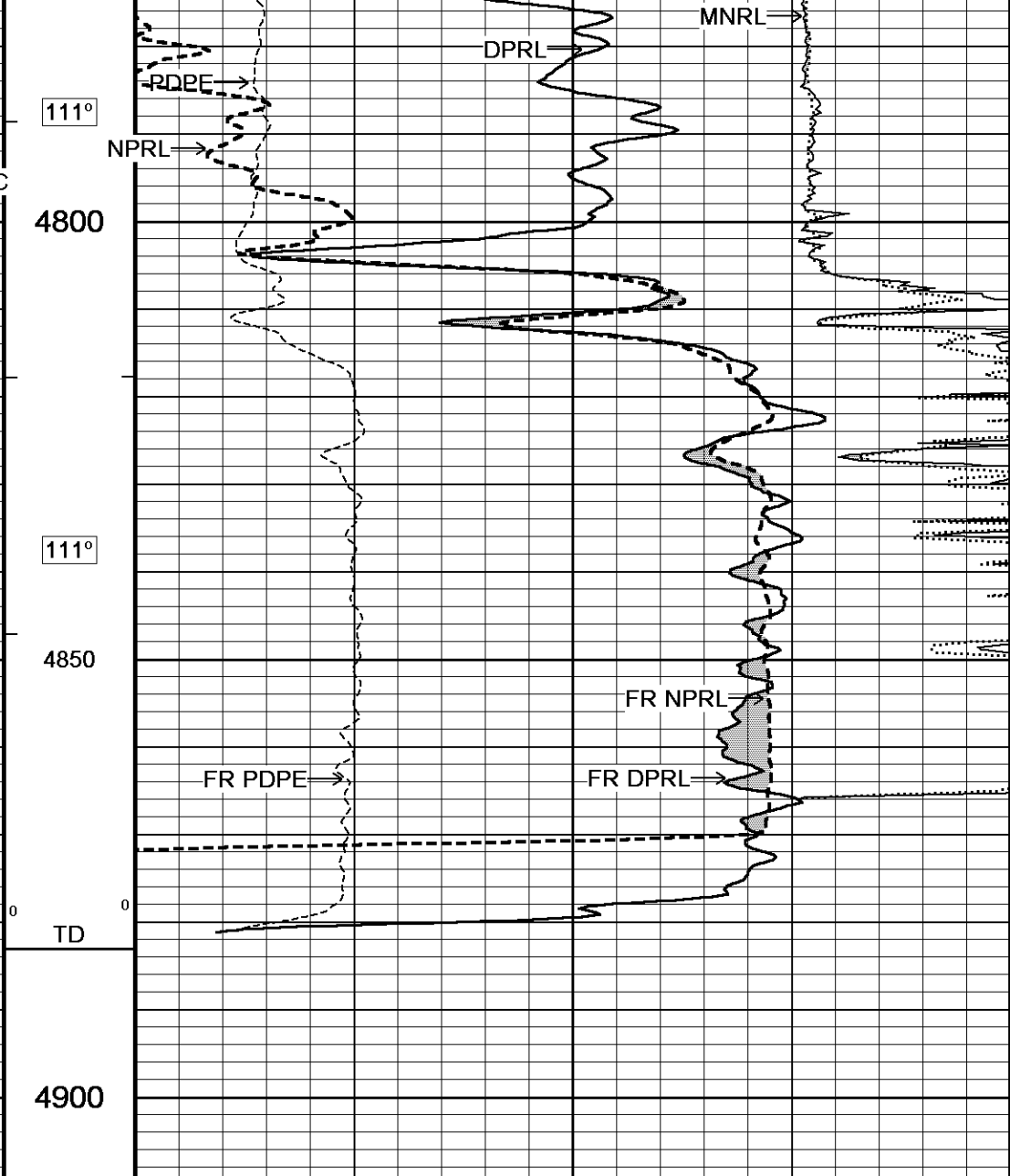
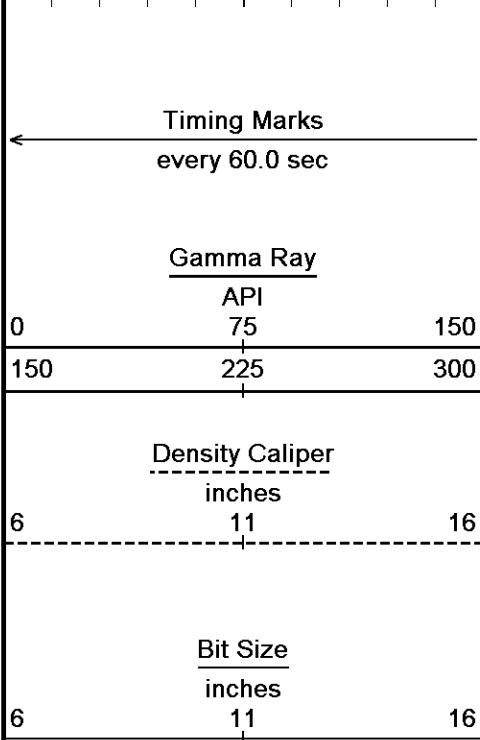
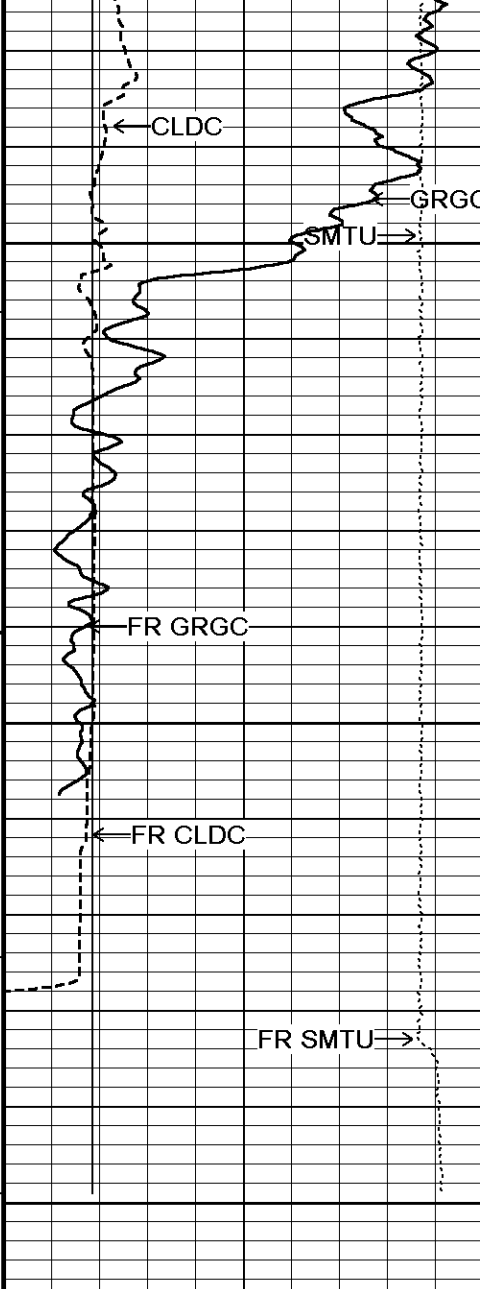
111°

4750

BIT



MINV



DST Uphole Tension
pounds

50000

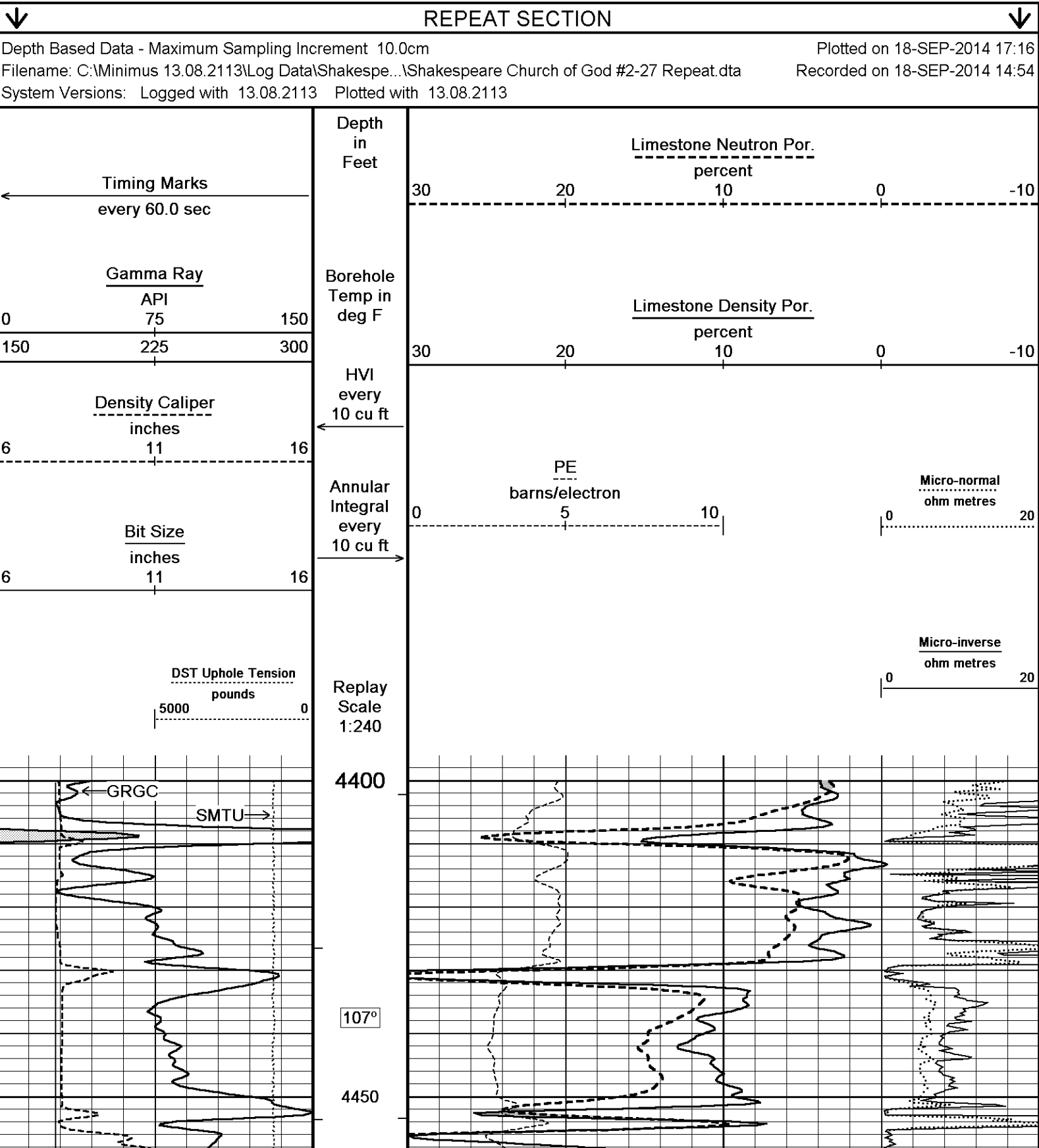
Replay
Scale
1:240

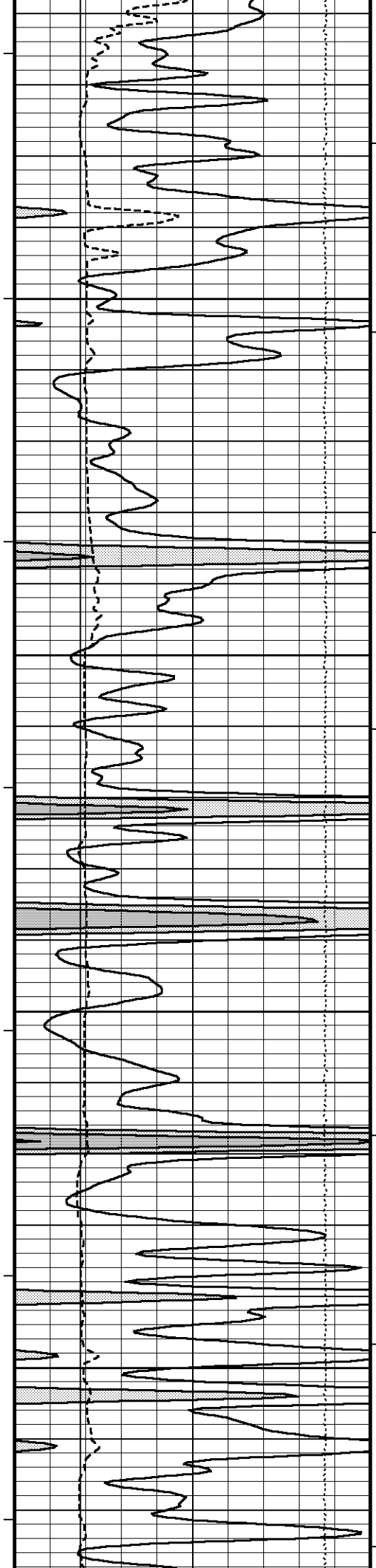
ohm metres

020

Depth Based Data - Maximum Sampling Increment 10.0cmPlotted on 18-SEP-2014 17:16
Filename: C:\Minimus 13.08.2113\Log Data\Shake...\Shakespeare Church of God #2-27 Main Detail.dtaRecorded on 18-SEP-2014 16:29
System Versions: Logged with 13.08.2113Plotted with 13.08.2113

↑5 INCH LIMESTONE MAIN↑





108°

4500

108°

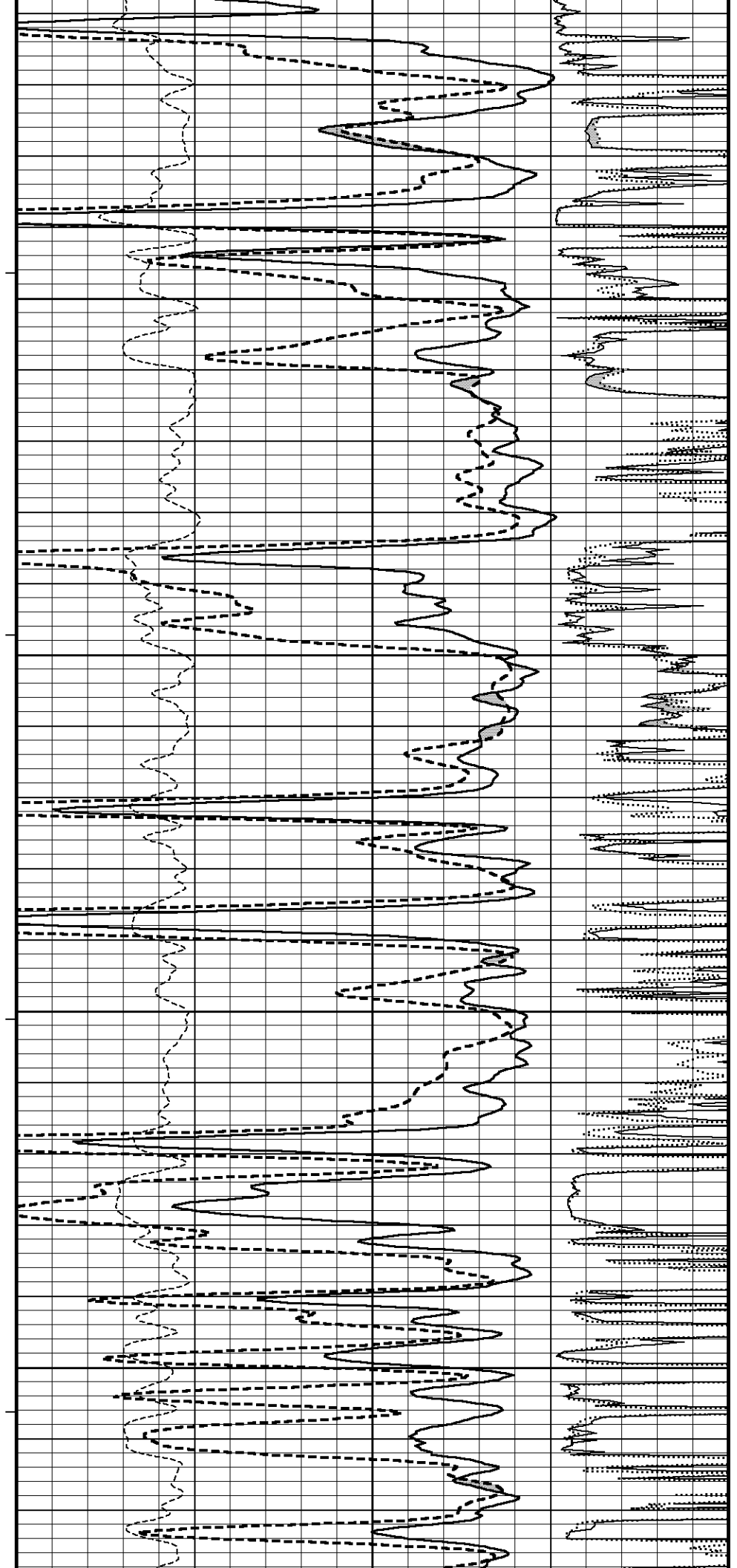
4550

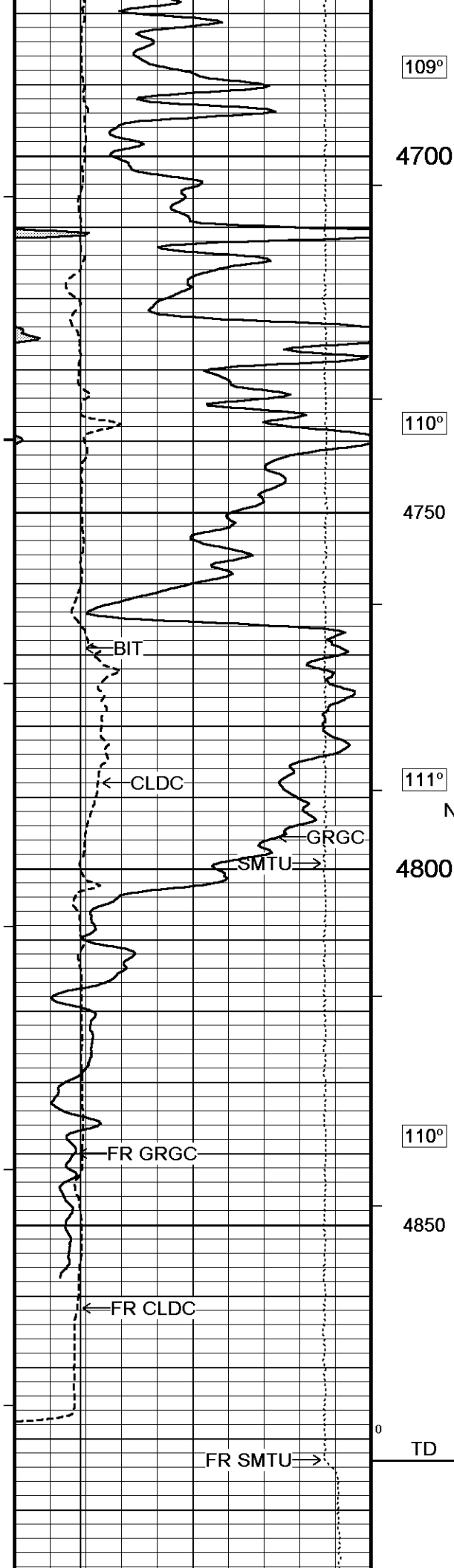
108°

4600

109°

4650





109°

4700

110°

4750

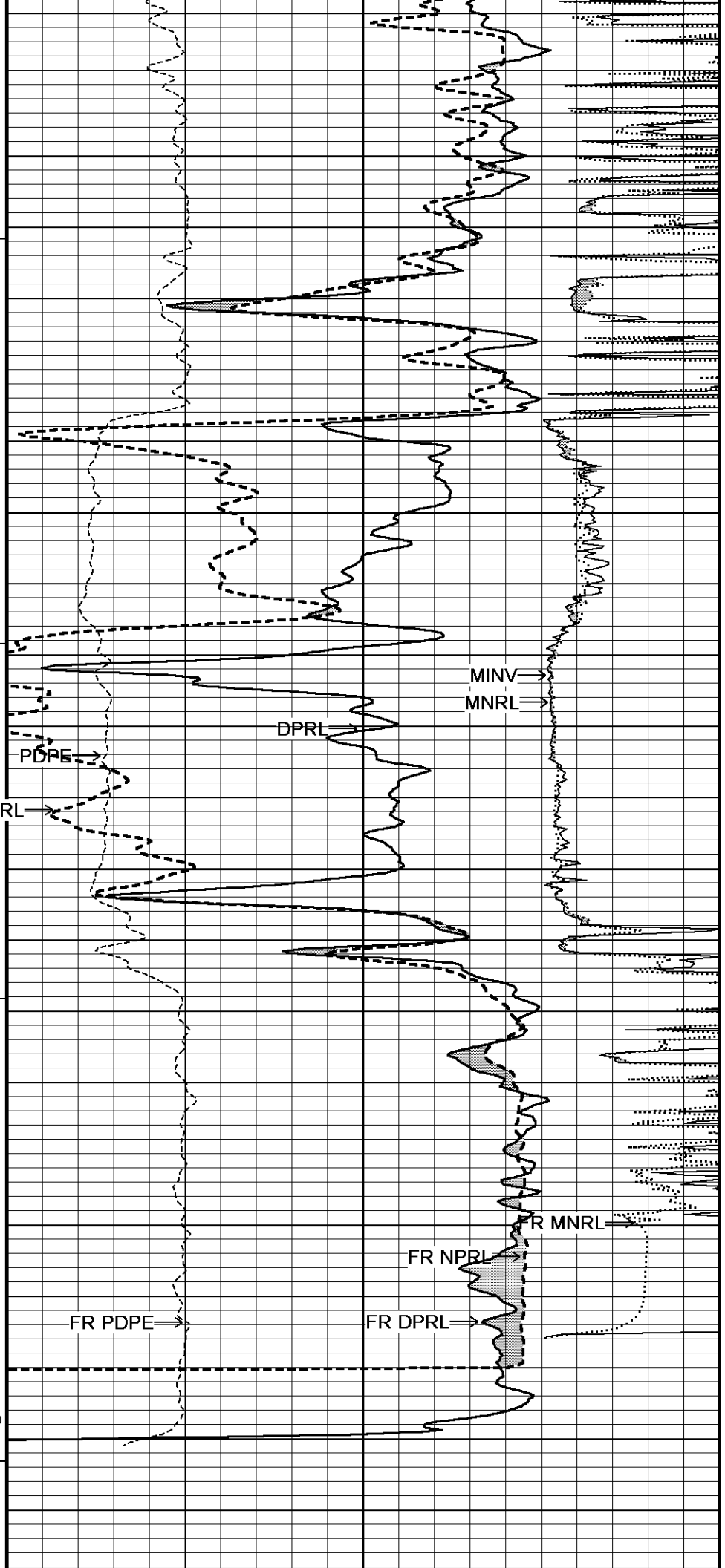
111°

4800

110°

4850

TD



Bit Size
inches

6 11 16

DST Uphole Tension
pounds

5000 0

Integral
every
10 cu ft

Replay
Scale
1:240

3800

200

104°

3850

105°

3900

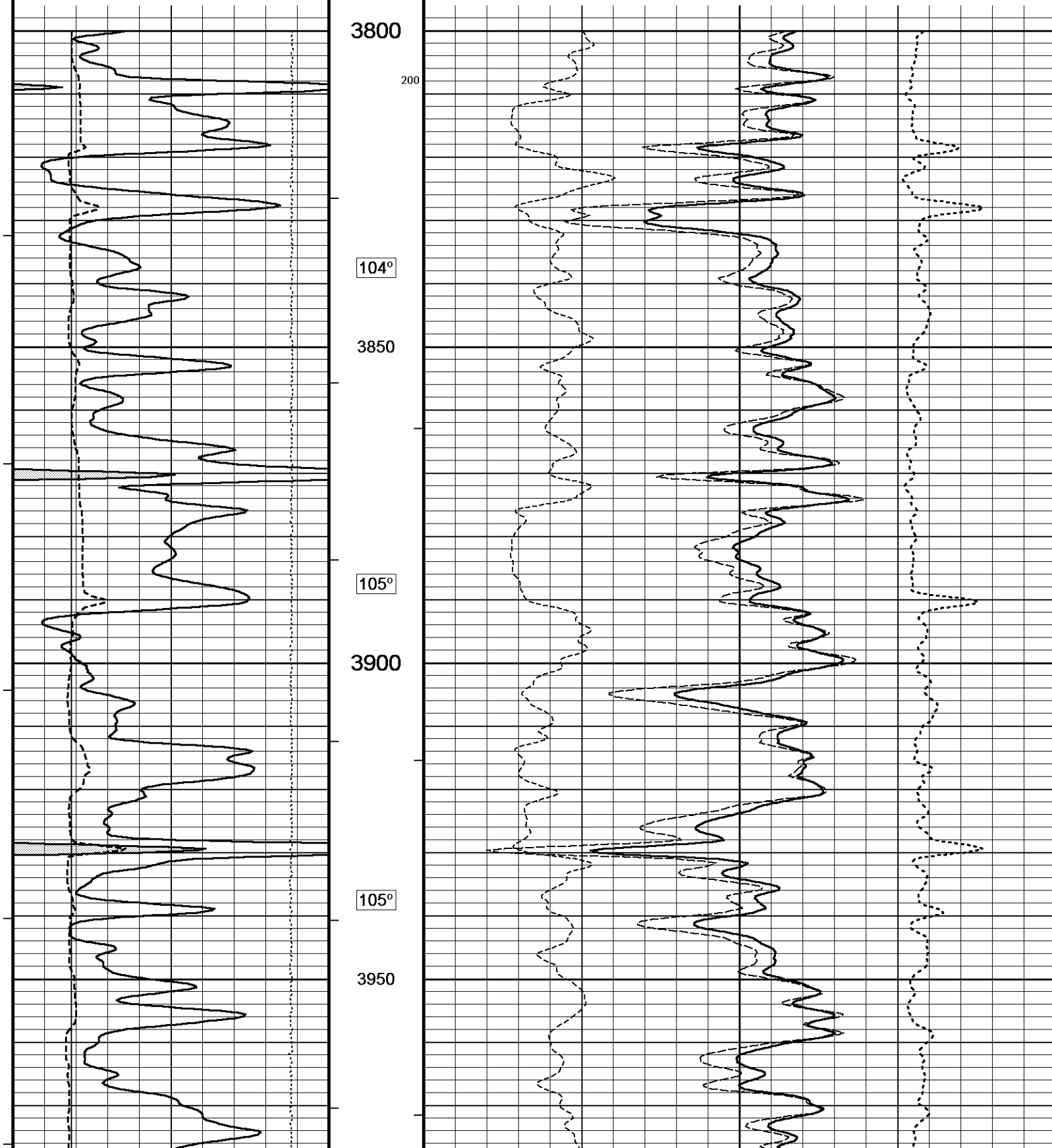
105°

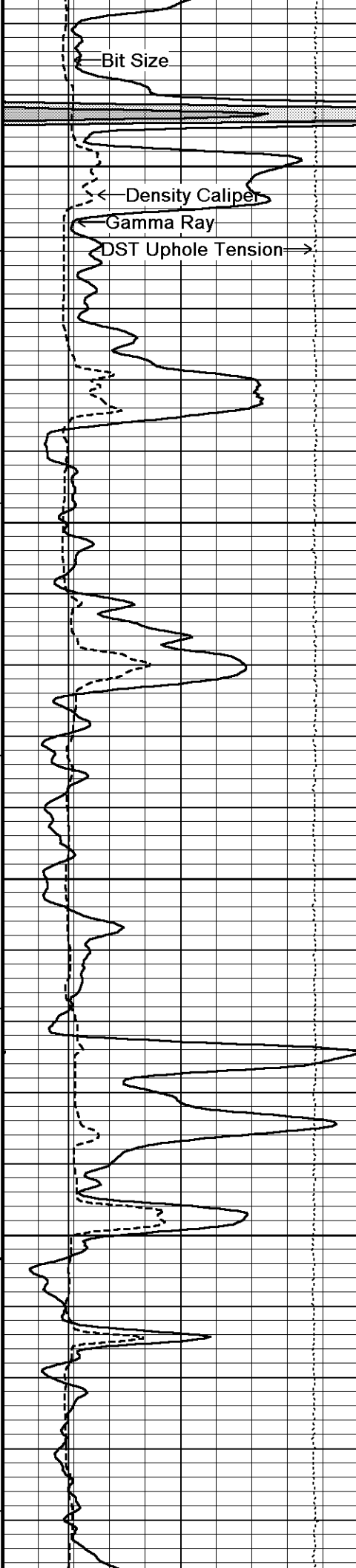
3950

PE
barns/electron

Density Correction
grams/cc

0 5 10 -0.50 0 0.50





105°

4000

300

105°

4050

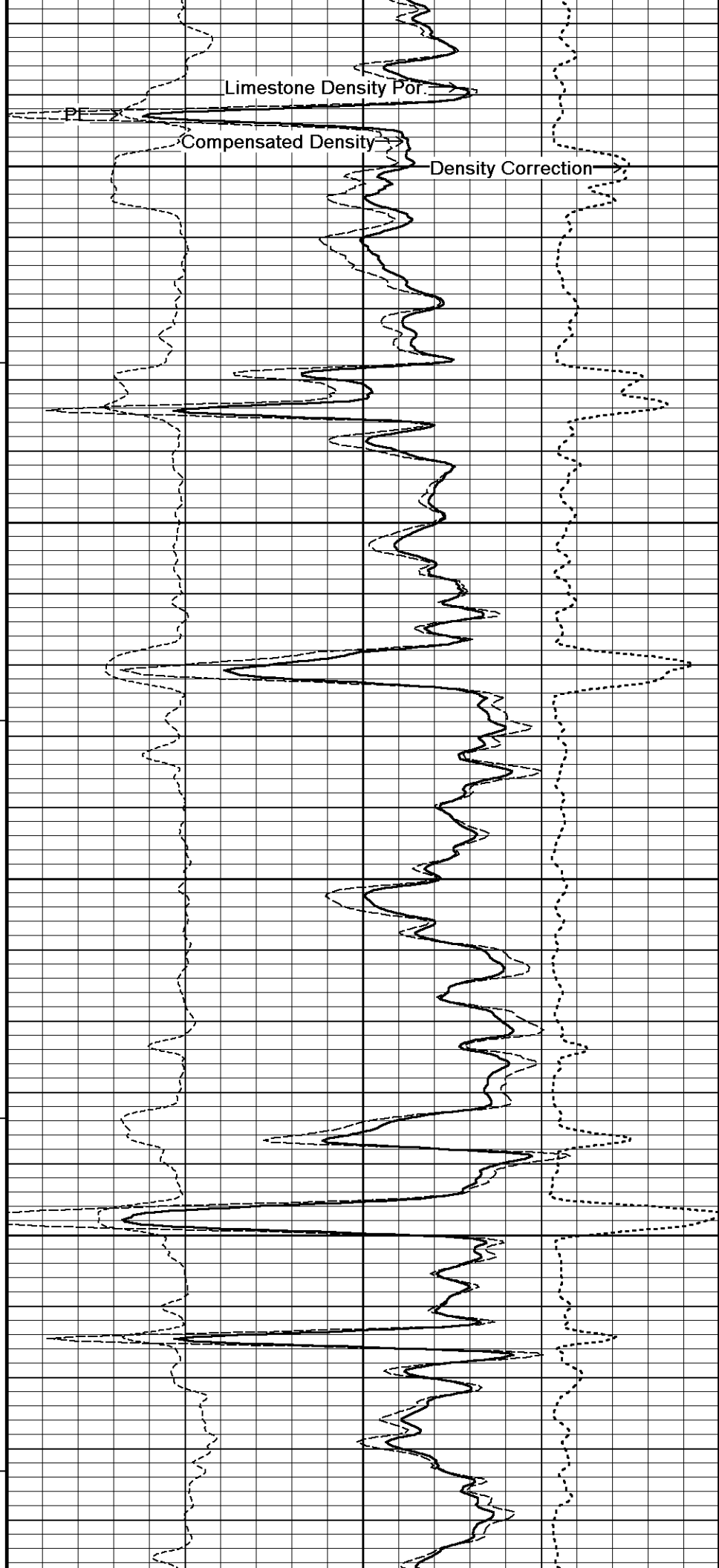
106°

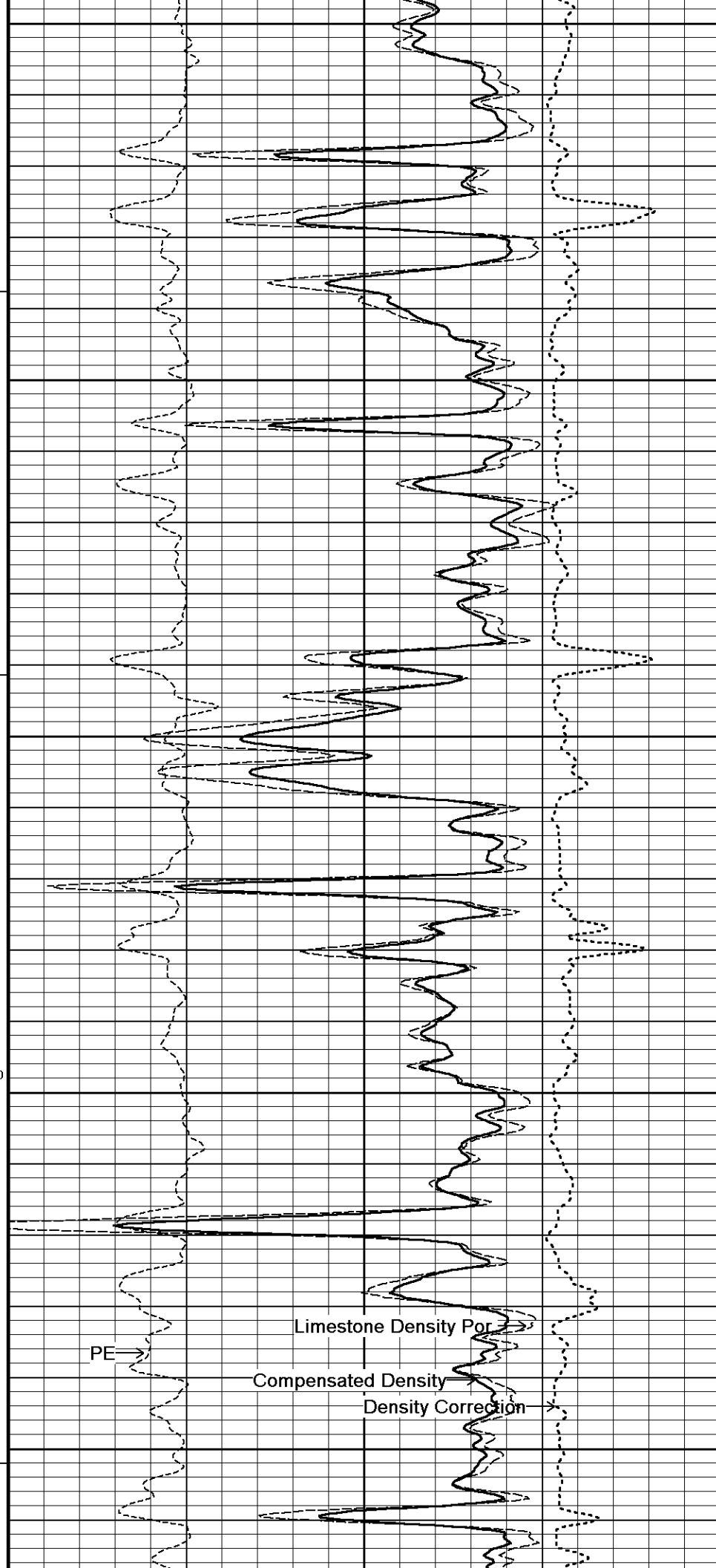
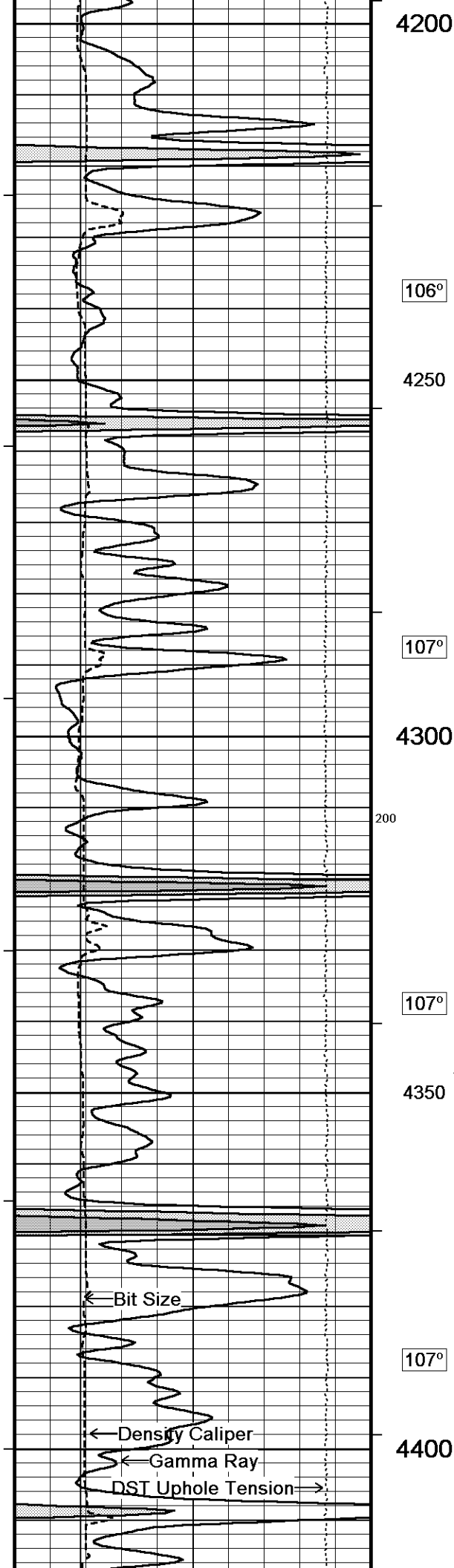
4100

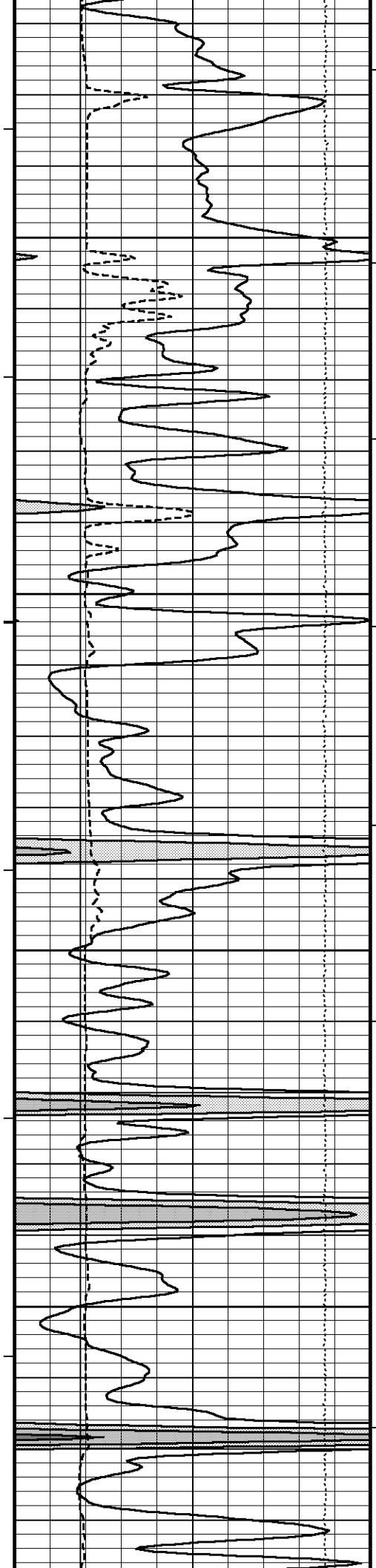
106°

4150

106°







107°

4450

108°

4500

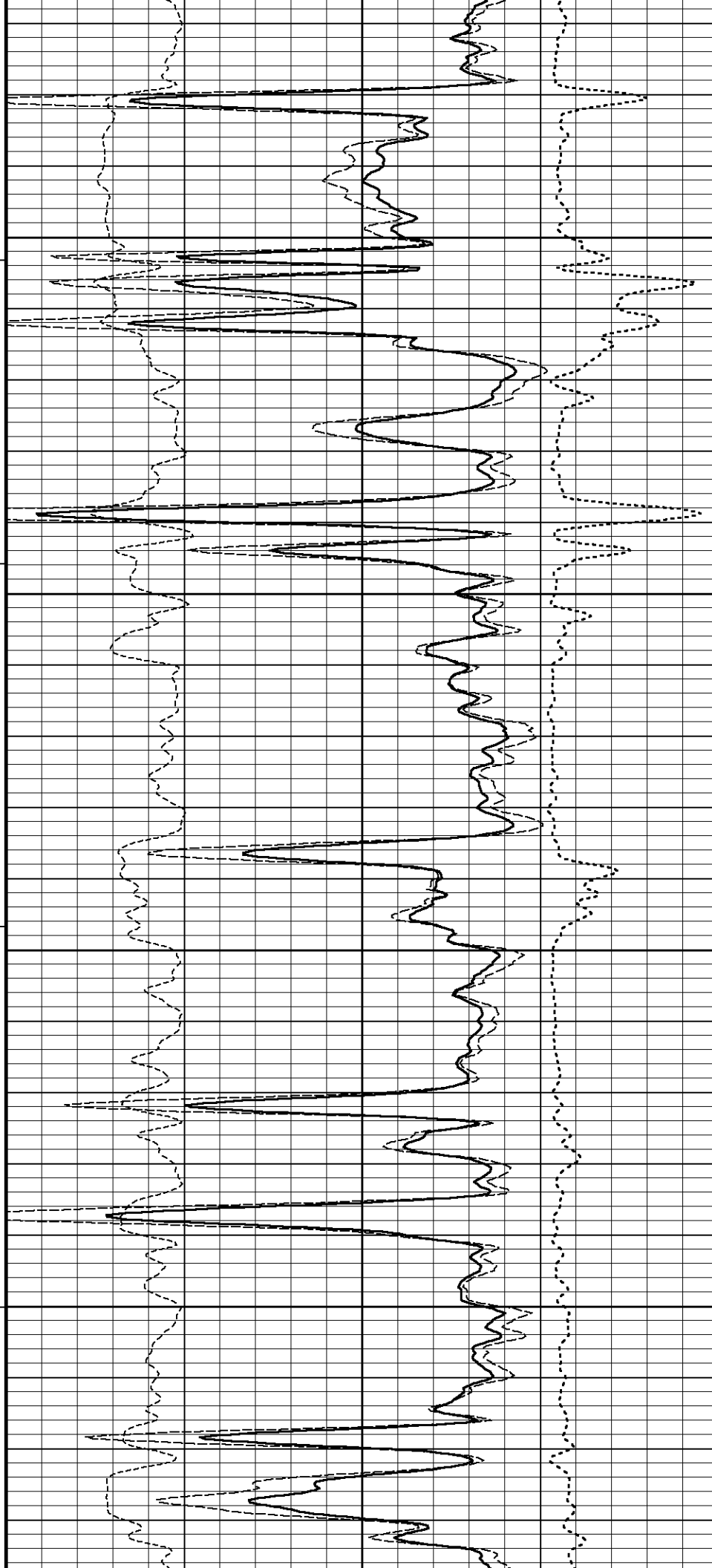
109°

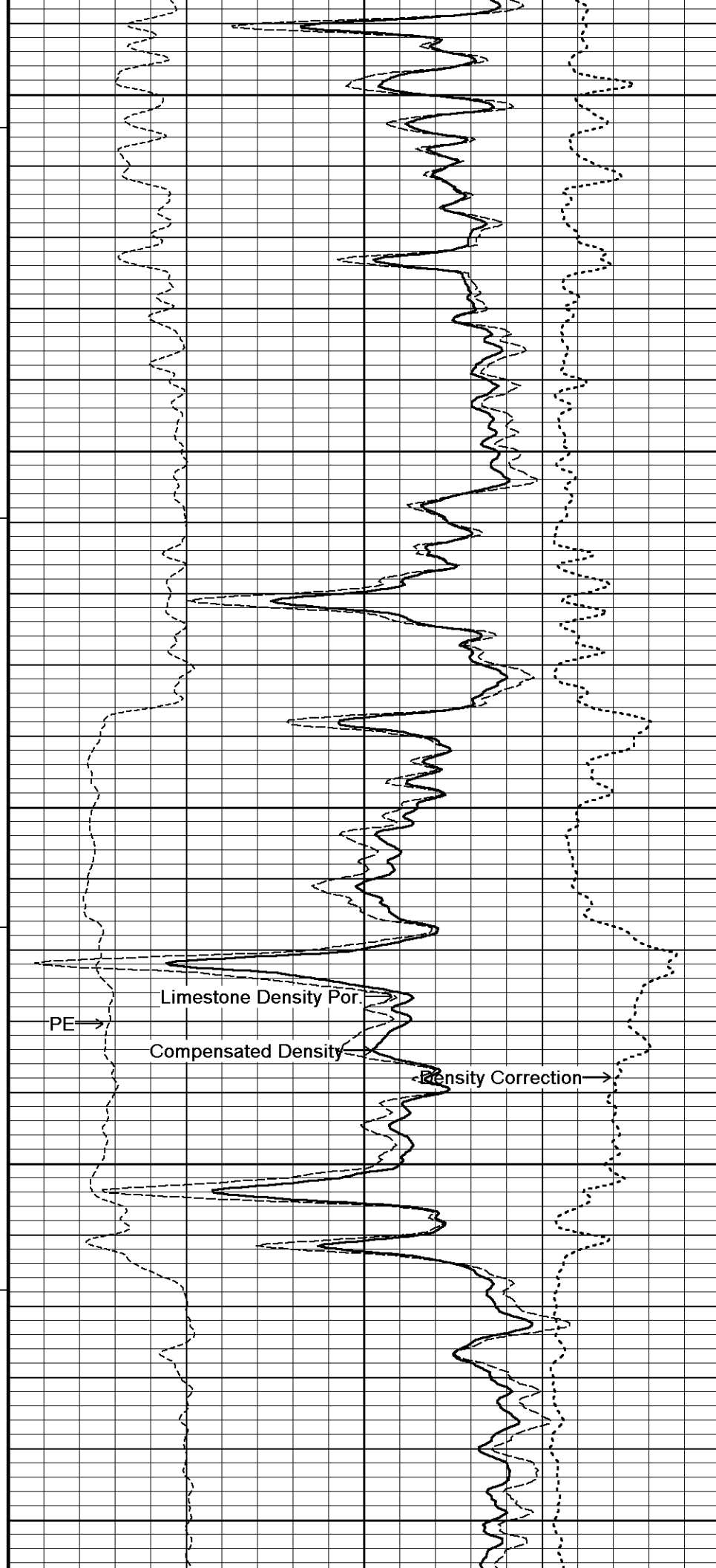
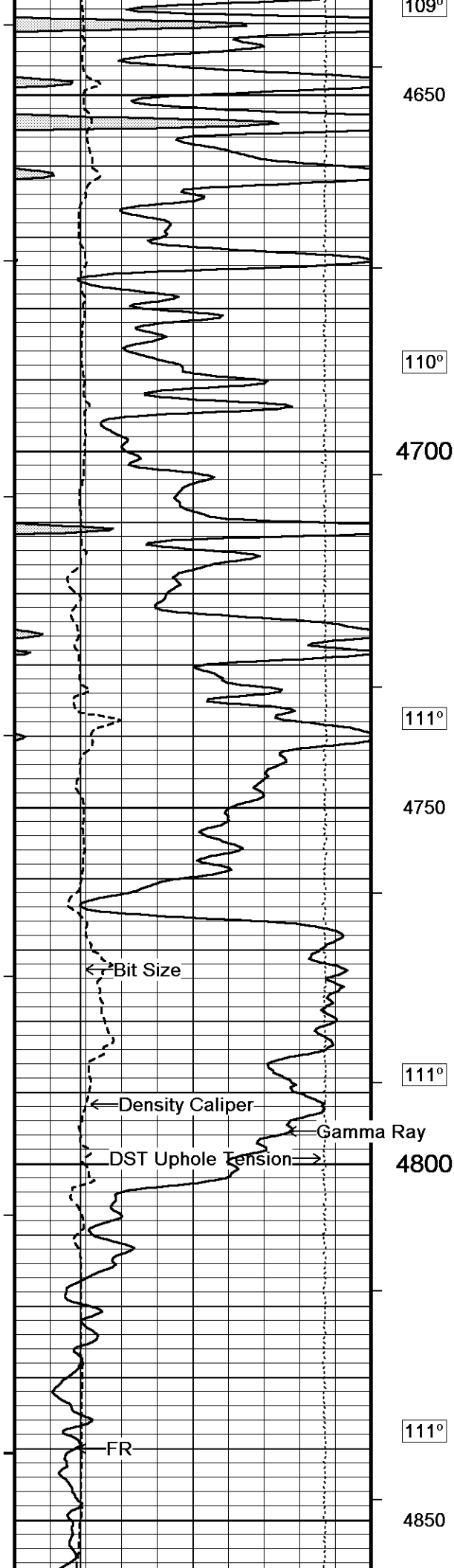
4550

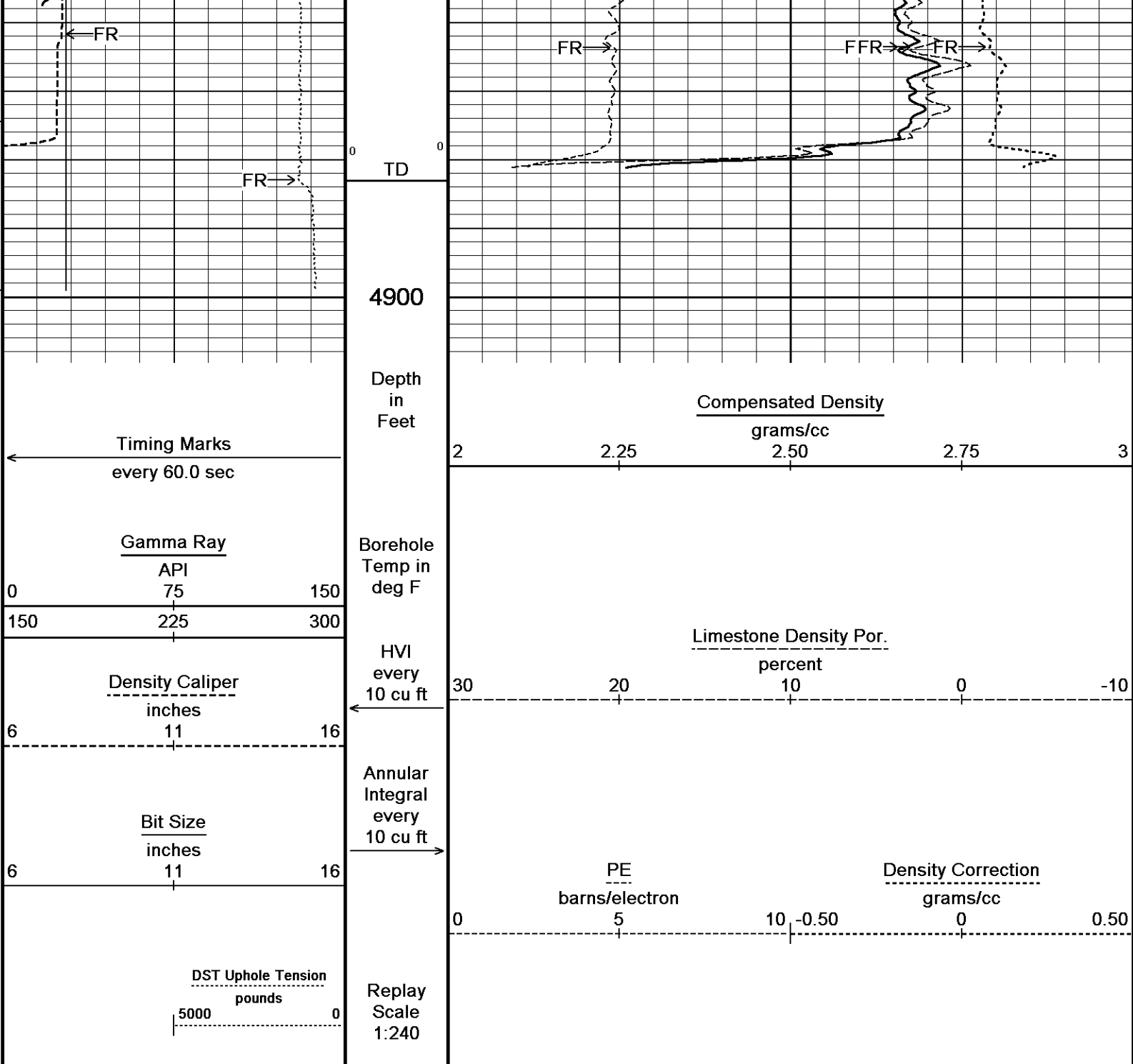
109°

4600

100°





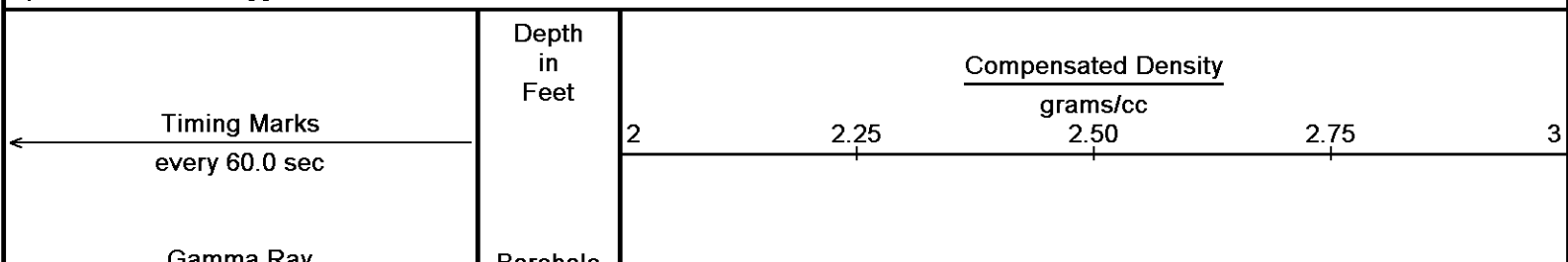


Depth Based Data - Maximum Sampling Increment 10.0cm	Plotted on 18-SEP-2014 17:16
Filename: C:\Minimus 13.08.2113\Log Data\Shake...\Shakespeare Church of God #2-27 Main Detail.dta	Recorded on 18-SEP-2014 16:29
System Versions: Logged with 13.08.2113 Plotted with 13.08.2113	

↑	5 INCH BULK DENSITY MAIN	↑
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↓	REPEAT SECTION	↓
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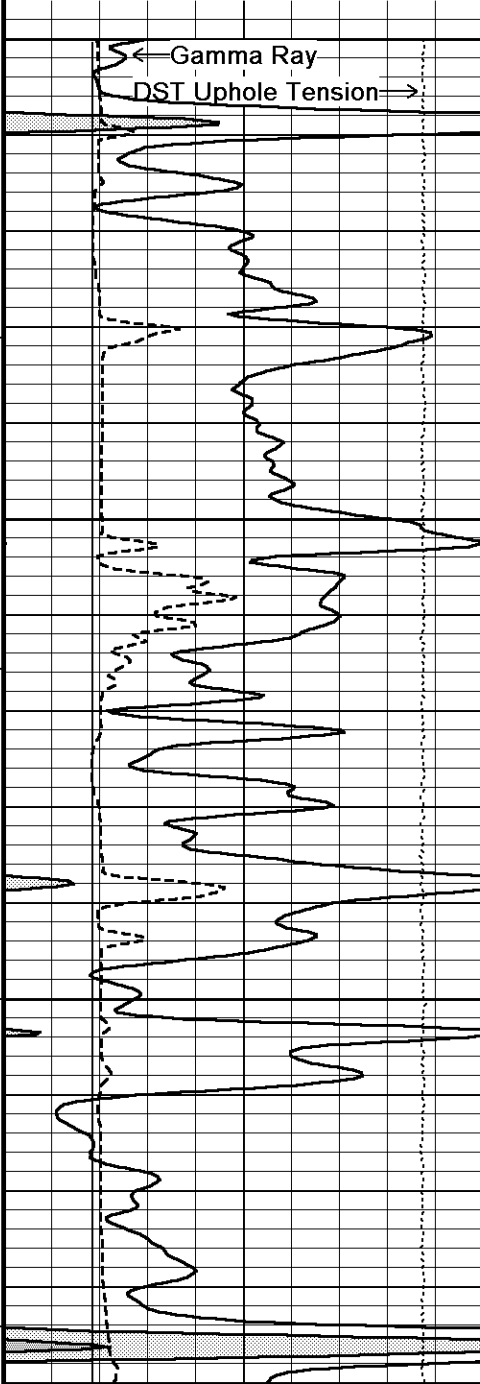
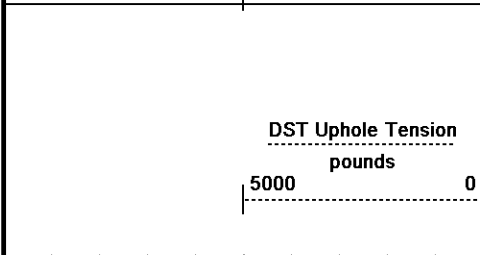
Depth Based Data - Maximum Sampling Increment 10.0cm	Plotted on 18-SEP-2014 17:16
Filename: C:\Minimus 13.08.2113\Log Data\Shakespe...Shakespeare Church of God #2-27 Repeat.dta	Recorded on 18-SEP-2014 14:54
System Versions: Logged with 13.08.2113 Plotted with 13.08.2113	



Gamma Ray		
API	0	150
75		
150	225	300

Density Caliper		
inches	6	16
11		

Bit Size		
inches	6	16
11		



Borehole
Temp in
deg F

HVI
every
10 cu ft

Annular
Integral
every
10 cu ft

Replay
Scale
1:240

4400

107°

4450

108°

4500

108°

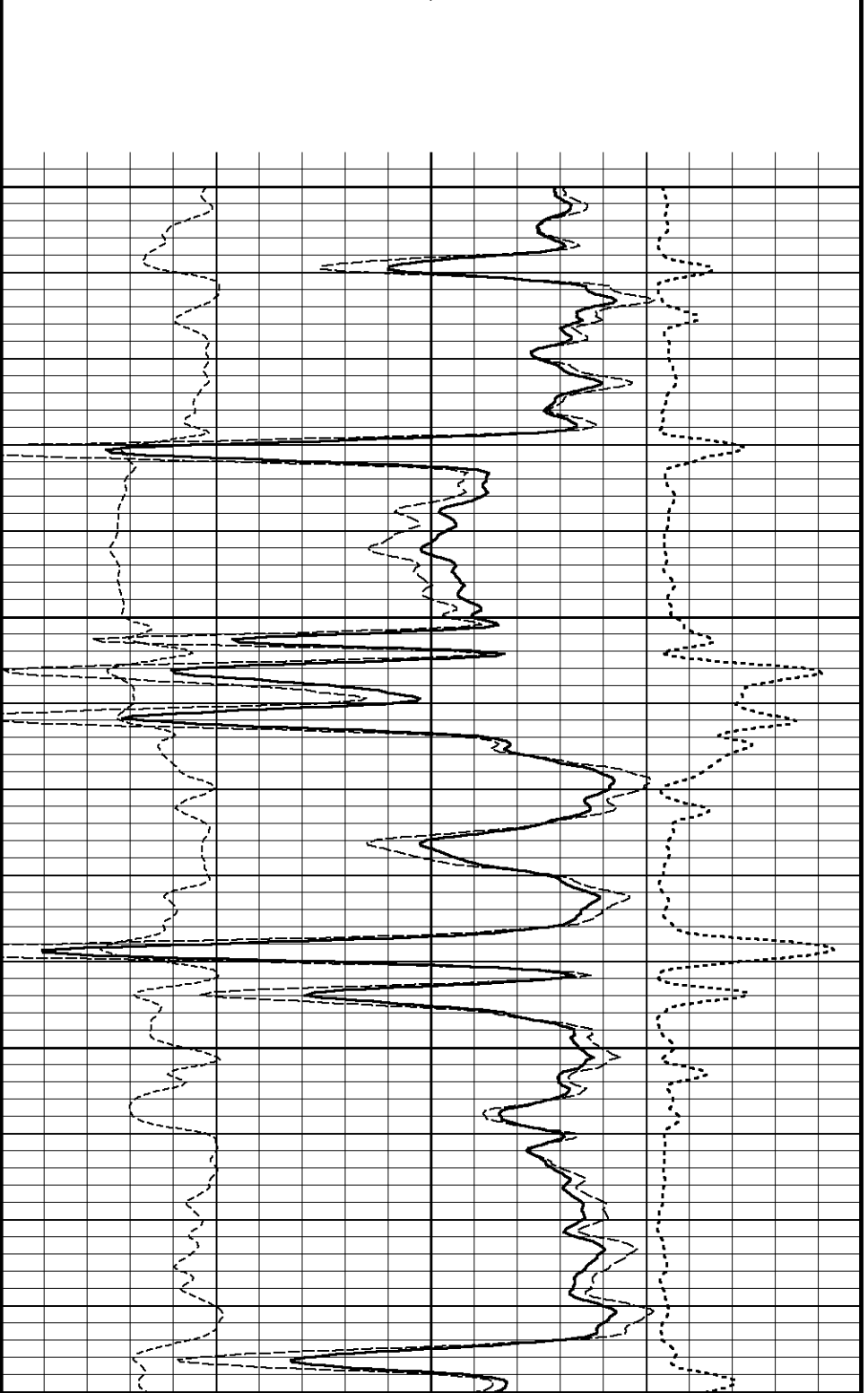
Limestone Density Por.
percent

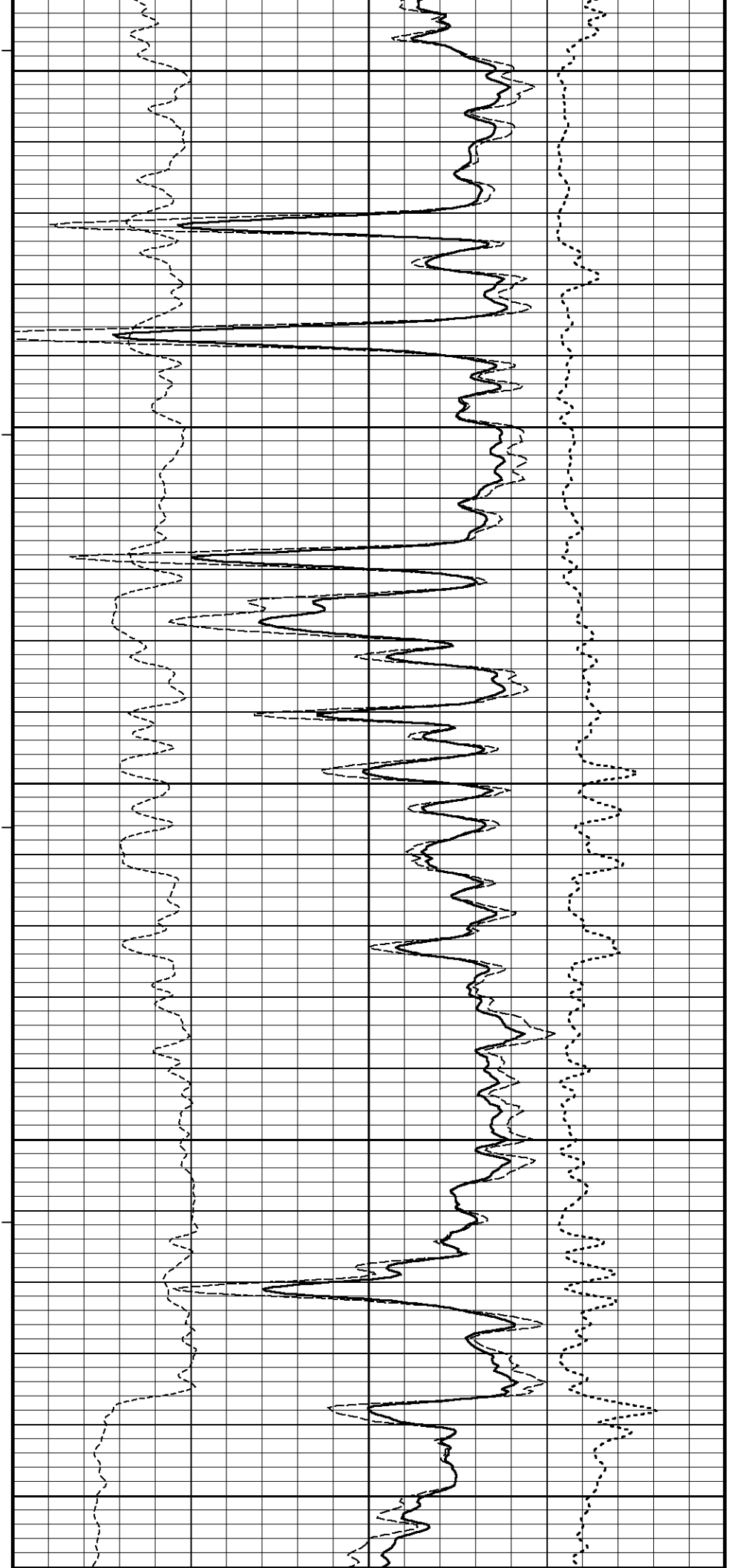
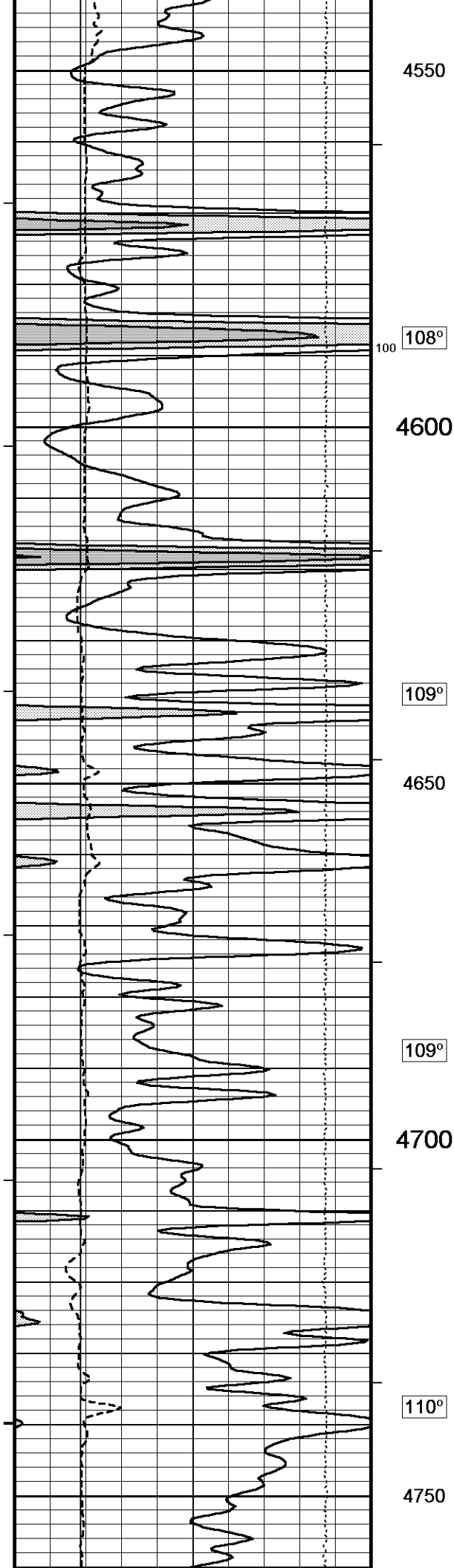
30 20 10 0 -10

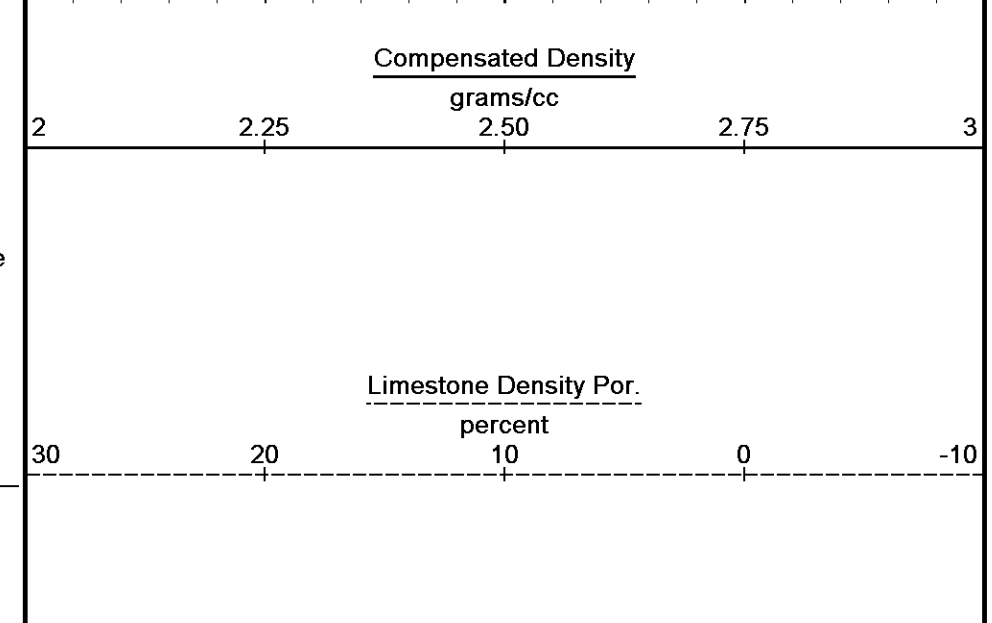
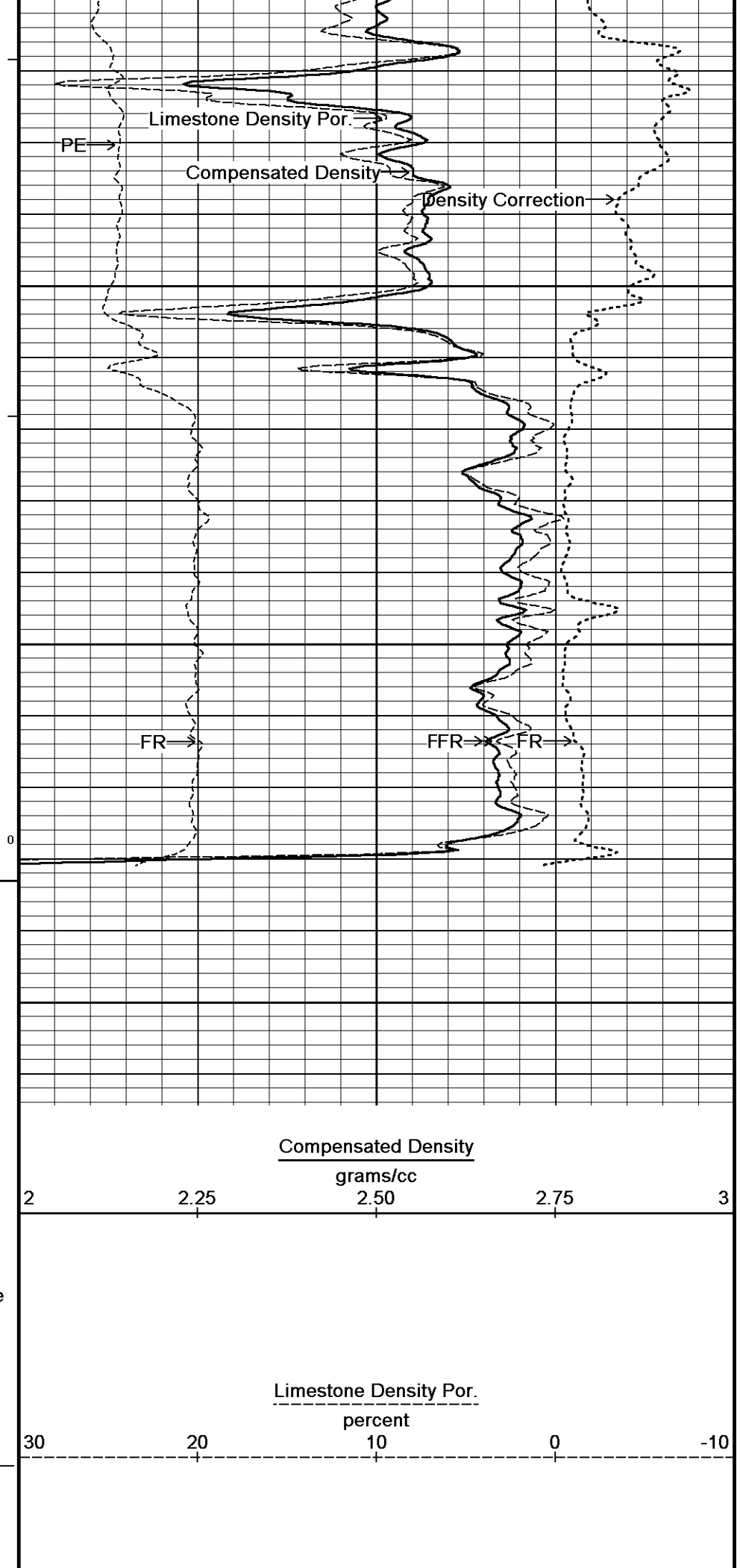
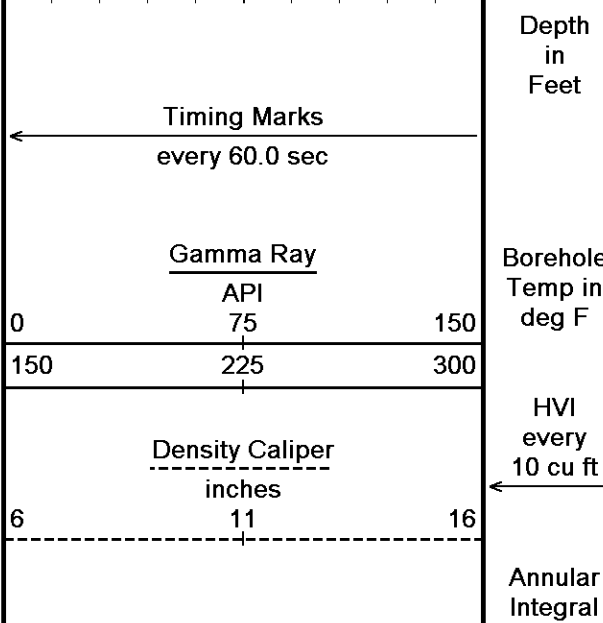
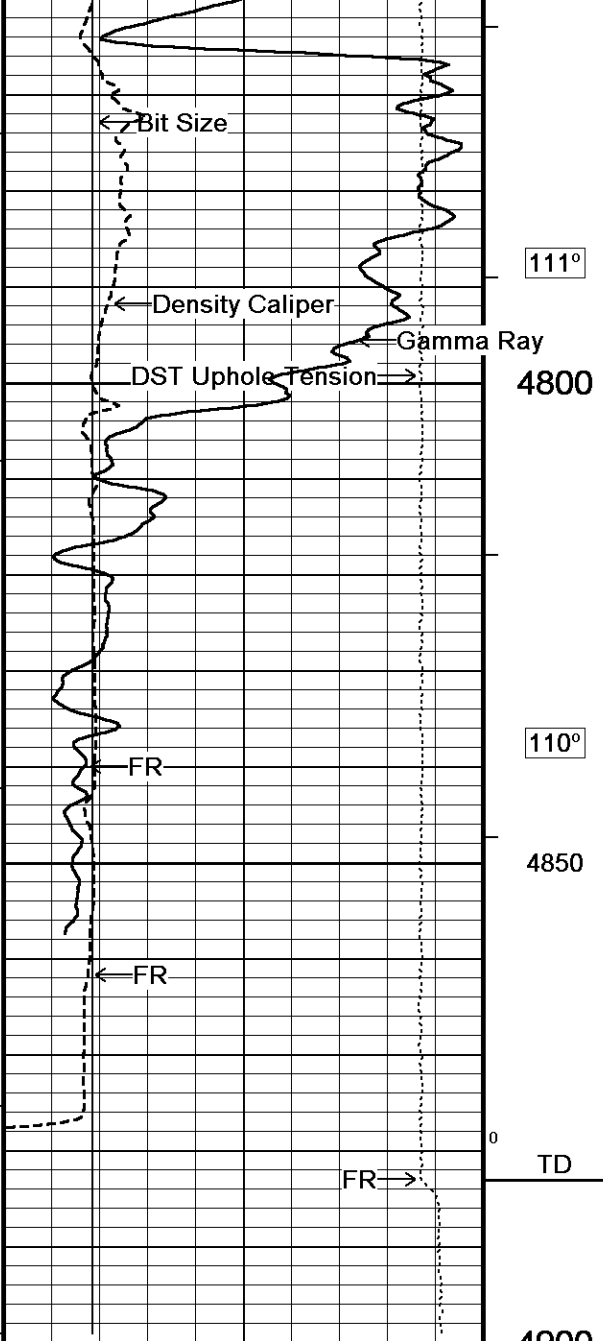
PE
barns/electron

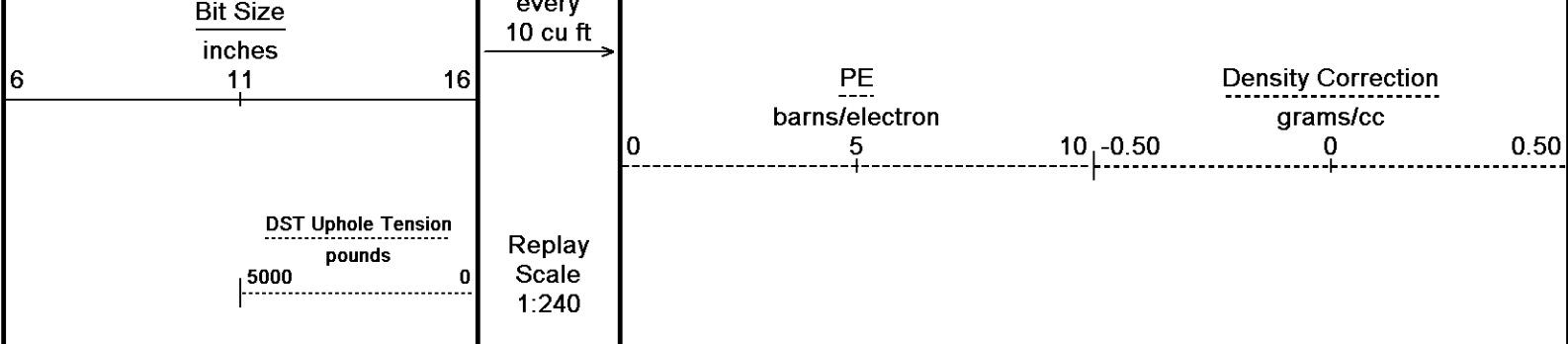
Density Correction
grams/cc

0 5 10 -0.50 0 0.50









Depth Based Data - Maximum Sampling Increment 10.0cm
 Plotted on 18-SEP-2014 17:16
 Filename: C:\Minimus 13.08.2113\Log Data\Shakespeare...\Shakespeare Church of God #2-27 Repeat.dta
 Recorded on 18-SEP-2014 14:54
 System Versions: Logged with 13.08.2113 Plotted with 13.08.2113

↑ REPEAT SECTION ↑

BEFORE SURVEY CALIBRATION
 C:\Minimus 13.08.2113\Log Data\Shakespeare Church of God #2-27\Shakespeare Church of God #2-27 Main.dta

General Constants All 000			Last Edited on 18-SEP-2014,13:21		
General Parameters					
Mud Resistivity	0.600		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	None				
Rwa Parameters					
Porosity used	Crossplot Porosity				
Resistivity used	Array Ind. One Res Rt				
RWA Constant A	0.610				
RWA Constant M	2.150				
SW/APOR Tool Source	0.000				

Gamma Calibration MCG-D.K 469			Field Calibration on 19-AUG-2014 08:47		
	Measured		Calibrated (API)		
Background	68		46		
Calibrator (Gross)	1127		771		
Calibrator (Net)	1059		725		

Gamma Constants MCG-D.K 469			Last Edited on 17-SEP-2014,20:44		
Gamma Calibrator Number	GRC038				
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		%		

High Resolution Temperature Calibration MCG-D.K 469			Field Calibration on 12-MAY-2014,02:16		
	Measured		Calibrated(Deg F)		
Lower	10.00		10.00		
Upper	100.00		100.00		

High Resolution Temperature Constants MCG-D.K 469			Last Edited on 13-JUL-2014,14:53		
Pre-filter Length	11				

Caliper Calibration MPD-C.A 216			Base Calibration on 04-SEP-2014 11:25		
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Base Calibration

Reading No	Measured	Calibrator Size (in)
1	17824	3.99
2	27984	5.98
3	38032	7.97
4	47728	9.86
5	58896	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
7.92	7.97

Photo Density Calibration MPD-C.A 216

Base Calibration on 04-SEP-2014 11:50

Field Check on 11-SEP-2014 11:20

Density Calibration

Base Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Background	1102	1298		
Reference 1	60531	31618	59556	30836
Reference 2	25133	2756	24941	2541

Field Check at Base

1101.5 1298.3

Field Check

1098.6 1290.0

PE Calibration

Base Calibration	WS	Measured		Calibrated
		WH	Ratio	Ratio
Background	199	981		
Reference 1	25096	60333	0.419	0.371
Reference 2	7209	25001	0.292	0.272

Field Check at Base

198.7 981.0

Field Check

200.5 978.2

Density Constants MPD-C.A 216

Last Edited on 17-SEP-2014,20:44

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 (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

DOWNHOLE EQUIPMENT

3/8" Triple Cone Cable Head (MCB C A)
MCB-C.A 234 LG: 1.58 ft WT: 15.4 lb OD: 2.240 in

Compact Comms Gamma
MCG-D.K 469 LG: 8.70 ft WT: 63.9 lb OD: 2.240 in

Compact Micro-log
MML-A 3 LG: 7.97 ft WT: 81.6 lb OD: 2.240 in

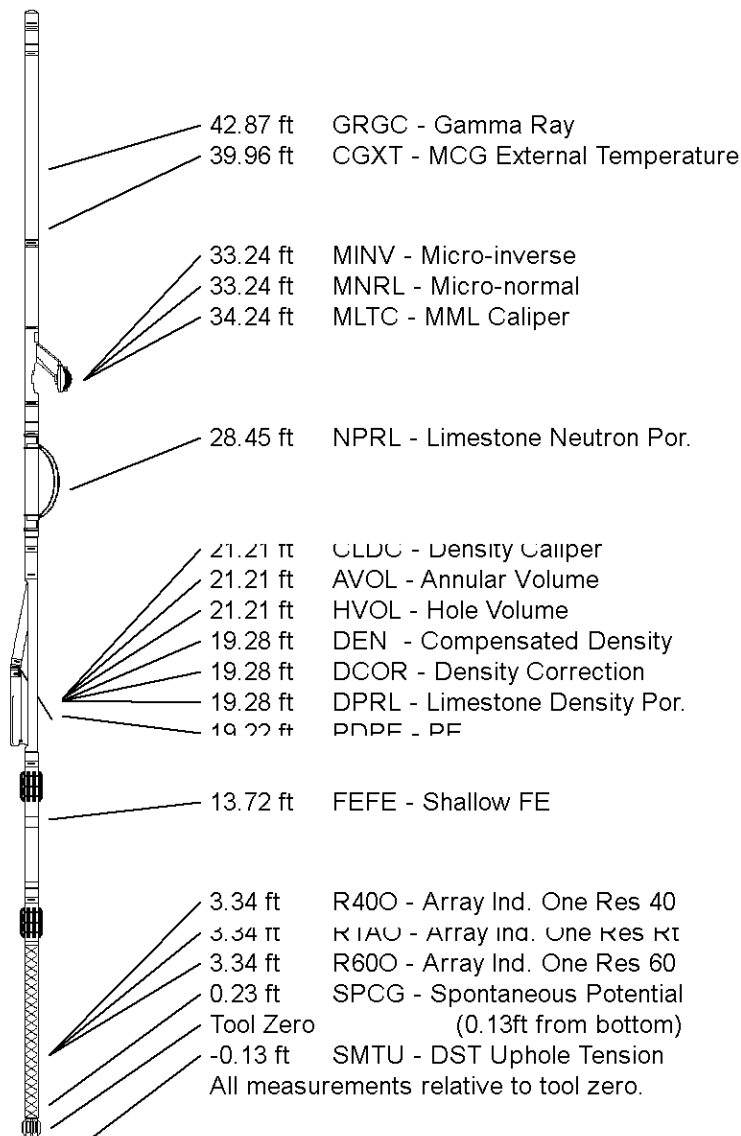
Compact Neutron
MDN-A.B 66 LG: 5.04 ft WT: 50.7 lb OD: 2.244 in

Compact Density/Caliper
MPD-C.A 216 LG: 9.59 ft WT: 90.4 lb OD: 2.449 in

Compact Focussed Electric
MFE-B.J 353 LG: 6.05 ft WT: 48.5 lb OD: 2.244 in

Compact Induction
MAI-A.A 178 LG: 10.81 ft WT: 48.5 lb OD: 2.244 in

Total Length: 49.73 ft Weight: 399.0 lb



COMPANY	SHAKESPEARE OIL CO., INC.
WELL	CHURCH OF GOD #2-27
FIELD	PENCE
PROVINCE/COUNTY	SCOTT
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	3129.00	feet	First Reading	3800.00	feet
Elevation Drill Floor	3127.00	feet	Depth Driller	4890.00	feet
Elevation Ground Level	3119.00	feet	Depth Logger	4883.00	feet



Weatherford®

COMPACT PHOTO DENSITY
COMPENSATED NEUTRON
MICRORESISTIVITY LOG